



Chesapeake Bay National Estuarine Research Reserve in Virginia

Highlights 2013

A partnership between NOAA, the Commonwealth and the Virginia Institute of Marine Science

Reserve Information

Location:

In order to incorporate the diversity of habitats found within the southern Chesapeake Bay, CBNERR maintains a multi-component system along the salinity gradient of the York River estuary. Reserve components include Sweet Hall Marsh, Taskinas Creek, Catlett Islands and Goodwin Islands.

Lead State Agency:

Virginia Institute of Marine Science,
The College of William & Mary

Reserve Web Sites:

<http://vims.edu/cbnerr>
<http://nerrs.noaa.gov>

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Dear Friends of the Chesapeake Bay Research Reserve,

As part of 28 protected areas that make up the NOAA's National Estuarine Research Reserve System, the Chesapeake Bay Research Reserve (CBNERR or Reserve) was established for long-term research, education and stewardship in support of informed management of our Nation's estuaries and coastal habitats. The Reserve is administered by the Virginia Institute of Marine Science (VIMS), of the College of William and Mary. In this 2013 summary report, we highlight a diverse range of activities, products and services provided by the Reserve to further our understanding and better conserve our coastal resources and enhance support of our coastal communities.

Research and Monitoring

The Reserve's research program is designed to enhance scientific understanding of coastal ecosystems, surrounding environments and the natural and human processes influencing such systems. To accomplish this, the Reserve monitors coastal ecosystems to describe reference conditions and changes over space and time, develops in-house research programs that address Reserve priorities, and encourages and assists other scientists conducting research activities within Reserve boundaries.

- **Virginia Estuarine and Coastal Observing System (VECOS).** Through VECOS (www.vecos.org), the Reserve continued to collect and expand sources of water quality data and increase access to these data in support of coastal communities, natural resource protection, education, water-based industry and the general public. CBNERR use state-of-the-art equipment to collect near continuous water quality information to address both short and long-term variability and to map extensive water bodies in great detail. In 2013, VECOS supported over 135 million water quality values derived from CBNERR's maintained monitoring programs including the NOAA York River System-wide program, the southern Chesapeake Bay Shallow Water program and NOAA's Chesapeake Bay Interpretive Buoy System.



- **Beyond Reserve Boundaries.** In 2013, CBNERR was invited to collaborate and work with partners that extended well beyond Reserve boundaries. Examples in 2013 included the multi-year "NOVAGRASS" collaborative project where the Reserve shared seagrass restoration expertise with Danish scientists and managers who are trying to enhance recovery of eelgrass in the Odense Fjord. Scientists exchanged techniques and tools for restoring and monitoring underwater grass beds in varying environments and assisted in the development of techniques specific to Odense fjord system. Additionally, CBNERR was invited to participate in the "Our Global Estuary" initiative sponsored by the Harbor Branch Oceanographic Institute Foundation and Florida Atlantic University. The vision of this initiative is to support management of the world's estuaries through the benefit of scientific understanding derived from a global network of diverse but synergistic estuarine observation and prediction systems; national and international efforts will continue in 2014 and 2015.

- **Service as a Living Laboratory.** Due to their protected status and availability of extensive onsite information, the four components of the Reserve continued to serve as platforms and living laboratories for both short and long-term research efforts. In 2013, there were 30 permitted projects within Reserve boundaries.

- **NERRS Graduate Research Fellowship (GRF).** Diane Tulipani (2 yr NOAA/NERR GRF) successfully defended her doctorate work entitled "Foraging ecology and habitat use of the northern diamondback terrapin (*Malaclemys terrapin terrapin*) in southern Chesapeake Bay". Additionally, Diane developed and coordinated the first Virginia State-wide diamondback terrapin survey - VA TerpSearch 2011.

Education and Outreach

The Reserve's Education and Outreach Program strives to increase awareness, understanding, appreciation and wise-use of coastal resources through K-12 education programs, teacher training, summer camps, participation in college intern programs and implementation of family/community based activities.

- **Chesapeake Studies.** The Reserve completed its eighth year of the program Chesapeake Studies for Virginia Middle Schools; this provides students from Gloucester, Mathews, and York Counties with classroom visits and meaningful field bay experiences. Over 1,000 students participated in the 2013 program that focused on estuarine water quality and observing systems. This program was supported, in part, by NOAA's Bay-Watershed Education and Training (BWET) competitive grant program.

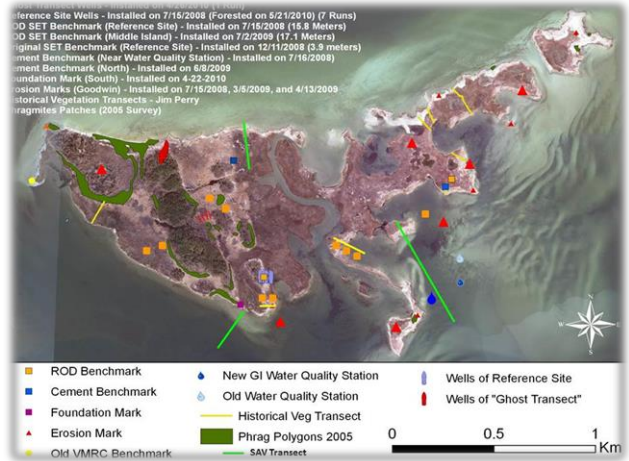
- **Climate Education for a Changing Bay (CECB).** The Reserve was granted a NOAA Bay Watershed Education and Training (BWET) grant to implement a new climate education program with 9th grade students at Gloucester and Mathews High Schools. The overall objective of the CECB is to improve climate literacy within local high schools by advancing the use of locally relevant environmental data and information in classroom curriculum, field experiences and professional teacher training.

- **Teacher Training.** CBNERR offered professional development opportunities for over 40 teachers through several workshops focusing on the NERRS national Teachers on the Estuary (TOTE) and estuarine aquarium keeping for in-school aquariums including collection of organisms.

- **Experiential Summer Camps.** Over 100 1st through 8th grade students participated in week-long CBNERR led summer programs focused on bay habitats (1st and 2nd grades), natural resource sustainability (3rd and 4th grades), stewardship (5th and 6th grades) and coastal field studies (7th and 8th grades). The five weeklong camps were made possible by a gift from a local private donor.

- **Public Outreach.** Through public outreach programs, that included the popular monthly Reserve Discovery Lab series, 2,500 life-long learners participated in family-friendly learning opportunities in 2013. Lab presentations, exhibits and hands-on activities highlighted sturgeon, sharks, mammals of the Bay's watershed, as well as regional sport fishing and locally available seafood. CBNERR also participated in specific events including VIMS Marine Science Day (Gloucester Point and Eastern Shore) and Estuaries Day at York River State Park.

- **Mid-Atlantic Marine Education Association (MAMEA).** CBNERR Educators hosted MAMEA's annual conference in October 2013. This year's conference consisted of more than 80 participants from Virginia, Maryland, North Carolina, Washington, D.C., and beyond. The three-day event featured concurrent professional development sessions, board meetings, field trip highlighting local coastal habitats, tour of VIMS and an organizational fund-raiser.



Professional Training

The Coastal Training Program (CTP) improves the capacity and skills of coastal decision-makers by communicating results of current research, making science-based information available, and by providing a forum to increase networking and collaboration across local/state/federal government and coastal management disciplines.

- **Technical Workshops.** In 2013, the Reserve provided training opportunities to over 375 local and regional coastal decision-makers who use the information to directly support efforts to manage natural and community resources. Training topics in 2013 included stormwater management, coastal wetland plant identification delineation, riparian plant identification and perennial stream identification and assessment, management of the invasive *Phragmites australis*, tools for identifying and evaluating natural area conservation sites, and enhancing environmental issue communication skills through the Water Words that Work messaging approach.

- **Public Issues and Conflict Management.** In partnership with NOAA's Coastal Services Center, CBNERR offered a two-day Public Issues and Conflict Management Course for decision-makers from throughout Virginia's coastal zone. Participants enhanced their ability to design, conduct, and control public or targeted meetings. Additionally, participants learned how to use and practice facilitation skills to reduce conflict and enhance communication/cooperation between diverse groups with multiple perspectives.

- **VIMS Public Lectures.** The Reserve continued to co-sponsor the VIMS monthly 'After Hours Seminar Series' that reached approximately 500 persons in 2013 with timely management, cultural and naturalist topics. Lecture topics included solution options for recurrent coastal flooding, rising sea levels and coastal insurance, costs and benefits of fracking, uranium mining in the Commonwealth, oyster aquaculture, menhaden fisheries and ecological shifts in Bay osprey populations.



Environmental Stewardship

Environmental stewardship refers to the responsible use and protection of coastal ecosystems using the best available science and developing information in order to maintain and restore healthy, productive and resilient ecosystems. While Reserve ecosystems are managed to primarily support research and education missions, it is recognized that people rely on the health and productivity of our coastal resources and access to these resources should be provided on an appropriate basis.

- **Public Access.** Through active management, the CBNERR continued to allow for traditional public use that does not conflict with Reserve goals or agreements with private landowners and public lands managers. Several components of the Reserve are included in the Virginia Birding and Wildlife Trail network and/or Captain John Smith Chesapeake National Historic Water Trail. Additionally the Reserve continues to provide hunting and eco-tourism opportunities at selected components.

- **Climate Change Sentinel Site Initiatives.** The Reserve continued its monitoring and experimental inquiries of its coastal habitats in order to better understand and predict habitat response to various anticipated climate related factors with an end goal of supporting the development and demonstration of adaptive strategies. Additional efforts in 2013 included historic imagery analysis of forest retreat and marsh transgression into these transitional areas with hopes of linking to habitat dynamics to changes in sea level. In addition to Reserve level efforts, CBNERR has made significant contributions to regional and national level efforts as related to climate change sentinel sites initiatives. Efforts included contributing to the development of the Chesapeake Bay Sentinel Site Cooperative 2013-2018 Implementation Plan and a "living" guidelines document for sea level change sentinel sites, and supporting the US Geological Survey's assessment of Hurricane Sandy impacts on salt marshes.



- ***Climate Change Vulnerability Assessment Tool for Coastal Habitats (CCVATCH)***. In support of land managers/stewards and local officials who are challenged with making conservation decisions in a changing environment, CBNERR in partnership with Hudson River (NY) and North Inlet-Winyah Bay (SC) NERRs are piloting and refining a newly developed decision support tool to assess habitat vulnerability to anticipated climate change impacts. Developed as part of a recent grant award from the NERRS Science Collaborative, CCVATCH is spreadsheet based and calculates numerical vulnerability scores based on collaborative input of local knowledge experts and habitat managers to a series of guidance document questions.

Advisory and Professional Service

Reserve staff continued to provide a high-level of advisory and professional service to Federal agencies, the Commonwealth, regional government Bay-wide programs, local government, nongovernmental organizations and professional societies; service included membership and participation in over 35 committees and workgroups. Selected 2013 committee membership and service is provided below. Of note, Reserve staff were elected to leadership roles in regional (Mid-Atlantic Marine Education Association, President) and national (National Estuarine Research Reserve Association, President) professional associations.

- Federal Government (NOAA/OCRM/NERRS)

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| Integrated Ocean Observing System Workgroup | Estuaries 101 Workgroup |
| Climate Change Workgroup | Teachers on the Estuary Workgroup |
| SWMP Biomonitoring Committee | Education Technology Workgroup |
| SWMP Guidance Committee | CTP Oversight Committee |
| Restoration Science Workgroup | Sentinel Sites Oversight Committee |
| Education Market Analysis-Needs Assessment Workgroup | |
| Coastal and Estuarine Lands Conservation Program (CELCP) Workgroup | |

- Regional Government - Chesapeake Bay Program

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| Analytical Method and Quality Assurance Workgroup | Criteria Assessment Protocol Committee |
| Tidal Monitoring and Analysis Workgroup | Water Quality Steering Committee |
| Data Management and Acquisition Workgroup | Data Analysis and Monitoring Workgroup |
| SAV Research Monitoring and Restoration Workgroup | |
| Chesapeake Bay Sentinel Site Cooperative Steering Board | |

- State Government

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| Virginia Coastal Policy Team | Virginia Phragmites Workgroup |
| Virginia Nonpoint Source Advisory Committee | Virginia CELCP Evaluation Committee |
| Surface Water Quality Standards Workgroup | |
| James River Chlorophyll Standards Technical Workgroup | |

- Local Government

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| York River and Small Coastal Basin Roundtable | Dragon Run Steering Committee |
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- Other Committee Service

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| The Coastal Society, Education Committee | Virginia Water Monitoring Council |
| Mid-Atlantic Marine Educators Association | Chesapeake Bay Education Council |
| Virginia First District Environmental Advisory Council | Digital Coasts Partnership |
| National Estuarine Research Reserve Assoc. (NERRA) Executive Committee | |
| NERRA Legislative Affairs Committee | |