

## WATER QUALITY: Assessment of Current Situation

### Team Leaders

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### Habitats to Consider

Freshwater Wetlands, Intertidal Marsh and Flats, Longleaf Pine Habitat, Maritime Forest, Oyster Reefs  
 Pine Savanna Forest

### Issues to Consider

Freshwater discharge, Aquifer recharge, Point source Pollution, Ports, Industry, Non-Point Source Pollution,  
 Stormwater, Litter/Trash, Sediment, Pathogens, Waste water treatment alternatives, Atmospheric disposition

### Stresses on Habitats that Contribute to Water Quality Ecosystem Services

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 have been highlighted in the table below.

| Eco_Service               | Habitat                    | 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 |
|---------------------------|----------------------------|------------------------|------------------|------------------|---------------|------------------|-----------------|---------------------|-----------|---------------|----------------|---------------------|----------------------|---------------------|
| Water quality enhancement | Beaches and Dunes          | 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                 |
| Water quality enhancement | Freshwater Wetlands        | 2                      | 2.5              | 0.6              | 2             | 1.2              | 2.4             | 2.4                 | 1.6       | 2.1           | 1.4            | 1.3                 | 2                    | 1.7                 |
| Water quality enhancement | Intertidal Marsh and Flats | 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                 |
| Water quality enhancement | Longleaf Pine Habitat      | 1.1                    | 1.1              | 1.1              | 2             | 0.9              | 2.1             | 1.5                 | 0.8       | 1.6           | 0.7            | 1                   | 1.5                  | 1.6                 |
| Water quality enhancement | Maritime Forest            | 1                      | 1.2              | 0.6              | 1.5           | 0.9              | 2               | 1.3                 | 1         | 1.3           | 0.8            | 1.1                 | 1.1                  | 1.2                 |
| Water quality enhancement | Oyster Reefs               | 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                 |
| Water quality enhancement | Pine Savanna Forest        | 1.5                    | 1.2              | 1                | 2             | 0.9              | 1.9             | 1.4                 | 1.3       | 1.6           | 0.7            | 1.3                 | 1.7                  | 1.6                 |
| Water quality enhancement | Riparian Buffers           | 1.7                    | 1.9              | 0.9              | 2.1           | 1                | 2.4             | 1.7                 | 1.3       | 1.8           | 1.2            | 1.5                 | 1.8                  | 1.7                 |

| Eco Service               | Habitat                      | 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 |
|---------------------------|------------------------------|------------------------|------------------|------------------|---------------|------------------|-----------------|---------------------|-----------|---------------|----------------|---------------------|----------------------|---------------------|
| Water quality enhancement | Streams and Rivers           | 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                 |
| Water quality enhancement | Submerged Aquatic Vegetation | 1.1                    | 2.3              | 0.1              | 1.8           | 0.7              | 1.7             | 2.1                 | 0.8       | 2.2           | 1.1            | 1.3                 | 1.6                  | 1.1                 |
| Water quality enhancement | Subtidal habitats            | 1.2                    | 1.6              | 0.1              | 1             | 0.6              | 1.2             | 1.7                 | 1         | 1.7           | 0.9            | 0.9                 | 1.4                  | 1.1                 |

## Strengths

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

### Research, Monitoring, Management Plans

1. **ADEM Water Quality Monitoring Strategy** - ADEM's current Monitoring Strategy is a coordinated monitoring approach designed to characterize water quality, to identify impacts from a variety of sources, and to provide a systematic and integrated framework for gathering necessary information to support the decision-making process.  
<http://www.adem.state.al.us/programs/water/wqsurvey/2010WQMonitoringStrategy.pdf>
2. **ADEM Coastal Waters Monitoring Program** - Alabama's 2010 Integrated Water Quality Assessment and Monitoring Report combines information about Alabama's surface and ground water resource management programs with a comprehensive listing of state waters consistent with EPA's 2006 Integrated Reporting Guidance. The guidance requests that states report on the condition of all surface waters by categorizing rivers, streams, lakes, estuaries, and coastal waters according to their designated uses and the degree to which water quality is supporting those uses. <http://www.adem.state.al.us/programs/water/waterforms/2010AL-IWQMAR.pdf>
3. **Coastal Alabama Recreational Waters Monitoring Program** - The monitoring and assessing of coastal recreational waters and the prompt notification of the public when applicable water quality standards are not being met. <http://adem.alabama.gov/programs/coastal/beachMonitoring.cnt>
4. **Fish Tissue Monitoring Program** – A statewide screening of bioaccumulative contaminants in fish tissue which is provided to the Alabama Department of Public Health with data needed to determine any potential risk to those that consume fish from Alabama waters.  
<http://adph.org/tox/assets/FishTissueMonitoring.pdf>
5. **National Pollutant Discharge Elimination System (NPDES) Program** –Regulations for the implementation and control of erosion and sedimentation following Construction Best Management

Practices associated with regulated construction sites.

<http://www.adem.state.al.us/programs/water/permitting.cnt>

6. **DISL/ NEP Real Time Monitoring Program** - Instrumentation located throughout Mobile Bay (Meaher Park, Middle Bay Light, Weeks Bay and DISL) to take continuous measurements of air and water temperature, relative humidity, wind speed and direction, barometric pressure, precipitation, quantum radiation, water depth, salinity, turbidity, dissolved oxygen and total DO.  
[http://www.mobilebaynep.com/images/uploads/library/03-05\\_Implementationfinal.pdf](http://www.mobilebaynep.com/images/uploads/library/03-05_Implementationfinal.pdf) p.8
7. **Little Lagoon Water Quality Monitoring** - Trained volunteers and DISL researchers sample 4 locations in the Lagoon every two weeks. The team gathers field measurements and samples, prepares and analyzes samples, and enters and maintains observations in the SEPMN national data base and the DISL Water Chemistry and Phytoplankton database. <http://littleglagoon.org/water-quality/research-and-monitoring-results.cfm>
8. **Alabama Marine Environmental Sciences Consortium** – The purposes of the consortium are to provide educational programs in marine sciences on both the undergraduate and graduate levels, to promote and encourage pure and applied research in marine sciences and related areas, to promote and encourage communication and dialogue among those interested in marine sciences.  
<http://research.gulfresearchinitiative.org/research-awards/block-grants-year1/alabama-marine-environmental-science-consortium/>
9. **Dauphin Island Sea Lab** - Is Alabama's marine science education and research laboratory whose mission includes marine science education, marine science research, coastal zone management policy and educating the general public through the Estuarium, DISL's public aquarium. <http://www.disl.org/>
10. **Mobile Bay National Estuary Program** - The mission of the MBNEP is to promote wise stewardship of the water quality characteristics and living resource base of the Mobile Bay estuarine system. It is a non-regulatory program that brings together citizens; local, state, and federal government agencies; businesses and industries; conservation and environmental organizations; and academic institutions to implement a Comprehensive Conservation Management Plan for the estuary.  
<http://www.mobilebaynep.com/>
11. **Mississippi-Alabama Sea Grant Consortium** – A federal/state partnership that matches NOAA Sea Grant expertise and resources with state academic institutions to enhance the sustainable use and conservation of ocean and coastal resources to benefit the economy and environment in Alabama and Mississippi. <http://www.masgc.org>
12. **National Coastal Condition Assessment (NCCA)** - One of a series of water assessments being conducted by states, tribes, the U.S. Environmental Protection Agency (EPA), and other partners. In addition to coastal waters, the water assessments focus on rivers and streams, lakes, and wetlands in a revolving sequence. The purpose is to generate statistically valid reports on the condition of our Nation's water resources and identify key stressors to these systems.  
<http://water.epa.gov/type/watersheds/monitoring/upload/ncca-qapp.pdf>
13. **National Aquatic Resources Surveys (NARS)** - A series of surveys of the nation's aquatic resources to provide nationally consistent and scientifically-defensible assessments of the nation's entire water resource (i.e., rivers and streams, lakes, wetlands, or coastal waters).  
[http://water.epa.gov/type/watersheds/monitoring/aquaticsurvey\\_index.cfm](http://water.epa.gov/type/watersheds/monitoring/aquaticsurvey_index.cfm)
14. **Bon Secour NWR CCMP** - The purpose of this management plan is to improve water quality in the Bon Secour River Watershed in order to meet or exceed present use classifications and meet the goals decided

upon by the citizens of the Bon Secour River Watershed.

<http://www.mobilebaynep.com/images/uploads/library/Bon-Secour-WMP.pdf>

15. **Weeks Bay NERR - System Wide Monitoring Plan** - Develop quantitative measurements of short-term variability and long-term changes in the meteorological, water quality, biological systems, and land-use/land-cover characteristics of estuaries and estuarine ecosystems for the purposes of informing effective coastal zone management. <http://www.nerrs.noaa.gov/Doc/PDF/Research/2011SWMPPlan.pdf>
16. **Grand Bay National Estuarine Research Reserve** - designed to promote estuarine research and education within some 18,400 acres of Mississippi's Coastal Zone and its adjacent ecosystems.
17. <http://grandbaynerr.org/>

**NOAA Mussel Watch Program** - The longest running continuous contaminant monitoring program in U.S. coastal and Great Lakes waters. The project was developed to analyze chemical and biological contaminant trends in sediments and bivalve tissues collected at over 300 coastal sites from 1986 to present. <http://ccma.nos.noaa.gov/about/coast/nsandt/musselwatch.aspx>

18. **ACAMP/ NEP Coastal Marine Spatial Planning** -The purpose of the ACAMP is to promote, improve, and safeguard the lands and waters located in the coastal area through a comprehensive and cooperative program. [http://api.ning.com/files/6VMXe-q-6YNTn\\*uYDoz9YfHnLDgSBttV-uAY5i-8rIFPxTh1\\*ttM6dmC4Uoh3IsIsL1JQS4bJ3UgjnLHRUOfmq8J1Hmfkeo/Hinsley\\_2012ACAMPMeetingPresentation.pdf](http://api.ning.com/files/6VMXe-q-6YNTn*uYDoz9YfHnLDgSBttV-uAY5i-8rIFPxTh1*ttM6dmC4Uoh3IsIsL1JQS4bJ3UgjnLHRUOfmq8J1Hmfkeo/Hinsley_2012ACAMPMeetingPresentation.pdf)
19. The **Geological Survey of Alabama's (GSA) - Groundwater Assessment Program** - Investigates the occurrence, availability and quality of the state's waters by employing hydraulic and geologic expertise. <http://www.adem.state.al.us/misc/gwshows2011/06.GeologicalSurveyofAlabama-M.Cook.pdf>
20. **National Atmospheric Deposition Program (NADP)** – Monitors and investigates trends in atmospheric chemical deposition to south Alabama and the nation. <http://nadp.sws.uiuc.edu/>
21. **NASA** – Provides frequent satellite observations (daily to weekly) for assessing the condition of Mobile Bay and coastal Alabama (e.g. <http://modis.gsfc.nasa.gov/> )
22. **USGS** – Provides stream discharge monitoring for many streams and waterways in Mobile and Baldwin counties and in the greater Mobile Bay watershed and conducts biological resource assessments. (<http://waterdata.usgs.gov/AL/nwis/current/?type=flow>)  
[http://gulfsoci.usgs.gov/gom\\_ims/pdf/pubs\\_gom.pdf](http://gulfsoci.usgs.gov/gom_ims/pdf/pubs_gom.pdf) )
23. **NOAA** – Provides meteorology, tides, currents, model forecasts for Mobile Bay and the northern Gulf of Mexico. [http://tidesandcurrents.noaa.gov/ofs/ngofs/ngofs\\_mobile.html](http://tidesandcurrents.noaa.gov/ofs/ngofs/ngofs_mobile.html)
24. **USACE** – Provides environmental planning and assessment studies related to dredging and water infrastructure projects. <http://www.sam.usace.army.mil/Missions/PlanningEnvironmental.aspx>

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

1. **Alabama Clean Waters Initiative** – Includes such actions as the Alabama Clean Boating Act, the Clean Boating and the Clean Vessel Act dealing with vessel sewage disposal. <http://www.outdooralabama.com/boating/clean-waters/>

2. **Coastal Clean Up** – A part of the International Coastal Cleanup designed to not only remove but document every piece of litter (marine debris) found on a shoreline. In Alabama it is a project of ADCNR SLD and Alabama PALS just celebrating its 25<sup>th</sup> year, and now the largest volunteer event in the state. <http://www.alcoastalcleanup.com/>
3. **Natural Resource Damage Assessment** - The Oil Pollution Act authorizes the natural resource trustees (federal agencies, states, and Indian tribes) to conduct impact assessments of oil spills, ship groundings, and hazardous substance releases on natural resources. Scientists work together to identify potential injuries to natural resources and lost public uses resulting from the spill. <http://www.gulfspillrestoration.noaa.gov/assessment/>
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. **100-1000 Restore Coastal Alabama** – An example of a living shorelines effort, 100-1000 is an effort to build 100 miles of oyster reefs along the state’s coastline which will assist in setting up the conditions needed to plant, support and promote more than 1000 acres of coastal marsh and seagrass. Not only will it help replenish needed habitat but will also help reduce wave energy and decrease erosion, stabilize sediments and decrease turbidity. <http://100-1000.org/>
6. **SAV restoration** – The aerial extent of seagrass meadows has declined globally during the last several decades, with major losses of seagrasses reported along the Atlantic and Gulf coasts of the United States. The positive correlation between the area covered by seagrass and the production of valuable finfish and shellfish has led to a large number of studies designed to elucidate the causes of seagrass declines. Worldwide, the destruction and the loss of critical seagrass habitat are being attributed to both natural and human-induced disturbances. In many cases, deteriorating water quality, especially resulting from excessive nutrient inputs and turbid runoff, has been associated with seagrass loss. Reversing seagrass loss in these cases usually requires large scale changes in land use and water treatment. <http://marineecologylab.disl.org/projects.htm>  
<http://masgc.org/pdf/masgp/07-011-01.pdf>

#### **Local, State, And Federal Regulations And Policies, Technical Training**

1. **Weeks Bay and Grand Bay NERRs** – The research reserves provide technical training on issues such as stormwater best management practices and nonpoint source pollution prevention
2. **Alabama Cooperative Extension programs-** <http://www.aces.edu/forestry-nature/water-resources/>
3. **ADEM Water Quality Program** – Administers programs for protecting water quality (Alabama designated uses and water quality standards are codified [ADEM Admin. Code r. 335-6 – April 3, 2012](#)), reporting water quality conditions to congress, listing impaired waters, developing total maximum daily loads (TMDLs) for impaired waters, developing waste load allocations, and water quality planning, monitoring, and modeling (<http://www.adem.state.al.us/programs/water/waterquality.cnt>)
4. **ADEM Environmental Regulations Division 6 and 8** - Projects having the potential to impact Alabama's coastal resources are subject to review pursuant to ADEM's Coastal Rules. Such programs include: Construction on Gulf-fronting properties, Commercial and residential development on properties greater than 5 acres, projects impacting wetlands and/or water bottoms, construction of new, or expansion of existing marinas, installation of groundwater wells with a capacity greater than 50

gallons per minute (GPM), siting, construction and operation of energy facilities, shoreline stabilization projects and discharges to coastal waters.

<http://adem.alabama.gov/programs/coastal/coastalPermitting.cnt>

5. **ADEM MS-4 rules** – Sets forth authorization of discharges of storm water from small municipal separate storm sewer systems (MS4s). <http://www.adem.alabama.gov/programs/water/municipal.cnt>
6. **National Pollutant Discharge Elimination System (NPDES) Program** – Regulations for the implementation and control of erosion and sedimentation following Construction Best Management Practices associated with regulated construction sites. <http://www.adem.state.al.us/programs/water/permitting.cnt>
7. **USACE Nationwide permits** - <http://www.sam.usace.army.mil/rd/reg/nwp.htm>
8. **USACE Section 404 fill permits** – Dealing with the filling of wetlands. <http://www.sam.usace.army.mil/rd/reg/section404.htm>
9. **Clean Water Act (CWA)** – Provides the legal structure for regulating pollutants discharged to the waters of the United States and for regulating quality standards for surface waters. <http://www.epa.gov/lawsregs/laws/cwa.html>
10. **CWA Section 10** – Navigable Waters - Section 1502(10) of Title 33) – Dealing with control of water resources, submerged lands, or navigable waters. <http://coastalmanagement.noaa.gov/about/czma.html>
11. **CWA Section 319** – Provides assistance for local and state nonpoint source management efforts <http://water.epa.gov/polwaste/nps/cwact.cfm>
12. **CWA Section 6217** - Under Section 6217, all states with approved coastal zone management programs must develop a Coastal Nonpoint Program to control polluted runoff to coastal waters. <http://coastalmanagement.noaa.gov/initiatives/legislation.html>
13. **USDA NRCS Programs** – Implement policies and incentive programs to improve water quality <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/>
14. **Clean Air Act** – Provides the legal structure for regulating air emissions from stationary and mobile sources. <http://www.epa.gov/lawsregs/laws/caa.html>

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

1. **Alabama Coastal Foundation** – A non-profit organization working to improve and protect Alabama’s coastal environment through cooperation, education and participation. <http://joinacf.org/>
2. **Alabama Water Watch** – Part of [Global Water Watch](#), AWW is a citizen volunteer, water quality monitoring program covering all of the major river basins in Alabama. <http://www.alabamawaterwatch.org/>
3. **Dog River Clearwater Revival (DRCR)** - A non-profit group of property owners, recreational boaters, fishermen, businesses, non-profit environmental organizations and citizens who focus is on the water quality of the Dog River Watershed. <http://www.dogriver.org/about-us.html>
4. **Little Lagoon Preservation Society**- <http://littleglagoon.org/>

5. **Mobile Baykeeper** - A nonprofit environmental organization whose focus is Clean Air and Clean Water in the Mobile Bay Watershed. <http://www.mobilebaykeeper.org/>
6. **Wolf Bay Watershed Watch (WBWW)** - A grassroots citizen's advocacy organization whose mission is to protect and preserve the natural resources of Baldwin County's Wolf Bay Watershed. Several members are volunteer water quality monitors. <http://www.wolfbaywatch.org/>
7. **Alabama Forestry Commission's Treasure Forest** –A voluntary program sponsored by the Alabama Natural Resources Council that encourages landowners to implement sound and sustainable, multiple-use forest management practices, using their forests wisely to meet their own needs while at the same time protecting and enhancing the environment. [http://www.forestry.state.al.us/treasure\\_forest.aspx](http://www.forestry.state.al.us/treasure_forest.aspx)
8. **Baldwin County Grasses in Classes Program** - Coordinates and sustains a network of teachers, students, restoration specialists, and other community members to plan and implement restoration of coastal environments in Baldwin County, Alabama. <http://www.outdooralabama.com/publiclands/stateLands/WeeksBay/Weeks%20Bay/Grasses%20In%20Classes/>
9. **Dauphin Island Sea Lab** – The State of Alabama's premier marine science education and research facility. The DISL Estuarium, the only public coastal aquarium in the state, is also located on the campus on the east end of the barrier island. <http://www.disl.org/>
10. **Volunteer Field Observer (VFOB)** –Developed in response to the Deep Horizon Oil Spill as a means to document changes that may occur along Alabama shorelines as a result of the accident, the program uses volunteers to regularly assess estuarine shorelines. <http://saveourgulf.org/>
11. **Alabama Coastal Counties Environmental Handbook** – A directory of federal, state and local agencies focusing on natural resource conservation and management. <http://co.baldwin.al.us/uploads/Coastal%20Counties%20Environmental%20Handbook.pdf>

## **Weaknesses/Threats**

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

**Atmospheric deposition (e.g. nutrients and mercury)**- In 1977, U.S. State Agricultural Experiment Stations (SAES) organized a project, later titled the National Atmospheric Deposition Program (NADP), to measure atmospheric deposition and study its effects on the environment. <http://nadp.sws.uiuc.edu/>

**Invasive Species**- The State of Alabama has a plan for managing aquatic nuisance species but it has not been adopted. [http://www.mobilebaynep.com/images/uploads/library/FINALDRAFTALANS0107\\_workcopy\\_reduced.pdf](http://www.mobilebaynep.com/images/uploads/library/FINALDRAFTALANS0107_workcopy_reduced.pdf)

**Water quantity** issues associated with water withdrawals, drainage, and stormwater

Rising sea surface temperatures

Ocean acidification

Waste water treatment overflows

Point and nonpoint source pollutant discharge

**Wildlife-** Wildlife populations can pose a variety of problems to managers of public water supplies. Further, new federal and state regulations governing the management and protection of drinking water supplies require greater consideration and mitigation of these problems.

<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1021&context=ewdcc6>

**Waterfront Development/land use changes – (urbanization and sub-urbanization)** While development is needed to keep a community viable, there has to be a balance reached between anthropogenic development and protection of the environment. It is estimated that by 2025 the coastal population of Alabama will increase nearly 90 percent. Pg. 5 and 6 <http://www.mobilebaynep.com/images/uploads/library/State-of-Mobile-Bay-Final.pdf>

**Sedimentation, Stormwater Polluted Runoff** - Stormwater runoff cause increasing impervious surfaces like pavement and rooftops causes flooding and erosion and carries pollutants like dirt, clay, oil, chemicals, pet waste, and fertilizers into our streams, rivers, and bays without any kind of treatment or purification. ***It*** causes a typical city block to produce more than five times as much runoff as a woodland area of the same size ***rather than*** allowing it to seep, or infiltrate, into the ground.

<http://www.mobilebaynep.com/stormwater1/>

**Filling of Wetlands** – Is another result of increased development. <http://www.outdooralabama.com/public-lands/stateLands/landsCoastal/309%20Assessment%202006%20Final.pdf>

**Agriculture** - A continuing prime source of nonpoint source pollution in area waterways.

<http://www.outdooralabama.com/research-mgmt/cwcs/Chapter3.pdf>

[http://www.outdooralabama.com/images/File/Weeks\\_Bay/WBWPManagementPlan.pdf](http://www.outdooralabama.com/images/File/Weeks_Bay/WBWPManagementPlan.pdf)

**Golf Courses/Groundwater withdrawals** -

[http://www.outdooralabama.com/images/File/Weeks\\_Bay/TNC.gulfrestoration.pdf](http://www.outdooralabama.com/images/File/Weeks_Bay/TNC.gulfrestoration.pdf)

**Marine debris** – Defined as any man-made object that has somehow found its way into a coastal or marine environment. Last year along Alabama coasts, volunteers removed some 1,448,488 pounds of marine debris. This global problem affects the economy, environment, navigation, fishing, health and safety.

<http://marinedebris.noaa.gov/>

**Dirt Roads** – Run off from unpaved roads attributes to increased sediment contamination in the Mobile Bay Watershed.

**Storms** – As ocean temperatures raise so does the intensity of hurricanes, according to many scientists. Regardless of the cause, stronger storms result in significant erosion of beaches, intertidal marshes and many associated ecosystems. <http://www.gfdl.noaa.gov/global-warming-and-hurricanes>

**HABs**, appear to be occurring more often. The increased frequency of HABs is a major concern; these events can make people sick when contaminated shellfish are eaten or when people breathe toxic air sprayed from a beach with a harmful algal bloom. HAB events can result in the closure of beaches and shellfish beds, massive fish kills, death of marine mammals and seabirds, and alteration of marine habitats. This hurts commercial and recreational fishing, tourism, and valued habitats, which are important local economies and the livelihood of coastal residents.

[http://www.gulfofmexicoalliance.org/pdfs/GOMA\\_2012\\_All\\_Hands/PITS/All%20Hands%20WQ%20PIT%20Presentation%20v1%202012.pdf](http://www.gulfofmexicoalliance.org/pdfs/GOMA_2012_All_Hands/PITS/All%20Hands%20WQ%20PIT%20Presentation%20v1%202012.pdf)



**Technological disasters** – Defined as any disaster partially or wholly caused by human error, intent or negligence resulting in significant injury or death. An example along the Alabama coast would be the Deep Water Horizon oil spill of 2010. <http://www.emdat.be/technological-disasters-trends>

**Sea Level Rise** – Projections are that the rise will be around 20 cm in the next 50 years (LA Coastal Wetlands Conservation and Restoration Task Force 1998). The influx of salt water is most likely to affect species and communities that require brackish to fresh water and these communities are already at risk from many other stresses. In many places, however, the rates of coastal subsidence are several times greater than the rate of sea level rise; that is, the problem of land sinking is greater than the problem of sea rising. [http://www.outdooralabama.com/images/File/Weeks\\_Bay/TNC.gulfrestoration.pdf](http://www.outdooralabama.com/images/File/Weeks_Bay/TNC.gulfrestoration.pdf)

**Lack of stable funding** sources undermines ability to consistently address needs

### ***Opportunities***

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

1. RESTORE Act
2. Continued funding for industrial and municipal compliance inspections
3. Continued evaluation and improvement of water quality standards (e.g. quantitative nutrient criteria)
4. Living Shorelines
5. ADCNR 100/1000
6. Forever Wild
7. Green development – Reuse of wastewater/stormwater
8. Enforcement of existing regulations
9. Additional technical training for municipal and industrial inspectors
10. Low impact development
11. Community wastewater and stormwater treatment