

**Climate Ready Estuaries
A Blueprint for Change
Nicholas Institute for Environmental Policy Solutions
Duke University
Bulleted Summary of Recommendations
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Improve climate change monitoring, mapping, and modeling of the region

- *The APNEP Policy Board_ should recommend improved monitoring and mapping of sea-level rise.*
- *The APNEP Policy Board_ should recommend expansion of the State Climate Office's ECONet climate monitoring stations in the region.*

Measure the value of coastal ecosystems, economies, and communities

- *The APNEP Policy Board_ should ask North Carolina Department of Environment and Natural Resources (DENR), North Carolina Department of Commerce, U.S. Environmental Protection Agency (EPA), other federal agencies, scientists, and economists to periodically measure the ecosystem services produced and consumed in the Albemarle-Pamlico region and their value to the state's economy and to coastal communities in coordination with APNEP's Comprehensive Conservation Management Plan (CCMP) and Ecosystem-based Management Plan.*
- *The APNEP Policy Board_ should ask scientists and economists to evaluate the potential economic costs and benefits of both preventing emissions of greenhouse gases due to the conversion of salt marshes and other coastal habitats and of sequestering carbon by restoring salt marshes and coastal habitats.*

Develop maps to help the region protect its drinking water from the impacts of climate change.

- *The APNEP Policy Board_ should ask the local water utilities, Division of Water Resources, Division of Environmental Health, EPA, university scientists, and others to develop a regional groundwater monitoring and modeling program for the region.*
- *The APNEP Policy Board_ should ask Division of Environmental Health, Division of Emergency Management, and Center for Geographic Information and Analysis to develop detailed maps to help local water utilities and state regulatory and funding agencies evaluate the risk to drinking water infrastructure posed by sea-level rise.*

Develop maps that identify risk to existing septic tanks and waste water infrastructure to protect public health and water quality

- *The APNEP Policy Board_ should ask Division of Water Quality, Division of Environmental Health, Division of Emergency Management, and Center for Geographic Information and Analysis to develop detailed maps to help county health departments, local wastewater utilities, and state regulatory and funding agencies to evaluate the risk to existing septic tanks and wastewater infrastructure posed by sea-level rise.*

Drainage and water management

- *The APNEP Policy Board_ should convene Division of Water Quality, Division of Soil and Water Conservation, Division of Emergency Management, Department of Transportation, Center for Geographic Information and Analysis, local soil and water conservation districts, local drainage districts, federal land managers, resource agencies, and others to increase state and local knowledge of water management in the*

Albemarle-Pamlico peninsula and to begin development of a more comprehensive water management system for the region.

Determine agency roles and responsibilities

- *The APNEP Policy Board_ should ask DENR to designate APNEP as the lead state agency coordinating, directing, and prioritizing state and federal nonregulatory technical and financial assistance to help protect and restore the ecosystems, economy, and communities in the region from climate change and sea-level rise. Directing demonstration projects toward priority areas of Coastal Habitat Protection Plan's and SHA's managed by DCM are good examples of ways that APNEP can help to shepherd change.*

Establish and coordinate goals with other agencies

- *The APNEP Policy Board_ should review these and other recommendations and set interim goals for its climate ready estuary program.*

Integrate state programs to protect and restore living ecosystems and shorelines

- *The APNEP Policy Board should ask DENR to update the Coastal Habitat Protection Plan (CHPP) to identify and prioritize estuarine shorelines for protection and restoration. APNEP should sponsor living shoreline restoration projects where local governments lack the capacity to plan and manage them. APNEP could develop the science and site-specific information to expedite the permitting of living shoreline projects for both communities and individuals. APNEP should work with local governments to develop policies that protect living shorelines and that protect valuable waterfront properties and local property tax revenues.*

Develop, implement and sustain a communications plan.

- *DENR should designate a lead state agency to coordinate the development and implementation of a communications strategy to educate the public and decision makers about sea level rise and climate change. The APNEP Policy Board and the DENR Office of Public Affairs should convene key state, federal, local, university, and private organizations to develop a communications plan.*

Help pilot communities adapt

- *The state should provide technical and financial assistance to municipalities and communities that are planning for and adapting to climate change and sea-level rise. **The APNEP Policy Board_** should convene state agencies that provide technical and financial assistance to local governments and develop a "climate ready communities" pilot program.*

Engage insurance and markets

- *The APNEP Policy Board_ should ask the Commissioner of Insurance, National Flood Insurance Program, Division of Emergency Management, private insurance companies, and others to work together to manage risks, mitigate hazards, and maintain affordable property insurance for the residents of the region and the state.*

Be an advocate for the Albemarle-Pamlico region

- *The Albemarle-Pamlico National Estuary Program (APNEP)_ should educate state, federal, and local decision makers and the public on the value and importance of the ecosystems and economy (what's at stake) to the state and nation and advocate on behalf of the region.*

Conclusion

The citizens and local officials of the Albemarle-Pamlico region need the **best available information** about climate change, sea-level rise, and risk to their property, their communities, and their infrastructure. They also need the best available information about how they can protect their region. They deserve effective **governance** by state, local, federal, and private agencies with clear roles and responsibilities. They deserve transparency and accountability. They need technical and financial resources to **implement** the policies and projects that will protect and restore their estuary, their communities, and their economy.