

Monterey Bay National Marine Sanctuary Research Advisory Committee Meeting

April 30, 1993

Attendees:

G. Cailliet, Moss Landing Marine Labs
F. Cava, NOAA/SRD
A. DeVogelaere, Elkhorn Slough NERR
L. Ehret, Naval Postgraduate School
D. Evans, NOAA/NOS
H. Golde, NOAA/SRD
G. Greene, USGS
C. Harrold, Monterey Bay Aquarium
T. Jackson, Monterey Bay NMS
B. Robison, MBARI
J. Roletto, Gulf of the Farallones NMS
J. Rote, California State Legislature
R. Saunders, Center for Marine Conservation
B. Schram, NOAA/OAB
F. Schwing, NOAA/NMFS
G. Sharp, CIRIOS
R. Starr, Sea Grant Extension Program
M. Stephenson, Department of Fish and Game
E. Ueber, Gulf of the Farallones NMS
M. Yoklavich, NOAA/NMFS

Terry Tackson: Introduced the meeting. He handed out the RFP for the site characterization.

Francesca Cava: Introduced Dr. David Evans, NOS Senior Scientist. Talked about the marine biodiversity project. It is designed to coordinate with the terrestrial biodiversity program which Dept. of Interior is working on. NOAA's marine biodiversity program is focused on the Gulf of Maine, Florida Bay and Keys and Monterey Bay. SRD is also considering setting up an internship program similar to the Sea Grant fellowship. This program would pair research interns with research institutions in order to focus ongoing research on management issues. Ideally this would be an ongoing system with new interns every year or two.

Gary Sharp suggested that we need to get senior scientists as well as youth into the system.

Presentations from Working Groups (includes comments and discussion by the entire committee)

Ecological Interactions (Greg Cailliet & Chris Harrold)

A questionnaire was sent out to researchers between San Luis Obispo and San Francisco. The individual responses were given to T. Jackson for the permanent files. The responses are summarized in handouts. Habitats, organisms, and ecological questions are ranked. The most important projects are:

- monitoring: multispecies, multidisciplinary, to distinguish natural from anthropogenic variation.
- using the Sanctuary as a large scale experiment to distinguish natural from anthropogenic variation (examine human impacts).

We don't have a current baseline so we have to set up comparisons (e.g. set up areas with and without trawling).

Key things that should be monitored are:

- Elkhorn Slough: It has been modified and is changing.
- near shore communities - rocky intertidal (the interface between land and water)
- continental shelf and soft bottom
- the canyon
- the kelp forests and subtidal reefs
- pelagic and midwater (nekton, including mammals and birds)

There are different sites in the different habitats. Comparative work between different sites should be done. Teams should be put together to determine what the exact monitoring guidelines should be. Environmental parameters as well as the biological components should be measured in each of these habitats. Geology and Physiography (Gary Greene) Researchers were asked what their priorities were (no written survey). Most answered in relation to their own work. Answers are summarized in a handout.

The priorities were:

- Tectonics: faulting, tsunami generation, earthquakes
- Sedimentation: mass wasting, turbidity currents, canyon erosion, coastal bluff
- erosion
- Fluids: aquifers, salt water intrusion, dewatering (from plate convergence)
- Paleoclimatology: global warming, El Nino, upwelling, history through sedimentation

To address these priorities we need to:

- Collection new field data (always need more data) as well as in situ instrumentation.
- Characterize the sea floor and geology using the existing data which covers almost all of the existing Sanctuary. The Monterey Bay Modeling Group is working on this.
- Have NOAA emphasize the need to have shallow water bathymetric work done.
- Develop good resolution bathymetric maps. High resolution side scan sonar can map the geology in the same resolution as is being done on shore.
- Understand earthquake periodicity.
- Identify the geological anomalies in order to properly manage the Sanctuary.
- Look at tectonic history and climatic changes in exposed canyon walls.

Submarine canyons expose geological stratigraphy to look at the history

We need to highlight the fact that Monterey Bay has the most diverse and complex physiography of any National Marine Sanctuary. This is because the area is on a tectonic boundary in the San Andreas fault area. Geology is the driving force here. Catastrophic events affect the biology and physical environment. Geology plays a major role in habitats, fisheries, etc. We should integrate geology with the other disciplines to truly understand the Sanctuary. Existing core groups (i.e., NURP' group, cold seep group, Moss Landing group, USGS group) have individuals which can help with this integration. The Monterey Bay Modeling group is an ~d hoc group which is focusing on imaging the bottom starting with bathymetry, adding physical, chemical and biological parameters at a later date. There are too many small groups looking at things. We need to foster communication so that people know about these different groups. The Sanctuary can be a clearinghouse to provide quarterly reports of all of the groups.

Chemistry and Water Quality (Mark Stephenson)

A questionnaire was sent out. There were limited responses. There was no response from people working on: nutrients, geochemistry, AMBAG, municipalities (sewage discharges), private consultants, Monterey County health department, trace metal chemistry, Slough studies. The results of a prioritization are in the handout.

80% of the current research is funded by the State

There is not much Federal money for pollutant work. There are many issues in the Northern part of the Sanctuary (such as dredge spoil disposal) which haven't been addressed in the survey. The final page of the survey results should be lumped into 5-8 general categories and ranked.

The public and other groups, such as governmental employees, may generate different priorities. For example salt water desalination or non-point source pollution may be important issues for management purposes. Also, Highway 1 repair, earthquake rubble removal.

The Sanctuary needs to do a water quality protection/management plan, but there is no money to do this. Water quality and toxicity of sediments tie into long term monitoring. Bioassays don't tell you what the pollutants are.

Physical Oceanography and Meteorology (Frank Schwing)

A semi-prioritized list was presented on a handout.

There is a lot of ongoing research in the Sanctuaries. At least nine research vessels are currently collecting data. An electronic cruise schedule should be implemented which people can use to figure out what is going on. There are many things which need to be done concurrently. We need to look at the continuum of the four California Sanctuaries. Meteorology needs to be dealt with in this category as well. Office of Naval Research funds a lot of coastal meteorology. We need to locate the ONR sites within the Sanctuary area. CODAR measurements are made which measure surface velocity instantaneously.

We should do a retrospective data survey of circulation.

Money should be spent supporting existing long term monitoring. We should also try to attract researchers and resources to the Sanctuary. The administration level of NOAA and local politicians should also endorse that work be done in the Sanctuary. The Sanctuary should be a testing ground for new technologies.

Oceanographers are inherently networked. All scientific disciplines within the MBNMS should become similarly networked.

Land Margin Interactions (Andrew DeVogelaere & Gary Griggs)

A questionnaire was sent out and interviews were done over the phone. Results on a handout. Ongoing research and questions include:

- Sources, sinks and transport rates of sediment. Where is the sand coming from? Will it keep coming?
- Erosion rates. A large amount of the coast is already armored.
- Elkhorn Slough - tidal scour and erosion. The U.S. Army Corps has proposed a \$900,000 feasibility study to see if a metal barrier to stop erosion through the channel will work.
- Salt water intrusion - relationship between restoration of tidal inundation and groundwater intrusion.
- Bathymetric survey of Elkhorn Slough.

The land margin is the transition. Andrew feels uncomfortable being the expert of this topic. Gary Griggs is much more experienced on this topic. Perhaps the topic should be put into other groups such as water quality and physical oceanography. There is overlap with Geology/Physiography (i.e. where sediment goes in deep water.)

The National Science Foundation currently funds the Land Margin Ecosystem Research (LMER) program. They are currently on a five year funding cycle. These are multi-institutional, multidisciplinary projects funded for about \$400,000 a year. A possible project for this area would be the impact of agriculture. SRD, NOS, etc. can endorse this. There will be a May 17 meeting to discuss the possibilities of this.

Communications and Information (Gary Sharp)

Everyone is not on the same computer network.

ECONET is the most user friendly of all of them. It is easy to use, inexpensive, and universal. The ecological community around the world uses it; 80% is the non-science community. The National Marine Sanctuary should get involved with this network.

Maps of the world's coastline are available through ECONET.

Most oceanographic information doesn't belong to any one person anymore. Some sort of data management system is needed. Data sets should be brought into public access. Other funding sources don't require that data become public. There is a lot of proprietary information. There will be things which don't get into the site characterization because people won't give up their data. There are different problems with old archived data such as QA/QC. High resolution data sets must be organized so that people can use them (GIS).

There are duplications between Elkhorn Slough NERR and MBNMS. Technically the Slough is part of the Sanctuary.

Human Impacts (Tami Grove)

- Extractive activities: oil/gas development; kelp harvesting; minerals mining; sand/gravel mining
- Vessel activities: navigation conflicts; discharges; catastrophic events (oil spills, hazardous materials discharges, vessel groundings, shipwrecks)
- Harbors: dredging; dredge spoil disposal; runoff (including bottom paint sloughing); discharges; docks / piers /jetties
- Industrial, commercial, residential development: coastal watershed development; road/bridge construction, maintenance, and repair; desalination plants; energy facilities; industrial plants; dams and other water flow diversions; sewage disposal (treatment plants and septic tanks; seawalls; groundwater withdrawals
- Agriculture and silviculture: row cropping, livestock grazing, confined animal facilities, etc.; road construction; timber harvesting; fire management, mosquito abatement, etc.
- Recreational activities: diving; surfing; boating/kayaking; intertidal collecting; hiking, bird watching and related activities
- Military activities
- Aircraft activities
- Ecotourism

Clearly, many important resource questions relative to the Sanctuary are raised by these activities:

- What type of environmental impacts such as sedimentation, shoreline erosion, noise, air/water borne pollutants, salt water intrusion, marine debris, wetland fill, etc. result from these activities and what is their relative degree of impact?
- How do these activities individually or cumulatively degrade habitats due to displacement, pollution, species disturbance, etc.? Can these degraded habitats be enhanced or restored?
- How is species abundance and diversity being affected by these activities? What are other "ecosystem" effects of these activities?
- Are there potential indicators to assess the status and patterns of change in the marine and coastal environment in order to monitor or predict the effects of these activities?

There is a regional research board which is part of a system set up by Sen. Mitchell of Maine. Members are from NOAA, EPA and State of California. They are working on a research plan for the area. Jim Rote will work closely with them. The Board plans to meet in Monterey in September.

Fisheries (Mary Yoklavich & Rick Starr)

This should be separate from human impact. This has a large user group in the Sanctuary. An information request was sent out. Results were received from seven different agencies and summarized in a handout. Four types of research

were identified:

- Recruitment, transport mechanisms and ocean conditions.
- Identification of critical species, habitat associations and assessment of effective refugia/reserve management concepts.
- Effects of fishing on life history characteristics.
- Trophic interactions between pelagic prey and top level predators.

The survey results show how people prioritized topics and questions. They also show which topics people feel aren't relevant to the Sanctuary. Most of the research lists are related to what people are working on. Aquaculture should be considered in this section.

It may be important to look at specific indicator species to look at trophic interactions.

Sanctuary-wide identification of priorities (committee discussion)

Why are we prioritizing research?

- To generate future funding
- To try to direct researchers
- To target things that aren't being done. A lot will be done anyway.
- Not everyone wants rigid research priorities so that new ideas can be added in the future. The priorities must be allowed to evolve.
- The system is never constant. Funds are needed to study serendipitous events.
- Research ~ such as biodiversity can be used to leverage additional funding.
- Some questions can't be answered without a long term (10, 20, 40 years) database. Mineral Management Service has large databases which are in individual consultant files. It may be difficult to access these data.
- Annual research plans should be developed.

We must look into research which will help MBNMS manage the resources better. We have to make sure that other research goals fit into this. There are political vs. scientific issues and T. Jackson's needs vs. the researcher's needs.

We may have different strategies for different priorities. A two-pronged approach: 1. Searching out money for big projects 2. What does NOAA have money for now?

Do we have to wait for the site characterization to be done before we do anything? We should identify priorities whether they are funded now or not.

There are many multi-disciplinary cross-cutting topics:

- Sanctuary as clearinghouse
- long-term monitoring - water quality (what do we look for where?)
- baseline information (site characterization); sea floor characterization
- circulation-surface flow (hazmat); overall circulation (habitats)
- sediment: sources, sinks, transport
- human impacts and threats - sewage-point source (long-term monitoring) - agricultural runoff (long-term monitoring) - oil-spill/hazmat: baseline information - coastal development

We are moving toward a research plan. We need to keep the wish list open. We will synthesize all of the information presented today.

Existing programs are going to have to provide the data and the actual work. We can market this by saying that institutions cooperation can leverage money.

Terry Jackson, Jim Rote and Helen Golde will work on the research plan which will have the following format (may be revised as plan takes shape). I. Overview: EIS/MP mandate; annual research plans; summarize major issues & themes
II. Chapters from each working group with priorities III. Synthesize cross-cutting issues

First draft will be ready May 21. Working group chairs will review the first draft and then it will go to the whole committee. Working group chairs will meet again to discuss on June 22.

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