

Gulf of Mexico Coastal Ocean Observing System (GCOOS):

A Regional Association

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Gulf of Mexico Coastal Ocean Observing System (GCOOS)

- Objective of presentation
- Background
- GCOOS Mission Statement
- Elements of Design and Implementation
- GCOOS Structure

Objective of presentation

- Brief description of IOOS/GCOOS
- Relevance to Red Tide Binational Collaboration Workshop
- **Define a strategy to incorporate Mexico into GCOOS**

Background: National perspective

The IOOS

- Integrated Ocean Observing System (IOOS):
 - U.S. effort to develop a basic infrastructure to assess, detect and predict the effects of global climate change, the weather and human activities.
 - Justified by social, economic and scientific needs
- Coordinated by Ocean.US
- Controlled by NORLC (National Ocean Leadership Council of the National Oceanographic Partnership Program/NOPP)

Background: Components of the IOOS

- IOOS has the following components:
 - “Global”: (Global Ocean Observing System)
 - US contribution to GOOS
 - “Coastal”:
 - National backbone of observations
 - Regional Associations (RA)
 - EEZ, Great Lakes, coastal zones and estuaries
 - “Data Management”
 - Connected via Data Management and Communications (DMAC) subsystem

GCOOS Background

- GCOOS is the RA for the Gulf of Mexico
- Brings together many existing activities that provide:
 - Continuous observations
 - Satellite products
 - Models
 - other products.
- Each promises broader use if integrated and enhanced.
- Supported by federal and state government, private industry, NGOs, and academia.

Northern Gulf of Mexico Observing Sites



Continuing Measurements:	■ TABS	■ LUMCON
Physical □	■ TCOON	■ NWLON
Physical and Ecosystem △	■ PORTS	■ NDBC Moorings
Ecosystem ■	■ COMPS	■ NDBC C-MAN
	■ Army CoE	▲ WAVCIS/LUMCON
	■ WAVCIS	▲ SEAKeys

Satellite Products

Satellite products are available from the USF Institute for Marine Remote Sensing, Colorado Center for Astro-dynamics Research, Johns Hopkins University, LSU Earth Scan Laboratory, and Naval Research Laboratory. Below are some examples of products available.



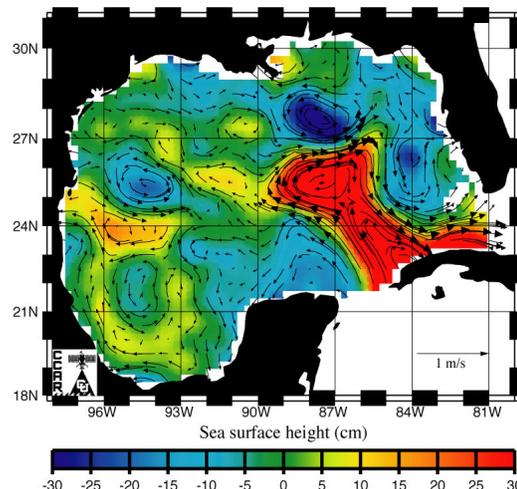
IMaRS

MODIS image
3/23/2003

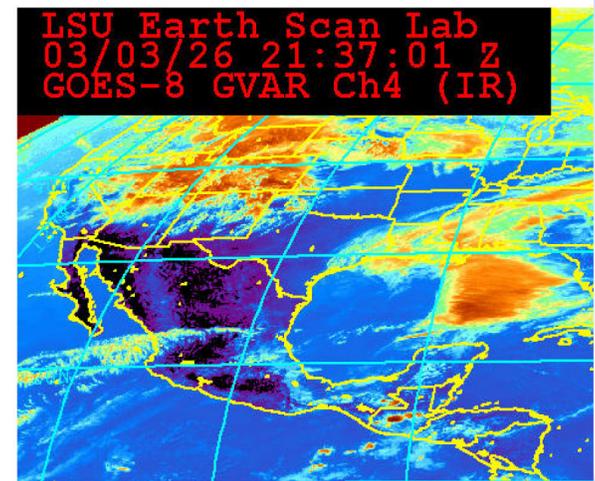


CCAR

TOPEX/ERS-2 Analysis
3/23/2003

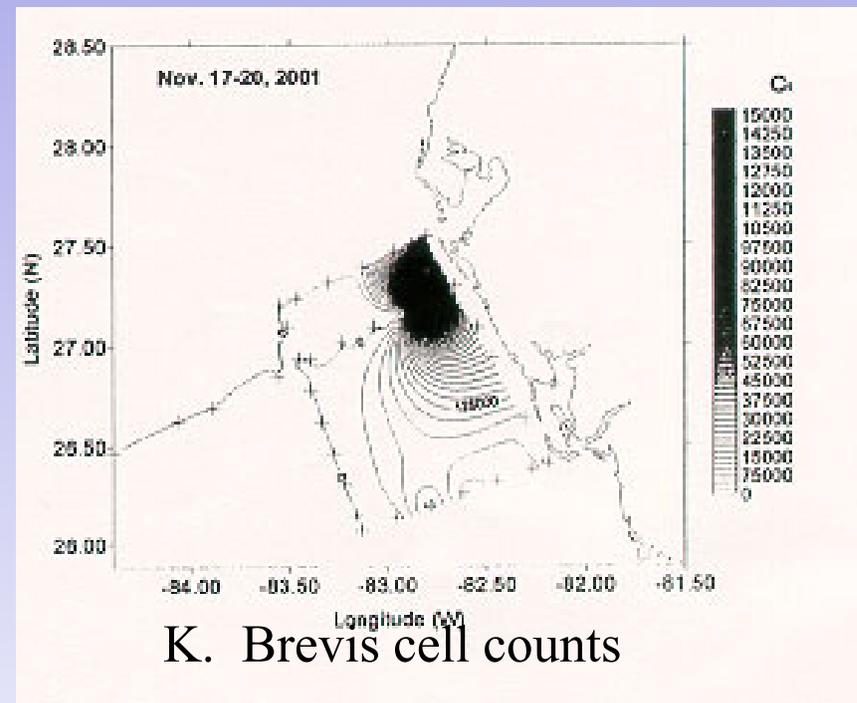
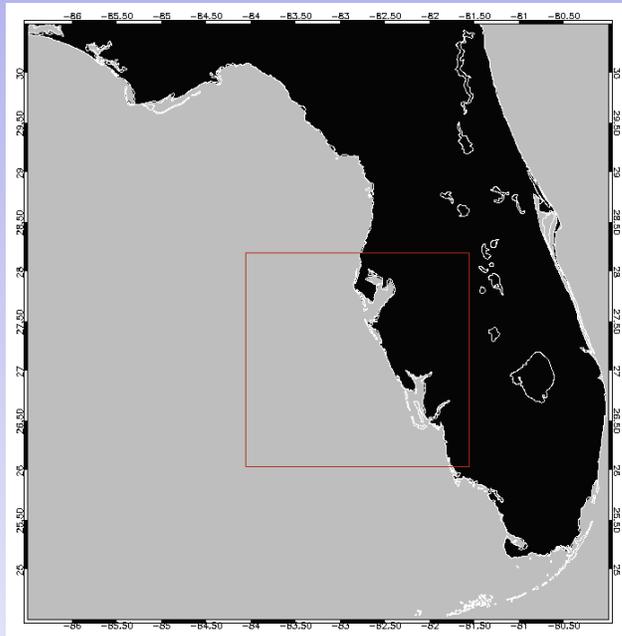


Color Thermal
Imagery LSU
Earth Scan Lab



Detection of Harmful Algal Blooms

University of South Florida/FMRI
Study Area: West Florida Shelf



Data:

Ground truth (1998-2001) (ECOHAB)

SeaWiFS satellite images (1998-2001)

SeaWiFS images: Water leaving radiance and CHL-a

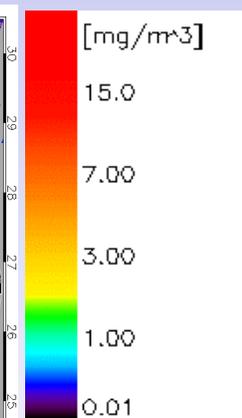
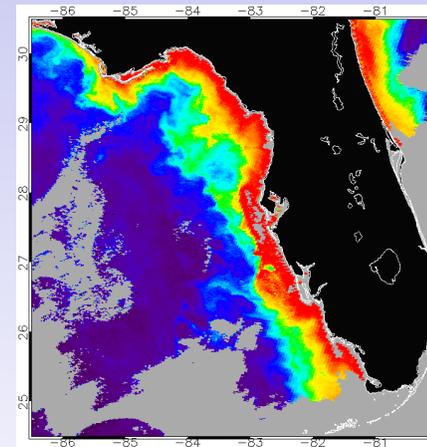
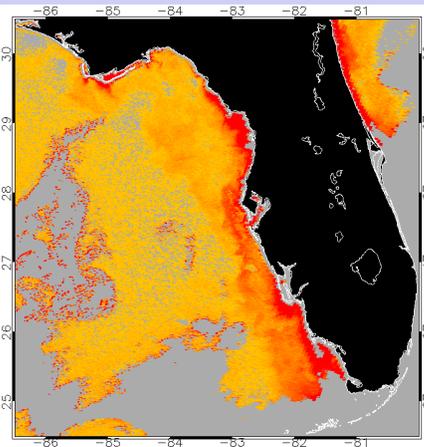
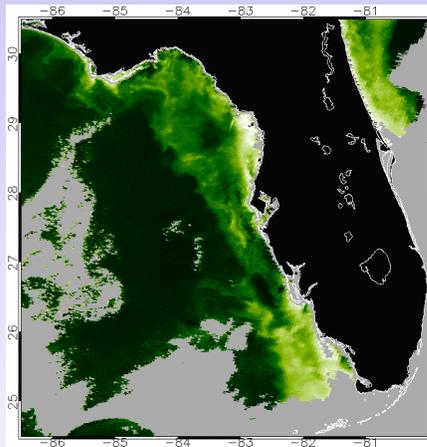
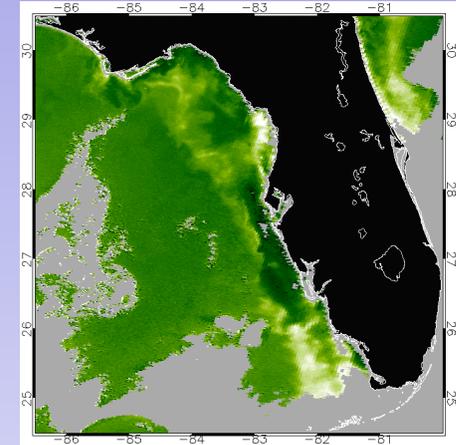
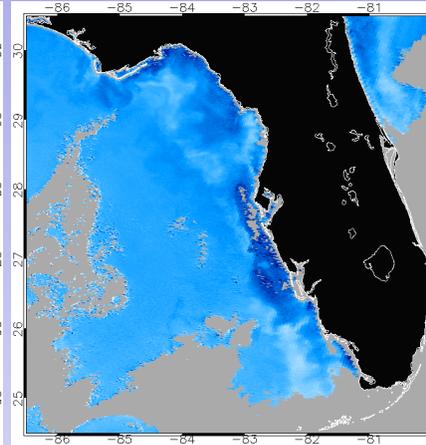
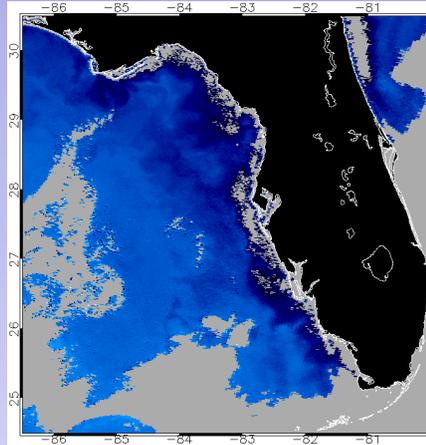
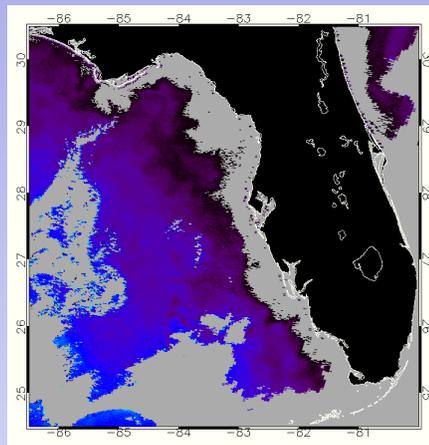
Oct. 2, 2001

412 nm

443 nm

490 nm

510 nm



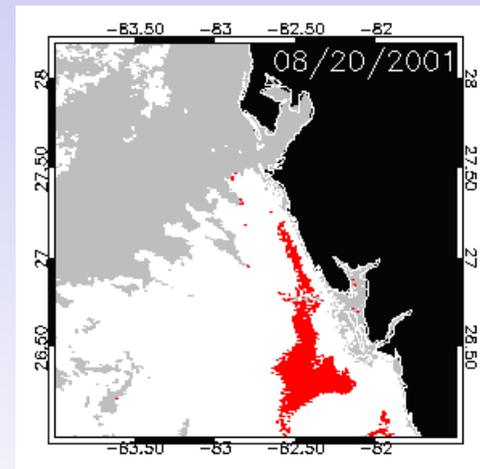
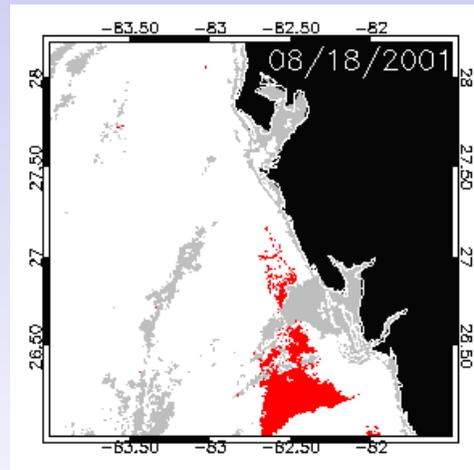
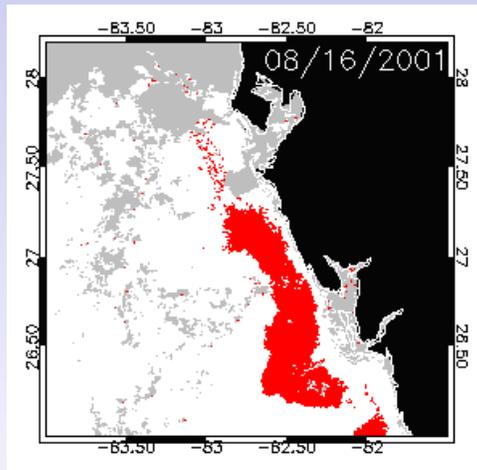
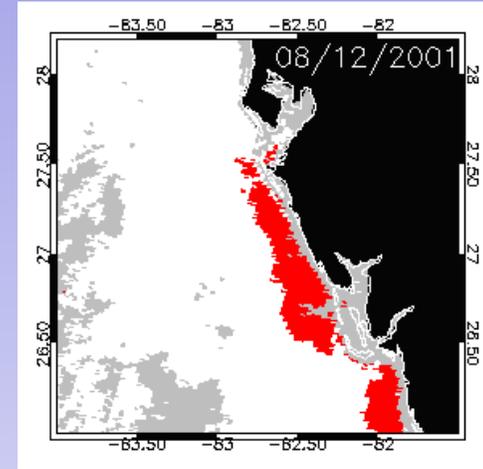
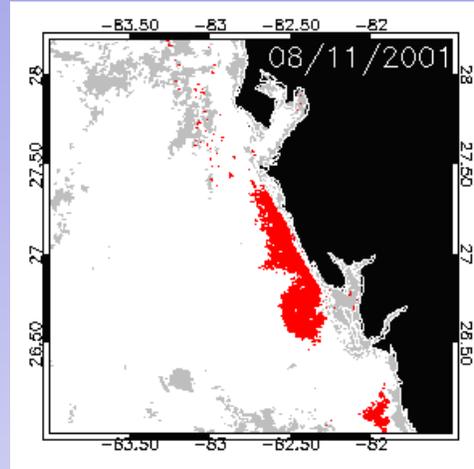
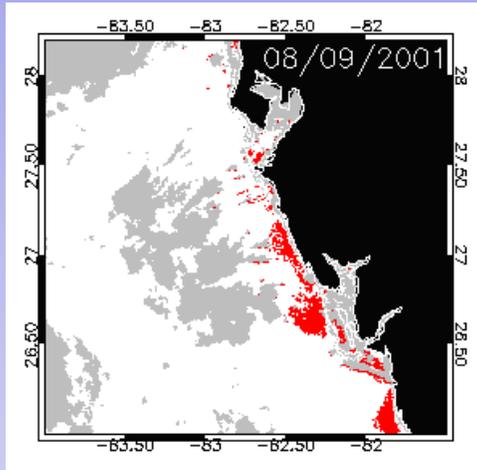
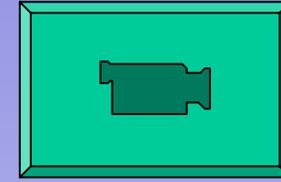
555 nm

670 nm

CHL-a

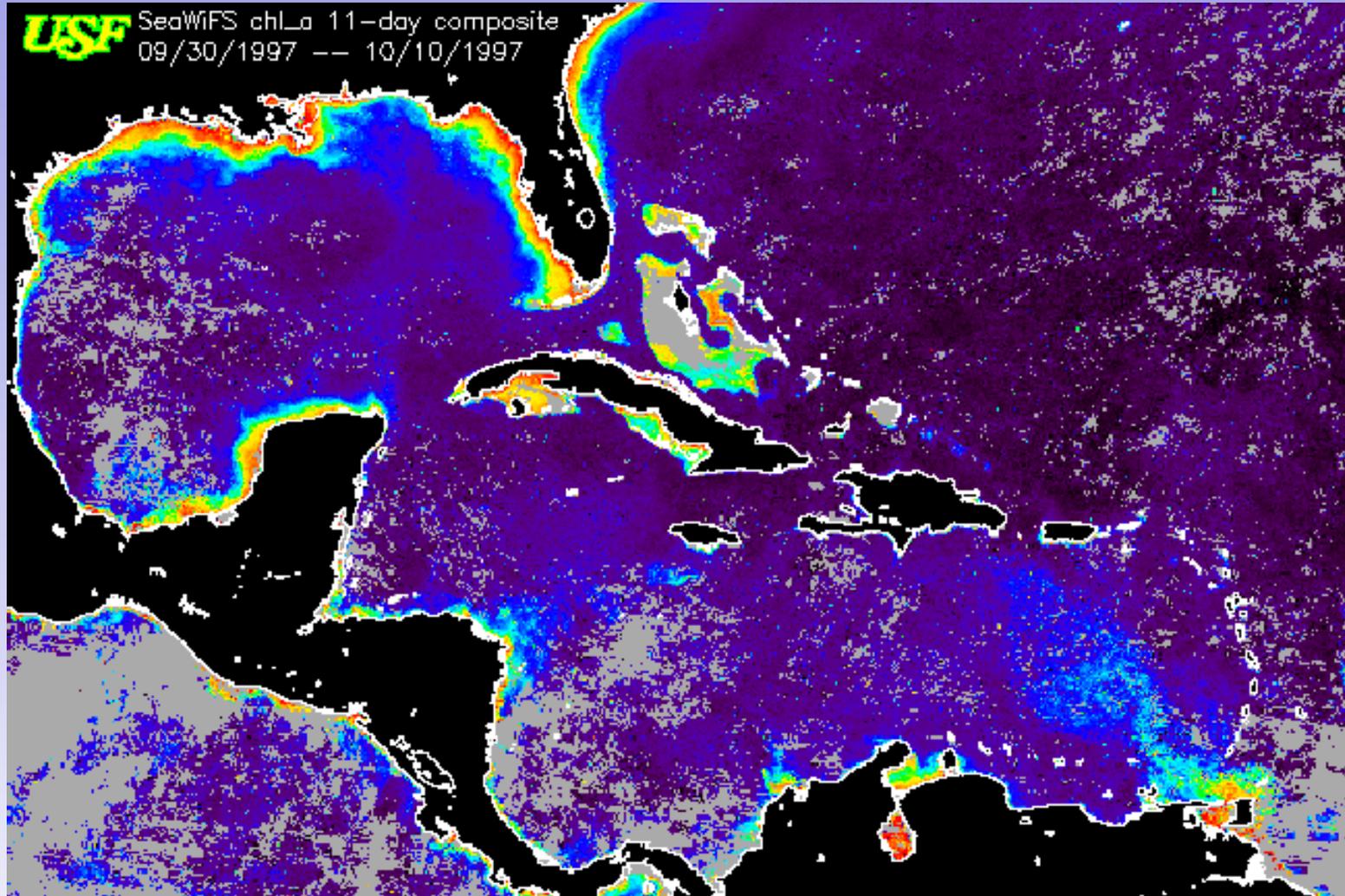
“Classification” Method uses:

Fuzzy C-mean clustering, and
Neural Network



Case Study: August 2001

SeaWiFS: Intra-Americas Sea



Data Management

- NVOADS: National Virtual Ocean Data System
 - Funded by the NOPP to inventory data in the Gulf
 - Uses DODS (Distributed Oceanographic Data System), also known as OPeNDAP (Open source Project for a Network Data Access Protocol), for data networking
- NVOADS: a contribution to the IOOS DMAC
- Real time data are transferred to and QCed by NDBC for distribution.
- Signatories to GCOOS resolution have agreed to open exchange of non-commercial data and products.
- OPeNDAP data transfer protocol is the goal.

GCOOS 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

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.

Design and Implementation Objectives for GCOOS

- Complete inventory of existing operational and product-producing components for the Gulf of Mexico; entrain those responsible into the design process
- Establish a Gulf of Mexico User Forum; Determine needs of regional users
- Prepare initial design with priorities for implementation
 - Priorities for Federal Network
 - Priorities for Regional Enhancements
 - International Linkages

Suggested Objectives (cont'd)

- Establish data and information management system
 - Part of a national system; integrated with other regional coastal observing systems
 - Coordinated with observing systems of Mexico and Cuba
 - Integrated with the global observing system module
- Augment sharing of model code and output
- Compare/validate models
- Maintain continuous effort to evaluate, complete, improve, and refine based on customer feedback, science and technology developments, and assessment of participant objectives.

Initial Priority Actions for Design and Implementation

1. Complete and circulate for signature a Resolution agreeing to form a Regional System;
2. Refine the Inventory of existing observing system elements in the Gulf of Mexico, including costs as feasible;
3. Create an organization of users;
4. Establish data sharing first
 - Obtain commitments for data sharing
 - Utilize assistance offered by NVOODS, NDBC, and NCDDC;
5. Identify and publicize products
 - Create a Gulf of Mexico Portal
6. Regarding models: share, compare, validate

A Structure is Required

Key Organizational Steps

- Interested parties have signed a Resolution agreeing to work to establish a GCOOS.
- We are working to identify the user base and their requirements for GCOOS. A GCOOS Users Forum will be formed.
 - Represent user needs and feedback to system operators
 - Serve as advocates for the system
- A Regional Association will be formed for the governance of the GCOOS. It will become part of the National Federation of such associations.
- The GCOOS Regional Association will prepare a business plan for the operation and funding of the GCOOS.

Resolution

Section C, Implementation, reads:

The Signatories hereby resolve to work together toward establishment of a Gulf of Mexico Regional Coastal Ocean Observing System (GCOOS); to work toward development of regional governance structures and coordination; to work towards common data management standards; and to openly share non-proprietary data and metadata, non-commercial data and products, model code, and related information. GCOOS will not compete with the private sector because it will not distribute commercial products and services, which are those produced by commercial enterprises. The Signatories will actively seek collaborations with other nations bordering the Gulf of Mexico in the design and implementation of this regional observing system. The Signatories will work toward implementation of specific action items decided upon at the workshop held at Stennis Space Center, MS, January 14-15, 2003, a summary of which is included herein by reference.

Signatories

Vernon Asper, University of Southern Mississippi

Peter Betzer, University of South Florida

Jim Byous, Gulf Fiber Corporation

Jim Cato, Florida Sea Grant

George Crozier, Mobile Bay National Estuary
Program and Dauphin Island Sea Lab

Dean Dunn, National Coastal Data Development
Center

Norman Guinasso, Texas A&M University

Gregg Jacobs, Naval Research Laboratory

Gary Jeffress, Texas A&M University Corpus
Christi

Mark Luther, University of South Florida

Robert (Buzz) Martin, Texas General Land Office

Douglas Meffert, Long-term Estuary Assessment
Group

Avichal Mehra, Mississippi State University

Patrick Michaud, Texas A&M University Corpus
Christi

Paul Moersdorf, National Data Buoy Center

Christopher N. K. Mooers, University of Miami

Frank Muller-Karger, University of South Florida

Worth D. Nowlin, Jr., Texas A&M University

James J. O'Brien, Florida State University

John Ogden, Florida Institute of Oceanography

Shirley Pomponi, Harbor Branch Oceanographic
Institution

David Prior, Texas A&M University

Nancy Rabalais, Louisiana Universities Marine
Consortium

Mary Jo Richardson, Texas A&M University

Kerry St. Pe, Louisiana Universities Marine
Consortium

Robert Stickney, Texas Sea Grant Program

LaDon Swann, Mississippi-Alabama Sea Grant
Consortium

John W. (Wes) Tunnell, Jr., Texas A&M University
Corpus Christi

Jan van Smirren, Fugro GEOS Inc.

Nan Walker, Louisiana State University

Integrating Mexico into GCOOS

- Develop a bilateral management strategy and framework for:
 - coastal zone management
 - natural resource management
- Short-term focus:
 - Sharing information
 - Capacity building
 - Basis for a regional observing system
 - HAB detection equipment
 - Joint HAB and other science programs
- Develop joint proposals to secure funding
- Leverage: use IOCARIBE-GOOS and IOC

GoMSA WG: Possible budget (Dec. 02 mtg)

- Sharing information (Total Y1: \$60K)
 - 2 Workshops per year (\$15K each x2)
 - Management, Science
 - Integrating databases (\$30K)
 - HAB, NOAA/EPA HABSOS program, Oceanography
 - Internet
- Capacity building (\$100K)
 - Management
 - 15 people for 1 week each to (\$60K):
 - » FMRI/Florida, NOAA, EPA
 - US agency personnel to visit Mexican facilities
 - Science (\$40K)
 - 2 Mexican graduate students per year (fellowships)(year 2 will need \$40K +\$40)
- Basis for a regional observing system (\$110K)
 - 3 automated coastal observing systems
 - One each for: Campeche, Quintana Roo, Veracruz
 - Marine monitoring (salinity, temperature, tides, meteorology)
- Joint science planning (\$50K)
- Biotoxin (red tide) detection equipment (\$50K)
 - capacity building phase
 - ELISA, centrifuges, reagents (+ shipping: \$50K)

<http://www.gcoos.org>

Please visit our web site for further information.

If you wish to become a signatory to the resolution, please send an email request to wnowlin@tamu.edu stating if you are signing as an individual or for an institution.