The Gulf of Mexico Coastal Ocean Observing System Regional Association: So Much More than Data!

Barbara Kirkpatrick
Executive Director

BOEM ITM
August, 22 2017
New Orleans, LA

GCOOS

IOOS
Integrated Ocean Observing System

Matt Howard

Chris Simoniello

Shin Kobara

Felimon Gayanilo

Bob Currier

Marion Stoessel

Jen Vreeland

Laura Caldwell

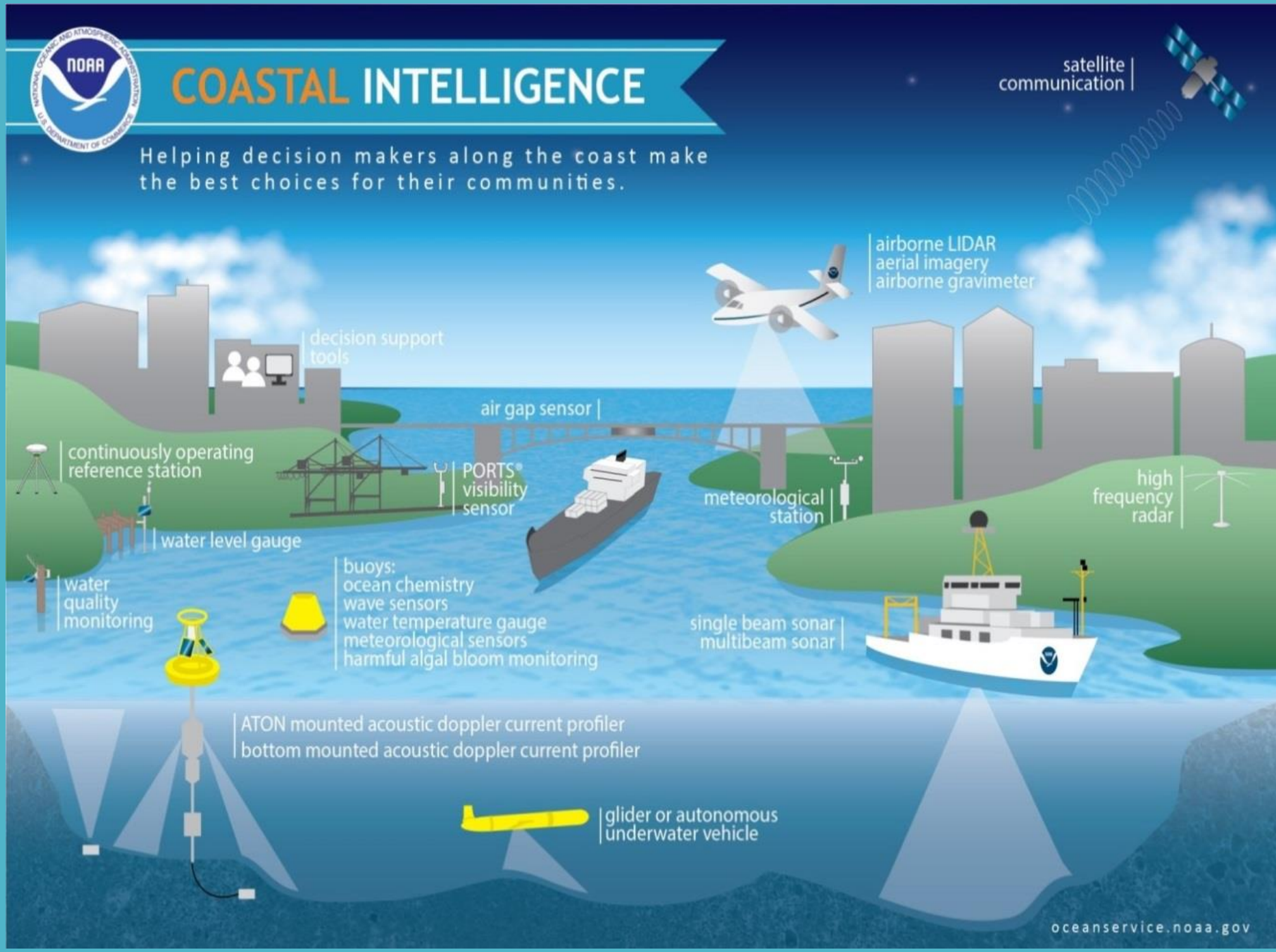
Nadine Slimak

Grant Craig

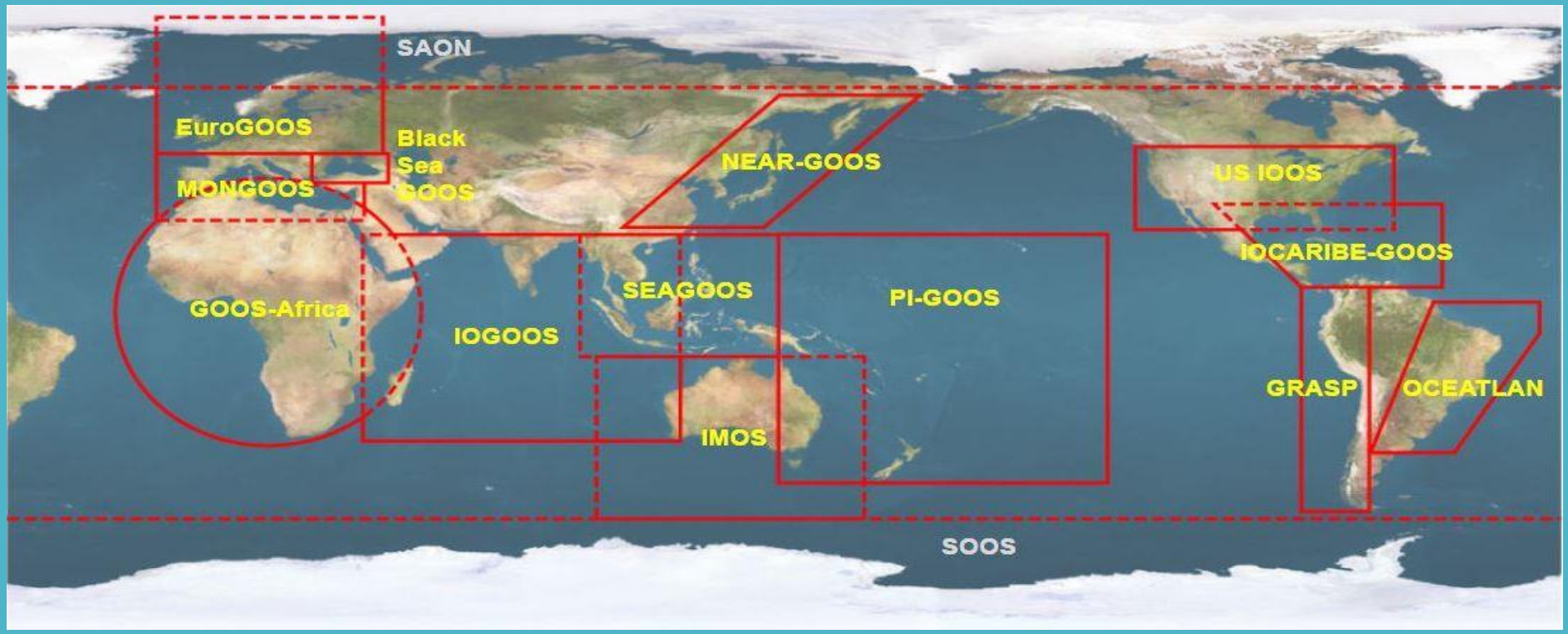
And advised by a 17 member Board

GCOOS

IOOS Integrated Ocean Observing System


COASTAL INTELLIGENCE
Helping decision makers along the coast make the best choices for their communities.
satellite communication
airborne LIDAR
aerial imagery
airborne gravimeter
decision support tools
air gap sensor
continuously operating reference station
PORTS® visibility sensor
meteorological station
high frequency radar
water level gauge
water quality monitoring
buoys:
ocean chemistry
wave sensors
water temperature gauge
meteorological sensors
harmful algal bloom monitoring
single beam sonar
multibeam sonar
ATON mounted acoustic doppler current profiler
bottom mounted acoustic doppler current profiler
glider or autonomous underwater vehicle
oceanservice.noaa.gov

U.S. IOOS: Contribution to Global Observations



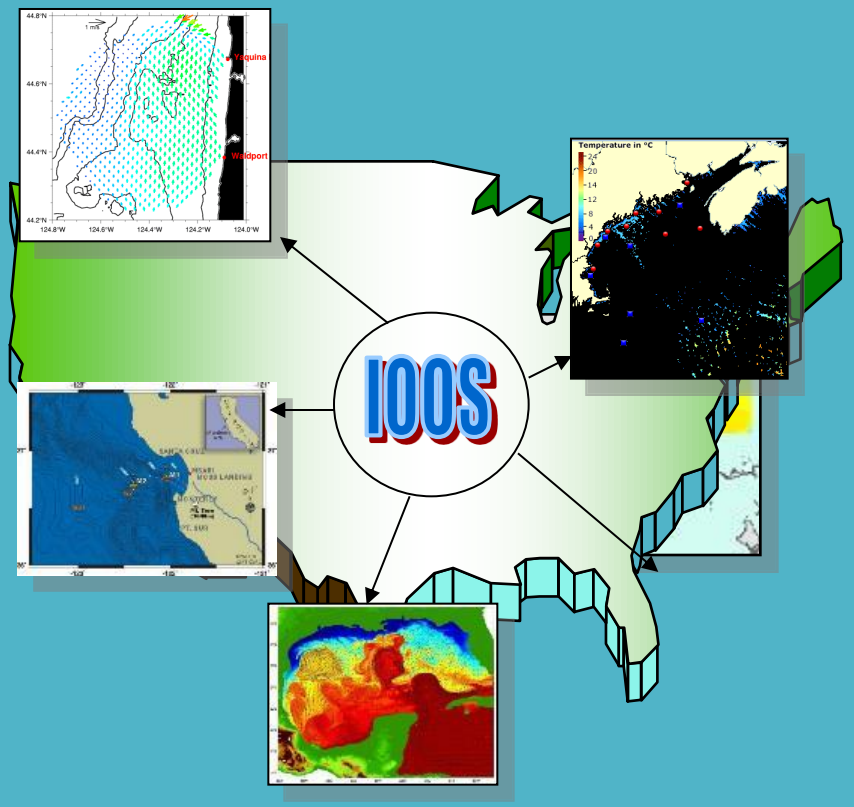
How is the national initiative organized?

International GOOS

National IOOS-Ocean.US

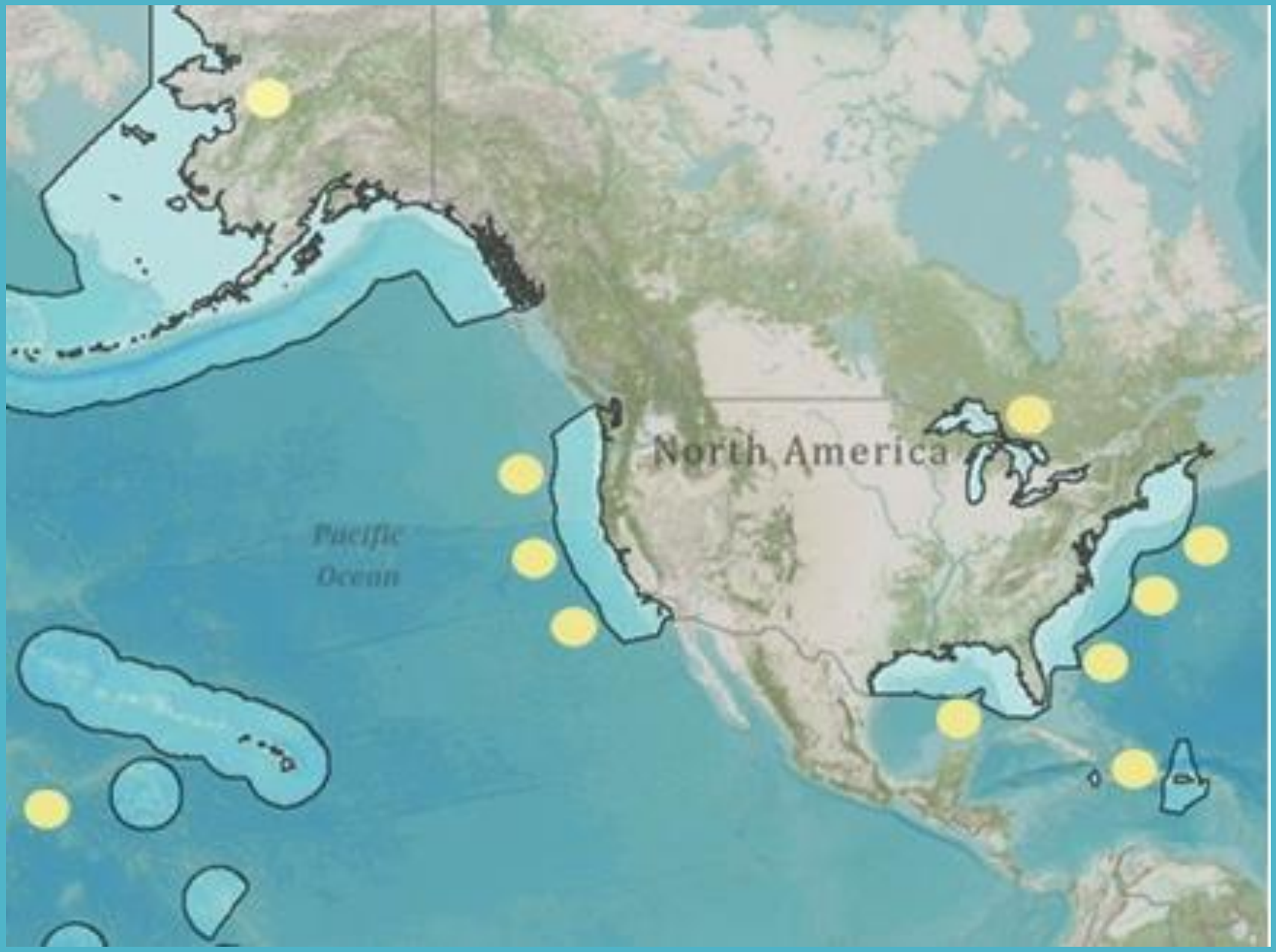
Coastal Component COOS

Regional Association Implementation (RA-COOS)



GCOOS

IOOS Integrated Ocean Observing System



GCOOS

IOOS
Integrated Ocean
Observing System

26 IOOS Variables

- Acidity, Bathymetry, Bottom Character, Colored Dissolved Organic Matter, Contaminants, Dissolved Nutrients, Dissolved Oxygen, Fish Abundance, Fish Species, Heat Flux, Ice Distribution, Ocean Color, Optical Properties, Partial Pressure of CO2, Pathogens, Phytoplankton Species, Salinity, Sea Level, Stream Flow, Surface Currents, Surface Waves, Temperature, Total Suspended Matter, Wind Speed and Direction, Zooplankton Abundance, and Zooplankton Species·

What is the purpose of Regional Coastal Ocean Observation?

End-user Relevance

Regional Differences

Local Applicability

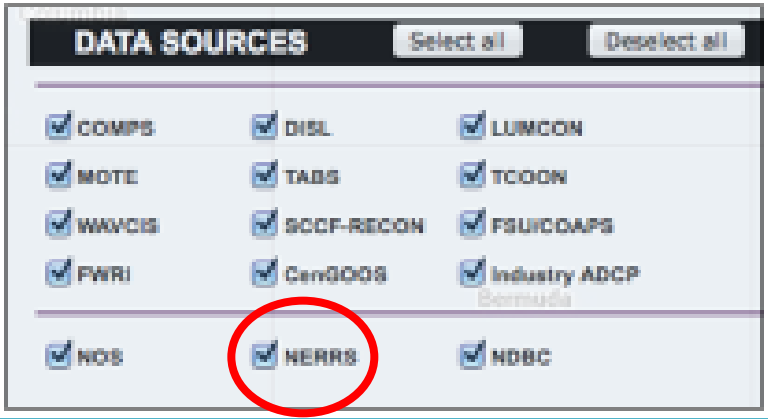
Increased Flexibility

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

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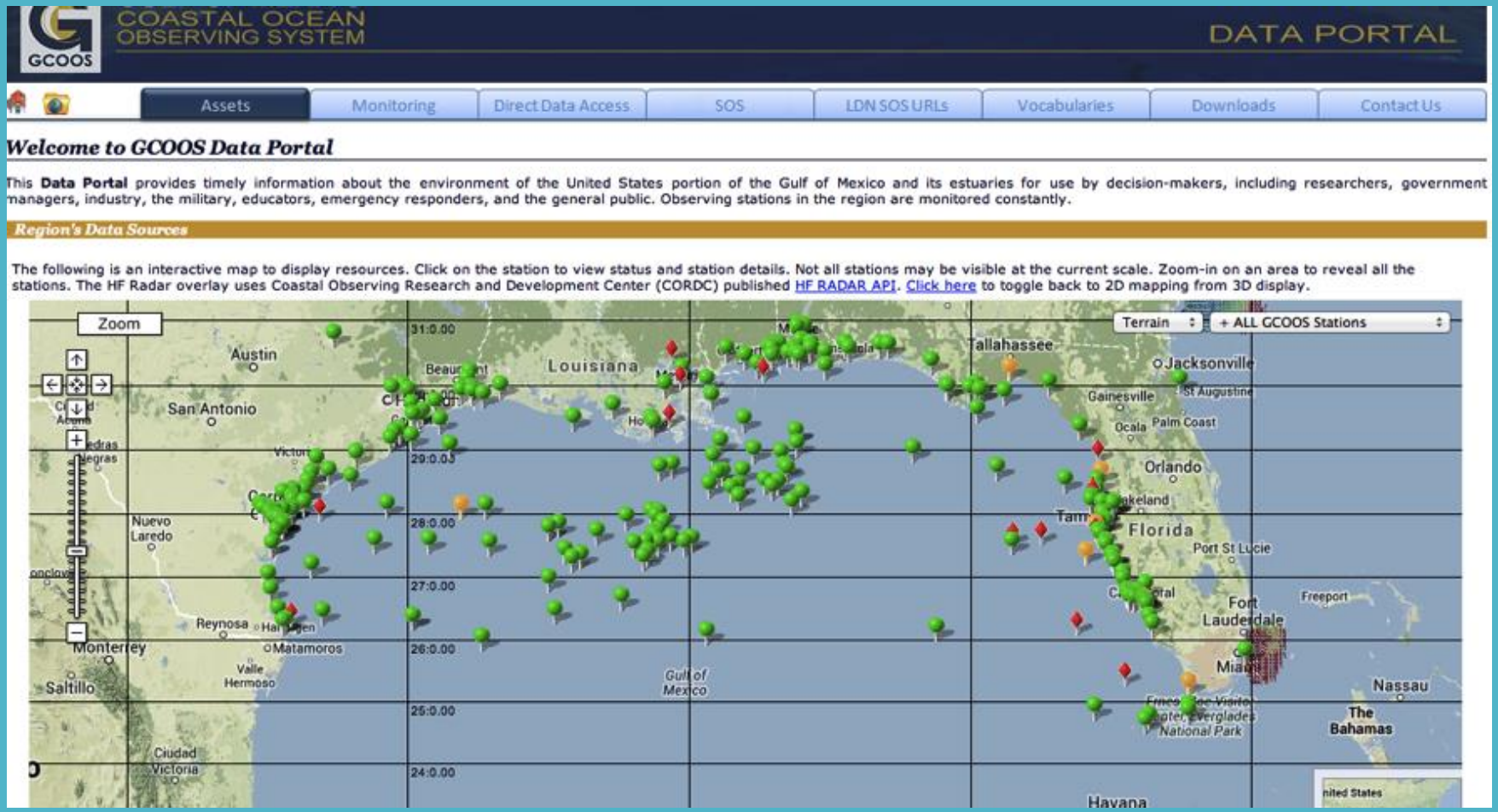
GCOOS Data Portal



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……but, we are so much more!

- Real time, near real time and archival data
- Physical parameters-AND chemical and biologic parameters
- Products tailored to community needs

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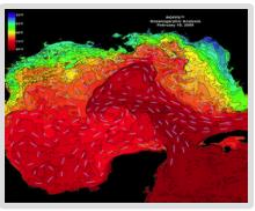
GCOOS Data Management and Products Portals

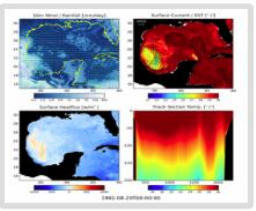
Real time and Historical Data

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

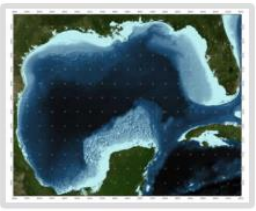

Observations


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
- Processed to the National Glider Data Assembly Center (DAC)

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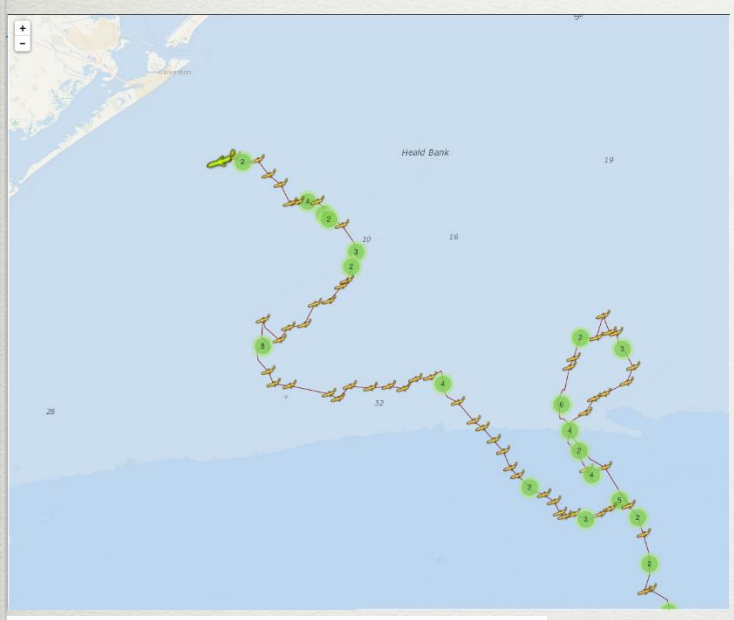
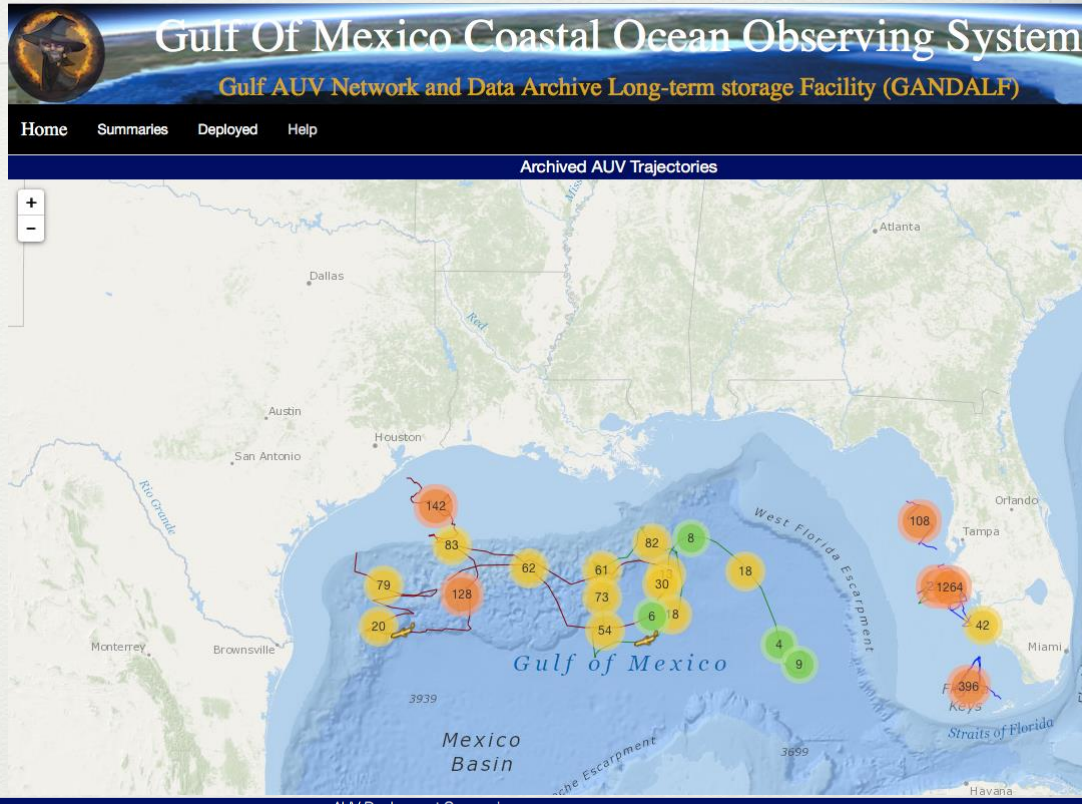
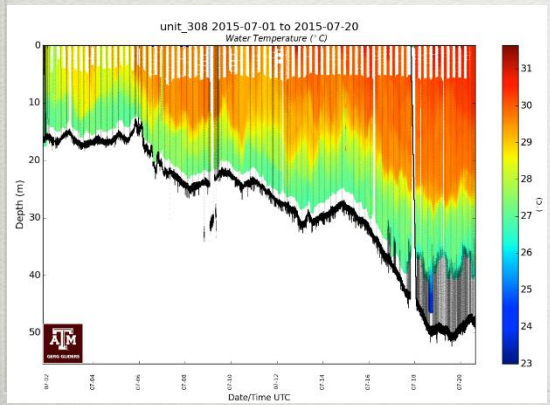
Gandalf

Trajectories, Data, Summaries

Plots, Overlays, Google Earth

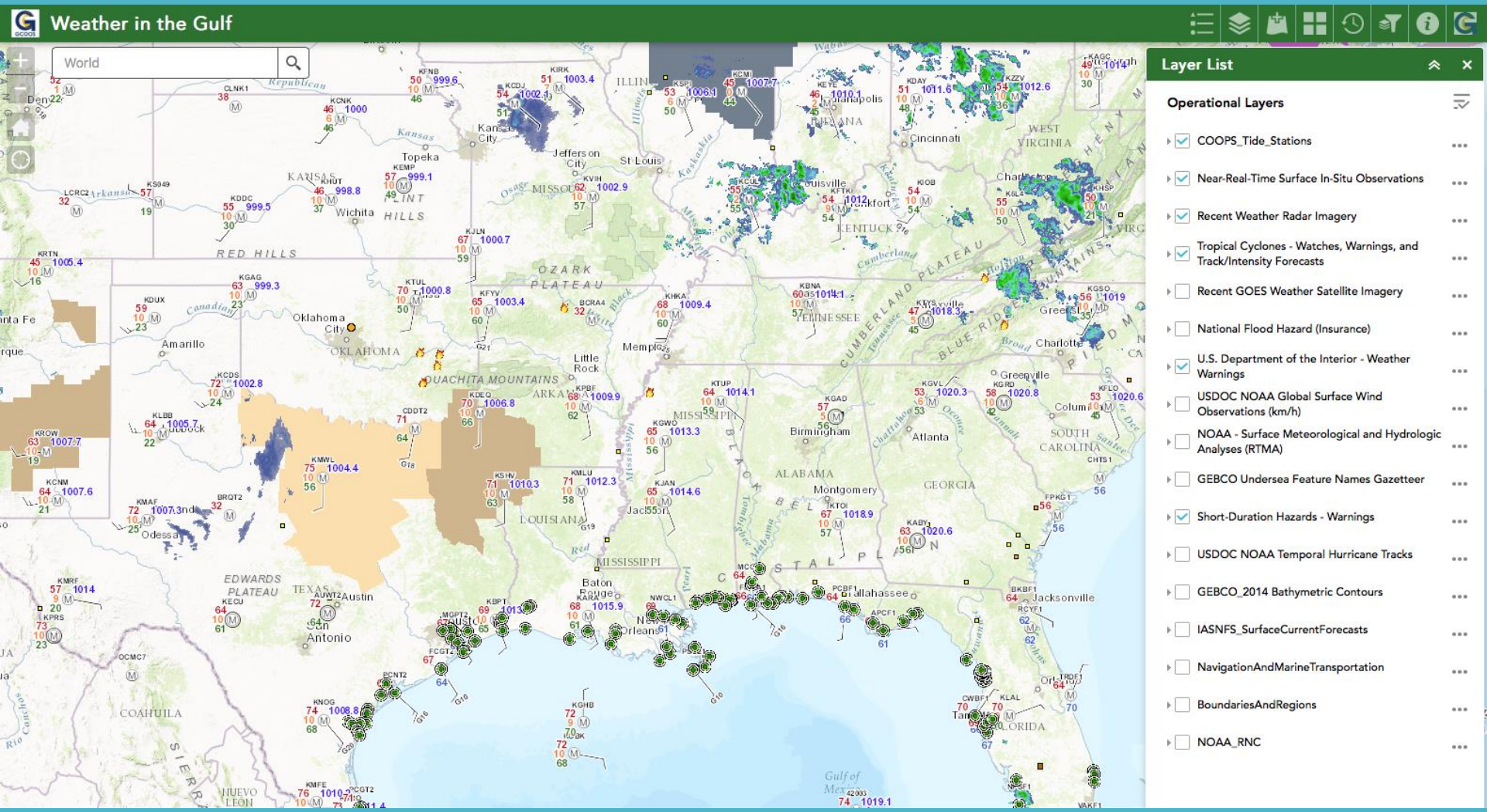






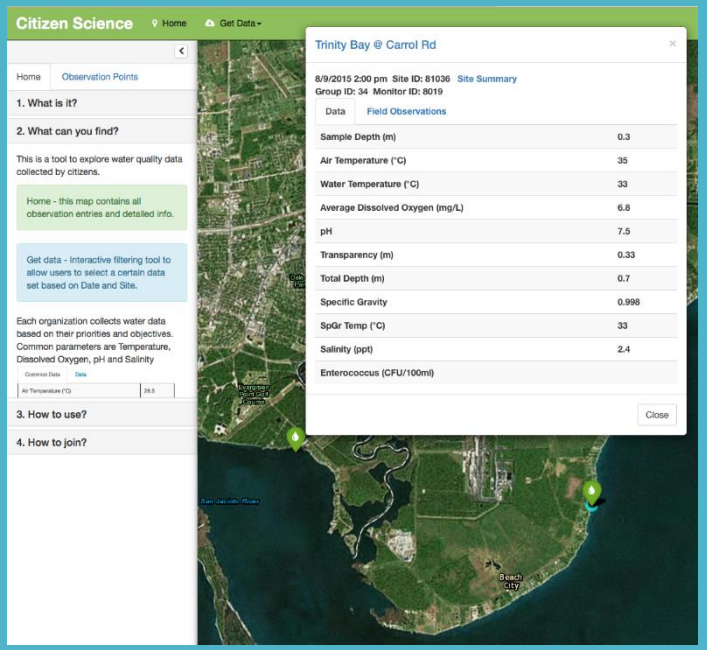
AUV Deployment Summaries

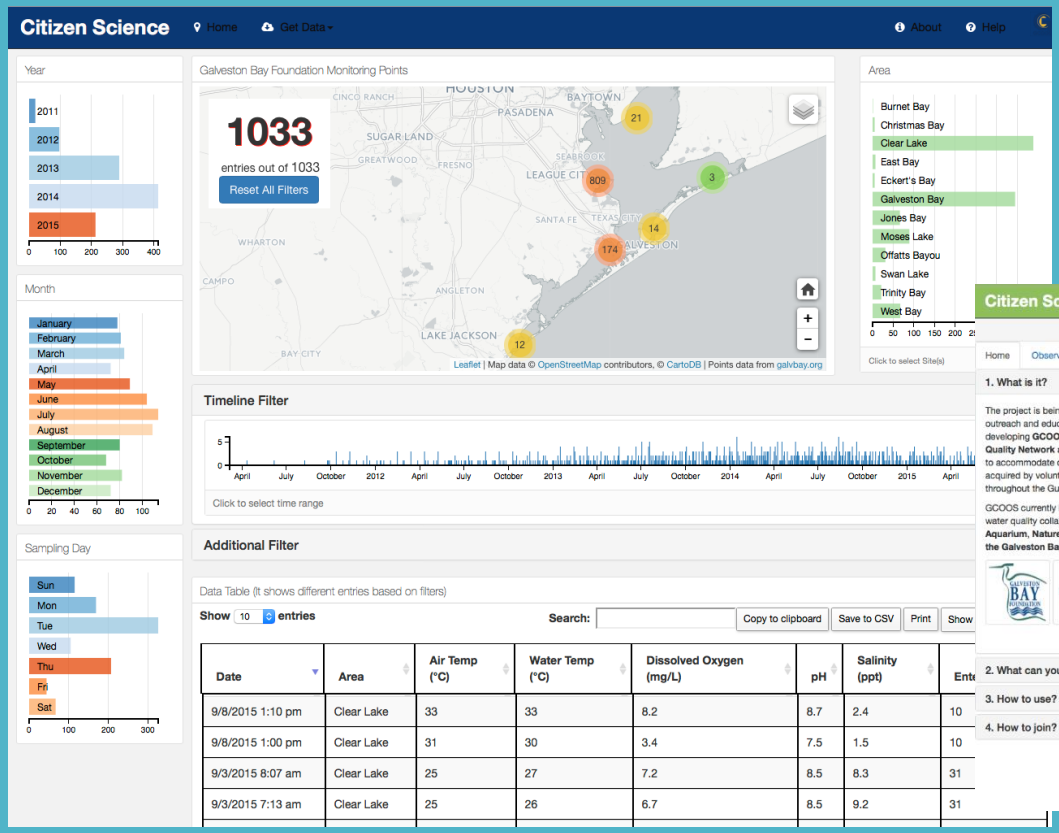
P.I.	Vehicle	Type	Operator	Project	Deployed	Recovered	Days Wet	Distance (km)	Data	KMZ	Plots
Beckler/Dixon	mote-genie	Slocum G2	Mote	FWRI	2015-12-01	2015-12-11	10	149			
Beckler/Dixon	mote-genie	Slocum G2	Mote	FWRI	2015-11-09	2015-11-12	3	38			
Ordonez	se_02	Slocum G2	DOF Subsea	Loop Current	2015-09-23	2015-11-01	39	1268			
Dixon	usf-bass	Slocum G1	USF	FWRI	2015-08-27	2015-09-04	9	138			
DiMarco	Sverdup	Slocum G2	TAMU	GERG	2015-08-22	2015-11-10	80	862			
Sutton/Hu	usf-murphy	Slocum G2	USF	USF	2015-08-09	2015-08-19	10	265			
DiMarco	Stommel	Slocum G2	TAMU	GERG	2015-08-05	2015-10-12	68	1177			
Dixon	usf-bass	Slocum G1	USF	FWRI	2015-07-06	2015-07-17	11	182			
DiMarco	unit_308	Slocum G2	TAMU	GERG	2015-07-01	2015-07-20	13	240			
DiMarco	unit_540	Slocum G2	TAMU	GERG	2015-07-01	2015-07-20	13	267			
Dixon	usf-bass	Slocum G1	USF	FWRI	2015-04-15	2015-04-23	8	137			
DiMarco	unit_307	Slocum G2	TAMU	GERG	2015-03-02	2015-03-25	23	267			
Dixon	mote_045	Slocum G1	Mote	FWRI	2014-08-01	2014-08-13	12	251			

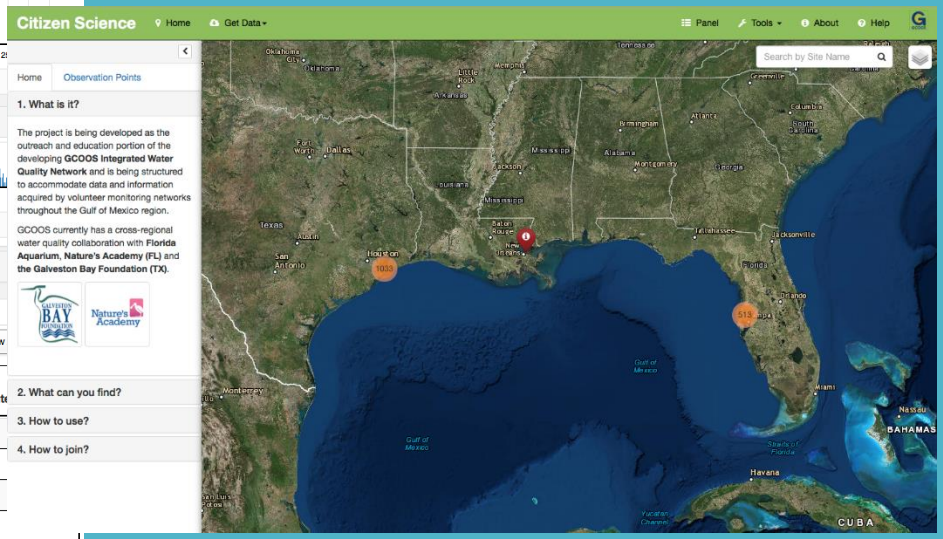

Weather in the Gulf
World
Layer List
Operational Layers
COOPS_Tide_Stations
Near-Real-Time Surface In-Situ Observations
Recent Weather Radar Imagery
Tropical Cyclones - Watches, Warnings, and Track/Intensity Forecasts
Recent GOES Weather Satellite Imagery
National Flood Hazard (Insurance)
U.S. Department of the Interior - Weather Warnings
USDOC NOAA Global Surface Wind Observations (km/h)
NOAA - Surface Meteorological and Hydrologic Analyses (RTMA)
GEBCO Undersea Feature Names Gazetteer
Short-Duration Hazards - Warnings
USDOC NOAA Temporal Hurricane Tracks
GEBCO_2014 Bathymetric Contours
IASNFS_SurfaceCurrentForecasts
NavigationAndMarineTransportation
BoundariesAndRegions
NOAA_RNC
Topeka
Wichita
Oklahoma City
Amarillo
Little Rock
Memphis
Jefferson City
St Louis
Cincinnati
Louisville
Birmingham
Atlanta
Montgomery
Jacksonville
Tallahassee
Baton Rouge
New Orleans
Austin
San Antonio
Odessa
Greenville
Charlotte
Columbia
Greenville
Indianapolis
Charleston
Knoxville
Nashville
Evansville
Paducah
Jackson
Meridian
Tupelo
Shreveport
Monroe
Lake Charles
Beaumont
Corpus Christi
Brownsville
Laredo
Del Rio
Abilene
Lubbock
Midland
Roswell
Albuquerque
Santa Fe
Denver
Kansas City
Springfield
Fayetteville
Tulsa
Enid
Dodge City
Pueblo
Colorado Springs
Grand Junction
Salt Lake City
Las Vegas
Phoenix
Tucson
El Paso
Flagstaff
Gulf of Mexico
OZARK PLATEAU
OUACHITA MOUNTAINS
RED HILLS
EDWARDS PLATEAU
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
SOUTH CAROLINA
TENNESSEE
KENTUCKY
WEST VIRGINIA
COASTAL PLAIN
CUMBERLAND PLATEAU
BLUE RIDGE MOUNTAINS
COAHUILA
NUEVO LEON

Citizen Science

Custom Web Environment







1. What is it?

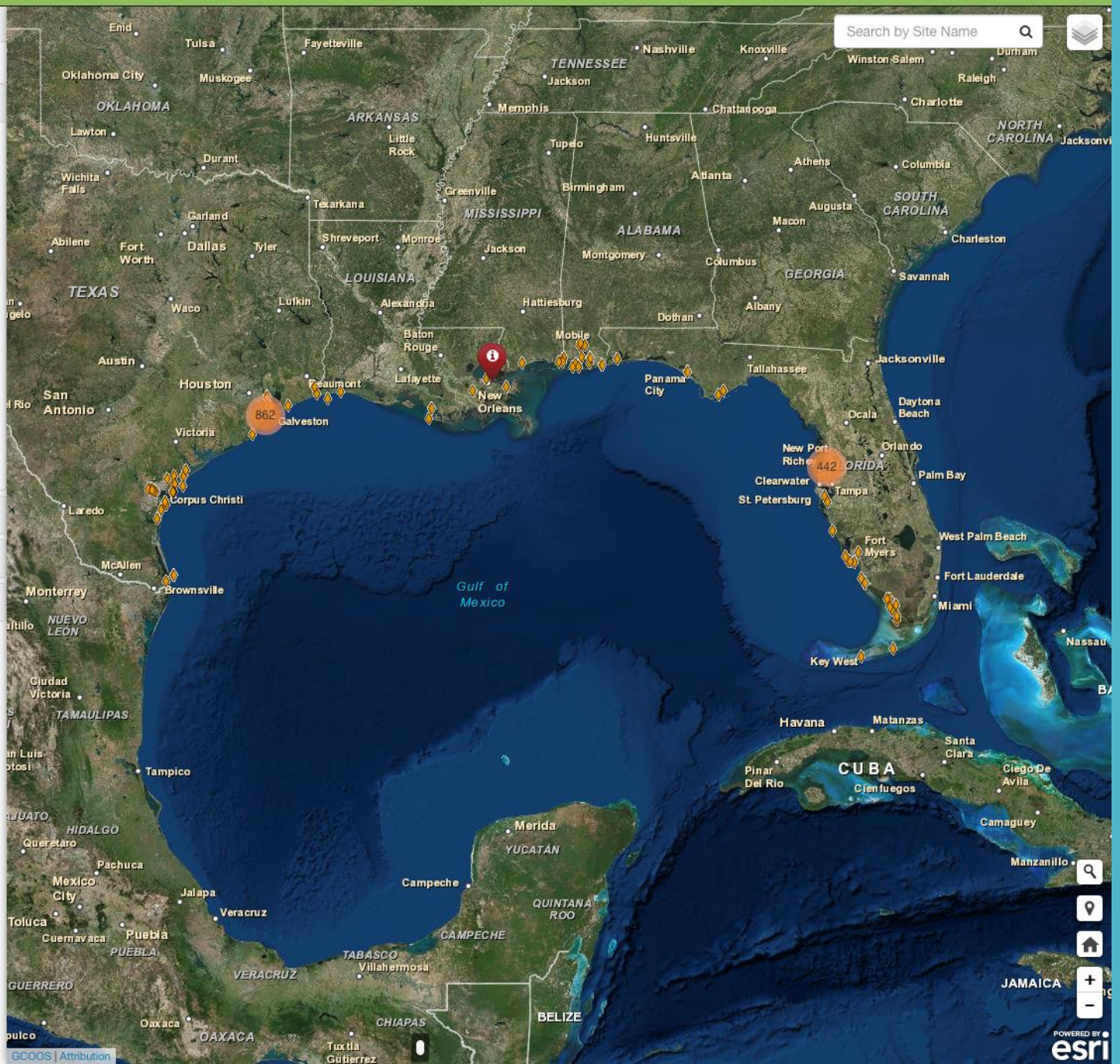
The project is being developed as the outreach and education portion of the developing **GCOOS Integrated Water Quality Network** and is being structured to accommodate data and information acquired by volunteer monitoring networks throughout the Gulf of Mexico region.

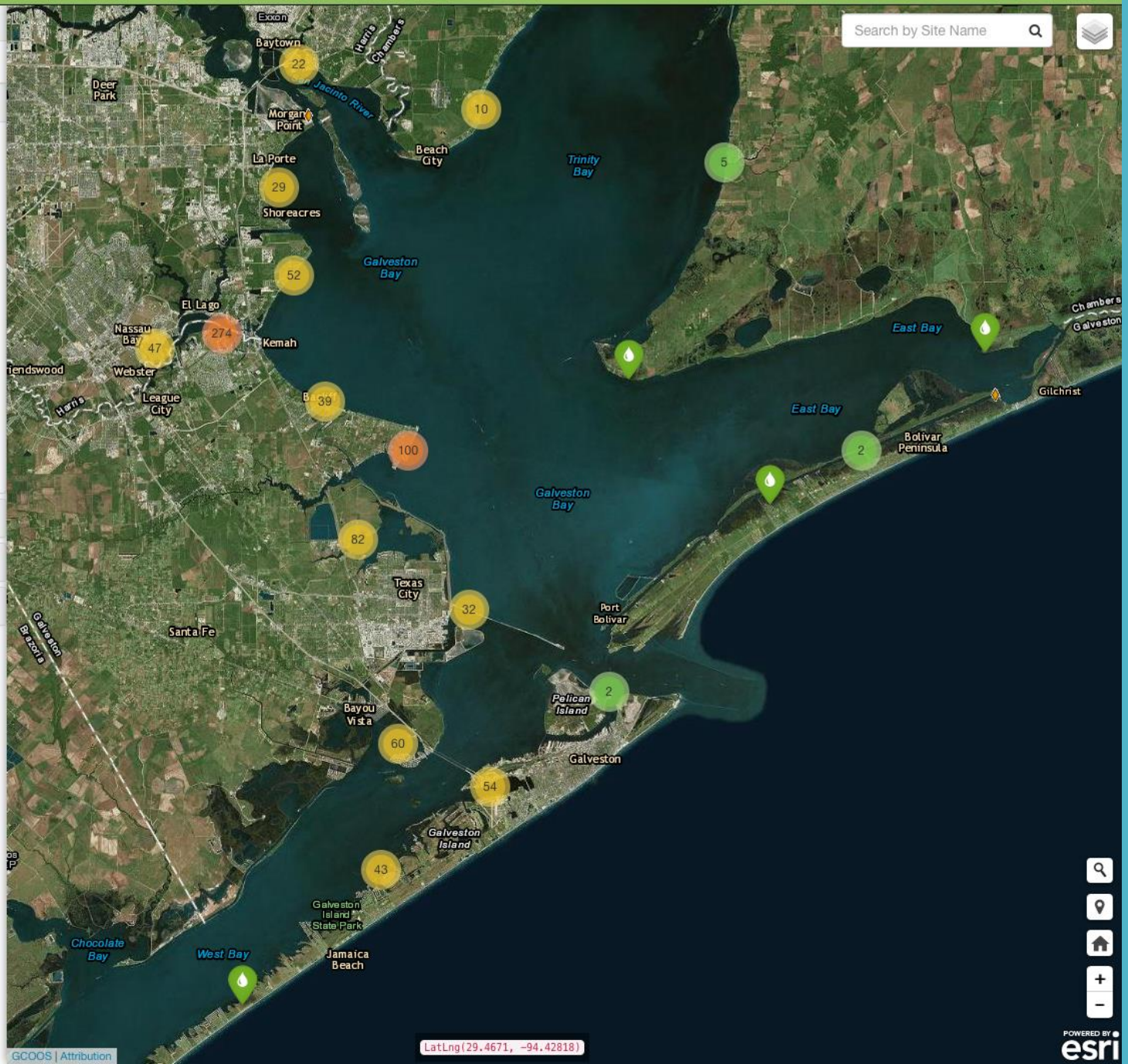
GCOOS currently has a cross-regional water quality collaboration with **Florida Aquarium**, **Nature's Academy (FL)** and **the Galveston Bay Foundation (TX)**.

2. What can you find?

3. How to use?

4. How to join?





Home | Observation Points

1. What is it?

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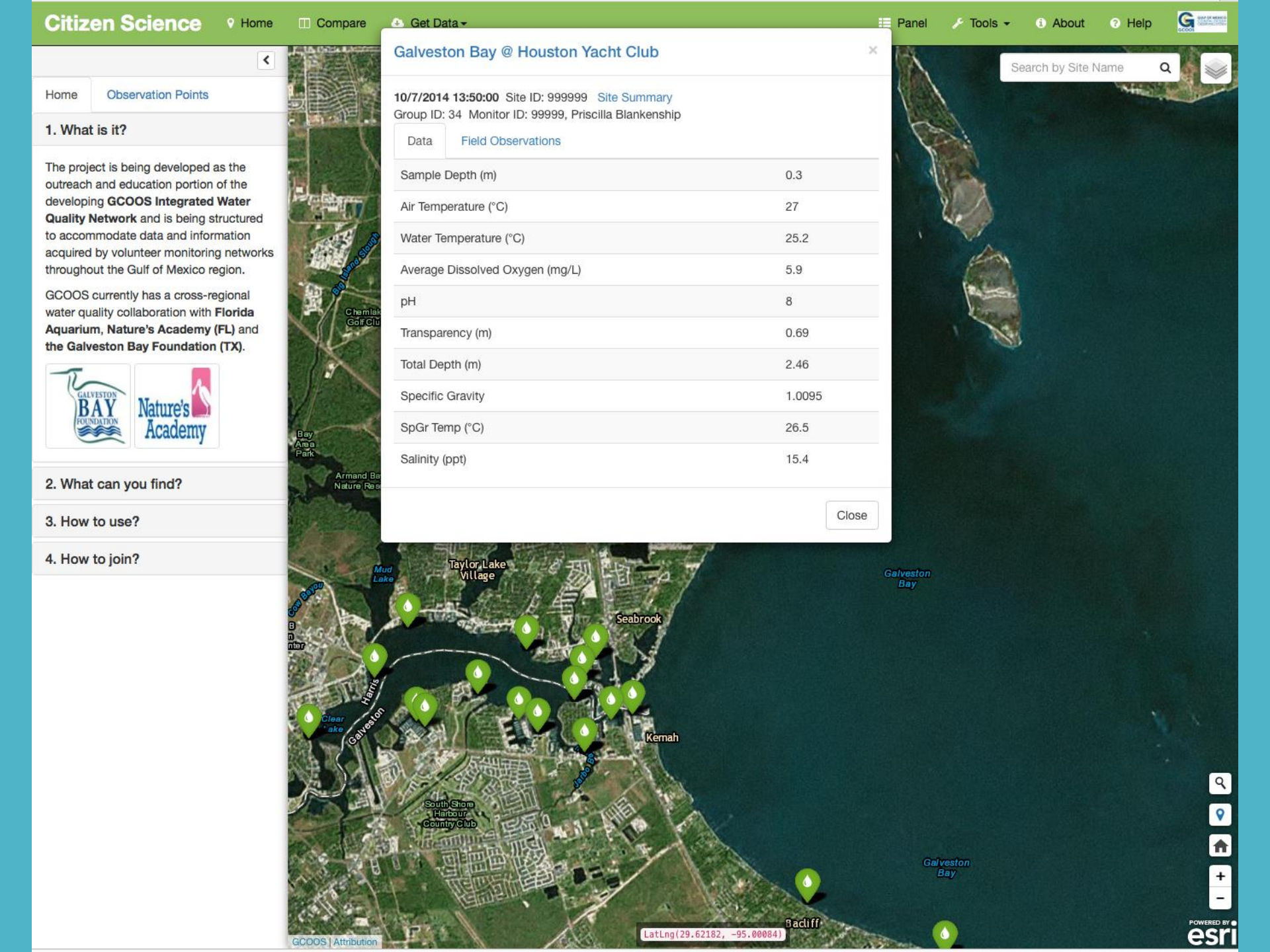
Citizen Science
Home
Compare
Get Data
Panel
Tools
About
Help
Home
Observation Points
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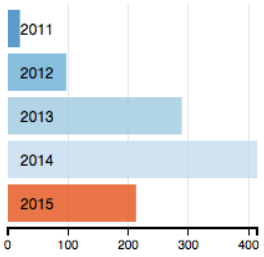
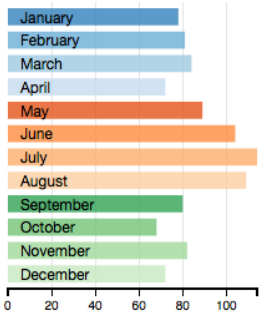
2. What can you find?
3. How to use?
4. How to join?
Galveston Bay @ Houston Yacht Club
10/7/2014 13:50:00 Site ID: 999999 Site Summary
Group ID: 34 Monitor ID: 99999, Priscilla Blankenship
Data
Field Observations
Sample Depth (m) 0.3
Air Temperature (°C) 27
Water Temperature (°C) 25.2
Average Dissolved Oxygen (mg/L) 5.9
pH 8
Transparency (m) 0.69
Total Depth (m) 2.46
Specific Gravity 1.0095
SpGr Temp (°C) 26.5
Salinity (ppt) 15.4
Close
Search by Site Name
Taylor Lake Village
Seabrook
Kemah
Galveston Bay
Bacliff
Clear Lake
Harris
Galveston
Mud Lake
Cow Bayou
Bay Area Park
South Shore Harbour Country Club
LatLng(29.62182, -95.00084)
GCOOS | Attribution
POWERED BY esri

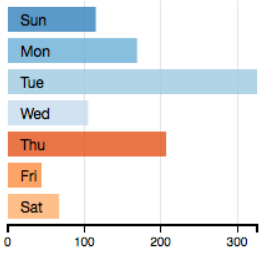
Year



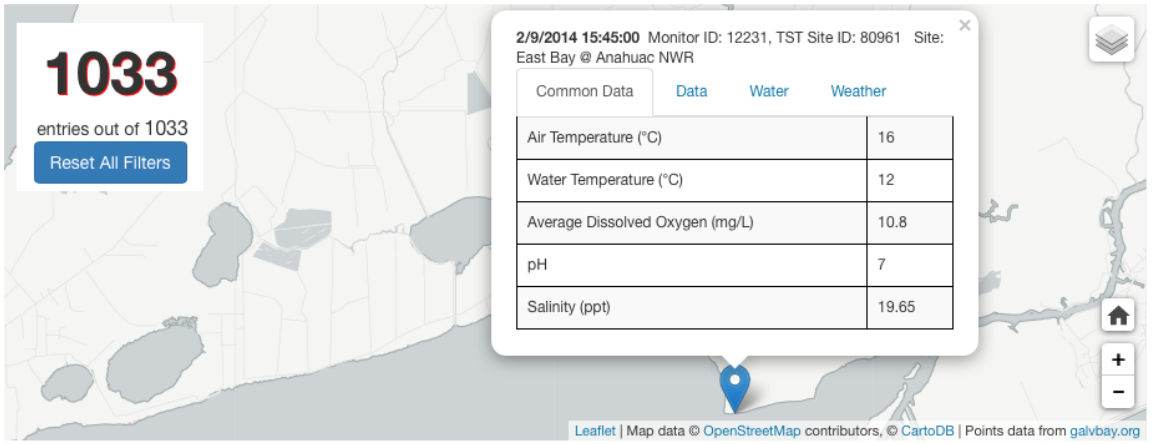
Month



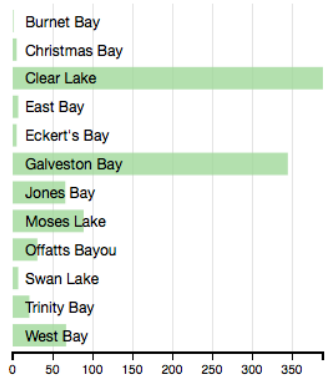
Sampling Day



Galveston Bay Foundation Monitoring Points

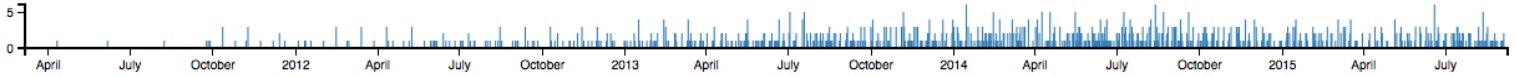


Area



Click to select Site(s)

Timeline Filter



Click to select time range

Additional Filter

Data Table (It shows different entries based on filters)

Show 10 entries

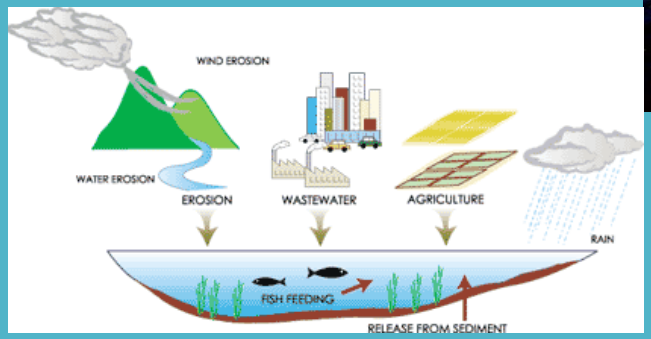
Search:

Copy to clipboard | Save to CSV | Print | Show / hide columns

Date	Area	Air Temp (°C)	Water Temp (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (ppt)	Enterococcus
9/8/2015 1:10 pm	Clear Lake	33	33	8.2	8.7	2.4	10
9/8/2015 1:00 pm	Clear Lake	31	30	3.4	7.5	1.5	10
9/3/2015 8:07 am	Clear Lake	25	27	7.2	8.5	8.3	31
9/3/2015 7:13 am	Clear Lake	25	26	6.7	8.5	9.2	31
9/2/2015 1:35 pm	Galveston Bay	26.5	27.5	5	8.5	16.6	

Hypoxia Nutrient Decision Support System

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



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GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

HYPOXIA - NUTRIENTS

Assets and Inventory | Interactive Access | WAF & Direct Access | Tools and Administration

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.
Variable: Chlorophyll	55,889	Chlorophyll-a concentration (mg L-1).
Variable: Dissolved Oxygen	785,554	Dissolved oxygen concentration (mg L-1).
Variable: Enterococcus	244,727	Enterococcus bacteria (counts).
Variable: Fecal coliform	155,654	Fecal coliform bacteria (counts).
Variable: Nitrogen	44,086	Nitrogen (nitrite, nitrate, ammonia and organic nitrogen) concentration (mg L-1) as N.
Variable: pH	6,381,872	Measure of the acidity or basicity of a water sample.
Variable: Phosphorus	107,304	Dissolved Total Phosphorus concentration (mg L-1).
Variable: Salinity	5,937,533	Measure of salt content following UNESCO standards.
Variable: Water temperature	6,146,860	In situ water temperature measured in degrees Celsius.
Variable: Silicate	47,767	Silicate concentration (uM L-1).
Total observation records	**19,907,246**	

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.

Direct Access: Assets/Inventory

The 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
- To list all stations contributing data to the portal:http://nutrients.gcoos.org/get_data.php?assets=stations

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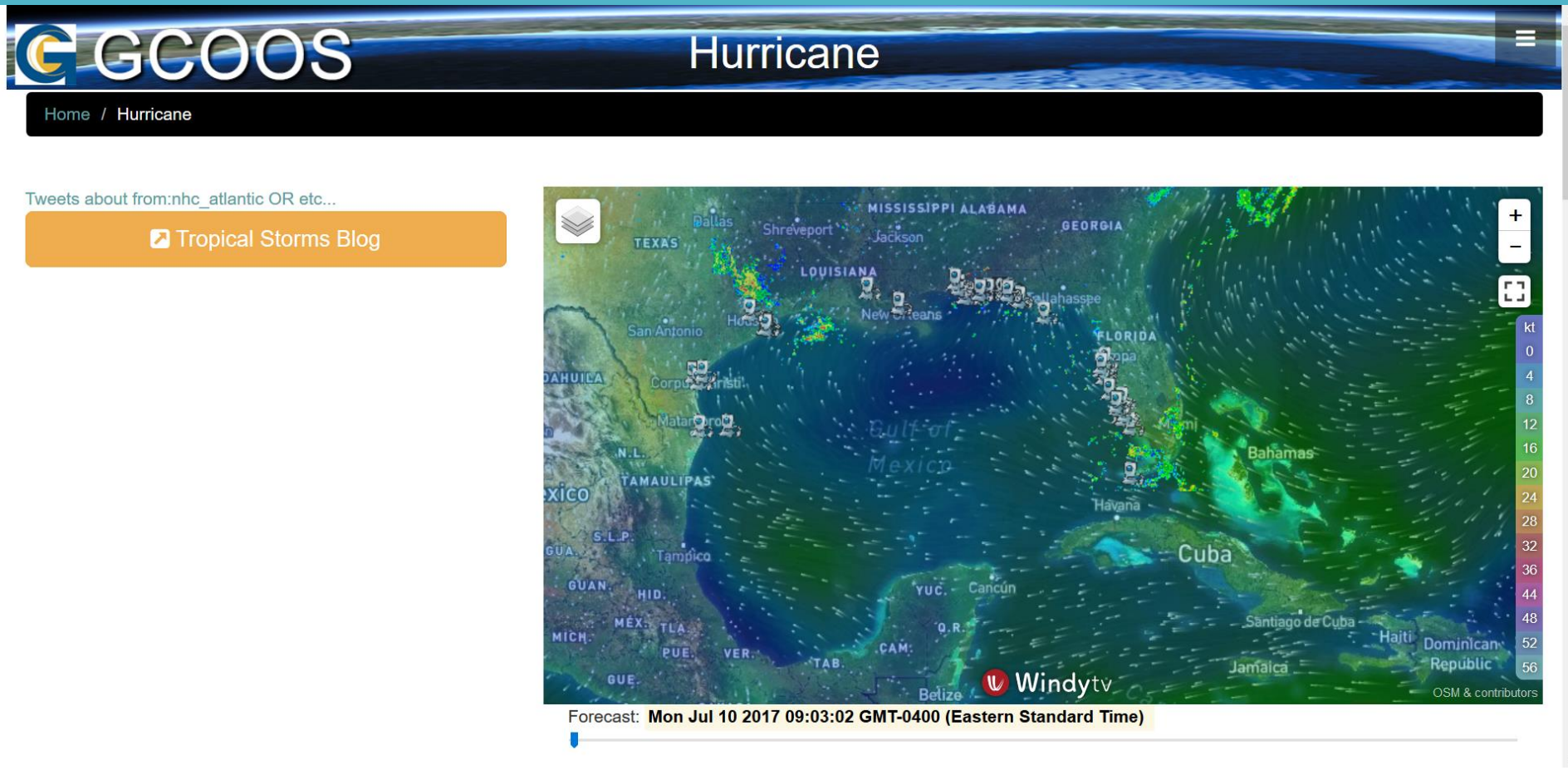
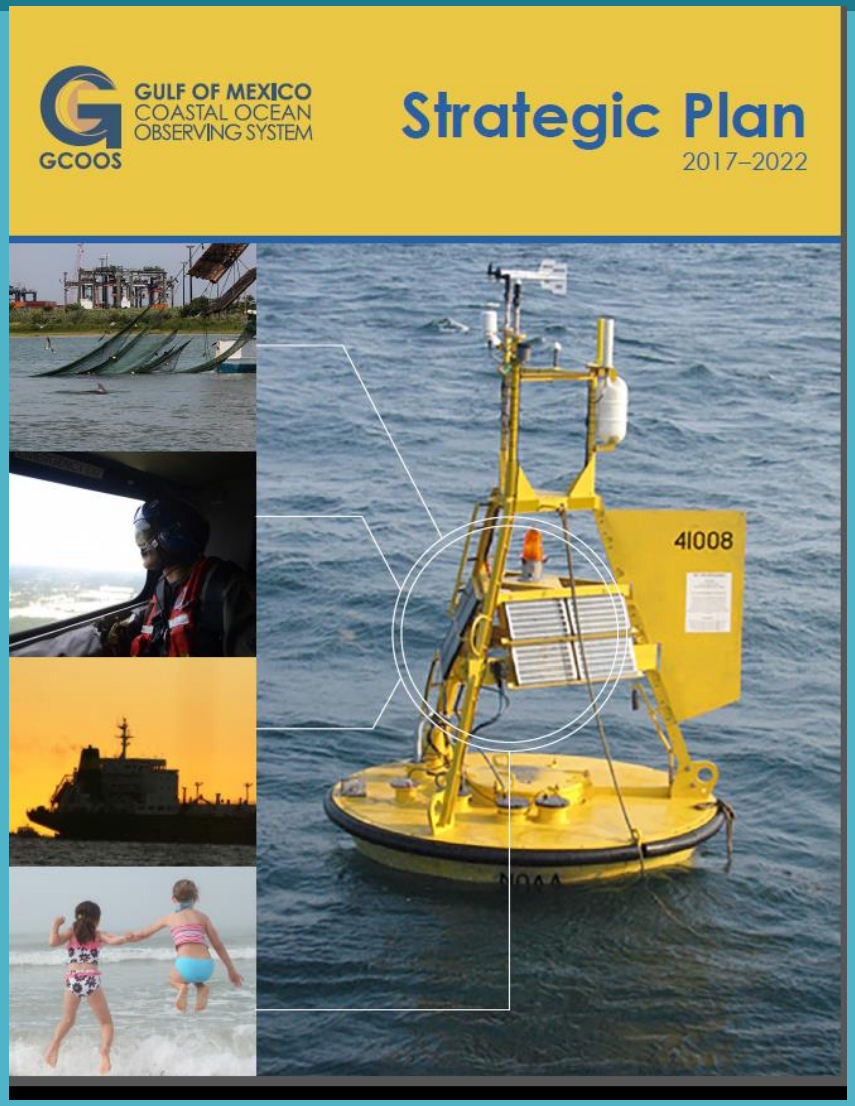


http://products.gcoos.org/en/hurricane/

2016 First Strategic Plan

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



GCOOS

IOOS
Integrated Ocean
Observing System

In Summary

- GCOOS is the regional association for observing in the Gulf of Mexico
- Our data portal takes in real time and near real time data from a wide variety of providers
- Our data product developers can manage physical, chemical and biologic data sets and display in a variety of maps, graphs, and tables to foster data synthesis
- You do they research- let us do your data management!

GCOOS

IOOS Integrated Ocean Observing System

Join us!

Membership is free!

Be a part of a community committed to building a robust ocean observing system for our Gulf.

Contact: Barb.Kirkpatrick@gcoos.org

If you have data manangement needs……call us!

Barb.Kirkpatrick@gcoos.org
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