

# **Gulf of Mexico Research Planning Workshop Report**

For the workshop held in  
**St. Petersburg, Florida**  
on  
**February 19, 2008**

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## Background

The purpose of the Gulf of Mexico Research Plan (GMRP) is to identify regional research and information needs and develop a strategy to address these needs through collaboration with agencies and organizations that conduct and use Gulf of Mexico-related research. The project is sponsored by the National Sea Grant College Program and Gulf of Mexico Sea Grant College Programs. The GMRP is rooted in stakeholder input, and workshops were one of the primary methods used to collect this input. Workshops were held in each Gulf of Mexico state and supported by numerous individuals (see acknowledgements section). This report provides the results from the workshop at the **USGS Florida Integrated Science Center, St. Petersburg, Florida**.

The workshop agenda (appendix A) was designed to identify high-priority research topics related to the six societal themes described in the Joint Subcommittee on Ocean Science and Technology's 2007 document "Charting the Course for Ocean Science in the United States for the Next Decade—An Ocean Research Priorities Plan and Implementation Strategy." The themes included:

- stewardship of natural and cultural ocean resources,
- increasing resilience to natural hazards,
- enabling marine operations,
- the ocean's role in climate,
- improving ecosystem health, and
- enhancing human health.

A process (appendix B) was developed to allow workshop participants (appendix C) to efficiently develop a list of research priorities in a limited amount of time. Participants were divided into breakout groups by theme area to discuss specific research topics, information needs, and other topics that related to their theme area. Individuals in the breakout group then voted for the research topics discussed in their session that they believed were most important. The eight to ten topics with the highest votes were then presented to all workshop participants. All workshop participants then voted for these top research topics across all theme areas.

This report presents 1) the results of the breakout group voting for each theme area, 2) the non-research topics discussed in each breakout group, and 3) the results of the large group voting session across all theme areas.

If you will be using the information provided in this report for planning or other purposes we would like to hear from you. For more information about the Gulf of Mexico Research Planning effort or to share how you will be using the results of the GMRP workshop(s) please contact Steve Sempier, Gulf of Mexico Research Planning Coordinator, at [stephen.sempier@usm.edu](mailto:stephen.sempier@usm.edu).

You can also learn more about the GMRP at the project's web site at: [masgc.org/gmrp](http://masgc.org/gmrp).

## **Breakout Group Results**

Participants in each themed breakout group identified research needs and voted for the research topics they believed were most important. Each participant was provided eight votes and they could place up to two votes on an individual research topic.

Prior to the voting session some breakout groups combined multiple ideas that were mentioned during the brainstorming session, and therefore crossed out similar ideas so that they would not be available during the voting session. The tables below include all comments written on the flip chart paper, and those topics that were crossed out on the flip chart paper are indicated with a strike through in the table.

Information needs and policy, management, and education related topics were also captured in the breakout group sessions but were not voted on for the prioritization process. The results of these discussions are also included under each themed heading.

Stewardship of Natural and Cultural Ocean Resources

**Research Needs**

Table 1. Research topics identified by the “Stewardship of Natural and Cultural Ocean Resources” breakout group and voting results from the breakout group voting session.

<b>Research Topic</b>	<b>Votes</b>
Effectiveness of education about these resources and examine our methodology	9
Understand connectivity of related fisheries species from coastal habitats across shelf to shelf edge habitat	8
Economic value / costs of restoration, habitat, ecological benefits	6
Understand habitat change over time - what is and isn't sustainable	6
Understand resource / fisheries abundance - historic sustainability and current abundance - what is sustainable?	6
What are the options from (snapper / grouper) labor dynamics and alternatives for fishing communities, socioeconomic impact of managing fisheries?	6
Connectivity of offshore hard bottom areas throughout the Gulf of Mexico “Islands in the Stream” concept (species specific)	5
Determine nourishment effects/timing and recovery on <del>effective</del> affected habitats/benthic and physical ocean <del>acoustic</del>	5
Look at historical, current, and future impacts of oil and gas industry on biodiversity; effect of oil and gas pipeline structure, both active and not	5
Understand habitat connectivity to help manage fisheries; how fisheries use connecting habitats	5
Physical and ecological comparisons of shoreline stabilization > natural versus hard armor	4
Devise efficient and effective methods to map oyster reefs; intertidal and subtidal, preferably in 3-D	3
Understand fisheries potential, sustainability, and potential impacts on deep water reefs and shelf edge reefs -What are the impacts of fishing it/harvesting? -What is there, what is the fishing potential?	3

Table 1 (continued). Research topics identified by the “Stewardship of Natural and Cultural Ocean Resources” breakout group and voting results from the breakout group voting session.

Biotic and abiotic effects of fire suppression of coastal scrub (bird nesting > invertebrates) versus watershed	2
Ecosystem services and value to guide management; evaluate habitat restoration benefit over time given sea-level rise	2
Marine debris eradication and what is safe to leave or not	2
Study of sound in water and impacts to species (human sounds)	2
Understand and assess status of deepwater and mesopelagic zones and shelf beds/reefs	2
Biochemical impacts on species (i.e., toxicology)	1
Impact of fisheries on communities (reduce gear impacts)	1
Impacts to species biodiversity from anthropological and natural impacts - shifting baselines	1
Methods to <del>fill</del> assess the status of data limited fisheries	1
Near shore current patterns as conduits for connectivity	1
Retreat patterns of inter and subtidal habitats with SLR and how people are using coastal resources	1
Cost of switching gear versus value to ecosystem	0
Determine vulnerable species to manage ecosystem	0
How effective are gear modifications?	0
Look at values of socio-economic <del>classes</del> positions and <del>look</del> how that translates to action	0
Relationship between location, abundance, and human use of the resource	0
Water column on west Florida shelf interaction between surface, pelagic, and benthic/trophic zones	0
<del>Cedar Key interaction between near shore, open ocean, and watershed</del>	0
<del>Effect of leaving platforms as artificial reefs – habitats, function, biodiversity, etc. (before and after it has been abandoned)</del>	0
<del>Historic habitat and determine what is sustainable &gt; do we determine sustainability based on now or then shifting baselines</del>	0
<del>Interactions between trophic zones</del>	0

## Stewardship of Natural and Cultural Ocean Resources

### **Information Needs**

- Big Bend of Florida - need to know more
- Cost versus benefit of fishing gear modifications
- Economic information about ecosystem services
- Economic value / cost
- Effectiveness of education and outreach
- Impact of managing fisheries
- Map oyster reefs throughout Gulf of Mexico
- Values of socio-economic positions
- Depth/water column
- From watershed across shelf to edge habitat & species - snapper/grouper
- Long shore around Gulf of Mexico

### **Policy, Management or Education Topics**

- Educate human reference points
- Large scale mapping efforts

Increasing Resilience to Natural Hazards

**Research Needs**

Table 2. Research topics identified by the “Increasing Resilience to Natural Hazards” breakout group and voting results from the breakout group voting session.

<b>Research Topic</b>	<b>Votes</b>
<p>Several topics combined for voting:</p> <ul style="list-style-type: none"> <li>-Economic study of tourism on community resiliency relative vulnerability of various classes of tourism--interdependency</li> <li>-Economic study of coastal development. True cost versus benefits. Who pays? Cross-subsidies, health costs, social costs.</li> <li>-Economic study of fisheries and recreational/commercial fisheries--an economic model of recovery/resiliency of fisheries--health/marine debris</li> <li>-Improve storm surge modeling--finer scale topo / bathy</li> <li>-The impacts of sea-level rise on surge modeling and decisions based on modeling</li> </ul>	9
<p>Storm surge and wind force/speed</p> <ul style="list-style-type: none"> <li>-Energy dissipation associated with various tree types</li> <li>-Ecosystems, built environment, land use (how the loss of these systems impact) and its mitigation benefits</li> <li>-Study the true value of ecosystems on storm mitigation--the economics of ecosystem services</li> </ul>	5
<p>Critical Infrastructure</p> <ul style="list-style-type: none"> <li>-Bridge design--Performance in hydrodynamic conditions. (e.g. Ivan-damage. How transportation system would perform)</li> <li>-Port facilities--Engineering design research. Ports as critical facilities. (e.g. Tampa petroleum services)</li> </ul>	4
<p>Behavioral science hurricane evacuation. Why people behave given various risks confronting them.</p>	3
<p>Marine debris modeling</p> <ul style="list-style-type: none"> <li>-Where, what will end up offshore and how that may impact pick-up and damage to fisheries sand other services</li> </ul>	3
<p>Coupled surge flood models</p> <ul style="list-style-type: none"> <li>-River floods/surge--understand the combined impacts</li> </ul>	2
<p>Phosphate mining standards</p> <ul style="list-style-type: none"> <li>-Effluent in surface waters</li> <li>-Economic impacts of spills</li> <li>-Modeling of potential for spills</li> </ul>	2
<p>Research on the resiliency of data collection. Wind/water--design standards. These data collection systems must perform in storms to be of full value</p>	2

Table 2 (continued). Research topics identified by the “Increasing Resilience to Natural Hazards” breakout group and voting results from the breakout group voting session.

Modeling droughts, climate change, and how lack of water impacts ecosystem resiliency	1
Potable surface water supply -Study land use effluents-runoff categories as to how they would recover after storms (e.g. HAB's ) -Modeling to predict how the reservoirs would be impacted	1
HAB's -Events-predict the impacts allow communities to adapt -Community pilots to I.D. HAB's risk and adaptation	0
Studies of communities that have been impacted by storms versus those that have not--behavior related to experience	0

**Information Needs**

- FL Bathy
- FL- DEM- Redelineate SLOSH

**Policy, Management or Education Topics**

- Education of the public--understanding difference between flooding (flood insurance)/storm surge (evacuation)
- Mandates for following the plans that exist. Requirements for following the plan
- Phosphate mining policy/standards potential for cathosplumes
- Ports facilities--standards for design

## Enabling Marine Operations

### Research Needs

Table 3. Research topics identified by the “Enabling Marine Operations” breakout group and voting results from the breakout group voting session.

Research Topic	Votes
Develop GIS databases (layers) that characterize the marine & coastal environment as well as human uses -Need to develop missing layers and/or extension of onshore databases -Automate mechanism to incorporate existing and new data (real time) (clearing house)	10
Impact of larger ports for larger vessels, and conflict of multiple uses	7
Creating new predictive tools (models) to test the impact of specific activities (remodeling of coastal power plants) beach renourishment	6
Establish baseline conditions to better understand the impact of maritime operations on human and environmental health	6
Run sensors using GIS to prioritize water way maintenance and navigation. Linked to value	5
What is the value (\$) (up and down sides) of maritime activities (looking at economic or environmental impacts of different alternatives)	5
Impact of short sea shipping	2
Need to identify invasive species that are transported in ballast discharged fluids/other mechanical methods (trailers) -Look at controlling	2
New navigational aids to better inform and direct traffic to enhance habitat protection and human safety	2

## Enabling Marine Operations

### **Information Needs**

- Environmental inventory (species & habitat)
- GIS navigational layer identifying navigational rules, distribution and changes (10 speed zone)
- Human uses (maritime environmental)
- Mapping & benthic habitat needed
- Need comprehensive (adaptable/consistent/comparable) study plans to respond to a variety of commercial activities in various environments
- Results of predictive models and level of success
- Standardization of economic value of a specific object or animal (value of barrier island or manatee)

### **Policy, Management or Education Topics**

- Are marine discharge policies being enforced and are they helping or improving environmental conditions?
- Maps & education for tourists and out-of-area visitors
- Need to get the US Coast Guard engaged with research and navigation and water safety information
- Partnerships with policy makers to provide information, communication to user groups (funding to develop products)
- Preservation of working waterfronts and commercial and recreational destination

The Ocean's Role in Climate

**Research Needs**

Table 4. Research topics identified by the “Ocean’s Role in Climate” breakout group and voting results from the breakout group voting session.

<b>Research Topic</b>	<b>Votes</b>
Model/temperature effects on hydrology and temperature in the Gulf of Mexico; better regional land view Research and modeling how pollution (i.e., Mississippi River) and flow water influxes will respond to circulation changes resulting from climate change -Groundwater -Nutrients	15
Where are the best locations for sensors -Gap analysis -Redundancy -Money Consider wind, climatological hotspots, atmospheric, ocean circulation, Gulf of Mexico circulation	14
Physical, chemical, and environmental tolerances for (larvae) all species within Gulf of Mexico -Temperature/salinity -Light -Winds -CO2 Effects of climate change on population dynamics and community dynamics -Pathogens/disease -Distribution and range -Fisheries and invasive species	13
Examine important components of carbon sink/source for baseline Gulf of Mexico Address impacts of CO <sub>2</sub> /acidification -Calcification rates -Trace metal chemistry -Biological systems/corals	11
Need to develop coastal algorithms for satellite data analysis (dissolved organic matter, gas exchange, transmittance; how these factors change with climate change)	11
Extreme weather events on Gulf of Mexico scale Generation of... -Impacts - environmental/economic -Frequency -Intensity	10

Table 4 (continued). Research topics identified by the “Ocean’s Role in Climate” breakout group and voting results from the breakout group voting session.

Development of models to predict sea-level rise throughout Gulf of Mexico (new or tweak existing models)	5
Social science/human dimension relative to decision makers (how they process, understand, and apply climate change science - assessment/metrics)	1
<del>Look at terrestrial/ocean/atmospheric (climate) variability on a more refined scale —Historical—to improve forecasting/mitigation</del>	0

### Information Needs

- Grad student mandate - social sciences
- Support:
  - Radar, bathymetry - fill gaps
    - Increase range - landward; develop means to measure seaward
    - Satellites going offline - more gaps in ability to monitor on large scale (e.g., location of loop current)
  - More refined scale - spatial and temporal to make cross-connections
    - DM (Database management) protocol/central distribution DMAC (Database Management Analysis Center)

### Policy, Management or Education Topics

- Analysis of:
  - Users/stakeholders / MPA public forums
  - ID data sources - archived, real-time, and other
  - ID research funding sources
  - Forecasts required - drives, instrument demands
- Briefing materials for communicators & environmental journalists
- Develop educational materials/workshops for formal and informal educators
- Policy scenarios for decision-makers and coastal stake-holders

Improving Ecosystem Health

**Research Needs**

Table 5. Research topics identified by the “Improving Ecosystem Health” breakout group and voting results from the breakout group voting session.

Research Topic	Votes
Freshwater inputs -- effects on ecosystem. Need to examine what really happens in the field under current permitting/development practices. Also need research linkages between reductions in freshwater inputs and benthic communities, trophic interactions, fisheries, shifts in emergent coastal habitats, and sediment transport/erosion.	14
New models for ecosystem-based management -Need models for fisheries, and other key components to model include habitat, threatened/endangered/protected species, cumulative impacts, and systematic ecosystem overview -Need to define ecosystem based management components in order to allow comparisons across the GOM. (NOAA Regional Coordination Team is discussing an integrated ecosystem assessment in the Gulf)	14
Research on how to present information most effectively, in a user-friendly way. How to disseminate and present to public.	13
Need socioeconomic research -Research on the social aspects / anthropologic characteristics of coastal communities -Need to look at impacts of environmental changes on social communities -Also need to determine the social and economic drivers in communities that do or do not lead to caring about the resource / conservation action. For example, could do an analysis of how different GOM communities have decided to develop and explore why different -Socioeconomic research should be used to help figure out how to optimize future coastal development to minimize environmental impacts, maximize quality of life, and maintain public access	12
Marine Protected Areas (MPA's) research -Role of MPA's in ecosystem management, how to measure effectiveness -More research to support the "Islands in the Stream" concept (system of MPA's around the GOM) -- specifically looking at larval transport, how different proposed sites are connected	7

Table 5 (continued). Research topics identified by the “Improving Ecosystem Health” breakout group and voting results from the breakout group voting session.

<p>Need greater understanding of factors that affect productivity based on the habitat needs of species. Including the benthic link to fisheries</p> <ul style="list-style-type: none"> <li>-When benthic habitats are destroyed what are the impacts?</li> <li>-Need to examine the cumulative impacts of habitat loss</li> <li>-Also need to look at connections between wetland characteristics and productivity (e.g. edge.)</li> </ul>	7
<p>How can genuine change in ecosystem structure and function be discerned with greater certainty?</p> <ul style="list-style-type: none"> <li>-Lots of talk about there being more HAB’s, more variability in system, but hard to be certain – difficult to know for sure when it isn’t just natural variability. (e.g. on HAB’s don’t have the data resolution to know whether natural variability)</li> <li>-Other example issues are coral bleaching, rising sea temperatures.</li> <li>-How do we know when ecosystem changes from one state (dynamic equilibrium) to another? And can we attribute the change to natural or anthropogenic sources?</li> </ul>	6
<p>How are anthropogenic stressors to Gulf ecosystems like natural stressors and how do they differ? (perturbation theory) For example, wetland loss in Louisiana is due to both natural and anthropogenic causes – how are responses similar and how are they different?</p>	5
<p>Do some open ocean aquaculture to understand the impacts, both positive and negative. Should do carefully, take an adaptive management approach.</p>	3
<p>Impacts of oil and gas drilling on plankton</p>	2
<p>Quantify differential effects of different fisheries management techniques (artificial reefs, marine managed areas, effort limitations, total allowable catch (TAC), stock enhancement)</p>	2
<p>Research impacts on benthic infauna from beach renourishment. Need to know whether we should worry about it.</p>	2
<p>Research iron “seeding” concept (adding iron to stimulate phytoplankton growth to suck up carbon)</p>	2

Table 5 (continued). Research topics identified by the “Improving Ecosystem Health” breakout group and voting results from the breakout group voting session.

Economic value of natural resources (e.g. value of keeping some lands)	1
Exploring the efficacy of mitigation of coastal habitats. Looking at both the efficacy of different methods, and also among/between different habitats	1
Liquid natural gas (LNG) facilities -Impacts of cycling water through -Need baseline information on the presence/abundance/life history characteristics of ichthyoplankton so can then measure impacts	1
Cumulative impacts (on fisheries) of ichthyoplankton losses due to different causes.	0
Efficacy of carbon offsets	0
Impacts of wind farms on migratory birds -Impacts of all types of alternative energy (e.g. tide energy)	0
Research impacts of hypoxia, GOM dead zone -How does the dead zone impact other areas via the loop current? -Other hypoxia areas emerging	0
Synthesize water quality monitoring information in order to understand impacts on biodiversity	0

## Improving Ecosystem Health

### **Information Needs**

- Basic information on Florida west shelf benthic communities, what's out there -- natural ledge communities
- Better coordination across all things going on in the GOM; coordination of research and management efforts
- Biodiversity of phytoplankton / microalgae (too much emphasis on harmful algal blooms -- need to look at all.) Need repository collections
- Estuary, coast, offshore linkages; modeling the linkages
- Gather and synthesize existing data from state/federal/university sources
  - Lots of existing research
  - Need clearinghouse (GOMA Habitat Identification team is working on this for habitat)
- High resolution maps of shelf and slope exist for TX and LA, and these need to be extended around the Gulf. Requires multibeam. Good educational tools as well
- Information needs re: open ocean aquaculture
- Synthesize and translate information for use by management community
- Water quality and nutrient run-off -- need synthesis of monitoring information

### **Policy, Management or Education Topics**

- Incentives for leaving open land
- Need to provide context for why people need to care about the ecosystem (this is an a priori need to get the political will.) Need education about how impacts people directly
- Open ocean aquaculture -- need policies (GOM Fisheries Management Council working on an amendment about this currently; National policy is currently stalled.)
- Smart growth

## Enhancing Human Health

### Research Needs

Table 6. Research topics identified by the “Enhancing Human Health” breakout group and voting results from the breakout group voting session.

Research Topic	Votes
Integrated study to determine the effects of wastewater to water quality / human health (source of contaminant, especially as it relates to sewage treatment)	8
Research new and better technologies for addressing sewage treatment / pharmaceuticals and costs	6
Evaluate the long- and short-term human exposure risk to marine aerosolized Brevetoxins and other HAB's	5
Better / improved method to eliminate pathogens / pharmaceuticals during harvesting and processing of seafood	4
Research link between climate change / sea-level change and how that will affect human health	4
Evaluate the geographic extent of contaminants in commercially harvested fish and shellfish	3
Research rapid assessment for mitigating human health impact from coastal hazards	3
Research the effect of pharmaceuticals on ecosystems and human health including best disposal methods for pharmaceuticals	3
Research to predict conditions favorable to HAB's and forecast health risk	3
Continue to do research in marine biotechnology to develop pharmaceuticals and products that enhance human health	2
Evaluate impact of cruise ship or other large vessel waste disposal	2
What are the cumulative impacts associated with increased human activities to human health along the coast?	2
What is the ecosystem impacts of the harvest of marine life that have human health benefits?	0
Evaluate localized disposal of treated waste water versus off-shore disposal	0

## Enhancing Human Health

### **Information Needs**

- Are there bioproducts to enhance human health that are being lost due to ecosystem degradation?
- Develop list of pharmaceuticals that have been identified in fish / others
- Develop list of seafood processing methods and imports
- Evaluate what are the best, most-current technologies for addressing sewage treatment and costs
- ID source of human health contaminants
- Identify different types / species of airborne health risks
- Develop comprehensive database in real time (IOOS) and integrate existing HAB information
- What is current situation? What would change with sea-level change and higher temperatures?

### **Policy, Management or Education Topics**

- BMP's for cruise ships or other large vessels for the disposal of waste
- Consistent management of septic systems
- Increase in education regarding human health implications related to disposal of pharmaceuticals
- Policy on imported seafood quality
- What is the acceptable balance between harvest of marine life for human health and protection of the resource?
- What regulation changes will have to be made as coastal communities shift to seawater for drinking water?

## Overall Results—Research Priorities Determined in Large Group Voting Session

The research topics presented in Table 7 were derived from the highest rated topics from each of the themed breakout groups. The column titled, “Theme,” in Table 7 corresponds to the breakout group from which the research topic originated. The following codes were used: stewardship of natural and cultural ocean resources (Stewardship), increasing resilience to natural hazards (Resilience), improving ecosystem health (Ecosystem), enabling marine operations (Operations), enhancing human health (Human), and the ocean’s role in climate (Climate).

Each participant had 12 votes for the large group voting session and could place up to two votes for any one research topic.

Note that in some cases research topics presented by different breakout groups were very similar. An in-depth analysis of similar topics identified within and between workshops will be discussed in a later report.

Table 7. Results of the large voting session for high-priority research topics across all theme areas.

Research Topic	Votes	Theme
Understand connectivity among populations and habitats -Watershed to shelf edge -Fisheries management -Shelf edge deep water hard bottom habitat	30	Stewardship
Fresh-water inputs - effects on ecosystem -Examine what really happens in the field under current building and permitting practices (i.e. current impacts) -Examine/project impacts of reductions on benthic communities, trophic interactions, fisheries, emergent coastal habitats, sediment transport / erosion	28	Ecosystem
Marine Protected Areas (MPA’s) research -How to measure effectiveness -Role in ecosystem management -Research to support the "Islands in the Stream" proposal in the GOMEX (e.g. larval transport, connectivity between sites)	27	Ecosystem
Develop GIS databases (layers) that characterize the marine and coastal environment -Develop additional layers or create extensions of onshore data layers -Develop automated mechanism to incorporate existing and new data (real time) -Identify a clearing house for data and layers	25	Operations
Economics research of coastal development. True costs, true benefits, including economic modeling of damage to fisheries production, various classes of recreation, and many other aspects of community resiliency	25	Resilience

Table 7 (continued). Results of the large voting session for high-priority research topics across all theme areas.

<p>What are the effects of climate change on population and community dynamics?</p> <ul style="list-style-type: none"> <li>-Emergence / prevalence of pathogens</li> <li>-Distribution and range changes</li> <li>-Effects on biology of invasive species</li> <li>-Response of organisms to changing levels of: temperature, salinity, light, winds, CO<sub>2</sub>, etc.</li> </ul>	22	Climate
<p>Understand habitat change over time - what is / is not sustainable?</p>	20	Stewardship
<p>Integrated study to determine effects of wastewater to water quality / human health (source of contaminant - especially as it relates to sewage treatment)</p>	19	Human
<p>Where are the best locations for sensors? (data collection)</p> <ul style="list-style-type: none"> <li>-Wind</li> <li>-Climatological hot spots</li> <li>-Gulf of Mexico</li> <li>-Atmospheric / ocean circulation</li> <li>-GAP analysis</li> <li>-Redundancy</li> <li>-\$</li> </ul>	19	Climate
<p>Need new models for ecosystem-based management</p> <ul style="list-style-type: none"> <li>-Considering fisheries, habitat, threatened / endangered species, ecosystem processes</li> <li>-Need to define ecosystem based management components to allow comparisons across different areas in the Gulf</li> </ul>	18	Ecosystem
<p>Socio-economic research; social aspects of coastal communities and impacts of environmental change on communities</p> <ul style="list-style-type: none"> <li>-Includes looking at social and economic drivers that influence whether communities do / don't care about resources; look at why communities make different conservation decisions</li> <li>-Research how to optimize future coastal development to minimize environmental impacts, maximize quality of life, and maintain public access</li> </ul>	18	Ecosystem
<p>Understand the effectiveness of education about resources and examine our methodology</p>	18	Stewardship
<p>How can genuine change in ecosystem structure and function be discerned with more certainty</p> <ul style="list-style-type: none"> <li>-Hard to know when it's more than natural variability</li> <li>-e.g. changes in HAB's, coral bleaching</li> <li>-How to know when real change from one system state to another?</li> </ul>	16	Ecosystem

Table 7 (continued). Results of the large voting session for high-priority research topics across all theme areas.

How will climate change affect hydrology on land, in coastal regions and open oceans - with a focus on interactive processes (pollution, freshwater influx, nutrients, groundwater)	16	Climate
Understand resource / fisheries abundance - historic sustainability and current abundance: what is sustainable?	12	Stewardship
Evaluate long and short term human exposure risk to marine aerosolized Brevetoxins and other HAB's	10	Human
Research on how to present information most effectively, and in a user-friendly way (how to disseminate and present to public) -e.g. GIS layers, web-based products (efficacy of different delivery mechanisms) -e.g. use of the media	10	Ecosystem
What are the important components for a baseline carbon sink / source for GOM and what are the impacts of changing CO <sub>2</sub> on ocean acidification and biogeochemistry and the subsequent biological consequences	10	Climate
The resiliency of data collection platforms - engineering designs of data collection systems in severe events	9	Resilience
Storm surge modeling -Improvements in DEMs (topo / bathy) and how it influences results -Sea-level rise component of surge modeling	8	Resilience
Wind speed / storm surge energy dissipation as it interfaces with wetlands and uplands vegetation. Understanding the mitigation benefits of vegetation and the economic value of these buffers.	8	Resilience
Research to predict conditions favorable to HAB's and forecast health risk	7	Human
What is the value (\$) (up and down sides) of maritime activities (looking at economic or environmental impacts of different alternatives)	7	Operations
Determine re-nourishment effects / timing and recovery on affected habitats / physical oceanography	6	Stewardship
Marine debris - modeling, predicting--type, location, impacts / economics of withdrawal	6	Resilience
Need greater understanding or factors that affect productivity based on habitat needs of species. Includes research on benthic link to fisheries, understanding cumulative impacts of habitat losses	6	Ecosystem
Research link between climate change / sea level change and how that will affect human health	6	Human

Table 7 (continued). Results of the large voting session for high-priority research topics across all theme areas.

Research the effects of pharmaceuticals on ecosystem and human health including best disposal methods for pharmaceuticals	6	Human
What is the impact of larger ports (to accommodate larger deep draft vessels) and conflicts with multiple use areas (recreational fishing, environmentally sensitive areas)	6	Operations
Development of models to predict sea-level rise throughout the GOM (new or enhance existing models)	5	Climate
Economic / engineering studies of phosphate mining and its risk to coastal resources	5	Resilience
Study extreme weather events in the GOM including -Generation of events -Impacts - environmental and economic -Frequency and intensity	5	Climate
Coupled modeling for storm surge / river flooding	4	Resilience
Creating new predictive tools (models) to test the impact of specific activities (remodeling of coastal power plants) beach renourishment	4	Operations
Economic value / costs on restoration, habitat, ecological benefits	4	Stewardship
Establish baseline conditions to better understanding of the impact of maritime operations on human and environmental health	4	Operations
Evaluate the human dimension - e.g. relative to decision makers. Develop metrics to assess how they process, understand and apply climate change science	4	Climate
Look at historical, current, and future impacts of oil and gas industry on biodiversity	4	Stewardship
Research on protection of critical infrastructure -Engineering design research. Bridges (e.g. Ivan and Katrina examples) -Port facilities: dependant functionality; e.g., gasoline in Tampa Bay	4	Resilience
Run scenarios using GIS to prioritize water way maintenance and navigation (linked to value)	4	Operations
Better / improved method to eliminate pathogens / pharmaceuticals during harvesting and processing of seafood	2	Human
Research new and better technologies for addressing sewage treatment and costs	2	Human
Water column on west Florida shelf: interaction between surface, pelagic, and benthic / trophic zones	2	Stewardship

Table 7 (continued). Results of the large voting session for high-priority research topics across all theme areas.

Develop algorithms for coastal satellite data (dissolved organic materials, gas exchange, etc. - how these change with climate change)	1	Climate
Evaluate geographic extent of contaminants in commercially harvested fish and shellfish	1	Human
What are the options for labor dynamics and alternatives for fishing communities / socio-economic impact	1	Stewardship
Behavioral science; e.g. hurricane evacuation - why people make risk based decisions or not	0	Resilience
Evaluate localized disposal of treated wastewater versus offshore disposal	0	Human

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Gulf Coast Services Center (Heidi Recksiek, Todd Davison, and Ann Weaver)

Florida Sea Grant (Chris Simoniello and Betty Staugler)

USGS (Jack Kindinger)

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See appendix C.

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Transcription support:

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Mississippi-Alabama Sea Grant Consortium (Kay Bruening, John Grigsby, Devaney Cheramie,

Loretta Leist, Melissa Schneider, and Valerie Winn)

**Appendix A:**

**Gulf of Mexico Research Planning Workshop Agenda**

**U.S. Geological Survey Florida Integrated Science Center**

**St. Petersburg, Florida**

**February 19, 2008**

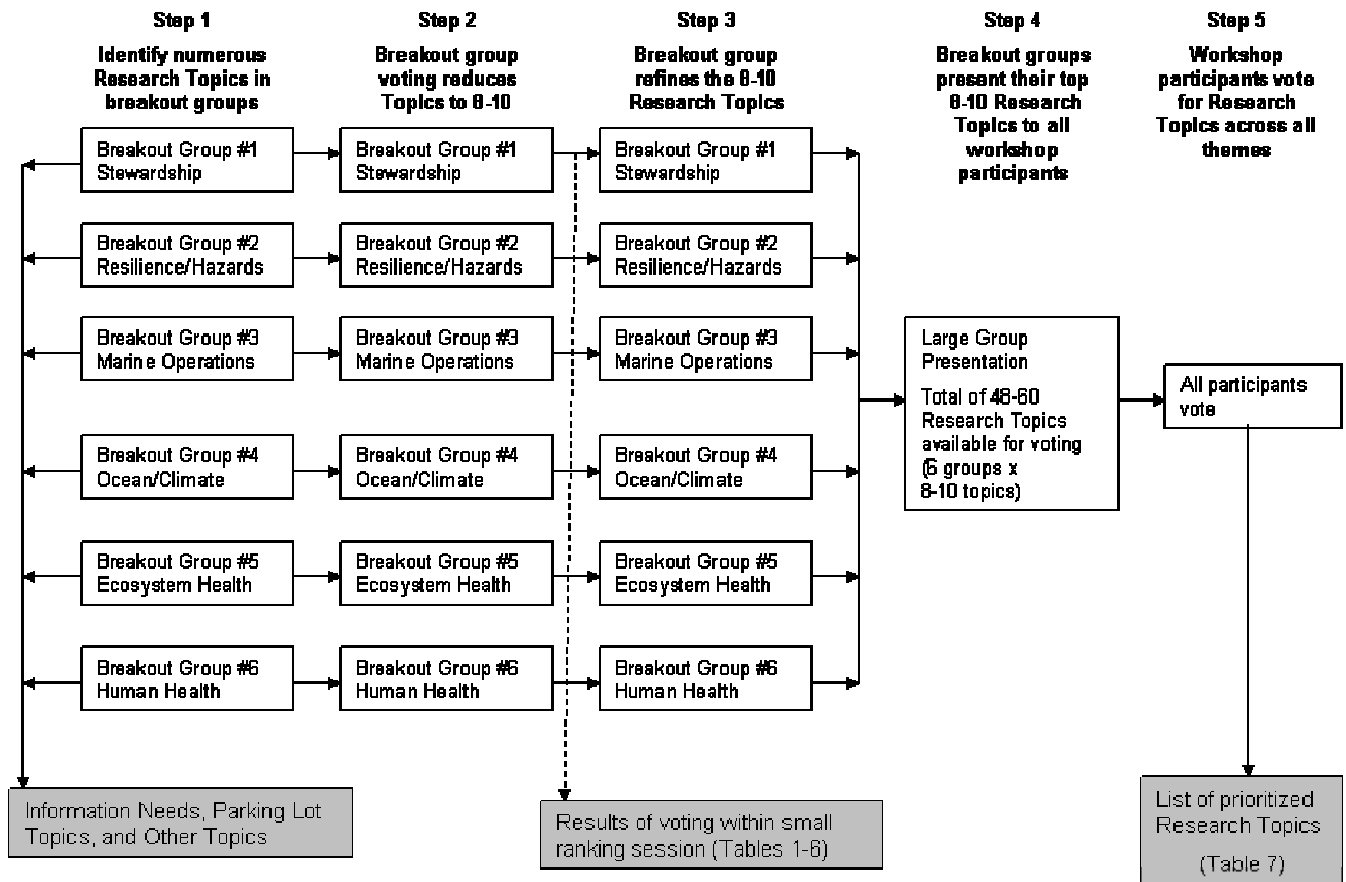
**10:00 a.m. – 2:45 p.m.**

**Workshop Agenda**

- 10:00-10:15 **Check-in, coffee**
- 10:15-10:40 **Welcome and Purpose of the GMRP workshop** (all participants)
- 10:40-10:45 **Small Group Session Goals and Objectives** (all participants)
- 10:45-11:45 **Identify Research Topics within Themes** (breakout group)
- 11:45-12:10 **Break and Pick-up Lunches**
- 12:10-1:30 **Refine and Prioritize Research Topics—includes breakout group voting session** (breakout group)
- 1:30-2:00 **Groups Present Top Research Topics for each Theme** (all participants)
- 2:00-2:30 **Voting Session of all Research Topics** (all participants)
- 2:30-2:45 **Wrap up** (all participants)
- 2:45- **Optional tour of USGS facilities**

**Appendix B:**

**Process diagram to identify and prioritize research topics at the GMRP workshop**



## Appendix C:

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