GCOOS Members Meeting
November 8, 2024

Lightning Talks

GCOOS GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

IOOS Integrated Ocean Observing System

NATIONAL ACADEMIES Sciences Engineering Medicine

GULF RESEARCH PROGRAM

Science Policy Fellow at GCOOS

Dr. Renata Kamakura

Urban Heat Waves

Emily Cooley

HAB Detection

Nick Gagliano

Sofar Ocean

Jerad King

Erddap2agol tool

Dr. Kevin Xu

HF Radar Systems

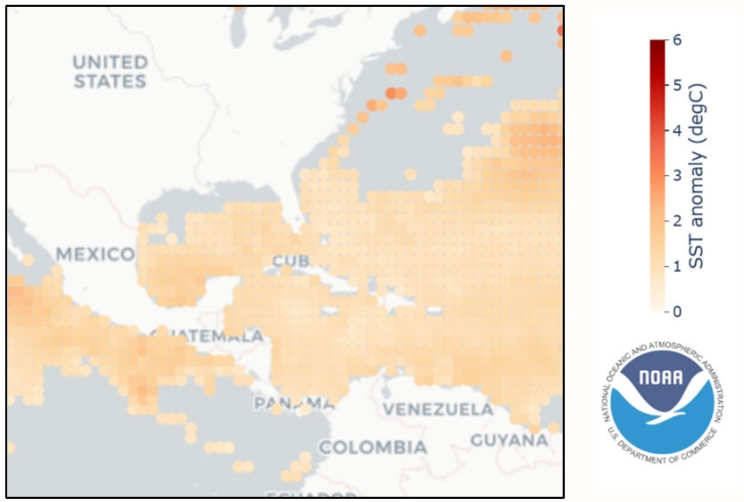
Dr. De'Marcus Robinson

Ocean Biogeochemistry

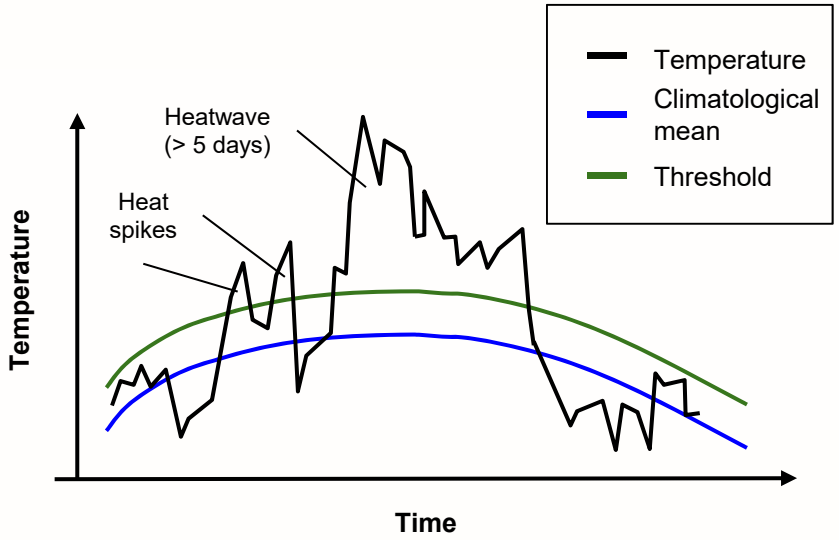
Marine Heatwaves Project

Renata Poulton Kamakura, Ph.D.
NAS Science Policy Fellow ’24-25, GCOOS
renata.kamakura@gcoos.org

Marine heatwaves are periods of elevated ocean temperatures



Unusually high sea-surface temperatures in the Gulf of Mexico in September 2024, from NOAA OISSTv2

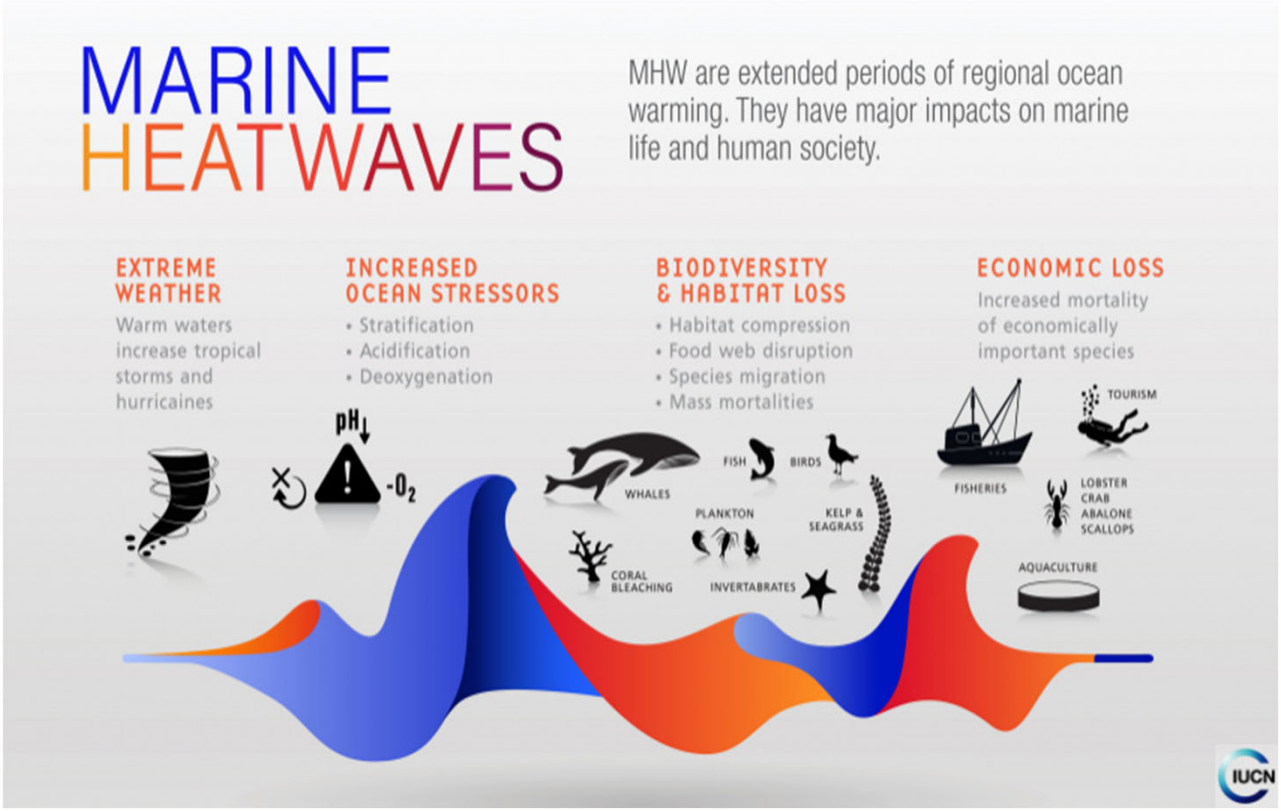


Adapted from marineheatwaves.org

GCOOS GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

IOOS Integrated Ocean Observing System

Marine heatwaves impact marine resources, ecosystems, and coastal communities



GCOOS GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

IOOS Integrated Ocean Observing System

GCOOS is collaborating with regional partners to:

- Develop framework to identify the impacts of MHWs on fisheries, coastal ecosystems, and coastal climates
- Use climate models to quantify the relationship between marine heatwave intensity and coastal urban climates (starting with Houston, TX)
- [over 2 years] Develop a system to detect Gulf of Mexico marine heatwaves in near real time based on in-situ sensors
- Collaborate with other regional associations (CARICOOS, SECOORA), researchers, and local groups to expand our understanding of MHW impacts in the southeastern U.S. and Caribbean

GCOOS GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

IOOS Integrated Ocean Observing System

Spotter with Smart Mooring

- Wave & Wave Spectra
- Wind (Derived)
- Sea Surface Temperature
- Atmospheric Pressure

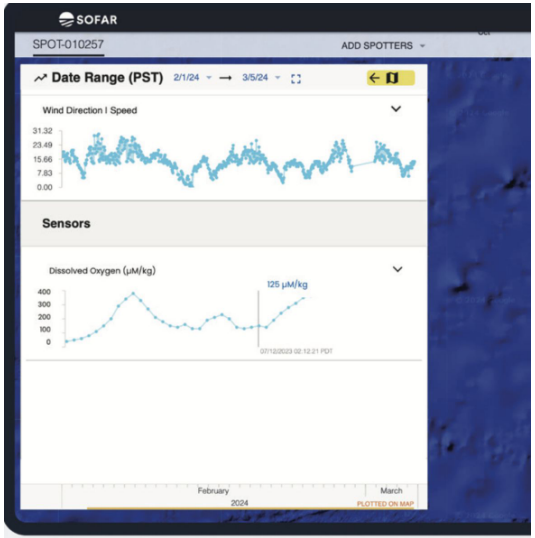
- Temperature
- Pressure (Water Level)
- Current
- Development Kit

Sofar Ocean

Available for Pre-Sale

Spotter Oxygen

Ultra-low power consumption and anti-fouling wiper ensure continuous, long-term performance. Compact size enables integration of up to three payloads per Smart Mooring for water column profiling.



Payload	PME Dissolved Oxygen Sensor	
Dissolved Oxygen	Accuracy	±5%
	Resolution	0.001 mg/L
	Range	0-387 µM Concentration, 0 to 150% oxygen saturation
Temperature	Accuracy	±0.1°C
	Resolution	0.001° C
	Range	0°C - 35°C
Data Outputs	Measured:	
		Dissolved O2 concentration
		Temperature
	Computed:	
		Dissolved O2 concentration (salinity compensated, µmol/L)*
		Dissolved O2 saturation (%)
Operating Temperature	-5° to 30°C	

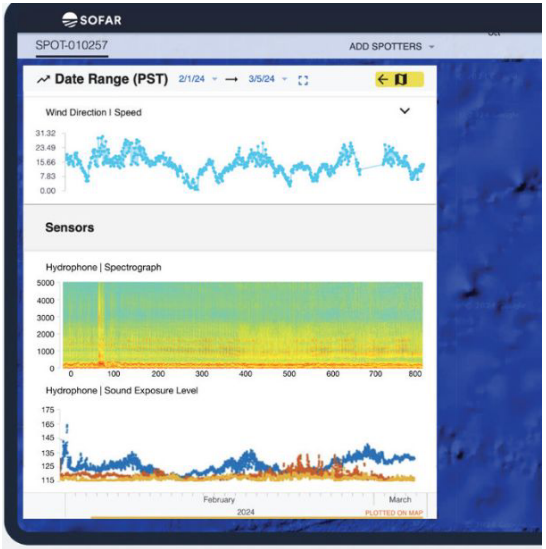
**Requires salinity measurements to be provided*

Sofar Ocean

Available for Pre-Sale

Spotter Sound

Flexible configuration enables continuous characterization of the soundscape throughout the water column and temporal comparisons across multiple payloads and systems.



Payload	Applied Ocean Science Acoustic Recorder Sensor Technology SQ0017 Hydrophone	
	Frequency	18 Hz - 25 kHz
	Sensitivity	-203 dB re 1V/µPa
	Self Noise	<31 dB re 1 µPa/√Hz
	Directional Response	Omni-Directional
	Collection Modes	Continuous Duty Cycling Epoch/Trigger Arrays
	Data Outputs	**Formats:** Waveform Spectral Event **Computed:** Sound Pressure Level (SPL) Sound Exposure Level (SEL)
	Operating Temperature	-5° to 30°C

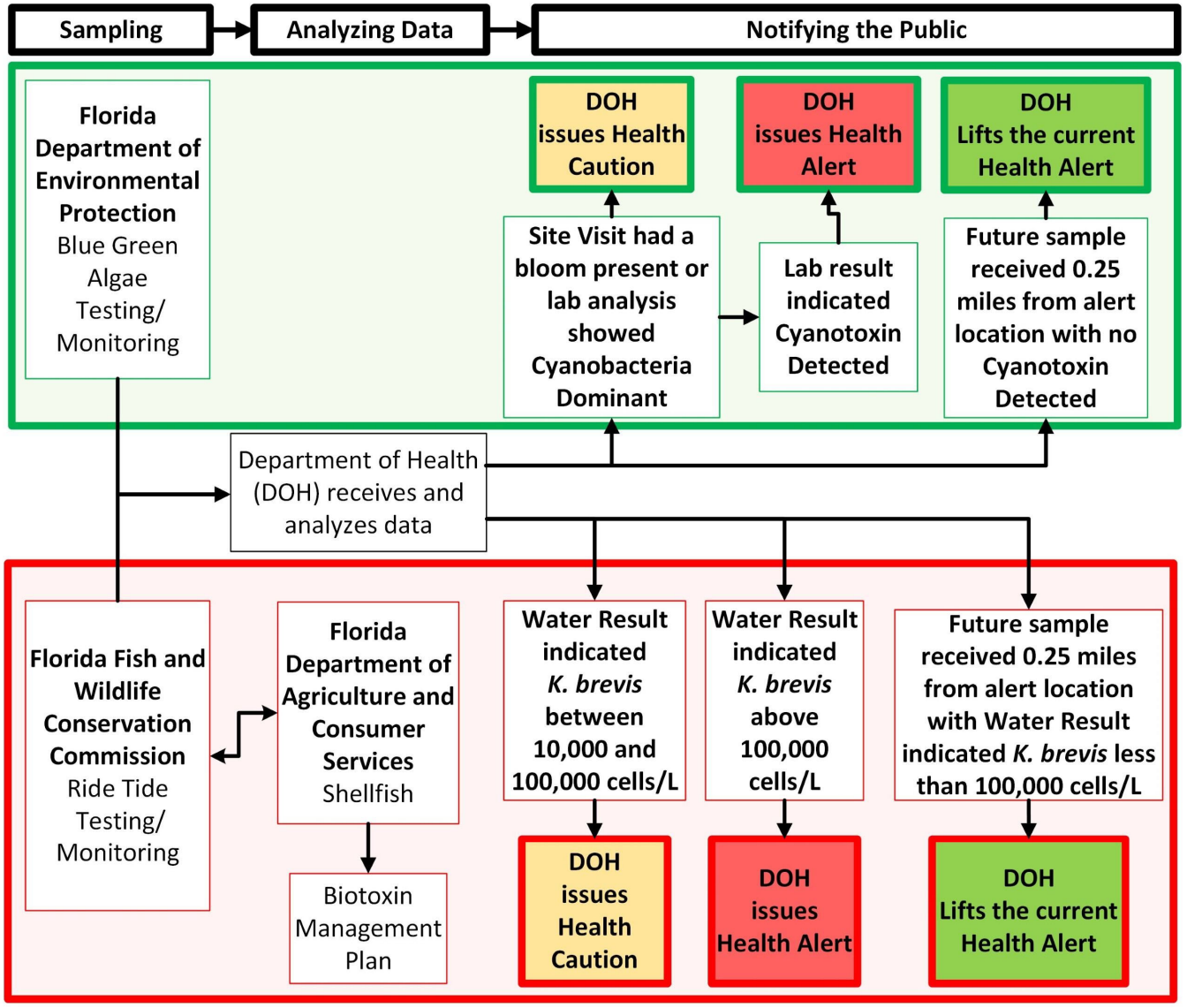
Sofar Ocean

Florida Department of Health

Multi-Agency HAB Monitoring in Florida

November 8, 2024

Multi-Agency HAB Monitoring in Florida



Florida HEALTH

Contact Information

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ERDDAP2AGOL

A data pipeline for creating and managing ERDDAP data on ArcGIS Online

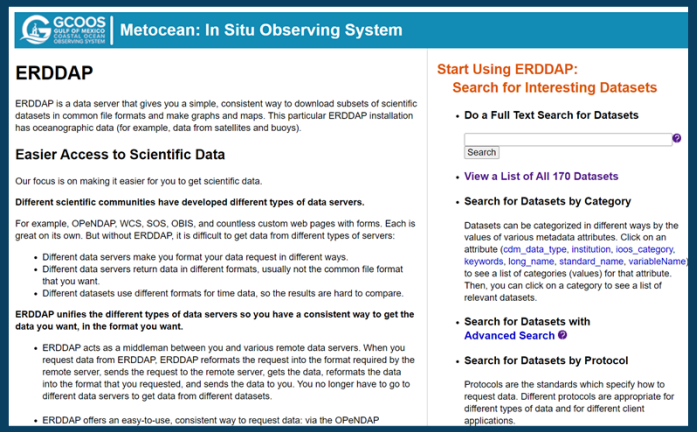
GCOOS Fall Meeting Lightning Talk

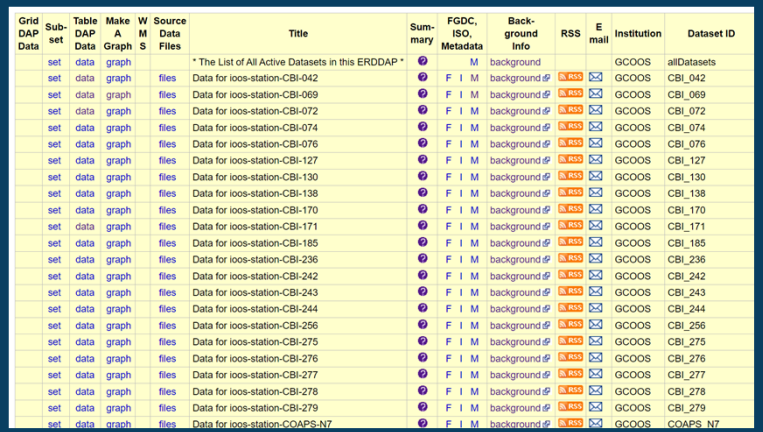
November 8th, 2024

Jerad King
GCOOS DMAC
GIS Developer & Manager

ERDDAP

- ERDDAP (Environmental Research Division Data Access Program).
  - Open source -> https://github.com/ERDDAP/erddap
- A data service that standardizes access to oceanographic and atmospheric datasets.
- Data requested on ERDDAP can be requested in a variety of common file types.
  - Data is reformatted from the source type to the requested type.





Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	WMS	Source Data Files	Title	Sum-mary	FGDC, ISO, Metadata	Back-ground Info	RSS	E mail	Institution	Dataset ID
	set	data	graph			* The List of All Active Datasets in this ERDDAP *		M	background			GCOOS	allDatasets
	set	data	graph		files	Data for ioos-station-CBI-042		F I M	background	RSS		GCOOS	CBI_042
	set	data	graph		files	Data for ioos-station-CBI-069		F I M	background	RSS		GCOOS	CBI_069
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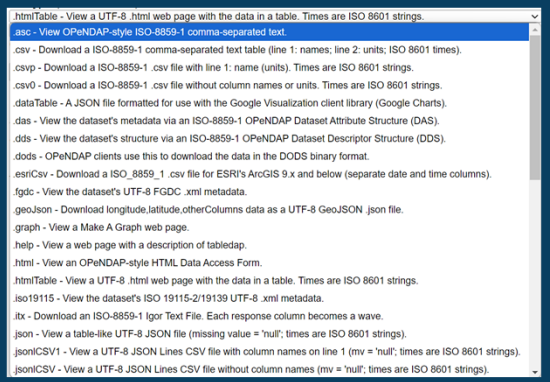
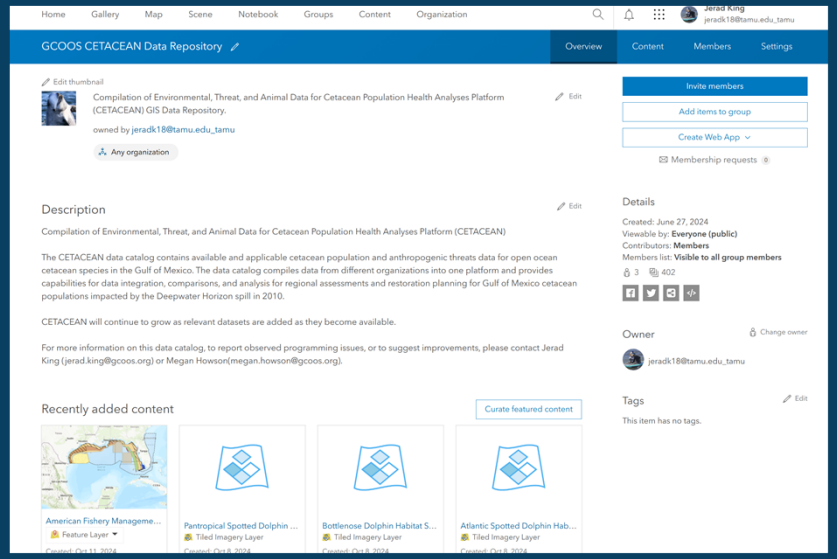
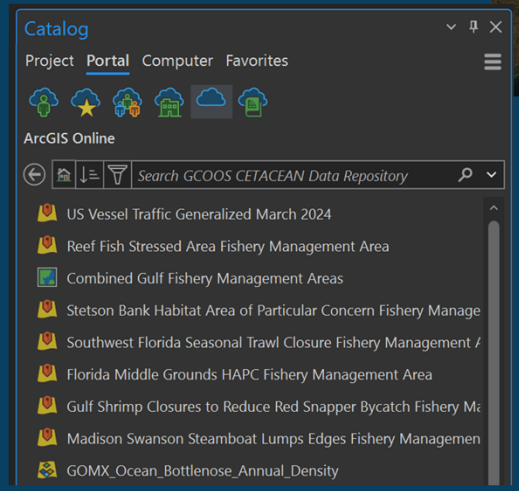
	set	data	graph		files	Data for ioos-station-COAPS-N7		F I M	background	RSS		GCOOS	COAPS_N7

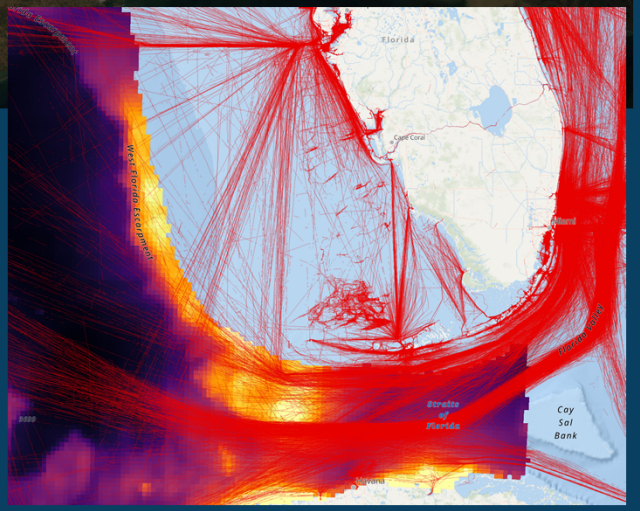


ArcGIS Online

- Where GCOOS serves GIS data.
  - Where the CETACEAN Hub and its data are hosted.
- Data on ArcGIS Online can easily be connected to any application within the Esri ecosystem

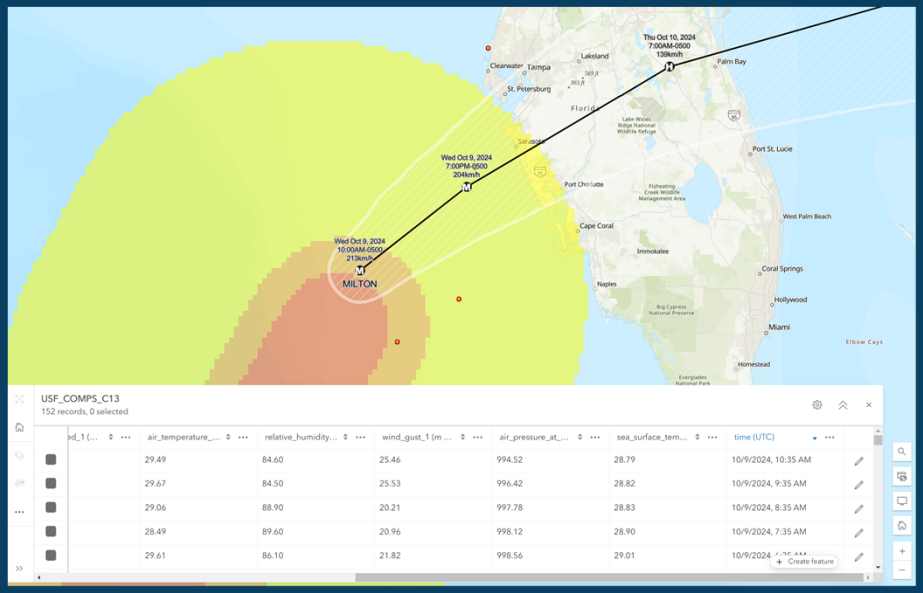


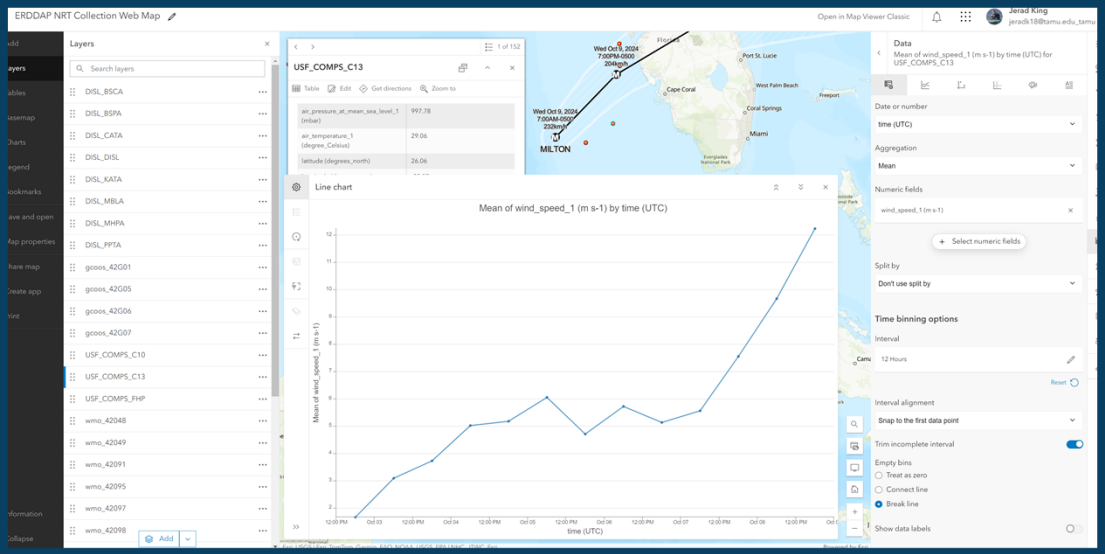




ERDDAP on ArcGIS Online

- By leveraging the same metadata information that ERDDAP uses to serve data in a variety of formats, the erddap2agol Python package creates Hosted Feature Layers from ERDDAP Data.
  - Just specify datasetid and desired ERDDAP service.

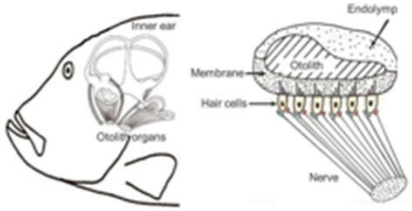




De’Marcus Robinson, Ph.D.

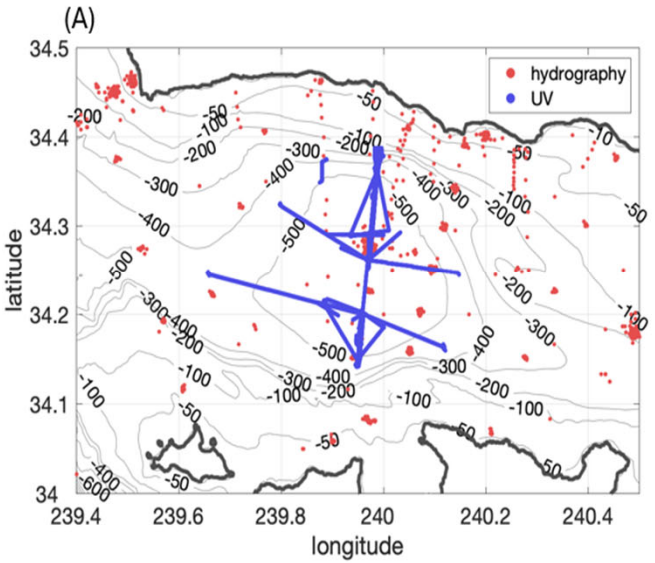
NOAA CCME Postdoctoral Research Associate

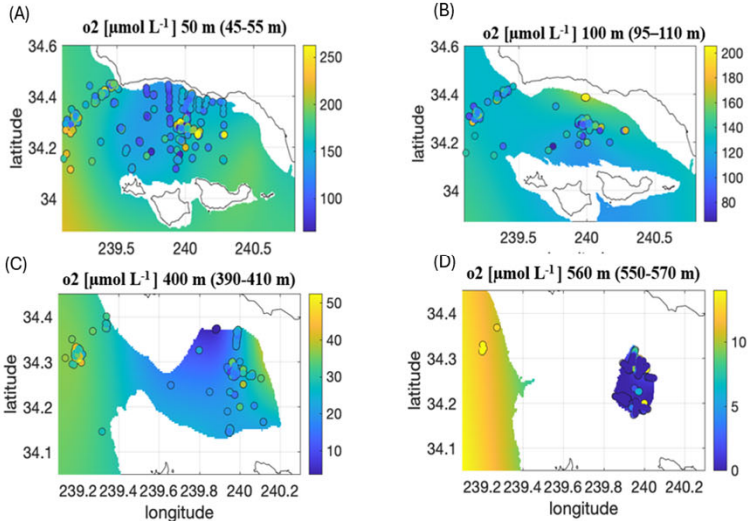
Research interest: Ocean Biogeochemistry, Geomicrobiology, geochemistry, Carbonate geochemistry, ocean policy

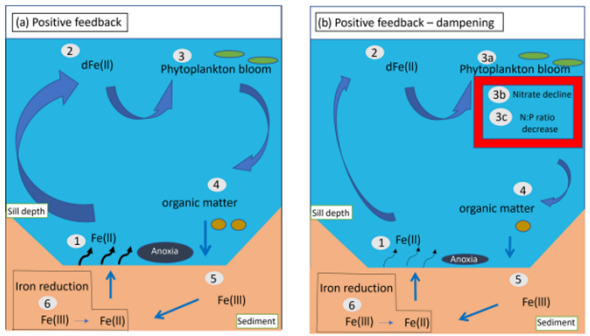


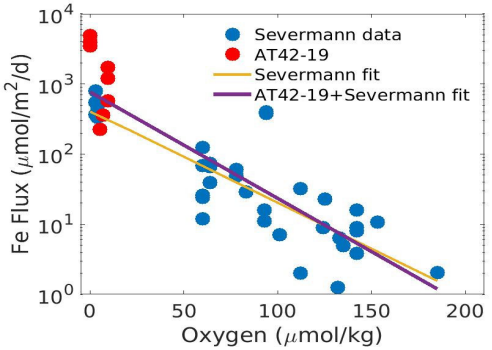
NOAA CCME
NOAA Center for Coastal & Marine Ecosystems

Ocean Deoxygenation and the impact on ocean biogeochemistry









Marine Genetic Resource

How would deoxygenation effect marine genetic resource?

- Marine biodiversity changes
  - Dominated by organism that can tolerate low oxygen
- Habitat compression

Nutrients, Temperature, Ocean Physic

Areas Based Management

What deoxygenation effect?

- Changes Marine biodiversity
- Fisheries management
- Subsistence Fishing

Area of Concern

- Marine Protected Area
- Marine Sanctuaries
- National Heritage Sites

Deoxygenation

Environmental Impact Assessment

How might oxygen conditions change?

- Oxic
- Hypoxic
- Anoxic

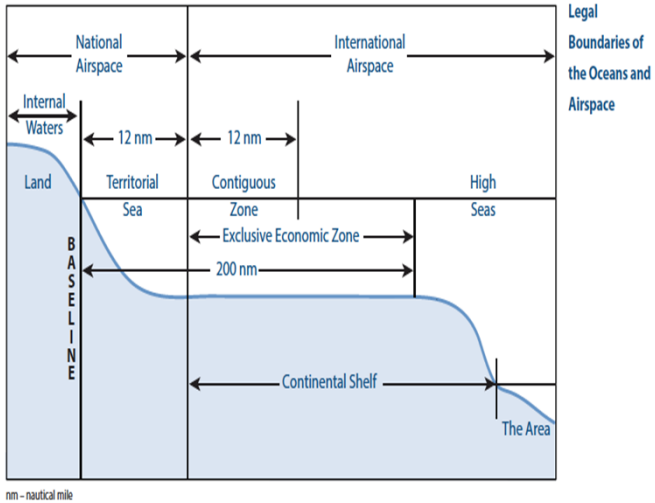
Legend

- BBNJ
- Deoxygenation and the causes
- Intersecting BBNJ and Deoxygenation

Compacity Building and Transfer of Marine Technology

What are the technology needs? Examples

- Argo Float BGC
- Optode Sensors
- Wrinkle Titration
- AUV/ROV
- Long-term time series



CLOSING THE GAP: LSU RECEIVES $5M FUNDING TO BUILD HIGH FREQUENCY RADAR SYSTEMS ON THE COAST

Principal Investigators:

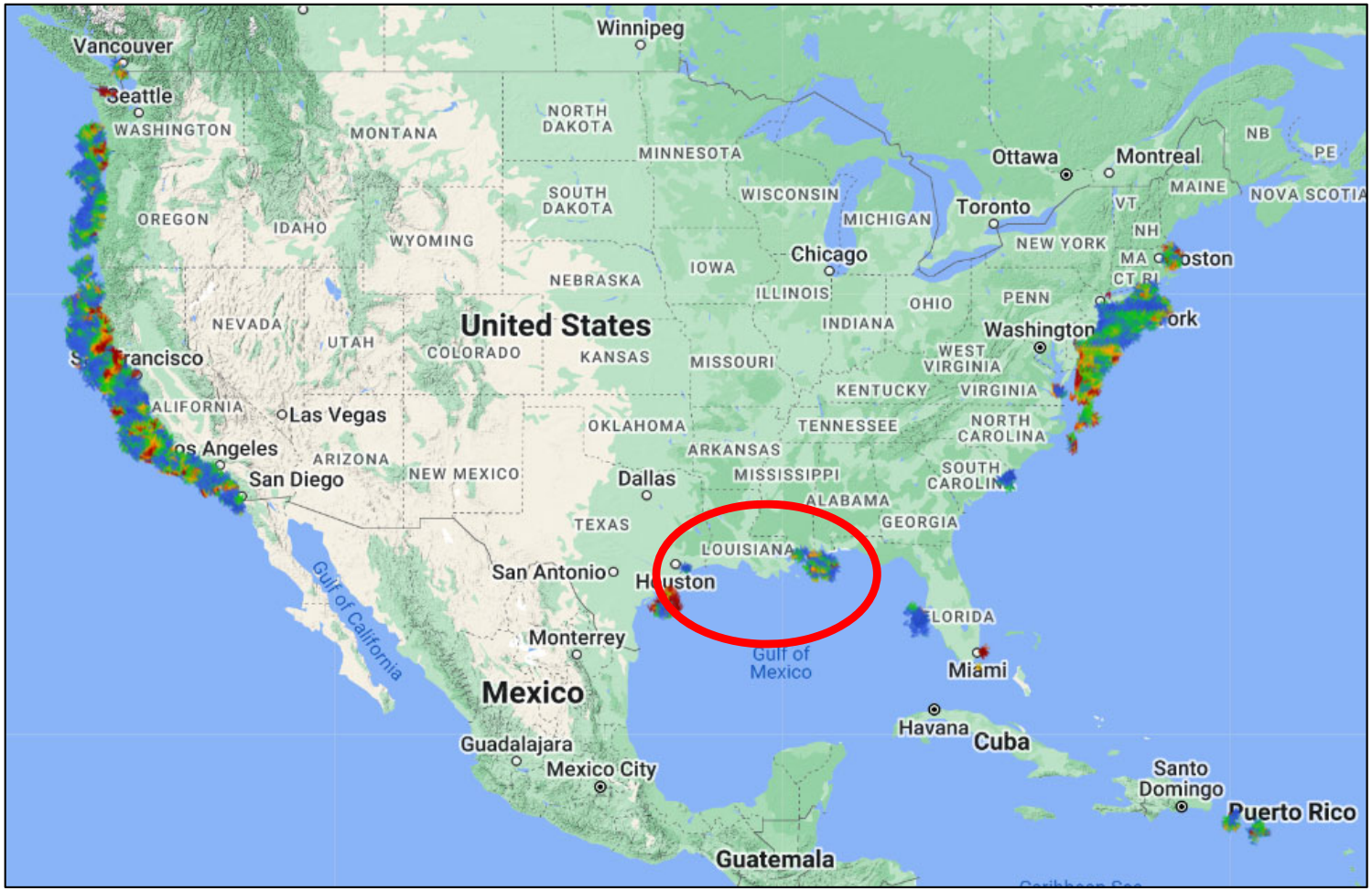
Dr. Kehui Xu, Louisiana State University
Dr. Chunyan Li, Louisiana State University
Dr. Samuel J. Bentley, Louisiana State University
Dr. Paul Miller, Louisiana State University
Dr. Z. George Xue, Louisiana State University

Dr. Steven F. DiMarco, Texas A&M University, College Station
Dr. Jorge Brenner, Gulf of Mexico Coastal Ocean Observing System, Texas A&M University, College Station

A CODAR HF radar antenna similar to the ones that will be used on the Louisiana coastline.

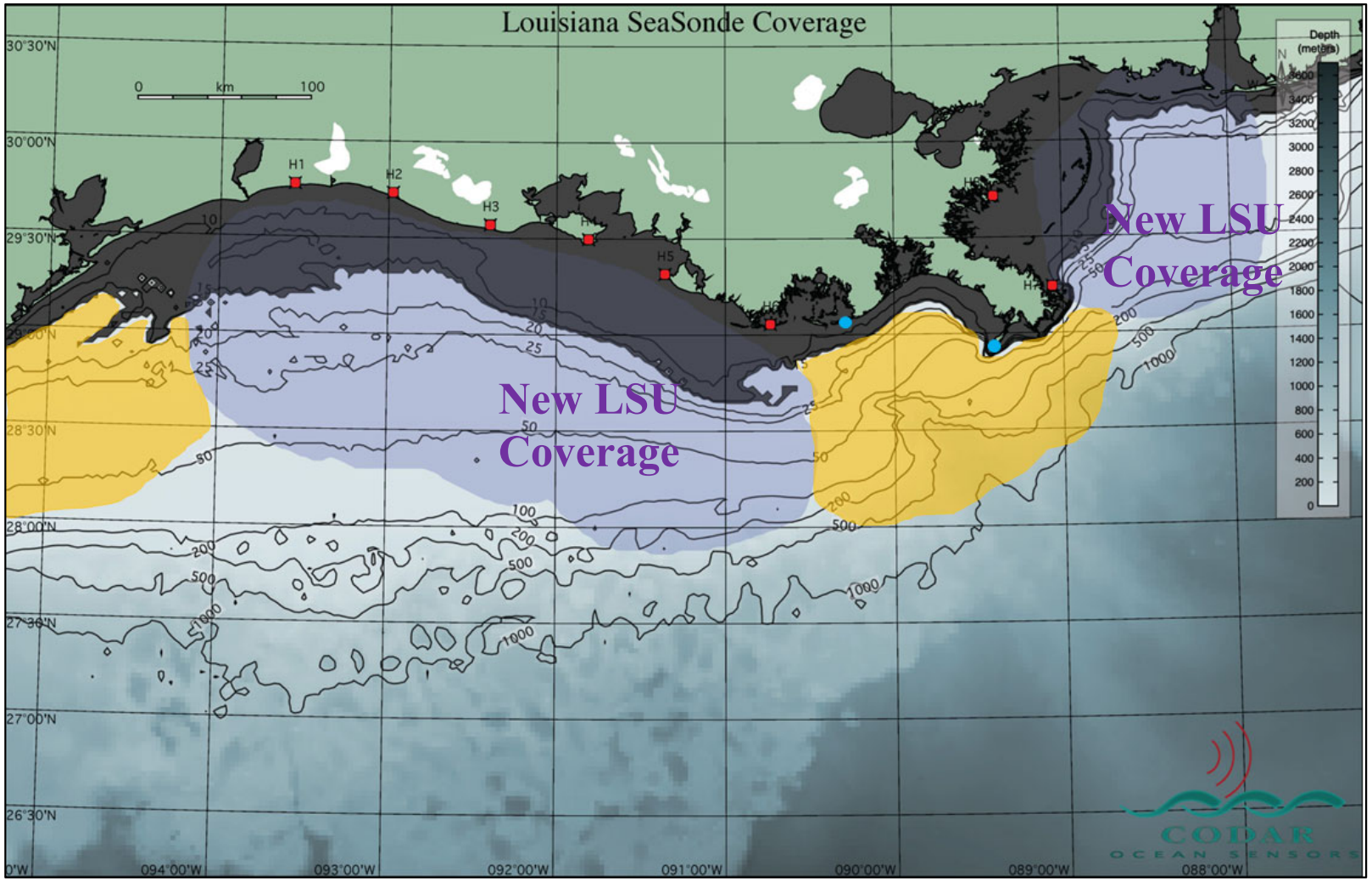
– Photo credit: Laura Pederson, CODAR

LARGE RADAR GAP IN LOUISIANA COAST



Map of the US showing current coverage of HFRs as of 5/10/2023

POTENTIAL NEW LSU RADAR COVERAGE



From CODAR and Dr. Chunyan Li

Table 1. *Timeline of proposed work*

Tasks	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Acquisition of equipment	x	x			
Number of operating radars			2	4	8
Training of HFRs	x	x			
Site visit, finalization of sites, and fine-tuning bandwidth; Visits between/among TAMU, LSU, Fugro and USM	x	x	x	x	
Fabrication of enclosure for electronics	x	x	x	x	
Installation of HFRs and antennas	x	x	x	x	x
Test runs	x	x	x	x	
Research training, user workshop for use of HFR data	x	x	x	x	x
Research training, use of HFR for oceanography, coastal meteorology, and data analysis class	x	x	x	x	x
Research training, use of HFR for student projects, outreach activities	x	x	x	x	x
Seeking external funding for continued operation			x	x	x
Data management	x	x	x	x	x
Radar Operator Meeting and Radio wave working group meetings	x	x	x	x	x
Workshop and conference meetings	x	x	x	x	x
Project reports	x	x	x	x	x