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THE GULF RESEARCH PROGRAM'S INITIATIVE ON LONG-TERM MONITORING IN THE GULF OF MEXICO

October 25, 2017

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Information Science and Healthy Ecosystems Initiative

The Gulf Research Program

Who: Division of the NASEM (2013)

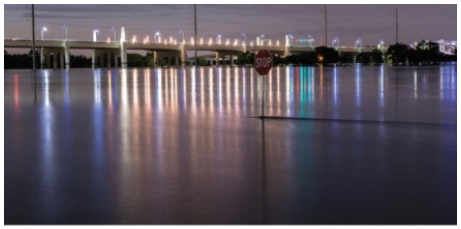
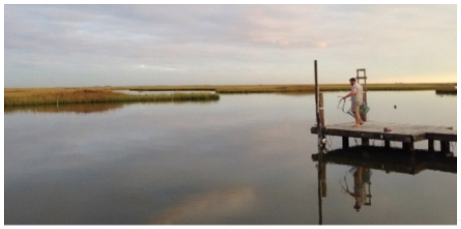
Why: Courts allocated some *Deepwater Horizon* penalty monies to "community benefit"

What: $500 million to support grants, fellowships, and other activities

When: 30-year program (2013-2043)

How: Competitive funding opportunities; Guided by the GRP's "Strategic Vision" (2014) and 20+ member Advisory Board.



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Defining Features of the GRP

- Directed to operate in three areas:
  - Oil system safety
  - Human health
  - Environmental resources

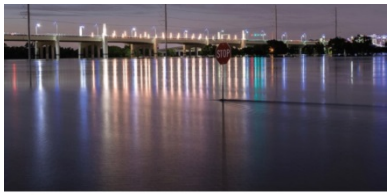
- Directed to work via three mechanisms:
  - Research & development
  - Education & training
  - Environmental monitoring

- Future-oriented, rather than documenting effects of DWH
- Perspective extends beyond the Gulf of Mexico
- 30-year duration

Mission and Program Initiatives

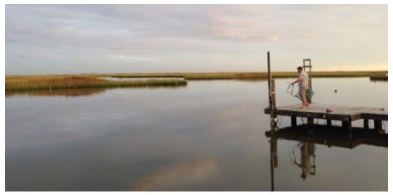
Mission: Over its 30-year duration, the Gulf Research Program works to enhance oil system safety and the protection of human health and the environment in the Gulf of Mexico and other U.S. outer continental shelf areas by seeking to improve understanding of the region's interconnecting human, environmental, and energy systems and fostering application of these insights to benefit Gulf communities, ecosystems, and the Nation

Reducing risk in offshore oil and gas; improve underlying science



Enhancing the health and resilience of coastal communities

Data & Observations for improved management of coastal resources



Building capacity to address cross-boundary challenges

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Projects with Enduring and Lasting Impact

1. Engage **multiple generations of scientists**, through fellowships grants, and other career building activities, in research and policy making.
2. Catalyze long-term monitoring and research that will advance scientific understanding of **deep water ecosystems and processes** in the Gulf of Mexico
3. Support long-term monitoring and research to improve the science and practice **environmental restoration and restoration monitoring**
4. Participate and provide leadership in an **oil-system safety** network of stakeholders
5. Strengthen the science and practice of **coastal community resilience** in regions along the US outer continental shelf through research and capacity building
6. Encourage and develop capacity for **scientific synthesis** (e.g., integration of data and methods; application of scientific research) to improve the safety of energy production and protect human well-being and the environment

Grants

2016 Exploratory Grants - $4 million, 10-20 projects, 1-2 years

- TOPIC 1: **Scenario planning to explore risks in offshore oil and gas** operations
- TOPIC 2: Helping **coastal communities plan and adapt to environmental change in regions** with offshore oil and gas operations

2016 Synthesis Grants - $5 million, 10-15 projects, 2-years

- TOPIC: **Scientific synthesis connecting environmental, social, and/or health data**

2016 Capacity Building Grants – $1 million, 5-10 projects, 1-2 years

- TOPIC: **Cross-boundary networks to address regional environmental challenges** in U.S. OCS regions

2017 Research-Practice Grants – $10 million, 3-6 projects, 3 years

- TOPIC: Enhancing **coastal community resilience** and well-being in the Gulf of Mexico region

Grants Continued

2017 Research & Development Grants - $10 million, 1-3 years

- TOPIC: **Preventing the Next Spill: Understanding Systemic Risk in the Offshore Oil and Gas Environment**

2017 Research-Practice Grants - $5 million, 1-3 years

- TOPIC 1: **Integration of Monitoring and Evaluation into Environmental Restoration Projects to Improve Outcomes in the Gulf of Mexico**
  TOPIC 2: **Improving Risk-Based Evaluations to Support a Public Health Response to the Next Oil**

- Provides valuable experience at science-policy interface through one-year placement on staff of state environmental, natural resources, oil and gas, or public health agency; or regional offices of relevant federal agencies.
- Fellows participate in and contribute to state or federal policymaking process. Duties vary by placement but can include analysis and synthesis of scientific information to support policy development, writing policy memos, and drafting legislation.

2017 EARLY CAREER RESEARCH FELLOWS

Christoph Aeppli
Bigelow Laboratory for Ocean Sciences
East Boothbay, ME

Laura Bakkensen
University of Arizona
Tucson, AZ

Paul Harnik
Franklin and Marshall College
Lancaster, PA

YeongAe Heo
Case Western Reserve University
Cleveland, OH

Michael Martínez-Colón
Florida A&M University
Tallahassee, FL

Ali Mostafavi
Texas A&M University
College Station, TX

David Murphy
University of South Florida
Tampa, FL

Ashley Ross
Texas A&M University, Galveston
Galveston, TX

Wanyun Shao
Auburn University
Montgomery, AL

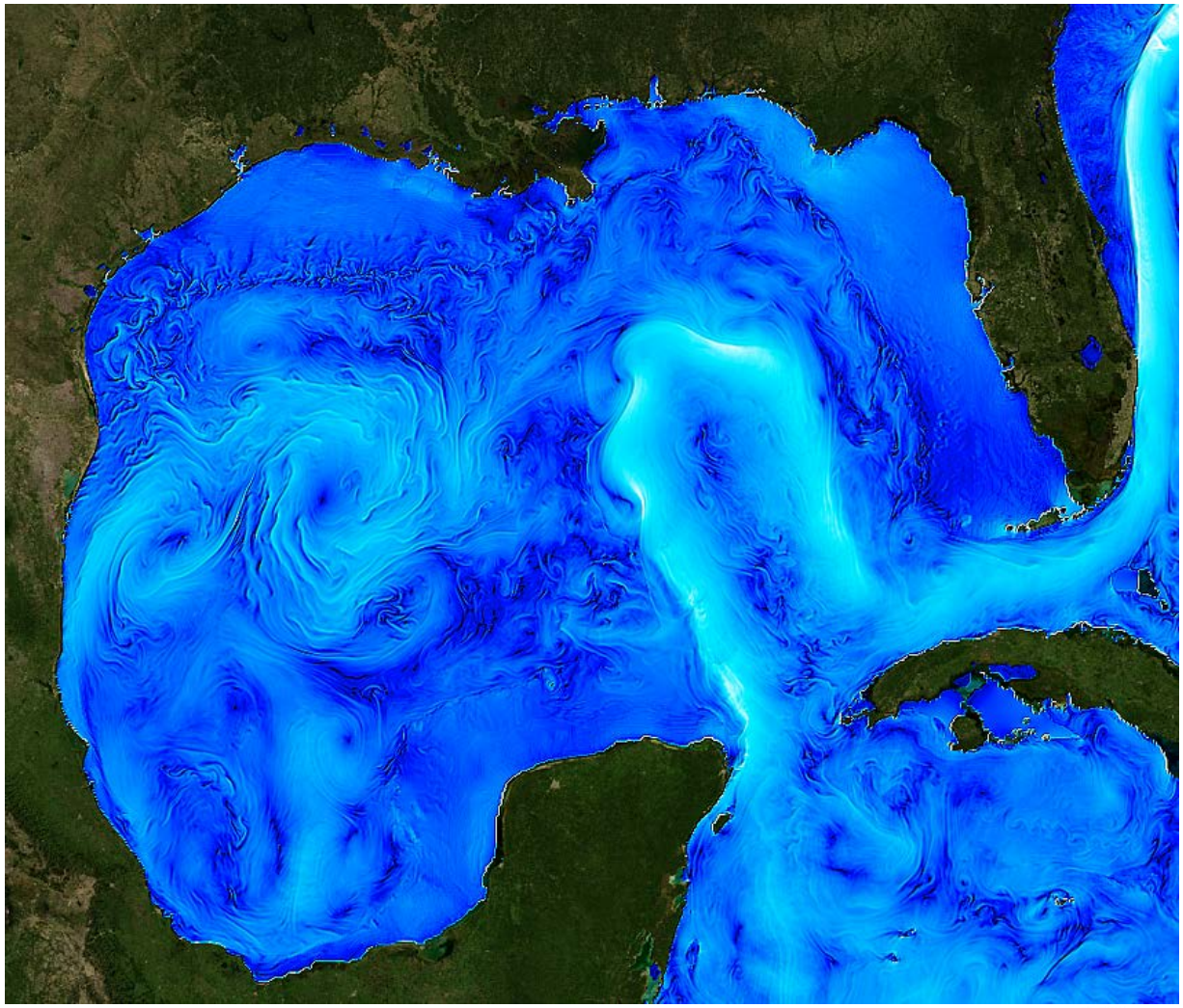
J. Cameron Thrash
Louisiana State University
Baton Rouge, LA

- Facilitate academic, intellectual, and professional development of individuals who have outstanding scholarship promise
- Recognize early-career researchers for past performance and future potential for substantial contributions to advancing scientific understanding
- Provide funding and mentorship at critical pre-tenure phase of fellows' academic careers

Expert Reports/Workshops in Process

- Effective Monitoring to Evaluate Ecological Restoration in the Gulf of Mexico (OSB, available at www.nationalacademies.org/gulf/resources).
- Committee on Advancing Understanding of Gulf of Mexico Loop Current Dynamics (GRP)
- Committee on Measuring Community Resilience (PGA)
- Committee on Long-term Coastal Zone Dynamics: Interactions and Feedbacks between Natural and Human Processes and their Implications for the U.S. Coastline (DELS)
- A Workshop on Research Needs: Preparing for a Rapid Response to Major Offshore Oil and Gas Spills (HMD)
- The Human Factors of Process Safety and Worker Empowerment in the Offshore Oil Industry: A Workshop (BOHSI)

Loop Current Campaign



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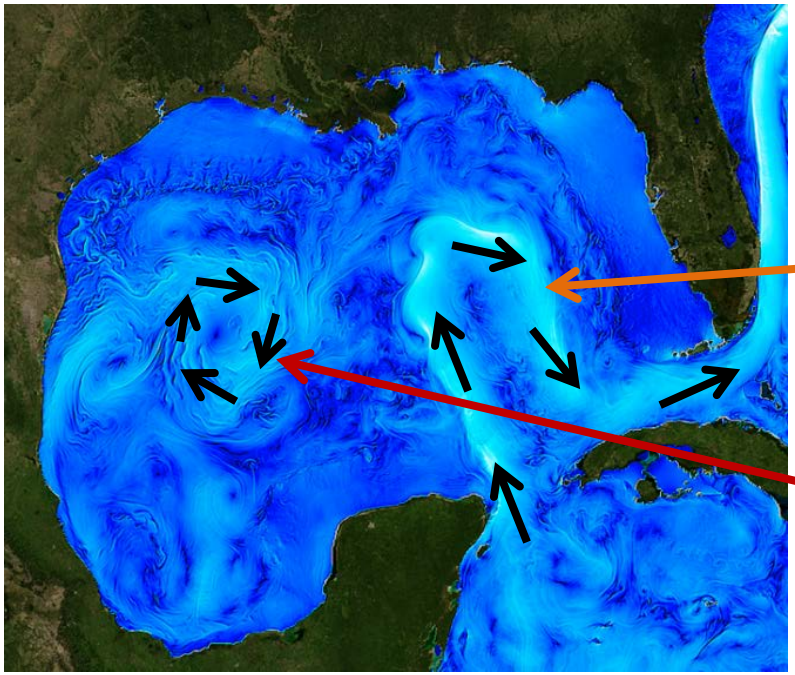
What is the Loop Current System (LCS)?

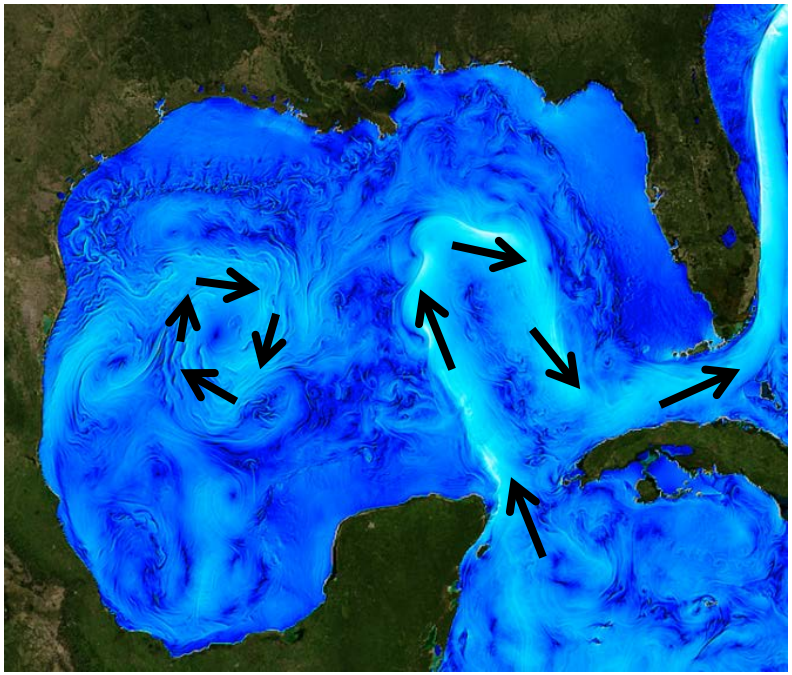


↑ Direction of currents

- It is the primary physical oceanographic feature in the Gulf of Mexico
- It consists primarily of a current (**meander**) that enters the GOM via the Yucatán Channel and exits via the Florida Straits.
- It also consists of any **eddies** that shed from main meander
- It is part of the subtropical gyre circulation of the North Atlantic

Both the degree of intrusion of the meander into the Gulf of Mexico and on what timescale an eddy will be shed varies considerably.

The Importance of the Loop Current System (LCS)



The position and extent of the LCS affects a variety of important processes including:

- The entire Gulf food chain, from the degree of phytoplankton to the amount and distribution of fish and their larvae
- Storm intensity
- Disaster response (e.g. oil spill distribution and cleanup)
- Offshore drilling safety
- Moisture flux into the central U.S.

In spite of the clear influence of the LCS on many important areas for management and many studies over the years to understand the LCS, we still do not understand what controls the shape of the Loop Current in the GOM or what controls eddy shedding. This makes predicting the LCS dynamics very challenging.

Loop Current Study Statement of Task

- Summarize the existing scientific understanding of the physical forces that shape and energize the Gulf of Mexico Loop Current
- Determine what critical information is needed to better understand the Loop Current
- Assess the capacity of current technologies
- Describe critical components of a field campaign necessary to fill gaps identified
- Include estimated costs

Longitudinal Community Data Project

- Multiple stressors affecting Gulf Coast communities
- Longitudinal data (individual & community level) provides information and insights into
  - Impacts of multiple stressor environment
  - Successful adaptation strategies
  - Opportunities to enhance resilience
- Goal: Inform research, policies, and decision making that improve resilience and well-being.

Rationale for GRP

- GRP's interest → Advancing science that serves community needs
- GRP's 30 y duration → Long-term commitment and coordination
- Identified need → Baseline information is critical, but rarely available
- High Impact → Challenging, but if done well provides valuable information and lasting resource

Next Steps

- Fall 2017 – Project scoping, information gathering meetings- last week
- Spring 2018 (tentative) - Exploratory workshop with researchers and community members and leaders

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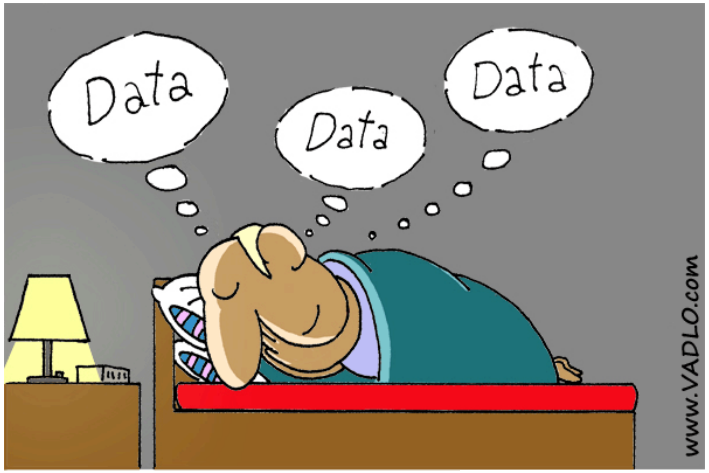
Summary

1 - Looking to invest (soon) in long term monitoring to better understand Gulf of Mexico circulation.

2 – Longitudinal data to understand impacts of multiple stressors on coastal communities.

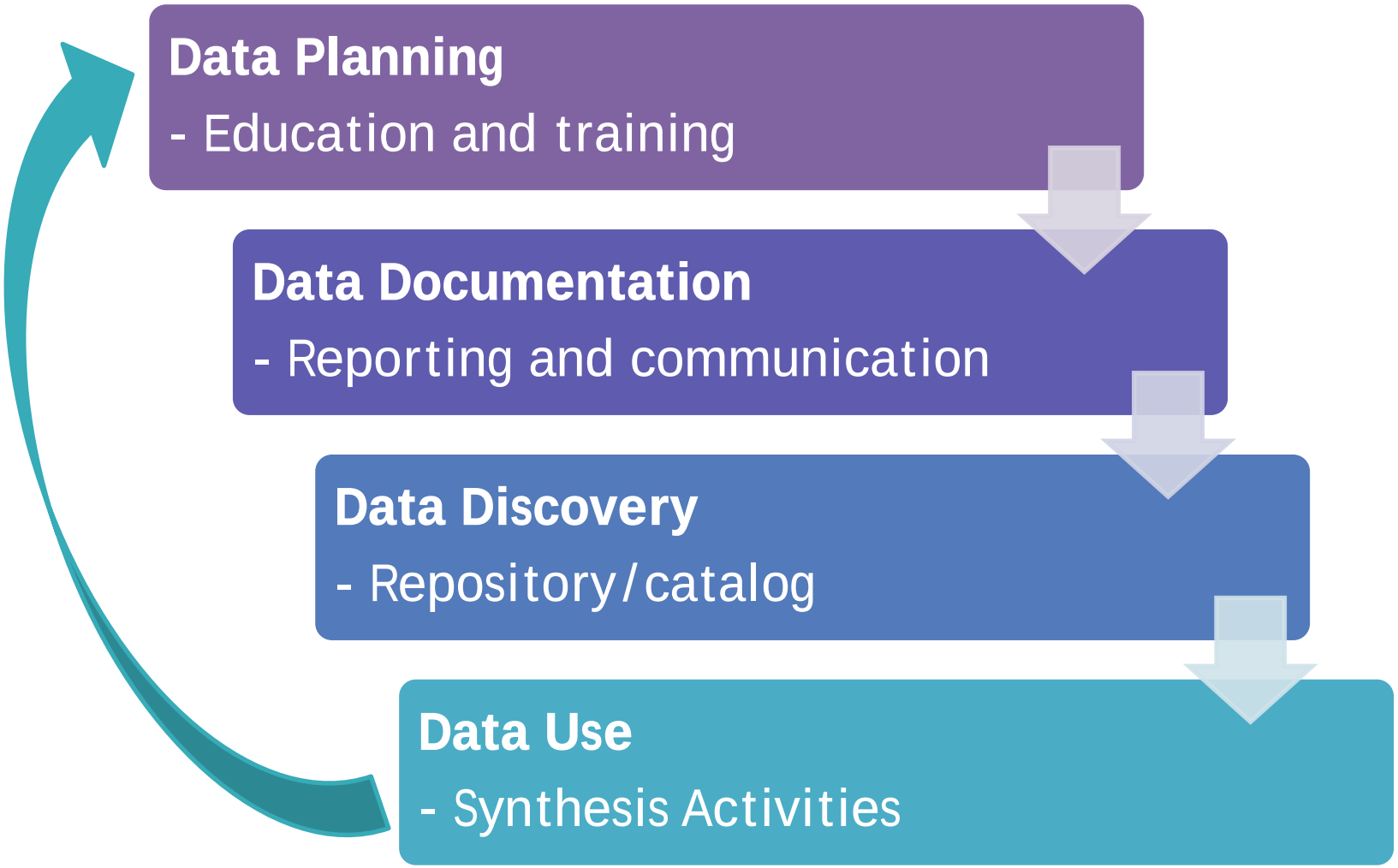
GRP Data Management Program

- Goals:
  - To ensure the legacy of the science from the GRP is accessible to researchers in the region and around the world
  - Help improve data management practices through training and education
  - Build data management capacity in the Gulf of Mexico



The Not-So-Secret life of a Lauren

Data Outline



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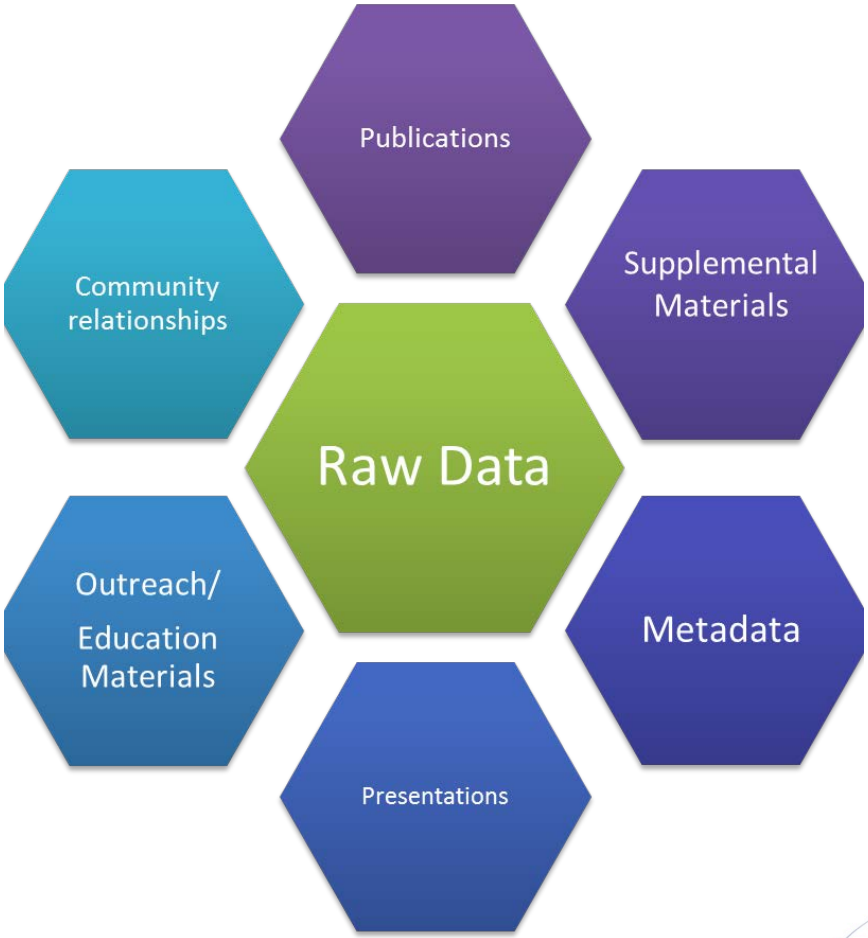
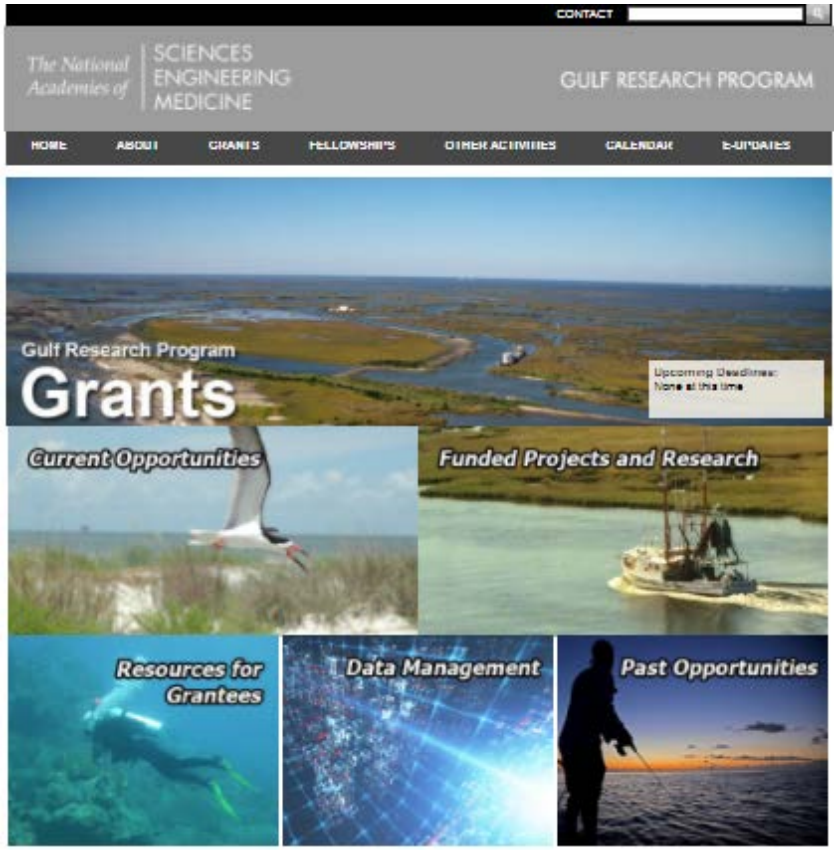
The Information Package

- Data is supported by a variety of other information
- The GRP will fund many activities that do not produce data, but the products/relationships created from these projects will need to be cataloged



GRP Data Management Protocols

- GRP provides a list of data repositories to grantees to make their data publically available (within 1 year of grant closeout)
- New repositories will be added as the need arises
- GRP provides a data management policy and all grantees are required to write a DMP



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Contact Information

Gulf Research Program

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Questions about funding opportunities?

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