

## ENVIRONMENTAL HEALTH AND RESILIENCE: Assessment of Current Situation

### Team Leaders

Tracie Sempier MASGC 228-818-8829 [tracie.sempier@usm.edu](mailto:tracie.sempier@usm.edu)

LaDon Swann MASGC 251-648-5877 [swanndl@auburn.edu](mailto:swanndl@auburn.edu)

### Habitats to Consider

Beaches and Dunes, Freshwater Wetlands, Intertidal Marshes and Flats, Long Leaf Pine, Maritime Forests, Oyster Reefs, Pine Savannahs, Streams/Rivers/Buffers, Subtidal habitats

### Issues to Consider

Landuse Planning, Smart Growth, Disaster Preparedness, Hazardous Materials, Solid Waste Management Vector Control

### Stresses on Habitats that Contribute to Heritage and Culture

The below tables are the result of an exercise completed by 30 scientists/resource managers to evaluate the level of impact of thirteen stressors on the habitats that provide ecosystem services of value to our coastal community. The rating scale was from 0-3 with 0 being no impact and 3 being severe impact. For the purposes of analysis the committee defined significant stress as any average value over 2.0. These values are highlighted in the table below.

Habitat	Eco-Service	Chemical Contamination	Dredging/Filling	Fire Suppression	Fragmentation	Invasive Species	Land Use Change	Nutrient Enrichment	Pathogens	Sedimentation	Sea Level Rise	Climate Variability	Freshwater Discharge	Resource Extraction
Beaches and Dunes	Biodiversity	1.5	1.5	0.4	2.3	1.9	2.5	0.8	1	1.1	1.7	1.6	0.8	1
Beaches and Dunes	Carbon Sequestration	0.6	0.9	0.3	1.2	0.5	1.7	0.4	0.2	0.9	1.2	0.9	0.5	0.6
Beaches and Dunes	Fisheries habitat	0.5	0.6	0	0.4	0.4	0.6	0.6	0.6	0.9	0.6	0.6	0.5	0.3
Beaches and Dunes	Flood control	0.3	1.4	0	1.4	0.4	1.8	0.5	0.4	1.1	1.3	0.9	0.5	0.5
Beaches and Dunes	Groundwater replenishment	0.8	0.5	0	0.9	0.4	1.2	0.5	0.3	0.7	0.9	0.6	0.8	0.7
Beaches and Dunes	Nesting habitat for birds and turtles	1.2	1.9	0.3	2.1	1.3	2.4	0.6	0.7	1.2	1.7	1.7	0.6	1
Beaches and Dunes	Oyster production	0.4	0.4	0	0.1	0.2	0.4	0.5	0.5	0.4	0.3	0.2	0.3	0.5
Beaches and Dunes	Primary production	0.9	0.9	0.2	1.1	0.8	1.6	0.5	0.3	0.6	1.1	1	0.3	0.6
Beaches and Dunes	Sediment and nutrient retention and export	0.4	1.4	0.1	1	0.7	1.8	0.7	0.1	1.5	1	0.7	0.4	0.7

Habitat	Eco-Service	Chemical Contamination	Dredging/Filling	Fire Suppression	Fragmentation	Invasive Species	Land Use Change	Nutrient Enrichment	Pathogens	Sedimentation	Sea Level Rise	Climate Variability	Freshwater Discharge	Resource Extraction
Beaches and Dunes	Storm buffer/hazard protection	0.6	1.8	0.2	2	0.5	2.4	0.5	0.5	1.3	1.8	1.3	0.7	0.6
Beaches and Dunes	Water quality enhancement	1.1	1.4	0.1	1	0.5	1.6	1.1	0.9	1.1	0.8	0.7	0.8	0.6
Beaches and Dunes	Wildlife habitat	1.5	1.8	0.8	2.2	1.6	2.4	0.9	1	1.3	1.8	1.6	0.7	1.1
Freshwater Wetlands	Biodiversity	1.9	2.3	0.9	2.3	2.4	2.6	1.6	1.1	2.2	1.6	1.8	2	1.6
Freshwater Wetlands	Carbon Sequestration	1	2	0.7	1.7	1.5	2.3	1.4	0.7	2.1	1.5	1.5	1.5	0.9
Freshwater Wetlands	Fisheries habitat	1.8	2.5	0.5	2.1	2.1	2.4	1.9	1	2.2	1.7	1.8	2.2	1.4
Freshwater Wetlands	Flood control	0.6	2.4	0.5	1.9	1.1	2.4	0.8	0.5	2.2	1.8	1.4	1.9	1.1
Freshwater Wetlands	Groundwater replenishment	1.3	2.1	0.4	1.8	0.9	2.2	1.3	1	1.7	1.7	1.4	2.1	1.2
Freshwater Wetlands	Nesting habitat for birds and turtles	1.7	2.5	1.2	2.5	2.1	2.7	1.5	1.3	1.9	2	1.7	2.1	1.5
Freshwater Wetlands	Oyster production	0.8	1	0.2	0.8	0.8	1.1	1	0.8	1	0.6	0.7	1	0.6
Freshwater Wetlands	Primary production	1.3	2.1	0.8	1.9	1.9	2.6	1.9	0.7	2.1	1.7	1.5	1.9	1.2
Freshwater Wetlands	Sediment and nutrient retention and export	0.9	2.3	0.6	1.9	1.2	2.6	2.1	0.6	2.6	1.5	1.5	2	1.6
Freshwater Wetlands	Storm buffer/hazard protection	0.7	2.4	0.5	2.2	1.1	2.7	0.8	0.4	2.2	1.8	1.7	1.6	1.2
Freshwater Wetlands	Water quality enhancement	2	2.5	0.6	2	1.2	2.4	2.4	1.6	2.1	1.4	1.3	2	1.7
Freshwater Wetlands	Wildlife habitat	1.7	2.5	1.1	2.3	2.3	2.5	1.8	0.9	1.9	1.8	1.6	1.9	1.6
Intertidal Marsh and Flats	Biodiversity	1.7	2.4	0.7	2.2	1.8	2.3	1.6	1.1	2.3	2.3	1.5	1.8	1.2
Intertidal Marsh and Flats	Carbon Sequestration	1.1	1.8	0.6	1.7	1	2.3	1.5	0.7	1.9	1.9	1.4	1.1	0.7

Habitat	Eco-Service	Chemical Contamination	Dredging/Filling	Fire Suppression	Fragmentation	Invasive Species	Land Use Change	Nutrient Enrichment	Pathogens	Sedimentation	Sea Level Rise	Climate Variability	Freshwater Discharge	Resource Extraction
Intertidal Marsh and Flats	Fisheries habitat	1.6	2.6	0.4	2	1.4	2.4	1.7	1.2	2.4	2.3	1.6	1.8	1.3
Intertidal Marsh and Flats	Flood control	0.9	1.9	0.6	1.7	0.9	2.4	0.8	0.5	1.7	1.9	1.4	1.6	0.9
Intertidal Marsh and Flats	Groundwater replenishment	0.8	1.1	0.1	1	0.6	1.5	0.9	0.6	1	1	1	1.2	0.8
Intertidal Marsh and Flats	Nesting habitat for birds and turtles	1.3	2.2	0.9	2	1.5	2.3	1.3	1	2	2.1	1.6	1.3	1.2
Intertidal Marsh and Flats	Oyster production	1.6	2.1	0.4	1.4	0.9	1.6	1.3	1.5	1.8	1.5	1.2	1.7	1.3
Intertidal Marsh and Flats	Primary production	1.2	2.1	0.7	1.6	1.1	2.2	1.7	0.8	2.3	2.1	1.6	1.6	1
Intertidal Marsh and Flats	Sediment and nutrient retention and export	0.8	2.1	0.5	1.8	0.9	2.3	1.6	0.5	2.4	2.1	1.4	1.6	1
Intertidal Marsh and Flats	Storm buffer/hazard protection	0.7	2.1	0.5	1.9	0.9	2.3	0.7	0.6	2	2.2	1.4	1.4	1.1
Intertidal Marsh and Flats	Water quality enhancement	1.8	2.2	0.6	1.7	0.9	2.2	1.9	1.5	2.1	1.7	1.3	1.8	1.1
Intertidal Marsh and Flats	Wildlife habitat	1.4	2.4	0.8	2.1	1.5	2.2	1.6	1.2	2	2.2	1.6	1.6	1.1
Longleaf Pine Habitat	Biodiversity	1.1	0.9	2.5	2.4	2.3	2.4	1.1	1.1	0.9	0.9	1.4	0.8	2.1
Longleaf Pine Habitat	Carbon sequestration	0.6	0.9	2.1	1.7	1.9	2.5	1	0.5	0.5	0.8	1.4	0.7	2
Longleaf Pine Habitat	Fisheries habitat	0.4	0.3	0.1	0.6	0.6	0.7	0.4	0.4	0.5	0.5	0.4	0.4	0.4
Longleaf Pine Habitat	Flood control	0	0.9	1.2	2	0.6	2.3	0.2	0	0.6	0.7	0.8	1.1	1.6
Longleaf Pine Habitat	Groundwater replenishment	1.4	1.1	1.1	1.9	1	2.3	1.4	0.9	1.1	0.7	1.2	1.4	1.9

Habitat	Eco-Service	Chemical Contamination	Dredging/Filling	Fire Suppression	Fragmentation	Invasive Species	Land Use Change	Nutrient Enrichment	Pathogens	Sedimentation	Sea Level Rise	Climate Variability	Freshwater Discharge	Resource Extraction
Longleaf Pine Habitat	Nesting habitat for birds and turtles	1.1	1.1	2.4	2.2	2.2	2.4	1.2	1	1.2	1.1	1.5	1.2	2
Longleaf Pine Habitat	Oyster production	0	0	0	0.3	0	0.5	0.2	0.1	0.2	0.1	0.2	0.1	0.2
Longleaf Pine Habitat	Primary production	0.8	1	2	2.3	1.4	2.3	1	0.8	0.9	0.7	1.3	1	2
Longleaf Pine Habitat	Sediment and nutrient retention and export	0.4	1.1	1.6	2.1	1.2	2.3	1.2	0.5	1.3	0.8	0.9	1.2	1.6
Longleaf Pine Habitat	Storm buffer/hazard protection	0.4	1.3	1.3	1.7	0.9	2	0.5	0.3	1	0.8	1	1.1	1.4
Longleaf Pine Habitat	Water quality enhancement	1.1	1.1	1.1	2	0.9	2.1	1.5	0.8	1.6	0.7	1	1.5	1.6
Longleaf Pine Habitat	Wildlife habitat	1.4	0.9	2.5	2.5	2.5	2.4	1.3	1.1	1	1.1	1.8	1.2	2.5
Maritime Forest	Biodiversity	0.8	1.2	1.2	2.3	1.9	2.2	1	0.9	0.8	1.2	1.6	0.6	1.5
Maritime Forest	Carbon sequestration	0.5	0.8	0.9	1.7	0.7	2.1	0.5	0.3	0.7	1	1.4	0.3	1.4
Maritime Forest	Fisheries habitat	0.1	0.5	0	0.4	0.2	0.8	0.4	0.1	0.4	0.4	0.8	0.2	0.7
Maritime Forest	Flood control	0.2	1	0.5	2	0.2	1.9	0	0	1	0.7	1	0.7	1.1
Maritime Forest	Groundwater replenishment	1.1	1.2	0.8	1.6	0.8	2	0.6	0.4	1.1	0.9	1.1	1.3	1.5
Maritime Forest	Nesting habitat for birds and turtles	1.4	1.3	1.5	2.3	2.7	2.4	1.3	1.3	1.2	1.4	1.8	0.9	1.4
Maritime Forest	Oyster production	0.3	0.3	0	0.3	0.1	0.5	0.3	0.3	0.3	0.3	0.4	0.5	0.6
Maritime Forest	Primary production	0.6	1	1.1	1.6	1.1	2.1	0.9	0.6	0.9	0.9	1.4	0.8	1.1
Maritime Forest	Sediment and nutrient retention and export	0.4	1.2	1.1	1.6	1.1	2.4	1.3	0.6	1.1	1	1.4	0.8	1.2
Maritime Forest	Storm buffer/hazard protection	0.4	1.1	0.9	2.1	0.8	2	0.4	0.4	0.9	1.2	1.6	0.6	1.2

Habitat	Eco-Service	Chemical Contamination	Dredging/Filling	Fire Suppression	Fragmentation	Invasive Species	Land Use Change	Nutrient Enrichment	Pathogens	Sedimentation	Sea Level Rise	Climate Variability	Freshwater Discharge	Resource Extraction
Maritime Forest	Water quality enhancement	1	1.2	0.6	1.5	0.9	2	1.3	1	1.3	0.8	1.1	1.1	1.2
Maritime Forest	Wildlife habitat	1.1	1.3	1.6	2.3	2.2	2.4	1.2	1.2	1.1	1.3	1.8	1	1.6
Oyster Reefs	Biodiversity	1.8	2.3	0.3	1.5	1.5	1.5	2	1.8	2.4	1.3	1.4	2.2	1.9
Oyster Reefs	Carbon Sequestration	0.8	1.2	0.2	0.9	0.7	1	1.1	0.9	1.3	0.8	0.8	1.2	1.3
Oyster Reefs	Fisheries habitat	1.6	2.1	0.3	1.7	1.3	1.5	1.7	1.5	2.2	1.2	1.2	2	2.1
Oyster Reefs	Flood control	0.4	0.8	0.2	0.8	0.6	0.9	0.6	0.4	0.8	0.7	0.4	0.7	0.9
Oyster Reefs	Groundwater replenishment	0.2	0.2	0	0	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Oyster Reefs	Nesting habitat for birds and turtles	0.2	0.2	0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2
Oyster Reefs	Oyster production	2.1	2.2	0.3	1.8	1.5	1.5	2	2.2	2.8	1.7	1.7	2.2	2.5
Oyster Reefs	Primary production	0.9	1.2	0.3	0.9	0.8	1.3	1.4	0.9	1.4	0.9	0.9	1.3	1.3
Oyster Reefs	Sediment and nutrient retention and export	0.7	1.6	0.3	1.1	0.7	1.5	1.2	1	1.9	1.2	1.1	1.7	1.6
Oyster Reefs	Storm buffer/hazard protection	0.6	1.5	0.2	1.2	0.8	1.3	0.8	0.9	1.5	1.2	0.9	1.2	1.5
Oyster Reefs	Water quality enhancement	1.9	2.1	0.4	1.5	1.1	1.7	2.1	1.9	2.4	1.3	1.2	2.1	1.9
Oyster Reefs	Wildlife habitat	1.2	1.4	0.2	1.1	0.9	1.2	1.2	1.2	1.6	1.1	1.1	1.4	1.2
Pine Savanna Forest	Biodiversity	1.3	1.6	2.6	2.2	2.4	2.5	1.2	1.1	1.1	1	1.5	1.1	1.8
Pine Savanna Forest	Carbon sequestration	0.5	1	1.7	1.7	0.8	1.8	0.7	0.3	0.5	0.7	1.2	0.6	1.8
Pine Savanna Forest	Fisheries habitat	0	0	0	0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0	0.1
Pine Savanna Forest	Flood control	0.5	1.4	1	1.7	1	1.9	0.3	0.3	0.6	0.9	1.1	1.2	1.9
Pine Savanna Forest	Groundwater replenishment	1.4	1.3	0.9	1.6	0.5	2	1	0.8	1	0.7	1.1	1.2	1.5
Pine Savanna Forest	Nesting habitat for birds and	1.5	1.5	2.1	2.2	2	2.2	1.2	1.1	1.1	1.1	1.5	1.1	1.6

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	turtles													
Pine Savanna Forest	Oyster production	0	0	0	0	0	0	0	0	0	0.1	0.1	0.2	0.1
Pine Savanna Forest	Primary production	1	1	1.3	1.7	1.1	2.1	0.7	0.8	0.8	0.7	1.2	0.7	1.5
Pine Savanna Forest	Sediment and nutrient retention and export	0.7	1.4	1.3	2	1.1	2.1	1.2	0.5	1.1	0.8	1.3	1.4	1.6
Pine Savanna Forest	Storm buffer/hazard protection	0.3	1	0.9	1.7	0.5	1.8	0.2	0.2	1	0.9	1.1	1.2	1.1
Pine Savanna Forest	Water quality enhancement	1.5	1.2	1	2	0.9	1.9	1.4	1.3	1.6	0.7	1.3	1.7	1.6
Pine Savanna Forest	Wildlife habitat	1.4	1.6	2.4	2.4	2.4	2.4	1.3	1.3	1.1	1.2	1.6	1.5	2.1
Streams and Rivers	Biodiversity	1.9	2	0.7	1.9	2.2	2	1.7	1.4	2.2	1.2	1.4	2.1	1.6
Streams and Rivers	Carbon Sequestration	0.9	1.1	0.5	0.9	0.9	1.5	1.2	0.5	1.4	0.9	1.1	1.3	1.2
Streams and Rivers	Fisheries habitat	2	2.2	0.4	1.8	2.1	2.2	1.8	1.5	2.3	1.1	1.3	2.2	1.7
Streams and Rivers	Flood control	0.6	1.7	0.4	1.5	0.9	2.1	0.7	0.5	1.6	1.2	1.3	2.1	1.1
Streams and Rivers	Groundwater replenishment	1.1	1.5	0.4	1.2	1	1.6	1.1	0.6	1.3	0.9	1.1	1.9	1.5
Streams and Rivers	Nesting habitat for birds and turtles	1	1.4	0.9	1.2	1.1	1.4	1	1	1.4	1	1.1	1.2	1.1
Streams and Rivers	Oyster production	0.8	0.6	0.3	0.7	0.5	0.6	0.6	0.8	0.8	0.5	0.4	0.9	0.5
Streams and Rivers	Primary production	1.4	1.5	0.6	1.1	1.5	1.7	1.9	0.8	1.8	0.8	1.1	1.9	1.1
Streams and Rivers	Sediment and nutrient retention and export	0.8	2.1	0.5	1.5	1.1	2.2	1.6	0.5	2.2	1	1.1	2.2	1.5
Streams and Rivers	Storm buffer/hazard protection	0.8	1.6	0.6	1.3	1	1.7	0.7	0.5	1.7	1.2	1.2	1.8	1.1

Habitat	Eco-Service	Chemical Contamination	Dredging/Filling	Fire Suppression	Fragmentation	Invasive Species	Land Use Change	Nutrient Enrichment	Pathogens	Sedimentation	Sea Level Rise	Climate Variability	Freshwater Discharge	Resource Extraction
Streams and Rivers	Water quality enhancement	1.9	1.7	0.6	1.4	1.1	1.9	1.9	1.7	1.9	0.9	1.2	1.9	1.2
Streams and Rivers	Wildlife habitat	1.5	1.7	0.8	1.5	1.7	1.8	1.4	1.1	1.7	1	1.3	1.6	1.4
Subtidal habitats	Biodiversity	1.6	2.4	0.3	1.3	1.5	1.4	1.7	1.2	2.3	1.2	1.2	2	1.9
Subtidal habitats	Carbon Sequestration	0.6	1.4	0	0.5	0.6	1	1.7	0.4	1.7	0.7	0.8	0.9	1
Subtidal habitats	Fisheries habitat	1.4	2.1	0.3	1.3	1.2	1.4	1.9	1.3	2.2	1	1.3	1.5	1.7
Subtidal habitats	Flood control	0	0.1	0	0.2	0	0.2	0	0	0.2	0.2	0.1	0.1	0.1
Subtidal habitats	Groundwater replenishment	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0
Subtidal habitats	Nesting habitat for birds and turtles	0.1	0.2	0	0.2	0.2	0.3	0.2	0.1	0.4	0.1	0.1	0.4	0.2
Subtidal habitats	Oyster production	1.1	1.5	0.2	0.7	0.8	0.9	1.2	1.2	1.6	0.8	1	1.3	1.3
Subtidal habitats	Primary production	0.6	1.8	0.2	1	0.7	1.2	1.9	0.6	1.8	1	1.3	1.5	1.2
Subtidal habitats	Sediment and nutrient retention and export	0.4	1	0.1	0.7	0.3	1	1.4	0.4	1.6	0.6	0.8	1.2	0.7
Subtidal habitats	Storm buffer/hazard protection	0.1	0.5	0	0.5	0.2	0.5	0.2	0	0.7	0.5	0.5	0.4	0.2
Subtidal habitats	Water quality enhancement	1.2	1.6	0.1	1	0.6	1.2	1.7	1	1.7	0.9	0.9	1.4	1.1
Subtidal habitats	Wildlife habitat	0.9	1.5	0.5	1.1	0.9	1	1.1	0.8	1.6	1.1	1.1	1.1	1

## **Strengths**

*What is in place currently that supports the health/sustainability of this value?*

### **Research, monitoring, management plans**

1. **MASGC's research program** – A part of the consortium's strategic plan, the research program includes the NOAA Coastal Storms Program and a variety of resilience projects. <http://masgc.org/page.asp?id=17>
2. **NOAA sentinel sites in Weeks Bay and Grand Bay NERRS** – The Sentinel Program establishes a place-based strategy to track the status of ecosystem integrity and socioeconomic health indicators for specific management issues using existing NOAA infrastructure and resources. The data collected by the program will inform management response and adaptation planning related to stressor impacts on ecosystems, NOAA Trust Resources, and human communities. [http://nerrs.noaa.gov/Doc/PDF/Research/NOAA\\_SSP\\_PPISubmission.pdf](http://nerrs.noaa.gov/Doc/PDF/Research/NOAA_SSP_PPISubmission.pdf)
3. **NOAA/Sea Grant Sea Level Rise Projects** - The sea-level-rise funding area is designed to utilize a regional sea-level-rise visualization tool under development by the NOAA Coastal Services Center. The tool is currently available for Texas, Alabama, Florida and Mississippi and will soon be available for the entire Gulf of Mexico region. <http://csc.noaa.gov/digitalcoast/tools/slrviewer/> Extension, outreach and education for this effort will occur through the Gulf of Mexico Climate Community of Practice <http://masgc.org/climate/cop/index.html> Three projects were funded for 2012-2014. <http://masgc.org/page.asp?id=735>
4. **Hazard Mitigation Planning** – Urbanized areas throughout the estuary have developed or revised their hazard mitigation and comprehensive plans.
  - **Mobile County** – A major revision of the Multi-Hazard Mitigation Plan includes the hazards, the historical impacts of these hazards and establishes goals, strategies and objectives for lessening their adverse impact. Each community has developed an action program to become more disaster resistant and resilient. <http://www.mcema.net/HazardMitigationPlan.aspx>
  - **Baldwin County** – The plan addresses all natural disasters deemed to threaten property and persons in the county. It presents both short and long term mitigation strategies, implementation tasks, and funding alternatives. <http://www.co.baldwin.al.us/uploads/EOC%20Mitigation%20Plan.pdf>
5. **Gulf Of Mexico Alliance Resilience Team projects** – Are designed to provide tools to coastal communities to better understand the risks and impacts associated with coastal hazards, including climate changes. In addition, the Alliance will assess the risks of coastal hazards to the natural, built, and social environments of the Gulf Coast and increase infrastructure to better quantify these risks in the future. While **GOMA's Habitat's Team** focuses on habitat conservation and restoration. [http://www.gulfofmexicoalliance.org/pdfs/GOMA\\_2012\\_All\\_Hands/PITS/All%20Hands%20WQ%20PI%20Presentation%20v1%202012.pdf](http://www.gulfofmexicoalliance.org/pdfs/GOMA_2012_All_Hands/PITS/All%20Hands%20WQ%20PI%20Presentation%20v1%202012.pdf)  
<http://www.gulfofmexicoalliance.org/issues/resilience.php>
6. **The Nature Conservancy Resilience Projects** – Aimed at increasing the resilience of local communities that historically depended upon oyster reefs for a plethora of reasons, these projects rebuild reefs. <http://www.nature.org/ourinitiatives/regions/northamerica/oyster-restoration-study-kroeger.pdf>
7. Coastal Resilience Tools and Resources- <http://coastalresilience.org/gulfmex>

### **Ecosystem Restoration, Protection, Conservation**

1. **USACOE Lines of Defense Concept** - The strategy proposes that two essential elements of the coast be managed and perpetuated, which together can economically sustain the coast. It suggests using natural



and manmade features (lines of defense) that directly impede storm surge or reduce storm damage and establish and sustain habitat goals. <http://ascelibrary.org/doi/abs/10.1061/40968%28312%2972>

2. **Regional Sea Grant Ecosystems Services Valuation Research** - Estimates ecosystem service values for specific habitat types at National Estuary Program (NEP) sites in the northern GOM. Values will be estimated from primary (survey) and secondary (private market transaction records) data using integrated SP (contingent valuation, choice experiments) and RP (hedonic pricing) methods in order to cover the full range of potential use and non-use values. <http://www.masgc.org/page.asp?id=762>
3. **Community Resilience Index** - A MSSGC tool that communities can use to examine how prepared they are for storms and storm recovery. To complete the index, community leaders get together and use the tool to guide discussion about their community's resilience to coastal hazards. (<http://masgc.org/ri>)
4. **Community Rating System** – This joint program of FEMA and the National Flood Insurance Program uses the CRS as a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions to meet the CRS goals. <http://www.fema.gov/national-flood-insurance-program/community-rating-system>
5. **Policies Guiding Gulf Coastal Development** – A Resilience Team project of MASGC and GOMA to research existing policies guiding coastal development and make recommendations to enhance resilience using best management practices. [http://masgc.org/bb2012/Abstractspdf/CHR\\_PDFs/CHR\\_Pace\\_Niki\\_abstract\\_final.pdf](http://masgc.org/bb2012/Abstractspdf/CHR_PDFs/CHR_Pace_Niki_abstract_final.pdf)  
[http://masglp.olemiss.edu/Advisory/GOM\\_States'\\_Coastal\\_Land\\_Use\\_Planning\\_Laws.pdf](http://masglp.olemiss.edu/Advisory/GOM_States'_Coastal_Land_Use_Planning_Laws.pdf)
6. **Coastal Code Supplements** (for building using LID) a Coastal Code supplements mandates such cost savings measures as a Sealed Roof Deck and Roof Deck Attachment Requirements for all new homes and re-roofs. [http://masgc.org/bb2012/Abstractspdf/CHR\\_PDFs/CHR\\_Cary\\_Alex\\_abstract%20final.pdf](http://masgc.org/bb2012/Abstractspdf/CHR_PDFs/CHR_Cary_Alex_abstract%20final.pdf)

#### **Volunteer Programs, Outreach, Education**

1. **Sea Grant and GOMA Resilience Benchmarking for the North Central Gulf Coast**- The Gulf Regional Planning Commission (GRPC) in Mississippi, the Gulf of Mexico Alliance (GOMA), and the Mississippi-Alabama Sea Grant Consortium (MASGC) are expanding the work underway through the Mississippi *Plan for Opportunity*. This project will create a framework for assessing resilience across critical systems by expanding the existing Community Resilience Index (CRI) assessment tool used by communities around the Gulf of Mexico Region.
2. **Gambling Against Mother Nature** – A three part television series about life in coastal watersheds. <http://ms.stormsmart.org/2009/08/25/new-tv-program-on-storm-and-insurance-airs-tonight/>
  - “Wind and Water” about hurricanes, storms and impacts on coast
  - “Water Runs Down Hill” about coastal watersheds
  - “Hedging Our Bets” about storms and insurance
3. **Sea Level Rise and Inundation** In December of 2009, a workshop brought together leaders from a range of these communities to discuss and develop a framework on coastal inundation and sea level rise in order to help guide where investments should be made to enable states and local governments to assess impacts and initiate adaptation strategies over the next decade. <http://www.csc.noaa.gov/publications/inundation-workshop.pdf>

4. **Living Shorelines** –A program that uses living plant material, oyster shells, earthen material, or a combination of natural structures with riprap or offshore breakwaters to protect property from erosion. The result of wind, water, and wave action, erosion results in loss of residential and commercial property, reduction of storm buffering capacity, aquatic and terrestrial habitat loss, increased suspended solids and water quality degradation. <http://www.masgc.org/page.asp?id=235>
5. **Clean and Resilient Marinas** – This GOMA project produced a guidebook for use by marina owners and operators to give guidance on pre-design or upgrade considerations, berthing facilities, landside facilities, boat storage, mooring and tie-down strategies, and natural shoreline erosion control measures. <http://stormsmart.org/wp-content/blogs.dir/1/files/group-documents/20/1352147149-11163110512RPT01R01DGuidebookataGlanceVolumeI.pdf>
6. **Coastal Resilience Index** – The purpose of this self-assessment is to provide community leaders with a simple and inexpensive method of predicting if their community will reach and maintain an acceptable level of functioning after a disaster. Experienced local planners, engineers, floodplain managers or administrators can complete this self-assessment using existing sources of information from their community. <http://www.masgc.org/pdf/masgp/08-014.pdf>
7. **Smart Home America**- Organization focused on building safer, smarter and stronger communities through education of best practices for fortifying buildings. <http://www.smarthomeamerica.org/>

### **Weaknesses/Threats**

*What stresses are currently putting negative pressure on the long-term viability of this value?*

1. Research – Lack of information on the short- and long-term cost benefits for proactive policies to increase resilience.
2. Monitoring – And data collection that track salinity levels within Mobile Bay are needed. <http://www.al.com/specialreport/mobileregister/index.ssf?delta/i-intro.html>  
<http://www.mymobilebay.com/stationdata/stationinfomiddlebay.asp?jday=&property=&chartyear=&StationID=188>
3. Management Plans – long-term planning efforts that do not include the effects of climate change. Examples would be the State’s water plan and oyster management plans
4. No state building code
5. Current mitigation programs do not address fortified homes
6. Insufficient support for extension, outreach and education programs to help improve community resilience and implement mitigation strategies.
7. Lack of overall coordination of resilience work

### **Opportunities**

*Are there any opportunities that you know of to support the long term sustainability of this value?*

1. Opportunity to include a resilience component in the Alabama Center of Excellence (RESTORE)
2. NOAA Sentinel sites if the data can be extrapolated beyond the state managed lands
3. Guide MASGC’s research program toward more resilience work
4. To place real values (market and non-market) on ecosystems, “you have to value them to save them”.
5. Implementation of resilience components of RESTORE

6. Greater participation from Alabama in the Gulf of Mexico Alliance's Resilience Priority Issues Team
  7. Completion and implementation of Sea Grant and GOMA Resilience Benchmarking for the North Central Gulf Coast: A systems approach.
  8. Develop watershed management plans with implementation strategies that will result in better control of development within the watersheds.
  9. Support new technology to reduce the impacts of storm and waste water.
  10. Reduce runoff from roadways by working with the Alabama Department of Transportation (ALDOT).
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