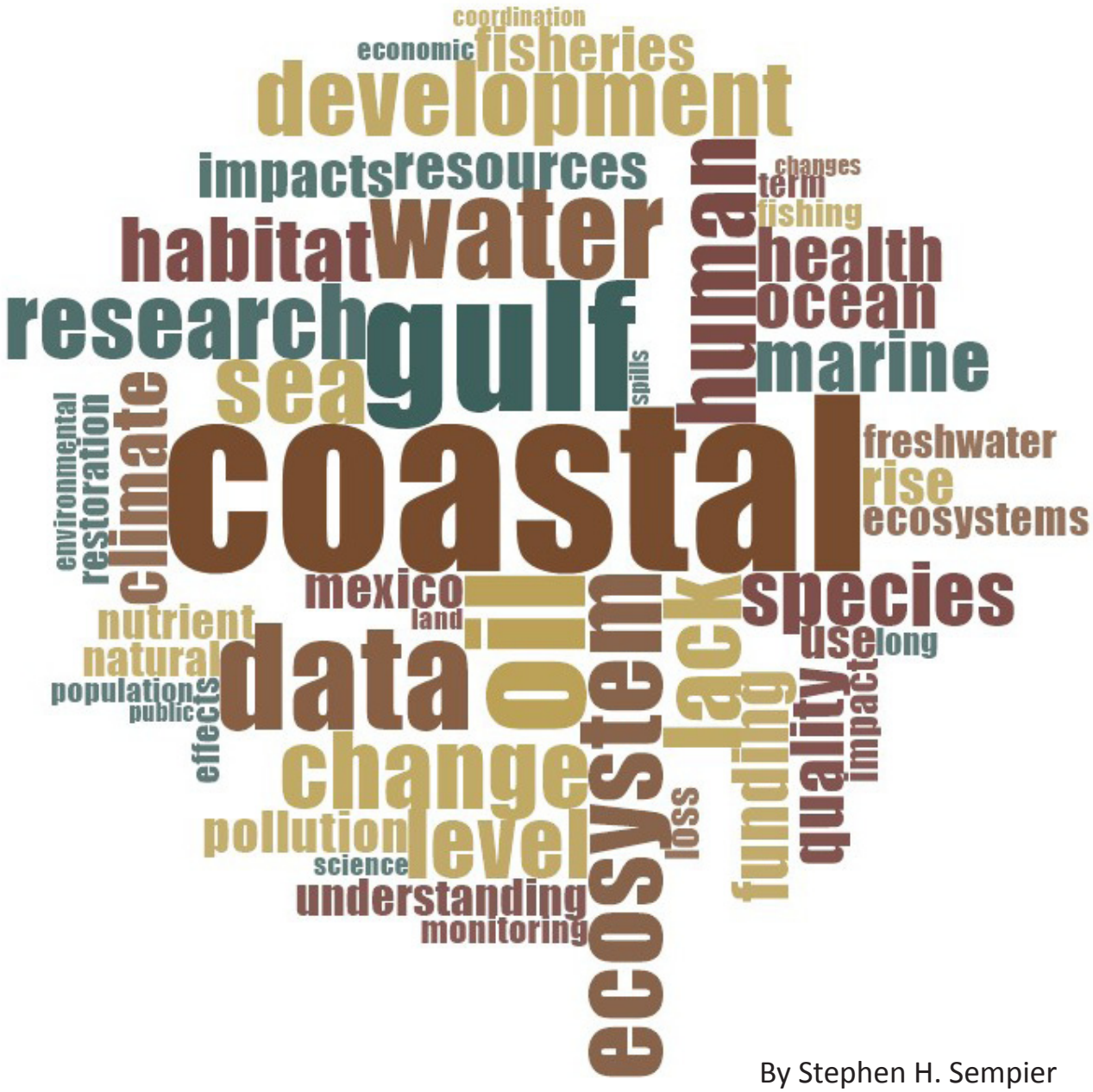
Initial Results
from the 2013 Gulf of Mexico Research Plan Survey

A customized report prepared for the:

Gulf of Mexico Alliance
Habitat Conservation and Restoration
Priority Issue Team



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Introduction

The four Sea Grant College Programs in the Gulf of Mexico region released surveys in 2007, 2010 and 2013 that asked about regional research and related needs. This was part of an effort to develop and update the Gulf of Mexico Research Plan (GMRP). For the 2013 GMRP survey, **1,668 people** answered at least a portion of the survey. Hundreds of people from each of the Gulf of Mexico states and beyond completed the survey, and they represented a broad cross section of people from government, universities, business/industry, NGOs and other groups. Charts that illustrate demographic information about the people who completed the survey are included in the Appendix. This is one of six separate reports created for each of the GOMA Priority Issue Teams (PITs).

The report

This report contains two sections that were developed based on the open-ended questions from the 2013 GMRP survey. The questions asked respondents to describe Gulf of Mexico research priorities, stressors and barriers to implementing a regional research plan.

Section I: Word Trees

The first section contains word trees that were developed using keywords related to each PIT. Word trees provide a quick way to provide some context on the keywords people used answering the questions. Most of the word trees only contain the first four or five words before and after the keyword in order to be readable in this document.

Section II: Research Priorities by subcategory

The second section is an analysis of open-ended research priorities through the lens of the PIT. The 2013 GMRP survey presented a standardized list of research priorities. It also asked people to identify up to three additional research priorities in open-ended text boxes. There were a total of **1,003 research priorities described**. These research priorities were linked to PITs. In some cases the same research priority could connect to a topic that is covered by more than one PIT. In addition, subcategories were created to better organize similar or related research priorities within a PIT and in many cases subcategories were based on PIT focus areas. The priorities were alphabetized within each subcategory. Table 1 in the Appendix summarizes the number of research priorities linked to each PIT and subcategory.

The research priorities are listed as bullets that are organized by PIT and subcategory. In many cases people's response to the question was not a true research priority. However, these bullets were retained so that readers can see the scope and breadth of input that was provided. Finally, the bullets are **unedited, actual responses** that survey respondents provided.

Next steps

Significant survey analysis and reporting still needs to be completed for the 2013 GMRP survey, which closed in November 2013. Additional details will be shared in the coming months along with a comparison between responses in the 2007, 2010 and 2013 GMRP surveys. For more information, please contact Steve Sempier, Mississippi-Alabama Sea Grant, at stephen.sempier@usm.edu.

Cover: The 50 most frequently used words by people who completed the 2013 GMRP survey. Word size reflects the frequency the word was used with larger words being used more frequently.

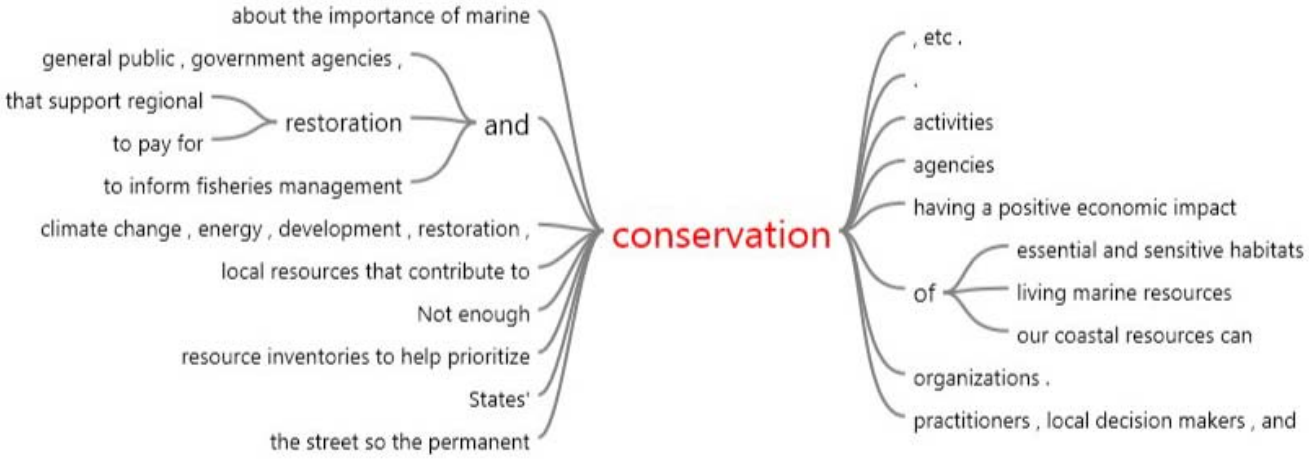
Section I: Word Trees

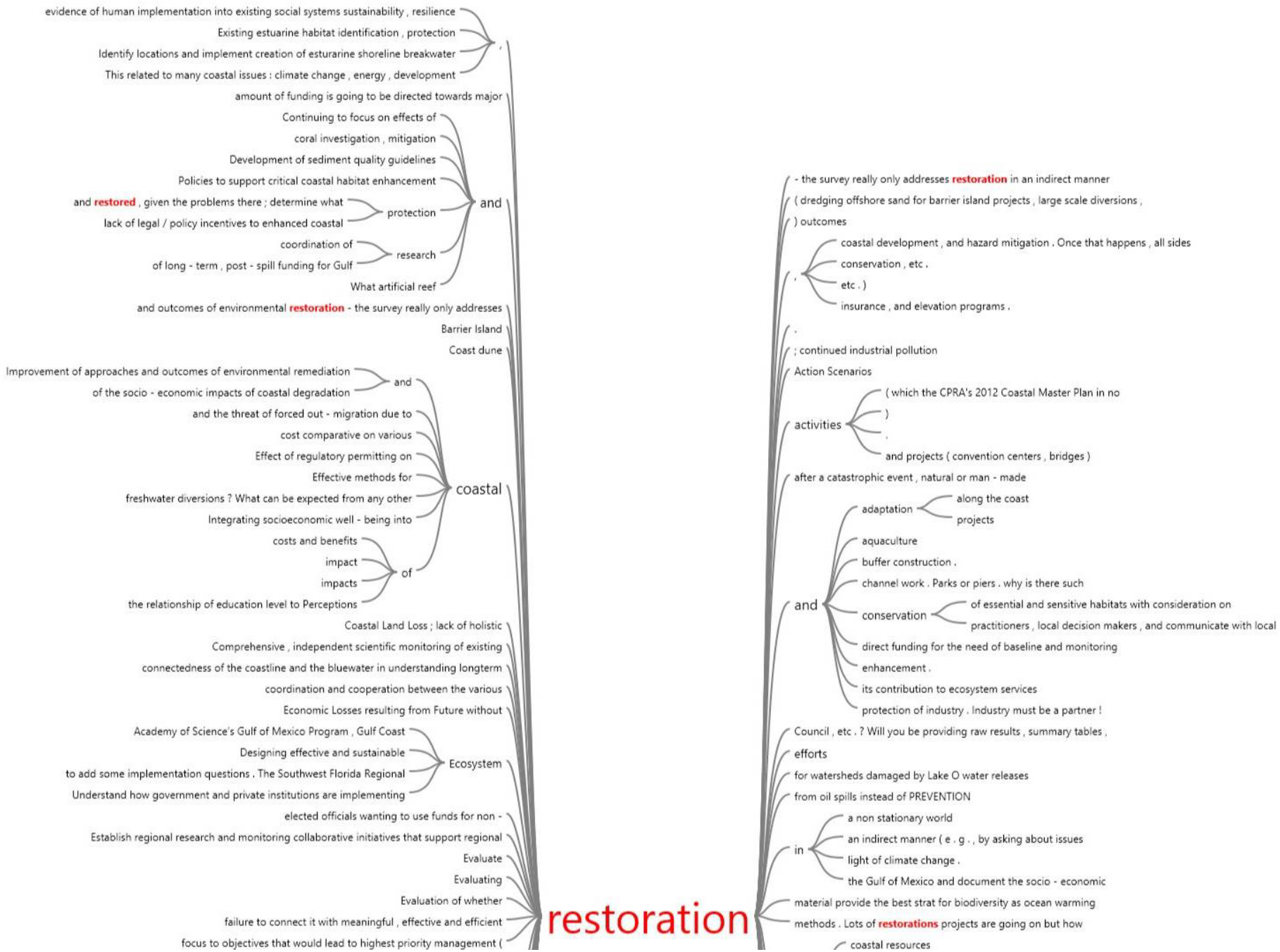
Word trees were created for several keywords related to the **GOMA Habitat Conservation and Restoration Priority Issue Team**. The keywords used in the diagrams below are:

- Conservation
- Restoration (divided onto two pages to be more readable)
- Ecosystem services
- Sea level
- Freshwater

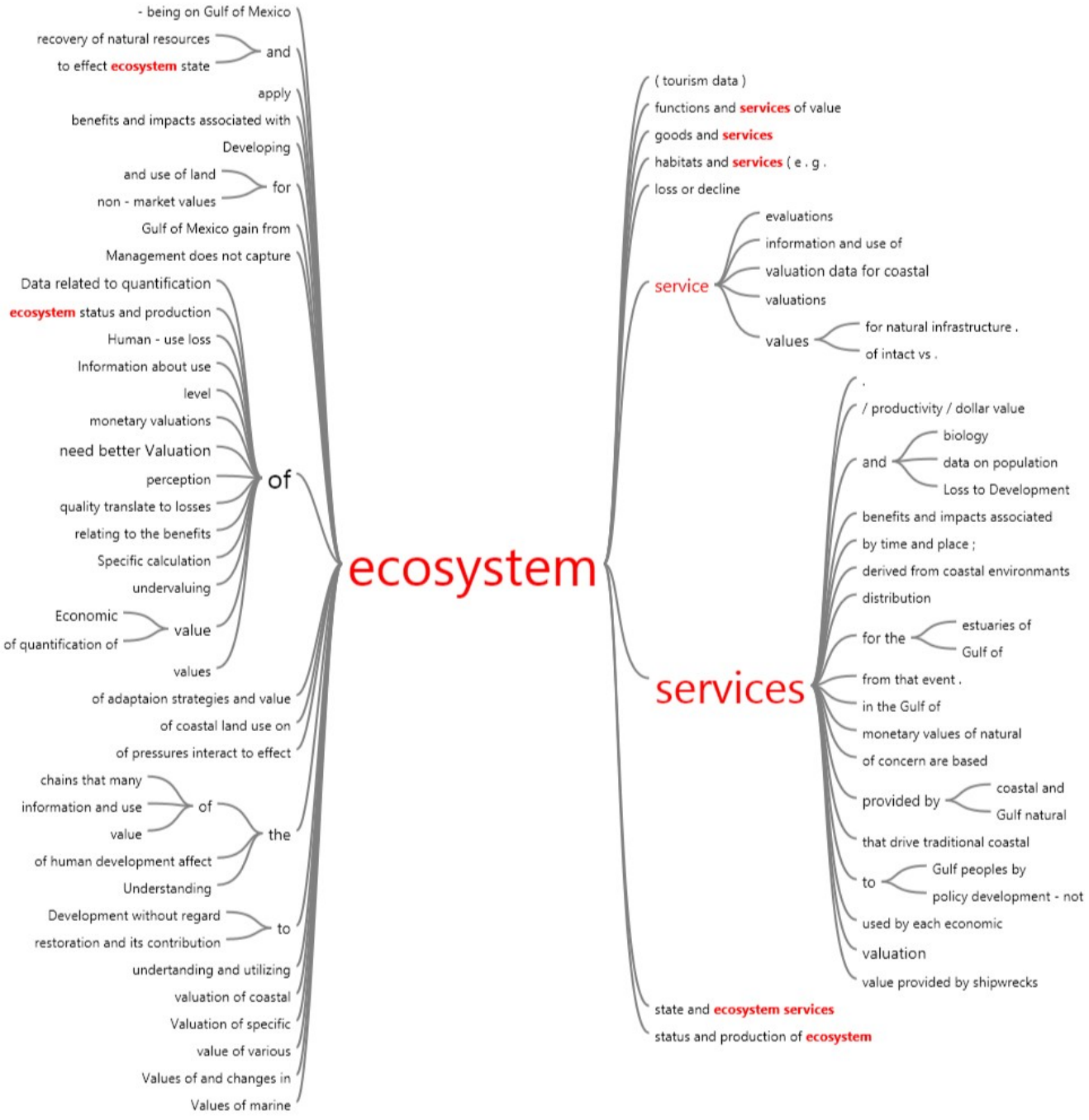
Note: The keyword “Ecosystem” generated too many responses to include in this document.

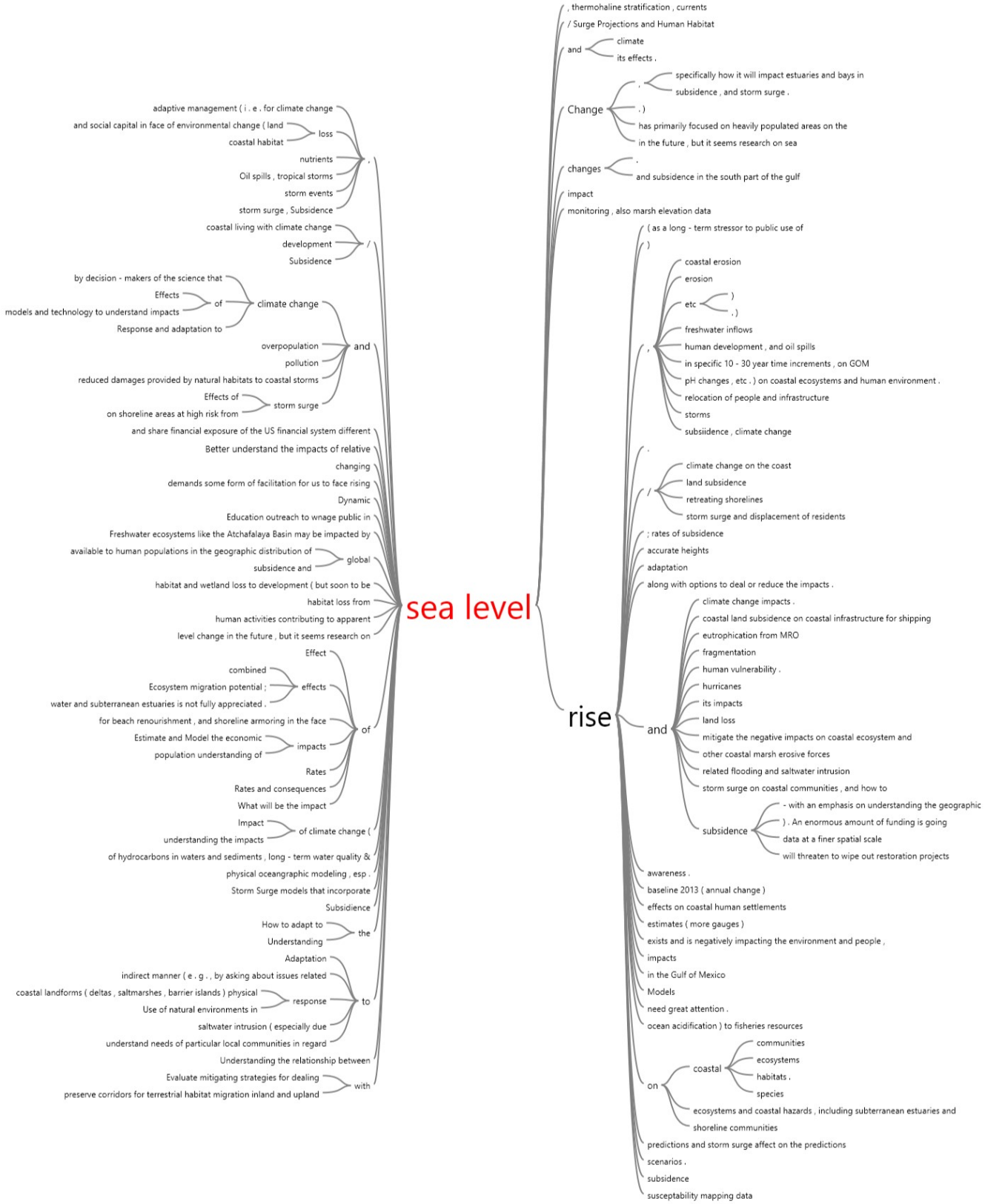
While analyzing the open-ended survey responses “freshwater” and similar concepts were mentioned numerous times. Often this related to freshwater input. This may be an area that is not explicitly addressed by the GOMA PITs so the word tree was included here. Additional details can be provided upon request.

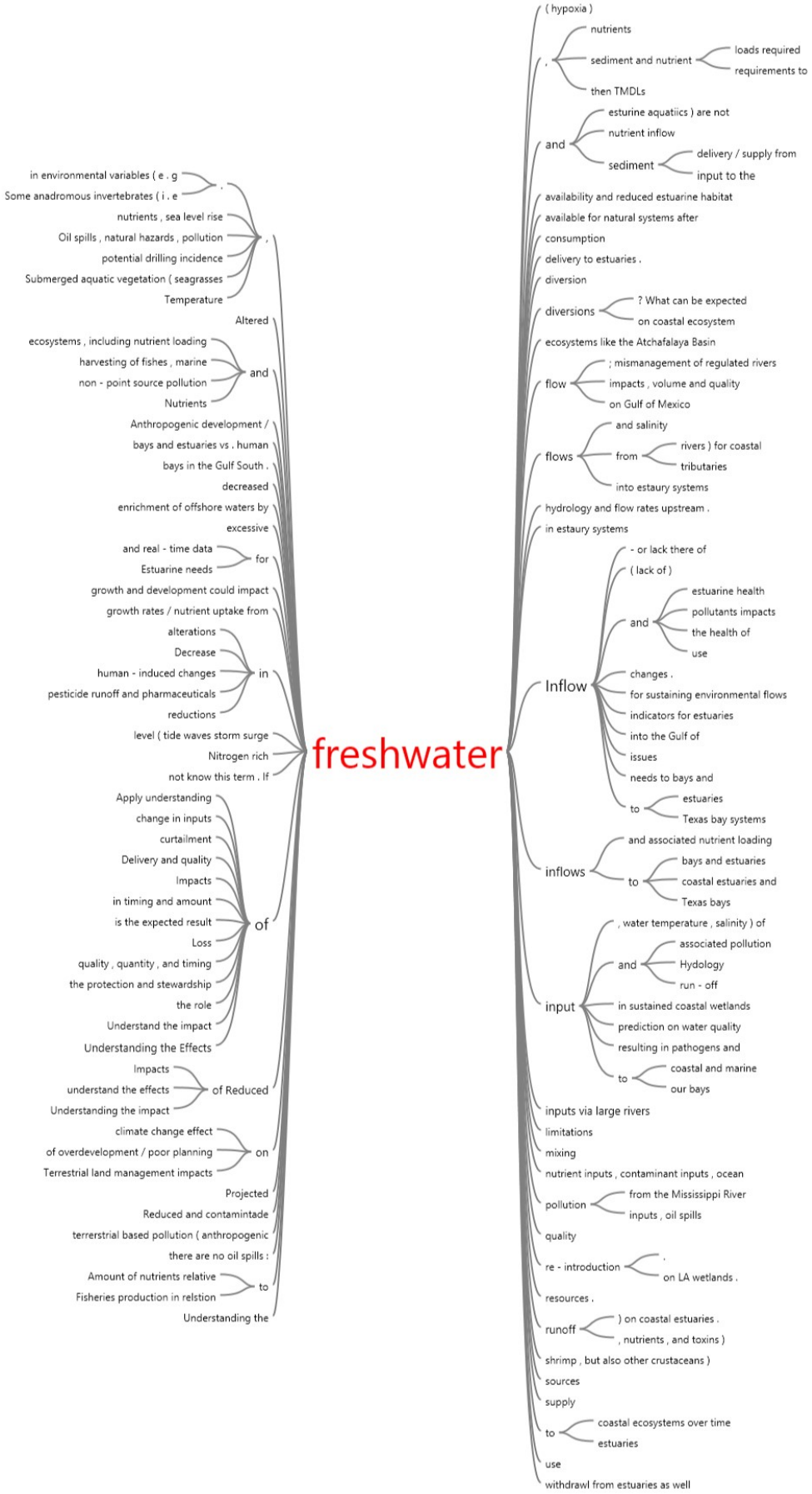



restoration
evidence of human implementation into existing social systems sustainability , resilience
Existing estuarine habitat identification , protection
Identify locations and implement creation of esturarine shoreline breakwater
This related to many coastal issues : climate change , energy , development
,
amount of funding is going to be directed towards major
Continuing to focus on effects of
coral investigation , mitigation
Development of sediment quality guidelines
Policies to support critical coastal habitat enhancement
and restored , given the problems there ; determine what
lack of legal / policy incentives to enhanced coastal
protection
coordination of
of long - term , post - spill funding for Gulf
research
What artificial reef
and
and outcomes of environmental restoration - the survey really only addresses
Barrier Island
Coast dune
Improvement of approaches and outcomes of environmental remediation
of the socio - economic impacts of coastal degradation
and
and the threat of forced out - migration due to
cost comparative on various
Effect of regulatory permitting on
Effective methods for
freshwater diversions ? What can be expected from any other
Integrating socioeconomic well - being into
costs and benefits
impact
impacts
of
the relationship of education level to Perceptions
coastal
Coastal Land Loss ; lack of holistic
Comprehensive , independent scientific monitoring of existing
connectedness of the coastline and the bluewater in understanding longterm
coordination and cooperation between the various
Economic Losses resulting from Future without
Academy of Science's Gulf of Mexico Program , Gulf Coast
Designing effective and sustainable
to add some implementation questions . The Southwest Florida Regional
Understand how government and private institutions are implementing
Ecosystem
elected officials wanting to use funds for non -
Establish regional research and monitoring collaborative initiatives that support regional
Evaluate
Evaluating
Evaluation of whether
failure to connect it with meaningful , effective and efficient
focus to objectives that would lead to highest priority management (
- the survey really only addresses restoration in an indirect manner
(dredging offshore sand for barrier island projects , large scale diversions ,
) outcomes
coastal development , and hazard mitigation . Once that happens , all sides
conservation , etc .
,
etc .)
insurance , and elevation programs .
.
; continued industrial pollution
Action Scenarios
(which the CPRA's 2012 Coastal Master Plan in no
)
activities
.
and projects (convention centers , bridges)
after a catastrophic event , natural or man - made
adaptation
along the coast
projects
aquaculture
buffer construction .
channel work . Parks or piers . why is there such
and
conservation
of essential and sensitive habitats with consideration on
practitioners , local decision makers , and communicate with local
direct funding for the need of baseline and monitoring
enhancement .
its contribution to ecosystem services
protection of industry . Industry must be a partner !
Council , etc . ? Will you be providing raw results , summary tables ,
efforts
for watersheds damaged by Lake O water releases
from oil spills instead of PREVENTION
a non stationary world
an indirect manner (e . g . , by asking about issues
in
light of climate change .
the Gulf of Mexico and document the socio - economic
material provide the best strat for biodiversity as ocean warming
methods . Lots of restorations projects are going on but how
coastal resources


restoration
Evaluation of whether
failure to connect it with meaningful , effective and efficient
focus to objectives that would lead to highest priority management (
for
am . Each Gulf State needs a focused , master plan
BMPs
co - management skills of local communities
how to manage hypothetical situations and conceptual models , particularly
identify areas that can be utilized
state - wide politics , competing agendas
Survey data with willingness of the population to pay
Use of the Mississippi River and its Resources
Get managers to talk with scientists to guide the many
habitat
decision support models to more efficiently and effectively guide
Long term monitoring of
What are the most effective
implement
the cooperation of the countries . Especially when trying to
The lack of understanding by those that can
in order to better predict the effects of large scale
local perceptions / expectations about
metrics to assess
of
metrics to assess success
Understand the implications
Understanding how different types
of politics within individual states diverting funds away from true
of Specific Selection Critera / Metrics to assess , rank , and select
oyster
predictive science scenarios for both
projects across region to better understand successes / failures of those
Quantifying service benefits of ecological
reasonable , and which are not ; resolve the controversies surrounding the
research projects / programs ; lack of solid and comprehensive coordination across
response , migration patterns , sediment distribution patterns , ecosystem response to a
Response of biota to
Salt Marsh
sea grass
Sea level rise and subsidence will threaten to wipe out
Seagrass
should be placed on the science and outcomes of environmental
to restore ecosystems (biggest bang for buck , ie tidal hydrology
use our understanding of ocean ecosystems to enhance
used for research and restore gulf waters , not for beach
Wetland
Wetland / marshland
wetland habitat , sav and oyster beds analysis and long term
material provide the best strat for biodiversity as ocean warming
methods . Lots of restorations projects are going on but how
of
coastal resources
last marsh lands
marine resources
near - shore marsh habitat
nearhshore resources .
sav , oyster beds to create and enhance new or
the
ecosystems
Mississippi River's connection with its delta (from a
vegetated wetlands
or infrastructure project , estuarine plankton trends , etc . cannot be understated .
outcomes based on wildlife response to created habitat
Plan contains the projects I think RESTORE should be funding
Planning using alternative futures analyses
programs
.
and between the Gulf States
project
?
types
.
on their surrounding ecosystems .
projects
(e . g . , increased hope of frustration / fatalism)
, especially diversions .
across region to better understand successes / failures of those
Gulf - wide
proposed . Fund the basic science that is needed to
provide improved ecological services
restore or conserve those benefits most critical to communities
such as river diversions . These projects could / would be
to provide stated services
science programs
strategies on marsh stability in the Mississippi Delta
success rates
targets for determining biological impacts and recovery of oil - contaminated
techniques
are reasonable , and which are not ; resolve the controversies
vs success rates
when we don't yet know what needs to be restored .


ecosystem
- being on Gulf of Mexico
recovery of natural resources
to effect ecosystem state
and
apply
benefits and impacts associated with
Developing
and use of land
non - market values
for
Gulf of Mexico gain from
Management does not capture
Data related to quantification
ecosystem status and production
Human - use loss
Information about use
level
monetary valuations
need better Valuation
perception
quality translate to losses
relating to the benefits
Specific calculation
undervaluing
Economic
of quantification of
value
values
of
of adaptaion strategies and value
of coastal land use on
of pressures interact to effect
chains that many
information and use
value
of
of human development affect
Understanding
the
Development without regard
restoration and its contribution
to
undertanding and utilizing
valuation of coastal
Valuation of specific
value of various
Values of and changes in
Values of marine
(tourism data)
functions and services of value
goods and services
habitats and services (e . g .
loss or decline
service
evaluations
information and use of
valuation data for coastal
valuations
values
for natural infrastructure .
of intact vs .
services
.
/ productivity / dollar value
and
biology
data on population
Loss to Development
benefits and impacts associated
by time and place ;
derived from coastal environmants
distribution
for the
estuaries of
Gulf of
from that event .
in the Gulf of
monetary values of natural
of concern are based
provided by
coastal and
Gulf natural
that drive traditional coastal
to
Gulf peoples by
policy development - not
used by each economic
valuation
value provided by shipwrecks
state and ecosystem services
status and production of ecosystem


sea level
rise
, thermohaline stratification , currents
/ Surge Projections and Human Habitat
and
climate
its effects .
Change
,
specifically how it will impact estuaries and bays in
subsidence , and storm surge .
.)
has primarily focused on heavily populated areas on the
in the future , but it seems research on sea
changes
.
and subsidence in the south part of the gulf
impact
monitoring , also marsh elevation data
(as a long - term stressor to public use of
)
,
coastal erosion
erosion
etc
)
.)
freshwater inflows
human development , and oil spills
in specific 10 - 30 year time increments , on GOM
pH changes , etc .) on coastal ecosystems and human environment .
relocation of people and infrastructure
storms
subsiidence , climate change
.
/
climate change on the coast
land subsidence
retreating shorelines
storm surge and displacement of residents
; rates of subsidence
accurate heights
adaptation
along with options to deal or reduce the impacts .
and
climate change impacts .
coastal land subsidence on coastal infrastructure for shipping
eutrophication from MRO
fragmentation
human vulnerability .
hurricanes
its impacts
land loss
mitigate the negative impacts on coastal ecosystem and
other coastal marsh erosive forces
related flooding and saltwater intrusion
storm surge on coastal communities , and how to
subsidence
- with an emphasis on understanding the geographic
) . An enormous amount of funding is going
data at a finer spatial scale
will threaten to wipe out restoration projects
awareness .
baseline 2013 (annual change)
effects on coastal human settlements
estimates (more gauges)
exists and is negatively impacting the environment and people ,
impacts
in the Gulf of Mexico
Models
need great attention .
ocean acidification) to fisheries resources
on
coastal
communities
ecosystems
habitats .
species
ecosystems and coastal hazards , including subterranean estuaries and
shoreline communities
predictions and storm surge affect on the predictions
scenarios .
subsidence
susceptability mapping data
,
adaptive management (i . e . for climate change
and social capital in face of environmental change (land
loss
coastal habitat
nutrients
Oil spills , tropical storms
storm events
storm surge , Subsidence
/
coastal living with climate change
development
Subsidence
and
climate change
by decision - makers of the science that
Effects
of
models and technology to understand impacts
Response and adaptation to
overpopulation
pollution
reduced damages provided by natural habitats to coastal storms
storm surge
Effects of
on shoreline areas at high risk from
and share financial exposure of the US financial system different
Better understand the impacts of relative
changing
demands some form of facilitation for us to face rising
Dynamic
Education outreach to wnage public in
Freshwater ecosystems like the Atchafalaya Basin may be impacted by
global
available to human populations in the geographic distribution of
subsidence and
habitat and wetland loss to development (but soon to be
habitat loss from
human activities contributing to apparent
level change in the future , but it seems research on
of
Effect
effects
combined
Ecosystem migration potential ;
water and subterranean estuaries is not fully appreciated .
for beach renourishment , and shoreline armoring in the face
impacts
Estimate and Model the economic
population understanding of
Rates
Rates and consequences
What will be the impact
of climate change (
Impact
understanding the impacts
of hydrocarbons in waters and sediments , long - term water quality &
physical oceangraphic modeling , esp .
Storm Surge models that incorporate
Subsidience
the
How to adapt to
Understanding
to
Adaptation
indirect manner (e . g . , by asking about issues related
response
coastal landforms (deltas , saltmarshes , barrier islands) physical
Use of natural environments in
saltwater intrusion (especially due
understand needs of particular local communities in regard
with
Understanding the relationship between
Evaluate mitigating strategies for dealing
preserve corridors for terrestrial habitat migration inland and upland


freshwater
(hypoxia)
, nutrients
, sediment and nutrient loads required
requirements to
then TMDLs
and esturine aquatiics) are not
nutrient inflow
sediment delivery / supply from
input to the
availability and reduced estuarine habitat
available for natural systems after
consumption
delivery to estuaries .
diversion
diversions ? What can be expected
on coastal ecosystem
ecosystems like the Atchafalaya Basin
flow ; mismanagement of regulated rivers
impacts , volume and quality
on Gulf of Mexico
flows and salinity
from rivers) for coastal
tributaries
into estaury systems
hydrology and flow rates upstream .
in estaury systems
Inflow - or lack there of
(lack of)
and estuarine health
pollutants impacts
the health of
use
changes .
for sustaining environmental flows
indicators for estuaries
into the Gulf of
issues
needs to bays and
to estuaries
Texas bay systems
inflows and associated nutrient loading
to bays and estuaries
coastal estuaries and
Texas bays
input , water temperature , salinity) of
and associated pollution
Hydology
run - off
in sustained coastal wetlands
prediction on water quality
resulting in pathogens and
to coastal and marine
our bays
inputs via large rivers
limitations
mixing
nutrient inputs , contaminant inputs , ocean
pollution from the Mississippi River
inputs , oil spills
quality
re - introduction .
on LA wetlands .
resources .
runoff) on coastal estuaries .
, nutrients , and toxins)
shrimp , but also other crustaceans)
sources
supply
to coastal ecosystems over time
estuaries
use
withdrawl from estuaries as well
in environmental variables (e . g
. Some anadromous invertebrates (i . e
nutrients , sea level rise
Oil spills , natural hazards , pollution
potential drilling incidence
Submerged aquatic vegetation (seagrasses
Temperature
, Altered
ecosystems , including nutrient loading
harvesting of fishes , marine
non - point source pollution
and Nutrients
Anthropogenic development /
bays and estuaries vs . human
bays in the Gulf South .
decreased
enrichment of offshore waters by
excessive
and real - time data
Estuarine needs for
growth and development could impact
growth rates / nutrient uptake from
alterations
Decrease
human - induced changes
pesticide runoff and pharmaceuticals
reductions
in
level (tide waves storm surge
Nitrogen rich
not know this term . If
Apply understanding
change in inputs
curtailment
Delivery and quality
Impacts
in timing and amount
is the expected result
Loss
quality , quantity , and timing
the protection and stewardship
the role
Understand the impact
Understanding the Effects
of
Impacts
understand the effects
Understanding the impact
of Reduced
climate change effect
of overdevelopment / poor planning
Terrestrial land management impacts
on
Projected
Reduced and contamintade
terrerstrial based pollution (anthropogenic
there are no oil spills :
Amount of nutrients relative
Fisheries production in relstion
to
Understanding the

Section II: Research Priorities by subcategory

Open-ended Research Priorities arranged by subcategory

The bullets below are **unedited responses** to the 2013 GMRP Survey questions that asked people to identify their top three research priorities for the Gulf of Mexico over the next 5-15 years.

Several subcategories were created for the **GOMA Habitat Conservation and Restoration Priority Issue Team**. These were organized around the GOMA PIT focus areas of:

- Monitoring changes in habitat
- Ecosystem services
- Technological development
- Regional sediment plan
- Policy change
- Expand partnerships

Monitor changes in habitat

- Assessment and interaction between terrestrial land management as it influences the Gulf of Mexico ecosystem.
- Better understand the impacts of relative sea level rise on coastal habitats.
- Better understanding of benthic habitat and its role in a healthy ecosystem
- better understanding system dynamics relative to restoring coastal wetlands
- Change in coastal ecosystems in the next centruy due to climate change and other long terms trends INDEPENDENT of 'restoration' interventions. A better 'future' without.
- Climate change effects on coastal plant and animal populations and communities, such as mangroves replacing salt marsh
- coastal landforms (deltas, saltmarshes, barrier islands) physical response to sea level rise
- Comprehensive, independent scientific monitoring of existing restoration project types.
- Critique the quantification and 'indicator-ization' of ecological and socio-economic processes in the Gulf of Mexico which reduce complex and qualitative processes into model inputs that silence and marginalize coastal communities, turn all our common property resources into money, and frustrate any semblance of the democratic process as the spirit of NEPA, NRDA, OPA 90, and other processes intended.
- Dependence of coastal ecosystem processes on character (magnitude and quality) of terrestrial inputs.
- Determine how similar/different created and natural wetlands are regarding fish and wildlife habitat.
- Determine whether the coastal wetlands of the Mississippi River Deltaic Plain and Chenier Plain can be protected and restored, given the problems there; determine what protection and restoration techniques are reasonable, and which are not; resolve the controversies surrounding the restoration of the Mississippi River's connection with its delta (from a scientific standpoint).
- Difference in the ecosystem along the coast and at various depths in the GoM since the Macondo spil.
- Ecosystem Health
- Ecosystem health - specifically establishment of baseline understanding of wildlife species that are impacted by human activity (including oil spill, agricultural runoff, wildlife movement).
- effect of salinity on marshes
- Effects of disasters and climate change on microbial components of the ecosystems
- Effects of increasing night-time water temperatures on estuarine and coastal respiration
- Effects of Mississippi River channelization on coastal ecosystems.

- effects of multiple stressors on habitats and ecosystems
- environmental and natural resources changes from climate change
- Environmental baselines and benthic habitat
- Estuarine needs for freshwater inflow
- Evaluate restoration projects across region to better understand successes/failures of those restoration projects to provide stated services
- Evaluating restoration outcomes based on wildlife response to created habitat
- Existing estuarine habitat identification, protection, restoration and enhancement.
- Factors that have resulted in decreases in aquatic habitats and resources (grass beds, oyster beds, fish populations, nn-native species, etc.)
- Freshwater inflow needs to bays and estuaries and the short- and long-term impacts to these ecosystems.
- Geomorphic response of coastal systems to sea-level rise and subsidence.
- Habitat Assessment
- How climate change affects species, ecosystems
- How do the multitude of pressures interact to effect ecosystem state and ecosystem services
- How does changing levels of human development affect the ecosystem status and production of ecosystem services
- How hydrological change of rivers effects coastal ecosystems
- Hurricane impacts on the upper oceas and coastal ocean
- impact of coastal restoration strategies on marsh stability in the Mississippi Delta
- Impact of dicharges from natural disasters on the ecosystem areound the area, due to floods, hurricantes etc.
- Impact of subsidence on the faunal range and diversity
- impacts of coastal restoration (dredging offshore sand for barrier island projects, large scale diversions, dredging inshore for marsh creation) on environment and humans
- Impacts of various port dredging projects on hydrology and ecology
- Impacts on and loss of habitat due to human practices
- Influence of the Mississippi River on the GOM ecosystem
- Interconnections between ecosystems - if one gets degraded, others might follow
- investigate the influence multi-stressor on biological resilience
- Local effects of global warming on species and habitat
- location and extent of surface and subsea habitats
- Long term monitoring of habitat restoration and its contribution to ecosystem services
- metrics to assess success of restoration efforts
- More generally, connectivity (via processes, migration routes, etc.) between terrestrial and coastal (even offshore) systems
- Quantify the aerial extent of artificial and natural habitats inside the outer continental shelf. Provide funding to support long term multidiscipline research program
- research on increasing the health of wetlands in relation to salinity intrusion on coastal subsidence
- research on the role of wetlands in the Gulf Ecosystem
- Sea level change, specifically how it will impact estuaries and bays in the Gulf South. Freshwater ecosystems like the Atchafalaya Basin may be impacted by sea level change in the future, but it seems research on sea level change has primarily focused on heavily populated areas on the east coast like Miami and NYC
- Studies on role of marine habitat is supporting populations

- The impacts of sea leve rise, including salt water intrusion, on coastal ecosystem and the built environment.
- The role of marine protected areas in preserving biodiversity and enhancing productivity in the Gulf has received only lip service.
- To understand how alterations of the Mississippi River outflow will effect the shelf and oceanic ecosystems in order to better predict the effects of large scale restoration of nearhshore resources.
- Understand causes of variability in within-estuary habitat value and productivity of fishery species among estuaries.
- understand changes in ecosystem components related to changes in habitat characteristics, including those influenced by human activities
- Understand how and where anthropogenic impacts to marine ecosystems spread from one system to another, i.e. from the deep sea to the continental shelf or vice versa, from coastal communities to the offshore, etc.
- Understand how man made habitat can boost production and diversity (future protection for disasters) in non-nutrient limited ecosystems (habitat limited)
- understand the effects of reduced freshwater flow on Gulf of Mexico coastal ecosystems
- understand the synergistic effects of changes in flow and eutrophication on estuaries
- Understanding how climate variability affects marine resources in the Gulf of Mexico
- understanding relationships between ecosystem change, habitat utilization and climate variability
- Use of natural environments in response to sea level rise
- use our understanding of ocean ecosystems to enhance restoration
- What are the most effective habitat restoration methods. Lots of restorations projects are going on but how effective have they been at accomplishing the original objective?

Ecosystem services

- apply ecosystem services to policy development - not just study it
- Capacity of authorities to understand environmental problems and its relation with economy and welfare
- Critique the quantification and 'indicator-ization' of ecological and socio-economic processes in the Gulf of Mexico which reduce complex and qualitative processes into model inputs that silence and marginalize coastal communities, turn all our common property resources into money, and frustrate any semblance of the democratic process as the spirit of NEPA, NRDA, OPA 90, and other processes intended.
- Define resiliency and economic services in a manner that those individuals/culture groups affected by these "terms" can clearly understand their meanings, since they are the once being affected by these decision "tools."
- Determine the costs and benefits of various climate adaptation strategies.
- Determine the costs of existing and projected climate change impacts to natural, built, and social systems.
- Evaluation of whether restoration projects provide improved ecological services
- How do the multitude of pressures interact to effect ecosystem state and ecosystem services
- How does changing levels of human development affect the ecosystem status and production of ecosystem services
- Identify and valuing ecological services in the GoM
- Impact of human use and alteration on ecosystems
- initiating a conversation about reducing use of resources such as oil in addition to educating public about maximizing efficiency and valuing environmental services appropriately
- local perceptions/expectations about restoration projects (e.g., increased hope of frustration/fatalism)
- long-term nature-society relationships to sustainable coast

- Produce alternative approaches to measuring and managing Gulf of Mexico natural resources and their human uses that do not rely on the quantitative modeling, contingent valuation, and dollarization approaches that have shown themselves to be so empirically lacking in other contexts and yield grossly unequal socio-economic outcomes.
- Quantative measurements of the benefit of the ecosystem
- Quantifying service benefits of ecological restoration activities
- social-ecological systems adaptation to climate change
- Socio-economic
- Specific calculation of ecosystem services for the estuaries of the Gulf of Mexico
- Understand causes of variability in within-estuary habitat value and productivity of fishery species among estuaries.
- Understand how multiple social, economic, political, and environmental (including climate change) scenarios may impact resources.
- Understand human values as they relate to taking action on ocean issues.
- Understand the socioecological systems in the Gulf of México
- understanding all of the benefits people living in the Gulf of Mexico gain from ecosystem services
- Understanding how different types of restoration projects restore or conserve those benefits most critical to communities
- understanding the benefit (in dollars) that these natural ecosystems provide to ensure greater respect toward the natural ecosystems' value
- Understanding the ecosystem services value provided by shipwrecks as sites frequented by the recreational scuba diving and recreational fishing industries in relation to the tourism economy.
- Understanding the reliance of human well-being on Gulf of Mexico ecosystem services
- Valuation of entire ecosystems to Public
- Value and impact of marine protected areas, e.g. fishing closures
- Value of ecosystem resources

Technological development

- A new research needs to be developed in the Calcacieu Lake Estuary Weir Projects to allow the movement of water into and out of the marshes. The system in the Vermilion Bay area works and allows the Commercial Industry to survive but the Calcacieu Lake needs a manual operation.
- complete Coastal Rock Levee alone the coast for saving the coast line.
- Designing effective and sustainable ecosystem restoration
- Determine how similar/different created and natural wetlands are regarding fish and wildlife habitat.
- Develop and Implement a Strategic (consistent, on-demand) Coastwide Coastal Resource Mapping and Monitoring System
- Developing management tools that facilitate coastal resilience to climate change
- Effective methods for coastal restoration of near-shore marsh habitat
- Evaluate restoration projects across region to better understand successes/failures of those restoration projects to provide stated services
- Identify locations and implement creation of esturarine shoreline breakwater, restoration of sav, oyster beds to create and enhance new or lost nursery habitat do to turbidity and boat and ship wake disturbance.
- Improvement of approaches and outcomes of environmental remediation and coastal restoration
- Ingress and egress of marine organisms into hundreds of thousands of acres of coastal marsh nursery is already detrimentally affected by water control structures. Hundreds of thousands of more acres will be

affected by those planned in the Louisiana Master Plan to slow marsh loss.Research is desperately needed to design water control structures that will better pass marine organisms.
- Marsh Management through water level and salinity control.
- Most efficient ways to restore ecosystems (biggest bang for buck, ie tidal hydrology restoration, etc.)
- Rebuilding the coastal plains of Louisiana using informed, sustainable, and state of the art technology
- The value of mitigation creating habitats under docks an piers.
- understanding how to engineer coastal wetlands and waterways to make a system that is sustainable in the face of sea-level rise and subsidence
- Use living shoreline approaches for habitat ;loss
- What are the most effective habitat restoration methods. Lots of restorations projects are going on but how effective have they been at accomplishing the original objective?
- What artificial reef and restoration material provide the best strat for biodiversity as ocean warming continues across the Gulf of Mexico

Regional sediment plan

- Beneficial use of dredged sediments
- control of land erosion caused by natural incidents.
- Develop and Implement a Strategic (consistent, on-demand) Coastwide Coastal Resource Mapping and Monitoring System
- Develop better sediment transport models and sediment budgets in support of regional sediment management on the Gulf coast.
- Development of sediment quality guidelines and restoration targets for determining biological impacts and recovery of oil-contaminated sediments
- Future costs of maintaining white Beaches in the gulf from tar balls and oil
- impacts of coastal restoration (dredging offshore sand for barrier island projects, large scale diversions, dredging inshore for marsh creation) on environment and humans
- island stability
- quantify sand resources for beach and island nourishment
- Rebuilding the coastal plains of Louisiana using informed, sustainable, and state of the art technology
- regional sediment management and quantifying a regional sediment budget for the MS Delta plain and gulf coast.
- Restoration Planning using alternative futures analyses
- sedimentation and accretion/erosion in marshes
- stop soil run off and unconsolidated bank erosion from making estuaries and ocean turbid
- study offshore sediment transport and barrier island stability
- Understanding the freshwater, sediment and nutrient loads required to sustain coastal wetland ecosystems
- Undoing major causes of coastal land loss in Louisiana so that we can achieve "no net loss" in conjunction with Research Priority 2

Policy change

- apply ecosystem services to policy development - not just study it
- Assessment and interaction between terrestrial land management as it influences the Gulf of Mexico ecosystem.
- Balancing resource extraction (commercial fisheries) with resource conserving activities (limits, aquaculture)

- complete Coastal Rock Levee alone the coast for saving the coast line.
- Effect of regulatory permitting on coastal restoration.
- Effective planning policies for habitat preservation and enhancement
- Historic preservation of cultural coastal resources (Fort Gaines, Fort Morgan, etc.)
- local perceptions/expectations about restoration projects (e.g., increased hope of frustration/fatalism)
- Maintain open rivers with no dams, sills, dredging as these feed water to estuaries
- Need more application of what is known or understood and incorporate this knowledge into policy and actions. Example: everyone knows that saltwater intrusion is a serious contributor to marsh loss. Yet the USCOE is still proposing to dredge new or maintain existing channels with minimal concern for saltwater intrusion because it will affect the benefit/cost ratio in a negative way.
- Produce alternative approaches to measuring and managing Gulf of Mexico natural resources and their human uses that do not rely on the quantitative modeling, contingent valuation, and dollarization approaches that have shown themselves to be so empirically lacking in other contexts and yield grossly unequal socio-economic outcomes.
- Restrict future development that will cause ecological destruction or would be hazardous to health.
- Restricting development in estuaries
- Understand how multiple social, economic, political, and environmental (including climate change) scenarios may impact resources.

Expand partnerships

- Need more application of what is known or understood and incorporate this knowledge into policy and actions. Example: everyone knows that saltwater intrusion is a serious contributor to marsh loss. Yet the USCOE is still proposing to dredge new or maintain existing channels with minimal concern for saltwater intrusion because it will affect the benefit/cost ratio in a negative way.
- tr-national collaboration between Mexico, USA, and Cuba to manage resources
- Understand how government and private institutions are implementing ecosystem restoration in the Gulf of Mexico and document the socio-economic and environmental impacts of those activities.
- Understand the implications of restoration project types on their surrounding ecosystems.

Other research priorities related to Habitat Conservation and Restoration

- Address the need to preserve corridors for terrestrial habitat migration inland and upland with sea level rise and climate change impacts.
- Altered freshwater inflow to estuaries
- Apply above to identifying adaptation strategies that benefit natural systems.
- Apply understanding of freshwater, sediment and nutrient requirements to project future needs in light of climate change
- Barrier Island restoration
- Better understanding of habitat use and ecosystem relationships
- Climate change impacts
- Climate-induced Vegetation Shifts
- Coast dune restoration in light of climate change.
- Coast line recession.
- Coastal erosion
- Coastal erosion
- coastal erosion
- coastal erosion

- coastal hydrology
- Coastal restoration in a non stationary world
- coastal vegetation
- Coastal wetland preservation
- Connectivity of ecosystems (coastal, pelagic, deep)
- consistent delineation of a MHW and MLLW shoreline
- coral investigation, mitigation and restoration
- Destruction of coastal habitats by encroachment from human use activities
- Determine if marsh vertical accretion can be managed.
- Ecosystem migration potential; effects of sea level rise and hurricanes
- Ecosystem restoration
- Effect of climate change on marine biota
- Effect of coastal erosion
- Effects of global warming and seal-level rise on coastal systems
- effects of tropical storms on coastal ecosystems
- Enhance marine habitats for improving species abundance and sustainability
- Global warming and its effects on the Gulf of Mexico.
- gulf hard bottom habitat study and protection
- habitat
- Habitat adaptability to climate change
- Habitat loss
- habitat loss
- Habitat restoration for watersheds damaged by Lake O water releases
- habitats and living resources
- Historic preservation of cultural coastal resources (Fort Gaines, Fort Morgan, etc.)
- How do Ecosystems shift in the climate change environment. Use as a predictive tool for determining where to properly allocate resources in a changing enviroment.
- Human development effect on watersheds
- Identification of hard mineral resorces for coastal resoragtion.
- Identify locations and implement creation of esturarine shoreline breakwater, restoration of sav, oyster beds to create and enhance new or lost nursery habitat do to turbidity and boat and ship wake disturbance.
- Identify specific inland and coastal waterway processes that contribute to ecosystem sustainability that will contribute to protection from environmental (storms) and human caused hazards (chemical & oil spills)
- Impact of climate change (sea level rise, pH changes, etc.) on coastal ecosystems and human environment.
- Impact of climate change on the open ocean ecosystem of the GoM
- Impacts of increased tanker traffic linked erosion on seagrass flats
- Implementation of Restored Ecosystems and Links to Improved Water Quality and Coastal Resources Health
- Improved mapping of wetland systems by detailed type (8 types of mangroves, 12 types of salt marshes, etc.) for the Florida coast.
- Increase seagrass and emergent marsh habitat in order to increase productivity
- inundation and sea-level rise modelling

- Know HOW to: Recover losses caused by human error and natural disasters. Know how to be prepared when Natural disasters happen. Know how the environment can benefit from these changes in the environment and animal habitat
- land erosion
- local perceptions/expectations about restoration projects (e.g., increased hope of frustration/fatalism)
- Man made climate change is a ruse. No more money or resources should used.
- Mapping and characterizing the sea floor and gelogy of the West Florida Shelf.
- Marine and wetland preservation. Sea life habitats
- Marine Protected Areas
- Marine Sanctuary expansion and exploration
- Mississippi River diversion and coastal resilience
- On shore nutrient management to minimize off-shore deleterious impacts
- oyster restoration
- physical aspects of habitats in the Gulf of Mexico
- Protections of coastal systems, especially coastl wetlands and their ecotones. This as this "edge environment" is trapped by human development upland and deep water to the Gulf. This system is reorganizing potentially loosing critical services, and needs to be assessed, then mitigate as appropriate.
- Quantify the amount of wetlands destroyed by the oil industry
- Rates and consequences of sea level rise
- re-establishing water quality and quantity in the marsh habitats of delta regions
- Relative Sea-level rise documentation and prediction
- Research on sustainability of the Gulf and its natural resources across all three countries that border the Gulf and share its resources.
- Resorting the. Everglades
- Restoration
- restoration
- Restoration after a catastrophic event, natural or man-made
- restoration and conservation of essential and sensitive habitats with consideration on the effects of climate change
- restoration of coastal resources
- restoration of last marsh lands
- Restoration of marine resources
- Restoration of vegetated wetlands
- Restoration Planning using alternative futures analyses
- Riverine sediment transport to the coast and management
- Salt Marsh Restoration
- Salt water encroachment into aquifers
- sea grass restoration
- Sea level
- sea level change
- Sea level change
- Seagrass Restoration
- Sealevel rise and it's implications
- Submerged aquatic vegetation (seagrasses, freshwater and esturine aquatiics) are not addressed in the plan.These aquatic species form the basis of the food chains that many of the ecosystem services of concern are based on.

- The importance of coastal forests and addressing the threats to their long-term existence.
- The value of mitigation creating habitats under docks an piers.
- Understand how climate change could affect coastal ecosystems and species
- Understanding connectivity between terrestrial, coastal and deep sea ecosystems.
- Understanding the freshwater, sediment and nutrient loads required to sustain coastal wetland ecosystems
- Understanding the impact of reduced freshwater inflows to coastal estuaries and near shore ecosystems
- Understanding the sea level rise in the Gulf of Mexico
- urbanization impacts on coastal resources
- Use of the Mississippi River and its Resources for Restoration
- We need to permanently protect what we can now, ASAP before it is lost. That needs to be the first priority.
- Wetland restoration
- Wetland Restoration
- Wetlands and coastal ecosystems as part of a risk reduction system from storms and storm surge

Appendix—Demographic Statistics from the 2013 Gulf of Mexico Research Plan Survey

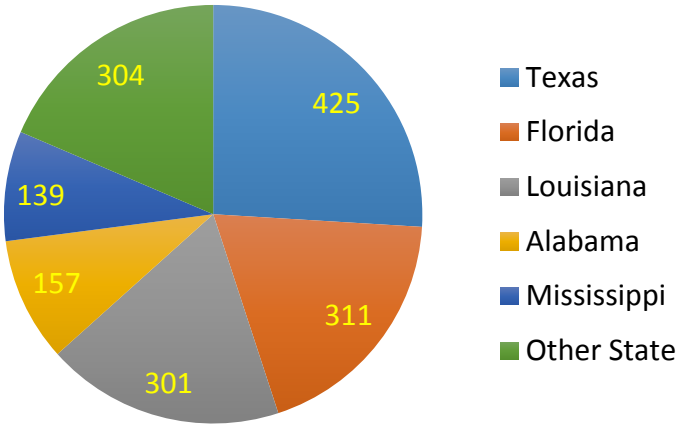


Figure 1. Number of respondents to the 2013 GMRP survey by state (N=1,637).

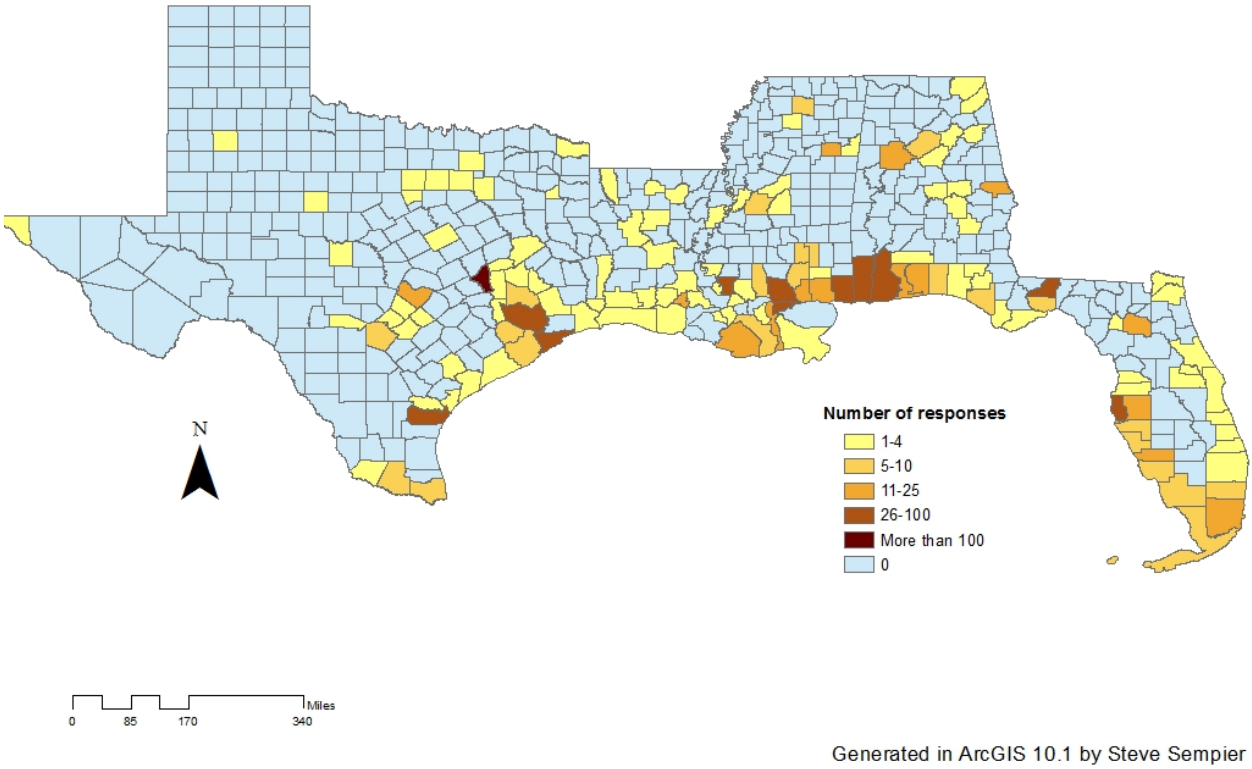


Figure 2. Number of responses to the 2013 GMRP survey by county for U.S. Gulf of Mexico states (N=1,315).

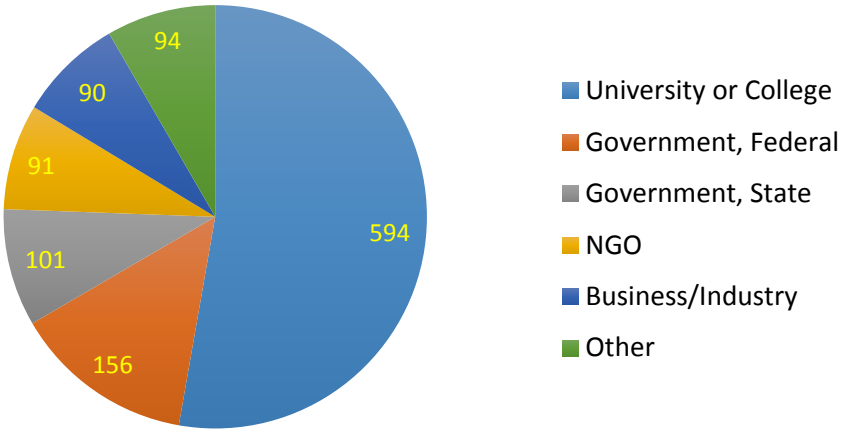


Figure 3. Number of 2013 GMRP survey respondents by affiliation (N=1,126).

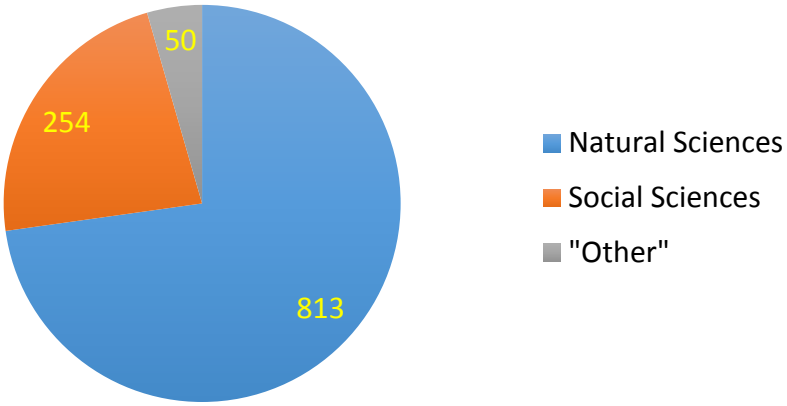


Figure 4. Number of 2013 GMRP survey respondents by area of expertise aggregated into “natural sciences,” “social sciences” and “other” (N=1,117).

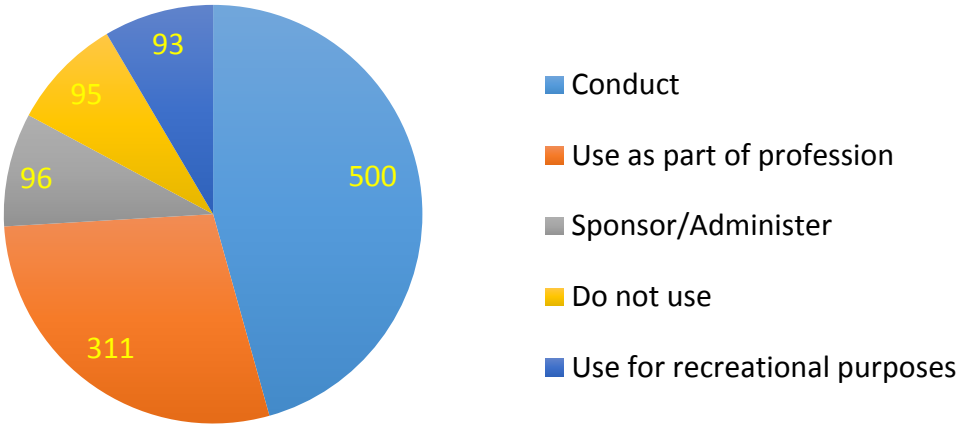


Figure 5. Number of 2013 GMRP survey respondents categorized by their primary relationship to Gulf of Mexico research (N=1,095).

Appendix—2013 GMRP Survey Demographic Statistics

Table 1. Number of research priorities identified in open-ended responses to the 2013 GMRP survey that related to GOMA PITs and subcategories. Note that the same research priority may have linked to multiple PITs and/or subcategories.

Priority Issue Team and Subcategories	Number of Research Priority References
Ecosystem Integration and Assessment	**55**
Ecosystem health	19
Ecosystem service valuation	15
Ecosystem connectivity	9
Ecosystem change over time	4
"Other" EIA	9
Education	**25**
Habitat Conservation and Restoration	**233**
Monitoring changes in habitat	68
Ecosystem services	32
Technological development	19
Regional sediment plan	17
Policy change	14
Expand partnerships	4
"Other" Habitat Conservation and Restoration	102
Nutrients	**48**
Hypoxia	13
Nutrient reduction	13
Nutrient characterization and criteria	11
"Other" Nutrients	12
Resilience	**144**
Climate or sea level-specific	52
Management	29
Assessment	26
Tropical Storm-specific	14
Communication	4
"Other" Resilience	37
Water Quality	**88**
Monitoring	13
Pathogens	5
Mercury	4
Harmful Algal Blooms	1
"Other" Water Quality	67
Other Topics	**583**