

Testimony for the U. S. Commission on Ocean Policy

Submitted by
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“The History and Future of GoMOOS: Elements of a Successful Partnership”

Admiral Watkins and distinguished members of the Commission, thank you for this opportunity to brief you on GoMOOS, the Gulf of Maine Ocean Observing System. GoMOOS is a prototype regional, user-driven, coastal ocean observing system. As such, our immediate goal is to provide data and information to serve a wide variety of public and private sector needs for decision-making, problem solving, and research in the Gulf of Maine. Our long-term goal is to become an element of the national coastal ocean observing system as conceived in several recent reports [1,2,3].

GoMOOS has two major components, a technical component, which includes the infrastructure for acquiring, managing, archiving, and disseminating oceanographic and meteorologic data on an hourly basis, and an institutional component, which allows GoMOOS to operate as an effective partnership within the region. The institutional component may represent the biggest breakthrough in the concept of implementing a national coastal ocean observing system. After a brief overview of the technical program, I would like to focus on the history of the organization, review some user feedback, and present some recommendations that will allow us to succeed as part of an integrated, national system.

Technical Program

GoMOOS has partnered with the research community to implement a versatile and state-of-the-art observing system for the Gulf of Maine. The international partnership includes the University of Maine, Bigelow Laboratory for Ocean Sciences, Woods Hole Oceanographic Institution, and Bedford Institute of Oceanography in Canada. The infrastructure includes over a dozen moored buoys that measure weather at the ocean surface and a wide variety of physical and biological properties throughout the water column. We augment these point measurements with hourly Gulf-wide maps of currents from shore-based radar, and satellite images of the ocean surface. And computer models use these data for environmental predictions.

The data management system is as versatile and expandable as the measurement program. Our objective is to provide a clearinghouse for data collected by GoMOOS and for related data collected by other organizations, to convert that data to useful information, and to disseminate that information in a timely way for all interested users.

Institutional Structure – The History

When GoMOOS was first conceived, its founders began with the paradigm of most other coastal ocean observing systems: that of a research program. But the founders soon realized that a different paradigm was needed to overcome three important limitations of the research model. First, existing research institutions in the region were suspicious of what appeared to be the creation of a competing organization, one that would survive only by eating into the resources upon which existing universities and research labs depend. It became clear that the region did not need another competing organization. Rather, the region needed infrastructure that would enable existing institutions to pursue their work more effectively.

Second, in the research model the capital assets and data management system would be designed and deployed to answer research questions. It would be assumed that the observations and predictive capacity thus gained would be useful to other sectors as well, including shipping, fisheries, search and rescue, and so on. Such spin-off benefits would be incidental in a research program, not primary. But, to sustain long-term support and funding, the many user groups must see the system as essential to them, and designed specifically to help solve their problems in a timely way.

Third, the research model did not provide a path to operations. It was difficult to project how the system would evolve into a 24-by-7 operation when such a mode may be inconsistent with the mission and objectives of the principal investigators and their academic and research institutions. Researchers are not interested in the long-term, mundane and demanding maintenance requirements of an operational system.

Thus, a different model was required. The founders of GoMOOS turned to the model of a cooperative utility which, in many ways, is the converse of the research model. GoMOOS is organized as a nonprofit corporation; a membership organization whose members represent the broad array of users in the Gulf. It is a service organization governed by a Board of Directors, its Board is drawn from the membership, it has a chief executive officer who understands the science and answers to the Board, it is targeted to user needs as determined by market analysis, its mission is the dissemination of data and information upon which many, including researchers, can rely for a variety of purposes, and it requires long-term funding. GoMOOS evolved conceptually from a research organization that needs infrastructure to an infrastructure organization that will support research in an impartial, comprehensive manner. This approach has enabled many different interests to participate with the confidence that GoMOOS will be a shared platform for many.

Transition to Operations

After two years of development and implementation at a cost of roughly \$10M, GoMOOS is beginning the transition to an operational system. The transition has two overriding implications. First, existing relationships with research partners will be revised to create a clear path for moving appropriate technologies to operational status. Second, GoMOOS will restructure operations around a core suite of reliable data to serve regional and national needs. In this new mode of operations, GoMOOS will continue to support the development and implementation of new technologies, but these will not be held to

the same operational standards. The objective is operational infrastructure that continually evolves through partnerships with the research community.



Membership

Research/Education:

Bedford Institute of Oceanography
Bigelow Laboratory for Ocean Science
Dalhousie University
Maine Maritime Academy
Rutgers University
University of Maine
University of Mass. – Dartmouth
University of New England
University of New Hampshire
University of Rhode Island
Woods Hole Oceanographic Institute

Government:

Maine Dept. of Marine Resources
Maine Science & Technology Foundation
Maine State Planning Office
Mass. Coastal Zone Management
Mass. Water Resources Authority
Stellwagen Bank National Marine Sanctuary

Marine Industry:

Bath Iron Works
Connor Brothers, Ltd.
James W. Sewall Company
Maine Lobstermen Association
Portland Pipe Line Corporation
Satlantic, Inc.
Atlantic Pilotage Authority
Eastport Port Authority
Federal Marine Terminals
Penobscot Bay & River Pilots Assn.
Saint John Marine Pilots
Saint John Port Authority

Nonprofit:

Gulf of Maine Aquarium
Island Institute
New England Aquarium

Meeting User Needs

The user community, as represented by our Board, will help set the priorities for the future. The GoMOOS membership is evidence of the broad support for the promise of ocean observing from users within and outside the research community. GoMOOS provides a natural forum for these stakeholders in the system. An ongoing dialog allows the scientists to work with other users to identify achievable near term goals. In the long term, the hope is that user feedback will stimulate research agendas in the direction of meeting user needs.

Our structure as a user-driven organization virtually guarantees the relevance of our products. The GoMOOS mission includes an ongoing commitment to discovering user needs and to assuring an appropriate response.

Our first major effort to convert data to useful information led to the present version of our web site, gomoos.org. Design criteria targeted users who need real-time data, including mariners, commercial fishermen, and recreational boaters. For these users, GoMOOS augments the Weather Service buoys with improved regional coverage and

with new kinds of observations, such as fog. As a result, harbor pilots have become dependent on GoMOOS data for helping to navigate oil tankers through some of the most productive lobster fisheries in the world. The positive feedback has extended outside our targeted users to include Weather Service forecasters, the U.S. Coast Guard, and others. In fact, at the request of fishermen, NOAA now reports information from GoMOOS buoys on their daily weather-radio broadcasts.

Environmental managers are important users for GoMOOS data as demonstrated by the Massachusetts Water Resources Authority (MWRA). The MWRA is responsible for the Boston sewage outfall that pumps effluent into Massachusetts Bay. A GoMOOS buoy monitors water quality upstream of the outfall, which allows the MWRA to distinguish the impact of the outfall from other environmental factors. This issue affects communities around neighboring Cape Cod Bay and endangered marine mammals in the adjacent Stellwagen National Marine Sanctuary.

The aquaculture industry needs GoMOOS data for choosing aquaculture sites, for scallop-spat collection, and for evaluating the environmental impact of their activities.

The fishing industry wants data that leads to more informed resource management. To this end, we're working with the Department of Fisheries and Oceans in Canada and the NOAA National Marine Fisheries Service. Together we hope to add a new sentinel buoy to the GoMOOS array. Recent studies show that data from this buoy could produce 6-9 month predictions of the effects of climate variation in the western Gulf of Maine and Georges Bank. Our partners hope to use the data to help predict and manage groundfish stocks and other demersal species.

Researchers are benefiting from the growing number of funded research proposals to use GoMOOS data and the GoMOOS infrastructure. These include projects to understand and predict harmful algal blooms, and modeling activities that will enhance the rapid environmental assessment needs of the Navy, our primary sponsor.

For education and outreach, GoMOOS is partnering with nonprofit organizations on our Board on projects that will use GoMOOS data to further their respective outreach missions. The entire system stands to benefit from their efforts to increase public awareness and appreciation of ocean science. When it comes to capturing the imagination, there is no substitute for the dynamic character of real-time observations.

Needs for Future Success

As a nation, we have the technology and we have the need, we have only to allocate the resources necessary to create and sustain a national system. A recent NOAA cost/benefit analysis quantified the benefits from GoMOOS in dollar terms. Their conservative estimate of \$30M/year exceeds operating costs by a factor of ten. In human terms, they estimated that GoMOOS observations applied to Coast Guard search and rescue could save six or more lives per year in the Gulf of Maine alone. We need to expand these benefits to the national scale.

In closing, I would like to propose three recommendations that will allow the GoMOOS partnership to continue, and will allow nascent systems in other regions to benefit as well:

1. Long-term federal funding for a national coastal ocean observing system,
2. Support for the national system as a federation of regional systems, and
3. Coordination at the national level between the regional systems and the relevant federal agencies.

Perhaps all three objectives could occur through expansion of the National Oceanographic Partnership Program and related offices such as Ocean.US. Certainly this approach would promote interagency partnerships, minimize duplication of efforts, and foster an integrated system that benefits all participants. As a pilot for the national system, GoMOOS anxiously awaits the outcome of your recommendations.

References

- [1] Ocean.US, 2002. "An Integrated and Sustained Ocean Observing System (IOOS) for the United States: Design and Implementation. Ocean.US, Arlington, VA. 21pp.
- [2] R. Frosch and The Ocean Observations Task Team, December 1999. "An Integrated Ocean Observing System: A Strategy for Implementing the First Steps of a U.S. Plan."
- [3] W. Nowlin and T. Malone, April 1999. "Toward a U.S. Plan for an Integrated, Sustained Ocean Observing System."

[All three documents are available online at <http://www.ocean.us.net/>]