



Thank you for being a Panelist at the GCOOS Members Meeting to be held virtually November 13, 2025.

Here are some guidelines to help you prepare and maximize productivity during each session.

- Purpose: To improve understanding of current and emerging stakeholder data applications, challenges, and needs for ocean observing to inform updates to the GCOOS Strategic Plan.
- Format
 - Each PI-Stakeholder co-presenter team will be given 8-10 minutes to present information indicated on the slides provided here.
 - Q/A will follow after all panelists in the session present their slides.
 - The slides with requested information should be sent to Chris.Simoniello@GCOOS.org by November 11, 2025, so that, in the interest of time, presentations can be collated for each panel.
 - A meeting link for panelists and facilitators will be sent to you by Marcus Ogle. It will be different from the general meeting link.
- Have questions? Don't hesitate to ask!

Note: Please focus the information you provide on the category for which you are serving as a panelist. Thank you!

10:00-11:00 CT, Stakeholder Panel I: Marine Operations and Coastal Hazards, Tracie Sempier, Facilitator

Panelists: Chris Fuller, Tony Knap, Chunyan Li, Tuomo Saari

11:10-12:00 CT, Stakeholder Panel II: Healthy Ecosystems and Human Health & Safety, Steve Sempier, Facilitator

Panelists: Brian Dzwonkowski, Eric Milbrandt (Allie Pecenka), Chuanmin Hu



Stakeholder Panel I
Marine Operations and Coastal Hazards
Tracie Sempier, Facilitator

Panelists: Chris Fuller, Tony Knap, Chunyan Li, Tuomo Saari



Galveston Bay and Sabine Lake HFR Networks: Operation and Maintenance

PI: Christopher Fuller

Research Applied Technology Education Services

cfuller@office.ratesresearch.org

GCOOS Strategic Plan Focus Areas

- 1) Marine Operations;
- 2) Coastal Hazards;
- 3) Healthy Ecosystems and Living Resources;
- 4) Human Health and Safety

Project Background and Focus

- Galveston Bay
 - 3 stations at 25 MHz
- Sabine Lake
 - 2 stations at 42 MHz
- Commissioned with data to RTV processing since March 2, 2023
 - Funded by TGLO CMP-27 PSM
 - Leverage RATES' SeaSonde assets
 - Originally acquired by TGLO (circa 2004)
 - Co-Investigators: UTEP, Lamar University
 - Partners: Galveston and Chambers counties, City of Port Arthur, USACE
 - Project ended: March 2024
- Continued operation through GCOOS funding since: 08/2024
- Maintain operation of HFR networks on Galveston Bay and Sabine lake to address coastal data needs with respect to:
 - TWDB SCHISM modeling efforts
 - Address data gaps in inshore wave measurements identified by TIFF
 - Provide long term dataset to provide design criteria and enable assessment of large scale coastal flood mitigation projects. (e.g. Ike Dike)
 - Address emergency response needs

Recent Activities

- SeaSonde services
 - Repairs to 4 transmitters and receivers
 - GPS Share Module upgrades to 3 receivers
- Replacement of RF cable bundle at Moses Lake (April 23, 2025)
- All stations operations in July, 2025)
- O&M Routine (ongoing)
- APM's – tentatively scheduled for winter 26-26.
 - Vessel based
 - CODAR 72 hour remote bundle service contract



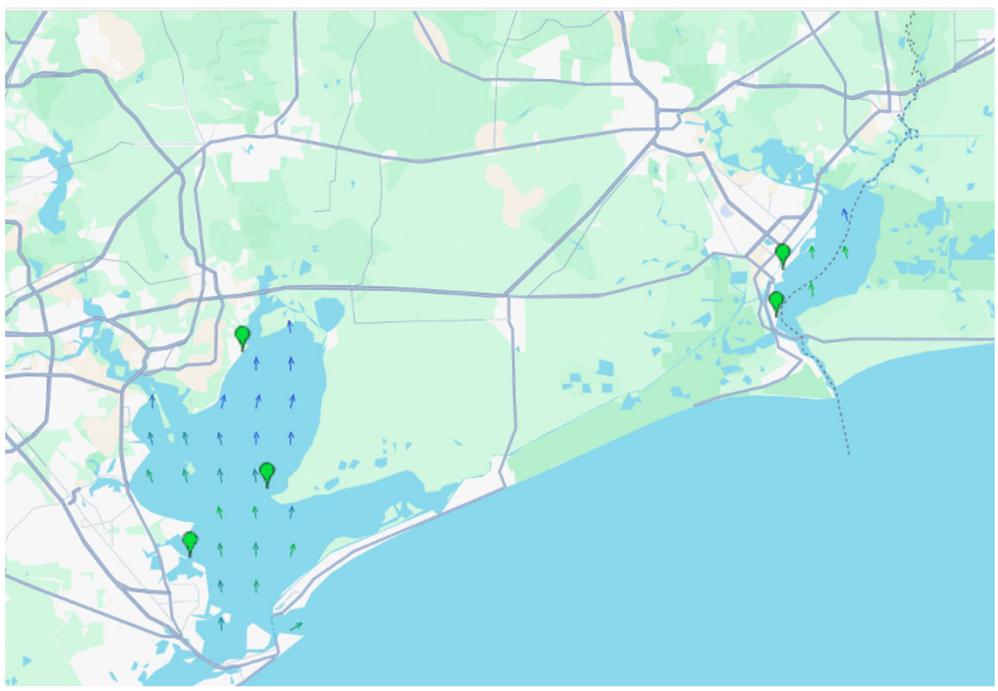
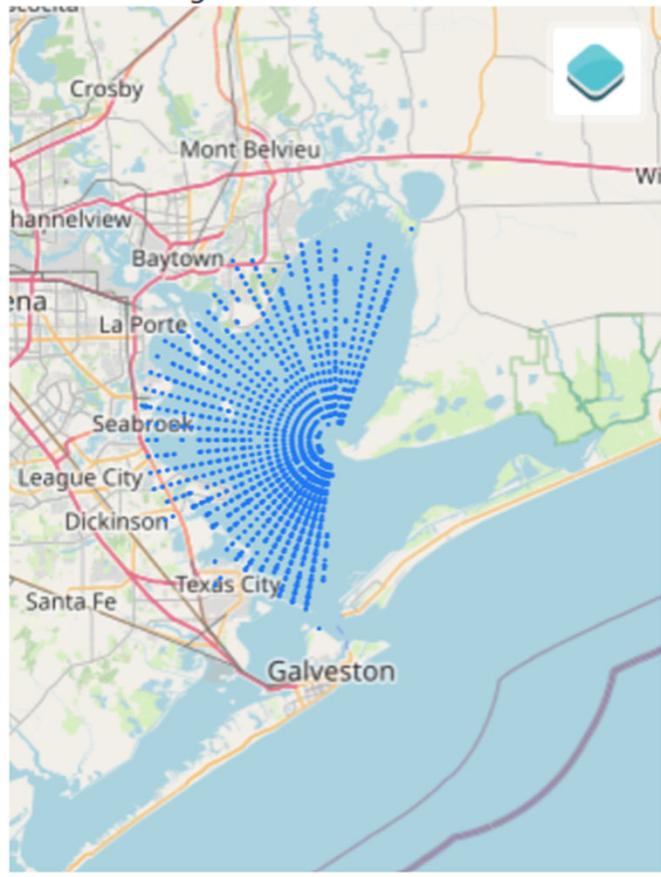
RATES Stakeholders

- Texas Water Development Board (TWDB)
 - Primary interested in HFR current data to support their coast wide SCHISM model development
 - Storm surge, salinity dynamics, oil spill trajectory
- Texas General Land Office (TGLO)
 - Spill response
- U.S. Army Corps of Engineers (USACE)
 - Coastal hydrodynamics
- Texas Integrated Flood Framework (2022-2023 Annual Report)
 - Identified data gap in nearshore wave data that is crucial for managing coastal environments, aids design of coastal structures, assessing hazard risks, and research.
 - HFR wave data needs to be validated in near shore regions
 - Assessment of applicable HFR frequencies for near shore wave measurements
 - Assessment of HRF wave measurements under extreme conditions
- Chambers County
 - Public safety

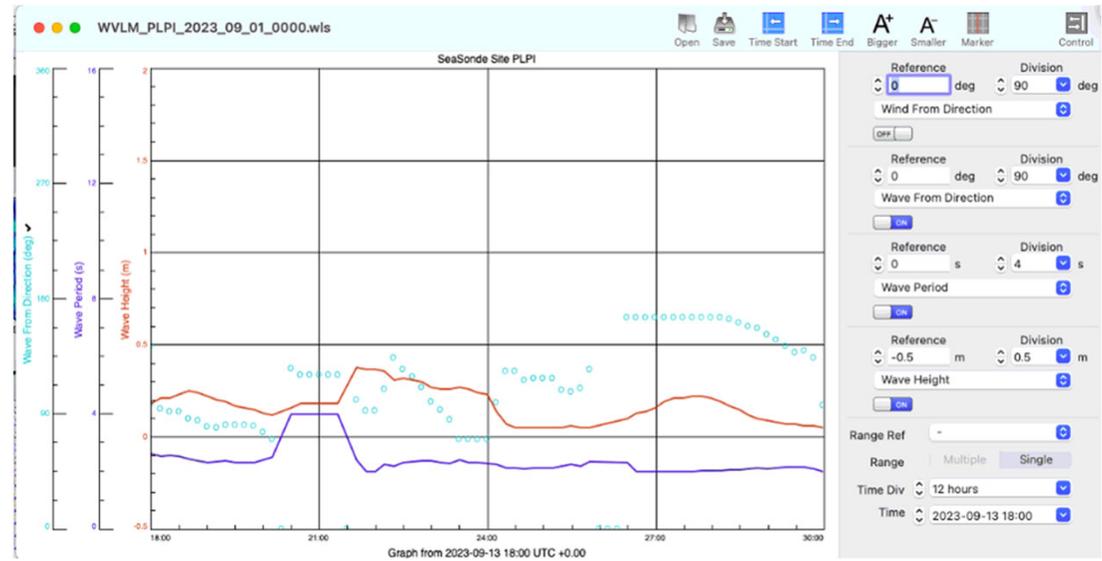
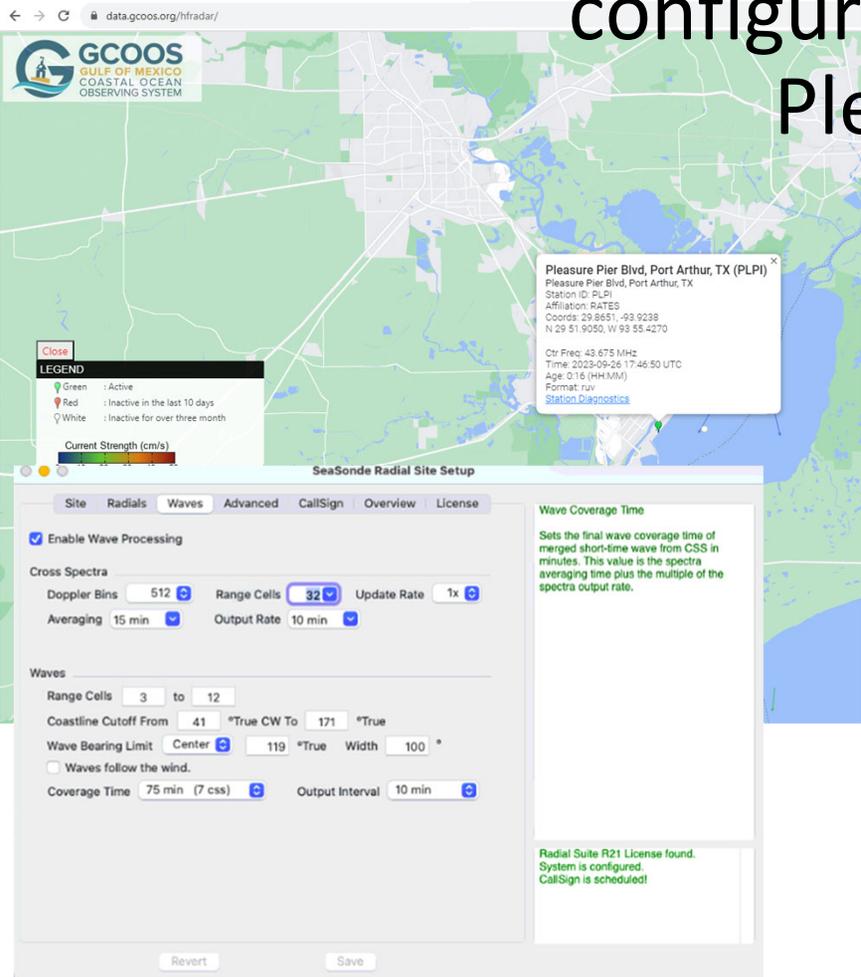
Radial Vector Data



Radial Coverage for Most Recent File



HFR Wave Data: Test configuration at Sabine Lake – Pleasure Pier Blvd.



Data Application



- **CMP-27 Project of Special Merit: High-Frequency Radar for Texas Bays and Ports**
 - SCHISM Model Validation
 - Co-PI: Dr. Rosa Fitzgerald, University of Texas-El Paso




Article

Intercomparison of Surface Currents Obtained Using SCHISM and the HF Radar Data in Galveston Bay and Sabine Lake, Texas

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² Department of Physics, The University of Texas at El Paso, 500 West University Avenue, El Paso, TX 79968, USA; rapera@gmail.com

³ Research, Applied Technology Education Services, Inc., P.O. Box 697, Edinburg, TX 78540, USA; cfuller@edtechservices.com

⁴ Department of Engineering, College of Engineering and Technology, Faculty of Engineering, East Carolina University, Greenville, NC 27838, USA; kejung24@ecu.edu

⁵ Department of Physics and Mathematics, Universidad Autónoma de Ciudad Juárez, Ciudad Juárez, 32310, Chihuahua, Mexico; javierpolanco@uacj.mx

* Correspondence: rfitzgerald@utep.edu

Abstract: This study provides a comprehensive analysis and intercomparison of surface currents, for Galveston Bay and Sabine Lake, Texas, obtained from High-Frequency (HF) radars and SCHISM model. We established a methodology based on qualitative and quantitative analyses to compare measured and modeled surface currents. One-month HF radar data, in April 2023, were extracted from the two newly installed HF radar networks comprising two and three HF radar stations at Sabine Lake and Galveston Bay, respectively. The extracted surface current data were compared to corresponding SCHISM-simulated currents to assess the model's performance in predicting currents. The comparison encompassed qualitative and quantitative assessments by evaluating current vectors and the magnitude of eastward and northward velocity components from both methods. The results showed the ocean current predictive capabilities of SCHISM exemplified by their strong correlations (up to 0.94), high index of agreement (up to 0.95), and low error metrics, during the study period. The disparities in the eastward and northward current measurements across the dates underscore the complex interplay between prevailing winds, bay-ocean interactions, and regional weather patterns. This study sheds light on the intricate dynamics of the surface currents in estuaries and nearshore lakes with the underlying efficacy of both the HF radar and SCHISM surface current determinations. The findings can contribute to advancing the understanding of coastal dynamics and determining the strategies for environmental monitoring and management.

Keywords: HF radar; SCHISM; surface currents; estuary; Galveston Bay; Sabine Lake

1. Introduction

The state of Texas, the United States of America, has several major estuaries along its coast including Galveston Bay and Sabine Lake. Galveston Bay (GB) and Sabine Lake (SL) are among seven major estuaries along the Texas coast that support vibrant maritime and industrial sectors. These commercial activities represent real threats to the GB and SL estuarine ecosystems, for example, due to oil and other chemical spills. The bay and lake provide tremendous economic benefits to the state and are also of industrial importance to the country. These estuaries are home to major ports for the United States, including the Port of Houston, which ranks as the nation's largest port, and sixth globally in terms of foreign tonnage. The region surrounding the bay (GB) is home to over a third of the country's chemical production facilities and oil refineries, signifying its strategic importance

J. Mar. Sci. Eng. **2024**, *12*, 1962. <https://doi.org/10.3390/jmse12111962>

<https://www.mdpi.com/journal/jmse>



Key Findings & Challenges



- Key finding
 - HFR is applicable for measuring current and wave data on brackish estuarine systems
- Key Challenges
 - Continued operation of network under harsh environmental conditions
 - Maintaining operational condition of legacy equipment (circa 2000)



TWDB Mission



The mission of the Texas Water Development Board is to lead the state's efforts in ensuring a secure water future for Texas and its citizens. To support this mission, the Coastal Science department provides data, modeling, and analytical services for environmental flows, water supply, and flood mitigation planning as well as for emergency oil spill response. HFR current data in Texas Bays enables characterization of estuary hydrodynamics, at high temporal and spatial resolutions, that represent important forcing factors with respect to coastal hydrology, circulation, salinity dynamics, oil spill fate and effects, tidal and wave impacts, and coastal flooding.

Stakeholder Needs



Empirical data to validate and calibrate hydrodynamic models

- Fill data gaps in near shore wave data that is directly applicable to managing coastal environments, aid design of coastal structures, assess hazard risks, and research
- HFR wave measurements need to be validated in near shore regions
- Assessment of HRF wave measurements under extreme conditions



TWDB Data Applications



HF RADAR current and wave data for Texas bays can be applied in TWDB's coast-wide hydrodynamic modeling efforts. HFR data provides empirical observations applicable to assessment of SCHISM, a 3-dimensional baroclinic circulation model that spans creek-lake-river-estuary-shelf-ocean scales and is directly applicable to simulating storm surge and combined flooding, salinity dynamics, sediment transport, and oil-spill trajectory. In the long term, HFR data may be assimilated in the SCHISM to improve model precision.



Stakeholder Challenges



Stakeholder, please indicate any current and/or future challenges and data/information needs moving forward.

- Need for high resolution, real-time wave measurements to support calibration and validation of wave models
 - Significant wave height, period, and direction
- Need for comprehensive strategy to establish and maintain near shore data network
- Need to validate nearshore HFR wave measurements against conventional wave observations.
- Long-term operational funding for coastal data observatories is recurring challenge



Geochemical and Environmental Research Group (GERG) Texas A&M University



Steve DiMarco, Anthony Knap, Uchenna Nwankwo, Jun Liu, Henry Potter and an
army of Associates

Texas General Land Office, US Coast Guard

tknap@tamu.edu, Brent.Koza@tglo.Texas.gov, cristinaforbes11@gmail.com

GCOOS Strategic Plan Focus Marine Operations and Coastal Hazards

GCOOS Virtual Members Meeting, November 13, 2025



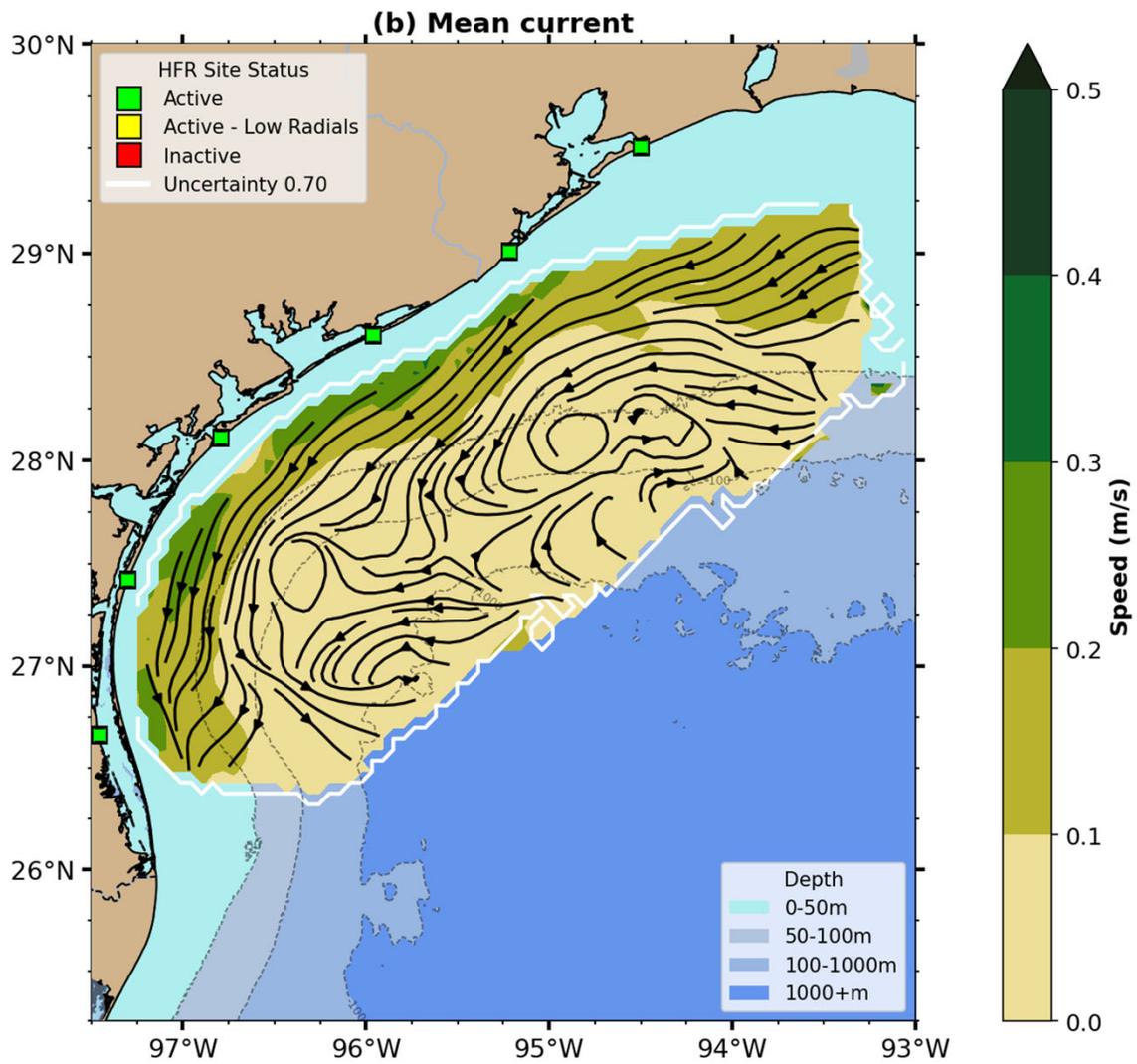
PI Project Focus



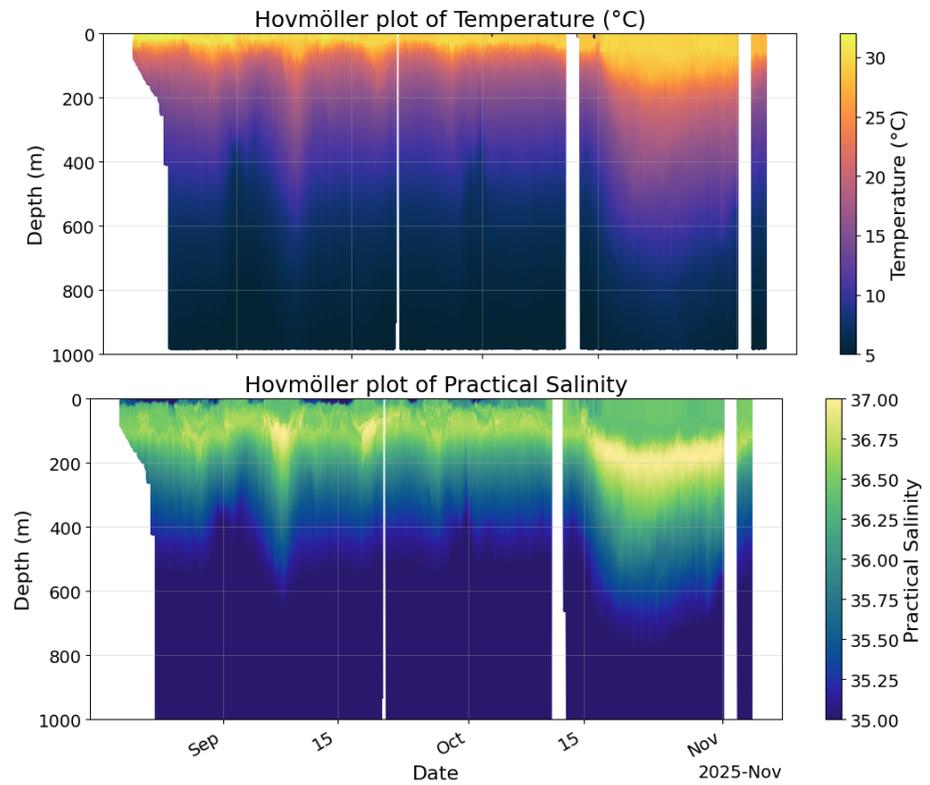
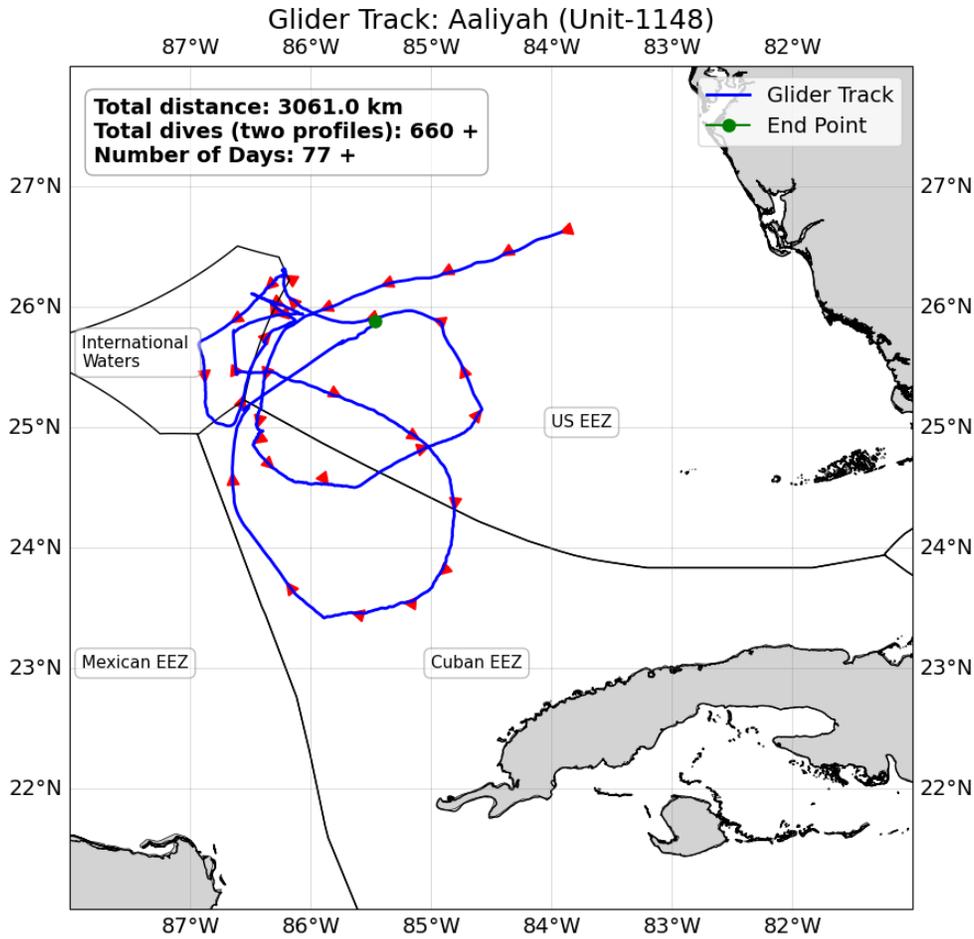
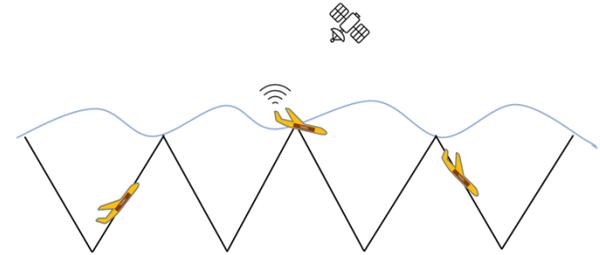
GERG operates Texas HF Radars, Texas Automated Buoy System, Ocean Heat content gliders and the Tex/LA Regional Model.

- 1) HF Radars, 5 stations in very remote areas, the 6 th Radar site (Rollover Pass) was abandoned due to Construction, looking for a replacement.
- 2) 6 buoys make up TABS. Located in key locations to provide realtime data for oil spill models – have many other uses. Current speed and direction, Met info
- 3) GCOOS funds 1-2 glider missions for Ocean Heat content hurricane intensity measurements
- 4) TXLA model, Used for oil spill, hypoxia, Search and Rescue

Stakeholders include, Texas General Land Office, US Coast Guard and the US Hurricane Center



UGOS- GrASE: Mission Overview of Glider Aaliyah



Texas Automated Buoy System



Texas General Land Office
Commissioner Dawn Buckingham, M.D.

Oil Spill Prevention
& Response

Texas Automated Buoy System
Real Time Ocean Observations
Supporting Oil Spill Prevention and
Response since 1995



GEOCHEMICAL AND
ENVIRONMENTAL RESEARCH GROUP
TEXAS A&M UNIVERSITY

TABS Data Products

[TABS Home](#)
[Current Summary](#)
[Buoy Status](#)
[TABS Model Results](#)
[NOAA Wave Model](#)
[Vector Addition Trajectory Tool](#)

NOAA GNOME Oil Spill

Data Products
[TGL/TABS GNOME Forecast](#)
[TWBD Texas Bays and Estuaries](#)
[GNOME Files](#)
[NOAA GNOME Download](#)

Weather

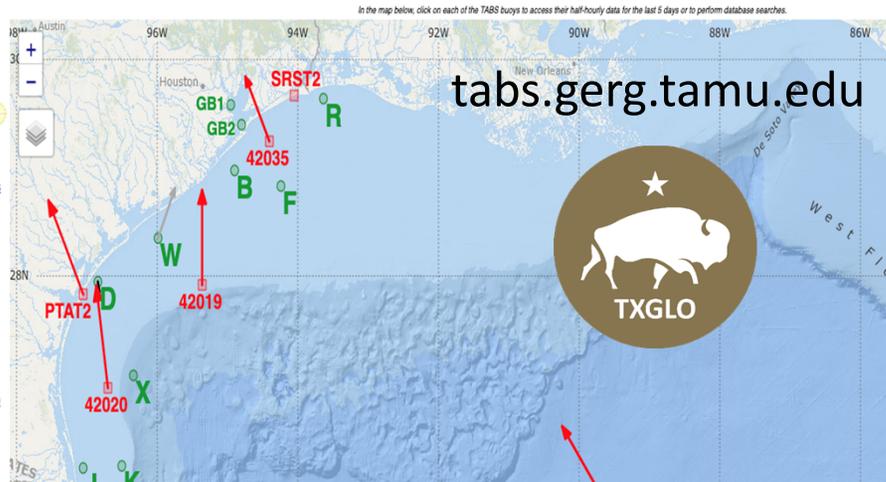
[Hurricane Tracks](#)
[Marine Forecasts](#)
[TX](#) [LA](#) [Offshore](#)

TABS Information

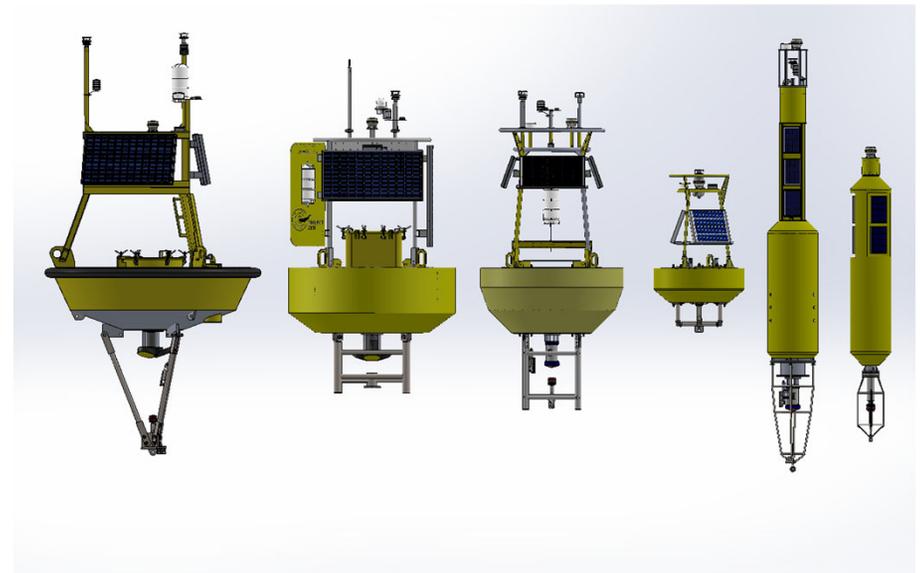
IMPORTANT: [Notice to Mariners](#)

Articles & Publications

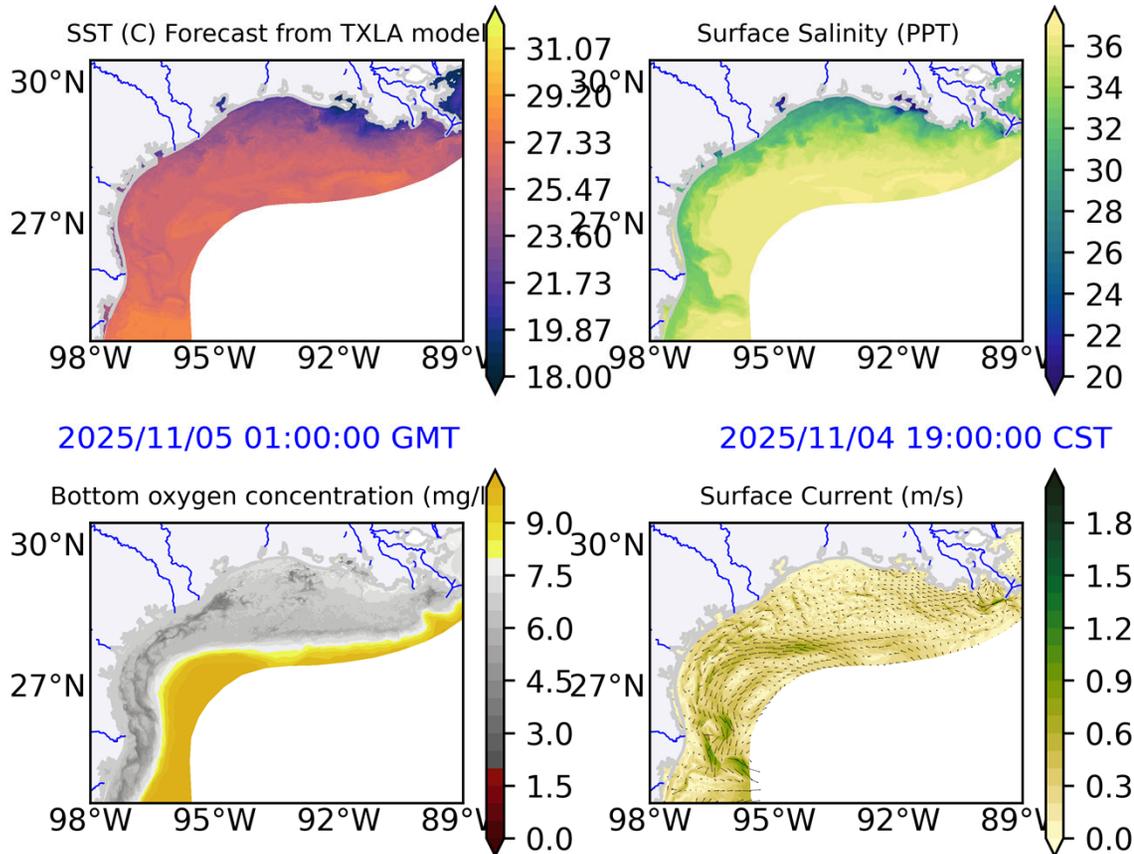
[Development of TABS paper\(pdf\)](#)
[Ten Years of TABS paper\(pdf\)](#)
[Oceans 2001 TABS paper\(pdf\)](#)
[Oceans 2009 TABS paper\(pdf\)](#)
[Oceans 2011 TABS paper\(pdf\)](#)



GERG/TABS Buoy Family



TGLO-TXLA forecast system



- **Model:** ROMS
- **Spatial Resolution:** 650m to 3.7km
- **Surface forcing:** NOAA GFS
- **Lateral boundary forcing:** HYCOM
- **River runoff forcing:** National Water Model (NWM)
- **Forecast frequency:** daily
- **Forecast length:** four days



Type of Data Generated



1. HF Radar – current speed and direction in 6 km resolution 180 km from coast (verification of TABS) -
2. TABS – current speed and direction in near real time (verification of HF Radar)
3. Buoyancy gliders – current, temperature 0-1,000m, Salinity, density, chlorophyll, over 90 day mission.
4. TXLA Model – 4 day rolling forecast of temperature, salinity, Oxygen, Currents



Data Application



Data is reported in near-real time through web servers and web pages. TABS and TXLA reported additionally through TGLO website. HF Radars, Gliders through GCOOS website.

In the case of TABS – whenever there is an oil spill TGLO use the data to calibrate Oil Spill models as well as to provide an early warning of where to site oil recovery equipment or areas to protect by oil boom. In the case of HF radars GERG is working with USCG on data quality to eventually use in SAR events. The TXLA model is interrogated about once per day to provide information for Marine Incidents such as Search and Rescue



Key Findings & Challenges



HF Radar work well. Challenges are to find a new site at Rollover pass. Challenges to keep radar operating. 10 years old – equipment fails – lightning strikes. Need to replace receive and transmit amplifiers. GCOOS/BIL has helped. Vandalism is also a challenge as a whole radar trailer was stolen in July, 2024.

TABS work well however also require regular maintenance are grateful to TGLO to provide funds for M&O. Grateful for extra funds from GCOOS to add to TABS capabilities

Glider Operations work well – part of a larger GCOOS effort

TXLA – model works well and is used by a large group of users. Forecast is 4 days in future



Stakeholder Mission TGLO



The Texas General Land Office (GLO) is the oldest agency in the state, established in 1836 by the newly formed Republic of Texas Congress. Back then, the GLO's primary charge was to collect and keep records, provide maps and surveys, issue titles, and manage the settlement of state lands.

Today, the GLO is the state's lead agency in responding to coastal oil spills. The Texas Oil Spill Planning and Response TOOLKIT is the most comprehensive oil spill preparedness and response tool available, providing ready access to contingency plans and environmental data, including TABS, the GLO real-time offshore spill tracking system that provides instant data to monitor spills and establish trajectories.



Stakeholder Needs TGLO



TGLO needs real-time current speed and direction data and wind speed and direction in order to initialize oil spill tracking models. Specifically, TABS and the TXLA model are funded to provide this information.



Stakeholder Data Applications TGLO

Reatime environmental models are plugged into the various oil spill models used by TGLO and upadated as the data are received. Teams of responders are sent to specific coastal areas with pre-determined vulnerability and deploy oil spill protection systems where needed.

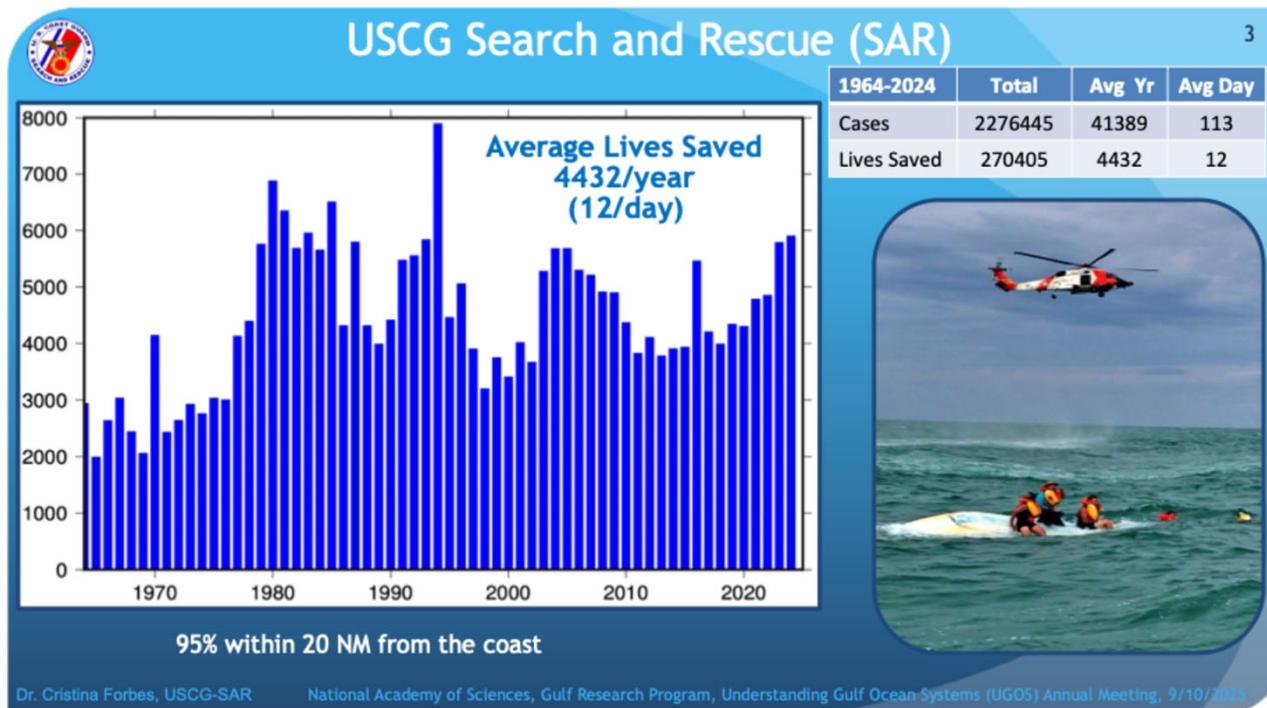


Stakeholder Challenges TGLO



Challenges are always the keeping the system operational in incredibly harsh marine environmental conditions. Corrosion, sensor functionality, mooring security, fishing all play a role and as TGLO needs a full set of working buoys buoy failures are difficult and need to be replaced/repared quickly.

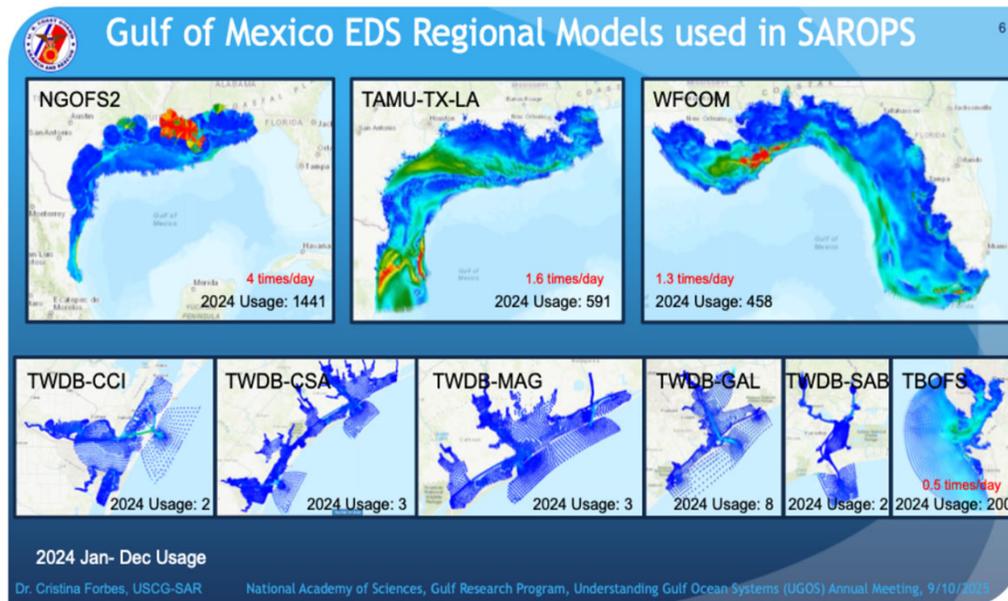
Stakeholder Mission USCG SAROPS



Stakeholder Needs

USCG SAR

Current speed and Direction, Met data, Access to real-time model output





Stakeholder Data Applications USCG SAROPS

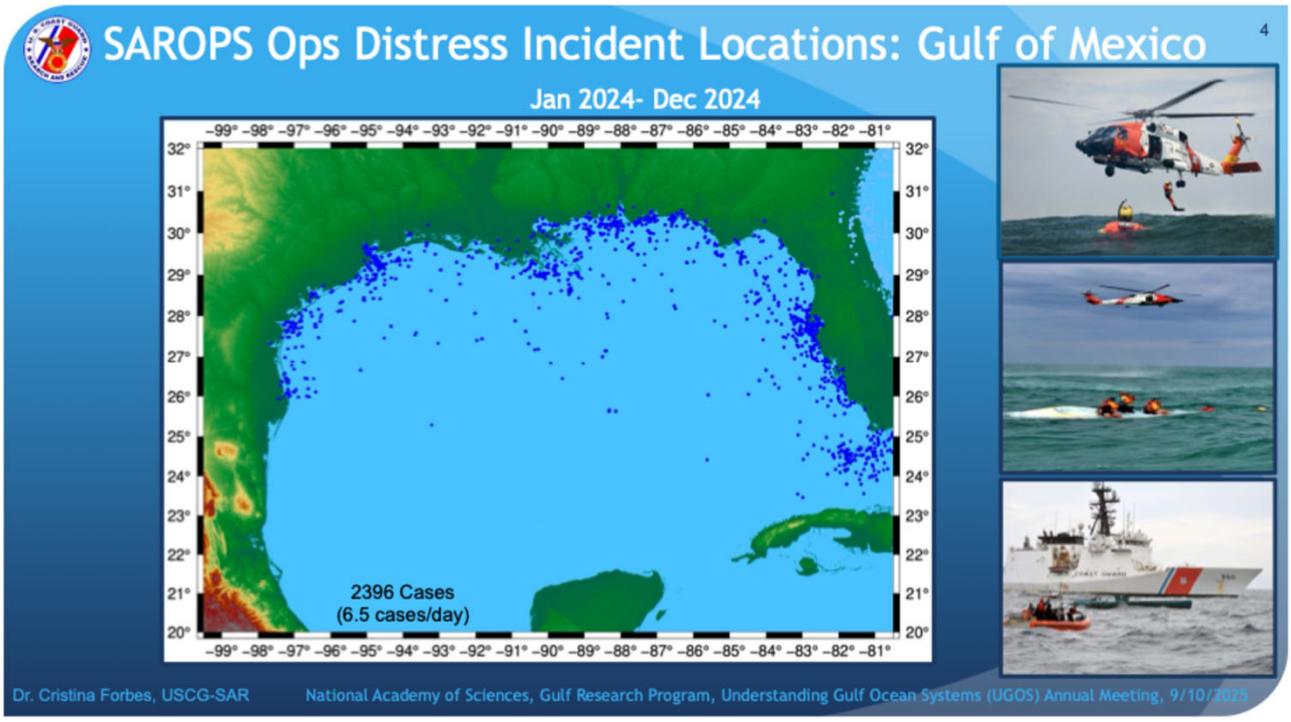


CG-SAR Requirements for Environmental Data		
Parameter	Product	Specs
Coverage	Ocean/met variables*	Global and Regional
Forecast output frequency	Ocean/met variables*	6 hrs
Temporal resolution of output	Ocean/met variables*	1 hour
Forecast range	Ocean/met variables*	72 hours
Reliability	Ocean/met variables*	99%
Locations	Ocean/met variables*	Global & regional: open ocean, bays/rivers/lakes, around islands
Height	wind speed/direction	@10 m ★
Upper Layer Depth	surface currents	0-1 m ★
Horizontal resolution	surface currents	10 m in rivers, 50 m-1km in inlets/bays, 1 km in lakes, <=2 km around small islands, <=5 km in open ocean
	winds	<= 2.5 km coasts, 3-12 km vast ocean
Accuracy	currents speed/direction	0.1 m/sec / 10 degrees
	winds speed /direction	1.0 m/sec / 10 degrees
	waves	SWH: 10 cm, period: 1 sec, dir: 10 deg, whitecapping % coverage: 10%
	SST, air temperature	1° C
	rel humidity, precip, visibility	10%
* Ocean and atmospheric variables: wind, surface currents, waves, SST, air temperature, rel humidity, precipitation, visibility		

Forbes C, 2022: "CG-SAR Recommendations/Requirements for Environmental Data", U.S. Coast Guard, Search and Rescue, CG-SAR-CF-20220208.
 Dr. Cristina Forbes, USCG-SAR National Academy of Sciences, Gulf Research Program, Understanding Gulf Ocean Systems (UGOS) Annual Meeting, 9/10/2025

Stakeholder Challenges

USCG SAROPS





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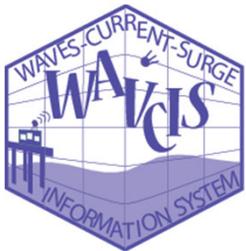
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Panelists: Brian Dzwonkowski, Eric Milbrandt, Yuyuan Xie



Continuing the Development of the Gulf Coastal Ocean Observing System

PI: Chunyan Li
Brian Milan (field technician)
Peter Luo (IT technician)
LOUISIANA STATE UNIVERSITY
(cli@lsu.edu)



GCOOS Strategic Plan Focus Areas:
Marine Operations; Coastal Hazards; Education

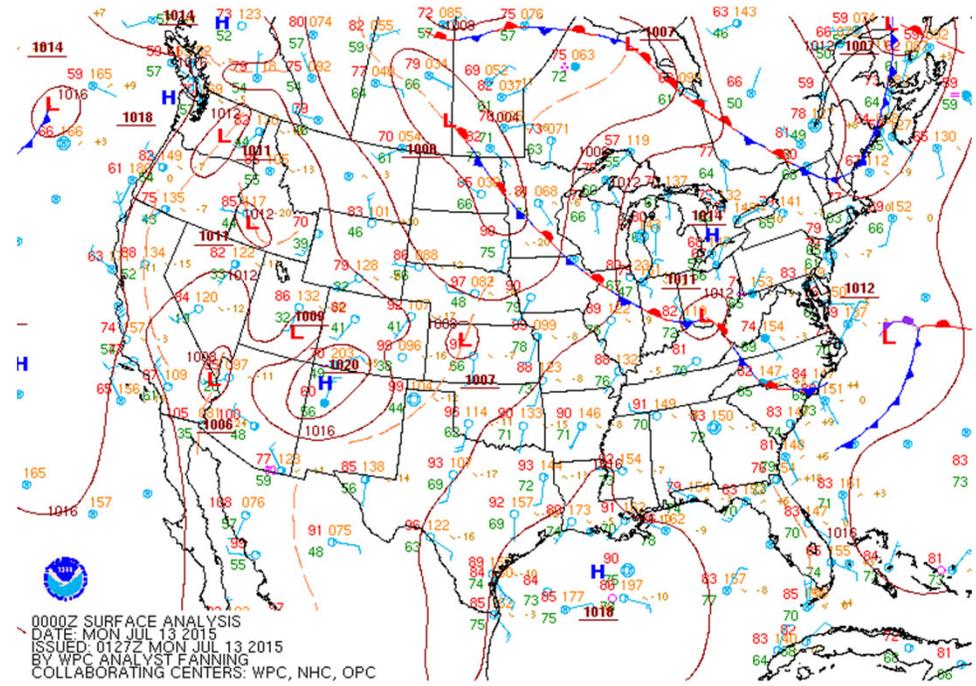
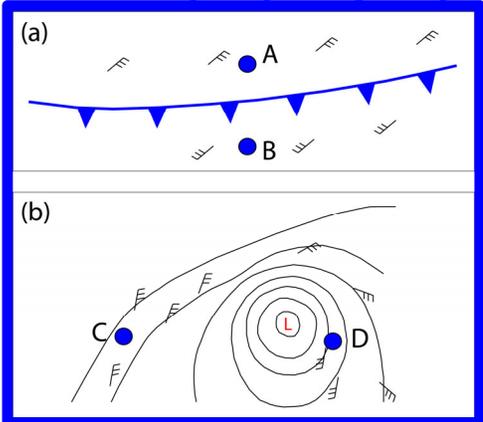


GCOOS Virtual Members Meeting, November 13, 2025

PI Project Focus

To expand, sustain and advance the critical WAVCIS real-time observations of met-ocean data along Louisiana shelf and coastal waters

- Ocean response to moving weather systems
- Storm surges / Meteorological tides
- Meteotsunami
- Shelf circulations
- Land-ocean carbon and nutrient fluxes
- Water property / quality



Type of Data Generated



Atmospheric data
 Velocity profile time series
 Wave, hydrography
 AERONET-OC

VELOCITY / CTD / PRESSURE (WAVE) TIME SERIES DATA INVENTORY					
		STATION	YEAR	REAL TIME	DT
NEW DATA	<i>Estuarine</i>	Caminada New Pier	2025-	Realtime	5 MIN
	<i>Shelf</i>	CSI 6A	2025-	Realtime	30 MIN
		CSI 6	2020-2025		1 SEC - 20 MIN
		SS91	2017-2022		1 SEC - 20 MIN
OLD DATA		Barataria Pass	2011-2018		1-20 MIN
		Caminada Mid	2014-2016		1-20 MIN
		Caminada Mid AOS	2014-2016	Realtime	1-20 MIN
		Pass Abel	2013-2015		1-20 MIN
		Caminada New Pass	2015-2016		1-20 MIN
		Caminada boat dock	2013-2015		1-20 MIN
		Caminada Fishing Pier	2013-2016		1-20 MIN
		Pelican Island	2014-2016		20 MIN
		Vermilian Bay	2009-2011	Realtime	2 MIN
		Bell Pass	2010-2010		2-15 MIN
		Wax Lake	2008-2012		1 SEC - 15 MIN
		<i>Shelf</i>	Breton	2011-2014	
		Calcasieu	2012-2013		15 MIN
		LA Bight	2015-2015		10 MIN



Type of Data Generated

Weather & wave data on shelf

Meteorological data

Met sensor	value
last updated:	2025-10-17 12:00:00 (UTC)
Relative Humidity(%):	65.81
Air Temperature(degC):	26.2
Sealevel Pressure(hPa):	1012.08

Wind data

Wind sensor	value
last updated:	2025-10-17 12:00:00 (UTC)
Wind Speed(m/s):	3.699
Wind Direction(deg):	160
std_wind Speed(m/s):	0.425
std_wind Direction(deg):	8.67
Gust Speed(m/s):	4.753
Wind Speed 10m(m/s):	4.254

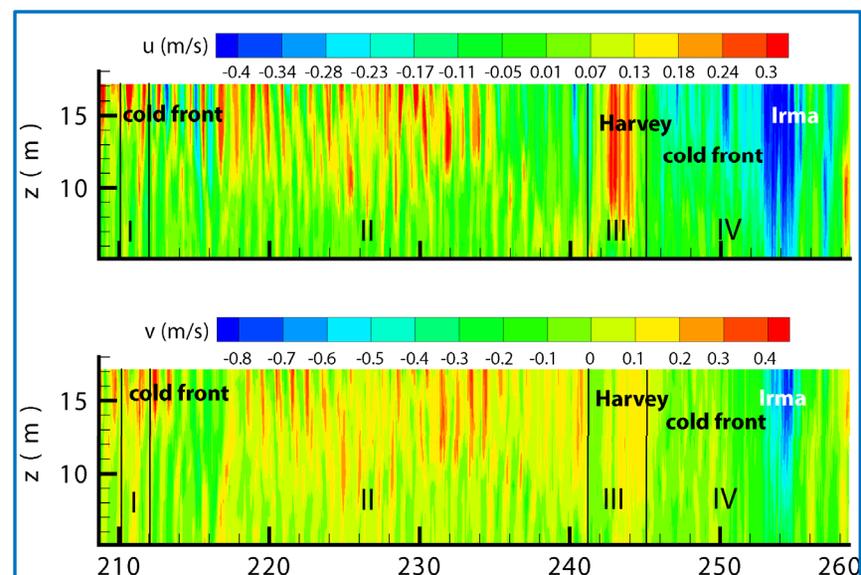
Current data

Date	Cell	Speed(m/s)	Direction(d)
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Flow data at tidal passes



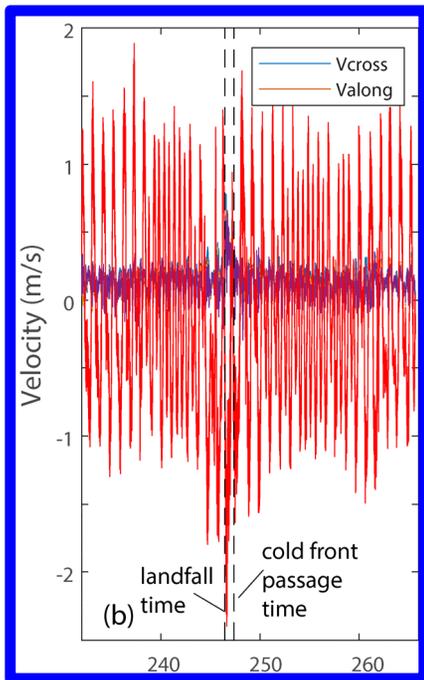
Shelf flow data - CSI 6 ADCP



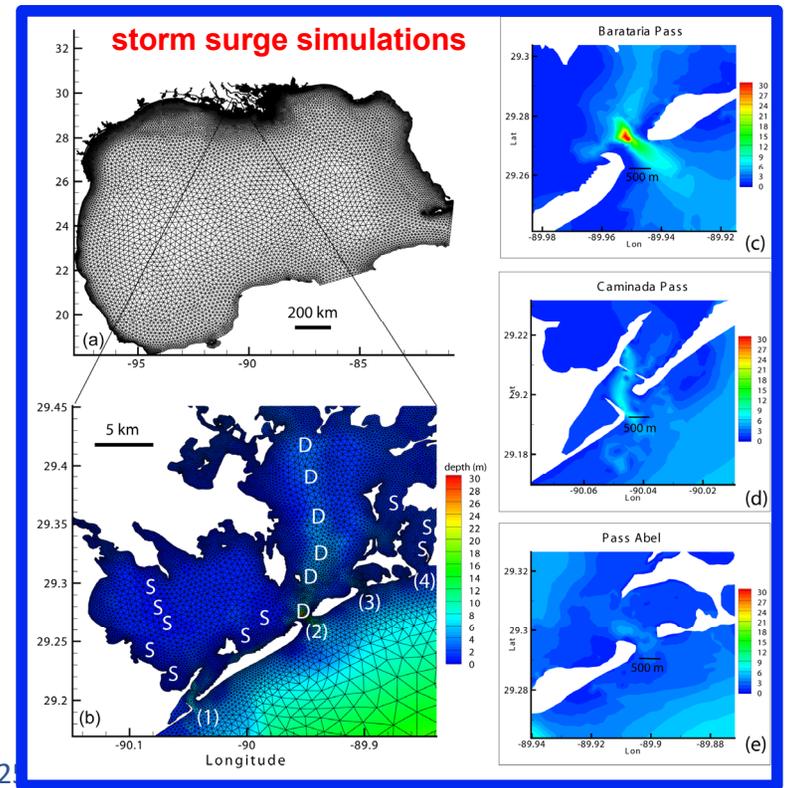
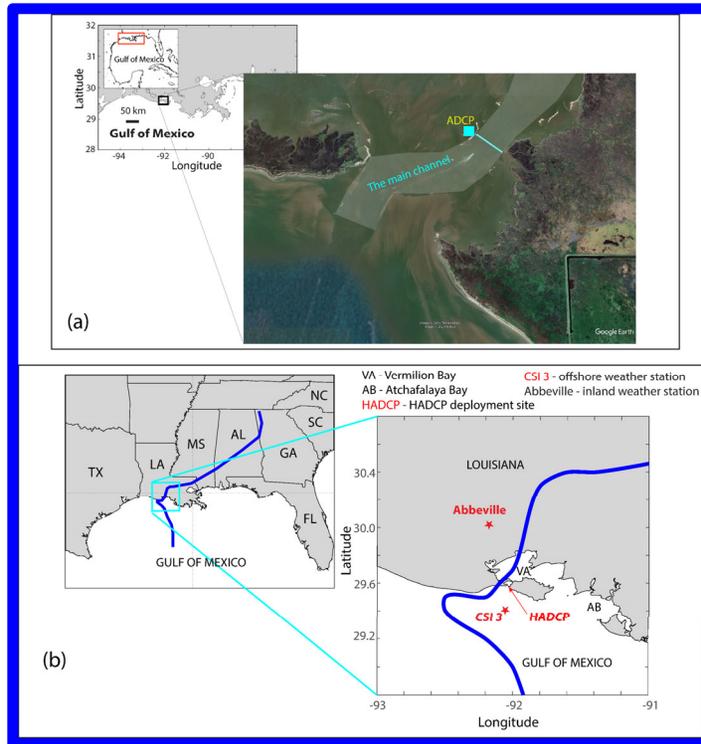
Data Application

- ***Katkar, A.** et al. (2026) Short-Term Impacts of Cold Front Passage on Coastal Water Quality and Material Transport, *Scientific Reports*, in press.
- Li, C. et al. (2024) Dynamic impact of transiting weather systems on coastal currents in the northern Gulf of Mexico, *Deep Sea Research Part II*, Volume 216, 2024, 105395.
- Li, C. et al. (2025) Enhanced water transport when a tropical storm meets an atmospheric cold front, *Scientific Reports*. 15(1), 6860.
- Li, C. et al. (2019) Atm. Cold Front Induced Exchange Flows ...: Analysis using ADCPs and FVCOM ..., *Journal of Atmospheric and Oceanic Technology*, 36:443-472.
- ***Feizabadi, S.** et al. (2023), A Numerical Experiment of Cold Front Induced Circulation in Wax Lake Delta, *Frontiers in Marine Science*, DOI: 10.3389/fmars.2023.1228446.
- Li, C. (2025) Nonlinear Proudman Resonance Under Moving Atmospheric System. *Journal of Nonlinear Mathematical Physics*, in press.
- Li and Xu (draft manuscript) Wind-Topography Interactions and Circulations in Louisiana Bight to be submitted.

*students

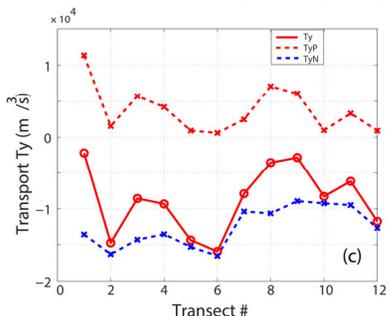
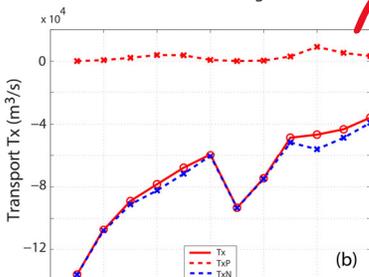
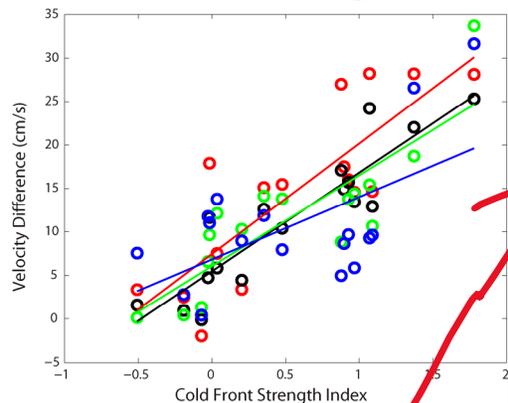


Tropical storm meets a cold front



Key Findings & Challenges

Shelf water response to moving weather systems
 Force-response – example - cold front strength index
 Convolution relation – forcing & response relationship
 Challenges: sustainability (DT); vandalism; permit



Non-aliased observations



GCOOS Virtual Members Meeting, November 13, 2025

“Convolution Theorem” for Shelf Circulation

$$Z_R = u + iv = \sum F(t) \otimes G(t) \quad (\text{rotary format of velocity})$$

$$F(t) = e^{-\frac{\beta}{h}t} e^{-ift} \quad (\text{a natural “filter”})$$

complex frictional-rotary inertial function (CFRIF)

Convolution
definition

$$\psi(t) \otimes \phi(t) = \int_0^t \psi(\tau) \phi(t - \tau) d\tau$$



Stakeholder Mission



Giuseppe Zibordi: one of the leading scientists behind AERONET-OC and SeaPRISM calibration/validation efforts. He works with NASA & the European Commission’s Joint Research Centre (JRC) in Ispra, Italy, and has led much of the methodology for ocean color validation and uncertainty analysis of in situ optical data.

David Camardelle: Grand Isle Mayor. Provided permit for us to install real-time ADCP at Caminada Pass. The Mayor’s office is interested in accessing the real time data for local residents, fishermen, and industries.

Stakeholder Group	Examples / Partners	Primary Interests
Operational and Industrial Users	Offshore oil and gas operators, shipping and port authorities	Real-time metocean data for safety, operations, and planning
Government and Regulatory Agencies	NOAA IOOS, NASA, NRL, BOEM, USACE, state coastal management offices	Data integration, environmental monitoring, decision support
Academic and Research Users	Universities (e.g. LSU, UNO, Tulane U, TAMU, USM, UF, FIU), GCOOS-affiliated PIs, modeling groups (e.g. Dr. Xue’s group)	Model validation, process studies, climate and ecosystem research
Public, Local Government, Education, and Outreach	City of Grand Isle, students, GCOOS Education and Outreach, university newsletters, web posts, pamphlets, student projects, media	Environmental awareness, educational demonstrations, citizen science

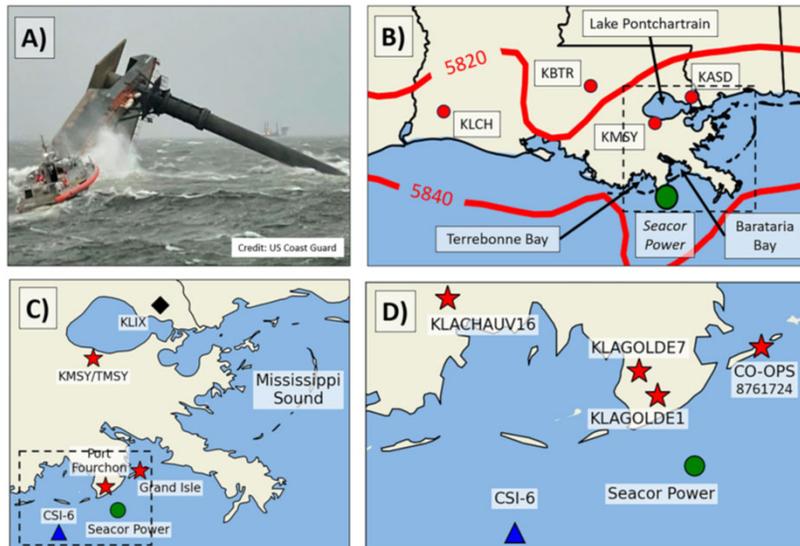
Stakeholder Needs

GZ Giuseppe Zibordi <giuseppe.zibordi@eoscience.eu>
 To: 'Ladner, Sherwin D CIV USN NRL DET SSC MS (USA)' <sherwin.d.ladner.civ@us.navy.mil>;
 'Kraft, Jason (GSFC-618.0)[FIBERTEK INC]' <jason.kraft@nasa.gov>; 'Brian Milan' <brian.j.milan@gmail.com>
 Mon 6/16/2025 5:28 PM
 Cc: Chyunan Li;
 'Sorokin, Mikhail G. (GSFC-618.0)[SCIENCE SYSTEMS AND APPLICATIONS INC]' <mikhail.g.sorokin@nasa.gov>;
 'Gupta, Pawan (GSFC-6180)' <pawan.gupta@nasa.gov>; 'Lind, Elena S. (GSFC-6180)' <elena.lind@nasa.gov>;
 'Werdell, Jeremy (GSFC-6160)' <jeremy.werdell@nasa.gov>

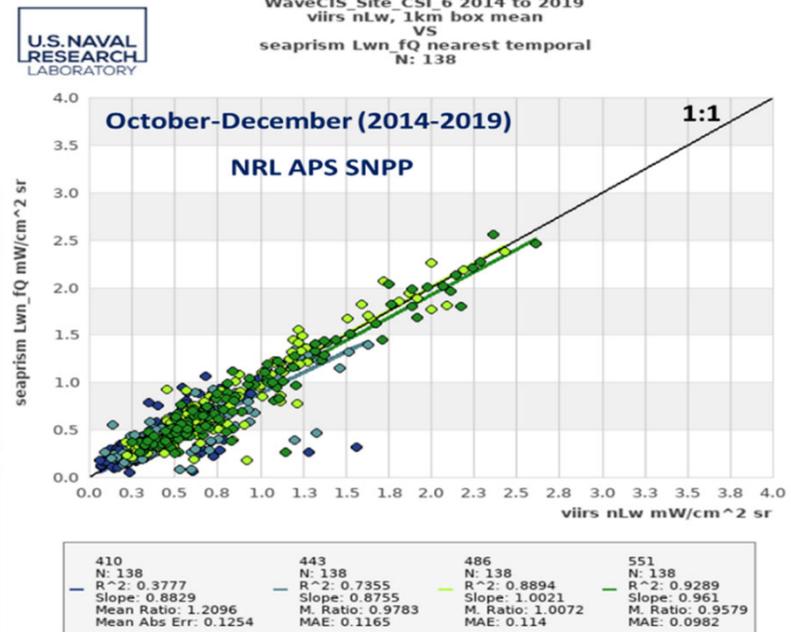
Dear All,
The AERONET-OC site in the Gulf of Mexico is one of the most relevant in the US.
 As per former discussions within the AERONET team and with Jeremy, this site should benefit of a new CE-318T system and ideally of some NASA funding within the framework of future ocean color missions. Because of this, the replacement of the old CE-318 instruments with a new CE-318T should be a priority.

Yours,
 Giuseppe

Miller, P. W., C. Li, K. Xu, S. Caparotta and R.V. Rohli (2024) The evolution of the 2021 *Seacor Power* Tragedy in Coastal Louisiana, *Weather and Forecasting*, Vol. 39, <https://doi.org/10.1175/WAF-D-23-0179.1>

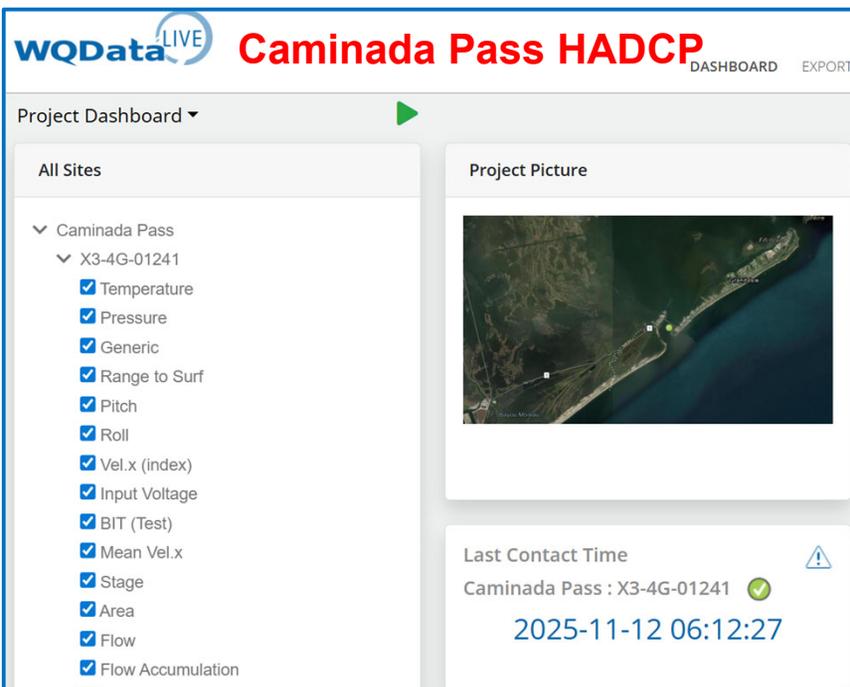


Calibrating satellite data

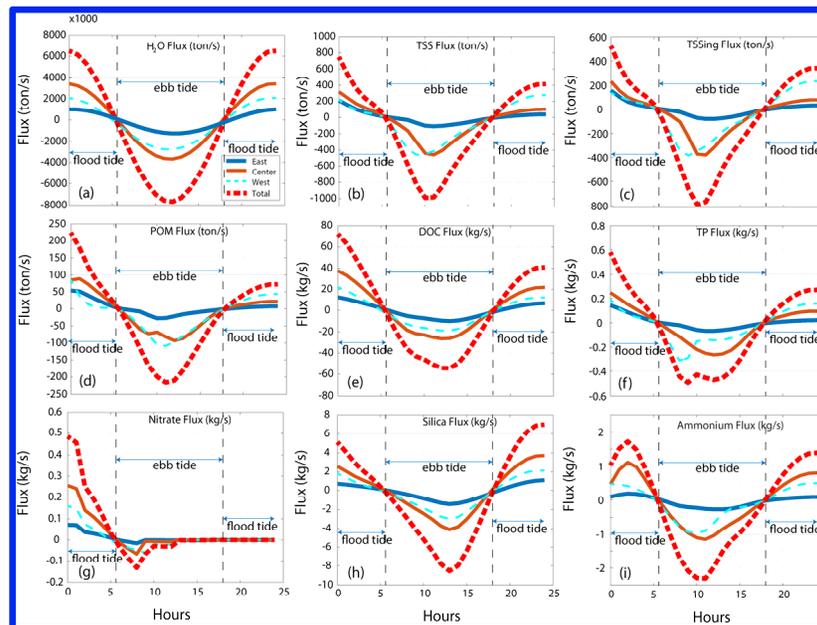


Stakeholder Data Applications

- Forecasting model usage
- Severe weather impact
- Satellite data validation
- Carbon, nutrient, sediment flux computation
- Local community usage
- Researchers needs
- Education of next generation



Carbon & nutrient Flux



Stakeholder Challenges

- Sustainable data support
- Sufficient data points in the ocean



Sea Surface Height / Satellite Altimetry Data: The GCOOS DMAC Component

Presenter:

Tuomo Saari | Scientific Computing Specialist
GCOOS / Department of Oceanography
Texas A&M University, College Station, TX
tuomo.saari@gcoos.org

GCOOS Project PI:

Dr. Robert R. Leben | Research Professor Emeritus
Colorado Center for Astrodynamic Research
Ann and H.J. Smead Aerospace Engineering Sciences
College of Engineering and Applied Sciences
University of Colorado Boulder

GCOOS Virtual Members Meeting, November 13, 2025

Recent Changes



Satellite data products

Before: Various satellite missions, compiled to a data product by Dr. Robert Leben @ CCAR

Now: Copernicus datasets for the near-real-time and delayed mode data

- Global Ocean Gridded L 4 Sea Surface Heights And Derived Variables Nrt (<https://doi.org/10.48670/moi-00149>) | 3 Oct 2022 to 9 Nov 2025
- Global Ocean Gridded L 4 Sea Surface Heights And Derived Variables Reprocessed 1993 Ongoing (<https://doi.org/10.48670/moi-00148>) | 31 Dec 1992 to 30 Apr 2025
- 0.125° × 0.125°
- "Altimeter satellite gridded Sea Level Anomalies (SLA) computed with respect to a twenty-year [1993, 2012] mean."
- "... gives additional variables (i.e. **Absolute Dynamic Topography** and geostrophic currents (absolute and anomalies))."
- "... processed by the DUACS multimission altimeter data processing system."



More Changes



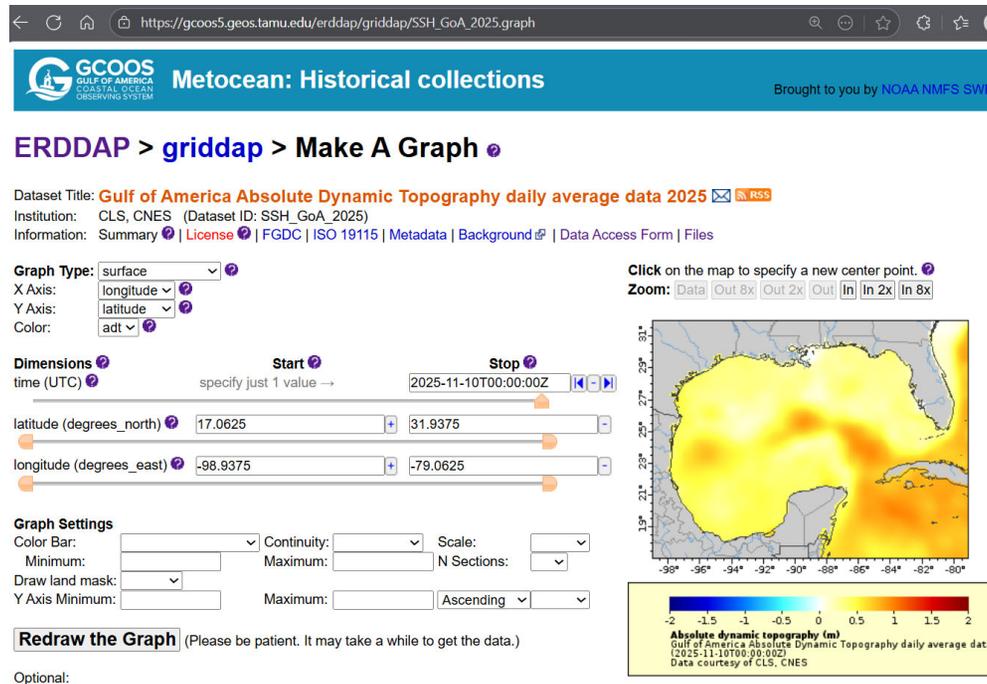
GCOOS DMAC Component

- Data download:
 - Source: CCAR -> Copernicus
 - Monthly? -> Daily
 - Manual -> Automated (Copernicus download tool)
 - Data processing and publishing (ERDDAP, WAF, SSH Project website)
 - Monthly -> Daily
 - Manual -> Automated
- > GCOOS SSH data updates daily

SSH data @GCOOS

GCOOS ERDDAP server (historical data):

https://gcoos5.geos.tamu.edu/erddap/griddap/SSH_GoA_2025.html



ERDDAP > griddap > Make A Graph

Dataset Title: **Gulf of America Absolute Dynamic Topography daily average data 2025**

Institution: CLS, CNES (Dataset ID: SSH_GoA_2025)

Information: Summary | License | FGDC | ISO 19115 | Metadata | Background | Data Access Form | Files

Graph Type: surface

X Axis: longitude

Y Axis: latitude

Color: adt

Dimensions: time (UTC) Start: 2025-11-10T00:00:00Z Stop: specify just 1 value →

latitude (degrees_north): 17.0625 to 31.9375

longitude (degrees_east): -98.9375 to -79.0625

Graph Settings: Color Bar, Continuity, Scale, Minimum, Maximum, N Sections, Draw land mask, Y Axis Minimum, Maximum, Ascending

Redraw the Graph (Please be patient. It may take a while to get the data.)

Optional:

Click on the map to specify a new center point.

Zoom: Data | Out 8x | Out 2x | Out | In | In 2x | In 8x

Absolute dynamic topography (m)
Gulf of America Absolute Dynamic Topography daily average data
(2025-11-10T00:00:00Z)
Data courtesy of CLS, CNES

SSH data @GCOOS

<https://geo.gcoos.org/ssh/data3>



Sea Surface Height

The ADT data served here is E.U. Copernicus Marine Service Information; <https://doi.org/10.48670/moi-00148> and <https://doi.org/10.48670/moi-00149>.

The Sea Surface Height (SSH) or height of the ocean surface is affected by tidal forces, ocean circulation and variations in the gravitational field. The sea surface height above the Geoid is the Absolute Dynamic Topography (ADT), which is observed by satellite altimeters. For convenience purposes, this site redistributes the Copernicus ADT data as yearly data files, along with ADT contour animations generated by GCOOS.

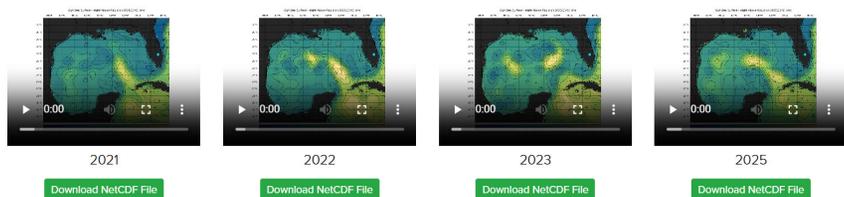
The description of the original Copernicus data product:

Altimeter satellite gridded Sea Level Anomalies (SLA) computed with respect to a twenty-year [1993, 2012] mean. The SLA is estimated by Optimal Interpolation, merging the L3 along-track measurement from the different altimeter missions available. Part of the processing is fitted to the Global ocean. (see GUID document or <http://duacs.cis.fr> pages for processing details). The product gives additional variables (i.e. Absolute Dynamic Topography and geostrophic currents (absolute and anomalies)). It serves in delayed-time applications. This product is processed by the DUACS multimission altimeter data processing system.

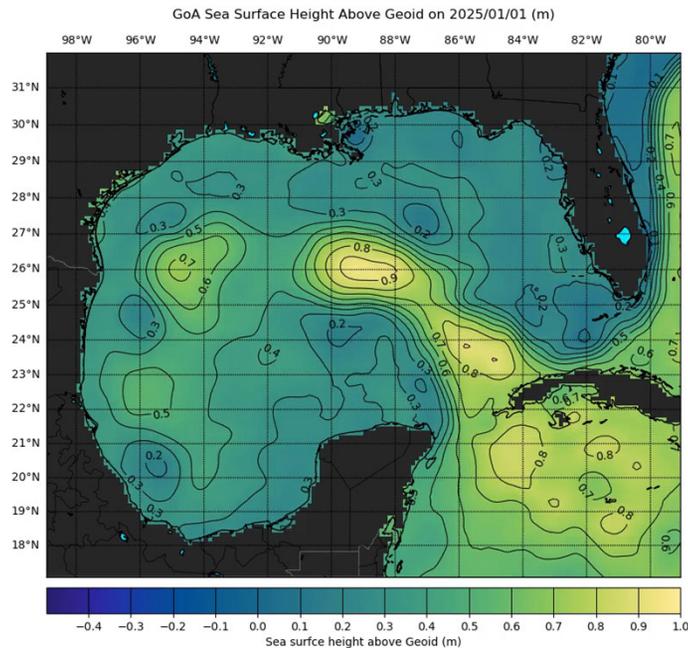
For more information about the Gulf of America Sea Surface Height, contact Robert Leben (leben@colorado.edu). For more information about the Copernicus data, visit <http://marine.copernicus.eu>.

Animation & NetCDF files

Note: all netcdf files are version4 and IOOS-compliant. Questions: info@gcoos.org



Generated using E.U. Copernicus Marine Service Information;
<https://doi.org/10.48670/moi-00148> and
<https://doi.org/10.48670/moi-00149>.



Data publishing pipeline

```
(1) # m h dom mon dow  command
00 02 * * * bash /data/erddap/ssh_Copernicus/staging/dl_copernicus_ssh_nrt_year.sh 2025
```



ERDDAP > griddap > Data Access Form

Dataset Title: **Gulf of America Absolute Dynamic Topography daily average data 2025**

Institution: CLS, CNES (Dataset ID: SSH_GoA_2025)

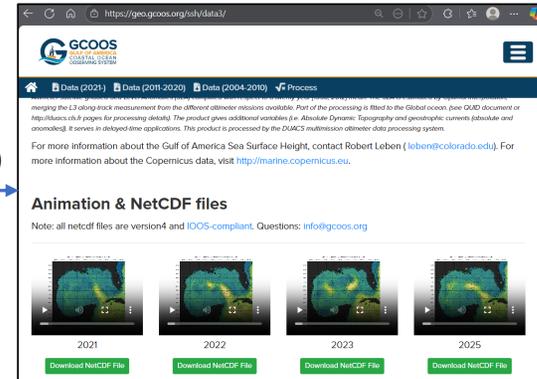
Information: [Summary](#) | [License](#) | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Files](#) | [Make a graph](#)

(2)

(3)

```
05 03 * * * bash /data/erddap/ssh_Copernicus/staging/ssh_contours_per_year.sh 2025
```

(4)



Animation & NetCDF files

Note: all netcdf files are version4 and IOOS-compliant. Questions: info@gcoos.org

2021 2022 2023 2025

[Download NetCDF File](#) [Download NetCDF File](#) [Download NetCDF File](#) [Download NetCDF File](#)

(4)

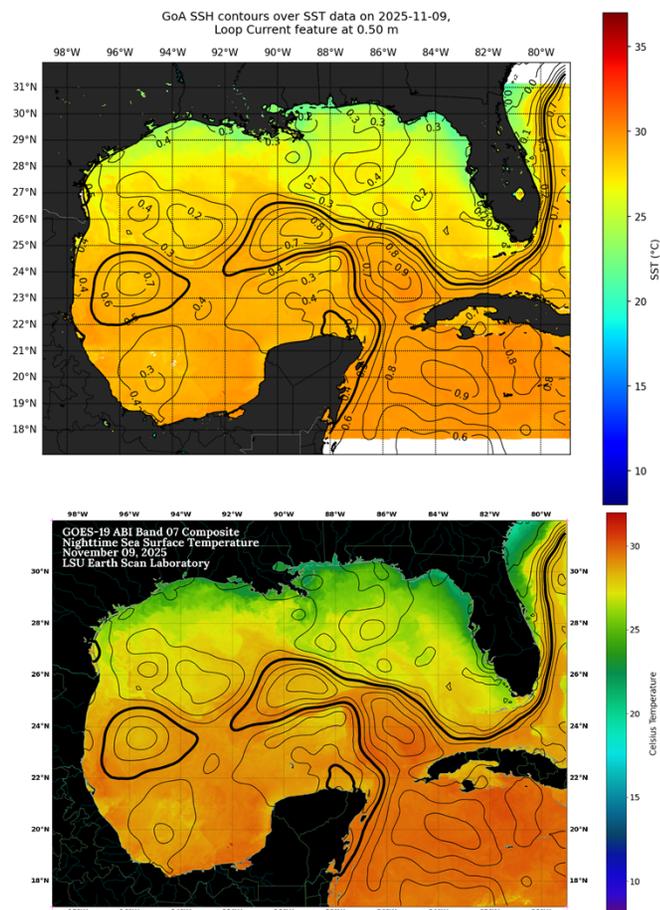
- (1)** Download SSH data (Copernicus)
e.g. <https://doi.org/10.48670/moi-00149>
- (2)** Update annual SSH dataset (ERDDAP)
e.g. https://gcoos5.geos.tamu.edu/erddap/griddap/SSH_GoA_2025.html
- (3)** Generate annual animation of the SSH contours
- (4)** SSH website links to data on ERDDAP and WAF



Index of /WAF/GoA_SSH

Name	Last modified	Size	Description
Parent Directory	-	-	-
ssh_goa_2025.mp4	2025-11-10 03:23	11M	
ssh_goa_2023.mp4	2025-03-05 05:44	12M	
ssh_goa_2022.mp4	2025-03-05 05:19	12M	
ssh_goa_2021.mp4	2025-03-05 04:54	11M	

Future plans



Daily Sea Surface Temperature (SST) plot with Sea Surface Height (SSH) contours and Loop Current feature

- Operational, not published yet
- SST: “A nightly composite SST of the Gulf of America, derived from GOES-19 ABI sensor Channel 07.” “ABI Composite SST with land and cloud mask applied.”
- SSH: The Copernicus Nrt dataset

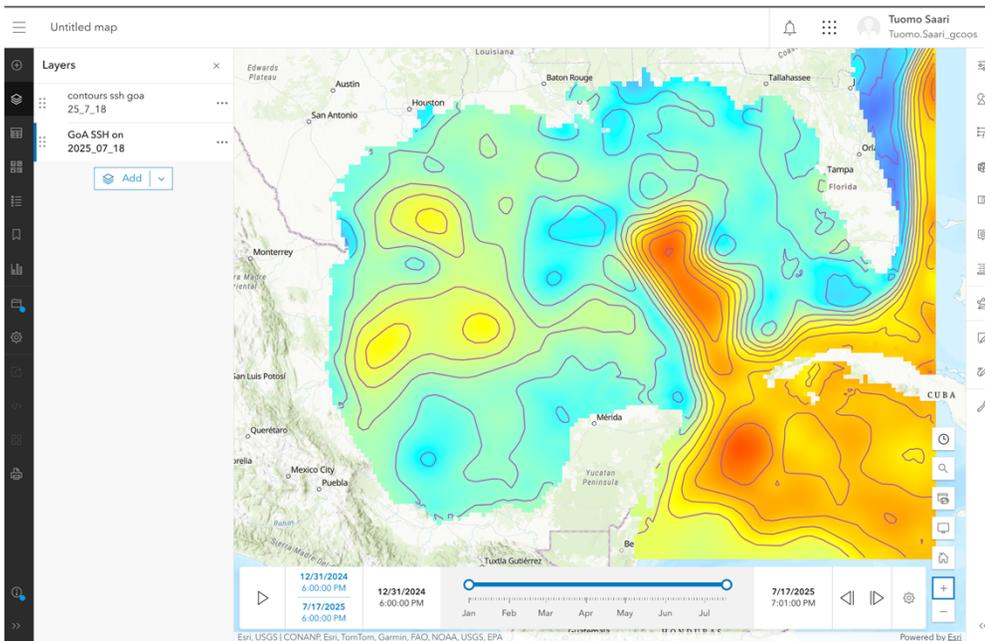
CREDITS:

- The GOES SST data is provided by **Mr. Alaric Haag** and **Dr. Nan Walker**, affiliated with the **LSU Earth Scan Lab**, Dept. of Oceanography and Coastal Sciences Coastal Studies Institute, Louisiana State University, Baton Rouge.
- SSH derived data has been generated using E.U. Copernicus Marine Service Information; <https://doi.org/10.48670/moi-00149>.
- The lower picture was provided by **Dr. Robert Leben**

Future plans



GCOOS ArcGIS Online: <https://gcoos.maps.arcgis.com>



- AGOL platform can potentially reach a larger and different audience
- Overlaying all sorts of data layers
- Tool for outreach and education

* SSH derived data has been generated using E.U. Copernicus Marine Service Information; <https://doi.org/10.48670/moi-00149>



Challenges / Things to Do



- Knowing what type of data products would be most useful
- Learning about the art of data visualization
- Automated dataflow of data layers to ArcGIS Online



Thank you!

Panel Discussion Points

What is the greatest challenge or need (and potential solution) for improving stakeholder application of observation data?

How can we improve tracking of outcomes related to stakeholder data applications, and measure economic value of activities? We can do this for GCOOS funded activities. However, it is more difficult to track and measure outcomes from partnering organizations.