

Sea Grant South Atlantic Research Priorities Needs Assessment
Draft 6/04/07

DRIVERS

- Human population growth
 - Coastal development
 - Seasonal/vacation use
- Watershed activities
 - Urbanization and other land use changes
 - Operation of dams
 - Emissions from industry, waste from power plants
 - Effluent from sewage treatment plants, septic tanks
- Direct alteration of coastal habitat:
 - construction of docks and marinas
 - dredging (dredge and fill)
 - trawling
 - building seawalls, jetties, etc.
 - impoundments
- Marine activities
 - Ecotourism
 - Swimming
 - Boating
 - Fishing, shellfishing
 - Aquaculture
 - Shipping activity (operation of ports, ballast water management)
 - Military operations
 - Offshore oil and gas development, extraction
- Climate
 - Precipitation
 - Temperature
 - Storm events
 - Sea level
 - Wind stress
 - Decadal indices and other long-term forcing
- Physical Setting
 - Bathymetry
 - Wave environment

produce PRESSURES on the environment

- Point source pollution
- Non-point source pollution, including atmospheric deposition
- Changes in freshwater inflow
- Habitat loss, fragmentation
- Changes in hydrography, bathymetry
- Introduction of invasive species

- Acoustic effects
- Overfishing, bycatch
- Climate effects
 - Increased frequency of hurricanes and other storms
 - Sea level rise
 - Drought, flooding

which affect the STATUS of the environment

- Physical characteristics
 - water circulation patterns
 - residence time
 - sediment transport, rate of erosion
 - extent and location of habitat (wetlands, coral reefs, hard bottoms, salinity zones, etc.)
- Water, sediment quality
 - salinity
 - suspended sediment
 - dissolved oxygen (hypoxia)
 - nutrient concentrations
 - contaminant concentrations (metals, toxins, pharmaceuticals, plastics)
 - coliforms, pathogens
 - pH
 - radioactivity
 - marine debris
- Biological components
 - amount and distribution of primary producers
 - amount and distribution of secondary producers
 - food web interactions
 - species diversity
 - presence of invasive species
 - contaminant concentrations in organisms

which IMPACT human health and ecosystem services

- Habitat loss and degradation
 - wetland loss
 - coral bleaching
 - seagrass dieoff
 - marsh dieback
 - alteration of physical setting (e.g. interruption of sand budget)
- Eutrophication symptoms
 - decrease in submerged aquatic vegetation
 - increase in harmful algal blooms
 - high chlorophyll concentrations
 - fish kills
- Effects on fisheries
 - Decreased fish catch

- Increased disease of fish, aquaculture species
- Disruption of food web due to invasive species
- Effects on human health and quality of life
 - Contaminated fish and shellfish
 - Beach closures
- Effects on Valued Species
 - Endangered, Threatened and Species of Concern (i.e. sea turtles, right whales)
 - Culturally or commercially valued species (i.e. crabs, shrimp, shellfish, seagrass, coral, finfish)

catalyzing human RESPONSES for change

- Point source pollution control: NPDES permits, secondary wastewater treatment
- Stormwater management strategies
 - buffers
 - impoundments
 - retention ponds
 - constructed wetlands
- Habitat mitigation and restoration
 - beach renourishment
 - wetland mitigation and restoration
- Fisheries management
 - fisheries regulations
 - Marine Protected Areas
 - ecosystem-based management
- Eutrophication mitigation
 - targets to decrease nutrient loads
 - best management practices in watershed

Other Tools:

- Development of predictive models
 - circulation
 - global climate change
 - runoff
- Monitoring for preventative and responsive measures
- Enforcement
 - Improved inspection of shellfish and fish
- Changes in legislation
- Education

