

EVOS ANNUAL PROJECT REPORT

Project Number: 040702

Project Title: Synthesis of Natural Variability in the Nearshore: Can We Detect Change?

PI Name: Ginny L. Eckert

Time Period Covered by Report: September, 2004 – September, 2005

Date of Report: September 27, 2005

Work Performed

One of the primary goals of the GEM program is to detect anthropogenic changes within the four focal habitats in the Gulf of Alaska, however natural variability in these systems can be so high that it prevents detection of human-induced effects. This project synthesized existing data to identify, within the nearshore habitat, environments and species that have less natural variability so that these variables can be included in the GEM monitoring plan. Data were synthesized from the Gulf of Alaska and across a broad range of geographic areas to identify general characteristics that predict lower levels of natural variability in nearshore marine populations. Significant progress has been made for all objectives planned during this period.

Long-term time series data from Gulf of Alaska nearshore populations were collected using datasets and literature identified by Bodkin and Dean in GEM Project # 030687, titled, "Monitoring in the Nearshore: A Process for Making Reasoned Decisions". Of the 1,104 reports and articles identified by Bodkin and Dean that I surveyed, only 32 included time series appropriate for this project. Data were collected from tables directly and indirectly from graphs using image analysis software. At the time of this report, 663 Gulf of Alaska time series were collected and used in analyses. Only time series greater than two years from unimpacted (control) sites were used. Preliminary results are described below for several of the major hypotheses.

- How does variability differ among taxonomic groups?
Bird populations have the highest variability, followed by invertebrates, fish, mammals, and algae.
- How does variability differ among different measures of abundance?
For both invertebrates and algae (the groups for which different measures of abundance were used), there was no significant difference in population variability when populations were measured by biomass, density or percent cover.
- How does variability differ among different tidal heights?
This analyses was conducted for invertebrates and algae, as these are the groups for which populations were surveyed at different tidal heights. There was less variability in subtidal populations than intertidal populations for invertebrates, whereas there was no significant difference in variability among algal populations at different tidal heights, however sample sizes for subtidal algae were small.

- How does variability differ among different substrates?

This analyses was conducted for invertebrates and algae, as these are the groups for which populations were surveyed on different substrates. There was less variability in invertebrate populations on bedrock than on soft sediment substrates, and invertebrate populations on cobble varied an intermediate amount. There was no significant difference in variability among algal populations on bedrock and cobble substrates, and algae were not surveyed on soft sediment substrates.

The results of the project have been disseminated through presentation at professional conferences (see below).

Future Work

Preparation of the final report is underway and is planned for submission to EVOS by April 15, 2006. This final report will be a manuscript submitted to a peer-reviewed journal.

Coordination/Collaboration

Jim Bodkin provided his full reference set and GIS products from GEM Project # 030687, titled, "Monitoring in the Nearshore: A Process for Making Reasoned Decisions".

Community Involvement/TEK & Resource Management Applications

Collaborative efforts will be made to communicate data analyses and syntheses to communities.

Information Transfer

January 2005

Poster Presentation, Alaska Marine Science Meeting, Anchorage, Alaska

"A Synthesis of Natural Variability in the Nearshore: Can We Detect Change?"

June 2005

Oral Presentation, Evolution 2005, a joint meeting of the Society for the Study of Evolution, the Society for Systematic Biologists, and the American Society of Naturalists, Fairbanks, AK

"Assessing Natural Variability in Gulf of Alaska Populations"

Data products will be made available once complete.

Budget

No changes.

Report Prepared By: _____ Ginny L. Eckert _____

Project Web Site Address: _____ n/a _____