

# The Gulf of Mexico Coastal Ocean Observing System Regional Association



*Dr. Barbara Kirkpatrick  
Executive Director GCOOS  
IOOS FAC October 25, 2017*

- The Gulf of Mexico
- The GCOOS-RA





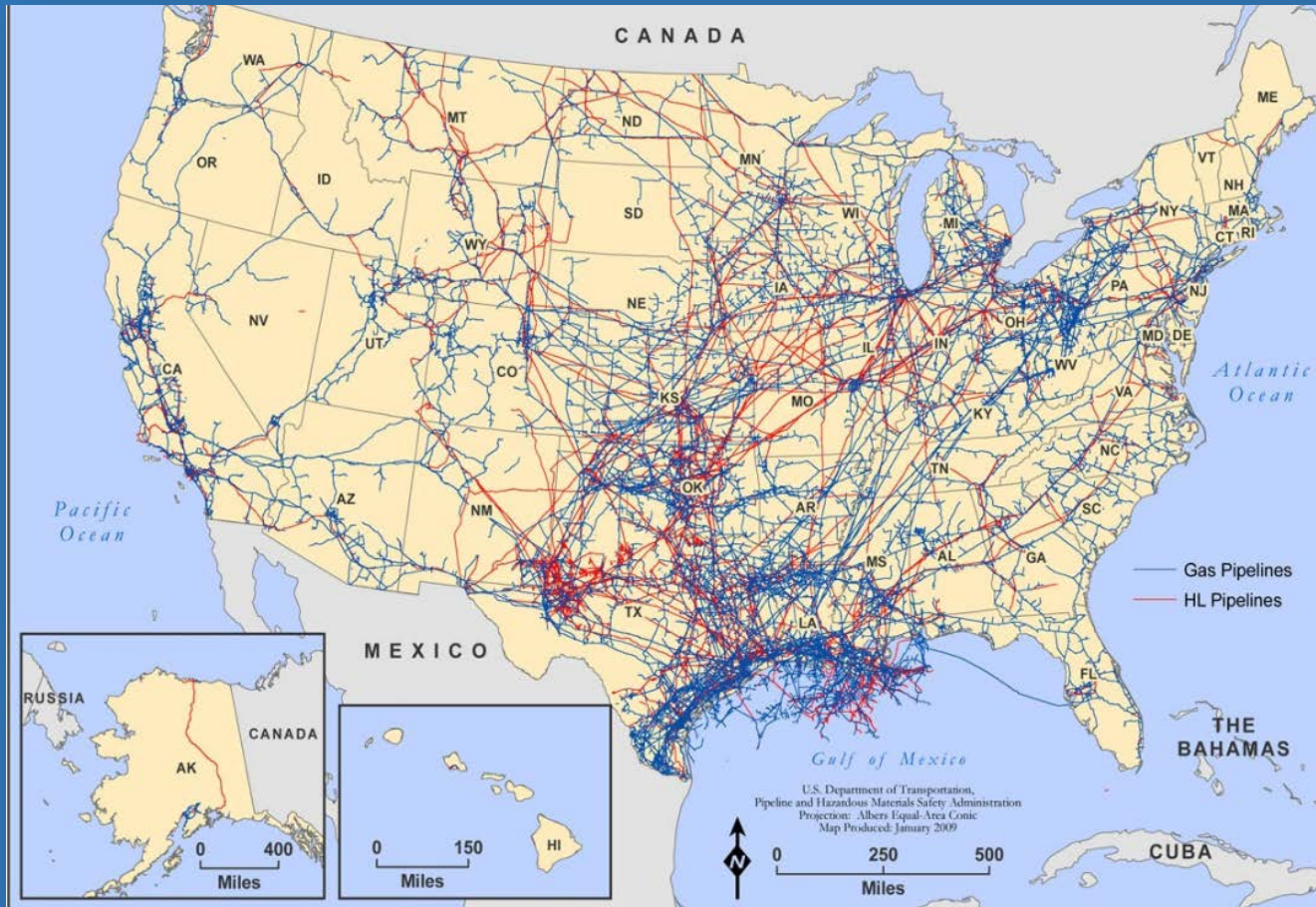
Why the Gulf of Mexico  
is

*America's Sea*



# The Gulf of Mexico is the USA's Gas Station

HRI



**54%**  
crude oil

**52%**  
natural gas  
reserves

**47%**  
refining  
capacity

## *The Gulf of Mexico is also the Nation's Fish Market*

HRI



**1.4 billion pounds** of seafood annually

**78%** of USA shrimp landings

**62%** of USA oyster landings



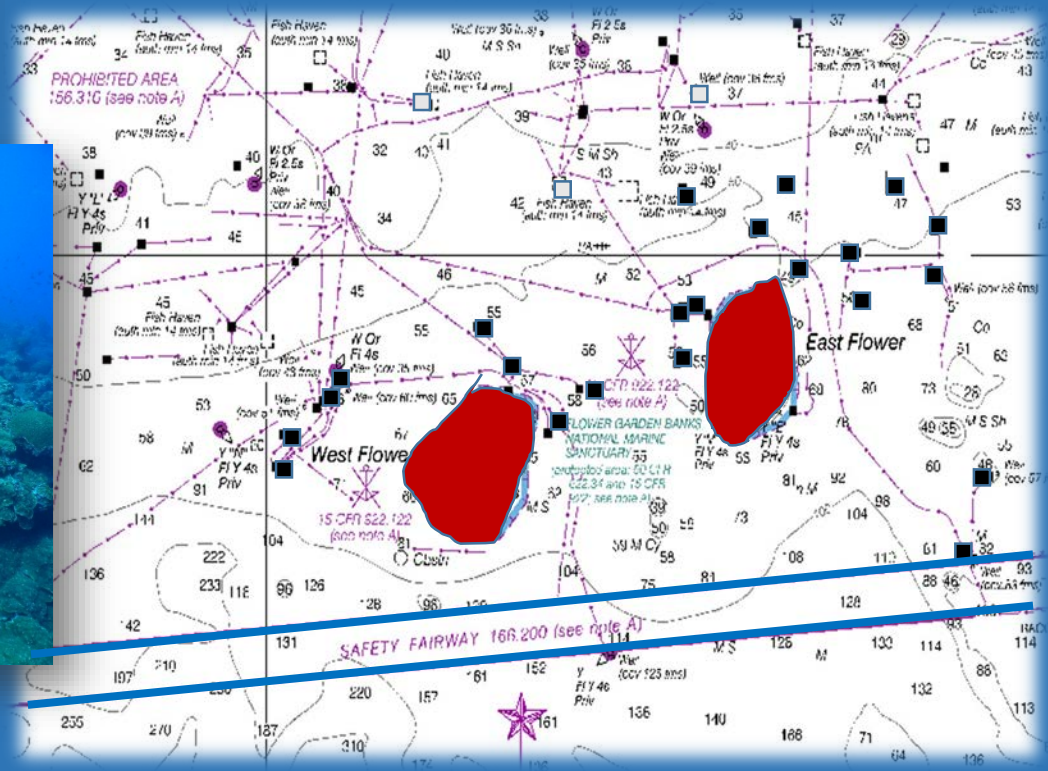
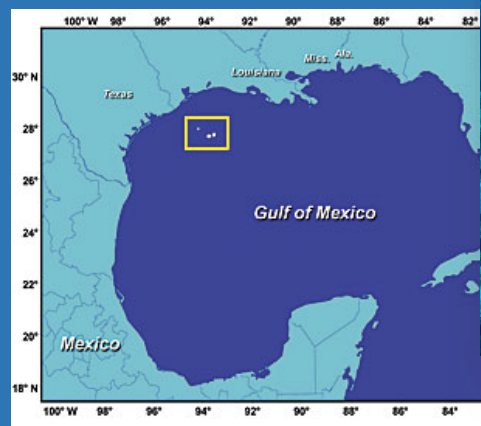
**44%** of USA recreational fishing - **\$16.2 billion** annually



HRI

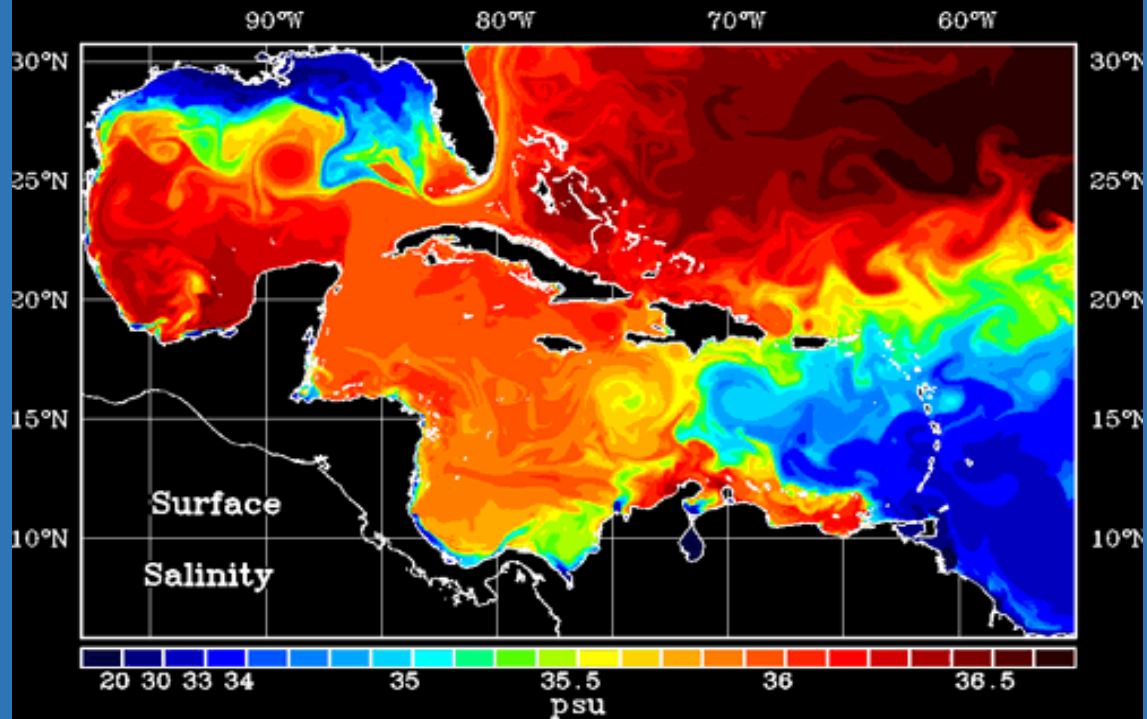
*The Gulf of Mexico is a sea of contrasts...*

Where a healthy economy  
and a healthy environment  
both *coexist* and *contend*  
with one another



Maintaining this balance is possible  
only if we understand the Gulf as a  
*Large Marine Ecosystem*

**OCEAN  
OBSERVING  
IS THAT KEY  
GCOOS/IOOS**





*What we do not know about the Gulf  
could kill someone and it is certainly  
costing our country and industry  
billions...*



*Freighter rams Sunshine  
Skyway Bridge -  
35 Dead*

*Photo credit – St. Petersburg Times, 1980*



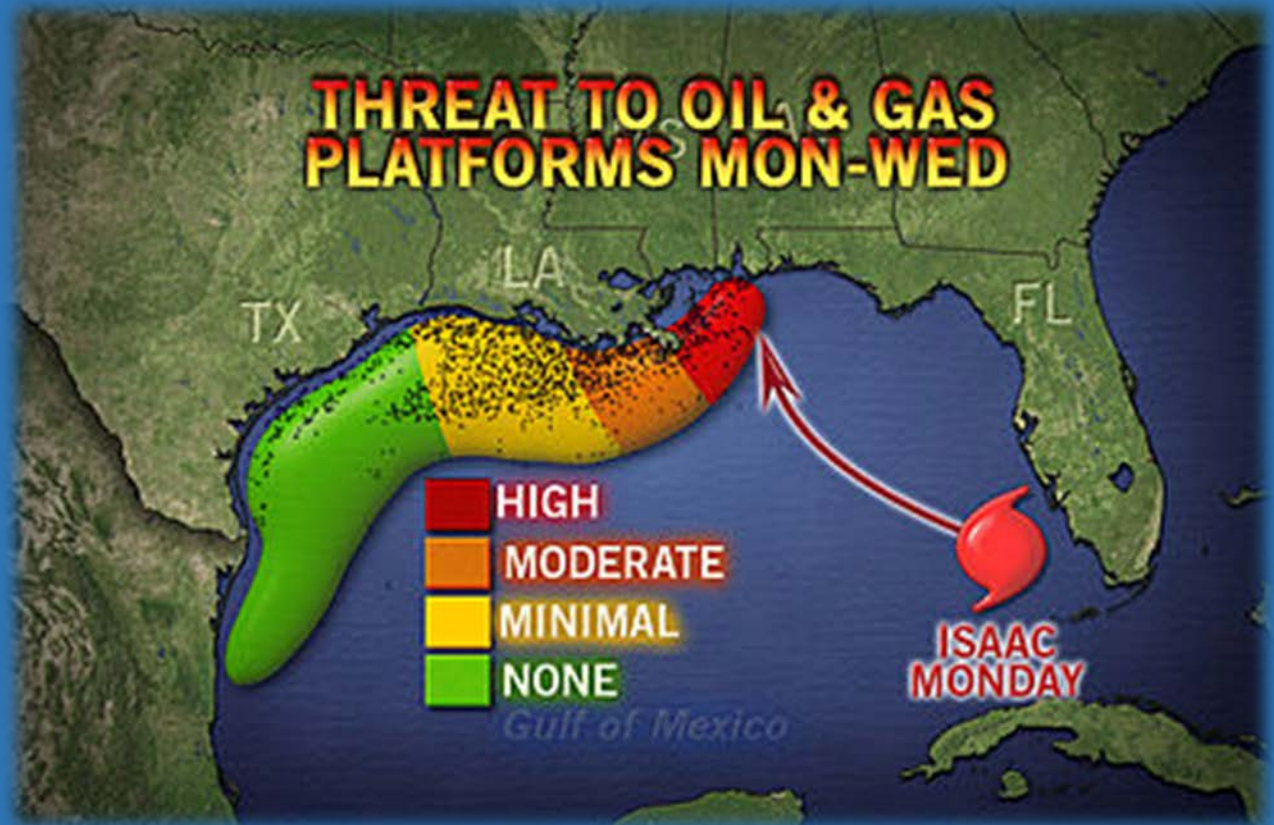
*What we do not know about the Gulf could kill someone and it is certainly costing our country and industry billions...*



FISHERIES MANAGEMENT –  
A CRITICAL NEED IN SUPPORT  
OF...  
REAUTHORIZATION –  
MAGNUSON STEVENS  
FISHERIES CONSERVATION ACT

*What we do not know about the Gulf could kill someone and it is certainly costing our country and industry billions...*

**VITAL TO OUR  
NATIONS  
ENERGY  
SECURITY**



August 27, 2012

MAP BY ACCUWEATHER



- The Gulf of Mexico
- The GCOOS-RA



# GCOOS RA Governance Board of Directors

- Private sector – 5
- Government – 5
- Academic – 3
- Outreach and Education - 4

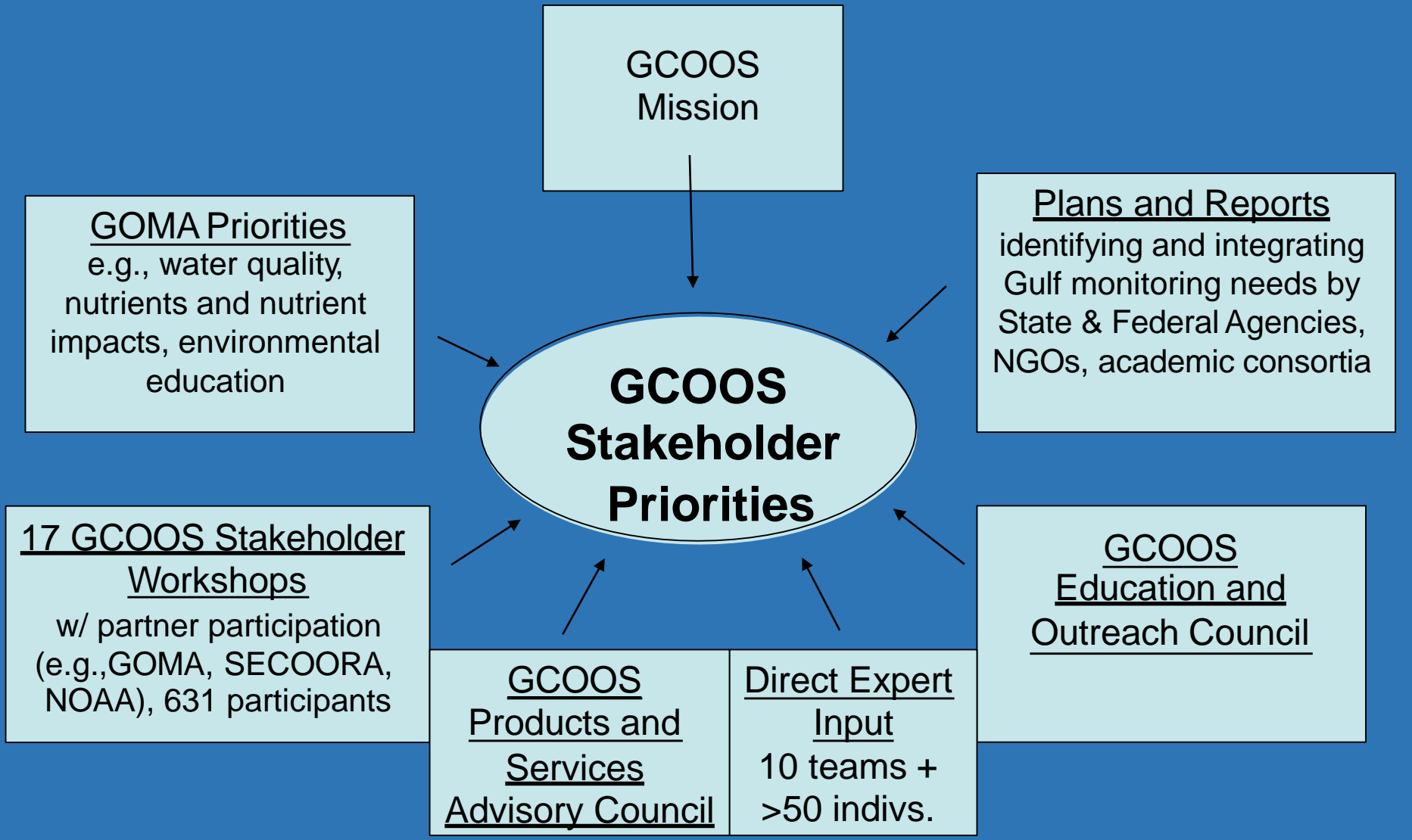
Board chair- Bill Lingsch,  
Vencore





# Funding

- Currently- majority of funding is through NOAA IOOS office
  - Grant administered through Texas A and M University
  - Governed by Board of Directors
  - Subawards to 14 PIs
    - Florida – 4
    - Alabama – 1
    - Mississippi – 2
    - Louisiana- 2
    - Texas – 4
    - Colorado – 1



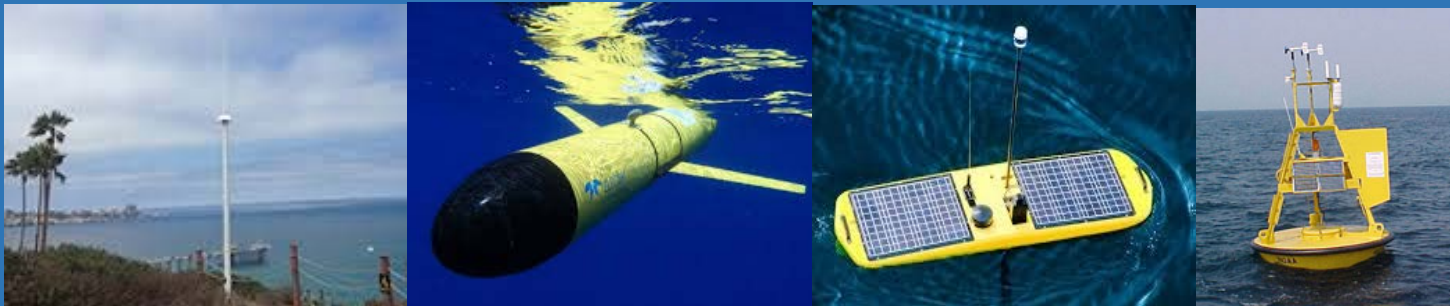


# GCOOS-RA Model

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

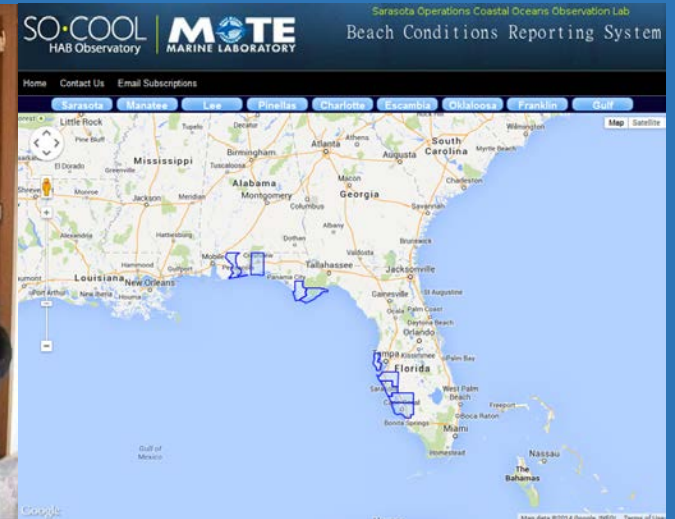
- Federal
- State
- Academic
- NGO's

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



# GCOOS RA

- Executive director
  - ~ 3 years
  - 80% time GCOOS, 10% NASA
  - Background: Biologist, Respiratory therapist, Public health scientist, Harmful algal blooms





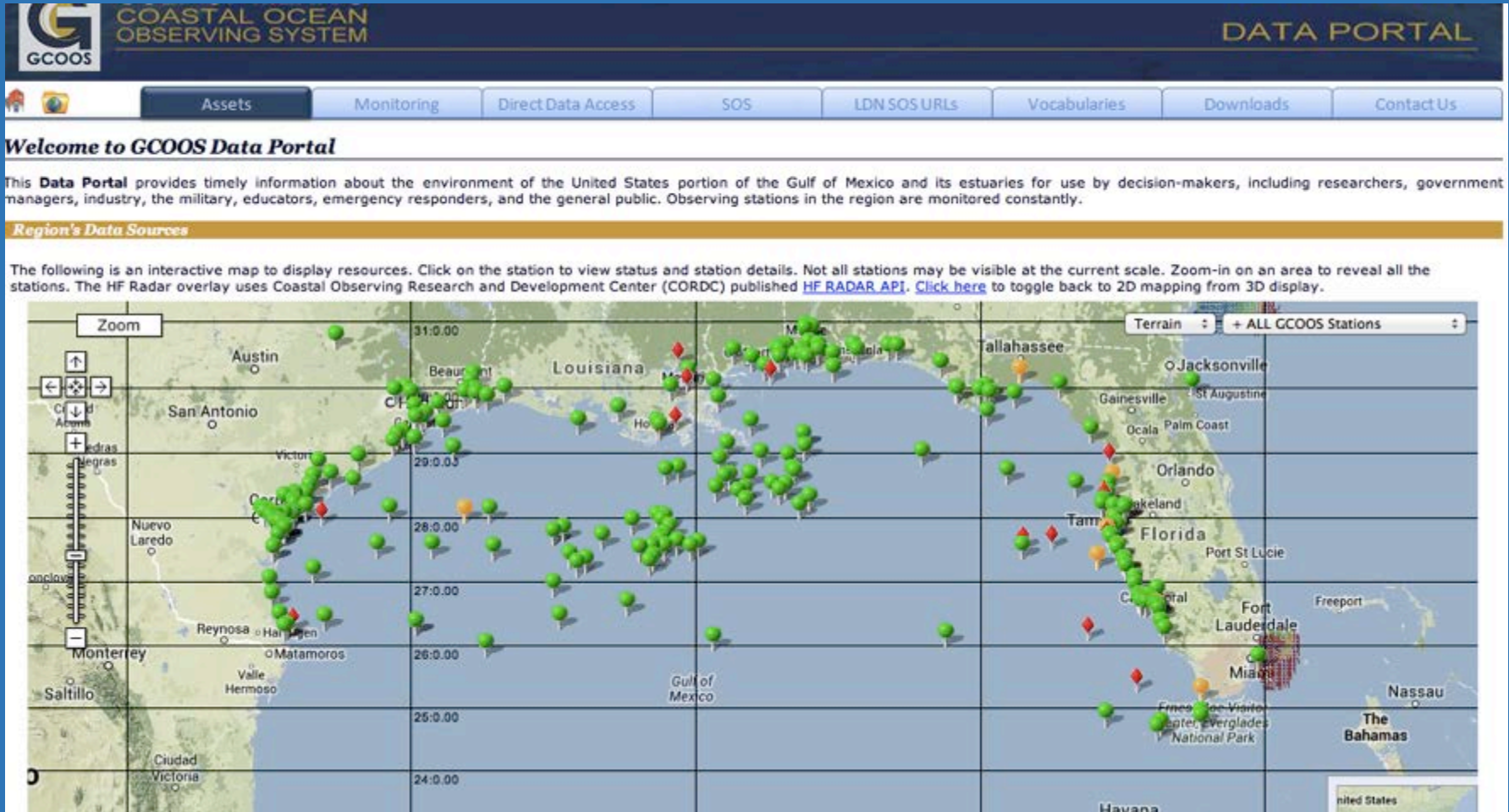
# GCOOS RA

- Outreach and Education (Dr. Chris Simoniello)
  - Communications contractor- media releases
  - Monthly E- newsletter
  - Outreach activities- Science fairs, web content, lesson plans, publications
  - O and E Council- sustained membership 10+ years



# GCOOS-RA

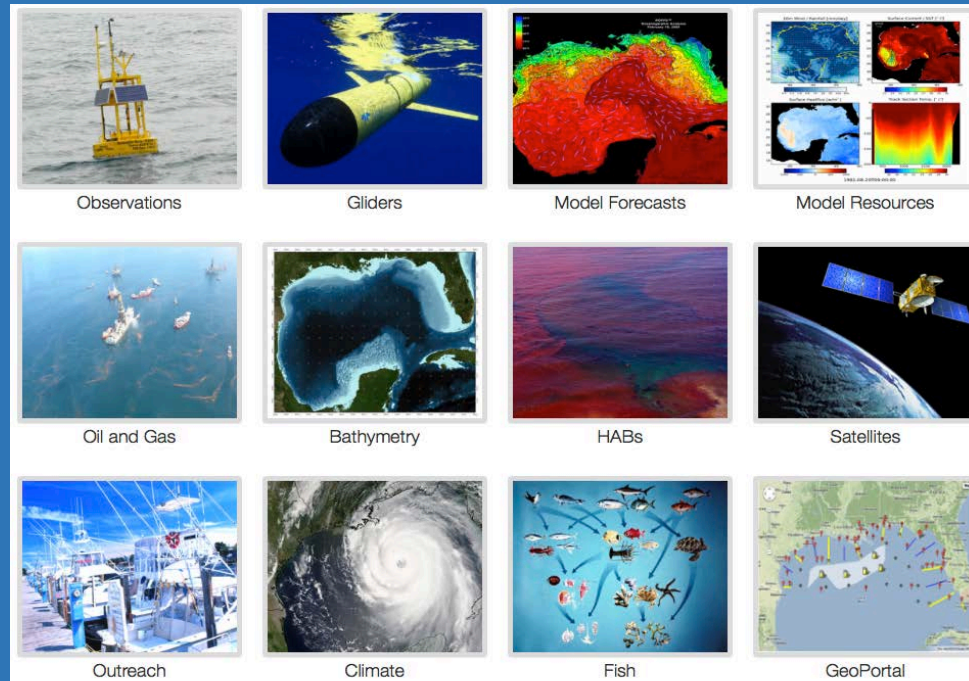
- Data Integration and Products -Dr. Matt Howard, TAMU





# 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



## New/Updated Map Products

 <p><b>MSU Wave gliders</b> During the 2014 Hurricane Seasons, three Unmanned Surface Vehicles known as Wave Gliders leased from Liquid Robotics have been deployed into the eastern Gulf of Mexico.</p>	 <p><b>Gulf gliders map</b> Near real-time glider tracking map in the Northern Gulf of Mexico Updated in January 2015</p>	 <p><b>Lionfish observations</b> Observations of red lionfish from 1965-2014 have been recorded and shown in a map Updated in July 2014</p>	 <p><b>Information for Mobile/Tablet Users</b></p>
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# GCOOS Data Management 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
  - Processed to the National Glider Data Assembly Center (DAC)



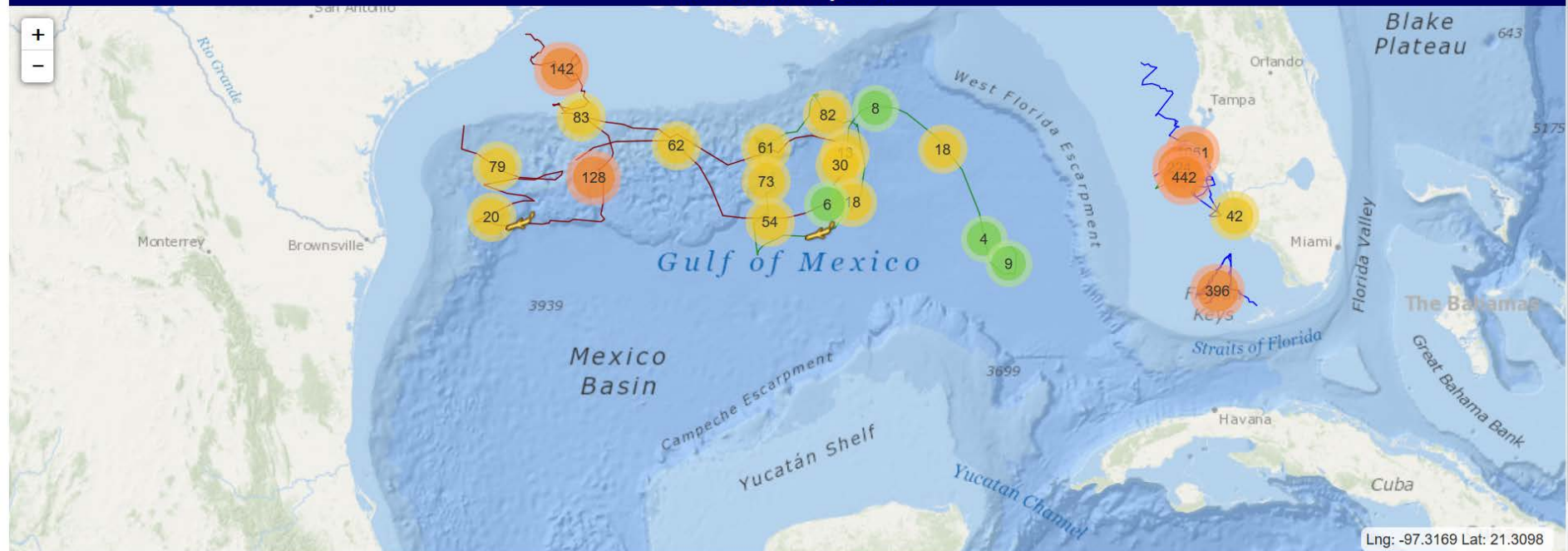
# Gulf Of Mexico Coastal Ocean Observing System

Gulf AUV Network and Data Archive Long-term storage Facility (GANDALF)

[Home](#) [Summaries](#) [Deployed](#) [Help](#)

[Sign In](#)

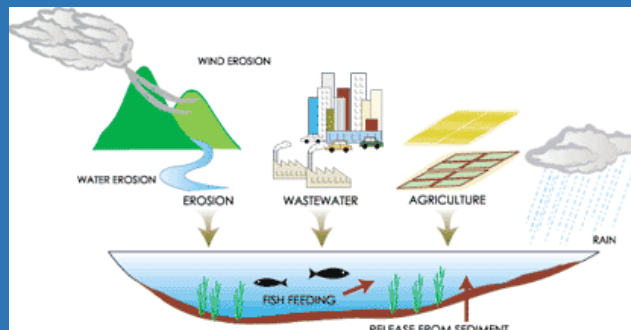
## Archived AUV Trajectories



# GCOOS Data Management Projects

## HN-DSS: Hypoxia Nutrient Decision Support System

- 71 organizations all with different data recording practices
- 9 measured variables
- 7.5M records





**Statistics: Assets/Inventory**

Item	Count	Remarks
Organizations	80	Organizations or departments that reported data to a repository.
Platforms	285,391	Distinct locations where data were collected.
<i>Variable: Chlorophyll</i>	55,889	Chlorophyll-a concentration (mg L-1).
<i>Variable: Dissolved Oxygen</i>	785,554	Dissolved oxygen concentration (mg L-1).
<i>Variable: Enterococcus</i>	244,727	Enterococcus bacteria (counts).
<i>Variable: Fecal coliform</i>	155,654	Fecal coliform bacteria (counts).
<i>Variable: Nitrogen</i>	44,086	Nitrogen (nitrite, nitrate, ammonia and organic nitrogen) concentration (mg L-1) as N.
<i>Variable: pH</i>	6,381,872	Measure of the acidity or basicity of a water sample.
<i>Variable: Phosphorus</i>	107,304	Dissolved Total Phosphorus concentration (mg L-1).
<i>Variable: Salinity</i>	5,937,533	Measure of salt content following UNESCO standards.
<i>Variable: Water temperature</i>	6,146,860	In situ water temperature measured in degrees Celsius.
<i>Variable: Silicate</i>	47,767	Silicate concentration (uM L-1).
<b>Total observation records</b>	<b>19,907,246</b>	

**Direct Access: Assets/Inventory**

To get a list of all the organizations and/or stations, their labels, description and coordinates, use the following call syntax:


```
http://nutrients.gcoos.org/get_data.php?assets={organization || stations}
```

**Example:**

- To list all organizations contributing data to the portal: [http://nutrients.gcoos.org/get\\_data.php?assets=organization](http://nutrients.gcoos.org/get_data.php?assets=organization)
- To list all stations contributing data to the portal: [http://nutrients.gcoos.org/get\\_data.php?assets=stations](http://nutrients.gcoos.org/get_data.php?assets=stations)

Click on the map below to enlarge the map of H-N stations.

**WARNING!** Due to the number of stations, this can take a minute to render.





## GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

Close

### DISCLAIMER

The Gulf of Mexico Coastal Ocean Observing System (GCOOS) Data Portal aggregates data from the regional data providers for the convenience of all data users. Data published on this website should not be used for navigation or certain other uses as we cannot guarantee data accuracy or availability. The data and delivery services are provided "as is" without warranty of any kind.

[Click here for full statement](#)

NOTE: click the button above the label to hide message. Labels can be dragged.

Google

Map data ©2016 Google, INEGI Terms of Use

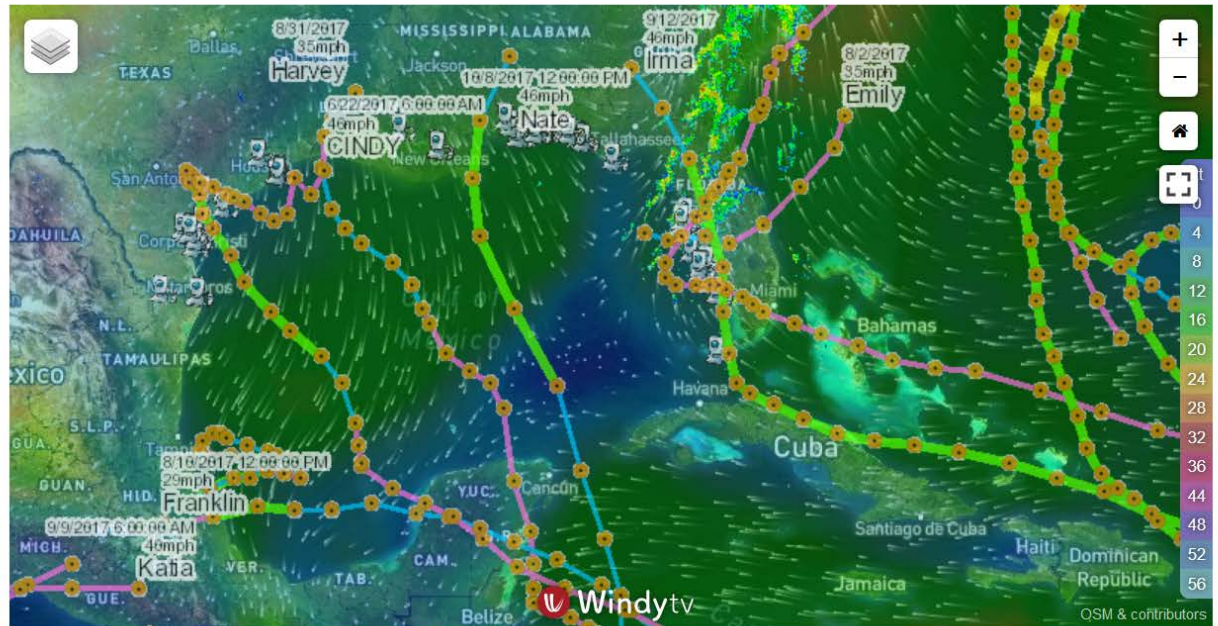


# GCOOS Data Management Projects- Hurricane Product

 Hurricane 

Home / Hurricane

Tweets about Hurricane



Forecast: Mon Oct 23 2017 16:24:04 GMT-0400 (Eastern Standard Time)

# GCOOS Data Management Projects- Citizen Science Portal

The screenshot shows a web browser window displaying the Citizen Science portal for GCOOS. The browser's address bar shows the URL `citizenscience.gcoos.org`. The page has a green header with the text "Citizen Science" and navigation links for "Home", "Get Data", "Panel", "Tools", "About", and "Help". A search bar in the top right corner is labeled "Search by Site Name".

On the left side, there is a sidebar with a "Home" button and a "Observation Points" link. Below this, a section titled "1. What is it?" contains the following text:

The project is being developed as the outreach and education portion of the developing **GCOOS Integrated Water Quality Network** and is being structured to accommodate data and information acquired by volunteer monitoring networks throughout the Gulf of Mexico region.

GCOOS currently has a cross-regional water quality collaboration with **Florida Aquarium**, **Nature's Academy (FL)** and the **Galveston Bay Foundation (TX)**.

At the bottom of the sidebar are logos for the **Galveston Bay Foundation** and **Nature's Academy**.

The main content area is a map of the Gulf of Mexico region, showing the Gulf of Mexico, the Straits of Florida, and parts of Texas, Louisiana, Mississippi, and Florida. Two orange circular markers are placed on the map: one near Houston, Texas, labeled "1977", and another near Tampa, Florida, labeled "814". A red information icon is visible near New Orleans, Louisiana. The map includes standard navigation controls like a search icon, location pin, home button, and zoom in/out buttons. At the bottom of the map, a coordinate box displays "LatLng(29.55435, -99.25049)".

At the bottom of the page, there is a footer with the text "GCOOS | Attribution" and "Leaflet | Powered by Esri | DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community".

# The GCOOS Build Out Plan



GULF OF MEXICO  
COASTAL OCEAN  
OBSERVING SYSTEM



IOOS  
Integrated Ocean  
Observing System

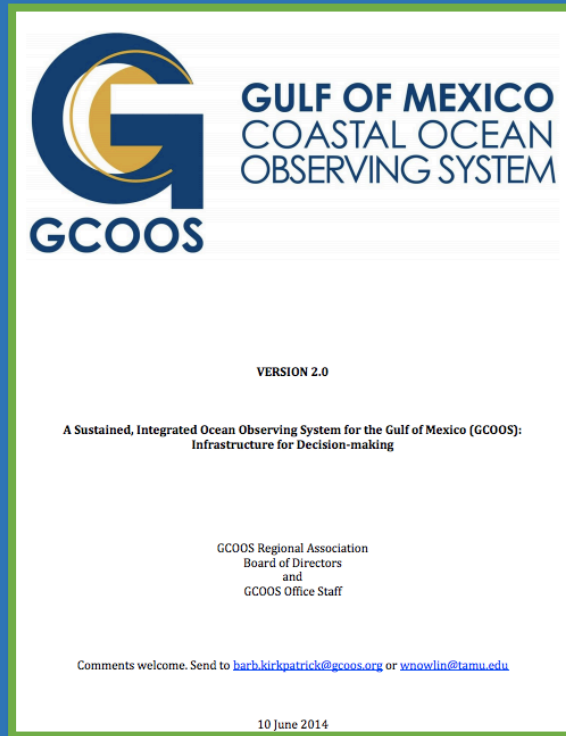


# The GCOOS Build-out Plan

631  
workshop  
contributors

From 297  
organizations

90 plans  
reviewed



50 additional  
contributors

19 elements in  
the BOP

13 subject  
matter expert  
writing teams

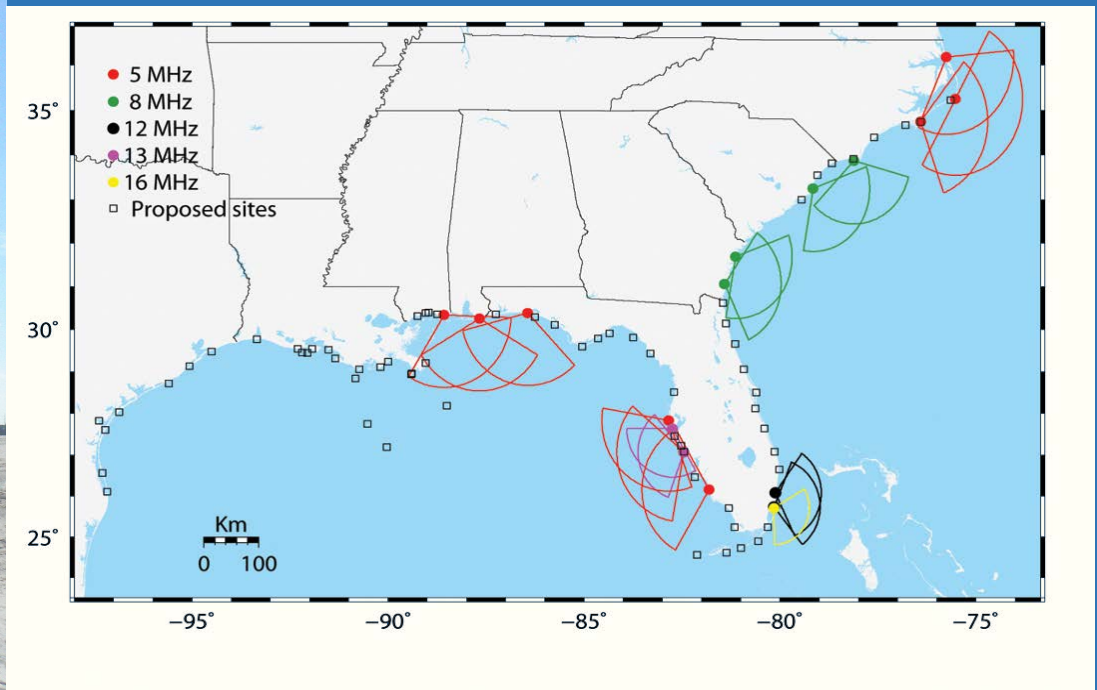
# Plan includes 19 elements to meet stakeholder needs- with cost estimates

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- 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

# Critical Gaps being closed- HF Radar

2 new radars – Mouth of Mississippi





# HF Radar Impact For Ports

- Louisiana's 6 deep-draft seaports and 16 inland river ports support **400,000 jobs**, or **1 in 5 jobs** in the state, according to the Port Association of Louisiana.
- HF radar will provide **improved, time-sensitive weather forecasts leading to safer and more efficient navigation** for industries which rely on the Gulf



**Port Fourchon** (pictured left) is the intermodal support base for **over half** of the domestic oil and gas activity in the U.S. Gulf of Mexico and the **Louisiana Offshore Oil Port (LOOP)**, a deep water port designed for unloading crude oil cargoes from deep-draft tankers.



The **Port of South Louisiana** (pictured below) is the **largest tonnage port in the Western Hemisphere** and ranks **eleventh in the world**.



# RA Activities

- Development and publication of GCOOS RA Strategic Plan

<https://issuu.com/gcoos-ra/docs/gcoos-stratplan-and-addendum>



# RA Activities

- Continue to call for increased observations to prepare for next Gulf disaster
- ? \$19B settlement from DWH

## Opportunity Lost? Ocean Observing in the Gulf of Mexico

Stephanie Watson<sup>1</sup>, Barbara Kirkpatrick<sup>2</sup>, and Nadine Slimak<sup>3</sup>

<sup>1</sup> Gulf of Mexico Coastal Ocean Observing System Regional Association

<sup>2</sup> Gulf of Mexico Coastal Ocean Observing System Regional Association and Dept. of Oceanography, Texas A and M University

<sup>3</sup> Gulf of Mexico Coastal Ocean Observing System Regional Association and Vetted Communications, LLC

Corresponding author: Barbara Kirkpatrick, Executive Director, GCOOS-RA, Barb.Kirkpatrick@gcoos.org

If you were asked whether new, sustained ocean observing assets were put in place in the Gulf of Mexico in the six years following the Deepwater Horizon (DWH) oil spill disaster, would you say yes?

If so, you would be wrong.

Surprising, but true. Despite the billions of dollars available from many funding sources in the post-DWH era that are to be dedicated to restoration and *improved understanding* of the Gulf so we can be prepared for future disasters, no money has been allocated to new, sustained observations that provide real-time or near-real time data about the Gulf of Mexico to support these efforts.

While the DWH was certainly the largest spill in our nation's history, it was by no means the only spill. Since 1979, there have been six significant spills and numerous smaller spills in the Gulf. During Hurricane Katrina alone, the costliest Hurricane in U.S. history at \$41.1 B (Insurance Information Institute, 2015), more than 146 spills were recorded; 113 offshore platforms were destroyed and 457 pipelines were





# RA Activities

- Products and Services Advisory Council, Outreach and Education Council, and Public Health and Safety Task Team all meeting in November, 2017
- Submitted application for certification to IOOS Program Office
  - Currently under review



# RA Activities

- Federal funds for 2 HF radars for mouth of the Mississippi
- Continue to develop the Gulf Coastal Ocean Acidification Network (GCAN)
- Funds for Gulf wide Animal Tracking Network workshop
- Hosting the IOOS Federal Advisory Committee in October '17
- Funds for workshop to bring partners who studied bleaching event at Flower Gardens Banks together for synthesis report

- **Congressional Action**
- Support the IOOS Budget to fill critical gaps in observations
- Support the reauthorization of the ICOOS Act





The U.S. Integrated  
Ocean Observing System  
(IOOS)  
*and*  
Gulf Coast Ocean  
Observing System  
(GOOS)



***CRITICAL COASTAL  
INFRASTRUCTURE***

***ON WHICH THE HEALTH,  
WEALTH AND WELL-BEING OF  
THE GULF OF MEXICO DEPEND***



**Photo credit:** Gulf of Mexico Sperm Whale Seismic Study (SWSS) (U.S. Minerals Management Service, 2002).