NOAA’s Deep Sea Coral Research and Technology Program:

Alaska Coral and Sponge Initiative

North Pacific Fishery Management Council
January 31, 2012
Outline

- NOAA’s Deep Sea Coral Research and Technology Program
- Alaska Research Priorities
- FY 12 – 14 Projects and Objectives
- FY 12 Planning
- Expected Timelines and Products
NOAA’s Strategic Approach to Deep-Sea Coral and Sponge Ecosystems

Goal:
Improve the understanding, conservation, and management of deep-sea coral and sponge ecosystems

- Exploration and Research
- Conservation and Management
- International Cooperation
Deep Sea Coral Research and Technology Program: National Overview

Program funded in FY 2009
  o $1.5 million in FY 2009
  o $2.5 million in FY 2010, 11 & 12

Collaboration among NMFS, NOS, OAR and NESDIS
Deep-Sea Coral Research and Technology Program: National Overview

- Identify existing research on, and known locations of, deep-sea corals
  - Develop GIS databases to manage deep-sea coral information
  - Analyze existing information

- Monitor activity in deep-sea coral locations
  - Analyze distribution and intensity of fishing using bottom-contact gear
  - Develop methods to enhance information from bycatch

- Conduct research and locate and map locations of deep-sea corals:
Deep-Sea Coral Field Research and Mapping

Alaska 2012-2014


West Coast 2010-2012

Southeast U.S. 2009-2011

Structure-Forming Deep-Sea Corals of the U.S.

- Stony Coral
- Gorgonian
- Black Coral
- Gold Coral
- Lace Coral
Further Information


http://coris.noaa.gov/activities/deepsea_coral/


http://coris.noaa.gov/activities/deepcoral_rpt/
Implementation

• Alaska (FY12-FY14)

• Dedicated $800-900K per year to Alaska for these three years

• Team: Rooper (RACE), Bob Stone (ABL), Peter Etnoyer (Charleston Lab NOS), Jennifer Reynolds (UAF-NURP), John V. Olson (AKR), John Tomczuk (NOS/DSC)
Timeline

• Deep sea coral priorities workshop (09/10, Anchorage)
• Team formation (12/10)
• Series of planning and informational meetings (05 – 08/11)
• Draft objectives and projects developed (09/11)
• Draft research plan delivered
  —AFSC, (11/11)
  —DSCRT, (NMFS HQ), (12/11)
  —Tentative approval last week
Objectives for Alaska (NPFMC, EFH-EIS & DSCRTP priorities workshop)

- Maps of distribution, abundance and diversity of sponge and coral
- Habitat and substrate maps
- Associations with FMP species and contribution to fisheries production
- Impacts of by gear type and modifications to reduce impacts
- Recovery and recruitment rates
- Long-term monitoring program for climate change & ocean acidification
Project #2: Predictive modeling of coral and sponge areas in Alaska

Objective: Determine the distribution and areas of high abundance and diversity of deep-sea corals and sponges

Area covered: Gulf of Alaska & Aleutian Islands

Approach: Predictive model based on existing habitat data with groundtruthing using field data in FY12-14

Anticipated Products:
- Maps of probable presence/absence of coral & sponge
- Maps of expected abundance of coral and sponge
- Maps of predicted diversity of coral and sponges
Objective: Derive an interpreted substrate map for the GOA and AI based on geological features defined from bathymetry and existing sediment data

Area: GOA and AI

Approach: Compile existing and new bathymetry and sediment data throughout Alaska and interpret this data using a geological approach to come up with potential habitat areas for coral and sponge

Anticipated Products:
- GIS layers with interpreted substrate
Project #1: Primnoa distribution in the GOA

Objective: Identify and map areas of thickets of Primnoa corals

Approach: Using existing data, multibeam mapping and ROV transects to map areas of high Primnoa abundance

Area covered: Eastern and Central GOA

Anticipated Products:
- Maps of individual Primnoa thickets in the GOA
Objective: Estimate growth, recruitment, recovery and sustainable extraction rates for Primnoa corals

Area: Eastern and Central Gulf of Alaska

Approach: Estimate coral biomass and profiles of colony size structure and compare to history of fishing, as well as deployment of settlement plates for recruitment estimation. Will use same sites as Project #1 in FY12-14

Anticipated Products:
- Size and age class structure in Primnoa thickets
- Simulations using recovery, growth and recruitment rates to estimate sustainable harvest level
Objective: Estimate connectivity using genetic markers between North Pacific Ocean red tree coral populations along the west coast of North America and Alaska

Area: Central and Eastern GOA

Approach: Will collect specimens from red tree colonies around the margin of the GOA for genetic analysis and compare to results from collaborators along the west coast

Anticipated Products:
- Estimates of population structure in red tree corals in the North Pacific
Project #4: Production of FMP species from DSCSE’s

Objective: Determine the role of coral and sponge in production of FMP species

Area: Central GOA (additional seasons and areas with funding)

Approach: Will compare community structure and density of FMP species in rocky habitats with coral and sponge present to rocky habitats with biotic species absent.

Anticipated Products:
- Species behavior in DSCSE and non-DSCSE areas
- Diets, condition and energetic content by habitat
- Predator density and prey availability in the two habitats
- Reproductive potential of adults at each location
Objective: Measure impacts of longline gear on coral and sponge habitat

Area: Central or Eastern GOA

Approach: Will use cameras mounted on longlines to collect images of gear movement across the seafloor during deployment, at intervals within the set and retrieval

Anticipated Products:
- Estimates of area swept by groundline during sets
- Estimates of distance traveled over the seafloor during setting and retrieval operations
Objective: Measure $O_2$ and pH annually in Alaskan waters

Area: AI, GOA, EBS

Approach: Purchase equipment to measure $O_2$ and pH during AFSC bottom trawl survey operations each summer throughout Alaska

Anticipated Products:
- Time series of $O_2$ and pH corresponding to trawl survey locations
- Maps of locations and figures of means and variability for ecosystem considerations report
Objective: Monitor oceanographic conditions at two established shallow-water populations of Primnoa

Area: SE Alaska (Tracy Arm and Glacier Bay)

Approach: Purchase and deploy equipment to measure oceanographic conditions throughout the three year horizon of the program at shallow water (diving depth) coral populations in two glacial fjords in SE Alaska

Anticipated Products:
- Time series of current speed and direction, temperature, salinity and pH at the two locations
Project #9: Improving coral and sponge taxonomy

Objective: Improve the tools available for identification of corals and sponges

Area: Throughout Alaska

Approach: Collect unidentified specimens through this program, AFSC trawl surveys and other opportunistic sampling and develop taxonomic keys for these species

Anticipated Products:
- Updated taxonomic keys for use by observers and scientists collecting sponges and corals in Alaska
Project #10: Paleoclimatological, microbial and marine natural products studies

**Objective**: Collect specimens that can be used for paleoclimatological studies and studies that explore natural products derived from corals and sponges.

**Area**: Throughout Alaska

**Approach**: Identify partnerships with other agencies and academic institutions where we can provide useful specimens for examining climate effects on coral growth. Provide specimens for existing partnerships with academic institutions searching for useful natural products that can be derived from coral and sponge.

**Anticipated Products**:
- Products developed by collaborators and partners
Major activities in FY12

- **Project #1, 3 & 6: Primnoa thickets in GOA**
  - Multibeam mapping in GOA
  - Potential Delta sub cruise in Aug/Sept.
- **Project #2: Coral and sponge distribution**
  - Modeling right now
  - Field work in August (2 weeks, Central AI, camera work)
- **Project #4: FMP production from coral/sponge habitat**
  - Fieldwork in August (2-3 weeks collecting FMP species from coral/non-coral areas, camera work, lab work, COOP funding)
- **Project #5: Longline impacts**
  - Short fieldwork with LL survey (2 days), camera development and manufacture
- **Project #7: O₂ and pH monitoring**
  - Deployment as special project, water collections for calibration
- **Project #8: SEAK monitoring**
  - Establish oceanographic sites and deploy equipment (spring)
- **Project #11: Geological substrate mapping**
  - Technicians compiling bathymetry and sediment
Timeline for completion and expected products

- Completion of fieldwork and funding @ end of FY14
- Updates to Ecosystem Chapter & AI-FEP
- EFH-EIS review FY14
  - Recovery rates
  - Distribution maps
  - Longline impact results
- Final reporting to DSCRTP in FY15