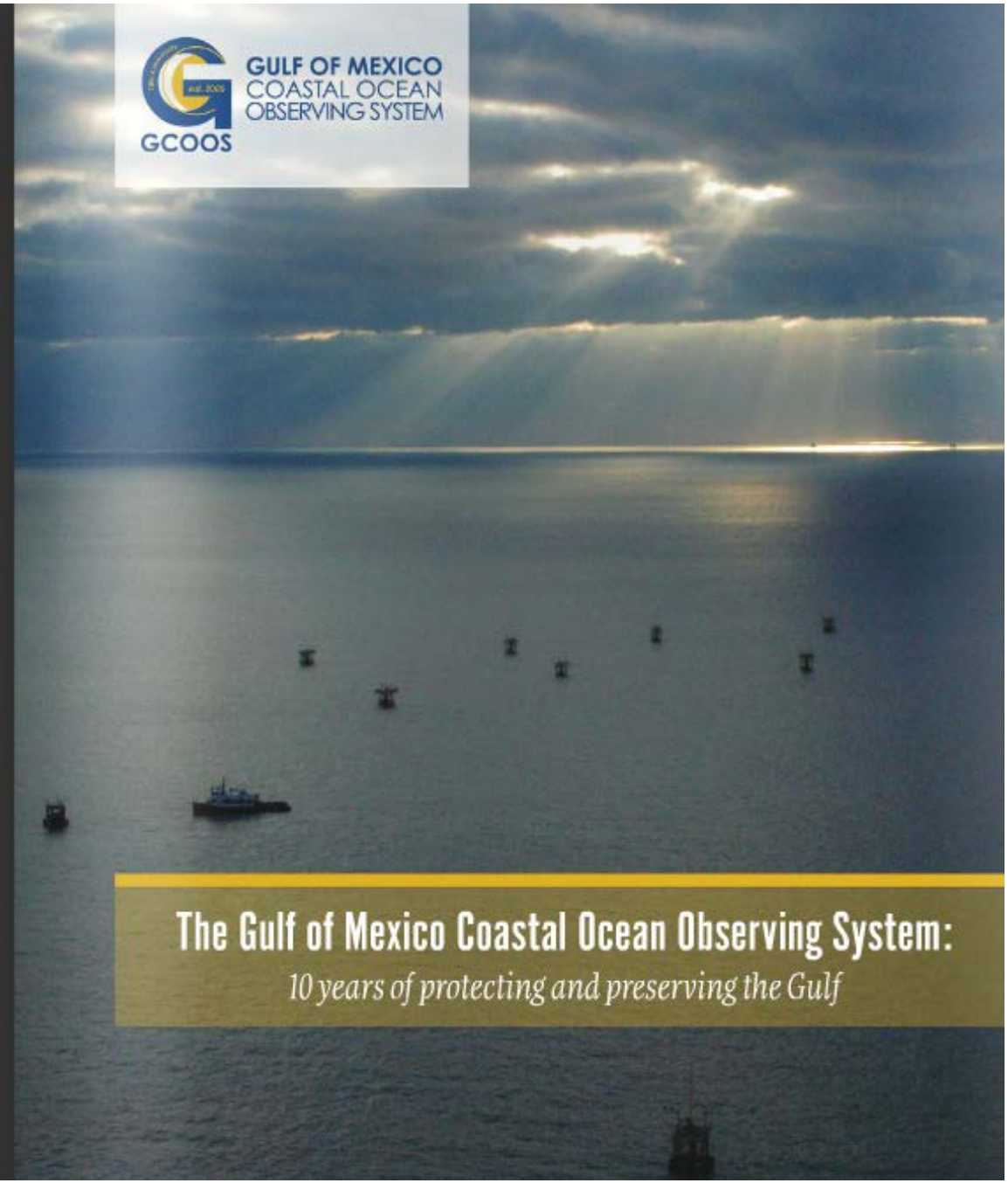


Dr. Barbara Kirkpatrick, Executive Director

GoMRI Research Board Ocean Observing Committee

February 1, 2016

Outline

- GCOOS Build Out Plan
- Ecosystem Monitoring from Build Out Plan
- GCOOS Data Management
- SECOORA and GCOOS collaborations
- Closing comments

GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM
GCOOS

IOOS Integrated Ocean Observing System

History of the GCOOS-RA

- Global Ocean Observing System >U.S. IOOS>GCOOS
- 2005-2015: 10 years old
- 5 themes of GCOOS
  - ***Public Health and Safety***
  - ***Healthy Ecosystems and Water Quality***
  - ***Mitigation of Effects of Coastal Hazards***
  - ***Safe and Efficient Marine Operations***
  - ***Long-Term Ocean Variability and Changes***
- Membership and Partnership Model

>>

Data Portal and Products:

- Integrated Data for Emergency, Resource Managers and Others
- Data Products to Meet Public Stakeholder Needs
- Integrated Data for Private Sector Use in Building Business

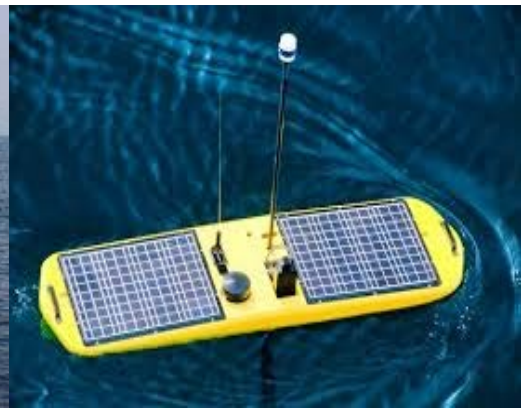
GCOOS-RA Model

Data Providers/Owners/Operators – NOT the GCOOS- RA

- Federal
- State
- Academic
- NGO's

GCOOS – RA- Data management into centralized portal for all to use



The GCOOS Build Out Plan

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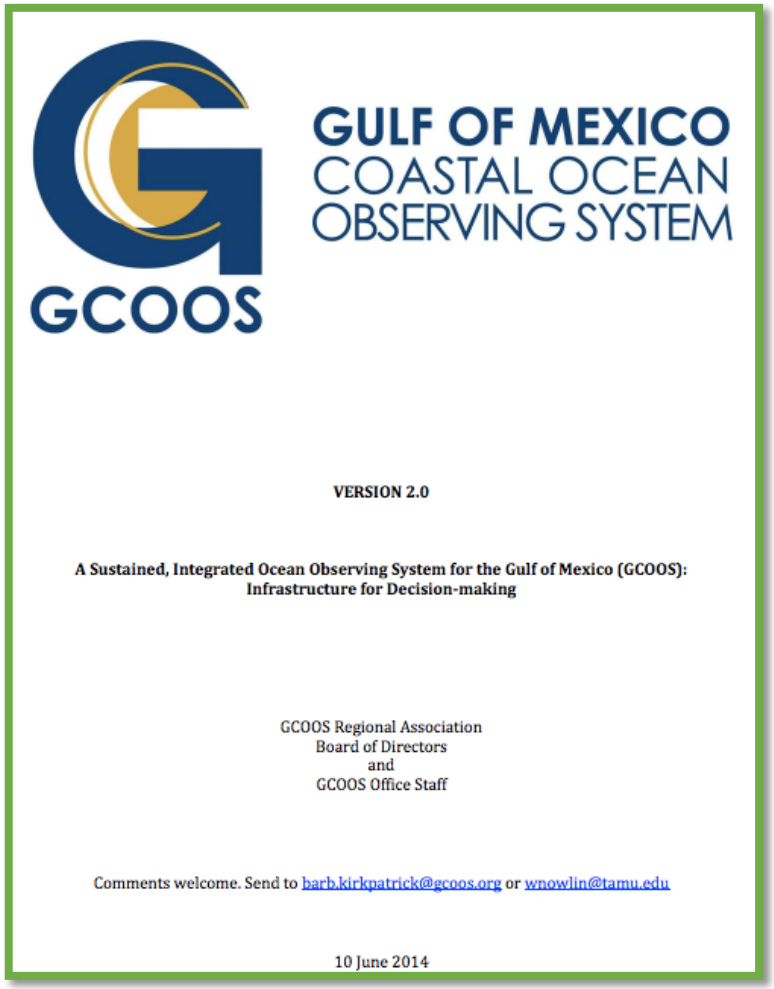
The GCOOS Build-out Plan

631 workshop contributors

From 297 organizations

90 plans reviewed



50 additional contributors

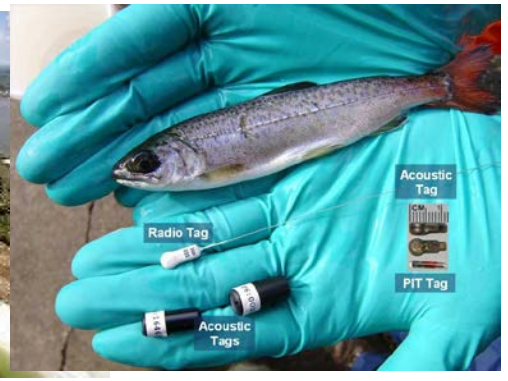
19 elements in the BOP

13 subject matter expert writing teams

http://gcoos.tamu.edu/BuildOut/BuildOutPlan-V2-1.pdf

Stakeholder workshops held to identify needs

Integrated Data systems	NVODS for managers	Private sector interests	HABSOS
Next steps	Oil and Gas	Storm surge/Inundation	Educator GPS
HABs (1)	Boaters	HABs (2)	Integrated water quality
Recreational Boaters	Ecosystem modeling (1)	HABs (3)	Acoustic Tagging
	NGOs	Ecosystem modeling (2)	



GCOOS

Plan includes 19 elements to meet stakeholder needs- with cost estimates

- Surface currents and waves network
- Fixed mooring network
- Autonomous meteorological measurement network,
- Glider and AUV network
- Satellite observations and products
- Aircraft observations
- Bathymetry and topography mapping network
- Water level network
- Enhanced PORTS® network
- Outreach and Education
- Harmful Algal Bloom Integrated Observing System
- Ecosystem monitoring
- Water quality and beach quality monitoring
- Hypoxia monitoring
- Monitoring of river discharge
- Physical modeling
- Ecosystem modeling
- Data management and communications system
- Research – input into new technology development

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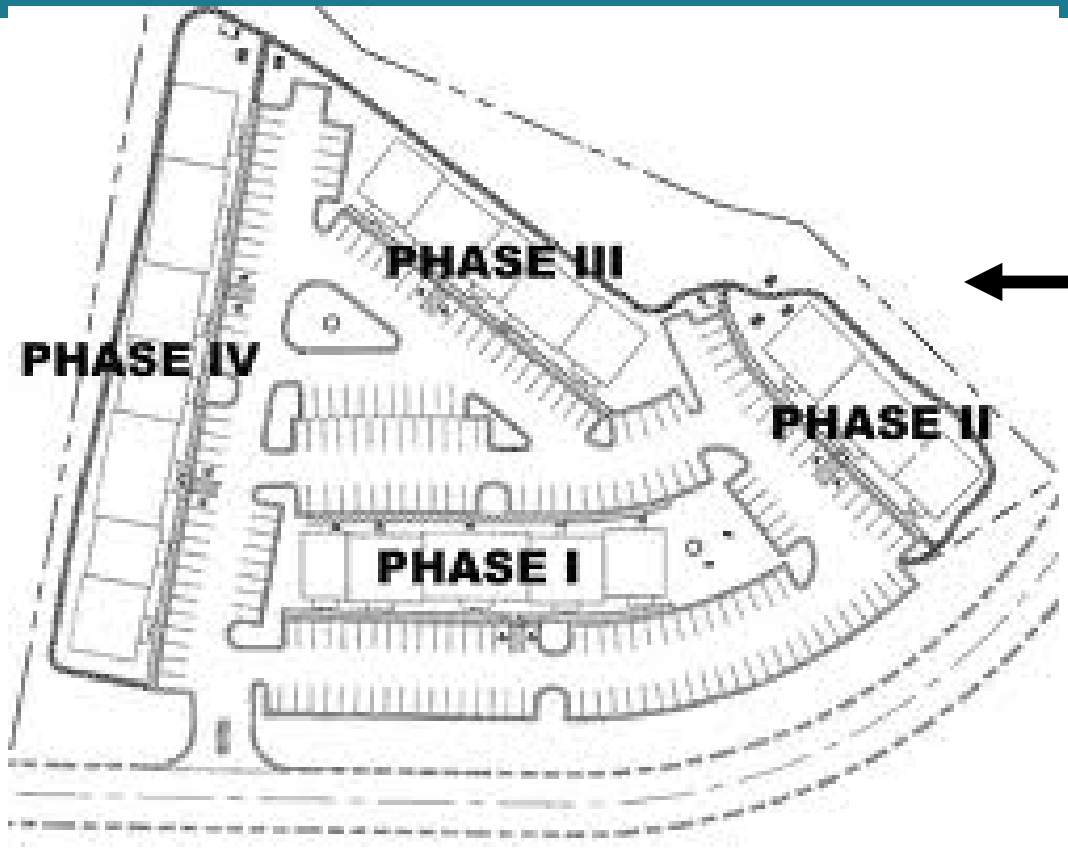
Building the Observing System



Ideal!

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IOOS Integrated Ocean Observing System

Reality……

- Different sources of funding
- Different timelines
- Doesn't change the contributions an integrated observing system can/will provide to society
  - 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.

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IOOS Integrated Ocean Observing System

Ecosystem Monitoring Section- GCOOS Build Out Plan

Table 3.4. Priority observing needs by topic

OBSERVING NEED/TOPIC	Fisheries	Marine Mammals	Sea Turtles	Plankton	Coastal Birds and Seabirds	Habitats	Monitoring for Restoration Projects
T&S profiles							
Surface T & S							
Shoreline habitat and sediment monitoring							
Habitat identification, characterization, change, and use							
Deep sea monitoring							
Coral monitoring (distribution, abundance, change)							
Passive acoustics for identification							
Individual tracking, identification of migratory habitat and corridors							
Zooplankton, phytoplankton (incl. seasonal chlorophyll) and bacteria monitoring							
HABs dynamics & distribution							
Passive acoustics for characterizing marine sound							
Surface currents and depth-averaged current profiles							
Near bottom currents							
Dissolved oxygen concentrations							
Oceanic features (e.g., convergence zones)							
Distribution, abundance, status and trends							
Environmental & habitat stressors							
Diseases, parasites, & toxins							
Nutrients							
pH							
Turbidity							
Data products: e.g., depth profiles, habitat, and fish catch							
Data Product: Bottom mapping							
Invasive species – distribution and abundance and trophic interations							
Protected species – distribution and abundance and trophic interactions							
Marine sound characterization and monitoring – including the whole Gulf							
Centralized data access and data integration; data infrastructure and protocols							
Development of models							
Additional funding							

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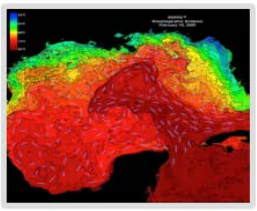
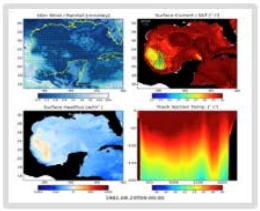
GCOOS Data Management and Products Portals

- Real time and Historical Data
  - Water Quality
  - Field Cruises
  - Model Forecasts
  - MBON
  - Sea Surface Height
  - Bathymetry
  - Satellite Data
  - Gliders
  - Fish


Observations


Gliders


Model Forecasts


Model Resources


Oil and Gas


Bathymetry


HABs


Satellites


Outreach


Climate


Fish


GeoPortal

New/Updated Map Products

MSU Wave gliders

During the 2014 Hurricane Seasons, three Unmanned Surface Vehicles know as Wave Gliders leased from Liquid Robotics have been deployed into the eastern Gulf of Mexico.

Gulf gliders map

Near real-time glider tracking map in the Northern Gulf of Mexico.
Updated in January 2015

Lionfish observations

Observations of red lionfish from 1985-2014 have been recorded and shown in a map
Updated in July 2014

Information for Mobile/Tablet Users

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GCOOS Data Management
Recent projects

- GANDALF: Gulf AUV Network and Data Archive Long-term Storage Facility
  - AUV plots, trajectories and feature collections
  - Binary AUV data files, text log files, encoded ARGOS messages
  - 34B sensor records for an 80 day mission

- HN-DSS: Hypoxia Nutrient Decision Support System
  - 71 organizations all with different data recording practices
  - 9 measured variables
  - 7.5M records

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Collaboration with SECOORA

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SECOORA
Southeast Coastal Ocean Observing Regional Association

SECOORA and GCOOS

- SECOORA- supports assets in Florida waters
- GCOOS - supports data management and transfer
- Frequent discussions to assure not duplication of efforts
- Co-sponsor workshops, media releases, white papers

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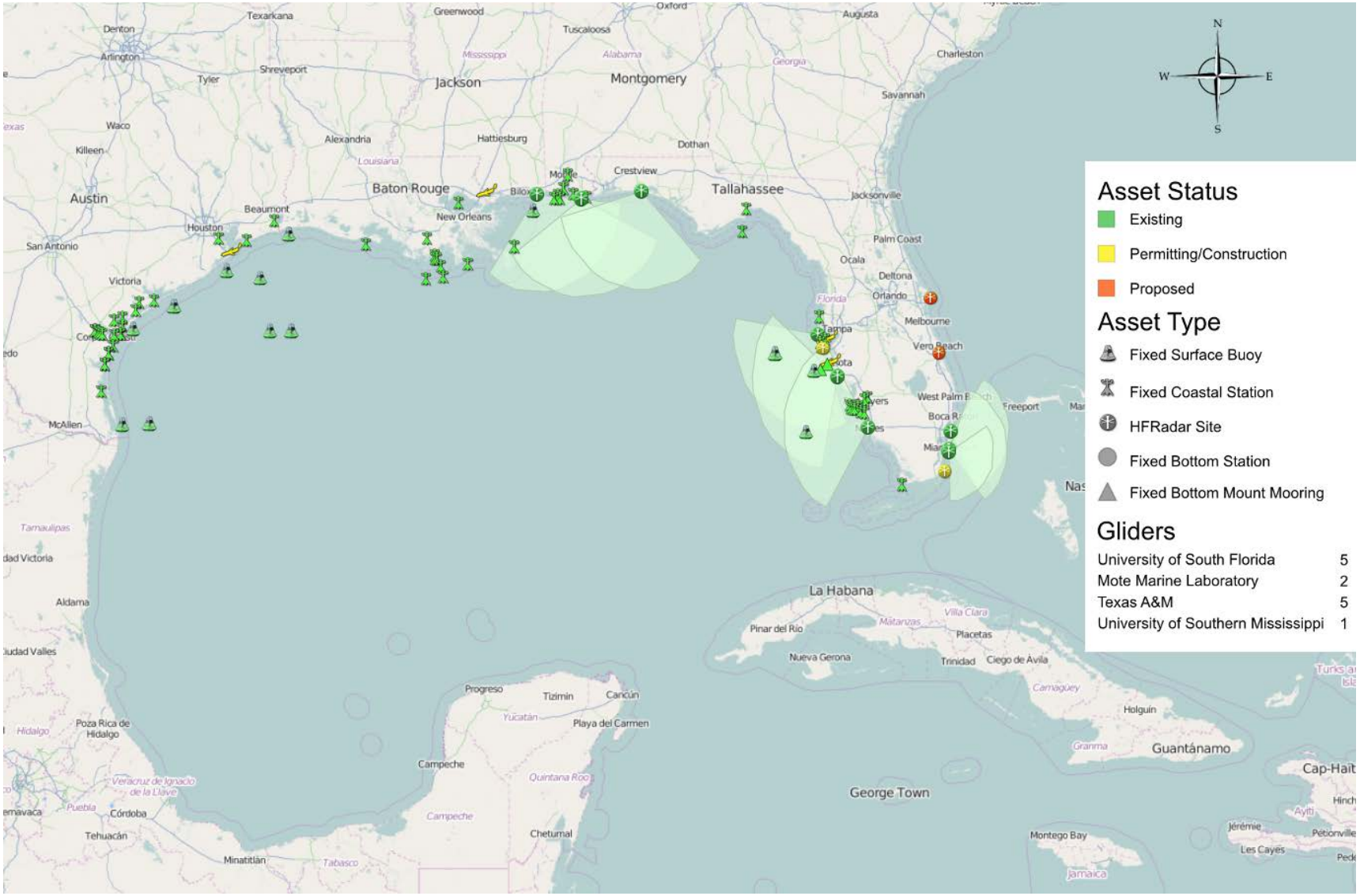
SECOORA
Southeast Coastal Ocean Observing Regional Association

Non Federal Assets – SECOORA and GCOOS



Closing Thoughts

GoMRI Mission Statement:

The ultimate goal of the GoMRI will be to improve society's ability to understand, respond to and mitigate the impacts of petroleum pollution and related stressors of the marine and coastal ecosystems, with an emphasis on conditions found in the Gulf of Mexico. Knowledge accrued will be applied to restoration and to improving the long-term environmental health of the Gulf of Mexico.

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Closing Thoughts

- **Where is the oil now?**
- **Where is it moving to?**

Are we more prepared to answer these questions now than in 2010?

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