



DIRECTOR'S NOTE

Fall greetings,

Over the summer we have enjoyed seeing many of our projects come to fruition, and with fall we look forward to beginning new initiatives and funding more great work throughout the region. Perhaps most significantly, we recently completed our multi-year SAV mapping project, which documented 137,000 acres of this precious habitat in the Albemarle-Pamlico estuary. The [map](#) marks a significant step in protecting SAV and also gives our regional scientists an excellent indicator for the health of the estuary.

On a more somber note, we continue to follow developments in the aftermath of Hurricane Irene. Many coastal residents are still recovering from the storm, while cities and counties of the region consider steps they can take to rebuild and prepare for the future. A new EPA/APNEP initiative will provide technical and scientific support for coastal water utilities as they plan for future storms, flooding, and eventual sea level rise. We hope to see water infrastructure become more resilient as a result of these efforts, and ultimately withstand the inevitable next storm.

Finally, we are looking forward to the [State of the Sounds: Charting a New Course symposium](#) in New Bern on November 17, which promises to be a landmark occasion for APNEP. We will release our preliminary "State of the Sounds" ecosystem assessment report and discuss our draft ecosystem-based Comprehensive Conservation and Management Plan. Please [register](#) if you have not already; we will look forward to seeing you there.

- Dr. Bill Crowell, APNEP Director

FIRST EVER SAV MAP COMPLETED FOR REGION

APNEP recently announced the completion of a submerged aquatic vegetation [map](#) for the Albemarle-Pamlico region and the North Carolina coastline, the result of a multi-year partnership effort conducted by several state and federal agencies.

Submerged aquatic vegetation, or SAV, provides an important ecological habitat along North Carolina and Virginia's shorelines. Many fish or shellfish in our estuary are dependent on this habitat during some phase of their life. As a result, this habitat directly supports recreational and commercial fisheries in North Carolina and along the east coast. These industries contribute \$1.75 billion dollars and 24,000 jobs annually to North Carolina's economy.

Because of its importance to fisheries and overall aquatic health, environmental economists conservatively estimate that SAV habitats can be valued at \$12,000 per acre per year, with some estimates being much higher. In total, 137,000 acres of SAV were mapped in the Albemarle-Pamlico estuary.

Fish, scallops and blue crabs rely on SAV in multiple ways. The vegetation can serve as a source of food, a place to hide from larger predators, or a meeting place to reproduce. SAV produces dissolved oxygen that helps prevent fish kills, and it also takes in excess nutrients that can harm estuarine waters.

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SAV habitat on the soundfront at the Outer Banks Center for Wildlife Education in Corolla, NC.

AT THE WATER'S EDGE TEACHER INSTITUTE

This past July, APNEP again teamed up with the N.C. Office of Environmental Education and the Environmental Education Fund to host its signature event for educators. In support of APNEP's engagement mission, the week-long "At the Water's Edge" Sound Learning Teach Institute has been held annually since 2004 in Salter Path, NC.

As in years past, the program agenda included an all-star cast of environmental educators and practitioners to lead the sessions. Highlights included Project WILD instruction and surf fishing led by Mike Campbell of the Wildlife Resources Commission, a suite of engaging coastal lessons presented by Terry Kirby Hathaway of N.C. Sea Grant, and an insider's tour of the Rachel Carson Research Reserve led by Reserve staff. Other excellent programs were hosted by the N.C. Aquarium at Pine Knoll Shores, the N.C. Museum of Natural Sciences, the University of North Carolina, and Amy Sauls of Jones Senior High School. Teresa Lindberg, who recently completed the construction of an outdoor classroom in Virginia with APNEP support, also spent an evening relating her experiences.

The enthusiasm and experience of the hosts were un-



doubtedly matched by the educators in attendance. This year, program participants were elementary school teachers hailing from all parts of North Carolina. Many were making progress toward their environmental education certification, and all showed a keen interest in the week's various programs.

Teachers left the Institute with dozens of resources and lesson plans in tow, as well as a deeper understanding of the estuarine environment. They have returned to their home schools well-equipped to support their colleagues and provide engaging and enriching lessons to the students in their care. Lessons from the Institute have improved the education of thousands of students living in and beyond the Albemarle-Pamlico region, and will continue to do so as long as our most recent Institute attendees remain in the classroom.

Clockwise from top: an egret skims the mud flats at the Rachel Carson National Estuarine Research Reserve in Beaufort, teachers closely examine a marsh periwinkle, a short hike at Bird Shoal, N.C. Coastal Reserve educator Lori Davis (left) offers participants an overview of the habitats and biological diversity and found within the reserve.



(SAV, continued from [page 1](#))

lina's Coastal Habitat Protection Plan and APNEP's Comprehensive Conservation and Management Plan both detail strategies to monitor, protect and restore SAV.

Mapping SAV for such a large area is no simple task. Airplanes fitted with special cameras flew 1,795 miles along the estuarine coastline during a two year period. Winds, waves, excessive humidity, or even sediment-laden water from recent rains could potentially interfere with the camera's ability to detect SAV. To overcome these problems, volunteers along the coast sampled the water for clarity and communicated with project managers to clear the high altitude flights.

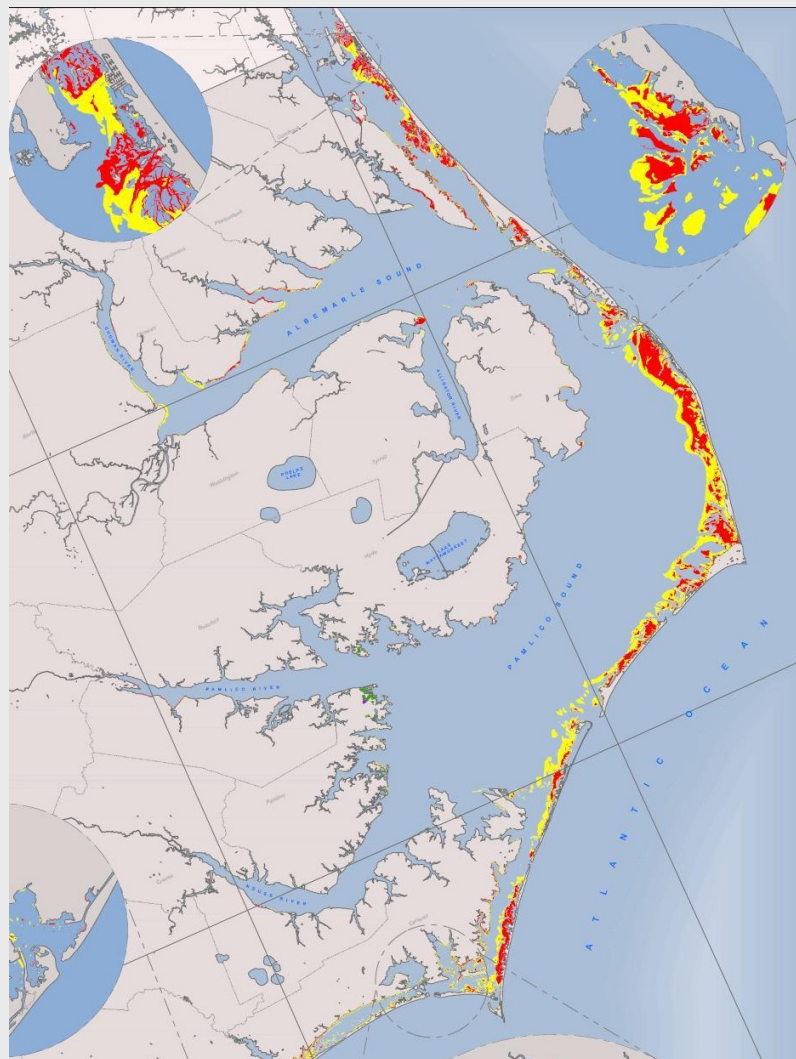
While the flights were occurring, boat crews directly surveyed SAV at locations under the flight lines. By taking this step, scientists were able to confirm that results obtained from the aerial imagery are fair depictions of the SAV that actually existed in the water.

"Committed citizens, dedicated professionals and strong agency partnerships were required to bring this challenging project to fruition," noted APNEP director Dr. Bill Crowell. "The success of this project bodes well for the future of ecosystem-based management in the Albemarle-Pamlico estuarine region."

To complete the work, funding and technical expertise were provided by APNEP, N.C. Department of Environment and Natural Resources, N.C. Division of Marine Fisheries, N.C. Wildlife Resources Commission, U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration. Some aspects of the project were contracted to private companies as well. Dewberry assisted with the collection of aerial imagery of the coastline, while Atkins provided expertise to develop the final maps.

With the completion of this map, officials have documented a majority of SAV throughout the Albemarle-Pamlico estuary and the North Carolina coast. Yet because SAV is sensitive to changes in temperature and water quality, its extent can change over time. For this reason, it is an excellent indicator of the health of the overall estuarine ecosystem.

In addition to its scientific applications, the new SAV map can be used to assist local, state and federal agencies as they consider permit applications for water-dependent uses. While site visits will still be performed, the historical presence of SAV is one factor often considered in the permitting process.



SAV habitat map of the Albemarle-Pamlico estuary. Dense areas of SAV are recorded in red, while patchy areas are recorded in yellow.

Members of these agencies and other organizations continue their work of protecting and restoring habitats through the SAV Partnership. Among other projects, scientists with the partnership are now working to develop a monitoring program to track changes in this valuable resource, including a significant portion invisible in high-flight images. A variety of technologies can be used for SAV monitoring, including underwater cameras, boat-based sonar, and aerial imagery. Now that the first map has been completed, scientists are considering the most efficient and cost-effective ways to combine these techniques to produce future versions of the map.

The map and GIS layers are available online at www.apnep.org.

Interestingly, the extent of the Albemarle-Pamlico estuary's SAV far exceeded that of its larger and more famous northern neighbor, the Chesapeake Bay. The bay and its tributaries supported 79,675 acres of SAV in 2010.

*On the **calendar**:*

November 17: [Register today](#) for State of the Sounds Symposium at the New Bern Riverfront Convention Center.

APNEP ON TWITTER

In recent editions of Soundings, we have highlighted various social media tools that can help you connect with APNEP. [Twitter](#) is a great way to stay tuned in with APNEP and many of our partner organizations. "Tweets" are no longer than 140 characters and provide continuous news updates that are easily accessible with a few computer clicks or on a mobile phone. Venture over to check out our tweets, or sign up and follow us at [APSounds](#). Other programs, including Tweetdeck, can help you get even more from this service.



From top: Development and engineering professionals learn about living shoreline stabilization techniques by viewing an example at Jockey's Ridge State Park, educators take a tour of the Currituck Banks National Estuarine Research Reserve led by Reserve Manager Claudia Jones (right), Rhana Paris of the N.C. Aquarium at Roanoke Island delivers the "Estuary Essentials Program" to a packed house.

Our mission: To identify, protect and restore the significant resources of the Albemarle-Pamlico estuarine system..

APNEP AND N.C. COASTAL RESERVE PARTNER ON ENGAGEMENT INITIATIVES

This summer, the N.C. Coastal Reserve launched a multi-faceted estuarine stewardship campaign with APNEP support. In addition to public canoe trips and a social media campaign, APNEP staff enjoyed attending two workshops hosted on the Outer Banks.



In August, staff from the Coastal Reserve and Sea Grant hosted a one-day workshop for educators at the Outer Banks Center for Wildlife Education in Corolla. New estuarine-themed lessons were unveiled at the workshop, and participants also toured the Currituck Banks Research Reserve nearby. This excellent program was only slightly upstaged by the earthquake that occurred during our session.

The Coastal Reserve also offered a workshop covering techniques and regulatory issues related to living shoreline stabilization. These techniques have exceptional environmental benefits, but they remain rarely practiced. APNEP hopes to support this practice in the future through training and the easing of regulatory constraints.

ESTUARY ESSENTIALS

APNEP awarded a grant to the N.C. Aquarium at Roanoke Island to conduct a summer program entitled "Estuary Essentials" for 24 libraries in the region. The response to our office was phenomenal, with attendees and hosts thanking APNEP for its support and noting how well the program engaged library patrons.

The program was led by Rhana Paris, who gave students and parents an introduction to the Albemarle-

Pamlico estuary. Attendees were shown how brackish water is formed when salty sea water and fresh river water meet. Also highlighted were some of the region's most notable inhabitants, including diamond-back terrapins, ospreys, black bears, and sea turtles.

After the program, many were inspired to take further action. Nearly 3,000 people signed a pledge to protect clean water in our estuary on a scroll that was 13 feet long! Check out the scroll and many more photos on our [Flickr](#) page.

