Participatory scenarios to guide sustained observations relevant to resource development in a rapidly changing Arctic

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Which variables or key factors do we need to track?

- NSSI: 123 Long-term monitoring projects

NORTH SLOPE SCIENCE INITIATIVE
ALASKA

Long-Term Monitoring

Monitoring Studies

Add Monitoring Study | For the Studies Displayed: Print All | Export All to CSV | Clear Filter(s)

ID	Title	Duration	Primary Org.	Subtopics	Emerging Issues
148	Biological Monitoring at Cape Lisburne, Alaska	1976-present	U.S. Fish and Wildlif...	seabirds	Species of Interest: Migratory Birds
147	Teshekpuk Lake Area Molting Goose Survey	1982-present	U.S. Fish and Wildlif...	geese	Species of Interest: Migratory Birds
146	Arctic Coastal Plain Common Eider Breeding P...	2000-present	U.S. Fish and Wildlif...	eider	Species of Interest: Migratory Birds
145	Breeding Ecology of Steller's and S...	1991-present	U.S. Fish and Wildlif...	spectacled eid...	Species of Interest: Migratory Birds
144	Fox Den Monitoring in Greater Prudhoe Bay	2005-present	BP Exploration Alask...	birds, foxes	None Applicable
143	Tundra Swan Monitoring in Greater Prudhoe Bay	2005-present	BP Exploration Alask...	swans	Species of Interest: Migratory Birds
142	Colonial Goose Monitoring in Greater Prudhoe ...	2005-present	BP Exploration Alask...	geese	Species of Interest: Migratory Birds
141	Raven Monitoring in Greater Prudhoe Bay	2004-present	BP Exploration Alask...	birds	Species of Interest: Migratory Birds
140	Yellow-billed Loon Surveys in the Northeast N...	2001-present	Conoco Phillips Alask...	yellow-billed l...	Species of Interest: Migratory Birds
139	Steller's Eider Surveys Near Barrow...	1999-present	U.S. Fish and Wildlif...	eider	Species of Interest: Migratory Birds
138	Ikpikpuk Snow Goose Colony Monitoring	1992-1993, 20...	Department of Wildli...	snow goose	Species of Interest: Migratory Birds
137	Avian Studies for the Alpine Satellite Develop...	1992-present	Conoco Phillips Alask...	geese, eider, s...	Species of Interest: Migratory Birds
136	Sea Ice Trends and Climatologies from SMMR ...	1978-Present	National Snow & Ice...	sea ice	Changing Sea Ice Conditions
135	Sea Ice Index	1978-Present	National Snow & Ice...	sea ice	Changing Sea Ice Conditions
134	Weekly/Bi-Weekly Ice Analysis Products	1994-Present	U.S. National Ice Ce...	sea ice	Changing Sea Ice Conditions
133	Daily Ice Analysis Products	1995-Present	U.S. National Ice Ce...	sea ice	Changing Sea Ice Conditions
130	Changes in the Colville River Channels, Lakes ...	1961-present	Louisiana State Univ...	shoreline	Coastal and Riverine Erosion
129	AON: Thermal State of Permafrost (TSP) in No...	1985-Present	University of Alaska ...	permafrost	Permafrost
128	Coastal change in Arctic National Wildlife Refu...	1947-	U.S. Fish and Wildlif...	tundra vegetat...	Coastal and Riverine Erosion, Veg...
127	Elson Lagoon Shoreline Erosion, Barrow, Alaska	2002-Present	University of Texas - ...	shoreline	Coastal and Riverine Erosion
125	Frost Tube Protocols	2007-Present	University of Alaska ...	active layer	Permafrost
124	Tundra Travel Model in the Arctic Foothills and...	2003-Present	University of Alaska ...	soil, tundra ve...	Permafrost, Vegetation Change
123	Arctic Alaska Soil Climate	1995-Present	U.S. Department of ...	soil, active layer	Permafrost

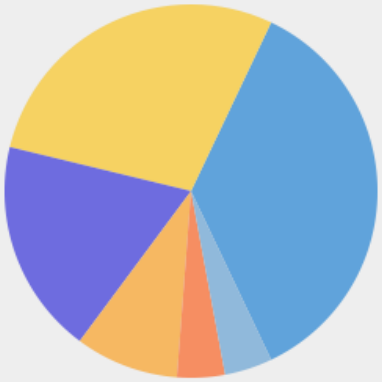
Page 1 of 1 | Displaying studies 1 - 123 of 123

Home | Statistics | Study Details

View Statistics...

Proportion of Studies by Topic

Hover over a pie slice for more info
Click a pie slice to filter studies by that item



Top Topics

physical: 36% (52 Studies)
mammals: 28% (41 Studies)
birds: 19% (27 Studies)
vegetation: 9% (13 Studies)
social: 4% (6 Studies)
fish: 4% (6 Studies)
invertebrates: 0% (0 Studies)

Scenarios for energy development & resource extraction – North Slope of Alaska, 2040

Driving Forces → Key Trends and Critical Uncertainties → Plausible Scenarios → Critical Implications → Future R&M efforts

Workshop #1
Scenarios Identification
Nov 2014

Workshop #2
Scenarios Implications
Jun 2015

Workshop #3
Research and Monitoring
Feb 2016

- Co-led by UAF, GeoAdaptive & North Slope Science Initiative
- Participation by seven major stakeholder/actor groups

Biophysical Drivers

- Climate Change
- Extent of Sea Ice

Resource Development Drivers

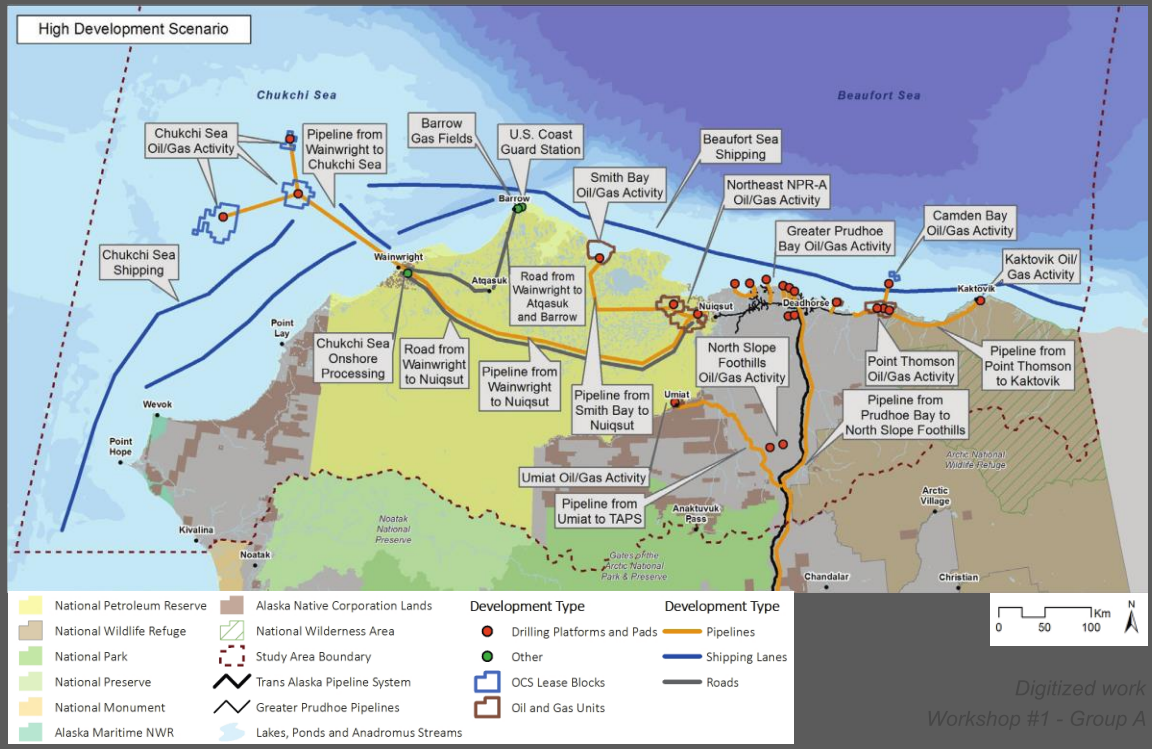
- Environmental Disasters (e.g. spills)
- Infrastructure
- New Technology

Market Drivers

- Price of Oil & Gas
- Demand for Energy and Minerals
- Development of Oil and Gas outside of Alaska

Sociopolitical Drivers

- Regulatory Environment (state/federal)
- Global Political Stability
- Community Decision Making/Stance on Development



Digitized work
Workshop #1 - Group A

Future Effort	Conditions that make this a priority	Scenario
Hunting and Trapping (on land)		
Ecosystem-based habitat status and trends monitoring, include site, remote sensing and community based methods for terrestrial systems that support species used in subsistence hunting and trapping.	Necessary to understand the relationship between development and habitat quality in order to differentiate from other change agents, such as fire, climate change, invasive species, etc…	High, Low
Health and Community Well-being		
Comprehensive Social and Health Impact Assessments	No aggregated data on social & health baseline HIPAA (Health Insurance Portability and Accountability Act) constrained data sharing, so need locally driven permissions	High, Medium, Low
Permafrost and Hydrology		
High resolution elevation data	Understanding microtopography is essential to modeling hydrology, useful for planning and differentiating polygon structure, identifying wetlands, and vegetation; also useful for estimating needed snow depth for ice road designation in tussock tundra.	High, Medium
Marine Mammals-Subsistence		
Document TK and local knowledge about hunting success, hunting areas, and effects/impacts from climate change and industrial activities	Hunters and communities have a deep understanding of marine mammals and the ecosystem, often having a better understanding than visiting scientists. This information and knowledge can be used to inform decision making.	High, Medium, Low
Marine Oil Spills		
Research on how to respond to oil spills from other users (e.g. cruise ships, fuel tankers)	Increased activity from other users (independent of the scenario) can increase the likelihood of a spill.	High, Medium, Low

Implications analysis: Subcategories & variables to track (excerpt)

Human/Social

- Health and Community Well-being
- Community Culture
- Demographics

Natural Environment: Physical Factors

- Permafrost
- Erosion
- Sea Ice
- Hydrology

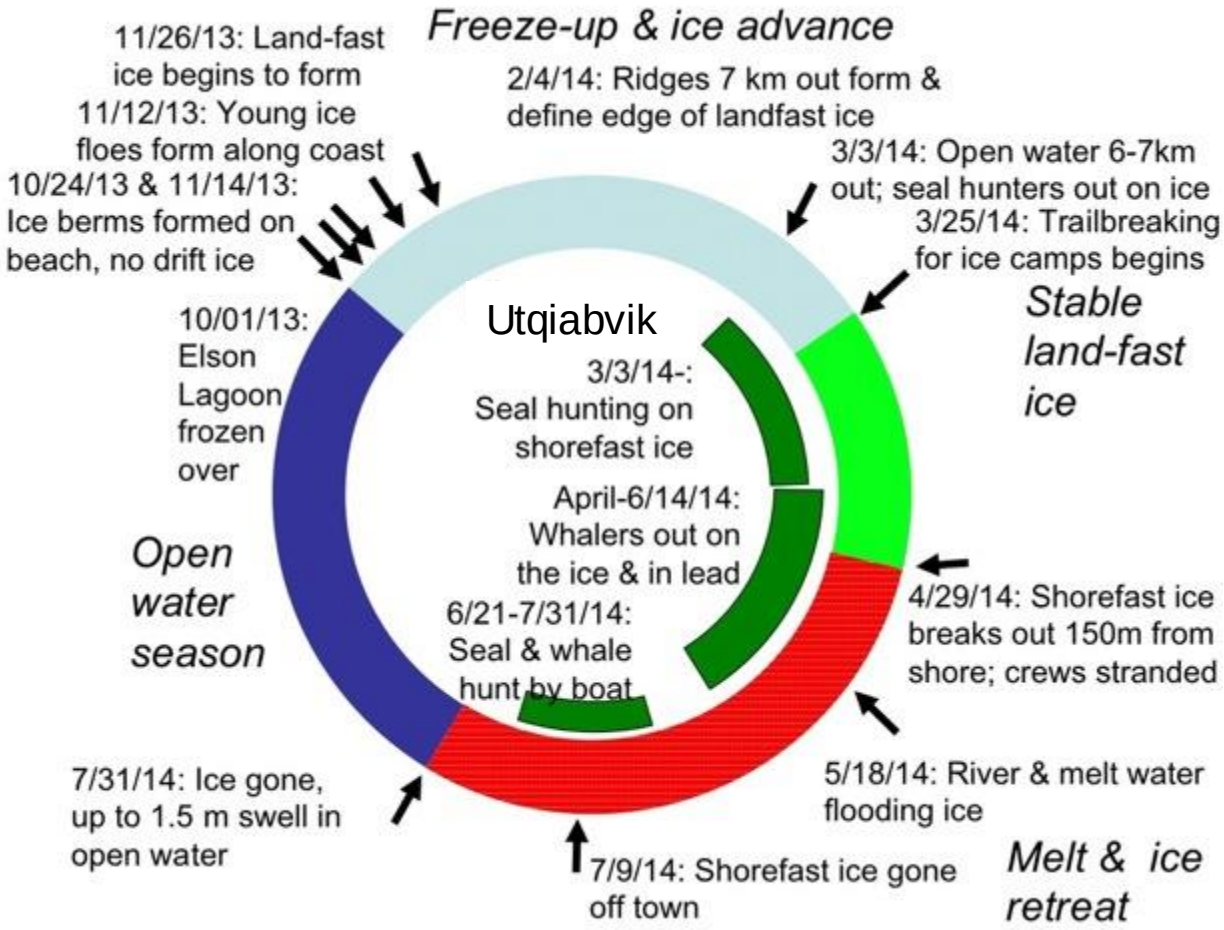
Northern Alaska Scenarios Project (NASP)

- ***What is required for healthy, sustainable communities by 2050?***
- Collaboration between local and regional governments, tribal organizations and UAF with support from National Science Foundation (ArcSEES), Northwest Arctic and North Slope Boroughs

- 21 key factors identified
- Rigorous plausibility & consistency analysis
- Climate change in lower ranks of 10 top ranked key factors
- Key theme: Decoupling of seasonal cycles of key factors major disruption of health and well-being

Key driver	Linked/Indicator variables
Sustainable energy & cost of living	Infrastructure maintenance
Iñupiaq values & intergenerational engagement	Access to cultural resources, proportion of subsistence harvest shared, community celebrations
Subsistence resource management & transmission/recognition of traditional knowledge	Youth education in traditional knowledge, voluntary bag limit reductions
Climate change	***Sea ice extent & thickness***, ***freeze-up and thaw dates***, ***animal migration patterns*** & distributions

Alaska Indigenous ice experts observe changes in seasonal ice cycle and ice use

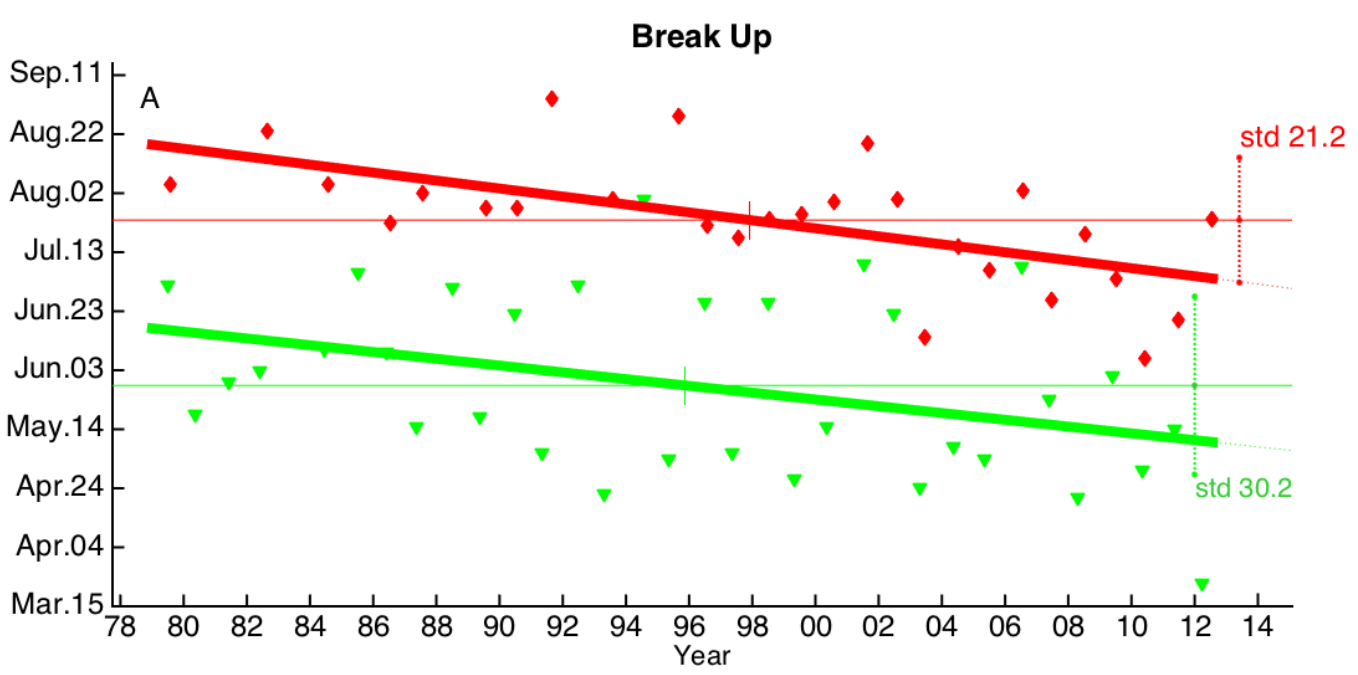


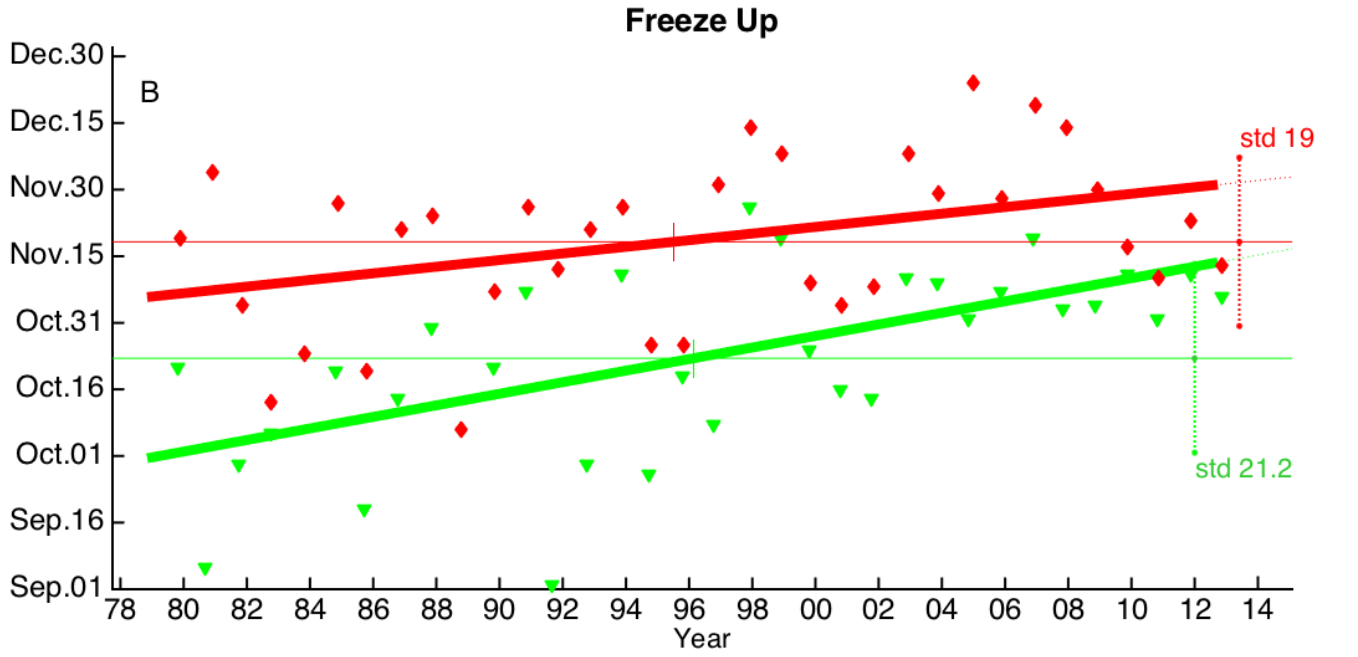
Community expert observations (>5000 daily logs)
https://eloka-arctic.org/sizonet

Eicken et al., Polar Geogr., 2014; http://dx.doi.org/10.1080/1088937X.2013.873090

- Trend towards shortened ice season in coastal Chukchi & Beaufort Seas
- Linear trend:
  - By 2030 “open water” season doubled relative to 1979-2013
  - By year 2100 “open water” season year-round

Johnson & Eicken, Elementa, 2016





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