

Science, Service, Stewardship



NOAA's Deep Sea Coral Research and Technology Program:

Alaska Coral and Sponge Initiative

North Pacific Fishery Management Council
January 31, 2012



**NOAA
FISHERIES
SERVICE**



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

NOAA Strategic Plan for Deep-Sea Coral and Sponge Ecosystems

Research, Management, and International Cooperation



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

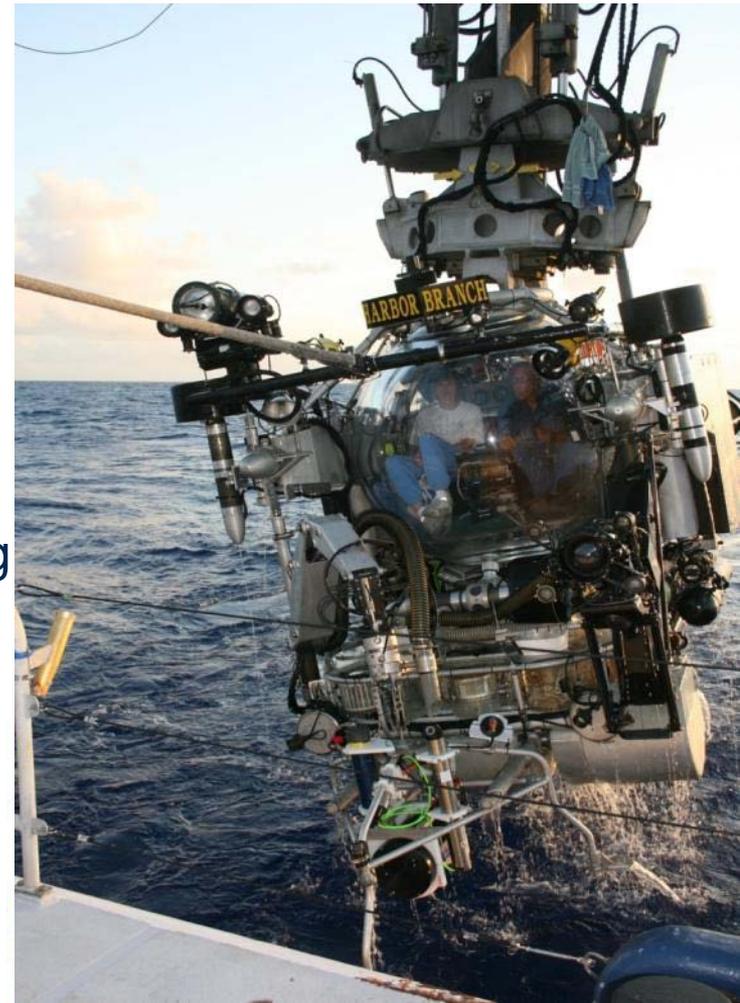
- \$1.5 million in FY 2009
- \$2.5 million in FY 2010, 11 & 12

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

Northeast U.S.
2013-2015

West Coast
2010-2012

Southeast U.S.
2009-2011

● Stony Coral ● Gorgonian ● Black Coral ● Gold Coral ● Lace Coral

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





Further Information

Report to Congress on the Deep Sea Coral Research and Technology Program (2010)

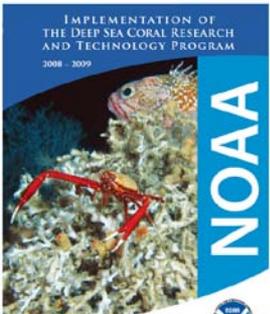
http://www.habitat.noaa.gov/pdf/pub_deep_coral_report_2010.pdf

NOAA Strategic Plan for Deep-Sea Coral and Sponge Ecosystems: Research, Management, and International Cooperation (2010)

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

The State of Deep Coral Ecosystems of the United States: 2007

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



**NOAA Strategic Plan
for Deep-Sea Coral and
Sponge Ecosystems**
Research, Management, and International Cooperation



**THE STATE OF
DEEP CORAL ECOSYSTEMS OF
THE UNITED STATES: 2007**

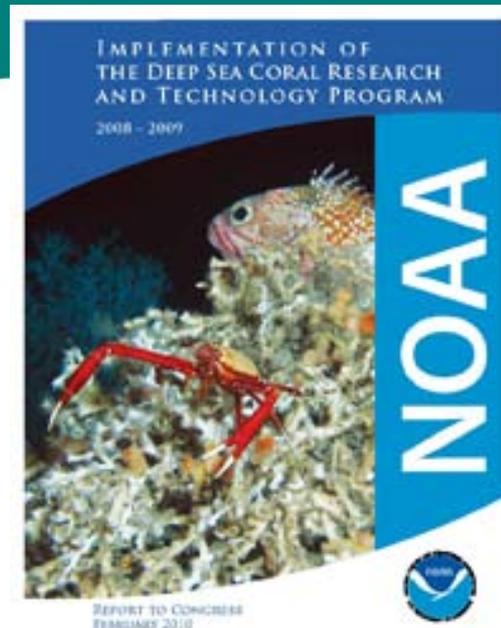
PHOTOGRAPH BY THE UNIVERSITY OF CALIFORNIA, SANTA BARBARA

NOAA TECHNICAL MEMORANDUM NMFS-11



Implementation

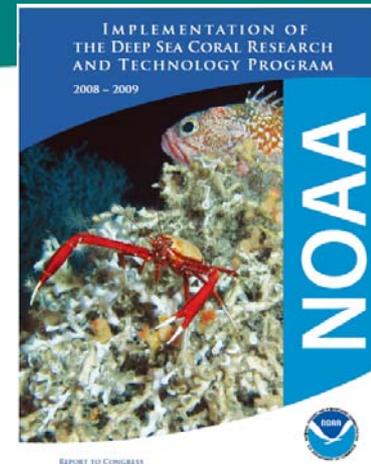
- Alaska (FY12-FY14)
- Dedicated \$800-900K per year to Alaska for these three years
- Team: Rooper (RACE), Bob Stone (ABL), Peter Etnoyer (Charleston Lab NOS), Jennifer Reynolds (UAF-NURP), John V. Olson (AKR), John Tomczuk (NOS/DSC)





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)
 - DSCRTP (NMFS HQ), (12/11)
 - Tentative approval last week



What is the Alaska Plan?





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



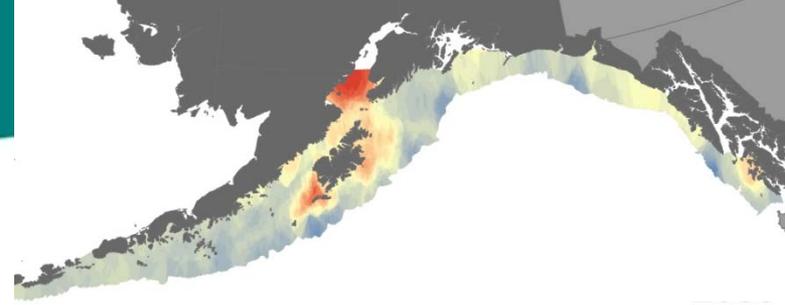
Objective: Determine the distribution and areas of high abundance and diversity of deep-sea corals and sponges

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



Project #11: Geological substrate map in the GOA margin and the AI shelf and slope

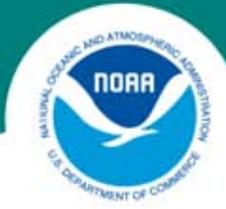
Objective: Derive an interpreted substrate map for the GOA and AI based on geological features defined from bathymetry and existing sediment data

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



Project #3: Primnoa growth, recruitment and recovery



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



Project #6: Connectivity among regional populations of red tree corals

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



Project #5: Longline effects in coral habitat – pilot project

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



Project #7: Long-term monitoring of O₂ and pH in Alaska waters



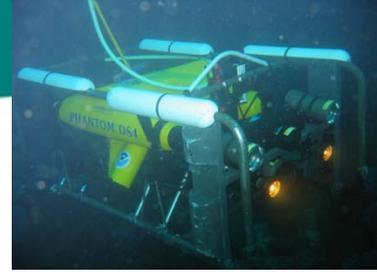
Objective: Measure O₂ and pH annually in Alaskan waters

Area: AI, GOA, EBS

Approach: Purchase equipment to measure O₂ and pH during AFSC bottom trawl survey operations each summer throughout Alaska

Anticipated Products:

- Time series of O₂ and pH corresponding to trawl survey locations
- Maps of locations and figures of means and variability for ecosystem considerations report



Project #8: Long-term monitoring of SE Alaska coral communities

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

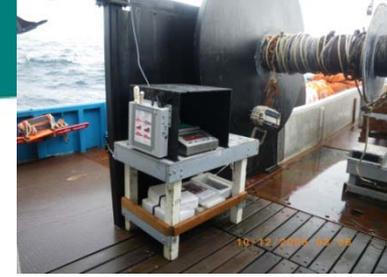
Approach: Collect unidentified specimens through this program, AFSC trawl surveys and other opportunistic sampling and develop taxonomic keys for these species

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