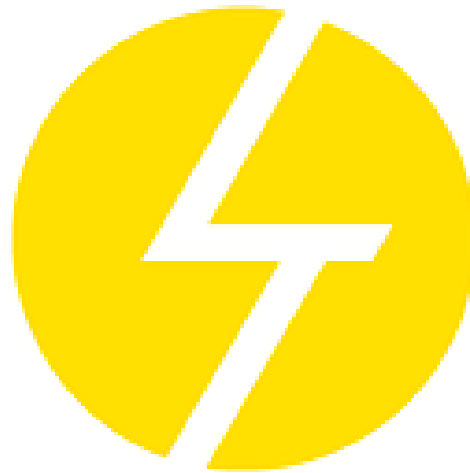


GCOOS Members Meeting

November 8, 2024



Lightning Talks

NATIONAL *Sciences*
ACADEMIES *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

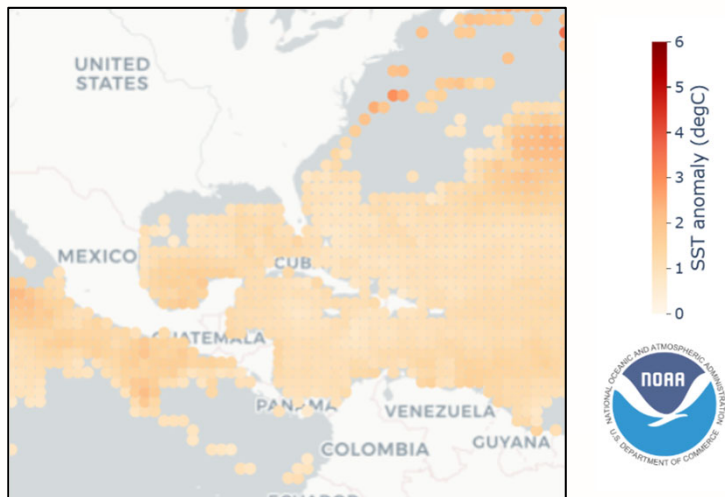


Marine Heatwaves Project

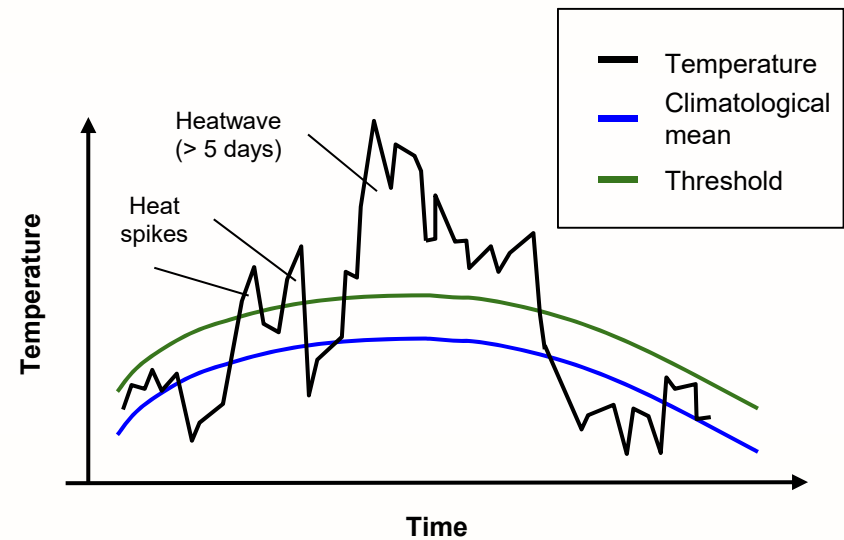
Renata Poulton Kamakura, Ph.D.
NAS Science Policy Fellow '24-25, GCOOS
renata.kamakura@gcoos.org



Marine heatwaves are periods of elevated ocean temperatures

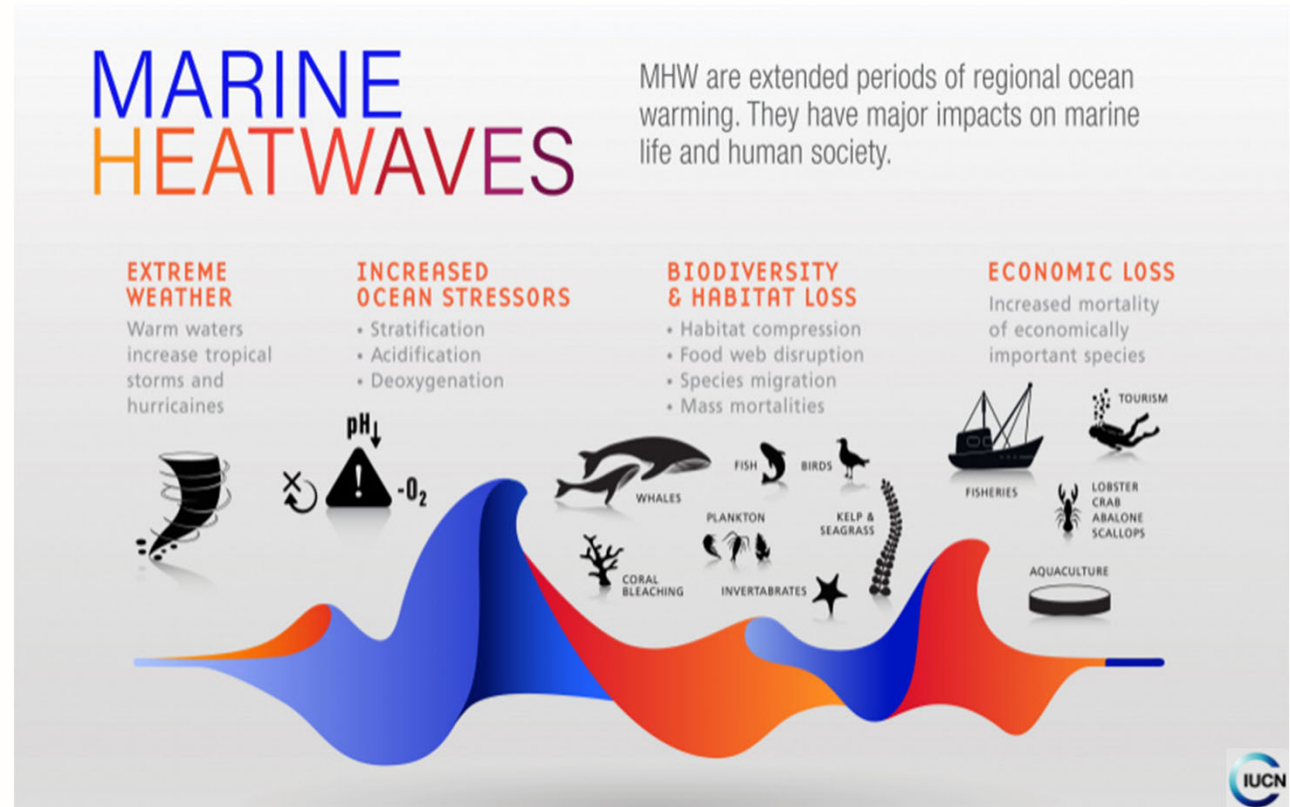


Unusually high sea-surface temperatures in the Gulf of Mexico in September 2024, from NOAA OISSTv2



Adapted from marineheatwaves.org

Marine heatwaves impact marine resources, ecosystems, and coastal communities



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



Spotter with Smart Mooring



Wave & Wave Spectra



Wind (Derived)



Sea Surface Temperature



Atmospheric Pressure



Temperature



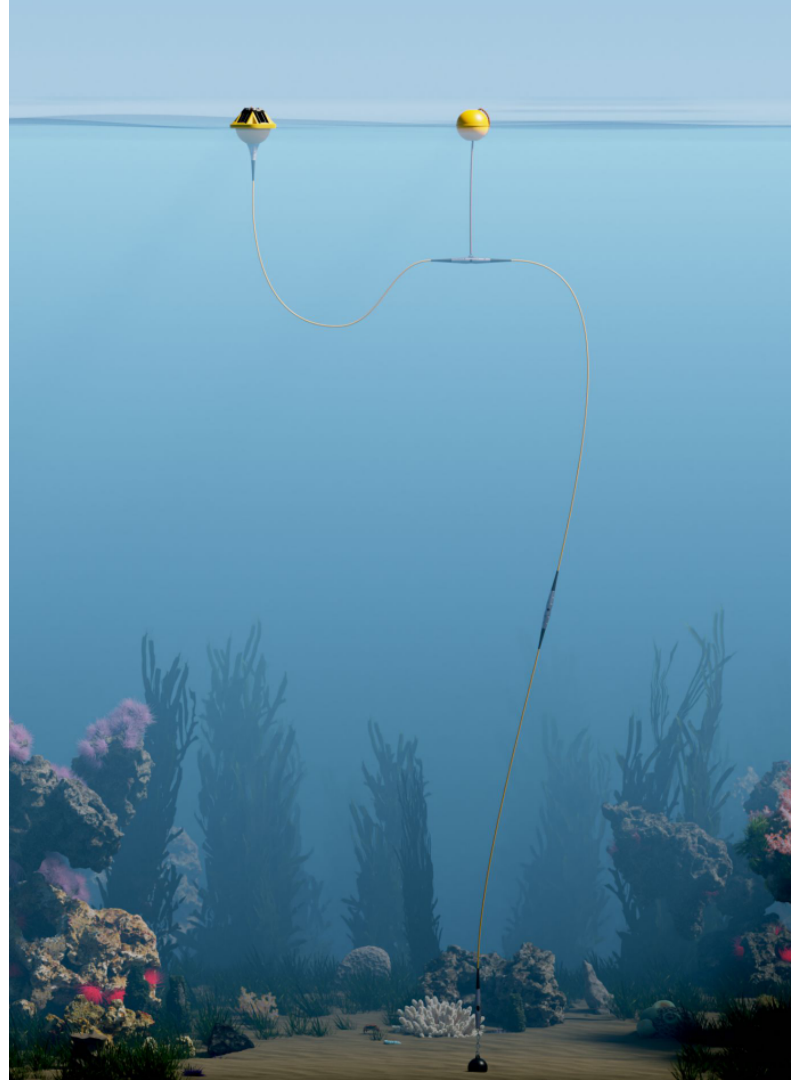
Pressure
(Water Level)



Current

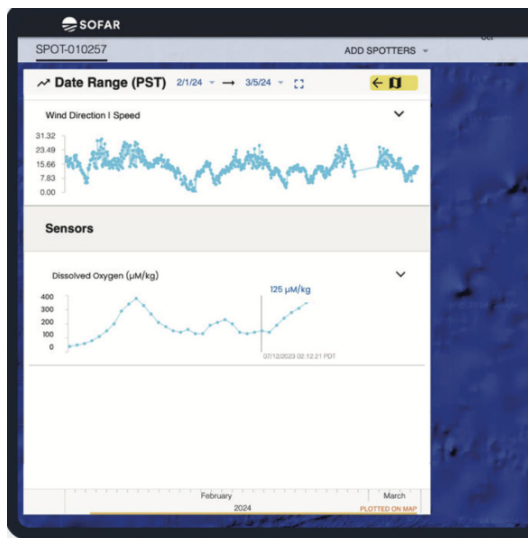


Development Kit



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.

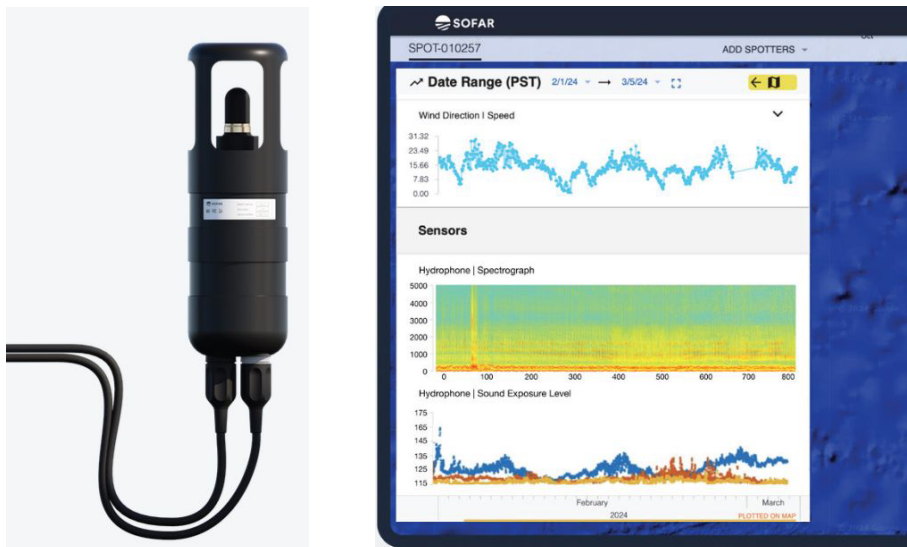


Payload	PME Dissolved Oxygen Sensor	
Dissolved Oxygen	Accuracy	$\pm 5\%$
	Resolution	0.001 mg/L
	Range	0-387 μM Concentration, 0 to 150% oxygen saturation
Temperature	Accuracy	$\pm 0.1^\circ\text{C}$
	Resolution	0.001 $^\circ\text{C}$
	Range	0 $^\circ\text{C}$ - 35 $^\circ\text{C}$
Data Outputs	Measured:	Dissolved O2 concentration Temperature
	Computed:	Dissolved O2 concentration (salinity compensated, $\mu\text{mol/L}$)* Dissolved O2 saturation (%)
	Operating Temperature	-5 $^\circ$ to 30 $^\circ\text{C}$

**Requires salinity measurements to be provided*

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/ μ Pa
Self Noise	<31 dB re 1 μ Pa/ \sqrt 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

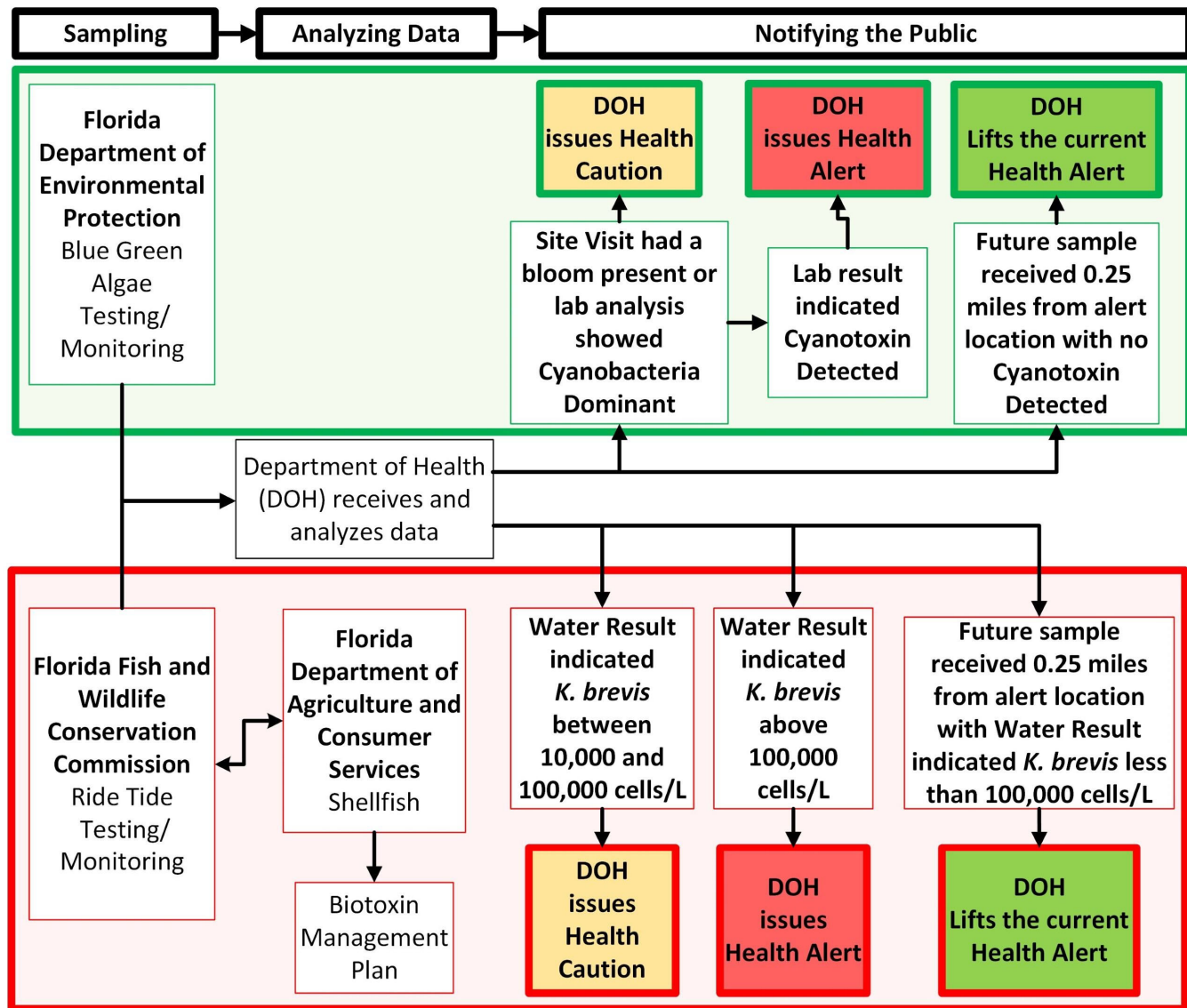


Florida Department of Health

Multi-Agency HAB Monitoring in Florida

November 8, 2024

Multi-Agency HAB Monitoring in Florida



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.

Metoccean: In Situ Observing System

ERDDAP

ERDDAP is a data server that gives you a simple, consistent way to download subsets of scientific datasets in common file formats and make graphs and maps. This particular ERDDAP installation has oceanographic data (for example, data from satellites and buoys).

Easier Access to Scientific Data

Our focus is on making it easier for you to get scientific data.

Different scientific communities have developed different types of data servers.

For example, OPeNDAP, WCS, SOS, OBIS, and countless custom web pages with forms. Each is great on its own. But without ERDDAP, it is difficult to get data from different types of servers:

- Different data servers make you format your data request in different ways.
- Different data servers return data in different formats, usually not the common file format that you want.
- Different datasets use different formats for time data, so the results are hard to compare.

ERDDAP unifies the different types of data servers so you have a consistent way to get the data you want, in the format you want.

- ERDDAP acts as a middleman between you and various remote data servers. When you request data from ERDDAP, ERDDAP reformats the request into the format required by the remote server, sends the request to the remote server, gets the data, reformats the data into the format that you requested, and sends the data to you. You no longer have to go to different data servers to get data from different datasets.
- ERDDAP offers an easy-to-use, consistent way to request data: via the OPeNDAP

Start Using ERDDAP:

Search for Interesting Datasets

- **Do a Full Text Search for Datasets**

- **View a List of All 170 Datasets**
- **Search for Datasets by Category**

Datasets can be categorized in different ways by the values of various metadata attributes. Click on an attribute (`cdm_data_type`, `institution`, `loos_category`, `keywords`, `long_name`, `standard_name`, `variableName`) to see a list of categories (values) for that attribute. Then, you can click on a category to see a list of relevant datasets.

- **Search for Datasets with Advanced Search**
- **Search for Datasets by Protocol**

Protocols are the standards which specify how to request data. Different protocols are appropriate for different types of data and for different client applications.

Grid DAP	Sub-set	Table DAP	Make A Graph	W M Data Files	Source S	Title	Summary	FGDC, ISO, Metadata	Back-ground Info	RSS	E mail	Institution	Dataset ID
	set	data	graph		files	* The List of All Active Datasets in this ERDDAP *		F I M	background			GCOOS	allDatasets
	set	data	graph		files	Data for loos-station-CBI-042		F I M	background	RSS	E mail	GCOOS	CBI_042
	set	data	graph		files	Data for loos-station-CBI-069		F I M	background	RSS	E mail	GCOOS	CBI_069
	set	data	graph		files	Data for loos-station-CBI-072		F I M	background	RSS	E mail	GCOOS	CBI_072
	set	data	graph		files	Data for loos-station-CBI-074		F I M	background	RSS	E mail	GCOOS	CBI_074
	set	data	graph		files	Data for loos-station-CBI-127		F I M	background	RSS	E mail	GCOOS	CBI_076
	set	data	graph		files	Data for loos-station-CBI-127		F I M	background	RSS	E mail	GCOOS	CBI_127
	set	data	graph		files	Data for loos-station-CBI-130		F I M	background	RSS	E mail	GCOOS	CBI_130
	set	data	graph		files	Data for loos-station-CBI-138		F I M	background	RSS	E mail	GCOOS	CBI_138
	set	data	graph		files	Data for loos-station-CBI-170		F I M	background	RSS	E mail	GCOOS	CBI_170
	set	data	graph		files	Data for loos-station-CBI-171		F I M	background	RSS	E mail	GCOOS	CBI_171
	set	data	graph		files	Data for loos-station-CBI-185		F I M	background	RSS	E mail	GCOOS	CBI_185
	set	data	graph		files	Data for loos-station-CBI-236		F I M	background	RSS	E mail	GCOOS	CBI_236
	set	data	graph		files	Data for loos-station-CBI-242		F I M	background	RSS	E mail	GCOOS	CBI_242
	set	data	graph		files	Data for loos-station-CBI-243		F I M	background	RSS	E mail	GCOOS	CBI_243
	set	data	graph		files	Data for loos-station-CBI-244		F I M	background	RSS	E mail	GCOOS	CBI_244
	set	data	graph		files	Data for loos-station-CBI-266		F I M	background	RSS	E mail	GCOOS	CBI_256
	set	data	graph		files	Data for loos-station-CBI-275		F I M	background	RSS	E mail	GCOOS	CBI_275
	set	data	graph		files	Data for loos-station-CBI-276		F I M	background	RSS	E mail	GCOOS	CBI_276
	set	data	graph		files	Data for loos-station-CBI-277		F I M	background	RSS	E mail	GCOOS	CBI_277
	set	data	graph		files	Data for loos-station-CBI-278		F I M	background	RSS	E mail	GCOOS	CBI_278
	set	data	graph		files	Data for loos-station-CBI-279		F I M	background	RSS	E mail	GCOOS	CBI_279
	set	data	graph		files	Data for loos-station-COAPS-N7		F I M	background	RSS	E mail	GCOOS	COAPS_N7

htmlTable - View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.

asc - View OPeNDAP-style ISO-8859-1 comma-separated text.

csv - Download a ISO-8859-1 comma-separated text table (line 1: names; line 2: units; ISO 8601 times).

csv0 - Download a ISO-8859-1 .csv file with line 1: name (units). Times are ISO 8601 strings.

csv0 - Download a ISO-8859-1 .csv file without column names or units. Times are ISO 8601 strings.

dataTable - A JSON file formatted for use with the Google Visualization client library (Google Charts).

das - View the dataset's metadata via an ISO-8859-1 OPeNDAP Dataset Attribute Structure (DAS).

dds - View the dataset's structure via an ISO-8859-1 OPeNDAP Dataset Descriptor Structure (DDS).

dds - OPeNDAP clients use this to download the data in the DODS binary format.

esriCsv - Download a ISO_8859_1 .csv file for ESRI's ArcGIS 9.x and below (separate date and time columns).

fgdc - View the dataset's UTF-8 FGDC .xml metadata.

geoJson - Download longitude,latitude,otherColumns data as a UTF-8 GeoJSON .json file.

graph - View a Make A Graph web page.

help - View a web page with a description of tabledap.

html - View an OPeNDAP-style HTML Data Access Form.

htmlTable - View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.

iso19115 - View the dataset's ISO 19115-2/19139 UTF-8 .xml metadata.

itx - Download an ISO-8859-1 Igor Text File. Each response column becomes a wave.

json - View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).

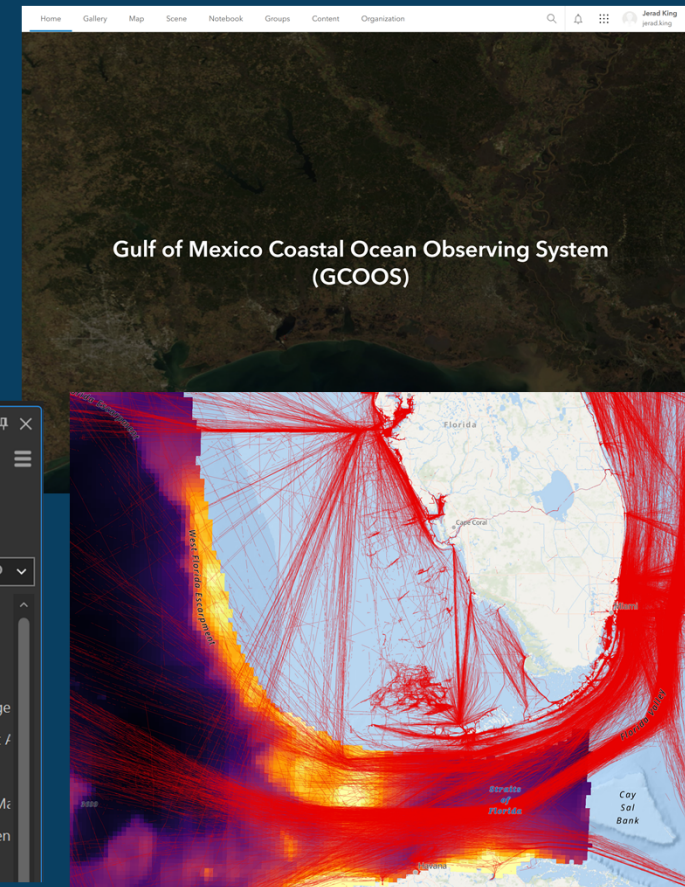
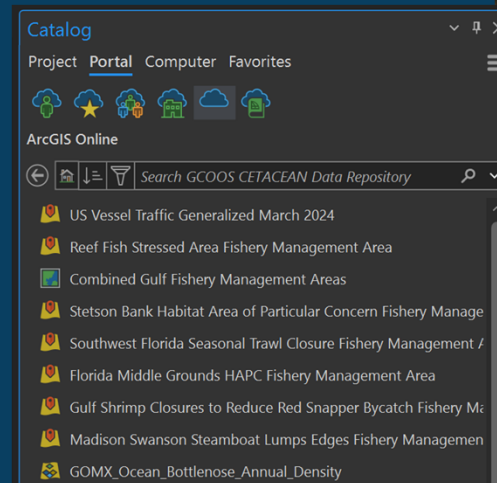
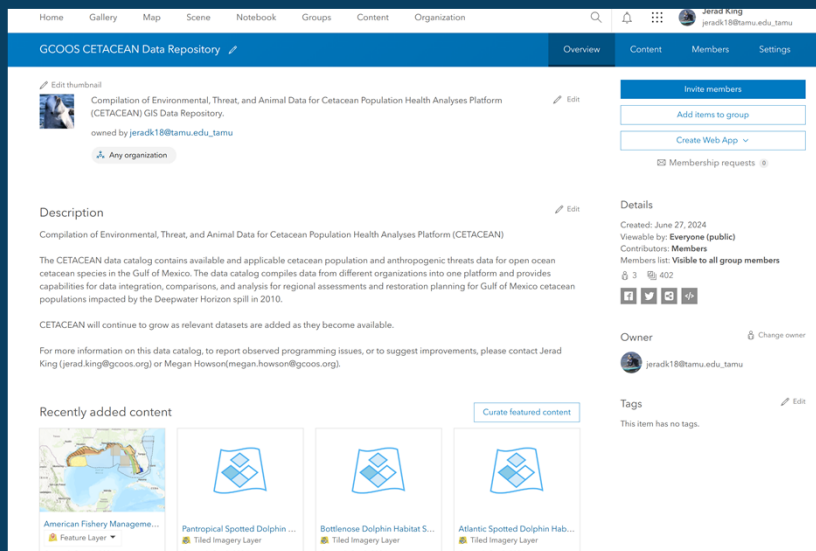
jsonCSV1 - View a UTF-8 .JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).

jsonCSV - View a UTF-8 .JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).

ArcGIS Online

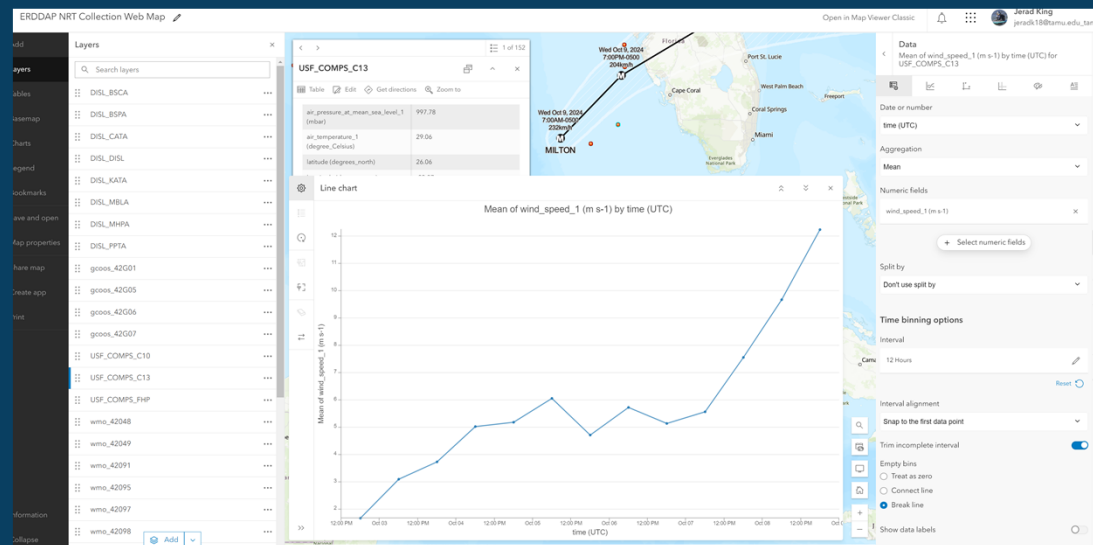
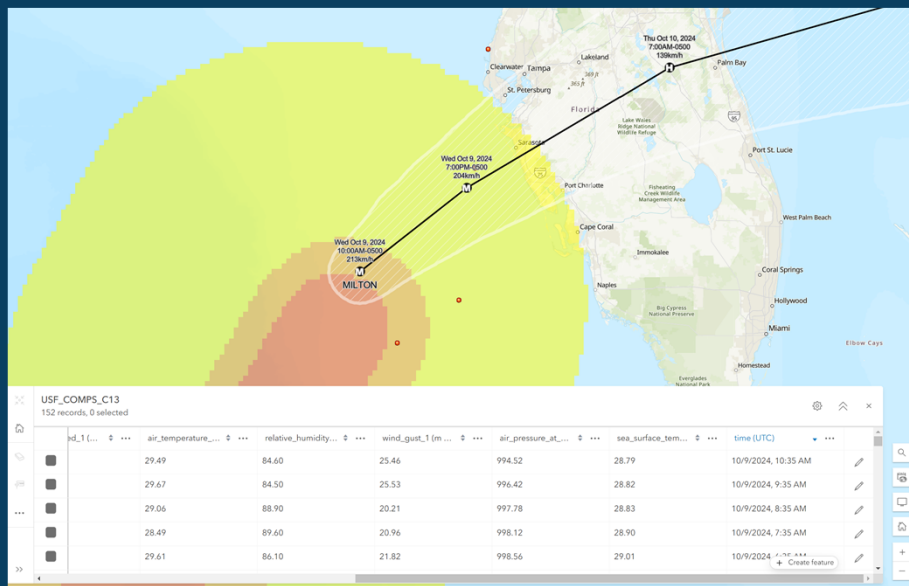


- Where GCOOS serves GIS data.
 - Where the CETACEAN Hub and its data are hosted.
- Data on ArcGIS Online can easily be connected to any application within the Esri ecosystem



ERDDAP on ArcGIS Online

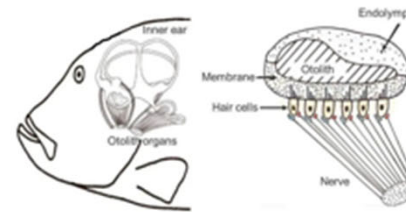
- By leveraging the same metadata information that ERDDAP uses to serve data in a variety of formats, the erddap2agol Python package creates Hosted Feature Layers from ERDDAP Data.
 - Just specify datasetid and desired ERDDAP service.



De'Marcus Robinson, Ph.D.

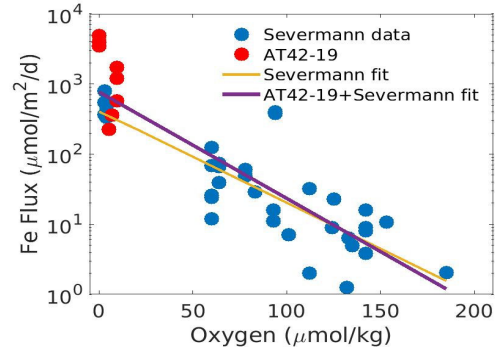
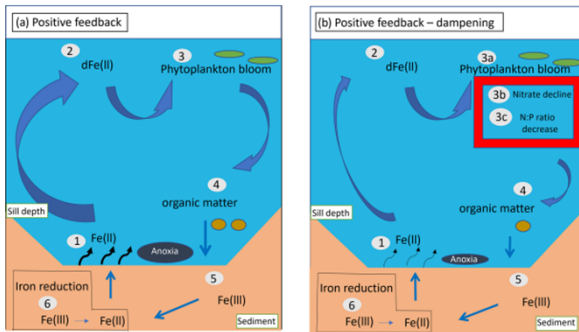
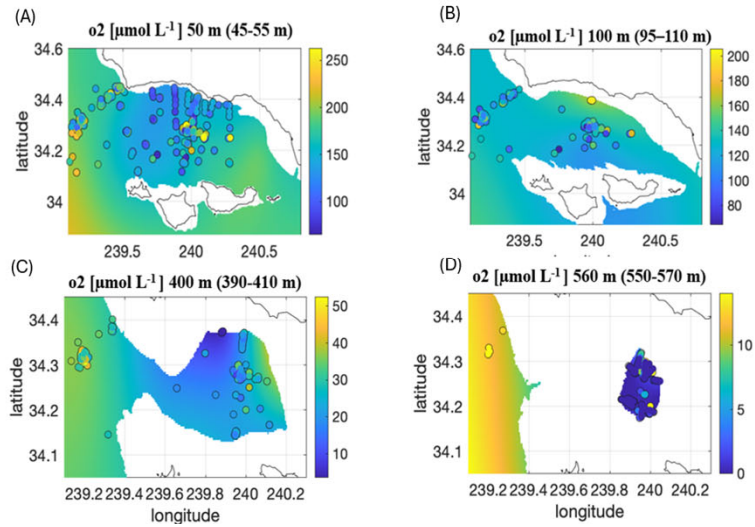
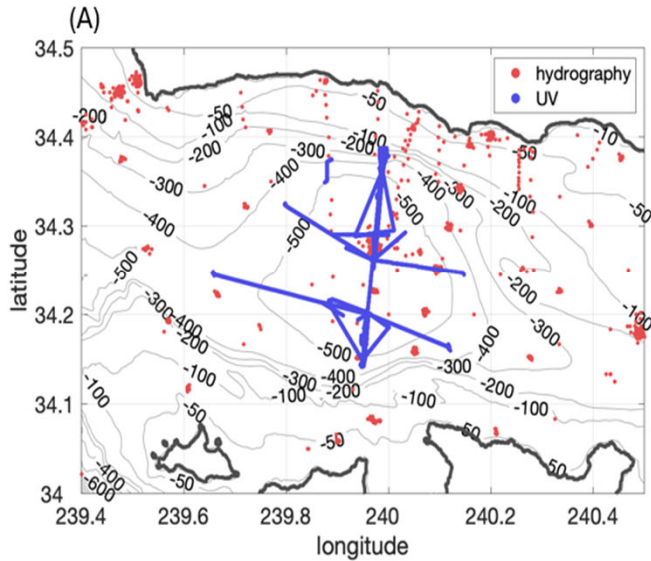
NOAA CCME Postdoctoral Research
Associate

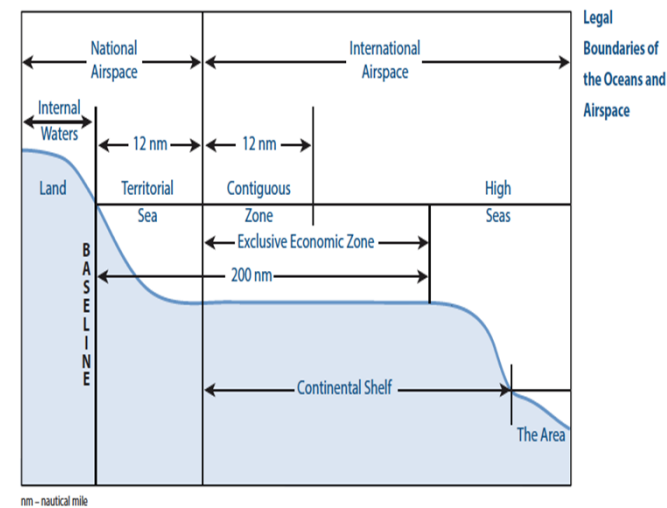
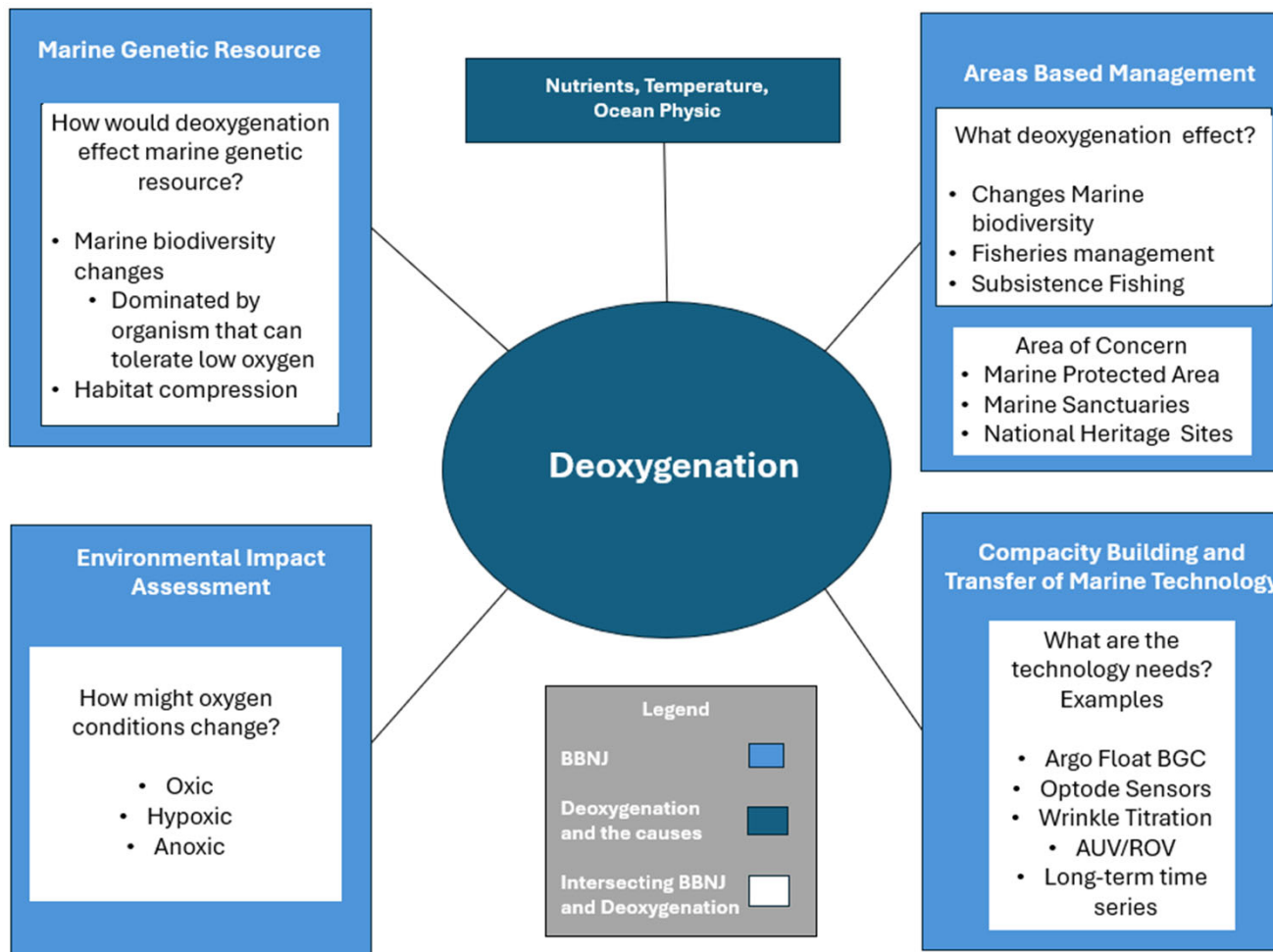
Research interest: Ocean Biogeochemistry,
Geomicrobiology, geochemistry, Carbonate
geochemistry, ocean policy



NOAA CCME
NOAA Center for Coastal & Marine Ecosystems

Ocean Deoxygenation and the impact on ocean biogeochemistry





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

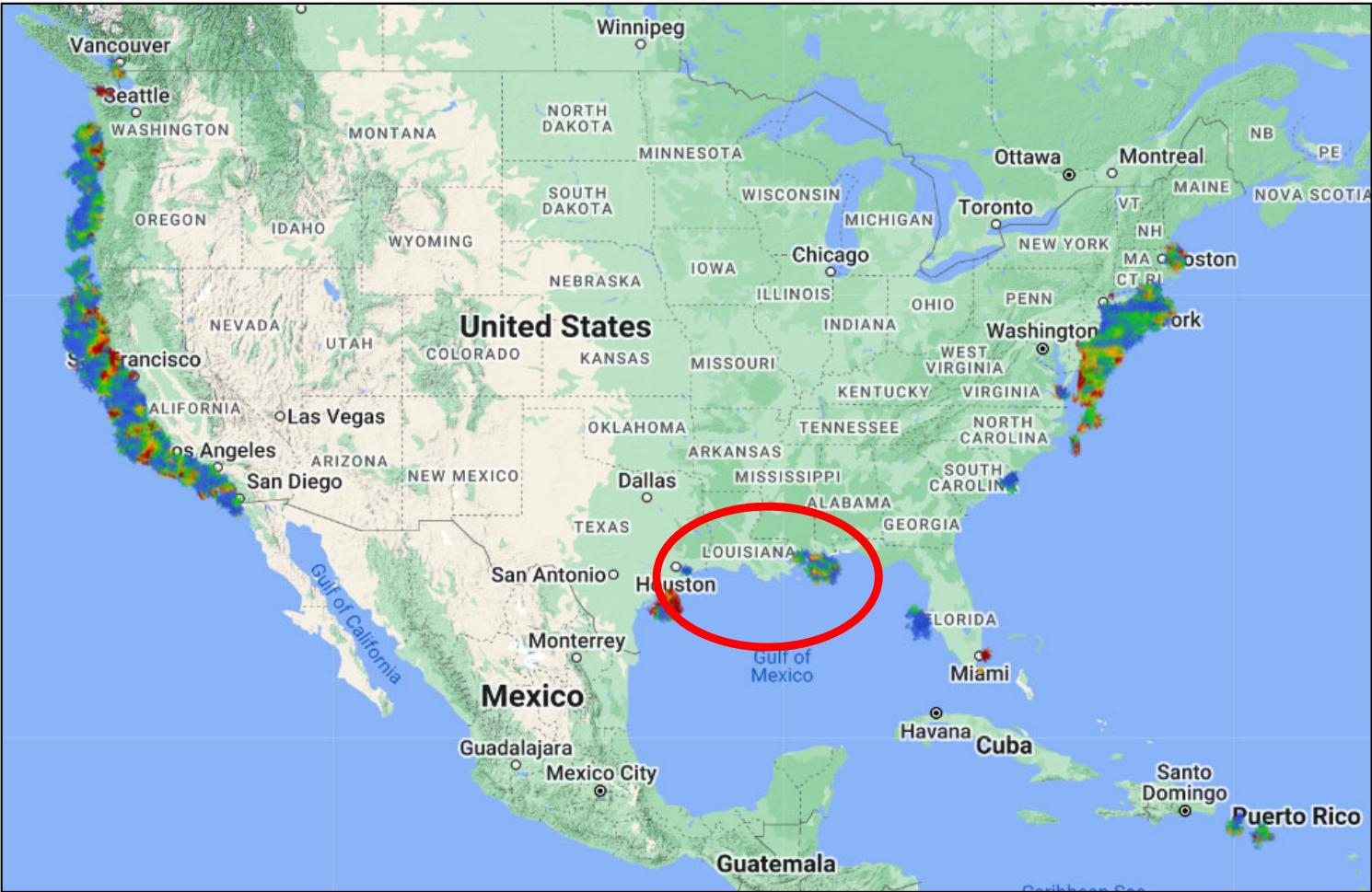
Dr. Jorge Brenner, Gulf of Mexico Coastal Ocean Observing System, Texas A&M University, College Station



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

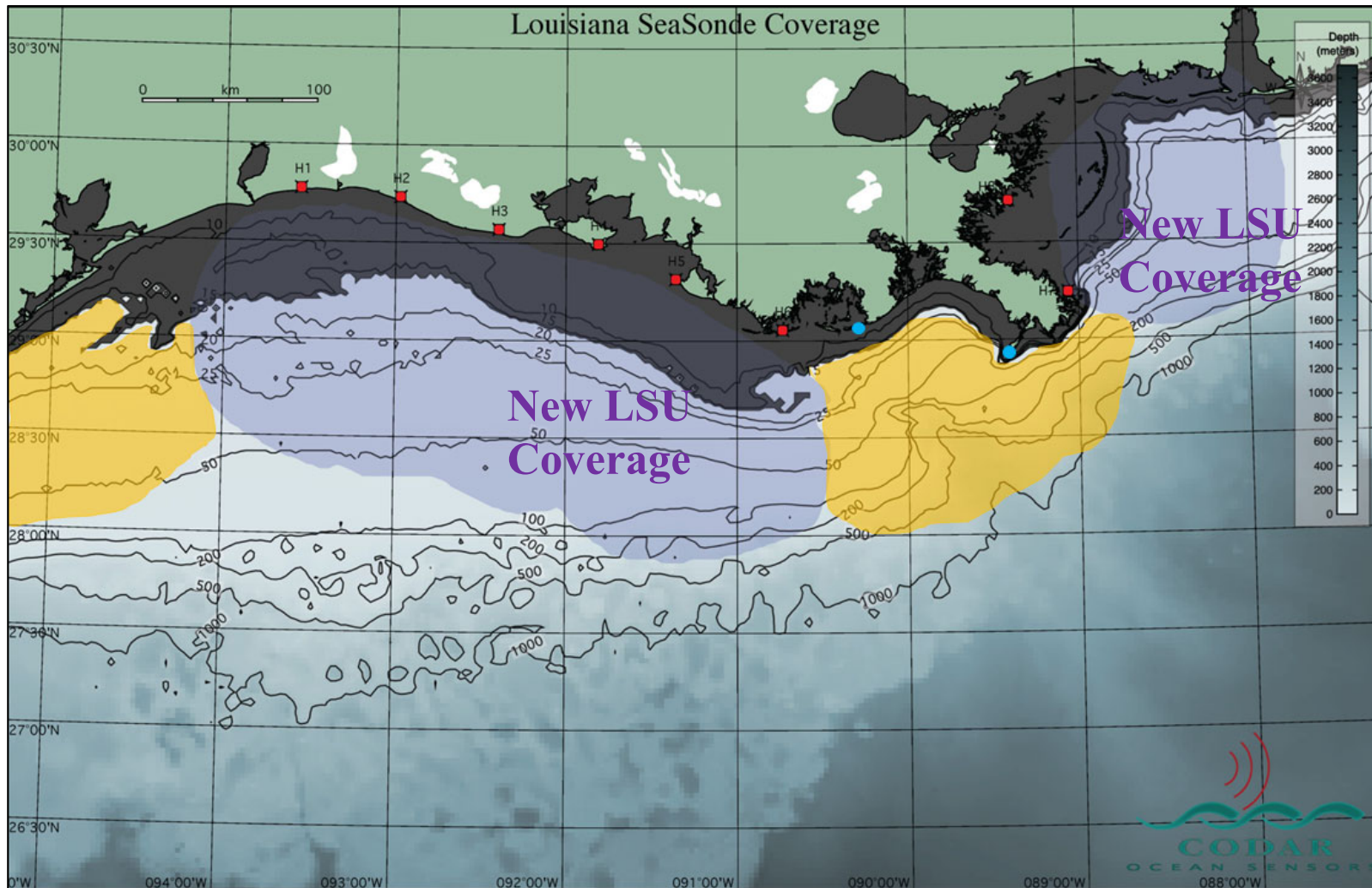
– Photo credit: Laura Pederson, CODAR

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