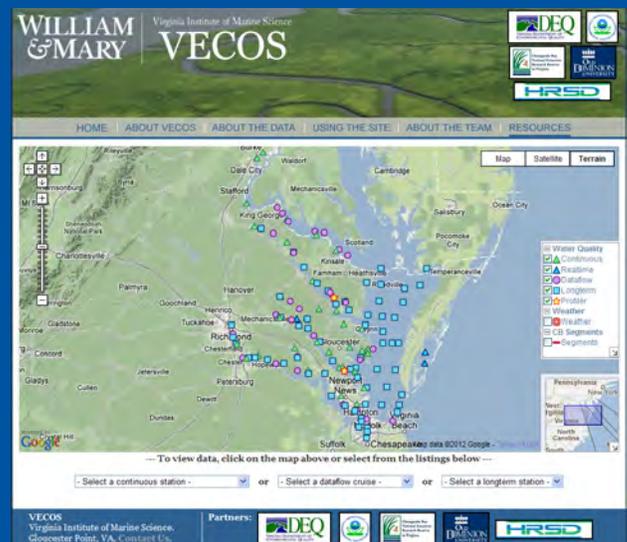


Water Quality Monitoring: From Measurement to Management

The Chesapeake Bay National Estuarine Research Reserve has been a leader in the development and implementation of the National Estuarine Research Reserve's System-Wide Monitoring Program (SWMP) whose mission includes measuring short-term variability and long-term changes in water quality, weather and estuarine habitats such as marshes and underwater grass beds. SWMP has matured into one of the Nation's paramount environmental monitoring programs for the purpose of informing effective coastal zone management.

SWMP water quality measurements include water depth, temperature, salinity, dissolved oxygen, pH, turbidity, chlorophyll and nutrients. With the exception of nutrients, water quality parameters are measured year-round at 15 minute intervals using automated dataloggers equipped with specialized sensors. As part of a national program, York River real-time and quality assured archived data is made available through the Reserve's Centralized Data Management Office. SWMP data has helped establish the NERRS as a system of national reference sites, as well a network of sentinel sites for detecting and understanding the effects of various stressors within coastal regions.

The Reserve also contributes to the Chesapeake Bay Water Monitoring Program. This program supports state and Bay-wide efforts to assess tidal water quality using both continuous monitoring stations, vertical profiling buoys, and high resolution mapping of surface water quality, termed DATAFLOW. We participate with the Virginia Department of Environmental Quality to assess seasonal Chesapeake Bay water quality standards for water clarity, phytoplankton chlorophyll, and dissolved oxygen standards.



The Virginia Estuarine and Coastal Observing System (VECOS) website provides access to water quality data sampled from the Chesapeake Bay and tidal rivers within Virginia. Visit <http://www3.vims.edu/vecos/>.



Shallow Water Quality Monitoring Program Results

- The 28 Reserves in the National Estuarine Research Reserve System serve as the backbone of the U.S. integrated ocean observing system (IOOS).
- Data supports the development of state water quality standard criteria for shallow waters and used in water quality assessments in the James, York, Piankatank, Rappahannock and Potomac River systems.
- Data is used to address a number of regional water quality management issues such as storm impacts on water clarity and dissolved oxygen, underwater grass water quality assessment and restoration; ecosystem response to inter-annual variations in hydrologic budgets; monitoring of harmful algal blooms, and calibration and verification of water quality models to address dissolved oxygen dynamics.
- Reserve System Wide Monitoring Programs support national (NOAA Sentinel Site Initiative) and regional (Chesapeake Bay Sentinel Site Cooperative) sentinel site initiatives to address coastal habitat stressors such as sea level rise.
- Uses the monitoring data in education curriculum to meet standards of learning at both national (estuaries 101) and state levels.
- In June 2011, the VECOS database exceeded 100,000,000 quality assured water quality measurements.

For more information on Shallow Water Quality Monitoring by CBNERR:

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All photos courtesy of CBNERR

