Gulf G.A.M.E.

(Geospatial Assessment of Marine Ecosystems) – Data Discovery

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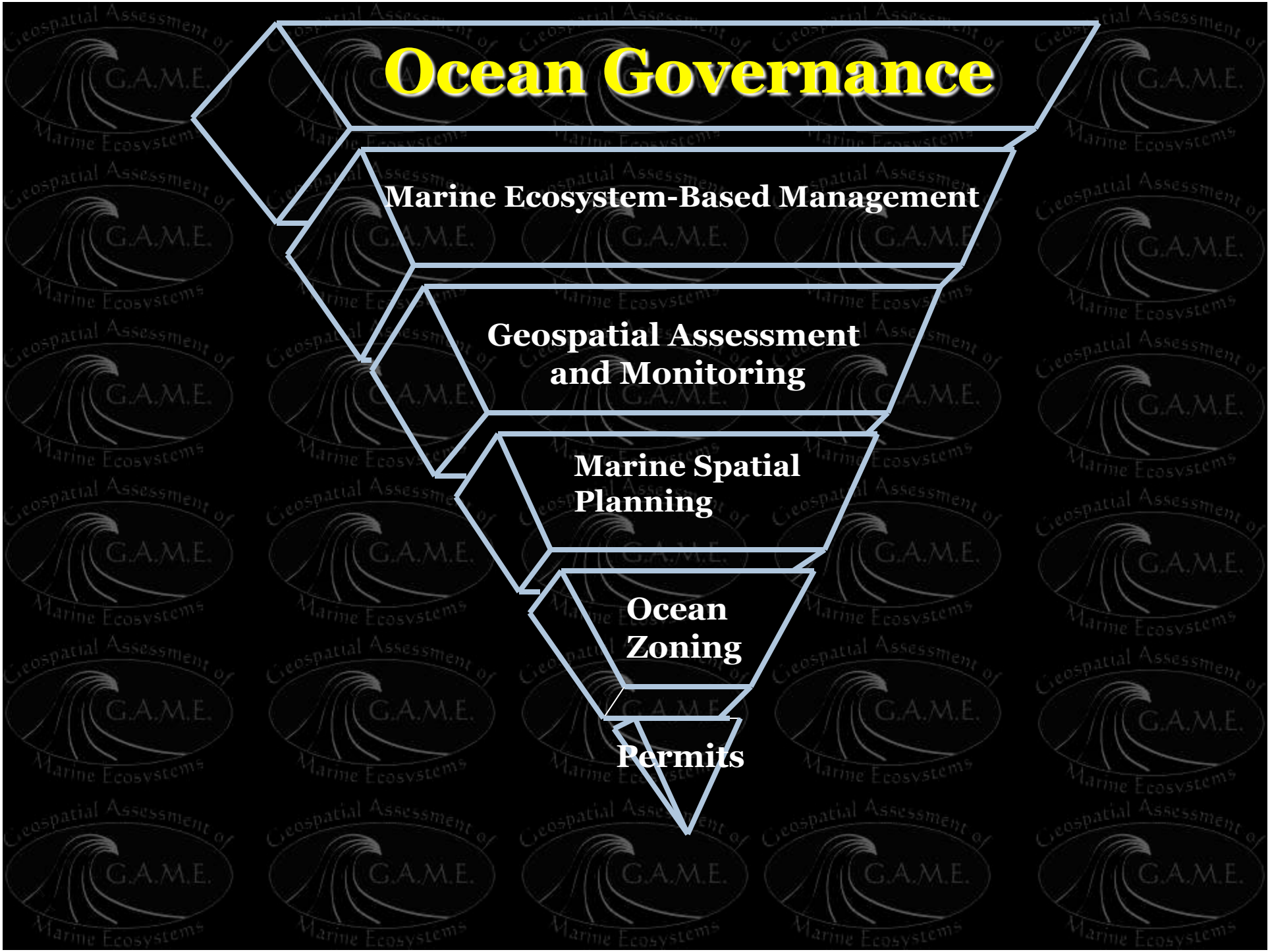
Presentation Outline

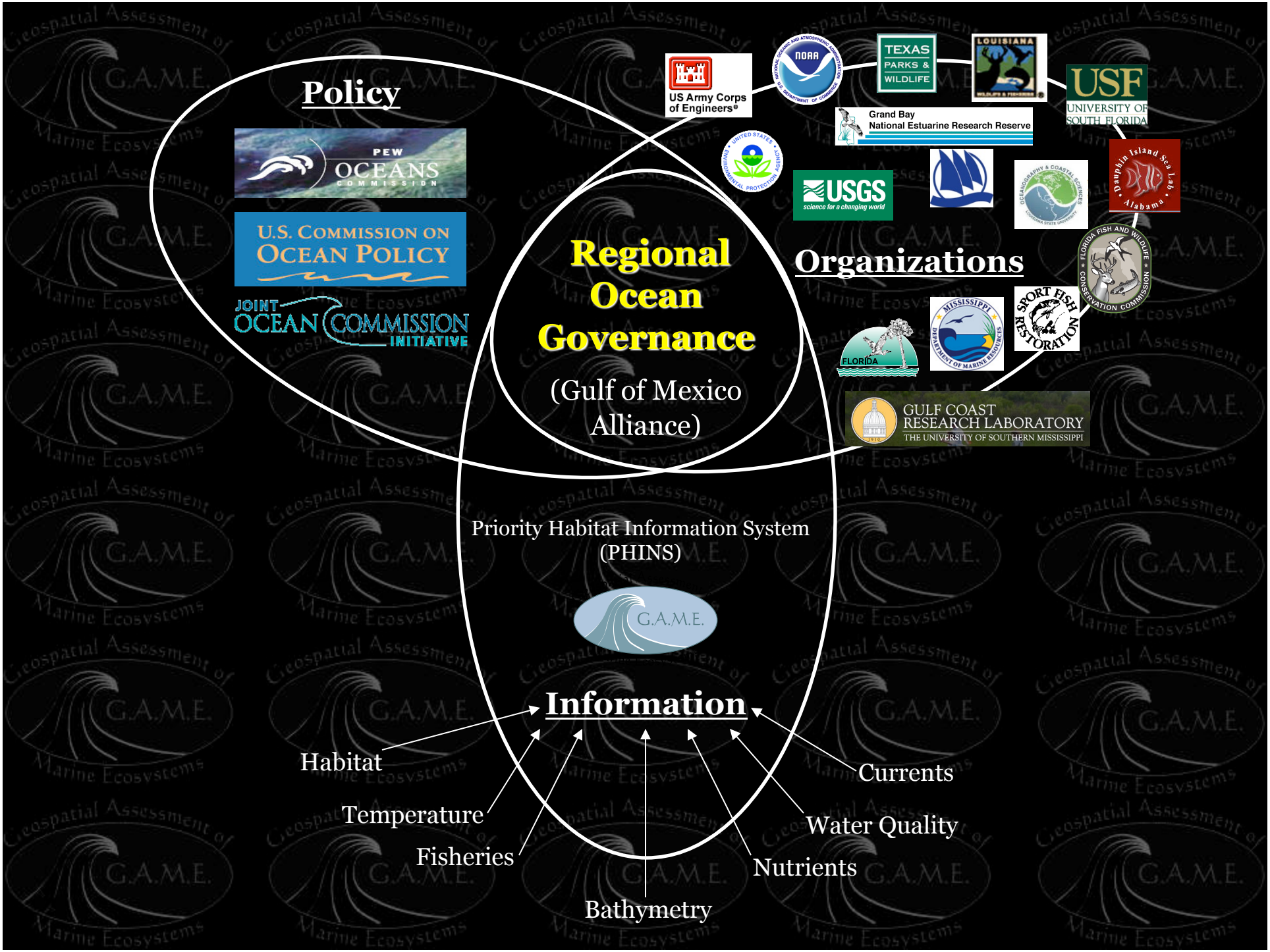
- **Introduction:**
  - Ocean governance and Ecosystem-Based Management
- **The Gulf of Mexico Alliance**
  - Habitat Identification and Characterization
- **The Gulf GAME project**
- **MERMAid and PHINS**
- **Results & Conclusions**
- **What's next?**
  - Gap maps
- **Examples**

Ecosystem-Based Management

The escalating crisis in the ocean, from loss of biodiversity to marine pollution to global climate change, is in large part a failure of governance.

There is an emerging scientific and policy consensus that the holistic approach of ecosystem-based management can reform ocean governance through the identification of ecologically coherent regions and the demarcation of zones that take into account biophysical, socioeconomic, and jurisdictional considerations.


Ocean Governance
Marine Ecosystem-Based Management
Geospatial Assessment and Monitoring
Marine Spatial Planning
Ocean Zoning
Permits


Policy
PEW OCEANS COMMISSION
U.S. COMMISSION ON OCEAN POLICY
JOINT OCEAN COMMISSION INITIATIVE
US Army Corps of Engineers
NOAA
TEXAS PARKS & WILDLIFE
LOUISIANA
USF UNIVERSITY OF SOUTH FLORIDA
Grand Bay National Estuarine Research Reserve
USGS science for a changing world
Dauphin Island Sea Lab Alabama
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
SPORT FISH RESTORATION
MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
FLORIDA
GULF COAST RESEARCH LABORATORY THE UNIVERSITY OF SOUTHERN MISSISSIPPI
Organizations
Regional Ocean Governance
(Gulf of Mexico Alliance)
Priority Habitat Information System (PHINS)
G.A.M.E.
Information
Habitat
Temperature
Fisheries
Bathymetry
Nutrients
Water Quality
Currents

GULF OF MEXICO ALLIANCE

Texas
Louisiana
Mississippi
Alabama
Florida

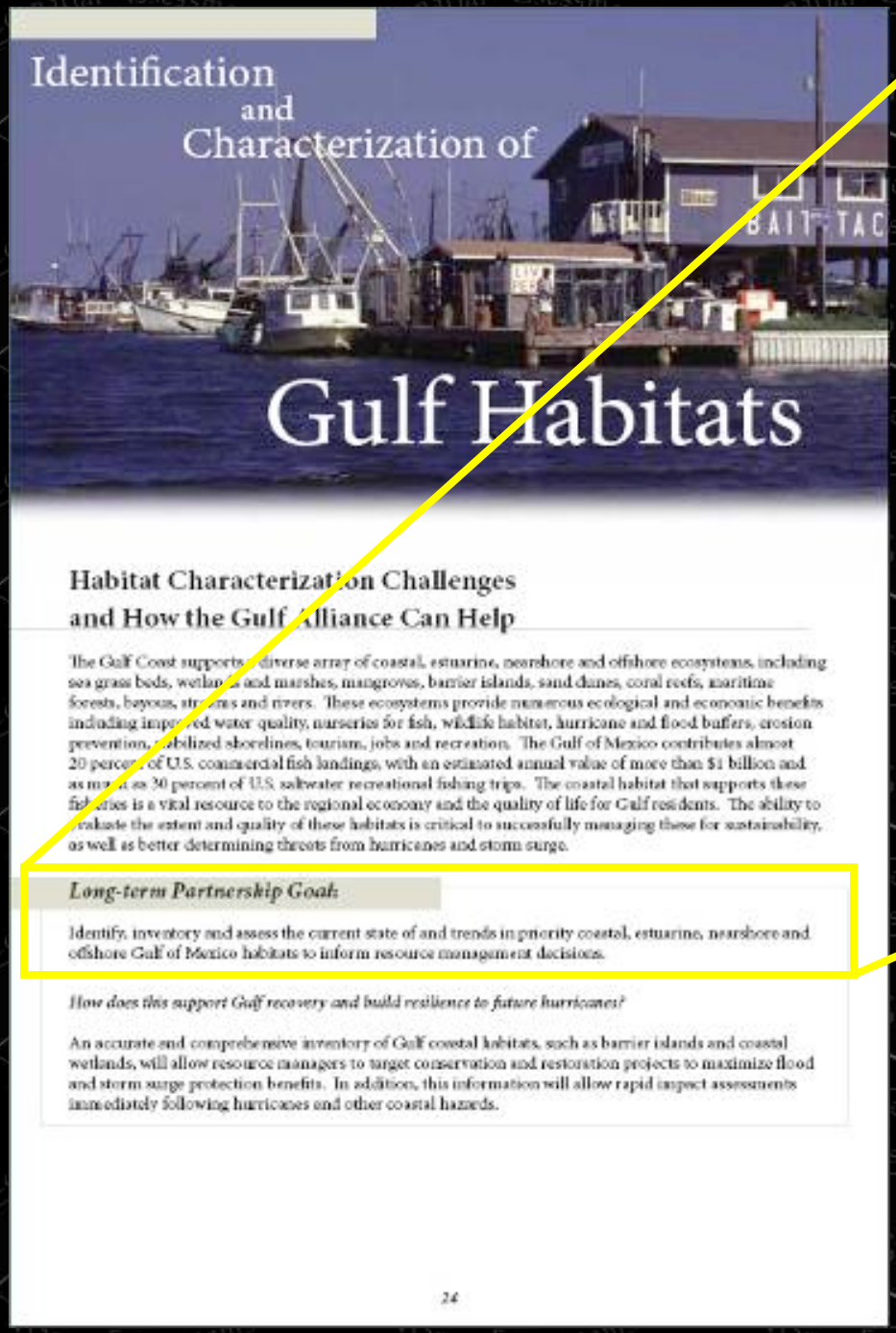
The Gulf of Mexico Alliance is a partnership of the states of Alabama, Florida, Louisiana, Mississippi, and Texas, with the goal of significantly increasing regional collaboration to enhance the ecological and economic health of the Gulf of Mexico.

The Alliance has identified 5 issues that are regionally significant and can be effectively addressed through increased collaboration at the local, state and federal levels. These priorities represent an initial focus for action through the Alliance:

- Water quality for healthy beaches and shellfish beds;
- Wetland and coastal conservation and restoration;
- Environmental education;
- **Identification and characterization of Gulf habitats**, and
- Reductions in nutrient inputs to coastal ecosystems.

http://www.gulfofmexicoalliance.org

From the Governors' Action Plan
For Healthy and Resilient Coasts



Long-term Partnership Goal:
Identify, inventory and assess the current state of and trends in priority coastal, estuarine, nearshore and off shore Gulf of Mexico habitats to inform resource management decisions.

From the Governors' Action Plan
For Healthy and Resilient Coasts

Gulf GAME - Objectives

The aim of the project is to develop an inventory of habitat-related data within the Gulf of Mexico. This will serve as a foundation to develop a spatial framework for Ecosystem-Based Management associated with regulatory and planning programs and areas of government coordination.

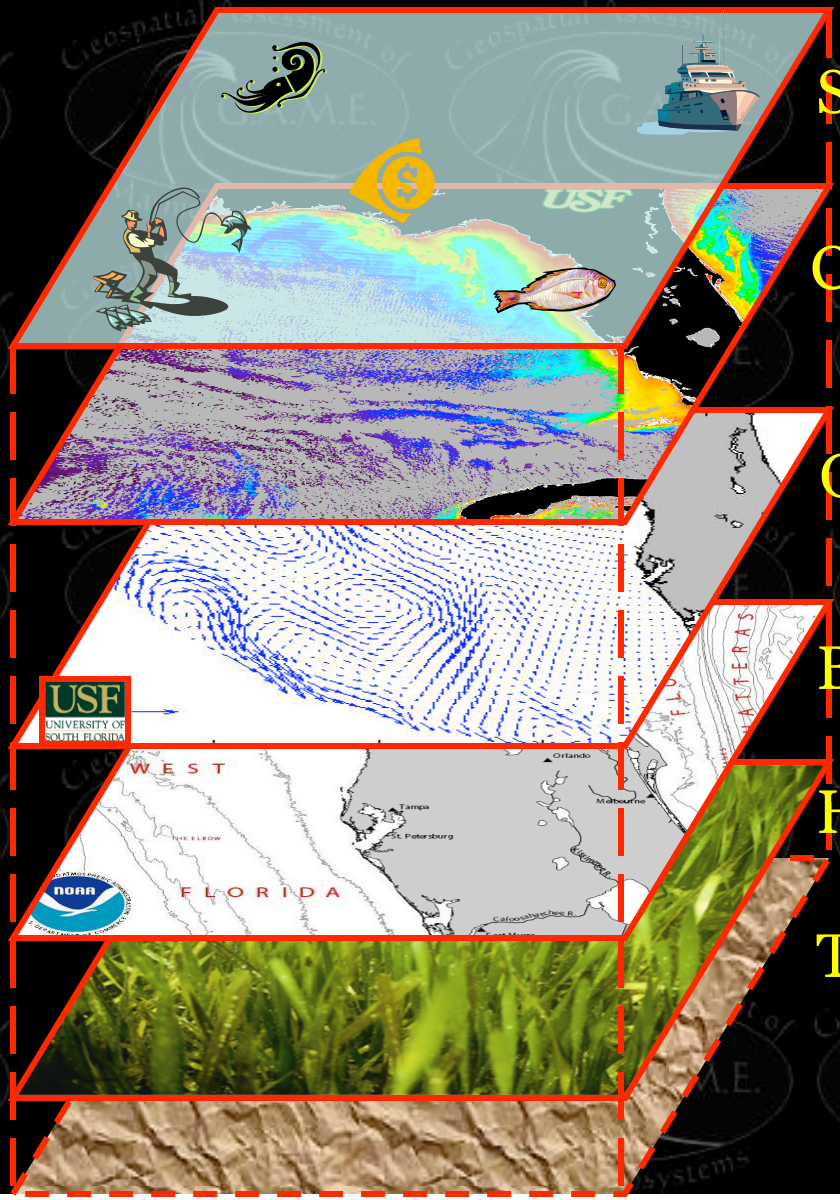
The data inventory has both a regional and local scope and focuses on gathering data and mapping coastal habitats from the estuaries onshore to the edge of the continental shelf offshore.

Carollo C, et al, 2009. The importance of data discovery and management in advancing ecosystem-based management. Marine Policy. In press

Habitat-related Data

- **Bathymetry**
- **Benthic habitats:**
  - seagrass beds *(EPA's critical need)*
  - oyster reefs
  - coral reefs
- **Oceanography:**
  - circulation patterns
  - salinity
  - temperature
- **Geomorphology:**
  - topography
  - sediment characteristics

GIS Data Layers



Socioeconomic data

Chlorophyll distribution

Ocean Currents

Bathymetry

Habitat Type

Topography

What one piece of information can answer all of these questions?

Who?

Where?

What?

METADATA

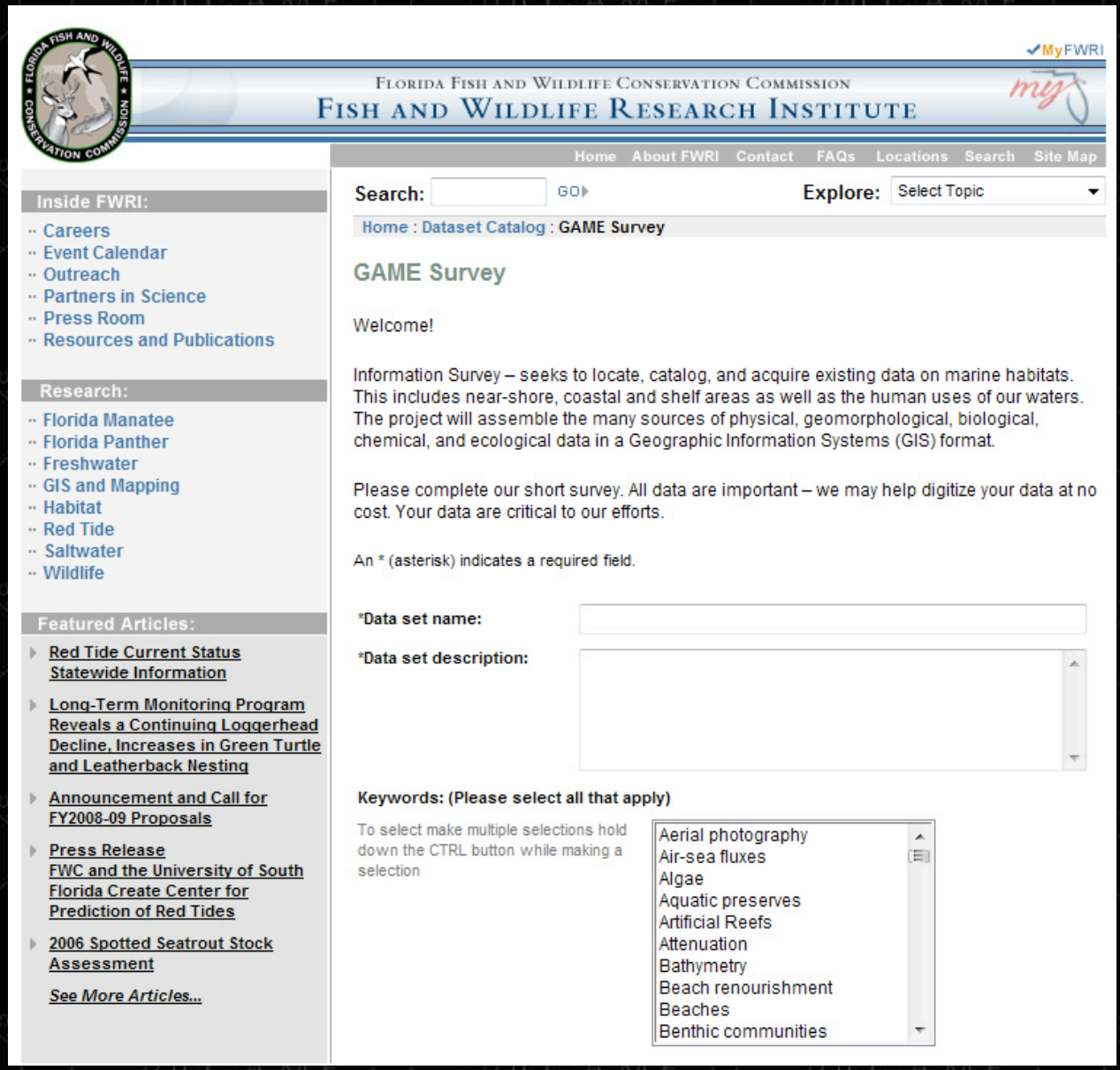
When?

Why?

GAME Catalog

- A relational database describing key features (metadata-lite) for each data set
- Highly compatible database for multiple applications
- Broad definition of each class (biological, geological, physical, chemical and huma use)
- Federal Geographic Data Committee (FGDC) concurrent
- The utility of the catalog is that it will point to data sets of interest

GAME Survey



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- Habitat
- Red Tide
- Saltwater
- Wildlife

Featured Articles:
- Red Tide Current Status Statewide Information
- Long-Term Monitoring Program Reveals a Continuing Loggerhead Decline, Increases in Green Turtle and Leatherback Nesting
- Announcement and Call for FY2008-09 Proposals
- Press Release FWC and the University of South Florida Create Center for Prediction of Red Tides
- 2006 Spotted Seatrout Stock Assessment

See More Articles...

Search: GO Explore: Select Topic

Home : Dataset Catalog : GAME Survey

GAME Survey

Welcome!

Information Survey – seeks to locate, catalog, and acquire existing data on marine habitats. This includes near-shore, coastal and shelf areas as well as the human uses of our waters. The project will assemble the many sources of physical, geomorphological, biological, chemical, and ecological data in a Geographic Information Systems (GIS) format.

Please complete our short survey. All data are important – we may help digitize your data at no cost. Your data are critical to our efforts.

An * (asterisk) indicates a required field.

***Data set name:**

***Data set description:**

Keywords: (Please select all that apply)

To select make multiple selections hold down the CTRL button while making a selection

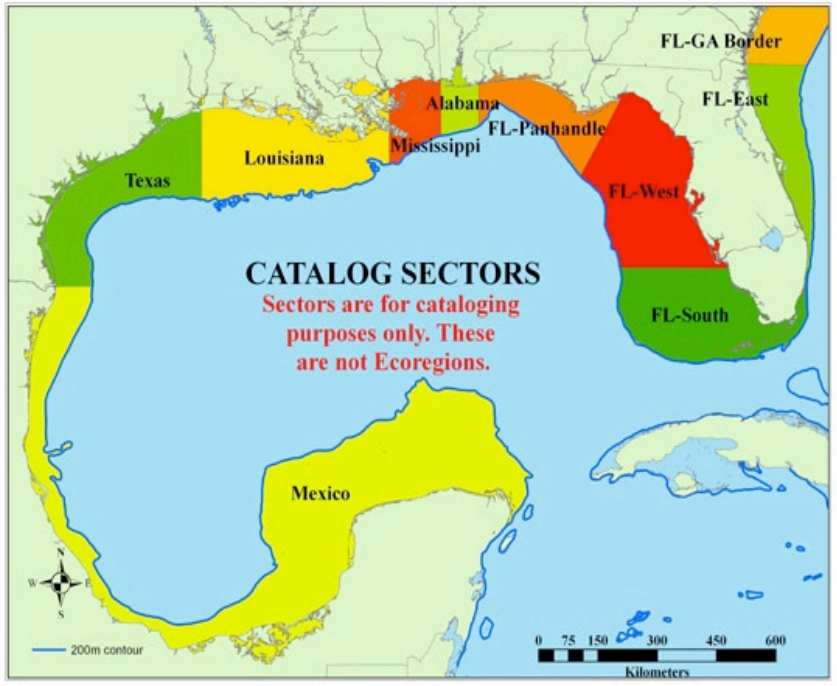
Aerial photography
Air-sea fluxes
Algae
Aquatic preserves
Artificial Reefs
Attenuation
Bathymetry
Beach renourishment
Beaches
Benthic communities

http://research.myfwc.com/game/survey.asp

GAME Survey

*Sectors: (Please select all that apply)

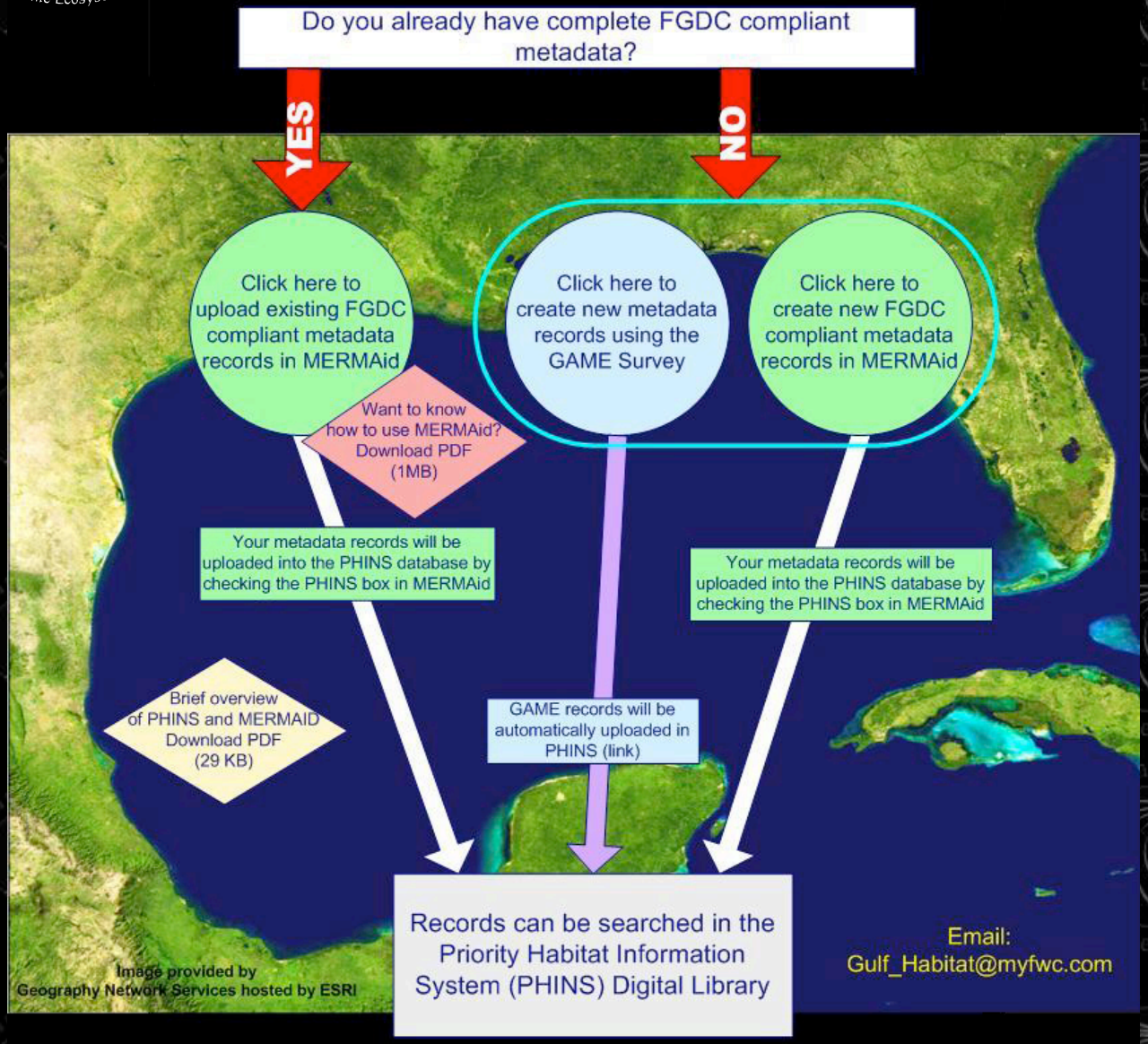
- Alabama
- FL East
- FL East (Georgia border)
- FL Panhandle
- FL South
- FL Statewide
- FL West
- Gulfwide
- Louisiana
- Mexico
- Mississippi
- Texas



*Place keyword:
(Study area)

http://research.myfwc.com/game/survey.asp

Interactive Web page



From this page users are directed to

- the GAME survey to create metadata "lite"
- MERMAid to upload existing and/or create new FGDC compliant metadata records
- the PHINS Digital Library

MERMAid Web Site

NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

National Coastal Data Development Center

Search GO
NCDDC NOAA

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  - Access Data
  - Submit Data
- Center Activities
- Interactive Maps
- Metadata Information
- Outreach
- Contact Us
- Site Map
- NOAA Services

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Metadata Tools

Access and information about various tools, including tools such as the Metadata Enterprise Resource Management Aid (MERMAid), used for creation, validation, management or publication of metadata.

Metadata Enterprise Resource Management Aid (MERMAid)

NCDDC provides coastal data resources (organizations and individuals) with a web-based tool to develop, validate, manage and publish metadata records via secure internet access. The Metadata Enterprise Resource Management Aid (MERMAid) allows users/data providers to establish unlimited metadata databases to organize their metadata records any way
they see fit (i.e. by program, project, data type, personnel).

Key features in MERMAid include
(1) user-defined roles and permissions at the metadata management and database levels; (2) change tracking; and (3) enhanced validation. Also, your existing FGDC compliant metadata (in XML format) can be ingested into and managed through MERMAid.

In the near future, NCDDC will be shifting from its current metadata catalog to a knowledge base catalog. MERMAid will play an integral role in this transition. To better leverage these new capabilities, enhanced search and discovery tools will be made available to the public and metadata managers that will provide powerful drill-down features.

Getting Started with MERMAid

- Request an Account
- V1.2 Getting Started Guide (PDF 5 MB)
- V1.2 Getting Started Guide (PPS 6.5 MB)
- V1.2 PPS WinZip File (ZIP 5.0 MB)

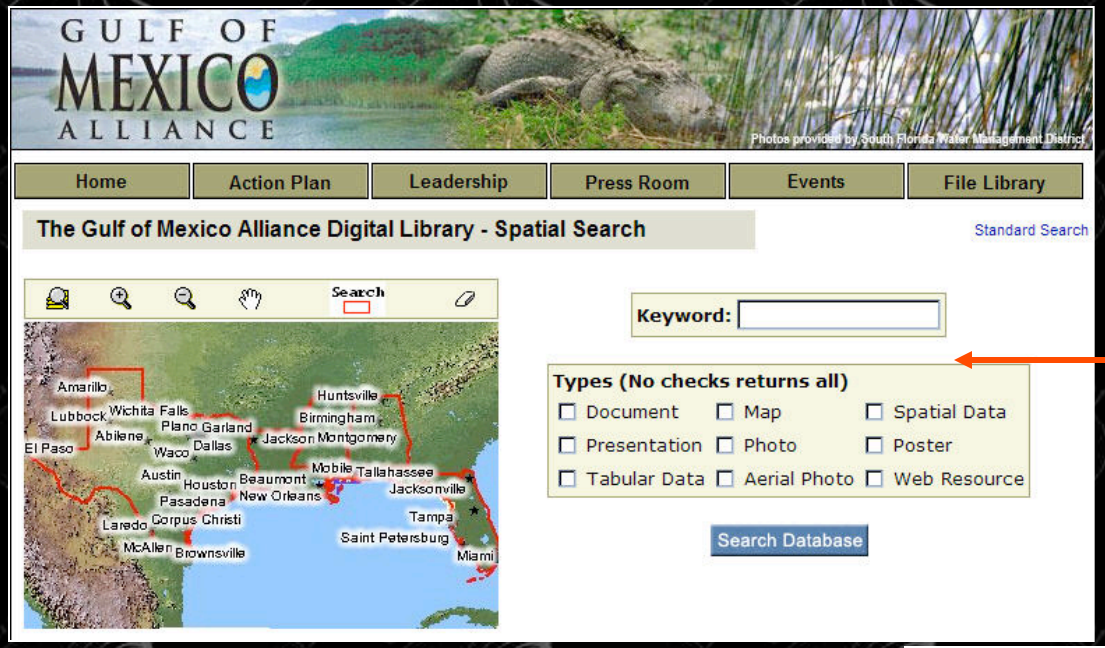
Additional Tools

NOTE: Some links on this page take you to offsite locations

Additional tools to assist in metadata creation and metadata management are available for download and for use online. The following tools provide a means to create FGDC compliant metadata. NCDDC does not endorse the tools named.

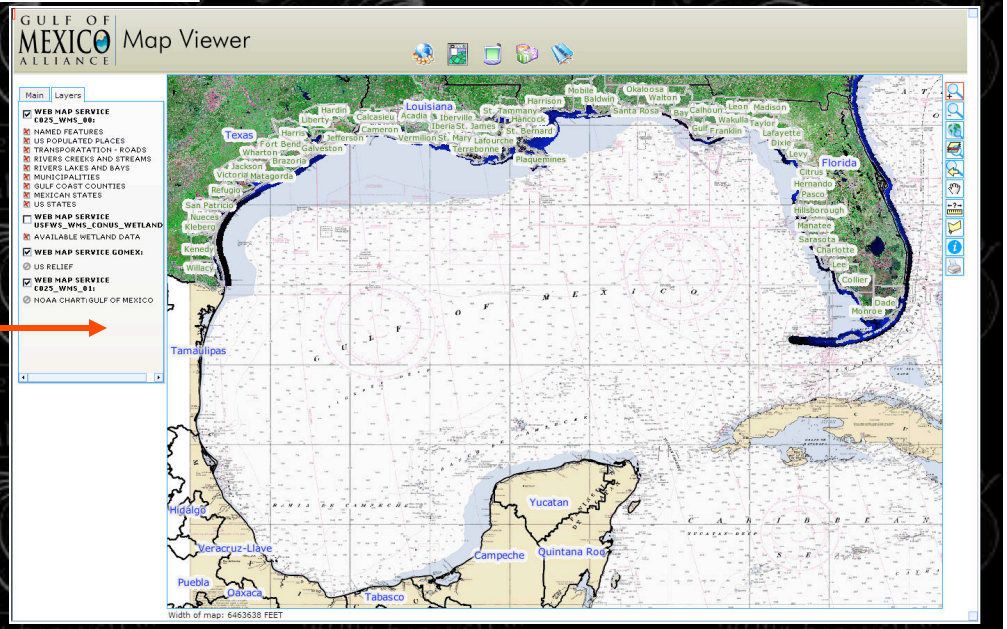
Downloadable and remote web-access tools (free)

PHINS Digital Library & Map Viewer

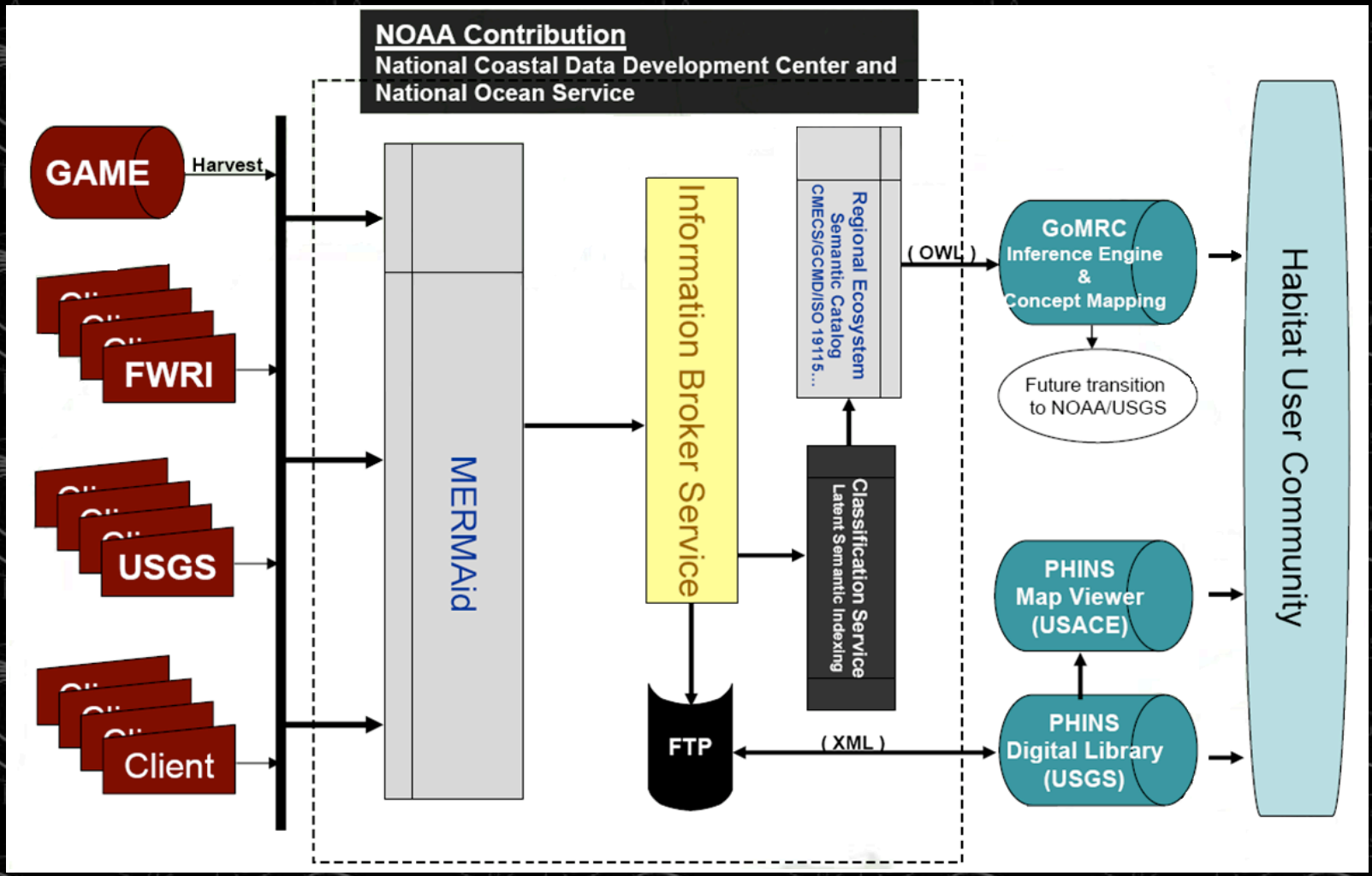


Digital Library to search for data and information

Map Viewer to build maps and view data by simultaneously pulling from PHINS participants



State and Federal Collaboration



Results & Conclusions

- Prototype Web Portal to provide public access to and delivery of current and historic local, state and federal Gulf of Mexico habitat data
- The Portal allows users to search a Digital Library for habitat information by keyword or geographic location
- The Portal allows users to preview geospatial data

Making this project work is possible only through the sharing of knowledge and pooling of resources with properly prepared metadata.

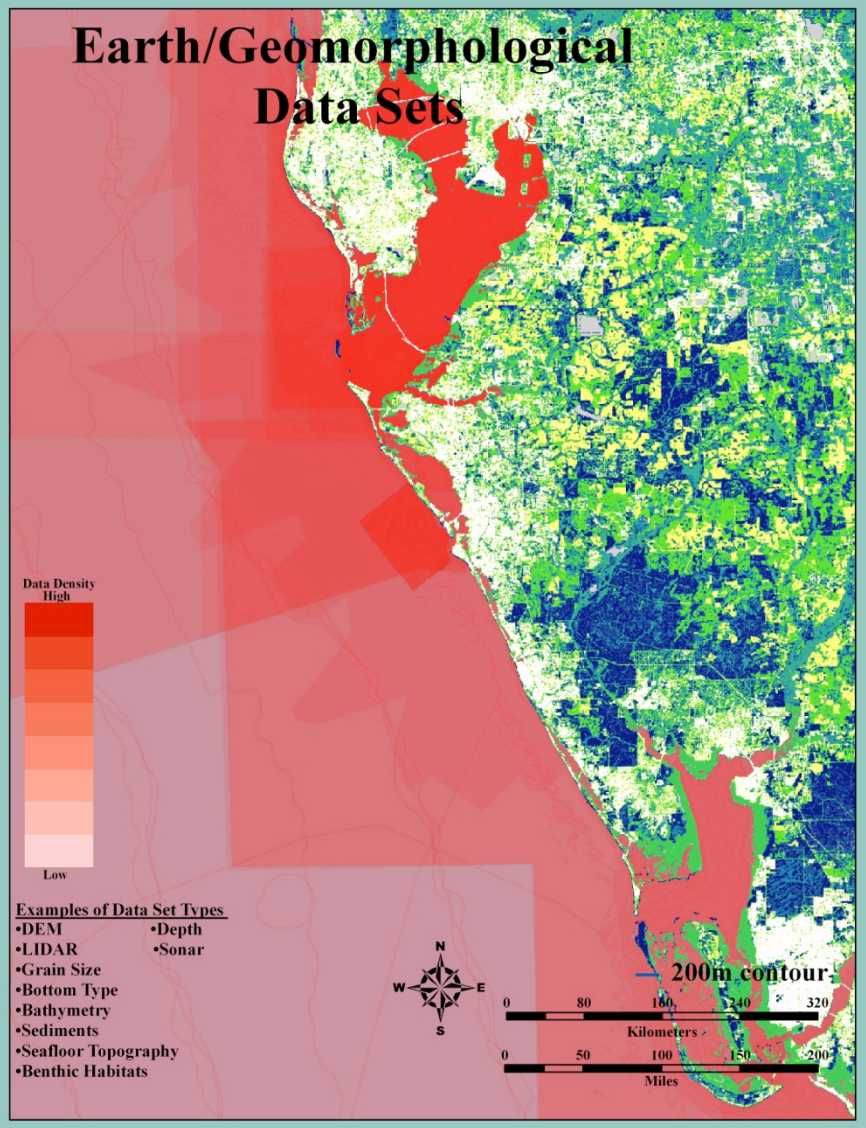
What's next?

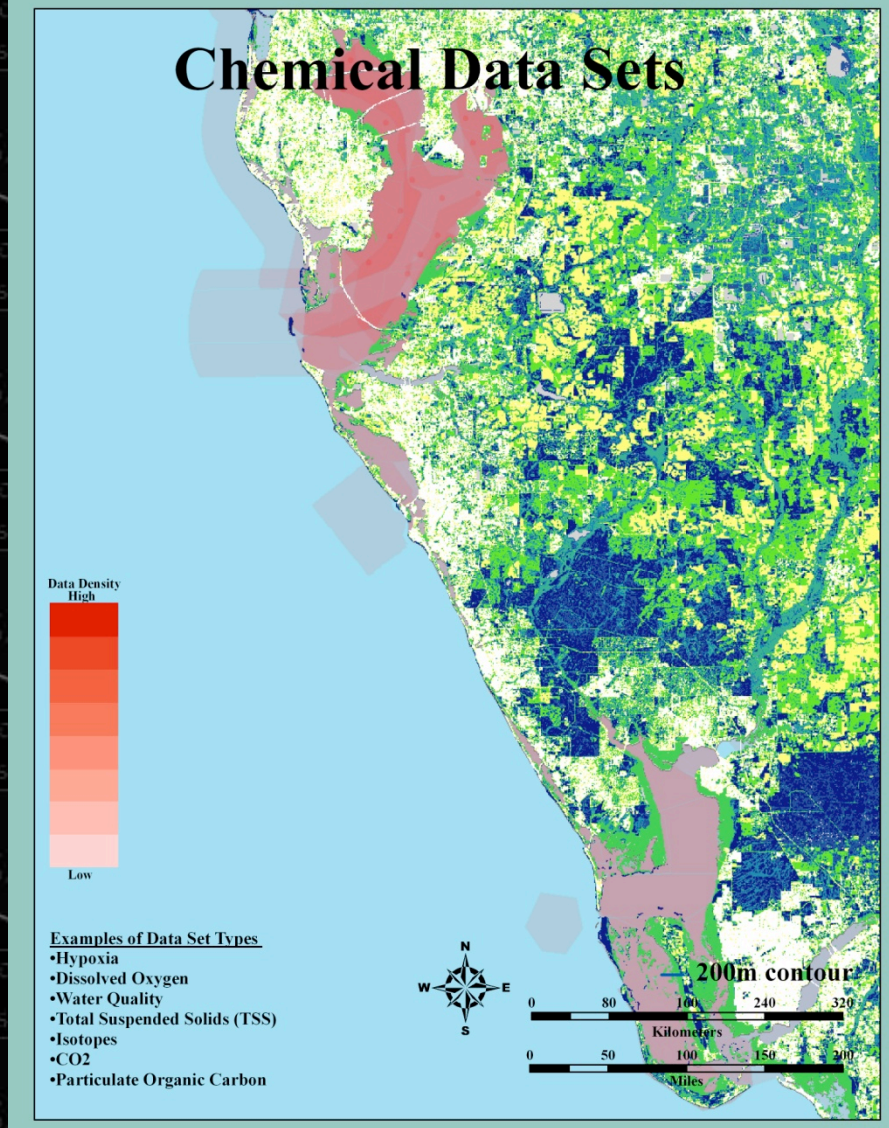
Phase II:

Gap analysis of existing habitat data in the region

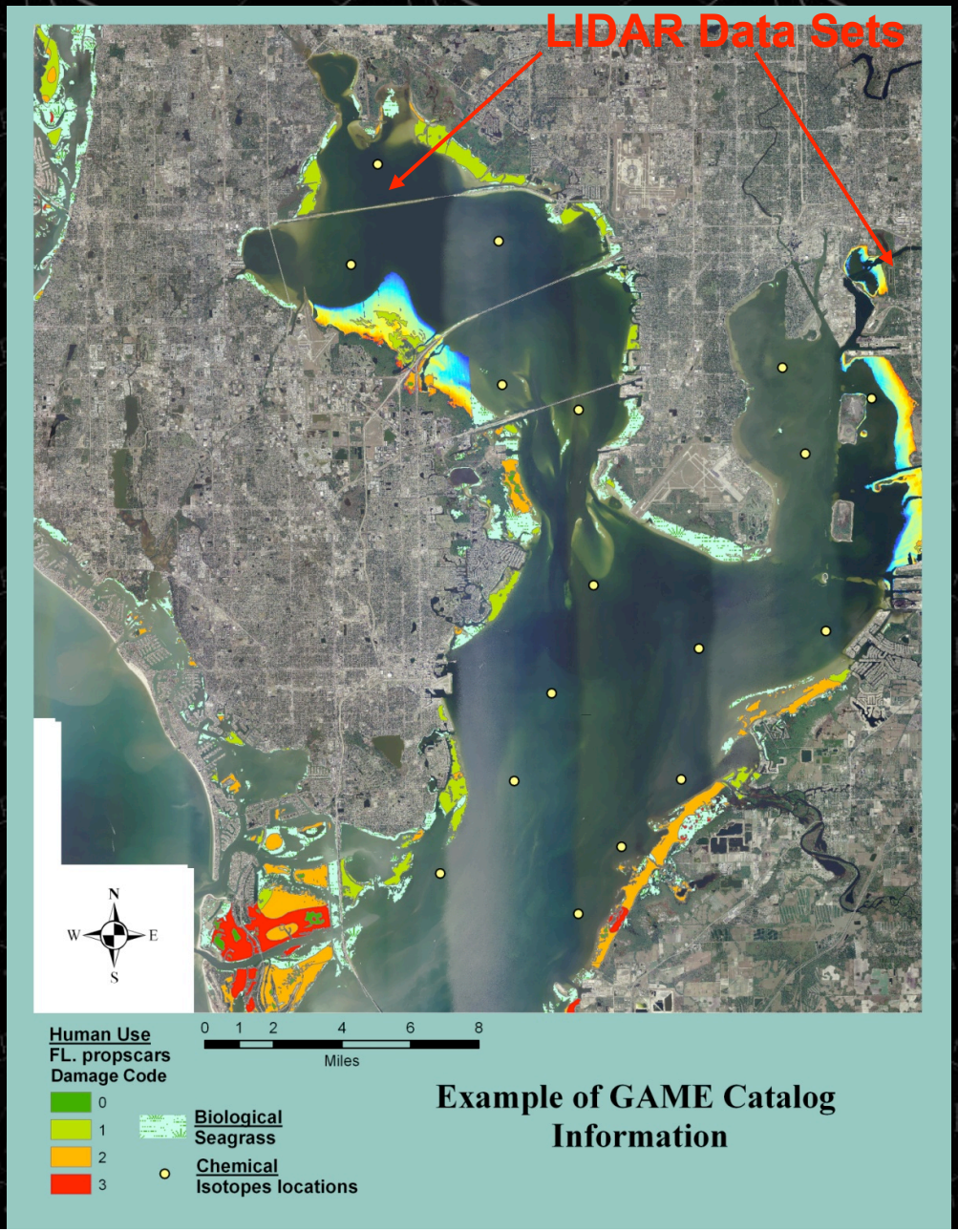
- Qualitative gap analysis of geospatial data compiled from all the Gulf States
- Design and implement a quantitative gap analysis for Florida that will serve as a pilot project for conducting gap analyses in other States

Gap Maps


Earth/Geomorphological Data Sets
Data Density
High
Low
Examples of Data Set Types
•DEM
•LIDAR
•Grain Size
•Bottom Type
•Bathymetry
•Sediments
•Seafloor Topography
•Benthic Habitats
•Depth
•Sonar
N
W
E
S
200m contour
0 80 160 240 320
Kilometers
0 50 100 150 200
Miles


Chemical Data Sets
Data Density
High
Low
Examples of Data Set Types
•Hypoxia
•Dissolved Oxygen
•Water Quality
•Total Suspended Solids (TSS)
•Isotopes
•CO2
•Particulate Organic Carbon
N
W
E
S
200m contour
0 80 160 240 320
Kilometers
0 50 100 150 200
Miles

Examples

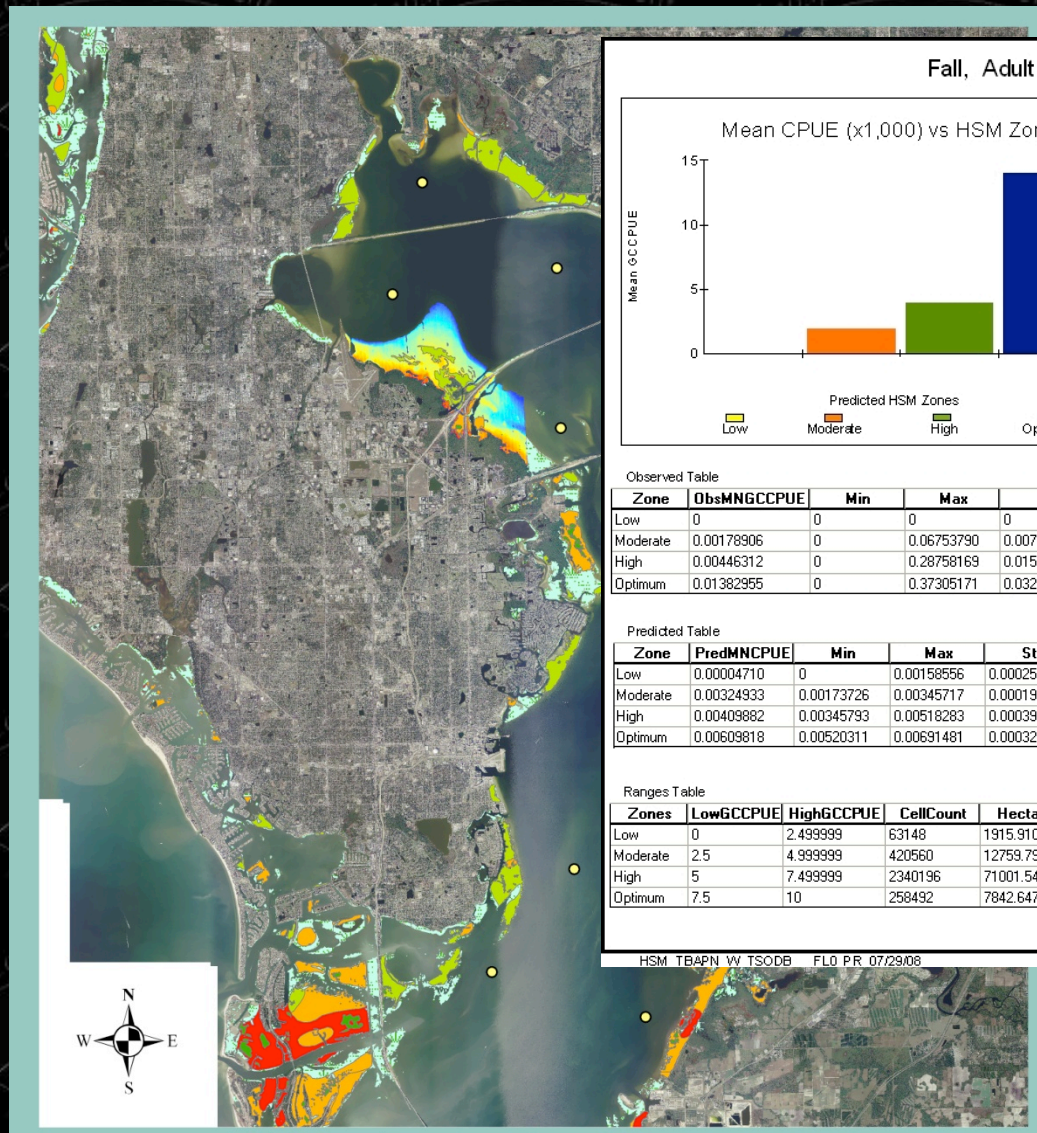


Example of GAME Catalog Information

This map shows how a diverse overlay of information can be used by decision makers to assess the different types of data available.

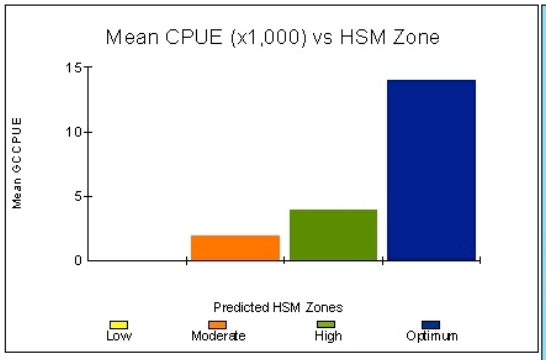
LiDAR, seagrass coverage, human influence (boat propeller scars) and chemical testing sites are shown over satellite imagery for Tampa Bay.

All data shown here are located in the GAME Catalog.



Example of GAME Catalog Information

Fall, Adult Pinfish, >= 100 mm SL, Tampa Bay CPUE



Observed Table

Zone	ObsMNGCCPUE	Min	Max	Std	Count
Low	0	0	0	0	52
Moderate	0.00178906	0	0.06753790	0.00730723	262
High	0.00446312	0	0.28758169	0.01578575	1032
Optimum	0.01382955	0	0.37305171	0.03286298	277

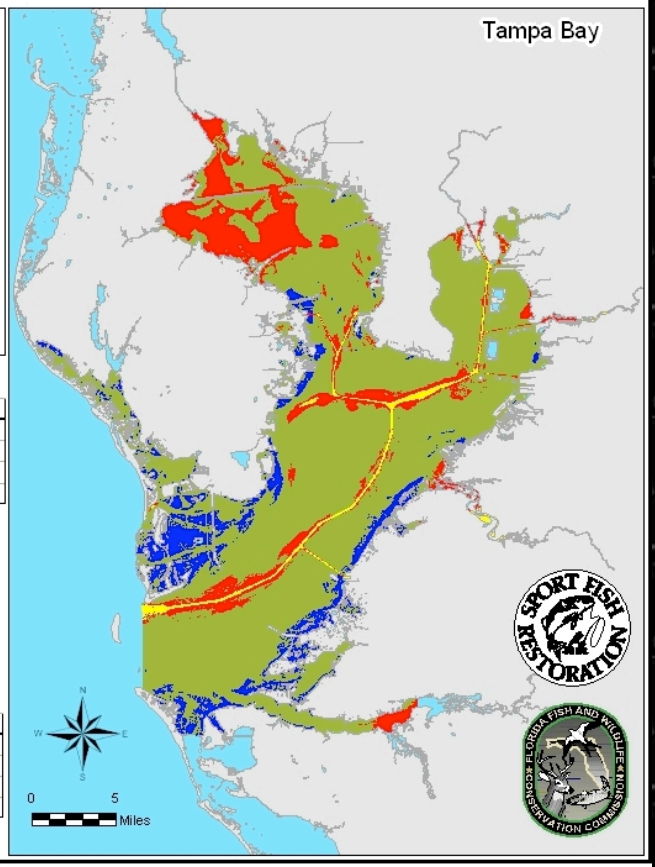
Predicted Table

Zone	PredMNCPUE	Min	Max	Std
Low	0.00004710	0	0.00158556	0.00025160
Moderate	0.00324933	0.00173726	0.00345717	0.00019356
High	0.00409882	0.00345793	0.00518283	0.00039264
Optimum	0.00609818	0.00520311	0.00691481	0.00032013

Ranges Table

Zones	LowGCCPUE	HighGCCPUE	CellCount	Hectares	Percent
Low	0	2.499999	63148	1915.91032	2.04
Moderate	2.5	4.999999	420560	12759.7904	13.6
High	5	7.499999	2340196	71001.5466	75.9
Optimum	7.5	10	258492	7842.64728	8.38

HSM_TBAPN_W_TSODB_FL0_PR_07/29/08



The above maps use data found in the GAME Catalog to predict Adult Pinfish locations based upon several environmental variables.

Map courtesy of Dr. Peter Rubec

Acknowledgments

This work was supported by a grant from the U.S. EPA Gulf of Mexico Program.

The next phase of the GAME project will be funded through a NOAA Coastal Services Center's collaborative agreement with the Harte Research Institute for Gulf of Mexico Studies.

Thank you

Questions and Comments ?

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