Abstracts

Wednesday, April 30

Session G6: Challenging and Innovative Networks, Models, and Application of Conservation Information that Support the Chesapeake Bay TMDL

10:00 – 11:30 am | Room 232

Give and Take: Building and Sustaining Integrated Long-term Water Quality Monitoring Networks in the Chesapeake Bay and Basin.

Peter Tango
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Abstract
Long-term data are important for many reasons including documenting change over time, evaluating ecosystem response to disturbance or evaluating ecosystem structure and function in response to management actions. The Chesapeake Bay Program established its tidal bay long-term water quality network in 1984 to document status and track trends in Bay habitat health in response to management activities. A Chesapeake Bay Nontidal Water Quality monitoring network was further established in 2003 under a memorandum of understanding with Chesapeake Bay jurisdictions across the watershed. The Chesapeake Bay Program Partnership provides leadership in the monitoring effort with input from representatives from across the region and working through an organizational structure that includes a Management Board, Goal Implementation Teams, a Science, Technical Assessment and Reporting Team with workgroups and a Chesapeake Bay Program Science and Technical Advisory Committee. The business model supporting monitoring network operations knits and leverages funding, effort and expertise across federal, state, and local agencies, interstate river commissions, academic institutions and citizen monitoring organizations. The operational model supporting monitoring and analysis needs has involved a degree of flexibility in implementing a common set of Bay and Basin-wide monitoring strategies. The monitoring strategies support the acquisition of data and completion of analyses that lead to the presentation of decision-making products for the Chesapeake Bay Program Partnership. It is important to recognize that since the start of the monitoring networks nearly three decades ago, the long-term water quality monitoring programming has not remained static in structure, function and funding. The program has undergone phases of adjustment, building and sustaining monitoring program elements by adapting to the evolving scientific understanding of water quality and its drivers, availability of new technologies for measuring chemical, physical and biological parameters of interest, shifts in funding support, and accounting for management needs of the Chesapeake Bay Program partners. This presentation will review key challenges that led to monitoring program reviews, the collective, strategic community-based processes that led to decisions about financial resource distributions to support network operations, and the incorporation of recommendations that have revised and sustained network operations.

Recording Progress in Agricultural Conservation on Chesapeake Bay Farms Using USDA Data Records: Balancing Privacy with Useful Information

W. Dean Hively
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Abstract
In response to the Executive Order for Chesapeake Bay Protection and Restoration (E.O. #13508, May 12, 2009), the United States Geological Survey (USGS) took on the task of acquiring, assessing and evaluating agricultural conservation practice data records for United States Department of Agriculture (USDA) programs, and transferred those datasets in aggregated format to State jurisdictional agencies for use in reporting conservation progress to the Chesapeake Bay Program Partnership's Annual Progress Review. The site-specific USDA data records are privacy protected under section 1619 of the 2008 Farm Bill, but the data can be released whenever information from five or more farms is aggregated together. In 2012, the USGS used its USDA Conservation Cooperator status to obtain site-specific implementation data for conservation programs sponsored by the USDA Natural Resources Conservation Service (NRCS) and the USDA Farm Services Administration (FSA) for all farms within the Chesapeake Bay watershed, documented the methods that were used by the Chesapeake Bay jurisdictions to integrate Federal and State data records and report conservation data to the Annual Progress Review, and supplied the jurisdictions with a USDA dataset aggregated to county scale. A similar tracking, reporting, and assessment will occur in 2013 and future years, as State and Federal governments and non-governmental organizations continue to work with farmers and conservation districts to reduce the impacts of agriculture on water quality. In addition to supporting the Annual Progress Review, the USGS is using the site-specific dataset to support scientific investigations in three USDA Showcase Watersheds (Conewago Creek, PA, Upper Chester, MD, Smith Creek, VA) where USGS

researchers are seeking to link land management to water quality monitoring data. In 2014 the project will aggregate the USDA dataset to the small watershed scale (HUC- 12) to support watershed management decisions and water quality initiatives associated with Chesapeake Bay TMDLs, EPA 319 programs, and the NRCS Chesapeake Bay Initiative. The information could also be used to investigate water quality response to conservation practices by processing the data through models such Mapshed (Penn State) or Sparrow (USGS) to derive estimations of conservation effects (reduced nutrient and sediment loading from farmland).

Linking Models of the Atmosphere, Watershed, and Estuary to Inform the Chesapeake Bay TMDL

Gary Shenk
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Abstract
The Chesapeake Bay Total Maximum Daily Load (TMDL) requires significant reductions in nitrogen, phosphorus, and sediment to meet water quality standards. The federal government, the six states in the watershed, and Washington. D.C. all have separate commitments under the TMDL to make these reductions. The Chesapeake Bay Program Partnership used linked atmospheric, watershed, and estuarine models along with input from stakeholders to arrive at an allocation method. This allocation method took into account the ability of each jurisdiction and sector to make load reductions, the relative position of each jurisdiction in the watershed, the relative position of the point of entry of the loads to the estuary from each jurisdiction, and the benefits derived from a restored bay.

Application of the Chesapeake Bay Program Partnership's Watershed Model in Support of the Chesapeake Bay TMDL

Gary Shenk[1], Olivia Devereux[2] and Matt Johnston[3]
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Abstract

The Chesapeake Bay Program Partnership's (CBP) Watershed Model (CBWM) has been in continual use and development since 1985. The CBWM estimates the amount of nitrogen, phosphorus, and sediment that are delivered to the tidal waters of the Chesapeake from the 64,000 square mile watershed for current, past, and future scenarios. The CBP uses the CBWM to estimate load from point and nonpoint sources, from basins, and form jurisdictions within the watershed. The CBWM is comprised of a model of watershed inputs (Scenario Builder), a dynamic model of the watershed (the Phase 5 watershed model), and a web based tool that predicts the output of the other two tools (CAST). The current version of the CBWM has been developed with extensive partnership and scientific input specifically for use in the TMDL. The CBWM is extensively calibrated to hundreds of monitoring stations.