

# **Workshop Summary Report**

**Nantucket Sound Research Strategy Workshop**

Tuesday, March 7, 2006  
Craigville Conference Center  
Craigville, Massachusetts

Prepared by:

Marjorie L. Mooney-Seus, Fort Hill Associates  
Olivia Free, Massachusetts Fishermen's Partnership  
March, 2006

## **Welcome and Introductions**

### **David Bergeron, Massachusetts Fishermen's Partnership**

The Massachusetts Fishermen's Partnership (MFP) is an umbrella organization that was established in 1995 and is comprised of 18 commercial fishing associations. Its first successful program was the Fishing Partnership Health Plan, which provides comprehensive health care at a lower cost premium to fishermen and their families throughout Massachusetts. Approximately 2,000 people are currently covered under this plan.

MFP's Fishermen's Initiative for Scientific Habitat and Ecosystem Research (FISHER Initiative) promotes better quality science through increased collaboration between fishermen and scientists. MFP seeks to integrate the empirical knowledge of commercial fishermen who have collectively been fishing for several hundred years into the process because informed science leads to better stewardship, sustainability of the marine environment, and healthy fishing communities and families. Fishermen are an inherent part of the ecosystem and are thus well suited to be actively involved in marine observing and data collection.

The role of the MFP is to facilitate communication and coordination between fishermen and scientists. The organization is developing a comprehensive ecosystem cooperative research plan for Nantucket Sound. A year ago, MFP, in cooperation with MIT Sea Grant, mapped fishing use in Nantucket Sound (a copy of the report was available for participants at this meeting), data that can inform the research plan that results from this workshop. The main purpose of this meeting was to identify three research projects in the following disciplines: oceanography, water quality and seafloor mapping.

### **Susan Nickerson, Nantucket Soundkeeper**

Nantucket Soundkeeper is an initiative of the Alliance to Protect Nantucket Sound and is formally affiliated with River Keeper. The Soundkeeper organization runs the following projects in Nantucket Sound:

- 1) Pollution hotline
- 2) Monitoring program to study water quality
- 3) Eel grass mapping project to study the die off problem in some areas and learn whether eel grass beds are shrinking or expanding in other areas.
- 4) Shoreline survey to identify critical habitats, which need to be protected.
- 5) Patrol boat, which provides visibility on the water to encourage, among other things, recreational users to be more environmentally conscientious by using pump out facilities for their heads.

Nantucket Soundkeeper partnered with the MFP to host the workshop as it recognizes the need to characterize the resource and, like the MFP, is actively engaged in working with the community to promote an understanding of the Nantucket Sound marine ecosystem.

### **Workshop Operating Policies and Goals**

**Paul Radcliff, Project Adventure**

**David Bergeron, MFP**

Operating policies that were developed by the FISHER Initiative when working on a collaborative research strategy in the Stellwagen Bank National Marine Sanctuary were provided to participants during this workshop. These operating policies describe expectations of participation for fishermen and scientists in cooperative projects undertaken in conjunction with the MFP. These include:

- MFP will coordinate all invitations to plenary and subcommittee meetings.
- Participants will not discuss the overall initiative, its goals, or its projects with the media but rather will refer all such inquiries to the MFP.
- Participation in this initiative is defined as active attendance in a majority of plenary and project meetings when appropriate, strategic planning for the initiative, assistance with proposal development and review, meaningful time and/or equipment resources contributed to a project, data collection and analysis, and report preparation and presentation.
- Participants may not use the name of the initiative or any association with it to leverage funds or partners that are not relevant to the initiative unless this use has first been authorized by the MFP.
- The proprietary nature of project concepts, preliminary findings, related data, and final results from initiative projects will be respected; however, it is the hope of initiative participants that results will be shared with the group prior to publication so that they may inform other on-going components of the initiative.

The MFP will subcontract with fishermen and scientists to conduct research projects and often serves as fiscal agent for cooperative projects. It was emphasized that the proprietary nature of project concepts, preliminary findings, related data, and final results will be respected. However, it is hoped that initiative participants are willing to share preliminary results at future meetings so that other ongoing coordinated projects of the initiative can potentially benefit from initial findings. MFP will provide a forum for the discussion and sharing of data in order to promote coordination of initiative projects and the creation of a scientific framework for a shift towards ecosystem-based approaches to marine resource management. Requirements of disparate funding sources will also be respected. Moreover, in the unlikely event that participating scientists and fishermen disagree on explanations for project findings, scientists will address this difference in the final report. Lastly, a website will be established where data can be accessed to help facilitate a better understanding of the marine ecosystem.

## **Scientific Presentations**

### **Oceanographic Modeling**

**Dr. Changshen Chen, University of Massachusetts, Dartmouth, School for Marine Science and Technology**

Dr. Chen presented a Finite-Volume Coastal Ocean Model (FVCOM). Inputs to the model included tides, winds, heat flux, precipitation, evaporation, river discharges and groundwater discharges. It is an “unstructured grid” model that allows modelers to match the coastline.

The first generation of the model had a horizontal resolution of 0.3-1.0 km in the coastal region, 31-sigma levels in the vertical. It was driven by tidal forcing at open boundaries; MM5-predicted meso-scale wind field and surface heat flux; river discharges and Nova Scotian Shelf wind-induced inflow.

Three important mixing zones were identified in the region: Georges Bank, the Bay of Fundy and Nantucket Sound and Shoals. To understand Nantucket Sound, it is necessary to understand Massachusetts Bay. A seasonal front tidal/wind induced upwelling results in strong tidal flushing which causes eddies and a flow through zone into Buzzards Bay. In addition, off the southern end of Nantucket, there is tidal wave interaction zone with large tidal dissipation/mixing.

Song Hu and Zhongxiang Wu Gulf of Maine/Georges Bank MM5 Weather Forecast Model System was briefly discussed. It is undergoing modification. The MM5 is being converted to 4 km resolution for the Gulf of Maine and 1 km resolution for Georges Bank, Massachusetts Bay and the New England shelf.

An ecosystem model is being built using both of the FVCOM and MM5 models. Known as the SMAST Gulf of Maine/Georges Bank/New England Shelf Model System, this ecosystem model also incorporates other models such as a Generalized Ecosystem Model, a Sediment Transport Model, a Fish Larval Model and a Multi-Stage Zooplankton Model, all of which contribute to a more complete understanding of environmental and ecological relationships.

Model validation experiments for FVCOM were carried out from 1995-2005. The model system will be set up for the local forecast system.

### **Seafloor Mapping Presentation**

**Dr. Larry Poppe, USGS**

Not much is known about the seafloor in Nantucket Sound. CONMAP data provides a general overview of dominant sediment types and gross textural trends for the Southern and Eastern Seabeds of Cape Cod. It can be used to produce a digital sediment map of regional extent on a scale of 1:1million.

Use of historical sediment data in understanding the seafloor is valuable because data collection and analysis are expensive. A substantial number of sediment analyses have been completed. However, the station distribution is uneven, consisting of discrete points that do not address variability.

What is needed for Nantucket Sound is a continuous acoustic imagery to show the connection between areas. This can be done by using side scan or multibeam sonar. This method has proven to be effective for mapping the seafloor in other areas. (e.g., QUICKS HOLE, NOAA's Survey H11076 consisted of a multibeam bathymetry and backscatter at a resolution of 2 m. Great Round Shoal, NOAA Survey H11079 consisted of a multibeam bathymetry and backscatter at a resolution of 3 m. It is scheduled to be groundtruthed in July, 2006.) It is possible to compare the old and new data and look at obstructions on the bottom to see sediment transport.

Multibeam data sets exist for the outer Cape and show locations of Exposed Glaciodeltaic Deposits (i.e., Barnstable Plain, Wellfleet Plain, Truro Plain and Eastham Plain). Exposed Glaciodeltaic Deposits are of importance because they form a rough sea floor that provides shelter for finfish, a seabed amenable to burrow construction, and hard substrates for sessile fauna and flora. Increased seafloor roughness contributes to greater habitat variability and species diversity. Sedimentary facies associated with glaciodeltaic environments consist of bottomset beds that are composed primarily of pelagically-deposited cohesive sand and clay, foreset beds that consist of finer grained sand and topset beds that are composed primarily of fluvially deposited noncohesive sand, gravel and boulders.

With the help of multibeam sonar, scientists now have a better understanding of the typical character of the sea floor off of Eastern Cape Cod. For instance, low, broad ripples interspaced with current rippled sandy patches and gravel pavements dominate the seafloor of the Eastern Cape. Gravel, shell debris and organics collect in the ripple troughs and sand dollars congregate on the ripple crests. These sediments provide little shelter for fish and no substrate amenable to sessile the biota.

It is important to know where Exposed Glaciodeltaic Deposits are for the purposes of protecting and rebuilding fish stocks as well as for citing wells. Multibeam sonar can help generate a better picture of these areas in Nantucket Sound.

### **Water Quality**

**Dr. Roland Samimy, University of Massachusetts, Dartmouth, School for Marine Science and Technology**

Dr. Samimy is the program manager for the Massachusetts Estuaries Project (MEP), a joint project between the University of Massachusetts, Dartmouth, the

State Department of Environmental Protection, and the Executive Office of Environmental Affairs. The purpose of the project is to quantify nutrient loads for 89 coastal embayments in Southeastern Massachusetts. The state provides matching money to the municipalities where most of the work entails restoration of coastal areas. The primary focus is on nutrients and the degradation of coastal areas due to nutrient enrichment resulting in increased algal blooms, loss of seagrass communities, loss of aesthetics and bottoms devoid of life. In several of these coastal areas, quantifiable thresholds (critical nutrient levels) have been set for restoration. Before a site can qualify for participation in the program, three years of monitoring must be completed at the site.

Nantucket Sound is believed to be a receiving basin for nitrogen and a management plan for the Sound must include nitrogen management to restore and/or protect the Sound from future water quality decline.

MEP has implemented a multi-phased approach in quantifying nutrient loads:

- Phase 1: Monitoring of embayment nutrient related to health
- Phase 2: Quantitative watershed-embayment assessment and modeling
- Phase 3: Implementation: design use of validated watershed basin model to prioritize management options, costs and benefits
- Phase 4: Engineering design and implementation of selected nitrogen management alternatives
- Phase 5: Embayment/Basement modeling to support adaptive management

MEP is currently completing phase 2 of their program. In order to effectively address water quality issues in Nantucket Basin, data collection and assessment, model construction, calibration and validation, and management alternative analysis must be conducted. Data mining of past water quality monitoring and resource and habitat assessments should also be analyzed.

### **Fishermen's Perspective** **Captain Ron Borjeson, F/V Angenette**

Captain Borjeson commented that commercial fishermen frequently see things in their nets or gear and in the environment around them that make them curious. The commercial fishing industry is well positioned and extremely interested in participating cooperatively to craft an understanding of the marine ecosystem in Nantucket Sound. He underscored the need for fishermen/scientific community collaboration and the ways in which fishermen can participate, including data collection and analysis. In his words, the industry is "ready to roll."

# Breakout Group Recommendations

## Oceanographic Modeling Breakout Group

Working Group Rapporteur: Allan Robinson

Working Group Members: Richard Limeburner (WHOI) , Changshen Chen (SMAST), Haosheng Huang (SMAST), Captain Ron Borjeson, Captain Bill Amuru, Rabao Ji (WHOI), Allan Robinson (Harvard), Steven Tucker, Cape Cod Commission

### Project Outline:

Title: A Nantucket Sound Forecast System

Hypothesis: What are the dominant oceanographic factors that effect fisheries? (e.g., storms, tides, etc.)

Goals and Objectives: Determine mean state variables, tidal and subtidal, within Nantucket Sound and adjacent areas and their influence on fisheries such as squid and fluke (e.g., physical, biological, chemical, fish stocks/food web dynamics/trophic level interactions, etc.)

Methodology: Acquire and assimilate physical oceanographics using satellitesfishing vessels, ferries, etc.

Nutrient buoyant drifters will provide trajectories that will be maintained as an array picking up and receiving by fishing vessels

Model validation, scales, error, sources of uncertainty

Deliverables:

Forecast of tides, Chen's model

Ongoing synoptic picture of temperature, salinity, velocity and florescence, zooplankton (as there likely will be occasional plankton tows), nutrients and other variables.

Project Partners: MFP

University of Massachusetts  
Woods Hole Oceanographic Institution  
Harvard University  
Fishermen  
National Marine Fisheries Service

- Budget:** Support for fishing vessels of opportunity and dedicated fishing days  
Data processing  
Sensors  
Academic salary support  
Supplies, insurance, acquisition of other materials and data and information
- End Users:** Fishing Industry  
Managers  
Scientific Researchers  
General Management of multi-use coastal zone
- Next Steps:** Firm up participants  
Meeting to firm up proposal  
Identify funding sources  
Develop a marketing strategy if want to publicize and help generate funding support

### **Seafloor Mapping Breakout Group**

Working Group Rapporteur: Stephanie Cunningham

Working Group Members: Captain Ed Barrett, Stephen McKenna (MCZM), David Dowd, (NEFSC), Larry Poppe (USGS), Stephanie Cunningham (MA DMF), Rick Tidd, (Teledyne Benthos, Inc)., and David Bergeron (MFP)

#### **Brainstorming Discussion:**

A burning question has to do with the need to groundtruth what is known about Nantucket Sound. Anything we can do in region will be an improvement. We need to institute a project that will have 1-2 sq m resolution. Opportunistic sampling in the Sound will not work to create state-of-the-art maps, and funding this caliber mapping is very expensive. There is a need to promote political awareness of the need to map Nantucket Sound.

Fishermen need to prioritize areas where continuous imagery is most important (e.g., Horse Shoe Shoal). To begin with we could groundtruth existing maps of the area with grab sampling and video imaging from fishing vessels.

In addition, state GIS maps showing eel grass distribution need to be groundtruthed. (This project idea was developed below).

The Division of Marine Fisheries (DMF) may be able to help create a base map with new equipment being tested. It is possible but not yet known that this equipment may be used for this from a fishing vessel. The next step will be to follow up with DMF on this.

## Project Outline:

Title: Groundtruthing Eel grass maps of Nantucket Sound

Hypothesis: State GIS maps of eel grass and macro algae are no longer valid  
(include salt ponds)

Goals and Objectives:      Verify eel grass coverage  
                                    Compare acoustic signatures with eel grass areas  
                                    and other areas with other species of submerged  
                                    aquatic vegetation  
                                    Compare with water quality data  
                                    Contribute to habitat characterization  
                                    Contribute to ocean management

Methodology:                Conduct a five year monitoring program to track change.  
                                    Fishing vessels to take video and acoustic imagery. Seiki  
                                    discs and optic instruments to check water clarity in near  
                                    shore areas.

Deliverables:              Revised maps of eel grass/codium distribution  
                                    Analysis of water quality and eel grass success  
                                    Assessment of the use of acoustic imaging technology in  
                                    mapping submerged aquatic vegetation  
                                    CD with products and website

Project Partners:        MFP  
                                    Department of Environmental Protection (DEP)  
                                    Massachusetts Fishermen's Partnership  
                                    Department of Marine Fisheries (DMF)  
                                    Soundkeeper  
                                    Fishermen/Clammers  
                                    WBNERR  
                                    Teledyne (benthos)  
                                    CI CEET (Cooperative Institute of Coastal Environment and  
                                    Estuarine Environmental Technology, UNH)

Budget:                    Support for fishing vessels of opportunity and using dedicated  
                                    fishing days  
                                    Video and Acoustic technology  
                                    Data processing/research translation  
                                    Website support  
                                    PI/participants/technicians

Supplies, insurance

End Users: Municipalities  
Fishing Industry  
Fishery Managers  
State and Federal environmental agencies  
Research community  
NGOs

Next Steps: Meet with eel grass folks at DEP to identify areas of greatest need  
Charlie Costello at DEP  
Fred Short at UNH for technology & Teledyne  
Steve McKenna  
Roland Samimy  
Dennis Donahue

### **Water Quality Breakout Group**

Working Group Rapporteur: Maggie Mooney-Seus

Working Group Members: Captain Dennis Donohue, Roland Samimy (SMAST),  
Scott Gallagher (WHOI), , Sue Nickerson (Soundkeeper), Captain  
David Casoni (MA Lobstermen's Assoc), Captain Wade Bohlman,  
Yuegang Zuo (UMassD), Joanna Muramoto (Horsley Whitten  
Group), Mark Weissman (MA Fisheries Commission)

### Brainstorming Discussion:

There are limited data on chemical oceanography of Nantucket Sound  
(biogeochemical cycling)

A question was raised about the ocean color as presented in a report by Horsley Whitten where the tracer was chlorophyll. From January throughout the spring, Nantucket Sound remains in a blue state – could it be a source of nutrients to the rest of the Massachusetts shelf region?

A long-term water quality monitoring program for the Sound needs to be established. We want to look at interannual variability. A big data gap is the impact of nutrient loading in the Sound. There is a big question about the circulation patterns of the Sound – pumping effect, when can you expect the water to come in? You also need to look at the flux and exit.

Would be good to learn the relationship between Waquoit Bay and Nantucket Sound in terms of nutrient loading. Another area of focus is water coming in from Monomoy? Big question is whether Nantucket Sound is a receiver?

Work just underway by WHOI using ferries to collect real time data – image identification, plankton monitoring of large phytoplankton. The next step will be to

look at smaller species. Ferries make several trips/transects across Sound everyday.

### Project Outline:

Title: Creating a baseline of water quality conditions for Nantucket Sound

Hypothesis: Nantucket Sound is being compromised by impaired conditions of abutting estuary systems from land-based pollutants.

Another question which potentially could be answered through this project is how well vertically mixed is Nantucket Sound? This would be done through station monitoring and looking at various vertical profiles of dissolved oxygen (DO).

Goals and Objectives:      Measure seasonal and interannual variability of water quality  
   Prove or disprove hypothesis

Methodology:                Initially begin with a three year monitoring program with the hopes of securing enough funding to establish long-term monitoring program to look at water quality and productivity, land/sea interactions (How far out do nutrients go?) and biogeochemical cycles.

It would be good to put this project in the context of monitoring impacts of Climate Change or combine this study with habitat assessment (e.g., sea grass distribution, fish spawning areas). For such a habitat assessment you would need continuous imagery via transects to identify habitat characteristics – characterize the background and cluster organisms. This would then be coupled with water quality processes and benthos and plankton relative to settlement rates. A similar project is being done with scallop vessels as a TAC funded program. Before attempting to characterize the habitat of Nantucket Sound it would be good to do some data mining of historic data.

1. Fishing vessels will be equipped with sensors. Can use any vessel, which has a sea chest where water can be brought up through the hull. Vessels will need to make frequent, persistent transects, 12 times a year. As the sensors will transmit data this will provide high frequency, real time, short-term monitoring. Sensors measure top 2 m of the water column.

- 2 Fishing vessels also will gather data from 16 stations setup throughout the sound. Samples will be taken from multiple depths (vertical profiles) and then the fishermen will redeploy the instruments. Fishermen will send samples back to lab for analysis. Fishermen also may conduct some simple boat sampling as is currently being done by Ferries in WHOI project. This will provide long-term monitoring data. Coastal embayment program provides a working model, which could be expanded upon for this project.
- 3 Another future or additional aspect of this current project would be to complete a snap shot of habitat – could be that a complimentary sea floor mapping project was conducted simultaneously.

Basic data to be collected could include:

- a. Nutrient information (via sensors used by WHOI): temperature, pressure, turbidity, phosphorus, ph, particle load, salinity, plankton, dissolved oxygen.
- b. Primary Production: will test a prototype, FFRP instrument which measures chlorophyll.
- c. Secondary Production: species composition of zooplankton
- d. Dissolved Organic Compounds (DOC)

Deliverables:

1 year of data will provide a snap-shot of nitrogen levels and DOC variation

3-years of data will provide some short-term trends in changes in diversity and population structure in benthos and plankton which will provide some insight into nitrogen loading.

DOC assays will provide information on level of sunlight penetration to various depths.

Project Partners:

MFP  
SMAST  
WHOI  
University of Massachusetts/Dartmouth Chemistry Dept.  
Horsley Whitten  
Soundkeeper  
Fishermen

Budget: Support for fishing vessels of opportunity and using dedicated fishing days  
Sensors/equipping fishing vessels, Data processing/research translation \$25,000 per vessel. (x 5 =\$125,000)  
Website support  
PI/participants/technicians  
Supplies, insurance  
16 stations, equipment and water chemistries analysis \$55,000-\$60,000  
Running DOC assays, \$20,000

End Users: Educators  
Fishing Industry  
Fishery Managers  
State and Federal environmental agencies  
Research community  
NGOs

Next Steps: Scott Gallagher, Roland Samimy, and Olivia Free will work together to draft a white paper.

Olivia Free will circulate the white paper to the working group.

A meeting of participating parties will be called to finalize the proposal.

### **Fundraising Options**

**Olivia Free, MFP**

**Susan Nickerson, Soundkeeper**

Olivia Free presented NOAA's Cooperative Research Partners Program (CRPP) as a possible funding option for the projects resulting from this initiative. The CRPP program funds collaborative projects according to the research priorities of the New England Fishery Management Council's Research Steering Committee. Approximately \$1 million may be available in this funding cycle and the RFP may be released this spring. In addition, there are several foundations such as the Kendall Foundation that support the participation of fishermen in cooperative research.

Susan Nickerson then presented a list of foundations that may be amenable to funding resulting projects and made that list available to workshop participants.

## **Next Steps and Closing Remarks**

### **David Bergeron, MFP**

David Bergeron stated that in order to maintain the cohesiveness of the initiative process, next steps in the development of the projects outlined during the workshop will be for MFP's Collaborative Research Coordinator Olivia Free to convene project meetings and develop white papers for each of the three topics areas.

David then noted that additional potential research topics may be suggested at any time and submitted to workshop participants for consideration. He thanked everyone for their participation and hard work during the day and noted the significant progress that had been made towards crafting a coordinated interdisciplinary research strategy for Nantucket Sound.

David thanked Paul Radcliffe of Project Adventure for a job well done in facilitating the day. He recognized Olivia Free for her hard work in organizing the workshop. He also thanked Sue Nickerson for the support of Soundkeeper and all participants for participating and working so well together.

#### Attachments:

- Workshop Agenda
- Workshop Participants
- Collaborative Research Operating Policies
- Potential Research Topics

## Nantucket Sound Research Strategy Workshop DRAFT AGENDA

Tuesday, March 7, 2006

10:00 AM – 4:00 PM

Craigville Conference Center, Craigville, MA

9:30 – 10:00	<b>Check-In</b>
10:00 – 10:20	<b>Welcome and Introductions</b> David Bergeron, Massachusetts Fishermen's Partnership Susan Nickerson, Nantucket Soundkeeper
10:20 – 10:30	<b>Workshop Operating Policies and Goals</b> Paul Radcliffe, Project Adventure
10:30 – 10:40	<b>Overview of Collaborative Ecosystem Research</b> David Bergeron
10:40 – 11:30	<b>Scientific Presentations</b> <ul style="list-style-type: none"> <li>• Oceanographic Modeling, Dr. Changshen Chen, U. Mass. Dartmouth</li> <li>• Seafloor Mapping, Dr. Larry Poppe, USGS</li> <li>• Water Quality, Dr. Brian Howes, U. Mass. Dartmouth</li> </ul>
11:30 – 11:45	<b>Fishing Industry Perspective</b> Captain Ron Borjeson, F/V Angenette
11:45 – 12:00	<b>Current and Future Research Topics</b> Paul Radcliffe
12:00 - 12:30	<b>LUNCH</b> (Sign up for break-out groups)
12:30 – 12:40	<b>Break-Out Group Instructions</b> Paul Radcliffe
12:40 - 3:00	<b>Project Development Break-out Groups</b> Rapporteurs: Paul Radcliffe, David Bergeron, Maggie Mooney-Seus
3:00 - 3:30	<b>Project Presentations to Full Group</b>
3:30 – 3:45	<b>Funding Opportunities</b> Olivia Free and Susan Nickerson
3:45 - 4:00	<b>Next Steps and Closing</b> David Bergeron

## **Workshop Participants**

David Bergeron, MFP  
Olivia Free, MFP  
Susan Nickerson, Nantucket Soundkeeper  
Paul Radcliffe, Project Adventure  
Maggie Mooney Seus, Fort Hill Associates  
Captain Ed Barrett  
Captain Ron Borjeson  
Captain Bill Amaru  
Captain David Casoni  
Captain Dennis Donohue  
Captain Wade Bohlman  
Changshen Chen, SMAST  
Larry Poppe, USGS  
Roland Samimy, SMAST  
Rubao, Ji, WHOI  
Joann Muramoto, Horsley Witten Group  
Scott Gallagher, WHOI  
Richard Limeburner, WHOI  
Robert Duncanson, Town of Chatham  
Steve Tucker, Cape Cod Commission  
David Dow, NEFSC  
Mark Weissman, MA Fisheries Commission  
Rick Tidd, Teledyne Benthos, Inc.  
Stephen McKenna, MCZM  
Stephanie Cunningham, MADMF  
Yuegang Zuo, UMassD  
Allan Robinson, Harvard  
Haosheng Huang, SMAST

## **Fishermen's Initiative for Scientific Habitat and Ecosystem Research (FISHER Initiative)**

### **Operating Policies for Collaborative Ecosystem Research**

The purpose of these operating policies is to make explicit the common expectations with which participants enter into this process that examines ecosystem structure and function with the aim of promoting an ecosystem-based approach to management. The intent of these policies is to promote productive discussion and effective work that guides and enhances rather than constrains creativity and interaction. Participation in the initiative and its projects indicates acceptance of its mission and operating policies.

#### Mission

To coalesce fishermen's and scientist's empirical and technical knowledge into a legitimate, credible, and durable scientific foundation that encourages the collaboration between fishermen and scientists and promotes an ecosystem-based approach to fisheries management.

#### **Roles and Responsibilities of MFP**

1. MFP will coordinate the collaboration by convening meetings, planning agendas, and arranging for meeting facilitation, logistics, and meeting summaries, as needed.
2. MFP will coordinate with researchers on specific projects, including the physical oceanography and biological processes components.
3. MFP will work with research project teams of scientists and fishermen to ensure, as appropriate, that information, data, and conclusions are shared with all the partners in an open and timely manner.
4. MFP will help assist in fund raising and grant seeking in order to secure funding to achieve the initiative's goals and objectives.

## **Roles and Responsibilities of Initiative Participants**

1. In order to ensure focused and constructive meetings, MFP will coordinate all invitations to plenary and subcommittee meetings, including participation in project design meetings. Suggestions from partners of additional invitees should be discussed with the MFP and if appropriate to the participants and issues at hand, MFP will extend an invitation.
2. Participants will not discuss the overall initiative, its goals, or its projects with the media but rather will refer all such inquiries to the MFP. Participants are of course free to discuss specific projects on which they are working directly while seeking to abide by the operating procedures of this collaboration and to preserve and enhance the relationships among participants.
3. Project partners will contribute active participation and resources to projects associated with this initiative. Participation in this initiative is defined as active attendance in a majority of plenary and project meetings when appropriate, strategic planning for the initiative, assistance with proposal development and review, meaningful time and/or equipment resources contributed to a project, data collection and analysis, and report preparation and presentation.
4. In order to preserve the integrity of the partnership, participants may not use the name of the initiative or any association with it to leverage funds or partners that are not relevant to the initiative unless this use has first been authorized by the MFP. If this association will be used in this manner, participants must obtain a letter of support from the MFP before doing so. The inclusion of participant involvement in the initiative on resumes, biographical statements, and other similar documents does not require prior authorization.
5. The proprietary nature of project concepts, preliminary findings, related data, and final results from initiative projects will be respected; however, it is the hope of initiative participants that results will be shared with the group prior to publication so that they may inform other on-going components of the initiative.

The misappropriation of data constitutes sufficient reason to preclude further participation in the initiative.

6. Data collected from related projects should be used to support the intent of this initiative to create a scientific framework for a shift towards ecosystem-based approaches.
7. Should any partner have a concern about the collaboration or MFP, they will raise that concern directly with MFP to ensure problems are considered, and resolved as quickly and effectively as possible. As needed, if a partner feels their concern was not sufficiently addressed, the partner may then raise their concern to the plenary group.
8. It is expected that all initiative participants will adhere to the operating policies established by these policies and will conduct themselves in a manner that will earn the respect of their peers.
9. Participating scientists agree that project contracts or sub-contracts will include the following provision in the "Report" section: "Sub-contractor agrees that in the event that the fisherman or fishermen participating in the project does not agree with the scientific finding or findings, the final report will explain this disagreement."
10. Operating policies may be amended by consensus of the plenary group as needed.

## Potential Research Topics

Open System Characterization: Dr. Allan Robinson

Primary Production: importance for food web and nutrient impacts

Nutrient Dynamics in Sound and whether coastal embayments are feeding nutrients to larger shelf

Water circulation model

Benthic habitat mapping

Consider Climate Change – J. Muramoto

Social Science: overlay fishing activities to oceanography – maps of fishing communities associated with NS fishing activities and areas – economic dependence – assess potential economic benefits of habitat restoration – track change in NS fishing and fishing communities. – David Bergeron

How well vertically mixed is Nantucket Sound?

What is the impact of algae (blue-green) on ecosystem/fishing industry? (areas of concern Half Moon Shoals, Hyannis-Falmouth out to Horse Shoe Shoal)

What is the impact or degree of spread of black slime?

What is the impact of codium expansion – particularly in area north of Horse Shoe Shoal?, codium found at what depths? 60-ft?

What is the affect of codium on eel grass recovery?

Look at shift in copepods to ctenophores – is this a result of nutrient loading?

Consider the effects of pollution on quahogs – green gill – belief that quahogs eat algae when there is a lack of plankton – gills turn green. Not very aesthetically pleasing – Explore economic costs to industry?

Has water quality compromised fish stocks?

Study the correlation between plankton mass and water quality

Are the Sound estuaries a nursery for fish?

Consider the estrogen compounds and how they are impacting reproductive potential of fish species.