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**Minutes of Meeting**  
**March 19, 1999**  
**Dartmouth College, Hanover, New Hampshire**

Present:

Lew Incze	Bigelow Laboratory for Ocean Sciences
Chris Naimie	Dartmouth College
Wayne Arnold	Harvard University
John Allen	Huntsman Marine Science Centre
Linda Mercer	Maine Department of Marine Resources
Josie Quintrell	Maine State Planning Office
Christian Krahforst	Massachusetts Coastal Zone Management Program
Judy Pederson	Massachusetts Institute of Technology Sea Grant Program
Ivar Babb	National Undersea Research Program/University of Connecticut
Carolyn Levi	New England Aquarium
Eugenia Braasch	RARGOM headquarters at Dartmouth College
Anne Hayden	Resource Services, for the Island Institute
Gerald Pesch	United States Environmental Protection Agency
Kevin Friedland	United States National Marine Fisheries Service
Fei Chai	University of Maine
Francis Juanes	University of Massachusetts at Amherst
Jeff Turner	University of Massachusetts at Dartmouth
Wendell Brown	University of New Hampshire
Bruce Tripp	Woods Hole Oceanographic Institution

The Meeting was called to order by Jerry Pesch at 9:00 a.m., with Genie Braasch keeping the minutes.

**Old Business**

It was moved to accept the minutes from the 10/19/98 meeting. The motion was unanimously approved.

**Research Topics of High Regional Interest and Need**

J. Pederson asked Board members to envision the GoM in 50 years, considering especially the implications of coastal development. She encouraged input on big issues facing the region, asked for suggestions of key research questions and distributed lists of research topics found in the Regional Marine Research Program Plan, as well as the research priorities had been identified at the recent RARGOM Migis workshop. She asked the Board members to suggest research topics that would build on these other efforts. Topics mentioned for future research (listed here as mentioned during the round table discussion):

Water quality monitoring

Contaminant research vs. current monitoring efforts (a disconnect between research results and what managers' need for decision making)

Shellfish toxins/red tide/ sewage

Where have all the lobsters gone?

Where have all the fish gone?

What are we using our coastal waters for? (impact of sewage from residential sites)

Fishing gear and destruction of the benthos

Oil and gas resources

## Fisheries enhancement

Fisheries recruitment processes for a number of species are needed /spatial and temporal abundances/ human vs. natural impacts

Groundfish in the GoM (Georges Bank is being well investigated). What is limiting the return of healthy groundfish stocks? What is the role of environmental change? Quantitatively, how should we manage this resource?

## Significant Fish Habitat

Nearshore coastal waters (inside 50 fathoms, estuarine)

It was noted that as more people crowd the coast, there will be an even greater need for the predictive capabilities of modeling. Modeling projects are becoming interdisciplinary by nature, leading to honest dialogue about levels of uncertainty. It was suggested that some case studies be developed that use modeling results with real and simulated data, and the question was raised whether there are there portions that can be developed into community data

Productivity in the GoM (linkages not well understood).

C. Krahforst also presented a list of issues generated at the last Council on the Marine Environment (CME) meeting (see attached). General reaction to the CME list was that it was too broad, that pieces of those issues need to be identified to move those larger issues forward in a step-wise fashion (this is perhaps a role that RARGOM can perform).

J. Pesch said that this discussion was a timely exercise from the standpoint of EPA, because that agency is in the process of launching a national monitoring program and especially wants to solicit information from local and state levels. Generating information from the regions prior to initiating a national program represents a new approach for EPA as a federal agency and Pesch encouraged RARGOM members to participate, as EPA plans to begin monitoring the New England region in two years. Funding is anticipated to be \$4M annually for 5 years, with investments targeted at the state level to meet legal requirements such as the Clean Water Act. EPA has also funded a "Coastal 2000" monitoring program, where the goal is to monitor the entire coast during the summer of 2000.

Discussion shifted to the question of how to make a regional research program work in conjunction with management needs. The MWRA program was described as a good model. It was suggested that in addition to the research topics, the administrative leadership, the researcher partnerships combining state and private expertise, data availability and management, and the structure of the program itself made it responsive to the variety of needs. Translation of the research findings was another MWRA program strength. The group identified other features of a successful regional research program: visibility, level of funding/resources, identification of macro-level as well as micro-level research questions, structured interdisciplinary investigations, and incorporation of both applied and basic research, using management recommendations for inquiry prioritization. Long term financial support is necessary to sustain researcher interest (a 3 yr. program would not be an adequate time frame).

Science/Management integration and funding partnerships were also discussed. While EPA would likely fund the monitoring aspects, where would support for other areas of research come from? NMFS might fund research about the impacts of fishing gear and recruitment. Other NOAA programs might also fund other aspects. Are there Canadian sources of support as well? It was noted that there are not many funding sources for regional work, and proposals submitted with regional scope are often not successful in federal agencies.

## *Actions to take:*

1. J. Pesch indicated that EPA plans to hold a workshop that will put together an integrated monitoring plan. The group decided to propose a workshop to EPA "Integrating Research and Monitoring Needs" that will take some priority management questions and work out the research approaches for these topics. G. Braasch and J. Pederson will work together on this task and will then circulate to the Board for comments. RARGOM will help to organize this effort by drafting a workshop proposal during the next couple of weeks. For that workshop, a white paper would to be written that highlights the research questions and recommendations from the St. Andrews and Migis meetings as well as other recent GoM workshops (for example, the Bay of Fundy Ecosystem Partnership workshops).
2. Analyze the MWRA program using NRC guidelines. (i.e., why it worked, what it would take to build a successful program along these lines). This analytical process might help to identify generic framework elements that would contribute to a successful regional program design.

## **Buoys and Ships/Ocean Observing Systems**

Following the discussion about the need for regional monitoring, L. Incze made the distinction between monitoring and observing systems -- observing including satellite technology and being broader in scope. Incze said that the OOS workshop report was completed in January and has been widely distributed to RARGOM members, workshop participants, and other interested people. He said that he was glad that RARGOM held the workshop, that there is lots of interest in this topic nationally and that this builds good recognition for our group. W. Brown indicated that he plans to attend a national ocean observing systems workshop held in May, hosted by Tom Malone. I. Babb noted that the RARGOM OOS workshop report will be useful when he seeks support for a \$3M seafloor initiative in Washington D.C.

*Actions to take:*

1. L. Incze will have follow-up conversations with Tom Malone and Don Scavia.
2. L. Incze will send OOS report with cover letter to D. Pittenger at WHOI.

J. Pederson reported that MIT Sea Grant is undertaking a Mass. Bay/Stellwagen Bank project using AUV, establishing a communication network on the seafloor with links to satellite.

L. Incze reported that the SWATH vessel is developing nicely, that it is a high priority project at WHOI, but fund raising is not yet completed. The plan is to complete the fund raising this year, with the goal of construction and operation of the vessel by 2001. Incze stated that the boat has been modified to operate at a slower speed, 12 knots instead of 16, in favor of increased payload and endurance. The issue of UNOLS membership is undecided at this time and is under active discussion. The anticipated per diem cost for the vessel is \$6,000. The vessel is intended to operated from ports throughout the GoM, including Canadian ports (some safety requirements were modified to enable travel to Canada).

I. Babb said that Univ. CT took delivery of the R/V CT 3 months ago, sea trials begin next week. The issue of UNOLS membership is also under discussion for that vessel. The per diem cost for the R/V CT is \$3,000.

## **Data & Information Subcommittee**

B. Tripp said that RARGOM, as a group, has identified outreach as a priority more than most of its institutional member organizations have. Efforts to create regional systems have not yet evolved into a coherent operation; both vision and funding are lacking. At this point, REDIMS/EDIMS web sites exist and there are useful web sites that are managed by individual researchers. The REDIMS site has limited usefulness because RMRP investigators have not all put up their data on that site (there is a lack of incentive, now that the program funding is gone). W. Brown suggested that RARGOM could play a role here, providing the moral incentive for sharing data; he estimated that 80% of the RMRP data could be up and available in 1-2 months time if it was a priority, the data sits on the computers of individual researchers and should be archived for public use. K. Friedland agreed, saying that data collected with federal support belongs to the public, not to the investigator. C. Naimie said that he believes it is important to summarize the RMRP results, so that the outcomes of the program are documented and we can learn from that program as we develop future initiatives.

The New England Aquarium Aquatic Forum Series "Out of the Fog: Furthering the Establishment of an Electronic Environmental Information Exchange for the Gulf of Maine" workshop report was distributed to those at the meeting.

## **Workshop Proposal Status and Review**

Several workshop topics were reviewed, including:

- Lower Trophic Level Species Management workshop. L. Mercer reported that this program will focus on rockweed and krill, that the workshop will be fairly small in size, will be held at the Huntsman Marine Science Centre in St. Andrews, NB next fall (late Sept. or early Oct.) No budget has been established, G. Braasch will provide some fiscal information for planning and it was also suggested that RARGOM might handle the resulting workshop report preparation.
- S. Kraus, New England Aquarium, proposed a workshop about Large Vertebrate Populations in the Gulf of Maine, he would like to hold a 20 year retrospective meeting in order to summarize what is known about these organisms, and identify trends and future research initiatives (see attached description).
- A regional monitoring workshop seems likely to be supported through EPA. B. Tripp offered to send J. Pesch a brief description of some workshop discussion topics that he wrote, based on his review of the GulfWatch program. Pesch indicated that this is an ideal time for RARGOM to suggest an integrated monitoring program for the GoM. Developing partnerships and defining the process for establishing baselines for measuring progress are the goals.

- L. Mercer said that the notion of conducting a follow-on workshop to the 1995 workshop about habitat, to review methodologies to be evaluated in the field has been put on the back burner for now. P. Auster led a review of Regionally Significant Species for the CME and will probably hold a small meeting among interested colleagues.
- According to G. Wallace, UMass Boston, plans are underway to run a workshop about Mass. Bay in the spring of 2000. There are several sponsors from Boston area institutions, Wallace suggested that RARGOM participate as a co-sponsor.

### **Guest Speakers: Research Presentations**

C. Naimie gave an overview of the research activities currently underway in the Numerical Methods Laboratory, emphasizing coastal ocean physical and coupled physical/biological model development and implementation. A web-served version of his talk, which includes links to web-served archives for a number of these initiatives, is available at: [http://www-nml.dartmouth.edu/~naimie/files.RARGOM/RARGOM\\_03-19-99.html](http://www-nml.dartmouth.edu/~naimie/files.RARGOM/RARGOM_03-19-99.html)

### **Publications**

G. Braasch reported that she recently received communications from Dr. Tom Powell (former Chair of the US GLOBEC Scientific Steering Committee) and Dr. Hal Batchelder (former US GLOBEC National Coordinator) regarding RARGOM publications. Both indicated that although their roles within the US GLOBEC program have changed, they nonetheless wish to continue receiving RARGOM publications. Powell said that "the comparison of many Gulf of Maine studies to GLOBEC investigations other than that on Georges Bank are of considerable interest to me, the broader group of GLOBEC scientists, and the still larger coastal oceanographic community". The *GoM NEWS* winter 1999 issue with an estuarine theme is in progress. The spring issue will feature the research of the EcoHab program. R. Geyer and D. Townsend are helping to coordinate that issue. The summer issue will contain an update on the MWRA program. Braasch also said that the 1998 GoM Bibliographic search is being prepared using EndNote software so that it will be a searchable database.

### **Remote Sensing Information Center**

J. Quintrell and A. Harvey are currently developing a plan for a Remote Sensing Center with support from a State of Maine feasibility study. The concept of such a center is to expand the use of NOAA satellite data (currently used primarily by the National Weather Service), so that remote sensing will be available to inform resource management issues. Partners in this activity might use remote sensing to look at near-shore coastal interests such as the dismantling of Edwards Dam, the blueberry industry, or lobster populations in Penobscot Bay. The goal is to also provide service support along with the data. While the intention is that the center will be jointly supported by several partner institutions, there will need to be a hub location as well. This hasn't been decided yet. Hayden also reported that a new "Special Events Imager" sensor is being developed at the MIT Lincoln Labs.

### **LTER next round**

L. Incze said that he spoke recently with Peter Weibe at WHOI about the future establishment of a joint NSF/NOAA Georges Bank LTER. It seems likely that this development will take place in the next LTER funding cycle. The support will be used to collect long-term, limited data in order to better understand the processes investigated in the US GLOBEC Georges Bank Program.

### **Announcements**

The next US GLOBEC Georges Bank Program proposal deadline is April 15, 1999.

A Princeton Ocean model users group meeting will be held at Univ. Maine Orono, next fall.

ONR has targeted the northern New England states as recipients of research funding. An informational meeting will be held on June 9<sup>th</sup> in Portland, ME.

Sea Grant and NMFS will hold a colloquium on Fish Habitat on April 7-9 in Portsmouth, NH.

C. Levi distributed a draft vision statement for the Gulf of Maine which she is developing with support from the Cabot Family Charitable Trust (see attached). She asked the Board members to contact her with their reactions. It was noted that L. Hildebrand, Environment Canada, had promoted the notion of a GoM Charter document (based on one from the Great Lakes region) to the CME.

### **1999 Budget and Fiscal Report**

G. Braasch presented the budget update (see attached). There was no discussion.

### **Other Business**

G. Braasch said that she, J. Pederson and J. Pesch have been discussing the need for and process of developing a 5 year strategic plan for RARGOM. They believe that RARGOM needs to establish goals and strategies for carrying out its mission, so that the organization operates within these guidelines as it makes decisions concerning its annual activities. They will be contacting the Board members over the spring months to ask them to reflect about whether RARGOM is meeting the current and future needs of its member institutions.

**The next meeting will be held on June 11.** K. Freidland and F. Juanes offered to host the meeting at UMass Amherst. The group appreciated this offer, but the concensus was that a coastal location in S. Maine should be selected for the next meeting and Amherst would be the location for the fall 1999 meeting.

The meeting adjourned at 3:30 p.m.

Respectfully submitted,  
Eugenia Frey Braasch  
March 25, 1999

## **Large Marine Vertebrates in the Gulf of Maine RARGOM Workshop Proposal 3/19/99**

Scott Kraus, New England Aquarium  
Romona Habler, EPA

### **Summary**

Recent changes in the distribution, feeding patterns, and reproductive intervals of large marine vertebrates in the Gulf of Maine are thought to be associated with environmental anomalies beginning in 1991. These observations are illustrated in Right whales, the most endangered of all whales, in major shifts in local distribution and abundance of arctic seals, and may be reflected in fish stocks and turtle distributions. We propose a workshop to examine the potential causal factors in these changes, to identify potential links between data sets, and to identify methods for analyzing retrospective multi-layered information on oceanography, population dynamics, and trophic dynamics. Our goal is to develop the components of a retrospective multi-disciplinary study on ecosystem dynamics, using a few, well studied vertebrates as indicators of significant ecosystem change.

### **Example**

The Gulf of Maine is one of the major feeding habitats of right whales, especially the Great South Channel where approximately 70% of the entire population feeds each spring. In 1991, Mt. Pinatubo erupted in the Philippines spewing enough ash into the environment to cause a decrease the following year in both atmospheric and sea surface temperature in the North Atlantic. In 1992, no right whales were observed in the Great South Channel. This change in whale distribution is thought to be associated with temperature dependent alterations in prey abundance and distribution. Whales must have appropriate feeding habitat to survive.

To meet the energetic requirements of Right whales, feeding habitat requires an unknown combination of hydrographic, oceanographic and behavioral processes that result in sufficient concentrations of prey. Since 1992, changes have continued. Starting in 1993 and continuing through 1998, Right whales abandoned Browns Bank/Roseway Basin as a feeding habitat. Females are not calving as frequently. From 1980-1992, the mean calving interval was 3.2 years; from 1993-1998, the mean increased to 5.1 years. Computer analysis of population status indicates their mortality rate may have increased as much as six fold during this time (H. Caswell, in press). Though the reasons for these changes remains unknown, atmospheric and oceanographic changes are thought to be potential factors.

One function of this workshop would be to analyze the environmental changes that may have contributed to such dramatic changes in the demography of right whales and to use this species as a model for examining the status and possible impact of environmental change on other key species. Data on other species is likely to be identified at the workshop, and additional layers of information will become apparent. We hope this workshop will lead to a large scale, multi-institutional, multi-disciplinary research effort to examine ecosystem dynamics from the top down.

### **Suggested Participants**

State and Federal Agencies: National Marine Fisheries Service (NEFSC and Regional Office), Environmental Protection Agency (AED and Regional Office), State Departments of Fish and Wildlife (member states), MA Water Resource Authority, Canadian DFO, Marine Mammal Commission, NESDIS, Climate Change Groups  
Academic and Private Research Organizations: URI/GSO, Harvard, UMASS, New England Aquarium, Center for Coastal Studies, WHOI (GLOBEC and others), Bigelow Lab, Huntsman Marine Lab, others

## **Approach**

A. Plenary sessions to establish 1) 20 year retrospective on large vertebrate population dynamics 2) what we know about the last 20 years of atmospheric and oceanographic change, 3) how this information can be used analyze the past and predict the future impacts on large marine vertebrates.

B. Workshop to address how biology and environmental knowledge can be integrated to address these complex changes.

## **Available databases**

Oceanographic, atmospheric, remote sensing, whale distribution and abundance studies, fisheries data, MARMAP data, GLOBEC data (See database list compiled for A Predicting Right Whale Distribution Workshop) etc...

## **Questions/issues to be addressed in workshop**

1. Determine if existing data is sufficient to develop clear and testable hypotheses about environmental effects on vertebrates.
2. Determine if vertebrates can serve as good environmental indicators for environmental or trophic changes
3. Identify further experiments or observations needed to confirm current questions.
4. Develop a proposal to use retrospective analyses to understand effects of environmental change on large marine vertebrate, and develop predictive models.

1999 Budget Summary  
updated 3/15/99

	<u>Year to Date</u>	<u>Committed</u>	<u>Actual &amp; Committed</u>	<u>Budgeted</u>
1998 Carried Forward	\$13,846.		\$13,846.	
<u>Income</u>				
Membership dues				
Full (11 @ \$2750.)	\$24,750.	\$5,500.	\$30,250.	\$30,250.
Associate (12 @ \$650.)	\$2,600.	\$4,550.	\$7,150.	\$7,150.
<b>Income Sub-Total</b>	<b>\$41,196.</b>	<b>\$10,050.</b>	<b>\$51,246.</b>	<b>\$37,400.</b>
<u>Expenses</u>				
Salaries				
Chair		\$7,000.	\$7,000.	\$7,000.
Vice Chair		\$0.	\$0.	\$0.
Executive Director	\$7,112..	\$21,784.	\$28,896.	\$28,896.
<b>subtotal</b>	<b>\$7,112.</b>	<b>\$28,784.</b>	<b>\$35,896.</b>	<b>\$35,896.</b>
Operations				
Travel	\$0.	\$2,000.	\$2,000.	\$2,000.
Supplies	\$0.	\$500.	\$500.	\$500.
Printing	\$0.	\$4,500.	\$4,500.	\$4,500.
Other	\$142.	\$1,858.	\$2,000.	\$2,000.
<b>subtotal</b>	<b>\$142.</b>	<b>\$8,858.</b>	<b>\$9,000.</b>	<b>\$9,000.</b>
<b>Contingency</b>	<b>\$0.</b>	<b>\$5,000.</b>	<b>\$5,000.</b>	<b>\$5,000.</b>
<b>Total Direct</b>	<b>\$7,254.</b>	<b>\$42,642.</b>	<b>\$49,896.</b>	<b>\$49,896.</b>
O/H (@10%)	\$0.	\$4,989.	\$4,989.	\$4,989.
<b>Expenses Sub-Total</b>	<b>\$7,254.</b>	<b>\$47,631.</b>	<b>\$54,885.</b>	<b>\$54,885.</b>
<b>Net (Income less Expenses)</b>	<b>\$33,942.</b>	<b>&lt;\$37,581.&gt;</b>	<b>&lt;\$3,639.&gt;</b>	<b>&lt;\$17,485.&gt;</b>

**Program**

1997 Ocean Observing Systems Workshop N=36

Income	\$3,999.	\$3,999.
Expenses	\$3,701.	\$3,701.
Net	\$298.	\$298.

Workshop Fund	\$4,000.	\$4,000.
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<b>Net Program</b>	<b>\$4,298.</b>	<b>\$4,298.</b>
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