

# Governors' South Atlantic Alliance Implementation Plan 2011

## Implementation Plan Executive Summary

The Governors' South Atlantic Implementation Plan is a regional response to address key environmental, economic, national defense, and cultural issue areas facing the Southeastern U.S. coasts and ocean. The Governors identified and promoted four priority issue areas that are of mutual importance to the sustainability of the Southeast U.S. region's resources: healthy ecosystems, working waterfronts, clean coastal and ocean waters, and disaster-resilient communities. The Issue Area Technical Teams, guided by lead state mentors and the Executive Planning Team, with input from stakeholders and other partners, will continue to develop this Implementation Plan to address objectives contained in the Alliance's Action Plan.

**HEALTHY ECOSYSTEMS.** Healthy ecosystems are the backbone of the Southeast's thriving coastal communities. To meet the challenges of conserving the biological, economic and cultural diversity of the region, four objectives were identified: regionally-coordinated, compatible and sustainable ecosystem planning and management; assessment of economic development and climate change impacts on the structure and function of coastal habitats; development and employment of science-based land use, coastal, and ocean planning and management; and determination of long-term impacts of and remediation strategies for invasive species.

Implementation steps for the first objective include analyses of existing habitat and marine resource mapping efforts, identification of gaps in those efforts, and development of a coordinated framework through which to map priority resources. Metadata from existing monitoring programs will be collated and compared to identify resource measures of common interest. This information will be used to enhance, inform and coordinate ongoing coastal ecosystem management initiatives.

For the second objective, implementation includes development of a list of anticipated climate change impacts on priority habitats and biological resources as well as vulnerability assessment maps that integrate these impacts for use in multi-state planning efforts. Other actions include evaluation of existing "indices of condition" (e.g., for habitats, ecosystem function, community structure, etc.) to determine suitability for use at a regional scale. These efforts will inform the development of a methodology to forecast regional ecosystem "carrying capacity" that integrates climate change and cumulative impact assessments from coastal development.

Implementation actions to accomplish the third objective include identification and prioritization of resources in greatest need of conservation that would benefit from regional coastal and marine spatial planning. The Alliance will develop and define ecosystem-based land-use planning strategies that incorporate established methods and policies. Finally, the Alliance will evaluate existing public education and outreach efforts regarding ecosystem health and develop complementary programs where necessary to target specific user groups or incorporate additional information for current target groups.

With regard to the fourth objective that addresses invasive species, implementation steps include evaluation and expansion (where necessary) of invasive species map products and compilation of state invasive species remediation plans that identify mechanisms to prevent future introductions. The identification and engagement of regional species experts for life history information and understanding of gaps in knowledge, surveillance, and alert systems must also be undertaken.

**WORKING WATERFRONTS.** Growth, environmental degradation, and displacement are some of the issues facing traditional working waterfront communities along the southeastern U.S. coastline. Robust working waterfronts that incorporate water-dependent facilities and related shore-side infrastructure that offer access or support facilities for recreation, commerce, research, and other public uses, including military operations and training, are essential to community well-being. Further, major port complexes in the Southeastern U.S. are of vital economic importance to the

nation's vast international trade and the region's link to global commerce. The working waterfronts portion of the Implementation Plan incorporates three objectives: enhanced capability of ports and waterfronts through expansion of infrastructure; preservation of traditional uses of working waterfronts by balancing public, commercial, port, residential, and military use; and determination of the viability of energy development on natural and human communities. Each objective is focused on a time horizon of 18 – 36 months and in many cases is concurrent with others.

Improving capability of ports through multimodal port expansion that results in economic and environmental viability and capacity is essential to sustaining traditional issues as well as being successful in the global economy. Specifically, we must document long-range needs through inventorying current infrastructure, determining future needs (20-30 years) and prioritizing those needs and investment opportunities in terms of public, commercial, and military uses. Implementation steps include partnering with key agencies such as port authorities, the military services, NOAA, USGS, environmental networks, and coastal development agencies. Most importantly, these partnerships will be based on supporting community-based mapping, with technical assistance, through interactive maps and decision tools to support local, state, and regional planning for commercial, recreational, and environmental use.

Ensuring sustainable viability of working waterfronts will incorporate public/private partnership opportunities and promotion and use of new and more flexible incentives to sustain traditional waterfront uses, as well as expand on multi-functional human and other (e.g. military, ecotourism, and public access) use of waterfronts. Finally, economic viability will be supported through identification of tax incentive programs for traditional small business, local seafood and fishery co-ops, as well as proactive identification of the effects of infrastructure loss on larger transportation and supporting programs linked to robust comprehensive and local land use planning.

Supporting energy development will focus on suitability of facilities, production, and distribution sites along the region's waterfronts. The Alliance will propose methods and means to develop an appropriate workforce through existing educational systems, ensuring no net loss of military access to traditional training areas, and recreation, and commercial business. The Alliance will also make recommendations on policies that result in balancing energy development with ecological, environmental, economic, and social needs and public expectations.

**CLEAN COASTAL AND OCEAN WATERS.** The goal of the clean coastal and ocean waters issue area is to enhance the ability of managers to effectively target pollution prevention, enforcement, response, and mitigation activities, and to integrate coastal and ocean observing systems in the Southeastern U.S.. This goal will be achieved by enabling coastal managers and decision-makers to predict, prevent, enforce, respond, and mitigate ecosystem and human health impacts, as well as by providing consistent data through an integrated coastal and ocean observing and monitoring system.

The first objective identified for this issue area of the Implementation Plan, is to improve watershed management of point and non-point source pollution to reduce impacts to water quality. Initial implementation steps include: establishing a regional technical level work group for the purpose of sharing watershed and water quality improvement processes; improving the ability to model loading coefficients for point and non-point sources of nitrogen in coastal ecosystems using the best available technology and information including climate change information; and developing recommendations on processes and protocols to transfer knowledge and implement best management practices for point and non-point source controls and to encourage smart growth and green infrastructure (including monitoring-based performance measures).

The second objective identified is to enhance the understanding of climate change impacts to water quantity and water quality and develop avoidance, mitigation, and adaptation strategies. The steps to be completed within the first year of the plan include: developing interactive map-based assessment tool(s) to support climate change mitigation and adaptation strategies, developing opportunities and partnerships with Federal, State and local agencies in their sustainability initiatives, and supporting research to study regional water quality impacts due to climate change.

The third objective is to increase data comparability across the region by improving standardization of water quality data collection and reporting and increasing monitoring where needed. The initial implementation steps to achieve this include: establishing a regional level monitoring workgroup to address compatibility among states; cataloging and describing existing near shore and offshore monitoring programs, designs, and data accessibility; and identifying state and

regional monitoring needs and implement monitoring programs to the extent possible through identifiable funding sources.

The final objective identified is to improve marine debris removal programs, especially for abandoned and derelict vessels, traps, equipment, and navigation hazards. The implementation steps determined by the team include: increasing inter-state communication among agencies to aid in identification of owners of abandoned or derelict vessels; establishing a sampling program to estimate the baseline density of marine debris on the shoreline, within open waters, and in submerged habitats, be capable of detecting significant change at broad and fine scales, and adapt or improve existing marine debris projects to provide complementary data; and developing educational materials on the ramifications of marine debris of all sorts, both from direct and indirect inputs.

**DISASTER-RESILIENT COMMUNITIES.** The promotion of disaster-resilient communities is the fourth issue area identified by the Alliance. The Southeast U.S. region continues to experience significant weather- and climate-related events that cause significant hardships for the economic, environmental, and social well-being of residents and visitors alike. Both short-term episodic events (e.g., hurricanes and coastal storms) and long-term chronic changes (e.g., drought, climate change, and sea level rise) are major concerns for the low-lying Southeastern United States, threatening our coastal communities, a multi-billion tourism industry, coastal and watershed development and infrastructure, and local fishing industries. Emergency responders and community planners must develop and implement strategies to minimize risk to the trillions of dollars worth of insured property and the millions of people that live in our coastal counties. Understanding our vulnerability to and the impacts of drought, sea level rise, storms, and climate change will enable coastal and natural resource managers and community decision-makers to adapt their management strategies, improve planning and preparedness, and develop mitigation strategies to address impacts to public safety, environmental health, shoreline change, coastal infrastructure, habitat loss, and species migration. The disaster-resilient communities portion of the Implementation Plan incorporates five objectives: undertake regional and state-specific vulnerability assessments of social, economic and natural resource systems; develop and implement adaptation and mitigation strategies (including retreat) to prepare for climate change impacts; improve post-disaster redevelopment planning at the regional, state, and local community level; identify and implement incentives for encouraging development away from high risk areas; and identify and incorporate management and financial options to address beachfront and estuarine shoreline change.

The South Atlantic Alliance partner states have made significant progress on a sub-regional basis in many of these critical areas. Actions identified to achieve these objectives include the development of (1) a guidance document for coastal hazards adaptation planning by state and local governments, with particular attention on storm surge and sea level threats; (2) a region-wide socio-economic vulnerability assessment and social perception analysis for sea-level rise impacts; (3) post-disaster redevelopment plans at the regional, state, and local levels to enhance the readiness of communities in anticipation of future hazard events; (4) maps and visualizations of high hazard coastal areas in the region that identify hot spots for focused planning and management applications; and (5) detailed analysis of beachfront and estuarine shoreline change projections and coastal development trends based on state-level efforts to anticipate and minimize impacts of a changing shorelines and landscape ecology on the region's communities.

Implementation of the South Atlantic Alliance's disaster-resilient communities actions focus on extending and expanding these state efforts region-wide through the support of applied research on the region's socio-demographics, natural and built environments, and assessment of needs; conduct of directed pilot projects; generation of region-wide standards, guidelines, and protocols for vulnerability assessments, risk analyses and modeling and mapping efforts; and comparison, analysis, and drafting of policy frameworks and management approaches that focus on community adaptation and mitigation strategies.

## Introduction

The South Atlantic Alliance Implementation Plan is a living document subject to ongoing revision and update as agreed upon among the membership. It contains brief outlines of the objectives and actions as determined and prioritized by members of the four individual issue area technical teams. Each issue area outline contains a proposed estimated timeline for accomplishment, identifies prospective partner agencies and organizations, specifies the final deliverable or desired outcome, notes other ongoing, complementary efforts when known to the groups, and provides an opportunity for brief comments or resource needs. These objective/action outlines will be used to inform and guide future work. The

Implementation Plan is supplemented by an action matrix, in MS Excel spreadsheet and bulleted format that will be used in conjunction with this text version, although it is not a formal part of this plan. While the Alliance will implement these activities, progress will be dependent on the availability of numerous funding sources.

### **Healthy Ecosystems**

***Objective H.E.1. Implement regionally-coordinated, compatible, and sustainable ecosystem-based planning and management, including but not limited to, habitat mapping, characterization, monitoring, and modeling.***

**Action HE1A:** Develop coordinated state programs to map known distributions of key estuarine and marine habitats and land use cover in the coastal watersheds of each state, and distribution of key species of management concern using a common set of standards and attributes.

#### **Implementation Steps:**

- 1) Conduct an analysis of key habitats and resources that have been mapped or are being mapped by each state.
  - Timeline: Year 1, 3-6 month effort.
  - Prospective Partners: Team working with appropriate staff and agencies involved in such efforts.
  - Deliverable: Tabular summary and Geographical Information System (GIS) map products of distribution.
  - Ongoing/Complementary Efforts: Most states already developing GIS databases of key habitats. Maps of distribution of key biological resources (e.g. fishery resources) may not be as readily available.
  - Comments/Resource Needs: Limited funding would be needed to support generation of existing GIS data where it is not already available online.
  
- 2) Convene workshops involving resource managers and scientists to identify major habitat types and key resources of common concern among the states. Identify the attributes of each resource or habitat type that are desired or possible.
  - Timeline: Year 1, 3-6 month effort.
  - Prospective Partners: Appropriate SAA leadership to organize workshops with relevant partners.
  - Deliverable: List of major habitat types and resources of common concern.
  - Ongoing/Complementary Efforts: These efforts are already occurring in most states, but relative importance of habitats and key resources may be different among states. SAFMC, SARRP and ASMFC-ACFHP priorities should be considered.
  - Comments/Resources Needs: Funding needed to support regional meetings of key resource managers and scientists. Need to refine landward and seaward limits of SAA initiative.
  
- 3) Initiate an interstate GIS workgroup to recommend minimum standards for mapping methodology and parameters to ensure compatibility across states and to make trend comparisons over time.
  - Timeline: Years 1-2, 3-6 months, subsequent to above efforts.
  - Prospective Partners: Appropriate SAA leadership to organize workshops with relevant partners.
  - Deliverable: List of standards & parameters for all data layers.
  - Ongoing/Complementary Efforts: SAFMC and TNC have similar efforts ongoing, but standards, mapping methodology and parameters may not be agreed on, or consistent w/ongoing state efforts.
  - Comments/Resource Needs: Funding needed to support regional meetings of key resource managers and GIS staff.
  
- 4) Map habitats and resources agreed upon through above steps in a coordinated consistent GIS framework.
  - Timeline: Year 2.
  - Prospective Partners: will require leadership in appropriate state agencies to commit GIS staff for this effort.

- Deliverable: Series of regional habitat and resource maps.
  - Ongoing/Complementary Efforts: SAFMC Habitat/FEP, SECOORA and states already engaged in such efforts.
  - Comments/Resource Needs: Likely to require funding GIS staff in multiple agencies to re-evaluate or re-analyze data in a more consistent framework. Some data layers would like best be assemble by the data source (e.g. fisheries data).
- 5) Identify all protected lands in each state and the region as a GIS layer.
- Timeline: Years 2.
  - Prospective Partners: To be identified. Will require SAA leadership within appropriate agencies to commit GIS staff for this effort.
  - Deliverable: Multiple data layers for federal, state, local and private lands.
  - Ongoing/Complementary Efforts: States are already mapping protected lands. Common framework, parameters and standards may not exist.
  - Comments/Resource Needs: Information likely already in various GIS layers. If common framework, parameters, and standards do not exist, funding to reassess GIS layers will likely be needed. A definition of “protected lands” will be needed.
- 6) Develop mechanism for distribution of data.
- Timeline: Years 2-3.
  - Prospective Partners: To be identified – possibly states, some federal partners and a few non-governmental organizations (NGOs).
  - Deliverable: Web-based portal accessible to all states. If not feasible, then a common or distributed data clearing house will be needed at a minimum (preferably using enhanced software other than ArcIMS).
  - Ongoing/Complementary Efforts: NOAA, BOEMRE, SAFMC, TNC.
  - Comments/Resource Needs: May be a distributed database (e.g. maintained by each state but linked to a common website) or both technical and financial support will be needed to maintain a web-based portal. Consider links to an existing resource mapping effort (e.g. SAFMC, FWRI, and TNC). Look at MARCO web portal as an example.
- 7) Seek funding support to fill data and GIS/mapping gaps.
- Timeline: Years 1-3.
  - Prospective Partners: SAA leadership to determine.
  - Deliverable: Grant or commitment of state funds.
  - Ongoing/Complementary Efforts: SECOORA proposal.
  - Comments/Resource Needs: Efforts in previous steps will not be successful without funding commitment.

**Action HE1B:** Develop an integrated database that captures existing state, federal and NGO monitoring metadata for programs that are ongoing or long-term.

### **Implementation Steps:**

- 1) Collate information (metadata) on existing biological monitoring programs conducted by the states, federal agencies, and NGOs: who is doing work, where is it occurring, parameters measured, program duration. A small amount of funding should be made available to ensure this task can be completed in a timely fashion.
  - Timeline: Years 1-2.
  - Prospective Partners: Potential to contract out to Sea Grant, NGOs, academics.
  - Deliverable: Spreadsheet/database.



- Ongoing/Complementary Efforts: NGO's such as TNC, state Sea Grant offices, federal management bodies such as the SAFMC, ASMFC, SECOORA, etc.
  - Comments/Resource Needs: See if agencies already have info collated in some fashion; could also be a great intern/student project.
- 2) Identify biological and environmental resource measures of common interest to the states and develop integrated database for those resources. A small group of IT specialists with knowledge and/or input from the ecosystem members should discuss the primary variables necessary and the appropriate format for each. This data hierarchy will then be sent to the state partners to complete the matrix for data sources available in their agency.
- Timeline: Years 1-2.
  - Prospective Partners: IT specialists with assistance from ecosystem/GIS specialists.
  - Deliverable: Searchable (online) database.
  - Ongoing/Complementary Efforts: CCOW group also has a metadatabase action for their plan; HE should link to this to ensure consistency in structure. NPS has ongoing SE Coastal Water Monitoring metadata portal, Phase II underway ([www.gcrc.uga.edu/wqmeta](http://www.gcrc.uga.edu/wqmeta)).
  - Comments/Resource Needs:
- 3) Identify status of important species (managed and unmanaged) and imperiled species for each state/region. Various state and federal agencies already produce status of the stock reports on a regular basis for managed species. For ecosystem management, it is equally important to know the status of unmanaged species such as forage species.
- Timeline: Years 1-3.
  - Prospective Partners: States, ASMFC, SAFMC, potential grant to develop regional forage species estimates
  - Deliverable: Status of stocks for unmanaged species, list of imperiled species, forage species indices. Identify species regularly evaluated by states.
  - Ongoing/Complementary efforts: NOAA, USFWS, state agencies.
  - Comments/Resource Needs: What are the commonalities and what are the gaps in terms of species that are/are not being monitored? Develop consensus on which species/groups are key for assessing ecosystem health.
- 4) Seek funding to maintain or expand programs that will help in monitoring condition over time at useful scales. A meeting between principal investigators conducting monitoring programs, NGOs, federal agencies, and federal assistance grant specialists may be necessary to “brainstorm” possible funding solutions. Grant specialists understand funding sources that are available and can direct investigators to the proper RFPs.
- Timeline: Ongoing.
  - Prospective Partners: SAA leadership/EPT.
  - Deliverable: Funding for monitoring programs.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

**Action HE1C:** Maintain/enhance interstate/regional efforts to implement ecosystem based planning and management.

**Implementation Steps:**

- 1) Identify ongoing coastal ecosystem management activities. List operational and strategic plans and models being used at multiple scales. Inventory regional capacity, planning, networking, and infrastructure for data management, implementation and support of various initiatives.
- Timeline: Year 1.
  - Prospective Partners: SAA or funded contractor(s).

- Deliverable: Database inventory.
  - Ongoing/Complementary Efforts: SECOORA, SAFMC, state and federal agencies, SARP.
  - Comments/Resource Needs: Identify duplication of effort, gaps, streamline process to achieve common goals. Develop strategies for oversight and management of inventory database.
- 2) Convene workshop to review and discuss strategies for ecosystem management and planning at multiple scales across the region, to assess funding needs, and to develop a consensus definition for management of coastal areas where possible/desirable among states. Identify priority components, resources and habitats.
- Timeline: Years 1-2.
  - Prospective Partners: SAA/EPT leadership, others.
  - Deliverable: Workshop report posted on website.
  - Ongoing/Complementary Efforts: State and federal resource agencies, SARP, SAFMC, NEPs, SECOORA.
  - Comments/Resource Needs: Funding is required to support workshop participation. Define boundaries (geographical) and component resources and habitats covered under SAA.
- 3) Ensure SAA has a significant role in development of any regional ecosystem-based management plan that may be developed in conjunction with federal agencies. Seek opportunities to enhance networking and coordination among potential partners, as well as to avoid conflicts. Reflect state and regional level ocean planning and ecosystem-based management activities in monitoring and mapping priorities at a regional level.
- Timeline: Years 2-3.
  - Prospective Partners: State and federal participants with assistance from other partners (NGOs, academics).
  - Deliverable: Plan with prioritized action items for coastal ecosystem management that includes key resources and habitats of regional (and state) concerns posted on SAA website.
  - Ongoing/Complementary Efforts: SECOORA, SAFMC, SARP, state and federal agencies.
  - Comments/Resource Needs: Develop process for follow up. Identify responsible party to review progress and provide updates to the HE team. Provide funding or infrastructural resources to support team participation and finance product.

***Objective H.E.2. Assess the independent and cumulative impacts of development and climate change on coastal habitats, biodiversity, natural community structure/function and ecosystem services.***

**Action HE2A**: Identify priority issues (e.g. sea level rise, ocean acidification, coastal development resiliency, and other major anthropogenic issues) and evaluate coastal resources at greatest risk to (1) climate change and (2) anthropogenic effects from coastal and inland development.

**Implementation Steps:**

- 1) Develop list of expected effects from climate change on specific habitats, biological resources and associated uses identified in Action HE1A (i.e. wetlands – inundation from sea level rise; hard bottom – acidification, water column productivity and trophic interactions, temperature change, etc.).
  - Timeline: Year 1, 3-6 month effort.
  - Prospective Partners: NOAA, state agencies, academics, appropriate SAA leadership to organize workshops.
  - Deliverable: Table/report with effects of climate change stressors on habitats/resources, ranked in severity.
  - Ongoing/Complementary Efforts: Information somewhat compiled in SAFMC FEP, NC CHPP, NOAA Sea Level Rise Initiative, IPPC, South Atlantic Regional Research Project (SARRP).
  - Comments/Resource Needs: Minor funding for holding workshops, existing SAA partners. Can be combined with other workshops.
- 2) Develop list of expected effects from increasing development on specific habitats, biological resources and associated uses identified in Action HE1A.

- Timeline: Year 1, 3-6 month effort.
  - Prospective Partners: Appropriate SAA leadership to convene workshops; to be determined.
  - Deliverable: Table/report with effects of development stressors on habitats/resources, ranked in severity.
  - Ongoing/Complementary Efforts: Information somewhat compiled in SAFMC FEP, NC CHPP, SARRP, others.
  - Comments/Resource Needs: Minor funding for holding workshop, existing SAA partners.
- 3) Develop vulnerability assessment maps that integrate climate change (e.g. sea level rise) and development impacts for use in state and local level planning.
- Timeline: Years 2-3, after habitat mapping completed; 1-2 year effort.
  - Prospective Partners: NOAA Coastal Services Center, Universities, state resource management agencies, NGOs, USGS Regional Climate Centers (NC State), SECOORA.
  - Deliverable: Vulnerability assessment maps, with accompanying metadata report and levels of uncertainty.
  - Ongoing/Complementary Efforts: State vulnerability assessments (e.g. NC SHA process), USFWS Landscape Conservation Cooperative, Coastal Services Center Habitat Priority Planner training.
  - Comments/Resource Needs: Build upon information learned at the workshops; grant funding to support research; coordinate on mapping with SAA Team for "Disaster Resilient Communities".
- 4) Develop and refine processes that integrate multi-state coordination and review of activities with multi-state influence (e.g. affecting 4-digit HUC watersheds), on in-stream flow (e.g., effects of withdrawals, dams, obstructions) and associated anthropogenic inputs as they relate to healthy estuarine function; provide mechanisms to assess impact from upstream development.
- Timeline: Year 1, 3-6 month effort.
  - Prospective Partners: SAA leadership, NMFS.
  - Deliverable: Interstate MOA.
  - Ongoing/Complementary Efforts: SAFMC Habitat AP, ASMFC Habitat Committee, and NMFS review large federal and state permit apps, EISs that may cross state lines, FERC process.
  - Comments/Resource Needs: Existing SAA partners with time to do this. Effort focuses on watersheds - are there other multistate issues that we would want to incorporate in the future?
- 5) Identify cross-cutting cultural, socio-economic and political pressures on ecosystem health.
- Timeline: Years 3-4, 6-12 month effort.
  - Prospective Partners: Appropriate SAA leadership to organize workshop.
  - Deliverable: Table/report with impacts ranked in severity.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: Minor funding for holding workshop, existing SAA partners.
- 6) Develop tools to enhance management networking and communications.
- Timeline: Years 3-4; after habitat mapping is completed, 1-2 year process.
  - Prospective Partners: NOAA Coastal Services Center, academics.
  - Deliverable: collaborative communication tools, shared data and infrastructure.
  - Ongoing/Complementary Efforts: CSC.
  - Comments/Resource Needs:

**Action HE2B:** Develop indices of condition for each different habitat type, level of biodiversity, community structure/function and ecosystem services.



## **Implementation Steps:**

- 1) Evaluate existing condition indices already developed in the region by federal agencies (EPA, NOAA, USGS, USFWS), or by state, local or NGO entities.
  - **Timeline:** Year 1.
  - **Prospective Partners:** HE Team members working with appropriate state and federal representatives assigned by SAA.
  - **Deliverable:** List of existing condition indices for habitat quality that are already established for all or a portion of the region.
  - **Ongoing/Complementary Efforts:** EPA has established several ecological and environmental condition measures for SE estuarine habitats. USFWS has another new initiative with indicators. SC has established multiple integrated measures of habitat condition for SC estuaries. Several states have condition measures and thresholds for water quality (may be more appropriate for other working groups), NOAA SECART team.
  - **Comments/Resource Needs:**
  
- 2) Determine if indices can be adapted region-wide (w/thresholds relevant to each state).
  - **Timeline:** Years 1-2.
  - **Prospective Partners:** Committee of appropriate scientific and management staff for each state and the region, including federal and NGO partners.
  - **Deliverable:** Listing of indices available for use with appropriate thresholds to reflect conditions in different parts of the region.
  - **Ongoing/Complementary Efforts:** EPA, USFWS, SCDNR, NOAA, ACFHP, others.
  - **Comments/Resource Needs:** A group of federal, state, NGO technical experts will need to interact to resolve appropriate thresholds, which may be different among states within the region.
  
- 3) Collaboratively develop new condition indices and thresholds where needed.
  - **Timeline:** Years 2-3; possibly longer.
  - **Prospective Partners:** Committee of appropriate scientific and management staff for each state and the region, including federal and NGO partners.
  - **Deliverable:** Identification of most desirable indices of habitat and biological condition that do not already exist. Development of new indices using expertise of scientists that have experience in developing indices and are familiar with resource(s) of concern.
  - **Ongoing/Complementary Efforts:** USFWS, ACFHP, but in its infancy. EPA for wetlands - success uncertain. EPA estuaries - may need modification.
  - **Comments/Resource Needs:** This could be a time consuming process and efforts would need to be prioritized. Finfish indices are especially problematic. Specific habitats should be prioritized.

**Action HE2C:** Develop a method for cumulative impact assessment of priority threats.

## **Implementation Steps:**

- 1) Develop a methodology for integrating climate change and cumulative impact assessment from coastal development for the purpose of forecasting carrying capacity (including ocean and estuarine stabilization and impervious surfaces, marinas, discharges, instream flow, river discharges, point and nonpoint pollution, etc) Incorporate impact factors and indicators identified in Actions HE2A and HE2B; factors from other models. Review current cumulative impact assessment models/methods.
  - **Timeline:** Years 1-2.
  - **Prospective Partners:** SAA contractor /universities/ industry partners, state resource management agencies, NGOs.

- Deliverable: Report, possible model development, schema, predictions. Report should include mention of past, present, and potential future impacts. Measurable goals to evaluate impacts.
  - Ongoing/Complementary Efforts: NRDA, NOAA, EPA, CZM, states, local governments, SARRP.
  - Comments/Resource Needs: Identify review panel to assess planned CIA methodology. Identify baseline condition, mitigation needs (as appropriate), and trend analysis. Determine the coastal resources at greatest risk by each threat and state.
- 2) Secure funding and conduct pilot studies in each state on the CIA of development and sea level rise. Identify high risk target areas/resources at small and large scales for field testing and/or assessment.
- Timeline: Year 1 (funding), Year 2-3 (pilot).
  - Prospective Partners: SAA and contractor, state and federal partners.
  - Deliverable: Feasibility report /recommendations for larger scale testing.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: Identify state needs and recommendations for CIA testing.
- 3) Conduct studies at larger scales for widest regional applicability based on results of pilot studies. Identify boundaries (spatial, temporal, economic, ecological, administrative, technical, uncertainty).
- Timeline: Years 2-3, possibly longer.
  - Prospective Partners: States, federal agencies, NGOs, universities in collaboration with SAA.
  - Deliverable: Assessment report (to include mitigation/management recommendations/proposed actions).
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: Determine action for monitoring post CIA study, long term data acquisition and management planning.

***Objective H.E.3. Develop and employ economic, science-based land-use, coastal and ocean planning and management that support healthy ecosystems. This should include, but not be limited to, the conservation and restoration of key habitats, evaluation of ecosystem health using appropriate measures, and evaluation of direct and cumulative impacts.***

**Action HE3A**: Initiate a joint federal-state agency marine spatial plan that identifies the location of key coastal and marine resources and activities (e.g., commercial and recreational fishing areas, shipping lanes, military areas, energy development areas, sand resource areas used for beach nourishment, etc.) for incorporation into multi-use management decisions.

**Implementation Steps:**

- 1) Identify locations and scope of coastal/marine activities likely to benefit from interstate coordination of planning, implementation, or monitoring.
- Timeline: Year 1.
  - Prospective Partners: Marine: NOAA, BOEMRE, EPA, SAFMC, SECORA, States; Coastal: NOAA, EPA, FWS, COE, ASMFC, states, local governments, NGOs.
  - Deliverable: Report with spatial data maps identifying coastal/marine issues most amenable to interstate collaboration.
  - Ongoing/Complementary Efforts: Issue specific groups for wind energy (SEA), AIWW (AIWA), sand sources (BOEMRE), fishing (ASMFC, SAMFC).
  - Comments/Resource Needs: Are coastal and marine sufficiently different that they benefit from separate efforts?
- 2) Prioritize resources currently in greatest need of conservation or restoration that could be affected by the above activities.

- Timeline: Year 1.
  - Prospective Partners: Marine: NOAA, BOEMRE, EPA, SAFMC, SECOORA, States; Coastal: NOAA, EPA, FWS, USACE, ASMFC, states, local governments, NGOs.
  - Deliverable: Report with spatial data maps prioritizing coastal/marine resources most likely to be impacted by above.
  - Ongoing/Complementary Efforts: LCC, ACFHP, SARP, SARRP, TNC, EPA, state resource agencies.
  - Comments/Resource Needs: Agency strategic plans may be a good start.
- 3) Prioritize coastal/marine resources at greatest risk to future degradation due to anthropogenic or climate change effects.
- Timeline: Year 2.
  - Prospective Partners: Above in previous steps, USGS, academia.
  - Deliverable: Report with spatial data prioritizing coastal/marine resources most likely to be impacted by climate change.
  - Ongoing/Complementary Efforts: LCC, USGS, NOAA, USFWS.
  - Comments/Resource Needs: Agency strategic plans may be a good start.
- 4) Identify junctures in existing decision-making processes that would benefit from coastal/marine spatial planning.
- Timeline: Year 2.
  - Prospective Partners: USACE, States, BOEMRE, EPA, NOAA, USCG, SAFMC, NaCO.
  - Deliverable: Report on decision-making processes and evaluating opportunities for affecting these processes within their time constraints.
  - Ongoing/Complementary Efforts: Academia.
  - Comments/Resource Needs: May require significant time contributions from SAA members.
- 5) Format spatial data for use in above decision-making processes.
- Timeline: Year 2-4.
  - Prospective Partners: State GIS groups, NOAA, NaCO, Sea Grant.
  - Deliverable: Distribution of data in the format(s) most amenable to incorporation into decision-making processes; may also require training.
  - Ongoing/Complementary Efforts: NOAA, State GIS clearinghouses.
  - Comments/Resource Needs: Likely to require significant resources; might want to test drive the data formatting.

**Action HE3B:** Use results from resource mapping and evaluation of impacts from climate change and coastal development to make regional recommendations for ecosystem-based land-use planning.

### **Implementation Steps:**

- 1) Define "ecosystem-based land-use-planning" for purposes of the SAA.
- Timeline: Year 1.
  - Prospective Partners: SAA on its own.
  - Deliverable: Working definition.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: Need a definition of "ecosystem-based" management or planning. Most all definitions focus on identifying some level of carrying capacity for the system in question. Several papers have been written in this regard.

- 2) Develop land use planning strategies for ecosystem management that can be implemented at local and state government levels.
  - Timeline: Years 2-4.
  - Prospective Partners: SAA team, local and state representatives, federal, local and county government; academia.
  - Deliverable: Strategic plan with recommendations.
  - Ongoing/Complementary Efforts: NEPs, SERPPAS (marine coastal initiative), USGS climate change initiative (SERAP), SALCC.
  - Comments/Resource Needs: Identify state and regional priorities for incorporation.
  
- 3) Incorporate methods and policies already established for ecosystem-based management (e.g., SAFMC).
  - Timeline: Years 2-5.
  - Prospective Partners: Local, state, federal governments; alliances.
  - Deliverable: Conduct survey; provide results of existing methods and policies, with recommendations for incorporation or adaptation; implementation and strategic plans, report updates.
  - Ongoing/Complementary Efforts: SAFMC, SARRP, SARP (southeast aquatic habitat plan), SERPPS, USGS.
  - Comments/Resource Needs: Review ongoing efforts for EBM application, success, troubleshooting. Develop process for follow up; identify responsible party to review progress, provide updates to HE team. Look to other examples even abroad; EU has different approach -- how different programs operate together rather than tweaking one process.
  
- 4) Identify impediments to complete efforts such as lack of finances, management resources, competing stakeholder interests, jurisdictional boundaries.
  - Timeline: Years 2-5, phase 1 at start up [funding] and ongoing during implementation phase.
  - Prospective Partners: Industry, foundations, stakeholders, local governments, SAA, NGOs, academia.
  - Deliverable: Hold stakeholder workshop/conduct survey to identify potential conflicts; identify jurisdictional boundaries; report on survey results and recommendations; action plan; regional network of participants.
  - Ongoing/Complementary Efforts: SARRP, NOAA (OCRM).
  - Comments/Resource Needs: Inventory existing grant programs, funding resources, foundations and ongoing sources for funding ecosystem management activities. Assess if these financial resources, RFPs can be used to supplement funding for priority SAA activities. Assess the feasibility of developing other/alternate funding incentives if funding is not available. (Is policy decision/authorization needed for implementation?) Set up MOUs, staffing, reps from each vested entity/agency.

**Action HE3C**: Expand on existing educational and outreach efforts to enhance public awareness of impacts on key habitats and ecosystem health as they relate to land use, coastal and ocean planning and management.

### **Implementation Steps:**

- 1) Assess existing efforts and highlight the best and most promising plans and programs. Develop a list of important terms with a brief definition of each.
  - Timeline: Years 1.
  - Prospective Partners: SAA members working with appropriate state and federal representatives.
  - Deliverable: A list of exceptional educational programs highlighting the strengths of each.
  - Ongoing/Complementary Efforts: [www.Estuaries.gov](http://www.Estuaries.gov) COSEE, State Sea Grant Offices.
  - Comments/Resource Needs: A list of definitions and important acronyms should be relatively easy to produce and provide an end-user a good reference point. (Note - This should be done for entire effort.)

- 2) Develop a network to notify end-users of potential coastal management actions so public input can be provided prior to final decision/rule making.
  - Timeline: Years 1-2.
  - Prospective Partners: States, federal agencies, and NGOs with SAA collaboration.
  - Deliverable: A network that will alert interested parties of potential permits, rule making, public hearings, etc.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
  
- 3) Incorporate ideas and methods from existing plans to develop a comprehensive strategic education plan for the Southeast targeted at specific end-users: K-12, educators, rule makers, and general public.
  - Timeline: Years 2-3.
  - Prospective Partners: States, federal agencies, NGOs, universities in collaboration with SAA.
  - Deliverable: Educational plans targeted towards specific groups.
  - Ongoing/Complementary Efforts: COSEE, NERRS, Sea Grant, Project Wet, [www.Estuaries.gov](http://www.Estuaries.gov)
  - Comments/Resource Needs:
  
- 4) Develop programs that are targeted at specific end-users: K-12, educators, rule makers, and general public. Programs should encompass internet, personal interactions, and printed materials.
  - Timeline: Years 3-4.
  - Prospective Partners: States, federal agencies, NGOs, universities, Sea Grant, in collaboration with SAA
  - Deliverable: Specific programs to education specific user groups.
  - Ongoing/Complementary Efforts: COSEE, NERRS, Sea Grant, Project Wet, [www.Estuaries.gov](http://www.Estuaries.gov)
  - Comments/Resource Needs:

***Objective H.E.4. Determine long term impacts and remediation strategies for existing invasive species while implementing strategies to prevent further introductions.***

**Action HE4A**: Inventory national/regional/state efforts that identify invasive species and their current regional distributions and compile data into an integrated regional map.

**Implementation Steps:**

- 1) Evaluate and where necessary expand invasive species existing map products for marine, estuarine, and freshwater flora and fauna.
  - Timeline: Year 1.
  - Prospective Partners: Appropriate state agencies, SAFMC, NMFS.
  - Deliverable: Invasive species map products for marine, estuarine, and freshwater plants and fauna that are readily available for interested partners.
  - Ongoing/Complementary Efforts: USDA National Invasive Species Information Center; Gulf and South Atlantic Regional Panel on Aquatic Invasive Species; SARP; EDD maps (University of Georgia); non-indigenous species database network (NIS); USGS non-indigenous aquatic species (NAS); SE-EPPC; Invasive plant atlas of the US.
  - Comments/Resource Needs: Need to resolve the scope of invasive species to be considered and their priority for SAA objectives. Analysis should include consideration of magnitude of the problem, number of state affected, etc. Initial emphasis should be on marine, estuarine and freshwater flora and fauna in the coastal zone, though the watershed connection was recognized for the longer term.



- 2) Identify and compile state plans to remediate existing introductions where feasible and prevent future introductions.
  - Timeline: Year 1, 3-6 months.
  - Prospective Partners: Appropriate state agencies, SAFMC, NMFS.
  - Deliverable: Database listing existing plans developed by each state in the SAA, and federal efforts where appropriate.
  - Ongoing/Complementary Efforts: Ongoing state planning efforts, USDA, SAFMC, NOAA.
  - Comments/Resource Needs: Under Actions HE4B and HE4C - evaluate if there are opportunities to work as a region on the remediation of invasive species as has happened with freshwater plants and in the Great Lakes with zebra mussels.
  
- 3) Establish regional list of taxa experts for life history and identification information.
  - Timeline: Year 1, 3-6 months.
  - Prospective Partners: Appropriate state agencies, academic researchers, NGOs, Southeast Regional Taxonomic Center (SERTC).
  - Deliverable: Listing of experts available in the region by species/taxa type.
  - Ongoing/Complementary Efforts: There are probably many lists of research and taxonomic experts for particular species groups. Contacting ongoing working groups would enhance this effort. Make sure list is readily available throughout the region.
  - Comments/Resource Needs:
  
- 4) Identify gaps in knowledge, funding resources, surveillance areas, communication and alert systems.
  - Timeline: Years 1-2.
  - Prospective Partners: State agencies, NMFS, NOAA, USGS, SAFMC.
  - Deliverable: Brief report that provides listing of gaps, potential funding resources, contact information to notify of new observations.
  - Ongoing/Complementary Efforts: Unknown.
  - Comments/Resource Needs:

**Action HE4B:** Enhance educational, outreach and enforcement strategies to prevent further introductions and to aid in current remediation efforts.

#### **Implementation Steps:**

- 1) Identify locations of primary regional sources of introductions (e.g. ports for ballast water, unregulated “pet” trade, illegal imports, ocean currents, intracoastal trade (e.g. AIWW), aquaculture facilities).
  - Timeline: Year 1.
  - Prospective Partners: USGS, USCG, USFWS, EPA, Ports, State DNRs, Southeast Aquatic Regional Partnership (SARP), Universities, State Invasive Species Task Forces.
  - Deliverable: Conduct workshop to identify sources to be mapped and to compile any existing data, along with identifying data gaps. Develop maps of source introductions.
  - Ongoing/Complementary Efforts: USGS NAS database/alert system; build upon any existing mapping effort (unknown); build upon work in Florida.
  - Comments/Resource Needs: Small amount of funding for workshop. Additional funding needed for research to produce maps for region. Link with maps on species location. Additional funding needed to review existing regulations and to determine if they are effective.

- 2) Develop strategies for funding outreach campaigns, developing volunteer networks, mechanisms to centralize reporting of invasive species, reward systems, amnesty days, “wanted” posters, and identification guides) to ensure that the public is fully aware of the problems and issues of each species.

- Timeline: Years 1-3.
- Prospective Partners: State DNRs, Sea Grant, aquariums, foundations, state AIS task forces, regional panels, pet stores, marinas, COSEE.
- Deliverable: Improved coordination across state lines. Establish work group to develop a strategic plan with recommendations.
- Ongoing/Complementary Efforts: State AIS/ANS Mgmt Plans/Programs, National efforts, GSARP (Gulf and South Atlantic Regional Panel).
- Comments/Resource Needs: Should review State AIS Plans and regional efforts (GSARP is in process of developing early detection plans, remediation strategies, etc.) Need to refine the SAA role in this. Funding needed. State plans have similar actions identified.

**Action HE4C:** Identify life history information for each invasive species and conduct studies to determine levels of risk associated with established invasive species.

### **Implementation Steps:**

- 1) Develop regional risk assessment models for high/medium/low risk aquatic and wetland invasive species in the southeast.

- Timeline: Years 1-2.
- Prospective Partners: SE- EPPC, and individual state chapters, USDA, CAIP, universities, NOAA, SARP.
- Deliverable: Risk ratings and maps of risk are provided to states to incorporate into state invasive species plans.
- Ongoing/Complementary Efforts: SE- EPPC, and individual state chapters, USDA, CAIP, academics, NOAA; SA LCC Workgroup; USGS Southeast Ecological Science Center (SESC).
- Comments/Resource Needs: SA LCC has research funding for the next year to support aquatic invasive species an initial step will be bringing experts together to evaluate data gaps and develop RFP. Note that these should take into consideration climate change. This is a potential opportunity for the Alliance.

- 2) Conduct studies to evaluate physical/temporal limits of aquatic and wetland invasive species in the southeast where unknown.

- Timeline: Ongoing.
- Prospective Partners: SE-EPPC, and individual state chapters, USDA, CAIP, universities, NOAA; regional panels.
- Deliverable: Information is provided to states to incorporate into state invasive SPP plans.
- Ongoing/Complementary Efforts: SE-EPPC, and individual state chapters, USDA, CAIP, academics, NOAA, USGS SESC.
- Comments/Resource Needs: Research funding.

- 3) Develop methods for eradication and control of high priority southeast invasive species where feasible, and develop cost estimates of necessary control programs.

- Timeline: Ongoing.
- Prospective Partners: SE-EPPC, and individual state chapters, USDA, CAIP, academics, NOAA.
- Deliverable: Handbook or document - available on web.
- Ongoing/Complementary Efforts: SE-EPPC, and individual state chapters, USDA, CAIP, academics, NOAA, USGS SESC.
- Comments/Resource Needs: Research funding.

- 4) As a pilot, work with USCG and other agencies to develop and implement more restrictive regulations regarding ship ballast discharge, ballast water quality requirements.
  - Timeline: Year 1.
  - Prospective Partners: USCG, Department of Commerce, SARP, SAFMC.
  - Deliverable: New regulations.
  - Ongoing/Complementary Efforts: USCG.
  - Comments/Resource Needs: Region could work to ensure implementation of regulations that are already in place and that are being updated.

### **Working Waterfronts**

*Objective W.W.1. Improve the capability and vitality of ports and working waterfronts through expansion of infrastructure and modes of access while addressing cargo and ship-borne invasive species, dredging impacts, and protection of natural resources.*

**Action WW1A:** Integrate regional long-range planning for both commercial and federal ports emphasizing multi-modal, multi-use capacity, and promoting the use of existing infrastructure and navigational channels through increased communication between member states.

#### **Implementation Steps:**

- 1) Identify and compile best practice recommendations for integrating port planning into comprehensive plans and other planning documents.
  - Timeline: 18 Months.
  - Prospective Partners:
  - Deliverable: Recommendations and Guide.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 2) Develop coordination infrastructure to facilitate communication among the four South Atlantic Alliance member states on issues of mutual concern regarding ports.
  - Timeline: 12-24 Months.
  - Prospective Partners:
  - Deliverable: Formal partnerships.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 3) Support optimum economic viability and capacity in the region's ports.
  - Timeline: 36 Months.
  - Prospective Partners:
  - Deliverable: Needs and Forecast Assessment Report.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 4) Prioritize transportation investments according to how well they support multimodal connectivity.
  - Timeline: 24 Months.

- Prospective Partners:
- Deliverable: Multi-modal gap analysis
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

5) Identify underutilized Brownfield's for port expansion opportunities.

- Timeline: 18 Months.
- Prospective Partners: EPA, State Environmental agencies.
- Deliverable: GIS compatible database.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Action WW1B:** Conduct research and studies that forecast long-range needs of coastal ports.

**Implementation Steps:**

1) Conduct needs assessment to identify gaps, inventory/catalog all existing needs and compile for all states.

- Timeline: 36 Months.
- Prospective Partners: USCG, USACE.
- Deliverable: Needs assessment report.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

2) Prioritize the regional needs based on the assessment and support related research to identify regional military, civilian, and commercial needs (e.g., cruise ships, commerce).

- Timeline: 24-36 Months.
- Prospective Partners:
- Deliverable: Gap analysis and needs assessment.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Action WW1C:** Support community-based mapping work to identify contemporary and historical, recreational and commercial working waterfront sites.

**Implementation Steps:**

1) Establish criteria for identifying contemporary and historical, recreational and commercial working waterfront sites with the goal of compiling information in such a way as to clearly demarcate (different scales of) recreational and commercial working waterfronts so that technical assistance might be more effectively targeted and delivered.

- Timeline: 12 Months.
- Prospective Partners:
- Deliverable: Existing conditions report.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

2) Create and distribute an interactive map to display historical and contemporary, recreational and commercial working waterfront sites across the region.

- Timeline: 36 Months.

- Prospective Partners:
- Deliverable: GIS compatible data protocols.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

*Objective W.W.2. Ensure sustainable economic viability of working waterfronts while preserving traditional uses, including national defense, by balancing suitable public, commercial, port, residential, and environmental uses with best management practices.*

**Action WW2A:** Limit the loss of recreational and commercial waterfronts.

**Implementation Steps:**

1) Promote public/private partnerships.

- Timeline: Ongoing.
- Prospective Partners:
- Deliverable: Marketing Plan and Model Use Standards.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

2) Support the use of flexible incentives.

- Timeline: 24-36 Months.
- Prospective Partners:
- Deliverable: Model Legislation.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

3) Predict the effects of working waterfront resource loss and/or conversion.

- Timeline: 36 Months.
- Prospective Partners:
- Deliverable: Trend Analysis.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

4) Encourage the use of waterway and land-use planning and policy options.

- Timeline: 12-18 Months.
- Prospective Partners:
- Deliverable: Model ordinances and case study report.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

5) Expand the level and type of technical assistance.

- Timeline: 36 Months.
- Prospective Partners:
- Deliverable: Technical Assistance Program and Tool Kit.
- Ongoing/Complementary Efforts:



- Comments/Resource Needs:

6) Promote the development of heritage and nature-based tourism opportunities.

- Timeline: 12-24 Months.
- Prospective Partners:
- Deliverable: Marketing and Educational Programs.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Action WW2B:** Protect U.S. military waterfront access and water-dependant land use related to military footprint, operational readiness, and training missions by engaging military representatives in the identification of sites that support military operational and training capacity and national defense mission.

**Implementation Steps:**

1) Engage the military representatives in the identification of sites that support military operational and training capacity and national defense mission.

- Timeline: 18 Months.
- Prospective Partners:
- Deliverable: GIS compatible military site database.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

2) Provide the public with information depicting military areas of interest.

- Timeline: 12-24 Months
- Prospective Partners:
- Deliverable: GIS compatible military database.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Action WW2C:** Inventory public access infrastructure and support facilities within the four states. (Commercial)

**Implementation Steps:**

1) Create an integrated database of all traditional working waterfronts and associated public access facilities.

- Timeline: 24 Months.
- Prospective Partners:
- Deliverable: GIS compatible database.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Objective W.W.3. Address the viability and effects of energy development on natural and human communities and uses through planning and public education.**

**Action WW3A:** Plan for the local and regional economic, ecological, and social effects of emerging industries by encouraging placement of local workforce in new jobs associated with emerging industries.

### **Implementation Steps:**

- 1) Ensure local education systems (local universities, colleges, vocational schools, and high schools) at all levels know what the proper training needs (skill set, knowledge, etc.) are to meet the job requirements for emerging energy industries.
  - Timeline: 12 Months.
  - Prospective Partners:
  - Deliverable: Gap Analysis Report and Needs Assessment.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

**Action WW3B:** Encourage the adoption of model land-use and water body management policies that address the interface between energy development and other working waterfront issues.

### **Implementation Steps:**

- 1) Encourage development standards that are in concert with Coastal Marine Spatial Planning and national ocean plan objectives as well as compatible/consistent with energy development needs, while considering how to balance ecological, environmental, public access, health, safety, economic, and other social concerns.
  - Timeline: 18 Months.
  - Prospective Partners:
  - Deliverable: Recommended Integrated Policy.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

**Action WW3C:** Ensure no-net loss of access facilities during development of new offshore energy industries.

### **Implementation Steps:**

- 1) Ensure that military can sustain training and operational capabilities.
  - Timeline: 24 Months.
  - Prospective Partners:
  - Deliverable: Report and Policy recommendations.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 2) Provide local governments guidance on establishing policy that prohibits the loss of public water access and requires mitigation when loss is unavoidable.
  - Timeline: 18 Months.
  - Prospective Partners:
  - Deliverable: Recommended Standards and Best Practices.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

## Clean Coastal and Ocean Waters

*Objective C.C.O.W.1. Improve watershed management of point and non-point source pollution to reduce adverse impacts to water quality.*

**Action CCOW1A:** Establish a regional technical level work group for the purpose of sharing watershed water quality improvement processes.

### **Implementation Steps:**

- 1) Catalogue watershed/water quality process within each state and evaluate the need to enhance and be consistent in its implementation.
  - **Timeline:** Year 1.
  - **Prospective Partners:** SJRWMD, FL Sea Grant, NERRS CTP, DEP, SFWMD, GA EPD and other watershed management agencies in each state, NCDENR agencies including APNEP and Clean Marinas, NRCS, NOAA, Coastal Carolina University, SCDHEC, USC/Clemson-Baruch Inst., County Govt., Santee Cooper, USFS, Clemson Ext. Offices, Low County Institute, USGS.
  - **Deliverable:** Report identifying areas of inconsistency with suggestions, database, website, establish central point of contact.
  - **Ongoing/Complementary Efforts:** Clean Marinas and APNEP are both involved in outreach to improve water quality through education, NCDENR has staff position to do outreach including workshops related to coastal water quality, Coastal Training Program, demonstration project (contact Whitney Jenkins: 252-838-0882), NC has a Coastal Habitat Protection Plan (CHPP) that coordinates interagency activities (DENR regulatory and resources agencies participate) to protect and enhance coastal resources
  - **Comments/Resource Needs:**
  
- 2) Develop the ability to transfer the knowledge about modeling and process development between states to enhance the water quality improvement process.
  - **Timeline:** Years 1-3.
  - **Prospective Partners:** SJRWMD, FL Sea Grant, NERRS CTP, DEP, SFWMD, GA EPD and other watershed management agencies in each state, EPA R4, university(s), NCDENR agencies, Coastal Carolina University, DHEC, USC/Clemson-Baruch Institute, USFWS, EPA, USGS.
  - **Deliverable:** Report identifying areas of inconsistency with suggestions, database, website, establish central point of contact, periodic conference.
  - **Ongoing/Complementary Efforts:**
  - **Comments/Resource Needs:**
  
- 3) Identify and utilize resources for developing and implementing water quality improvement processes in shared watersheds that would lead to enhanced water quality on a large watershed scale.
  - **Timeline:** Years 1-3.
  - **Prospective Partners:** DEP, SJRWMD, SFWMD, Sea Grant, NERRS CTP, GA EPD and other watershed mgmt. Agencies in each state, NCDENR, EPA, all point and nonpoint stakeholders, SCDNR, NRCS, USFS, SC Forestry Comm., DHEC, EPA, USGS.
  - **Deliverable:**
  - **Ongoing/Complementary Efforts:**
  - **Comments/Resource Needs:**

**Action CCOW1B:** Improve the ability to model loading coefficients for point and nonpoint sources of nitrogen in coastal ecosystems using the best available technology and information including climate change information.

## **Implementation Steps:**

- 1) Apply recently available datasets, such as LiDAR, to produce high resolution digital elevation models.
  - Timeline: Years 1-3.
  - Prospective Partners: FWC, NOAA Coastal Services Center, regional academic institutions, DEP, CRCP, USGS, SJRWMD, SFWMD, NCDENR, DHEC, USFS, DNR, counties.
  - Deliverable:
  - Ongoing/Complementary Efforts: Mike Piehler at East Carolina University (ECU) is doing nutrient cycling research in marshes (contact: [mpiehler@email.ecu.edu](mailto:mpiehler@email.ecu.edu)), Flood plain mapping “Coastal Vulnerability Study”- John Dorman with NC Crime Control & Public Safety, Florida Institute of Oceanography (FIO) has a Geospatial Assessment of Marine Ecosystems (GAME) project- a database of various types of coastal data. SC has a Consortium currently collecting LiDAR for the state; the Georgia Coastal Elevation Project was recently completed and is a continuous LiDAR dataset for the coastal counties.
  - Comments/Resource Needs: Combine existing datasets- identify gaps in region, identify funding opportunities to acquire new datasets, database GIS information, recommendations in form of report, establish central point of contact.
  
- 2) Evaluate regional nutrient models, such as SPARROW, to assess nutrient sources and the processes that influence transport of nitrogen and phosphorus delivered to coastal ecosystems (with USGS). Identify areas where additional monitoring is needed and areas where monitoring could be used to verify model results.
  - Timeline: Years 2-5.
  - Prospective Partners: USGS, DEP, SJRWMD, SFWMD, NOAA Coastal Services Center, regional academic institutions. (Note- USGS is monitoring SE USA, but this does not cover from Lake Okeechobee to the south.) NCDENR, EPA, universities, DHEC, USFS, DNR, Coastal Carolina, USC/Clemson-Baruch Inst.
  - Deliverable: Database, GIS information, recommendations in form of report, establish central point of contact.
  - Ongoing/Complementary Efforts: USGS NAWQA SPARROW modeling and refinement.
  - Comments/Resource Needs:
  
- 3) Apply existing GIS data layers to model impervious surface coverage, watershed hydrologic connections and estimate loading coefficients for point and nonpoint sources of nitrogen using the best available technology, future land use projections and climate change information.
  - Timeline: Years 2-5.
  - Prospective Partners: USGS, DEP, SJRWMD, SFWMD, NOAA Coastal Services Center, regional academic institutions, FWC, NCDWQ, EPA, DHEC, USFS, DNR, Coastal Carolina, counties, USC/Clemson-Baruch Institute.
  - Deliverable: Model as application in ArcGIS, database, GIS information, recommendations in form of report, establish central point of contact.
  - Ongoing/Complementary Efforts: The Georgia Coastal Elevation Project was recently completed and is a continuous LiDAR dataset for the coastal counties.
  - Comments/Resource Needs: Funding for contract with outside vendor to develop models.
  
- 4) Investigate models that better predict loading of coastal pollution with: increased sea-level rise, increased dry deposition periods of air borne particulate pollution during drought, and increased runoff during periods of above normal precipitation.

**Action CCOW1C:** Develop recommendations on processes and protocols to transfer knowledge and implement BMPs for point and non-point source controls, and to encourage smart growth and green infrastructure (including monitoring-based performance measures).

## Implementation Steps:

- 1) Produce a compendium of accepted BMPs.
  - Timeline: Years 1-2.
  - Prospective Partners: Sea Grant, CRCP, DEP, regional academic institutions, SJRWMD, SFWMD, NCDENR, Farm Bureau, EPA, NRCS, USGS, DHEC, USFS, DNR, Coastal Carolina, counties, USC/Clemson-Baruch Inst., Clemson Extension Service.
  - Deliverable: Updatable database, a tool box format on the website.
  - Ongoing/Complementary Efforts: USGS & SCDOT conducted BMP evaluations for stormwater runoff from roadways for coastal and inland sites, The Southeast Florida Coral Reef Initiative has a Land-Based Sources of Pollution (LBSP) Focus Team that is working on the identification and implementation of best management practices to reduce the impacts of land-based sources of pollution, the University of Florida (UF)- IFAS Extension has a multitude of programs, research, resources and training available on Low-Impact Development, green infrastructure, etc. The Georgia Coastal Stormwater Supplement document is a recently published comprehensive list of stormwater BMPs, just a note that Minnesota & Wisconsin have done their own compendium that we could build upon and regionalize.
  - Comments/Resource Needs: For the implementation steps under Action CCOW1C, academia could be very useful.
  
- 2) Publish a list of LID and BMP demonstration sites and programs throughout the region.
  - Timeline: Years 1-2.
  - Prospective Partners: Sea Grant, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, (DNR agencies?) or university extension groups, SAA?, EPA, USGS, DHEC, USFS, DNR, Coastal Carolina, counties, USC/Clemson-Baruch Inst., Clemson Extension Service.
  - Deliverable: Updatable database, report to be periodically updated on website.
  - Ongoing/Complementary Efforts: See National NEMO (Non-point Education for Municipal Officials) website- they may have taken care of most identification.
  - Comments/Resource Needs: Could require funding to contract with consulting firm.
  
- 3) Develop strategies to encourage and evaluate innovative best management practices (BMPs) and green technologies.
  - Timeline: Years 2-5.
  - Prospective Partners: Sea Grant, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, (DNR agencies?) or university extension groups, consulting firm?, NCDENR, Farm Bureau, EPA, NRCS, USGS, DHEC, USFS, DNR, Coastal Carolina, counties, USC/Clemson-Baruch Inst., Clemson Extension Service.
  - Deliverable: Reports, ordinance changes tracking, website.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: Could require funding to contract with consulting firm.
  
- 4) Post incentive programs available to support BMP installation on the SAA website.
  - Timeline: Continuous.
  - Prospective Partners: SAA.
  - Deliverable: Updatable posting on website.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
  
- 5) Provide training to private and public sectors on LID techniques on a long-term basis.



- Timeline: Years 1-5.
  - Prospective Partners: Sea Grant, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, NOAA CSC, NCDENR, Cooperative extension, EPA, DHEC, universities.
  - Deliverable: Annual or semi-annual training workshops with training manuals published, post training materials on the website, online training modules.
  - Ongoing/Complementary Efforts: The University of Florida (UF)-IFAS Extension provides such training.
  - Comments/Resource Needs:
- 6) Develop a regional process to identify state and federal funds to control non-point source pollution.
- Timeline: Years 2-5.
  - Prospective Partners: State lead, Federal and State agencies, universities.
  - Deliverable: Conference, reports, workshops.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 7) Host a workshop to summarize the use of structural and non-structural BMPs for storm water controls and fresh water influx into salt water systems and performance measures.
- Timeline: Years 2-3.
  - Prospective Partners: Sea Grant, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, partner with engineering firms, NCDCM, Cooperative Extension, EPA, DHEC, universities, local governments.
  - Deliverable: Workshops and conferences, compendium on the website.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: The “performance measures” part of this is a new and important piece.

***Objective C.C.O.W. 2. Enhance understanding of climate change impacts to water quantity and water quality and develop avoidance mitigation and adaptation strategies.***

**Action CCOW2A**: Develop interactive map-based assessment tool(s) to support climate change mitigation and adaptation strategies.

**Implementation Steps**:

- 1) Acquire contiguous datasets and catalog regionally mapped data and initiatives (i.e. LiDAR) to identify gaps in regionally contiguous datasets that may be useful in modeling climate changes impacts.
- Timeline: Years 1-2.
  - Prospective Partners: NOAA Coastal Services Center, FWC- Climate Change Team, Sea Grant, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, USGS, USFWS, NCDENR OneMap.
  - Deliverable:
  - Ongoing/Complementary Efforts: DCM has been instructed to make climate change outreach including water quality impacts; however, lack of funds is hampering full implementation of the mandate, NOAA in NC-marsh response to sea level rise- Carolyn Currin: 252-728-8749. The Georgia Coastal Elevation Project was recently completed and is a continuous LiDAR dataset for the coastal counties, a recently completed Habitat assessment project in the 11 coastal counties as part of a larger partnership project called the Georgia Coastal Land Conservation Initiative including a map of all vegetative communities using NatureServe's classification system, GA has a recently updated National Wetlands Inventory in their 6 coastal counties and is available on the online wetlands mapper tool, USGS, University of SC, BJWSA, SC Sea Grant, Water Resources Foundation, and ADMi are working on mitigation and adaptation strategies to protect freshwater intakes near the coast, Climate Adaptation Capacity is being investigated in NC. East Carolina University is doing

inundation maps for Plymouth, NC area (northeast NC)-NOAA funding. NC and SC Sea Grant have a shared position related to this issue (Jessica White)-this position also does outreach.

- Comments/Resource Needs: Where do you allow wetland mitigation in light of climate change? Is this being addressed by anyone?

2) Map regional hotspots for saltwater intrusion and other high priority water quality issues.

- Timeline: Years 3-5.
- Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, NOAA CSC, Contract with university or private partner, NCDENR.
- Deliverable:
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

3) Use existing GIS data layers to model climate change impacts on land cover for proximal watersheds of coastal waters and tributaries in the South Atlantic Region.

- Timeline: Years 3-5.
- Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, NOAA CSC, FWC, universities, USFWS, USGS, state climate organizations.
- Deliverable:
- Ongoing/Complementary Efforts: The Georgia Coastal Elevation Project was recently completed and is a continuous LiDAR dataset for the coastal counties, a recently completed Habitat assessment project in the 11 coastal counties as part of a larger partnership project called the Georgia Coastal Land Conservation Initiative including a map of all vegetative communities using NatureServe's classification system.
- Comments/Resource Needs:

**Action CCOW2B**: Develop opportunities and partnerships with Federal, State and Local Agencies in their sustainability initiatives.

**Implementation Steps**:

1) Develop compendium/catalog of services, agencies and local resources related to sustainability, adaptation, mitigation, and other activities related to climate change impacts.

- Timeline: Year 1.
- Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS, DEP, NOAA CSC, FWC, CRCP, all states, EPA, USFWS, USGS.
- Deliverable:
- Ongoing/Complementary Efforts: The ASTHO ([www.astho.org](http://www.astho.org)) and NACCHO have empanelled a Climate Change Collaborative in 2007 to study and recommend efforts to stimulate action on the issue of climate change and the health threats it poses. Florida Atlantic University (FAU)-Center for Environmental Studies has launched a program called the Integrative Collaboration on Climate and Energy (ICCE) specializing in linking efforts.
- Comments/Resource Needs:

2) Develop communication network that links all services (health, public transportation, water quality, etc.), government, and local stakeholders to resources and information/data exchange tools.

- Timeline: Years 2-3.
- Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, NOAA CSC, FDOT, FDOH, DENR, USGS, FWS.
- Deliverable:

- Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 3) Develop publicly available economic analysis of water conservation, the cost of conservation now vs. later when more advanced techniques such as desalination are required to meet our drinking water needs.
- Timeline: Years 1-3.
  - Prospective Partners: DENR, EPA, university(s).
  - Deliverable:
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 4) Develop consortium of researchers to get information to the network.
- Timeline: Years 2-3.
  - Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, NOAA CSC, Sea Grant, NERRS, partner with universities, DENR, USGS, USFWS.
  - Deliverable:
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 5) Host community workshops involving climate change scientists, local businesses, planners, landowners, educators, federal and state staff, elected officials and other stakeholders to describe the process used to synthesize research findings into climate change predications and to highlight predictions for the South Atlantic Region and generate support for the use of these projections in land use decisions.
- Timeline: Ongoing.
  - Prospective Partners: NOAA Climate Program Office, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, DCA, NOAA CSC, FWC, USFWS, DENR, USGS.
  - Deliverable: Bi-annual workshops.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: With a lack of global information, it would be hard to scale down to the regional level.
- 6) Summarize global reports to state, local and watershed level to make them easier to interpret and communicate.
- Timeline:
  - Prospective Partners: NOAA.
  - Deliverable:
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

**Action CCOW2C:** Support research to study regional water quality impacts due to climate change.

### **Implementation Steps:**

- 1) Study/model regional climate change impacts on water temperature, salinity, dissolved oxygen, currents, etc. and effects of those changes on local species migrations, including vegetation and locally important aquatic species, as well as the above associated impacts on fisheries and local economy.
- Timeline: Years 1-5.
  - Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS, DEP, DCA, NOAA CSC, FWC, USGS, FWS.

- Deliverable:
- Ongoing/Complementary Efforts: APENP has Climate Ready Estuary initiative- already talking with local governments, the University of Miami's Rosenstiel School of Marine and Atmospheric Sciences is conducting such research, Florida International University (FIU)-research focuses on coastal vulnerability, freshwater sustainability and the impacts of climate change, etc. Cooperative Institute for Marine and Atmospheric Studies (CIMAS), a research institute of the University of Miami, conducts modeling and forecasting on regional climate change impacts (including studies on the impacts on fisheries), The Florida Coastal Everglades (FCE) Program and Long Term Ecological Research Network (LTER) conducts such research
- Comments/Resource Needs: US Global Change Research Program/IPCC/Century Commission.

2) Develop educational materials that can be distributed regionally, posted on website, etc.

- Timeline: Years 1-5.
- Prospective Partners: USFWS (has regional climate change offices), NCDENR Division of Coastal Management, NC Climate Action Plan Advisory Group (they might be able to assist with educational materials w/ some funding), Sea Grant.
- Deliverable: Ongoing development of educational materials.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

***Objective C.C.O.W. 3. Increase data comparability across the region by improving standardization of water quality data collection and reporting and increasing monitoring where needed.***

**Action CCOW3A:** Establish a regional level monitoring workgroup to address compatibility among states.

**Implementation Steps:**

1) Host local/state/federal workshops/roundtables to compile current monitoring methodologies and analyze data gaps and differences. This includes identifying modifications to methodologies necessary for compatibility and addition or subtraction of station(s) criteria & parameters.

- Timeline: Years 2-5.
- Prospective Partners: Regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, NOAA CSC, DENR, USGS.
- Deliverable: Bi-annual workshop, a list/matrix/report, by State, including recommended changes, or additions.
- Ongoing/Complementary Efforts: NERRs can be a contributor from NC also. Need to emphasize coordination and sharing. Quite a bit of working going on including Swamp Monitoring Program. NERRs have over 20 years of monitoring data-all NERRs nationally doing this at selected sites. NC contact, John Fear: 252-838-0884, APNEP doing extensive work in this arena.
- Comments/Resource Needs: Federal- NOAA/EPA/USGS.

2) Identify a common set of parameters collected by federal and state agencies, universities, and other entities, to provide a WQ index for the South Atlantic Coast (EPA's National Estuarine Assessment Program, for example).

- Timeline: Years 2-3.
- Prospective Partners: NOAA, EPA, regional academic institutions, SJRWMD, SFWMD, NERRS CTP, DEP, EPA along with equivalent state agencies, other monitoring programs (NOAA, USFWS, USGS).
- Deliverable: A final report identifying necessary parameters and describing a South Atlantic coast WQI
- Ongoing/Complementary Efforts: USGS Real-Time Water-Quality Network.
- Comments/Resource Needs:

3) Identify regional goal(s); identify questions to be answered by monitoring and recommend potential modifications to monitoring programs as appropriate to answer those questions.

- Timeline: Years 2-4.
- Prospective Partners: EPA along with equivalent state agencies, other monitoring programs (NOAA, USFWS, USGS).
- Deliverable: Final report.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Action CCOW3B**: Catalog and describe existing near shore and offshore monitoring programs, designs, and data accessibility.

### **Implementation Steps:**

1) Identify federal and state agencies, universities, and other entities collecting water quantity and quality data, including ocean acidification data.

- Timeline: Years 1-2.
- Prospective Partners: SECOORA, FWC, NOAA, regional academic institutions, SJRWMD, SFWMD, DEP, EPA along with equivalent state agencies, USGS.
- Deliverable: A list/matrix/report, by State.
- Ongoing/Complementary Efforts: USGS Real-Time Water-Quality Network, Florida Atlantic University (FAU)-Harbor Branch: Center of Marine Ecosystem Health. Florida Water Resources Monitoring Council: water monitoring data and metadata access tool. Also charged with coordinating with other water resource monitoring programs.
- Comments/Resource Needs: Implemented best at the funding level.

2) Identify common parameters and metadata collected by those entities – analytical laboratory, monitoring period, funding sources, accessibility by others, analytical methods (including EPA Standard Methods Reference Number), detection limits, etc.

- Timeline: Years 1-2.
- Prospective Partners: SECOORA, FWC, NOAA, regional academic institutions, SJRWMD, SFWMD, DEP, EPA along with equivalent state agencies, USGS.
- Deliverable: A list/matrix/report, by State.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

3) Identify regional goal(s) for use of monitoring data.

- Timeline: Years 1-3.
- Prospective Partners: SECOORA, FWC, NOAA, regional academic institutions, SJRWMD, SFWMD, DEP, EPA along with equivalent state agencies.
- Deliverable: A final report to describe a regional monitoring strategy.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

4) Based on regional goals develop a standardized database for ease of access among all users, to preserve pertinent data and answer specific questions including those related to metadata.

- Timeline: Years 3-5.

- Prospective Partners: SECOORA, FWC, NOAA, regional academic institutions, SJRWMD, SFWMD, DEP, EPA along with equivalent state agencies.
- Deliverable: A regionally standardized database.
- Ongoing/Complementary Efforts:
- Comments/Resource Needs:

**Action CCOW3C:** Identify State and Regional monitoring needs and implement monitoring programs to the extent possible through identifiable funding sources.

**Implementation Steps:**

- 1) Identify regional monitoring needs and funding gaps at the State level.
  - Timeline: Years 1-2.
  - Prospective Partners: EPA, FWC, NOAA, regional academic institutions, Sea Grant, SJRWMD, SFWMD, DEP, NERRS, CRCP.
  - Deliverable: A list/matrix/report by state, develop a timeline and assign responsibilities to implement any identified monitoring program(s) changes.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 2) Identify funding opportunities to address current and increased monitoring needs of the region. Solicit State input and apply for regional funding. Notify States of RFPs open to State government.
  - Timeline: Ongoing.
  - Prospective Partners: Identify funding opportunities to address current and increased monitoring needs of the region. Solicit State input and apply for regional funding. Notify States of RFPs open to State government.
  - Deliverable: Implemented best at the funding level.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:
- 3) Funnel available grants etc. to increase data collection, equipment updates and maintenance/repairs, etc.
  - Timeline: Ongoing.
- 4) Reassess needs and implementation at least once every five years.
  - Timeline: Years 3-5.
  - Deliverable: Periodic report.
- 5) Develop strategies to increase efficiency of offshore water quality monitoring networks.
  - Timeline: Ongoing.
  - Prospective Partners: Regional academic institutions, DEP, FWC, NOAA.
  - Deliverable: Obtain funding and implement changes.

**Objective C.C.O.W.4. Improve marine debris removal programs, especially for abandoned and derelict vessels, traps, equipment, and navigation hazards.**

**Action CCOW4A:** Increase inter-state communication between agencies to aid in identification of owners of abandoned or derelict vessels.

**Implementation Steps:**



- 1) Compile list of State and Federal agencies (including agencies outside of environmental realm such as Revenue and Commerce) with vessel removal programs and create a database including existing enforcement capabilities in each state and across state lines.
  - Timeline: Years 1-2.
  - Prospective Partners: USCG, FWC, USACE, State CZ programs, Sea Grant, Abandoned/derelect vessels- FWC and FIND have grant programs for this, Law Enforcement Agencies, state DNR (or equivalent), NOAA SE Atlantic Marine Debris Initiative, University with state & federal assistance.
  - Deliverable: Updatable manual/document.
  - Ongoing/Complementary Efforts: The House amended, approved, and sent to the Senate H.3287, regarding ABANDONED WATERCRAFT. This bill adds that an abandoned watercraft may be removed, at the risk and expense of the owner, and disposed of by a governmental entity that has jurisdiction over the area where the abandoned watercraft is located. Any watercraft abandoned for at least ninety days may be claimed by any person or entity as abandoned property. NC been working of legislation identifying boat owners as responsible- NC contact: Lisa Shevantato, NC Sea Grant coastal law & policy, NERRs doing monofilament line recycle, FWC has an At-Risk Vessel Program (a database), and works in partnership with other state departments.
  - Comments/Resource Needs: FWC-Derelect Vessel Removal Grant Program/At-Risk Vessel Program (statewide database).
  
- 2) Develop and implement a MOU between responsible agencies to encourage cooperation in determining ownership of abandoned or derelect vessels.
  - Timeline: Years 2-4.
  - Prospective Partners: State CZ programs, Law enforcement agencies, state DNR (or equivalent).
  - Deliverable: Signed MOU.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs: Utilize existing MOUs in other regions as a template/example.
  
- 3) Research legislative or local ordinance changes that would facilitate the ability for the appropriate agency to place burden of vessel removal on vessel owner through ties to other state licenses (i.e., drivers license).
  - Timeline: Years 2-5.
  - Prospective Partners: DEP CAMA, FWC, DNR agencies (or equivalent), law interns from state universities, University(s) with state & federal assistance.
  - Deliverable: Hold a workshop to discuss all of the above.

**Action CCOW4B**: Establish a sampling program to estimate the baseline density of marine debris on the shoreline, within open waters, and in submerged habitats, be capable of detecting significant change at broad and fine scales, and adapt or improve existing marine debris projects to provide complementary data.

### **Implementation Steps:**

- 1) Develop a classification system, including definitions, to distinguish types of marine debris as well as level of imminent threat to health or environment.
  - Timeline: Years 1-3.
  - Prospective Partners: State CZ programs, Sea Grant, DEP, CRCP, FWC, DEP-CAMA, NOAA SE Atlantic Marine Debris Initiative, Universities, River Keepers, Research Councils.
  - Deliverable: Published classification system.
  - Ongoing/Complementary Efforts: Utilize NC Big Sweep information and program- uses volunteers to conduct clean ups and publicize need for proper management of trash and garbage. Several years of data on

amounts collected that can be used in public information documents. Contact: Judy Bolin, President of Big Sweep.

- Comments/Resource Needs: Utilize existing programs in other regions/states as template/example.
- 2) Document man-made navigational hazards via GPS and classification system into shared database accessible by all local and regional governments.
    - Timeline: Years 2-5.
    - Prospective Partners: USCG, State CZ programs, Sea Grant, DEP, CRCP, FWC, DEP-CAMA, responsible agency in each state (GA DNR), and NOAA SE Atlantic Marine Debris Initiative.
    - Deliverable:
    - Ongoing/Complementary Efforts: Georgia online mapped database (was being updated until funding removed but database still exists).
    - Comments/Resource Needs:
  - 3) Investigate on-line mapping tools, (such as Georgia's online mapping tool) to summarize data collected and provide the data to the public in a web based format.
    - Timeline: Years 2-4.
    - Prospective Partners: State CZ programs, Sea Grant, DEP, CRCP, FWC, DEP-CAMA, NOAA SE Atlantic Marine Debris Initiative, and NOAA CSC.
    - Deliverable: Online tool that is consistent through SAA region.
    - Ongoing/Complementary Efforts: Georgia online mapped database (was being updated until funding removed but database still exists).
    - Comments/Resource Needs: Funding for outside contract.
  - 4) Coordinate partnership and reporting database by Federal (e.g. US Coast Guard), Regional (e.g. River Keepers), State (e.g. OCRM, SCDNR) and Local agencies (e.g. County Law Enforcement).
    - Timeline: Ongoing.
    - Prospective Partners: State CZ programs, Sea Grant, DEP, CRCP, FWC, and DEP-CAMA.
  - 5) Utilize database during Beach Sweep, Earth Day and similar activities for focused and coordinated removal of areas of heavy impact.
    - Timeline: Ongoing.
    - Prospective Partners: State CZ programs, Sea Grant, DEP, CRCP, FWC, and DEP-CAMA.
  - 6) Utilize database with entities needing environmental restoration credits or other credits to meet regulatory requirements for coordinated removal of areas of heavy impact.
    - Timeline: Ongoing.
    - Prospective Partners: State CZ programs, Sea Grant, DEP, CRCP, FWC, DEP-CAM, USACE, state permitting agencies, state mitigation programs.
  - 7) Develop a regional Model Marine Debris Removal Program and Model Comprehensive Prioritization Tool that can be implemented throughout the region to identify funding mechanisms and priority rankings for marine debris removal programs.\*
    - Timeline: Years 2-5.
    - Prospective Partners: State CZ programs, Sea Grant, DEP, CRCP, FWC, DEP-CAMA, Work with a consulting firm, state DNR agencies, NOAA SE Atlantic Marine Debris Initiative, NOAA CSC.

- Comments/Resource Needs: Funding for consulting contract, Utilize existing programs in other states/regions as a template/example.

\*These should be included in the program and tool: 1) Vessel owner becomes responsible party to remove offending vessel or face enforcement actions; if not, removal is done and billed back to vessel owner at increased rate to help fund removal of vessels with no owner determination. 2) If no vessel owner can be determined, classification system and prioritization tool would determine whether it should be removed or left as artificial reef or growth structure for shellfish.

**Action CCOW4C**: Develop educational materials on the ramifications of marine debris of all sorts, both from direct and indirect inputs.

### **Implementation Steps:**

- 1) Develop a prototype for a marine litter educational component that can be used in K-12 curriculum and community outreach.
  - Timeline: Years 2-4.
  - Prospective Partners: FWC, DEP, USCG, State CZ programs, Sea Grant, CRCP, FWC, DEP-CAMA, Universities (GA Marine Extension), NOAA SE Atlantic Marine Debris Initiative.
  - Deliverable:
  - Ongoing/Complementary Efforts: NCDCM has some materials that may be useful including a Boaters Guide that is complete just working on getting funding to print. Developed using Coastal NPS funds. Contact: Pat Durrett, DCM, "The Educator's Guide to Marine Debris : Southeast and Gulf of Mexico" (2009) was produced by the COSEE Southeast Program; FWC currently has a Monofilament Recovery & Recycling Program that focuses on education and coordinated clean-up efforts.
  - Comments/Resource Needs: Need funding to develop educational component.
- 2) Investigate and encourage most appropriate method for inclusion of marine debris education into steps required to obtain boat registration, renewal, and fishing license.
  - Timeline: Years 1-3.
  - Prospective Partners: FWC, DEP, USCG, State CZ programs, Sea Grant, CRCP, FWC, DEP-CAMA, State agencies (GA DNR Law Enforcement), NOAA SE Atlantic Marine Debris Initiative.
- 3) Continue to develop and enhance Clean Marina Programs throughout region.
  - Timeline: Ongoing.
  - Prospective Partners: FWC, DEP, USCG, State CZ programs, Sea Grant, DEP-CAMA, NERRS, Responsible agency in each state, NOAA SE Atlantic Marine Debris Initiative.
  - Comments/Resource Needs: Need funding to enhance program in Georgia.
- 4) Educate public on effects of terrestrial litter impact on rivers and eventually oceans via media campaign and school classroom activities. This can also be coordinated with the non-point source pollution entering the water bodies.
  - Timeline: Ongoing.
  - Prospective Partners: SJRWMD, SFWMD, FWC, DEP, Coast Guard, State CZ programs, Sea Grant, CRCP, DEP-CAMA, NERRS, Universities, local education groups.
  - Deliverable: Developed media campaign and schedule of outreach events; development of classroom activities.
  - Comments/Resource Needs: Need funding to develop media campaign and classroom activities.

## Disaster Resilient Communities

*Objective D.R.C.1. Conduct regional and state-specific vulnerability assessments of: a) public infrastructure, social assets, and economies to hazards and climate change (including sea-level rise) and b) natural processes and features that support resilience, including economic valuation of these ecosystem services.*

**Action DRC1A:** Identify and evaluate alternative approaches to “risk assessments” for state hazard mitigation planning with consideration of unique socioeconomic and natural resources in the South Atlantic Alliance region.

### **Implementation Steps:**

- 1) Conduct an analysis of present approaches: Geographic scope (State/local) State CZM boundaries; hazards identified; methods used; outcomes: identification of commonalities/differences/regional context/deficiencies and identification of best practices for risk assessments in state and local hazard mitigation plans (HMPs), as well as international best practices. Work with new FEMA-sponsored “Risk Map” coordinators in each state to determine best practices and available datasets for integrated coastal risk assessments.
  - Timeline: 2 years.
  - Prospective Partners: To be determined through RFP; State EMDs and CZM programs; Sea Grant and NERRs; FEMA; NOAA.
  - Deliverable: Report (including recommendations) and outreach activities.
  - Ongoing/Complementary Efforts: Ongoing, quarterly HMP Intergovernmental Coordination Committee meetings within each state to prepare for next update to state HMPs.
  - Comments/Resource Needs: Important to consider local level HMPs and who sets standards for local HMPs. Are standards the same across the states? Do all states have Risk Map Coordinators?

**Action DRC1B:** Enhance pilot initiatives to integrate sea-level rise into state and local hazard mitigation plans.

### **Implementation Steps:**

- 1) Identify existing efforts, methods used, legal & regulatory frameworks. Work with FEMA and state EMDs to assess existing state-approved (or sanctioned) sea-level rise projections, the utility of state-scale projections, and policy/regulatory implications. Make recommendations for state and local policy and planning changes.
  - Timeline: 2-3 years.
  - Prospective Partners: To be determined through RFP; State EMDs and CZM programs; Sea Grant and NERRs; FEMA; NOAA.
  - Deliverable: Report/Outreach Activities; recommendations/justification/approach.
  - Ongoing/Complementary Efforts: Sea-level rise studies/planning efforts in each state; HMP updates.
  - Comments/Resource Needs: Need to involve experts in risk assessments, sea-level rise, and coastal climate change adaptation; HMP; law; local governance / public policy; planning.

**Action DRC1C:** Develop a regional strategy for economic valuation of ecosystem services for both general characterizations and case-by-case decision making.

### **Implementation Steps:**

- 1) Identify range of coastal ecosystem services in South Atlantic region. Determine “snapshot” economic values. Review ongoing and completed work in ecosystem services valuation, particularly at universities and in private sector. Evaluate utility of economic analysis in case-by-case decision-making by conducting decision analysis. Evaluate utility of economic analysis in coastal land use planning.

- Timeline: 2 years.
- Prospective Partners: To be determined through RFP.
- Deliverable: Report, decision support tool, extension activities.
- Ongoing/Complementary Efforts: Much has been done, but not aware of ongoing research – NOAA CSC; academia; private sector.
- Comments/Resource Needs: Various measures/methodologies already exist for valuation, and have gained a measure of acceptance in environmental economics. What is mostly needed is a good researcher to find what is out there and draft a regional strategy. University or private sector partners? Consultant? Graduate students?

**Action DRC1D (supplemental action)**: Identify gaps in regional risk assessments with a particular focus on earthquakes and tsunamis.

### **Implementation Steps:**

- 1) Compile a regional inventory of current regional and state-specific vulnerability assessments. Analyze the inventory and build on this to create a regional approach. Develop regional standards or “best practices” for local-level risk assessments and mitigation plans.

- Timeline: 1 year.
- Prospective Partners: To be determined through RFP; State CMPs; State Geologists / Geological Survey.
- Deliverable: Report on earthquake and tsunami risk in SA region.
- Ongoing/Complementary Efforts: Seismology studies? Regional / local risk assessments focusing on earthquakes and tsunamis?
- Comments/Resource Needs: Want to have a degree of confidence. Does this region have a regional risk assessment from which to measure gaps?

*Objective D.R.C.2. Develop and implement adaptation and mitigation strategies for climate change impacts (including sea-level rise), with plans for retreat of natural and human communities.*

**Action DRC2A**: Identify and characterize the full range of potential climate impacts on coastal and ocean resources in the South Atlantic Alliance Region.

### **Implementation Steps:**

- 1) Assemble existing programs, studies and data related to climate changes and coastal impacts from the region – leverage NOAA Climate Services or Adaptation web portal.

- Timeline: 1-2 years.
- Prospective Partners: To be determined through RFP; State CZMs (climate/SLR lead) & academic/research partners, including NCDC, NOAA RISAs, DOI Climate Science Centers, and NOAA Regional Climate Centers.
- Deliverable: glossary of impacts.
- Ongoing/Complementary Efforts: NC SLRRMS (due fall 2011); NC LCGCC 2010 Report; NC CHPP 2010; SC-DHEC Guidance on Near-Term Adaptation Priorities (spring 2012); US Global Change Research Program National Climate Assessment.
- Comments/Resource Needs: glossary might not be sufficient if we’re tackling all of climate change. May also need some narrative to provide some background, additional detail, explanations of linkages and uncertainties, etc. Include a description of federal programs that help or hinder adaptation and examples of other state and local adaptation efforts. GSAA can be a vehicle for seeking changes at the federal level.

**Action DRC2B**: Develop standards, best practices, and adaptation options for addressing sea-level rise at the regional, state and local level.

### **Implementation Steps:**

- 1) Develop a SAA regional focus for the NOAA Digital Coast website. Develop a guidance document for coastal adaptation planning by state and local governments in the South Atlantic Alliance Region that builds on NOAA's recent Adaptation for Coastal Managers guidance document, and on existing state and local adaptation plans and studies, standards or best practices for regional, state, and local-level sea-level rise vulnerability analyses.
  - Timeline: 3 years.
  - Prospective Partners: To be determined through RFP; State CMPs; local governments; NOAA; EPA; Sea Grant; USACE; RISAs.
  - Deliverable: Scenario-based assemblage of options, including economic, ecological, geological analysis. Gap analysis report. Recommendations for establishing and sustaining regional linkages.
  - Ongoing/Complementary Efforts: NC SLRRMS; NC DCM; NOAA Adaptation Guide; FL inventory (pending); FL Community Resiliency Project (309 proposed); GA Adaptation Guidance Document (proposed).
  - Comments/Resource Needs:

**Action DRC2C:** Improve understanding of socioeconomic vulnerabilities and perceptions, with a particular focus on human responses to chronic erosion and storm events.

### **Implementation Steps:**

- 1) Perform needs assessment at state and local level to determine existing perceptions of socioeconomic vulnerabilities to chronic erosion and storm impacts.
- 2) Establish broad marsh accretion (SET stations), shoreline change, and sea-level rise monitoring networks to collect data to support increased understanding of changes and effects.
- 3) Acquire high resolution, merged topo-bathy imagery for coastal zone and produce visualizations for public education.
- 4) Using the tailored model created in the action above, conduct a region-wide socioeconomic vulnerability assessment for sea-level rise impacts that takes advantage of efforts at the state and local levels.
- 5) Develop a regional social marketing plan to improve understanding of vulnerabilities and human responses.
  - Timeline: 3-5 years.
  - Prospective Partners: To be determined through RFP; state CMPs; NOAA (especially CSC).
  - Deliverable: Baseline perceptions and needs report (should also reveal gaps in data availability and education); regional standards for selecting SLR scenarios; expanded SET stations and monitoring capacity; topo-bathy maps and visualizations; vulnerability assessment report; social marketing plan.
  - Ongoing/Complementary Efforts: Sea Grant 4-state pilot program to look at focused climate-related issues, primarily SLR. NC SLRRMS.
  - Comments/Resource Needs:

**Action DRC2D:** Improve upon/tailor existing habitat-oriented sea-level rise model including recent National Centers for Coastal Ocean Science (NCCOS) studies in North Carolina and US Fish and Wildlife Services (USFWS) Sea Level and Marshes Model (SLAMM) modeling for use in the South Atlantic Region.

### **Implementation Steps:**

- 1) Project/model human responses to inundation/erosion/storms under different scenarios.
- 2) Conduct economic analysis of "tipping points" that could make engineered responses unsustainable for communities with a certain tax base (absent state and federal support).
- 3) Improve understanding of how different groups perceive tradeoffs between loss of public trust (intertidal) lands and property loss.
- 4) Explore environmental justice issues in relation to sea-level rise and other climate-related vulnerabilities in the South Atlantic Region.



- Timeline: 2-3 years.
- Prospective Partners: To be determined through RFP; USFWS Landscape Conservation Cooperatives; State CMPs; NOAA; Sea Grant, NERRS, AP3C.
- Deliverable: Region-specific enhancements to existing habitat models. Tipping point analysis of engineered adaptation options. Reports/publications based on regional surveys of human perceptions and willingness to pay. Environmental justice report based on case law and existing work.
- Ongoing/Complementary Efforts: SoVI; NC SLRRMS.
- Comments/Resource Needs:

***Objective D.R.C. 3. Improve post-disaster redevelopment planning for coastal communities, including infrastructure and business continuity.***

**Action DRC3A**: Evaluate nationwide Post-Disaster Redevelopment Planning initiatives (e.g., Florida) to improve understanding of post-disaster redevelopment options.

**Implementation Steps:**

- 1) Review Post-Disaster Redevelopment Planning Processes and inventory what has been done throughout all of the states.
- 2) Hold regional summit to improve understanding of post-disaster redevelopment options.
- 3) Compile an online database of tools and resources with a forum for discussion that could be used to help with post-disaster redevelopment planning.
- 4) Explore land use change analysis and planning tools that could be used during the post-disaster redevelopment process, and implications for implementation.
- 5) Examine current federal recovery resources and evaluate any barriers or obstacles that they present and offer ways to better coordinate with them through the states.

- Timeline: 1 year.
- Prospective Partners: State EMDs; State CMPS; State DNRs; Long-term Recovery Organizations (LTROs)
- Deliverable: Inventory; Summit invitation; online database and forum for discussion; report that explores land use change analysis and planning tools; a white paper that explores barriers to recovery resources and ways to better coordinate.
- Ongoing/Complementary Efforts: GA will begin PDRP through NOAA 309 Strategy, incorporating sea level rise. Florida will complete their PDRP effort in 2012.
- Comments/Resource Needs:

**Action DRC3B**: Develop guidance to improve redevelopment considerations in state and local hazards mitigation plans and local comprehensive and growth management plans.

**Implementation Steps:**

- 1) Coordinate with Emergency Support Function (ESF)-14, guidance focused on long-term recovery at the Federal and State level.
- 2) Meet with FEMA Region 4 and Headquarters to discuss how to better coordinate with ESF-14.
- 3) Evaluate state growth management laws, state hazard mitigation plans and federal hazard mitigation laws to create a framework for Post-Disaster Redevelopment Planning that connects the local, state and federal post-disaster redevelopment planning processes.
- 4) Develop guidance on how to best coordinate these efforts.
- 5) Evaluate RiskMAP as a tool for post-disaster redevelopment planning efforts.

- Timeline: 1 year.
- Prospective Partners: State EMDs; State Land Planning Agencies; State CMPs; FEMA Region 4; LTROs.

- Deliverable: Report evaluating current ESF-14 and National Disaster Recovery Framework, Meeting invitation to FEMA Region 4 and Headquarters, Report on state and federal laws and plans, Guidance on how to best coordinate these efforts, Report on how RiskMAP could be used to compliment PDRP.
- Ongoing/Complementary Efforts: State of Florida Integration of Hazard Mitigation into Growth Management 2006 Project; APA PAS Report 560, 483/484 and upcoming PAS report.
- Comments/Resource Needs:

**Action DRC3C**: Explore short-term economic recovery aspects of long-term redevelopment, and opportunities to create partnerships in support of local business recovery.

#### **Implementation Steps:**

- 1) Evaluate successful public-private partnerships.
  - 2) Evaluate current tools available for this collaboration and their effectiveness (i.e. Business Continuity Information Network – BCIN).
  - 3) Create Guidance on what a successful partnership may look like in organization and practice.
  - 4) Begin to forge regional state collaborative efforts on sectors of the economy (i.e. tourism, water-related, etc.) that span all states and ways to leverage opportunities for expedited recovery.
- Timeline: 1 year.
  - Prospective Partners: State EMDs, State Economic Development Agencies, State CMPs, Regional Economic Development Alliances, Universities, LTROs.
  - Deliverable: Guidance document; collaborative workshop.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

**Objective D.R.C. 4**. *Create and employ incentives for locating and relocating development away from high risk areas, minimizing subsidization of development in high risk areas, and reevaluating of building standards (flood, storm, wind).*

**Action DRC4A**: Identify the most vulnerable areas along the coast and improve understandings of incentives and disincentives for development in those areas.

#### **Implementation Steps:**

- 1) Create a map of high-vulnerability areas.
  - 2) Create an inventory of all federal, state and local incentives and disincentives that direct populations away from high risk areas (or subsidize development in those areas) and analyze each for application in other states.
  - 3) Compile a database of funding sources for relocating development away from high risk areas and/or create a regional mechanism to support these types of activities.
  - 4) White paper for CMPs and local governments on avoiding/relocating from high risk areas.
- Timeline: 2-3 years.
  - Prospective Partners: To be determined through RFP; State CMPs, FEMA/NFIP, State EMDs, State Insurance Commissions
  - Deliverable: Vulnerability map; White Paper, including inventory & database
  - Ongoing/Complementary Efforts: NC SLRRMS; FEMA flood mapping; GA SLAMM
  - Comments/Resource Needs:

**Action DRC4B**: Conduct regional legal and economic analysis of the full range of federal, state, and local subsidies, issues related to withdrawal of public subsidies, and analysis of past property relocations and related incentives/disincentives.

### **Implementation Steps:**

- 1) Action is implementation step.
  - Timeline: 2 years.
  - Prospective Partners: To be determined through RFP; State CMPs.
  - Deliverable: Report with recommendations.
  - Ongoing/Complementary Efforts:
  - Comments/Resource Needs:

**Action DRC4C:** Develop a Regional Social Marketing Strategy to look at current barriers to relocation and develop a targeted strategy for the public and elected officials that makes adaptation strategies such as retreat and relocation a more feasible option.

### **Implementation Steps:**

- 1) Assess present owners' interest in future relocation strategies and financial options and conduct outreach training to decision-makers and the public.
- 2) Prepare wants & needs assessment of stakeholders to be used in crafting social marketing strategy.
- 3) Develop social marketing strategy to be implemented by State and local governments.
  - Timeline: 2-3 years.
  - Prospective Partners: To be determined through RFP; State CMPS; NOAA; local governments.
  - Deliverable: Market assessment & marketing strategy, including specific tools applicable at the State and local levels.
  - Ongoing/Complementary Efforts: NOAA CSC social marketing program. FL developing social marketing proposals. FL Sea Grant making social marketing a priority.
  - Comments/Resource Needs:

**Action DRC4D:** Explore building standards and incentives that allow options for sheltering in place, vertical evacuation, and commercially feasible homeowner mitigation improvements.

### **Implementation Steps:**

- 1) Conduct audit and comparative analysis of state and federal building standards and incentives.
  - Timeline: 2 years.
  - Prospective Partners: State CMPS; State Building Code Councils; FEMA/NFIP; Federal Alliance for Safe Homes (FLASH); Institute for Business and Homes Safety (IBHS); Public Entity Risk Institute (PERI).
  - Deliverable: Guidance document for communities and homeowners; recommendations for building code and insurance agencies.
  - Ongoing/Complementary Efforts: Fortified for Safer Living (IBHS).
  - Comments/Resource Needs:

**Objective D.R.C. 5. Consider management and financial options for addressing short and long-term beachfront and estuarine shoreline migration.**

**Action DRC5A:** Model future shoreline migration patterns given present and future development and shoreline protection scenarios.

### **Implementation Steps:**

- 1) Review and synthesis of state-based shoreline change projections, growth projections, existing data on shoreline alterations, projections of demand for shoreline stabilization, and alternative projections of relative sea-level rise.

- Timeline: 2 years.
  - Prospective Partners: To be determined through RFP; Sea Grant; State CZM programs (core role); USACE; EPA; NOAA; NERRs; universities (for growth projections and economic models – demand for shoreline stabilization will depend on public works, maintenance, property values, etc.); private sector.
  - Deliverable(s): Report, visualizations, extension activities.
  - Ongoing/Complementary Efforts: Ongoing efforts by state CZM programs; recent academic work by Titus et al. and several others (NY example).
  - Comments/Resource Needs: This activity addresses a core role of CZM and an opportunity for improved collaboration across states and between state and federal agencies. As such, funds will be needed to directly support state coastal zone management program staff in addition to the issuance of any broader RFP.
- 2) Develop a tool to model “build-out” scenarios for shoreline alteration and potential intertidal habitat loss over next 50, 100 years.
- Timeline: 3-5 years.
  - Prospective Partners: RFP.
  - Deliverable: Tool.
  - Ongoing/Complementary Efforts: SC developing pilot shoreline reports for coastal communities (similar to Virginia and Maryland). GA provided tool to local governments: AMBUR (digitally measuring and evaluating shoreline change, beachfront and estuarine). AMBUR can be adapted to other states.
  - Comments/Resource Needs:

**Action DRC5B**: Develop regional standards or best practices for monitoring and mapping beachfront and estuarine shoreline changes for the purpose of targeting specific areas for management responses.

### **Implementation Steps:**

- 1) Develop/improve upon beachfront and estuarine shoreline digitization, change analyses (e.g. DSAS), and economic/natural resource vulnerability assessments.
- Timeline: 2 years.
  - Prospective Partners: State CZMs; NERRs; local governments, NOAA, academia; private sector, Sea Grant.
  - Deliverable: Vulnerability analysis protocol, extension activities.
  - Ongoing/Complementary Efforts: Existing SAA pilot proposal. Leverage existing shoreline mapping efforts underway by SAA states.
  - Comments/Resource Needs:
- 2) Develop guidebook and decision support tool to help local governments define and identify areas for management responses.
- Timeline: 3 years.
  - Prospective Partners: State CZMs; academia; NOAA; NERRS; local governments; private sector; Sea Grant.
  - Deliverable: decision support tool, guidebook.
  - Ongoing/ Complementary Efforts: Titus, NCSLRRMS.
  - Comments/Resource Needs:

**Action DRC5C**: Compile research and examine differences in “retreat” and shoreline and land use policies across the South Atlantic Alliance region, including lessons learned from case law.

### **Implementation Steps:**

- 1) Identify and compare state and local beachfront policies for retreat/abandonment; relevant case law; and inventory the full range of potential legal and policy mechanisms available to achieve “managed retreat” in the U.S.
  - Timeline: 2 years.
  - Prospective Partners: To be determined through RFP; should include legal scholars, economists, and policy experts.
  - Deliverable: Report and outreach activities.
  - Ongoing/Complementary Efforts: Recent report by Clemson University for SCDHEC-OCRM.
  - Comments/Resource Needs: Need to focus on out-of-the-box, market-based mechanisms such as reverse mortgages, purchase of rolling easements, etc., and include economic analysis of implications of various approaches in the South Atlantic region.

**Action DRC5D (supplemental action)**: Explore long-term potentials for "living shorelines" or alternatives to traditional bulkheads for erosion control.

### **Implementation Steps:**

- 1) Categorize, inventory, and evaluate all existing demonstration projects and cases where alternatives to traditional bulkheads have been implemented for shoreline stabilization in each state.
- 2) Synthesize existing guidance related to living shorelines from NC, MD, and elsewhere.
- 3) Conduct state-by-state policy analysis to determine regulatory gaps/hurdles at state and local levels.
- 4) Conduct surveys of regulated community to determine perceived and real obstacles.
- 5) Develop recommended improvements to state and local policies.
  - Timeline: 3 years.
  - Prospective Partners: State CZM programs; Sea Grant; NERRs; academia; private sector.
  - Deliverable: Report and extension activities.
  - Ongoing/Complementary Efforts: NC guidance; policy analysis by SC Shoreline Change Advisory Committee; GA inventory of shoreline alterations under EPA Wetlands Enhancement Grant.
  - Comments/Resource Needs:

## SAA Implementation Plan - Acronyms

ADMi	
AIWA	Atlantic Intracoastal Waterway Association
AP3C	
APNEP	Albemarle Pamlico National Estuarine Program
ACFHP	
ASMFC	
ASTHO	Association of State and Territorial Health Officials
BOEMRE	Bureau of Ocean Energy, Regulation and Enforcement
BJWSA	Beaufort Jasper Water & Sewer Authority
CAIP	
CAMA	Coastal and Aquatic Managed Areas
CHPP	Coastal Habitat Protection Plan
COSEE	Center for Ocean Sciences Education Excellence
CRCP	Coral Reef Conservation Program
CSC	Coastal Services Center
CTP	Coastal Training Program
CZM	Coastal Zone Management
DCA	Department of Community Affairs
DEP	Department of Environmental Protection
DOI	Department of Interior
DOT	Department of Transportation
EMD	Emergency Management Division
EPA	Environmental Protection Agency
EPT	Executive Planning Team
FEMA	Federal Emergency Management Agency
FEP	
FERC	Federal Energy Regulatory Commission
FIND	Florida Inland Navigation District
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	
GA EPD	Georgia Environmental Protection Division
GSAA	
GSARP	Gulf and South Atlantic Regional Partnership
HMP	Hazard Mitigation Plan
HUC	
ICCE	Integrative Collaboration on Climate and Energy
IPCC	
LCC	
LCGCC	
LTRO	Long-term Recovery Organization
MARCO	
NaCO	
NACCHO	National Association of County and City Health Officials
NAWQA	National Water Quality-Assessment Program
NCCHPP	
NCDCM	North Carolina Division of Coastal Management
NCDENR	North Carolina Department of Environment and Natural Resources



NCDWQ	North Carolina Division of Water Quality
NCSHA	
NEP	
NERRS	National Estuarine Research Reserve System
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRDA	Natural Resource Damage Assessment
PDRP	
RISA	
SAFMC	
SALCC	
SARP	Southeast Aquatic Regional Partnership
SARRP	South Atlantic Regional Research Partnership
SCDNR	South Carolina Department of Natural Resources
SCDHEC	South Carolina Department of Health and Environmental Control
SCDOT	South Carolina Department of Transportation
SEA	
SECART	Southeast and Caribbean Region Team
SECOORA	Southeast Coastal Ocean Observing Regional Association
SERAP	
SE EPPC	
SERPPAS	Southeast Regional Partnership for Planning and Sustainability
SERTC	Southeast Regional Taxonomic Center
SFWMD	South Florida Water Management District
SJRWMD	Saint Johns River Water Management District
SLAMM	
SoVI	
TNC	The Nature Conservancy
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey