NATIONAL ACADEMIES Sciences Engineering Medicine

GRP 2023 5 year review:

GRP RESPONSE TO THE GOVERNING BOARD

February 2024. The Beckman Center

Lauren Alexander Augustine, PhD, Executive Director of the Gulf Research Program

This Talk

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The GRP's Mandate and Context

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GRP and TRB Collaboration?

It’s so nice to be here.

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GULF RESEARCH PROGRAM

GRP Mandate and Context

01

In the GRP, we start with "why"

Reducing the environmental harm, loss of life or injury, and economic damage…in the Gulf of Mexico … is a national priority.

Scientific and engineering research are essential to enhancing safety and minimizing the risk of future harm…in the Gulf of Mexico.

GRP is charged to use science and engineering to enhance

- Offshore energy safety
- Environmental protection
- Health and resilience of Gulf communities

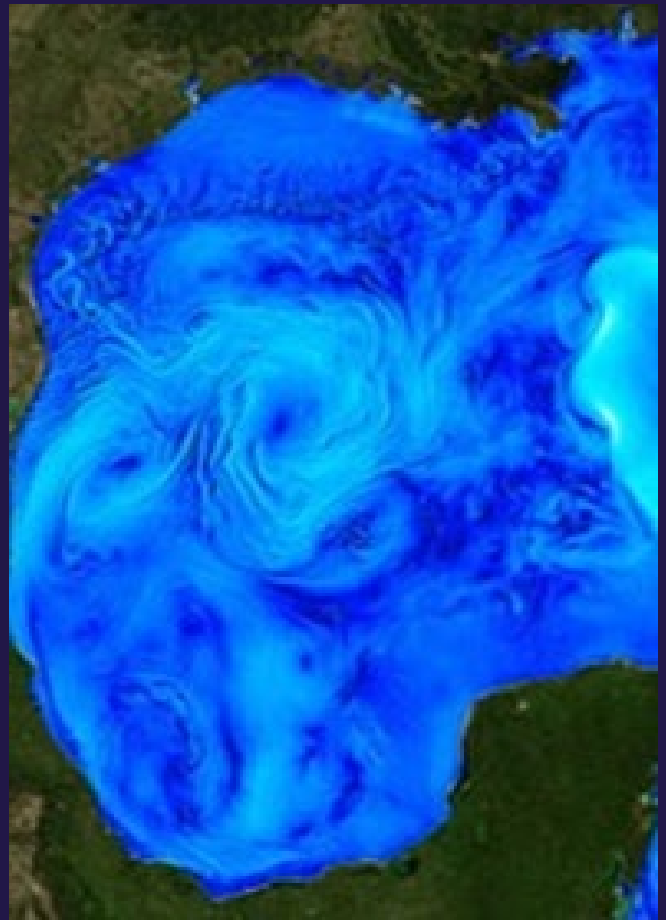
GRP Strives to

Keep the Gulf a productive, working coast that supports a safe, resilient, and sustainable future for all those who call the region home under conditions of change.

GRP End Goal

To invest in people, coalitions, collaborations, and partnerships to generate integrated solutions to the integrated challenges that involve offshore energy, coastal and environmental changes and management, and health and resilience in gulf communities or regions now and for generations to come.

The Gulf Coast as a Working Coast



02

A Working Coast Economy: a “national priority”

Economy of Food: $680B/yr

Economy of Shipping: $1.5T/yr

Economy of Fuel: $350B/yr + $35B/yr + $1T

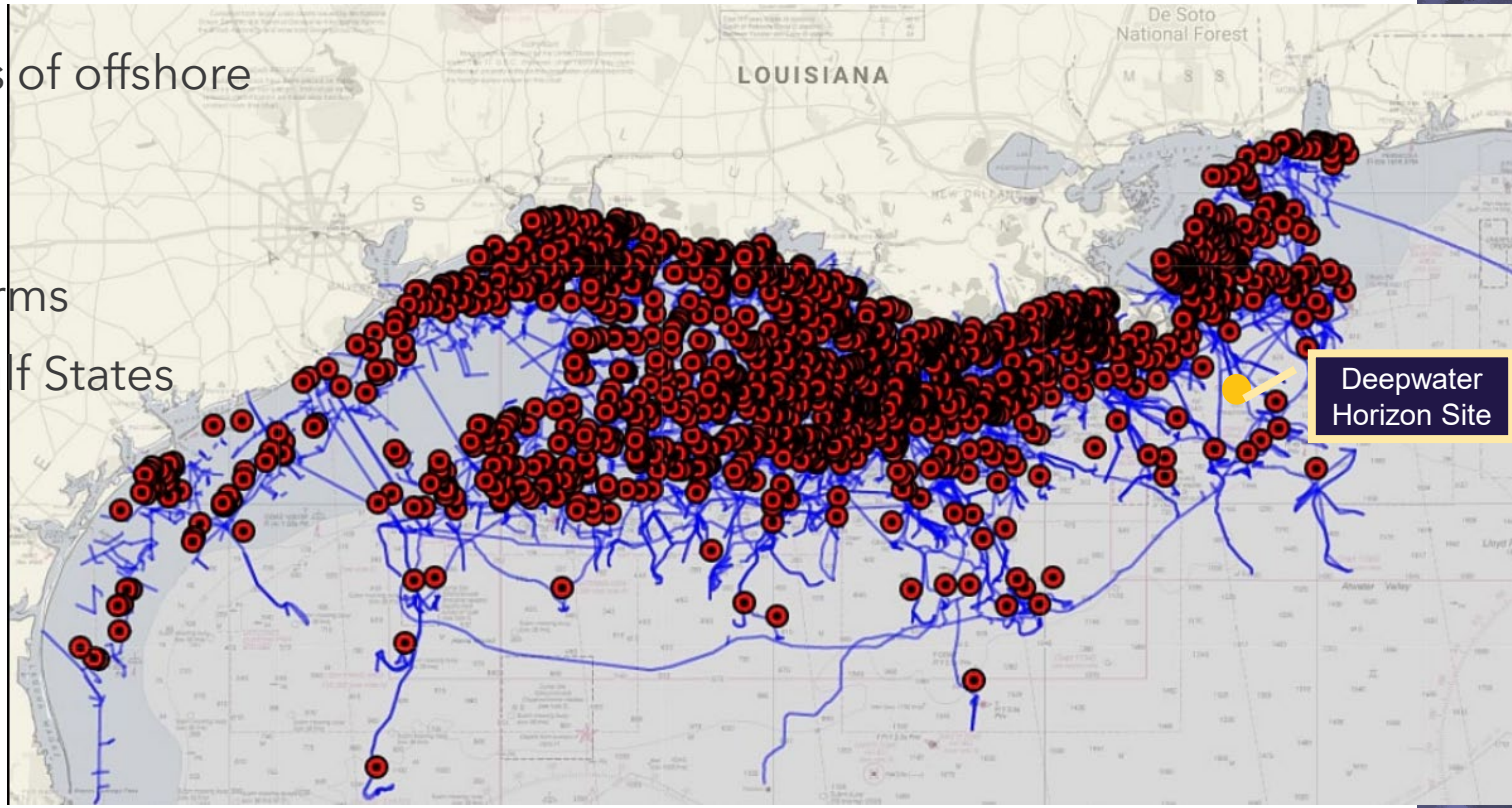
Economy of Fun: $20B/yr

GRP-TRB Overlap is in our Settlement Language

The Program will seek to advance scientific and technical understanding with the objective of enhancing the safety of offshore oil drilling and hydrocarbon production and transportation in the Gulf of Mexico and on the United States' outer continental shelf.

That's nontrivial in the Gulf of Mexico

- ~30,000 miles of offshore pipelines
- >55,000 wells
- >7,000 platforms
- 28 ports in Gulf States



LNG: $34 B/yr

6 of 12 (50%) existing facilities in the Gulf

15 of 17 (88%) FERC approved LNG Import/Export facilities are located on the Gulf –7 of these are already under construction

FERC – APPROVED, UNDER CONSTRUCTION

1. **Sabine Pass, TX**: 2.57 Bcfd (ExxonMobil – Golden Pass) (CP14-517, CP20-459)
2. **Plaquemines Parish, LA**: 3.32 Bcfd (Venture Global Plaquemines) (CP17-66)
3. **Calcasieu Parish, LA**: 3.81 Bcfd (Driftwood LNG) (CP17-117)
4. **Corpus Christi, TX**: 1.58 Bcfd (Cheniere Corpus Christi Stage III) (CP18-512)
5. **Port Arthur, TX**: 1.86 Bcfd (Sempra - Port Arthur LNG Trains 1 & 2) (CP17-20)
6. **Brownsville, TX**: 3.73 Bcfd (Rio Grande LNG – NextDecade) (CP16-454)
7. **Cameron Parish, LA**: 0.06 Bcfd (Venture Global Calcasieu Pass) (CP15-550)

FERC – APPROVED, NOT UNDER CONSTRUCTION

A. **Lake Charles, LA**: 2.27 Bcfd (Lake Charles LNG) (CP14-120)
B. **Lake Charles, LA**: 1.22 Bcfd (Magnolia LNG) (CP14-347)
C. **Hackberry, LA**: 0.93 Bcfd (Sempra - Cameron LNG Train 4) (CP15-560, CP22-41)
D. **Freeport, TX**: 0.74 Bcfd (Freeport LNG Dev Train 4) (CP17-470)
E. **Pascagoula, MS**: 1.50 Bcfd (Gulf LNG Liquefaction) (CP15-521)
F. **Jacksonville, FL**: 0.13 Bcf/d (Eagle LNG Partners) (CP17-41)
G. **Brownsville, TX**: 0.62 Bcfd (Texas LNG Brownsville) (CP16-116)
H. **Nikiski, AK**: 2.76 Bcfd (Alaska Gasline) (CP17-178)
I. **Cameron Parish, LA**: 1.21 Bcfd (Commonwealth LNG) (CP19-502)
J. **Port Arthur, TX**: 1.86 Bcfd (Sempra - Port Arthur LNG Trains 3 & 4) (CP20-55)

A Dynamic Gulf Landscape

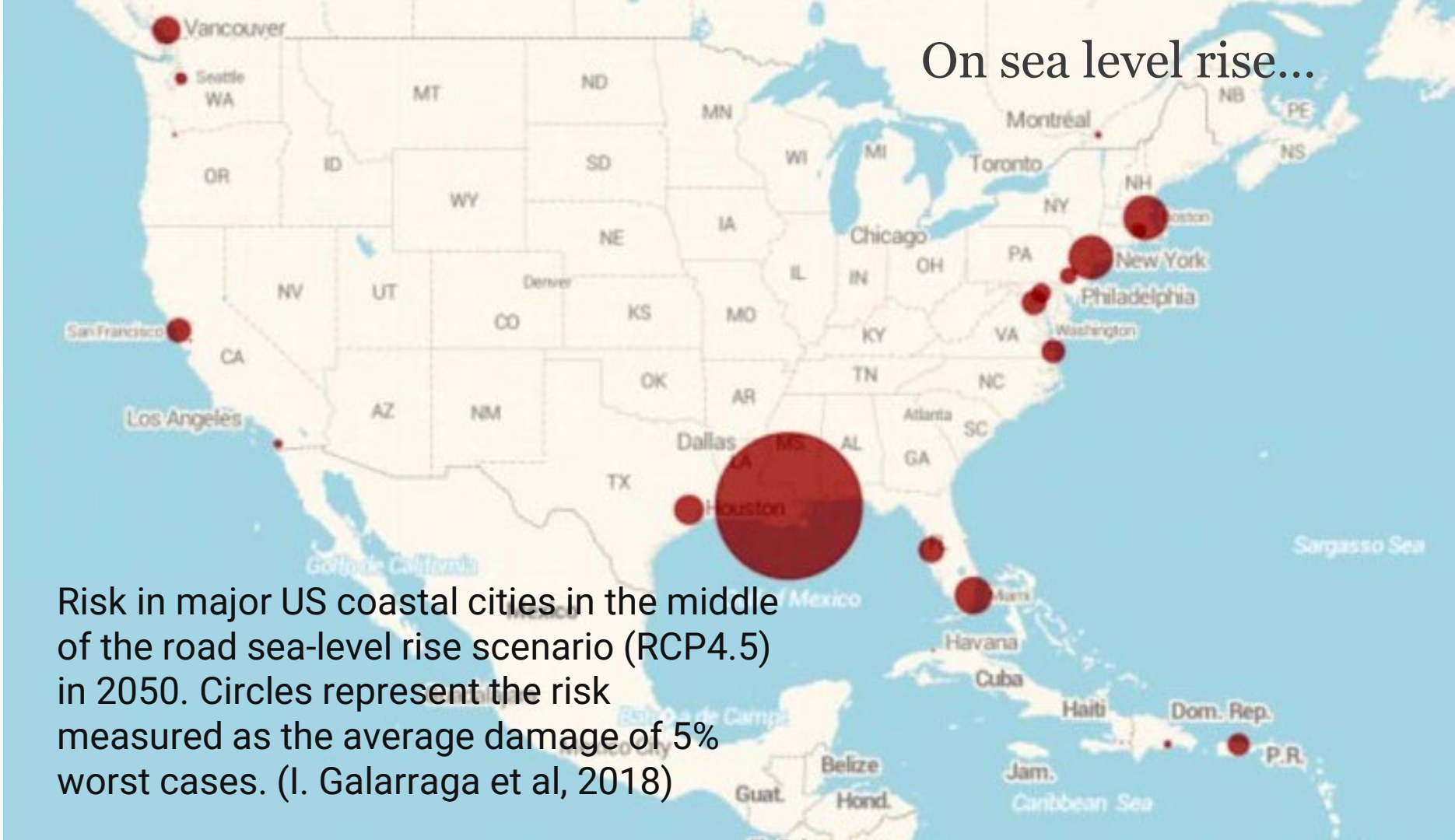
Environmental changes: sea level rise, coastal land loss, extreme heat, changes in water quality, extreme weather, more frequent and more intense storms

Energy changes and transition: changes in the offshore, onshore, increases in exportation, moving towards a post-hydrocarbon economy, automation, workforce

Changing communities: people on the move, low measures of social determinants of health, compounding disasters, overlapping and incomplete recoveries, workforce and training

Sometimes oil, environment, and people combine in disastrous ways

On sea level rise...



Risk in major US coastal cities in the middle of the road sea-level rise scenario (RCP4.5) in 2050. Circles represent the risk measured as the average damage of 5% worst cases. (I. Galarraga et al, 2018)

Ports Under Threat

Climate and subsidence

"While any closure of this sliver of a road is a hardship for people who live in the area, it's also a blow to the nation. That's because Highway 1 is the only land route to Port Fourchon, a sprawling, deepwater harbor on the Gulf of Mexico that supplies nearly 20 percent of the nation's oil and gas at any time. It's connected to nearly 50 percent of the nation's refining capacity and is a supply point for about 90 percent of offshore drilling vessels in the Gulf.

GRP’s major programming and approaches

03

Major GRP Programs

Engagement: $50 Million Gulf Futures Challenge to launch in June

Program Integration: $10M Build out the design studio course

Mississippi River Delta Transitions: $25M consortium grant to 15 collaborating organizations for modeling, resilience, and lower river management

Learning and applied lessons: Gulf Alaska Exchange

Education and Workforce: education, industry, community college, and environment programming in southern Louisiana

GRP Impact: Reaching the Next Generation

Gulf Scholars, undergraduates

STEMM Grantees: high schoolers learning to conduct environmental science research

Mississippi Delta Transition Initiative

- The GRP invited a joint application from Louisiana State University and Tulane University who will co-lead the development of an integrated, diverse research consortium

- MissDelta will:
  - Project the future evolution of the lowermost region of the Mississippi River Delta (referred to as the Birdsfoot region) and broader socioeconomic implications
  - Work with CPRA, USACE, and BOEM to incorporate findings into their work and to assess change that is relevant to their programs while mentoring /training a new generation of young scientists

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Miss Delta Objectives

I. **Future Projection Development**. Project the future evolution of the Birdsfoot region at multiple time frames that support the needs of the Gulf community under various environmental and human-influenced scenarios. Projections should consider the ecological implications for the broader deltaic plain.

II. **Management Evaluation.** Evaluate various management strategies for the allocation of water and sediments within the Birdsfoot region based on future projections. Assess the consequences of the Birdsfoot region's future evolution on ecosystems, natural resources, and energy operations in the Gulf of Mexico.

III. **Workforce Diversity.** Broaden the diversity and number of scholars working on coastal-deltaic issues in the Gulf of Mexico region and seek to diversify the representation of experts, at both the individual and the institutional level throughout various groups (research, education, and outreach) within the Initiative.

IV. **Socioeconomic Resilience.** Assess the socioeconomic effects on community resilience under scenarios of altered navigation, fishing/fisheries, and energy output or operations, including implications for disaster management and infrastructure due to changes in the Birdsfoot region.

SINCE 1837

The Times-Picayune

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Grant to help future of Bird's Foot Delta

Researchers to study area where Mississippi River meets Gulf

BY MARK SCHLEIFSTEIN
Staff writer

A major new initiative will investigate the future of Louisiana's Bird's Foot Delta, the disappearing wisps of land where the Mississippi River meets the Gulf of Mexico, holding wide-ranging importance to the state and beyond.

A new research consortium is being created to examine the geological, economic and cultural future of the delta with hands-on research and computer modeling. It will be funded with a five-year, $22 million grant, the National Academy of Sciences, Engineering and Medicine's Gulf Research Program announced Tuesday.

"Multiple natural and human-made factors are driving major changes to the Mississippi Delta, and how these play out will have profound implications for the Gulf and the nation," said Lauren Alexander Augustine, executive director of the Gulf Research Program, which is funded with $500 million in criminal fines paid by BP and its drilling partners involved in the 2010 Deepwater Horizon oil spill.

The new Mississippi River Delta Transition Initiative, or MissDelta, will include the development of new, state-of-the-art computer models to help researchers determine how the lower delta, from mile 44 on the river's east bank to its mouth, will change over the next 100 years, said Tulane professor Mead Allison and LSU professor Samuel Bentley, co-leaders of the consortium.

"It's the area that's most at risk of collapse in the 21st century of anywhere on the Gulf Coast," Allison said in an interview.

The concerns include whether the wetlands and land that make up the delta will continue to retreat north, and whether the underwater sediment platform extending into the Gulf of Mexico will also continue to subside.

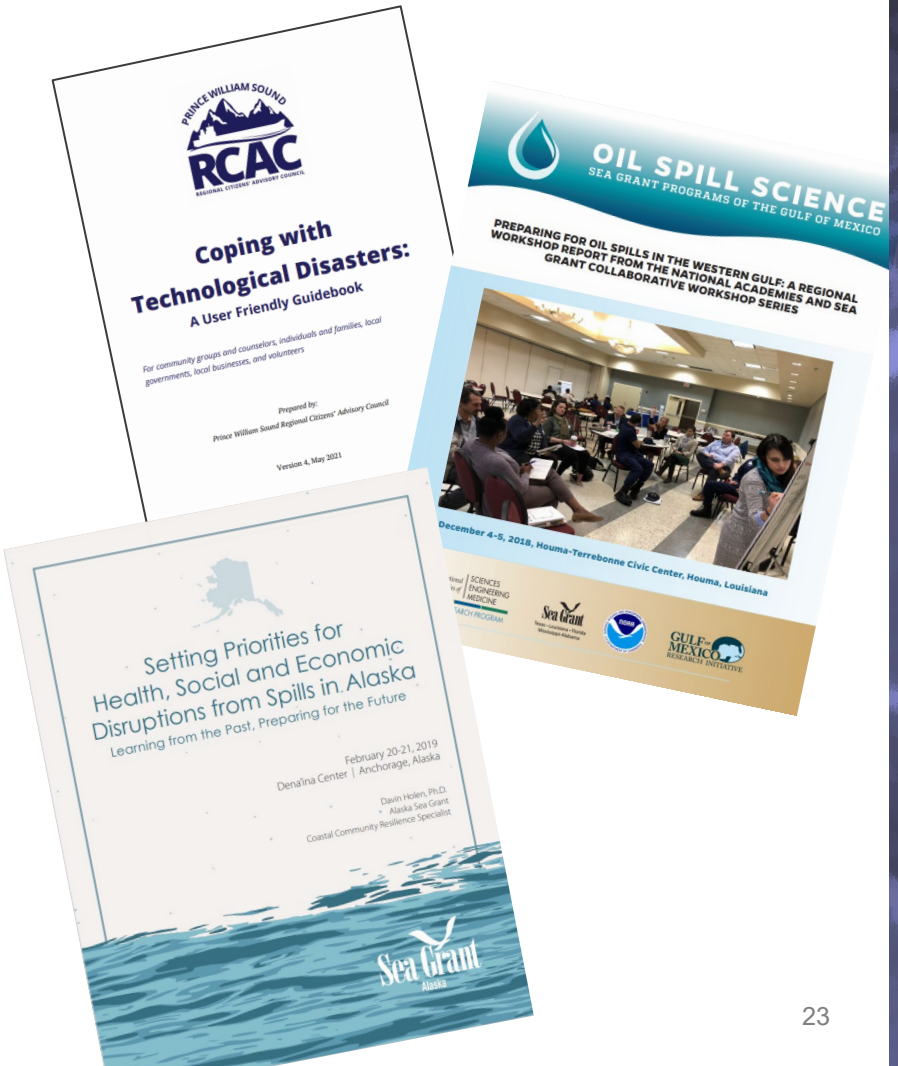
A key worry is that both those changes will affect the river's role as the main channel for Midwest grain harvests to reach world markets, Bentley said in an interview.

"Those kinds of threats will increase the silting in of the navigation channel, increase the cost of dredging and also destabilize the river's banks," Bentley said. "We don't want to get to a point where Southwest Pass is just a corridor

➤ See DELTA, page 2B

The seed of an idea…

- Two sites of largest U.S. oil spills
- Depth of experience
- Existing exchange examples
- Shared interest in developing understanding and methodologies



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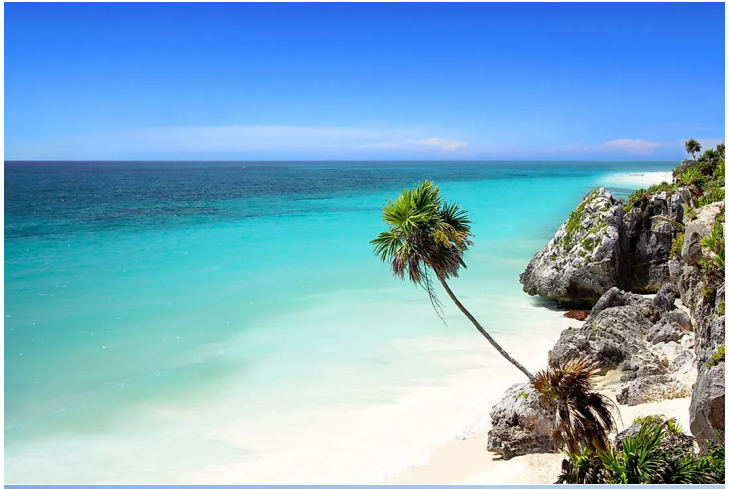
Gulf Alaska Knowledge Exchange

- Three workshops
- Cumulative summary document at the end
- Themes to include:
  - Oil spill impact on biology
  - Oil spill impact on seafood industry
  - Climate change



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GRP Presence in the Gulf Region

“There is the perception that the GRP is too distant from the community as most of the GRP staff are located in Washington, DC; however, connections with local organizations counterbalance that. Those connections are a solid use of resources—and should continue to grow.”

“The GRP has had a positive impact in …bringing together groups that had not previously been engaged, helping foundations in the region to connect….”

GRP has hired four staff members who live in the Gulf region.

SINCE 1837

The Times-Picayune

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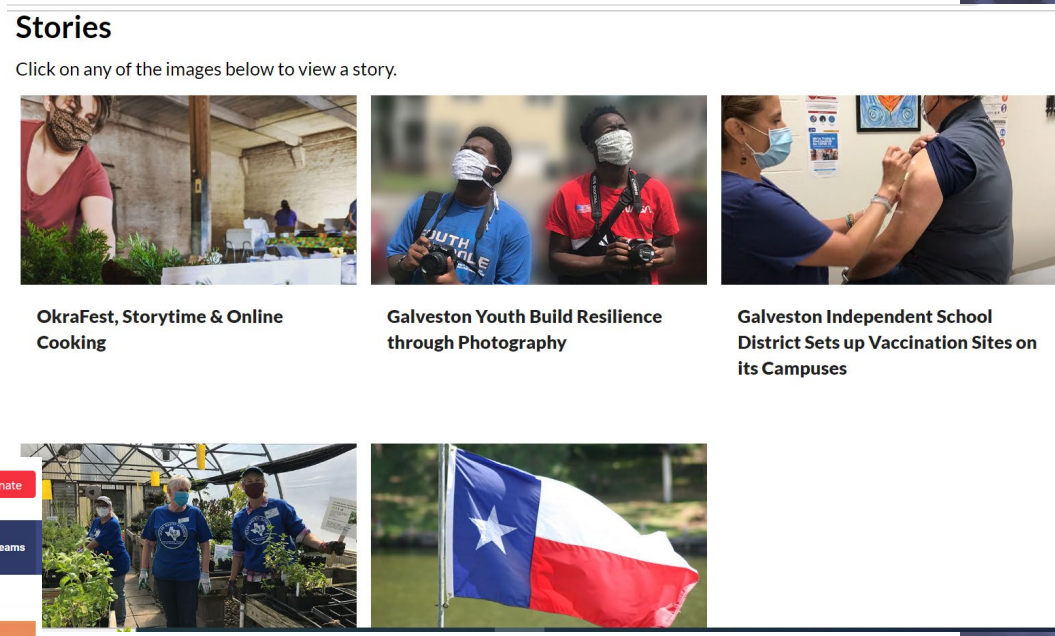
➤ See DELTA, page 2B

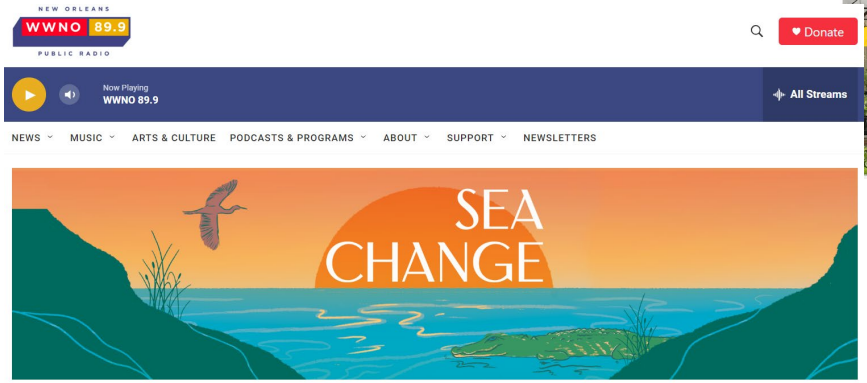
ELECTION 2023
ST. TAMMANY

GRP Impact: Communications and Outreach

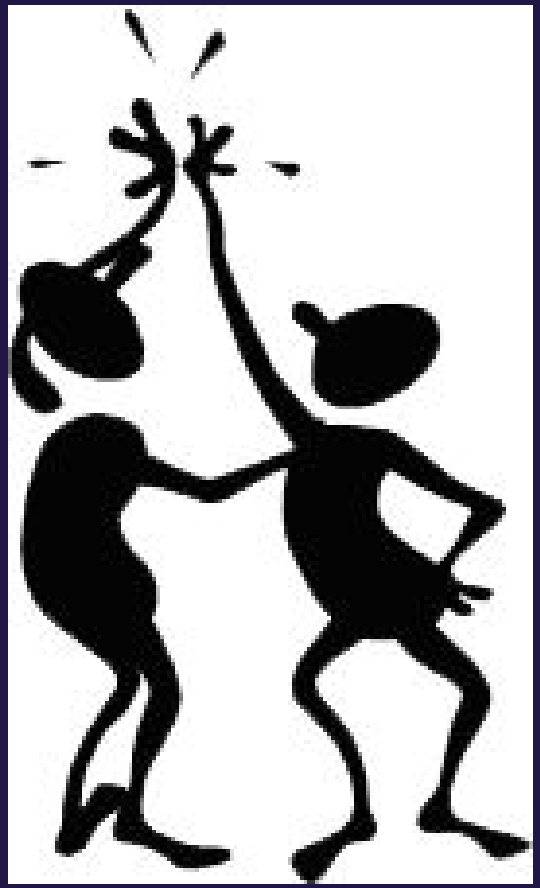
Stories from SE Texas (https://www.nationalacademies.org/our-work/covid-19-stories-of-resilience-across-the-state-of-texas

Broadened audiences via the WWNO podcast, SeaChange





GRP and TRB



04

Ideas for Collaboration

- The TRB/GRP report on Offshore Risk
- Ideas around safety culture across different sectors
- Port safety in the Gulf
- Opportunities around LNG exportation
- Ideas…?

Questions?

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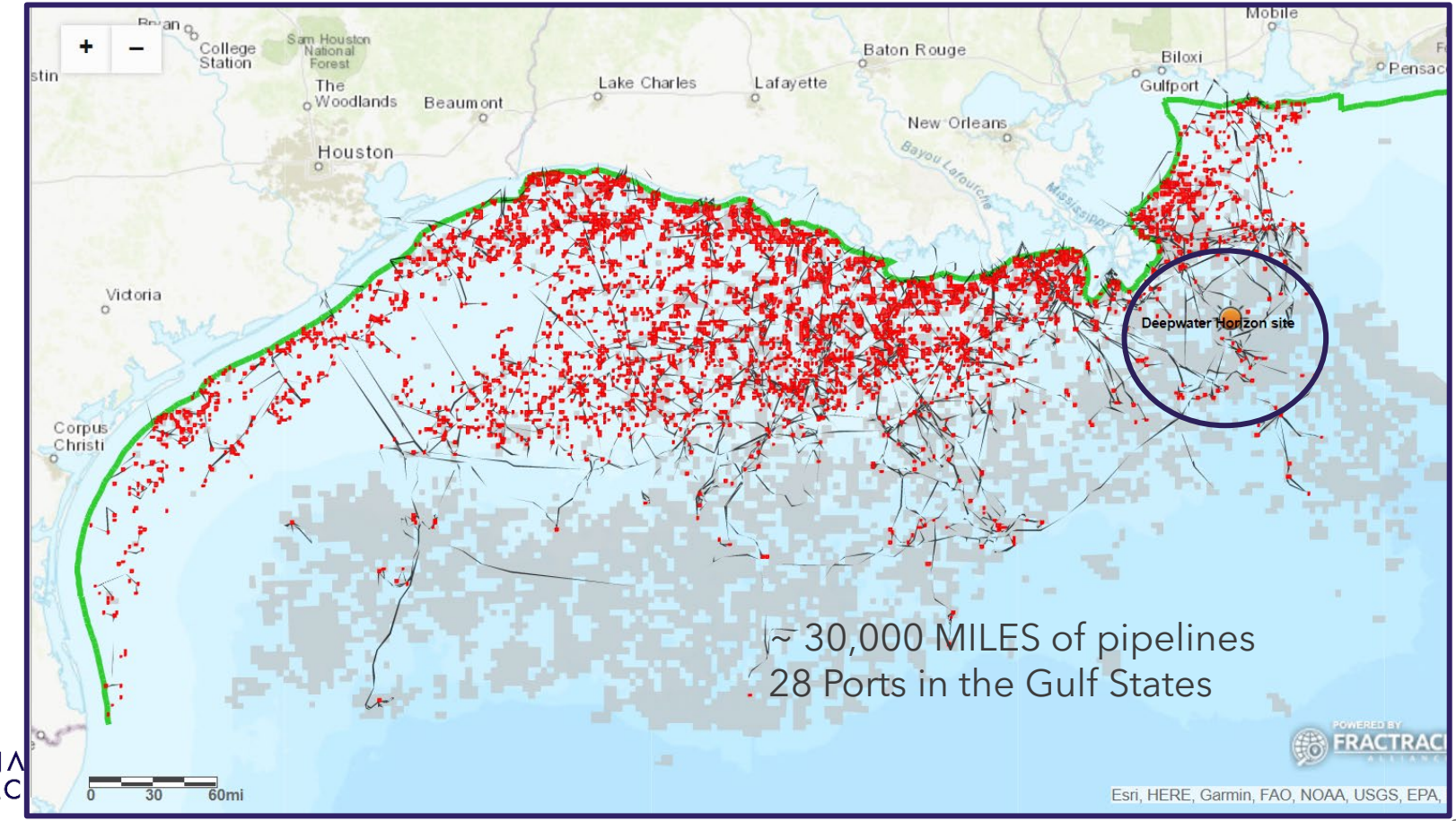
Lauren Alexander Augustine

Pipelines, Platforms, and Deepwater Horizon



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