Development of an Ocean Observing System for the Gulf of Mexico: A Gulf Numerical Laboratory

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- Background
- Mission Statement: Vision
- Elements of Design and Implementation
- A Structure is Required
Background:

Why Develop a Gulf of Mexico Regional Ocean Observing System?
The GOOS Modules

The Global Ocean Observing System (GOOS) is being designed and implemented in two modules:

• **A global module** designed to monitor, predict, and understand marine surface conditions and climate variability; and

• **A coastal module** designed to sustain healthy marine ecosystems, ensure human health, promote safe and efficient marine transportation, enhance national security, and predict and mitigate against coastal hazards.
Implementation of the Coastal Module

It has become clear that the coastal module of GOOS will be implemented as a federation of regional observing systems.

It is important that they be integrated among one another and with the global component of GOOS. This implies sharing of data and products to produce a sustained and integrated ocean observing system (IOOS) for the U.S.
Types of Observations in Coastal Module

Some of the observations needed for regional coastal ocean observing systems will be common to most, if not all, systems (e.g., surface winds, sea level, temperature, currents, or surface waves). These “core” observations may be common to needs for the global module of GOOS.

Other types of observations will be specific to regional systems (e.g., sand transport, hypoxia, or healthy conditions of beaches for human recreation).
Funding for Coastal Module

Within the U.S. coastal zone (extending from the estuaries to the boundaries of our EEZ) it may be expected that the federal government will support a considerable portion of the needed core observations, referred to as the national network.

However, it is likely that many of the specific observations needed by distinct regional systems must be financed by entities within the region, including industry, NGOs, and state, regional, and local government agencies, referred to as regional enhancements.
U.S. Integrated Ocean Observing System

Coastal Component

- Northeast
- Mid-Atlantic
- Southeast
- Gulf of Mexico
- Southwest
- Northwest
- Alaska
- Great Lakes
- Hawaii/Pacific Islands

Federation of Regional Systems

Global Component

Federal core observations

Data and Communications Subsystem

Contributions of other nations
Regional GOOS Systems Under Development

Regional ocean observing systems already are under development along the coasts of our nation, including:

- The Gulf of Maine Ocean Observing System (GoMOOS)
- The Gulf (of Alaska) Environmental Monitoring and Prediction System (GEM)

In Europe, some regional coastal observing systems are considerably further developed than within the U.S. An example is the Baltic Ocean Observing System (BOOS) and the Mediterranean GOOS (MedGOOS).
Mission Statement:
Vision
Mission Statement: Vision

We seek to establish a sustained observing system for the Gulf of Mexico to provide observations and products needed by users in this region for the purposes of

- Detecting and predicting climate variability and consequences
- Preserving and restoring healthy marine ecosystems,
- Ensuring human health,
- Managing resources,
- Facilitating safe and efficient marine transportation,
- Enhancing national security, and
- Predicting and mitigating against coastal hazards.
Mission Statement (continued)

We envision sharing of data, models, and products via the internet for the common benefit of all participants, including industry, NGOs, academia, and federal, state, regional, and local government agencies. It is understood that this Gulf of Mexico observing system will be integrated with other regional coastal ocean observing systems, in particular to create an integrated and sustained U.S. component of the ocean observing system.
Mission Statement
(continued)

We recognize that the system will require sustained financial support from a combination of government, private, and non-governmental organizations. That will be possible only if the system is built and remains responsive to the needs of these organizations and to the public. Thus, the system will be subject to continuing oversight by representatives of such organizations and of the public.

Collaborations with other nations bordering the Gulf of Mexico is to be actively sought in the design and implementation of this regional observing system.
Elements of Design and Implementation
Design and Implementation

Objectives

• Establish data and information management system
  – Part of a national system; integrated with other regional coastal observing systems
  – Integrated with the global observing system module

• Implement sharing of model code and output

• Complete inventory of existing operational and product-producing components for the Gulf of Mexico; entrain those responsible into the design process

• Determine needs of regional users
Suggested Objectives (cont’d)

• Establish a Gulf of Mexico GOOS Users’ Forum

• Compare/validate models

• Prepare initial design with priorities for implementation
  - Priorities for Federal Network
  - Priorities for Regional Enhancements

• Augment existing observations and products to begin implementation of the initial design

• Evaluate, complete, improve, refine
A Structure is Needed
Concluding Remarks

• The Global Ocean Observing System is being designed and implemented based on user needs.
• Different regions have different user needs.
• Regional users and providers of ocean data and products must develop each regional observing system.
• The U.S. coastal ocean observing system will consist of an National Federation of regional systems.
• Users and providers in the Gulf of Mexico region must be engaged in developing a regional system, tentatively called the Gulf Numerical Laboratory.
• They should begin with existing building blocks, integrated by improved data and product sharing.