BOEM ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

BOEM OCS Region: Gulf of Mexico

Planning Area: Central

Title: Biomass and Mass Balance Isotope Content of Seep Populations on the Upper Slope of Gulf of Mexico Determined from Archived Samples (GM-09-01-08)

Total Cost: $85,550 **Period of Performance:** FY 2010-2012

Conducting Organization: Louisiana State University Coastal Marine Institute

BOEM Contact: Arie Kaller

Description:

Background: In spite of considerable past and ongoing at-sea investigation many questions about Gulf of Mexico seep systems remain. Some are of a more basic nature, while others have clear management relevance. It is a central proposition of the work proposed herein that knowledge of temporal trends in seep communities is critical to BOEM's environmental management. It is now quite evident that not all seep communities change through time and are not all at the same stage of development. Some contain a diversity of actively growing individuals and are attracting recruits while others are near termination. Without a better knowledge of the course of seep initiation, errors might be made as to the cause of any changes observed in the proximity of oil and gas development. A natural decline might be misidentified as an impact.

Objectives: Specific project objectives for this proposal are to test:

- whether or not there are significant differences in the condition index of archived deep water (seep population) mussels and nerite snails between samples collected from the inner and outer portions of mussel aggregates; and
- whether or not there are significant differences in trophic positions indicated by stable isotopes of archived deep water (seep population) mussels and nerite snails collected from the inner and outer portion of mussel aggregates.

Methods: It is proposed to carry out specimen by specimen analysis of 250 *Bathymodiolus childressi* and 250 *Bathynerita naticoidea* from paired samples in the specimen archive. Analysis will test for difference between position in a patch, patch of origin, and site of origin using condition index (CI) based on ash free dry weigh biomass and shell volume isotopic content. Ash free dry weight determinations will be based on techniques applied to site-specific samples collected 1989-1992 for the purpose of data uniformity. Stable isotope analyses will also examine ^{13}C, ^{14}N, and ^{34}S in a manner similar to previous analysis.

Products: Final Report, Presentation at the 26th Annual Gulf of Mexico Information Transfer Meeting, Publication in a Referred Journal

Importance to BOEM: The ability to identify the natural cycles of deep water seep communities and to distinguish the senescent communities from those physically damaged by anchor ropes, chains, pipelines and other oil related activities is important to BOEM in their management of seep communities. This study is a start seeking evidence of temporal changes in seep communities.

Current Status: Ongoing. On schedule as of now.

Final Report Due:	May 2012
Publications:	N/A
Affiliated WWW Sites:	N/A
Revised date:	November 2014
ESPIS	**ESPIS** - All ***completed*** ESP Studies: **Full Text, Online, Right Now! E**nvironmental **S**tudies **P**rogram **I**nformation **S**ystem