

# A Foundational Monitoring System to Inform the Gulf of Mexico Report Card

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# GoM Environmental Report Card

- Conceptual framework: Drivers-Pressures-Stressors-State-Impacts-Response
- Integration of diverse information: physical, biological, chemical, geological, and meteorological data
- Foundational monitoring system is needed to provide the information
- Many entities contributing – Leveraging

# GCOOS Regional Association

- Multi-entity partnership of government agencies, academic and research institutions, and private industries
- Building a sustained, integrated, operational observing system for the Gulf of Mexico
  - Science-based: integrates data collected by diverse entities that use scientifically sound methods
  - Decision-support: makes data and products widely accessible for many uses and user groups
  - Stakeholder-needs driven: provides information in forms readily understandable by policy-makers, stakeholders, scientists, and the public.

# Gulf of Mexico Themes & Users

- *Safe and Efficient Marine Operations*
  - Recreational (e.g., boaters, sport fishermen)
  - Commercial (e.g., fishing, offshore energy, shipping)
- *Mitigation of Effects of Coastal Hazards*
  - Coastal communities
  - Tourists
  - Urban planners
- *Public Health and Safety*
  - Health departments
  - Coastal communities
  - Tourism
- *Healthy Ecosystems and Water Quality*
  - Resource managers
  - Educators
  - Public
- All with climate change



Photo Credit

Gulf of Mexico Sperm Whale Seismic Study Project  
U.S. Minerals Management Service, 2002

# Stakeholder Requirements

- **Accurate bathymetry and topography**
- **Improved coverage of real-time currents**
- **Improved real-time, offshore meteorological measurements**
- Improved forecasts & nowcasts of sea level, winds, waves
- Improved monitoring, forecasts and dissemination of hurricane and wave severity
- **Enhanced water quality measurements**
- Coastal storm surge/inundation maps for mitigation planning
- Improve real-time forecasts of coastal inundation
- **Improved Harmful Algal Bloom/Hypoxia monitoring**
- Improve dissemination of information to diverse groups

- **Geophysical**

- Sea surface meteorological variables
- Land–sea stream flows
- Sea level
- Surface waves, currents
- Sub-surface currents
- Bottom & sediment character
- Temperature, salinity
- Bathymetry/topography

- **Biophysical**

- Optical properties
- Benthic habitats

- **Chemical**

- pCO<sub>2</sub>
- Nutrients
- pH
- CDOM
- Contaminants
- Dissolved oxygen

- **Biological**

- Fish & invertebrate species, abundance
- Zooplankton species, abundance
- Phytoplankton species, biomass (ocean color)
- Waterborne pathogens

# Support Ecosystem-Based Management

## Examples:

- Integrated Data Management
- Monitoring Harmful Algal Blooms
- Monitoring Hypoxia and Eutrophication
- Rivers to Estuaries to Ocean Ecosystem Network
- Ecosystem Modeling

# GCOOS Integrates Information

**GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM DATA PORTAL**

Resources Regional Assoc. Monitoring Maps Advanced Search

**Welcome to GCOOS Data Portal**

This **Data Portal** provides timely information about the environment of the United States portion of the Gulf of Mexico and its estuaries for use by decision-makers including researchers, government managers, industry, the military, educators, emergency responders, and the general public. Observing stations in the region monitored constantly. Please visit the GCOOS main web site at <http://www.gcoos.org/> for more information on this regional association. The option to view landscape in 3D (i.e. option 'Earth') will require additional plug-in from Google Earth and this Add-on should be allowed to run.

**Region's Current Condition**

**NOTE:** The following is an interactive map to display resources and status of coastal and ocean observing stations. Green markers represent stations in operation, **yellow** markers are those with defective sensors and **red**-marked stations are those that are currently not transmitting data. Click on the station to station details. Not all stations may be visible at the current scale. Zoom-in on an area to reveal all the stations.

**TABS Buoy F**  
 Coordinates: 28.8425, -94.2433  
 Last update: 2009-02-20T13:18:57Z  
 Operator: [Texas Automated Buoy System](#)  
 Observation(s): [Currents](#), [Water Temperature](#)

**USM 2004** **DISL 2003**

**TABS 1995** **TCOON 1992** **COMPS 1996**

Mouse Lat/Lon: 29.009207, -94.300041

LSU/ESL  
1988

LUMCON  
1999

Oil & Gas  
2005

IMaRS  
1993

WAVCIS  
1999

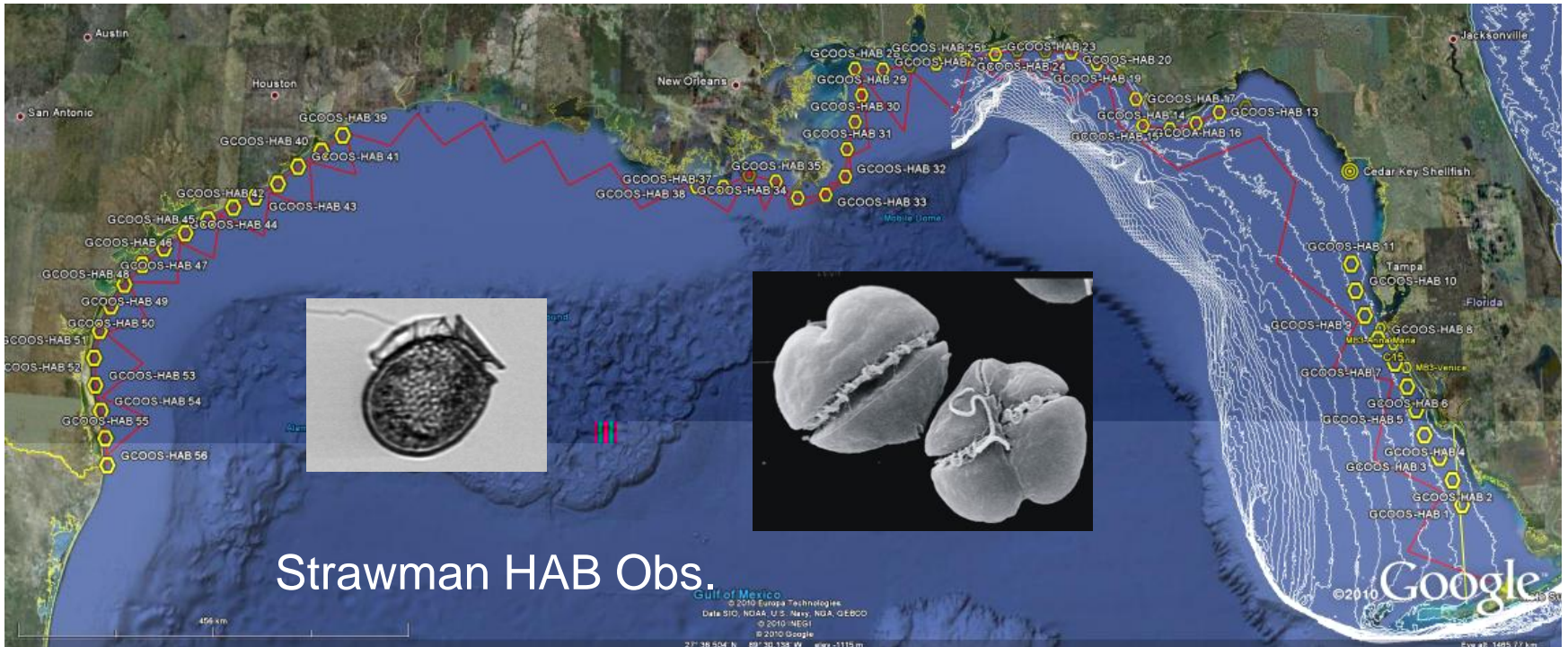
MOTE  
2004

[Privacy Statement](#) [Legal Notices](#) [Contact Developer](#)



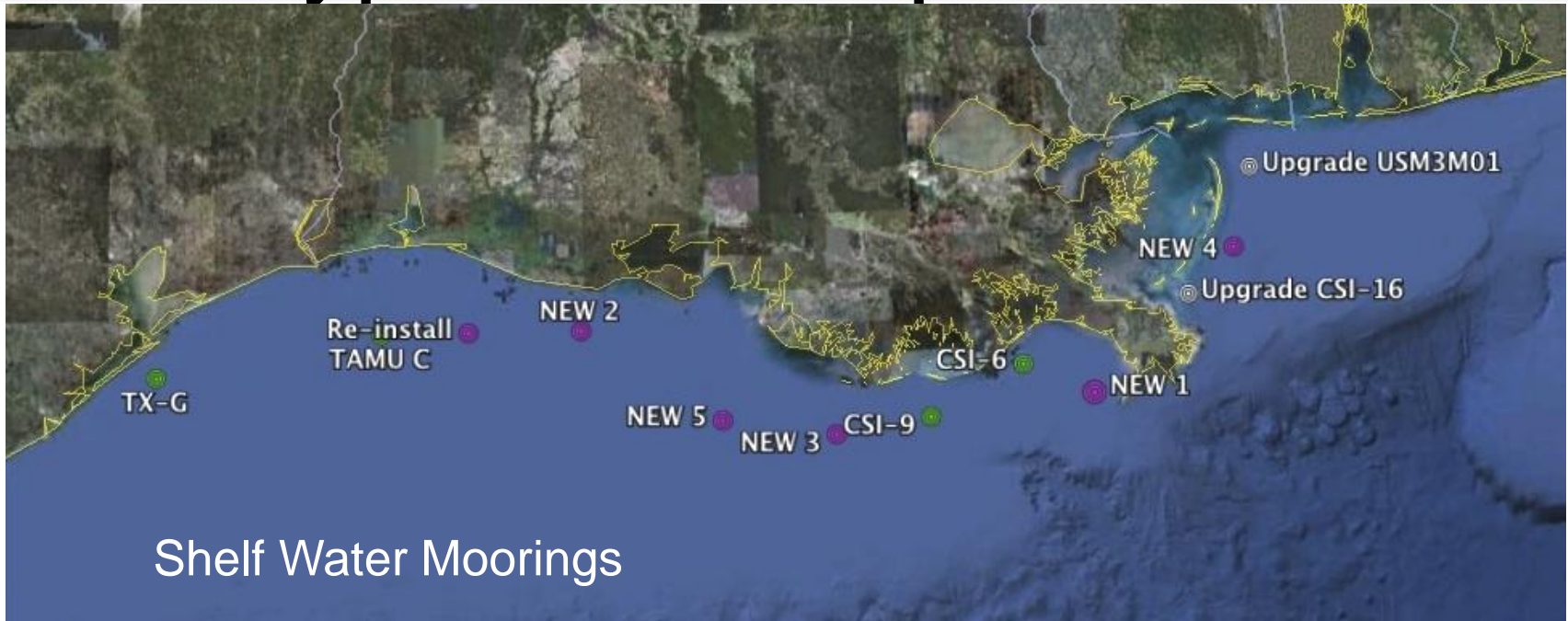
# Harmful Algal Bloom Monitoring

GCOOS Partners, GOMA WQ PIT HAB Working Group, NOAA: HAB Integrated Observing System Implementation Plan



Strawman HAB Obs.

# Hypoxia-Eutrophication

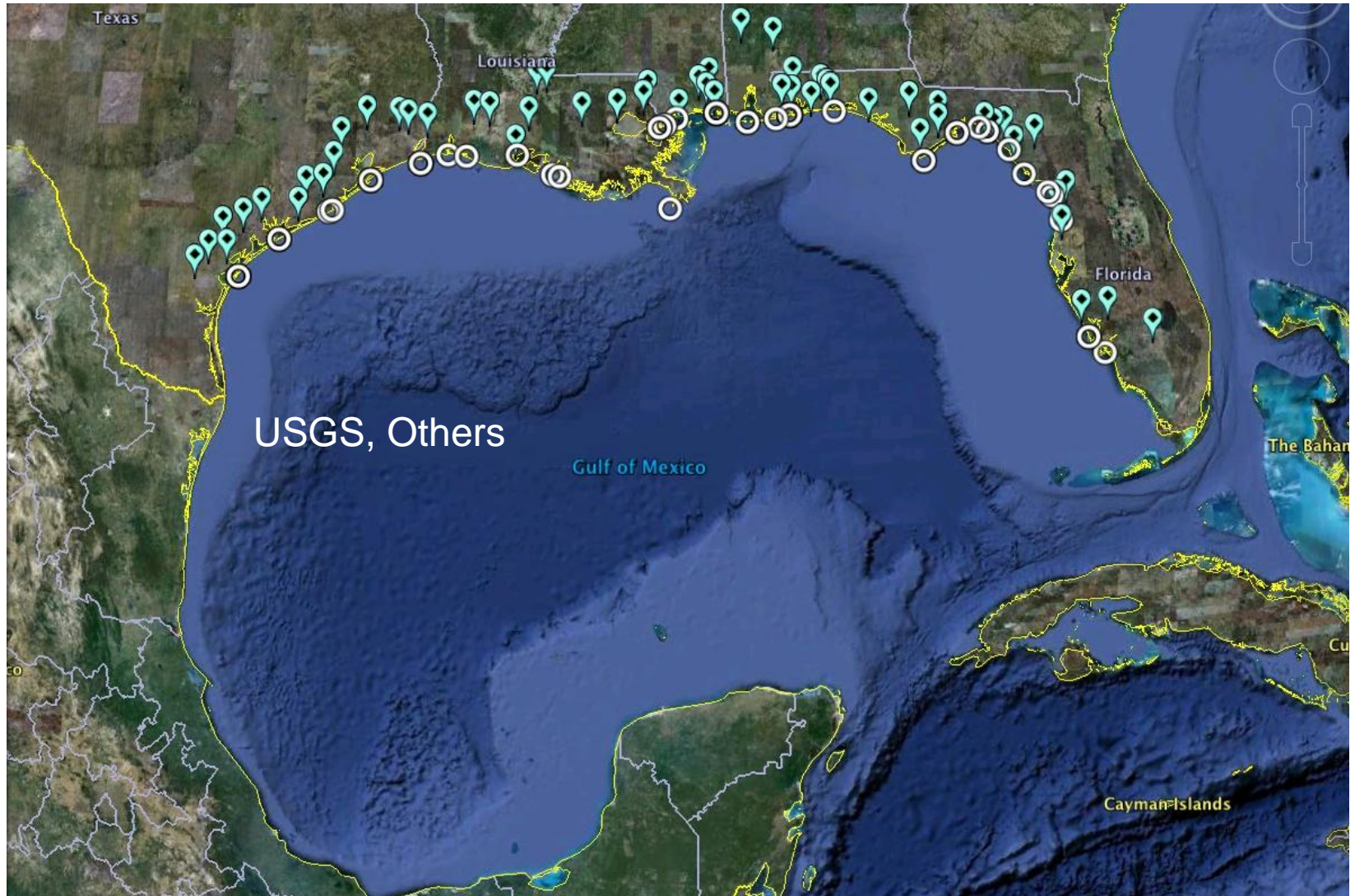


## State Waters: Estuaries, Bays, Tidal Reach of Rivers

Working with GOMA Nutrient Reduction and Water Quality PITs

- Hypoxia-Nutrient Data Portal
- Planning for Increased Monitoring
- Data Management and Tools

# River Monitoring Assets



# Water Quality: Rivers to the Gulf



River, Estuary and Coastal Observing Network (RECON): Caloosahatchee river and estuary

## Sites

- |                |                 |
|----------------|-----------------|
| Blind Pass     | Redfish Pass    |
| Fort Myers     | Shell Point     |
| Gulf of Mexico | Tarpon Bay Home |
| Moore Haven    |                 |

# Ecosystem Modeling

- Model Resource Center
  - Circulation & hydrodynamic
  - Hypoxia
  - Others
- Gulf-wide Physical Circulation Model
- Ecosystem Modeling Pilots

# Bathymetry/Topography

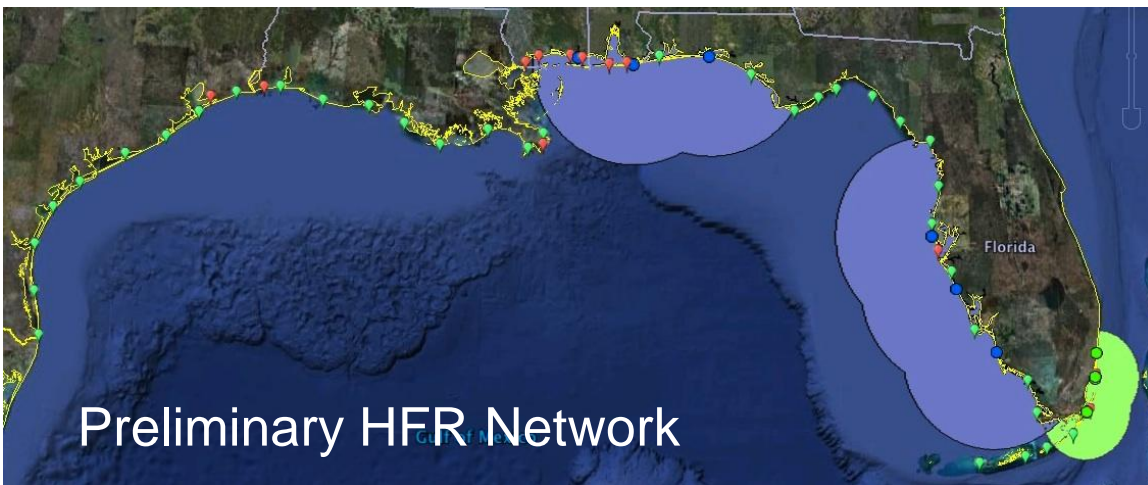
## Gulf of Mexico Alliance Ecosystem Integration and Assessment Priority Issue Team

### **ACTION 1: Gulf of Mexico Master Mapping Plan**

**Action:** Produce the Gulf of Mexico Master Mapping Plan (GMMMP), a comprehensive plan to collaboratively acquire data on the physical characteristics of the Gulf region, particularly elevation, shoreline, and surface data.

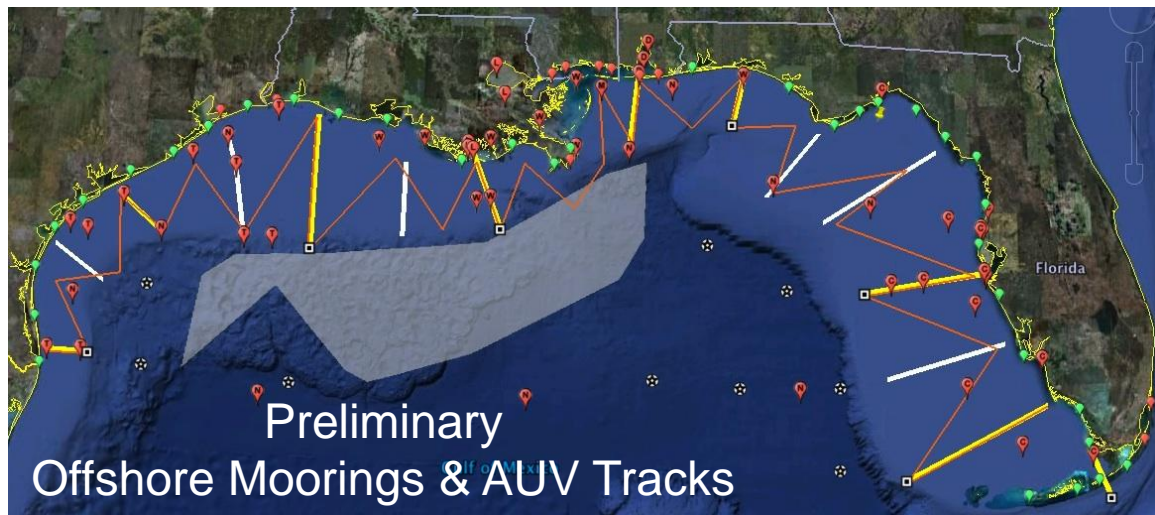
GCOOS: Eventually host and upgrade

# GCOOS Build-Out Planning



Integrated Systems in Federal and State Waters for  
HAB Monitoring  
Hypoxia Monitoring  
Beach Quality Monitoring  
Expand Existing Systems, e.g.,  
Water Level  
PORTS  
Moorings, Surface Currents  
Remote Sensing

Cross-Cutting Activities:  
Data Management  
Outreach and Education  
Stakeholder Engagement  
International Collaboration



# Questions?

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Photo Credit

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