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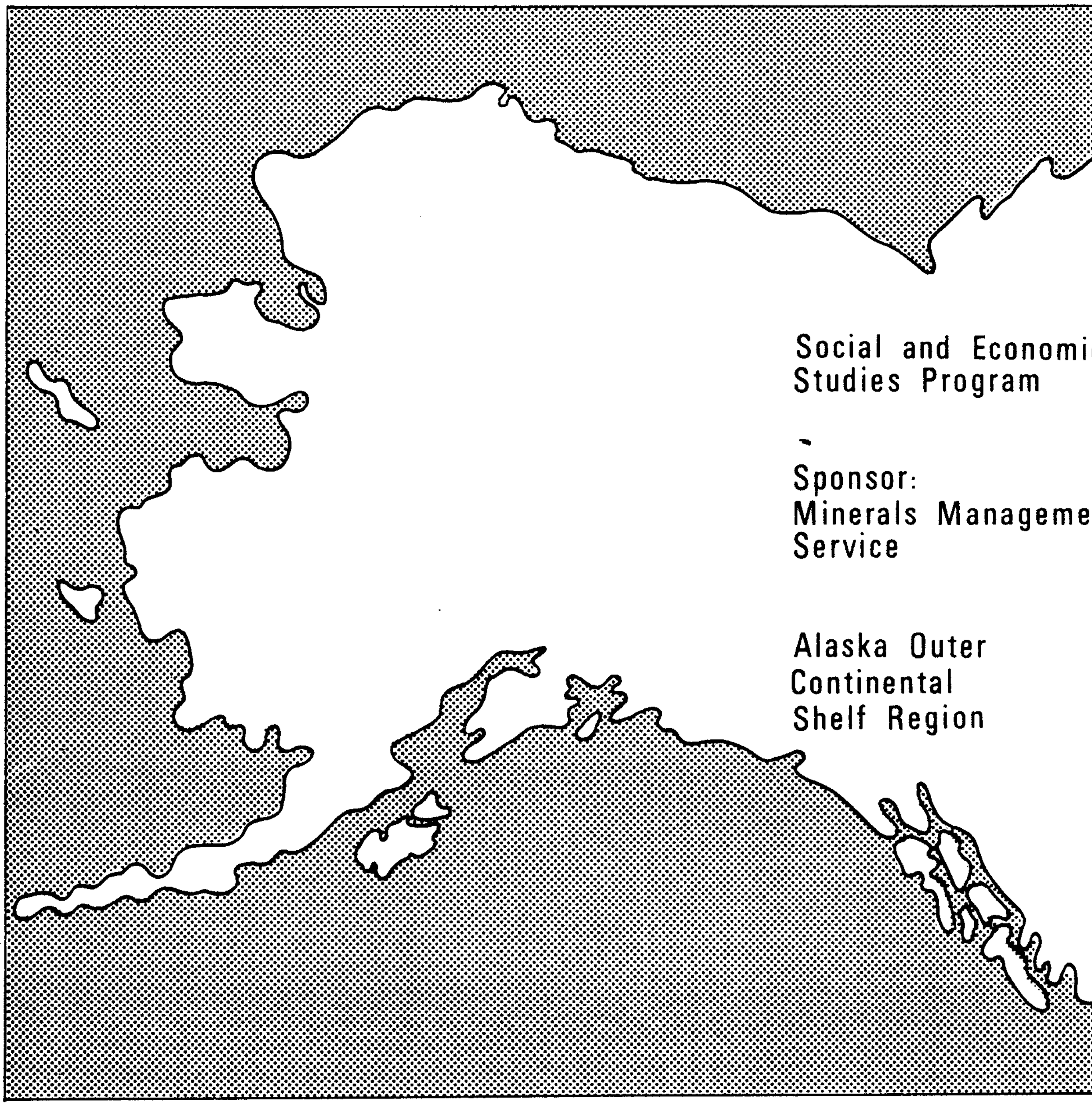

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A Description of the Socioeconomics of Norton Sound

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A DESCRIPTION OF THE SOCIOECONOMICS OF NORTON SOUND

Prepared for:

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A Description of the Socioeconomics of Norton Sound

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Abstract

This study focuses on three main variables--economic activity, employment opportunity and inflation--which may be expected to change significantly in the Norton Sound region of Alaska as a result of OCS activities. They are treated as independent variables in the analyses and forecast of the report. Five primary impact categories--demography, economics, social organization, values and attitudes, and infrastructure--were studied. The aim has been to create a systematic typology of the characteristics of a sample of Norton Sound communities.

Primary and seconday data included key informant data about institutions and organizations and information on extended household networks. Data was collected through the use of protocols that provided uninformity of information. Field data were collected from 82 families in the villages of Savoonga, Nome, Golovin, Unalakleet, and Emmonak. Some primary data from Alakanuk and Gambell were also used in portions of this analysis. Aggregate data were retreived from local, regional, and centralized state sources. The data were analyzed in two stages, the first based on univariate, bivariate, and trend analysis techniques, and the second on multivariate analysis that led to a typology and forecasting methodology.

The analysis is predicated on several assumptions that establish a context for interpreting and later applying the forecasting model. We suggest that most avenues of direct economic impact on Norton Sound communities can be ruled out of consideration. The region lacks the geographical, infrastructural, commercial, and other economic assets to attract offshore industries and workers. The main potential for direct economic interaction between OCS development and the local economies may be through resident participation in the OCS workforce. Other effects may be dependent on the ability and interest of local organizations and entrepreneurs to capitalize on opportunities arising from the development process.

Findings are summarized below:

1. The higher the income of a household, the greater the proportion and the diversity of subsistence protein in the diet.

2. The greater the household income, the more predictable it is.
3. The higher the ratio of males to females in a community, the greater the diversity of subsistence resources used.
4. The greater the proportion of subsistence protein in household diets, the greater the diversity of subsistence harvests.
5. Increased investment in subsistence pursuits results in increasing proportions of subsistance protein in the diet to a certain point, beyond which increased investments leads to wider distribution of subsistence protein to other households.
6. The age of the head of household is associated with both the proportion of income invested in subsistence pursuits and the proportion of subsistence protein in the diet up to a point. Elders, however, continue to consume large proportions of subsistence protein secured with the assistance of younger kinsmen.
7. Younger households with relatively low subsistence investments but which are part of large kin networks enjoy access to relatively high and diverse subsistence harvests.
8. Almost all households, regardless of income, are intensively engaged in subsistence, directly or indirectly.
9. Larger villages reflect more coordination, have more autonomy in institutional functions, and are more polarized than smaller communities.
10. The larger the village, the higher the degree of institutional specialization and institutional tensions, and the lower the degree of cooperation. (See Chapter 4.)
11. The larger the village, the smaller the proportion of dependents (elders and children), indicating an economically influenced (wage and subsistence) migration from smaller to larger communities. Thus, perceived economic opportunities and employment tend to draw able-bodied people away from smaller to larger communities, at least temporarily.
12. Membership in voluntary, informal organizations increases as community size increases. These organizations function to bring people together to compensate for the functions larger institutions cannot or do not provide.
13. Membership in institutions (political and otherwise) increases with household income.

Based on our findings we conducted a path analysis that resulted in development of a typological path model (see Chapter 5.) This model is keyed to the effects of the exogenous project variables and, if validated, may be used in forecasting applications.

I. METHODS AND OBJECTIVES

1.1 Objectives

The objectives of this study are to develop an understanding of current conditions and trends of change in the local economic processes of Norton Sound communities. In carrying out these objectives, the study will provide a detailed description of the economic structures of the region, especially those sensitive to the economic activities associated with oil and gas exploration, development, and production. The study boundaries include all of Norton Sound from Teller on the west through Unalakleet on the east, and also include St. Lawrence Island and the Yukon Delta communities. As a final product the study will lead to the development of forecasting methods appropriate for assessing changes likely to occur as a result of oil and gas activity in the region.

The research accounts for historical and contemporary relationships among communities in social and economic activities that group communities in clusters. The clusters, or types, respond differently to changes from place to place. An understanding of these patterns requires a solid descriptive base and a comprehensive comparative analysis. The potential OCS impacts of inflation, increased economic activity in general, and increased employment opportunity are of key importance in the research. The ramifications of these impacts are researched to integrate data and findings from formal institutions, domestic groups, economic activities, and cultural practices. Indigenous forms of social organization, domestic functions, subsistence production and distribution patterns, and traditional attitudes play critical roles in the research, as do large scale economic processes, institutional and infrastructural change, regulatory processes, and capital development. The study is charged with developing a synthetic understanding of these interrelated variables and their bearing on local responses to potential OCS development.

This final report represents edited and consolidated versions of all previous project reports (the methods, descriptive analysis, and Nome Update products, technical memoranda 83/88 - 1, 2, and 3, respectively) as well as additional analysis and foreasting methodology. An additional and subsidiary objective of the project is the updating of OCS Technical Report Number 53 (Ender et al), a Nome baseline document now several years out of date in some significant respects.

1.2 Research Team

Research reporting and analysis was carried out by the Co-Principal Investigators Dr. Lynn Robbins and Steven McNabb and socioeconomic analysts Kevin Waring and Paul Wasserman. Drs. Joseph Jorgensen, Richard McCleary, and Ron Little provided technical consultation on many aspects of the research. Dr. Ken Weber assisted our demographic analysis, and Dr. George Hicks reviewed the report. Kawerak Inc., Sitnasuak Inc., the Bering Straits Coastal Resource Service Area Board, the Association of Village Council Presidents Inc., and the IRA Councils, corporations, and city councils cooperated in each of the study communities.

Field investigations were carried out early in the study by Dr. Lynn Robbins at Savoonga in conjunction with OCS harvest disruption research. Paula Rasmus subsequently travelled to Nome twice to collect data. Golovin (Rasmus), Unalakleet (Zilys and Maxwell), and Emmonak (Topping) followed as sites in our sample. Paul Wasserman collected aggregate and institutional data on two field excursions (Nome and Juneau). Researchers were assisted by agency representatives and local authorities in all these communities. All of our associates in the field played important roles in carrying out this research. These include Marie Levi in Emmonak; Harry Boone and Margaret Olson in Golovin; Vernita Zilys and Paul Katchatag, as well as Weaver and Herbert Ivanoff and Tim Towaruk in Unalakleet; Tim Slwooko and many others in Savoonga; and 82 families who willingly gave of their time in what were often protracted, grueling discussions over a period of days.

Local and regional authorities participated in and, in many cases, aided in this study. For instance, a formal memorandum of understanding between the John Muir Institute and the Association of Village Council Presidents established a firm cooperative arrangement for research in the Yukon delta. Local research associates and bilingual translators assisted the field researchers in many phases of research, and many households and institutional representatives provided us not only with rich information for analysis but also viewpoints and outlooks on this information that have helped us to make sense of it. As a whole all primary data collection activities were well received and productive. We are also fortunate to be able to include primary data from Gambell. Dr. Fienup-Riordan graciously provided a sample of 16 Alakanuk households, and arranged the data in such a way as to allow analysis against other site villages for many of the variables we analyzed. These household data stem from her parallel harvest disruption analysis funded by the Alaska Council on Science and Technology.

1.3 Organization and Summary of the Document

The introductory chapter accomplishes three goals: 1) restatement of the study objectives; 2) description of the organization of the the research team and report; 3) methodological review that summarizes parts of Technical Memorandum 83/88-1 and describes the study approach and some selected background information derived from secondary literature, as well as site selection, data collection methods, and the analysis. This chapter was written by Steven McNabb and Lynn Robbins.

Chapter two, "Socioeconomic Description of Norton Sound", provides socioeconomic and cultural background on the study area and describes the primary and secondary data collected and analyzed during the research. Kevin Waring, Lynn Robbins and Steven McNabb prepared the regional descriptions. The subregional and village descriptions and discussions of the primary and secondary data were written by Steven McNabb and Lynn Robbins with contributions from other team members.

Chapter three, "Demographic Analysis", describes the demography of the study area. The significance of selected demographic features of the communities requires presentation separate from demographic discussion in other chapters. This chapter was written by Ken Weber.

Chapter four, "Analysis", consists of three parts, "A Framework for Impact Analysis", "Typological Analysis", and "Typological Generalizations". The first, prepared by Kevin Waring, lays the groundwork for later interpretation of what OCS impacts are likely and what these impacts may mean in the larger analysis. Steven McNabb wrote the second and third sections which condense the general analysis of the primary data into compact and testable generalizations.

Chapters five ("Synthesis of the Model") and six ("Validation and Application"), also by Steven McNabb, end the report by first describing the typological forecasting model that results from the analysis and justifying it and then by describing how such a model should be used.

Numerous appendices support these chapters, and readers should examine them since they contain much of the corroborative detail to the text. For example, Appendix A ("Data Collection and Analysis Protocols") provides much detail, and spells out the steps followed and actual collection guidelines employed at field sites. Appendix B ("Methodological Review") provides a more theoretical and technical explanation of study methodology. Appendix C ("Sample Characteristics") describes the distribution of data collected at field sites and provides a picture of specific subpopulations. These appendices were assembled by Steven McNabb. Appendix D is Technical Memorandum 83/88-3, the Nome Update. This document is intended to update OCS Technical Report 53 and provides a great deal of detail on Nome and the institutions centered there. It is important to understand the role of Nome and regional institutions and put them in larger perspective. This document was written by Kevin Waring and Paul Wasserman. Appendix E, written by Paul Wasserman, is a comprehensive village-level socioeconomic data base. Data from it are contained in the text, but the base itself is included here for reader reference. The last appendix ("Path Analysis Techniques") provides technical background on the modeling approach we used and was written by Steven McNabb.

1.4 Review of Relevant Literature

Recent research has identified similarities and contrasts that suggest the usefulness of the concept of village "types". Correll's (1972) work in Norton Sound showed how durable historical ethnic shifts are in current perceptions and that current community and family solidarity and mutual assistance alliances are linked to ethnic composition and history. Ellanna's (1980) analysis in the Norton Sound area built explicitly on typological comparisons based on resource exploitation strategies that have been current in subsistence and anthropological analysis of Alaska Native groups for more than a decade (Oswalt, 1967). Kleinfeld, et al. (1981) and Kruse et al. (1981) in studies of North Slope Inupiat distinguished between a variety of income and employment, subsistence, and other socioeconomic variables that by their presence or absence may influence still other individual and community variables.

Recent work by study team members in Alaska, both in the OCS social indicators work and in other research, strongly suggests good potential for distinguishing between communities by differences in domestic and formal institutional processes, income levels, skill and resource distribution patterns, attitudes and perceptions concerning local autonomy and control as well as benefits of development and expectations about local institutions.

Past work indicates that subsistence investments (in labor and cash) in the region often seem quite high, but they generally turn out to be more productive and efficient than alternate investments or purchases. Wolfe's research in the Yukon Delta shows that family subsistence investments may exceed 30 percent of family income (Wolfe, 1979, P. 218). His sample, however, excluded many less productive hunters and fishers, and so the larger role of subsistence investments in entire populations remains unclear. Nonetheless, Wolfe's Kotlik data for the "highliner" families show how high the subsistence yield and low the unit cost of goods can be given substantial investments. He calculated an average overall cost of subsistence foods of about 30 cents per dressed pound (Wolfe, 1979, P. 221), a remarkably low figure and one lower than nearly any purchased substitute available locally. But this average is composed of wildly divergent figures that vary by family and subsistence species. Many extraction costs vary by a thousand percent, and differences among families often exceed 100 percent. These wide variations in unit costs reflect differences in competence, investment and capital maintenance strategies, and systematic sharing and redistribution practices. For instance, sharing of capital for such purchases as sleds and snowmachines might reduce investment in harvests, thus reducing unit costs. Sharing of harvests might inflate unit costs for those giving the most.

These issues rise again and again in much of the secondary literature about the region. Drawing support from Wolfe, Thomas (1982) finds that higher investments seem to mean higher yields in the Shaktoolik case. Fienup-Riordan finds parallel evidence in other parts of the Yukon Delta and Bering Sea coast (1982, P. 427). She concluded that access to cash may enhance rather than detract from subsistence endeavors; poorer families may become more dependent on transfer incomes, but may still be able to participate actively in subsistence activities if they rely on species with lower effective unit costs. Thus, the sheer biomass of the harvest is only part of the picture. The strategies families use to engage in a variety of economic practices help explain the role subsistence plays.

Relying in part on earlier research (Hughes, 1960; Bogojavlensky, 1969), Ellanna concludes that the products of wage labor do not normally flow through traditional distribution networks (1980, P. 29) in the Bering Sea area. However, Fienup-Riordan finds, as have study team members in other parts of the state, that capital (but seldom cash) is widely shared; and through channels and mechanisms that function like traditional channels (cf., Fienup-Riordan 1982, P. 428 for details on the Bering Sea case). Cash purchases are indeed one step removed from the cash itself, but this pattern of capital exchange and sharing is a persistent practice thoroughly grounded in a traditional habit rather than in innovation. It is also a way to share wage labor. The literature has not come to a conclusion about the relationship between wage labor and subsistence practices.

Much of Ellanna's research over the last 10 years is contained in her study of ecology, population structure, and subsistence in the Bering Strait island communities and at Wales (Ellanna 1983). This study reaches a number of conclusions based on insular populations that hunt large sea mammals. She found a number of strong relationships among demographic and ecological variables: a high ratio of males to females; high birth rates; an ecological base that may support both productive and dependent members; and high proportions of young to middle age males who exploit the greatest number of ecological niches. These conclusions reveal the importance of demographic characteristics and their potential relationship to volume and diversity of harvests. Ellana argued that large populations with high ratios of able bodied males were ". . . a prerequisite for specializing in large marine mammal hunting" (1983, P. ii). Her evidence supports this contention. However, this population ratio may apply well but not uniquely to large sea mammal hunting. For instance, a high ratio of young, able-bodied men and women might be essential to most demographic growth and economic adaptations. These traits seem to underlie many hunting and fishing adaptations throughout Alaska and study team members witnessed this in areas with large land mammal and fishing emphasis in Unalakleet and in the NANA Region. This population structure might also be a prerequisite for wage labor specializations. This possibility is explored in our report.

Much of Ellanna's analysis was about the limits and constraints of population size in the undertaking of cooperative hunts for large sea mammals. She found that an average of about 35 able bodied men per community were needed to staff the skin boats, and that because of the typical population characteristics no more than a third of the population could actively engage in the hunt (1983, P. 479). Her account is especially pertinent to the early historical period. Recent structural changes in local economies and the nature of subsistence investments may cast a new light on a current meaning of these traits. For instance, in today's world cash investments are necessary for subsistence activities and the more people there are in the wage economy the easier investments may be. Larger communities and those with more able-bodied wage earners are likely to be those with more wage opportunities. Wage earners who do not belong to crews often underwrite the subsistence pursuits of others. Thus, demographic characteristics are very important in subsistence pursuits. However, the functions of different cohorts in modern village economies might be different now.

The role of inflation, a key variable in this study, is a problematic one. Ellanna reports that "...inflation in the cash economy in the study area will increase the economic disparity between the "haves" and the "have nots"" (1980, P. 31). In another OCS study, Porter noted "What is less commonly realized than the high level of Alaskan prices is their tendency to increase at a rate less than that of the United States" (1980, P. 39). If both statements are valid, inflation might be less important than high prices, differential access to cash in various communities, and purchasing habits that distinguish the wealthy from the poor. Inflation might be secondary to the acquisition of cash in the first place, or to differences in consumption practices that force the poor to pay higher prices than their richer neighbors. These possibilities obviously need to be assessed in this research.

Given the composition of the study area, the sociopolitical characteristics of two sets of regional institutions must also be compared. Ellanna predicted that the diverse and sometimes fragmented politics of Nome's institutions will persist into the near future but that those of Bethel, more homogeneous to begin with, will remain so. Because the study area overlaps these two administrative areas, differentiation between study villages might be due in part to the local institutional consequences of this pattern. The source of village differences may be difficult to determine as indigenous to the community or influenced by larger regional affiliations.

Another key element of the study, employment change, has been researched, and previous studies generally concluded that continued growth in the government sector represents a critical component of the future picture. Typically, change in the government sector has been abrupt and sporadic (cf., Alaska Consultants, 1982, P. 265; Ender, et al., 1980). Therefore the role of transfer payments and opportunities in the government sector are important and deserve very careful examination.

1.5 Methodology

The ultimate goal of the research and analysis was to create a systematic typology of Norton Sound community characteristics. Within the context of OCS activities in the area, the typology should predict and analyze price movements (inflation), employment opportunity, and economic activity and their consequences. This typology developed here is based on socioeconomic characteristics of communities, and can accommodate gradual as well as sudden changes in communities. The typology reflects similarities and contrasts discovered empirically among the characteristics of communities. A particular community or cluster of communities may reveal certain characteristics now, but changes in some or all of those communities over time should allow a reordering of the communities to analyze changes within the context of the typology. By focusing on community and domestic socioeconomic characteristics as the crucial elements within the typology, reordering can be accomplished without creating a new typology every time communities appear to have changed. The approach is analytic in that it disassembles larger wholes (communities and general socioeconomic patterns) and examines their constituent parts.

Hundreds of typological analyses have emerged from socioeconomic and anthropological literature. These typologies refer to patterns of organization and behavior by groups and societies relating to population size and density, isolation, homogeneity, stratification, individuality, stability, self-sufficiency, consensus and conformity, specialization of social knowledge, and many other variables.

Many typologies that social scientists have developed are bivariate and/or extremely general in that they make very high-level abstract distinctions that may be universally generalized across all societies. They are of little practical value for impact analysis.

The aim of the Norton Sound research and analysis is development of a more specific typology; that is, a model that can distinguish among many characteristics. The categories we use are particular characteristics that represent the Norton Sound sample (described below) and, by careful extension, the larger Norton Sound area as a whole. The purpose of the typological analysis is to discern clusters of structural features in social organization and economic patterns. These typologies must provide explanatory and predictive strength.

Typologies have been useful in virtually all sciences--astronomy, geology (Flint and Skinner, 1974), biology (Smith, 1982), archeology, social anthropology (Redfield, 1960), economics (Baran, 1957), and psychology (Freud, 1938). Based on grouped characteristics, they have been used for descriptive (classificatory), postdictive, and predictive purposes. Classificatory uses are largely heuristic. Arbitrary boundaries are assigned to a welter of data for convenience of recognition and ordering of information; postdictive and predictive models require two implicit assumptions: -- 1) a shift from one type to another is systematic; 2) causal variables are generally operative in initiating change. Some of the causal variables cited in the social sciences are: new technologies (White, 1959); political and economic domination (Baran, 1957); shifts in human habitation from one ecological niche to another

(Jorgensen, 1968); government allocation of funds (Galbraith, 1967); and class control of productive property (Marx, 1906), among others.

The key question addressed in this report is: in a context of OCS activities in the study area, what are the likely demographic, economic, and organizational consequences of increased economic activity, increased employment opportunity, and increased inflation? These effects, or impacts, should not be thought of as variables dependent on or consequential to discrete independent variables; nevertheless, for illustration we can imagine the three major change categories (increased inflation, employment, and economic activity) as independent variables hypothetically and causally linked to dependent response categories.

The study assumptions and methodology are comparative. Communities are considered to be interlocking and interacting, aligned along many different formal and empirical dimensions, and with shared goals, memberships, resources, and trends of response to change. Current conditions are analyzed with awareness of time depth, interaction, and variation.

This present discussion of methodology is based directly on the more comprehensive discussion in the earlier Technical Memorandum 83/88-1, and only briefly summarizes key points. That document and Appendices A and B outline the most important details of the research approach.

1.5.1 Selection of Study Sites

Information availability and criteria concerning historical demography, cultural and ethnic practices, resource utilization, income and employment, and potential impacts guided site selection. Many of these criteria are naturally interdependent; e.g., historical demography is often tightly linked to resource availability and income and employment factors as well as ethnic composition and cultural practices. None of the criteria were assessed independently, and site selection hinged on a balanced judgment of currently available information; background factors relating to the economies, past and present; practical and logistical factors such as community willingness to participate in the study. The selections listed below cite the characteristics of the communities that made them candidates for detailed study. These are the communities our team conducted primary investigations in; in addition, recent data from Alakanuk were shared with us, allowing a larger base for comparative analysis (see Section 1.2).

Emmonak (1980 census population: 567) Census figures show Emmonak's population growth rate to be more than 20 percent over the last decade. Emmonak represents the Central Yupik cultural tradition and a mixed historical resource utilization pattern concentrating on fish and small sea mammals (but not excluding some larger sea mammals, numerous furbearers, fowl, vegetable products, and large land mammals). Commercial fishing has become a mainstay of the local economy, comprising for many families the major source of income in recent years (Wolfe 1981). Emmonak has played a vocal role in providing community input and testimony concerning potential energy development impacts in the last five years and recently sought assistance in creation of local plans for impact planning and mitigation (State of Alaska Coastal Energy Impact Program).

Golovin (1980 census population: 87) Golovin is the smallest of the communities we selected, and displays substantial population turnover during the last decade. Golovin is at the periphery of what is often considered the Nome "suburb" cluster of villages, most conspicuously linked by economic, governance, social, and kinship patterns. Many of the same criteria also closely connect Golovin to neighboring villages like White Mountain, Elim, Koyuk, Shaktoolik, and even Unalakleet. Fishing and small sea mammal utilization have traditionally provided major resources for the community, but caribou and, later, reindeer also have played major roles. Golovin represents an historical zone of high mobility and demographic shift. Here, Malimiut newcomers from the north and east comingle with many of the original Kawerak Inupiat (although this current portrayal of ethnic and geographic shifting is much stronger elsewhere, such as at Unalakleet). Golovin is the smallest village in the site selection, and its population has dropped more than 25 percent in the last decade, according to census figures. Commercial fishing, though not as pronounced as elsewhere in Norton Sound, still remains crucial to the local economy. Historically, reindeer herding was important and may reemerge under regional corporation support.

Nome (1980 census population: 2301) Census figures for 1980 show a slight drop in the Nome population over the last decade, but these figures are inaccurate. A more accurate figure for 1980 probably exceeds 3,000; see demographic and census discussions in Chapters 3 and 4. A Department of Labor estimate in 1981 lists a population figure of 3039 for Nome, indicating substantial growth over the last decade.

Nome was not a year-round Inupiaq settlement until the gold rush at the turn of the century. At this time Nome exhibited tremendous "boom" growth, and for a decade was the second largest community in the State. Nome today is a complex community consisting of several well-defined components, including the white population (approximately 40 percent), the St. Lawrence Island Siberian Yupik community, the King Island community, and a remainder consisting of Malimiut, Kawerak, and other Inupiat as well as others. The diverse population is factionalized politically, socially, and economically. Although traditional subsistence pursuits may be practiced on a scale no less overall than many other regional communities, the internal diversity of these pursuits is quite pronounced; for instance, the King Island population is widely known to pursue traditional hunting, and now fishing, far more than any other distinct subpopulation. These and many other current and historical demographic, socioeconomic, and cultural factors make Nome a necessary but difficult site for study. In addition, because of the infrastructure, transportation and communications, governance, and other facilities and services centralized in Nome, potential impacts of energy developments at Nome are a key concern.

Savoonga (1980 census population: 491) St. Lawrence Island may represent the most viable center of subsistence resource production, distribution, and consumption in the study area. Large and small sea mammals represent the major indigenous food resources, as in the past, and products from the sea mammals (ivory and ivory carvings) provide a major source of income. Cottage industry here is a major source of cash in contrast to the other study sites. Savoonga has exhibited a population increase exceeding 30 percent over the last decade. After the island's population was nearly decimated late in the nineteenth century, it has shown steady and even dramatic growth. St. Lawrence Island migrants to Nome, in particular, hold major leadership positions. Political and institutional roles of Savoonga residents distinguish Savoonga from most of the other study sites.

Unalakleet (1980 census population: 615) Unalakleet is a thriving community that serves as a secondary hub for communications, transportation, and institutional services (now, in particular, education). Even more than Golovin, Unalakleet is an ethnic and economic crossroads, representing a transitional and blended zone of Yupik, Athapascan, Malimiut Inupiaq, Kawerak Inupiaq, and other ethnic influences. Many elderly Unalakleet residents have a grasp of three languages, an historical artifact reflecting the past presence of Lapp reindeer herders, Swedish missionaries, and others. Small and some large sea mammals, fish, and large land mammals represent traditional indigenous resources of great importance that remain crucial today. Unalakleet was also an historic trade crossroads with affiliations north, east, and south. According to available census data, Unalakleet has demonstrated the most dramatic growth of all study sites over the last decade, more than 40 percent. According to a census conducted by the city in 1982, the population has since increased to 790 (Jorgensen, et al., 1983, P. 35). The regional role of secondary hub community, accented by Unalakleet's conspicuous and perhaps growing economic role in the area, represents no abrupt departure from the past.

1.5.2 Data Collection Procedures

1.5.2.1 Date Categories

The basic categories of data collected below reflect major research topics and some assumptions about Norton Sound socioeconomic conditions. Changes, and the meaning of this change is addressed in terms of social, political, economic, and cultural consequences in the study region. The data that allow us to detect these changes and their consequences are primary or secondary aggregate data, key informant data concerning institutions and organizations, and domestic data concerning extended networks. These data, the sources from which they were retrieved, the methods used for obtaining them, and the forms of analysis to which they have been subjected are discussed in the following subsections.

1. Demography

   a. population size
   b. transience and seasonality
   c. rate of natural increase, births and deaths, in-and outmigration
   d. ethnic composition trends
   e. aggregate household composition, age-sex trends

2. Economy

   a. employment and payrolls by industrial classification
   b. household and per capita income
   c. number and ownership of local businessess
   d. dependency ratios
   e. employment structure
   f. sources of income
   g. basic/nonbasic ratios
   h. occupational skills/skill levels
   i. participation rates and changes therein
   j. labor mobility
   k. unemployment rates by classification and changes therein
   l. annual employment cycles
   m. occupational primary data
   n. subsistence cycles
   o. subsistence capital requirements
   p. local employment opportunities
   q. local purchase habits
   r. production, distribution, and consumption patterns, including subsistence
   s. price trends
   t. public and private finance and revenues

3. Social Structure

   a. formal institutional inventories; number, growth, and funding patterns
   b. institutional services
   c. organizational structures
      (including selected aggregate data but chiefly primary data concerning locally situated formal and nonformal political, economic, and domestic institutions, including kinship, sharing and cooperative networks and units, leadership and civil management, economic exchange, and so on as discussed above)

4. Attitudes and Values

   a. perceptions of control and benefits of development
   b. perceptions of local institutions
   c. economic beliefs
   d. social distance and solidarity

5. Infrastructure

   a. descriptive economic indices and time series
   b. facilities revenue and control trends

6. Access-Exposure

   a. primary data concerning transience and primacy of specified places, activities, ways of life
   b. primary data concerning perceived autonomy of institutional activity
   c. secondary demographic data
   d. control and authority attitudes, domestic and institutional
   e. centripetal and centrifugal trends in the distribution of communications and transportation services

The three major types of data collected were institutional key informant data, primary and secondary aggregate data, and domestic-family data collected through a network sample. These data, described below, were keyed specifically to the study's working assumptions and the data categories described above. Field protocols in the form of data collection guides were used to aid in the collection of key informant and domestic data. The institutional key informant protocol also guided the collection of numeric data as needed, following criteria sketched out in the protocol (described below and included in Appendix A). The aggregate data were collected using an inventory of aggregate data assembled during the planning phases of the study, and supplemented by additional sources identified during the course of the research.

1.5.2.2. Primary Domestic Data

Primary field data were collected in site communities using field protocols that guided data collection within networks. Past research has shown that communities are internally diverse, not monolithic, uniform entities. Unless researchers can randomly sample a large proportion of the rural village generalization is futile. Network samples, however, capture much of this diversity and can be specifically geared to sampling through regularized and cohesive socioeconomic networks (hence the title), a feature that recommends such an approach in this study.

The domestic network protocol consists of: an income grid; a production, distribution, and consumption grid; a family residence-composition grid; an institutional grid; a facilities grid; a job history and employment attitude grid; and a series of attitude indices. (See Appendix B, "Methodological Review" for uses of these grids and scales in collecting primary data.).

In general, the field researchers sampled far more shallow than deep networks; thus more networks are included in our sample, but they are of shorter extent. Either option is appropriate in most circumstances, and either offers data collection procedures sensitive to the diversity in the sample. Because of the concern about representativeness in a number of areas, in most cases sampling was steered to achieve credible age and income representation. In all we completed 82 extended domestic discussions (protocols) and 24 institutional discussions (protocols) in the five central and one subsidiary (Alakanuk) village sites. These sites or "cases" represent the primary data base. Chapter 4 and Appendix 2 describe these cases, their specific characteristics, and associations between them.

Networks can reveal the ways individuals, families, and households are linked in common functional relations, and they solve some of the methodological pitfalls in a random sample technique which assert that units of sampling are independent. Researchers in Alaska Native communities must pay special attention to networks, especially in the realms of subsistence pursuits and kin-based associations. This approach uncovers the deeper and more substantial ties that bind families, households, and individual together in reciprocal economic and other social activities.

A single unit (individual, family, household, political faction, hunting crew leaders, etc.) initiates the sampling of a network. Membership in the network is ascertained , and subsequent sample discussions are carried out with other members, and members who they may in turn identify. Analysis can then give empirical substance to the very basis upon which these systems thrive, cope, wither, change membership, and generally function as coherent units. One hunch, for instance, is that Gambell and Savoonga, because of heavy reliance on subsistence products, stand at one end of the spectrum of social change. This extreme can be characterized by the rich elaboration and depth in kin-based activities, formal traditional systems of personal conduct, "cottage industry", training and recruitment and extensive social protocols based on respect for elder male and female kin. Nome, at the opposite extreme, may reveal heavy recruitment into many networks that are formal, bureaucratic, less personal and which use criteria for recruitment based more on characteristics deemed worthy outside of the norms and social rituals common to the function of kin units; on the other hand, the diveristy of Nome may be reflected in diverse network functions. These issues are considered in the research.

Geographical distance can be an important variable in accounting for presence, character, and function of various networks. Gambell and Savoonga, more distant from Nome and its impetus for change than other study communities (except Emmonak and Alakanuk), are still steeped in patriclan traditions and functions. These communities, in the context of the modern world economy and social structure, cling stubbornly and pridefully to their island way of life with conscious knowledge of the many forces that have eroded some of the special traditional features of Alaskan Native mainland networks.

1.5.2.3 Aggregate Data

Following are the main aggregate data types collected and reviewed. Chapters 2 and 3 describe relevant data categories, and chapters 5 and 6 (Sections 5.4. and 6.2.) report forecasting applications.

a. DHSS, Vital Statistics, and IHS birth and death records
b. DOE school enrollment time series
c. DHSS, Dept. of Youth and Family Services case loads
d. AFDC payments and warrants
e. APA payments and warrants
f. DOL employment and wages at the regional level in:
   - federal classification
   - state and local classification
   - contract construction classification
   - manufacturing classification
g. DOL total employment and number of firms at the village level
h. DCRA, Division of Community Planning:
   - occupation skills, income levels
   - housing: types of units, total numbers, average density
i. Department of Education, Division of Management, Statistics Section:
   - enrollment comparisons with previous years
   - withdrawals, transfers, drop-outs
   - enrollments by ethnic affiliation, grade, district, number of graduates
j. Department of Fish and Game, Game Division, Survey and Inventory Section:
   - harvests from harvest tickets, sealing documents, and village enumerations
k. Department of Health and Social Services, Division of Corrections:
   - crime type, offender status, and sex
l. DHSS, Division of Mental Health and Developmental Disabilities:
   - admission dates, age, residence, sex, diagnosis, family income
   - discharge dates, disposition, separation date

m. DHSS, Division of Public Assistance:
   - Aid to Blind, numbers
   - Aid to Disabled, households
   - Food Stamps, average volume (case load)
   - Medicaid and Old Age Assistance residence, income, payment amount, vital stats
n. DHSS, Division of Mental Health and Developmental Disabilities:
   - admission dates, age, residence, sex, diagnosis, family income
   - discharge dates, disposition, separation date
o. Department of Labor, Research and Analysis Section: employment center data: job applicants, characteristics of applicants, job openings available, openings received
p. Department of Public Safety, Division of Alaska State Troopers:
   - activity reports: location, complaints received, citations, arrests
   - civil complaints: location and number of criminal processes served, warrant arrests
q. DPS, Records and Information Section:
   - part 1 and part 2 offenses
r. Department of Revenue, Administrative Services, Cashiers Section:
   - business gross receipts by business name, owner, city
   - state receipts, tax amount
s. Alaska Court System, Office of Administration:
   - number of offenses by date, type, number of counts (Nome only)
   - criminal and civil cases, magistrate system, by location, date opened and closed (Emmonak, Savoonga, Unalakleet)
t. University of Alaska, Cooperative Extension Services: selected food prices, quarterly (Nome)

1.5.2.4 Institutional Data

After the institutional inventory had been completed and some knowledge of local organizations developed, the institutional protocol was used to collect information on five institutions selected on the basis of (in order of importance): (1) size of revenues or budget and (2) duration of existence, or (3) size of membership. Once the largest organizations had been researched, substitute selections were sometimes made as institutional links between organizations emerged. That is, field researchers sometimes opted to delete one organization in favor of another because of coordination with or some other connection to organizations previously researched.

In addition to institutional and domestic data, field researchers also surveyed selected commodity prices in each community. The items chosen and their price fluctuations may not be representative of commodities in general but are those purchased frequently and should provide a useful index of price movements. These commodities and data collection guidelines are detailed in the protocols (see Appendix A).

1.5.3 Units of Analysis

Units of analysis in socioeconomic research are invariably artificial. Although it is simple to "define" units of analysis in terms of real social situations, it is ultimately difficult to "defend" them in the same way. That is, units of analysis, be they places or institutions as well as domestic groups or abstract variables, can be defined as if they were singular, unconnected, and discrete items -- hence the designation as "unit". Whether they in fact are and whether or not definitions prove useful to the actual research are problematic issues. Three problems related to unit definition in all social research are boundary determination, multidimensionality, and comparability. These terms mean that (1) even with formal and specific definitions (labels for the units of analysis), it is difficult in practical terms to determine where one unit ends and another begins; that is, an institution strictly defined in political terms may have religious or economic roles that depart from the political definition; (2) even with formal and specific definitions, the unit being analyzed may really consist of a collection of other units that are ultimately responsible for the condition of the larger unit; for example, the domestic household unit would as easily be seen as a collection of sentimental and psychological, organizational, economic, and political factors that underlie this more comprehensive unit; and (3) for these reasons, comparisons between units or of one unit at two points in time may not make sense.

Even the traditional units of socioeconomic analysis (communities, occupations) should be scrutinized on these grounds. There may be no doubt in our minds that community X or occupation Y is clearly definable as "Fairbanks" or "blue collar" or who belongs in which group, but these units may not be best for explaining the data. These units may, and often do, crosscut other sorts of units that might, given particular research aims, better explain the information at hand. For example, the concept of "blue collar" differs markedly between Pittsburgh and Nome. Is use of the term valid in the latter context?

Most of the nominal variables or units used in socioeconomic analysis, such as community or occupation, are inherently multidimensional. They are composed of many dimensions along which these nominal units vary, any of which may be important in any one connection (Blalock, 1982, P. 110-113). Comparisons and analysis are groundless if only this "proxy" unit, representing these underlying dimensions, is used at the expense of those underlying dimensions themselves. The elements that compose units of analysis and the units themselves should be examined together. Differences in group properties represent differences between groups (and hence between units of analysis). Groups can then be better defined and compared on the basis of their fundamental, shared, or unique properties.

Boundaries in organizations, communities, national systems, etc., are to a great extent set by precedent, charter, custom, or tradition, and are easily identifiable. Boundaries in cross-cultural research, the logical and empirical boundaries of an extended family, an informal institution, or networks for sharing and distribution of goods are difficult to identify or to specify in advance. For instance, we can establish boundaries for a traditional exchange network in advance only if we are willing to use artificial or ad hoc definitions. When viewed empirically, their boundaries invariably become fuzzy. Clearly, alternate units of analysis are needed and for more than one reason. Because many of these alternate social entities are very real and functionally critical to the regional socioeconomic condition, they must be considered within the scope of this work as units of analysis to complement and in fact assess the salience of others.

All social and economic behavior at least involves interactions between people and their interests. Some of these interactions are fleeting, some recur in association with others. In cases where these interactions endure and show somewhat stable patterns, networks of people must by definition be evident. Thus, endurance and patterning are clues that networks exist. These units will be analyzed in this report in addition to institutions (as organizational units), communities, and variables representing the underlying properties that may embody more complex or larger units of analysis. In this way we hope to encompass many of the alternative formulations of units of analysis and at the same time examine those underlying properties of units that make a difference.

In practical terms, this means that not only organizations, but elements of organizations need to be compared; not only networks, but attributes of networks; not only groups, but properties of groups; and not only these units and their parts, but also the variables they may possess alone or share among others need to be assessed. This comparative, typological approach assesses places and "things" as well as the common denominators that may underlie them. For instance, an understanding of organizations as wholes can only emerge from an analysis of smaller organizational components. Previous research shows that key organizational dimensions, such as organizational structure and persistence, can explain much about institutional change and power. Unitary (or what are sometimes called "monocephalic") organizations are more apt to be able to form lasting commitments than "confederated" organizations (Aldrich 1982, P. 292). This dimension clearly distinguishes unitary political entities found in the NANA region and on the North Slope from confederated entities typical of the Bering Strait and Yukon-Kuskokwim areas. Comparisons of networks as wholes, regardless of the functions they may fulfill, tend to focus only on strong links. Analyses of the links as properties of larger networks, however, have shown that so-called weak links may in fact be crucial to information transfer and economic distribution since they tie together groups that otherwise might be insulated from one another (Blau, 1982, P. 275).

1.5.4 Analysis

Elementary time series trend analysis was undertaken to identify what might be forecastable and what conditions warrant comparison with the primary data or other data sources. A wide variety of univariate and multivariate analyses have been accomplished, leading to myriad domestic, institutional, and aggregate data comparisons. These steps merge, leading into the typological analysis and forecasts. The core of the analytic and interpretative task is in the typological analysis and development of the forecasting model reported in Chapters 4 and 5. The forecast model is built upon the multidimensional typology. To the extent that the typology is comprised of aggregate indicators that can be forecast, forecasting may plot anticipated changes in community types and detect changes after they have occurred. Note that these techniques lead to a hypothetical typological model that, to be technically validated, must be tested at two or more points in time. Although a time dimension can be accommodated in the analysis, future events may invalidate conclusions made herein about the data.

Variables corresponding to the data and research objectives were developed to score and group data in ways that would facilitate analysis. The creation and rating of variables entails full review of the data and development of categories to which data correspond. These categories are predicated on the objectives and steps described earlier and create a meaningful and sound format for describing and comparing data. Data examiners reviewed the primary data and entered, case by case, the correct variable scores in each category to build up a large rectangular data grid composed of rows (as cases, or households in this example) and columns representing the variables. The resulting grid allows nearly infinite possibilities for data manipulation as variables are compared, resorted, and compared in other ways. The univariate and multivariate analyses were conducted with these variables. These analyses culminate in a path analysis that employs many of the original variables. This analysis accounts for multiple and mutual relations between these variables.

Appendix A lists and explains the variables. The use of these variables in analysis is detailed as needed in the discussions of our data (Chapters 2 and 4 primarily). The community and household data were coded by the field researchers who conducted work in the respective villages, in consultation with other project staff, with the exception of Unalakleet and Emmonak data which were coded by Steven McNabb, a principal investigator. Appendix B covers analysis and data collection methods.

2. SOCIOECONOMIC DESCRIPTION OF NORTON SOUND

2.1. Historical and Sociocultural Background

The Norton Sound region includes all of the coast of the sound from Cape Nome/Safety Sound to Stebbins and for project purposes includes the Yukon River delta (See Maps 1 and 2). Before Malimiut and Kauwerak settlements were established in the region, all of the indigenous people of the region were Yupik speakers (Unalit dialect). In the north, especially in what is now Unalakleet, Yupik speakers mingled with in-coming Inupiaq-speaking* peoples (Malimiut and Kauwerak). Tribal groupings and their contemporary community correlates and boundaries appear on Table 1. Associated names can not be accepted without some reservations because the ethnohistorical record lacks some details. There may have been no more than 850 people in the region during aboriginal times. (See Ray, 1964, P. 63-64 for population estimates and settlement patterns.) Mingling between the Norton and Yukon delta peoples created ties that, especially in the southern portion of Norton Sound, remain today. The coastal strip of the sound was then as now a launching point for subsistence activities up rivers and offshore into the sound.

The indigenous communities depended on multiple subsistence resources, and for this reason they were more scattered than those of the Bering Strait. Boat travel was less a part of life than for Bering Strait people.

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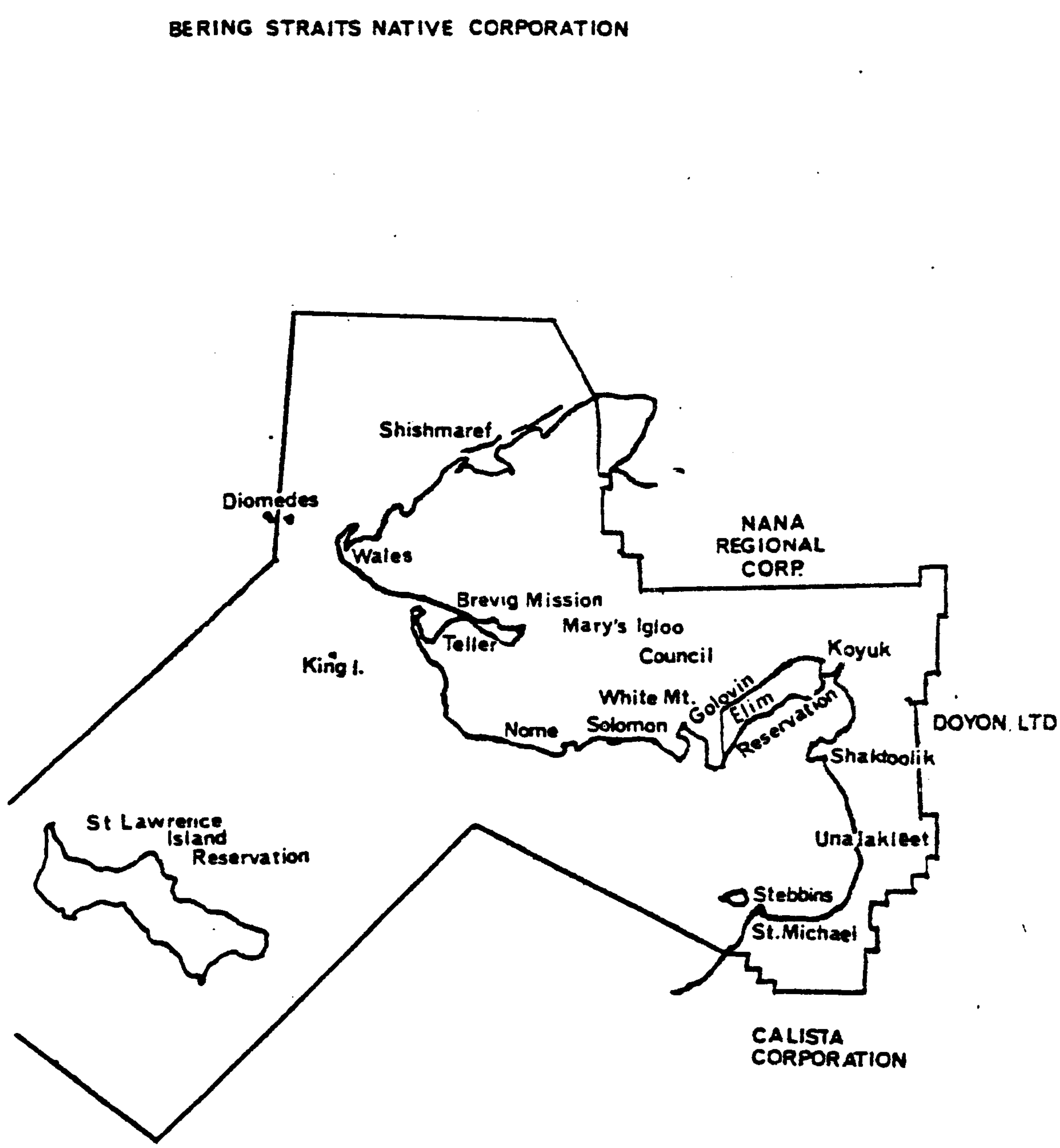
* In this report the terms "Inupiaq" and Inupiat" will be used in a linguistically correct manner that varies from their use in much recent literature. "Inupiaq" is a singular and collective noun, whereas "Inupiat" is a plural noun. "Inupiaq" conventionally refers to the Eskimo language spoken from roughly Norton Bay, north throughout North Alaska and east through Canada to Greenland. This use is accepted in the report although a more proper term is "Inupiatun" which means literally "like an Eskimo." "Inupiaq" can refer to an individual Eskimo or to their collective groups. Thus "Inupiaq culture" is correct, whereas "Inupiat culture" is not. "Inupiaq" is to "Inupiat" as "Greek" or "German" is to "Greeks" or "Germans".

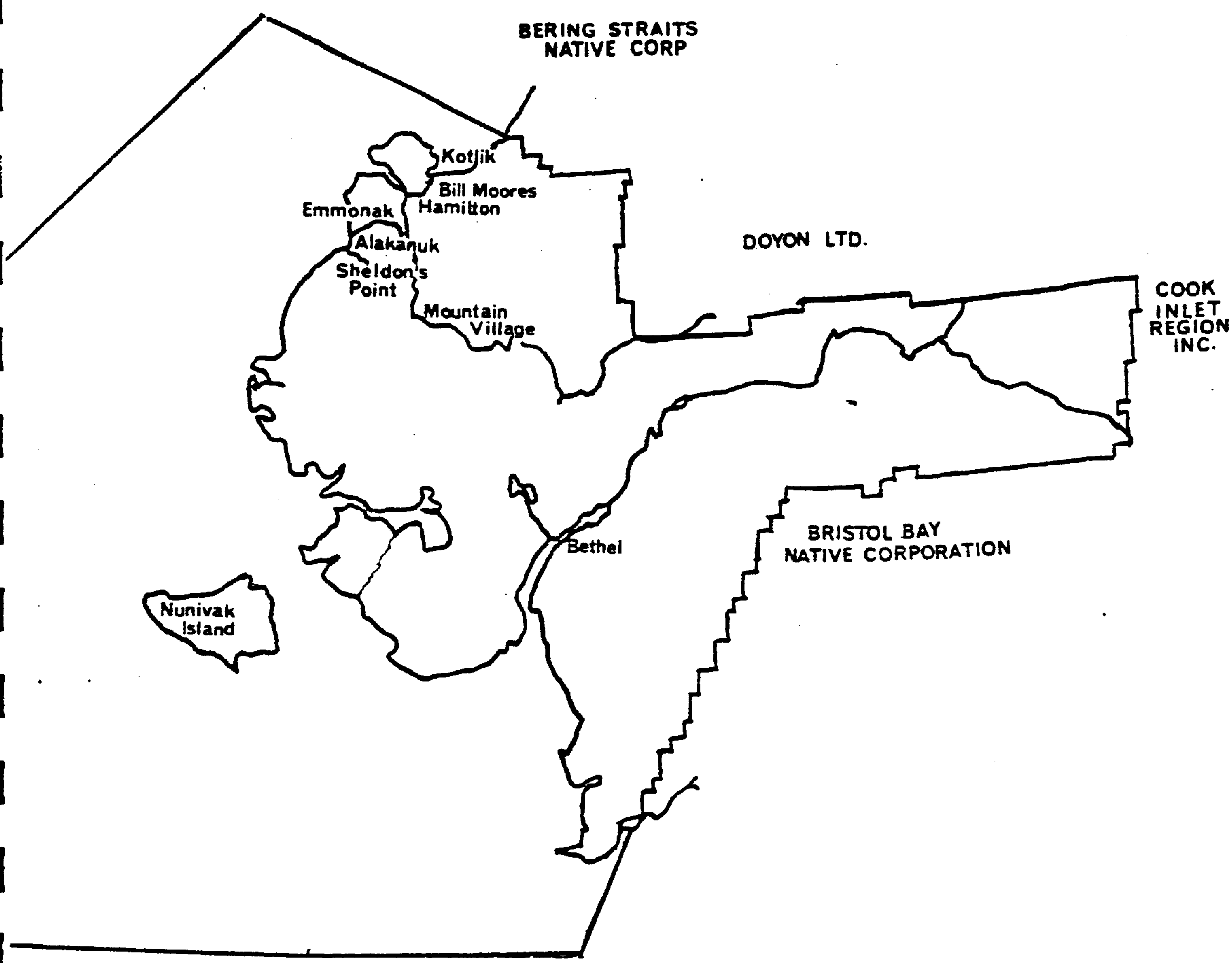
<u>MAP 1</u>



Source: Ellanna 1980

MAP 2

CALISTA NATIVE CORPORATION



Source: Ellanna 1980

Table 1

NORTON SOUND TRIBES

Tribe	Contemporary Community(ies)	Territorial Boundaries
Chiukak[1] (Golovin Bay area)	none	uncertain, taken from a miner's report and 1880 census and reported as having a kazgi (Ray, 1964, p. 71)
Ignituk[1] (Rocky Point)	none	Rocky Point at the western mouth of Golovin Bay
Atnuk[1]	Golovin[3] Elim Moses Point[2]	Cape Darby and Golovin Bay
Koyuk	Koyuk[3]	drainage of the Koyuk River and head of Norton Bay, west along the coast to Moses Point
Inglutalik	none	northeastern Norton Bay
Shaktoolik	Shaktoolik[3]	drainage of Shaktoolik River and eastern shore of Norton Sound coast, Besboro Island
Egavik	none	eastern shore of Norton Sound
Unalakleet	Unalakleet[3]	drainage of Unalakleet River, southeastern shore of Norton Sound
Kikiktauk	none	east of contemporary St. Michael
St. Michael (Tachik)	St. Michael	"St. Michael Island"[4] on southwestern edge of Norton Sound and Stuart Island[5]
Stebbins (Atuik)	Stebbins	"St. Michael Island" west of St. Michael and Stuart Island[5]

1 In Ray, 1967, the term "Golovin" or "Chinik" is used to describe a single tribe including several communities she later lists as separate "tribes" in her 1975a publication.

2 Primarily occupied today seasonally as subsistence and commercial fishing community for primarily Elim residents.

3 Inupiaq speaking today, or having some residents who speak Inupiaq or are "bi- or trilingual".

4 "St. Michael Island" is today a cape separated only by a stream from the mainland and is not recognizable as an "island" on most maps.

5 Populations of both communities have apparently utilized Stuart Island.

Source: Ellanna 1980

In the northern part of this area (Safety Sound to Ignituk) family groups moved frequently from one site to another, hunting caribou in organized drives. Small sea mammals were also hunted, and there was considerable reliance on salmon and herring runs where these resources were available. Belukha whales were important food sources in some communities (Ray, 1975, P. 113; Ellana, 1980, P. 99).

The central unit of social organization was the extended family; residential units were probably smaller in size in the Norton Sound region than in the Bering Strait culture area (Ellana, 1980, P. 101). Most subsistence activities were conducted cooperatively by more than one family group. Inupiaq intrusion from the north and west may account for the presence of matrilocal residence and male-female segregation in households (Nelson, 1899, P. 285). Bilateral kin reckoning was the dominant descent system. The kayak was the primary vehicle for water transport. The umiaq was largely absent and band leadership was based on factors other than boat captaincy.

The Yupik population of St. Lawrence Island reached at least five thousand in the late 1800's, and it was probably greater than this at one time. They hunted the bowhead, minke, and grey whales (principally the bowhead), the Pacific walrus (the primary source of food and material for boat coverings and house floors, etc.), four species of seals, which like walruses were a major source of food and were important for garments, the salmon groups, cod, the trout group, at least a dozen bird species and eggs of three species, large quantities of sea and land plants, and mussels, clams, crabs, and other sea life.

The indigenous Eskimo social structure and its status hierarchy and diverse subsistence techniques and implements directly reflect the richness and diversity of the marine resources upon which they depend on St. Lawrence Island for instance, whaling, walrus, and bearded seal hunting boat captains represented clan segments and were usually the eldest members of the crews. Sources of authority in hunting and resource allocations, their wisdom, knowledge, and powers extended to all aspects of daily resource and social management. Patrilineal clans, headed by the great hunters and who served as redistributive authorities, were territorial and composed of demes; that is, village-based clan segments made up of patrilineal, patrilocal extended families (Hughes, 1960, P. 249-269). All subsistence activities revolved around crews of men constituted from various households to harvest the resources. Women processed and distributed these resources to other clan members. Bride-service was commonly practiced and it continues today.

The people of St. Lawrence Island were much more closely related to the Bering Strait people in economic orientation and social structure than to indigenous peoples of Norton Sound. The difference is largely the result of the use of large sea mammals and the many forms of social organization, implements and rituals that accompany them. The two present Eskimo villages on the island, Gambell and Savoonga, have a combined population of about 900. Many of the indigenous customs and economic practices briefly described above remain an integral part of life there today.

The Yukon delta traditionally was densely populated and a distinct linguistic and political geographical area. Strong ties with the lower Yukon communities are evident, and cultural similarities exist between the Yukon and Kuskokwim delta peoples. Contemporary villages in this region, which includes the delta, its channels proper, and the area upriver just beyond the main channel juncture, include Mountain Village, Kotlik, Emmonak, Alakanuk, and Sheldon Point. All of the people in the region were, in aboriginal times, Yupik speakers (with dialectic variations from Norton Sound to the Kuskokwim delta, Oswalt, 1967). There might have been as many as three thousand indigenous persons in the region before 1880 (Ray, 1975).

Indigenous, traditional use of the Yukon delta extended well beyond the boundaries of modern communities (Ellana, 1980, P. 105). Cooperation among villages in hunting and fishing continues today (Ellana, 1980, P. 108). Such interconnections among villages are evident in frequent movement from one village to another and joint movements to distant resource sites occasionally. Settlement patterns consisted of summer and winter villages, but permanent villages were distinguished from seasonal use sites by the presence of the kazgi, the community house, one of the distinctive (but not exclusive) features of Yukon delta settlements. The kazgi was the focus of aboriginal social structure and values, a feature it shared with the extended family. Kinship reckoning was bilateral, despite male dominance in many activities.

Fish (especially salmon) were the major source of livelihood, followed by sea mammals, water fowl, and caribou. Migration to and from fish camps and seasonal villages were integral to community life. Each family used traditional sites based on usufruct rights (rights by use). Cooperative hunts by boat took place in spring and early summer during smelt and herring runs and whenever belukha whales and seals were available; kayaks were used in summer on lakes and rivers. The subsistence pattern and values related to it today remain essentially unaltered in modern times (Ellana, 1980, P. 109).

2.2 Regional Description

2.2.1 Regional Economics

The study area encompasses parts of two western Alaska rural regions called the Nome region and the Wade Hampton region for census purposes. These are two of six western and northern Alaska coastal regions (Barrow, Kobuk, Bethel, and Bristol Bay are the other four) that border on frontier offshore petroleum provinces scheduled for lease under the federal OCS program. As a group, these regions share some typical socioeconomic characteristics as undeveloped rural regions that set them apart from developed rural or urban regions.

2.2.1.1. Population

These rural regions are remote and sparsely populated, mainly by Alaska Natives living in many small villages and a few, larger regional centers. The Nome Census Division experienced a 5.6 percent decrease in population between 1960 and 1970, a 13.7 percent increase between 1970 and 1980 and a net gain of 7.3 percent between 1960 and 1980 (Table 2). The Wade Hampton Census Division increased 25.2 percent in population between 1960 and 1970 and 19.1 percent between 1970 and 1980 for a net gain of 49.1 percent between 1960 and 1980. Although growth characterizes the entire study area, it is far from uniform.

TABLE 2
Regional Census Division
Population Comparisons, 1960-1980

Division	Year		
	1960	1970	1980
Nome	6,091	5,749	6,537
Wade Hampton	3,128	3,917	4,665

Source: U.S. Census Bureau

TABLE 3
Regional Census Division
Population Comparisons, 1980-1982

Division	1980[a]	1981[b]	1982[b]
Nome	6,537	7,565	7,449
Wade Hampton	4,665	4,726	4,832

Source: [a]U.S. Census Bureau
[b]Alaska Department of Labor

TABLE 4
Nome Census Division
Race Comparisons, 1970-1980

	Race (%) Native	White
1970	78	22
1980	79	20

Source: U.S. Census Bureau

TABLE 5
Wade Hampton Census District
Race Comparisons, 1970-1980

	Race (%) Native	White
1970	94	6
1980	93	6

Source: U.S. Census Bureau

The 13.9 percent increase in population in the Nome Census District between 1980 and 1982 and a 3.6 percent increase in the Wade Hampton Census Division during the same period, present a pattern inconsistent with the 20-year trend (see Table 3). Part of the increase for the Nome Census Division may be attributable to more accurate data gathering methods by the State. Races other than Native and white have not been included in Tables 4 and 5 since they generally total less than 1 percent. This explains why the totals can be less than 100 percent.

2.2.1.2. Economic Structures

Regional economies are undeveloped by Western standards, showing a low rate of capital investment in economically productive private and public infrastructure. Subsistence remains crucial to the economic welfare of many residents. The indigenous cash economic base is narrow. Existing export industries are natural resource based (fish and oil) with minimal value added by local labor. Nonlocal government expenditures are the main source of personal income. Per-capita incomes are low, consumer purchasing power is low, and the scope of locally provided goods and services is also very limited. Seasonality is typical of cash employment. Resident unemployment is generally high, partly due to the low level of overall economic activity and partly due to a poor match between the occupational skills of residents and the skill requirements of available job openings. Labor force participation rates are generally low, reflecting the depressed state of the cash economy, the level of workforce skills, and the competing role of subsistence economic activity.

Though these regional economies appear broadly similar to the mainstream economy, closer inspection exposes basic differences in economic organization and functions that may affect response to the economic choices and changes brought about by OCS development. Because the study area overlaps two regions, a comparative review of data can help distinguish pertinent economic characteristics and patterns of the study area. Interrelationships with the Bethel region economy warrants its inclusion in this review. Such distinctive features rather than in-depth analysis can help establish regional economic patterns that affect Norton Sound communities.

Alaska Department of Labor employment data (on which the following analysis is based) do not include the self-employed. Therefore, income from such sources as commercial fishing, small-scale mining, and cottage industries such as ivory carving does not appear, nor does the cash value of subsistence income. Consequently, the data tend to somewhat understate the scale and importance of the private economy, especially where local commercial fishing and other forms of self-employment are common. Within these limits, however, the Department of Labor employment series stands as the most reliable source of consistently compiled historical employment data for rural regions.

Comparison of 1980 employment data for the pertinent Alaska Department of Labor labor areas (the labor areas closely match the designated rural regions and corresponding census divisions), shows some gross differences in economic structure, functional organization, and the relative strengths and weaknesses of various economic activities (Table 6). The economic structures of the Nome and Bethel labor areas share a number of similarities. Each is dominated by its regional center (Nome and Bethel, respectively), which by itself accounts for at least one-third of the region's population and employment. Governmental employment is the most important single sector in each region, amounting to about 40 percent of all employment. Both have relatively strong trade and services sectors but little to export. The Wade Hampton labor area, on the other hand, differs in some important respects. Governmental employment is even more dominant than in the Nome and Bethel areas, accounting for more than 60 percent of employment. State and local governments together provide about half of all employment. This labor area has the weakest nongovernmental sector of the three here, and has, in fact, the weakest of all rural regions of Alaska.

To summarize, significant differences in functional organization are apparent among these rural regions as they face the advent of OCS development. There is wide variation in the relative roles of governmental and nongovernmental sectors. Private sector differences in employment patterns reflect varying degrees of functional specialization (e.g., mining, commercial fishing, services, construction, transportation services) in the economic structure of individual regions. None of the three areas has a significant basic export industry. With specific reference to the

TABLE 6
Western and Northern Alaska Labor Areas
Percent Distribution
1980 Average Annual Employment, by Industry

	Nome	Wade Hampton	Bethel
Mining	*	*	*
Contract Construction	*	1.9	3.2
Manufacturing	*	*	1.8
Transporation, Communications and Public Utilities	6.3	3.3	6.2
Trade	12.6	14.4	11.2
Finance, Insurance and Real Estate	6.4	3.2	3.3
Services	29.3	5.9	30.9
Government	37.6	61.2	41.1
(Federal)	(7.4)	(14.2)	(12.3)
(Local & State)	(30.2)	(47.0)	(28.8)
Total	100.0%	100.0%	100.0%
Total Employment	2,205	999	3,342

*Withheld to comply with disclosure regulations.
1/First three quarters of 1980 only

Source: Alaska Department of Labor,
Statistical Quarterly

study area, the Nome labor area has a strong services and trade sector but little basic private employment and comparatively little governmental employment. Wade Hampton, on the other hand, depends heavily on governmental employment for cash input.

2.2.1.3. Employment and Income

Recent employment and income data (Tables 7 through 11) show some clear signs of changes under way in the Wade Hampton and Nome regional cash economies. Total Wade Hampton employment increased about 113 percent between 1970 and 1980, though population rose only 19 percent (Table 7). Nearly all employment growth was in government. Over the past decade, governmental employment grew by 325 percent, compared to an increase of only 19 percent reported for nongovernmental employment. In contrast to the Nome area, the Wade Hampton area does not have any single community that dominates the regional economy by force of numbers or economic functions. The commercial salmon and herring roe fisheries draw some nonresident fishermen and processing workers to certain lower Yukon River and eastern Norton Sound communities.

Of the three regions Wade Hampton is most dependent on transfer income (Tables 8 and 9). The composition of this large share of transfer income and aid, however, is not consistent by area or through time. For instance, Table 12 presents the average monthly number of Food Stamp cases for both regions for the period 1973-1981. The average number of Food Stamp recipients for the Norton Sound Region, for instance, decreased from 1973 through 1977 and increased from 1978 through 1981 (Figure 12). The Yukon-Kuskokwim region shows a similar pattern.

The number of AFDC assistance cases for a typical month for Norton Sound generally increased between 1975 and 1979 and decreased between 1980 and 1982 (Table 13). This pattern is contrary to the one evident in Table 12; increases in one correspond to decreases in the other. Note the large Yukon-Kuskokwim caseload increase between 1975 and 1977, followed by fluctuating figures between 1977 and 1982. Some of the rise in expenditures for both regions reflects cost-of-living and inflation adjustments.

TABLE 7
Wade Hampton Labor Area, 1970 and 1980
Recent Distribution
Average Annual Civilian Employment, by Industry

	1970		1980 1/		Percent Change
	Number	%	Number	%	1970 to 1980
Mining	0	0	*	*	*
Contract Construction	0	0	19	1.9	NA
Manufacturing	*	*	*	*	*
Transporation, Communications and Public Utilities	*	*	33	3.3	*
Trade	75	16.0	144	14.4	+92%
Finance, Insurance and Real Estate	0	0	32	3.2	NA
Services	113	24.1	59	5.9	-48%
Government	144	30.8	612	61.2	+325%
(Federal)	(99)	(21.2)	(142)	(14.2)	(+43)
(State and Local)	(45)	(9.6)	(470)	47.0)	(+944%)
Total	468	100.0%	999	100.0%	+113%

*Withheld to comply with disclosure regulations
1/ First three quarters of 1980 only.

Source: Alaska Department of Labor, Revised Alaska Labor Force Estimates and Statistical Quarterly

TABLE 8
Transfer Payments as a Percentage
of Personal Income

Census Division	1959	1970	1980
Nome	11.3%	19.0%	19.3%
Wade Hampton	16.3	21.3	31.0
Bethel	12.3	23.0	19.7

Source: Bureau of Economic Analysis

TABLE 9
Wade Hampton Census Division, 1970 and 1980
Personal Income, By Source

	1970		1980	
	($000)	%	($000)	%
Agriculture	320	5.4	144	1.0
Mining	0	0	0	0
Construction	718	12.1	(D)	(D)
Manufacturing	908	15.4	(D)	(D)
Transportation and Public Utilities	87	1.5	897	6.0
Trade	249	4.2	1,103	7.3
Finance, Insurance and Real Estate	0	0	0	0
Services	829	14.0	268	1.8
Government	2,800	47.4	10,501	69.9
(Federal)	(2,373)	(40.2)	(3,055)	(20.3)
(State & Local)	(427)	(7.2)	7,446)	(49.6)
Total	5,911	100.0%	15,020	100.0%

(D) Not shown to avoid disclosure of confidential information
1/ By place of work

	1970		1980	
	($000)	%	($000)	%
Net Earned Income By Place of Residence	4,941	77.4	13,454	66.5
Dividends	83	1.3	500	2.5
Transfer Payments	1,358	21.3	6,272	31.0
Total	6,382	100.0%	20,226	100.0%

Source: Bureau of Economic Analysis

TABLE 10
Percent Distribution
Average Annual Civilian Employment, by Industry
Nome Labor Area, 1970 and 1980

	1970 Number	1970 %	1980[1] Number	1980[1] %	Percent Change 1970 to 1980
Mining	*	*	*	*	*
Contract Construction	39	4.1%	*	*	*
Manufacturing	*	*	*	*	*
Transporation, Communications and Public Utilities	115	12.2	138	6.3	+20%
Trade	128	13.6	278	12.6	+117%
Finance, Insurance and Real Estate	*	*	141	6.4	*
Services	93	9.9	646	29.3	+595%
Government	526	55.8	828	37.6	+57%
(Federal)	(187)	(19.8)	(162)	(7.4)	(-13%)
(State and Local)	(339)	(35.9)	(666)	30.2)	(+96%)
Total	943	100.0%	2205	100.0%	+134%

*Withheld to comply with disclosure regulations
1/ First three quarters of 1980 only.

Source: Alaska Department of Labor, Revised Alaska Labor Force Estimates and Statistical Quarterly

TABLE 11
Personal Income, By Source
Nome Census Division, 1970 and 1980

	1970		1980	
	($000)	%	($000)	%
Agriculture	79	.8	0	0
Mining	0	0	(D)	(D)
Construction	830	8.4	1,284	2.9
Manufacturing	(D)	(D)	453	1.0
Transportation and Public Utilities	1,082	10.9	3,820	8.7
Trade	635	6.4	3,970	9.0
Finance, Insurance and Real Estate	68	.7	(D)	(D)
Services	1,395	14.1	11,831	26.9
Government	5,774	58.4	18,663	42.4
(Federal)	(2,472)	(25.0)	(4,400)	(10.0)
(State & Local)	(3,302)	(33.4)	(14,263)	(32.4)
Total	9,895	100.0%	44,051	100.0%

(D) Not shown to avoid disclosure of confidential information
1/ By place of work

	1970		1980	
	($000)	%	($000)	%
Net Earned Income By Place of Residence	10,184	78.1	41,916	77.9
Dividends	374	2.9	1,510	2.8
Transfer Payments	2,482	19.0	10,395	19.3
Total	13,040	100.0%	53,821	100.0%

Source: Bureau of Economic Analysis
Regional Governance

In 1980 governmental employment and transfer payments together accounted for about 83 percent of all personal income in the Wade Hampton region. In the Nome labor area, transfer payments and governmental employment account for only about 54 percent of personal income. Nome's total employment increased by about 134 percent between 1970 and 1980 (Table 10), though population increased by only about 14 percent. The overall picture, however, should not obscure the divergence of economic conditions between the city of Nome, the dominant settlement in the region, and the region's other communities. Nome's service industries were by far the fastest growing sector (+595 percent) followed by trade (+117 percent) and state and local government (+96 percent). Although it lacks a strong private economic base, the Nome area has evolved into a contemporary service-oriented economy. In contrast to the Wade Hampton area, nongovernmental employment grew much more rapidly (+230 percent) than governmental employment (+57 percent). (Appendix D, Nome Update, details the socioeconomic status of Nome, a separate task of this study which updates OCS Technical Report 53 (Ender et al., 1980), a major reference for Nome and the larger study area.

Earnings in Nome's private sector grew relative to the public sector (Table 11). In 1970 the private sector accounted for about 41.6 percent of earnings, in 1980, about 57.6 percent. At the beginning and end of the decade, earnings from state and local governmental employment comprised roughly one-third of earned income. Earnings from federal civilian and military employment, however, dropped from about 25 percent to about 10 percent of personal income. Within the private sector, the strongest earnings growth occurred in services, which accounted for nearly half of all private sector earnings in 1980. (Note that 1980 was an unusually low year for construction activity in the Nome region.)

In both regions the steady curtailment of the federal goverment as a direct provider of services is evident in diminished federal employment figures. Many public service functions formerly provided by federal agencies have been assumed by state and local governments or by other public service organizations or have simply been terminated. Native corporate dividends appear not to be a prominent source of income. In the Nome region, total dividend income comprised 2.8 percent of personal income in 1980 and in Wade Hampton, 2.5 percent.

TABLE 12
Regional Food Stamp Data
Caseload Comparisons, 1973-1981
Number of Cases

Year	Norton Sound	Yukon-Kuskokwim
1973	214.7	265.5
1974	157.9	162.3
1975	130.8	95.5
1976	69.8	80.4
1977	69.4	92.3
1978	97.2	69.0
1979	218.3	84.5
1980	316.8	122.0
1981	301.0	136.5

Source: Department of Health and Social Services, Division of Public Assistance

TABLE 13
Regional AFDC Typical Month Data
Caseload and Expenditure Comparisons, 1975-1982

	Norton Sound		Yukon-Kuskokwim	
Year	# Cases	$ Expenditures	# Cases	$ Expenditures
1975	223	63,695	105	31,980
1976	228	64,365	103	28,512
1977	243	68,194	155	42,775
1978	238	73,325	130	39,908
1979	242	70,397	133	33,421
1980	221	75,228	142	43,230
1981	229	99,533	160	56,419
1982	210	100,199	144	52,587

Source: Department of Health & Social Services, Division of Public Assistance

2.2.2. Regional Institutions

At the regional level, settlements in the upland perimeter of the Norton Basin petroleum province fall into either of two well-defined sociopolitical regions. The Nome region comprises a cluster of some 16 heterogeneous settlements. The Wade Hampton region is itself one of three subareas within the remote political economic jurisdiction of the Association of Vilage Council Presidents (AVCP), Calista Corporation, and a number of other regional organizations headquartered in the regional center of Bethel.

Administratively and politically, lower Yukon villages are largely oriented toward Bethel, where most of the federal, state, and other public agencies serving their communities are headquartered. Lower Yukon coastal villages (Alakanuk, Emmonak, Kotlik, Sheldon Point) comprise only a small fraction of the 58 villages usually grouped together as the AVCP region. The villages north and west of Stebbins and St. Michaels are oriented toward Nome, which has its own concentration of regional headquarters. For the villages of eastern Norton Sound, Unalakleet is a secondary subregional center. Major ethnic and linguistic differences also separate the two regions. Unalakleet is regarded as the mainland linguistic divide between the Yupik-speaking southern Eskimos and the Inupiaq-speaking northern Eskimos. St. Lawrence Island residents speak Siberian Yupik. Two separate air transportation trunk systems serve the two subregions -- the Lower Yukon through St. Mary's and Bethel and the Norton Sound villages through Nome and Unalakleet.

2.2.2.1. Local Government and Administration

These fundamental sociocultural differences are expressed consistently in the territorial regime of the major political and adminstrative institutions that represent and serve the regions. First and foremost the areas fall within two separate Native corporate regions, the Calista Corporation and the Bering Straits Native Corporation (BSNC). Numerous Native-controlled service organizations also tend to conform to these regional lines. The two subareas seem to fall within different jurisdictions for nearly all other important governmental purposes. For instance, the two regions are served by different regional education and coastal management districts, housing authorities, regional health and social service agencies, BIA agencies, community colleges, and state legislative and judicial districts. Innumerable other lesser governmental agencies deliver services to the two regions through separate administrative or field offices.

Local governmental in the two regions is rudimentary. Both regions are in the unorganized borough and outside the jurisdiction of any general regional government. All but one of the communities in the Nome and Wade Hampton regions have incorporated local governments. Each of the six communities chosen for detailed study, with the exception of Nome, also has an IRA or traditional council that provides certain community services and performs certain functions. During the past decade, local governments and locally based public service agencies have assumed increasing responsibility for delivery of a wide variety of services. For example, regional service agencies or local governments now administer many housing, health, social service, manpower, public safety, utilities, basic education, and economic development programs. The scale of these services is substantial and in many cases is growing.

School enrollments (Table 14) are an index of the scope of one locally administered service. The general patterns show increasing Bering Strait Rural Educational Attendance Area (REAA) enrollments, decreasing Nome enrollments, and relatively steady total area enrollments. Data for the Lower Yukon REAA and the Lower Kuskokwim REAA (Table 15) show a pattern of steadily increasing enrollments in each REAA and for the total area as well.

Even where local governments and service agencies administer programs, state and, to a lesser degree, federal governments remain the source of most funds. With the exception of Nome, locally raised and controlled financial resources are practically nonexistent. For example, the City of Nome is the only local government that levies a real property tax and maintains its own school district. Thus, local autonomy is often exercised only within fiscal and program bounds set by nonlocal funding sources.

In sum, the study area is not well integrated by a reinforcing network of common geographic, ethnic, political, economic, subsistence, transportation, communications, or other ties and interests. In fact, the interregional pattern might best be described as persistent cleavage along economic, governmental, ethnic, subsistence, and other lines that confirm the differences and division among the region's communities. This might seriously impair the communities' capacity to respond together to the cultural and economic development issues arising from OCS development.

2.2.2.2. Institutional Changes

The growth and proliferation of formalized institutions modeled on or extracted directly from a Western bureaucratic form is, in many respects, a capsule history of economic, social and cultural change in the study area. Sometimes there is a tight and complementary fit between the functions of indigenous nonformal institutions and those mandated by newer ones. Sometimes this accomodation is not so pronounced, and the formalized institutions may be intrusive. On other occasions the institutions of both types retain specialized but distinct roles, such that the domestic or nonformal structures provide options for organization and joint action that cannot be found in the Western models, and vice versa. Despite specific and very productive adaptations found in any particular case, however, this monumental growth in institutions, and the introduction of new dependencies on them, cannot be understated.

TABLE 14
Norton Sound Region (Bering Strait and Nome)
School Enrollments, 1975-76 - 1981-82

Year	Bering Strait REAA	Nome City	Total Area
1975-1976	188	982	1,170
1976-1977	344	899	1,243
1977-1978	472	797	1,269
1978-1979	304	751	1,055
1979-1980	422	823	1,245
1980-1981	443	712	1,155
1981-1982	591	700	1,291

Source: Department of Education

TABLE 15
Yukon-Kuskokwim Region (Lower Yukon and Lower Kuskokwim)
School Enrollments, 1975-76 - 1981-82

Year	Lower Yukon	Lower Kuskokwim	Total Area
1975-1976	227	1,399	1,626
1976-1977	741	1,463	2,204
1977-1978	905	1,466	2,371
1978-1979	923	1,565	2,488
1979-1980	1,012	1,639	2,651
1980-1981	1,123	1,761	2,884
1981-1982	1,180	1,867	3,047

Source: Department of Education

Specialization among formal institutions and their sheer growth and proliferation have made it increasingly difficult to separate roles, goals, and activities. Residents, visitors, and institutional leaders themselves often note that joint planning and coordination needs between these institutions may in some cases eclipse their practical efforts because the administrative burden is increasingly time consuming and expensive. These comments refer to nearly all centralized institutions in the study area, including city government, the REAAs, IRA councils, committees and executive boards of numerous local and state agencies, the Native corporations, and the many state and federal agencies upon which locally initiated and administered programs depend, including (at least) the federal Bureau of Land Management (BLM), and Bureau of Indian Affairs (BIA), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), Army Corps of Engineers, and Economic Development Administration, the Alaska Departments of Natural Resources and Fish and Game, and the University of Alaska.

A brief preview of prospective joint roles in the coming years should shed some light on how these institutions interpret their charge and how they intend to carry it out. This review represents only a portion of the functions foreseen in the area, specifically those pertaining to the Bering Straits Overall Economic Development Plan (OEDP). It illustrates how complex the interactions of these formal institutions have become in dealing with complex issues, and how complex they are apt to become in the future.

BSNC envisions integrated development in six main areas: traditional and cultural skills, economic opportunity and management development, transportation, infrastructure, employment, and land use (Bering Straits OEDP, 1980, P. 52-55). These components are further subdivided into topics and objectives with specific target and scheduling requirements that provide for cooperation of multiple local, state, and federal entities. For instance, the economic opportunity and management component recognizes seven specific objectives, all with variable timelines. One of these is conflict resolution, which requires joint continuous involvement of regional and village corporations and the BLM. Additional assistance is required from Kawerak, local OEDP committees, NPS, and BIA staff. Another is subsistence food storage developments in Gambell, Savoonga, Nome, Wales, Shishmaref, and Little

Diomede, which demand major attention from local OEDP committees, Kawerak, city governments, local IRA councils and outside assistance from ADF&G, and the National Marine Fisheries Service (NMFS). Targeting priorities, defined on a village-by-village basis, can cause scheduling shifts that make the overall objective more difficult to achieve.

These are only two objectives, and it should be immediately apparent that the institutional demands on local individuals and state and federal agencies are very great. Planning is vital to rational development and avoidance of even greater complications down the line. But the very sophisticated, technical, time-consuming, and expensive requirements of this sort of programmatic development, in even what is assuredly a "streamlined" development effort, will certainly introduce their own institutional demands that will in turn create the need for more coordination and integration in the future to carry out even current plans. This cyclic and constant "involution" (change through highly constrained, internal differentiation) is not rare, and is in fact a hallmark of Western institutions and bureaucracies. It is the price paid to secure a certain level of organization.

The record of institutional change in general, or institutionalization as it is called in social service terminology (which is practically the same as "bureaucratization"), involves other risks that have already begun to influence rural programs and organizations. Institutionalization frequently involves preemtion of services originally in the hands of nonformal or grass-roots institutions, by centralized institutions that demand a higher level of professionalization and accountability. Control, in other words, may be part of the price that must be endured in order to secure the service. Although the genesis of institutionalization is hardly cruel or calculated, it will in many cases build but then seize programs that have been nurtured by local organizations.

The path to institutionalization is simple. A need is recognized by locals and perhaps informal services are provided by a grass-roots organization. Finally, institutional attention is attracted, and small grants or contracts are offered. The service grows; the expense grows; and, finally, the service becomes too expensive or too valuable to leave in immature or unprofessional hands. A centralized authority is either created or steps in, and professional bureaucrats assume control of the service. This is neither a danger nor an advantage, only a nearly inevitable end product of institutional growth and one that may figure prominently in programs in the study area. Alcoholism and drug abuse and domestic violence projects have begun to show these tendencies in the area, and it is probable that others increasingly will if current trends hold true.

A number of major factors influence the complexity and interrelationships among service providers in the Norton Sound and Yukon-Kuskokwim regions that should be illustrated here. These factors are common to nearly all regional institutions, but especially those underwritten largely through transfer funding — Kawerak, Inc., local government, specific state or federal assistance programs, Norton Sound Health Corporation, public safety, and others.

One set of factors relates to the geography of the area, the density of population, village size, and the distances separating one community from another. These factors, together with economic constraints and cost-effectiveness considerations, have dictated a pattern of regionalized service delivery employing a "levels-of-care" approach. Such a system begins first by offering services, usually gradually, in a regional population center (Nome and Bethel). As services develop, resources improve, and the need or demand grows or persists. Those one or two service components which can be most easily (and inexpensively) provided are offered at the next largest (e.g., district or subregional) community level (for instance, Unalakleet or St. Mary's). This pattern continues until it reaches the smallest village level where maybe one two paraprofessionals may be responsible for providing primary services for a wide range of health, employment, social, and related needs and problems. Field personnel typically are employed, supervised, and trained by an agency at the district or regional level.

Thus, this system tends toward hierarchy and centralization within the region. The composition of health and human service delivery agency boards of directors, which typically draw representatives from throughout their region, may offset this hierarchical tendency.

Institutional growth and complexity in rural Alaska also relates to the preponderance of Alaska Natives who, as Native Americans, receive a variety of health and other services indirectly and directly from federal and state agencies. Also, local (government or public) service agencies may spring up in response to a particular or pressing social or health problem of the day.

Such factors encourage complexity within the system, but this is increasingly mitigated by regional Native health corporations providing many services that were formerly governmental. Where there is more than one health agency in a community, any lack of coordination or cooperation can be offset by the shared membership between or among agency boards.

The nature of community problems further influences institutional complexity in health and social services. A major, common thread running through a variety of problems or concerns helps to integrate and coordinate services. The common thread in this area is alcoholism and alcohol abuse. The incidence and prevalence of a host of other health, social, and public safety problems closely correlates with the use of alcohol.

The complexity of the problem itself may further convolute institutional response. If a problem such as alcoholism is multidimensional, either in terms of its etiology or its symptoms, it is more likely that the service deliverers will attempt to initiate, coordinate, or consolidate to deal effectively with such a multidimensional problem.

Policies, requirements, and regulations of funding agencies influence institutional complexity. Typically, government funding agencies (because they are required by statute or by a need to professionalize or rationalize a system) administer categorical programs and require that contractors or grantees also maintain categorical identity for their services. The financial management, planning, client reporting, and other accountability systems required by funding agencies may increase complexity in terms of organizational structure and collaboration within as well as between agencies.

All of these forces and factors are at play in the Norton Sound region. The degree to which the centralized health and social service agencies in the region have been successful in establishing and maintaining boundaries and an effective division of labor is discussed in the Nome Updated Baseline Description (Technical Memorandum No. 83/88-3, Appendix D). The roles of local institutions are discussed in the remainder of this Chapter.

2.3 Yukon Delta Subregion

2.3.1 Subregion Description

Owing to the remarkable continuum of subsistence resource patterns that span the Norton Bay to Yukon Delta area, these communities can be grouped together and their similarities and differences discussed in a geographic format. Distinctive breaks in the overlapping patterns and subregional and systematic digressions from overall trends do occur, however. Commonalities apparent in this area partly stem from a scarcity of data and, thus, are based on generalities and some speculation. Nonetheless, strong physical and social factors seem to facilitate this Norton Sound-Yukon Delta comparative approach.

Although conspicuous disjunctures appear in the resource economy east from Nome and south to the delta, a real sense of orderly progression and transition emerges. Each locale reveals dominant but successive resource regimes. Clearly, these communities can be described within a comparative framework, except the St. Lawrence Island case, and distinctions can be made between the upper Norton Sound (Golovin, Nome and Unalakleet) and delta (Emmonak and Alakanuk) communities. These divisions cannot do justice to the finer patterning of affiliation, resource use, historical contact, and economy between these communities, but they are a start. These details and broader connections will emerge later in the text in a review of each case. Following is a summary of trends and patterns in the domestic economy and resource use at a subregional level. This treatment is general and comparative. The village descriptions, however, also contain comparative material in order to better illustrate the characteristics of the sample data from these villages.

Ellanna (1980) drew attention to this overlapping, discontinuous, or interrupted variation along the BSNC coastal zone east of Nome and south to the Yukon delta, but relevant detailed data are scarce. Nonetheless, this pattern seems to persist to the Yukon delta use zone (Ellanna, 1980, P. 282). The Yukon delta does seem to interrupt this graduated pattern of subsistence resource use, undoubtedly due to its rich and bountiful habitat and several distinct ecological features. Not surprisingly, a similarly graduated and overlapped pattern can be seen to merge with the Yukon delta zone from the south (Fienup-Riordan, 1982; Wolfe, 1981). The presence or absence of herring spawning grounds figures significantly. These and following references to habitat and use zones, it should be noted, are based on social and not physical information, and they should not be construed as fixed in space. Available data show instead overlapped and sometimes tenuous transition zones that may vary through time (and certainly by season).

Although most of the same species are used and there are overlaps in harvest timing all along this coastal strip, individual villages and groups of villages have distinct patterns of use. These different patterns mainly are due to differences in amounts harvested, which are in turn related to availability, scheduling, and intravillage variations in consumption habits (Fienup-Riordan, 1982, P. 326). She recognized several village groups in the area south of the delta and northwest of Bethel which showed a very gradual merger with neighboring zones (for instance, Kipnuk) and others that are more abrupt (e.g., lower Kuskokwim River villages) (Fienup-Riordan, 1982, P. 353). A key difference in village patterns revolves around the springtime economy and its fit with the summer economy. Although fish, seals, and birds are generally important in the spring throughout this area, differential access to and abundance of these resources point toward the relative dependence on herring (balanced against primarily salmon and secondarily sea mammals) as an important distinction between villages and use areas.

Villages both north and south of the rich herring spawning grounds in the Yukon-Kuskokwim coastal region share diminished access to and harvest of herring as well as greater reliance on other resources, particularly salmon. In the northern section of Fienup-Riordan's sample, for instance, Scammon Bay, like its neighbors, relies heavily on the birds, seals, and herring during spring. The herring fishery, however, "is somewhat abbreviated as the families are in a hurry to make the move to fish camp at Black River by the first of June. There they engage in both commercial and subsistence salmon fishing. The successful subsistence harvest of salmon on the Black River is as important to the residents of Scammon Bay as the herring harvest is to the Nelson Islanders." (Fienup-Riordan, 1982, P. 337).

Thus, although Scammon Bay has access to herring, the proximity to the salmon resources of the Yukon effectively reduces the role of herring and, in view of the Scammon Bay pattern, highlights the overall economic role of salmon in the delta region. Villages to the south of Scammon Bay show primarily a lateral and easterly trend of land use (Fienup-Riordan, 1982, P. 332-333), whereas the Scammon Bay pattern adjoins the Black River to the north and, in doing so, overlaps with use zones typical of Yukon delta communities as they have been documented in the literature. As Wolfe shows in his analysis (1981, P. 117, 120), families from Emmonak, Alakanuk, and Sheldon Point commonly fish the Black River before or after the salmon season for nonsalmon species (sheefish, whitefish, etc.). Delta residents more often disperse for salmon harvests along the main Yukon tributaries, north of the Black River, when the Scammon Bay summer salmon effort moves there (these refer to general and variable patterns, not to entire populations) (Wolfe 1981, P. 107). The rich fish resources of the Yukon River attract people who otherwise use areas to the south, just as their neighbors to the south are drawn north.

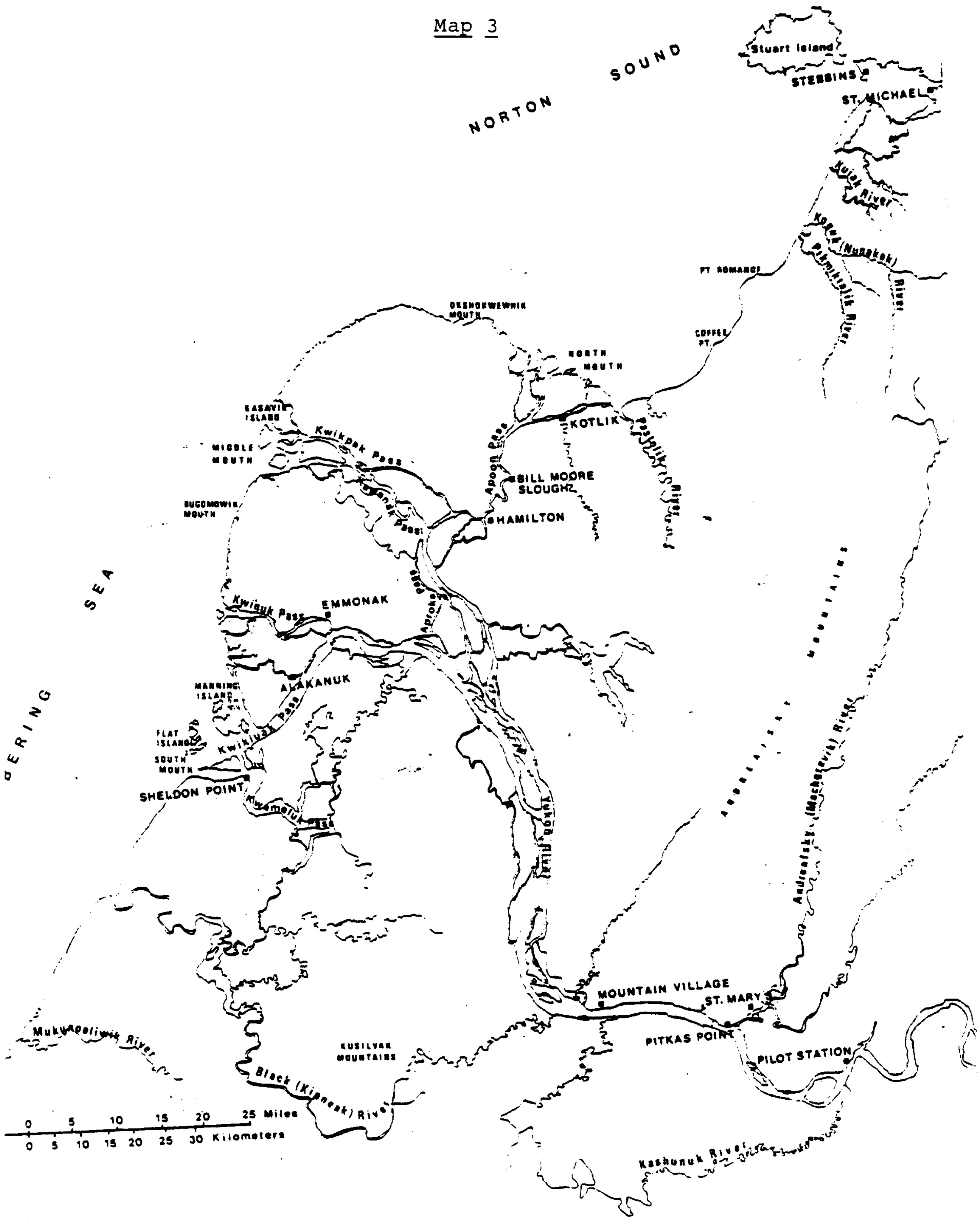
Nearby and major passes into the Yukon mouth, such as Kwikluak and Kwiguk passes (Wolfe, 1981, P. 107), serve as seasonal camp and fishing sites for many Emmonak and Alakanuk households in what can only be described as an intensive salmon fishery during summer (see Map 3). Salmon, harvested commercially or for subsistence purposes from early June through September, are a pivotal resource for these communities. Looking at the entire delta, Wolfe (1981, P. 67) found, "For most households, salmon represented the largest single source of food and income . . . The economic solvency of Kwikpagmiut households usually pivoted upon the success of salmon fishing." Seals and belukhas may be taken during summer but usually incidental to salmon activities.

As summer grades into fall, waterfowl and vegetation gathering increases as the salmon harvest diminishes, and fall seal and belukha hunting (offshore, west for Emmonak and somewhat southwest for Alakanuk) or fall fisheries (primarily whitefish) ultimately eclipse late summer activities just before freezeup. Fall fisheries might concentrate families near their villages (winter communities in Wolfe's terms), but whitefish and sheefish harvesting might draw Alakanuk and Emmonak families far to the south (Black River) toward Scammon Bay. Pike harvesting might occur to the far south or east, near Mountain Village (Wolfe, 1981, P. 111-120). Other harvests and related activities for the balance of the year might draw Emmonak and Alakanuk families to the east and south, as above, or may centralize them in their home villages, as habitat or game accessibility dictates.

In Wolfe's household sample, which includes Emmonak and Alakanuk, ". . . commercial salmon income represented the largest and most consistent source of money . . . commercial salmon earnings comprised 45.8 percent of their annual monetary income, or $8,026 per household." (1981, P. 92) Investigations for this study revealed that in Alakanuk wage income and commercial fishing income were nearly identical, but in Emmonak wage income was about twice fishing income. Mean sample incomes for Alakanuk and Emmonak were about $15,000 and $19,500, respectively. Transfer payments and welfare accounted for a significant but highly variable share of income (higher proportionally in Alakanuk). Although dependencies on cash introduce both demands and insecurities for local families, the search for cash penetrates and partially shapes the seasonal round for all. Nonetheless, traditional resource use, a dominant and fundamental element of the economy here, continues to disperse local families and productive units throughout this delta area since subsistence remains a lynchpin for overall economic adjustment. Fully half of Wolfe's sample, for instance, dispersed to fish camps during the summer (1981, P. 56).

In some economies elsewhere wage and cash pursuits may represent more private, individual, and independent quests, but here income and production are tied together as mutually supportive and contingent propositions. Most production continues to occur within family units. Economic activities are seen to support and promote a common strategy, whether related directly to cash or not. As Wolfe noted, ". . . most socially significant activity occurred within kinship-based groups." (1981, P. 59) Joint production, pooling, exchange, and consumption of resources continues to be the hallmark of the domestic network.

Map 3



Source: Wolfe (1981, P.27)

High costs of living make subsistence a costly proposition, but for many it remains essential. Ironically, in the face of high local costs for food and goods and limited assets, the wisest economic course for families is usually substantial investments in subsistence (Wolfe, 1981, P. 96). Yet, many incomes are unpredictable or erratic (in any event, not well timed and available vis-a-vis immediate subsistence needs). Families with less cash available to them may lose additional potential benefits because they cannot invest at a particular time. With the realities of resource availability, for instance, Wolfe noted that recent price increases for gasoline tend to restrict the mobility of the poorer families, which in turn inhibits certain pursuits they otherwise would engage in (1981, P. 154).

Cooperation is essential to families for this adjustment to these seasonal, regional, and large scale economic variations. The domestic network provides the structure and values for this cooperation. Cooperation may be exemplified in the household by activities that are allocated by sex, age, or production and exchange relations among families, and that are diversified spacially and in terms of economic roles. Network members assist one another directly in such tasks as fish harvests and indirectly when some members secure wages and others fish and hunt. In complex and diversified ways extended exchange networks bring common subsistence commodities to the community. Differentiated subsistence activities could be exemplified by the tendency for older men to surpass the younger in all but salmon and sea mammal harvests, possibly as the result of age cycle trends and different harvest costs (Wolfe, 1981, P. 200-203).

Although kinship undoubtedly provides a structure and general configuration for exchange and cooperation, goods, skills, and resources are distributed flexibly, logically, and extensively. Wolfe's schematic examples (1981, P. 212-213) show that, although tight, consanguineal links are important to food transfers, they account for only a portion of them. Wolfe and others document many types of food exchange and sharing, and though some share a more transactional meaning, all are associated with diverse cooperative sentiments. Theses exchanges often transfer regional specialities and rare commodities through an area, reaffirm economic relations, and play a nonformalized quasi-budgetary role in the domestic economy. The overall insecurity of economic resources in the area makes these cooperative relations and networks between households and communities a major stabilizing influence.

As is the case for most rural Alaska communities, Emmonak and Alakanuk have grown immensely in formal institutional complexity over the last 10 years. Centralization of authority and services also appear throughout rural Alaska. Once institutional needs outstrip the capacity of nonformal mechanisms of control and administration (a case that is typical certainly of all but the smallest villages), an inexorable transition toward increasing specialization and institutional complexity occurs. Emmonak and Alakanuk clearly reflect this transition.

The scale of local organizations has grown and continues to grow in both communities. Convenient measures of organizational scale, such as overall administrative proportions and numbers of organizational boundaries within institutions (See Appendix A and B; scale refers to qualitative and quantitative size and complexity), show that Emmonak may be somewhat more advanced along this gradual dimension of change than Alakanuk. For instance, organizations in Emmonak typically contain more internal boundaries (as between administration and management, management and line staff, and so on). Size of administrative cores, on the other hand, is much the same in both cases. It is pertinent to point out here, and somewhat in advance of our later findings (Chapter 4), that the larger communities are uniformly more complex using both measures than the smaller communities. Emmonak may seem to represent a transitional case that shows evidence typical of both smaller and larger communities, and Alakanuk fits more neatly into the "small community, less complex" institutional class.

Both communities are complex enough to require a degree of coordination (formalized affiliation) with other regional and community organizations to carry out chartered business. Both, however, are small enough to avoid purely technical and formal links to carry out this business; that is, a high degree of informal (and largely traditional) cooperation still links organizations and joint activities. Whereas very large communities tend to carry out their institutional activities through formalized and technically defined channels, these two communities may still rely on other, less institutionalized techniques. Both contrast with yet smaller and less complex communities that carry out joint activities quite well but without the many strictures of formalized, institutional liaisons between groups.

Organizations within each community retain relatively little autonomy in comparison with the many larger regional and state authorities with whom they must deal. Certainly autonomy is a relative measurement since no community is truly autonomous. Nonetheless it is possible to assess community institutions along this dimension in a very general manner. For example, large regional hubs or state centers (Fairbanks, Anchorage, etc.) are relatively autonomous compared to other communities, not in any absolute sense. Although most smaller communities lack autonomy, they may or may not show another institutional pattern related to autonomy -- polarization. Polarization tends to be less in evidence in these two communities than in smaller villages where, typically, organizations must embrace multiple and general, nonspecialized tasks to meet the needs of the community.

Overall, Emmonak and Alakanuk fall in a "middle" institutional class represented by modest organizational complexity, modest organizational coordination and specialization, and limited diffusion of activities and may stand on a border separating communities showing a more or less complex institutional structure. Bear in mind that these observations are only fragments of a larger analysis in Chapter 4. These comments, though descriptively helpful, will make more sense later when they are refined, corrected, and compared with other observations in other communities.

2.3.2 Emmonak

Emmonak is located at the mouth of the Yukon River on the north bank of the Kwiguk Pass in the Yukon Delta. Twelve households comprised mostly of Alaska natives, became respondents in this study, of which nine were nuclear family households (6.2 persons per household), two extended family households (9.5 average size), and one joint family (8 persons). The sample represents about twelve percent of the population and about ten percent of the households. The sample includes a disproportionate number of high earnings families, many of which are heavily engaged in commercial fishing and possibly less engaged in subsistence than their neighbors. This conclusion is supported by both our income data, field notes, and other data from these communities. More than 58 percent (seven of twelve) of the households held unstable but predictable incomes (i.e., commercial fishing), whereas 16.7% had unstable unpredictable incomes (seasonal or periodic and uncertain), and 25% had stable and predictable incomes (two and three households respectively); no families in the Emmonak sample had stable but unpredictable incomes.

Nearly all households in the sample are virilocal, which means that a female spouse lives near male spouse's bilateral kin and in the village of the male spouse. Nearly all households are part of a network of bilateral kinsmen (usually the male spouse's relatives) and friends. These networks fulfill diverse functions with greatest emphasis on subsistence tasks of all kinds and sharing of subsistence goods. Secondary functions include child care, assistance with house building and renovation, emotional support, socializing, and sharing nonsubsistence goods and money. Many networks extend to other villages. Most of the residents want family members with and near them, and they make special efforts to sustain these associations.

Of the 126 housing units, 51 belong to public agencies, principally the Association of Village Council Presidents Housing Authority, which rent them for about $55 per month. Other housing units are rented from individuals or are owned by the occupants. Most households have electricity, oil heaters, television sets, CB radios, and telephones, and many have refrigerators, and freezers. Water is generally hauled from the Yukon or from central holding facilities provided by the City.

Sample households expend an average of about $4,500 per year for food and other necessities at the local store and at wholesale grocery outlets mainly in Anchorage and about $3,000 per year on utilities; expenses range from $2,000 to $6,000 for subsistence. Wage earners with relatively high incomes claim that a family of five needs about $22,000 to maintain a household each year. Many households receive various forms of transfer payments (food stamps, energy assistance, and certain kinds of welfare) and subsistence products extracted or given by others. Emmonak shows high rates of food stamp (Table 16) and Aid to Families with Dependent Children (AFDC) use (Table 17), and amount of transfer income (Table 18) is second only to Golovin's.

TABLE 16
Emmonak Food Stamp Data
Individual Recipient Comparisons, 1981

Population[a]	Average number Indiv./Month	# Indiv. Case	Indiv./Total Population(%)
568	131	5.2	23.1%

Source: Department of Health & Social Services
Department of Public Assistance

TABLE 17
Emmonak AFDC Data
Caseload Comparisons, 1981

Number of Cases	Number of Cases/1,000
25	44.0

Source: Department of Health & Social Services,
Division of Public Assistance

TABLE 18
Emmonak Transfer Payment Data
Total Expenditure Comparisons, 1981

Total Annual Expenditure ($)	Total Per Capita Expenditure ($)/Year
238,955	420.70

Source: Department of Health & Social Services

Emmonak residents are under the political management of a seven-member village council, the Calista Regional Corporation (which holds rights to subsurface resources outside the city limits), and the Emmonak Native Corporation (which holds surface rights to more than 120,000 acres of land). The functions and composition of these institutions are similar to those described in this report for other village councils and regional and village corporations. Presently 477 residents of Emmonak are shareholders in the Emmonak Native Corporation.

The villagers interviewed expressed general satisfaction with the performances of these formal institutions. Most declared that social harmony, on a formal and informal level, is a treasured feature of life in the village, and most want to remain in the community with kin and friends. A repeated theme in the interviews underscores a desire on the part of adults for more jobs so they will not need to travel or live elsewhere to earn a living. Attitudes about formal long-range planning are divided between those who believe planning should be short term because of the unpredictability of federal, state, and corporate policies and plans and those who stress planning well into the future to maintain a tight rein on population, economic, and other changes. Some residents fear that long-term planning, with policies and guidelines intended for protracted periods, inhibits flexibility and adaptability to change. Residents express confidence in that growing knowledge and skill in Native institutions and time to acquire expertise needed to meet the demands of the future will be adequate to preserve community cohesion and subsistence activities that give the most meaningful substance to Native life.

The Emmonak sample wants more outsiders in their village only if they have professional skills that can be used to improve services and do not compete with local residents for badly needed jobs. Community residents want to continue to receive improved health care and other services and have a growing expectation for their provision in the future. Another hesitancy about more outsiders coming to the village is the fear that drug and alcohol use will rise. Emmonak is considered a peaceful and safe place to live, and residents take pride in the fact that adults continue to instill desired characteristics in their children -- politeness, willingness to share with and assist others, and to respect elders. Recent criminal justice records show extremely low rates of crime (Tables 19 and 20). As in all of the communities included in our study, family life in Emmonak is regarded as the most important feature in people's lives; subsistence activities are ranked equal to or slightly less important than family life, and third is a wage-earning job. Few complained that children showed less obedience than members of preceding generations.

Only very general attitudes about adverse or beneficial effects of oil developments were stated. The few people who commented on the subject expressed a general hope that the Emmonak Native Corporation would benefit, but no details were provided.

Emmonak's population rose from 439 in 1970 to 567 in 1980, or nearly 30 percent, a rate of which is in exceeds natural increase by 1 percent to 2 percent per year. New institutions requiring immigration of non-Native professionals and nonprofessionals are responsible for about 8 percent of the total. Overall population is young (median age of Native population is 20.8 years for males and 20.1 for females), indicating a relatively high birth rate rather than substantial outmigration of adults. Ages of household heads in Emmonak are 0 percent under 30; 58.3 percent (30-44); 25 percent (45-59); and 16.7 percent (60+), similar to the sample as a whole.

All sample households conduct subsistence activities, some spending their time year-round in subsistence pursuits and others only when time away from full-time employment is available. Everyone tries to participate in some way -- these activities, depending on the species sought and the season, often involve whole families. In summer, when fish camps are established along or near the Yukon River, people take time out from fishing with nets and boats to collect plants and hunt for birds and moose. In winter and spring groups of hunters (friends and relatives) or solitary trappers, hunters, and fishermen seek seals, tomcods, smelts, and birds and fur-bearing animals. Following the rationale to typify diversity subsistance harvests (in five categories, see Appendix B) Emmonak has no representation in the high category and instead shows a pattern of 25% of the sample (three of twelve households) in the moderate (one species/category) class, and 41.7 (five households) in the low (less than one species/category) class. However, 33.3% of the Emmonak sample cannot be placed due to insufficient data. These missing data make it

TABLE 19

Emmonak Public Safety Data

Arrest Comparisons, 1981

Homicide		Rape		Part I & II		Total	
#	#/1,000	#	#/1,000	#	#/1,000	#	#/1,000
0		1	1.8	4	7.0	5	8.8

Source: Department of Public Safety

TABLE 20

Emmonak Public Safety Data

Arrest Comparisons, 1982*

Homicide		Rape		Part I & II		Total	
#	#/1,000	#	#/1,000	#	#/1,000	#	#/1,000
	0		0		0		0

*All figures are prorated for full 12 months.

Source: Department of Public Safety

difficult to assess Emmonak, but it is clear overall that the Emmonak sample harvests fewer subsistence species than Alakanuk, for example, even given high incomes and seasonality of incomes. Native species commonly taken are: moose, belukha whales, seals, ptarmigan, rabbits, waterfowl, salmon, whitefish, blackfish, burbot, shellfish, smelt, tomcod; cranberries, blueberries, blackberries, salmon berries; and otter, red and Arctic fox, and lynx are trapped. The central importance of subsistence activities is that they perpetuate a traditional Yupik Eskimo way of life characterized by cooperative, compassionate kin and friendship networks held together by the common goals of extracting, distributing, processing, and consuming traditional foods.

Wage labor is crucial to the village economy. In summer about 300 part-time jobs become available, most (about 250) provided by the Yukon Delta Fish Marketing Cooperative to Native workers at $5 per hour. There are about 80 full-time seasonal jobs in fish processing. An undeterminate number of local fishermen sell salmon and other fish species to the cooperative, which sells most of its products to Japanese buyers. The few full-time year-round jobs in Alakanuk are at schools, a local store, a water treatment facility, a health clinic, the Alaska Village Electrical Cooperative, Delta Air Service, and city government. For a population of nearly 600 the number is small, emphasizing the importance of commercial fishing, subsistence activities, and transfer payments as crucial elements of the village economy.

2.3.3 Alakanuk

All of the discussion thus far merges both secondary literature information and our observations based on our primary data from Emmonak and, secondarily, Alakanuk. Trends portrayed in the literature are evident in the primary data, particularly at the level of general observation. Because our team did not conduct field investigations in Alakanuk, the data available to us are necessarily more sparse; we were fortunate enough to have access to data for Alakanuk (see Section 1.2), however, these data are only a subset of the data used for other communities. This section is therefore abbreviated and comparative.

The Alakanuk sample represents 16 households. An income frequency distribution across the entire regional sample of 82 households allows for comparison of income quartiles within the context of our sample. These quartiles represent percent of respondents at four income levels (Table 21). The Alakanuk sample shows nearly half the respondents in the bottom quartile.

In the Alakanuk sample only about 12.5 percent (two) of the households had unstable (seasonal) incomes, whether predictable or unpredictable; half had stable and predictable incomes (wage jobs, pensions, etc.), and the remainder (almost 38 percent or six households) were stable (nonseasonal) but unpredictable (fixed grants, annual jobs based on erratic transfer funds, and so on). The picture is of far more reliance than in Emmonak on stable but probably very low wages and far greater reliance in the Alakanuk sample on seasonal incomes at the expense of more permanent and stable incomes. Following the rationale to typify diversity of subsistence harvests (in five categories; see Appendix B), Alakanuk represents diverse harvesters (68.8 percent of the sample or 11 households harvested two or more species per category).

Household size tends to cluster around four to six members. Household sizes tend to be larger in Emmonak. The breakdowns appear in Table 22.

The range of Alakanuk household sizes is greater, but overall fewer of the Emmonak households are small, and more are larger. Further, although Emmonak sample incomes are a bit higher in comparison, larger household size probably reduces their effect on family economy. The diversity of species harvested is greater in the Alakanuk sample; and though incomes are smaller here, family sizes are as well. Because the samples are very small (two villages out of the regional sample) it is premature to draw any conclusions about the significance of these patterns. This analysis will appear in Chapter 4.

Table 21
Emmonak and Alakanuk
1982 Income Levels

Quartiles	Emmonak	Alakanuk
$0 to 12,000	0	43.8%
$13,000 to 18,000	25%	31.3%
$19,000 to 27,000	41.7%	12.5%
$28,000 +	33.3%	12.5%

Table 22
Emmonak and Alakanuk
Household Size and Percent 1982

Number of Household Members	Emmonak	Alakanuk
1 - 3	8.3%	18.8%
4 - 6	50.0%	56.3%
7 - 10	41.7%	18.8%
11 +	0.0%	6.3%

2.3.4 Potential OCS Participation

These two communities are similar in many pertinent respects. As noted in Section 2.2 and discussed in Chapter 4, their access to and through Nome to nonlocal employment openings in OCS indusries is poor. Neither community possesses infrastructure, location or commercial enterprises of importance to the proposed sales. Commercial salmon fishing and fish processing comprise the most important private economic enterprise. This is a very seasonal activity, with a brief midsummer employment peak. Fishing and fish processing engage many local residents in season and draw some non-local fishermen and processing workers into the vicinity as well. These are relatively stable, traditional communities with very limited commercial economic resources aside from fisheries. Outside the summertime fisheries, public service and a minor amount of secondary economic activity provide almost all local employment.

2.4 Upper Norton Sound Subregion

2.4.1 Subregion Description

At summer fish camps Kotlik and Emmonak villagers commonly mingle in the same use areas south and east of Kotlik, just as Kotlik and Stebbins villagers may share overlapped use zones in the summer near Kotlik (Wolfe, 1981, P. 43). From Stebbins north and through Norton Bay proper, however, habitat features and resource accessibility change, and, not surprisingly, domestic economies and subsistence also undergo a distinct shift. Stebbins is a convenient case for marking this interruption of the fairly ordered gradual variation in subsistence we see along the study area coast.

Stebbins area resource uses appear dramatically different from the main pattern directly to the southwest, although this departure is largely due to the distinctiveness of the Yukon delta itself rather than idiosyncratic patterns seen only in the Stebbins area. Stebbins area resource use is the logical product of both distinctive and specific factors (like proximity to the delta), as well as large-scale gradual trends in use that stretch the entire extent of the study area. According to Wolfe's data (1981, P. 132-138), the subsistence salmon harvest is higher in Stebbins than in most other delta villages, and commercial salmon fishing is practically nonexistent. It represents a case in which commercial and subsistence herring fisheries are significant, thus resuming a trend witnessed to the south of the delta. Other fish utilization patterns are dissimilar as well, and the total fish utilization at Stebbins is much lower compared to other villages in the sample (on a per-capita basis at about the level of Emmonak, otherwise the lowest ranking delta community).

It is also here in the vicinity of Stebbins that another contrast appears — a substantial increase in sea mammal utilization and a decrease in land mammal utilization relative to other delta communities. This shift is due to differences in physical features (like climate and accessibility) and social (traditional usage and habit) and economic (commercial fisheries) factors. Although sea mammal utilization in upper Norton Sound, and its distinctiveness vis-a-vis other resources used, is not at all dissimilar to that evident south of the Yukon delta, these and other differences have led many scientists to class the area differently. Wolfe, for instance, distinguishes between the Kwikpagmiut of the Yukon Delta ("Yukon River Salmon Fishing and Small Sea Mammal Hunting Adaptation") and the Tapraqmiut of Stebbins ("Coastal Norton Sound Herring Fishing, Salmon Fishing, and Small Sea Mammal Hunting Adaptation")(1981, P. 148-149). Although these terms emphasize the importance of herring, the overall configuration is different as well and does not hinge only on this single fish resource. Classifications like that summarize a major use pattern like this have been widely used in Alaska (Oswalt, 1967; Ellanna, 1980), and almost invariably partition upper Norton Sound off as a distinctive setting with many overlapped ethnic, resource, and use patterns.

Ellanna (1980, P. 93) includes St. Michael and Stebbins in her tabulation of Norton Sound tribes, a classification that condenses a number of sociopolitical and economic factors, even though local kinship organization (among other things) departed from the Norton Sound pattern. In general, there are very few good ethnohistorical data to help assess the traditional forms of polity, social, and economic organization in this area. The Norton Sound region, however, has clearly been a nexus of vast relocations and adjustments among the Yupik and Inupiaq populations before the turn of the century and remains so today. During the early nineteenth century, substantial movements of Inupiat from the north (Malimiut from the Kotzebue Sound area) and the east (peninsular Kauwerak) intruded into areas previously inhabitated primarily by Unalit-speaking Yupik people. Current kinship, settlement, and exchange relations in the area testify to these past events, and quadralingual speakers (Malimiut, Unalit, and Kauwerak and English) are still present today in communities like Unalakleet (Ray, 1964, 1975). Long historic contact and fusion has produced patterns that are pertinent today, evident in, among other things, very strong dyadic and multiple social bonds that reach from these communities to others (for instance, between Koyuk and Buckland to the north; Davis, 1983; Berger and Associates, 1982, Appendix A).

As might be predicted from general trends throughout this area, individual communities and use areas show a discontinuous variation along a common theme. Although salmon fishing, varied nonsalmon fishing, and sea mammal hunting patterns typify the whole in certain ways (in terms of general emphasis, accessibility, and the overall configuration of use), many variations are apparent. Land mammal use, for instance, varies substantially within this area and, hence, these overall configurations are not uniform even though they share many characteristics. Walrus are rare in Norton Bay, and belukha are far more important in the Norton Sound area than in the delta per se. Certain communities, such as Koyuk and Shaktoolik in the immediate study area, utilize caribou far more than do their neighbors (Ellanna, 1980, P. 94-97).

The Norton Sound herring fishery may have declined in subsistence importance in recent years (Thomas, 1982), but especially since 1979 (when the domestic commercial fishery was initiated) its overall economic importance has grown. This commercial resource, as are others, may be unreliable due to price fluctuations in the commercial sector or simple lack of availability or opportunity. Eastern Norton Sound (characterized by Unalakleet and Shaktoolik) may, for instance, experience very different conditions from place to place. In the case of the critical sea mammal harvests, appropriate sea ice conditions and resource concentrations may occur to the south but not to the north, thereby introducing a very real obstacle to harvests for a subset of these people who depend on them. Or in the case of the herring fishery, the short and intense duration of spawning (or the regulated opening and closing of the fishery) may block local groups from participation if they are not well situated (Thomas, 1981, P. 184). The 1980 harvest near Shaktoolik, for example, reportedly lasted five days.

Even within these villages or use zones and in view of the exceptional or transitional cases (e.g., Shaktoolik's caribou harvest), more variation can be found even along the common themes. Some variation results from environmental factors as well as social and economic ones. Others are mainly seasonal. Furthermore, such distinctions may not apply in every year or may apply only to the efforts of a single season. Thomas (1981, P. 250) calculated overall subsistence diet composition for a Shaktoolik sample. Based on fall and early winter periods, the sample diet showed an abundance of salmon, some reindeer, and only about ten percent from large land mammals (moose and caribou). This slice of time shows something entirely predictable for fall.

Caribou intake will likely increase later, especially during spring and, then in early summer share a major role with salmon. Thus, the pattern varies across space and time and, though useful, fails to distinguish the similarities among areas in seasons in which they (caribou) are not harvested. For instance, fall diets in the Yukon delta may parallel those at Shaktoolik (since both will reflect large amounts of salmon but few large land mammals -- e.g., moose for those delta hunters who venture up the Yukon at this time), whereas in spring they may be incomparable. The point of this discussion is to point out that useful categories for characterizing Norton Sound (and other local) communities do exist, but broad categories may not capture many important details.

Specific resource dependencies throughout this region have always hinged on variations in geographic location and resource availability, regardless of the traditional ethnic or ecological classifications or overall resource configurations applied to specific cases. Although the "Large Sea Mammal Hunting" pattern, represented by coastal Seward Peninsula and insular locales further to the west, is an example of the Eskimo whaling culture, small sea mammals, fowl, fish, and land mammals figure prominently in the larger resource regime when available. The local "Caribou Hunting" pattern, represented by inland, riverine populations (Fish River and Kuzitrin Kauwerak peoples in prehistoric times) and some cases in coastal Norton Sound, relied heavily on small sea mammals and fish to the extent available (Ellanna, 1980, P. 81; Oswalt, 1967). Thus, it may be difficult and misleading to inventory species and seasonal rounds to categorize specific cases in a way that will hold up through time and across space.

Some general features of the local resource regime can be described, however, in an effort to typify specializations that may occur from place to place as long as variations are suspended or otherwise pointed out where they are apt to occur. For example, although the Pacific walrus is a key resource further to the west, it is here available only under optimal conditions and is not a critical resource in the Norton Sound and Norton Bay areas. Migration of this species is closely associated with the north and south seasonal movement of pack ice, which typically withholds availability to those communities in the shallower bays in Norton Bay proper; however, depending on ice movements, breakup patterns, food availability, and other factors, this resource may from year to year be accessible not only in the areas flanking Norton Bay but in the bay itself. Thus, an early spring breakup may be accompanied by walrus and in fact, larger numbers of sea mammals of all kinds, in the more sheltered Norton Bay waters (which implies greater accessibility by Golovin hunters, for instance) when this is normally not the case. Although Norton Sound populations have typically been regarded as "Small Sea Mammal Hunters" (which denotes an overall reliance on small sea mammals, fish, and caribou) (Ellanna, 1980), these exceptional harvests are entirely predictable and consonant with more generalized resource strategies throughout Bering Straits and Norton Sound, given exceptional fluctuations in resource availability.

Belukha, noted above as a resource that is regionally more important here than further to the south, may also appear soon after breakup and, in the event of an early breakup, perhaps under conditions even more optimal than are normally the case. Ellanna (1980, P. 99) notes that belukha were more important in Norton Sound in traditional times than further to the west as well.

As was and is the case nearly throughout the study area except for the Large Sea Mammal Hunters, a common denominator of summer subsistence efforts is fish, primarily salmon. Access to fish, and abundance of local harvests, is greater in Norton Sound than to the west, and these resources represent a key economic lynchpin for each of these communities. Although later than in the Yukon delta, salmon and herring runs occur earlier in Norton Sound than to the north and west (Ellanna, 1980, P. 99). The commercial importance of fish resources is also tremendous, even where in a larger perspective it might seem marginal (for instance, Golovin). Even in those communities that historically and perhaps currently can be classed as representative of the "Caribou Hunting Pattern" (Shaktoolik, Koyuk, and perhaps Unalakleet), large harvests of fish during the summer are crucial food (and cash) resources for the duration of the year.

Until winter, fish (and secondarily small sea mammals) remain a primary food resource in Norton Sound. Only after winter is well under way do other subsistence pursuits gain substantial importance. For instance, caribou hunting commences in the eastern Norton Sound area after December and becomes especially important in early spring. Caribou remains a primary resource through spring and early summer, at which times it shares the primary role with sea mammal hunting and fishing. Unalakleet and Shaktoolik hunters deploy themselves in the same general use area and sometimes travel and hunt together (Thomas, 1981). The communities in the vicinity of Golovin Bay typically have far less access to caribou but may obtain them, certainly in smaller quantities, through exchange or in unusual cases through actual harvest. Although the opportunity costs incurred by Golovin area hunters who may range to the east for caribou are low, actual capital outlays are quite high and beyond the means of many. It is not uncommon for Nome caribou hunters to arrange to hunt in the vicinity of Unalakleet and Shaktoolik (Thomas, 1981). Thus distance itself may not pose an insurmountable obstacle to harvests in Norton Sound if financial and capital resources are sufficient.

This area is perhaps best known for its diverse use of multiple species. Although eastern Norton Sound often has excellent access to caribou, this area otherwise extracts those resources that are available, when they are available, and when cash pursuits can be integrated with their extraction. Salmon are probably a single key resource (Ellanna, 1980, P. 283-284), if a single one can be identified, accounting for nearly 40% of the diet for all these communities. Small sea mammals, especially bearded seals, also account for much of the diet, perhaps 20% (Ellanna, 1980, P. 288). The remainder of the diet consists of various fish, fowl, and mammal species which vary seasonally, from year to year, and on the basis of domestic economic pursuits in other sectors (employment, for instance).

Not surprisingly, the fundamental forms of social organization and institutions described for other parts of the study area operate here in much the same capacity. Although domestic and extended family and indigenous sociopolitical forms vary throughout the study area (and show very distinct variations in some areas, for instance St. Lawrence Island), underlying similarities in form and function far outweigh any variations. For instance, variations in the structure of social organizations, due in part to the historic migrations in the study area, are evident in certain locales (for example, Stebbins and St. Michael) and are visible in different historic or contemporary kinship, socialization, and residence patterns (Ellanna, 1980).

At a general level the observations reported for the Yukon delta concerning domestic cooperation, exchange, and social organization apply here as well. Economic cooperation between residential units, most likely along kinship lines, is critical to the joint adaptation to seasonal, regional, and broader variations in economic opportunity. The domestic network (often but not necessarily kinship-based) provides a structure, a format, not only of people, but of roles, commitments, sentiments, and social and economic objectives for carrying out this joint adjustment. Network tasks may vary by season or by resource and may be stratified or otherwise differentiated by fixed characteristics (such as age and sex) or achieved factors (such as job skills and education). Economic exchange may accrue different sentiments and may be based on a variety of conscious motivations, but nonetheless it penetrates nearly every household and, in general, implies reciprocal relations that may be established by historic precedent and may continue through time. Thus, domestic networks can represent what may be accurately described as corporate bodies with fairly well established charters and often well structured and specialized functions that integrate many families.

In recent years new and often imposed Western institutions have usurped some social, economic, and political roles that were previously housed within the family, the domestic kinship group, and larger and often highly structured kin-based residence and polity organizations. Many appropriated roles have occurred "on paper." Socialization and education, health, jurisprudence, and economic administration have become centralized and "institutionalized" (in quotes here because these functions technically were contained within institutions even in traditional times), the locus of most economic, social, and political activity remains familial and local. In many cases the "institutions" have, in fact, been appropriated by selected domestic and kinship groups in local communities. Western political and economic entities may actually represent a veneer over highly traditional forms of organization. This is not to say that Westerization and acculturation are only apparent realities, for this is hardly the case. The point is that traditional institutions and forms of social organizations, rooted in the family and based on long-standing cultural and ecological logic, persevere and remain durable, often in the guise of "new" Western entities. Chapter 4 further discusses institutional and domestic dynamics and in far more detail.

The remainder of this section describes and compares primary sample data for this subregion. Using the format established in Section 2.3, the subregional and subarea descriptions contain some village-level data treated in a comparative manner. Because the village samples represent different proportions of the communities, this approach allows only a comparison of samples and is not intended to represent broad differences between communities. Nonetheless, these sections are the most appropriate places for a comparative treatment. Other village-level data are summarized in Sections 2.4.2. and 2.4.3. and 2.4.4.

The sample of 13 Unalakleet households and 13 Golovin households can be used to illustrate some features of the sampling for this study as well as pitfalls of the process generally. For instance, the 1980 census lists 19 families in Golovin (hence the Golovin sample is proportionally large), but 133 in Unalakleet. The samples may somewhat underrepresent the lower income households in both communities, although marginally so. In Unalakleet, the sample is proportionally small in both the lowest and highest income categories. The Golovin sample may include most higher income families, but because it covers most households in town, it also adequately covers the low income category. In any case changes in income distribution in three years (1979 to 1982) in a very small village may result in erratic percentages. In Golovin, it is impossible to assess precisely what the sample represents. Nonetheless, both samples are suitable for our analysis. Table 23 summarizes income comparisons.

It is not the intention of the researchers that the sample statistically represent all population segments as they may be defined economically or socially. Not only is this impossible given a very small sample, but is unwarranted given the thrust of the study and constraints on the study design. Network samples sample through cohesive social groups that, in large part, follow kinship, peer, and common interest lines. Thus, it is not at all unusual to find networks that are better or worse off than others, more or less politically connected than others, and so on. These conditions do not validate or invalidate network samples but establish bounds within which they are useful.

Table 23 Unalakleet and Golovin Income
By Quartiles and Percent, 1982

	Unalakleet		Golovin	
quartiles	census	sample	census	sample
$0 - 12,000	39%	23%	47%	46.2%
$13,000 - 18,000	14%	15.5%	37%	15.4%
$19,000 - 27,000	20.5%	53.8%	16%	30.8%
$28,000 +	26.5%	7.7%	0	7.7%

In the entire sample of 82 households, most incomes were both stable and predictable. Both Unalakleet and Golovin exhibit this characteristic. In Golovin 76.9 percent of the sample (10 households) had stable and predictable incomes; about 8 percent (one household) were stable but unpredictable (for instance, incomes attached to erratic grants and contracts), and about 15 percent (two households) were both unstable and unpredictable (also erratic). In Unalakleet 69.2 percent of the sample incomes (nine households) were stable and predictable, whereas about 8 percent (one household) were stable and unpredictable, and 23 percent (three households) unstable but predictable (typical of large commercial fishing incomes among adept, skilled households). Thus, in both cases most incomes are stable, with fewer unpredictable overall in Unalakleet.

Data for Unalakleet are not suitable for many generalizations concerning proportions of subsistence protein in the diet and diversity of subsistence harvests. The data for Golovin, however, are suitable for some description and limited comparisons. In the entire sample, 28 percent of the households (23 households) relied on subsistence protein for more than 75 percent of their diets; in Golovin, however, 61.5 percent of the households did (eight households). About 31 percent of the Golovin households (four) relied on subsistence protein for between 50 and 75 percent of their diets, and only about 8 percent (one household) relied on less than that. Disregarding (and cautiously so) about 62 percent of the data in Unalakleet, 15.4 percent of the households (two) relied on subsistence protein for more than 75 percent of their diets, whereas 23.1 percent (three households) relied on this protein for between 50 and 75 percent of their diets. The volume of uncertain data in Unalakleet obviously inhibits reliable conclusions. But in the case of Golovin, many households clearly rely on subsistence protein for a major share of their diets. These households may not have harvested all of this protein, for this measure assesses only consumption and exchange is not addressed.

Actual harvests, measured in terms of diversity, bear out this pattern. Employing the same diversity measure noted earlier (see Appendix B), we find that 84.6 percent of the Golovin sample (11 households) harvests two or more species from each of five categories, only about 8 percent (one household) harvest one per category, and only about 8 percent (one household) harvest less. Unalakleet had a large share of uncertain information (30.8 percent of the sample), 30.8 percent of the sample (four households) harvests two or more species per category, almost 39 percent (five households) harvest one, and no families harvest less. Thus, diversity of harvests and subsistence protein seem associated in these cases.

Political participation and sodality participation patterns are somewhat different when we compare Golovin and Unalakleet. In Golovin almost 54 percent of the sampled households (seven) contained two or more formal political representatives, 15.4 percent (two households) had only one, and 30.8 percent (four households) had none. In Unalakleet about 23 percent of the data are unclear on this measure, but about 23 percent of the households (three) contain two or more representatives, the same number have one, and almost 31 percent (four) have none. Thus, except for uncertain data and the clearly higher level of substantial political representation in Golovin, the samples are similar in the proportions showing only one or no political representatives. In sodality participation the pattern reverses. In Golovin 23.1 percent of the households (three) contained two or more sodality participants, whereas in Unalakleet 53.8 percent of the households (seven) did. A significant quantity of data are missing in both cases (15.4 percent in Golovin and 23.1 percent in Unalakleet). Nevertheless, no matter what method was chosen, the pattern would still remain -- more sodality memberships in Unalakleet and less in Golovin. In Golovin 46.2 percent of the sample had no sodality participation, and 15.4 percent (two households) had only one affiliation. In Unalakleet, none of the sample had no affiliations, and 23.1 percent (three households) had but one. A reversal is evident for Golovin, where there is high political representation in the sample but low sodality representation. This pattern likely stems in part from the great institutional-political demands placed on any community, that in the case of Golovin (a very small village) might proliferate political roles far beyond a normal per-capita level.

In Unalakleet, 92.3 percent of the sample (12 households) is nuclear or nuclear-fragmentary, and just under 8 percent (one household) is coresidential. Sample household sizes are compared in Table 24. In Golovin about 39 percent of the household heads (five) are between 30 and 44 years of age. In Unalakleet almost 62 percent (eight) are 30 to 44 years of age (compared to the overall sample percentage of this age of 47.6 percent). In

Table 24 Unalakleet and Golovin
Household Size and Percent, 1982

	Unalakleet	Golovin
1 - 3	15.4%	69.2%
4 - 6	84.6%	30.8%
7 - 10	0	0
11 +	0	0

Golovin about 23 percent (three) are under 30, whereas 15.4 percent (two) are between 45 and 59 and about 23 (three) percent are older. In Unalakleet none are under 30, but about 8 percent (one) are between 45 and 59, and about 23 percent (three) older. The youngest category (under 30) is heavily represented in Golovin (23.1 percent) when compared with 9 perent in the overall sample.

The sample communities exhibit distinct as well as similar institutional characteristics. The common, underlying tendencies of massive institutionalization and centralization of services, governance and administration, economics, etc., even in the face of ongoing efforts to enfranchise local entities, is very strong and permeates local life. Real differences, however, are apparent. Each community in the sample, depending on size and composition among other factors, may respond differently to the same or equivalent social and institutional impulses. Moreover each community may express common trends in different ways, in patterns that may be logically determinate or idiosyncratically varied. (Chapters 3 and 4 cover institutional characteristics in more detail, but it is important to note both common trends and differential response early on as these matters are the crux of the community typology.)

Emmonak and Alakanuk data indicate that these two communities are transitional in terms of various institutional measures (see Section 2.3.1., 2.3.2., and 2.3.3.). Both were becoming increasingly complex and specialized, and both revealed similar patterns of coordination and cooperation among organizations. Measures of organizational scale placed them similarly, although Emmonak seemed to express the transitional case most clearly. The distance between Golovin and Unalakleet, on the other hand, is great. Unalakleet falls at one end of most scales (beyond Alakanuk and often Emmonak), whereas Golovin rests at the other end of these scales. The reasons can partially be attributed to their size, since size dictates, logically or empirically, a number of other social and economic conditions.

Organizational scale in Unalakleet far exceeds that in Golovin and differs markedly from the other communities, too, save Nome (see Chapter 4, Section 4.2.1.). Far more instititional organizations have large administrative cores, and more are marked by multiple hierarchic boundaries. Administrative core, or any measure of administration, refers not to absolute numbers but to the proportion of administrators to other staff. Thus this measure looks more at growing bureaucratization and "top-heavy" organizational formation, than at the sheer numbers of different classes of employees. Such measures may seem biased by variable and possibly idiosyncratic events; e.g., the recent relocation of Bering Straits School District headquarters to Unalakleet. On the contrary, the assumption here is that such events truly represent the institutional reality of Unalakleet and are far from idiosyncratic. This event is consistent with what we know about Unalakleet and the processes it is undergoing.

Unalakleet is typical of the overall sample in that coordination and cooperation are marked. Specialization and formalized liaisons are evident, and well-defined cooperative mechanisms carry out joint institutional activities. Similarly, Unalakleet organizations are somewhat more autonomous and less polarized, than in most of the other communities (Appendix B).

2.4.2. Unalakleet

This village is the second largest of the villages used in this study. With a population of about 800 and located 148 miles southeast of Nome, it is a secondary administrative hub in Norton Sound. Only Nome with a population of about 3,040 (Alaska Department of Labor 1981 estimate) is larger and more central to the economy and administration of Norton Sound's communities. Unalakleet's population jumped by about 150 from about 650 in 1980 due largely to the move of the Bering Straits School District offices from Nome (Jorgensen, et al., 1983, P. 229).

Unalakleet's population has a median age of 24.3 for males and 21.6 for females, according to the 1980 census. Eighty-eight percent of the residents are Native. The non-Native portion increased from 6 percent to 12 percent between 1970 and 1980. Natural increase is about one percent per year, doubling the population every 69 years. The numbers jumped 80 percent between 1970 and 1982, mostly because of migration.

Native residents avidly participate in subsistence pursuits, and in all age groups there is a persistent reaffirmation of their importance.

Subsistence activities are viewed as the basis of a good life, healthy diet, and cultural values that stress familial and friendship bonds in sharing, mutual concern, and cooperative endeavors in the wild. Conservation of natural subsistence and other species and respect for nature are ethics shared by most of the community. These attitudes are reflected in the many interviews conducted by interviewers for the harvest disruption study (Jorgensen, et al., 1983) and this study.

Of the 13 households contacted by our researchers, most depended on subsistence goods as sources of food despite the fact that about 75 percent of them earned wages sufficient to purchase store-bought foods. Most of the household heads and their spouses declared a very strong preference for Native foods (caribou, bearded seal, salmon, Dolly Varden, smelt, tomcods, herring roe-on-kelp, ducks, geese, etc.) regardless of age and, in most instances, place of birth. Their preferences are underscored by such statements as, "White man's food gives me a sour stomach" or "I feel at home with food of my own kind." Furthermore, those who earn substantial wages by village standards generally make every effort to get into the field to pursue subsistence species before or after regular work hours. Frequently an employed husband and wife will do this despite domestic and civic responsibilities. Allotted land available to extended families provided a firm, fixed, consistent base for family subsistence pursuits. Most of these are located up the Unalakleet River from the village.

The bilateral extended family is the basis of Native social and cultural support in the village. This kinship system has prevailed for many centuries. It now includes intermarriages between Yupik and Inupiaq speakers (since about the third decade of the twentieth century), whereas before Yupik and Inupiaq speakers maintained somewhat separate bilateral extended families. Most of the households belong to sharing and mutual assistance kinship groups that extend several generations in depth and are extended collaterally to include cousins, grandchildren, aunts, and uncles. Added to these are elders from all kin groups who are given foods, labor, and emotional support, and, finally, each household has friendship networks that form the basis of regular sharing and mutual aid of various kinds. Most networks extend beyond the village boundaries to other villages and urban areas of the state. Many Caucasians of Russian or Anglo-American descent have married into Eskimo families over the years.

Native residents practice virilocality (female spouses generally live with or near the male spouses' bilateral kin groups), and social and many economic functions are based largely on male kin and their friends. Families function cohesively in subsistence activities, and strong bonds are developed among siblings and male kin beyond household boundaries. Family functions provide social continuity from one generation to the next as elders teach younger males and females subsistence and other home crafts. Sharing and mutual assistance extend well beyond immediate blood and marriage kin and it is unthinkable that anyone should go without Native foods contributed by related and unrelated persons. (Kinship relations are described in detail in Jorgensen, et al., 1983, P. 198-219.)

The household composition table (Table 25) shows that Natives and non-Natives reside mainly in nuclear family households. Native families have fewer single persons living together, fewer conjugal pairs and more composite extended, single-parent, grandparent, and joint households than do non-Native households. These differences reflect some obvious social and economic circumstances in cultural preferences and the fact that most Native peoples are long-term residents and most non-Natives are temporary (Jorgensen, et al., 1983).

Commercial salmon fishing is one of the most important activities in Unalakleet. The Alaska Commercial Fisheries Limited Entry Commission, established in 1973 to regulate by permit entry into the commercial fisheries of the state, among other functions, issues 196 ($10,000 to 12,000/permit) permits for the Norton Sound area. Unalakleet Eskimos hold about 90 of these. Native fisherman, limited by capital costs of entries, earned about $5,000 per annum in 1980 (range of $2,000 to $38,000); about 50 Natives with permits reside in Unalakleet, and there are another 50 or so who participate in commercial fishing to some extent as helpers of permit holders. These 100 people belong to the Norton Sound Fishermen's Cooperative (along with 24 local non-Native people). Unalakleet Natives possess about three-quarter of the permits held by Unalakleet residents but do not earn an equal share of the earnings (Jorgensen, et al., 1983, P. 242). Unalakleet is clearly a robust community in economic terms; next to Nome, it generally shows lower rates of economic dependency than other study communities (Table 26).

TABLE 25
Unalakleet Household Composition
Native and Non-Native, 1982

Household Type [a]	Number	Native	Percent	Non-Native	Percent	Percent Difference Nat/Non-Nat.
Nuclear	97	77	(47)	20	(42)	+5
Single Person	31	24	(15)	7	(15)	0
Single Persons Living Together	5	0	(0)	5	(10)	-10
Conjugal Pair (married couple)	21	10	(6)	11	(10)	-60
Composite	12	12	(7)	0	(0)	+7
Single Parent (Denuded Nuclear)	13	13	(8)	0	(0)	+8
Extended	13	12	(7)	1	(2)	+5
Grandparent	7	7	(4)	0	(0)	+4
Joint	7	7	(4)	0	(0)	+4
Unknown	6	2	(1)	4	(8)	—
TOTALS:	212	164		48		

[a] Households were classified as follows: Nuclear = husband, wife, and offspring; Conjugal Pair = husband and wife; Composite = mixed kin and non-kin; Single Parent Or Denuded Nuclear = mother or father and offspring; Extended = husband and/or wife and married offspring (son or daughter with spouse and/or offspring); may include unmarried offspring; Grandparent = grandfather and/or grandmother and grandchildren; Joint = siblings; may include their spouses and/or offspring. (Jorgensen, et al., 1983, P. 209)

TABLE 26
Unalakleet Transfer Payment Data
Total Expenditure Comparisons, 1981

Total Annual Expenditure ($)	Total Per Capita Expenditure ($)/Year
232,826	346.50

Source: Department of Health & Social Services

Unalakleet has 21 formal and informal institutions whose staffs and members are in various combinations of Native (both Yupik and Inupiaq speakers), white, and a smattering of people from other ethnic and racial groups. These include the Village of Unalakleet, the traditional Indian Reorganization Act (IRA) Council of seven elected members, the Unalakleet Native Corporation, Bering Straits School District, Degnan School, Covenant School, Headstart, Norton Sound Fishermen's Co-op, two health clinics, state social services (youth services, public assistance, alcoholism program, home aides program), and Covenant and Catholic churches. These are served by 13 boards or councils, most of which are staffed by Natives. There are at least five informal organizations including a mother's club, dog mushers, and athletic teams.

This array of organizations and their boards and councils are vital to the social welfare of the residents, and the majority of those interviewed belong to several organizations and are for the most part very active in them. As is common in all villages in our sample, the residents of Unalakleet are very conscientious in their service, and they bear the burden of managing community affairs along with the pressing demands of subsistence activities and, to a much lesser extent, wage labor employment. Members of the Native institutions and their elected officials are acutely aware of the possible impacts of oil developments and they have developed a keen sense of the dilemmas faced by Native communities in the wake of oil and gas exploration and production.

The annual subsistence round is described on Table 27, beginning with the month of January. The majority of households in Unalakleet engages in one or more of these activities in any given year, and many spend more than $5,000 a year to conduct them. (These activities, the techniques used, the ways people are organized to conduct them and attitudes about subsistence are more fully described in Jorgensen, et al., 1983.)

The 13 households in the Unalakleet sample (somewhat less than 10 percent of all households in the village) are comprised mainly of married people with children. Most adults are wage earners who also engage extensively in subsistence pursuits. Following are some personal views on village life elicited from residents during interviews about their way of life, the future they envision, and their impressions of proposed and existing oil and gas exploration and production in Norton Sound.

Table 27
Unalakleet Annual Subsistence Rounds and Species
by Common Names, 1982

Month	Activities and Species
January	Fishing - trout, smelts, grayling, tomcods
	Hunting - caribou, rabbits, spruce hens, ptarmigans, grouse
February	Same as January
March	Same as January and February in addition to collection of crabs
April	Hunting - ugruk (bearded seal)
	Collecting - waterfowl, crabs
May	Hunting - ugruk (beared seal), walrus, whale (belukha)
June	Fishing - salmon (king)
	Collecting - bird eggs (murre), land plants ("greens")
July	Fishing - salmon (dog, pink)
	Collecting - salmon berries
August	Fishing - salmon (silver)
	Collecting - berries (blue, black, cran) tea
September	Fishing - ling cod
	Hunting - ugruk (bearded seal), waterfowl, bear, moose
	Collecting - berries (black, cran), tea
October	Hunting - moose
	Fishing - tomcods, grayling, trout
November	Hunting - moose, rabbits, ptarmigan
	Fishing - tomcods, trout
December	Hunting - rabbits, ptarmigan
	Fishing - smelts, tomcods

One 65-year old woman, a widow raised in the village who has raised children there and who participated in subsistence for many years with her parents' family and later her husband and sons, expressed herself as follows:

> Everyone loves the sunshiny day, clear sky—good people, bad people, old people, young children. We all love the sun. If they (developers of various kinds) take away my foods, they gonna take away my sun. That's how I feel. It's gonna be dark for all of us if they hurt our foods and make our water dirty.

Unalakleet is changing, and there are specific alterations in the character of social life and human relations with the natural environment. Most people find opportunities for solitude and quiet less frequent, and they clearly recognize that a rise in the human population by natural increase and inmigration inevitably causes game to vacate some of the customary subsistence sites, reduces naturally occurring species, and degrades the quality of human exeriences in the wild. New machines (boats, snowmobiles, and other recently adopted technologies) are also known to have adverse effects on the natural systems and the character of traditional life. These changes mainly are understood as separate from the suspected effects of proposed oil and gas developments. Most respondents did not favor these projects.

Coincident with an increase in population is a consistently perceived decline in the quality of personal relations--not serious as yet, but certainly a recognized change. These include less obedience on the part of children toward parental teachings, the advent of drugs and alcohol, and less opportunity for traditional activities. Even so, crime rates are quite low in Unalakleet (Table 28) but rising, and the proportion of juvenile arrests is declining (Table 29).

Most Eskimo residents, and many non-Eskimos as well, oppose oil and gas exploration and development in the vicinity of their village and along the Unalakleet River. They fear severe environmental disruption of plants and animals, and they particularly dread serious intrusion into their community from outsiders. Some of those interviewed expressed an attitude of helpless resignation, believing that developments are inevitable and that they will

TABLE 28
Unalakleet Public Safety Data
Incident Comparisons, 1980-1982

	Homicide		Rape		Part I & II		Total	
	#	#/1,000	#	#/1,000	#	#/1,000	#	#/1,000
1980	0		1	1.6	10	16.0	11	17.6
1981	0		1	1.5	18	26.8	19	28.3
1982	0		0		26	43.0	26	43.0

Source: Department of Public Safety

TABLE 29
Unalakleet Public Safety Data
Juvenile Arrest Comparisons, 1980-1982

Juvenile Arrests (% of Total)		
1980	1981	1982
83.3	20.0	12.5

Source: Department of Public Safety

bring unhappy social consequences of the kind they believe Native peoples on the North Slope have experienced. Some are bitterly opposed to energy developments in all of Norton Sound. They believe that no benefits will ever accrue in their village from oil and gas developments. They envision continued increases in prices, few job opportunities, and increased crimes as a result of developments. Several interviewees expressed interest in the jobs that might be available as a result of oil and gas exploration or developments, although they were a small minority. Others, also a minority, believed that representatives from the companies, the federal government, and the village should meet to discuss possible effects on the community (adverse and beneficial) and how to avoid or reduce adverse ones. The people believe that impacts must be monitored and carefully regulated to prevent irreversible harm to the natural environment.

Living in Unalakleet is exhilarating and delightful for most of the residents. The people are quick to express their generosity and warmth even to outsiders. In part because the village is multiracial and multiethnic, there is a feeling of tolerance of outsiders and of people of different racial inheritance. Most express a profound and deeply traditional bond with their natural surroundings. There are countless incidents of selfless action and expressions of a love of nature contained in Jorgensen, et al., 1983, P. 262-279, and it would be redundant to quote these, but one following from this study will suffice for emphasis.

One woman told of a memory that especially moved her that she recalls again and again. She and her husband passed an old man and his wife cutting fish on the riverbank. They returned later that evening and were amazed that, where the old man and his wife had been, not a sign remained of their presence, except for the old man's tracks in the sand by the river. The woman said this incident symbolized to her the inbred respect for the land and its resources, and that she and her spouse went up to the riverbank and looked all around and could not find one thing left behind to litter or deface the land. She said she would like to instill this same respect for the land in her children, feeling that if they had that, they would always be at home in Unalakleet living off the land.

2.4.3. Golovin

Golovin, located 70 miles east of Nome on the Seward Peninsula, is the smallest village in the sample with its year-round population of between 115 and 120 (according to local professionals in 1982). Located near the western margin of Norton Bay, it is regarded as a satellite village to Nome in administrative and commercial associations.

Villagers engage intensively in subsistence activities and the majority of 13 household heads in the Golovin sample reported that their families were the most important thing in their lives, closely followed by subsistence activites, and a low third choice are wage jobs--an order of preference very similar in all of the villages in the study. On the other hand, those who have full-time jobs seem satisfied with them. The population has not grown since 1970, and scarcity of economic opportunities is the major reason. Nome has apparently been the target of outmigration. The median age of males is nearly 30 and for females close to 25. This age differential largely results from the outmigration of males. Ninety-five percent of the residents are Eskimo.

The principal employer is the Golovin Fish Cooperative, which hires 50 employees from May to September--30 outsiders and 20 people from the village. Although wages are low (about $5 per hour), local people are eager to take these jobs in order to remain in their home community where their families can enjoy subsistence pursuits and be with relatives and friends. The second principal source of jobs is the City of Golovin, which routinely hires 30 to 40 people, largely locals, in the summer months for capital improvements and construction projects. The City also employs a police officer, village coordinator, clerk, health aide, an alternative health aide, and a maintenance person. Other full-time employment is scarce, confined to a few government or government-related positions (airport manager, two BIA elementary school teachers and two aides, and two REAA high school teachers). Olson Air Service employs two people, as does the local store. A variety of subsistence products are extracted by nearly all households (Table 30). Food preferences are for reindeer and seals, but a large quantity of birds, fish, and land and marine plants is also taken.

TABLE 30
Subsistence consumption during 1981 by One Golovin Household

Product	Quantity
Pink (salmon)	55
Silver (salmon)	150
Dog (salmon)	20
Trout	60
Greyling	45
Tom cods	60
Clams	20 gallons
Squirrels	50
Herring roe	50 lbs.
Maktak (whale skin and blubber)	20 lbs.
Walrus roast	10 lbs (acquired from store)
Moose	1 (given by relative)
Caribou	hind quarter
Rabbits	4
Berries	60 gallons (several varieties)
Sourdock	3 gallons
Wild celery	3 gallons
Willow leaves	1 gallon
Labrador tea	2 lbs.
Murre eggs	3 dozen
Ptarmigan, duck, geese, sandhill crane and brants	56 birds (combined total)

Note: These products and their variety are representative of a 13-household sample of 1982.

The importance of these species in kinship and friendship networks cannot be overstated. Informants emphasized repeatedly the delights experienced in taking these products with kin and friends and the vital roles they play in substaining a way of life featured by exhilarating outdoor experiences and working with close kin and friends. These same activities give householders a feeling of economic self-sufficiency, and they provide food products greatly preferred over purchased items. Subsistence goods are shared widely among bilateral kin groups and a variety of friends and more distantly related kin in Golovin, Nome, and other villages. Sample household members frequently expressed appreciation of subsistence goods as imparting a feeling of strength and great pleasure.

The majority of the residents of Golovin makes every effort to maintain subsistence activities, and out-of-pocket expenses for these pursuits often exceed $5,000 per year for boats, snow machines, three-wheelers, fuel, nets, rifles, ammunition, and other equipment. Budgets and time schedules of part-time and full-time wage earners are juggled to accommodate subsistence activities, particularly in summer when entire families with friends and bilateral kin set up camps for hunting, fishing, and collecting.

Householders invariably share their yearly catch with kin and friends; a portion of the yearly harvest is set aside for these intimates and the elderly, disabled, and those with full-time jobs who cannot get into the field as much as they wish. Occasionally non-Eskimo residents purchase subsistence goods from villagers outside Golovin (whole seals, parts of walrus and fish) but Native peoples, apart from infrequent bartering of subsistence goods, depend chiefly on kin and friendship networks to give and receive subsistence goods.

Most households have citizen band radios, oil-burning heaters, propane stoves, electricity, snow machines, three-wheelers, boats, and more and more have television sets (reception began in October 1981). The need for running water is seen as the most pressing physical and technical need, and there is considerable concern about rising fuel prices, a condition that has prompted reliance on wood as a source of heat in many households. Equally alarming are the dramatic increases in the prices of purchased goods at the local store. Our comparison of store items of importance to all households reveal great increases in the past 10 years. For example, flour has risen in price more than 300 percent since 1972, fuel oil about 900 percent, Pilot Bread 330 percent, and sugar more than 300 percent. These increases reflect inflation and increases in transportation costs. Price shifts in Golovin tend to be abrupt rather than gradual, which may seem to intensify impact temporarily. Using many measures, economic dependency is greater in Golovin than anywhere else in the study area (Tables 31, 32, 33, and 34), nearly double that evident in many other communities.

The City of Golovin incorporated in 1971 and is governed by a mayor and six other council members elected to staggered terms. The mayor and council oversee law enforcement, tax levies (not implemented as yet), and other administrative duties. City income is derived largely from telephone services, bingo games, movies, and revenue sharing from the State of Alaska. Most respondents in this study regard the city as functioning well in the service of the community and that city governance is steadily improving in sophistication and ability to handle growing complexities.

The Golovin Native Corporation was established in 1971, and in 1980 the corporation officially took control of the management of surface real estate of 88,457 acres conveyed to it under the provisions of the Alaska Native Claims Settlement Act. Bering Straits Regional Corporation headquartered in Nome, controls subsurface rights. Stockholders (the bulk of the Native peoples in Golovin) elect a seven-member board headed by a president.

The village has a very small population, and the responsibilities of formal public service are carried by people whose lives are filled with numerous other pressing obligations. There are 14 elected positions at any given time and those who hold these positions are given the added burden as well as the opportunity, as most see it, of attending to many demands on their time and energies. Pay for public service is meager or nonexistant. Those who take these difficult and often stressful duties must also meet the demands of subsistence activities and often full- or part-time jobs as well. And these responsibilities are not taken lightly, as evidenced by the praise given formal leaders by the household heads contacted in this study.

TABLE 31
Golovin AFDC Data
Caseload Comparisons, 1981

Number of Cases	Number of Cases/1,000
8	85.1

Source: Department of Health & Social Services, Division of Public Assistance

TABLE 32
Golovin AFDC Data
Expenditure Comparisons, 1981

Annual Total ($)	Average Monthly Amount ($)	Per capita Amount ($)/Year
41,676	3,473	443.36

Source: Dept. of Health & Social Services, Division of Public Assistance

TABLE 33
Golovin OAA Data
Caseload Comparisons, 1981

Number of Cases	Number of Cases/1,000
5	53.2

Source: Department of Health & Social Services, Division of Public Assistance

TABLE 34
Golovin Transfer Payment Data
Total Expenditure Comparisons, 1981

Total Annual Expenditure ($)	Total Per Capita Expenditure ($)/Year
60,844	647.30

Source: Department of Health & Social Services

The villagers expressed mixed feelings about long-term planning. Some claimed planning to be essential if adverse effects of social change were to be averted and funds and community resources allocated for humane goals. Others stated that efforts should not be consumed by the long-term planning process because sudden and unexpected changes in funding policies, population shifts, and state and federal actions negate its effectiveness. The most carefully considered opinions about planning focused on coastal zone management, which some persons feel should be projected a minimum of two years. Most respondents seemed to believe that regional institutions should control oil and gas developments and that city government should continue governing internal affairs of the village.

Golovin is the only sample community that shows relatively little institutional coordination and cooperation. In Golovin, neither is apparent, probably because they are not needed. Coordination is not yet needed, and cooperation occurs de facto since staff and leaders often overlap. Perhaps since they are simply unnecessary so many institutional activities do not occur in Golovin, or are handled by external institutions.

A general attitude expressed by many is that the Native institutions work well together, friction is generally slight, and that people in the community live in harmony and work well together. This social condition is one of the most frequently cited amenities of living in the community. Many believe that the ciy government would have its hands full if oil and gas developments were to bring in many newcomers. Strangers (both Native and non-Native) are invariably regarded with caution and are scrutinized with a watchful eye until they prove themselves to be worthy members of the community. Villagers want job opportunities originating with energy developments to be made available to residents first. Professionals in services--medicine and education--are desired, and there is a perceived need for improved expertise in the village. This does not imply a high level of dissatisfaction with present services. These opinions simply indicate that people would welcome additional trained personnel to improve living conditions. Public human services are heavily used now in Golovin (Table 35) at a rate exceeded only in Nome. No one made an association between the arrival of new professionals and oil and gas developments, and no one stated a preference for more people in the community.

TABLE 35

Golovin Social Services Data

DFYS Caseload Comparisons, 1977-1982

1977	1978	1979	1980	1981	1982	Average
10.7	11.9	14.0	8.6	6.8	9.6	10.3

Source: Department of Health and Social Services,
Division of Family and Youth Services

Attitudes toward energy corporations vary from no opinion to the majority skepticism about the corporations capacity to understand Bering Sea and Norton Sound conditions. Information disseminated by corporations about environmental safeguards is generally considered unreliable. With OCS acitivites some envision rising income for the regional corporation and hence some direct benefits to members of the village. Others foresee increases in local employment, but 11 of the 13 household heads and some of their spouses prefer the relatively tranquil life in the village and its environs and do not want oil developments. All of them called for honest dialogue among all parties--corporations, government agencies, and Native institutions, and a role for Native peoples in directions and specifics of developments if there is to be oil and gas exploration in the region. Local informants generally expressed the opinion that oil and gas developments would irreparably harm subsistence marine mammals, fish, and plants, and that serious social disruption would be inevitable.

There is a belief that oil developments could cause increased competition for goods among locals not employed in oil industries. Prices would rise and inflation, already a serious problem, would rise even faster, imposing a great burden on people with small incomes who depend largely on subsistence goods. Several persons said that energy developments would place greater emphasis on the cash economy and that this could greatly undermine the subsistence economy, make life less personal and cohesive, and bring higher incidences of alcohol and drug use.

Some negative social and technical changes have already been perceived in Golovin, for example noise created by the fish plant generator, snow machines, and three-wheeled vehicles, but these machines are regarded as necessities and are by no means rejected because they are annoying. There is more concern over the conduct of children, the common attitude being that children do not show proper respect for traditions and customary behavior. Causes of this condition do not seem clear. Some simply believe that children are less innocent now -- the modern world has come to Golovin. On the other hand, most people praised the social harmony and decency evident in social intercourse, and nearly everyone is willing to make special efforts to preserve this. Most people believe that they belong in Golovin and do not want to live elsewhere. The greatest sources of social disharmony are alcohol consumption, although recently passed "dry laws" (a local option) have apparently reduced the problem considerably. Nine-tenths of the events requiring some police action are related to alcohol use, and most of these are domestic squabbles. Drug use was often cited as a source of problems in the village, but no details were mentioned. Most of the residents of Golovin live in peace and trust.

About half of the sample families owned their own homes. Conditions of those dwellings varied from small, dilapidated, and ramshackle to rather spacious and well-furnished homes. Some were inherited or constructed by families inhabiting them, and others were purchased from the Bureau of Indian Affairs. The rest were rented from individuals or from the Bering Straits Regional Corporation at an average of about $55/month. Running water and a sewer system are the greatest needed improvements to homes cited by respondents. Hauling and storing water is time-consuming hard work for all householders, particularly for the elderly and handicapped. Most families take their water from the Fish River, and some supplement this source with rain barrels placed alongside their houses.

Although almost 75 percent of the entire sample (62 households) represents nuclear or nuclear-fragment household structures, in Golovin the sample revealed only about 31 percent nuclear structures as opposed to about 31 percent coresidential (four households each) and about 39 percent (five households) extended structures. Golovin is the only case in the sample that shows a preponderance of extended households. Single-person households are rare among Native peoples in the village, although some non-Natives basically live alone. (Chapter 3 details Golovin demography.)

2.4.4. Nome

Nome is unquestionably a unique sociological case in the annals of Alaska history. Nome, unlike other regional, isolated hub communities (Bethel, Kotzebue, Barrow) has a relatively large non-Native population prominent in the social, economic, and political affairs of the community. Nome is an important regional governance and commerce center whose characteristics influence socioeconomic trends in much of the area excluding the Yukon delta.

Nome comprises nearly half the population of the study area. The site of intense and prolonged interethnic contact in the region, Nome is qualitatively different from the smaller communities (Ellanna, 1980, P. 417-420). Once the second largest city in Alaska, Nome has undergone several boom-bust periods and might best be described as colonized, rather than settled, by successive waves of non-Natives from all over the world and Natives from all over north and west Alaska.

Although many Nome residents engage in a local subsistence economy, many do not. Some kinship and nonformalized social alignments are quite distinct in the community, others are discontinuous and sometimes fleeting. Many residents maintain a strong sense of "Nome identity", thereby highlighting some degree of permanence that holds a community together. These sentiments, however, mostly are directed inwards toward limited kinship and interest groups, or toward the communities of origin of Nome immigrants. With few exceptions, the bonds from domestic groups, to neighborhoods, and to the entire city result from aggregation rather than determined, mutual integration. The consequence of this pattern in institutional life may be factionalism and insulation.

Ellanna (1980, P. 394) wrote about this community:

> "Nome can probably best be described as a regional center with multiple economic and hence political factions in which the villages and Nome-based Natives play both a direct and indirect role through their membership in BSNC, Kawerak, and Sitnasuak and through ANCSA land rights. As a result, Nome clearly lacks a single dominant politicoeconomic body. Thus, factionalism exists not only between ethnic groups (i.e., Native and non-Native) but also between special interest groups in which ethnic orgins have negligible influence and, lastly, between Native groups and individuals whose priorities focus on subsistence and environment and other Native groups and individuals whose priorities are basically integration into and success in Western economic development. Thus, the many competing loyalties and objectives that all Native organizations cope with are pronounced here, and both individuals and groups share commitment to some issues but remain antagonistic on others.

Appendix D ("Nome Update") discusses Nome extensively. This appendix updates significant data reported in OCS Technical Report Number 53 and provides a detailed and current portrait of the economy, infrastructure, services, and institutions centered in Nome.

Nome has the most diverse ethnic population composition in the study area. About one-third of the population is white, nearly two-thirds Alaska Native, one-half percent black, one-half percent Aleut, nearly one percent Asian, and about one percent is classified as "Other." Probably due to the large white population, Nome's median age for males is just over 26 and just under 26 for females. This is the second oldest population (behind Golovin) of all villages in Norton Sound. Chapter 3 details the demography of Nome and Appendix D discusses socioeconomic issues that are not comprehensively treated here. Both also draw attention to the 1980 census undercount of Nome's population. As the center of economic and administrative activities, Nome has the greatest number and diversity of institutions, both formal and informal.

This section briefly profiles day-to-day life for some of Nome's residents--their activities, attitudes about the character of the community, subsistence and wage labor, ethnic relations, and industrial developments. Only 18 household heads were interviewed, and though no claim can be made that they are representative of the town as a whole, they do provide insights into the texture of daily life and how people manage their lives and envision the future.

The greatest weakness of the Nome sample concerns its underrepresentation, or nonrepresentation, of certain key segments of the population (for instance, it omits King Islanders). All household heads are wage earners, and earnings are generally high. The bulk of the earners are professional white-collar workers, a few are well-paid heavy equipment operators, and one is a local businessperson. Job satisfaction is high. Household size in the sample was generally smaller than in other communities except in comparison with Golovin (Table 36).

All of the household heads and spouses regard Nome as generally a good place to raise children because it is relatively peaceful and safe and because access to the out-of-doors is easy. This perception exists in spite of public safety incident rates that are the highest in the region (Table 37).

TABLE 36
Nome Household Size and Percent, 1982

	Nome	Overall Sample
1 - 3	50.0%	30.5%
4 - 6	44.4%	53.7%
7 -10	5.6%	13.4%
11 +	0.0%	2.4%

TABLE 37
Nome Public Safety Data
Incident Comparisons

	Homicide		Rape		Part I & II		Total	
	#	#/1,000	#	#/1,000	#	#/1,000	#	#/1,000
1980	1	0.4	10	4.3	1239	538.5	1250	543.2
1981	2	0.66	10	3.3	2392	787.1	2404	791.0
1982	1	0.3	13	3.8	2216	646.1	2230	650.2

Source: Department of Public Safety (Department of Labor population figures)

All households engage to some extent in subsistence pursuits. These activities are undertaken at considerable expense, at least $6,000 per year in most instances. Harvests are large, particularly by the most properous households with earnings of about $80,000 per year. Members of these households outfit themselves with an extensive array of subsistence equipment (rifles, nets, snow machines, three-wheelers, fishing rods, four-wheel drive vehicles, and, in one instance, an aircraft used to gain access to subsistence resources.) Subsistence forays are conducted by extended families, nuclear families, occasional kin, and friends.

Sharing networks are complex and diverse, depending in part on whether household members are white or Native and whether household members are from Nome or other Alaskan communities. Subsistence goods are customarily given to and received from several villages in Norton Sound. Many households receive goods from more than one village outside of Nome. Walrus parts and maktak are commonly shared. The Eskimo households with kinsmen in Nome are embedded in bilateral sharing networks with parents, grandparents, uncles, aunts, brothers, sisters, nephews, nieces, and more distantly related kin and friends. The old and needy are given subsistence goods routinely. White households often do not have many kinsmen with whom they can share subsistence goods, and these households harvest and consume these resources themselves. This social circumstance in no way discourages such people from pursuing subsistence activities eagerly, and food preferences emphasize naturally occuring species. These same people find themselves adopting practices and values that set them apart from their kinsmen who live in the lower forty-eight states. They identify with subsistence activities and the small-town character of Nome despite the fact that they may not have traditional family roots in North Sound communities.

The Nome sample is fairly evenly divided in terms of the proportions of subsistence protein in the diet. The sample consists of about 28 percent of the households (five) in the low class (less than 50 percent), followed by 39 percent (seven households) in the second (50 to 75 percent) and about 33 percent (six households) in the high (75 percent+) classes. Nome shares with Emmonak the feature of a large share of "non-diverse" subsistence harvests: about 39 percent of the Nome sample (seven households) falls in the lowest harvest class (less than 1 species for each category; see Appendix B), whereas about 11 percent (two households) is in the middle class, and half the sample (nine households) is in the highest (two or more/category) one. Nome exceeds other large communities (Unalakleet and Emmonak) in the highest class, but falls short of the smaller communities.

Each year most of the households take an average of several hundred salmon of various species, about 50 trout, 100 or more tomcods, 50 or so grayling, 20 pike, one or two seals, and 30 or 40 gallons of wild berries. These goods are stored for later use and frequently bartered for goods that might be in short supply in a given year. Many households barter services for goods, and vice versa.

Most of those interviewed own their own homes. Most of the households we visited in Nome have running water but no sewer hook-ups. Housing in Nome is in great demand but the informants in our sample are not among the many families waiting for new housing to become available. Monthly payments usually range from $650 to $850 per month. There was only one renter in the sample, and that household paid $150 per month for a two room cabin (Appendix D gives detailed data on housing.) Utilities expenses range between $1,700 and $6,000 a year. These figures are conveyed not as representative of Nome but as evidence that living in Nome and conducting subsistence activities can be very expensive.

As mentioned, informants consider Nome to be a peaceful and safe place to live. Evidence cited consists of relative harmony in the ways family groups--bilateral Eskimo networks--pull together to accomplish subsistence work, household chores, child care, lend emotional support, and care for the old and indigent. The community is relatively quiet compared with urban places where some of our informants have lived, and people recognize and acknowledge one another. The out-of-doors is accessible and the air is clean and, needless to say, bracing and exhilarating. There is pride in being able to fend for oneself and to maintain contact with kin and friends without difficulty. Though respondents mentioned that they have had to lock doors and storage buildings against thieves and vandals, there is a general attitude that people and property are safe. The streets at night generally are quiet except for an occasional drinker. The exception mentioned by several people is a perceived rise in domestic violence--sexual and physical assaults which seem largely confined to certain families and which do not directly affect the general population. Although arrest rates are high, they may in fact be declining (Table 38).

Outsiders are welcome in Nome, according to our informants, evidenced by the relative ease with which Native and non-Native people can fit into the community without serious resistance or discrimination. A case in point is the arrival and ready acceptance and rapid integration of several Vietnamese refugees. Several informants observed that if one has a job in Nome, there is no difficulty whatsoever in being accepted.

Sources of friction and discord mentioned by respondents generally related to the use of alcohol, especially assault, altercations, rape, vandalism, and child abuse. Drinking is occasionally excused as an expression of depression over harsh weather and hopelessness, but in the main drinking is condemned. Social problems arising from the use of alcohol are perceived as on the rise, and some interviewees stated that oil and gas developments would add to them. Drug use is viewed similarly, and informants were quick to say that they intend to shield their children from these substances. Institutional efforts to mitigate alcohol problems are clearly on the rise (Tables 39 and 40).

Most of our informants believe that Nome is a good place to raise children, a place where subsistence activities and Eskimo traditions can be instilled, and where children are respected and can gain an appreciation for nature and the excellent nutritional qualities of subsistence foods. Coupled with these aspirations, parents also wish to see their children obtain a good education, the kind that will assure them of promising opportunities in the job market, preferably in Nome. Jobs are ranked high by our sample residents, higher than in any other community where research was conducted, although family life and subsistence activities were also mentioned as highly valued aspects of life in Nome.

Several divisions in the community were cited, but none was regarded as particularly serious. Some perceive white and Native relations as comprising a clear split in values and aspirations. Whites are viewed as possessing greater skills for the marketplace, placing greater emphasis on professions (white-collar and blue-collar) as the mark of social worth, and among some as

TABLE 38
Nome Public Safety Data
Arrest Comparisons

Year	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
1980	1	0.4	3	1.3	809	351.6	813	353.3
1981	1	0.3	0		943	310.3	944	310.6
1982	1	0.3	5	1.5	870	253.6	876	255.4

Source: Department of Public Safety; Department of Labor population data

TABLE 39
Regional Alcoholism Treatment Data
Norton Sound
Client Admissions, FY 1980-82

	Number of Clients FY 80	FY81[a]	FY82[b]
CAP Community Alcohol Program		400	721
BSTC Bering Straits Treatment Center		46	118
NSFS Norton Sound Family Services	83	63	38
BSWG Bering Straits Women's Group		85	140
Total	83	594	1,017

[a] includes 9/80-6/81
[b] includes 7/81-5/82

Source: Department of Health and Social Services,
Office of Alcoholism and Drug Abuse

TABLE 40
Nome Community Mental Health
Treatment Data
NSFS Client Admissions
1975-1981

Number of Clients

1975	1976	1977	1978	1979	1980	1981
3	296	525	457	470	516	611

Source: Department of Health and Social Services,
Division of Mental Health and Developmental Disabilities

a source of resistance to state laws giving preference to Native subsistence rights. There is also recognition that some whites, mostly professionals, have openly declared firm support for Native subsistence activities as the law presently recognizes them. Another split appears between Natives who ardently follow Christian prohibitions against excessive use of alcohol and those who do not.

Attitudes about long-term community planning stress the need for long-term cooperative, coordinated efforts by the many formal institutions in Nome. Several persons stated that institutions now are reacting to, more than planning for, change. They most often cited housing, employment, health care, and the need for sewer facilities as problems that require immediate and long-term attention. Economic dependency rates are generally lower in Nome than elsewhere in the study area, and some measures of critical services show a decline (see Appendix E and Table 41).

All adults in the sample are members of several formal and informal institutions and for the most part are very active in them. Their views on community planning are therefore informed ones, and it appears that many people in Nome are socially concerned enough to put effort into the well-being of the community. Nome has many formal institutions as well as dozens of informal, voluntary organizations that keep the town functioning.

Control of industrial and commercial growth is perceived to largely rest with the City Council. Most informants state that the council manages these well now. They question, however, whether rapid development from oil production or other economic activity would place too great a burden on physical facilities and worry that alcohol and drug abuse would rise dramatically. Control of oil and gas developments themselves are perceived as the domain of oil companies, but no details were given about what people meant by this statement. Some informants believe that oil and gas developments are inevitable and that people in Nome, including newcomers the developments might bring, would simply have to live with such consequences as increased population, rising prices, reduced community spirit, and perhaps, declining opportunities to engage in subsistence and recreational activities. None registered opposition to oil developments, and several saw some benefits to the community through increased revenues for the city, the Native

TABLE 41
Nome Social Services Data
DFYS Caseload Comparisons, 1977-1982

1977	1978	1979	1980	1981	1982	Average
224.0	207.4	174.4	162.6	161.6	120.5	175.1

Source: Department of Health and Social Services,
Division of Family and Youth Services

corporations, and the local labor force. The chief beneficiaries specifically cited are some local merchants and the oil companies. The City of Nome Coastal Management Program conducted a survey of residents in 1981, and the majority of the sample respondents stated that they supported oil and gas development in the region.

To supplement the household sample several institutional leaders were asked their views on organizational cooperation, the future of Nome, and the ability of the community to manage increased demands on staff, budgets, and facilities. These leaders included representatives of the Chamber of Commerce, Kawerak (the nonprofit and service arm of the regional Native Corporation), Sitnasuak (the Nome village profit corporation), the Alaska Gold Corporation (the largest privately owned commercial employer in the community), the Nome Eskimo Community, and the King Island Native Corporation. Most of these organizations are on record as supporting oil and gas developments--the Native organizations because they envision larger revenues to improve conditions for their members and the community in housing, social services, and job opportunities; the Chamber of Commerce because the members believe business opportunities for local people would improve; and the King Island Native Corporation because of presumed improvements in job opportunities and expanded service opportunities for its 250 members. The Chamber of Commerce, for example, went on public record in support of OCS developments by a vote of its members in September 1982. These generally positive perceptions, however, are not without some reservations.

Despite this support, however, all representatives expressed fears about the inevitable negative effects of such development. For example, Nome would have trouble managing a large influx of newcomers. Housing, land management, health facilities and services, schools (excluding the high school), and water supplies simply lack the capacity to absorb much growth. There was a clear recognition that any substantial development would require profound revision of regulations and expansion and improvements of facilities. All of the community leaders believe that increases in alcohol and drug abuse and the incidence of crime would inevitably result. The small-town, rural character of Nome would suffer.

The sample is likely valid in its income distribution data since it is credible in terms of other factors. The Nome sample income range closely follows census figures (Table 42). Most of the sampled Nome incomes (61 percent or 11 households) were stable and predictable, similar to other sample communities; one-third (six households) had stable but unpredictable incomes, and only 5.6 percent (one household) had predictable but unstable incomes. Nome's breakdown shows higher income levels compared to the overall sample, but this is appropriate since incomes are generally higher in Nome. Appendix C, Characteristics of the Sample, contains the gradient of income distributions, village by village according to village size, and illustrates how central trends of incomes change only gradually, while the actual range of variation within villages increases dramatically, especially in the higher income levels. The average incomes are only marginally higher between smaller and larger villages, but the range grows tremendously and the averages grow smaller in proportion to the whole. In other words, sampled income distributions become increasingly skewed. Nome is situated at one end of the scale, opposed to Golovin at the other, in terms of both range and amounts of income.

Levels of political participation in Nome households exceed others in the region; 66.7 percent (12 households) fulfill two or more distinct political roles, but 33.3 percent of the sample (six households) have none. Levels of sodality participation are also highest in the Nome sample with nearly 78 percent (14 households) participating. Nome is followed by Savoonga at 70 percent (seven households), and all other communities are far lower. Interestingly, but not at all surprisingly (and related in part to sheer housing availability), the proportion of nuclear or nuclear-fragment households in Nome is lower than in some other villages (Alakanuk and Unalakleet). In Nome about 78 percent of the sampled households were of this type, and nearly 17 percent (three households) were extended and 6 percent (one household) coresidential. Head of households in the Nome sample are mostly in the 30 to 44 age class (66.7 percent or 12 households) but also show the highest in the elder (60+) class at 27.8 percent (five households). About 6 percent (only one household head) are under 30 years of age.

By all measures Nome is demographically and institutionally distinct; other sections (for instance, Sections 2.2.1 and 2.2.2 and Chapter 3) present

TABLE 42

Nome Personal Income by Quartiles and Percent, 1982

quartile	census	sample
$0 - 12,000	21%	27.7%
$13,000 - 18,000	10%	5.6%
$19,000 - 27,000	19%	16.7%
$28,000 +	50%	50.0%

details and discussion. Naturally, Nome represents a nearly polar example of the institutional tendencies analyzed with the primary data. It is the most specialized and complex, most autonomous and least polarized, most coordinative but generally noncooperative institutional case. The scale of socioeconomic institutions is great, multiple formalized relations bind them, they engage in generally nonpolarized activities or objectives (that is, they are more focused in purpose), and they enjoy relatively greater autonomy (latitude for action and fewer outside influences), but these activities are carried out with relatively less interorganizational cooperation compared with most other communities. Only in Nome is evidence of structural tensions obvious (that is, systematic dispute and competition; see Sections 4.2.1. and 4.3.).

2.4.2. Potential OCS Participation

Golovin, smallest of the six study communities, has experienced substantial population turnover during the past decade. The number of residents available for employment is small. Local employment is scarce and mostly seasonal, found mainly in commercial fishing and fish processing and a small reindeer herding/processing operation. Though close (about 75 miles) to Nome, it is not connected by road.

Though smaller than Nome, Unalakleet more closely resembles many of that city's economic patterns than it does the other small communities. A number of factors may help account for this similarity. Unalakleet has long been regarded as a progressive community. It has good air service and is a secondary transportation and distribution center. It has traditionally been a center for secondary education for western Alaska, which has also contributed to a relatively higher level of local educational and occupational achievement. Unalakleet is now emerging as an alternative to Nome as administrative headquarters for some regional governmental services (education, coastal management). A few state and federal employees are stationed at Unalakleet. Unalakleet is home base for a minor but locally important commercial fishery and the staging base for a couple of commercial guiding and outdoor recreation businesses.

For many reasons, Nome seems best positioned among the study communities to take on an economic role in OCS development in Norton Sound and perhaps in Navarin Basin as well. Community attitudes generally favor OCS development and the economic potential it affords but exhibit some reservations about potential negative socioeconomic impacts. Nome could function as a staging area for nonresident offshore personnel and transient field workers. As the air crossroads for the region, it would also benefit from resident participation in offshore activity. As a regional distributive and commercial center with a relatively diversified secondary economy, it is in a position to benefit from any increase in the purchasing power in its service region. The economy and workforce are largely oriented to the cash economy and cash employment, although there are subpopulations that retain strong ties to subsistence values and traditional work patterns. Nome's labor force possesses a sizable share of the region's professional, administrative, and entrepreneurial skills, skills which are well suited to local economic opportunities that may arise. Nome is also home for Northwest Community College, which gives its workforce better access to educational and training programs to upgrade its skills.

2.5 St. Lawrence Island

2.5.1 Subregion Description

The most salient feature of life on St. Lawrence Island is a great dependence on marine resources and the ethics of sharing tied to this dependence. More than 80 percent of all food consumed annually comes from the sea and is acquired through the efforts of the residents with special technical items and skills, and social organization, and underlying values and aspirations tailored to subsistence activities.

To understand the degree to which the two island communities rely on the natural resources and the extent to which they are organized to pursue these resources, requires an understanding of some essential facts. Nearly three-fourths of the people leave their villages in summer and early fall season to fish, hunt seals and collect sea plants, invertebrates, and land plants. These forays to resource sites away from villages are economically essential aspects of the yearly round of subsistence activities, and they afford opportunities to visit friends, neighbors, and relatives outside the routines of village life. Most families average many weeks of residence at these sites, and quite apart from the fact that camping yields critical food resources indispensable to family larders, it strengthens concern for protection of the island and its vast natural resources, and pride in possession of territory that is exclusively the domain of the Yupik Eskimos. The Gambell people use the section of island from Taphook Point in the north to Koosata Lagoon in the south, and the Savoonga people use the balance of the island. Resources are uniformly distributed (except whales and walrus) and are taken from nearly all major lagoons and rivers.

Summer and fall camping provides other amenities. Campers are able to leave the social and physical constraints of their village to achieve privacy, and peace of mind away from daily demands of village life and to engage in health-giving physical exertion. About 325 Gambell and 420 Savoonga people camped in 1982, a large percentage of the island population. Gambell campers were organized in 54 groups (mainly nuclear families) and Savoonga, 67 groups.

Those who do not camp consistently and for long periods each season usually are unable to go -- the elderly, the handicapped, some men and women who hold full-time jobs, and some teenagers. Only about 25 percent of the population of each village stays at home during the camping season, and there are very few people who do not want to camp.

In 1982 more than 300 people on St. Lawrence Island hunted walrus and they comprised 79 (41 Gambell, 38 Savoonga) crews. There were 218 hunters of bowhead whales, and they made up 42 crews (22 Gambell and 20 Savoonga). Savoonga hunters expected to form two additional whale-hunting crews in the spring of 1983. These data reveal that most of the eligible adult males are engaged in these subsistence activities, and there is no evidence of declining interest or participation.

Nearly 1,200 walruses were taken in 1982. Gambell hunters had a good year (more than 900 animals taken), but Savoonga hunters took only about 300, one of the worst years in their history because of a persistent build-up of pressure ice. The products from this crucial resource provide more food than any other single resource. Most of the walrus is eaten -- muscle meat, liver, intestines, skin, some of the blubber, and the stomach and its contents (clams primarily). The parts are shared among crew members, their kin (particularly their patrilineal relations), friends, and unrelated neighbors and with elders, widows, and women and children with no hunters in their households. The needy are invariably given walrus meat and other edible parts of the animals. It does not matter to those who give whether those in need are kinsmen. Hunters take great pride in being able to give these items without expectation of return. The network of the distribution of walrus products extends to many residents of Nome, Anchorage, and some other communities in Alaska as well as a few in the lower 48 states.

Social relations coalesce around walrus hunting in such a way that all major partilineal clans are held together in an endless yearly round of hunting, butchering, distributing, and consuming walrus products. No one is denied parts of the animal who calls at the homes of successful hunters. Furthermore, Gambell and Savoonga are threaded together by kin ties, friendships, and the common value of sharing. When one village lacks a major subsistence good, the other comes to its aid without hesitation. Each hunter gives walrus products to an average of 10 households each year, and his household receives similar subsistence goods from four others.

The spring whale hunt--brief, dramatic, exhilarating--brings joy and community solidarity unlike any other activity on the island. Hunters state that the search for whales, the quiet, intense expectation, the communal and manly pride associated with it, is the most important thing a man can do. Each community receives about one-half of each whale taken by the other community. The progress of the whalers is transmitted by CB radios, and people in both villages keep abreast of the hunt. When a strike is made all island residents are aware of it immediately.

Whale meat moves through the villages and into Nome and other mainland communities, as do the products from walruses. Maktak (skin and blubber) is often used on birthdays, holidays, home comings, and other special occasions. Its use in these circumstances reinforces Eskimo diet and, more importantly, the special character of Eskimo culture. It is the symbolic and ritual idiom of Eskimo life, and very special efforts are made to distribute it to as many kinsmen as possible. There are 22 whaling crews in Gambell and 10 in

Savoonga, and each village plans to add new crews in 1983. More than 200 persons make up the crews.

Undergirding these vibrant activities is a fierce, insistent pride in giving, giving, as many informants emphasized "Until it hurts. Until there is no more." And many people say "Give all you can and you will never go hungry." This eager ethic of sharing extends to all subsistence goods--fish, birds, bird's eggs, invertebrates and land and sea plants, as well as some store-bought goods. One household in Gambell was recorded as giving subsistence products to 315 people in a single year.

Each resource is associated with a specific form of social organization for its collection, distribution and use. Walrus and whale hunting crews are made up, with few exceptions, of closely related males (father-sons, uncles-nephews, parallel paternal cousins--father's brother's sons--and brothers), and these crews are the central instruments of distribution. Occasionally, unrelated people join together, but they do so when there are no close male kinsmen available to form a crew. Thus, most crews are recruited from patrilineal clans made up of several families related through the male line, who conduct certain important subsistence functions such as hunting, butchering animals, storage, and distribution of subsistence goods. The clans also form the basis for bearded seal hunting crews and summer camps, where fishing and collecting and hunting of smaller seals occurs. They are also the foundation for bird egg collecting and hunting young birds. Many clans have families in both Gambell and Savoonga, and this bonds the villages in social systems of mutual aid and common purposes in subsistence activities.

Approximately 40 percent of the Gambell hunters sampled in 1982 reported taking 554 ringed seals, 459 spotted, 324 bearded and 19 ribbon seals in 1981. The village overall probably takes about two and one-half times this number of seals. The bearded seal is probably the most important of the four species of seals because of its size and the many uses the people make of its flesh and hide. These animals were taken by either crews organized much like walrus-hunting crews or by lone hunters. Seals are a vital part of the island economy and are shared in about the same way as are walruses.

Fish are essential to the St. Lawrence Island diet, in both summer and winter. Thousands of sculpins and tom and blue cods are taken in winter and the salmon group, Dolly Varden, grayling, and whitefish mostly in summer.

All families use hundreds of birds and bird eggs each year. The major species are auklets, several species of ducks and geese, seagulls, and kittiwakes, among others. Murre, geese, and duck eggs are collected in large numbers.

Each Gambell family annually takes about 30 pounds of clams from beaches or the stomachs of walrus. The people of Gambell and Savoonga use at least 12 varieties of marine and 24 land plants. These important food sources yield about 170 pounds of sea plants and 120 pounds of land plants each year per family. These foods are nutritionally and culturally vital to Eskimo diet, and their use frequently underscores celebrations and homecomings.

A decline in a major subsistence resource would have a serious adverse effect on the depth, breadth, and strength of the clans and their associated groups. It would also erode that special communication of intense defense, and mutual concerns between villages. Subsistence activities--the technology, the labor demands, the seasonality, the monetary requirements--form the core of social life on St. Lawrence Island. Each household is tied to many others in the formation of hunting and collecting crews and in the reciprocal networks of shared subsistence and other goods.

Embedded within the partilineal clans in Gambell and Savoonga is a well-defined hierarchy of authority defined primarily by age. Age overrides even sex in the patridominant kinship system. The eldest person in a clan, provided his or her health is reasonably good, is asked for approval of marriages, major purchases, when hunts are to be undertaken, advice about personal matters, and serves as a redistributer of subsistence goods. These elders are treated with great respect and are expected to be particularly restrained, to carefully weigh each side of an issue, and to be available whenever needed. Some elders live outside the community of their birth, but they still must be sought by their kinsmen. There were 24 people in these positions in Gambell and 33 in Savoonga during the course of the research.

Women marry into their husband's clan, but the husband must first spend at least a year performing bride service for his father-in-law or a surrogate. The groom assists with household work in the pursuit of his male tasks and all subsistence activities that are conducted by his father-in-law and his crews. After a year the bride moves from her village to that of her husband; or if husband and wife are from the same village, residence might change from the bride's parent's house, or one nearby, to a residence nearer the groom's parents. The bride then becomes a member of her husband's patrilineal clan; she becomes her in-laws' "daughter," "niece," "aunt," depending on her place in the lineage to its members. She is given away by the patrilineal clan in that her orientation and her contacts with that group greatly diminish. Her social orientation - visiting, sharing subsistence and other goods, gift-giving, dining, recreation, subsistence activities, and others - fall mainly within the orbit of her husbands's clan. Most of the women derive their prestige and pride from their function in their husbands' clan, and they usually assume the tasks cheerfully and unquestioningly.

Only eight or nine women married out of Gambell into Savoonga and an equal number married into Gambell from Savoonga. Some women marry into mainland Eskimo communities, but most marriages on St. Lawrence Island are among people of the same village. Furthermore, the populations of both villages continue to rise through natural increase, although at least 10 percent of the Eskimo people born on the island live on the mainland.

Subsistence activities take people to all corners of the island, and there are few locations, save some interior regions, that are not visited for some subsistence resource and the quest for ancient ivory and artifacts in abandoned villages. Trapping of Arctic foxes, collecting of land and sea plants, marine invertebrates, fishing, seal hunting, hunting birds and collecting eggs, and the search for ancient ivory and artifacts, combines with the new transportation technologies - snow machines, all-terrain-cycles, and motorized boats - to bring most of the island into use by the residents.

Food is stored in home freezers or in small lockers in the community freezer, and these forms of storage and preservation technologies have allowed the pooling and cooling of resources with considerable convenience. Some resources can be stored for long periods that in the past were very difficult to keep and were therefore consumed as soon as possible.

Women on St. Lawrence Island prepare meals, care for children, keep house, maintain clothing, and collect land and sea plants and marine invertebrates, but their most important task, one that is expected of all of them during some time in their lives, is to prepare and dispense subsistence and other goods from their households. Some sew skin garments for use by their families and to sell to people on the mainland. Many women search for old ivory and ancient artifacts at the old village sites. Secondary roles involve keeping the family budget records, carving ivory, and in rare instances (one or two in each village) women hunt alongside men for whales, walruses, and bearded seals. Some of them aspire to positions of leadership, and one women holds two elected offices in Gambell.

Men are the hunters, fishermen, and trappers and comprise most of the carvers. They teach their younger male patri-kin (sons, grandsons, nephews, younger cousins, brothers, adopted kin) to hunt, trap, fish, search for old ivory, carve, and repair and maintain machines used for transportation and weapons. They occasionally prepare meals, keep family budget records, make skin boats for whale hunting, reload shell casings, and are generally expected to particiate in the island governments and institutions. They are the captains of all hunting and collecting crews, and they risk their lives on rough frigid seas and in harsh weather on the island to provide food for their families.

Girls help raise siblings, nephews, nieces, and children adopted by their parents or grandparents. They clean house, prepare meals, wash clothes, occasionally collect land and sea plants, marine invertebrates, and bird eggs and assist younger household members with formal education. They are expected to stand in for adult females in their absence. They also assist with skin sewing on some occasions and learn the valuable lessons of sharing with kin, friends, and others.

Boys assist men with hunting, fishing, and they frequently collect birds' eggs, a dangerous undertaking for which they seem well suited. They are trained to be strong, patient, enduring, and above all generous. They run errands for their families, help elders with chores, watch after younger members of their households, and they occasionally prepare meals and do general housework.

Elders are the object of respect and deference, and they are generally the heads of the patrilineal clans. They watch over grandchildren and often raise their first-born grandchild with the care expected of parents. Nearly all elders live with younger kinsmen, frequently married offspring, and they are always given the entire range of subsistence goods. Married couples honor recently deceased elders by naming a newborn child after the departed. This practice stems from the belief that the spirit of the deceased inhabits the body of the next child born into the lineage. Today the practice mainly reflects respect for ancestors.

The St. Lawrence Island Eskimo persist in referring to the father's brother's son as brother and the father's brother as father. These terms reveal the continued strength and integrity of the Eskimo patrilineal clan which has been an essential part of Yupik Eskimo kinship for many hundreds of years. This same social phenomenon also demonstrates the key role played by the patrilineal clan in the subsistence quest.

Most of the households in both communities are occupied by nuclear families (parents or surrogate parents and offspring or surrogate offspring). There are some extended families (parents and married offspring with children), some grandparent-grandchild households, some sibling households (brothers or sisters or a combination of the two), and single person households. Many households have adopted children, often grandchildren fondly raised by their grandparents, and there are households that have several people related to the household head such as brothers, nephews, cousins, etc. The households never stand alone economically. Each is wedded to many others through the complex networks of subsistence, crews, and crafts production; these networks span not only households but villages (Table 43).

The availability of new housing in the late 1970s and 1980 made it possible for many young married couples and single men and women to establish households separate from their parents and surrogate parents. In Gambell average household size is 4.1 people, and in Savoonga, with fewer

TABLE 43 Gambell and Savoonga Household Types and Frequencies, 1982.

Household Type	Frequency	Percent	Mean Family Size	Household Type	Frequency	Percent	Mean Family Size
Nuclear	61	55	4.9	Nuclear	60	64	6.0
Single Person	23	21	1.0	Extended	15	16	6.7
Extended	16	15	6.9	Single Person	12	13	1.0
Joint: (Brothers and sisters with or without children)	5	4	3.0	Joint	3	3	4.7
Grandparent-Grandchild	2	2	4.0	Grandparent-Grandchild	2	2	4.5
Avuncular (Uncles and neices or nephews)	2	2	3.0	Avuncular	1	1	2.0
Conjugal Pair (married couple)	1	1	2.0	Conjungal Pair	1	1	2.0
Total	100	100			100	100	
Mean Size			4.1				4.9

single-person households, it is 5.0. Families are large. Adults over 35 years of age average nearly four children, and in the past 12 years each village has increased an average of about 2.3 percent each year, a doubling of the population every 28 years at the present rate of increase.

Gambell and Savoonga had a total of 128 jobs available in the spring and summer (1982) among a total population of 913 people (455 in Gambell, 458 in Savoonga). Most jobs are in the service sector of the economy. More than half of the Gambell and about one-third of the Savoonga households have no wage earners (excluding carvers and garment makers), which further underscores the decisive importance of subsistence activities. Many of the jobs pay low wages, and many of them are part-time. There are 318 carvers in the villages (111 Gambell, 207 Savoonga), and these artisans make important monetary contributions to their households. About 90 seal skin sewers in each village sew family garments or items for sale.

Families in Gambell pay an annual average of $3,800 for goods (mainly food) from local retail stores where prices average about double those of the lower 48 states. The major items bought are cereals, tea, coffee, sugar, baby food, pilot bread, toiletries, soda pop, and cigarettes. At the maximum store-bought food averages no more than about $250 per month. (Some families spend up to $800, but they are conspicuous exceptions.) Needless to say, subsistence goods are the life blood of the people on the island.

In 1981 the annual cost of transportation (fuel and machines), weapons, ammunition, boats, boat motors, and fishing equipment averaged about $6,700 per household. Some households spend much more than this, some considerably less. Nearly half of the households in both communities receive food stamps (about $1,500/year/household), and a little less than one-third of the households receive energy assistance (average $600/year). Some transportation expenses are not related to subsistence, but the majority of vehicle use is. The U.S. Public Health Service provides medical care, but families must pay the one-way portion of a round-trip flight to Nome to receive more than the rudimentary service provided at local clinics. Energy costs for home heating cost families about $2,700 each year, and the energy assistance program rarely exceeds $700 for any family. Gasoline for snow machines and all-terrain and other vehicles costs each Gambell household about $1,700 each year and

Savoonga households about $1,100. Nearly all households in both villages have at least one snow machine and one all-terrain-cycle, and most have an aluminum boat with a motor of at least 40 horsepower. These machines are purchased in cash, and families save scrupulously and diligently, even going without a second or third daily meal to acquire them. Most clothing is purchased at retail stores or through catalogs. Women make traditional garments to sell or for special uses and occasions.

Gambell and Savoonga each maintain three local government and administrative organizations: a city council, an IRA council, and a Native corportion. Each city council consists of seven elected officials--mayor, vice mayor, treasurer, and four councilmen. Administrative officers are appointed by the council. Terms of office are staggered in all three organizations so that experienced people can help newly elected officers.

City councils have taxing powers over local businesses, provide police and fire protection, issue business permits, control road development within village boundaries, maintain airstrips, and are eligible for matching funds and for special grants for buildings and other community improvements from the State, and for federal grants. Both villages have agreements with the Alaska Village Electrical Co-op (AVEC) whereby village governments maintain electrical facilities and collect charges from customers. In return for these services, the villages charge monthly fees to AVEC. Gambell has installed four wind machines to reduce costs of power generation. The present charge is about 47¢ per kilowatt hour. There are plans to purchase as many as 45 such machines to further reduce costs. The Savoonga city council is considering a similar plan.

State grants bring in far more money than local tax revenues. State benefits to the people of Savoonga amounted to about $100 per capita in 1981, rising to $190 in 1982. Gambell experienced a similar increase. Gambell and Savoonga have received state grants for development of new community facilities. The State's recent influx of oil revenues from developments on the North Slope have greatly benefitted both villages. Those benefits reached their peak in 1983 when the communities received state grants for new fire-fighting equipment, and community buildings for city offices, recreation, learning centers, and libraries.

The State of Alaska, again through special grants to both villages, recently funded the first phases of the establishment of ivory co-ops. The total sum will be about $250,000 for each village's co-op once the details have been worked out and the state review of plans is completed.

Each IRA council has a president, vice president, and five council members. Gambell's council was chartered by the federal government in 1939 and Savoonga's in 1940. The councils receive funds from the Alaska Native Industries Co-operative (ANICA), Native mercantile stores in each village, and from federal grants. They have broad powers, many of which overlap those of the Native corporations. Most of them pertain to protection and management of resources on the island and Native customs and crafts. Both island IRA councils are chronically low on funds.

On or before December 18, 1971, the two villages were faced with options of: 1) deciding to take fee simple title to the reserve (island) lands, surface and subsurface and not participate in the Alaska Native Claims Settlement Act (ANCSA), or 2) participate as any villages may in the provisions of the act and give up the boundaries of St. Lawrence Island. After the Gambell and Savoonga Corporations were formed and the initial articles of incorporation approved by the Bering Straits Native Corporation, the Eskimo people of Gambell and Savoonga voted to take fee simple title to the 1,205,000-acre island, both surface and subsurface, and not participate in ANCSA. The decision of the two villages was to receive full fee title to the 1,205,000 acres in joint ownership between them instead of each village receiving surface rights to 138,240 acres of land and receiving money under ANCSA. Thus, the villages chose to manage their corporate affairs and to reject participation in the Bering Straits Native Corporation. They also chose to turn down any funds that would have come to them from the 962 million dollars disbursed to Native corporations through the provisions of ANCSA. The island people have surface rights to about three-and-one-half times as much land now as they would have, had they chosen to participate in the act.

Stockholders of the two Native corporations elect a president, vice president, secretary-treasurer and four members to governing boards. The corporations have all powers that any corporation possesses under charter with the Alaska Department of Commerce and Economic Development to manage resources and all activities related to resource use and protection. When the Native corporations were established, no firm guidelines distinguished IRA from Native corporate powers and functions. The people of the island have worked out amicable relations among their various governments, and they have been careful to avoid serious jurisdictional conflicts. In general the corporations have become responsible for resource use and protections, and both corporations exercise their power conscientiously.

Essentially, the two Native corporations own and control the resources of the island as well as control future development of the resources, both physical and human. One Native corporation cannot overrule the other, and the two work together to coordinate their efforts. Stockholders in one corporation cannot own stock in the other corporation. Shareholders are those enrolled Gambell and Savoonga Native people born before December 18, 1971. Only they have the right to vote for members of the board of directors and receive dividends. The designated or apparent heirs of shareholders will inherit shares.

There is constant talk of what should be done to best serve the most cherished traditions in Eskimo life on the island when, in 1991, the corporate shareholders will have an opportunity to sell shares to any buyers they choose. Both corporate boards and IRA councils recognize and discuss these options open to the people when that important date arrives. Our discussions of options, which follows, is largely based on field investigations in Gambell as part of the OCS harvest disruption study.

The people of Gambell believe that ANCSA places too much pressure on them to decide much too soon about the disposition of corporate shares, the best form of government after 1991, and the vast knowledge and research required to protect future generations. Most of the leaders in the Gambell Native Corporation and the IRA council believe that the people of the island must prepare for the future one step at a time and proceed at their own pace. The Savoonga leadership in these two complementary bodies seems to concur with this approach. Several joint Gambell-Savoonga meetings of representatives from the two corporations and IRA councils have been held to discuss these matters in depth and to chart a course without rancor, jealousy, haste, or quest for exclusive powers. The same leaders assert that the elders of both communities did not and do not want to sell any subsurface rights to the island, and they want powers vested in the two villages corporations to prohibit inholdings on the island.

Consensus of the villages seems to be that they should not jump into any large development schemes now or after 1991. There is a strong preference for powers to be systematically shifted from the corporations to the IRA councils and that the latter formal governmental entity can answer the challenge of the future. The prevailing attitude is that vesting continued, concentrated powers in the corporations could run the risk that some shareholders might, in haste, sell their shares and create havoc for any unified, all-Eskimo management plan.

The essential political structures of St. Lawrence Island and their institutions appear, for the time being, to serve the people well and to manage the essentials of government with relative ease. Though strains exist in these institutions, the most pressing matters concern the demands placed on the elected officials themselves. The same leaders frequently hold positions in the Alaskan Eskimo Walrus Commission and the Eskimo Whaling Commission, and the Bering Straits School District; they maintain close ties with Kawerak, and membership in many other specialized organizations; and they attend conferences where they can acquire new knowledge and techniques.

In Gambell and Savoonga there are 44 elected or appointed offices (23 Savoonga, 21 Gambell). Most are held by men, many of whom have previously held other elected positions. To maintain close contact with their constituents, the kin groups, and subsistence crews, local people should hold the positions, and those considered best best qualified should serve. And this is exactly what happens in the communities. Public servants, although occasionally exasperated and often exhausted and overworked, generally continue to serve out of a deep sense of commitment and obligation. Some have vowed never to serve again, but they usually give in and run if needed.

Many take pride in their service, realizing that they form a core of leaders who rotate from one institution to another gaining invaluable experience and a broad perspective on the interrelationships among them and the functions exclusive to each. These people are recognized for their positions within patriclans and clan segments and for hunting talent, wisdom, and knowledge of many matters of importance to the villages. Many are also boat captains, a responsibility that requires enormous amounts of time, money, and organizational skills. Leaders in one village are often closely related to leaders in the other, a social circumstance that accounts for some of the good will in governmental affairs between the communities. Leaders experience serious conflicts between the need to serve and the requirements of management of hunting, fishing, trapping and carving. Their first obligation is to subsistence pursuits. Other matters are clearly secondary, and leaders make no pretense to the contrary. Instead of attending meetings, these men would prefer to be at home with their children and other relatives, refurbishing equipment, reloading cartridges, and other work related to subsistence.

Professionalism has come to Gambell and Savoonga government. The city councils have professional full-time managers, recruited locally. The IRA councils and Native corporations have clerks, a further step toward professional specialization in institutional function. These recent innovations in government portend accelerated specialization which could eventually remove some of the generalized character of the present elected leadership whose roles span government, kin, and other social service functions largely embedded in the particlans and organization of subsistence pursuits.

There are two dominant Christian denominations in Gambell and Savoonga. Most prevalent is the Presbyterian Church, which has been present and entrenched in Eskimo life since just after the turn of the century. Members number about 365 in Gambell and about 300 in Savoonga. The Seventh Day Adventist Church, which was established on the island in the 1920s, has 87 members in Gambell and about 10 in Savoonga. More than half of the Presbyterians and Seventh Day Adventists attend services regularly.

Christian doctrines have proved appealing to Eskimo people on St. Lawrence Island, and converts have been numerous without evidence of heavy-handed proselytizing. The Christian heritage, stressing Old Testament male-dominant lineages, and respect for elders and tradition, have found a comfortable place in Eskimo patriclans and attendant values. The New Testament message of communitarian, humane values of brotherly love, treating others as one would like to be treated, and forebearance of life's unforeseen difficulties, found eager recipients in the elder men and women.

Christian doctrines have fundamentally altered certain aspects of traditional Eskimo beliefs and practices. Animism--the belief that all things animate and inanimate possess spirits and that each is accorded specific respect and deference--has slipped away. Remaining is persistent respect for nature and living things, but inanimate objects and beings are no longer seen as possessing spirits that are eternal and no longer require particular ritual acknowledgement (Hughes, 1960, P. 312-333). Christian monotheism has also replaced the traditional hierarchy of spirits. Man and Christian God alone are invested with eternal life, and they are moral beings. Eskimo people have not lost their profound respect for marine life. The animals, particularly marine mammals, are viewed with great reverence, and particular attention is given to their majesty, beauty, intelligence, and power. This respect will remain embedded in Eskimo life so long as the subsistence economy is the dominant means of obtaining food. Eskimo people respect all living beings. They abhor cruelty and slaughter.

Christian churches also play a crucial social role in Gambell and Savoonga. People of all ages, males and females, engage in various activities and are given special responsibilities that are assumed with pride and general enthusiasm. The women teach gospel lessons, give sermons (in the Presbyterian Church), and the two radio stations in Nome are owned by Christian sects. Some elder Gambell women deliver messages expounding on the Christian teachings which are frequently illustrated by traditional Eskimo tales and legends. Churches take responsibility for aiding those in need and for sponsoring countless gatherings for special community purposes quite apart from the formal religious functions. When Eskimo people speak of their treasured way of life, they are also frequently including daily Christian aspects.

Formal education is provided by the Bureau of Indian Affairs in the lower grades and by state-funded high schools from grades nine through 12. Before the early 1970s, St. Lawrence Island high school students could not be educated in their home communities. Most were sent off to schools on the mainland, principally at Mt. Edgecombe, Alaska, nearly 1,000 miles from the island. This pattern had a special socializing effect, instilling certain values and skills dominant in Euro-American societies. During the 1960s, Mt. Edgecombe was particularly noted for a liberalizing ethic, stressing respect for minority peoples, including Alaska Natives. Many island leaders, some of whom are now on the mainland in important positions in various institutions, were students at the school in the 1960s.

Public schools recently established in the villages absorb the bulk of high school-age students. The reasons for building schools on the island, and in many other Native communities in Alaska, were to protect village traditions, insure that young people were not forced to leave families and friends, and allow opportunities to carry on subsistence pursuits. Proponents claim that the desired and beneficial effects accrued override the need for mainland educational experience to adapt to modern life. Enrollment at the Gambell and Savoonga high schools is high. Many students graduate and then leave their villages for stints in military service, to acquire more education, or to look for jobs. A large proportion eventually returns to the island.

Gambell and Savoonga high schools are great rivals in basketball and wrestling. These new activities take on all the trappings of high school athletics anywhere with teams of cheerleaders, bands, and keen competition for trophies and community accolades. The two schools also sometimes compete with mainland schools in these events.

2.5.2 Savoonga

The Savoonga sample of ten households is the smallest of the study, but substantial ethnographic information fortunately exists as part of the OCS harvest disruption study. As a whole the Savoonga data base is very good, but judging by 1980 census income data for Savoonga, the sample may be disproportionally low in the lowest income category, and high in others (Table 44). This signals caution in generalizing the results and emphasizes using the ethnographic data to its fullest advantage.

Stable and predictable incomes were claimed by 50 percent (five households) of the Savoonga sample, 40 percent (four households) were unstable and unpredictable (periodic and erratic), and 10 percent (one household) were stable and unpredictable. Thus about half of the sample incomes are unstable and/or half unpredictable. Savoonga has the highest proportion of unstable and unpredictable incomes among all villages in the sample, and a comparatively small proportion of stable and predictable incomes (larger than only one other village, Emmonak). Recalling the income distribution in Savoonga, our sample seems to have captured, in what is patently a poor community, a relatively vigorous and prosperous group which relies on unpredictable, unstable cash incomes.

Subsistence protein ratings (as a percentage of overall diet) for this sample were only exceeded by Golovin. Half the Savoonga sample fell into the 75 percent or greater category, 40 percent (four households) figured in the 50 to 75 percent range, and only 10 percent (one household) in the lowest class (less than 50 percent). The Savoonga sample uniformly fell in the most diverse subsistence harvest category: 100 percent of the sample intensively harvested two or more species per category (as defined in Appendix B). Thus, in many respects this sample may be a microcosm of economic adjustments highly representative of St. Lawrence Island: very unstable and unpredictable cash resources, cottage industry, high levels of subsistence activity, and so on.

Levels of political participation in the sample are lower than in any other study community except Alakanuk. No participation is evident in 60 percent (six households) of the sample, and only 10 percent (one household) of the sample rated in the high class (2+ roles in the household). Sodality participation, however, was extremely high (70 percent of the sample or seven households representing 2+ roles, and 20 percent and then 10 percent in decreasing order along this scale, (Appendix B)). Sodality activity was more pronounced only in the Nome sample, but in Savoonga it centers around resource extraction and distribution and in Nome in formal institutions.

The Savoonga sample has a larger proportion (40% or four households) of extended family cases than any other except Golovin. The remaining 60 percent of the sample falls in the nuclear/nuclear-fragment class. The Golovin residence patterns are, however, demographically peculiar (see Chapter 3) and represent many unbalanced extended family remnants, while Savoonga represents more highly traditional and intact extended groups. This also shows in the

TABLE 44
Savoonga Personal Income by Quartiles and Percent, 1982

Quartiles	Census	Sample
$0 - 12,000	61%	20%
$13,000 - 18,000	9%	50%
$19,000 - 27,000	17%	-0-
$28,000 +	13%	30%

breakdowns by age of household head. In Savoonga we find by far the greatest proportion of household heads in the 45 to 59 age bracket; although Savoonga has fewer households in the highest age class (60+) than others, the overall trend clearly shows that there are older household heads in Savoonga. Only 20 percent of the sample (two households) is below the 45 to 59 age interval and 20 percent (two households) fell in the 60+ group.

Small households also are rare in Savoonga. Only Alakanuk has more households with 11 or more people (Table 45). The Savoonga breakdowns are larger in each of the three higher classes, and lower only in the first (1 - 3), when compared to the averages for the sample as a whole.

As the second smallest community in our sample, Savoonga is remarkable for its low level of institutional coordination, high levels of real cooperation, and so little polarization of activities among local institutions. The rather smooth functioning of local institutions has developed in ways that dovetail with kin-based traditional institutions. Little formal coordination is required considering the small scale of institutions there. Moreover, informal cooperation provides a well-developed format for carrying out work within clearly marked boundaries (i.e., cooperation, and little formal coordination tied to highly nonpolarized, that is (focused) objectives, yields amazingly resilient and adaptive institutions).

In short, Savoonga represents an isolated dynamic enclave (in the overall sample) which is at the mercy of unstable and unpredictable cash resources but buoyed by extensive subsistence pursuits and institutional stability and vitality . Even though Savoonga residents may at times feel swamped and often sorely tested by outside institutional demands, their response has been comparatively competent and very adroit. Institutional characteristics at domestic levels, however, are structured and often rigid, based on age and sex distinctions that may be unbending and sometimes tension provoking in this community. Whereas many communities may be seen to grapple with new, imposed institutional changes, the Savoonga case shows a comparatively prompt adjustment to them.

Table 45

Savoonga Household Size and Percent, 1982

	Savoonga	Overall Sample
1 - 3	10%	30.5%
4 - 6	60%	53.7%
7 - 10	20%	13.4%
11+	10%	2.7%

2.5.3 Potential OCS Participation

Savoonga on St. Lawrence Island is most distant from Nome, but closer than any other study community to the Navarin Basin and closer than all but Nome to the second Norton Basin lease sale area. Savoonga has no facilities or infrastructure to host any OCS support operations. It is conceivable, however, that industry might seek to develop facilities for its Navarin or Norton Basin operations on St. Lawrence Island under certain conditions.

Households in Savoonga depend on subsistence for their livelihood more than the other study communities. Savoonga has no commercial fishing industry and relies on Native craft products, cash, public sector employment, and a few small businesses for the bulk of local employment opportunities. Savoonga's distance from Nome, the likely point of dispatch to offshore worksites, appears a handicap to its residents.

3. DEMOGRAPHIC ANALYSIS

3.1 Introduction

The demographic analysis is based on numerous assumptions. One is that the census data basic to this analysis are accurate and complete. Another is that these data are assumed to reflect the general historic pattern, not an aberrant or temporary phenomenon counter to general trends. Trends based on these data should be regarded as suggestive or indicative and not conclusive. More and better data over a longer historic period would be necessary to validate apparent trends. Another problem arises because of sample sizes. Small sample size makes a modest change in absolute numbers look large in relative terms. Thus, small numerical changes may "cause" trends to appear or disappear. Larger frequencies should even out aberrances caused by short statistical runs and statistical swings induced by small frequency changes should be less of a potential problem. Along with these assumptions, however, keep in mind that Alaska census data often are erratic or incomplete. The 1980 census figures for Nome, for instance, represent a serious undercount. Nevertheless, analysis must be based on the data available. Knowledge of inherent limitations in the data should temper the conclusions drawn.

3.2 Total Population

Population totals increased in all sampled communities (Table 46) except Golovin from 1950 to 1980. During this 30-year period, however, considerable fluctuation has occurred from decade to decade. Only Gambell posted continuous population gains. (Savoonga might also have shown a similar pattern, but a 1960 count for this community was not available.) During the decade of the 1950s Gambell, Unalakleet, and Nome increased in population from 15.9 percent to 23.5 percent (Table 47); Golovin was the exception decreasing by over 37 percent. The 1960s showed only modest population changes for Alakanuk, Gambell, and Nome, ranging from a 4.7 percent loss to a 7.4 percent gain. Unalakleet's population loss during the 1960s approached 25 percent and Golovin, again the exception, posted a population increase of more than 98 percent. The exceptional jump in Golovin's population deserves special note. Its population changes are much larger than and run counter to the general patterns that are prevalent. While three other communities gained

TABLE 46

Total Population In Seven
Study Area Villages
1950 to 1980

	1950	1960	1970	1980
Alakanuk		278[2]	265[2]	522[3]
Emmonak (Emanguk)			439[2]	567[3]
Gambell	309[1]	358[1]	372[1]	445[3]
Golovin (Goloyin)	94[1]	59[1]	117[1]	87[3]
Nome	1,876[1]	2,316[1]	2,488[1]	2,301[3, 4]
Savoonga	219[1]		364[1]	491[3]
Unalakleet	496[1]	574[1]	434[1]	623[3, 5]

1. Selected 1970 Census data. Part II, Alaska.

2. Number of Inhabitants, Alaska.

3. 1980 Census tape data, unpublished.

4. This figure excludes Perkinsville and even considering that still represents an undercount of the population. The Alaska Department of Labor estimate for 1981 is 3,039, which may be considered a more accurate estimate of the 1980 population.

5. Only two years later a census by the City of Unalakleet reports a population total of 790 (Jorgensen, et al. OCS MMS Technical memorandum NS1-4, March 1983).

TABLE 47

Percent Change in Total Population
In Seven Study Area Villages
1950 to 1980

	1950-1960	1960-1970	1970-1980
Alakanuk		-4.68	96.98
Emmonak			29.16
Gambell	15.86	3.91	18.77
Golovin	-37.23	98.31	-25.64
Nome	23.45	7.43	-7.52[1]
Savoonga			34.89
Unalakleet	22.39	-24.39	43.55

1. This figure reflects an undercount of the Nome population for 1980. The Alaska Department of Labor 1981 estimate of 3,039 yields an approximate 1970-1980 change of +22.15%.

Source: Derived from TABLE 46.

approximately 20 percent during the 1950s, Golovin lost 37 percent. In the 1960s three communities remained relatively stable and one lost 25 percent and at the same time Golovin almost doubled in population. Similarly in the 1970s all communities with the exception of Nome (but see below) gained between 19 percent and 97 percent while Golovin lost over 25 percent of its population. The reasons for this pattern are not apparent from the demographic data alone, although it is probable that the 1980 census figures significantly miscount the populations in some communities.

Critically important for this study are the 1970 to 1980 population figures. During this decade the total population of the seven communities increased from 4,479 to 5,036. This growth was, however, neither universal nor consistent. Alakanuk increased 97.0 percent, but Gambell, Emmonak, Savoonga, and Unalakleet increases ranged from 18.8 percent to 43.6 percent. Both Golovin and Nome ran counter to the general pattern and posted losses of 25.6 percent and 7.5 percent, respectively, according to census figures (which undercount Nome's population). Alaska Department of Labor population estimates for 1981 provide a figure of 3,039 for Nome, which represents an increase of about 22 percent over the decade. The seven communities posted a net population increase of 12.4 percent for the decade, based on census data. Using the more accurate Department of Labor estimate for Nome, this increase represents a 28.9 percent change.

3.3 Ethnic Composition

Analysis of the 1970 ethnic composition of Gambell, Golovin, Nome, Savoonga, Emmonak, and Unalakleet shows that all communities except Nome are almost exclusively populated by Alaska Natives (Table 48). Nome, the largest community and regional administrative center, has the only population of blacks (14, or 0.6 percent) and the only sizable white population (920, or 37.0 percent of the Nome total), according to census information.

The 1980 ethnic composition of Gambell, Golovin, and Savoonga remained relatively unchanged from 1970 (Table 49). In Nome the Alaska Native

TABLE 48

Ethnic Composition In Five
Study Area Villages
1970

	Gambell	Golovin	Nome
Alaska Native[1]	357 (96.0%)	111 (94.9%)	1,554 (62.5%)
Black	-0-	-0-	14 (0.6%)
White	15 (4.0%)	6 (5.1%)	920 (37.0%)

	Savoonga	Unalakleet
Alaska Native	357 (98.1%)	407 (93.8%)
Black	-0-	-0-
White	7 (1.9%)	27 (6.2%))

1. Native is defined as Aleut, Eskimo, Indian and others, excluding black and white

Source: Selected data 1970 Census

TABLE 49

Ethnic Composition In Seven
Study Area Villages
1980

	Alakanuk	Emmonak	Gambell
Eskimo	491 (94.1%)	516 (91.0%)	424 (95.3%)
Indian	-0-	1 (0.2%)	1 (0.2%)
Aleut	-0-	-0-	-0-
White	30 (5.8%)	43 (7.6%)	20 (4.5%)
Black	-0-	-0-	-0-
Asian, Islander	1 (0.2%)	7 (1.2%)	-0-
Other	-0-	-0-	-0-

	Golovin	Nome[1]	Savoonga
Eskimo	85 (97.7%)	1,314 (57.1%)	462 (94.1%)
Indian	-0-	25 (1.1%)	-0-
Aleut	-0-	9 (0.4%)	1 (0.2%)
White	2 (2.3%)	900 (39.1%)	27 (5.5%)
Black	-0-	14 (0.6%)	-0-
Asian, Islander	-0-	20 (0.9%)	1 (0.2%)
Other	-0-	20 (0.9%)	-0-

	Unalakleet
Eskimo	537 (86.2%)
Indian	5 (0.8%)
Aleut	4 (0.6%)
White	75 (12.0%)
Black	-0-
Asian, Islander	-0-
Other	2 (0.3%)

1 Nome 1980 census figures undercount the population; the Alaska Department of Labor 1981 estimate of 3,039 is probably more accurate.

Source: 1980 Census tape data, unpublished population fell slightly from 62.5 percent to 60.4 percent of the total population*. With Nome's 1970 to 1980 reduction in the Alaska Native population percentage, it appears possible that Alaska Natives (predominately Eskimos) contribute to population growth at a slightly lower rate than do whites or blacks. If the 1980 Census undercounted more Alaska Natives than whites or blacks, which is likely the case, then this may not be true. In Unalakleet, a secondary administrative center posting a 43.6 percent population increase for the decade, the white population posted an increase of 178 percent and moved from 6.2 percent to 12.0 percent of the community's population.

3.4 Median Age

The median age for Native males in 1970 ranged from 17.7 (Savoonga) to 22.3 years (Golovin). For Native females, the median age ranged from Golovin's 15.6 years to Gambell's 20.7 years. In three of the five communities (Golovin, Savoonga, and Unalakleet) the median age of the males is greater than the females. Golovin has both the eldest median age for males (22.3 years) and the youngest median age for females (15.6 years) (Table 50).

Since the median age by ethnic group is not available for 1980 and the Native population constitutes the vast majority of the total population except for Nome, total population figures are taken as an adequate approximation of the Native population's median age. The median age of males in the total population (1980) ranged from 18.7 years (Alakanuk) to 29.4 years (Golovin). Alakanuk (1980) also had the youngest female median age (17.0 years), and Nome had the eldest at 25.6 years. In the five communities for which there are comparable data, the median age for both males and females increased with but one exception. Only in Gambell did the median age for females decline, moving

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* It is impossible to determine the exact changes since the 1970 Alaska Native category contains an unknown number of Asians, Islanders, and "others." In 1980 these three groups comprised some 40 individuals, or 1.8 percent of Nome's population.

TABLE 50

Median Age and Sex
Native Population by Communities
1970, and Total Population, 1970-1980

	Native Population		Total Population			
	1970		1970		1980	
	Male	Female	Male	Female	Male	Female
Alakanuk					18.7	17.0
Emmonak					20.8	20.1
Gambell	19.7	20.7	18.77	21.3	22.2	20.6
Golovin	22.3	15.6	19.2	14.9	29.4	24.4
Nome	18.3	19.5	21.5	19.5	26.3	25.6
Savoonga	17.7	16.7	18.0	16.6	22.9	20.2
Unalakleet	19.2	17.1	19.2	16.8	24.3	21.6

Sources: Selected 1970 Census Data. Part II, Alaska; 1980 Census tape data, unpublished

TABLE 51
Nome Census Division
Population Age Comparisons, 1970-1980

	Age (% of population) Under			
Year	Under 5 years	5-14 years	15-64 Years	65+ years
1970	11.6	28.9	55.4	3.9
1980	11.2	20.7	62.8	5.2

Source: U.S. Census Bureau

TABLE 52
Wade Hampton Census Division
Population Age Comparisons, 1970-1980

	Age (% of population) Under			
Year	Under 5 years	5-14 years	15-64 Years	65+ years
1970	15.7	31.4	50.2	2.6
1980	11.9	25.6	58.6	3.8

Source: U.S. Census Bureau

from 21.3 to 20.6 years. This general increase in the median age ranged from 3.5 years (Gambell) to 10.2 years (Golovin) for males and from 3.6 years (Savoonga) to 9.5 years (Golovin) for females (Table 50). Alakanuk and Emmonak have the youngest median ages for both males and females in 1980. Census figures for 1970 compared to 1980 for the region show populations aging as a whole (Tables 51 and 52).

3.5 Population Pyramids

The population pyramids shown on the next few pages are one means of describing the age and sex composition of a population. The percentage distribution of the youngest age group is at the bottom of the pyramid, the age group range is to the left, and the figures at the bottom indicate the percentage distribution of the total population. A population with a relatively stable birth and death rate and migration, exhibits a triangular, or pyramidal, structure. Deviations from this structure thus indicate a different demographic situation. Note that due to the way the data have been aggregated, the youngest cohort contains only five years, the next six cohorts each include a 10-year span, and the eldest cohort includes all those over 65 years of age.

Of the five pyramids from 1970, Nome's most closely approaches the "expected" progression from younger to older, represented by fairly even reduction in the percentage population present in each succeedingly older cohort (Figure 1). This distribution may be due to a larger numerical base, which would tend to overcome problems of small sample statistics. Several deviations from the "expected" or "normal," however, should be mentioned. First, the percentage of both males and females age 5-14 is relatively high. A more "normal" distribution would be less than twice that of the 0-4 age cohort and would not show the sharp drop present between the 5-14 and the 15-24 age cohorts. Also, the percentage of females over 65 seemingly should exceed that of the males due to greater female longevity.

In contrast with Nome the communities of Gambell, Golovin, Savoonga, and to a somewhat lesser extent, Unalakleet, show the differential effects of outmigration. The 45-54 age cohorts for Gambell and Savoonga are much smaller than might be expected and suggest that extensive outmigration or, secondarily, mortality affected this cohort. Savoonga's pyramid further suggests that outmigration was probably a strong factor in reducing the percentage of the 55-64 and 65+ cohorts as well. Other research suggests that outmigration is generally strongest in the young adult years (20-34). These data suggest relatively heavy outmigration during the period 1945-1954. Golovin, as might be expected given the total population figures, presents an unusual case with two cohorts (35-44 and 55-64) suggesting outmigration. That these two cohorts differ from that of Gambell and Savoonga again reflects Golovin's unusual patterns as seen in the total population presentation. The high proportion of young people under the age of 15 reflects the relatively low number of elders in each community, most pronounced in Savoonga, and it may also reflect of the relatively high birth rates of the 1960s.

The 1980 population pyramids differ in numerous ways from those of 1970. In general they show a slight aging of the population, which is validated by the increased median age figures (see also the previous Tables). Nome's 5-14 age cohort, for example, previously 10 percentage points larger than any other cohort in 1980 clustered at 20 percent with two other small cohorts. Savoonga's 5-14 cohort dropped from the low 30s in 1970 to just over 20 percent in 1980, while the 15-24 cohort increased by about seven percentage points. Unalakleet's 1980 pattern is similar to that of Savoonga and approximates a squat diamond rather than a pyramid. Like Savoonga, Unalakleet's 1980 15-24 cohort is the most populous; but in 1970 the 5-14 cohorts in these two communities were by far the largest. Gambell's pattern roughly approximates that of Nome and shows a relative decline in the number of those 65 and older. Golovin shows the most erratic pattern, which suggests cycles of population turnover or migration from the community. The 1980 Emmonak pattern is more similar to the general 1970 patterns as is true in Alakanuk, although to a lesser extent (Figure 2).

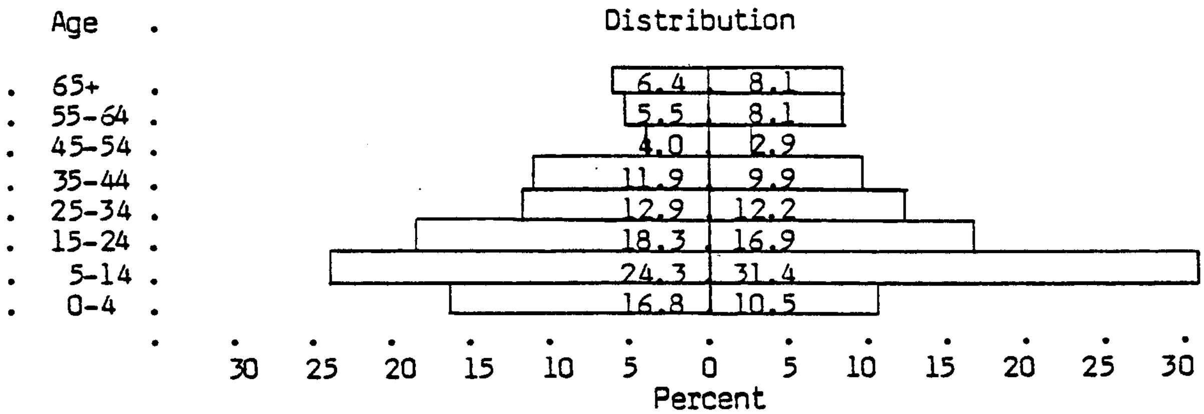
3.5.1 Cohort Analysis

Cohort analysis (Table 53) allows for two somewhat different forms of demographic analysis. First, the number of persons present by age group and decade is shown by reading horizontally across the table. Thus, in Gambell's

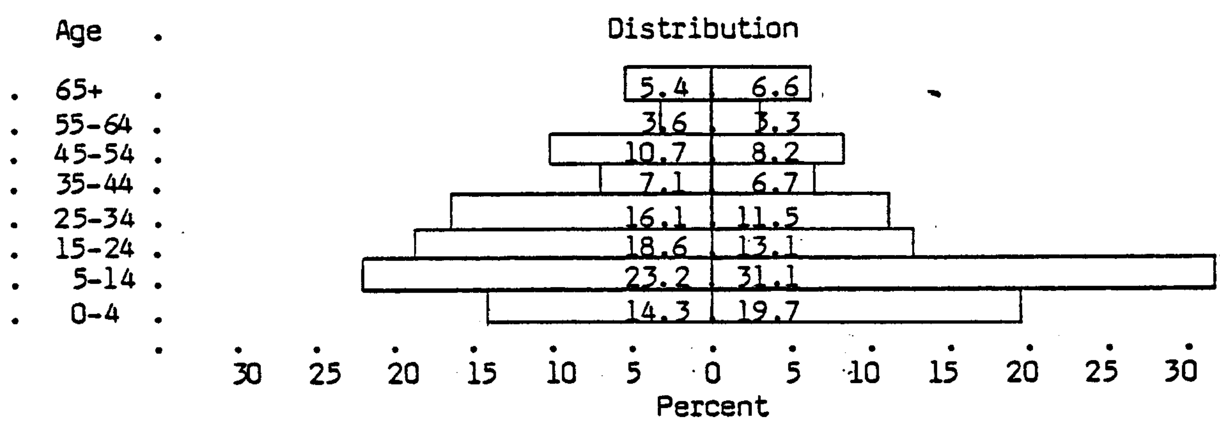
FIGURE 1

TOTAL POPULATION PYRAMIDS, 1970 (1)

GAMBELL



GOLOVIN



NOME

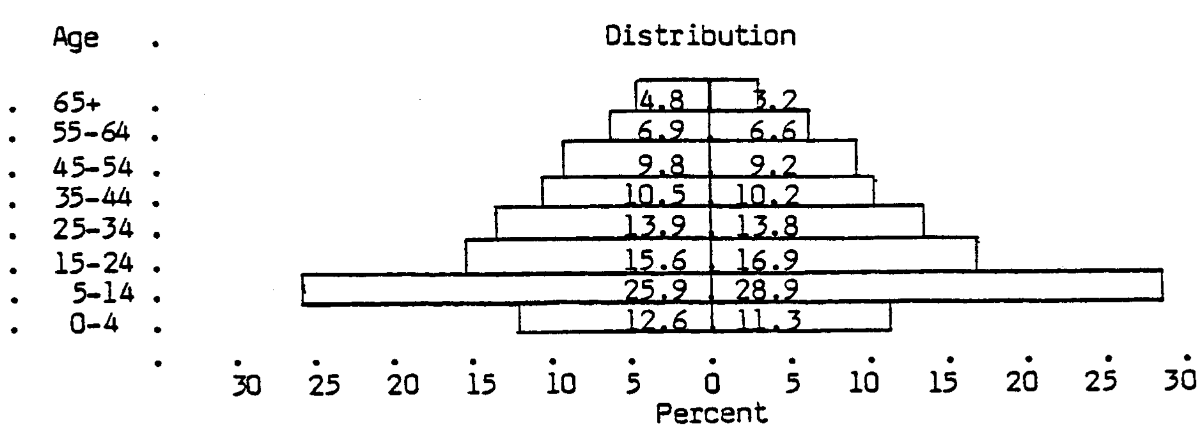
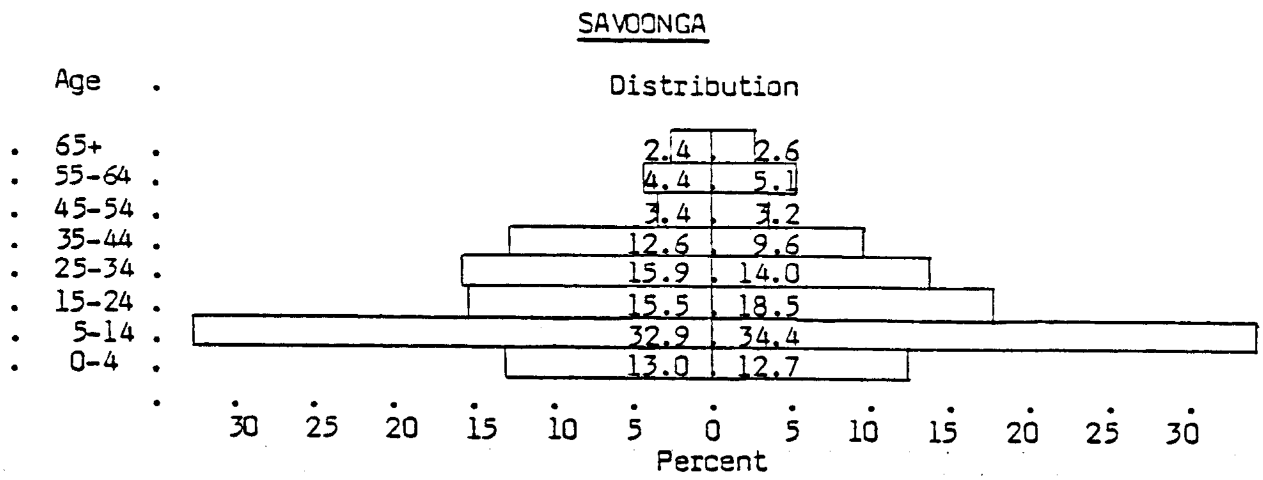


FIGURE 1 (cont.)

TOTAL POPULATION PYRAMIDS, 1970 (2)



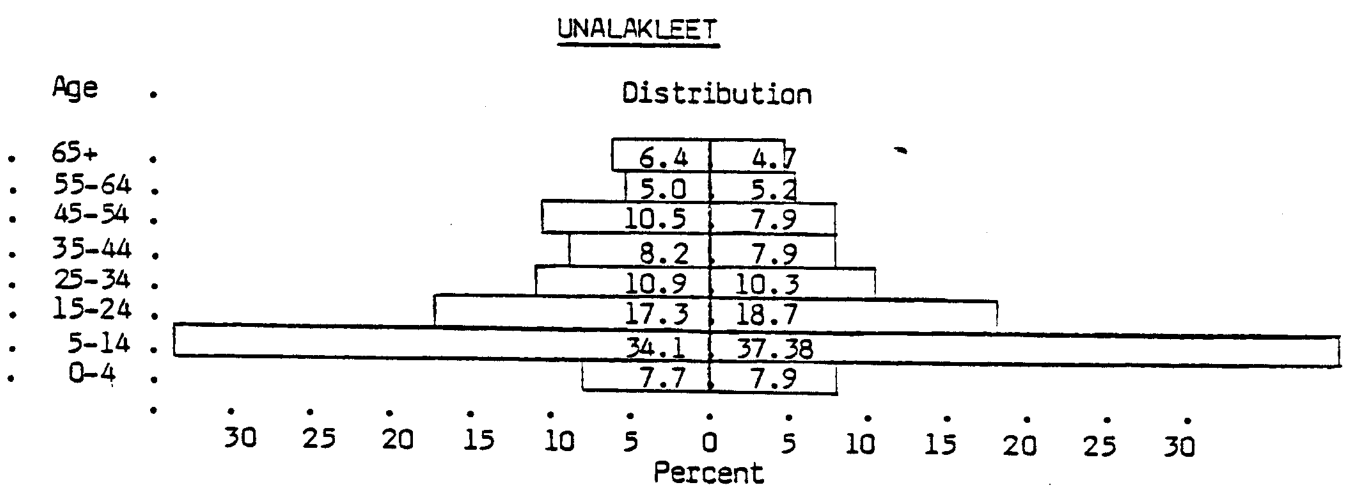
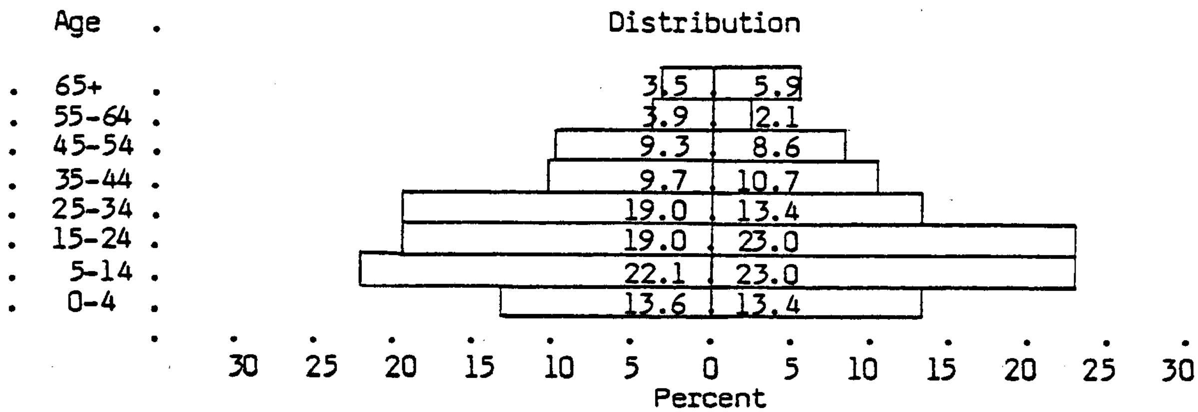


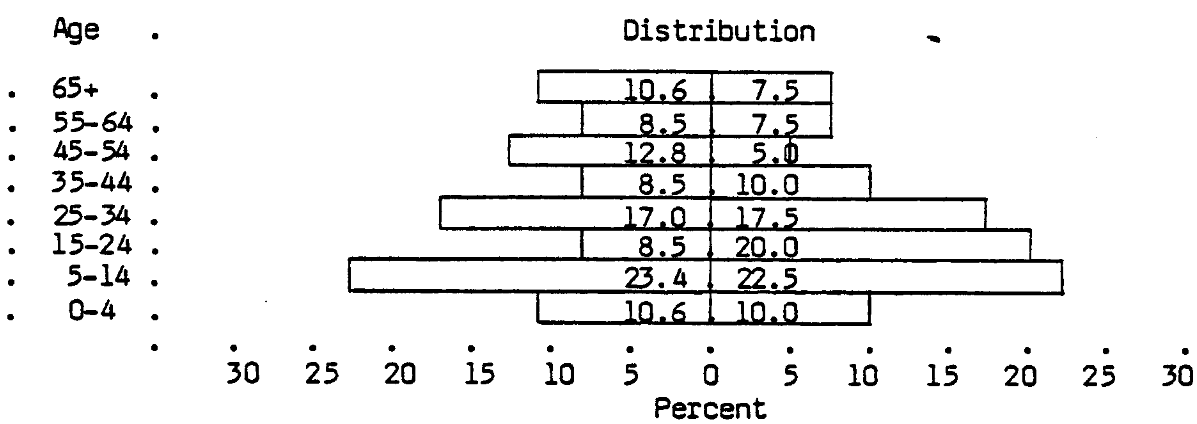
FIGURE 2

TOTAL POPULATION PYRAMIDS, 1980 (1)

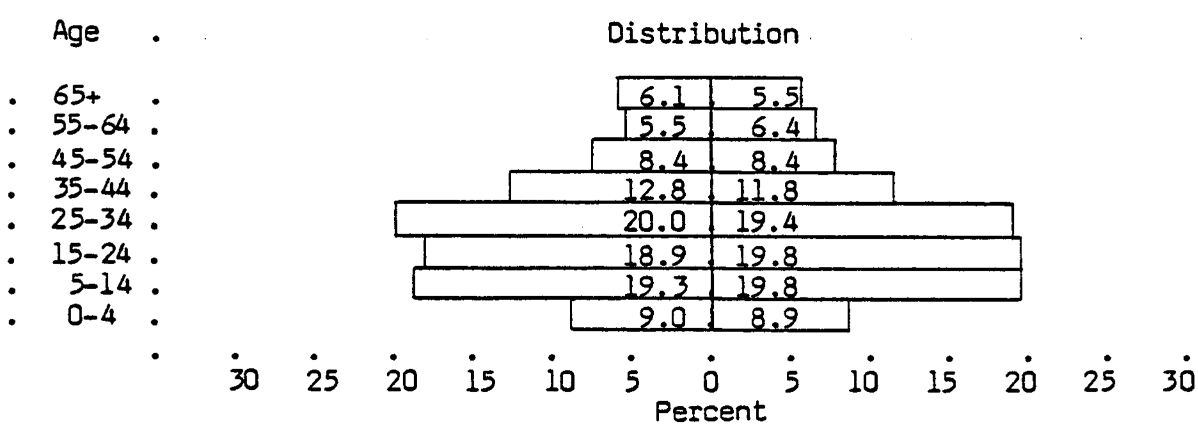
GAMBELL



GOLOVIN



NOME [1]

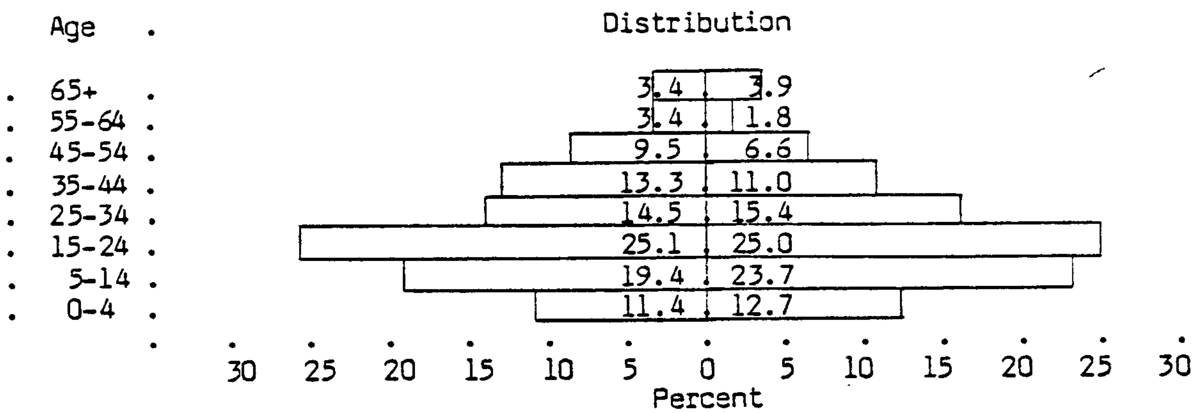


1 The 1980 census undercounted the Nome population, but this undercount may or may not introduce proportional errors in the pyramid.

FIGURE 2 (cont.)

TOTAL POPULATION PYRAMIDS, 1980 (2)

SAVOONGA



UNALAKLEET

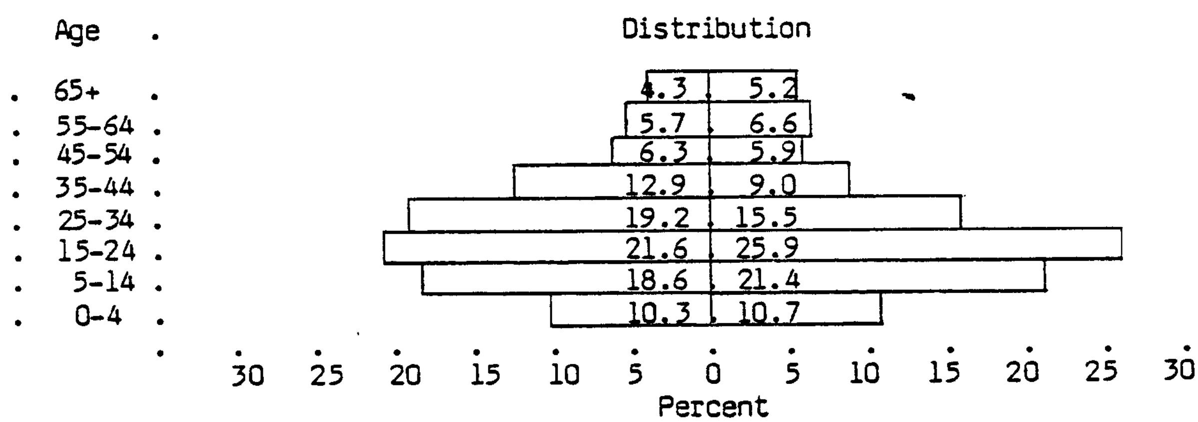
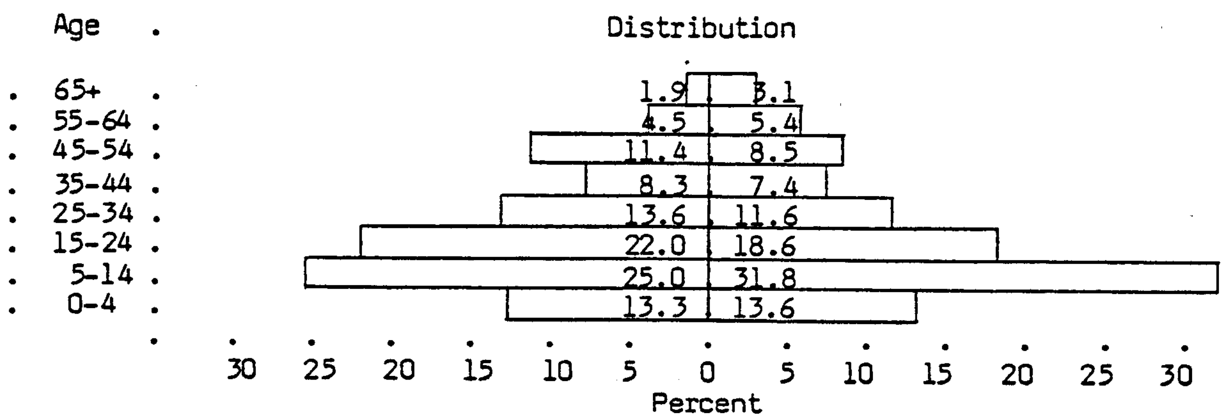


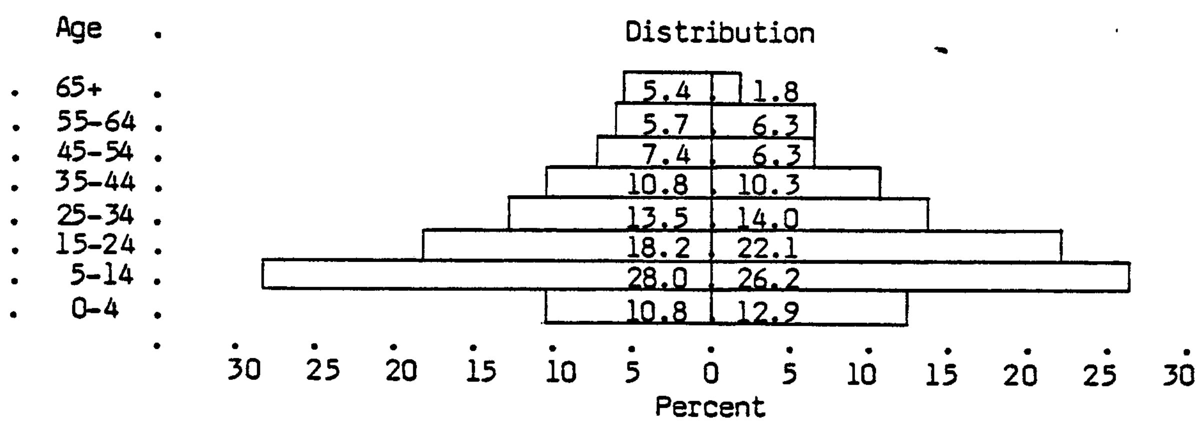
FIGURE 2 (cont.)

TOTAL POPULATION PYRAMIDS, 1980 (3)

ALAKANUK



EMMONAK



case, note that males 5-14 increased from 49 (1970) to 57 (1980). This presents a measure of absolute population change by age and sex. Second, by following the diagonal lines the number present in an age cohort can be traced from decade to decade, and the number retained in the cohort can be determined. For example, those 5-14 in 1970 become 15-24 in 1980. Again in Gambell's case, the 1970 males' 15-24 age cohort increased by approximately one-third from 37 in 1970 to 49 in 1980. This second form of cohort analysis is useful to follow absolute numbers of people from decade to decade to determine the age groups and decades marked by extensive population shifts. Mortality is generally discounted in both these forms of cohort analysis as it is thought to be relatively constant for the same age groups from decade to decade and to be relatively insignificant in the young and middle adult age groups. Inmigration during early adulthood generally connotes relative economic strength and outmigration usually indicates that local economic potentials are less than those perceived for other areas. The extent of male migration is likely correlated with the degree of male dominance in subsistence pursuits.

In Gambell the male population increased in every age group except those over 65. The increases were especially large for the 25-34 year olds, who increased from 26 to 49, and the 45-54 year olds, who increased from 8 to 24. Note that all of the cohorts under five or older than 64 at least maintained their numbers from 1970 to 1980. Age cohort 15-24 gained by 12, and cohort 45-54 gained two. Taken together, the absolute growth within age groups plus the maintenance and growth in the cohort retained through the decade suggests a domestic economy that is strong and growing relative to the area.

The changes observed in Gambell's female cohorts are not as regular as among the males. The general pattern is one of increased numbers in each cohort, but the 5-14, 55-64, and 65+ cohorts are important exceptions. Though the total female population increased by 15, none of the cohorts traced retained its numbers from the previous decade. The losses over the decade were generally modest except that the 1970 5-14 cohort lost 11 members (20.4 percent). These data suggest that the demographic and, inferentially economic gains posted in Gambell were largely male-dominated. Gambell's population of unmarried males increased markedly, and while the male cohorts were maintaining and increasing their numbers, the female cohorts showed losses.

TABLE 53

Cohort Analysis

Gambell

	Males		Females	
0-4	34	35	18	25
5-14	49	57	54	43
15-24	37	49	29	43
25-34	26	49	21	25
35-44	24	25	17	20
45-54	8	24	5	16
55-64	11	10	14	4
65+	13	9	14	11

Golovin

	Males		Females	
0-4	8	5	12	4
5-14	13	11	19	9
15-24	11	4	8	8
25-34	9	8	7	7
35-44	4	4	4	4
45-54	6	6	5	2
55-64	2	4	2	3
65+	3	5	4	3

Nome [1]

	Males		Females	
0-4	163	109	135	97
5-14	334	235	347	215
15-24	201	230	202	215
25-34	179	243	166	211
35-44	135	155	122	128
45-54	127	102	110	91
55-64	89	67	79	69
65+	62	74	38	60

Savoonga

	Males		Females	
0-4	27	30	20	29
5-14	68	51	54	54
15-24	32	66	29	57
25-34	33	38	22	35
35-44	26	35	15	25
45-54	7	25	5	15
55-64	9	9	8	4
65+	5	9	4	9

Unalakleet

	Males		Females	
0-4	17	36	17	31
5-14	75	62	80	62
15-24	38	72	40	75
25-34	24	64	22	54
35-44	18	43	17	26
45-54	23	21	17	17
55-64	11	19	11	19
65+	14	16	10	15

[1] The 1980 census (represented by figures in the right columns for males and females) undercounted the Nome population; some errors may be present.

In Savoonga only one age group among the males and one among the females declined from 1970 to 1980. The number of males 5-14 fell from 68 to 51, and the number of females 55-64 years dropped from eight to four. Two age groups (one male and one female) remained unchanged, and the other six showed population increases of up to 34 individuals. The cohort-retained analysis for Savoonga showed only moderate changes with net increases for the 1970 15-24 and 25-34 age cohorts of both sexes. Savoonga's ability to retain the size of its age cohorts with modest additions suggests a relatively strong domestic economy which, though attracting limited inmigration, is sufficient to hold the local population and retain much of its natural increase.

The primary causes of Nome's increasing median age are a combination of a severe drop in the number of persons under age 15 (a reduction of 33 percent) and an increase of about 22 percent in the number of persons 25-44. As an administrative and service center, it appears that Nome has attracted young adult males (1980 ages 25-34) and to a lesser extent females in the same age group. These factors, plus the fact that the remainder of the cohorts show population losses, suggest somewhat unstable conditions in local demographics and economics with some population flow out of Nome combined with selective inmigration.

The male and female age groups in Nome followed generally similar patterns. The first two age groups dropped substantially -- males from 497 to 344 (30.8 percent reduction) and females from 482 to 312 (35.3 percent reduction). The age groups 15-44 increased in number, ranging from 13.1 percent for the females to 21.9 percent for the males. Those 45-64 declined in number while those over 65 increased. The cohort-retained analysis shows only the 1970 15-24 (1980 25-34) cohorts to have increased in number. Males gained some 20.9 percent and the females 4.5 percent. The remainder of the cohorts showed negative retention, ranging from 13.4 percent to 47.2 percent. In sum the population of Nome is not reproducing itself and is maintaining its declining population largely through the retention and inmigration of young adults.

Golovin's young age groups showed a general and substantial reduction in numbers over the decade. Males 0-24 years of age dropped in number from 32 to 20, and the number of females dropped from 31 to 13. The remainder of the age groups are remarkably unchanged during the 1970s. Note that only the 1970 males' 35-44 cohort (1980 45-54) gained in number, increasing from four to six. All of the other male and female cohorts dropped from two to 11 members (33 percent to 58 percent). Golovin has neither maintained its age groups its cohorts over the decade, and its demographic picture is marked by outmigration, population decline and turnover.

Golovin figures show a community in serious demographic decline. The only age groups to post increases 1970-1980 were males and females 55-64 (from four to seven) and males 65+ (from three to five). Of the remaining 13 male and female age groups, five showed no change over the decade and eight lost a total of 35 persons. The total population declined from 117 to 87, partly due to a loss of 23 in the population under age 15. Similarly, there were substantial losses in young adult male cohorts. Given the history of population declines among the young people and the young adult male cohorts, it remains to be seen if the community can stabilize its demographic slide and maintain itself. Although census data are notoriously inaccurate and post-1975 data may suggest relative stability, these trends warrant careful scrutiny.

Unalakleet's population, judging from the cohort analysis, shows strong recent growth in most age groups. Only in the 5-14 age group do both males and females show population declines from the preceding decade. Females 45-54 remained unchanged. Population growth was especially strong in the young adult age groups (15-34), which more than doubled in number. The cohort-retained analysis shows strong inmigration among the 1970 males 15-24 and 25-34 cohorts, which posted an increase of 45 persons or about 73 percent. Only females 1970 15-24 cohort showed sizable inmigration with an increase of 14 or 35 percent. As with Gambell, Unalakleet's population increase demonstrates its ability to both retain its previous population and attract new residents. In addition, the number of persons 0-4 years in Unalakleet almost doubled during this decade.

Generalizing from the cohort analysis, it appears that the demographics and economics of Unalakleet, Gambell, and Savoonga are strong relative to the area. These communities have been able to hold their previous populations while attracting others, principally young adult males. A portion of this inmigration could be due to return migration. The increasing median age in these three communities is not due to fewer young people, their numbers increased, but to an ability to attract new residents or previous residents, or their children, in young adult age categories.

3.5.2 Sex Ratios

Table 54 presents sex ratios by age groups and communities for 1970 and 1980. The percentage of males in each age group is listed along with the percentage for the community. Two general patterns emerge from the community figures. First, with but one exception (Golovin, 1970), each community in both decades counted a higher proportion of males than females. Second, the statistical prevalence of males increased in all communities except Savoonga. Savoonga's reduction in male statistical predominance is, however, still within the range of the other communities.

Analysis by age groups and communities shows that male statistical prevalence in 1970 tends to cluster in the 25-54 age groups, especially in Gambell and Savoonga. Nome and Unalakleet present two partial exceptions in that the statistical prevalence of males is highest in the 65+ age group. The patterns of male statistical prevalence in 1980 are less clear. As the prevalence of males has increased over the decade, the age groups in which they prevail have also grown older. In Gambell and Savoonga the age group with the highest percentage of males is 55-64 years of age. In Nome the range of variation has declined from 1970, but the 65+ category still retains the highest percentage of males among that community's age groups.

3.5.3 Dependency Ratios

Dependency ratios are defined as the sum of the population under 15 and over 65 divided by the total population. For 1970 the community dependency ratios for Gambell, Savoonga, and Unalakleet are very similar, ranging from 48.6 percent to 49.1 percent (Table 55). The internal composition of these

TABLE 54
Percentage Males by Age in Five Study Area Communities, 1970 and 1980

	Gambell 1970	Total %	1980	Total %	Golovin 1970	Total %	1980	Total %
-5	65.38		58.33		40.00		55.56	
5-14	47.57		57.00		40.63		55.00	
15-24	56.06		53.26		57.89		33.33	
25-34	55.32	54.30	66.22	57.98	56.25	47.86	53.33	54.02
35-44	58.54		55.56		50.00		50.00	
45-54	61.54		60.00		54.55		75.00	
55-64	44.00		71.43		50.00		57.14	
65+	48.15		45.00		42.86		62.50	

	Nome 1970	Total %	1980[1]	Total %	Savoonga 1970	Total %	1980	Total %
-5	54.70		52.91		57.45		50.85	
5-14	49.05		52.22		55.74		48.57	
15-24	49.88		51.69		52.46		53.66	
25-34	51.88	51.85	53.52	53.33	60.00	56.87	52.05	53.56
35-44	52.53		54.77		63.41		58.33	
45-54	53.59		52.85		58.33		62.50	
55-64	52.98		49.26		52.94		69.23	
65+	62.00		55.22		55.56		50.00	

	Unalakleet 1970	Total %	1980	Total %
-5	50.00		53.73	
5-14	48.39		50.00	
15-24	48.72		48.98	
25-34	52.17	50.69	58.72	53.45
35-44	51.43		62.32	
45-54	57.50		55.26	
55-64	50.00		50.00	
65+	58.33		51.61	

1 The 1980 Census undercounted Nome's population; some errors may be present in these percentages.

figures shows a slightly higher ratio of dependent females. Nome posts the lowest dependency figures, 43.4 percent, and Golovin posts the highest at 50.4 percent. In all 1970 cases the vast majority of the dependency figures arise from the 0-14 age groups.

In 1980 the dependency ratios dropped in all cases, and the communities retained a similar relative ranking. Nome had the lowest ratio, 34.3 percent, Golovin the highest, 42.5 percent, with Unalakleet, Savoonga, and Gambell again in the middle. The overall reduction in the dependency ratio is due primarily to a relative reduction in the percentage of those aged 0-14. In each community this percentage dropped considerably. Although mixed, for those over 65 the general pattern was a relative increase in the percentage of population. This relative increase, however, did not counterbalance the reductions shown among those 0-14.

TABLE 55
Dependency Ratios in Five Study Area
Communities, 1970 and 1980

Gambell

	1970 Male	1970 Female	1980 Male	1980 Female
0-14	41.09	41.86	35.66	36.36
65+	6.44	3.14	3.49	5.88
Total	47.53	50.00	39.15	42.24
Community	48.66		40.45	

Golovin

	1970 Male	1970 Female	1980 Male	1980 Female
0-14	37.50	50.82	34.04	32.50
65+	5.36	6.56	10.64	7.50
Total	42.86	57.38	44.68	40.00
Community	50.43		42.53	

Nome

	1970 Male	1970 Female	1980[1] Male	1980[1] Female
0-14	38.53	40.20	28.31	28.73
65+	4.81	3.17	6.09	5.52
Total	43.34	43.37	34.40	34.25
Community	43.35		34.33	

Savoonga

	1970 Male	1970 Female	1980 Male	1980 Female
0-14	45.89	47.13	30.80	36.40
65+	2.42	2.55	3.42	3.95
Total	48.31	49.68	34.22	40.35
Community	48.90		37.07	

Unalakleet

	1970 Male	1970 Female	1980 Male	1980 Female
0-14	41.82	45.33	29.43	32.07
65+	6.36	4.67	4.80	5.17
Total	48.18	50.00	34.23	37.24
Community	49.08		35.63	

1 The 1980 Census undercounted Nome's population; some errors may be present in these percentages.

4. ANALYSIS

4.1 A Framework for Impact Analysis

4.1.1. Introduction

The Statement of Work identifies the three primary community socioeconomic conditions used in this study to measure impacts likely to occur with OCS development in the Norton Sound Basin of Alaska. These are changes in levels of economic activity, employment opportunities, and inflation. A basic economic framework that connects OCS development and the resident economy of the region is described below. Three dimensions of this economic framework need clarification:

1. The form of OCS development likely to occur in these OCS lease sale areas.

2. The most significant modes of interaction between OCS development and the region's economy.

3. The most significant indigenous socioeconomic factors influencing the course of the region's involvement in OCS development.

Once accomplished, these clarifications will narrow the bounds of inquiry and direct that inquiry toward the most promising avenues of study. Also, definition of the potential economic relationships between OCS development and the resident economy will create a basis for development of a forecasting methodology founded on subsistence harvest patterns, family and community organization, migration patterns, and other important modes of social interaction addressed later in this chapter and the next.

Specific features of potential OCS development in Norton Basin sale #100 and Navarin Basin sale #83 are especially relevant to the resident economy. Development decisions largely rest with the industrial corporations operating in the region. Their entrepreneurial decisions are governed primarily by geographic, environmental, technical, and economic considerations and only secondarily by socioeconomic characteristics of the region. Therefore, these decisions should be viewed as independent variables.

The Statement of Work establishes some important premises for the study. Two pertinent passages are quoted below:

> The purpose of this study is to provide the socioeconomic parameters to be used by the Alaska OCS Office in evaluation of the nature and extent of potential impacts on the Norton Sound communities should OCS oil and gas development activities occur . . ..
>
> It is possible that OCS activity in both the northern Navarin Basin and Norton Sound itself will result in increased economic activities which might affect the coastal communities of Norton Sound. These activities might include offshore drilling, marine and air support bases, pipeline landfalls, crude oil storage facilities, natural gas liquification plants, and tanker loading facilities. The study shall identify the infrastructure, social, economic, and cultural structures particularly sensitive to disturbances created by the OCS oil and gas activities.

Thus, the Statement of Work assumes that oil and gas development results from these two lease sales. The possibility that commercial reserves may not be found does not have to be considered for purposes of this study. Given the premise that there will be offshore development, some additional simplifying assumptions about the technology and geography of offshore development will help clarify the links between offshore activities and the resident Norton Sound economy.

Technically feasible alternatives to land-based support operations for these lease sales do exist. For example, industry could establish direct marine delivery of heavy supplies to offshore installations and install offshore product storage and transshipment terminals. This development would not physically intrude into the resident economy.

In the case of the Navarin Basin and second Norton Basin sales, geographic considerations, too, seem to rule out a number of the more problematic modes of direct economic interaction. The Navarin Basin is very remote from the study area. There are upland sites outside the study area that would be much closer to offshore operations in the Navarin Basin and thus better suited for land-based support functions. Although some potential operations (such as land-based aerial support) might influence some communities, it is not likely that new support facilities for the Navarin Basin that require substantial investment would be located onshore within the study area. The second proposed Norton Basin sale #100 comprises westward tracts throughout the planning area. Nome (or another western Seward Peninsula site established to support Norton Basin sale #57 offshore operations) or a St. Lawrence Island site could provide logistic support for field development. St. Lawrence Island could be selected as a site for a new marine oil terminal if the development scheme requires shore-based facilities in that vicinity. However, because of the distance from the scene of offshore operations, support facilities for this second Norton Basin sale would not be located at eastern Norton Sound or Yukon delta communities. Also the island communities did not favor having industrial facilities of this type on their land as of 1982.

To conclude, the remoteness of the proposed sale areas from the Norton Sound coastline make it very unlikely that certain of the onshore industrial facilities cited above in the Statement of Work such as pipeline landfalls, crude oil storage facilities, natural gas liquification plants, and tanker loading facilities would be sited within the study area. Most avenues of direct economic impact on Norton Sound communities can be ruled out of consideration. The foregoing discussion narrowed the scope of potential relations between OCS development and the resident economy. Further refinements of the nature of shoreside economic impacts would depend on facts about the production scenario and on the configuration of the development scheme and logistic arrangements employed by industry that are outside the scope of this study and will not be pursued here.

4.1.2 Employment

The main potential for direct economic interaction between OCS development and the community and regional economies in the study area might be through resident participation in the OCS workforce. Of the study area communities, only Nome could assume some limited support functions for the offshore industry. This section presents some key features of the local economies of the study communities. The discussion is very selective in scope and specifically meant to help anticipate how residents might respond to the employment opportunities introduced by OCS development. Thus, community socioeconomic characteristics essential to a comprehensive picture of the community economy are omitted.

Most direct employment opportunities resulting from OCS development would be onsite and away from settlements. Thus, the quality of intraregional communications and transportation would be a key determinant in how successfully local residents can participate in this job market. At present, all study communities have some telephone service, but household telephones are common only in Nome, Unalakleet, and Savoonga. The other communities have only a few telephone stations, usually in public places. Local radio stations at Nome and Bethel are an important means for distributing news and information of local and regional interest. Satellite television service is available to all the communities, and almost all households own televisions. Shortwave radio is also a popular means of local and intraregional communication.

Since most job openings would likely be away from existing settlements, intraregional transportation services would affect the access of interested residents to OCS employment opportunities. If Nome were to be the dispatch point to offshore worksites, then the quality of air service between Nome and the various communities would become critical. Unalakleet is the only study community with mainline jet service to Nome. The remaining others are served by small aircraft only. Approximate air distances to Nome are: Golovin - 75 miles; Emmonak - 120 miles; Alakanuk - 130 miles; Unalakleet - 150 miles; and, Savoonga - 135 miles. At the present level of service and cost, transportation barriers may inhibit the ability of residents in the communities more distant from Nome to work regularly on a rotating shift basis at OCS employment.

In most of the study area outside "urbanized" Nome, cash employment and subsistence activites have a complementary relationship. Many activities carried out for cash income such as commercial fishing and fish processing, Native arts and crafts, trapping and reindeer herding adapt for commercial purposes the same skills, natural resources, and equipment used for subsistence activity. Thus, cash employment and subsistence work are not separate or antithetical but complementary. This same pattern of skill transfer might help ease entry into the OCS employment market.

All of the study communities have a relatively large pool of unemployed adults in the prime working ages who are potential candidates for employment in OCS industries (Table 56). Official unemployment rates throughout the

TABLE 56

Resident Community Workforces, 1980

Community	Potential Workforce[1]
Alakanuk	146
Emmonak	196
Golovin	31
Nome	965[2]
Savoonga	195
Unalakleet	241

1. Defined as total population between 20 and 44 years of age.

2. Due to undercounting on the 1980 census, this figure is probably too low.

Source: 1980 U.S. Census.

region are high, but by report of the Alaska Department of Labor the official rates seriously understate effective unemployment rates for a number of technical reasons. Unfortunately, 1980 census data on the occupational skills of the region's residents were not available for analysis. Job skills and work experience of the resident workforce might not be well matched to the job requirements of the OCS industry, and if so, this would impair the short-term employability of the resident labor force. Job training programs could help overcome these handicaps.

Some sketchy data suggest that household and workforce mobility are generally low and might inhibit resident participation in the OCS job market. According to 1980 census data for each community, the percentages of 1980 residents then five years of age or older who still lived in the same census division as in 1975 were as follows: Nome - 71 percent; Unalakleet - 83 percent; Savoonga - 91 percent; Emmonak - 91 percent; Golovin - 96 percent; and, Alakanuk - 97 percent. These data indicate that the resident populations are relatively stable especially in the more remote communities. Perhaps this indicates a reluctance in many households to relocate just for better access to employment opportunities. Data on workforce willingness to pursue nonlocal employment are also sketchy. A 1981 Alaska Department of Labor survey of Lower Yukon-Kuskokwim communities found that the proportion of discouraged unemployed, that is, unemployed persons who were not actively seeking employment, was about equal to the official unemployment count. The same survey also found that younger members of the resident workforce were more interested in cash employment opportunities than their seniors.

4.1.3. Economic Opportunity

The resident economy can provide or perform three general functions for the offshore industry: upland facility sites; commercial and industrial goods and services; and labor services. With the exception of the southwestern coast of the Seward Peninsula and St. Lawrence Island, the study area is not a likely candidate to provide landsites for onshore industrial facilities. Thus, with those exceptions, provision of industrial facility sites and limited related facility construction activities probably would have limited economic impact on the region. The second potential, provision of various commercial and industrial goods and services essential to the offshore development program, would depend on what the communities in the region can offer and under what conditions demand for these goods and services might arise. Only the economic structure of the Nome area displays relatively strong trade and service sectors, but local goods and services of importance to the offshore industries would likely be quite limited. The Wade Hampton regional economy shows a very weak trade and services sector (see Section 2.2.1.2.), and as noted earlier (see Section 2.3.4), Yukon delta communities are poorly located for providing any kind of support for offshore operations.

Two major features of OCS development--logistics arrangements and onshore facility construction and operation--would determine the level of demand for local goods and services. The transportation system for offshore personnel in transit to and from the offshore work stations likely would require a combined jetport/heliport facility within flying range of offshore worksites. For sale areas now under consideration, Nome is the only locality with aviation and related support facilities for transients needed during the exploration phase. Similarly, Nome is a likely transit station for air shipment of light industrial goods, perishables, and other supplies to offshore platforms. Because of limitations on natural harbor and port facilities, neither Nome nor any other community in the region is equipped to serve as a marine support base to receive, warehouse, and dispatch as needed bulk supplies such as fuels and lubricants, drillpipe and other drilling suppplies, drillwater and potable water, etc., to platform sites. The region will not be attractive to oil service industries until it has a a medium-draft port facility.

The economics of developing offshore fields and related operations might encourage investment in new permanent air and marine transportation facilities. This would divert economic activity from Nome to other possibly remote sites that are not connected by road to Nome. Some operators might station some administrative support personnel in the region, but more likely is that these personnel would be located at Nome or some other major onshore facility installation closer to offshore operations.

We have previously discussed the prospects for large-scale onshore industrial facilities such as oil terminals and LNG plants being located in the study area. Establishment of these and other facilities would require a temporary on-site construction crew and a permanent operating force. If any of these facilities were set up at a remote site, they would probably be supplied directly from outside the region, needing few goods and services from local suppliers. On the other hand, if situated at or near an established community, the workforce might generate some local demand, particularly for consumer goods and services. A new, large, permanent workforce might also promote expansion of existing businesses and formation of new ones. With the exception of Nome, however, the opportunities for local supply of goods and services to offshore industries seem slight at best.

The third and last economic function that the resident economy might perform directly is to supply labor for the offshore enterprise. Sources of employment might include platform operations, facilities construction and operations, transportation services, warehousing, and administrative support. Much of the employment associated with these activities will be at sites remote from the workers' home communities. Though few residents of the region have experience in offshore industries, barriers to resident participation in the offshore workforce are not fixed and permanent. These speculations suggest that, eventually the resident workforce might penetrate the employment market and this possibility seems to offer the greatest potential for OCS-induced changes in the Norton Sound economy.

This working hypothesis differs from the premise often adopted for OCS community impact analyses that settlement impacts stem from nearby major construction projects and other OCS-related industrial activities that are carried out by a mix of transient and permanent nonresident workers. These new developments and workers presumably disrupt, overwhelm, transform, and otherwise impose changes on the resident economy. Based on review of the economic structure, workforce characteristics, and other economic features of Norton Sound communities, this may not be a suitable model for addressing overall economic impacts of OCS lease sales in the Norton Sound region. The region simply lacks geographical, infrastructural, commercial, industrial, labor, or any other economic assets to attract offshore industries and workers connected with the second Norton Basin and Navarin Basin sales. Instead, economic effects may depend primarily on the ability and interest of local workers, organizations, and entrepreneurs in capitalizing on opportunities.

4.1.4. OCS-induced Inflation

Inflation caused by OCS development is a specific topic of interest to this study. To isolate OCS-induced inflation from other sources, it must be distinguished from overall inflationary trends in the national and state economy and from the cost of living differential attributable to the region's remoteness, its small markets, and other characteristics.

Local inflation is often an unwelcome companion of rapid economic growth and increases in income. At first glance, the communities of the region would seem prone to rapid inflation caused by OCS development. These communities have few enterprises and entrepreneurs, a narrow range of locally available goods and services, and long, unreliable supply lines. Such essentials as housing stock and public facilities are in short supply and difficult to expand. Entrepreneurial capital is scarce, and entrepreneurs are slow to react to uncertain new opportunities. Under these conditions any sudden infusion of new purchasing power may put short-term upward pressure on prices especially if demand grows faster than supplies. Of course, local businesses could anticipate future growth, but a lag seems more likely. Industrial enclaves are designed to be relatively self-sufficient operations that insulate local communities from development impacts (such as inflation due to rapid shifts in demand and supply); however, enclaves may not be able to inhibit many impacts especially in the areas of revenue, taxation, and transportation.

The same dynamic factors that cause short-term inflationary distress can restructure the local economy and cause a higher level of performance. In small, emerging market economies, a sustained rise in consumer purchasing power and demand can eventually stimulate economies of scale, promote new business formation, help upgrade the assortment of locally provided goods and services, and raise the general level of economic well-being. Even where such a local inflationary cycle proves beneficial to most the short-term local residents, adjustment may be painful for certain sectors of the population. Local inflation usually affects different sectors of the population unevenly. For example, persons and households with fixed incomes or at the fringe of the cash economy are most hard hit by the climbing cost of living--typically, the elderly, the unemployed, and those dependent on income assistance. On the other hand, merchants, property owners, and those who supply goods and services in high demand and short supply may fare well economically during periods of demand-driven inflation, as do some chain operations and regional banks. Also, persons and businesses able to pay premium prices may preempt transportation services, housing, and other supplies and services to the detriment of other consumers. A recent case in point, unrelated to OCS development, is the relocation of Bering Straits School District headquarters from Nome to Unalakleet. Many households in the Norton Sound region rely heavily on subsistence harvests, and some of these are less vulnerable to the difficulties inflation can cause. But even they must cope with sudden increases in the costs of fuels, machines, ammunition, and fishing gear.

4.1.5. Governance, OCS Development, and Regional Economic Development

So far, this section has addressed the economic considerations that might govern the interactions between OCS development and the resident economy. The region's geography, economic organization, infrastructure, and workforce are not well suited to the development of offshore industries. The ties between OCS development and the resident economy would be limited. Potentially, the most important connection would be jobs.

A brief account of oil development in the North Slope Borough, eastern Gulf of Alaska, and Kenai-Cook Inlet regions will illuminate how sociopolitical factors come into play. This sketchy account will highlight some distinctive features of the study region and, will give some useful comparisons.

The North Slope Borough is a compelling example of the use of local regulatory and taxing powers to promote development of the resident economy. Outside Prudhoe Bay, the North Slope regional economy stands squarely on the sovereign authority of the regional government under state law to tax and spend. Effectively the two co-existing economies in the region are linked mainly by the Borough's authority to levy real property taxes. In 1980 approximately 75 percent of the personal income earned within the North Slope Borough was earned by nonresidents, nearly all of it in the private sector within the mining, construction, and transportation industries associated with Prudhoe Bay petroleum operations. Few local residents are employed at Prudhoe

Bay. On the other hand, since the Borough was established in 1973, it has accounted for most resident employment and personal income. By 1980 between 50 and 60 percent of the personal earned income remaining after adjustments for nonresidents accrues directly from public sector employment, nearly all of it funded by local tax levies on petroleum industry facilities. The Prudhoe Bay petroleum development does not have any direct economic impacts on the resident economy. Its economic impacts accrue from the ability of the regional government to levy and spend real property taxes on petroleum properties.

In the eastern Gulf of Alaska, the community of Yakutat possessed a monopoly of shoreside base sites in an offshore province where extremely hostile sea conditions mandated shore-based support operations. This monopoly was Yakutat's key asset in its negotiations with the oil firms. It was the extraordinary political effectiveness of the city government and the Native village corporation at dealing with state and federal government and corporate management of the oil industry that enabled Yakutat to parlay this asset into a powerful economic role in Gulf of Alaska OCS exploration. However, offshore operations in the eastern Gulf of Alaska terminated with exploration, so there is no way of knowing what would have happened to the community if oil had been produced.

Petroleum development in the Kenai/Cook Inlet province is in definite contrast to the North Slope Borough and the City of Yakutat. Local governments in the Kenai-Cook Inlet region favored intensive development based on the region's oil and gas resources. The communities offered hospitable entrepreneurial and living conditions that made the Kenai/North Kenai area attractive to industry and its workforce. In a bygone era of oil and gas economics, the receptivity helped transform the western Kenai Peninsula into a diversified industrial complex. The oil and gas industry and its affiliated businesses are well integrated into the economic and political life of the community. With each periodic boom, the Kenai/North Kenai industrial center attracted a new influx of workers in excess of available jobs and held unemployed workers long past the time temporary construction jobs were over. As a result, the area typically experienced higher absolute unemployment levels even during construction booms and higher unemployment rates after each stage of growth than it did at the outset of oil development. The local government in the Kenai/Cook Inlet region promoted rather than restricted oil and gas development, and it established a laissez-faire climate for the oil and gas industry.

This summary of petroleum development in three regions suggests some hypotheses for the present study. The employment and economic effects of an OCS lease sale are in part the outcome of institutional and political resources that the target region might bring to bear on the development process. In particular, the structure, powers, and posture of regional governing institutions will influence the impact of OCS development on resident employment and economic development. Furthermore, without regional institution to exercise influence over OCS development, villages will not be able to exert much influence over oil and gas projects.

The Norton Sound region differs greatly from the other example regions in two fundamental ways, based on our review of the region's indigenous economic assets. First, no strong unified local or regional governing body exists and second, industry needs would be limited for the labor, commercial, and other services that local residents, workers and entrepreneurs now can provide. Thus, the popular vision of offshore industries sponging up local goods and services, distorting local wage and price patterns, and generally disrupting the established economy seems a misconception of the probable situation.

This discussion does not assume that regional politics and other social characteristics belong to separate domains. The structure and performance of regional governing institutions depend on many geographical and economic conditions, ethnic features, transportation, communications technologies, and special circumstances in the communities. The approach used in this study first examines the regional characteristics and then those of the communities. Chapter 2 follows this logic, and most of the analysis reported in the remainder of this Chapter by and large is organized in the same manner. Chapter 5, which details the forecasting model, is structured explicitly along these lines.

4.2 Typological Analysis

This section is devoted to description and discussion of some key relations among variables discovered in the primary data analysis. This section is loosely divided into subsections based on institutional, village and domestic variables. Some of these descriptions at times merge village and domestic variables. Appendix C, "Characteristics of the Sample," gives statistical summaries of household size, age of household head, household structure, subsistence harvest expenses, diversity of subsistence harvests, earned proportion of income, household income, and income stability and predictability. This appendix also includes a bivariate linear display of household income graphed against village size, which illustrates the income range characteristics of the sample ordered by village size.

The variables that are cited in the text, Figures and Tables in this chapter were defined earlier and used throughout Chapter 2, however some of the variables used in this discussion are combined and otherwise modified versions of previous variables. The variables used in this chapter are defined below, with the variable labels on the left and definitions on the right (see also Appendices A and B). They are listed in the approximate order that they are encountered in the text.

Institutional Coordination and Cooperation	A two-dimensional dichotomy that signifies the presence or absence of institutional cooperation (mutual assistance and joint action) and coordination (formalized relations); used as a nominal variable and converted to a four-point ordinal scale in the path model (Chapter 5) as it was used in the OCS Social Indicators methodology.
Villge Size	1980 census population.
Organizational Scale (structure)	Variable 15 (see Appendix B); a dichotomous variable that specifies the number of formal boundaries within organizations.
Organizational Scale (staff)	Variable 14 (see Appendix B): a dichotomous variable that specifies the size of the administrative component of an organization as high (25% or more of total staff) or low (less than 25%).

Dependency Ratio	Proportion of persons under the age of 15 years based on 1980 census.
Autonomy and Polarization	Variable 13 (see Appendix B); derived from the Hemphill Index, this two-dimensional dichotomy signifies the absence or presence of distinct autonomy (independence of action) and polarization (unspecialized goals and objectives).
Single Person Households Percent of Total	Variable 41 (see Appendix B): the percentage of single person residential households in the total population, derived directly from 1980 census data.
Sex Ratio	Proportion of males to females as recorded in the 1980 census.
Diversity of Subsistence Harvests	Variable 27 (see Appendix B); a three-point ordinal variable that characterizes household susbsistence harvests; typical harvests may represent less than one species in any of five categories (land mammals, sea mammals, fish, fowl, vegetables); at least one in each; or two or more in each. This variable signifies diversity rather than volume.
Proportion of Harvested Protein in Diet	Variable 28 (see Appendix B); the proportion of harvested protein to all protein in the household diet, represented with a three-point ordinal scale.
Subsistence Harvest Expenses	Subsistence cash investments as a percentage of gross income, charted along a three-point ordinal scale.
Sex Ratio for Single Persons Over Age 15	Variable 28 (see Appendix B); a stratified sex ratio that represents the proportion of males to females, over the age of 15 (e.g., controlling for juvenile dependency); derived directly from 1980 census data.

Household Income	Gross household income, all residents.
Political Participation in Household	The number of political roles enacted by all household residents, whether elected or appointed, using a three-point ordinal scale.
Age of Household Head	Age of identified household head as one of four ordinal categories.
Sodality Memberships	The number of sodality (informal organizational memberships in the residential household, using a three-point ordinal scale.
Income Stability and Predictability	Variable 32 (see Appendix B); a two-dimensional dichotomy which represents the absence or presence of distinct stability (nonseasonal, pro rated) or predictability in household income as a whole; used as a nominal variable and converted into a four-point ordinal variable in the path model.
Income and Labor Strategies	Variable 24 (see Appendix B); a three-point ordinal scale that represents the degree to which household assets (cash, foods, labor) are accumulated or distributed to other households.
Household Size	Size of household residential membership, classed on a four-point ordinal scale.
Earned Proportion of Income	Variable 30 (see Appendix B); a three-point ordinal scale that represents the proportion of earned (as opposed to unearned transfer) income to all income.
Structural Tensions	Variable 16 (see Appendix B); this measure of solidarity specifies if systematic institutional tensions exist using a dichotomous variable.

4.2.1. Institutions and Organizations

As has already been pointed out (see Sections 2.3.1., 2.4.1., 2.4.4., 2.5.2.), institutional coordination and cooperation vary by village and are tied in part to village size to the extent that growth of specialization and population growth covary. The connections are systematic for the villages in the sample. Table 57 rates villages along these institutional dimensions. Smaller villages are more likely to show less institutional coordination because they are generally less specialized and less complex, whereas larger villages show more coordination among formal institutions. Cooperation is evident in most communities except the largest and smallest (Chapter 2 discusses Golovin and Nome data). Emmonak departs from the pattern and in several ways seems to be an anomoly. It is larger than Alakanuk, yet shows less coordination. Emmonak may be a transitional case that shows some characteristics of both larger and smaller communities.

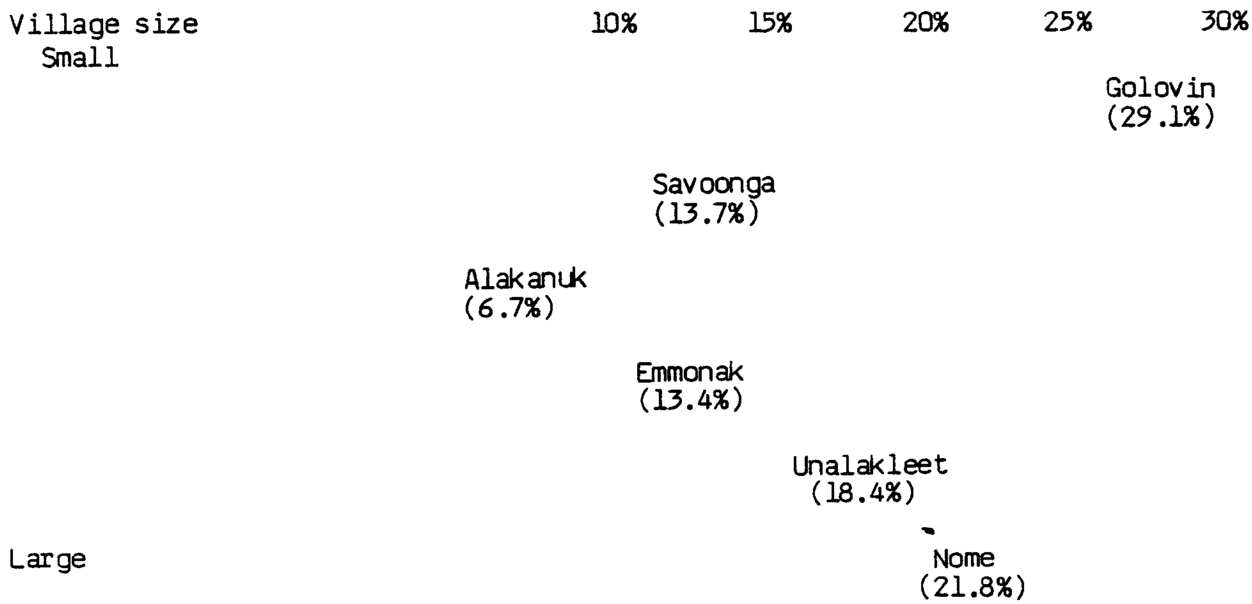
Table 58 shows the distribution of villages in terms of organizational scale as measured by specialization and boundaries within organizations. Thus, Emmonak is more like the large communities by virtue of organizational complexity. But using another measure of organizational scale based on ratios of staff to administrative personnel, a different pattern emerges (Table 59).

TABLE 60

Presence and Absence of Polarization and Autonomy in Sample Communities, 1982

+ Polarized - Autonomy	- Polarized - Autonomy	- Polarized + Autonomy
Golovin	Alakanuk	Nome
Savoonga	Emmonak	
	Unalakleet	

Figure 3
Single Person Households Percent of Total (X)
by Village Size (Y)



Many of the relations revealed between population variables are largely self-evident and not very surprising. In many of these Golovin and Nome emerge as problematic cases with similarities since they are different from other communities. For instance the single person household variable distributes the villages along a gradient of dependency (juvenile dependency, under age 15) in Figure 4. A fairly systematic relation exists between these variables; however, Golovin departs from the trend and behaves somewhat like larger communities.

Communitywide demographic patterns frequently covary with domestic economic variables. This is significant because a community variable assesses the entire community, while domestic economic variables classify only single families from the sample. Associations between these variables indicate that it is likely that community-level generalizations can have significant meanings when applied to individual families within these communities.

For instance, a comparison between diversity of subsistence harvests (a domestic variable pertaining to families in the sample) and community sex ratio (a communitywide demographic variable) reveals the pattern shown in Table 61. These numbers refer to the families which fall into each category; the sex ratios typify each commmunity (0.98=Alakanuk; 1.2=Savoonga and Golovin; 1.1=others). Even though there are eight families in the sample that we were unable to classify, it seems clear that sample families that display the most diverse subsistence harvest are found most often in communities with higher sex ratios (more males than females in the total population). The large number of Alakanuk families engaged in diverse subsistence harvests (represented by 11 families in the lower left cell) departs from this pattern, and undoubtedly there are numerous exceptions and complications that do not support this observation. Nonetheless, it seems warranted to further investigate the relationships between family structure, age and sex composition, workforce characteristics, and subsistence if we are to determine what this comparison may mean.

Figure 4
Six Sample Communities, 1980
Single Person Households Percent of Total (X)
by Dependency Ratio (Y)

Dependency ratio	6.7	13.4	13.7	18.4	21.8	29.1
0.4					Nome	
0.44				Unalakleet		
0.5			Savoonga			Golovin
0.64		Emmonak				
0.72	Alakanuk					

TABLE 61
Sex Ratio (M/F) (X)
by Diveristy of Subsistence Harvests (Y)

Diversity of Subsistence Harvests	0.98	1.1	1.2
Low (less than 1 spp./cat.)	3	12	1
Medium (1 spp./cat.)	2	10	1
High (2+ spp./cat.)	11	13	21
unclassed		8	

Table 62 shows another association between sex ratio and subsistence by comparing sex ratios and proportions of harvested protein in the family diet. Although some information is missing, there are positive associations among these variables. Communities with a preponderance of males are also those communities that in the sample have a greater proportion of subsistence protein in the diet. The relationship is weaker but still apparent in a comparison of sex ratios with subsistence harvest expenses; communities with a higher proportion of males are the communities with proportionally higher subsistence investment. For these and other reasons, the possible associations between the robust, largely male, transient workforce; income; employment; and subsistence should be explored in depth. By adjusting the sex ratio to control for juvenile dependents, a strong relationship emerges among sex ratios and percent of income spent on harvest expenses. Table 63 shows the relationship bewteen percent of household income used for subsistence harvest expenses an the sex ratio of single persons age 15 and over. This ratio accounts for the proportion of adult males who are not part of a conjugal family unit according to the 1980 Census.

Because these comparisons signal the importance of single persons and their economic roles (judged so far in terms of subsistence), further comparisons are warranted. Table 64 charts the distribution of family incomes (by quartile) against the percentage of single-family households. Since the larger communites tend to have more single-person households and more economic and employment opportunities, the single status per se may be far less important than other factors that single status tends to covary with. Table 64 shows a preponderance of single-person households associated with higher income (and, as stated above, with higher subsistence investments and a number of other factors). An identical and complementary distribution is obtained if we look at the percentage of conjugal, two-or more-person households.

4.2.3 Organizational Participation

Beyond the last section's description of community and institutional variables are domestic variables that examine participation in these organizations and institutions. Table 65 addresses the level of political participation in leadership positions within households against household

TABLE 62

Relationships Among Household Harvested Protein and Sex Ratios, Grouped Data from Six Sample Communities, 1982

Proportion of Harvested Protein in Diet	SEX RATIO (M/F) 0.98	1.1	1.2
Under 50%	7	6	2
50-75%	7	10	8
Over 75%	2	8	13
Unclassed		19	

TABLE 63
Sex Ratios for Single Persons 15 and Older and
Percent of Household Income Used for Subsistence Harvest, 1982

Subsistence Harvest Expenses		Sex Ratios for Single Persons 15 and Older						
		1.23	1.55	1.57	1.59	1.66	1.69	Row Totals
Missing Data		2 2.4	0 0.0	0 0.0	0 0.0	0 0.0	4 4.9	6 7.3
Low (0-9%) Income	A	7 8.5	6 7.3	3 3.7	6 7.3	1 1.2	3 3.7	26 31.7
Med (10-19%)	B	3 3.7	4 4.9	9 11.0	4 4.9	0 0.0	6 7.3	26 31.7
High (20%+)	C	0 0.0	6 7.3	1 1.2	8 9.8	9 11.0	0 0.0	24 29.3
Column Totals		12 14.6	16 19.5	13 15.9	18 22.0	10 12.2	13 15.9	82 100.0

Chi Square = 54.82
Probability = 0.000
Cramer's V = 0.472

(Percentages of total listed under frequency in each cell)

TABLE 64
The Relationship Between the Proportion of Single Person Households and Household Incomes by Quartile, 1982

Household Income In Quartiles	Single Person Households Percent of Total						Row Totals
	06.7	13.4	13.7	18.4	21.8	29.1	
1 (0-12K)	7 8.5	0 0.0	2 2.4	3 3.7	5 6.1	6 7.3	23 28.0
2 (13-18K)	5 6.1	3 3.7	5 6.1	2 2.4	1 1.2	2 2.4	18 22.0
3 (19-27K)	2 2.	5 6.1	0 0.0	7 8.5	3 3.7	4 4.9	21 25.6
4 (28+K)	2 2.4	4 4.9	3 3.7	1 1.2	9 11.0	1 1.2	20 24.4
Column Totals	16 19.5	12 14.6	10 12.2	13 15.9	18 22.0	13 15.9	82 100.0

Chi Square = 32.46
Probability = 0.006
Cramer's V = 0.363

(Percentages of total listed under frequency in each cell)

TABLE 65
Household Income (Quartiles) (X)
by Political Participation in Household (Y)

Political Participation In Household	0-12K 1	13-18K 2	19-27K 3	28K+ 4	Row Totals
Missing Data	1 1.2	1 1.2	3 3.7	3 3.7	8 9.8
2 + Roles	3 3.7	3 3.7	9 11.0	11 13.4	26 31.7
1	2 2.4	2 2.4	3 3.7	2 2.4	9 11.0
None	17 20.7	12 14.6	6 7.3	4 4.9	39 47.6
Column Totals	23 28.0	18 22.0	21 25.6	20 24.4	82 47.6

Chi Square = 19.93
Probability of Chance = 0.018
Cramer's V = 0.285

(Percentages of total listed under frequency in each cell)

income (quartiles). The level of political participation is clearly associated with income; families with high incomes tend to have members with multiple political roles. Thus relative affluence and political representation on the part of household members may covary; families with higher incomes have more members holding political offices than do poorer families. However, income is related to many other factors that complicate the issue; that is, is income the critical connection here or something else that income covaries with?

Although we cannot answer this question satisfactorily, or completely, Table 66 throws some light on it. Age of household head compared to the level of political participation in the household reveals a weak association, but the distribution of data suggests that political participation varies in a curvilinear fashion. The robust 30-44 age group is well represented in the high political participation class, whereas by comparison all other age groups participate less. This robust group is also a high earning group, and thus it is possible that levels of political participation are related to both income and age, and that in turn income and age are related such that higher incomes tend to fall in certain age classes. There are, no doubt, many other important elements that need to be addressed here, but these examples serve to illustrate that these variables are related to one another in complex and multiple ways.

4.2.4. Domestic Patterns

There are several possible positive relationships among the variables concerning household income, household size and composition, family dynamics, demography, and subsistence. For example, a strong correlation exists between the proportion of harvested protein in family diets and the percentage of family income invested in subsistence pursuits. The strongest association is between those households that expend 20 percent or more of their income on subsistence and a harvested protein proportion of 50 to 75 percent (Table 67). A linear relationship emerges as one moves from the lower to higher classes, although the trend is problematic in the high investment category (that is, the high investors are not the highest consumers). Many households (21) could not adequately be classed, and thus the results here are questionable. (We find much support for this general observation elsewhere.)

TABLE 66
Political Participation in Household (X)
by Age of Household Head (Y)

Age of Household Head	Missing Data	2+ Roles	1	None	Row Totals
Missing Data	1 1.2	0 0.0	0 0.0	0 0.0	1 1.2
Under 30	0 0.0	2 2.4	0 0.0	5 6.1	7 8.5
30-44	6 7.3	16 19.5	3 3.7	14 17.1	39 47.6
45-59	1 1.2	4 4.9	3 3.7	8 9.8	16 19.5
60+	0 0.0	4 4.9	3 3.7	12 14.6	19 23.2
Column Totals	8 9.8	26 31.7	9 11.0	39 47.6	82 100.0

Chi Square = 20.93
Probability of Chance = 0.056
Cramer's V = 0.290

(Percentages of total listed under frequency in each cell)

TABLE 67
Proportion of Harvested Protein in Diet (X)
by Subsistence Harvest Expense (Y)

Subsistence Harvest Expenses	Missing Data	Less Than 50% A	50-75% B	More Than 75% C	Row Totals
Missing Data	4 4.9	0 0.0	1 1.2	1 1.2	6 7.3
Low (0-9%) A	9 11.0	9 11.0	4 4.9	4 4.9	26 31.7
Med (10-19%) B	6 7.3	3 3.7	7 8.5	10 12.2	26 31.7
High (20%+) C	0 0.0	3 3.7	13 15.9	8 9.8	24 29.3
Column Totals	19 23.2	15 18.3	25 30.5	23 28.0	82 100.0

Chi Square = 27.75
Probability = 0.001
Cramer's V = 0.503

(Percentages of total listed under frequency in each cell)

Another comparison shows a strong association between the diversity of subsistence harvests and subsistence harvest expenses (Table 68). There is a clear relationship between medium and high investments (more than 10 percent of income) and diverse harvests--those who invest heavily tend to harvest many species. Though it might seem logical to discover some economy of scale associated with household size vis-a-vis either subsistence variable, no suggestive relationships were found between household size and harvests or investments. Diverse subsistence harvests seem to be occur at every income level, and hinge more on actual investment rather than overall income. We found no association between household income (measured by quartile) and diversity of subsistence harvests per se.

In most cases, interrelationships between subsistence variables were very conspicuous. Table 69, for instance, charts the proportion of harvested protein in family diet against diversity of subsistence harvests. In common sense terms, this table shows that diverse harvests are associated with more subsistence protein in the diet. (But one quarter of the sample is not represented in the analysis due to incomplete data (20 families out of 82), and interpretations should take this into account.) Among families for whom we did have enough information to make a determination, this pattern stands out.

Turning from subsistence comparisons per se to other family economy elements, it becomes evident that subsistence harvests are associated with general income and resource strategies at the family level. Table 70 compares diversity of subsistence harvests (using two classes of diversity) with family income and labor strategies. Income and labor strategies, ranging along a scale from pooling and accumulation within the household to both local and regional distribution of resources, is positively associated with the diversity of harvests. Thus families who pool and distribute resources most widely are also those who typically harvest the most diverse range of species.

Households with stable and predictable incomes engage in diverse harvest as well. Table 71 shows the breakdown of diversity of subsistence harvests by income type (i.e., predictability and stability). Note that although the stable and predictable incomes are associated with diverse harvests, so are the unpredictable and unstable incomes. This suggests that when incomes are

TABLE 68
Diversity of Subsistence Harvest (X)
by Subsistence Harvest Expenses (Y)

Subsistence Harvest Expenses	Missing Data	Less Than 1 SPP A	1 SPP Per Categ B	2+ SPP Per Categ C	Row Totals
Missing Data	2 2.4	0 0.0	4 4.9	0 0.0	6 7.3
Low (0-9%) A	3 3.7	11 13.4	4 4.9	8 9.8	26 31.7
Med (10-19%) B	3 37.5	0 0.0	4 4.9	19 23.2	26 31.7
High (20%+) C	0 0.0	5 6.1	1 1.2	18 22.0	24 29.3
Column Totals	8 9.8	16 19.5	13 15.9	45 54.9	82 100.0

Chi Square = 40.35
Probability = 0.000
Cramer's V = 0.405

(Percentages of total listed under frequency in each cell)

TABLE 69
Proportion of Harvested Protein in Diet (X)
by Diversity of Subsistence Harvests (Y)

Diversity of Subsistence Harvests	Missing Data	Less Than 50% A	50-75% B	More Than 75% C	Row Totals
Missing Data	7 8.5	0 0.0	1 1.2	0 0.0	8 9.8
Less than 2 SPP Per Category	10 12.2	8 9.8	7 8.5	4 4.9	29 35.4
2+ SPP Per Category	2 2.4	7 8.5	17 20.7	19 23.2	45 54.9
Column Totals	19 23.2	15 18.3	25 30.5	23 28.0	82 100.0

Chi Square = 35.3
Probability = 0.000
Cramer's V = 0.464

(Percentages of total listed under frequency in each cell)

TABLE 70
Income and Labor Strategies (X)
by Diversity of Subsistence Harvests (Y)

Diversity of Subsistence Harvests	Missing Data	Pool Accumulate A	Local Distrib B	Local/Reg Distrib C	Row Totals
Missing Data	1 1.2	3 3.7	3 3.7	1 1.2	8 9.8
Less than 2 SPP Per Category	0 0.0	12 14.6	12 14.6	5 6.1	29 35.4
2+ SPP Per Category	0 0.0	3 3.7	22 26.8	20 24.4	45 54.9
Column Totals	1 1.2	18 22.0	37 45.1	26 31.7	82 100.0

Chi Square = 25.38
Probability = 0.000
Cramer's V = 0.393

(Percentages of total listed under frequency in each cell)

TABLE 71
Income Stability and Predictability (X)
by Diversity of Subsistence Harvests (Y)

Diversity of Subsistence Harvests	Missing Data	Unstable Unpred A	Unstable Pred B	Stable Unpred C	Stable Pred D	Row Totals
Missing Data	0 0.0	0 0.0	4 4.9	0 0.0	4 4.9	8 9.8
Less than 2 SPP Per Category	0 0.0	2 2.4	6 7.3	9 11.0	12 14.6	29 35.4
2+ SPP Per Category	0 0.0	7 8.5	2 2.4	6 7.3	30 36.6	45 54.9
Column Totals	0 0.0	9 11.0	12 14.6	15 18.3	46 56.1	82 100.0

Chi Square = 19.64
Probability = 0.003
Cramer's V = 0.346

(Percentages of total listed under frequency in each cell)

unstable or unpredictable the diversity of subsistence harvests may be constricted by relative lack of economic resources. Families with erratic financial resources may depend on relatives for a wide range of species or capital to finance subsistence pursuits. In the Savoonga and Nome sample, for instance, low subsistence activity was often associated with full-time, relatively well-paid employment. However, families with unreliable sources of cash may participate in subsistence activities with other families, or may share subsistence capital, such that their harvests may nonetheless be diverse. In Savoonga, for instance, young males in non-conjugal households with few financial resources undertake many subsistence pursuits using borrowed equipment and harvest diverse resources. Findings of this study may indicate a bimodal distribution of subsistence species use. Households with unreliable financial resources may be inhibited from taking many species and may depend on others for these goods, or they may pursue different species with lower costs per unit. The harvest may be less diverse but still substantial in terms of actual volume. Households with very unreliable financial resources may engage in diverse subsistence harvests, as do the more diverse households, by virtue of access to (rather than ownership of) subsistence capital that other households possess. Reliable incomes, however, are not necessarily larger than their unreliable counterparts. Pension and social security incomes (which may be low) are stable and predictable. Many lucrative income opportunities are seasonal (hence unstable), and unpredictable even during seasons that they are normally available.

The income categories pertaining to predictability and stability can be ordered in a manner that, for heuristic purposes, may approximate a scale of "reliability" (Table 72). This table illustrates how income and income type are related. As incomes increase, so does the likelihood that these incomes are more certain (seasonally or absolutely). This association is significant at the 0.013 level. Higher incomes also tend to represent a higher proportion of earned, as opposed to unearned, money (Table 73). Thus, we see multiple associations between incomes, types of income, and subsistence variables.

There are no strong associations between sodality (nonpolitical, noninstitutional social affiliations) membership and household size, although sodality participation seems to be highest for households in the size range of four to six. In fact, in about half of the sampled cases in which sodality

TABLE 72

Household Income

by

Income Stability and Predictability

Income Quartiles

"Reliability"	1 (0-12K)	2 (13-18K)	3 (19-27K)	4 (28K+)
Unstable Unpred	3	5	1	0
Stable Unpred	8	4	2	1
Unstable Predict	3	0	4	5
Stable Predict	9	9	14	14

TABLE 73
Household Income (Quartiles) (X)
by Earned Proportion of Income (Y)

Earned Proportion of Income (EPRO)	0-12K 1	13-18K 2	19-27K 3	28K+ 4	Row Totals
Missing Data	0 0.0	1 1.2	0 0.0	0 0.0	1 1.2
None	4 4.9	0 0.0	3 3.7	0 0.0	7 8.5
1-49%	9 11.0	3 3.7	0 0.0	0 0.0	12 14.6
50% or More	10 12.2	14 17.1	18 22.0	20 24.4	62 75.6
Column Totals	23 28.0	18 22.0	21 25.6	20 24.4	82 100.0

Chi Square = 30.21
Probability of Chance = 0.000
Cramer's V = 0.350

(Percentages of total listed under frequency in each cell)

participation was recorded, it occurred in households of this size. This household size represents a stage in the domestic cycle when fathers and sons, mothers and daughters are most often eligible by age to be members in various sodalities such as structured subsistence crews and voluntary associations. This relationship, even though it is explainable in principle, requires further analysis. Sodality memberships, unlike political participation, are also unrelated to family income, but sodality memberships are indeed pronounced in the higher income quartiles. This factor, too, requires further analysis but may be related to age structure, subsistence pursuits that may be structured and require substantial capital expenses, and other family economic factors.

The sample generally tends to reveal relationships between household size and village size; that is, the larger communities tend to have larger households. This observation is contrary to the community-level demographic data, and represents only the sample. Half of the sample represents households between four and six persons in size; but Nome and Golovin fall short of this figure and are instead more heavily loaded in the small (one to three person) category. This is important to remember when reviewing sample data and should be compared to the aggregated demographic data from the 1980 census that in some cases depart from the sample distribution. Chapter Three examines these population characteristics in detail. As was pointed out before, village size and household income are associated. Table 74 compares these variables, and, although the trend is not uniform, higher incomes are generally associated with larger village size in the sample. This cross tabulation treats village size as an ordinal variable, and so 1980 census miscounts (for Nome for example) do not invalidate the comparison.

Although the meaning of the relation is unclear, a negative association between village size and diversity of subsistence harvests also exists. Table 75 compares these variables, and it is apparent that harvest diversity decreases as village size increases. The tendency is quite discontinuous, though, and one quarter (20 households out of 82) of the sample is missing from the comparison, hence caution is urged in interpreting these results.

TABLE 74
Household Income (Quartiles) (X)
by Village Size (Y)

Village Size	0-12K 1	13-18K 2	19-27K 3	28K+ 4	Row Totals
87	6 7.3	2 2.4	4 4.9	1 1.2	13 15.9
491	2 2.4	5 6.1	0 0.0	3 3.7	10 12.2
522	7 8.5	5 6.1	2 2.4	2 2.4	16 19.5
567	0 0.0	3 3.7	5 6.1	4 4.9	12 14.6
615	3 3.7	2 2.4	7 8.5	1 1.2	13 15.9
2301	5 6.1	1 1.2	3 3.7	9 11.0	18 22.0
Column Totals	23 28.0	18 22.0	21 25.6	20 24.4	82 100.0

Chi Square = 32.46
Probability of Chance = 0.006
Cramer's V = 0.363

(Percentages of total listed under frequency in each cell)

TABLE 75
Diversity of Subsistence Harvests (X)
by Village Size (Y)

Village Size	Missing Data	Less Than 1 SPP A	1 SPP Per Categ B	2+ SPP Per Categ C	Row Totals
87	0 0.0	1 1.2	1 1.2	11 13.4	13 15.9
491	0 0.0	0 0.0	0 0.0	10 12.2	10 12.2
522	0 0.0	3 3.7	2 2.4	11 13.4	16 19.5
567	4 4.9	5 6.1	3 3.7	0 0.0	12 14.6
615	4 4.9	0 0.0	5 6.1	4 4.9	13 15.9
2301	0 0.0	7 8.5	2 2.4	9 11.0	18 22.0
Column Totals	8 9.8	16 19.5	13 15.9	45 54.9	82 100.0

Chi Square = 51.91
Probability = 0.000
Cramer's V = 0.459

(Percentages of total listed under frequency in each cell)

One of the most revealing variables concerning community responses to the vicissitudes of economic conditions is household structure. Many studies have been conducted on this subject. Jorgensen (1968, 1971), Robbins (1971), Callaway (1981) and others have shown relationships between economic circumstances, household structure, socialization practices, and family and household developmental cycles. These studies demonstrate that low and unstable incomes and other resources force families and miscellaneous kin, friends, and foster children into a state of mutual dependence. Incomes, household resources, and families are grouped together under a single roof to help one another through cycles of low seasonal income. Such circumstances and household structures identify families as being part of an underclass dominated by economic forces beyond their control that keep them in a state of persistent dependence on external social entities. This model of the underclass does not, however, provide a full explanation of household structure shown in the Norton Sound area.

The OCS harvest disruption study describes the structure and function of Gambell and Savoonga households. This study observes that Norton Sound Native households are not economically independent units of social organization. Each household in the St. Lawrence Island case, for instance, is a functional part of larger social structures, particularly patriclans and clan segments that wed households to one another. The essential, persistent, and pervasive common bond lies in the manifold subsistence activities, each of which requires the coordinated efforts of people from more than one household for training, equipping, and sustaining various crews for hunting, fishing, and collecting. The authority structure in these vital activities rests with elder males and females who stand as heads of patriclans and whose importance in all essential functions stems from the quest for naturally occurring species. So although more than 60% of the Gambell and Savoonga households are nuclear in form, they are not autonomous units in the ways they support themselves. This observation applies to many households in the study area.

Family structure variables (distinguishing between nuclear, coresidential, and extended households) do not do justice to these subtle but crucial household dynamics. The vast majority of the sample represents nuclear households (74.4%). Although both Golovin and Savoonga show large proportions of households in the extended class (38.5% and 40%, respectively), the importance of relations between nonindependent nuclear households and others is not fully revealed. In the Golovin case it is possible that the large number of extended households represents an adjustment on the part of a demographically skewed population to uncertain economic resources. In the Savoonga case, an expression of the multiple family bonding noted above is revealed.

Households of all sizes are thoroughly involved in subsistence pursuits, and no consistent evidence emerged about size as a distinctive factor in subsistence. Both in terms of diversity of harvests, and harvested protein in family diets, household size makes little if any difference. Other household characteristics may do a better job of capturing the subtle dynamics and developmental stages described above and may make a difference. For instance, Table 76 describes a comparison of household income and age of household head. Although some variation between household head age and certain household developmental factors might be expected, age may serve as a good surrogate for more detailed but sometimes ambiguous characteristics. Here age and income are associated, but a review of the data distribution shows that in fact incomes (measured in quartiles) are highest in the robust 30-44 age class; the relations between income and age are curvilinear. Comparing age of household head and proportion of harvested protein in family diets, we find a good linear relationship in Table 77. The older group consumes far more subsistence protein as a proportion of their overall diet than the others, and this relationship is relatively consistent in other age classes. Thus, the elder-headed families consume a larger proportion of harvested protein but have somewhat smaller incomes compared to most of their junior neighbors.

Many other important factors cluster around age as well as all of the subsistence and economic measures. Most of these have been summarized in previous sections. The next section capsulizes the findings in a more succinct manner to prepare the reader for the modeling analysis and the key typological characteristics that have been identified.

4.3 Typological Generalizations

These general observations should be seen as points of departure for the analysis still to come. Many of the collapsed observations are redefined,

TABLE 76
Household Income (Quartiles) (X)
by Age of Household Head (Y)

Age of Household Head	0-12K 1	13-18K 2	19-27K 3	28K+ 4	Row Totals
Missing Data	1 1.2	0 0.0	0 0.0	0 0.0	1 1.2
Under 30	5 6.1	1 1.2	1 1.2	0 0.0	7 8.5
30-44	7 8.5	4 4.9	13 15.9	15 18.3	39 47.6
45-59	2 2.4	9 11.0	2 2.4	3 3.7	16 19.5
60+	8 9.8	4 4.9	5 6.1	2 2.4	19 23.2
Column Totals	23 28.0	18 22.0	21 25.6	20 24.4	82 100.0

Chi Square = 31.51
Probability of Chance = 0.002
Cramer's V = 0.358

(Percentages of total listed under frequency in each cell)

TABLE 77
Proportion of Harvested Protein in Diet (X)
by Age of Household Head (Y)

Age of Household Head	Missing Data	Less Than 50%	50-75%	More Than 75%	Row Totals
Missing Data	0 0.0	0 0.0	0 0.0	1 1.2	1 1.2
Under 30	0 0.0	4 4.9	1 1.2	2 2.4	7 8.5
30-44	11 13.4	7 8.5	15 18.3	6 7.3	39 47.6
45-59	3 3.7	3 3.7	6 7.3	4 4.9	16 19.5
60+	5 6.1	1 1.2	3 3.7	10 12.2	19 23.2
Column Totals	19 23.2	15 18.3	25 30.5	23 28.0	82 100.0

Chi Square = 21.77
Probability = 0.040
Cramer's V = 0.297

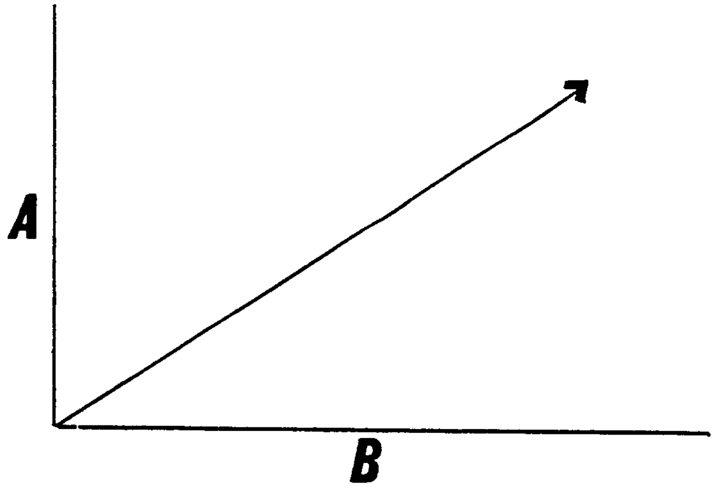
(Percentages of total listed under frequency in each cell)

discarded, or otherwise altered substantially as the analysis continues. These observations are in fact propositions that are tested during development of the forecasting model (Chapter 5). Furthermore, they are abstract. They do not describe data so much as they attempt to portray relations that many data represent. In this sense they are "models" although very simplified ones. This means that they omit great detail in favor of generalizations. The purpose of this brief section, then, is to introduce a set of typological observations and thereby point the way into our next stage of analysis while summarizing the current one. Finally, the reader must bear in mind that these observations are "time bound" in a technical sense. Although the observarions summarize trends, these trends refer to the distributions of data at a single point in time. Systematic trends of change through time in domestic economic cycles or institutional patterns may, in fact, underlie these observations, but we cannot verify this possibility because the data are not longitudinal or diachronic. Verification can be achieved through the validation process described in Section 6.1.

As earlier discussions in this chapter illustrated, many interwoven relations pertinent to the domestic economy tie wage and cash, capital, subsistence, and consumption patterns together in an intricate fashion. Perhaps one of the most basic but most variable associations is found between subsistence investments and income. Figure 5 formalizes this observation two dimensionally. All things being equal, higher incomes tend more often to coincide with proportionally higher subsistence investments. Many of the data, though, don't fulfill this tendency, and we know that subsistence activity is high across all income classes. Several complicating factors could be involved; for example, different kinds of expenditures may be more likely, depending on financial status. Thus, we should not assume that investment "dollars" pertain to the same fixed expenditures. Also, different sorts of subsistence activities can be and are carried out under very different investment requirements. Subsistence investment compared to income does not account for subsistence capitalization by external sources (for instance, kin upon whom lower income families may depend to some extent).

All of these possibilities find support in the data. Figure 6 summarizes a relation between income and a characteristic of income sources -- predictibility. By and large higher incomes are more often predictable

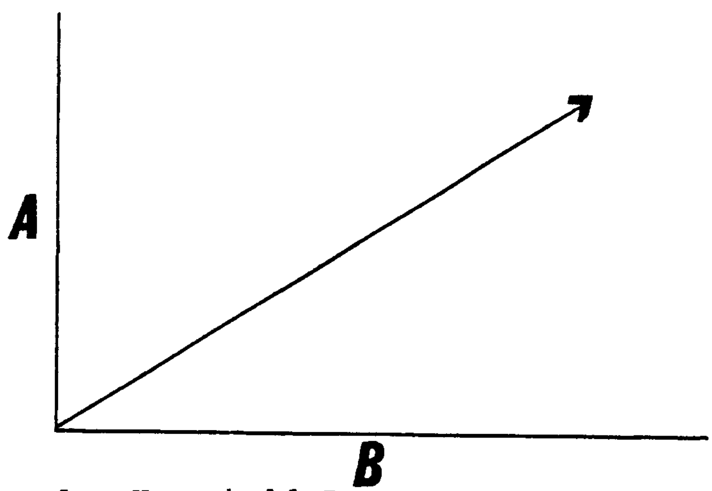
FIGURE 5



A = Subsistence Harvest Expenses

B = Household Income

FIGURE 6



A = Household Income

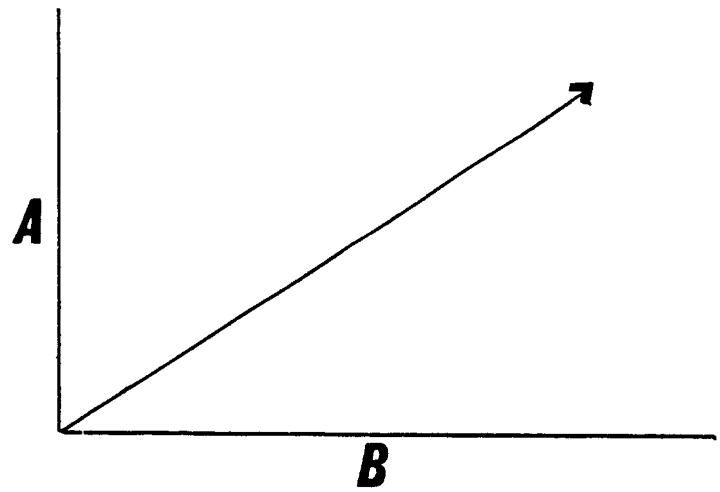
B = Income Predictability (derived from the Income Stability and Predictability variable data) regardless of their stability or instability. In turn, this suggests that predictability of income may bear on the investment strategies (see above) used to finance subsistence activities, at least in terms of proportional dollar volume and perhaps in other ways as well (for instance, in terms of purchase and maintenance patterns).

But the subsistence variables are obviously associated with a host of other variables aside from income. For instance, demography and the range of subsistence harvest may be related. Figure 7 summarizes a demographic variable (village sex ratio) and a domestic subsistence variable that indicates the diversity of family subsistence harvests. Communities with larger proportions of males are those in which the sample displayed increasingly diverse (multiple) subsistence harvests. Note that this measure looks not at volume but at sheer range of the harvest. Although the sample may represent an idiosyncratic population, village composition factors (and therefore family structures at least to some extent) may relate in this way to economic patterns evident in subsistence harvests.

Such a connection may seem remote, but there is good reason to believe that family organization and family composition can relate to a wide variety of other social and economic circumstances. Traditional sex roles in the Norton Sound area defined many different, sex-related subsistence activities, and a sheer preponderance of males may make certain sorts of pursuits more common. Volume of the harvest may in fact remain constant but range alone could vary by family or village composition. Actually, the weakest link in this problematic connection is the jump between a demographic (or village-level) variable and a domestic one based on our sample. Demographic characteristics, in particular skewedness in sex ratios, have been found to critically influence many social bonds, constraining some while promoting others. Recent network analysis (Rytina, 1982) shows, for instance, that sex ratio skewedness in a small population may significantly influence inmigration, outmigration, and family organization; it would not be surprising to find economic, specifically subsistence, correlates of this fact.

Figure 8 outlines a potential link between diversity of subsistence harvests and the actual consumption of subsistence protein. More diverse harvests generally co-occur with a higher proportion of subsistence protein in

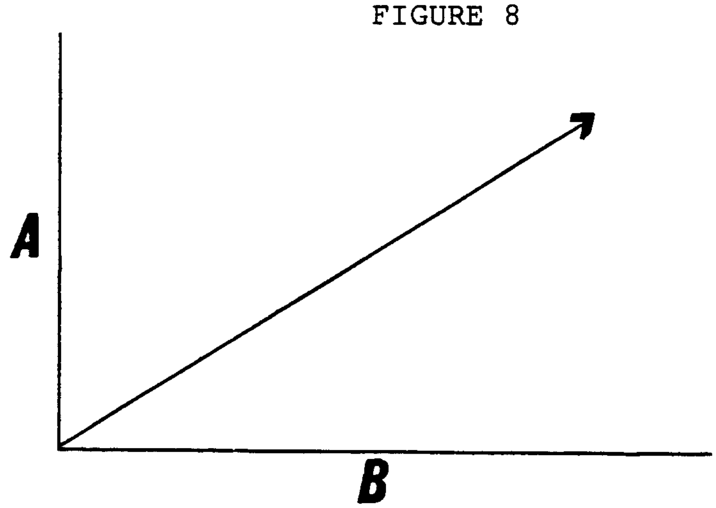
FIGURE 7



A = Diversity of Subsistence Harvests

B = Sex Ratio (increase in the proportion of males to females from left to right)

FIGURE 8



A = Proportion of Harvested Protein in Diet

B = Diversity of Subsistence Harvests

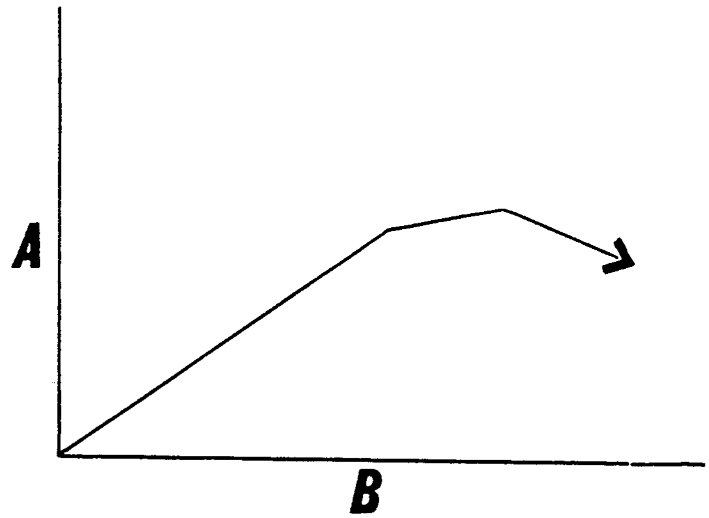
the family diet. Families harvesting diverse resources don't necessarily get more in volume, but harvest a wider range and consume a higher proportion. This is intriguing since by default it brings up the possibility of transfer of foodstuffs between families as well as differential subsistence routines in these observations. In this case, families with less diverse harvests regardless of volume eat less subsistence protein. Less diverse harvests may in fact entail lower volumes, but the facts don't show this yet.

Using a simple formalism representing subsistence investments and subsistence protein in family diets, Figure 9 shows that rising investments coincide with large proportions of subsistence protein, but only up to a point. Beyond a fairly substantial investment, higher proportions of protein in the diet are not evident. Thus, it is possible, and even probable to some extent, that no economies of capital scale are apparent beyond a certain point (at least in terms of family consumption); that different, more expensive investments may occur that do not yield a proportional addition to the family larder; and that larger or more diverse harvests achieved with higher investment do not add only to the family larder but also to others.

Figure 10 takes this a step further. The proportion of subsistence protein in family diets increases along the age scale while investments follow an increase along with consumption but then decline, dependent on the age of the household head. That is, families headed by younger persons invest relatively little in subsistence activities and the proportion of subsistence protein in family diet is relatively low. Families headed by older persons invest at a higher rate (relative to family income) and also consume a larger proportion of harvested protein. Families headed by the oldest persons, however, invest at relatively low levels but consume a larger proportion of subsistence protein (weighed against the rest of the family diet) than younger families. In any event, the samples do suggest that elders receive goods beyond their harvests, and they may also exert different subsistence strategies with different capital requirements.

Figure 11 reveals another perspective on harvested protein in family diets; this comparison shows that families headed by younger persons consume lower proportions of subsistence protein than all others and families headed by the oldest persons consume larger proportions than all others. The

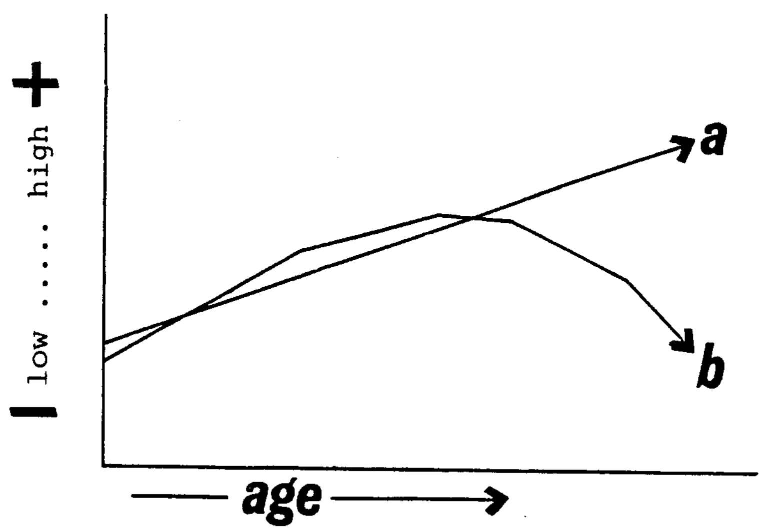
FIGURE 9



A = Proportion of Harvested Protein in Diet

B = Subsistence Harvest Expenses

FIGURE 10



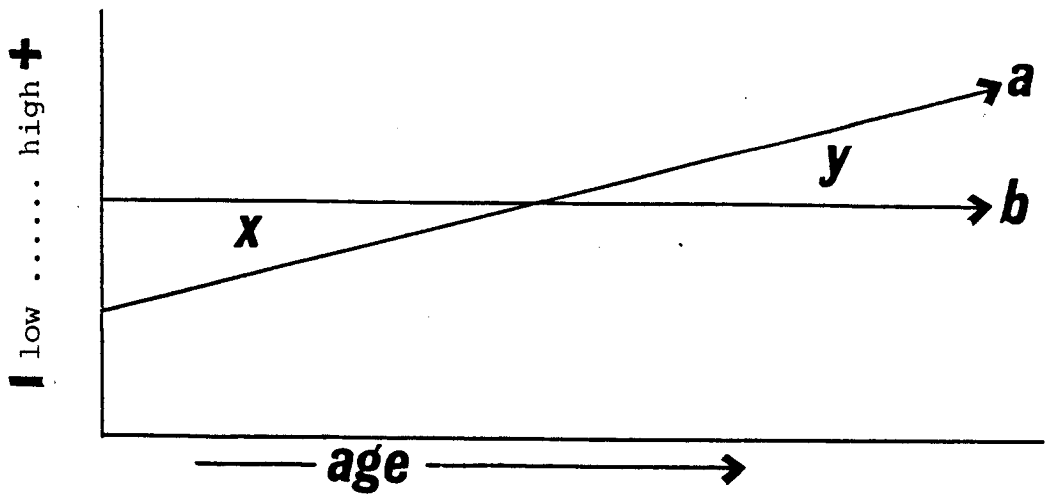
a = Proportion of Harvested Protein in Diet
(controlling for Age of Household Head)

b = Subsistence Harvest Expenses
(controlling for Age of Household Head)

diversity of subsistence harvest is relatively stable across all ages. This suggests that, holding harvest diversity constant, different resources (with different volume yields) may be harvested by older families and that younger families tend to give food to older families (which would expand the latters' consumption base irrespective of their own harvest patterns).

Figure 12 combines several observations and presents them together. As before, diversity of harvests is more or less constant (although it is associated with income variation, noted above) along the age categories; but both subsistence expenses and household income follow a curvilinear distribution. Though proportion of subsistence protein in diets tends to be larger among older families, we also know that both investments and income rise and then fall. Both extreme ends of this axis represent families who are more often economically dependent on the more robust, high-income families in the center. Many younger families, with generally low incomes and exercising relatively low subsistence investments, nonetheless can partake of generally diverse harvests by depending on older kin and neighbors for expertise, capital financing, and shared tools. Their subsistence investments are low, but this fact is conditioned by both low personal income and also reliance on others for shared resources (which effectively reduces their intrinsic costs). The situation is much the same at the other end of the scale and for the same reasons. However, bearing in mind that consumption is higher among older families we must determine if harvested foods tend to concentrate among elder families (through gifts), or if different subsistence capitalization patterns are evident among elders that would allow lower resource unit costs. Undoubtedly, both possibilities are true to some extent. Many subsistence practices have a very high yield with low costs (for instance, many forms of noncommercial fishing), and older families often engage in these activities to a greater extent than their younger neighbors. In addition, they are often reliant on younger kin for not only food but capital. Thus capital and skills are expended at high levels in the middle age range, in part to underwrite the needs of families to either side. For this reason, both harvested volumes and diet may be low in comparison with expenditures for this middle group. Also, subsistence expenses among elders are often low not because they can rely on borrowed capital and shared endeavors, but because they harvest less than they consume. Thus consumables (food) are the dependency that may be pronounced among elders; and it is likely that the increase in diet protein is matched by

FIGURE 11



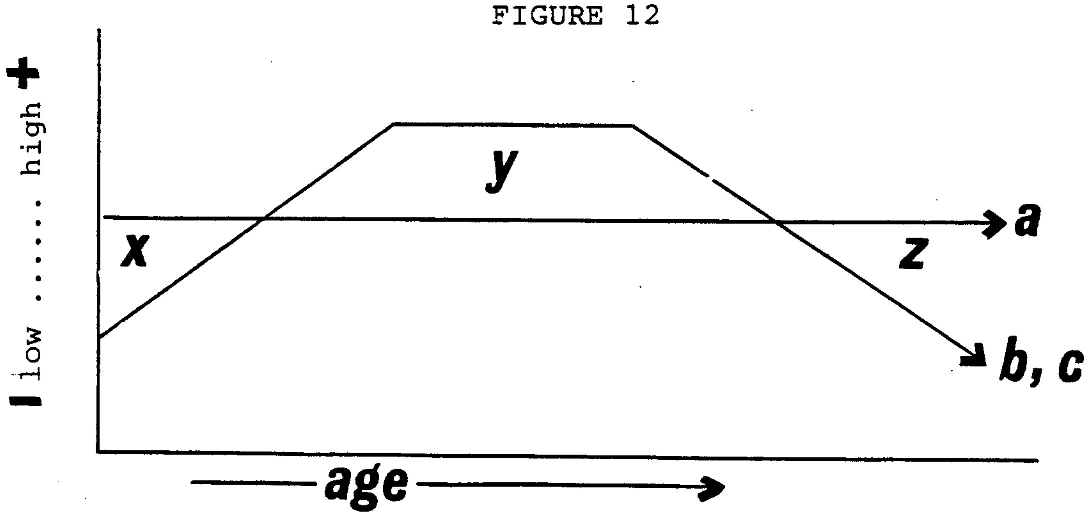
a = Proportion of Harvested Protein in Diet

b = Diversity of Subsistence Harvests

x = lower consumption ratio (dietary proportion vs. diversity of harvest)

y = higher consumption ratio (dietary proportion vs. diversity of harvests)

FIGURE 12



a = Diversity of Subsistence Harvests

b = Subsistence Harvest Expenses

c = Household Income

x = younger families, low investment ratio (harvest expenses vs. diversity of harvest)

y = mature families, high investment ratio (harvest expenses vs. diversity of harvest)

z = older families, low investment ratio (harvest expenses vs. diversity of harvests) increasing transfers of food along these age classes from the younger to the older.

Good supporting documentation for these domestic properties exists independent of our research. Looking at Dr. Fienup-Riordan's Alakanuk sample of 70 families and comparing various income and subsistence variables, we see that total household income shows some correlation with the total number of species harvested (i.e., diversity). However, income does not seem to correlate well with total harvested volume, volume per dependent, total salmon harvest, nonsalmon harvests, sea mammal, or land mammal harvests. Diversity of harvests may correlate with income, whereas the sheer biomass of the harvest does not. These observations are consistent with the idea that transfers of resources and differential capitalization requirements for subsistence activities and age and income variations in the patterning of both, are tightly interrelated.

The institutional and organizational observations can be neatly summarized as follows. Figure 13 outlines a pattern that seems to relate to village size. Because this sample represents a single point in time, we must refrain from thinking of the "size" dimension as a growth dynamic, although it may in fact be; however, we cannot demonstrate this dynamic with available data. The changes pertaining to organizational polarization, autonomy, and coordination describe current conditions rather than a process in time, although such a process could underlie what we see here. Briefly, the sample villages fall into three classes, ordered by size, in terms of these three characteristics. Institutions in larger villages tend to be more coordinative, more autonomous, and less polarized (more focused); and the intersections between these dimensions mark off the three classes. Polarization and coordination seem to change prior to, or more easily than, autonomy. We see that a decrease in polarization coincides with an increase in coordination; and although autonomy may be present under these conditions (i.e., low polarization and higher coordination), it need not be.

Figure 14 condenses several institutional dimensions - specialization, structural tension, autonomy, and cooperation, again ordered by size of community. By referring to Figure 13, it is possible to assess these dimensions against others, since both are plotted out on the same size scale.

FIGURE 13

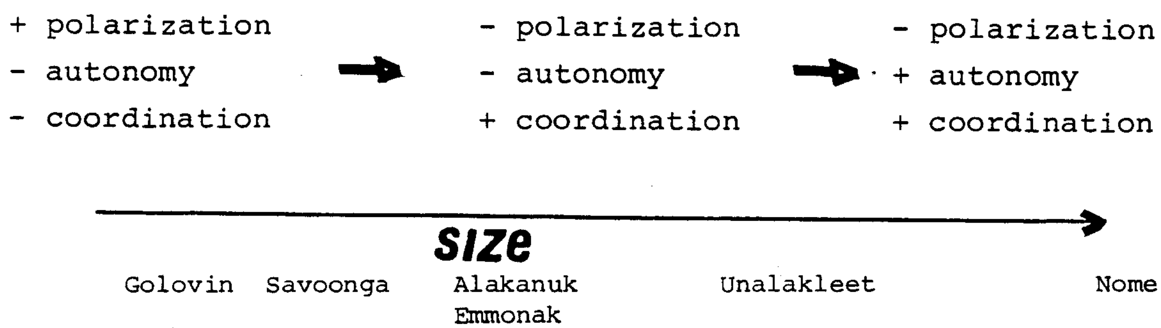
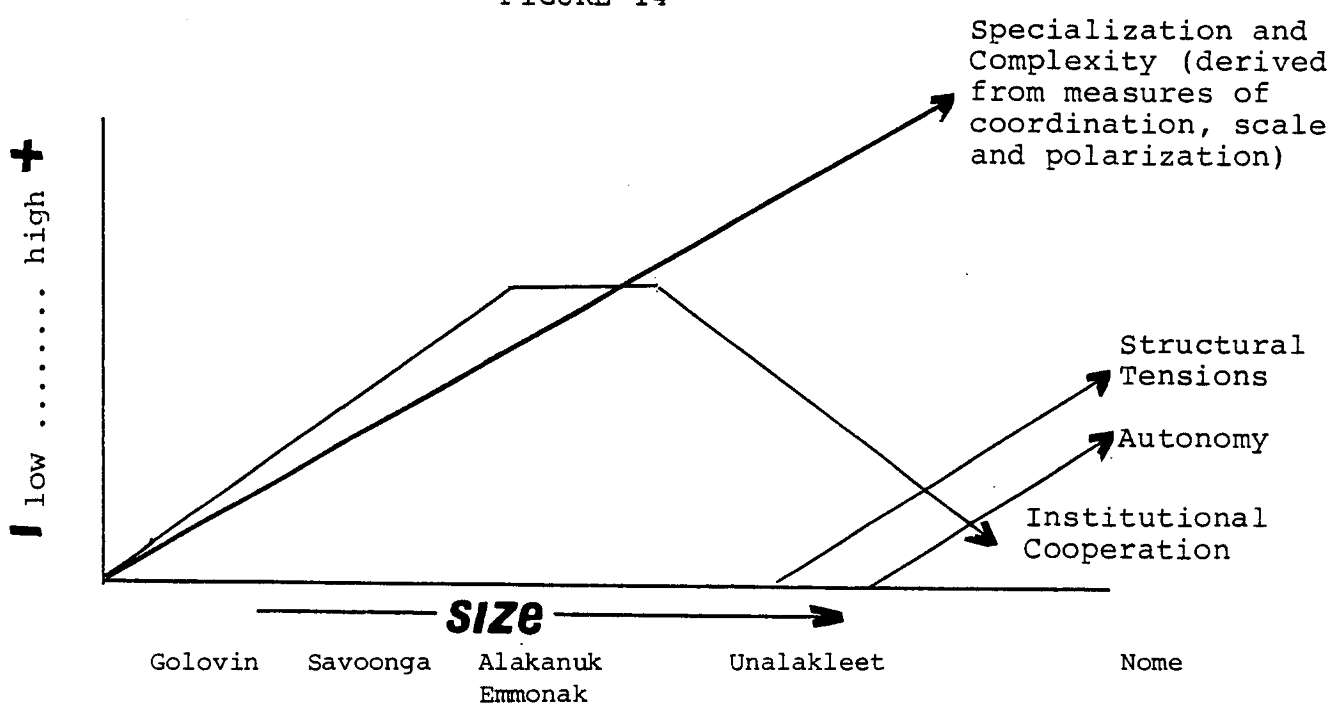


FIGURE 14



Thus, in the larger communities institutional specialization and complexity seem to be prominent; cooperation is greatly diminished compared to somewhat smaller villages; and coordination and cooperation coincide with one another, then diverge. Note too that, moving along this scale, polarization disappears as coordination increases (Figure 13; this simply rephrases "specialization"). Autonomy increases only along a short stretch of the scale, while specialization increases, cooperation falls, and structural tensions for the first time become evident.

These simplified models, or typologies, vastly reduce the data and in so doing lose some precision to gain general strength. Also, as the introductory paragraphs suggest, they should be seen as points of departure rather than final conclusions. This chapter summarizes much of the analysis and distills the information immensely. Further testing and analysis, reported in the next chapter, condenses the findings even more and assembles them in a forecasting model. Since Chapter 4 is an explicit point of departure for the modeling analysis discussed in the next chapter, readers are urged to return to it with any outstanding questions concerning the data.

5. SYNTHESIS OF THE MODEL

5.1 Introduction

This chapter will synthesize the key findings of the analysis thus far by discussing the model that integrates them. It is important to recognize that this chapter seeks to summarize and distill key elements of findings reported earlier as well as to reintegrate them into a model with forecasting potential. The common vehicle to accomplish this is discussion of the model itself, which is designed to embody basic and critical findings in a format suitable for assessment and monitoring applications.

As the structure of this report itself demonstrates, the first step in the study required an informed review of concepts and information to establish methods, definitions, and objectives consistent with stipulated contract needs as well as standards of science and scholarship. Next was collection and examination of a large body of primary and secondary data, (described in Chapter 1 Section 1.5.2). These more-or-less raw data and elementary interpretations of them helped to establish a meaningful context for further discussion, provide baseline documentation (in Chapter 2), and in large part form the ingredients of the analyses that follow them. Data were then examined in a comparative vein and patterns, processes, and places described. The logic that dictates this approach is also consistent with stipulated contract needs and analytical requirements. Chapters 3 and 4 analyzed the data. Key socioeconomic and sociocultural patterns were disassembled into their constituent pieces and compared and contrasted to identify similarities, differences, and other relations among themselves.

As explained in Chapter 4, nearly all of the analytic observations that have been made are typological in form; that is, they seek to categorize various specific findings. Chapter 5, then, is the reintegration of these pieces (quite literally, the "synthesis") into a single structure that accounts for these patterns and relations. Chapter 6 discusses some methods and constraints for applications.

5.2 Summary of Findings

Before moving on to the model constructed to account for the effects of inflation, employment, and economic opportunity on the Norton Sound socioeconomic system, it should prove useful to briefly summarize the essential findings from previous chapters. The study has derived the following generalization from the primary and secondary data that were collected and analyzed.

The analysis is predicated on several assumptions that establish a context for interpreting and later applying the forecasting model. We suggest that most avenues of direct economic impact on Norton Sound communities can be ruled out of consideration. The region lacks the geographical, infrastructural, commercial, and other economic assets to attract offshore industries and workers. The main potential for direct economic interaction between OCS development and the local economies may be through resident participation in the OCS workforce. Other effects may be dependent on the ability and interest of local organizations and entrepreneurs to capitalize on opportunities arising from the development process.

Findings are summarized below:

1. The higher the income of a household, the greater the proportion and the diversity of subsistence protein in the diet.
2. The greater the household income, the more predictable it is.
3. The higher the ratio of males to females in a community, the greater the diversity of subsistence resources used.
4. The greater the proportion of subsistence protein in household diets, the greater the diversity of subsistence harvests.
5. Increased investment in subsistence pursuits results in increasing subsistance protein in the diet to a certain point, beyond which increased investments leads to wider distribution of subsistence protein to other households.
6. The age of the head of household is associated with both the proportion of income invested in subsistence pursuits and the proportion of subsistence protein in the diet up to a point. Elders, however, continue to consume large proportions of subsistence protein secured with the assistance of younger kinsmen.

7. Younger households with relatively low subsistence investments but which are part of large kin networks enjoy access to relatively high and diverse subsistence harvests.
8. Almost all households, regardless of income, are intensively engaged in subsistence, directly or indirectly.
9. Larger villages reflect more coordination, have more autonomy in institutional functions, and are more polarized than smaller communities.
10. The larger the village, the higher the degree of institutional specialization and institutional tensions, and the lower the degree of cooperation. (See Chapter 4.)
11. The larger the village, the smaller the proportion of dependents (elders and children), indicating an economically influenced (wage and subsistence) migration from smaller to larger communities. Thus, perceived economic opportunities and employment tend to draw able-bodied people away from smaller to larger communities, at least temporarily.
12. Membership in voluntary, informal organizations increases as community size increases. These organizations function to bring people together to compensate for the functions larger institutions cannot or do not provide.
13. Membership in institutions (political and otherwise) increases with household income.

5.3 Overview of Path Analysis

The model will be explained in two steps. The first discussion section (contained in this overview) will describe the formal properties of the model, such as technical aspects of its construction and operation. This section will be abbreviated in comparison with the latter one, however Appendix F ("Path Analysis Techniques") will complement this shorter section and provide more comprehensive technical detail for those readers who may benefit from it. The section immediately following this one (Section 5.4) will provide a detailed examination of each element of the model developed for this study.

The type of model developed for use in this study is a path model, predicated on path analysis techniques. Path models can represent multiple and complex relations in a presumed system in which it is necessary to identify numerous chains of influence and response between elements. Reserving explanation of the more technical considerations for Appendix F, it can be stated that path models are appropriate when: (1) as a form of analysis, it is necessary to decompose and interpret multiple interacting and branched connections between elements of a system; (2) changes in a system are more appropriately represented as multiple changes throughout its substance rather than as singular discrete results of isolated determinate relations; (3) causal connections between elements are postulated; and (4) for purposes of analysis and modeling, the system depicted in the model can be seen as "bounded" or effectively insulated from other systems that might significantly influence it. These are acceptable constraints given the thrust of this study.

A brief review of the scope of work for this study underscores the fit between the strengths of path models and the topics and research design. This project was charged with the task of structuring the analysis at the community cluster level to reveal similarities and differences within the region. Data collection and analysis was to focus on socioeconomic processes and trends of change. The analysis had to be structured to lead to the development of a forecasting model keyed particularly to the effects of increased economic activity, employment opportunity, and inflation (see Chapter 2 for a summary of the scope of work and objectives). Changes initiated by or mediated through these three central elements are seen to cascade through many other sociocultural and socioeconomic elements in a larger system that also had to be described. These other elements, including a broad array of economic and employment structures, exchange and production patterns, resource extraction habits, forms of social organization and domestic processes, and demographic trends, are the subsystems that are influenced by and, in turn, influence these three critical and independent variables as well as one another. The complex web of relations and interdependencies that is envisioned in the scope of work is demonstrated in this analysis.

Our task was to disassemble these strands, identify the critical subsystems that connect them, and create a model to represent this complex system and to portray likely changes to these components in response to changes in three key variables. An assessment of these requirements and the basic features of path analysis listed in the previous paragraph (see also

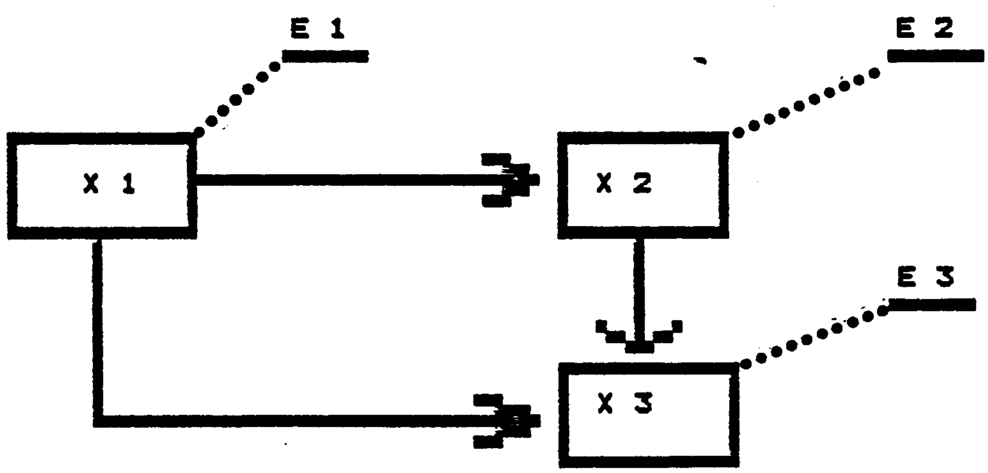
Appendix F) left little doubt that the path model approach could accommodate these needs. Although path analysis can be used for testing causal hypotheses and for assessing linear relationships between multiple variables under different conditions, it is first and foremost a method for examining the logical consequences of changes to selected elements of a larger system (see Nie, et. al., 1975, P. 383). We use path analysis to examine the consequences of changes within a system.

A rudimentary path model (Figure 15) can serve to illustrate how to use and interpret such models. The three variables, or subsystems, are linked by causal and linear bonds such that X3 is seen to be a product or consequence of both X1 and X2, and X2 is a product of X1 alone. X3, furthermore, is influenced or caused by X1 in two manners--one directly (the lower arrow) and one indirectly (as this influence is mediated through X2 back to the ultimate X1 subsystem). Thus, X1 produces changes in X3 directly, and influences X3 through its effects on X2; and X2 is influenced directly. E1, 2, and 3 represent, in path analysis terms, "latent" variables. They are influences (expressed as residual effects in our measurements) that may shape the behavior of subsystems but that are unspecified in the model. These effects may be intrinsic to the subsystem itself or be influences external to it. Thus our paths need not be the only impulses or channels of effects. They are, however, prominent ones. These technical points are treated more fully in Appendix F.

Although this rudimentary model is quite simple, it still may appear somewhat complicated without some hypothetical but tangible meanings attached to the subsystems. X3 could represent a complex variable, or subsystem, like "political sentiment" (which will be undefined since it need not be exact to make the point). This patterned behavior can be seen, for certain analytic purposes, as a product of (for instance) socioeconomic status and educational attainment. Likewise, educational attainment is in part a product of socioeconomic status. The model would be stating that certain types of political sentiments are linked to certain ranges of socioeconomic status as well as to levels of educational attainment which are in turn affected by socioeconomic status. In short, poorer folks receive less education, and poor, uneducated people tend to hold certain political sentiments. X1 would embody socioeconomic status, and X2 would represent educational attainment.

FIGURE 15

Hypothetical Path Model



X1 (socioeconomic status) influences both educational attainment and political sentiment directly. X1, as it is mediated by educational attainment (X2), also affects political sentiment (this influence is indirect). X2 also affects X3 directly, this effect being a product of both X2's unique effects and its indirect contribution from the original X1 subsystem. Thus, the model simply and neatly captures this somewhat complex set of relations. This example demonstrates the straightforward and intuitively credible nature of such models, enchancing the reader's understanding of the more complex model to follow.

For the purpose of this example, X1 was considered an independent variable and logically was not dependent on other variables or subsystems. Thus, only X2 and X3 were treated as partial "results" of influences and states beyond them and were therefore viewed to be dependent variables. Generally, statistical measures (described in Appendix F) are used to gauge and represent each of the linkages, but using path analysis conventions, they are typically analyzed and described only at the "dependent" position along the linkage. Thus, only very limited analysis may be afforded the independent variables (since they do not represent accumulated influences, but rather only the origin of influences), while the dependent variables receive more detailed examination and statistical measurement of their linkages back to independent and intervening variables. The model for this study describes the strengths of relationships only at their points of "arrival" (dependent subsystems) rather than points of "departure" or "intervention" (independent, i.e., X1, or intervening, i.e., X2 subsystems from the perspective of the X3 subsystem).

The format for systematic analysis that is evident in this rudimentary example is quite common, and the most basic principles that underlie path analyses are typical in many applications that involve complex but linear, causal or hierarchical relations. These would include models unrelated to path analysis, such as hierarchical trees, facet analysis, entailment analysis, several econometric models, flow diagrams, systems charts, panel models, and so on. Although many parts may be encompassed by the model, they do not necessarily represent increasingly difficult intellectual challenges to interpretation. The fundamentals of path modeling are simple, easy to apply, and intuitively acceptable in their superficial form.

5.4 A Norton Sound Path Model

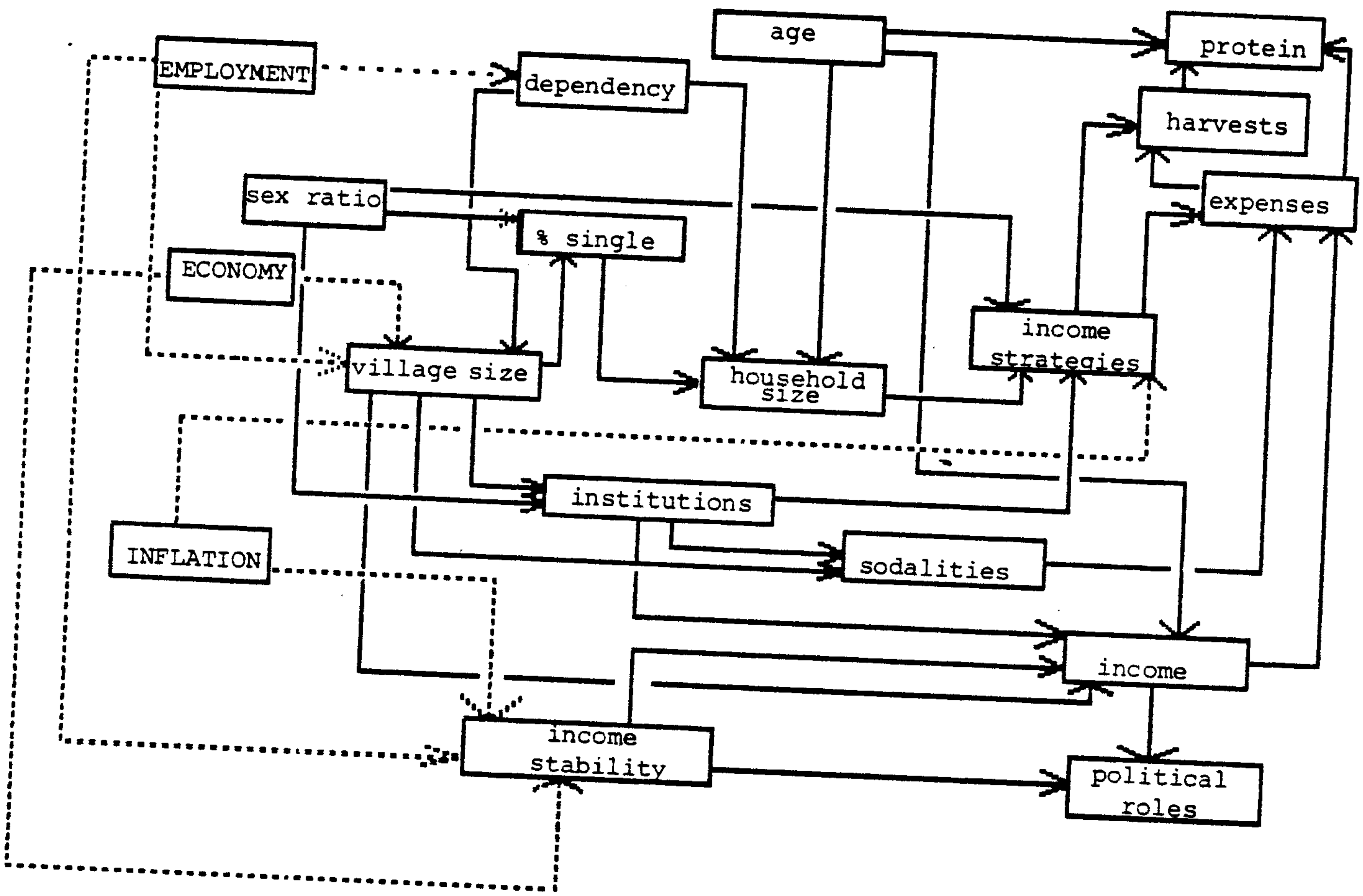
Figure 16 represents the socioeconomic-sociocultural path model developed for Norton Sound. The subsystems in the model are identified with abbreviated labels that correspond to the variable names. The variables are listed on the left, and the subsystem labels shown in the model graphics are listed on the right.

Exogenous Subsystems:	Subsystem Labels:
Employment	EMPLOYMENT
Economic Opportunity	ECONOMY
Inflation	INFLATION
Independent Subsystems:	
Sex ratio	sex ratio
Dependency ratio	dependency
Income stability and predictability	income stability
Age of household head	age
Dependent Subsystems:	
Village size	village size
Single person households, percent of total	% single
Institutional coordination and cooperation	institutions
Household size	household size
Sodality memberships	sodalities
Income and labor strategies	income strategies
Proportion of harvested protein in diet	protein
Diversity of subsistence harvests	harvests
Subsistence harvest expenses	expenses
Household income	income
Political participation	political roles

These subsystems, or variables, should all be familiar by now, for they are the variables created from the data collection protocols and subjected to analysis throughout the preceding chapters. This model represents a distillation of all the important links between these variables, condensed into a single complex set of relations. In a single page, this graphic summarizes the substance of our analysis. The solid lines represent patterns of effects postulated between these subsystems, using the conventions described earlier. The dotted lines represent direct influences from the three key independent variables, coded with capital letters. Because these major independent variables are exogenous (i.e., outside the system we assessed directly) and cannot yet be effectively measured since significant OCS impacts in inflation, employment, etc. are still in the future, we can

FIGURE 16

Norton Sound Path Model



only postulate their probable direct connections to other subsystems in the model. The other linkages can be assessed empirically and statistically.

To some extent the model is self-explanatory. For instance, substantial effects from increases in employment opportunity (an exogenous subsystem) primarily flow out to the community dependency ratio (due to selective inmigration, for instance) and the village size (due to potential slowing of outmigrations and increased inmigration) variables. Likewise, changes in the dependency ratio brought about by employment opportunity also affect village size since changes in the dependency ratio can affect the fertility profile and, thus, population growth as a whole. Of course there may be many more connections that are relevant, but one objective of path modeling is the creation of a model that efficiently and succinctly portrays the most substantial and meaningful connections rather than all possible ones. Similarly, changes to the dependency ratio and village size subsystems fan out and influence subsystems to which they are connected, and through them others are affected as well.

Before going on to a detailed discussion of the subsystems and their relationships, a review of the statistical measures that represent the reliability of the proposed linkage is in order. These measures (beta weights; see Appendix F) do not represent a proportional strength of the linkage. A weight of 0.9 does not necessarily represents a 90% unit change in the dependent variable for every unit change in the independent variable. Rather, these measures are similar to coefficients of correlation and should be interpreted in much the same way. Great caution should be exerciesd in interpreting these influences represented by paths in the model. For the sake of simplicity and caution, we interpret a positive change in one variable as corresponding to a similar, but not necessarily proportional positive change in the next variable down the line.

These subsystems, or in less constraining terms the variables used to represent them, vary in type and quantity. That is, the variables are of many different orders. Some have a large number of possible values (such as village size and sex ratios), and others have only three or four. Some are based on a sample of 82 households (the domestic variables) and others on a sample of six villages (the institutional variables). Also, some are ordinal-level variables and others are interval- or ratio-level. Figure 17 displays the connections between four subsystems and displays how disparate variables may be linked together in a way that is logical and effective, but nonetheless resistant to simple, additive interpretations of cause and effect.

To show why interpretations must be very general, we can extract subsystems directly from the model. Village size is an interval-level variable, as is household income; however, village size is based on a sample of six villages whereas household income is based on a sample of 82 households. Income stability and predictability, however, is quite different and, like subsistence harvest expenses, has few possible values. They are ordinal-level variables based on a sample of 82 households. Simple and proportional generalizations between them are invalid; for instance, associating a 50% increase in village size with a comparable 50% increase in household incomes. A change in one denotes a change in others and in the same direction, but the magnitude of change is unspecified.

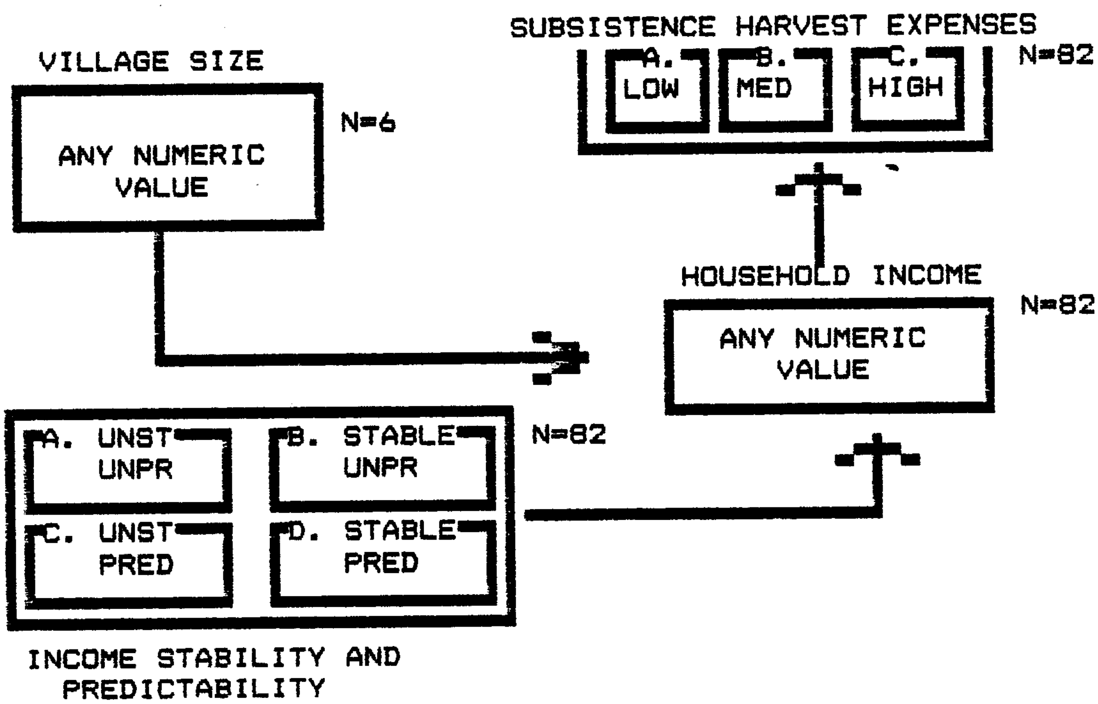
As the list of variable names and abbreviations assigned to the model subsystems indicates (see first paragraph, Section 5.4), we recognize three classes of variables. The exogenous variables correspond to the three major independent impact variables that are fundamental to the analysis. The independent variables may or may not be influenced by the exogenous variables, but for purposes of analysis were treated as independent subsystems that cause changes in other subsystems. The dependent variables may mediate or intervene in chains of effects within the model, but are seen primarily as response subsystems. These classes of subsystems are discussed in this order in the remaining sections of this chapter.

5.4.1 Exogenous Subsystems

There are two classes of independent subsystems that will be discussed in turn. The three exogenous variables at the core of this study (employment, economic opportunity, and inflation) form a single class, both because of their unique status and prominence, and because their roles are postulated whereas the others are operationalized and measured in the analysis. These subsystems are differentiated in the analysis and presentation (cf., Section

FIGURE 17

Path Model Illustration



5.3 and 5.4), and the reader is reminded that the exogenous subsystem paths are depicted in the graphics with dotted, not solid lines.

The primary and ultimate causal factors stipulated for this study are increases in employment, economic opportunity, and inflation. These are to be seen as precursors and impact points for changes that will percolate through a larger system subsequent, perhaps, to OCS developments. For purposes of interpretation and analysis they must be conceived to be insulated from other variables and subordinate to none. This assumption may distort reality but such a perspective can be built into a formal analysis if we are prepared to be more realistic in our appraisal and interpretation of results.

The second class of independent subsystems represents those that we treated as independent and superordinate variables for measurement purposes. The rationale for this approach has been discussed elsewhere (cf., Section 5.3 and 5.4). These subsystems include the sex ratio, dependency ratio, income stability and predictability, and age of household head subsystems. The independent subsystems are discussed in section 5.4.2.

5.4.1.1 Employment and Economic Opportunity

Employment and economic opportunity are tightly interrelated, although increases in the latter need not be complemented by uniform increases in the former. Labor participation characteristics vary by age, sex, ethnicity and other factors even holding employment and industry factors constant. Differences in the forms of specific developments and opportunities spell yet another dimension that fragments the distribution of costs and benefits across the study population.

As we suggested in Section 4.1, OCS development in the Norton Sound area may introduce economic opportunities and employment possibilities that will not be distributed equally across the study area. Some communities possess economic infrastructures or locations conducive to development opportunities, while others do not. If OCS development spurs demands for goods and services that local communities cannot accommodate, opportunities may exist that may nonetheless yield few tangible effects on local businesses. Employment possibilities may increase, but if work sites are prohibitively distant or local persons lack necessary job skills, these possibilities may not materially change local employment patterns. The connections between employment and economic opportunity are not simple. The model, therefore, must not depict a simple correspondence between these exogenous sybsystems on the one hand and tangible effects on local systems on the other.

But these variables can be used in a fairly general or raw form for our purposes. This is because many of the circumstances that stratify and differentiate their effects are treated in the model. Their multiple, unequal, or specialized influences are captured in part by intervening subsystems that in turn channel their effects throughout the system. Demographic and economic subsystems that intercept, transform, and then transmit these influences are built into the model. A review of the model shows that the primary effects of employment level changes pass first through age composition and population growth variables (dependency ratio and village size), and an economic variable that corresponds to industry and participation factors (income source stability and predictability). The effects of generalized economic opportunity flow first to growth (village size) and industry and participation patterns (income source stability and predictability). Opportunity per se need not influence demography, so the dependency ratio is not addressed.

What we postulate, in other words, is that material changes in economic opportunity and employment will co-occur with changes in income stability and predictability (sources of income will become more stable and/or predictable) and village size (through either outmigration to a distant site or inmigration from other communities), if in fact these former changes do have an impact on local communities. Furthermore, we postulate that employment changes co-occur with employment migration, and that the latter process will influence the dependency ratio (the proportion of juvenile dependents will increase or decrease). If these changes fail to occur, impacts are absent. If they do occur, then the effects of the impacts are only then passed along to other subsystems that will reveal varied domestic economic impacts, such as household income.

Additional factors that shape and differentiate the effects of employment and economic opportunity across the study population and village sample emerge as these influences are in turn modified by subordinate subsystems along the line. It would be possible to insert more detail into the model to accomodate other more minute distinctions, but such a plan carries too high a cost in complexity and triviality. Each subsystem, in fact, creates a distinction that ultimately traces back to exogenous and independent subsystems. For this reason it is possible to approach these two subsystems, employment and economic opportunity, so as to construe changes to them as simple deviations from their trends. Autoregressive integrated moving average (ARIMA) tests of numerous labor and employment time series in these categories have so far revealed nothing of interest, beyond those typical seasonal and industrial characteristics noted in Chapters Two and Four. However, this does not mean that such data series will fail to register the changes we are interested in. Although these series, Department of Labor participation and earnings statistics for instance, may be flawed we still conclude that they hold a promise of impact sensitivity for the uses we propose. In the next Chapter, the reader will find that we advise rather coarse and simple measures for these subsystems in the expectation that finer and empirically valid detail will emerge in their identified effects within the model.

5.4.1.2 Inflation

A review of the model shows that we postulate direct influences of inflation on (1) income stability and predictability and (2) income and labor strategies. Our reasoning here is simple. We assume that, to the extent that changes in the prices of commodities, services and rents necessitate an adaptive response or adjustment on the part of consumers, these effects will be felt primarily in those subsystems that represent economic adjustment and strategic planning. Therefore changes to income source stability and predictability (which reflects shifts in participation habits among other things), and income and labor strategies (which correspond to cooperative adjustments at the domestic level) will be the most obvious and important elements in this chain of effects. They are clearly the most appropriate subordinate subsystems in this model.

But inflation (or simply price changes as we conceive of them here since bond, mortgage and other national indicators are of limited use in the study area) can apply to different commodities, classes of commodities, and different periods of time. Thus this subsystem is internally diverse and differentiated, as are the previous two. However, there are fewer dependent subsystems in the model that can act to transform the effects of inflation per se in a manner comparable to the case stated above. In addition, the very conceptual dimensions of inflation are difficult to operationalize in a rural Alaskan example. Purchase habits in a multiethnic and subsistence-based economic setting may vary tremendously, thus generalizations concerning the roles of selected commodities are hard to develop. Inspection also reveals that pricing habits in local commercial outlets are not always rational, that is keyed to objective supply and demand conditions. Thus wild discrepancies and shifts in prices at odds with intuition and economic theory are apt to occur.

The figures below illustrate some of these problems. Figure 18 displays cost of living changes over a period of fifteen quarters for Nome, Bethel, and Anchorage. These data are extracted directly from Cooperative Extension Service reports that detail estimated household budget costs for a family of four. This budget represents an aggregated and averaged total of estimated and standardized food and utility needs. Anchorage is included so as to provide a comparative base, and Bethel and Nome represent the commercial centers relevant to this study. The dotted lines represent breaks in the data series. As the reader may observe, the trends, although bumpy, are more static than not although the last quarters of 1980 and 1981 coincide with price peaks in at least the Nome example. Nonetheless, there is little that draws our attention in this series.

On the other hand, a series composed of price trends for a selective sample of commodities shows a much more erratic picture. Figure 19 represents a similar series based on standard unit costs of only five commodities: evaporated milk, flour, sugar, cooking oil, and onions. These are a subset of the sample we surveyed as part of our data collection effort. These data were extracted from the original data collection sheets used by Cooperative Extension Service staff prior to the aggregation and averaging of data noted above. As before, dotted lines signify breaks in the record.

Here the situation is more erratic. The peaks we can identify are much more conspicuous, and occur fairly consistently in the summer rather than

FIGURE 18

Cost of Living Over Fifteen Quarters

Percentages Calculated Against 100% Baseline

9/79 - 3/83

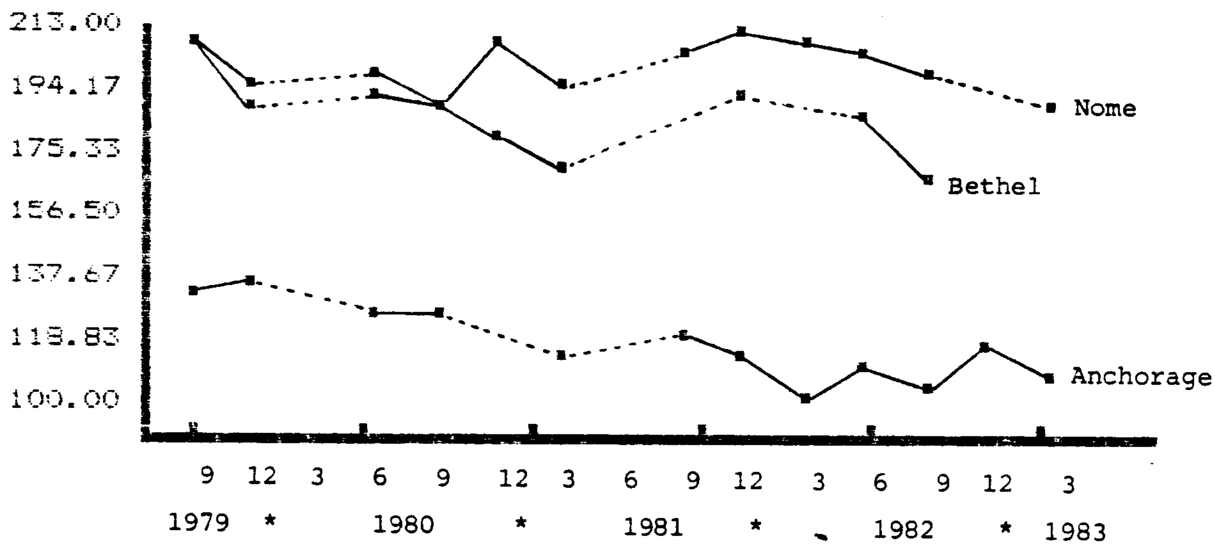
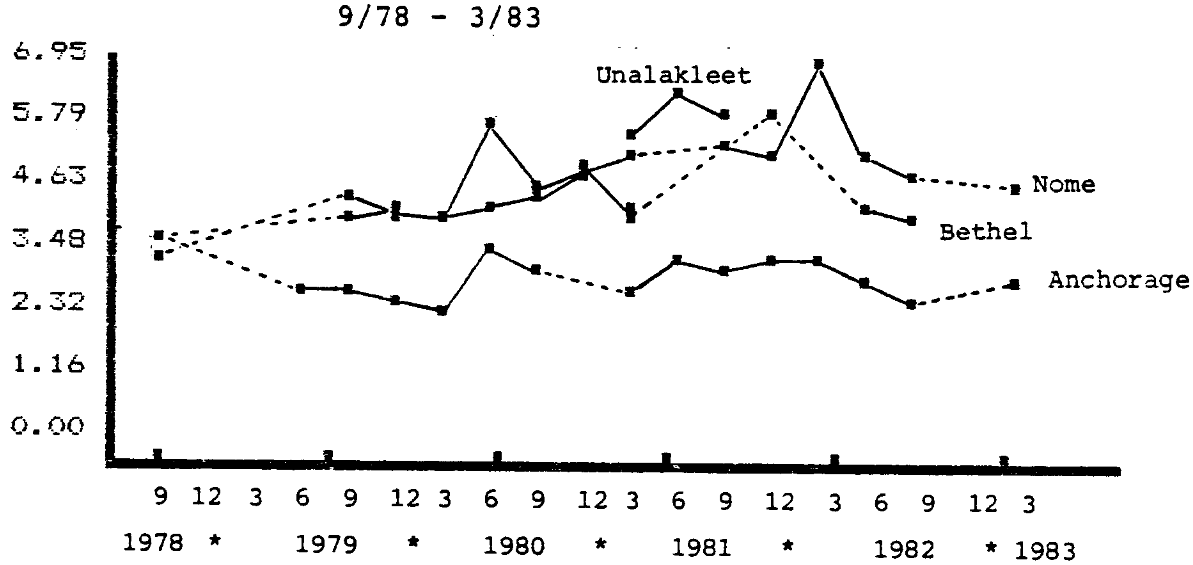


FIGURE 19

Dollar Cost of Five Sampled Foods

Over Nineteen Quarters

9/78 - 3/83



winter. The two prominent peaks in the Nome series, the brief blip in the Unalakleet series, and the Bethel peak overshadowed by the second Nome peak, occur in summer or spring. It is possible that seasonal restocking also provides an opportunity for price changes (i.e. in summer), although this explanation fails to account for the marginal peaks shown in Figure 18. The cost of living series, on the other hand, may be more sensitive to seasonal changes in overhead and indirect costs (as in winter, when air transportation of perishables may introduce additional costs)as well as consumption. However, both interpretations are speculative and we must admit that we cannot be sure of the meanings of these data.

Figures 20 and 21 display changes in the prices of energy over fifteen quarters relevant to the study area. Figure 20 presents electricity costs, while Figure 21 illustrates gasoline prices. These data were also extracted from Cooperative Extension Service raw data tally sheets. As the reader may observe, the Anchorage comparative base is much flatter in these cases than in the former (Figures 18 and 19), and we are better able to assess deviations from this base. It is obvious that throughout 1980 major price adjustments were being made in both Bethel and Nome. Although electricity prices in Nome show an acceleration through late 1982 and into 1983, this fact is overshadowed by the clear shifts that were initiated during 1980. The price of energy, perhaps the most pervasive, high volume commodity, and one that is a common denominator in every household in the region, seems to reveal deviations that can easily be identified since its general trend is not erratic. For this reason we will select energy costs as a promising measure of inflation in Chapter Six. The problematic and erratic nature of other commodity series and the factors of selective purchase habits, seasonal changes, pricing practices, and so on make these other series less useful for our purposes although they are intrinsically interesting.

5.4.2 Independent Subsystems

The placement and roles of the remaining subsystems are discussed in more than one fashion where appropriate: as partial products of the exogenous subsystems discussed above, or as the precursors, or independent variables for the dependent subsystems displayed in Section 5.4.3. The sex ratio and dependency ratio, income source stability and predictability, and age of

FIGURE 20

Dollar Cost of 55 Gallon Drum Gasoline
Over Fifteen Quarters
9/79 - 3/83

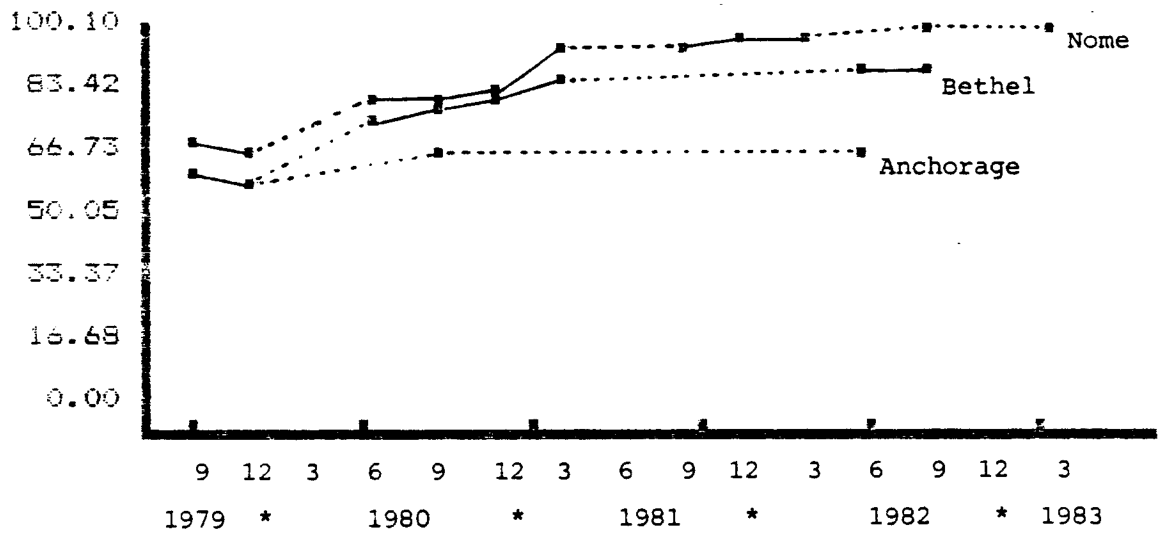
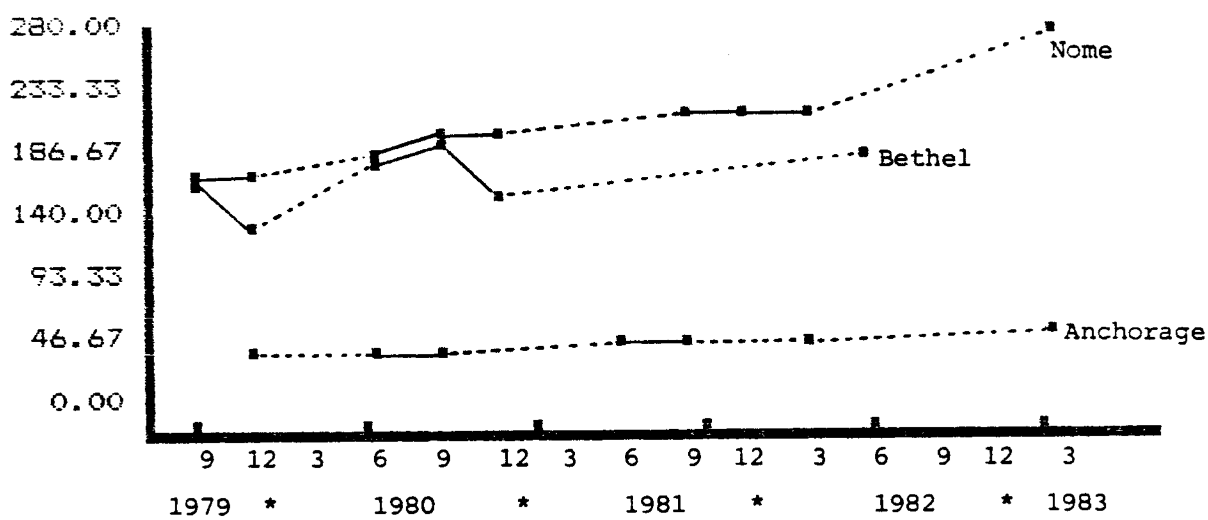


FIGURE 21

Dollar Cost of 1000KWH Electricity
Over Fifteen Quarters
9/79 - 3/83



household head variables embody these independent subsystems. Age of household head, as a subsystem, is perhaps most clearly independent from any of the other effects we witness in the model. This subsystem can easily be defended as an independent and nonsubordinate element that nonetheless entails tangible and important influences on other elements in the model. It is independent in that other model subsystems do not influence the ages of the heads of individual households. Although broad demographic changes may influence the age structure of an entire community, these influences are treated in other subsystems (for instance, by the dependency ratio, a proportional measure of the age structure of a community, and the proportion of single person households, in which residence may vary by age). This subsystem influences household size (since younger heads tend to have smaller households, although elderly heads may as well), household income (due to a general cycle of earnings that rise and then fall with increasing age), and proportion of harvested protein in diet (since older persons tend to have a larger proportion of subsistence foods in their diets).

A sex ratio is often highly responsive to economic change in a population. We chose to deal with it as an independent variable that for our purposes is best seen as the origin of numerous effects and contingencies elsewhere in the system. Were inmigration and relocation for employment to be an exclusively male or female pattern, we could place the sex ratio beneath the exogenous employment subsystem. As a matter of fact this is often a valid linkage. However, we cannot subscribe to the notion that males are by and large the primary breadwinners and likely candidates for relocation in the study area. Males and females alike will move for economic benefits, and although the female role in this pattern is only now becoming clearer it is best to omit such a path in our model (i.e. one that would posit sex ratio changes as a result of increased employment or economic opportunity) since the current and future relationship between gender, relocation, and financial responsibility is in flux. We infer paths leading away from this subsystem that influence institutional coordination and cooperation, proportion of single person households, and income and labor strategies.

The dependency ratio is directly influenced by changes in employment (see Section 5.4.1.1). In addition, the chief influences of this subsystem are directed toward village size and household size. The reasoning behind this placement is self-evident. It seems clear that we must predict changes in the age profile of communities in the face of inmigrations or outmigrations, as in the case of changes in employment availability. The ramifications of future fertility and natural increases (for instance, those that a changing dependency ratio might portend) seem less immediate and crucial in this connection, however they are by no means ignored by the model. Also, changes in the age profile (dependency ratio) may spell changes in village growth patterns, and likely changes to residential density and family size. The logic we are using here is not controversial, and is in fact commonplace in social and demographic analysis. The reader is referred to the discussion of demography (Chapter 3).

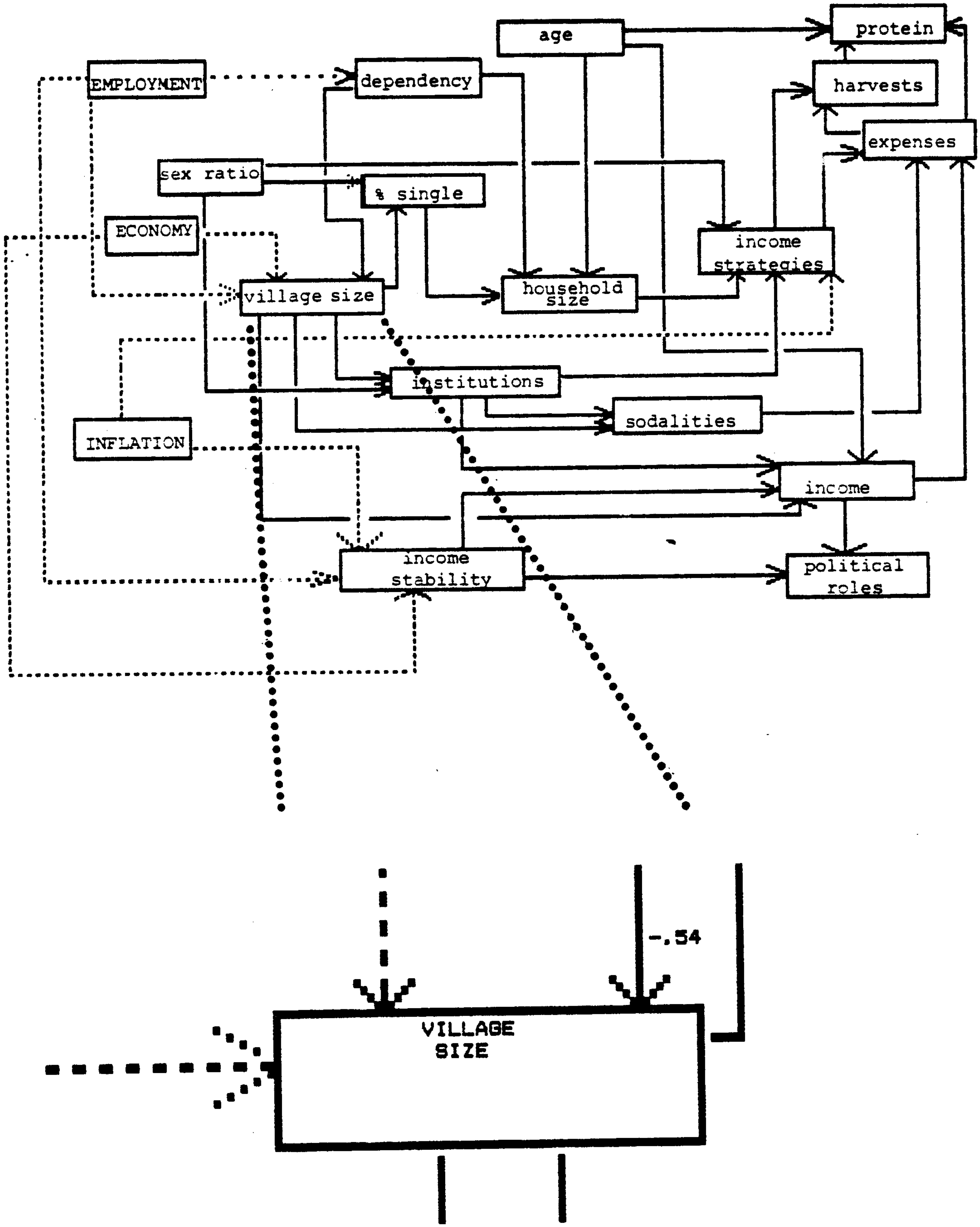
Income stability and predictability represents a classification of employment, industry, and labor participation characteristics. This variable rates the stability (nonseasonality or evenness) and predictability (certainty) of the primary sources of household income. It is influenced by a combination of exogenous factors, specifically employment, economic opportunity, and inflation. The first two exogenous factors may influence the sheer range and character of local income sources, whereas changes in either of these, or changes in inflation, may spur changes in the ways families secure income. Changes in the availability of jobs or other economic resources, levels of competition for these resources, ranges of economic options open to consumers and families, individual participation in economic pursuits, as well as constraints on any or all of these factors that may affect some or all of a population, will be reflected in this subsystem. The causal paths that originate with the exogenous subsystems are therefore appropriate in this case. In turn, this subsystem is responsible in part for changes in household income and political participation. The justification for these connections is explained in Section 5.4.3.

5.4.3 Dependent Subsystems

5.4.3.1 Village Size

Village size is the first dependent subsystem that we encounter in the model. Figure 22 portrays village size in terms of influences from other subsystems to which it is connected. Only the paths to the subsystem will be

FIGURE 22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VILLAGE SIZE

discussed at this time. The others branching out from this subsystem will be discussed as paths in subsequent subsystems.

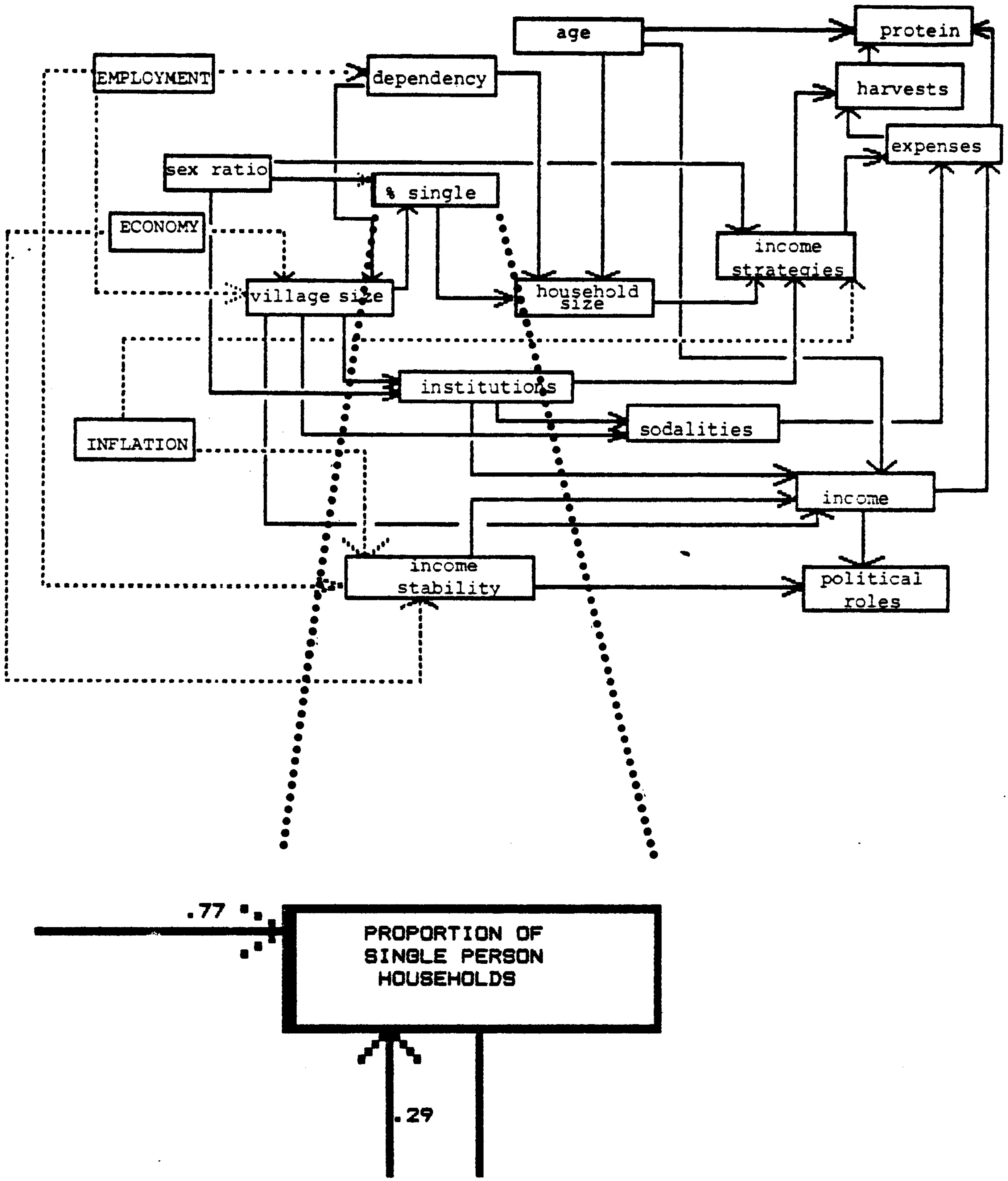
This subsystem captures village size as a trend that is mutually and jointly produced by the factors of employment and economic opportunity, and the dependency ratio. The dependency ratio is an independent subsystem from the standpoint of the variables selected for the study, but it can be measured and is not one of the trio of exogenous variables (of which both the former subsystems are). Therefore only the path between the dependency ratio and village size has a weight attached to it (-0.54). This denotes a fairly tight negative relation between the dependency ratio and village size. Hence, this connection signifies an expectation that a larger dependency ratio (i.e. a larger proportion of dependent persons in the population) would signify smaller populations and smaller dependency ratios would correlate with larger populations. The dependency ratio may be an indicator of in- and outmigration. Inmigration, chiefly by adults, will lower the dependency ratio, which in turn correlates with population growth.

The economic and employment ramifications of this connection are clear and important. Although a high dependency ratio may in theory portend a large potential population (through natural increase of a large and fertile subpopulation that is just emerging), we find that such "potential" demographic growth factors are overshadowed by the more immediate and prominent effects of economic opportunity, employment, and the dependency ratio which is in turn affected by employment changes. All of these have similar and complementary roles in the pattern of job relocation, in- and outmigration for economic purposes, and village growth and decline. A recent example of this pattern can be seen in the relocation of Bering Straits School District offices to Unalakleet. The population grew tremendously, but also "aged" demographically (i.e., the dependency ratio changed).

5.4.3.2 Proportion of Single Person Households

This subsystem ties some demographic characteristics together in a somewhat different manner (Figure 23). Basically it is a product of both the sex ratio and village size. It is also indirectly a consequence of influences exerted by the dependency factor (mediated by village size), and the exogenous

FIGURE 23



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PROPORTION OF SINGLE PERSON HOUSEHOLDS
.29

subsystems of employment and economic opportunity (as they are mediated by the dependency ratio and village size).

This subsystem can be justified on the grounds that: (1) a skewed sex ratio may reflect a population imbalance that favors more single person households should housing be available and (2) an absolute increase in the number of single households can be expected in rapidly growing communities due either to the sheer availability of new housing, rooming practices in boom situations that aggregate singles under one roof, the weight of selective employment migration, or any of a series of related factors. The roles of employment and economic opportunity, indirect though they may be, should not be ignored.

These multiple connections link a variety of demographic and economic features and help capture more detail than would a simpler model. For instance, it is important to be able to represent events or patterns that relate to fertility and growth in a population as well as age and family cycles. Both are crucial to any understanding of how domestic and civil economies work (Preston, 1982), but they are responsive to or measurable by different indicators. This portion of the model assembles variables so as to close the gap between these measures. Life and age cycles (dependency ratio and single person households), fertility and growth (sex ratio and village size, as well as dependency ratio), and economic factors are fitted together in this formulation.

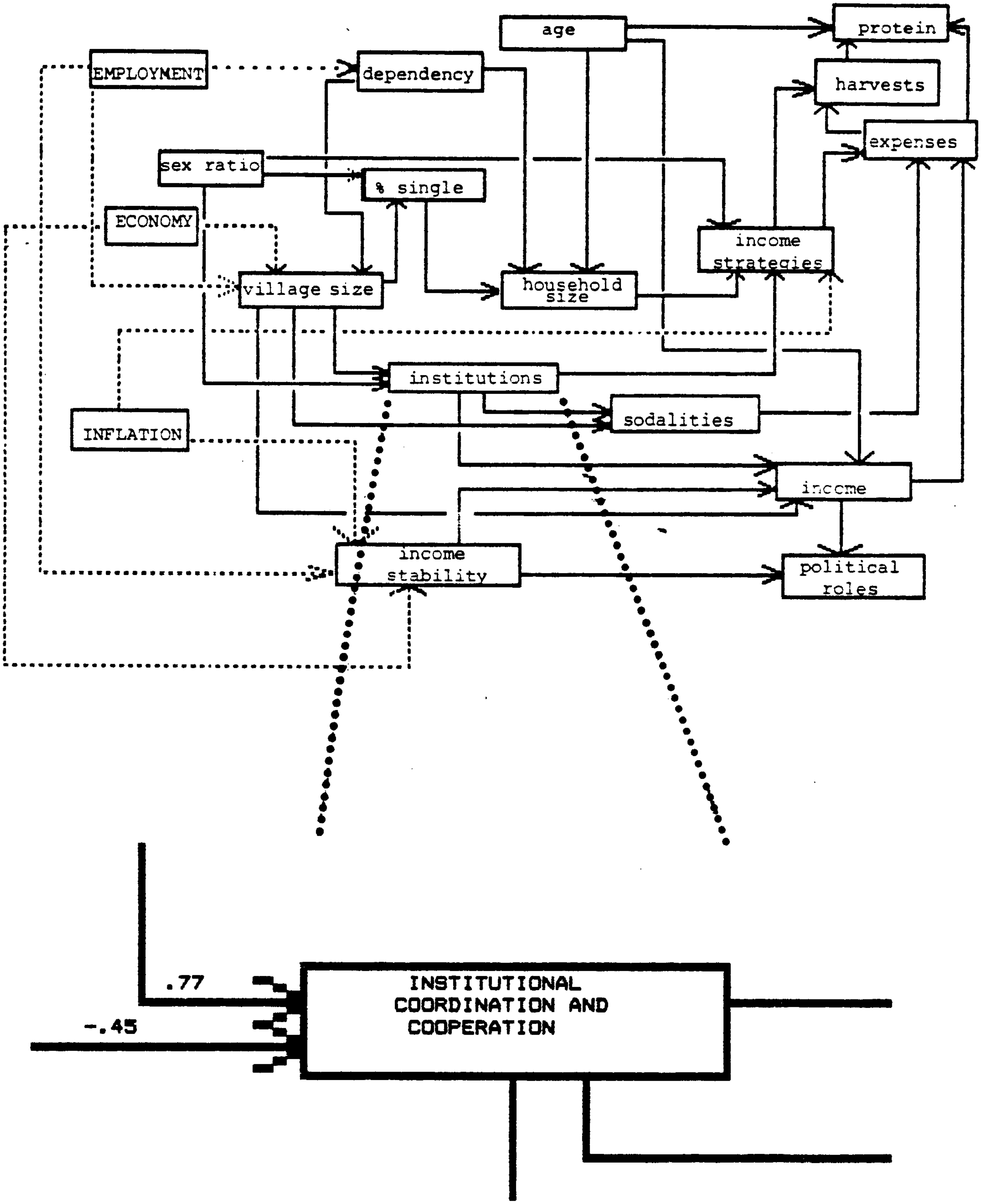
The measure of the influence of the sex ratio on this subsystem is quite strong (0.77) (Figure 23), but the influence of village size on it is small in comparison (0.29). This is because housing availability and household characteristics are not uniformly spread among the villages. In some villages housing availability is more saturated to begin with (and thus less able to absorb single person households), and given social and economic variation across the villages these households may simply be less or more likely to exist, depending on very localized conditions. The low measure may simply reflect a nonlinear relationship, but an important one. Because path weights are linear measures, however, the result is a modest score. This problem will arise again in other subsystems and in nearly every case can be attributed to nonlinear effects that are nonetheless important to include in the model.

5.4.3.3 Institutional Cooperation and Coordination

This subsystem is embodied by an ordinal variable scaled as in the OCS Social Indicators study (see Sections 4.1.1 and 4.2.1). Changes in the value of this subsystem (Figure 24) are strongly influenced by changes in village size and the sex ratio. It is indirectly influenced by a variety of other demographic and economic factors to the extent that they are transmitted to the subsystem through these former connections. Sections 4.2.1 and 4.3 describe changes to this subsystem. Briefly, these are higher levels of institutional coordination among larger communities, but an increase and then decrease in levels of cooperation; increasing specialization; and, as communities reach a subregional or regional status, the beginnings of institutional tensions. Figure 24 shows that the subsystem is strongly influenced in a positive direction by village size (0.77). The influence of the sex ratio is weaker (-0.45) and negative. This means that skewed (nonparity) populations influence institutional dynamics, most generally away from a cooperative and coordinated balance.

This pattern is not difficult to interpret and is undoubtedly achieved through several means. Rytina (1982) cited the fact that skewed populations are associated with many structural constraints on intergroup communications and interaction, and special interests, institutional tensions etc. may likely arise under skewed conditions. A skewed population may also represent an unbalanced and unequal distribution of economic resources (benefits) as well as civic and domestic responsibilities (obligations), conditions that may foster the same consequences. In addition, a skewed population may represent the result of selective migration. This is closely related to both examples above but adds a dimension of social differences that may be seen in patterns of different value systems in communities that are attracting transient or permanent residents. This is not related solely to the sheer influence of village size in producing more cosmopolitan but less cohesive communities. Research has shown that social tolerance, for instance, is highly correlated with residence during adolescence when values are taking shape (Stephan and McMullin, 1982). Thus inmigrants may represent a mosaic of vastly different habits, a condition that may influence the dynamics of the institutions that seek to serve them.

FIGURE 24



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INSTITUTIONAL COORDINATION AND COOPERATION

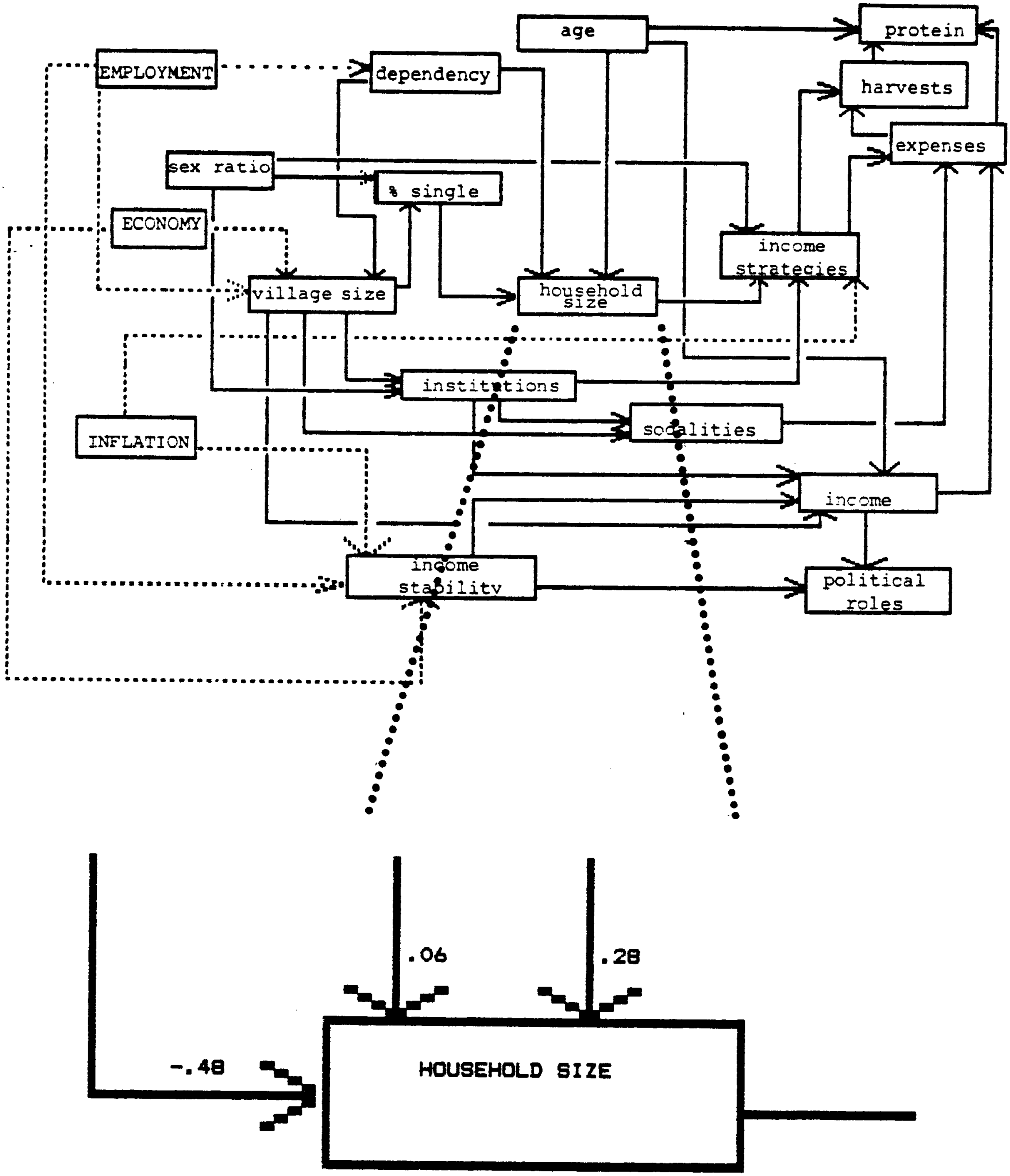
5.4.3.4 Household Size

Household size is the first of the dependent subsystems developed on the basis of the family-level primary data (Figure 25). Household size is construed to be a function of the age of the household head, the dependency ratio of the community, and the proportion of single person households. Both younger and older household heads may have smaller families, whereas the vigorous adults in the middle range account for many larger households. Nonetheless, we find that by and large older persons are heads of larger households. The dependency ratio measures the proportion of young dependents and thus provides a clue about household sizes, too. The measure of this path is very low (0.06) due to the fact that our sample probably misrepresents household sizes in communities with low (Nome) and high (Alakanuk) dependency ratios. In addition, our subjective observations suggest that flexible living arrangements are most common in villages with high dependency ratios in the study area, such that dependent juvenile relatives might board with single or attached adults (especially elders) in smaller households. This practice would encourage a curvilinear tendency in the data that yields a low measure.

The former relations are positive, whereas the influence of the proportion of single person households subsystem is negative (-0.48). This means that higher percentages of single person households coincide with smaller households overall. In short, age partly determines the size of the household--more children mean larger households--and the effects of single person households diminish the general density of households in the community. These relations are largely self-evident, although there are many exceptions; hence, the relatively low measures of all but the last of these influences.

The effects and prominence of certain socioeconomic habits are unevenly distributed across the study area, so we find that the measures are low for a reason. In addition, the sample size for this subsystem has suddenly jumped to 82 (households), and thus we may expect additional variations that may affect our analysis. Because household composition varies so dramatically in the study area, many cases of older heads of households in very large (extended) households can be identified as well as very small households (lone pensioners). Because housing availability varies by village, cases of large

FIGURE 25



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HOUSEHOLD SIZE

households headed by single persons can also be identified (for example, in fragmented joint families or boarding situations) as well as much smaller households. The joint effect of these many factors, however, prompts presentation of this subsystem as it is because it accounts for the most prominent and important patterns that must be represented in a model. Exceptions, however, should be given due consideration as predictable deviations from the general trend.

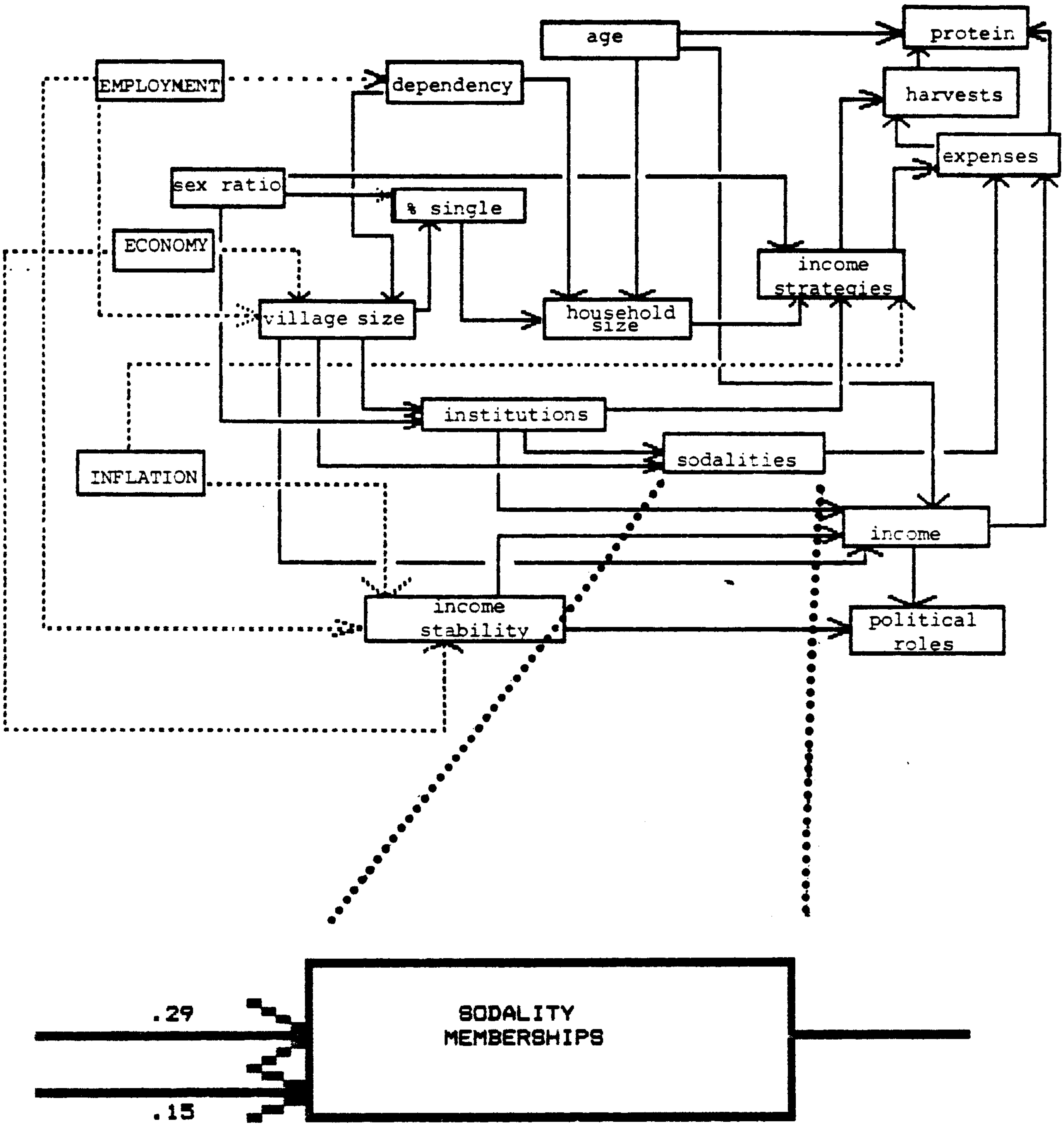
5.4.3.5 Sodality Memberships

This subsystem shows the influence of both institutional coordination and cooperation and village size (Figure 26). Thus, increasing complexity, specialization, and coordination and decreasing cooperation among institutions influence sodality memberships among families by increasing them. As institutions increasingly grapple among themselves, nonformal social bonds to organizations that serve individuals seem to proliferate. These informal mechanisms do function in the less institutionalized, smaller communities, but they are more numerous and penetrate more families more often in the communities further advanced along the institutional continuum. Similarly, as populations grow, so do these sodalities and the memberships in them. This subsystem plays an important role in identifying a nonformal (nonchartered) mechanism in communities that complements the formalized institutions, and although they are not surrogates for one another, their similarities bear attention. They may not substitute for one another, but clearly alternative forms of social bonding, mutual assistance, and solidarity come to the fore when formalized institutions grow increasingly complex and possibly divert their attentions from the interests of the population.

5.4.3.6 Income and Labor Strategies

Some of the weakest paths are evident in the income and labor strategies subsystem (Figure 27), but it is nonetheless a critical piece of the larger puzzle. A brief review of the figure shows that the sex ratio (with a weight of 0.31), household size (0.20) and institutional cooperation and coordination (0.19) influence this subsystem. It is a critical subsystem because it represents important but conceptually difficult influences. It summarizes domestic strategies families use to survive economically, obtain and share

FIGURE 26



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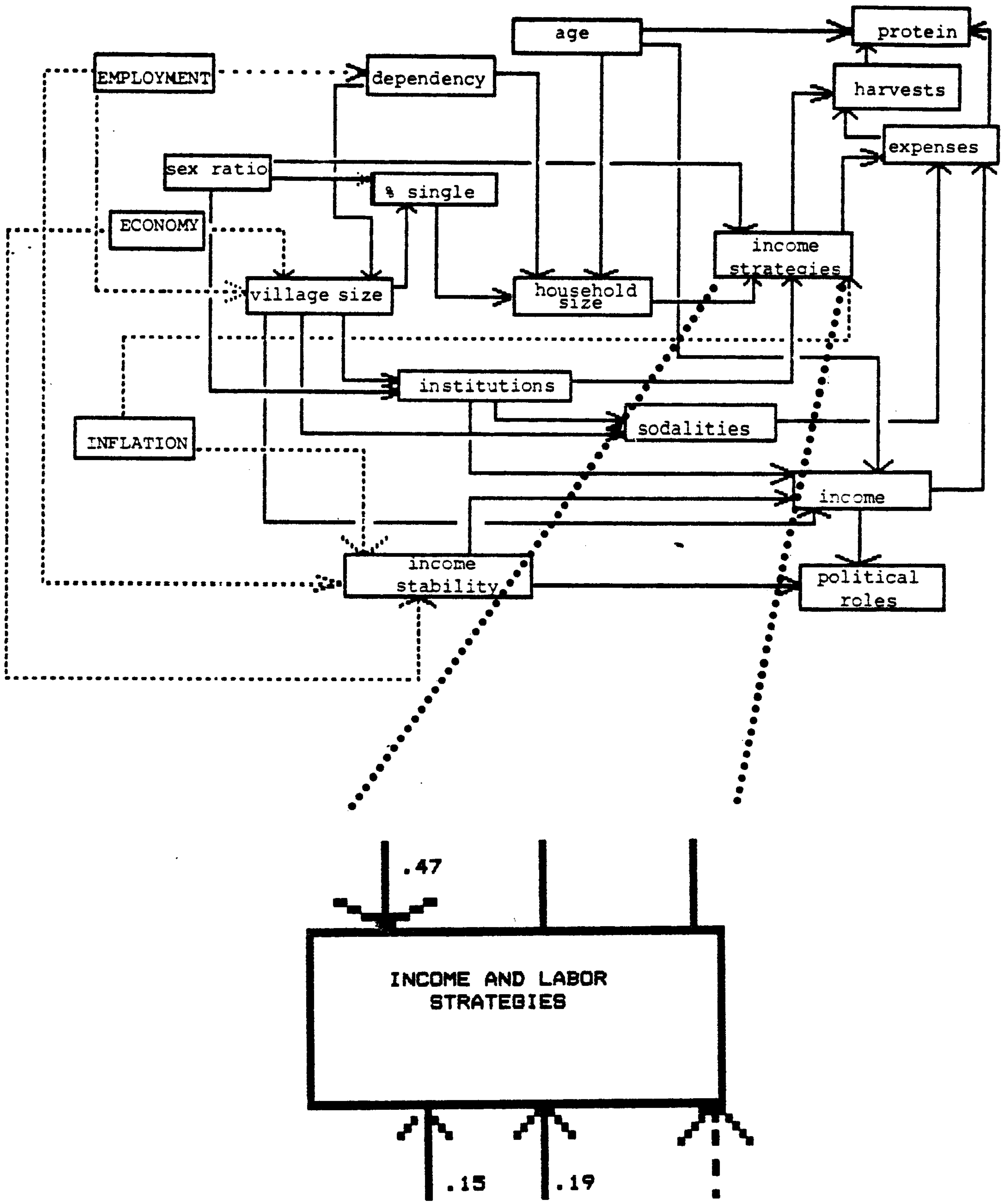
SODALITY MEMBERSHIPS

FIGURE 27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INCOME AND LABOR STRATEGIES
.15
.19

resources, distribute and use skills and mutual aid, and so on. It feeds, in turn, into other critical domestic factors involving subsistence strategies and is also directly influenced by the exogenous inflation subsystem shown with the dotted line (unmeasured).

This subsystem represents the overall strategy households employ in allocating their resources. They may tend to pool labor, food and capital within their confines where they remain; or, they may pool these resources and distribute or share some of them locally; or they may pool these resources and distribute or share them widely. Because domestic strategies, especially recruitment and labor habits, are often differentiated by gender, skewedness of the sex ratio can influence them. Not only because of differential labor and consumption demands, but also age cycle differences embedded in the size dimension, household size also predetermines much of the substance of this subsystem. Small households headed by young adults may be robust and engage in many subsistence activities and distribute labor and foods widely, although more commonly they do not. Larger households headed by older persons, though, frequently do. Communities with large proportions of males, for instance, may typically show evidence of more diverse subsistence harvests that in turn encourage wider distributions of certain foodstuffs. Institutional coordination and cooperation may also influence domestic strategies to the extent that institutions provide or deny services that may play a role in this strategy, provide jobs that underwrite them, or represent leadership that may create local stability and direction that may contribute to strategic domestic planning. Finally, inflation has a direct impact on the subsystem, since local costs figure prominently in the strategies families develop. Specifically, wider strategic networks are those typical of larger households, less skewed populations or those with proportionally more males, and more institutional cooperation and less specialization.

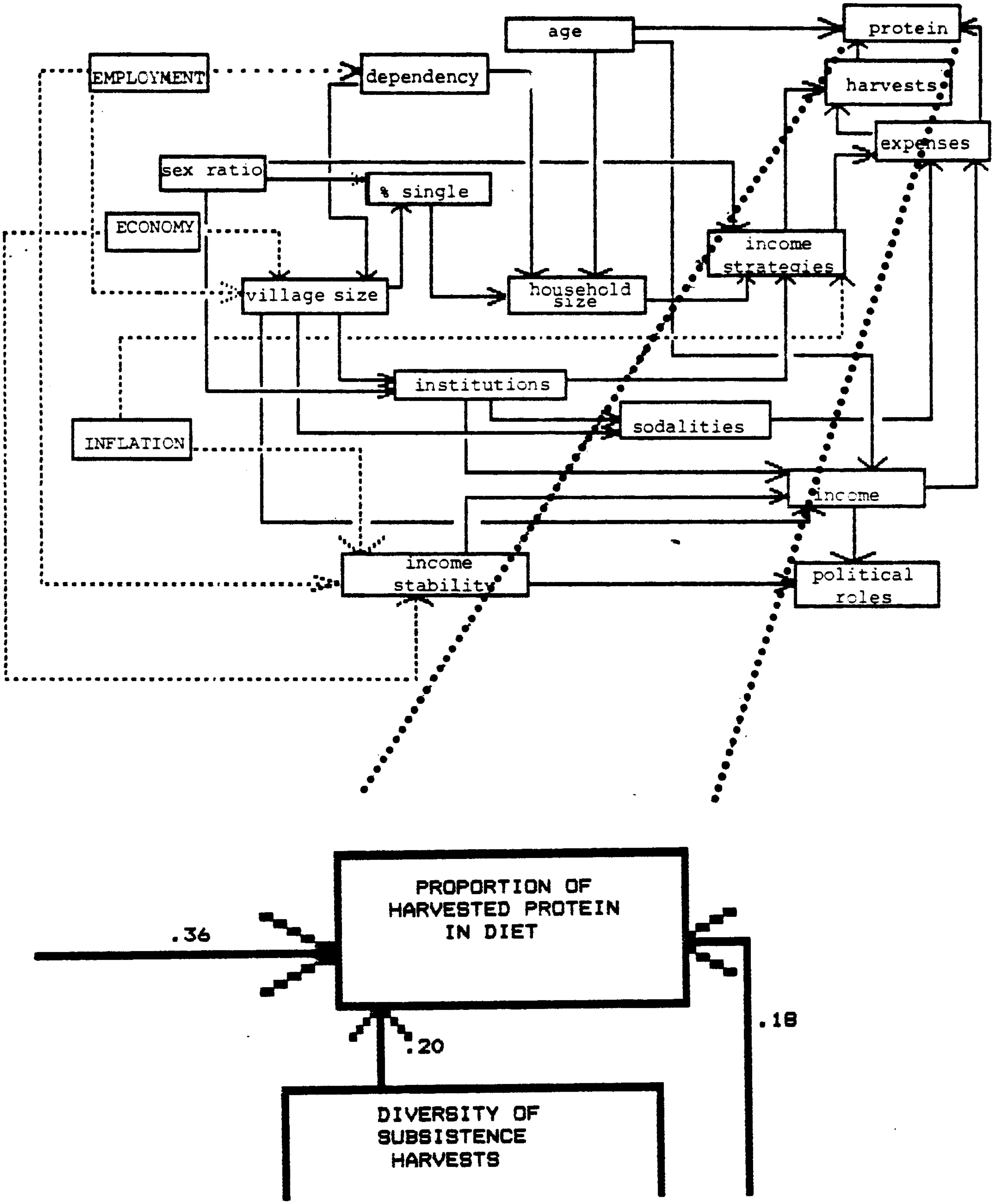
5.4.3.7 Proportion of Harvested Protein in Diet

Figure 28 represents this subsystem and shows that it is tightly connected to the two that are described next. Here we see that the proportion of harvested protein in the diet is contingent on (1) the age of the household head, (2) the diversity (range) of the subsistence harvest, and (3) the subsistence harvest expenses. Families headed by older persons consume a larger proportion of locally extracted protein, those who harvest more diverse ranges of food consume larger proportions of harvested protein, and those who invest larger proportions of their income in subsistence pursuits consume larger proportions of harvested protein.

The weights attached to these paths are weak, due more we think to inadequacies in the data than to any true weakness in the scale of the connections between these elements. These subsystems form a well defined, interrelated set, one that is meaningful and easy to interpret. The subsistence variables we used, however, have very few attributes. This means that they are extremely general and necessarily sacrifice detail. This sacrifice may be apparent in the weak links between them, links that we otherwise believe to be central and credible.

The relative strength of the path connecting age of household head and proportion of harvested protein in diet, even in light of the difficulties we have faced in interpreting the complex nature of age cycles in previous sections, probably gives us a clue as to why these other paths appear weak. First, we must recall that path measures are sensitive to linear and only linear relations. Curvilinear deviations, even if systematic, will reduce the path weights. Second, the privileges that accrue with age that may account for this path may also explain some underlying factors that influence the three subsistence variables. Elders consume larger proportions of harvested protein regardless of what they harvest. They are recipients in a spontaneous but nonetheless patterned sharing of goods that funnels local foodstuffs to them. This very fact highlights the importance of sharing and cooperation. It is probably these patterns of cooperation themselves that skew our data since we can only imperfectly measure them (with, for instance, the income and labor strategies variable). Were families only responsible for their own harvests and own investments in subsistence, we might find a much stronger relation between these subsystems. However, people share the burden of investments, and share the proceeds of the harvest. Therefore the level of investment may not predetermine harvest level, and harvest characteristics alone may not predetermine consumption patterns.

FIGURE 28



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PROPORTION OF HARVESTED PROTEIN IN DIET
.36
.18
.20
DIVERSITY OF SUBSISTENCE HARVESTS

5.4.3.8 Diversity of Subsistence Harvests

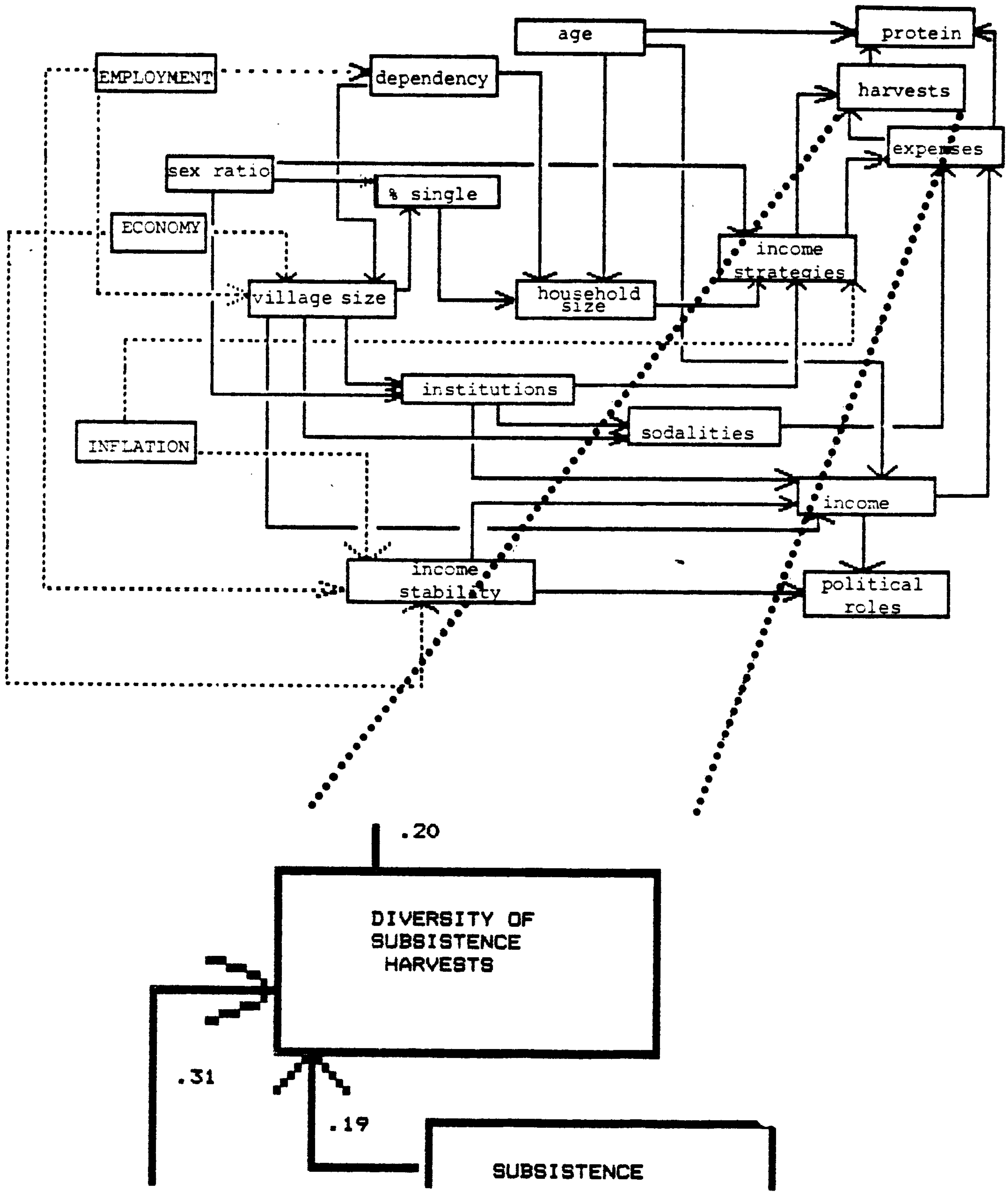
Figure 29 depicts this subsystem, which we postulate to be a cumulative product primarily of subsistence harvest expenses and income and labor strategies. This subsystem is a direct result of joint economic practices and domestic strategies, hence the role of the latter subsystem in shaping it. As well, the diversity of the harvest is in part the product of the investment in it, therefore the former subsystem also has a prominent role. Both relations are positive. Larger strategic networks (i.e. those displaying more and extensive cooperation and exchange), and higher proportional investments lead to wider ranges of subsistence harvests (more and different species).

5.4.3.9 Subsistence Expenses

Figure 30 represents capital investment, maintenance, and other direct and indirect expenses for subsistence activities. As shown in the previous paragraphs, several important facts concerning subsistence flow out of the behavior of this variable. In turn, this subsystem is directly influenced by (1) income and labor strategies, (2) sodality memberships, and (3) household income. These paths of influence are logical and straightforward.

Economic strategies that expand and share the burden of investment, make labor recruitment easy, and otherwise draw upon broader ranges of options, may allow different kinds of investments to be made irrespective of the dollar amount in question or, holding the type of investment static, reduce the cash requirement. Some people can stretch their dollars or make them work in different ways if they can make bulk purchases at lower rates, call on others for labor assistance they cannot perform themselves or pay for, and borrow supplies and capital goods they cannot afford or choose not to buy. Families engaged in broader networds of exchange can often do this. Hence income and labor strategies influence subsistence investments in these and many other ways. Similarly, the sheer amount of income upon which the family can draw upon can affect subsistence investments. Those with more money may invest proportionally more of their money, or save money by being able to make bulk purchases at low rates. Finally, we find a relation between sodality memberships and subsistence harvest expenses (with a weight of 0.18). Those with fewer memberships invest proportionally less, and those with more

FIGURE 29



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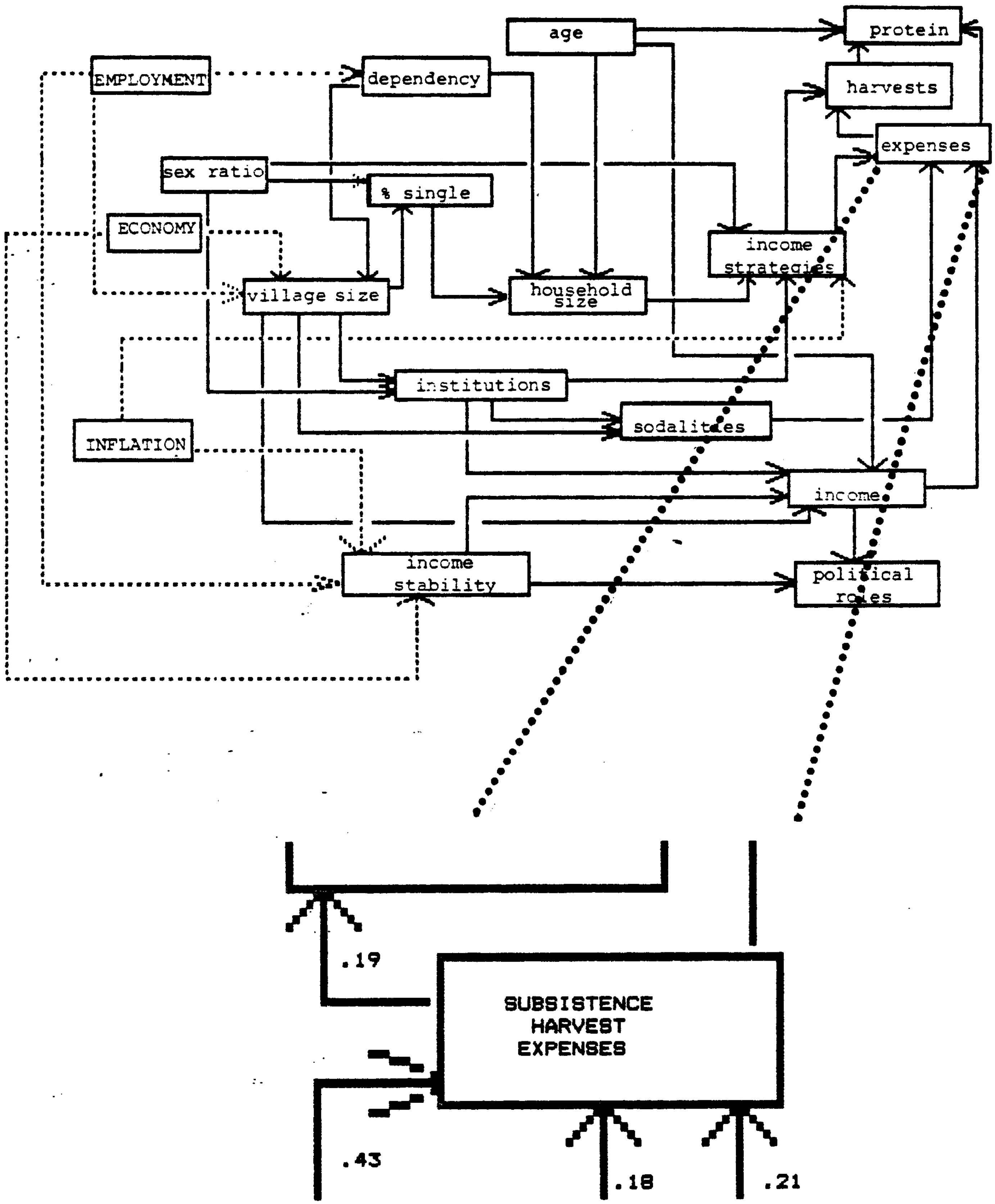
DIVERSITY OF SUBSISTENCE HARVESTS
.31
.19
SUBSISTENCE

FIGURE 30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memberships invest proportionally more. Holding all things equal, it seems that those families who are impoverished in terms of nonformal bonds in the community are also less able or less likely to invest large proportions of their income in subsistence costs. This influence is very weak, but it is nevertheless included in the model since it is important to capture the linkages between subsistence and other social subsystems that are logical, even if empirically weak in the data sample.

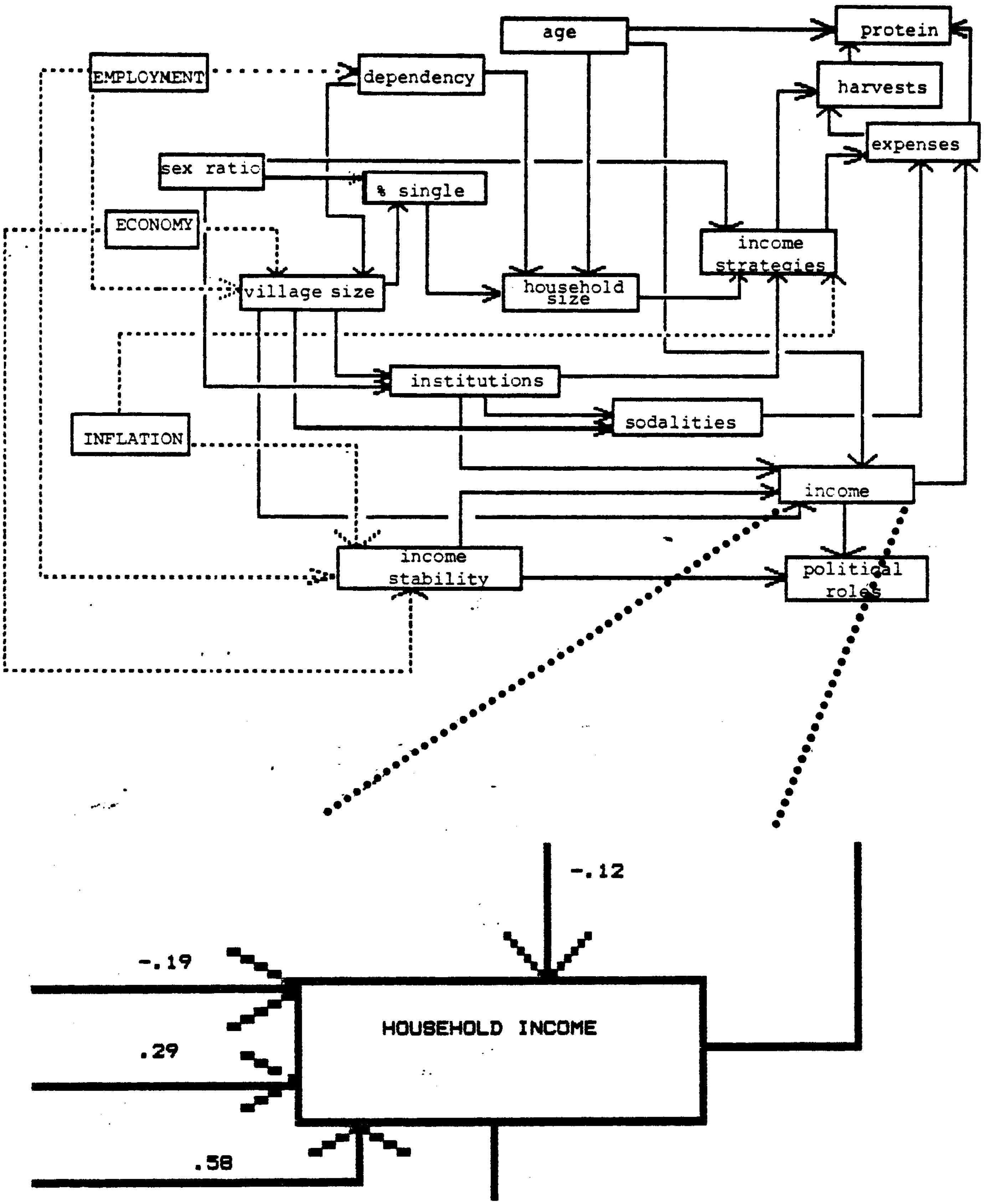
5.4.3.10 Household Income

Figure 31 shows the household income subsystem to be a product of age of household head, institutional cooperation and coordination, income stability and predictability, and village size. The interpretation of this subsystem is not difficult.

As we find in other cases, the effects of age are not strictly linear in many instances. The highest incomes are apt to be found in robust, middle age families whereas younger and older families may have lower incomes. The relationship is important but statistically weak for these reasons. Higher incomes are also found in larger communities, in communities and among families with more stable and predictable income sources, and in communities further advanced along the institutional continuum we have proposed (thus these higher incomes will be found among families in communities marked by less cooperation, but also by more specialization, more institutions, and in general, therefore, more opportunity).

None of the weights are entirely convincing on their own, but taken together these factors cumulatively influence household income in a logical way. Influences stemming from village size are the most reliable, but note that this subsystem underlies in part the other institutional measures that are presented here (i.e., institutional cooperation and coordination, and income source stability and predictability). Seen as a whole, the subsystem represents a tight package of effects that are undoubtedly important in the larger picture.

FIGURE 31



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HOUSEHOLD INCOME

5.4.3.11 Political Participation

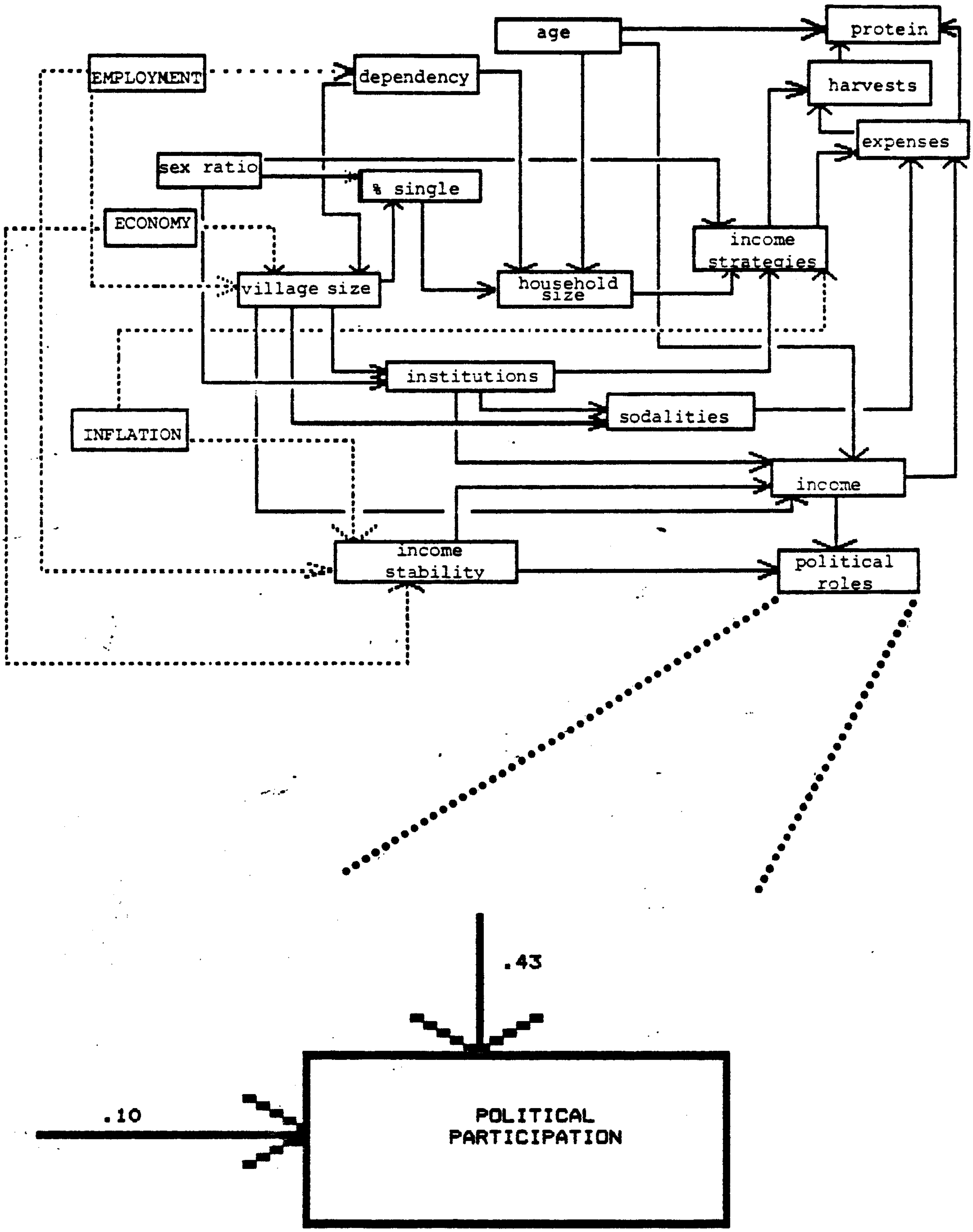
Political participation is the last subsystem to be discussed in this section (Figure 32). The relationships embodied in this subsystem are interpreted as follows. Higher household incomes coincide with more frequent and more varied political or institutional memberships within the family. Increasingly stable and predictable incomes are also associated with higher levels of representation. We assume that these factors interact with one another, and that in general more favorable economic circumstances lead to greater levels of political involvement. This undoubtedly occurs for several reasons.

First, wealth creates its own privileges, even in an egalitarian Inupiaq or Yupik society, especially when most political institutions are largely formed in a Western image. Second, the skills, charisma, strength of kinship and so on that shape favorable economic circumstances are also those factors that encourage recognition and acknowledgement among peers and, hence, may create political advantage. Those in the most favorable economic straits may also be more robust, more educated, stronger, and so on. All these factors add up to greater likelihood of political roles for those who represent these circumstances and skills.

Note than household income has a more reliable link to this subsystem than does income source stability and predictability; the latter is keyed to characteristics of entire income classes, whereas the former corresponds to specific family patterns. This indicates that more personal, circumscribed factors, such as those that shape individual family patterns, are more central to the question of level of political representation. Broader community characteristics may be important, but are probably more diffuse.

This concludes the description of the subsystems contained within the model. The findings that inform the model were outlined in Chapters 3 and 4. The following Chapter is an abbreviated discussion of model validation techniques, application guidelines, and constraints on interpretation. The reader who wishes additional technical detail on the model and path analysis methods in general is directed to Appendix F.

FIGURE 32



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POLITICAL PARTICIPATION

CHAPTER 6. VALIDATION AND APPLICATION

Methods of validation and application have already been introduced and discussed (mainly in Chapters 1 and 5), and both involve practically the same procedures. Conceptually, however, validation and application are quite distinct since the logic and structure of the model must be confirmed before it is legitimately applied as a forecasting methodology. On the other hand, once a preliminary validation is accomplished each subsequent application will prove to be an additional validation, hence application serves to refine the model. In addition to discussion of validation and applications, the last section of this chapter points out constraints relevant to both. References to previous chapters and sections identify more comprehensive discussions of these issues.

6.1 Validation

Validation implies confirmation of the sense and structure of a model, but in practical terms there are degrees of confirmation. Beyond determining if the model holds up in repeated tests, validation procedures can identify the flaws and imperfections that, given refinement and adjustment, may yield a stronger version of the model. Initially, however, validation helps determine how warranted the model assumptions are, and if connections and processes described persist through time and across different populations. Validation requires that the analysis be repeated (two times at minimum, but three or more times ideally) using comparable methodologies and samples to assess logic and operation of the model under different circumstances, how well the results can be generalized, how erratic any given trends are so that "background noise" can be distinguished from impacts, durability of the model at different times and for different groups, and many similar questions of legitimacy, accuracy, strength, and logic.

Two final merits of the validation process should be mentioned. First, successive trials of the model would also insure that a large body of secondary and primary data was collected. Once a longitudinal base is established, it would also be possible to specify the degree of stochastic or probabalistic error and variation in the data base. All trends, dips, and peaks in the data need not signify important events. Much of this variation would connote nothing more than the drift and flux of random change, but a longitudinal base provides information necessary for discerning impacts among the background noise. Second, repeated trials would also lessen the chance that systematic reactive problems could influence the data. Reactive effects are those that represent the interpersonal and psychological interference in the data collection process that might contaminate the results. By broadening the data base, sampling other persons and other communities, and using different field staff to accomplish the work, these reactive effects (that include the indifference, hostility, prevarication, friendships, respondent-field worker dependencies, etc. that may tarnish the quality of the data) should be reduced substantially.

The concept of validation is just as important as its concrete methods. This is why the guidelines discussed here emphasize the logic and purpose, whereas the practical methods are described in other chapters. The methodological framework and data collection procedures are explained in Chapter 1 and supplemented by appendices. The analysis plan is introduced in Chapter 1 and explained in Chapters 2, 3 and 4. Chapter 5 details the model and represents the synthetic summary, which must be compared to the validation results to assess its persistence, credibility, and strength. These procedures are explicitly described in previous chapters and their appendices and in the cited references.

A major objective of validation is to avoid overgeneralizing or misinterpreting the results of analysis. Beyond this objective, we can, by gauging the fit between the original model and susbequent validation trials, clarify and adjust data collection procedures, rework path arrangements, and otherwise calibrate and refine the model. Methods for validating the model are summarized as follows.

The analysis must be replicated, not solely to determine if the general features of the model stand up to repeated scrutiny but also to define the parameters that specify how the model applies across time, across sections (populations, communities), and in terms of specific variables or subsystems. Control of replications (or validations) is critical in terms of time, place, and variable. Validation must acknowledge potential variations through time, across populations, and in terms of specific facts. The time factor, though it cannot be manipulated, is at least encompassed by the fact of validation itself. Cross-sectional controls can be developed by creating a rational sampling scheme that includes some villages that already have been sampled in a new group that includes additional villages. The final controls would be exercised by selecting and systematically varying data collection procedures to provide overlap on most topics but some flexibility on others. This would allow the validation trials to build up an inventory of key data topics that work the best and to avoid data types that, although useful, may be superfluous. In short, the aim is to identify "differences that make a difference."

6.1.1 Season

The study should be repeated, using the essential methods and format described in Chapter 1 and in relevant appendices. As noted above, the mere fact of replication creates a longitudinal base of data. This procedure may adequately deal with the longitudinal factors that are most important, since we do not anticipate that other features of the dimension (like seasonality) exercise much influence on the data. The data we collected represent annual summaries or generalizations, and few should reflect conditions intrinsic to the season in which they were collected. However, it is possible that some of the subjective data, even though they are couched in terms of static or general factors, may be shaped in part by elements that cannot be controlled for and that are sensitive to seasonal fluctuation. In addition, village respondents may occasionally generalize on the basis of recent or seasonally fixed events or patterns. To give concrete but hypothetical examples, institutional dynamics typical of a certain period (perhaps summer, when they are most taxed) may have been generalized as a "status quo," or some subjective opinions may be responsive to very recent and idiosyncratic events rather than general and persistent ones. The model might best be validated using data collected during fall and winter or spring and summer, for instance, as opposed to summer and fall in this analysis.

A form of data control (see Section 6.1.3) can be achieved by sampling during different seasons (longitudinally). Although information may not vary by season per se, the residence of villagers who display this information does. Residents of Norton Sound villages are extremely mobile, often in patterned ways, and information collected during fixed seasons might typify that period but not others due to slightly different populations in each case. This factor might be insignificant at the village level, but a network sample, and a fortuitous one at that (only members of the networks who were present at the time of the field work were sampled), could introduce systematic bias which could influence the findings. The roles of the seasonal migrants within a network could be misstated. If they are inaccessible, so are their data. Networks might be better understood if both longitudinal and more comprehensive, representative data were used. This might be achieved in part by sampling across seasons.

6.1.2. Selection of Communities

Some cross-sectional controls can be exercised in the validation by selecting additional communities for the sample. Although similar controls could be achieved by simply sampling different networks, this method would prove less feasible than the former for several reasons (including the need for respondent confidentiality, the possibility of large autocorrelated influences among different networks, and so on). If is difficult to specify which characteristics these validation samples should share, since a valid and systematic sample cannot be validated itself without longitudinal data. As a rule of thumb, however, successive samples should at least overlap until there is greater confidence in the sampling strategy. This would insure collection of some longitudinal data (for those communities that have already undergone analysis) as well as additional data to make broader generalizations and to better understand the similarities and differences between communities. Significant cross-sectional differences do exist (for instance, Nome can be distinguished from the rest of the sample, etc.). Thus, it is important to refrain from speculative applications of the model before these cross-sectional differences are better charted out.

Cross-sectional control implies sampling of villages of different types and locations, and this fact itself often introduces other data controls. The Norton Sound sample used in this study contained several communities that displayed transitional or erratic characteristics in terms of several variables. Nome and Golovin, for instance, revealed several demographic and institutional features that were unlike the other sample villages. Both

Emmonak and Unalakleet showed evidence of institutional characteristics that illustrated some typological ambiguity. The institutional structures in these communities could be properly categorized to be sure, however it is possible that they are undergoing transition. We cannot verify this possibility since we have no longitudinal, diachronic primary data. But a validation trial will begin to build up a longitudinal data base that will allow researchers to determine if diachronic change is underway that can be detected with the typological model. Validation trials that sample these villages will insure (1) cross-sectional controls, (2) longitudinal controls, (3) data controls (pertinent to institutional variables), and (4) analytic verification of the characteristics of the extremes of the typological scales we used (where Nome and Golovin were often situated) as well as the internal transitions along these scales (typified frequently by Unalakleet and Emmonak). We recommend that some or all of these communities be included in a validation trial.

Obviously, many other cross-sectional differences fragment a village-based sample (age, sex, and socioeconomic status). These are effectively enclosed and accommodated within the network approach. In other words, the use of the methodology described in Chapter 1 and Appendices A and B could in part control for some of these features. However, cross-sectional differences of this type can also be handled by a form of data control, discussed below.

6.1.3. Data Control

Controls on information are also important to the validation process, more so because of the applied thrust of this project. This model can undoubtedly be made more compact, since it hinges on a wide variety of interrelated variables in a redundant arrangement. Once validated and once a longitudinal and cross-sectional base is available, it should be possible to delete or combine subsystems, simplify the web of paths, and otherwise refine the model. But before this happens, other forms of data control come into play.

Some data categories can and should be revised, and some may be deleted. The second option is discussed below. The revisions we recommend entail the use of interval as opposed to ordinal variables. Ordinal categories imply only a ranked ordering of data; some categories are larger or higher than others, but the degree of difference is unspecified and the data which reside in each category may not differ from one another in the same manner. All of the subsistence variables, sodality and political participation variables, household size, age of household head, and some other variables are ordinal. Households of one or two persons are scored the same, just as households of eleven or twelve persons are rated alike. Similarly, households in which four political roles are evident cannot be distinguished from those households in which only two roles are evident. We recommend that the ordinal variables upon which the model is based be converted to interval variables whenever possible in validation trials.

This requires little more than determining actual frequencies during data collection and using the actual frequencies in analysis. The methods of data collection and analysis are unchanged. Interval variables (that is, those whose categories are separated by unit differences of known size, which are the same for all categories) provide a more powerful analysis whenever they can be used. In addition, many social scientists believe that correlation and regression analysis techniques (which include path analysis methods) are best carried out using only interval variables. We contend that ordinal variables can be used for path analysis applications, and in this we are joined by a large proportion of the social scientists who have addressed a scholarly debate over the use of interval as opposed to ordinal variables. However, we find several reasons now to use interval variables in the future. We justified the use of ordinal variables in this study on the grounds of economy (they are simple to use and allow rapid analysis), descriptive utility (since a major portion of this study involved description aside from path analysis per se), and pragmatism (given limited resources and an immense initial data base, the data sorting and analysis procedures had to be streamlined and simplified). Since validation does not entail comprehensive description nor creation of a new model, these justifications are no longer pertinent.

The use of interval variables will allow both confirmation and great refinement. The model can be validated using interval variables since the interval data can be grouped using the same categories as were used for the ordinal variables. Thus ordinal measures from two points in time and for two samples of communities can be compared directly. This direct comparison embodies the validation. However, once the comparison is completed the variables can be transformed back into interval variables. A re-analysis of the path model using only interval variables is apt to provide much stronger evidence of path linkages, much more reliable beta weights as path measures, and in general a more secure and revised path model.

Only a portion of the data collected was actually used in development of the model. Key variables retain the same labels in both data collection and final analysis (and in the model subsystems) and can be readily identified. Data for these variables should certainly be collected in a validation, but the additional or subsidiary topics are problematic. Some may be deleted, but others may provide data indirectly important to informed understanding of a key variable. That is, the topic may lead to no tangible result per se in the model, but may provide data necessary for rating and recording yet another variable.

The variables that were not employed directly in the development of the model are not necessarily useless, although their value is marginal. Some may provide information that is indirectly useful for coding family or community data for another variable (as above), whereas other variables show no promise at this time. These latter variables may be discarded from any future consideration in validation or application. These are variables 3-5, 7, 17-18, 29, 34, and 37. Several other variables do not directly provide information necessary for model validation and application, but do provide data that aid in scoring other variables and contextual or descriptive information that enhances an overall understanding of the data. These variables include variables 10, 12-16, 21, 25, 30, 33, 35-36, and 38-40. The remaining variables are all critical to the model design. The variables are identified by number in Appendix A, and data collection quidelines pertinent to them are described and discussed in Appendices A and B.

Total control for these eventualities is impossible, but selective deletion and substitution of items from that set of peripheral variables in successive validation trials might prove usefull. By comparing results it should be possible to significantly streamline the model, retaining explanatory and forecast potential while eliminating "excess baggage." The gains in efficiency should outweigh any losses in detail.

6.2 Applications

If the generalizations and typological characteristics embodied in the model are confirmed, the model can then be used to forecast changes likely in the subsystems in the model susbsequent to changes evident in the three exogenous subsystems (employment, economic opportunity, and inflation). Once validated, postulated links between subsystems become more credible. Causal relations can only be defended with diachronic, longitudinal data, not synchronic (time-bound, single-point) data. Thus, validation is central to the justification of the most basic assumptions contained in the model.

Once validated, data collection requirements for forecasting can be reduced so the protocols used in forecasting applications can be brief and economical. To the extent that validation is an ongoing concern in actual applications, a full set of primary and secondary data corresponding to each of the model subsystems should be collected and analyzed. This would entail both archival and field data collection, although abbreviated compared to the initial effort. If enough confidence in the model is generated, we can dispense with repeated verification of all subsystem characterisitics, and forecasting can be accomplished by assessing only the independent subsystems and then determining the likely response pattern across the entire system.

The risks of avoiding certain data in forecasts in favor of cost benefits should be weighed carefully. Although it is true that each and every subsystem in forecast applications need not be analyzed once the model is validated but rather only the "trigger" independent subsystems and their influences outward, these influences and thus the accuracy of the forecast are likely to remain problematic until the model has been validated three or more times. A conservative approach is advised with combined validation and forecasting attempts made as often as is feasible. This would increase the cost of the task but would prevent many potential errors.

As in the case of validation, the methods appropriate to applications have been fully treated elsewhere in this report. The reader is directed to Chapter 1 for a review of data collection procedures, Chapters 2 through 4 for analysis methods, and Chapter 5 for modeling and measurement details as well as relevant appendices for each chapter. When applying the model the sample of villages or persons involved should accommodate the constraints discussed above. An application trial would add to the longitudinal base by definition, hence the data collected would be nested in a series of records that have already been prepared. Cross-sectional controls on the reliability and generality of application results could be achieved in large part by sampling (in addition to possible "impact" communities) a "no treatment" group for comparison in order to better define the nature and quality of an impact.

In a practical sense this would be difficult since no firm evidence of nonimpacts could emerge (and thus "no treatment" control villages) until after the application. Nonetheless, whenever a "no treatment" group is required (i.e., when we need to compare impacted villages with untouched villages in order to tease "impacts" away from any systematic, general effects), informed though speculative judgments must be made about the communities in question. Thus, some villages in any given scenario are unlikely to be affected due to distance, infrastructure, and so on; but examples from such a group (perhaps outside the region in question) can and should be included. The fact that no absolutely defensible boundaries can be drawn between treatment and no treatment groups is not really significant here. What is important is the ability to introduce solid contrasts in the sample to distinguish between the contrasting items.

The exercise of information control should trim down and consolidate the model. In any case, were there to be a need for further manipulation before or during an application, it would generally be better to delete rather than substitute data items from the inventory of data that should be assessed. Although either option could skew or unbalance the results, it is far more likely that substitution of a new variable would do so.

Application also involves the operationalization of the three key exogenous variables. As Chapter 5 demonstrates, however, the complex and variable behavior of these subsystems is largely addressed within the model and through the actions of intervening subsystems. For this reason rather coarse, raw measures might be used for these variables and measures might be aggregated from multiple sources. This redundancy would guard against idiosyncratic effects of one variable influencing the entire subsystem. For the independent subsystems of employment and economic opportunity, a simple deflection from the longitudinal trend (correcting for seasonality, stochastic effect, and so on) could represent a change, or impact, in a positive or negative direction.

Any joint index or ratio of measures should begin to operationalize these variables. For instance, sheer proportional changes in numbers of jobs in several industrial categories and commercial fishing receipts could, taken together, represent employment change. Similarly, total dollars in state and federal grants and contracts (corrected for population size), commercial fishing receipts and pounds of fish landed, and private industrial capital improvements could also represent a joint measure of change in economic opportunity. Measures must be suitably realistic and represent changes that need to be assessed. For instance, many private industrial developments could lead to little or no opportunity for the average resident, yet such developments represent likely events and therefore should be captured by the model. Nonimpacts and specialized impacts are as important to identify as those that affect everyone.

For the exogenous subsystem of inflation change, a combined measure incorporating energy costs could be used. The present study used electricity and gasoline costs. Fuel oil and propane could well be added or substituted if their recorded characteristics are similar. Chapter 5 details the reasons for this choice in the discussion of this subsystem. The characteristics of these items seem far less capricious and potentially more sensitive than other measures assessed.

We recommend that time series trend analysis techniques be used. Although a deviation from a trend can be construed as a potential impact for path model assessment, a deviation is not merely a change in slope of a least squares regression line from one time interval to another. Such change may be necessary but is never sufficient proof that an impact has occurred. Integrated moving averages (or ARIMA) time series approaches assume that once longitudinal data series have been de-seasonalized (e.g. seasonal oscillations have been controlled) and outliers (wild fluctuations in the data series) accounted for, the trend in a series is chiefly due to stochastic effects which "drive" the trend. Fluctuations that remain in the series after these controls have been exercised are assumed to be evidence of discrete interventions, or impacts, on the data series. These are the deviations we speak of.

When used in impact analysis, integrated moving average methods cannot be used as exploratory gestures that "search" for impacts in most cases. It is a method appropriate for verification and identification once a hypothetical impact is posited. It is not appropriate to amass a body of data and then screen through it looking for deviations. Deviations must be inferred or posited, at which time ARIMA techniques may be used to determine if in fact a deviation at the appropriate time and place can be detected. Therefore common sense, logic, and data review must preceded time series analysis. If measurable changes to aggregate longitudinal data trends occur, integrated moving average techniques should be able to discern them. If they can be discerned and measured, and if the path linkages we have postulated are valid, then complementary changes to the subsystems to which the exogenous variables are attached should be detected.

The procedural options in validation and application that we recommend can be summarized as follows:

(1) For the first replication (validation), the analysis may be carried out without great concern for discrete impacts. Possible changes in relations among subsystems or trends in aggregate data are important, but the main focus of the replication is confirmation or rejection of the model assumptions, path influences, and overall path structure.

(2) For a second replication (validation or application), deviations in exogenous or independent subsystem trends would be posited and attributed to real events that may have influenced the behaviors of the subsystem variables. In the absence of OCS developments, such impacts might include other industrial developments, regulatory changes that might influence patterns of transfer funding or local resource extraction, or documented migrations. The researchers would infer and calculate the changes to other model subsystems predicted by the model, and then determine if observed changes correspond to expected changes.

(3) If the second option is exercised and a good correspondence between expected and observed patterns is achieved, subsequent trials (application) may replicate the analysis focusing primarily on exogenous and independent village-level variables. The behavior of these variales could then be used to forecast the states of other subsystems. However, primary data collection and analysis of at least some dependent subsystems and independent household-level subsystems be advised. One option would entail analysis of all variables, but with a limited sample (either few villages, or few households in several villages). Another option would be the analysis of the exogenous variables and all independent variables (both village-level and household-level, such as age of household head and income stability and predictability in the latter case) as well as the subsystems they are directly connected to.

6.3 Interpretation

Interpretation of findings after the model has been applied is fairly self-evident. Positive changes in an independent subsystem influence the adjacent subsystems and, depending on the specified path value, incur similar or dissimilar changes that in turn percolate through the other adjoining subsystems. A reading of results could be as simple as tracing a wave of change, or an impulse, through the model from the initial subsystem and on to all others that are specified. Once the measurements have been made, the interpretation requires little more skill than is needed to read a street map or an organizational chart. The only complication is the direction of influence (negative or positive), which can be retrieved from the text in this report.

The main interpretation obstacles beyond the very basic level just noted lie in constant questions of validity. Although it is possible to convincingly validate the model and show that it applies through time and across many groups, the underlying conditions and facts that make this so are always subject to change. Thus, validation does imply verification but not in a timeless or universal sense. It is best to maintain a conservative and skeptical perspective and to consider validation and application findings secure only assuming stability of the system and its measurements and pending other evidence to the contrary. These constraints follow smoothly from the discussions above and should be acceptable limits to inferences regarding the model once it is validated.

Additional constraints emerge from the nature of the data collection methods and the variables (subsystems) that are constructed and related on the basis of these data. Many of the variables are composed of scales along which only three of four distinctions are made, as is the case in the subsistence subsystems and others. The underlying scale is continuous, but the categories recognized are not, nor are they equivalent in size. Thus, the level of investments families make in subsistence may vary continuously and in the end represent a number of values equal to the entire sample of families. (In this study there would be 82 separate levels of investment.) Only three options were recognized--less than 10 percent of the family income, between 10 percent and 20 percent, and 20 percent or more. Variables of this sort introduce transition barriers (here, at 10 percent and 20 percent) that do not occur in other scaler variables, like sex ratios and dependency ratios. Furthermore, some of the data were collected in categories (like the subsistence variables), whereas other data were continuous but during analysis converted to categorical forms (like family income, which was converted to quartiles). This discussion restates the issue of interval versus ordinal variables (see Section 6.1). As noted above, in validation and application trials we recommend the use of interval variables.

These transitions pose a problem in interpretation since changes to the continuous variables, although measureable, may not lead to a tangible change in other sorts of variables. For instance, some identified impulse might lead to a positive change in a domestic variable postulated on the basis of the model; but if this change represented an increased subsistence investment from 11 percent to 18 percent of family income, this would not dislodge the subsistence investment rating that the family originally had. The value still would reside in the same category. This example is grossly simplified since changes to any specific family would not be interpreted using this model anyway but is included to make the point. Strict, simple, additive links between subsystems are not intended, and any interpretation of changes to subsystems should bear these constraints in mind. The variables represent subsets of data, and real changes to these data need not be consistently expressed by changes to the subsets to which they belong.

Another constraint on interpretation stems from the fact that the path model does not encompass feedback between subsystems. We acknowledge that feedback does occur, and that changes in the behavior of "dependent" subsystems may influence "independent" subsystems. One could easily imagine changes in household income that, if sufficient, might dislodge a family from an income assistance program such that their rating for income stability and predictability might change. The direction of this change is contrary to the path model arrangement. Similarly, changes in village size might make some villages more attractive to entrepreneurs and retailers, such that economic opportunities would arise in these villages were businesses to locate there. This influence too is contrary to the path arrangement. Although we believe that the model reflects credible, logical, likely, and empirically supportable relations between socioeconomic elements, it does not account for feedback. It is a undirectional, hierarchic "trickle down" model. The hierarchic "trickle down" perspective was largely stipulated by the statement of work for this study. It is important that readers of this document understand the limits of the model. The model vastly simplifies empirical conditions for the sake of brevity and generalization.

Another constraint is due to the possible flaws in the demographic variables in several of the model subsystems. The demographic subsystems (village size, dependency ratio, sex ratio, and proportion of single person households) are based on census data. These data are apt to undercount village populations since they typically misrepresent the number of household members who are absent temporarily. To the extent that temporary outmigration and population turnover is stratified by age and sex, they may also misrepresent sectional ratios. These variables may do an adequate job of capturing a current status quo (e.g. actual village residence at one point in time), but may not adequately account for patterns of transient in- and outmigration that are nonetheless relatively pedictable and stable. Nome and Golovin, and possibly Savoonga and Unalakleet are cases in point (see Chapter 3) since they may exhibit significant patterns of temporary outmigration, return migration, and turnover in general. If census data consistently misrepresent temporarily absent household members, and if the cross-sectional characteristics of population turnover are much the same from year to year, this should not be a major problem. If however census data vary in their representation of temporary outmigrants and turnover characteristics vary significantly, this data source is inappropriate for the uses we advise and the demographic ratings we have developed for the villages may be invalid. In the latter case we recommend that primary rather than secondary data be used to develop demographic subsystem measures in the model. In any event we urge caution in interpreting these subsystems.

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APPENDIX A

(Data Collection Protocol, Discussion of Variables and Codebook)

APPENDIX A

Domestic Network Protocol

The focus of the protocol is households. The sample will be achieved by beginning discussions with two households of your choice, selected fortuitously or via key informant suggestions. The sample will be divided by sex for further sampling purposes. Although the household is the focus, further sampling through the network is planned, and in this way the identity of another network member (one with whom subsistence, institutional, or other activities are conducted) can be elicited from the key male and the key female. This does not mean that one sample is male and the other female; rather, the guidance for further sampling is through information from males in one case, females in the other. You will sample these two networks deeply, the target being about twelve households. During or at the close of each discussion, you will elicit the identity of two other persons with whom activities are conducted; and these two then represent the next lower nodes in the network under investigation. If you are unable to sample these two networks deeply, or if field events (i.e., willingness of other families to participate, for instance) dictate a change in plans, then you may shift to the second sampling option, sampling four networks at a shallow level. The same procedures as above will be followed, although you should try to further segregate your sample by age. In the same way you have already distinguished between sexes in carrying out the sample, in the second option, you should distinguish roughly between generations and elicit the identities, male and female, of parties who differ in generation (older or younger) from the party in the household through whom the network is defined. The protocol, in addition, is essentially an assignment for you, the field researcher, not for the households. Questions and other topics contained herein should not be asked directly. These questions and topics are directed at you and identify the information that you should collect. The collection process should be defined by field conditions and the nature of the domestic group in question. In some cases, and for some information, you may have to rely on direct observation, whereas in others directed discussions will be appropriate. In your field notes, be sure to describe the elicitation technique used and why.

Income Grid

Household Members:
(use more space as is necessary)

	1	2	3	4	5
paid: (5 yrs)					
source: (5 yrs)					
job type: (5 yrs)					
transfer: (5 yrs)					
transfer source: (5 yrs)					
self-employ: (5 yrs)					
loans: (current)					
loan source:					
gifts: (current)					

For the above, determine how (1) stable and (2) predictable incomes are, under what conditions, and for what types of incomes.

Production-Distribution-Consumption
Household members

	1	2	3	4	5
produce-extract: current; specify main types)					
production organization: (leaders, partners; describe characteristics)					
distribution: (to whom; what; decision/ channel, i.e. via kinship, normal agreement; specify nature of commodity i.e. resources, skills or services etc.)					
consumption: contrast to above; self or other extracted, via whom; what; distribution channel/type; specify type i.e. skills, goods)					

For all subsistence activities, and by extension from extraction/production to the other categories, seek to determine the scale of capital investment in subsistence, i.e., what it takes in cash outlays to sustain subsistence, whether this be production, distribution, or consumption. Capital outlays are required in each, though they are naturally more pronounced in production. Production entails all gas, durable goods, transportation and other expenses. These data are best elicited by concrete example. Go back to the most recent hunting or fishing trip, and have the discussant tally expenses. Then ask how many trips like that were conducted during the last year. To the extent that these other trips were different in scope or distance travelled, determine if the figure obtained from the first estimate could be applied to other activities. Distribution and consumption expenses would entail transportation and communications costs, cleaning, preparation, and other similar expenses.

In addition, perform a brief, capsule purchase-market habit review. Elicit an inventory of the typical, most common commodities purchased locally (gas, food, etc.), perceived price trends, attitudes about how critical these items are, (i.e., which could they go without), and which items have actually been dropped from the monthly roster of expenses.

Residence-Composition Grid

Household members

	1	2	3	4	5
sex					
age					
relation/ kinship					
formalization i.e. boarder, rent paid, etc. if relevant)					
domestic role (what do people do to sustain the household, briefly)					
transience (describe temporary residents)					
displacement (residence due to divorce, no home, etc.)					
time depth (how long)					
previous residence (5 yrs)					

Institutional Grid

Household members:

	1	2	3	4	5
IRA (role, how long)					
City (role, how long)					
Corporation (type, role, how long)					
CRSA (role, how long)					
REAA (role, how long)					
ASC (role, how long)					
commercial organization (role, how long, type)					
other (specify type, role, how long)					

For above, seek to determine shifts in role and membership through time (last five years) especially with regard to the way in which members were recruited into organizations, i.e., through election, nomination, assignment, transformation of organizations, and reorganization of personnel, etc.

Facilities Index

Chart out the age of the home, cost/value of the home, monthly payments on the home, funding source for the home (ASHA, etc.), utilities consumed, payments for utilities, working condition of the utilities, age of the utilities (i.e., when was the sewer put in? when did it start actually working? how long have they had a phone? CB? etc.), and, if the data in the residence-composition grid show recent (five years) residence in another home, try to determine these factors for the previous residence.

Job History/Attitudes

Refer back to the income grid and outline the job histories of household members who have worked in the last five years. Detail (1) type and location of job, (2) upward mobility, (3) job skills held by discussants and how attained, (4) reason for leaving past jobs, (5) duration of jobs, (6) ideal types of jobs preferred and (7) their seasonality. In addition, employ the following:

1. Brayfield and Rothe Index of Job Satisfaction: for each of these economic activities, and where relevant, use these elicitation prompts to collect open-ended information. This includes job, homemaker activity, subsistence hunting/fishing, self-employment (cottage industry, commercial fishing). We will attempt to scale responses, so determine just how strongly or weakly in a relative sense the discussant feels.

a. Discussant considers this activity interesting enough to prevent boredom.
b. Discussant considers this activity unpleasant.
c. Discussant considers this activity more enjoyable that leisure activities.
d. Discussant is disappointed that he/she participates in this activity.

General Attitudes

1. Bogardus Social Distance Scale: Do not consider these prompts to be questions, but rather elicitation guides for you. On the basis of local conditions and rapport, determine how to collect evidence for these concepts. For each of the following categories of persons and occupations, seek to determine how closely the discussant(s) would tolerate proximity/interaction.

persons: non-local but kin related persons; Native persons from outside the region; Anglo persons from outside the region; outside blue collar workers; outside professionals (teachers, physicians).

relations: live in the village (no reference to work); work in the village permanently; work in the village for a short time.

2. Control and benefits attitudes: determine household/discussant attitudes about where control of local institutions is vested (local, external, etc.); who would benefit from local economic development, especially energy development; who would exercise control of local economic development.

3. Community Solidarity Index: use these elicitation prompts to collect open-ended information.

a. People here work together to get things done (community spirit).

b. People feel that they belong here (interpersonal relations).

c. Children are taught to respect others here (family responsibility).

d. Some people benefit from things too much; some people are too greedy; incomes/resources are polarized (economic behavior).

e. Community is thought to be peaceful; people here exercise good judgement (tension areas).

Because we will attempt to scale responses, seek to determine how weak or strong these attitudes may be and under what conditions.

4. Kahl's Achievement Orientation Index: collect open-ended data for each of these four dimensions; the elicitation prompt conveys the key concept.

a. Trust: people may take advantage of you if they know all about your life.

b. Activism: planning ahead isn't useful since too many things can get in the way.

c. Occupational primacy: economic activities (job, subsistence) should come first, ahead of friends, family, leisure, etc. (specify for both jobs and subsistence activities).

d. Integration with relatives: it is best to work close to home/family/relatives, even if it means giving up good opportunities elsewhere.

As before, we will attempt to scale these data, so try to determine relativistically how weak or strong these attitudes are.

Economic Supplement

1. Market basket survey: Using available local records, compile a quarterly time series (using quarterly averages, figures from arbitrary months, or any feasible methods) of prices back (ideally) to a 10 year horizon for the following commodities (any brand, even if variable over time)--gasoline, fuel oil, electricity rates, toilet paper, disposable diapers, sugar, cooking oil, flour, pilot biscuits, onions, canned milk (add if feasible, or substitute, propane, cigarettes, canned soda, tea, coffee, peanut butter). Use standardized weights if possible.

2. For the current year, using key informants or local records, determine:

   a. Total number of paid employment positions occupied by local residents, of any duration (specify if possible where duplications occur, i.e., three positions occupied by one person over the year, for instance).

   b. Total number of local positions occupied by non-local people.

   c. Total number of entrepreneurial/self-employment, income-producing jobs occupied by local people.

Discuss and flesh out these data with details wherever possible.

INSTITUTIONAL PROTOCOL

Select five formal institutions on the basis of scale of revenues or budget and size or duration, (after completing topic one below).

1. Institutional inventory: assemble an exhaustive inventory of all formal institutions in the community, their duration of existence (founding/charter, as well as periods of inactivity), viability (oscillations in membership, periods of relative decline or reactivation), and size (membership, number of employees, size of operating budget). Be alert to the possibility of institutional transformation, wherein an older institution reappears in a new guise. Identify and review local documentation/records concerning these details (i.e., minutes, charters, etc.) as needed to corroborate and expand data base.

2. Institutional coordination and cooperation: for the selected five institutions, plot out a profile using the grid below as a guide; identify with which other institutions these relations may variably apply, and identify and review local records as needed for corroboration; determine if these characteristic relations are recent, and if other relations typified the given institution(s) before. Employ a key informant approach based on information collected in (1) above.

	Low Coordination	High Coordination
Low Cooperation		
High Cooperation		

Specify how the assessment was made.

2. Hemphill Index: for each topic, use open-ended discussion methods with key informants. The results will be scaled, so seek to determine relativistically just how "strong" or "weak" the measurements should be.

a. Control: profile supervision style. As an elicitation prompt, you might assert "members of the group work under close supervision."

b. Stability: as in (a), "there is a large turnover of members."

c. Intimacy: "all members know each other well."

d. Stratification: "every member of the group enjoys the same privileges."

e. Hedonic tone: "the group accomplishes its activities without vigor or pleasure."

f. Autonomy: "group activities are directly influenced by a larger or separate group (of which it may be a part)."

g. Potency: "group membership is a way to achieve social status."

h. Viscidity: "there are tensions among members or subgroups that interfere with group activities."

i. Permeability: "membership is open to anyone who wishes to participate."

j. Participation: "group work is evenly divided among members, or allocated by objective criteria."

k. Polarization: "the group performs many activities not related to its major objective."

l. Flexibility: "straightforward rules guide the group's activities."

m. Homogeneity: "members of the group vary widely in terms of social background."

4. Organizational indices: document the following, again employing relativistic weighting procedures when required.

a. size: proportion of administrative staff to others; total number of employees/members.

b. Hage and Aiken Formalization: job codification (how standardized are jobs, activities, etc); rule leniency (how does the organization, and to what extent, tolerate deviancy, i.e., how are personal differences, activity performance deviations, etc. handled).

c. Pugh Index of Centralization: autonomy (are decisions made internally, or externally through another organization); executive control (how many subordinates report directly, and primarily, to the top executive); worker/supervisor ratio; total number of direct supervisors.

5. Community Solidarity Index (institutional modification): begin with the following assertions as points of departure in discussions; however, and as is true for all protocols, do not ask or use these assertions, but rather use the key internal concept in some form as an elicitation prompt.

a. Institutional spirit: "members work together to get things done."

b. Interpersonal relations: "members feel that they belong."

c. Institutional responsibility: "members are encouraged to follow certain moral guidelines."

d. Economic behaviors: "some members benefit too much from group activities; resources are stratified or polarized."

e. Tension areas: "the institution/organization is peaceful; members exercise good judgement" (in what ways, and under what conditions?).

Discussion of Variables

The codebook included in this appendix is a listing of all the variables for primary data analysis that were developed on the basis of domestic protocol information as well as selected institutional protocol and aggregate data that might prove useful in characterizing the communities in which the domestic data are situated. These variables are condensed categories of information that were devised in order to rank or score the actual data, case by case, in a uniform fashion, to allow analysis of the data in a way that is both formally structured and empirically realistic. Therefore, the variables were developed on the basis of not only a review of the actual spread of our data but also distinctions that are meaningful to our general approach and objectives. These variables represent nominal (for instance, "village" or "region" categories), ordinal ("age of household head," or "political participation" ordered classes), interval ("income" and "village size"), and ratio (most demographic variables) measurement categories.

These variables may be either village or domestic variables in that some variables may apply to entire communities (such as the demographic and institutional variables), whereas others serve only to characterize individual cases, that is, families. Thus we have six sets of cases, for a total of 82 cases (families) across six villages. The village variables (which will be coded the same for all cases within that village) are variables 1-18 and 38-41; the domestic variables are variables 19-37 (which are used for coding individual cases, or families, within all villages).

These variables will be summarized very briefly below in those cases where some notation would be useful. Many of the variables are self-evident in form and use, and these will not be covered. The codebook follows this narrative, and the reader is urged to consult the codebook variables while reviewing the comments below. The codebook lists the variables by number and name and gives the values that can be assigned to any particular case. In the case of numeric interval or ratio variables, no values are listed but are instead coded as raw numbers. The additional entries in the codebook can be ignored and refer only to the computer file format and whether the variable is numeric or alphanumeric.

Variable 3: generalizes the overall employment status of a community and seeks to specify if overall the community draws or sends a workforce. The breakdowns are so gross that this variable was not useful.

Variable 4: soughtto generalize about the entire village economy, and to class villages on the basis of an overall reliance on primary production surges (seasonal fishing, for instance) or a more static reliance on public service transfer monies. This variable, too, was not useful.

Variable 5: could not be reliably operationalized.

Variable 7: classes communities on the basis of a comparison of population and school enrollment trends. Because school enrollment figures are highly problematic village by village, this variable has not yet been operationalized. Aggregate time series for enrollments are now in hand, and this variable can be used in the typological phase of analysis if it proves useful.

Variables 8-9: these ratios are taken directly from the 1980 census data.

Variable 10: classes villages on the basis of the proportion of Native leadership in local institutions. It did not provide information that wasn't better exposed in other ways and will not be used.

Variable 11: classes communities on the basis of relatively judged interplays between local institutions--more or less coordination (formalized associations between them), and more or less cooperation (actual, operational joint assistance between them regardless of coordination).

Variable 12: condensed from the Hemphill scale (cf. Technical Memorandum 83/88-1), this variable classes communities on the basis of institutional recruitment--whether organizations are by and large permeable (i.e., there is no privileged or fixed membership pool) and unstable (i.e., there is turnover back and forth between the group core and the open membership pool), nonpermeable (there is in fact a relatively fixed membership pool) and unstable, or stable (little flux in membership, whether or not the group's membership pool is fixed or not).

Variable 13: also condensed from the Hemphill scale, this variable classes communities on the basis of institutional independence and direction--whether institutions are in general relatively autonomous (are or are not heavily influenced by other organizations) and are in general relatively polarized (do or don't have diffused, relatively unconnected activities and objectives).

Variables 14-15: the former (14) specifies how large the administrative component is overall in local organizations; the latter (15) typifies in general how many structural boundaries there are in local organizations (i.e., an organization with an administrative core, management, and line staff would have two boundaries).

Variable 16: dervied from data collected with a variety of scales (Technical Memorandum 83/88-1), this variable seeks, on the basis of the researchers' best judgement and institutional data, to specify if structural tensions exist within and between local organizations, or if there is no such evidence. Here we refer not to perceived tensions, but to evidence of structured or institutionalized competition or polarization between organizations.

Variable 17-18: disregard; price changes and broad economic trends may be addressed with aggregate data but not with primary data at this stage.

Variable 21: extended and nuclear family structures are self-explanatory; by coresidential we refer to formalized or informal living arrangements in which more than one corporate estate and functional group is represented (as opposed to extended families that may have more than one estate but nonetheless can be considered a single corporate and functional entity for our analysis).

Variables 22-23: classes families on the basis of sheer numbers of roles in the household; sodalities are nonformal social affiliations, such as clubs and societies.

Variable 24: scales families along a dimension of resource strategies from a typical family pattern of resource pooling and accumulation (goods, money, etc., to be accumulated and kept), through local distribution (goods and resources will be pooled, but also distributed out to a more or less locally defined group), and to local and regional distribution (where these goods and resources would be distributed extensively). The rating is dependent on the specific primary evidence of resource distribution from the protocols to the extent that a generalization is allowed.

Variable 25: classes families on the basis of the task organization and recruitment patterns they show. Families tend to have a fairly closed and structured recruitment pattern; a fairly closed recruitment group and overall a more spontaneous, flexible organizational style; or an open, undefined recruitment group and a flexible, opportunistic style. These classes represent a condensation of empirical patterns in our data and do not necessarily refer to any formal breakdown that might be generalized to many other cases.

Variable 27: in a way that has proven useful elsewhere (e.g., OCS Social Indicators study), subsistence harvests in the household are here classed on the basis of diversity. Fewer than one typical harvest in every one of five categories (sea mammals, land mammals, fowl, fish, vegetables); at least one from each category; or two or more examples from every category. These do not refer to occasional or sporadic harvests, but rather to patterned and substantial efforts that the families make toward these ends.

Variable 29: intended to use the researchers' observations to arrive at a single judgement as to the stability of the "household infrastructure"; it was not useful.

Variable 32: income here is classed as being unstable or stable (i.e., seasonal or periodic, or not), and unpredictable or predictable (regardless of stability, whether or not there is some assurance of obtaining that income). Stability is easily judged on the basis of objective income data, whereas predictability depends on a consideration of both past performance and household perceptions.

Variable 33: scales the family perceptions of how development control and benefits will flow from a general perception of local benefits to a perception that overall places the controls and benefits of energy development external to the region.

Variables 34-37: drawn from a number of the scales and indices in the latter part of the domestic protocol and are intended to characterize families in terms of the extent to which economic goals predominate in their family affairs; the social distance (stigma in simplest terms) that is perceived between families and various groups; perceived community tensions; and family goals. In some minor cases these variables may have some use, but in general they are too intangible to analyze as they stand, and we have too many missing data due to the difficulty of applying vaguely defined variables. Except in cases that may be detailed in the text or later in other analyses, these variables can be disregarded.

Variables 38-41: demographic ratio-level variables that were drawn from 1980 census data, and represent a stratified (age and marital status) sex ratio; another stratified (age) sex ratio; and two household and marital status ratios that may allow useful comparisons with the dependency ratio and sex ratio in variables 8-9.

Codebook listing - NORT:1A

VARIABLE # 1 - REGION
Start column = 10   Number of columns = 1   Type = Alpha

A=BERING STRAITS
B=YUKON-KUSKOKWIM

VARIABLE # 2 - VILLAGE
Start column = 11   Number of columns = 1   Type = Alpha

A=SAVOONGA
B=NOME
C=GOLOVIN
D=UNALAKLEET
E=EMMONAK
F=ALAKANUK

VARIABLE # 3 - EMPLOYMENT TYPE
Start column = 12   Number of columns = 1   Type = Alpha

A=HOST COMMUNITY
B=NON-HOST/DONOR
=MISSING DATA

VARIABLE # 4 - ECONOMIC ACTIVITY/STRUCTURE
Start column = 13   Number of columns = 1   Type = Alpha

A=PRIM. PROD. PEAK
B=PUBLIC SERVICE
=MISSING DATA

VARIABLE # 5 - INFLATION/MULTIPLIER
Start column = 14   Number of columns = 3   Type = Numeric

=MULTIPLIER

VARIABLE # 6 - VILLAGE SIZE
Start column = 17   Number of columns = 4   Type = Numeric

VARIABLE # 7 - DEMOGRAPHIC GROWTH
Start column = 21   Number of columns = 1   Type = Alpha

A=POP./ENROLL CONS
B=INCONSISTENT

VARIABLE # 8 - DEPENDENCY RATIO (UNDER 15)
Start column = 22   Number of columns = 3   Type = Numeric

VARIABLE # 9 - SEX RATIO (M/F)
Start column = 25   Number of columns = 3   Type = Numeric

ARIABLE # 10 - INSTITUTIONAL PARTICIPATION (EIPART)
Start column = 28   Number of columns = 1   Type = Alpha

A=100% NATIVE
B=NOT 100%
=MISSING DATA

ARIABLE # 11 - INSTITUTIONAL COOP-COORD (EICOORD)
tart column = 29   Number of columns = 1   Type = Alpha

A=-COOP, -COORD
B=-COOP, +COORD
C=+COOP, -COORD
D=+COOP, +COORD
=MISSING DATA

VARIABLE # 12 - HEMPHILL STABILITY-PERMEABILITY
tart column = 30   Number of columns = 1   Type = Alpha

A=PERM; UNSTABLE
B=NONPERM; UNSTAB
C=STABLE/OTHER
=MISSING DATA

ARIABLE # 13 - HEMPHILL AUTONOMY-POLARIZATION
start column = 31   Number of columns = 1   Type = Alpha

A=AUTON. AND POLAR
B=NON-AUTON/POLAR
C=NONPOLAR/AUTON
D=NONPOLAR/NONAUT
=MISSING DATA

VARIABLE # 14 - ORGANIZATIONAL SCALE-STAFF RATIO
tart column = 32   Number of columns = 1   Type = Alpha

A=HIGH ADMIN(25%+)
B=LOW ADMIN %
=MISSING DATA

VARIABLE # 15 - ORGANIZATIONAL SCALE-STRUCTURE
tart column = 33   Number of columns = 1   Type = Alpha

A=2+ BOUNDARIES
B=0 OR 1 GENERALLY
=MISSING DATA

ARIABLE # 16 - SOLIDARITY
tart column = 34   Number of columns = 1   Type = Alpha

A=STRUCT. TENSIONS
B=NO EVIDENCE
=MISSING DATA

VARIABLE # 17 - MARKET BASKET
Start column = 35   Number of columns = 1   Type = Alpha

A=ENERGY/CAP. HIGH
B=OTHER CONSUM =/>
 =MISSING DATA

VARIABLE # 18 - UNEARNED STRUCTURES
 tart column = 36   Number of columns = 1   Type = Alpha

A=75%+ RAW ECON
B=50-74%
C=LESS THAN 50%
 =MISSING DATA

VARIABLE # 19 - HOUSEHOLD SIZE
Start column = 37   Number of columns = 1   Type = Alpha

A=1 TO 3
B=4 TO 6
C=7 TO 10
D=11+
 =MISSING DATA

VARIABLE # 20 - AGE OF HOUSEHOLD HEAD
Start column = 38   Number of columns = 1   Type = Alpha

A=UNDER 30
B=30-44
C=45-59
D=60+
 =MISSING DATA

VARIABLE # 21 - HOUSEHOLD STRUCTURE
Start column = 39   Number of columns = 1   Type = Alpha

A=EXTENDED
B=CO-RESIDENTIAL
C=NUCLEAR OR OTHER
 =MISSING DATA

 ARIABLE # 22 - SODALITY MEMBERSHIPS IN HOUSEHOLD
Start column = 40   Number of columns = 1   Type = Alpha

A=2+ MEMBERSHIPS
B=1
C=NONE
 =MISSING DATA

VARIABLE # 23 - POLITICAL PARTICIPATION IN HOUSEHOLD
 tart column = 41   Number of columns = 1   Type = Alpha

A=2+ ROLES
B=1
C=NONE
 =MISSING DATA

VARIABLE # 24 - INCOME AND LABOR STRATEGIES
Start column = 42   Number of columns = 1   Type = Alpha

A=POOL/ACCUMULATE
B=LOCAL DISTRIB
C=LOCAL/REG DISTRI
 =MISSING DATA

VARIABLE # 25 - DOMESTIC NETWORK TASK ORGANIZATION
Start column = 43   Number of columns = 1   Type = Alpha

A=CLS. RECRUIT/STR
B=CLS. RECRUIT/SPO
C=OPEN RECRUIT/OPP
 =MISSING DATA

VARIABLE # 26 - SUBSISTENCE HARVEST EXPENSES
Start column = 44   Number of columns = 1   Type = Alpha

A=LOW(0-9% INCOME)
B=MED(10-19%)
C=HIGH(20%+)
 =MISSING DATA

VARIABLE # 27 - SUBSISTENCE HARVESTS
Start column = 45   Number of columns = 1   Type = Alpha

A=LESS THAN 1 SPP
B=1 SPP PER CATEG
C=2+ SPP PER CATEG
 =MISSING DATA

VARIABLE # 28 - HARVESTED PROTEIN IN DIET
Start column = 46   Number of columns = 1   Type = Alpha

A=LESS THAN 50%
B=50-75%
C=MORE THAN 75%
 =MISSING DATA

VARIABLE # 29 - CAPITAL-TRANSPORT-SHELTER STABILITY
Start column = 47   Number of columns = 1   Type = Alpha

A=CAPITAL INTACT
B=UNSTABLE
 =MISSING DATA

VARIABLE # 30 - EARNED PROPORTION OF INCOME (EPRO)
Start column = 48   Number of columns = 1   Type = Alpha

A=NONE
B=1-49%
C=50% OR MORE
 =MISSING DATA

VARIABLE # 31 - HOUSEHOLD INCOME
Start column = 49   Number of columns = 2   Type = Numeric

=VALUE IN K $

VARIABLE # 32 - INCOME STABILITY AND PREDICTABILITY
Start column = 51   Number of columns = 1   Type = Alpha

A=UNSTABLE/UNPRED
B=UNSTABLE/PRED
C=STABLE/UNPRED
D=STABLE/PRED
=MISSING DATA

VARIABLE # 33 - PERCEPTIONS-CONTROL/BENEFITS OF DEVELOP
Start column = 52   Number of columns = 1   Type = Alpha

A=LOCAL LOCUS
B=BLEND
C=EXTERNAL LOCUS
=MISSING DATA

VARIABLE # 34 - ECONOMIC PRIMACY
Start column = 53   Number of columns = 1   Type = Alpha

A=SUBS/JOB/$ FIRST
B=OTHER FIRST
=MISSING DATA

VARIABLE # 35 - SOCIAL DISTANCE
Start column = 54   Number of columns = 1   Type = Alpha

A=EVIDENT STIG/XEN
B=NO EVIDENCE
=MISSING DATA

VARIABLE # 36 - SOLIDARITY
Start column = 55   Number of columns = 1   Type = Alpha

A=PERCEIVE TENSION
B=NO TENSIONS
=MISSING DATA

VARIABLE # 37 - ACHIEVEMENT GOALS (GOAL PRIMACY VS. NON)
Start column = 56   Number of columns = 1   Type = Alpha

A=GOAL/TASK PRIM.
B=PROCESS OR OTHER
=MISSING DATA

VARIABLE # 38 - SINGLE 15+; M/F
Start column = 57   Number of columns = 4   Type = Alpha

=MISSING DATA

ARIABLE # 39 - M/F, 20-44
Start column = 61 Number of columns = 4 Type = Alpha

=MISSING DATA

VARIABLE # 40 - 2+ PERSONS CONJUGAL HOUSEHOLDS %
Start column = 65 Number of columns = 4 Type = Alpha

=MISSING DATA

ARIABLE # 41 - SINGLE PERSON HOUSEHOLDS %
tart column = 69 Number of columns = 4 Type = Alpha

=MISSING DATA

APPENDIX B
Methodological Review

APPENDIX B: Methodological Review

Sampling Approach

There are two basic methods for maximizing the generalization potential of network data. One is to sample many networks at a shallow level, the other to sample few networks deeply. (These options presuppose constraints on resources making it impossible to sample all networks exhaustively.) Because we do not know particularistic details about the networks in the study communities (that is, how shallow they may be in given cases, how amenable those individuals are apt to be to participating in this research, etc.), the approach taken makes little difference. Field workers will sample only two networks very deeply (that is, to follow the linkages between network members out several steps to reach as much of the membership as possible). If it becomes difficult to sample deeply, then other samples shall be initiated to achieve the second alternative; i.e., a shallow sample of several networks. This will prevent the field effort from becoming diffused. If we were to begin with the notion of sampling several networks to a certain extent, we might find that certain networks are very amenable to participating and others are not. By the time it might be too late to take advantage of such fotuitous discoveries. Our plan is to begin with the "deep" option and retreat to the broader, but shallower option, if necessary.

Another key sampling consideration is representativeness. Although many structural similarities may emerge among networks, the sample must be planned to maximize its representativeness. Because we know that many skills, attitudes, uses of resources, etc. are age and sex-specific, age and sex must be considered. The field researchers will be instructed to base their field discussions not around the head of household, but around the key males in one set of networks and key females in the other. If deep sampling is impossible and the broader and shallow sample must be used, researcher will move on to two more networks. These will be divided but will use two males and two females of another generation (compared to the initial set of two networks, the samples of which are organized by sex). This will accomplish a set of network samples organized by both sex and age.

If we are unable to achieve two deep samples and move on to attempt four shallow samples, the samples will be further defined by generation; that is, the "Ego" upon which we will center will be same sex but of a younger or older generation. The reason we will not begin with an age-defined criterion is because age generation is potentially more ambiguous and confusing in interpreting as a sample characteristic. Are certain activities and elements characteristic of the older group representative of a "1930-40 milieu" as it is visible today, or are those activities and elements part of a predictable generational cycle? Age stratification is a hedge on time depth for this reason. Such a technique may show us how any network changes through time, rather than how, or if, "modern" networks are different from those of the past, or founded in the past.

Aggregate Data

As explained above, there are three distinct phases of aggregate data collection. The first phase consists of the collection and time series analysis of secondary and primary aggregate data that we already know to be useful. The results of the first phase dictate the course of the second phase in some particulars and the third phase in all particulars. The second phase represents the collection effort that will occur in the field. The Nome Update data and institutional data from the field sites, collected in conjunction with institutional key informant discussions, comprise this phase. The Nome Update data represent an ancillary add-on that will not undergo the typological and forecasting analysis that represents the core of the study. The institutional data in large part will be defined as a result of the key informant discussions.

The nature of these data are really better described in connection with the field protocols, but these data will be briefly described here. The key informant discussions, which would occur first in this scheme, would be geared toward determining the dimensions of organizations in the community, the type of coordination and cooperation that occurs among them, and so on. After the discussion and after the data have been reviewed preliminarily while still in the field, these data would be corroborated and complemented by records from the field site. For instance, once some information has been volunteered about coordination between organizations, the field researcher would then, and on the basis of that volunteered information, seek to collect data about that coordination. This evidence typically might consist of contracts between organizations, and minutes of joint meetings. The third phase would consist of the collection of additional primary and secondary data that, due to initial findings within the first phase, would be apt to help confirm, refute, or otherwise flesh out these preliminary and suggestive findings.

Field Protocols

Two types of field protocols will be employed by the field researchers to guide and structure data collection at the field sites--an institutional protocol and a domestic network protocol (see also Appendix A and Chapter 1).

The institutional protocol has three functions, which can be defined operationally as objectives to which the field researcher's attention is drawn and activities directed. First, the field researcher will assemble an exhaustive inventory of institutions or organizations in the site community and develop a profile of each. The inventory itself is useful chiefly as a descriptive catalog of social entities in the community. The significance of the mere number of organizations is unclear, but the proliferation of institutions throughout rural Alaska is an historic trend, and one that is accelerating, and it should be charted for each community. The institutional profile represents a brief history of the organization that will aid the study team in interpreting the role of the institution, plotting the emergence of organizations in response to past events that we can identify, and detecting possible oscillations in institutional viability and interactions with other institutions. The profile briefly sketches out the emergence of the formal institution, periods of decline and reactivation, and shifts in purpose or orientation. These data can easily be retrieved from key informants and organizational minutes or other records.

Employing a key informant dialogue with expert informants representing the institution, the protocol will guide the collection of data that will allow a description of the organizational dimensions, membership characteristics, and community roles of organizations to be developed. One matrix of institutional cooperation and coordination, and six organizational indices represent the core of the protocol. Once data demanded by these indices and the matrix have been collected, primary aggregate and other recorded data will be identified and pursued. These additional data will provide a second source of evidence to corroborate the reports of the key informants.

Coordination is defined by formal connectedness regardless of the quality of joint purpose or amiability that characterizes that coordination. Subcontracts, formal agreements, joint planning activities, etc. between institutions represent coordination. Cooperation has a less tangible definition but one that is easily evident to both residents and trained field researchers. Cooperation represents alliance, and joint institutional consensus and unity in carrying out institutional objectives. Cooperation may or may not co-occur with coordination, and vice versa. The best way to determine if cooperation exists is to detect if an organization is carrying out objectives another organization is chartered to perform, or if there is an informal "hidden agenda" that binds the parties together in mutual enterprise. For instance, two organizations may loan each other money "off the books," or lend one another equipment or facilities. This is cooperation. If these activities are formalized, it represents both coordination and cooperation. If the formalization exists, but the organizations fail to advance the objectives nominally represented by the coordination, then coordination exists without cooperation.

A modification of Hemphill's Index of Group Dimensions (Hemphill and Westie, 1950) will be used in this protocol. This index has been in use for more than 50 years and distinguishes between 13 largely independent dimensions including autonomy, control, flexibility, hedonic tone, homogeneity, intimacy, participation, permeability, polarization, potency, stability, stratification, and viscidity. Each dimension will be measured through the retrieval of information on relevant topics during the key informant interview and, where relevant, in secondary data searches. Autonomy, for instance, refers in very tangible, operational terms to how closely members of the organization are supervised. The topic of supervision will provide open-ended data on the subject.

Three related measurement indices will also be used. A simple size index is the first, consisting basically of measures of the numbers of members and the proportion of administration to others. Both measures are significant for many reasons: the size factor is greatly influenced by technology, the administrative proportion tends to follow predictable patterns (large if the organization is very small or large, but decreasing in the middle range), and large size creates both difficulty (in coordination and control) and advantage (less dependence on individuals, etc.). A modification of the Hage and Aiken Formalization Inventory will also be used. This index measures job codification (i.e., standardization of positions and performance) and rule leniency (i.e., toleration of deviancy) (Aiken and Hage, 1966). The topics of formalization, broken down into standardization and leniency, will be discussed with key informants and researched where feasible using records (e.g., performance guidelines, job descriptions, internal regulations, etc.). Centralization is a dimension that refers to the extent to which power is concentrated in organizations. Centralization will be researched using a modification of the Pugh Index (Pugh et al., 1968). This index will borrow some information from the institutional size measure and add some additional data. The Pugh Centralization Index is based on measures of autonomy (here defined by whether or not decisions are made internally or externally), control exercised by the top executive, overall proportion of supervisors, and employee/supervisor ratio.

Finally, a simple community solidarity index will be used, similar to those that have been used for about 30 years in sociological and psychological research (Fessler, 1952). This index will be fleshed out in the protocol through the use of open-ended discussion of five topics: community spirit, interpersonal relations, institutional responsibility (which replaces the more often used "family responsibility," modified here for organizational research), local government, and tension areas.

In addition to their institutional and domestic data activities, the field researchers will also compile a market basket survey of selected commodity prices in each community. Although the commodities chosen and their actual price fluctuations may or may not be representative of commodities in general, the items chosen are purchased commonly and frequently and will provide a useful index of price movements of critical commodities. The items to be plotted are: retail gas prices, retail fuel oil prices, and the prices of sugar, flour, pilot biscuits, canned soda, onions, canned milk, cooking oil, toilet paper, and disposable diapers. The volume and size dimensions of each item will be standardized.

The sampling procedures to be employed in the domestic network research have already been described. The domestic network protocol consists of the following: an income grid, a production-distribution-consumption grid, a family residence-composition grid, an institutional grid, a facilities grid, a job history and employment attitude grid, and a series of attitude indices.

In addition, we will employ a modification of the Brayfield-Rothe Index of Job Satisfaction, an index that has proved useful for more than 30 years (Brayfield and Rothe, 1951). This index provides a structure for determining both current and retrospective attitudes about jobs and comparison of job to leisure (or other) activities. The final series of attitude topics and scales include the following: elicitation prompts designed to provide data concerning attitudes about the control and benefits of development, prompts to collect data about institutional control perceptions, a modification of the Bogardus Social Distance Scale, a modification of Fessler's Community Solidarity Index, and a modification of Kahl's Achievement Orientation Index.

The Bogardus Social Distance Scale (Bogardus, 1959) measures social acceptance of a variety of specified members of other ethnic and employment groups. It is useful for determining the distribution of attitudes about types of people along a continuum of "closeness"; that is, the measurement hinges on types by proximity. For instance, it is likely that rural Alaskans will respond differently to incoming physicians as compared with incoming blue collar workers, just as they will respond differently if they reside simply in the region, or in their village, as compared with next door. The Bogardus Scale structures the elicitation of these data. The Community Solidarity Index has already been described in its application to institutions. In this connection the domestic network modification will employ all of the original eight dimensions--community spirit, interpersonal relations, family responsibility, schools, churches, economic behavior, local government, and tension areas. Kahl's Achievement Orientation Scale (Kahl, 1965) provides a rough measure of motivation to excel. It is built on data that reflect four dimensions of attitudes that covary with socioeconomic status and shift, and these are trust, activism, occupational primacy, and integration with relatives.

Analysis

Several categories of analysis will be conducted including:

1. Time series analysis of selected primary and secondary aggregate data designed to detect trend characteristics and socioeconomic responses of communities and the region.

2. Rating of socioeconomic characteristics of communities based on field data.

3. Comparative analysis of internal variation within communities.

4. Typological comparison of similarities and differences over time.

5. Typological comparison of similarities and differences between communities.

6. Typological modeling of communities and community clusters based on the above.

The basic steps entailed in the analysis are as follows:

1. Selected time series forecasting in order to designate likely socioeconomic factors that distinguish between communities, between shifts in these factors that have occurred or are likely to occur, or that identify data classes that may be used to complement, confirm, or refute initial findings.

2. Univariate and multivariate analysis of primary field data designed to detect significant differences and similarities, appropriate measurement

levels, and ranges of variable values that may, hypothetically, define community clusters, community response types, and implicational relations between variables that will lead up to the construction of a community typology.

3. Multidimensional analysis designed to specify the multiple forms of clustering and interdependencies among variables and among communities and institutions in such a way as to create a basis for a typology that will accomodate forecasts.

The analysis of primary field data will entail a process of ranking and scoring the data and the creation of univariate tables. Multiple forms of variable values will be compared and contrasted to determine whether or not the dimensions to which the variables refer break in a simple bivariate shape or if scaled continue best capture the range of variation within the given variables. After the review of these preliminary tables secondary analyses that will generate higher level generalizations about the variables and their correlations will proceed.

The forecast model would be created from and rest upon the multidimensional typology. To the extent that the typology is comprised of aggregate indicators that can be forecasted, forecasting can plot anticipated changes in community types, and designate such shifts after they have occurred thereby showing how critical characteristics at the community level define a new or altered typologic definition. It is important to point out that these techniques will lead up to a hypothetical typological model that, to be technically validated, must be tested at two or more points in time. Although we can accomodate a time dimension in the analysis, we cannot be positive that future events will not invalidate the conclusions we make about the data.

APPENDIX C

Characteristics of the Sample

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED
SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13,1983

HOUSEHOLD SIZE	Number	Percent
= MISSING DATA	0	0.0 %
A = 1 TO 3	25	30.5 %
B = 4 TO 6	44	53.7 %
C = 7 TO 10	11	13.4 %
D = 11+	2	2.4 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13,1983

AGE OF HOUSEHOLD HEAD	Number	Percent
= MISSING DATA	1	1.2 %
A = UNDER 30	7	8.5 %
B = 30-44	39	47.6 %
C = 45-59	16	19.5 %
D = 60+	19	23.2 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13,1983

HOUSEHOLD STRUCTURE	Number	Percent
= MISSING DATA	0	0.0 %
A = EXTENDED	14	17.1 %
B = CO-RESIDENTIAL	7	8.5 %
C = NUCLEAR OR OTHER	61	74.4 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13, 1982

SUBSISTENCE HARVEST EXPENSES	Number	Percent
= MISSING DATA	6	7.3 %
A = LOW(0-9% INCOME)	26	31.7 %
B = MED(10-19%)	26	31.7 %
C = HIGH(20%+)	24	29.3 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13, 1982

SUBSISTENCE HARVESTS	Number	Percent
= MISSING DATA	8	9.8 %
A = LESS THAN 1 SPP	16	19.5 %
B = 1 SPP PER CATEG	13	15.9 %
C = 2+ SPP PER CATEG	45	54.9 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13, 1982

EARNED PROPORTION OF INCOME (EPRO)	Number	Percent
= MISSING DATA	1	1.2 %
A = NONE	7	8.5 %
B = 1-49%	12	14.6 %
C = 50% OR MORE	62	75.6 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

~~SECOND NORTON RUN EMMONAK INCLUDED EDITED JANUARY 13, 1982~~

~~HOUSEHOLD INCOME~~	~~Number~~	~~Percent~~
~~= VALUE IN K $~~	~~0~~	~~0.0 %~~
06 =	3	3.8 %
07 =	3	3.8 %
~~08 =~~	~~4~~	~~5.0 %~~
09 =	5	6.3 %
11 =	1	1.3 %
~~12 =~~	~~5~~	~~6.3 %~~
13 =	3	3.8 %
15 =	5	6.3 %
~~16 =~~	~~4~~	~~5.0 %~~
17 =	2	2.5 %
18 =	4	5.0 %
~~19 =~~	~~3~~	~~3.8 %~~
20 =	4	5.0 %
21 =	3	3.8 %
~~22 =~~	~~2~~	~~2.5 %~~
23 =	2	2.5 %
24 =	5	6.3 %
~~25 =~~	~~1~~	~~1.3 %~~
27 =	1	1.3 %
28 =	1	1.3 %
~~30 =~~	~~1~~	~~1.3 %~~
31 =	1	1.3 %
32 =	1	1.3 %
~~33 =~~	~~1~~	~~1.3 %~~
35 =	3	3.8 %
37 =	1	1.3 %
~~38 =~~	~~2~~	~~2.5 %~~
39 =	1	1.3 %
40 =	1	1.3 %
~~43 =~~	~~1~~	1.3 %
45 =	2	2.5 %
65 =	1	1.3 %
~~69 =~~	~~1~~	~~1.3 %~~
80 =	2	2.5 %
Total	80	100.0 %

Missing Cases = 2
Response Percent = 97.6 %

DECEMBER 1982 PRELIMINARY NORTON RUN - EMMONAK SUPPRESSED

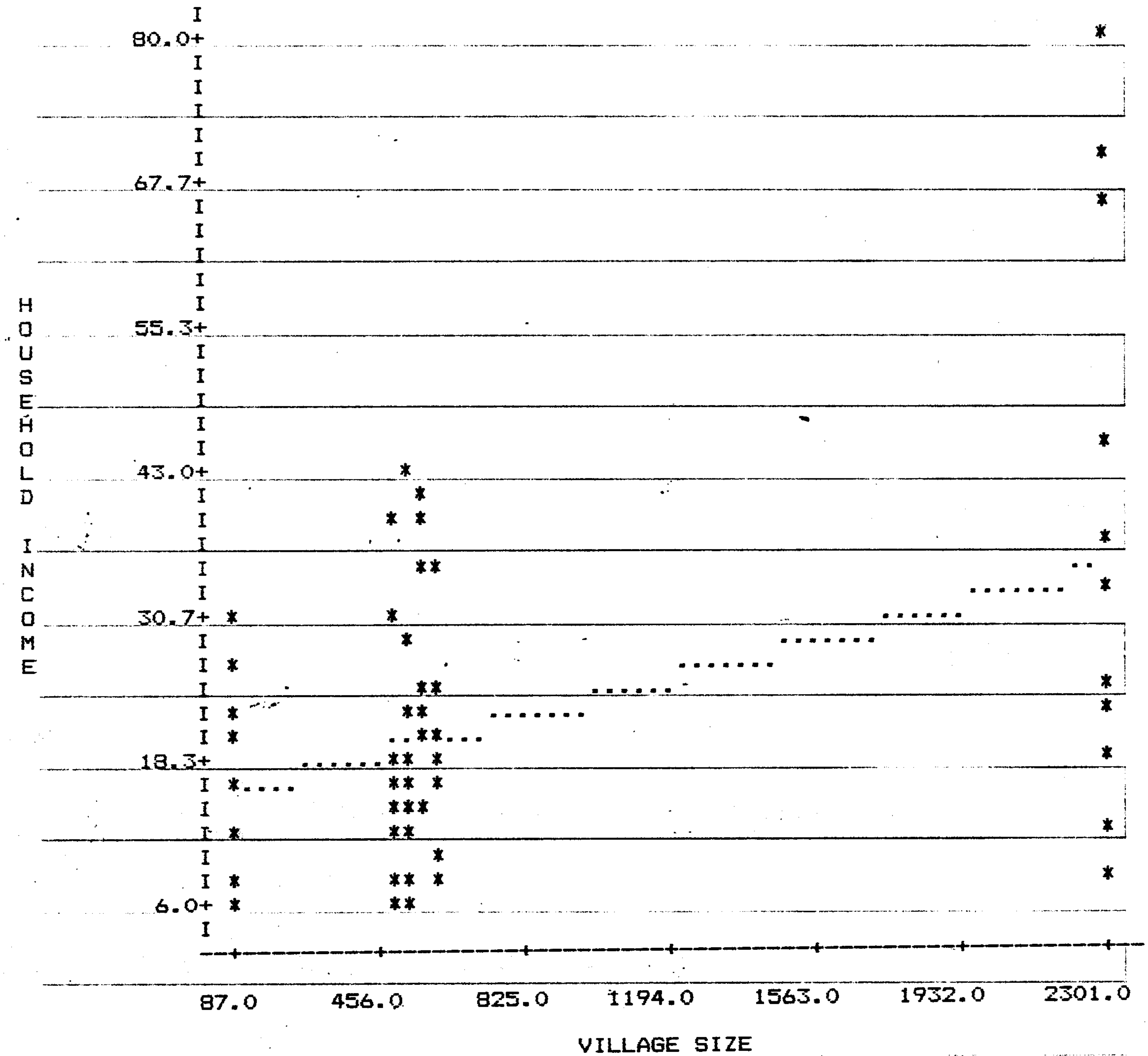
SECOND NORTON RUN-EMMONAK INCLUDED-EDITED-JANUARY 13, 1982

INCOME STABILITY AND PREDICTABILITY	Number	Percent
= MISSING DATA	0	0.0 %
A = UNSTABLE/UNPRED	9	11.0 %
B = UNSTABLE/PRED	12	14.6 %
C = STABLE/UNPRED	15	18.3 %
D = STABLE/PRED	46	56.1 %
Total	82	100.0 %

Missing Cases = 0
Response Percent = 100.0 %

DECEMBER 1982 PRELIMINARY NORTON RUN -

LINEAR ANALYSES-JANUARY 13, 1983



Mean of X =	873.85	Correlation Coefficient =	.43	Valid Cases =	80
S.D. of X =	786.38	Degrees of Freedom =	78	Missing Cases =	2
Mean of Y =	22.64	Slope of Regression Line =	.01	Response % =	97..
S.D. of Y =	15.43	Y Intercept =	15.33		

Regression Equation : Y' = .01 X + 15.33
Standard Error of Estimate for Regression = 13.96
Standard Error of Correlation Coefficient = .11
Significance of Correlation Coefficient = 0.000

APPENDIX D

Home Update

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I. INTRODUCTION: PURPOSE & SCOPE

This Technical Memorandum consists of an update of the community baseline description prepared under the Socioeconomic Studies Program (SESP) for the City of Nome in Technical Report No. 53, published in June 1980. It is incidental to a larger study to develop an understanding of current conditions and trends of change in the socioeconomic structure and organization of Norton Sound communities. The findings of the larger study will be used to analyze socioeconomic impacts of proposed OCS lease sales throughout the region.

Technical Report No. 53 was prepared as part of the assessment process for the first proposed Norton Sound OCS lease sale #57. Some of the factual background in the earlier baseline description is now out of date. This Technical Memorandum is limited to those elements of the Technical Report No. 53 baseline description that need to be made current. The updated baseline will form part of the background information to be used by Mineral Management Service (MMS) staff to prepare the community impact assessments for the EIS for two proposed OCS lease sales: the Navarin Basin sale #83 scheduled for March 1984 and the second Norton Sound sale #100, now scheduled for October 1985. This update does not present any scenario forecasts for base case and petroleum development nor does it provide the sale-specific community impact analyses that were also part of Technical Report No. 53.

In Technical Report No. 53, Nome was treated as an autonomous settlement in isolation from the other communities in its regional hinterland. However, as the degree of economic, demographic and social interaction between Nome and the region's other communities became clear, this narrow treatment of Nome came to be seen as an oversight. It ignored one of the key dynamic processes by which Nome and the region's communities may adjust to future economic and population growth in the region, especially any large-scale growth related to offshore petroleum development.

The current study will add the intra-regional dimension that was not covered in the Report No. 53 baseline description, but not as part of the present document. The population and economic element of the Nome baseline is more logically presented in the context of the primary study topic: a comparative sociocultural analysis of the interdependency of cash and subsistence economic activities in a group of Norton Sound communities for which Nome functions as a regional center and the prospective impacts of OCS development of local levels of economic activity, employment opportunities and inflation. Furthermore, with the exception of the economic and demographic data, the Nome baseline is a distinct work item unique to Nome and easily separated from the main body of the study. For these reasons, the baseline description of Nome's community infrastructure is presented here in a separate memorandum, along with an overview of Nome's population. The economic data and the more detailed comparative demographic data are incorporated in a subsequent technical memorandum.

One further difference between the methodological approach of this update and the earlier community baseline description should be noted. The earlier baseline emphasized descriptive details about existing community conditions. This update places somewhat less stress on literal detail and somewhat more stress on an interpretive description of the City's long-term ability to respond to and manage the impact of potential economic and population growth on basic community facilities and services.

A variety of data sources not available at the time the initial baseline was compiled was used to update the baseline description. The principal new sources included 1980 U.S. Census data, the coastal management program publications, the Nome Annexation Study, the Water and Sewer Master Plan Update and other documents related to annexation, plus numerous standard data series for which more recent information has become available. As needed, these sources were supplemented by field data collection and interviews with local public officials and administrators and other knowledgeable informants.

II. POPULATION

Technical Report No. 53 reported census data for Nome through 1979. These figures are reproduced and updated in Table D-1.

Table D-1

POPULATION COMPARISONS

CITY OF NOME

Year	Area		Population
1979[1]	Winter - City	2,842	
	Contiguous Areas	222	
	Total		3,064
	Summer - City	2,932	
	Contiguous Areas	272	
	Total		3,204
1980[2]	City of Nome	2,301	
	Perkinsville[a]	33	
	Total		2,334
1981[3]	City of Nome		3,039
1982[3]	City of Nome		3,428

[1]Ender et al, Technical Report No. 53, OCS, SESP, BLM, June 1980.

[2]1980 U.S. Census. [a]Included for sake of greater comparability with 1979 total and with 1981 and 1982 figures which include Perkinsville and other contiguous areas per redefinition of city boundaries.

[3]Alaska Department of Labor.

The difference between winter and summer population figures for 1979 in Table D-1 should be noted. This difference, of 140 people or approximately 5 percent, can most likely be accounted for by an influx of outside labor coming to Nome for seasonal work in the local gold dredging operation, local building construction, roadway maintenance and construction.

The 1980 figures reported were effective as of April 1, 1980 and the 1981 figures carry an effective date of July 1, 1981. In addition, 1981 figures were based on an actual State field census which took into account the municipal boundaries per the annexation which followed the 1980 federal Census. These factors and probable undercounting which appears likely to have occurred in 1980 should account for major changes in population totals. The 1982 figure, estimated by the State Department of Labor, should be more comparable to the 1981 figure and should have a greater accuracy as well.

Because of the uncharacteristic, and probably inaccurate, decrease for 1980, it is difficult to discuss unambiguous population trends over the last couple of years. However, if we take the low total figure for 1979 (3,064) and compare it to the 1982 figure (3,428), we derive a population increase of about 11.9 percent over the last three years.

Since specific or individual census data are available only for 1980 and not for 1981 or 1982, the analysis of major population characteristics will be based on the 1980 Census figure of 2,301. It is hoped that the proportions and relationships among these characteristics would be relatively constant if applied to the 1982 figure of 3,428, although this assumption should not be taken for granted.

According to the 1980 Census, males comprise 52.8 percent and females comprise 47.2 percent of Nome's population. By comparison, the population in 1975 divided into 51 percent male and 49 percent female. In

1980, 52.3 percent of those 20 and under were male and 47.7 percent were female. In the 21 to 59 year age group, 53.2 percent were male and 46.8 percent were female in 1980. In the group of those 60 and older, males accounted for 53.1 percent and females 46.9 percent of the total.

In 1975, the median age for Nome was 21.6 years, about 47 percent of the population was under 21 years and 6 percent was over 60 years of age. In 1980, the median age was 26.0 (26.3 for males and 25.6 for females), 40.1 percent of the population was under 21 years, and 8.4 percent was 60 or older. These figures reflect a substantial shift toward an older population.

According to the 1980 Census, 9 percent of the population was under 5 years, 25.8 percent was in the 5 to 17 years group, 59.4 percent was in the 18 to 64 year bracket and 5.8 percent was 65 years and over.

Analysis of age groups by race (see Table D-2) reveals a very interesting pattern wherein the population under 18 years is approximately two-thirds Alaska Native and less than one-third White. In the 18 to 64 age group, Native and White proportions approach one-half each, returning to the predominately Native proportion in the 65 and over category.

Table D-2

POPULATION BY RACE AND AGE

CITY OF NOME, 1980

	Age (%)			
Race	Under 5	5-17	18-64	65 and over
White	29.6	27.6	47.2	22.4
Native	66.9	70.5	50.2	77.6

Source: 1980 U.S. Census

According to the 1980 Census, 39.1 percent of Nome's population was White, 58.4 percent Alaska Native (57.1 percent Eskimo, 1.0 percent Indian and 0.3 percent Aleut), 0.6 percent were Black, 0.7 percent were Asian/Pacific Islander, and 0.9 percent were other.

According to the 1975 Census (Ellanna, 1976), the comparable figures were: White - 38.6 percent; Alaska Native - 61.4 percent. In 1970 the comparison figures were: White - 37.5 percent; Alaska Native - 62.5 percent.

These figures show a cumulative increase in the White population of 1.6 percent and a corresponding decrease in the Native population of 4.1 percent.

The apparent inaccuracy of the 1980 Census figures or at least their obvious inconsistency with estimates for immediately preceding and following years, makes it difficult to assess the trends in, or accuracy of, birth and death rates for Nome. The frequency figures of births and deaths per se, however, appear to be fairly accurate. These figures are presented for the most recent five year period available (see Table D-3 below).

Table D-3

BIRTH AND DEATH RATES

CITY OF NOME

Year	Population	Births	Births/1,000	Deaths	Deaths/1,000
1976	2,605	80	30.7	25	9.59
1977	2,585	70	27.1	*	*
1978	3,164	61	19.2	33	10.43
1979	3,204	45	14.0	22	6.87
1980	2,334	84	36.0	19	8.14

Source: Department of Health and Social Services, Bureau of Vital Statistics.

*missing or unavailable data

There does appear to be a downturn in the trends for birth rate and death rate with the exception of 1980. This latter upturn may be due in part to the problems with the 1980 figure discussed above, particularly in the case of the death rate. However, the birth rate would show an increase to 27.6/1,000 if 1981 population figures were to be used, and to 24.5/1,000 if 1982 figures were to be used. In other words, although the 1980 birth rate showed a substantial increase over the 1979 rate, it should be remembered that the 1979 rate was unusually low and that the 1980 rate is consistent with prior years (1976 and 1977), once the 1980 population figure is adjusted to compensate for a clear undercount in the census for that year.

Table D-4 below, present birth and death data for the Nome Census Division for the period 1976 to 1981.

Table D-4

REGIONAL BIRTH AND DEATH RATES

NOME CENSUS DIVISION

Year	Population	Births	Births/1,000	Deaths	Deaths/1,000
1976	7,088	172	24.26	59	8.32
1977	6,489	159	24.50	49	7.55
1978	6,700	170	25.37	60	8.95
1979	6,481	149	22.96	48	7.39
1980	6,537	202	30.90	53	8.10
1981	7,565	180	23.79	*	*

Source: Department of Health & Social Services, Bureau of Vital Statistics; Department of Labor

*missing or unavailable data

As evidenced in Table D-4, 1980 births increased markedly over 1979 figures in absolute and in comparative terms, as was the case for the comparable Nome data.

According to the State Department of Labor, the Census and estimation procedures used for the 1981 and 1982 City and regional figures represent improvements in the direction of greater accuracy. They also indicated that there have been real and verifiable increases in population throughout Alaska over the last two years, coincident with the influx of job-seekers and their families from outside the state.

III. NOME BASELINE: INFRASTRUCTURE

This update of Nome's community infrastructure covers the same topical scope as the earlier baseline description, though not in the same detail. The earlier document is still a timely and useful reference source for many of the baseline data. Rather than repeat the entire baseline description, this update concentrates on the most important new data. It is expected that the two documents will be used in a complementary way. This update also adds some interpretive commentary on the ability of the City to accommodate the demands of future growth upon various community services and facilities.

Land Use

The most important recent change in land status at Nome was the successful annexation in 1982 of adjacent lands and waters. Prior to annexation, the City's boundaries encompassed only about 525 acres. A number of small satellite residential clusters, for example at Icy View and at the Nome-Beltz school complex, were outside the City's boundaries, as were some nearby tracts with potential for community expansion and some other areas of particular value to the City, such as the municipal water supply at Moonlight Springs. After extended controversy and a number of failed annexation attempts, the 1981 Alaska Legislature directed preparation of a detailed study of the jurisdictional needs of the City.

The Nome Annexation Study (Alaska Economics, Inc., 1981) made a detailed analysis of the impact of annexation alternatives on the City's fiscal and organization structure, concluding with a specific recommendation for annexation. Ultimately, a slightly modified annexation proposal that significantly enlarged the City's area was approved in 1982. The annexation added, by rough approximation, 4,953 acres of land and 5,760 acres of immediately offshore water area to the City's original 525 acres, for a new total of about 11,238 acres or 17.56 square miles. See Figure D-1 for post-annexation boundaries and Figure D-2 for pre-annexation boundaries. Annexation also added an estimated 250 new residents to the City.

It is noteworthy that the approved annexation did not include the Cape Nome area which was a part of the annexation proposal rejected in 1981. Cape Nome, about ten miles further east of the new boundary, is of special concern to the City because it has been identified as a potential site for onshore industrial facilities to support offshore petroleum development and production operations.

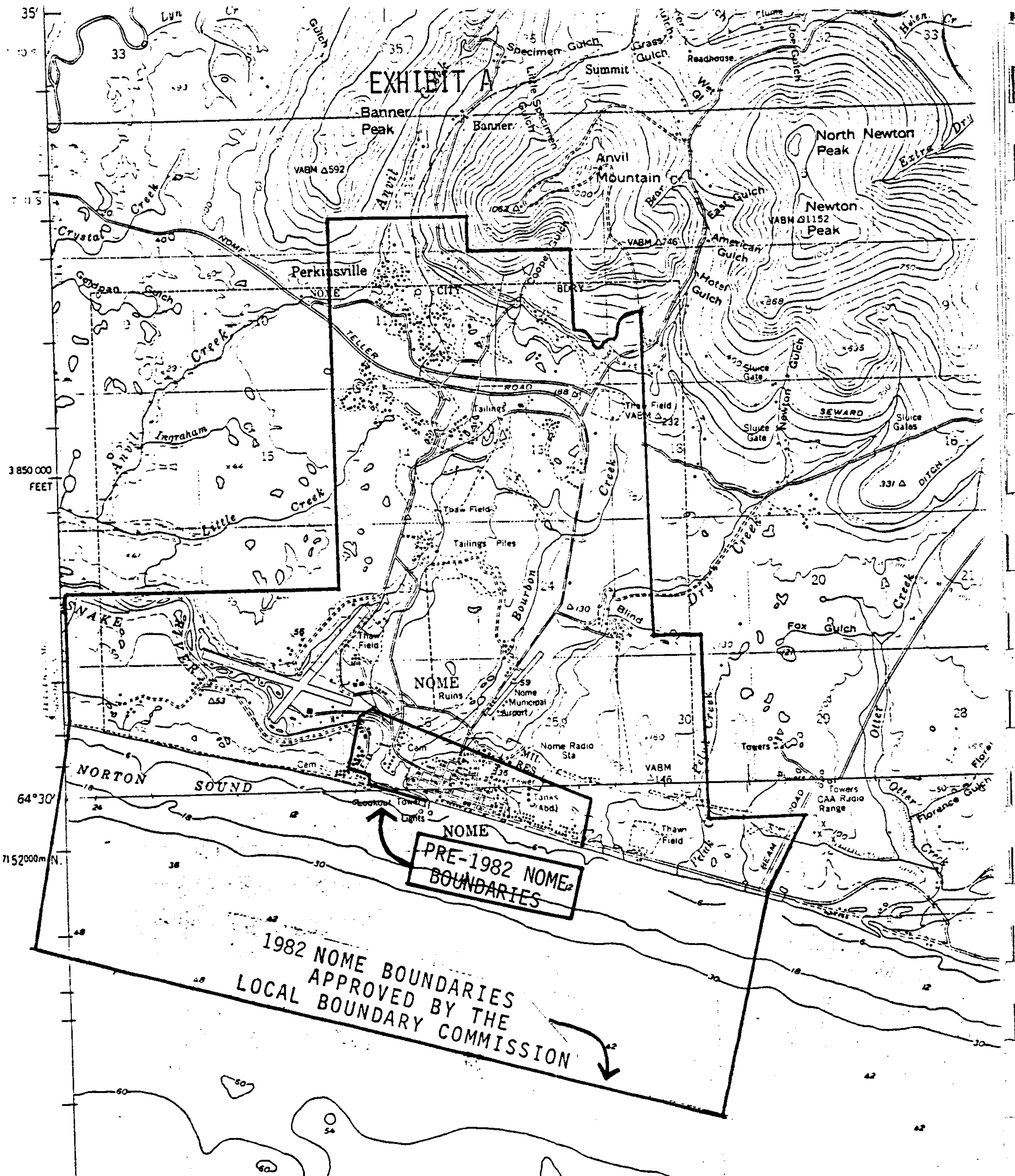


EXHIBIT A

Figure D-1

NOME MUNICIPAL BOUNDARIES, 1982

Among other consequences, the annexation extended the municipal planning jurisdiction, increased the population to which the City provides services and enlarged the City's real property and sale tax base. The Nome Annexation Study concluded that each of these changes would positively affect the City government's ability to fulfill its functions. Presumably, these changes also improved the City's ability to plan for and manage OCS-related growth impacts. These effects of annexation on City services and revenues and on its ability to plan for community expansion and new industrial development, including any local OCS-related development, will be more fully explored in the section on municipal powers and finances.

Part I of the Nome Coastal Management Program report (ESL, 1981) presents a good history of the evolution of land uses at Nome, a detailed description of current land use patterns and an account of land ownership patterns in and around Nome. Figure D-2, reproduced from that report, shows existing land use patterns. Table D-5 shows the change in land uses between 1967 and 1980 within the old City boundaries prior to the annexation. The most notable changes in land use were the substantial increase in acreage developed for residential use, by far the most important single land use, and for streets and other public and commercial uses.

Figure D-2
EXISTING LAND USE
CITY OF NOME, 1981

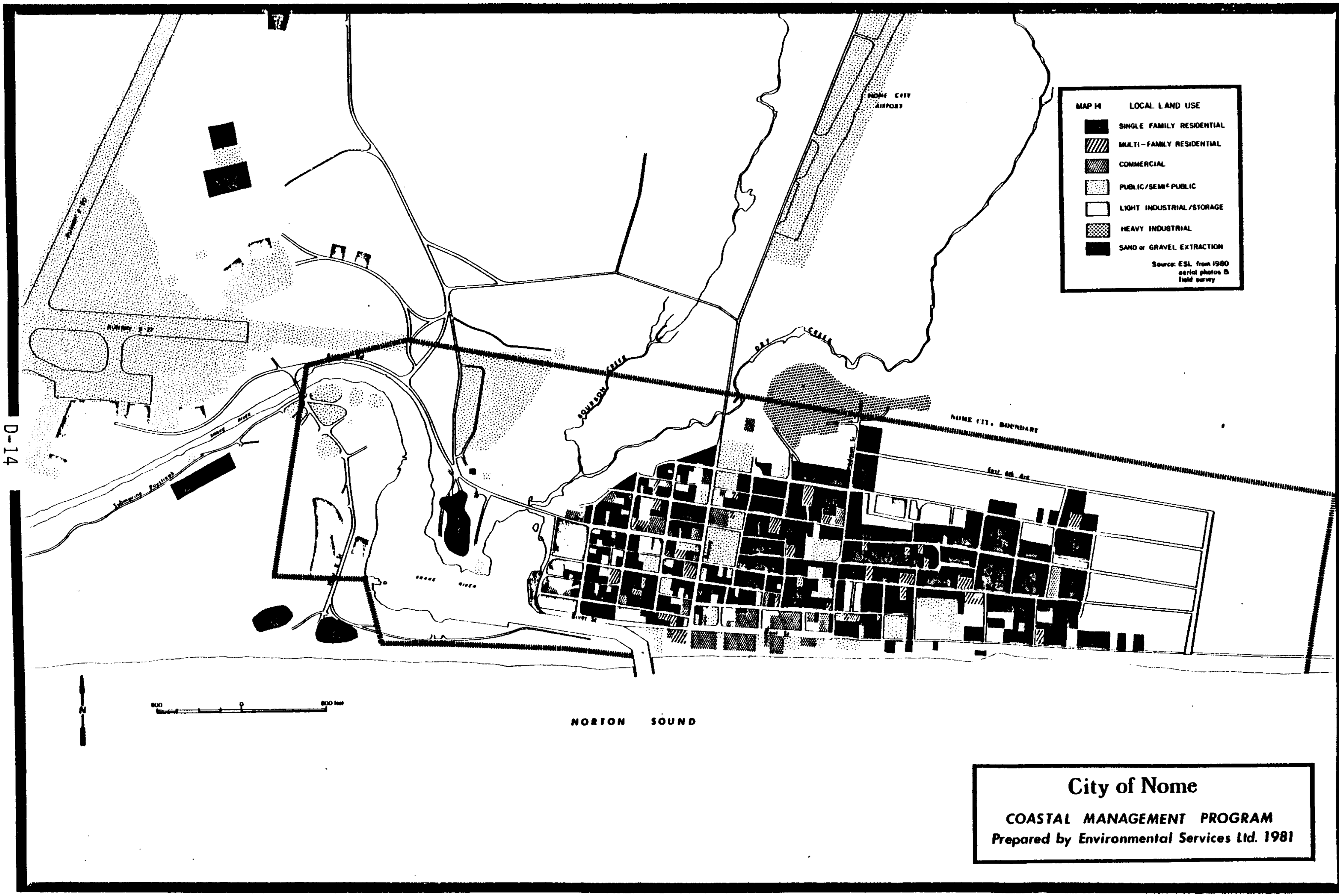


Table D-5

LAND USE

CITY OF NOME, 1967 and 1980

Land Use	Land Area (Acres) 1967	Land Area (Acres) 1980	Percent Change 1967-80	Percent Townsite 1967	Percent Townsite 1980
Residential	43.79	110.00	+151.0%	7.8	23.6
Commercial	5.19	12.00	+131.0%	.9	2.6
Industrial & Storage	23.90	32.02[2]	+34.0%	6.1	6.8
Public	4.58	29.00[3]	+557.0%	.8	6.2
Semi-Public	4.50	5.00[3]	+11.0%	.8	1.0
Improved Street	63.24	83.00	+31.0%	11.3	17.8
Vacant - Dedicated to public use	N/A	12.00	---[5]	N/A	2.6
Vacant - Undevelopable (Bourbon Creek, Dry Creek marsh)	35.00	35.00	0.0%	6.2	7.5
Vacant - Developable	367.59	148.25	-59.7%	65.9	31.8
TOTAL	557.59[1]	466.25[4]		100.0%	100.0%

Source: Environmental Services Limited, 1981; Alaska Consultants, 1967

[1]Includes townsite (USS 451) and a small part of land outside of townsite.

[2]1967 survey classified Alaska Gold Company complex vacant as mining activity was temporarily suspended.

[3]1967 survey did not include the cemetery or state airport lands within the city limits in this classification.

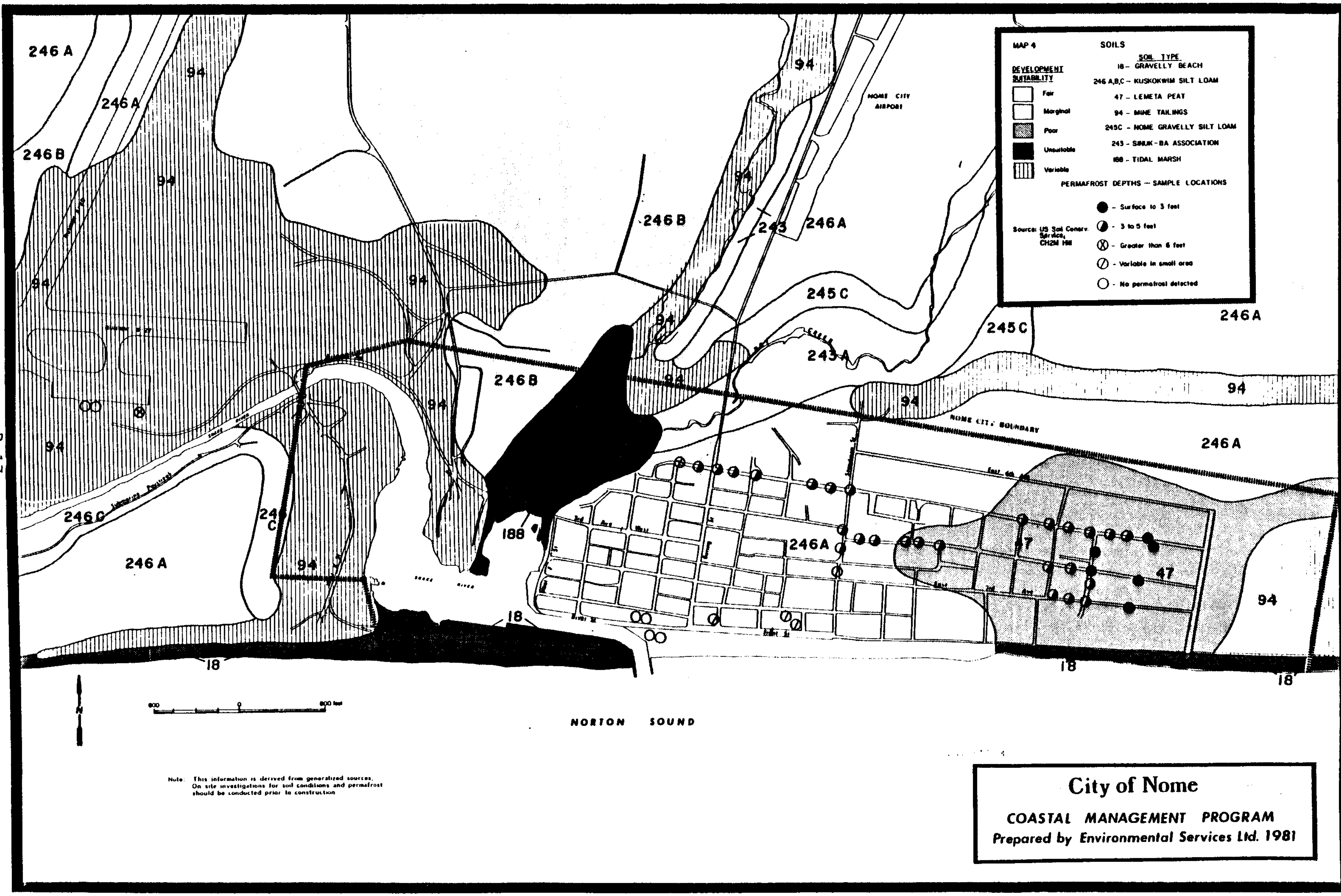
[4]1906 townsite excluding Snake River Basin area of 59.2 acres.

[5]Unable to calculate due to change in accounting methods.

Of note for future land development is the decline in vacant developable land within the old City boundaries from about 368 acres in 1967 to about 148 acres in 1980. This supply of vacant land, most of it in the so-called "East End" of the original townsite, is roughly equal to the sum of residential, commercial and industrial lands now developed. Ordinarily, this vacant land base could be developed to support about double the current population. However, a good share of this land has poor soil conditions and will be costly to improve. See Figure D-3. Until recently, much of this vacant land was owned by the Alaska Gold Company (see Figure D-4) which was reluctant to sell or develop its lands for settlement because of its mineral values. This company policy limited the capacity of the original townsite to accommodate growth. In 1982, the company changed this policy and decided to dispose of some tracts not needed for its long range development. The City of Nome purchased some of these lots and resold them on the condition that the buyer construct a house within two years. The city installed roads in most of "East End" in 1981-82 and intends to install piped water and sewer services in 1983.

igu -3

SOILS CONDITIONS
CITY OF NOME, 1981



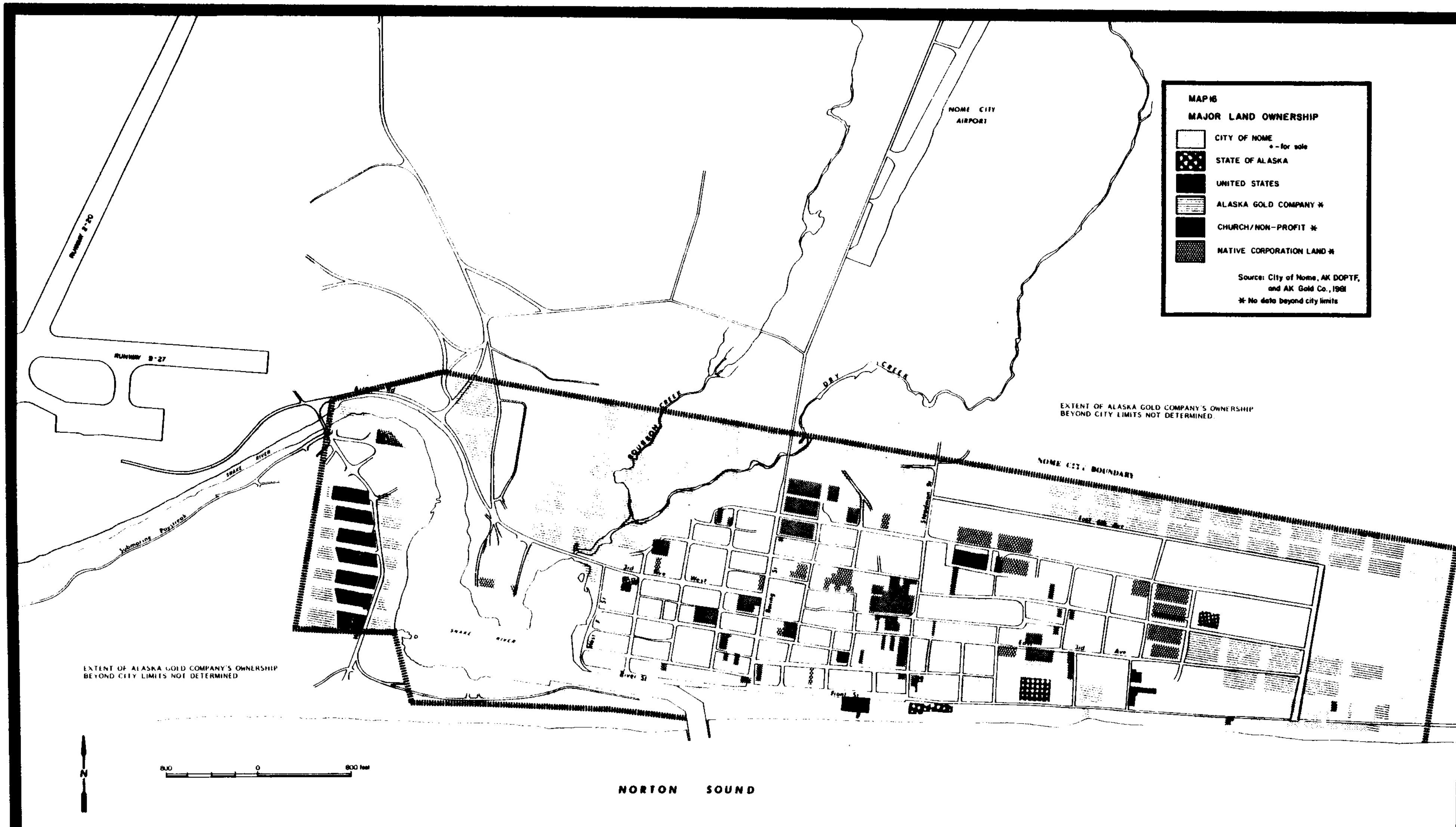


Figure 4
LAND OWNERSHIP

City of Nome
COASTAL MANAGEMENT PROGRAM
Prepared by Environmental Services Ltd. 1981

From the local perspective, Nome suffers a shortage of developable land available at a reasonable price. This perspective is commonplace in rural Alaskan communities where, until lately, much of the land base was retained in nonlocal public ownership, the market for land was inhibited by non-economic attitudes toward land ownership and development and land development was hindered by unfavorable soils conditions and the prohibitive costs of installing improvements such as water, sewer and power utilities and improved roadways. Still, in comparison to other rural western Alaska regional centers (Barrow, Kotzebue, Bethel, Dillingham), Nome is better supplied with a pool of developable land suitably located for town expansion than all except perhaps Dillingham. Over the long run, as population growth and economic development progress at Nome, a more rational market for sale and development of land resources should emerge in response to economic forces. In any case, the unavailability of developable land is not by itself a physical constraint on community expansion at Nome, although the inhibiting effect of the high costs of installing improvements to develop tracts for urban use should not be underestimated.

Nome has two pending marine facility projects, a port facility and causeway for medium-draft oceangoing vessels and a small boat harbor which have significant potential for altering land use patterns. The City recently had completed a feasibility study and Port Master Plan by Tetra Tech and a Small Boat Harbor Study by TAMS. Detailed engineering designs and cost estimates for the port facility/causeway to handle containerized, general cargo and bulk fuel deliveries is now being prepared by TAMS. The proposed port facility will eliminate lightering and reduce shipping costs into Nome. It may also improve Nome's attractiveness as a potential marine support center for offshore oil and gas operations in the Norton Sound region. If the port is successfully developed according to plan, it will itself become a major waterfront land use and may eventually generate demand for port-related storage and warehousing facilities.

The land status in the larger region (see Figure D-5) surrounding the City of Nome is described at length in Part I of the Coastal Management Program report and need not be dwelt on at length here. Under the Alaska Native Claims Settlement Act, both Sitnasuak Native Corporation and Bering Straits Native Corporation have selected lands on Seward Peninsula. Sitnasuak will receive only surface rights while the Bering Straits Native Corporation will receive subsurface rights on Sitnasuak selections and both surface and subsurface rights on its own selections. Conveyance of most of the lands selected by both corporations is still pending. Only a small part of these selections are located near Nome. In particular, nearly all the 161,280 acres of land selected by Sitnasuak are well outside the area of potential settlement interest at Nome. Thus, neither the ANCSA Section 14 (c) (3) lands (up to 1,280 acres) to be conveyed by Sitnasuak to the City of Nome nor the lands retained by Sitnasuak are likely to significantly affect the local settlement's land supply or community expansion patterns. However, resource development on these lands may, over the long run, have indirect spillover effects on the economy and population of Nome.

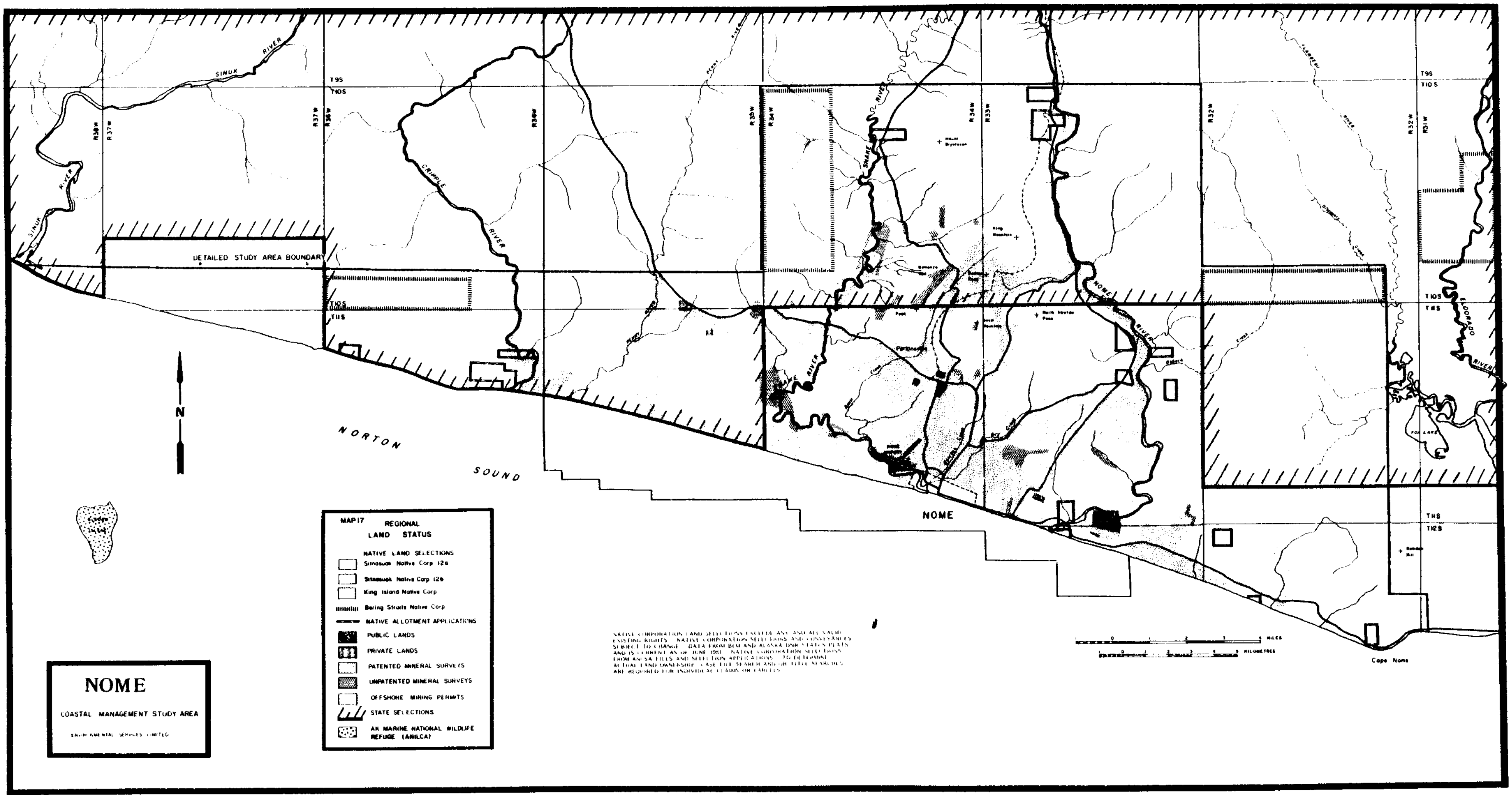


Figure 5

LAND STATUS

Nome is in the process of developing its district coastal management program. Nome chose to prepare its own plan rather than join with the other communities of the Bering Straits region to develop a unified program for the whole region. The study area for the City's coastal management program extended from the Sinuk River to Cape Nome although only the City proper will fall within the City's legal jurisdiction. The City engaged a consultant to draft its coastal management program. Part I - Background Report, Part II - Coastal Management Plan and Part III - Implementation Program have been completed in draft form, local public hearings have been held and the drafts are now being revised by the City for final approval. The current schedule anticipates that the City will adopt its concept-approved coastal management program in early 1983, followed by submittal to the State Coastal Policy Council for official approval and incorporation into the State's coastal management program. Nome does not exercise zoning authority, but one of the consultant's key recommendations was that the City implement a land use code, a sort of zoning ordinance, to guide future land development. This is one of the main issues to be resolved before local approval of the district coastal management program.

In the meantime, the other communities in the Bering Straits region have initiated preparation of their own regional coastal management program under the auspices of the Bering Straits Coastal Resource Service Area. That effort is still at its beginning stage.

Housing

Since the earlier baseline, some more recent data on the housing stock has become available from the 1980 U.S. Census and from the Coastal Management Program. According to the 1980 Census, there were a total of 839 housing units in the City of Nome. If, as there is reason to suspect, the 1980 Census undercounted population at Nome, then it is likely that the housing was undercounted also. Also, the 1980 Census was taken before annexation was approved and so does not include the settled areas added to the City of Nome's jurisdiction by annexation.

Table D-6 displays data on the tenure status of housing, as reported in the Census. Two features about the housing supply stand out.

Table D-6

STATUS OF HOUSING

NOME, 1980

Occupied housing units	697
Owned/buying	(290)
Renting	(407)
Vacant	142
For sale	(10)
For rent	(44)
Occasional use	(16)
Other vacant	(72)
TOTAL	839

Source: 1980 U.S. Census

First, there is an unusually large proportion of rental housing in Nome. About 54 percent of the total supply is rental housing and an even larger share, 58 percent, of the occupied housing is rented. This is an unusually high ratio of rental housing compared to most western Alaska regional centers where homeownership still predominates over rental housing.

Second, according to the census there appear to be a substantial number of vacant housing units at Nome -- 142 or 17 percent of the total housing stock. However, a number of circumstances suggest that this figure exaggerates the housing availability at Nome. The census was conducted during April, a time when Nome's resident population is at a seasonal low. Less than half of the vacant units were available for sale or rent or were in occasional use. This suggests that most of the vacant units were not available for use and, probably, were substandard. The latter suspicion is consistent with other census data that indicate that fully two-thirds of the vacant units lacked complete plumbing compared to one-third of the occupied dwellings.

As part of the background report for the Coastal Management Program, ESL conducted a field inventory of housing conditions at Nome in January 1981. According to this survey, there was a total of 943 occupied dwelling units, including 682 single-family units and 261 multifamily units. This count is substantially above the 1980 Census tally of 839 and tends to confirm that the census undercounted housing units as well as population. The most recent count of occupied housing units, prepared by the City of Nome for its annual municipal population estimate and after the annexation, tallied a total of 1,025 occupied dwelling units, including 693 single-family units and 332 multifamily units.

ESL also evaluated and mapped the structural condition of housing units. See Table D-7 and Figure D-6. Using evaluative criteria adapted from official U.S. Census definitions, ESL found that about 23 percent of all housing units was sound, about 60 percent was deteriorated and in need of minor repairs, 17 percent was badly deteriorated and in need of major repairs and about 1 percent was dilapidated beyond repair. The heaviest

Table D-7

HOUSING CONDITIONS

CITY OF NOME, 1980

Condition[1/]	Number[2/] of Units	Percent of Total
Sound	212	22.5
Deteriorating - needs minor repairs	564	59.8
Deteriorating - needs major repairs	165	17.5
Dilapidated	10	1.1
Total	943	100.0

Source: Environmental Services Ltd.

1/ Criteria for evaluating housing conditions were as follows:

Sound units: Have no visible defects or only slight defects that are normally corrected in the course of general maintenance. Repairs would cost less than three percent of the value of the structure.

Deteriorating units needing minor repair: Would need more repair than required in the course of regular maintenance, but would not cost more than twenty percent of the value of the structure. Essentially a good structure except in need of minor structural improvements. This category includes structures undergoing various stages of construction or renovation at the time of the survey.

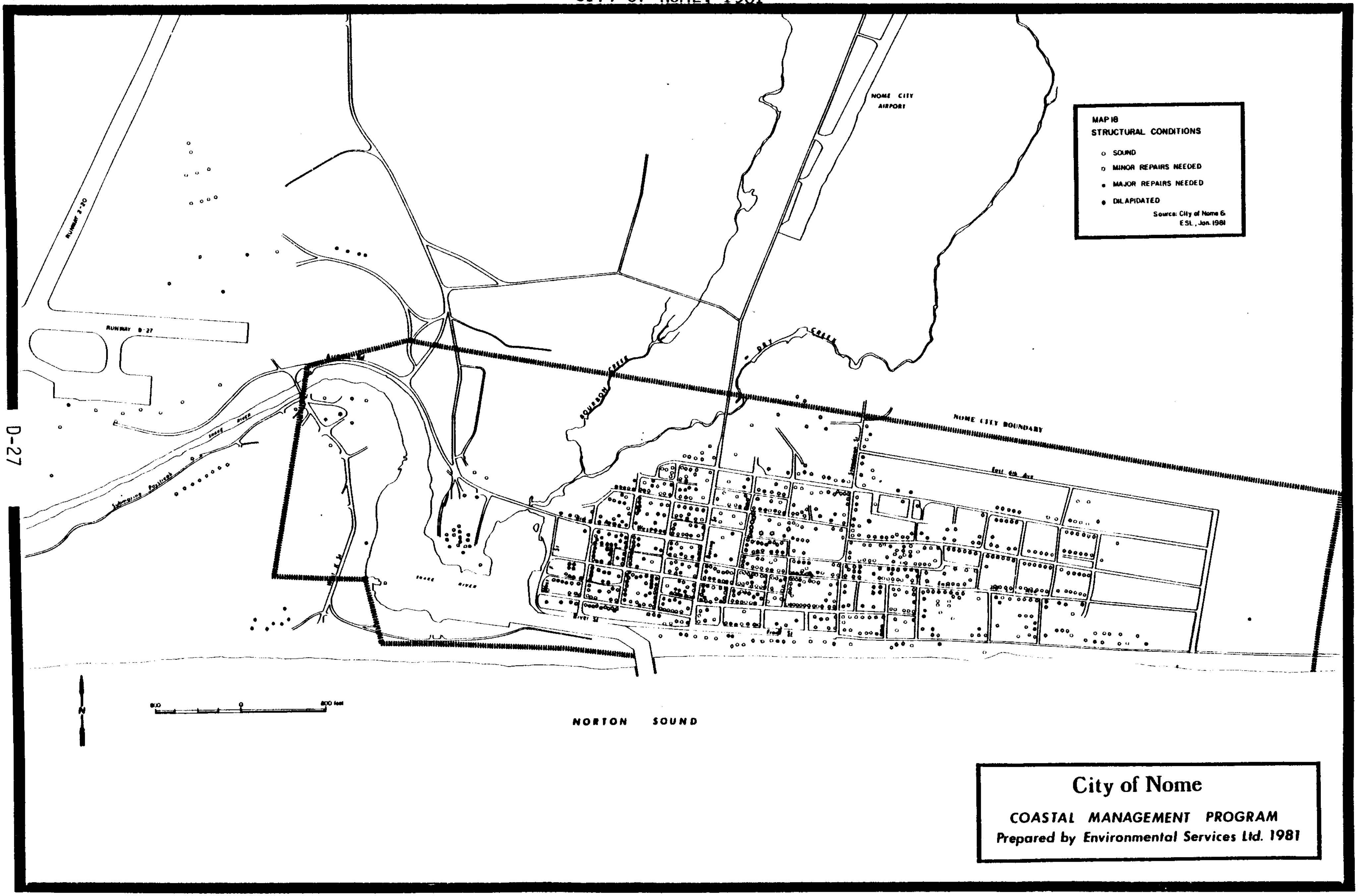
Deteriorating units needing major repair: Would required extensive maintenance to overcome serious structural problems such as foundation work. Repairs would not cost more than 50 percent of the cost of replacement to bring most of these structures up to standard.

Dilapidated units: Do not provide adequate shelter and in their present condition endanger the health and safety of their occupants. They should be demolished.

2/ Note that this column does not total correctly.

Figure 6

CONDITION OF HOUSING
CITY OF NOME, 1981



concentration of badly deteriorated and dilapidated dwellings was in the town's core area. These data, when compared to earlier housing surveys conducted for the 1967 comprehensive plan and the 1970 Census, indicate that the quality of housing has significantly improved over the last decade. With regard to the adequacy of the housing supply, informed local residents report that there is a critical shortage, especially during the summer months when a seasonal influx of residents add an estimated 300 persons to the city population.

In sum, considering the obstacles to land and housing development at Nome, the City does not seem well positioned to expand its housing stock quickly in response to any additional sudden influx of transient or permanent population beyond what it customarily receives. As a consequence, if immigrants compete in the local housing market, it will likely have detrimental short-term effects on the cost and supply of housing for permanent residents.

Community Facilities and Services

EDUCATION

Primary and Secondary

The school enrollment figures for Nome have been fairly stable over the last five years except for a gradual downturn related to the return of boarding home students to schools in their home villages (starting in

1980) and to the more recent relocation of the Bering Straits School District (REAA) regional headquarters from Nome to Unalakleet. These events accounted for the loss of approximately 30 students and 10 students respectively--the latter being children of relocated REAA staff.

Table D-8 below summarizes school enrollment data for the most recent five-year period. All figures are final quarter statistics.

Table D-8

SCHOOL ENROLLMENT

CITY OF NOME

Year	Number of Students
1978	797
1979	751
1980	734
1981	712
1982	700

Source: Alaska Department of Education

During the 1982-83 school year, a total of 731 students were enrolled in Nome Elementary and Nome-Beltz Junior/Senior High Schools distributed by grade as indicated in Table D-9.

Table D-9

SCHOOL ENROLLMENT, 1982-83

NOME

Grade	Number of Students
Kindergarten	57
1	59
2	60
3	63
4	67
5	60
6	65
7	54
8	58
9	57
10	47
11	52
12	32

Source: Nome School District

A total of 125 people are currently employed by the Nome School District. Of this number, 72 are professional personnel, 58 of whom are teachers. The Elementary School employs 32 teachers, there are 3 classes for each grade level (occupying 21 classrooms) averaging 20.5 students. Classes are typically mixed with students from different grade levels in the same class. Overall, the student/teacher ratio of 12.6:1 remains fairly close to the 1978 School District average of 11.6:1.

The Nome Elementary School is in need of replacement and toward this end the School Board is attempting to acquire the necessary funds. A $1.0

million bond issue has passed which is intended for use in planning and building design and engineering projects. An additional $17.0 million will be required for construction but such monies do not appear to be forthcoming from the legislature at present.

In addition, the Nome-Beltz High School is in need of major renovations in order to fully meet life safety standards and to increase energy efficiency. The School District is expected to pursue a combination of State general funds and Federal matching funds, in the near future, for undertaking this renovation.

Postsecondary

Northwest Community College (NWCC) maintains an active involvement in providing community education, research, and public service functions.

NWCC reported a total enrollment of over 700 persons during the past academic (1981-82) year and an average class size of about eight.

Specific offerings and accomplishments include: a cooperative skills program which graduated 22 students trained in entry level office occupations; a fisheries training program providing entry-level skills for commercial fishing; and an Eskimo teacher education program to assist village students who are working toward becoming certified teachers. All three of these programs represent cooperative ventures with Kawerak, Inc.

Additional programs include: a village corporation management training program in conjunction with Bering Straits Native Corporation; a board training and stockholder communications project with Sitnasuak Native Corporation; training for tank welders; seminars for small business persons; an alternative energy information center; a wind energy demonstration project; an arctic greenhouse demonstration project; small scale television studio production; and a series of art exhibits and concerts.

In addition, regular classes were offered in the areas of art and general studies, business and office occupations, communications and English, computer science, education, early childhood, human services, math and science, regional studies, aviation, and arctic technology.

As the programs and services listed above suggest, NWCC is, by design, actively committed to meeting the career and educational needs of individuals and institutions within Nome and the region as a whole.

PUBLIC SAFETY

The basic structure and adequacy of the public safety services in Nome remain unchanged since Technical Report No. 53 was completed.

The Alaska State Troopers maintain their regional detachment headquarters in Nome and confine their domain to the villages surrounding Nome. They have recently formed the Western Alaska Narcotics Team which includes State Troopers and local police in Nome, Kotzebue, and Bethel. This team is designed to deal with growing drug problems in western Alaska, primarily the illegal sale and use of cocaine and marijuana.

Law enforcement in Nome proper continues to be the responsibility of the Nome City Police Department.

Most reported crime in Nome involves offenses such as fourth degree (simple) assault, criminal mischief, disorderly conduct and firearms violations, driving under the influence and other liquor law violations, and theft. More serious crimes of violence such as rape and spouse abuse are thought to be more difficult to identify and, though less frequent, to be the cause of growing concern on the part of law enforcement personnel and the general public.

Police Protection

The public safety data which are presented represent incidents (calls or contacts) and actual arrests by the Nome Police Department for 1980, 1981 and the first ten months of 1982. These data are presented for homicides, suicides, rapes, all Part I and Part II offenses by race, and status as a juvenile or an adult.

Incidents. Table D-10 presents incident data grouped for all races and for both juvenile and adult categories.

Table D-10

OFFENSES (INCIDENTS)

CITY OF NOME

Type	1980	Year 1981	1982 (10 months)
Homicide	1	2	1
Suicide	0	0	0
Rape	10	10	11
Total (Part I & II)	1,239	2,392	1,847

Source: Alaska Department of Public Safety

Arrests. Table D-11 presents Nome arrest data divided by type of offense and by race for adult arrest only.

Table D-11

ADULT ARRESTS BY RACE

CITY OF NOME

	Year											
	1980				1981				1982			
Type	Native	White	Other	Total	Native	White	Other	Total	Native	White	Other	Total
Homicide	1	0	0	1	1	0	0	1	0	1	0	1
Rape	2	0	0	2	0	0	0	0	4	0	0	4
Total (Part I & II)	545	113	2	660	666	126	13	805	541	49	2	592

Source: Alaska Department of Public Safety

An examination of Table D-11 reveals a relative increase in rape arrests over the three year period, a steady homicide arrest rate of one per year, and a fluctuating total Part I and II arrest rate.

In 1980, Natives accounted for 82.6 percent of all arrests and Whites for 17.1 percent of the total. This may be compared to the 1980 Census figures which set the Native population for those in the 18 to 64 years age group at 50.1 percent and the corresponding White population at 47.2 percent.

The percentages for Native and White arrests were reported as Native arrests, 82.7 percent, and White arrests, 15.6 percent, for 1981 and Native arrests, 91.4 percent, and White arrests, 8.3 percent, for 1982.

Table D-12 presents Nome arrest data divided by type of offense and by race for juvenile arrests only.

Table D-12

JUVENILE ARRESTS BY RACE

CITY OF NOME

	Year											
	1980				1981				1982			
Type	Native	White	Other	Total	Native	White	Other	Total	Native	White	Other	Total
Homicide	0	0	0	0	0	0	0	0	0	0	0	0
Rape	1	0	0	1	0	0	0	0	0	0	0	0
Total (Part I & II)	124	25	0	149	119	19	0	138	109	22	2	133

Source: Alaska Department of Public Safety

As can be seen in Table D-12, the juvenile arrest rate has remained fairly stable over the last three years. In 1980, Natives represented 83.2 percent of all arrests and Whites represented 16.8 percent of the total. According to 1980 Census figures, 70.5 percent of the population in the 5 to 17 years of age category were Native and 27.6 percent were White.

The percentages for Native and White arrests were reported as Native arrests, 86.2 percent, and White arrests, 18.8 percent, for 1981 and Native arrests, 81.9 percent, and White arrests, 16.5 percent, for 1982.

Table D-13 compares the number of incidents with the number of arrests aggregated for all races and for both juveniles and adults.

Table D-13

COMPARISON OF INCIDENTS AND ARRESTS[1/]

CITY OF NOME

Type	1980	Year 1981	1982
Homicide	100%	50%	100%
Rape	30%	0%	36%
Total (Part I & II)	65%	39%	39%

Source: Alaska Department of Public Safety.

1/ Ratio of Arrests/Incidents

According to Table D-13, in 1982, 100 percent of all homicide calls resulted in arrests, 36 percent of all rape incidents or calls resulted in arrests, and 39 percent of total Part I and II contacts resulted in arrests. This last category shows a substantial decrease from the 1980 figure of 65 percent. The rape category shows the lowest incident/arrest ratio of the three categories listed for each of the past three years.

Fire Protection

Fire protection in Nome continues to be provided by the Volunteer Fire Department which is co-located with the Nome Police Department. No problems or changes were reported concerning the operation or adequacy of these services, with the exception of the addition, in 1982, of a full-time paid City Fire Marshall for training and additional services.

RECREATION

In addition to the ongoing recreation activities and resources described in Technical Report No. 53, current alternatives include the recent addition of a high school swimming pool and a 26,000 square foot recreation center. The new swimming pool opened in January 1983 and the Recreation Center is expected to be completed in late 1983 or early 1984. This center, built and operated by the City of Nome, provides six bowling lanes, a gym, handball/racketball courts, a game room with pool table, etc., exercise equipment, showers, sauna, whirlpool and hot tub. Nominal fees are planned for use of some of these facilities.

The City is also planning to develop an outdoor recreation area and to complete a couple of outdoor playgrounds for younger children.

HEALTH

The Norton Sound Health Corporation (NSHC) remains the primary provider of health care services in Nome. These services are funded through contracts with Indian Health Service, state government, local government and first and third party payers.

Alcohol-related mortality and morbidity, including accidents which correlate highly with alcohol misuse, continue to represent the most serious preventable health and social problems in the region.

Mortality

Table D-14 presents mortality data for Nome for the years 1978-1980, the three most recent years for which complete data is available. Total deaths, accidental deaths and crude death rate (per 100,000) are reported.

Table D-14

MORTALITY DATA

NOME

	Year		
	1978	1979	1980
Total Deaths	33	22	19
Accidental Deaths	15	7	6
Crude Death Rate	1,043	687	814
Ratio of Accidental/Total Deaths (%)	45	32	31

Source: Department of Health & Social Services, Bureau of Vital Statistics.

It should be noted that in view of the likelihood of a serious underestimate of population for 1980, there may be, in reality, a consistent downward trend in general mortality rates and in accidental death rates.

Morbidity

Alcohol Abuse. Alcoholism, alcohol abuse and related problems continue to be a major health and social problem in Nome as it does throughout Alaska.

During FY 80, Norton Sound Family Services (NSFS) saw a total of 83 alcohol program clients. Halfway through FY 81, a Comprehensive Alcoholism Program (CAP) was initiated under the auspices of NSHC. This program included alcohol-related components in mental health (NSFS), Bering Straits Treatment Center (BSTC) -- 12 bed intermediate care, 4 bed halfway house, 4 bed social setting detoxification -- Alcohol Safety Action Program, CAP's outpatient counseling, alcohol information school, after-care component, outreach, prevention/education and volunteer counseling program. The CAP also contracts with Bering Straits Women's Group (Women's Shelter) for alcohol-related client services.

The CAP employs six full-time and the BSTC employs 5-1/3 full-time staff. Less than 20 percent of staff are degreed and more than 50 percent are Alaska Natives.

As a result of this new programmatic effort, the number of clients seen directly through the alcoholism program increased dramatically as evidenced in Table D-15.

Table D-15

ALCOHOLISM CLIENT CASES

NOME

	FY 80	FY 81[a]	FY 82[b]
CAP		400	721
BSTC		46	118
NSFS	83	63	38
BSWG		85	140
Total	83	594	1,017

Source: Department of Health & Social Services, Office of Alcoholism & Drug Abuse.

[a]Includes 9/80-6/81

[b]Includes 7/81-5/82

It should be noted that the figures in Table D-15 do not represent unduplicated client counts since readmissions are included in the data.

Mental Health. Norton Sound Family Services continues to provide outpatient mental health services in Nome.

The most recent program data available is presented in Table D-16. Items 4-8 represent percentage of admissions by problem and Item 9 gives the number of admissions to API from the Nome mental health district.

Table D-16

MENTAL HEALTH CLIENT CASES

NOME

	FY 80	Year[1] FY 81	FY 82
1. Admissions	137	165	116
2. % White	18.4%	27.0%	34.5%
3. % Native	79.4%	71.7%	62.9%
4. Mental Illness	N/A*	13.2%	17.0%
5. Mental Retardation	N/A*	2.6%	0
6. Alcohol Abuse	N/A*	41.4%	30.0%
7. Drug Abuse	N/A*	2.6%	4.0%
8. Life Crisis	N/A*	40.1%	48.0%
9. API Admissions	19	27	*

Source: Department of Health & Social Services, Division of Mental Health and Developmental Disabilities

[1]Fiscal Year July-June

*not available

The total number of admissions can be seen as fluctuating somewhat irregularly. There does seem to be a slight trend toward an increasing percentage of White clients and a corresponding decrease in percentage of Native clients. The meaning of this shift would, however, depend upon an analysis of possible changes in population ratios for corresponding time periods. As stated earlier in this report, questions surrounding the 1980 Census figures make such an analysis difficult.

Health and Medical Services

Norton Sound Health Corporation services are divided into two major components: Hospital Services and Community Health Services.

Hospital Services include: nursing services, long-term care, pharmacy, radiology, outpatient clinic, respiration/physical therapy, specialty clinics, emergency and surgical services, and acute care.

Community Health Services include: emergency medical services, environmental health, village health services, dental services, eye care, family services, comprehensive alcohol program, teen risk reduction program.

The data presented in Table D-17 represents Norton Sound Health Corporation's Hospital and Community Services data for the most recent three-year period available. All numbers are rounded off, including percentages.

Table D-17

NORTON SOUND HEALTH CORPORATION UTILIZATION DATA

	Year[1]		
Activity	1979	1980	1981
Hospital Admissions	760	885	870
Adult & Child Patient Days	2,300	3,300	3,400
Acute Hospital Occupancy	40%	51%	53%
Deliveries	130	155	130
Nursing Home Days	1,800	2,000	1,800
Outpatient Visits	12,500	12,700	12,700
Emergency Room Visits	1,700	1,600	2,100
Laboratory Procedures	13,200	14,300	12,100
Radiology Procedures	3,400	3,600	2,600
Family Services	2,100	3,000	2,500
Patients Transferred:			
Village to Nome	1,150	1,100	1,150
Nome & Unalakleet to Anchorage	370	400	280

Source: Norton Sound Health Corporation, 1981 Annual Report.

[1]Fiscal Year October-September.

Adult and Child Patient Days, Acute Hospital Occupancy and Nursing Home Days show a gradual increase since FY 78 data reported in Technical Report No. 53. The remaining categories generally evidence less consistent changes over these past four years.

SOCIAL SERVICES

A variety of social services are offered in Nome directly, primarily through the State of Alaska, Kawerak, Inc., and Nome Eskimo Community.

State Division of Public Assistance

Table D-18 presents a summary of transfer payment data for: APA (Adult Public Assistance - blind, disabled, old age assistance); AFDC (Aid to Families with Dependent Children); and FS (Food Stamps) for the period May 1978 through October 1982.

Table D-18

PUBLIC ASSISTANCE PAYMENTS

NOME

Type	Year 1979[1] (May-Dec)	1980[2] (Jan-Dec)	1981[3] (Jan-Dec)	1982[4] (Jan-Oct)
APA				
Cases	555	898	738	512
Amount ($)	55,750	107,748	103,302	78,786
AFDC				
Cases	145	654	582	390
Amount ($)	17,685	191,042	238,467	173,529
FS				
Cases	471	2,143	1,765	517
Amount ($)	120,114	132,830	121,521	42,250

Source: Division of Public Assistance, Department of Health & Social Services.

[1] June missing APA, AFDC, FS

[2] November missing AFDC; July and September missing FS

[3] January and November missing APA & AFDC; December missing FS

[4] January, February & May missing APA & AFDC; April (cases only), May, June, July, September & October missing FS

Table D-19 presents transfer payment data expressed in terms of monthly averages and average payments per case for the period May 1978 through October 1982.

Table D-19

AVERAGE PUBLIC ASSISTANCE PAYMENTS

NOME

Type	Year 1979	1980	1981	1982
APA				
Cases/Month	79.3	74.8	73.8	73.1
$/Month	7,964	8,979	10,330	11,255
$/Case	100.45	119.99	139.97	153.88
AFDC				
Case/Month	24.2	59.5	58.2	55.71
$/Month	2,948	17,368	23,847	24,790
$/Case	121.96	292.11	409.74	444.95
FS				
Case/Month	67.3	214.3	160.5	129.3
$/Month	17,159	13,283	11,047	8,450
$/Case	255.02	61.98	18.85	65.04

Source: Division of Public Assistance, Department of Health & Social Services.

Table D-19 reveals a fairly steady level of APA cases and (as would be expected with annual increases in entitlements) a steady increase in average monthly payments and in average amount per warrant. AFDC cases, payments and rates, show a similar pattern (with the exception of a much lower level in 1979). Food stamps show a curvilinear pattern for average cases and payments per month and a dramatic drop in amount per case between 1979 and 1980, followed by a fairly even trend.

State Division of Family and Youth Services (DFYS)

The DFYS case data presented in Table D-20 below includes child protective services to children and adults, adult protective services, information and referral, and individual and family counseling.

Table D-20

DFYS CASELOAD DATA

NOME

	Year			
	1979 (Jan-Dec)	1980 (Jan-Dec)	1981 (Jan-Dec)	1982 (Jan-June)
Average Cases/Month	154.3	162.6	161.6	120.5
Total Cases/Year	1,389[1]	1,301[2]	1,150[3]	482[4]
Annualized Cases/Year	1,852	1,951	1,796	1,446

Source: Division of Family & Youth Services, Department of Health & Social Services.

[1]Three months missing data

[2]Four months missing data

[3]Four months missing data

[4]Two months missing data and six month uncovered for eight months total

Average monthly caseloads and annual totals are presented for the period January 1979 through June 1982.

It should be noted that the data used in deriving the figures in Table D-20 are somewhat inexact. They were calculated by subtracting the caseload figures for Gambell, Savoonga, Golovin, Unalakleet, and Teller from those from the Nome field office as a whole which also includes Diomede, White Mountain, Shishmaref, and Koyuk. Accordingly, the actual figure for Nome should be no more than about 5 percent less than shown based on the appropriate population and caseload proportions.

Given these qualifications, there appears to be a variable pattern exhibiting the sharpest change as a decrease between 1981 and 1982 for average cases per month and total per year.

Kawerak, Inc.

Kawerak is the Native regional nonprofit corporation providing social, general educational, social and cultural services and activities. These programs are represented by the following organizational divisions: Adult Basic Education, Employment and Training, Eskimo Teacher Education Program, Headstart, Subsistence, Adult Vocational Training, Eskimo Heritage, Fisheries Development, and Reindeer Herders Association. In addition, current programs include Village Public Safety Officers, Elders Conference and RuralCAP Energy.

Nome Eskimo Community (NEC)

NEC is the Native village nonprofit corporation providing services in the areas of housing, agriculture, direct employment, and social service. NEC is planning to expand its cultural/vocational education programs for Native residents of the Nome community.

SUMMARY

In general, most indicators of health and social problems demonstrate increasing levels of incidence and prevalence. Similarly, service utilization rates evidence a general upward trend over a period of succeeding years. Interviews with service providers generally confirm the view that most of these community services are operating at or near maximum level.

It is probably safe to assume, therefore, that any significant increase in population would be associated with a corresponding increase in the need or demand for services, independent of whatever increase there might be in problem rates per se.

The institutional and organizational structures necessary for responding to such an increase in demand for services are fairly well established. Given the prerequisite increases in funding and staff levels, it is reasonable to expect that these agencies would have the necessary potential for meeting increased needs in a fairly effective manner.

Moreover, the community in general appears to have an awareness of its problems -- current and potential -- and a commitment to meeting and overcoming such problems.

UTILITIES

The Nome Joint Utility Board is responsible for operation of the City's water, sewer and electric utilities and supervises operation of the solid waste disposal service. The Joint Utility Board is semi-autonomous and is governed by a five-member elected board.

Local telephone service is provided by the privately-owned General Telephone Company. In addition, the Alaska Gold Company operates its own electric power and water systems to serve its mining operations.

In 1982, the city embarked on a major program of improvements to its water supply and distribution system and sewer system estimated to cost a total of $25.9 million, not including the cost of a new wastewater treatment plant. Significant improvements have also been made to the electric power system since 1979.

According to the Joint Utility Board's most recent annual report (1981), the ratio of equity to long-term debt is very high for a utility system, about 9 to 1. This is largely because the utility has been able to fund recent capital projects with grant funds rather than through borrowing. Likewise, its assets have grown substantially over that period, again, mainly due to an infusion of capital grant funds.

As a whole, the system has had a net income for two of the last three years, with a net profit of about $250,000 for the three-year period 1979-1981. However, it is the profitable performance of the electric utility that accounts for this situation. For example, in 1981, the electric utility division generated 77 percent of total revenues, but only 71 percent of expenses. On the other hand, the water utility contributed 18 percent of the revenues, but 24 percent of expenses, for a substantial net loss. The sewer system division broke about even.

Each of the main utilities is discussed in turn below.

Water

As of mid-1982, according to the Annual Report of the Nome Joint Utility Board, there were about 660 customers hooked up to the piped water distribution system. Another 200 customers received their water from the trucked delivery service.

Since Technical Memorandum No. 53 was published, the City of Nome has had prepared a Water and Sewer Master Plan Update of the 1976 CH_2M Hill 1976 Nome Water and Sewer Master Plan. The Master Plan Update was prepared by QUADRA Engineering, Inc. It reappraised the City's water system for a design population of 5,000 residents by 2,000. The preliminary version of the new Master Plan recommended many immediate and long-range water system improvements, some of which were installed during 1982. Thus, the situation with regard to Nome's water (and sewer) system has changed since Technical Memorandum No. 53 and some of the system problems noted in that baseline description are now corrected or are proposed for correction.

Technical Memorandum No. 53 noted three main problems with the existing water system. First, the water source at Moonlight Springs, through adequate most of the year, was thought prone to low flow levels during break-up, with increasing danger of a seasonal water shortage as consumption rose. Also, the City's reservoir capacity of less than two days supply was considered below standard and compounded the potential supply problems.

Second, the pumping capacity for the piped water system was judged substandard for firefighting purposes and needed to be upgraded.

Third, the rate structure was deemed to overcharge piped-water customers while undercharging delivered-water customers. This, along with the high cost of hooking up residential plumbing systems, discouraged full use of the water distribution system within the service area, thus denying the community of the full benefit of the public investment in the water system.

The key findings and recommendations of the preliminary Master Plan Update prepared by QUADRA were:

- the water distribution system should be extended in two phases to include, first, the unserved areas in the developed core of the townsite and the newly developing area in the east end of the townsite and Belmont Point and, second, the Nome Airport and the Icy View subdivision. See Figure D-7. In all, about 200 additional existing residences and 400 vacant lots will be newly serviced by the proposed expansion.

- construction of a new reservoir with a storage capacity of 800,000 gallons, plus upgraded transmission lines were also recommended for Phase II. Even without added pumping capacity, these improvements would remedy the earlier-noted concern for firefighting capacity.

- contrary to earlier concern, the Moonlight Springs water source has proven adequate for supply needs to date and was judged likely to be adequate for average demand flows to the year 2000 and beyond. However, if demand eventually exceeds Moonlight Springs' capacity, there are other sources of supply that could be easily developed. Water quality at Moonlight Springs remains good. It was recommended that fencing be installed for better protection of the water source and watershed against contamination. Also recommended was development of an additional well near the proposed new reservoir as a back-up

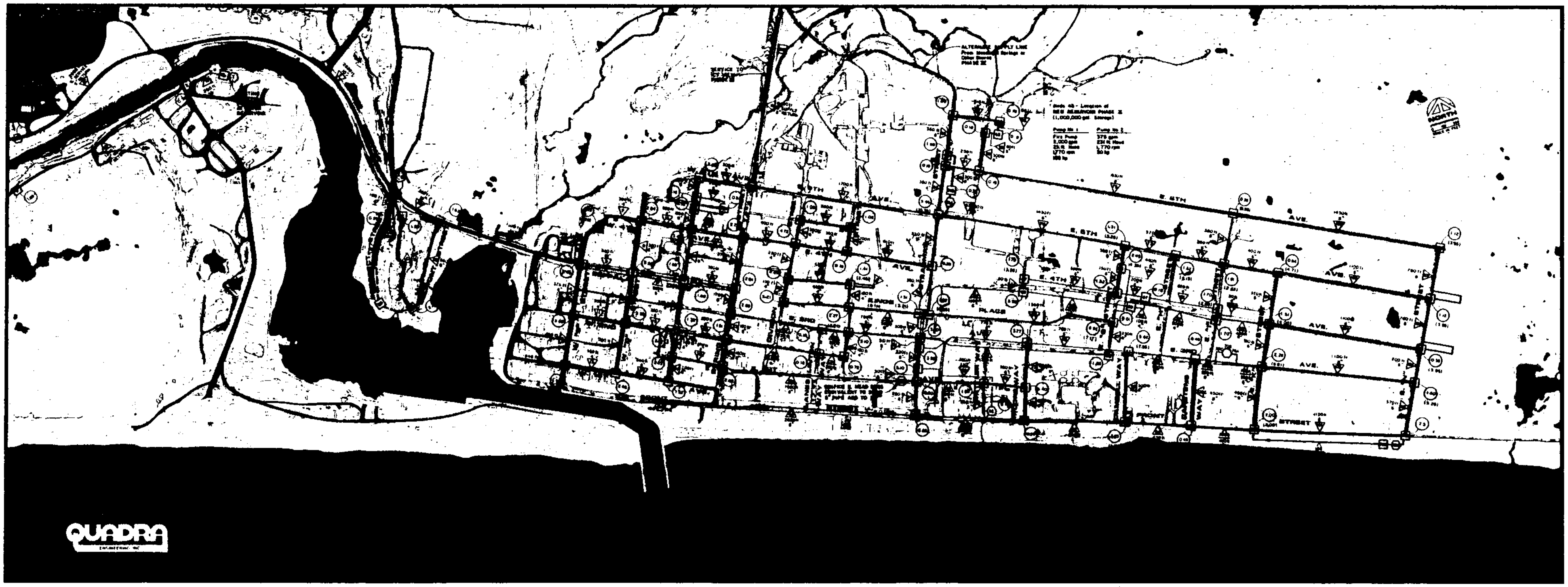


Figure 7
EXISTING AND PROPOSED
WATER SYSTEM

water supply for household consumption and power plant cooling. Finally, the Master Plan recommended that alternate water supply sources to Moonlight Springs be investigated as soon as funds were available.

- a number of lesser improvements and maintenance chores.

The Master Plan Update did not address the issue of user rates for the water service.

The cost of 1982 improvements for water and sewer lines to those parts of the core area not already serviced, was about $5.0 million. In 1983, the city intends to extend water and sewer lines to undeveloped parts of Belmont Point and the East End and to construct a new reservoir, at a cost of about $6.0 million. This figure did not include the cost of individual house connections for water and sewer services and plumbing improvements, estimated to cost $10,000 per dwelling. No date has been set for installing water system improvements to Nome Airport or Icy View Subdivision.

The recent annexation did not have any major effect on the water utility system. None of the area annexed was connected to the water distribution system although some of the proposed improvements will provide piped water to annexed areas. The City already did provide water delivery service to customers outside its boundaries, so the annexation did not add new customers for that service.

The Part I Coastal Management Program report stated that actual water consumption in 1980 was about 67 gallons daily per capita. The Master Plan Update assumed that consumption would rise to about 80 gallons daily per capita by 2,000 or about 400,000 gallons daily altogether. See Table D-21.

Table D-21

PROJECTED WATER DEMAND

CITY OF NOME, 1981-2000

Year	Population	Total Water Demand gallons/day
1981	3,039	243,120
1985	3,475	278,000
1990	4,883	390,740
1995	4,783	382,640
2000	5,000	400,000

Source: Water and Sewer Master Plan Update
QUADRA Engineering, Inc.

For the long run, this average per capita water consumption figure may be boosted by the planned shift of users from the truck-delivered to the piped water system or by a greater than expected growth in the visitor industry or water consumptive industries such as seafood processing. If so, then future water consumption might reach design capacity sooner than expected.

The City did receive a State legislative grant in the amount of $4.6 million for water and sewer facilities in FY 1982, part of which was used to begin the water system improvements. It is expected that completion of the entire proposed program of improvements will need to be assisted by additional grant funds from the State. The city has also applied for a $2.0 million loan under the Coastal Energy Impact Program for which the city electorate authorized a general obligation bond issue in October 1982.

Once the improvements proposed in the Master Plan Update are completed, the City will have in place the basic water system hardware to take care of present needs and future growth for the next decade and more.

The operating costs for the water and sewer utilities is very high. For each of the last three years, the combined operating statement for these two utilities has shown a growing operating loss, climbing from a few thousand dollars in 1979 to more than a quarter million in 1981. A review of the 1981 annual report indicates that the water system accounted for nearly all of this operating deficit.

Sewer

The local sanitary waste collection service, like the water supply system, is divided into two classes of service. As of mid-1982, there were about 650 customers connected to the piped sewage collection system and about 170 were served by the sani-can collection service provided by the

Utility through a private contractor. There were also a few onsite septic systems and a separate small treatment plan for the FAA housing. An unknown number of households had no regular arrangement for proper disposal of sanitary sewage wastes or graywater, a situation which posed a hazard to public health.

The Master Plan Update recommended extension of the sewer main collection system to parallel the extension of the water distribution system. As with the water system, two phases were proposed. Phase I, begun in summer of 1982, provides sewer collection service to heretofore unserved areas in and around the townsite core and Belmont Point. Phase II will extend the system to take in the airport and Icy View subdivision. See Figure D-8.

The total estimated cost for Phase I improvements, including work already completed, is $3.1 million. Phase II is estimated to cost about $7.5 million.

QUADRA is conducting two other studies related to the City's sewer system. First, it has already completed a comprehensive evaluation of the existing utilidor system in which the old water and sewer lines were installed. QUADRA recommended an extensive maintenance and repair program, estimated to cost $1.2 million, to rehabilitate the utilidor system to good working order.

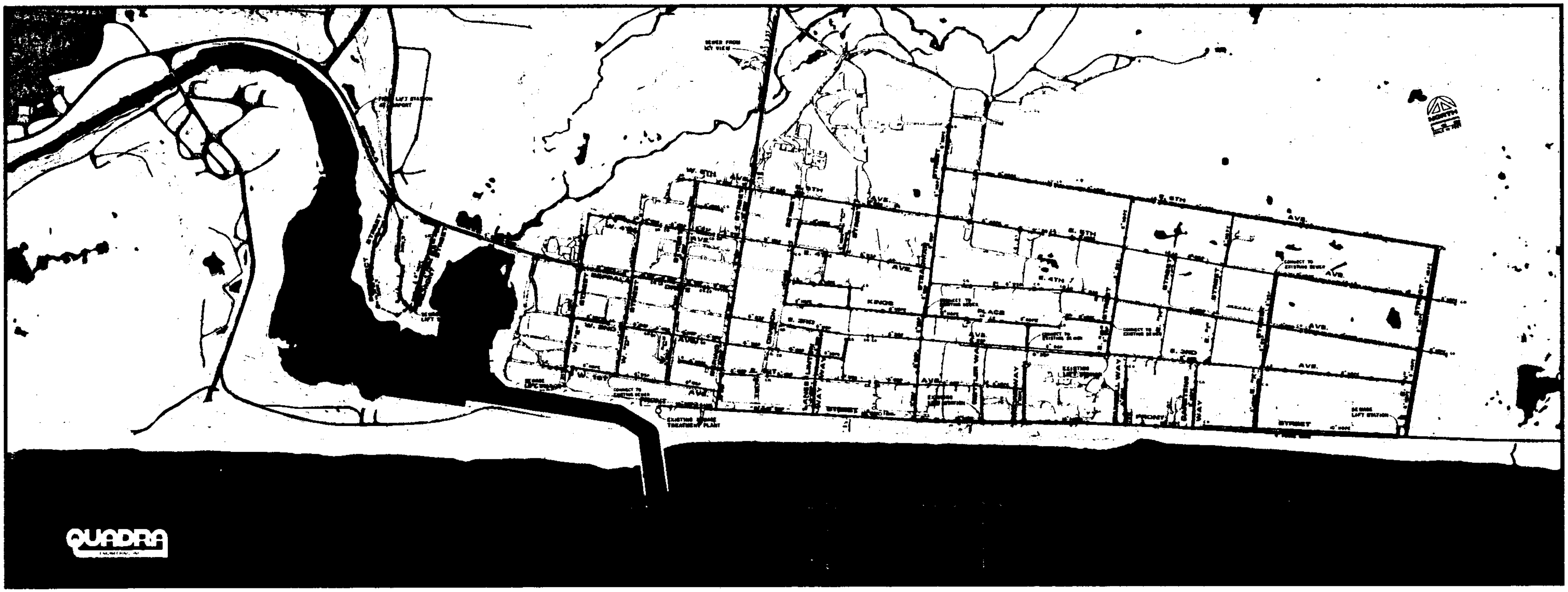


Figure 8
EXISTING AND PROPOSED
SEWER SYSTEM

Second, QUADRA will be preparing a Wastewater Facilities Plan to address existing problems and future systems needs of the waste treatment plant. Even as early as the 1976 CH_2M Hill Master Plan, it was noted that the wastewater plant was deficient. The system provides only primary treatment, is overloaded and does not comply with federal water quality standards.

As the sewage system extension will reach to areas previously serviced by the sani-can collection service, the number of customers for the latter service will decline. Replacement of the sani-can service with sewers will also help reduce the volume of honey-bucket wastes that are disposed of in burial trenches at the City landfill site.

As with the water system improvements, the various sewer system improvements will need to be financed by capital improvements grants obtained from the State government.

These projects, when completed, will result in a decided improvement in the standard of living for residents newly connected to the system. Installation of sewer lines to spottily developed areas of town will also make development of the remaining vacant tracts in the eastern part of the old townsite more attractive and feasible.

Power

The City's electric power utility, operated by the Nome Joint Utility Board, serves nearly all potential users within town with the exception of the major industrial power consumer, the Alaska Gold Company, which operates its own generating and distribution system. Apparently, the fluctuating power consumption of the company's mining dredges does not mesh well with the power production schedule of the City utility and so is served by its own self-standing system. As of mid-1982, the Joint Utility Board reports that it provided electric service to about 1,240 electric consumers.

The major change in the power system since 1979 has been installation of the new Belmont Point generator, which at 2,500 KW is by far the largest of the eight generating units in the system and accounts for nearly one-third of total system generation capacity.

According to the Joint Utility Board's 1981 annual report, Nome now has one of the most fuel-efficient diesel generation systems in the State. The main source of concern was the ongoing need to replace or modernize some equipment and distribution lines which have become obsolete. To this end, in 1981, the Joint Utility Board spent nearly $400,000 for improvements to the Snake River and Belmont Point generating units and related facilities and about another $400,000 to improve, upgrade and extend the electric distribution system. Both projects were funded almost wholly with State grant funds.

Electric rates have risen steeply since the earlier baseline description. The uniform rate of service for all classes of consumers in 1979 was set at about $0.15 per KW. By mid-1982, this rate had risen nearly 50 percent to about $0.214 per KW. Rising fuel prices account for a large share of this increase and it may be that the rates will level off if the recent trend to stable or declining oil prices continues.

In general, the electric power utility appears to be in sound financial as well as physical condition. According to the 1981 annual report, the electric utility has operated at a substantial profit for the last three calendar years (1979 to 1981) of from $200,000 to $300,000 annually. This is even after allowance is made for system depreciation. The debt ratio is low and falling since the utility has been successful in financing most of its recent capital improvements with grant funds.

In sum, at this time, there do not appear to be any major problems for provision of electric service.

Communications

Since Technical Memorandum No. 53 was prepared, there have been no significant changes in the local telephone and telecommunications service available at Nome. As noted in the earlier study, the existing capacity was more than adequate for immediate needs and there will be adequate time to plan for and install additional system capacity as needed.

Solid Waste

Solid waste collection service is provided on a user charge basis by the same local firm that operates the sani-can sanitary waste collection service. Solid wastes and sanitary wastes are both disposed of at the City landfill, now within the City post-annexation boundaries.

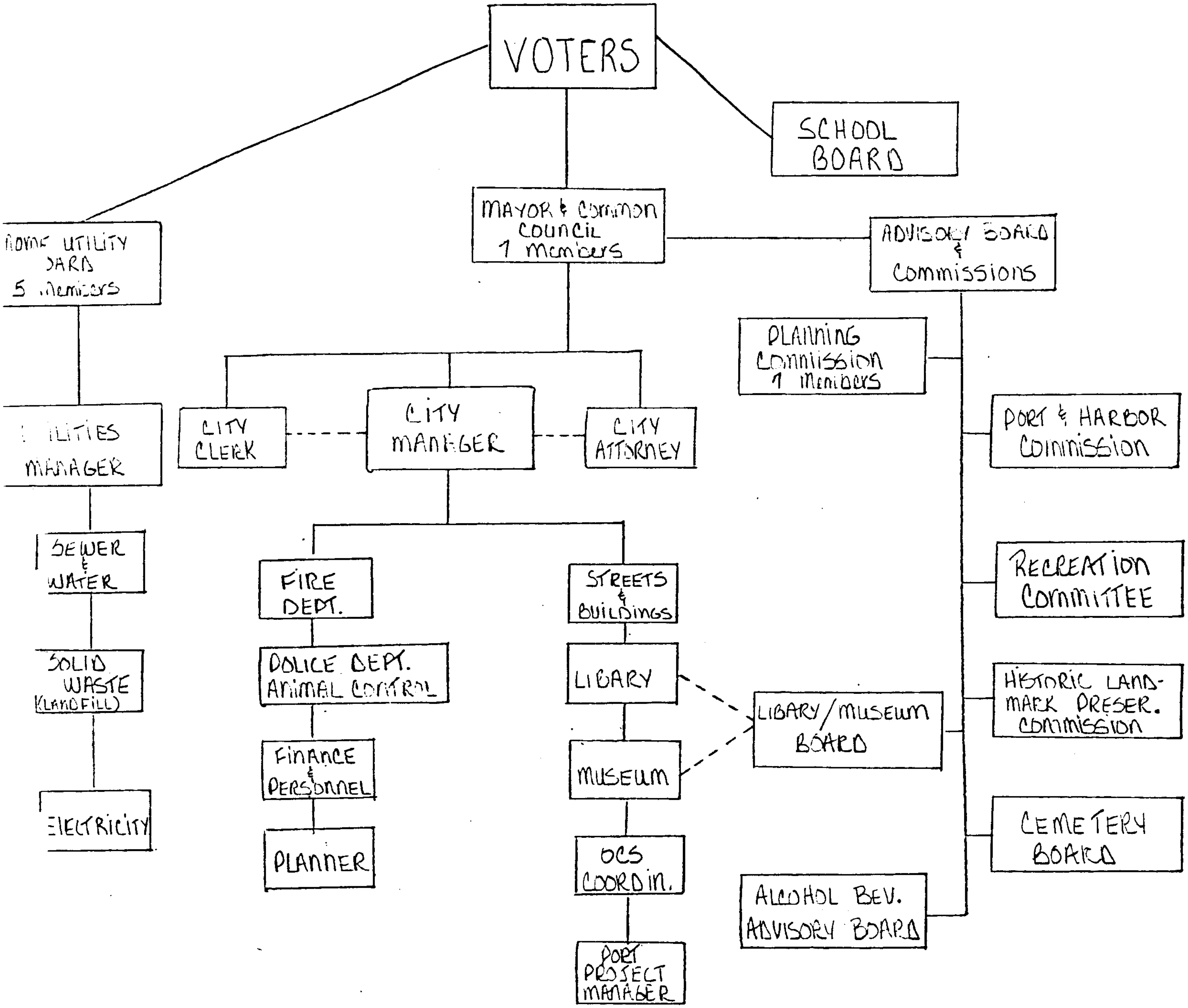
In mid-1982, according to the Joint Utility Board's annual report, there were an estimated 690 customers for the refuse collection service, a substantial increase over the approximately 400 customers reported in the earlier baseline description.

There are no difficulties expected for future provision of solid waste collection and disposal service for the community beyond routine problems of operating such a service.

Municipal Powers and Finances

MUNICIPAL POWERS

Compared to other regional centers in western Alaska, Nome has an unusually well-developed set of municipal institutions for local governance. Figure D-9 shows the organization of City government as of 1981. In fact, the abundance of local governing institutions and advisory boards prompted the consultant firm preparing the implementation program for the coastal management program to note that



Source: Updated from Nome Coastal Management Program, Public Hearing Draft, ESL 1981.

Figure D-9

CITY OF NOME ORGANIZATION CHART, 1982

the City had grown to have too many separate and decentralized governing agencies. The consultant recommended that the number of bodies be reduced and that stronger central city government be promoted.

Two events with long-term potential for altering the municipal structure and jurisdictional role of the City of Nome have taken place since the earlier baseline description. These were annexation and initiation of a district coastal management program.

In 1982, the City finally met with success in its annexation efforts as the Alaska Legislature approved annexation of about 10,700 acres of surrounding land and waters in 1982. This annexation expanded the area over which the City has authority to provide facilities and services.

The Nome Annexation Study, which was prepared by an economic consultant as background for the annexation decision, found that there were three municipal services that should be immediately extended to the annexed area: municipal planning, animal control and road maintenance at an estimated initial annual cost of $67,250. For other City services, the immediate effect of the annexation was expected to be minimal. Even before the annexation, the City already provided a number of services to the extraterritorial area, such as electric power, water delivery and waste collection and fire protection. There are no plans to provide new improvements in the annexed area right away, although eventual extension of municipal water and sewer facilities is part of the City's Water and

Sewer recent Master Plan Update. Since annexation, the city extended police protection to the annexed area.

For the long run, it is important that the annexation greatly expanded the land area over which the City of Nome can exercise its planning authority and development controls. The City now encompasses effectively all of the settled area and population in its immediate vicinity, plus a buffer zone that will include any future developments that are likely to have direct physical effect on the town. This enlarged planning jurisdiction will strengthen the City's position to plan for any future large-scale growth that may arise from OCS developments or other sources. However, the annexation did not extend to include Cape Nome, which has been tentatively identified as a potential site for onshore OCS support facilities.

Second, as earlier explained, the City is midway through the process of developing a district coastal management program. As part of the draft Coastal Management Plan and Implementation Program, it was recommended that the City pursue a variety of planning and other powers such as a land use code in order to exercise stronger influence over future community development. The City is now considering whether it wishes to adopt zoning-type land use ordinances to guide future community development.

In the near future, if the port development and small boat harbor facilities are constructed as planned, the City will have to assume some added management responsibilities for the operation and maintenance of each facility.

MUNICIPAL REVENUES AND EXPENDITURES

The City of Nome's fiscal situation is easy to describe but hard to appraise in meaningful terms. The City does not have a well-integrated budget process. In effect, there are three separate budgets, one each for the City government operations, the school district and the semi-autonomous utilities board. There is no effective multi-year capital improvements program or plan nor does the City keep a distinct capital budget. Capital improvements appropriations are handled as part of the operating budgets.

Table D-22 and D-23 summarize the City's combined statement of revenues and expenditures for Fiscal Years 1981 and 1982. Comparison of the two tables shows that general fund revenues and expenditures skyrocketed between 1981 and 1982. General fund revenues increased by about 169 percent and expenditures rose by about 236 percent in successive fiscal years. The increase in revenues stemmed almost wholly from a lavish and unprecedented infusion of State funds. As a result, in FY 1982, intergovernmental revenues accounted for nearly 80 percent of the City government's total general fund revenues, while local property and sales taxes provided barely 10 percent of revenues. Although not shown in the tables, the increased expenditures were allocated almost wholly for capital improvements.

Table D-22

COMBINED STATEMENT OF GENERAL FUND REVENUES AND EXPENDITURES

CITY OF NOME, FY 1981

EXPENDITURES		REVENUES	
ACCOUNT	AMOUNT	ACCOUNT	AMOUNT
Legislative	$ 34,212	Taxes	$1,357,596
Administrative	993,659	Intergov. rev.	2,202,311
City Clerk	42,107	Licenses, permits, fees	20,149
Roads & Buildings	710,549	Charges for services	51,015
Museum	32,229	Fines, forfeits	3,620
Police	411,174	Land sales	280,875
Fire	27,315	Other	135,508
Library	38,972		
Debt Service		Total	$4,051,074
Principal	63,750		
Interest	42,081		
Nondepartmental	862,620		
Total	$3,258,668		

Source: City of Nome Financial Statement, 1981

Table D-23

COMBINED STATEMENT OF GENERAL FUND REVENUES AND EXPENDITURES

CITY OF NOME, FY 1982

EXPENDITURES		REVENUES	
ACCOUNT	AMOUNT	ACCOUNT	AMOUNT
Legislative	$ 35,501	Taxes	$ 1,145,277
Administrative	2,443,771	Intergov. rev.	8,590,449
City Clerk	144,578	Licenses, permits, fees	22,327
Roads & Buildings	6,121,345	Charges for services	68,669
Museum	55,784	Fines, forfeits	4,333
Police	446,310	Land sales	137,182
Fire	44,922	Other	909,257
Library	64,349		
Debt Service		Total	$10,866,494
Principal	91,101		
Interest	17,889		
Nondepartmental	1,484,955		
Total	$10,950,505		

Source: City of Nome Financial Statement, 1982

Comparison of general fund expenditures for 1980 and 1982 (see Table D-24) shows that expenditures rose six-fold over the two-year period. Clearly, this trend will not last. It is implausible to project these recent short-term trends into the future or to draw any quantitative conclusions about the City's future financial situation from these most recent fiscal figures. In all likelihood, this spasm of State intergovernmental revenue transfers will be short-lived and will drop off sharply after FY 1982, though it may not return to pre-1980 levels.

Table D-24

GENERAL FUND EXPENDITURES

CITY OF NOME, 1975-1982

Year	Amount	% Change from Previous Year
1975	$ 1,301,592	
1976	1,731,134	+ 33
1977	2,157,701	+ 25
1978 (budget)	2,033,220	- 6
1979 (budget)	2,163,379	+ 6
1980 (budget)	1,803,684	- 17
1981	3,258,668	+ 81
1982	10,950,505	+226

Source: City of Nome Financial Statements, 1975-1977, 1981 and 1982; City of Nome Budgets, 1978-1980.

Furthermore, in the absence of any life-cycle costing analysis, it is impossible to say what the long-term effect of the new capital improvements will be on the City's operating budget.

Regardless of the above inconclusive analysis, it appears that the City is in a better position than most Alaskan municipalities as far as its debt situation is concerned. See Table D-25. Because the City has hardly used general obligation bonds to finance capital projects in the past, it is virtually free of bonded indebtedness.

Table D-25

VALUATION, POPULATION AND GENERAL OBLIGATION DEBT, 1981

CITY OF NOME, ALASKA CITIES AND ALASKA MUNICIPALITIES

	Full Value Property Determination	Civilian Population	G.O. Bonded Debt	Per Capita Debt	Per Capita Valuation	Debt as % of Valuation
City of Nome	$ 104,516,600	3,039	$ 550,000	$ 183	34,392	.53
Alaska Cities	2,453,998,510	30,447	89,791,689	2,949	80,599	3.66
Alaska Municipalities	25,788,058,230	392,492	1,091,019,504	2,780	65,703	4.23

Source: Alaska Department of Community and Regional Affairs Alaska Taxable 1981: Municipal Property Assessments and Equalized Full Value Determination.

APPENDIX E

Socioeconomic Data Base

Population

Local community level census data should be used with the same caveats advanced in the earlier sections on regional demographics (Chapter 3). This is particularly true for the city of Nome, which in comparison to previous figures (Table E-1) was significantly undercounted during the 1980 federal census.

TABLE E-1
Community Census Data
Population Comparisons, 1960-1980

Community	1960	Year 1970	1980
Nome City	2,316	2,357	2,301
Gambell	358	372	445
Golovin	59	117	87
Savoonga	*	364	491
Teller	217	220	212
Unalakleet	574	434	623
Alakanuk	278	414	522
Emmonak	*	439	567
Kotlik	57	228	293

* missing or unavailable
Source: U.S. Census Bureau

According to these findings, Nome experienced a small increase in population (1.8%) between 1960 and 1970 and a slight decrease (-2.4%) between 1970 and 1980 for a net decrease of 0.6%. The case against the accuracy of the 1980 census figure for Nome has already been advanced in this report. Nevertheless, analysis of major population characteristics and trends will be based on U.S. Census data for 1960, 1970, and 1980 so that proportions and relationships among these characteristics would be relatively constant if applied to later, more accurate state estimates.

Teller follows the same general pattern as Nome with a slight increase (1.4%) between 1960 and 1970, a slightly larger decrease (-3.6%) between 1970 and 1980, and a net decrease of 2.3%. The other communities show consistent increases in population at each successive census point. Gambell increased 3.9% between 1960 and 1970 and 19.6% between 1970 and 1980 for a net increase of 24.3% between 1960 and 1980. Golovin increased 98.3% between 1960 and 1970, decreased 25.6% between 1970 and 1980, and had a net increase of 47.4%

between 1960 and 1980. Savoonga (no 1960 figure) increased 34.9% between 1970 and 1980. Unalakleet decreased 24.4% between 1960 and 1970, increased 43.5% between 1970 and 1980, and had a net increase of 8.5% between 1960 and 1980. Alakanuk had a 48.9% increase between 1960 and 1970, a 26.1% increase between 1970 and 1980, and a net increase of 87.8% between 1960 and 1980. Emmonak (no 1960 figure) increased 29.1% between 1970 and 1980. Kotlik increased 300.0% between 1960 and 1970 and 28.5% between 1970 and 1980 for a net increase of 400.1% between 1960 and 1980.

In 1970 in all communities the under 5 age group ranged from a low of 7.8% (Unalakleet) to a high of 17.5% (Emmonak) of total community population (Table E-2).

TABLE E-2
Community Census Data
Population Age Comparison, 1970

Community	Under 5 years	Age (% of total population) 5-14 years	15-64 years	65+ years
Nome City	11.9	27.3	56.6	4.0
Gambell	13.8	27.6	51.5	7.1
Golovin	17.0	27.3	49.5	5.9
Savoonga	12.9	33.5	51.0	2.4
Teller	9.0	31.3	54.0	5.4
Unalakleet	7.8	35.7	50.9	5.5
Alakanuk	17.0	33.2	47.9	1.8
Emmonak	17.5	33.7	46.7	2.0
Kotlik	16.6	29.8	50.4	3.1

Source: U.S. Census Bureau

The 5-14 age group ranged from a low of 27.3% (Nome and Golovin) to a high of 35.7% (Unalakleet), the 15-64 age group from a low of 46.7% (Emmonak) to a high of 56.6% (Nome), and the 65 and over age group from a low of 1.8% (Alakanuk) to a high of 7.1% (Gambell).

In 1980 in all communities the under 5 age group ranged from a low of 9.0% (Nome) to a high of 13.5% (Gambell) of total community population (Table E.3).

TABLE E-3
Community Census Data
Population Age Comparisons, 1980

	Age (% of total Population)			
Community	Under 5 years	5-14 years	15-64 years	65+ years
Nome City	9.0	19.5	65.7	5.8
Gambell	13.5	22.4	59.5	4.5
Golovin	10.3	13.0	57.4	9.2
Savoonga	12.0	21.4	62.8	3.7
Teller	13.2	12.8	66.9	7.1
Unalakleet	10.8	19.9	64.4	5.0
Alakanuk	13.4	28.3	55.7	2.5
Emmonak	11.8	27.1	57.4	3.4
Kotlik	9.2	23.5	62.8	5.2

Source: U.S. Census Bureau

The 5-14 age group ranged from a low of 12.8% (Teller) to a high of 28.3% (Alakanuk), the 15-64 age group from a low of 55.7% (Alakanuk) to a high of 66.9% (Teller), and the 65 and over age group from a low of 2.5% (Alakanuk) to a high of 9.2% (Golovin).

On the whole the proportion of persons under 5 years of age decreased (average change of -2.3% of population) and the percentage of those in the 65+ category increased (average change of +1.0%) (Table E-4).

TABLE E-4
Community Census Data
Population Age Changes, 1970-1980

Community	Under 5 years	5-14 years	15-64 years	65+ years
	Age (% change between 1970 and 1980)			
Nome City	-2.9	-7.8	+9.1	+1.8
Gambell	-0.3	-5.2	+8.0	-2.6
Golovin	-6.7	-4.3	+7.9	+3.3
Savoonga	-0.9	-12.1	+11.8	+1.3
Teller	+4.2	-18.5	+12.9	+1.7
Unalakleet	+3.0	-15.8	+13.5	-0.5
Alakanuk	-3.6	-4.9	+7.8	+0.7
Emmonak	-5.7	-6.6	+10.7	+1.4
Kotlik	-7.4	-6.3	+12.4	+2.1
Average	-2.3	-9.1	+10.5	+1.0

Source: U.S. Census Bureau

The major general changes for all communities occurred in the 5-14 age group (average change of -9.1%) and the 15-64 age group (average change of +10.5%). Notable exceptions were Unalakleet and Teller with moderate increases in the 5 and under category. Interestingly, these two communities had appreciably lower percentages in this age group in 1970 than the others. In addition, both Unalakleet and Gambell showed slight decreases in the 65 and over category. In 1970 these two were among the three communities with the highest percentages in that category.

In 1970 each of the study communities, the median age for females was lower than for males except Gambell and Alakanuk where the reverse was true (Figure E-5).

TABLE E-5
Community Census Data
Median Age Comparisons, 1970

Community	Median Age (Years)		
	Male	Female	Total
Nome City	21.5	19.5	20.5
Gambell	18.7	21.3	20.0
Golovin	19.2	14.9	17.0
Savoonga	18.0	16.6	17.3
Teller	20.0	18.3	19.1
Unalakleet	19.2	16.8	18.0
Alakanuk	13.8	16.3	15.0
Emmonak	14.9	14.5	14.7
Kotlik	18.0	16.5	17.2

Source: U.S. Census Bureau

Overall, Emmonak had the lowest median age (14.7) and Nome had the highest (20.5).

In 1980 each of the study communities, the median age for females was lower than for males (Figure E-6).

TABLE E-6
Community Census Data
Median Age Comparisons, 1980

Community	Median Age (Years) Male	Female	Total
Nome City	26.3	25.6	26.0
Gambell	22.2	20.6	21.4
Golovin	29.4	24.4	26.6
Savoonga	22.9	20.2	21.8
Teller	26.3	22.6	24.6
Unalakleet	24.3	21.6	22.8
Alkakanuk	18.7	17.0	17.9
Emmonak	20.8	20.1	20.3
Kotlik	23.1	19.5	22.1

Source: U.S. Census Bureau

In 1980 Alakanuk (at 17.9) replaced Emmonak (in 1970) as the community with the lowest overall median age, and in 1980 Golovin (at 26.6) replaced Nome (in 1970) with the highest median age.

Median age increased in all cases between 1970 and 1980 with the exception of Gambell females, which decreased slightly. Table E-7 compares the difference, expressed in years, between median ages for 1970 and 1980 for each of the study communities.

TABLE E-7
Community Census Data
Median Age Changes, 1970-1980

Community	Median Age (Change in # Years) Male	Female	Total
Nome City	+4.8	+6.1	+5.5
Gambell	+3.5	-0.7	+1.4
Golovin	+10.2	+9.5	+9.6
Savoonga	+4.9	+3.6	+4.5
Teller	+6.3	+4.3	+5.5
Unalakleet	+5.1	+4.8	+4.8
Alakanuk	+7.0	+0.7	+2.9
Emmonak	+5.9	+5.6	+5.6
Kotlik	+5.1	+3.0	+4.9
Average	+5.9	+4.1	+5.0

Source: U.S. Census Bureau

Between 1970 and 1980 the median age for males increased by an average of 5.9 years in all communities (Table E-7). The corresponding change in median age for females was an increase of 4.1 years, and for both sexes combined there was a 5.0 year increase. Nome was the only community in which the increase was less for males than for females. Change in male median age was highest for Golovin (+10.2 years) and lowest for Gambell (+3.5 years). Change in females median age was highest for Golovin (+9.5 years) and lowest for Gambell (-0.7 years). Change for both sexes combined show Golovin (+9.6 years) as the highest and Gambell (+1.4 years) as the lowest.

In 1970 all communities except Name had Native population percentages averaging close to 95% (Table E-8).

TABLE E-8
Community Census Data
Race and Sex Comparisons, 1970

Community	Race (%) Native	Race (%) White	Sex (%) Male	Sex (%) Female
Nome City	62*	37*	52	48
Gambell	96	4	54	46
Golovin	95	5	48	52
Savoonga	98	2	57	43
Teller	89	13	58	42
Unalakleet	94	6	51	49
Alakanuk	93	7	52	48
Emmonak	96	4	53	47
Kotlik	98	2	51	49

*Totals less than 100% because of 1% "Other"
Sources: U.S. Census Bureau

In all cases except Golovin, males outnumbered females. Savoonga and Teller registered particulary high percentages of males at 57% and 58%, respectiveley. For all communities the average percentage of males was 52.9%, making the average percentage of females 47.1%.

In 1980 all communities except Nome had Native population percentages averaging 93.5% (Table E-9).

TABLE E-9
Community Census Data
Race and Sex Ratios, 1980

	Race (%)		Sex (%)	
Community	Native	White	Male	Female
Nome City	58*	39*	53	47
Gambell	95	5	58	42
Golovin	98	2	54	46
Savoonga	94	5	54	46
Teller	92	7	57	43
Unalakleet	88	12	53	47
Alakanuk	94	6	51	49
Emmonak	91	8	52	48
Kotlik	96	4	52	48

* totals less than 100% because of 3% "Other"
Source: U.S. Census Bureau

The most notable changes occurred in Unalakleet, which decreased 6% in Native and increased 6% in white composition, and in Nome, which decreased 4% in Native population and increased 2% each in white and "other" categories. Golovin joined the other communities with a higher percentage of males than females. In 1980, Teller and Gambell obtained the highest percentage of males at 57% and 58%, respectively. The average percentage of males across all communities was 53.8% and 46.2% for females.

Community population figures for 1980, 1981 and 1982 (Table E-10) were derived from the federal census for 1980 and based on estimates of the state demographer (included the results of a 1981 field census for Nome) for 1981 and 1982.

TABLE E-10
Community Population Data, 1980-1982

Community	1980[a]	Year 1981[b]	1982[b]
Nome City	2,301	3,039	3,430
Gambell	445	480	432
Golovin	87	94	112
Savoonga	491	530	477
Teller	212	229	206
Unalakleet	623	672	604
Alakanuk	522	534	546
Emmonak	576	568	581
Kotlik	293	339	347

Sources: [a] U.S. Census Bureau
[b] Alaska Department of Labor

All nine communities increased in population between 1980 and 1981, with Nome recording the largest gain (32.1%). Much of this increase for Nome (perhaps for other comunities, also, but to a lesser degree) can be accounted for by the greater accuracy of the 1981 field census for Nome and by general improvements in the accuracy of states estimates. The 1980 census undercount for Nome was particularly serious. Four of the nine study communities, however, show population decreases between 1981 and 1982.

Population change percentages for the period 1980-1982 for each community (Table E-11).

TABLE E-11
Community Census Data
Population Change Comparisons, 1980-1982

Community	Population Change (% Difference) 1980-81	1981-82	1980-1982
Nome City	+32.1	+12.9	+49.1
Gambell	+7.9	-10.0	-2.9
Golovin	+8.0	+19.1	+28.7
Savoonga	+7.9	-10.0	-2.8
Teller	+8.0	-10.0	-2.8
Unalakleet	+7.9	-10.1	-3.0
Alakanuk	+2.3	+2.2	+4.6
Emmonak	+0.2	+2.3	+2.5
Kotlik	+15.7	+2.3	+18.4

Source: U.S. Census Bureau and Alaska Department of Labor

Show that five communities increased in population (Nome by 49.1%, Golovin by 28.7%, Alakanuk by 4.6%, Emmonak by 2.5%, and Kotlik by 18.4%), and four communities decreased in population (Gambell by 2.9%, Savoonga by 2.8%, Teller by 2.8%, and Unalakleet by 3.0%). The growth rate for Nome is an artifact of the 1980 census undercount. Although Nome may have experienced some growth between 1980 and 1981, the estimated 1981 population may serve as a closer estimate of the 1980 population (see Chapter 3). It is possible therefore that the 1981-82 change listed above (+12.9%) more accurately reflects the likely 1980-1982 change.

Vital Statistics

The highest number of births overall occurred between 1977 and 1980, and 1970 and 1972 recorded the lowest number (Table E-12).

TABLE E-12
Births by Community, 1970-1980

Community	Year 1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
	Number of Births										
Nome City	65	75	56	61	70	80	80	70	61	45	84
Gambell	4	8	9	7	7	7	12	9	13	10	10
Golovin	1	2	2	2	3	1	0	3	3	4	10
Savoonga	10	8	7	13	10	7	7	12	9	10	11
Teller	2	4	3	3	3	0	5	5	5	10	6
Unalakleet	4	8	13	13	12	15	12	8	13	12	13
Alakanuk	15	12	14	16	18	18	12	6	9	7	15
Emmonak	12	12	8	9	13	15	14	26	13	14	12
Kotlik	4	7	4	13	3	7	3	6	8	8	8
Total	117	136	116	137	139	150	145	155	134	130	162

Source: Department of Health & Social Services, Bureau of Vital Statistics

A fair amount of variation can be seen in all communities within the 10-year period for which data is available.

The 1970 birth rate average over all nine communities equaled 19.2/1,000 with a range of 8.5/1,000 (Golovin) to 36.2/1,000 (Alakanuk) (Table E-13).

TABLE E-13
Community Vital Statistics
Birth Rate Comparisons, 1970-1980

Community	Birth/1,000 1970	Birth/1,000 1980
Nome	27.6	36.5
Gambell	10.7	22.5
Golovin	8.5	115.0
Savoonga	27.5	22.4
Teller	9.1	28.3
Unalakleet	9.2	20.8
Alakanuk	36.2	28.7
Emmonak	27.3	21.2
Kotlik	17.5	27.3
Average	19.2	35.8

Source: Department of Health & Social Services, Bureau of Vital Statistics, U.S. Census Bureau

The 1980 birth rate averaged 35.8/1,000 over all communities, with a range of 20.8/1,000 (Unalakleet) to 115.0/1,000 (Golovin). The average change overall was an increase of 16.6/1,000 births. Because 1980 census figures were used to calculate birth rates, the census undercount for Nome may overstate the Nome birth rate. The Department of Labor 1981 estimate for Nome's population yields an approximate 1980 birth rate of 28/1,000.

The greatest number of deaths over all nine communities occurred in 1973 and the lowest number in 1970 (Table E-14)

TABLE E-14
Community Deaths
1970-1980

Community	Year 1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
	Number of Deaths										
Nome	23	29	24	36	27	27	25	*	33	22	19
Gambell	3	3	3	0	1	12	3	*	2	3	5
Golovin	0	0	2	2	4	1	3	*	1	0	2
Savoonga	3	4	2	6	1	2	1	*	0	1	3
Teller	1	0	3	2	1	1	1	*	2	3	2
Unalakleet	4	7	5	6	3	4	2	*	6	6	5
Alakanuk	3	2	2	8	4	5	2	*	7	3	3
Emmonak	2	5	1	3	4	0	4	*	1	3	0
Kotlik	0	3	0	2	1	1	0	*	2	6	3
Totals	39	53	42	65	46	53	41	*	54	47	42

* not available
Source: Department of Health & Social Services,
Bureau of Vital Statistics

Variation is evident for all communities within the 10-year period for which data are available.

The 1970 death rate average over all nine communities equaled 5.7/1,000 with a range of 0.0/1,000 (Golovin and Kotlik) to 9.8/1,000 (Nome) (Table E-15).

TABLE E-15
Community Death Rate Comparisons, 1978-1980

Community	Deaths/1,000 1970	Deaths/1,000 1980
Nome	9.8	8.3
Gambell	8.1	11.2
Golovin	0.0	23.0
Savoonga	8.2	6.1
Teller	4.5	9.4
Unalakleet	9.2	8.0
Alakanuk	7.2	5.7
Emmonak	4.5	0.0
Kotlik	0.0	10.2
Average	5.7	9.1

Source: Department of Health & Social Services, Bureau of Vital Statistics, U.S. Census Bureau

The 1980 death rate averaged 9.1 over all communities, with a range of 9.9/1,000 (Emmonak) to 23.0/1,000 (Golovin). The average change overall was an increase of 3.4/1,000 deaths.

School Enrollments

It would be difficult to generalize about school enrollment data given the variation which occurs over time for each community, the different patterns which exist between communities, and specific changes related to the termination of State Operated School system, establishment of Regional Educational Attendance Areas and phasing out of Bureau of Indian Affairs Schools (Table E-16).

TABLE E-16
Community School Enrollments
1969-70 through 1981-82

Community	Student Enrollments												
	Year 1969 to 1970	1970 to 1971	1971 to 1972	1972 to 1973	1973 to 1974	1974 to 1975	1975 to 1976	1976 to 1977	1977 to 1978	1978 to 1979	1979 to 1980	1980 to 1981	1981 to 1982
Nome	773	833	*	955	884	917	982	899	797	751	823	712	700
Gambell	96	87	98	93	95	98	100	134	128	138	131	141	133
Golovin	39	31	34	27	26	27	24	25	20	16	19	30	24
Savoonga	114	105	108	123	109	125	121	107	147	140	146	127	156
Teller	55	56	56	60	39	*	38	39	35	45	42	40	39
Unalakleet	186	162	150	133	123	124	127	228	202	192	174	155	128
Alakanuk	107	109	117	129	134	160	175	181	168	154	154	149	149
Emmonak	131	132	162	165	150	181	215	238	220	240	201	203	207
Kotlik	70	63	73	85	92	137	88	83	79	77	81	94	99
Covenant H.S. (Private in Unalakleet)	61	76	78	100	120	100	109	116	81	*	74	82	80

* not available
Source: Department of Education

Food Stamps

Food stamp data for each community are reported as monthly average caseload and number of cases per 1,000 of population (Table E-17).

TABLE E-17
Community Food Stamp Data
Caseload Comparisons, 1981

Community	Population[a]	Average number Cases/month	Cases/1,000
Nome	3,039	58	19.1
Gambell	480	26	54.2
Golovin	94	4	42.5
Savoonga	530	17	32.1
Teller	229	15	65.5
Unalakleet	672	30	44.6
Alakanuk	534	27	50.6
Emmonak	568	25	44.0
Kotlik	339	8	23.6

Source: Department of Health & Social Services, Division of Public Assistance
[a] Alaska Dept. of Labor

The number of cases per 1,000 varied from a low of 19.1 (Nome) to a high of 65.5 (Teller) and averaged 41.8/1,000 overall.

Food Stamp case data for 1981 for each study community are reported for the average number of individual recipients per month, the number of individuals per case, and the ratio of individual recipients to community population as a whole (Table E-18).

TABLE E-18
Community Food Stamp Data
Individual Recipient Comparisons, 1981

Community	Population[a]	Average number Indiv./Month	# Indiv. Case	Indiv./Total Population(%)
Nome	3,039	155	2.7	5.1%
Gambell	480	127	4.9	26.5%
Golovin	94	12	3.0	12.8%
Savoonga	530	103	6.1	19.4%
Teller	229	48	3.2	21.0%
Unalakleet	672	92	3.1	13.7%
Alakanuk	534	171	6.3	32.0%
Emmonak	568	131	5.2	23.1%
Kotlik	339	42	5.3	12.4%

Source: Department of Health & Social Services
Department of Public Assistance
[a] Alaska Department of Labor

The average number of individual recipients per month ranges from 12 (Golovin) to 171 (Alakanuk). The average number of individuals (per month) per case ranges from 2.7 (Nome) to 6.3 (Alakanuk). On an average monthly basis, 5.1% of Nome's population receives food stamps (at the lowest end) and 32.0% of Alakanuk's population receives food stamps (at the highest end).

The total value of Food Stamp coupons for 1981 ranged from $11,116 (Golovin) to $131,062 (Alakanuk) (Table E-19).

TABLE E-19
Community Food Stamp Data
Coupon Value Comparisons, 1981

Community	Population[a]	Annual Total ($)	Average Monthly value($)	Per Capita Amount($)/year
Nome	3,039	127,992	10,666	42.12
Gambell	480	111,603	9,300	232.51
Golovin	94	11,116	926	118.25
Savoonga	530	81,661	6,805	154.08
Teller	229	40,478	3,373	176.76
Unalakleet	672	79,274	6,606	117.97
Alakanuk	534	131,062	10,921	245.43
Emmonak	568	98,255	8,188	172.98
Kotlik	339	29,803	2,483	87.91

Source: Department of Health & Social Services
Division of Public Assistance
Alaska Department of Labor

The annual per capita expenditure averaged $149.78 over all communities and ranged from a low of $42.12 per capita for Nome to a high of $245.43 per capita for Alakanuk.

Aid to Families with Dependent Children (AFDC)

The average number of cases (per month)/1,000 equals 42.5 over all communities, with a low of 19.1/1,000 for Nome and a high of 85.1/1,000 for Golovin (Table E-20).

TABLE E-20
Community AFDC Data
Caseload Comparisons, 1981

Community	Number of Cases	Number of Cases/1,000
Nome	58	19.1
Gambell	13	27.1
Golovin	8	85.1
Savoonga	14	26.4
Teller	10	43.7
Unalakleet	24	35.7
Alakanuk	26	48.7
Emmonak	25	44.0
Kotlik	18	53.1

Source: Department of Health & Social Services,
Division of Public Assistance

Annual AFDC expenditures for 1981 ranged from $41,676 for Golovin to $286,164 for Nome, and corresponding monthly averages ranged from $3,473 (Golovin) to $23,847 (Nome) (Tables E-21).

TABLE E-21

Community AFDC Data

Expenditure Comparisons, 1981

Community	Annual Total ($)	Average Monthly Amount ($)	Per capita Amount ($)/Year
Nome	286,164	23,847	94.16
Gambell	69,180	5,765	144.12
Golovin	41,676	3,473	443.36
Savoonga	57,972	4,831	109.38
Teller	43,164	3,597	188.49
Unalakleet	121,332	5,624	180.55
Alakanuk	107,556	8,963	201.41
Emmonak	90,480	7,540	159.30
Kotlik	67,488	5,624	199.08

Source: Dept. of Health & Social Services,
Division of Public Assistance

Annual per capita expenditures averaged $191.09 over all communities and ranged from a low of $94.16/year for Nome to a high of $443.36/year for Golovin.

Old Age Assistance (OAA)

The average number of cases (per month)/1,000 equalled 29.1 over all communities, with a low of 17.8/1,000 for Unalakleet and a high of 53.2/1,000 for Golovin (Table E-22).

TABLE E-22
Community OAA Data
Caseload Comparisons, 1981

Community	Number of Cases	Number of Cases/1,000
Nome	58	19.1
Gambell	14	29.1
Golovin	5	53.2
Savoonga	15	28.3
Teller	8	34.9
Unalakleet	12	17.8
Alakanuk	15	28.1
Emmonak	16	28.2
Kotlik	8	23.5

Source: Department of Health & Social Services, Division of Public Assistance

Annual expenditures for 1981 ranged from $8,052 for Golovin to $96,216 for Nome (Table E-23).

TABLE E-23
Community OAA Data
Expenditure Comparisons, 1981

Community	Annual Total ($)	Average Monthly Amount ($)	Per capita Amount ($)?Year
Nome	96,216	8,018	31.66
Gambell	32,160	2,680	67.00
Golovin	8,052	671	85.66
Savoonga	31,392	2,616	59.23
Teller	19,620	1,635	85.68
Unalakleet	18,552	1,546	27.61
Alakanuk	22,008	1,834	41.21
Emmonak	31,116	2,593	54.78
Kotlik	28,356	2,363	83.65

Source: Department of Health & Social Services,
Division of Public Assistance

Corresponding monthly averages ranged from $671.00 (Golovin) to $8,018 (Nome). Annual per capita expenditures averaged $59.61 over all communities and ranged from a low of $31.66/year for Nome to a high of $85.68/year for Teller and $85.66/year for Golovin.

Aid to Permanently Disabled (APD)

The average number of cases per month/1,000 equalled 9.7 overall and ranged from a low of 0.0 for Golovin to a high of 18.7 for Alakanuk (Table E-24).

TABLE E-24
Community APD Data
Average Caseload Comparisons, 1981

Community	Number of Cases	Number of Cases/1,000
Nome	2	0.6
Gambell	3	6.3
Golovin	0	0.0
Savoonga	5	9.4
Teller	7	13.2
Unalakleet	7	10.4
Alakanuk	10	18.7
Emmonak	8	14.1
Kotlik	5	14.7

Source: Department of Health & Social Services,
Division of Public Assistance

Average APD annual expenditures for 1981 ranged from $0.00 for Golovin to $19,104 for Emmonak, and average monthly amounts ranged from $0.00/month (Golovin) to $1,592/month (Emmonak) (Table E-25).

TABLE E-25
Community APD Data
Average Expenditure Comparisons, 1981

Community	Annual Total ($)	Monthly Amount ($)	Per capita Amount ($)/Year
Nome	4,368	364	1.44
Gambell	7,056	588	14.70
Golovin	0	0	0.00
Savoonga	10,380	865	19.58
Teller	16,176	1,348	70.64
Unalakleet	13,668	1,139	20.34
Alakanuk	17,400	1,450	32.58
Emmonak	19,104	1,592	33.63
Kotlik	6,936	578	20.46

Source: Department of Health & Social Services,
Division of Public Assistance

Annual per capita expenditures averaged $23.70 over all communities and ranged from lows of $0.00/year (Golovin) and $1.44/year (Nome) to a high of $70.64/year (Teller).

Total transfer payment expenditures for 1981 ranged from a low of $60,844 (Golovin) to $514,740 (Nome) and equalled $1,878,815 for all nine communities combined (Table E-26).

TABLE E-26
Community Transfer Payment Data
Total Expenditure Comparisons, 1981

Community	Total Annual Expenditure ($)	Total Per Capita Expenditure ($)/Year
Nome	514,740	169.40
Gambell	119,999	250.00
Golovin	60,844	647.30
Savoonga	181,405	342.30
Teller	119,438	521.60
Unalakleet	232,826	346.50
Alakanuk	278,026	520.60
Emmonak	238,955	420.70
Kotlik	132,582	346.50

*Includes Food Stamp, AFDC, OAA and APD expenditures.

Source: Department of Health & Social Services

Total per capita transfer payment expenditures for 1981 averaged $396.10 and ranged from a low of $169.40 per capita for Nome to a high of $647.30 per capita for Golovin.

HEALTH

Mortality

Suicides in the Norton Sound Region ranged from a low of one in 1979 to a high of five in 1978 and average three over the period of 1976-1980 (Table E-27).

TABLE E-27
Mortality Data
Norton Sound Region
Deaths by Cause, 1976-1980

	Year					
Causes	1976	1977	1978	1979	1980	Average
Suicide	4	3	5	1	2	3.0
Homicide	5	1	2	1	1	2.2
Accident	18	12	18	13	15	15.2
All causes	59	49	60	48	53	53.8

Source: Department of Health & Social Services,
Bureau of Vital Statistics

Homicides ranged from one in 1977 and 1979 to a high of five in 1976 and averaged 2.2 over five years. Accidental deaths varies from a low of 12 in 1977 to a high of 18 in 1976 and 1978 and averaged 15.2 for the period of 1976-1980. All deaths for the region ranged from a low of 48 in 1979 to a high of 60 in 1978 and averaged 53.8 for the full five-year period. Suicide, homicide, and accident accounted for 5.6%, 4.1%, and 28.2% respectively, of the five-year average for all deaths.

Suicides in the Yukon-Kuskokwin Region ranged from none in 1980 to four in 1976, 1977, and 1978 and averaged 2.8 over five years (Table E-28).

TABLE E-28
Mortality Data
Yukon-Kuskokwim Region
Deaths by Cause, 1976-1980

	Year					
Causes	1976	1977	1978	1979	1980	Average
Suicide	4	4	4	2	0	2.8
Homicide	4	2	4	1	1	2.4
Accident	28	24	31	34	36	30.6
All causes	36	75	86	88	86	74.2

Source: Department of Health & Social Services, Bureau of Vital Statistics

Homicides varied from one in 1979 and 1980 to four in 1976 and 1978 and averaged 2.4 for the period 1976-1980. Accidental deaths varied from 24 in 1977 to 36 in 1980 and averaged 30.6 over five years. All deaths for the region ranged from a low of 36 in 1976 to a high of 88 in 1979 and averaged 74.2 for 1976-1980. Suicide, homicide, and accident accounted for 3.8%, 3.2%, and 41.2%, respectively, of the five-year average for all deaths.

Mortality data is (Table E-29) are included despite apparent discrepancies with what could be expected from an examination of regional mortality data for death by cause, e.g., a greater frequency of suicide in the community data and some incidence of homicide in the community data.

TABLE E-29
Community Mortality Data
Deaths by Cause, 1970-76, 1978-80*

Accidental Deaths (#)

Community/Year	1970	1971	1972	1973	1974	1975	1976	1978	1979	1980
Nome	6	9	6	16	12	14	9	15	7	6
Gambell	0	0	1	0	0	9	2	0	0	1
Golovin	0	0	2	2	4	1	2	0	0	1
Savoonga	2	2	1	3	0	2	0	0	1	2
Teller	1	0	0	2	1	0	1	1	1	1
Unalakleet	0	2	2	3	0	1	2	2	0	2
Alakanuk	1	0	0	2	1	2	2	5	0	2
Emmonak	0	1	0	1	2	0	2	1	1	0
Kotlik	0	1	0	0	0	0	0	0	3	1
Total	10	15	12	29	20	29	20	24	13	16

*1977: no data

Source: Department of Health and Social Services,
Bureau of Vital Statistics

Nome averaged 10 accidental deaths per year for the period 1970-1980. Vital statistics data also indicated one suicide death for Nome for 1971. Yearly accidental death averages for the remaining communities are as follows: Gambell, 1.3; Golovin, 1.2; Savoonga, 1.3; Teller 0.8; Unalakleet, 1.4; Alakanuk, 1.5; Emmonak 0.8; Kotlik, 0.5.

Yearly totals across all communities ranged from a low of 10 in 1970 to a high of 29 in 1973 and 1975. The general pattern for the period 1970-1980 is a curvilinear one which peaks in the middle of the 10-year period and is followed by a general decline.

Alcoholism and Alcohol Abuse

Alcoholism data are presented only for Norton Sound region and not for the Yukon-Kuskokwim region since alcohol treatment programs are regional, and the statistical representation of Alakanuk, Emmonak, and Kotlik would be negligible in such regional data even if it were determinable. Norton Sound Health Corporation (NSHC) alcoholism program treatment data for fiscal years (July-June) 1980-1982 represent total client admissions (Table E-30). During FY80 the alcoholism program was combined with mental-health operated by Norton Sound Family Services (NSFS), and included an inpatient/residential treatment component-the Bering Straits Treatment Center (BSTC). In the second half of FY81 a separate Comprehensive Alcoholism Program (CAP) was initiated as were subcontracts with NSFS and Bering Straits Wommen's Group (BSWG) for alcohol-related client services.

TABLE E-30
Regional Alcoholism Treatment Data
Norton Sound
Client Admissions, FY 1980-82

	Number of Clients		
	FY 80	FY81*	FY82**
CAP		400	721
BSTC		46	118
NSFS	83	63	38
BSWG		85	140
Total	83	594	1,017

*includes 9/80-6/81
**includes 7/81-5/82

Source: Department of Health and Social Services, Office of Alcoholism and Drug Abuse

The increase in program activity following major budgetary and programmatic increase is clearly visible in Table E-30 figures.

Mental Health

Mental health treatment programs generally are also adminstrated regionally. Clients travel from outlying villages to a larger community or are visited somewhat infrequently by an itinerant counselor. Mental health data (Table E-31) represent admissions to the Norton Sound Family Services Community Mental Health Center and Yukon-Kuskokwim Mental Health Centers for the period 1975-1981. Data are presented according to community of residence for clients whose residence is one of the study communities.

TABLE E-31
Regional/Community Mental Health
Treatment Data
NSFS[1] and YKHC[2] Clients Admissions
by Residence, 1975-1981

			Number of Clients				
Community	1975	1976	1977	1978	1979	1980	1981
Nome[1]	3	296	525	457	470	516	611
Gambell[1]	10	5	0	5	0	3	1
Golovin[1]	0	0	0	5	0	0	0
Savoonga[1]	3	1	5	0	0	0	0
Teller[1]	0	0	0	0	0	0	0
Unalakleet[1]	0	6	0	0	0	0	0
Alakanuk[2]	0	10	9	27	0	16	6
Emmonak[2]	0	0	7	4	0	0	24
Kotlik[2]	0	7	15	3	0	38	34
Total	16	325	561	501	470	570	676

Source: Department of Health and Social Services,
Division of Mental Health and Developmental Disabilities

A relatively minor amount of funding and programmatic development occurred during the period 1975-1976 . Between 1977 and 1980 Nome averaged 515.8 clients/year, and the remaining communities contributed to a 555.6 client/year average overall. In general the YKHC region communities saw more activity than their NSFS region counterparts.

The number of yearly admissions to the Alaska Psychiatric Institute (API) for the period 1976-1981 by community of residence for each of the study locations, shows a fairly steady increase from a low in 1976 of 90 admissions across all communities to a high of 178 admissions overall for 1981 (Table E-32). The last two years (1980 and 1981) show the largest increase in all communities. The six-year averages ranged from 0.8 admissions/year for Savoonga to 124.5/year for Nome.

TABLE E-32
Community Mental Health
Treatment Data
API Admissions by Residence, 1976-1981

Community	1976	1977	1978	1979	1980	1981	Average
Nome	77	131	108	144	140	147	124.5
Gambell	1	0	1	0	3	3	1.3
Golovin	2	0	1	1	5	1	1.7
Savoonga	1	1	0	0	3	0	0.8
Teller	1	0	0	1	2	2	1.0
Unalakleet	3	2	2	5	2	1	2.5
Alakanuk	2	5	7	0	5	5	4.0
Emmonak	0	3	2	2	5	11	3.8
Kotlik	3	3	1	0	7	8	3.7
Total	90	145	120	153	172	178	

Source: Department of Health and Social Services, Division of Mental Health and Development Disabilities

The rate per 1,000 for 1981 admissions to API ranges from 0.0/1,000 for Savoonga to 48.4/1,000 for Nome and averages 14.2/1,000 overall for the communities (Table E-33).

TABLE E-33
Community Mental Health
Treatment Data
API Admissions Rate Comparisons, 1981

Community	Admissions/1,000
Nome	48.4
Gambell	6.2
Golovin	10.6
Savoonga	0.0
Teller	8.7
Unalakleet	1.5
Alakanuk	9.4
Emmonak	19.4
Kotlik	23.6

Source: Department of Health and Social Services,
Division of Mental Health and Developmental Disabilities

Social Services

Division of Family and Youth Services (DFYS) caseload data for 1977-1982 for each study community includes child protective services, adult protective services, information and referral, and individual and family counseling clients (Table E-34). Entries are average monthly caseload figures. Those for Nome were calculated by subtracting the figures for Gambell, Savoonga, Golovin, Unalakleet, and Teller from those for the Nome Field Office (the regional center) since individual counts for Nome are not recorded. Given the population of the remaining villages in the region, it is unlikely that the Nome figure is inflated by any more than 5%. Since cases are purged from the record after being closed for 4 1/2 years, a greater increase over time may seem evident than was actually the case.

TABLE E-34
Community Social Services Data
DFYS Caseload Comparisons, 1977-1982

Community	1977	1978	1979	1980	1981	1982	Average
Nome	224.0	207.4	174.4	162.6	161.6	120.5	175.1
Gambell	10.2	18.0	8.3	5.6	5.5	8.0	9.3
Golovin	10.7	11.9	14.0	8.6	6.8	9.6	10.3
Savoonga	4.0	4.0	1.8	1.0	3.7	5.8	3.4
Teller	2.6	3.1	3.4	1.0	1.1	4.2	2.6
Unalakleet	5.8	9.1	12.0	7.2	6.0	11.4	8.6
Alakanuk	4.2	8.7	11.8	9.8	4.0	13.0	8.6
Emmonak	2.3	4.5	6.2	9.1	14.2	16.3	8.8
Kotlik	1.4	4.3	4.0	1.5	1.3	1.8	2.4
Total	265.2	271.0	235.9	206.4	204.2	190.6	229.1

Source: Department of Health and Social Services,
Division of Family and Youth Services

The average monthly caseload number for Nome decreased steadily and significantly over the period 1977-1982. The remaining communities show a generally fluctuating and irregular pattern over time. The pattern across all communities combined generally parallels the Nome pattern but with a lesser degree of change over time. The average number of cases/month for the period 1977-1982 ranges from a low of 2.4 for Kotlik to a high of 175.1 for Nome.

Applying these six-year averages to the census population figures for 1980 (a year for which caseload figures are reasonably close to the six-year average) yields a rate per thousand population ranging from a low of 6.9 (Savoonga) to a high of 118.4 (Golovin) and averages 33.1 overall (Table E-35).

TABLE E-35
Community Social Services Data
DFYS Caseload Rate Comparisons, 1977-1982

Community	Average Number Monthly Cases/1,000
Nome	76.1
Gambell	20.9
Golovin	118.4
Savoonga	6.9
Teller	21.5
Unalakleet	13.8
Alakanuk	16.5
Emmonak	15.5
Kotlik	8.2

Source: Department of Health and Social Services, Division of Family and Youth Services

PUBLIC SAFETY

Public safety data represent activity of the Alaska State Troopers outside of Nome and of the Nome City Police Department in Nome. They include incidents (calls or contacts) and actual arrests for 1980, 1981, and 1982. Since data are available for only the first 10 months of 1982, figures are prorated for a full 12 month period based on the monthly average over the first 10 months.

Incidents

The only homicide reported during 1980 was in Nome, there were 12 rape reports (10 in Nome, 1 in Gambell, and 1 in Unalakleet), and there was a total 1,349 Part I and II incidents ranging from 1,239 in Nome to none in Kotlik (Table E-36).

Although crime statistics are usually converted to rates per 100,000, rate/1,000 is used here because it is more consistent with the small populations under study.

TABLE E-36
Public Safety Data
Incident Comparisons, 1980

Community	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
Nome	1	0.4	10	4.3	1239	538.5	1250	543.2
Gambell	0		1	2.2	29	65.2	30	67.4
Golovin	0		0		4	46.0	4	46.0
Savoonga	0		0		20	40.7	20	40.7
Teller	0		0		20	44.3	20	94.3
Unalakleet	0		1	1.6	10	16.0	11	17.6
Alakanuk	0		0		10	19.1	10	19.1
Emmonak	0		0		17	30.0	17	30.0
Kotlik	0		0		0		0	
Total								

Source: Department of Public Safety (Department of Labor population data).

The total for all categories was 1,362 incidents ranging from 1,250 for Nome to none for Kotlik. The rate/1,000 for all categories ranged from 17.6/1,000 for Unalakleet (Kotlik was 0.0) to 543.2/1,000 for Nome.

There are two homicide reports in 1981, both occurring in Nome and 19 rape reports, 10 in Nome and the remainder fairly evenly distributed among the remaining communities except for Teller and Kotlik, which had none (Table E-37).

TABLE E-37
Public Safety Data
Incident Comparisons, 1981

Community	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
Nome	2	0.66	10	3.3	2392	787.1	2404	791.0
Gambell	0		1	2.1	36	75.0	37	77.1
Golovin	0		2	21.3	16	170.2	18	191.5
Savoonga	0		1	1.9	22	41.5	23	43.4
Teller	0		0		21	91.7	21	91.7
Unalakleet	0		1	1.5	18	26.8	19	28.3
Alakanuk	0		2	3.7	20	37.4	22	41.2
Emmonak	0		2	3.6	9	15.8	11	19.4
Kotlik	0		0		0		0	
Total								

Source: Department of Public Safety

There were 2,534 Part I and II offense reports ranging from none for Kotlik to 2,404 for Nome. The rate/1,000 for all categories ranged from 19.4/1,000 for Emmonak (Kotlik was 0.0) to 791.0/1,000 for Nome.

There were two homicides reported in 1982 (one in Nome and one in Teller) and a total of 18 rapes (13 in Nome) (Table E-38).

TABLE E-38
Public Safety Data
Incident Comparisons, 1982*

Community	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
Nome	1	0.3	13	3.8	2216	646.1	2230	650.2
Gambell	0		2	4.6	41	94.9	43	99.5
Golovin	0		1	8.9	24	214.3	25	223.2
Savoonga	0		0		23	48.2	23	48.2
Teller	1	8.9	0		29	140.8	30	149.7
Unalakleet	0		0		26	43.0	26	43.0
Alakanuk	0		2	3.7	13	23.8	15	27.5
Emmonak	0		0		3	5.2	3	5.2
Kotlik	0		0		0		0	
Total								

*All figures are prorated for full 12 months
Source: Department of Public Safety

There were 2,375 Part I and II offenses reported, ranging from none for Kotlik to 2,216 for Nome. The rate/1,000 for all categories ranged from 5.2/1,000 for Emmonak (Kotlik was 0.0) to 650.2/1,000 for Nome.

Arrests

There was one homicide arrest (Nome) in 1980, three rape arrests for Nome, and one for Gambell (Table E-39). Part I and II arrests ranged from none for Kotlik to 809 for Nome.

TABLE E-39
Public Safety Data
Arrest Comparisons, 1980

Community	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
Nome	1	0.4	3	1.3	809	351.6	813	353.3
Gambell	0		1	2.2	24	53.9	25	56.1
Golovin	0		0		4	46.0	4	46.0
Savoonga	0		0		11	22.4	11	22.4
Teller	0		0		10	47.2	10	47.2
Unalakleet	0		0		6	9.6	6	9.6
Alakanuk	0		0		11	21.1	11	21.1
Emmonak	0		0		10	17.6	10	17.6
Kotlik	0		0		0		0	
Total								

Source: Department of Public Safety

Total arrests for all categories ranged from none (Kotlik) to 813 (Nome). Total arrests/1,000 ranged from 9.6/1,000 for Unalalkleet (Kotlik was 0.0) to 353.3/1,000 for Nome.

There was one homicide arrest in 1981 in Nome and three rape arrests, one each in Gamble, Savoonga, and Emmonak (Table E-40). Part I and II arrests ranged from none for Kotlik to 943 for Nome.

TABLE E-40
Public Safety Data
Arrest Comparisons, 1981

Community	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
Nome	1	0.3	0		943	310.3	944	310.6
Gambell	0		1	2.1	24	50.0	25	52.1
Golovin	0		0		10	106.4	10	106.4
Savoonga	0		1	1.9	17	32.1	18	34.0
Teller	0		0		23	100.4	23	100.4
Unalakleet	0		0		10	14.9	10	14.9
Alakanuk	0		0		16	30.0	16	30.0
Emmonak	0		1	1.8	4	7.0	5	8.8
Kotlik	0		0		0		0	
Total								

Source: Department of Public Safety

Total arrests for all categories ranged from none (Kotlik) to 944 (Nome). Total arrests/1,000 ranged from 8.8/1,000 for Emmonak (Kotlik was 0.0) to 310.6/1,000 for Nome.

There were two homicide arrests in 1982, one in Nome and one in Teller, and there were six rape arrests, five in Nome and one in Golovin (Table E-41). Part I and II arrests ranged from none for Emmonak and Kotlik to 870 for Nome.

TABLE E-41
Public Safety Data
Arrest Comparisons, 1982*

Community	Homicide #	Homicide #/1,000	Rape #	Rape #/1,000	Part I & II #	Part I & II #/1,000	Total #	Total #/1,000
Nome	1	0.3	5	1.5	870	253.6	876	255.4
Gambell	0		0		32	74.1	32	74.1
Golovin	0		1		23	205.4	24	214.3
Savoonga	0		0	8.9	17	35.6	17	35.6
Teller	1	4.8	0		23	111.6	24	116.4
Unalakleet	0		0		16	26.5	16	26.5
Alakanuk	0		0		10	18.3	10	18.3
Emmonak	0		0		0		0	
Kotlik	0		0		0		0	
Total								

*All figures are prorated for full 12 months.
Source: Department of Public Safety

Total arrest rates for all categories ranged from 18.3/1,000 for Alakanuk (Kotlik and Emmonak were 0.0) to 255.4/1,000 for Nome.

The level of juvenile arrest percentage and its pattern during the period 1980-1982 varies considerably from one community to another (Table E-42).

TABLE E-42
Public Safety Data
Juvenile Arrest Comparisons, 1980-1982

Community	Year	Juvenile Arrests (% of Total) 1980	1981	1982
Nome		18.5	14.6	18.3
Gambell		52.0	44.0	34.4
Golovin		25.0	0.0	41.7
Savoonga		54.5	38.9	30.00
Teller		10.0	4.3	8.3
Unalakleet		83.3	20.0	12.5
Alakanuk		45.4	0.0	20.0
Emmonak		0.0	0.0	N/A*
Kotlik		N/A*	N/A*	N/A*
Total				

*Not applicable-no recorded arrests
Source: Department of Public Safety

The percentages remain fairly constant for Nome, Gambell, Teller, and Emmonak and vary considerably for Golovin, Savoonga, Unalakleet, and Alakanuk.

Annual homicide incident/arrest ratios varied from 50% to 100% average 87.5% over three years, and annual rape incident/arrest ratios varied from 34.5% to 43.3% averaging 40.6% over three years (Table E-43). Each of the figures used represents the ratio of arrests to incidents for homicides and rapes.

TABLE E-43
Public Safety Data
Homicide and Rape Incident and Arrest Comparisons, 1980-1982
Arrest/Incident (%)

Community	1980 Homicide	1980 Rape	1981 Homicide	1981 Rape	1982 Homicide	1982 Rape	Average Homicide	Average Rape
Nome	100	30	50	0	100	38	83.3	22.7
Gambell		100		100		0		66.7
Golovin				0		100		50.0
Savoonga				100				100.0
Teller					100		100.0	
Unalakleet		0		0				0.0
Alakanuk				0		0		0.0
Emmonak				100				100.0
Kotlik								
Total	100.0	43.3	50.0	42.8	100.0	34.5		

Source: Department of Public Safety

Annual arrest/incident ratios varied from 63.1% to 71.5%, averaging 66.8% over all three years (Table E-44). Individual community three year averages ranged from 34.4% (Kotlik) to 86.1% (Golovin).

TABLE E-44
Public Safety Data
Part I and II Offense Incident and Arrest Comparisons, 1980-1982

Community	Arrest/Incident (%) 1980	1981	1982	Average
Nome	65.3	39.4	39.3	48.0
Gambell	82.7	66.7	78.0	75.8
Golovin	100.0	62.5	95.8	86.1
Savoonga	55.0	77.3	73.9	68.7
Teller	50.0	100.0	79.3	76.4
Unalakleet	60.0	55.5	61.5	59.0
Alakanuk	100.0	80.0	76.9	85.6
Emmonak	58.8	44.4	0.0	34.4
Kotlik				
Average	71.5	65.7	63.1	

Source: Department of Public Safety

APPENDIX F

Path Analysis Techniques

Path Analysis Techniques

Path analysis techniques have been in use for almost 60 years but seldom applied in the social sciences until the last 20. Developed in the fields of biology and genetics, they have been gradually appropriated by social scientists studying complex social and economic systems. Path analysis breaks down, or "decomposes" and interprets relationships between variables and includes several presumptions: (1) the relationships are linear, (2) there is a causal order among the variables, and (3) the system under analysis is closed (that is, detached or at least detachable from interactions with other systems it may be adjacent or related to). These are formal constraints placed on the analysis to limit and define standards. They are mental constructs, which may or may not reflect empirical facts, but do allow testing and investigation to proceed so that facts can be determined (Wright, 1923; Nie et al., 1975).

The meanings of terms like "causal order" should be touched on briefly since they are actually far less deterministic and inflexible than they sound. For instance, "casual" means that: "A" can be seen as a cause of "B" if, by changing "A" and only "A," a change occurs in "B." This meaning implies prediction, but it is premised on potential range of causes of "B" that allows for additive and multiple paths of influence. The definition above does not exclude the possibility that there may be other "causes" of "B" or that "A" may cause "B" not only directly, but through intermediary elements as well. By pointing out changes to "A and only A" it can be singled out as a cause. This does not imply that other potential causes and intervening elements are held constant.

The linear causal effect coefficient, or simply the "effect coefficient", is used in path analysis to designate the paths that lead from one to other variables. Conceptually similar (and in fact statistically identical under certain conditions; see below) to the regression coefficient, this measure reflects the expected difference in "B" when "A" is changed by one unit. A regression coefficient, in contrast, measures the differences between samples that simply are different in terms of "A" by one unit. Notice that the former implies causation and manipulation ("when A is changed"), whereas the latter refers to a de facto condition without reference to the process of change.

Regression coefficients and effect coefficients are identical, though, if a causal order and closure can be assumed. These assumptions produce a distinctly different concept to go with the same numeric measure (Kim and Kohout 1975).

A weak causal order is implied as well. This means that "A" may or may not uniformly influence "B," but "B" cannot affect "A." Thus, the flexibility and latitude to see "causes" in a somewhat equivocal manner so long "noncausal" definitions are unequivocal. Mere covariation and feedback conditions are largely set aside when we use path analysis methods. Closure, in technical terms, requires that the system be conceived in the following way: given a covariation between "A" and "B", assume that this effect is due either to the dependence of "B" on "A" (causally), the joint dependence of "A" and "B" on some limited set of other variables, or some combination of the two (Kim and Kohout, 1975, p. 385). Closure requirements limit analysis even before causal investigation begins. Note that this definition begins with the hypothesis of covariation but mainly seeks to delimit the set of possible causes, after which attention can focus on causal rather than covariable factors.

The construction of a path model, or analysis, requires postulation of a chain of causal paths in the system under investigation and testing and assessment of these paths using multiple regression techniques. Many separate multiple regression tests must be made to estimate a complex system; since for each point of effect (i.e., a subsystem on the "receiving end" of a set of paths from other subsystems) that element must be treated as a dependent variable influenced by a set of independent variables (i.e., the subsystems representing the points of origin for these influences). Any single subsystem may be treated sometimes as an independent and other times as a dependent variable, depending on how the subsystem is situated and connected in the postulated model. The path coefficients can be represented by ordinary regression coefficients or standarized beta weights (see discussion above). Figure F-3 following this discussion displays full statistics on each of the subsystems that make up the model. Included here are all multiple regression statistics, correlation matrices, and beta weights (the first column in the matrices).

After the model has been assembled and the paths specified and assessed, a key step in interpretation of the model involves decomposition of the model back to a set of bivariate relationships to assess what the cumulative influences are that bind them. The model itself designates individual path values (beta weights), but these cannot summarize the effects that stem from intermediary and intervening influences. That is, the path coefficient represents a singular path--the numerous branching connections that may lead away from the original "A" to other variables, and thence back to "B"--can be seen but their overall effects cannot. In short, what is sought are the indirect effects of "A" that are interpreted and transformed by other subsystems before finally influencing "B". The causal effects are determined by adding the products of all path coefficients for the paths in each set of indirect linkages to the direct path coefficient. In other words, the numeric values for each path throughout that set of paths that stems from "A" and ultimately arrives at "B" are multipled, these products from each of several indirect paths are added, and then this is added to the single direct path coefficient that is identified graphically in the model (repeated for the reader's convenience in Figure F-1). By convention the indirect and direct effects are separated for comparison and then shown as a combined total effect coefficient "C". A partial decomposition table appears in Figure F-2, and summarizes the cumulative effects that represent each subsystem pair. When interpreting the model, look at both direct effects and total effects for the direct effects in each path statistic can at best equal, but in many cases understate, the actual effects that bind a set of variables.

Figure F1

NORTON SOUND PATH MODEL

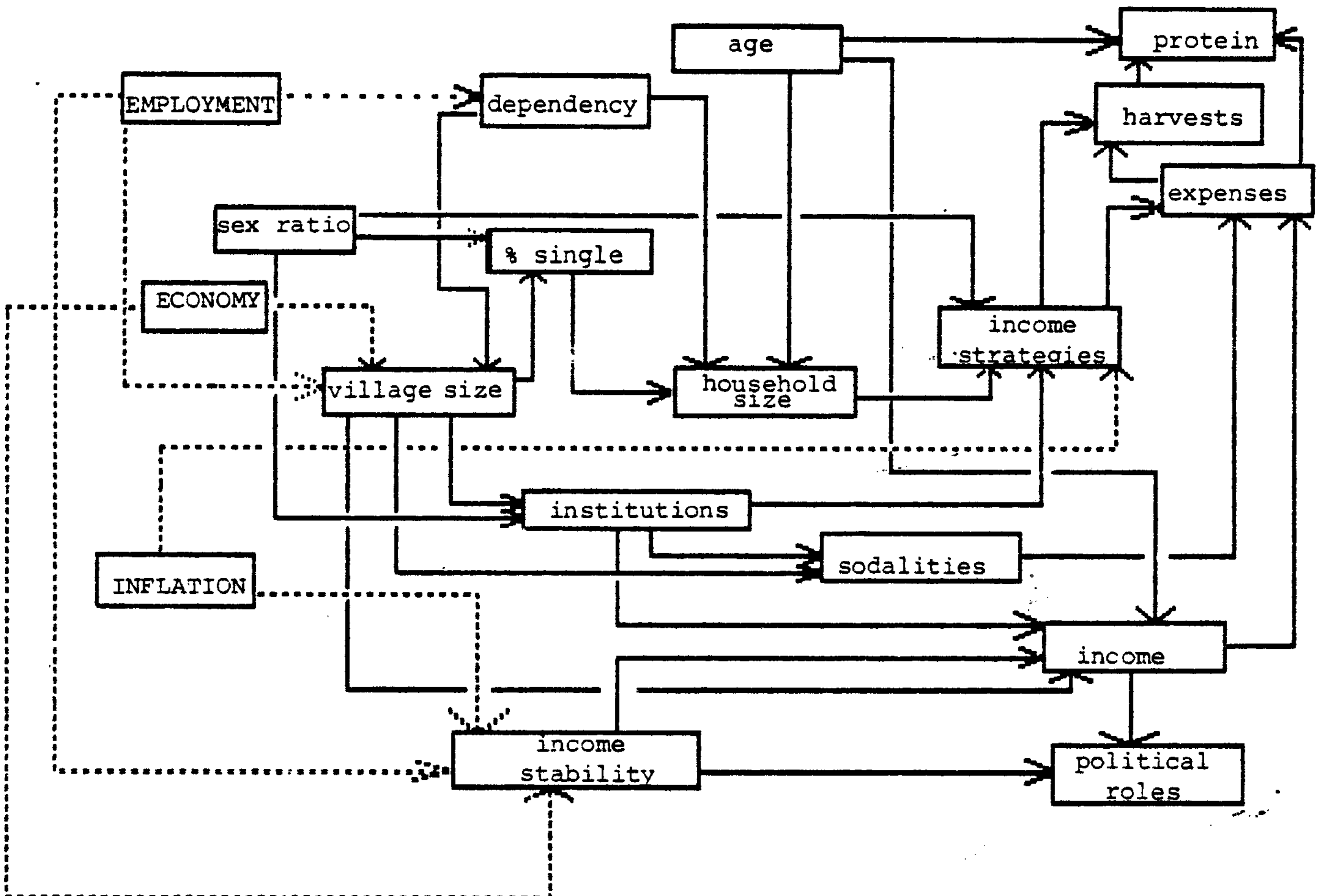


Figure F2

Partial Decomposition Table

Direct and indirect effect measures are listed with total effect coefficients tabulated at the right. Indirect effects are those mediated through other variables.

Bivariates[1]	Direct[2]	Indirect	Total Effect (C)
dependency X village size	.54	0	.54
dependency X Household size	.06	.08	.14
sex ratio X % single	.77	0	.77
sex ratio X institutions	.45	0	.45
sex ratio X income strategies	.47	.15	.62
village size X % single	.29	0	.29
village size X institutions	.77	0	.77
village size X sodalities	.15	.22	.37
village size X income	.58	.15	.73
% single X household size	.48	0	.48
institutions X sodalities	.29	0	.29
institutions X income	.19	0	.19
sodalities X expenses	.18	0	.18
income stability X income	.29	0	.29

[1]Variable labels are taken from the path model diagram.

[2]For decomposition calculations, all beta weights are considered positive.

Figure F2 (cont.)

Bivariates	Direct	Indirect	Total Effect (C)
income stability X political roles	.10	.12	.22
income X political roles	.43	0	.43
income X expenses	.21	0	.21
household size X income strategies	.15	0	.15
age X household size	.28	0	.28
age X income	.12	0	.12
age X protein	.36	.02	.38
income strategies X expense	.43	0	.43
income strategies X harvests	.31	.08	.39
expense X harvests	.19	0	.19
expense X protein	.18	.04	.22
protein X harvests	.20	0	.20

FIGURE F3

REVISED PATH ANALYSIS

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Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	SINGLE PERSON HOUSEHOLDS %	17.2549	7.2861
IV1	SEX RATIO (M/F)	1.1046	0.0752
IV2	VILLAGE SIZE	861.0976	786.8084

Regression Statistics

Coefficient of multiple determination = 0.6027 (Corrected = 0.5977)
Coefficient of multiple correlation = 0.7763 (Corrected = 0.7731)
Standard error of multiple estimate = 4.6505 (Corrected = 4.6795)

F-Ratio = 59.9138
Degrees of freedom = 2 & 79
Probability of chance = 0.0000

Number of valid cases = 82
Number of missing cases = 0
Response percent = 100.00 % (Mean substitution used 0 times)

Regression coefficients

Constant =-66.9865

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	74.1976	0.7663	114.078	0.000	1.023
IV2	0.0026	0.2860	15.886	0.000	1.023

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

5: 10

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	HOUSEHOLD SIZE	1.8780	0.7267
IV1	DEPENDENCY RATIO (UNDER 15)	0.5320	0.1193
IV2	AGE OF HOUSEHOLD HEAD	2.5802	0.9410
IV3	SINGLE PERSON HOUSEHOLDS %	17.2549	7.2861

Regression Statistics

Coefficient of multiple determination = 0.2021 (Corrected = 0.1819)
Coefficient of multiple correlation = 0.4495 (Corrected = 0.4265)
Standard error of multiple estimate = 0.6615 (Corrected = 0.6699)

F-Ratio = 6.5845
Degrees of freedom = 3 & 78
Probability of chance = 0.0008

Number of valid cases = 82
Number of missing cases = 0
Response percent = 100.00 % (Mean substitution used 1 times)

Regression coefficients

Constant = 2.8002

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.3412	0.0562	0.115	0.732	2.288
IV2	0.3358	0.2776	6.047	0.016	1.065
IV3	-0.0376	-0.3813	5.095	0.026	2.385

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

3: 11

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	INSTITUTIONAL COOP-COORD (EICOORD)	2.6341	1.0002
IV1	VILLAGE SIZE	861.0976	786.8084
IV2	SEX RATIO (M/F)	1.1046	0.0752

Regression Statistics

Coefficient of multiple determination = 0.8979 (Corrected = 0.8966)
Coefficient of multiple correlation = 0.9476 (Corrected = 0.9469)
Standard error of multiple estimate = 0.3236 (Corrected = 0.3256)

F-Ratio = 347.3651
Degrees of freedom = 2 & 79
Probability of chance = 0.0000

Number of valid cases = 82
Number of missing cases = 0
Response percent = 100.00 % (Mean substitution used 0 times)

Regression coefficients

Constant = 8.4255

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.0010	0.7675	445.328	0.000	1.023
IV2	-6.0032	-0.4517	154.229	0.000	1.023

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

7: 12

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	SODALITY MEMBERSHIPS IN HOUSEHOLD	2.3714	0.7257
IV1	VILLAGE SIZE	923.1714	833.0940
IV2	INSTITUTIONAL COOP-COORD (EICOORD)	2.7286	1.0204

Regression Statistics

Coefficient of multiple determination = 0.1761 (Corrected = 0.1640)
Coefficient of multiple correlation = 0.4197 (Corrected = 0.4050)
Standard error of multiple estimate = 0.6685 (Corrected = 0.6734)

F-Ratio = 7.1620
Degrees of freedom = 2 & 67
Probability of chance = 0.0019

Number of valid cases = 70
Number of missing cases = 12
Response percent = 85.37 % (Mean substitution used 0 times)

Regression coefficients

Constant = 1.6929

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.0001	0.1466	0.513	0.517	3.406
IV2	0.2054	0.2889	1.992	0.159	3.406

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

8: 23

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
[.	INCOME AND LABOR STRATEGIES	2.0988	0.7349
IV1	HOUSEHOLD SIZE	1.8642	0.7203
I 2	SEX RATIO (M/F)	1.1047	0.0757
I 3	INSTITUTIONAL COOP-COORD (EICOORD)	2.6420	1.0039

Regression Statistics

Coefficient of multiple determination = 0.1016 (Corrected = 0.0786)
C efficient of multiple correlation = 0.3188 (Corrected = 0.2803)
S andard error of multiple estimate = 0.7100 (Corrected = 0.7191)

F Ratio = 2.9030
[grees of freedom = 3 & 77
Probability of chance = 0.0393

N mber of valid cases = 81
N mber of missing cases = 1
Response percent = 98.78 % (Mean substitution used 0 times)

Regression coefficients

C_nstant =-1.6833

V r.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.1500	0.1497	3.256	0.072	1.050
IV2	3.9670	0.4675	5.393	0.022	2.725
I 3	0.1756	0.1883	0.846	0.636	2.818

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

9: 17 .

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	HARVESTED PROTEIN IN DIET	2.1270	0.7723
IV1	AGE OF HOUSEHOLD HEAD	2.5489	0.9618
IV2	SUBSISTENCE HARVEST EXPENSES	2.1103	0.8056
IV3	SUBSISTENCE HARVESTS	2.4983	0.7983

Regression Statistics

Coefficient of multiple determination = 0.2294 (Corrected = 0.2037)
Coefficient of multiple correlation = 0.4790 (Corrected = 0.4514)
Standard error of multiple estimate = 0.6950 (Corrected = 0.7065)

F-Ratio = 5.8555
Degrees of freedom = 3 & 59
Probability of chance = 0.0018

Number of valid cases = 63
Number of missing cases = 19
Response percent = 76.83 % (Mean substitution used 4 times)

Regression coefficients

Constant = 0.5394

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.2888	0.3597	9.881	0.003	1.002
IV2	0.1710	0.1784	2.296	0.131	1.061
IV3	0.1964	0.2030	2.969	0.086	1.062

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

10: 18

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	SUBSISTENCE HARVESTS	2.3919	0.8246
IV1	SUBSISTENCE HARVEST EXPENSES	2.0121	0.8023
IV2	INCOME AND LABOR STRATEGIES	2.1351	0.7276

Regression Statistics

Coefficient of multiple determination = 0.1832 (Corrected = 0.1719)
Coefficient of multiple correlation = 0.4281 (Corrected = 0.4146)
Standard error of multiple estimate = 0.7556 (Corrected = 0.7609)

F-Ratio = 7.9649
Degrees of freedom = 2 & 71
Probability of chance = 0.0011

Number of valid cases = 74
Number of missing cases = 8
Response percent = 90.24 % (Mean substitution used 4 times)

Regression coefficients

Constant = 1.2438

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.1999	0.1945	2.709	0.100	1.214
IV2	0.3493	0.3083	6.802	0.011	1.214

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

12: 19

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	SUBSISTENCE HARVEST EXPENSES	1.9737	0.8161
IV1	SODALITY MEMBERSHIPS IN HOUSEHOLD	2.3466	0.6842
IV2	INCOME AND LABOR STRATEGIES	2.1329	0.7180
IV3	HOUSEHOLD INCOME	22.3900	15.7047

Regression Statistics

Coefficient of multiple determination = 0.3067 (Corrected = 0.2877)
Coefficient of multiple correlation = 0.5538 (Corrected = 0.5364)
Standard error of multiple estimate = 0.6935 (Corrected = 0.7029)

F-Ratio = 10.6169
Degrees of freedom = 3 & 72
Probability of chance = 0.0000

Number of valid cases = 76
Number of missing cases = 6
Response percent = 92.68 % (Mean substitution used 11 times)

Regression coefficients

Constant = 0.1700

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.2205	0.1849	3.281	0.071	1.082
IV2	0.4912	0.4322	19.067	0.000	1.017
IV3	0.0107	0.2051	4.105	0.044	1.064

FIGURE F3 (cont.)

R_VISED PATH ANALYSIS

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Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
I '	HOUSEHOLD INCOME	22.6375	15.5297
: '1	INSTITUTIONAL COOP-COORD (EICOORD)	2.6500	0.9949
IV2	INCOME STABILITY AND PREDICTABILITY	3.1750	1.0647
IV3	AGE OF HOUSEHOLD HEAD	2.5875	0.9506
: '4	VILLAGE SIZE	873.8500	791.3429

Regression Statistics

Coefficient of multiple determination = 0.3040 (Corrected = 0.2766)
Coefficient of multiple correlation = 0.5514 (Corrected = 0.5259)
S :andard error of multiple estimate = 13.2965 (Corrected = 13.5564)

F-Ratio = 8.1912
Degrees of freedom = 4 & 75
Probability of chance = 0.0001

Number of valid cases = 80
Number of missing cases = 2
Response percent = 97.56 % (Mean substitution used 0 times)

Regression coefficients

onstant = 12.3631

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	-3.0395	-0.1947	1.220	0.272	3.348
IV2	4.2451	0.2910	8.908	0.004	1.025
V3	-1.9553	-0.1197	1.506	0.221	1.025
V4	0.0113	0.5779	10.737	0.002	3.352

FIGURE F3 (cont.)

REVISED PATH ANALYSIS

2: 15

Variables in the equation - Descriptive statistics

Var.	Variable label	Mean	Standard Dev.
DV	POLITICAL PARTICIPATION IN HOUSEHOLD	1.8243	0.92[illegible]
IV1	HOUSEHOLD INCOME	22.2248	15.858[illegible]
IV2	INCOME STABILITY AND PREDICTABILITY	3.1351	1.12[illegible]

Regression Statistics

Coefficient of multiple determination = 0.2277 (Corrected = 0.2169)
Coefficient of multiple correlation = 0.4771 (Corrected = 0.4658)
Standard error of multiple estimate = 0.8260 (Corrected = 0.8317)

F-Ratio = 10.4647
Degrees of freedom = 2 & 71
Probability of chance = 0.0003

Number of valid cases = 74
Number of missing cases = 8
Response percent = 90.24 % (Mean substitution used 1 times)

Regression coefficients

Constant = 0.9990

Var.	Coeff.	Beta	F-ratio	Prob.	Inv. Diag.
IV1	0.0253	0.4336	15.363	0.000	1.125
IV2	0.0836	0.1016	0.844	0.636	1.125