



Comparison of River Loads and Water Clarity with Respect to Submersed Aquatic Vegetation (SAV) Seasons

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Principle Investigator(s):

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Collaborators: Chesapeake Bay Program (over 25 Federal Agencies, 6 States, the District of Columbia, and numerous local customers and partners)

Statement of Problem: The extent to which sediment loadings from non-tidal portions of the Chesapeake Bay watershed system contribute significantly to variation of water column sediments in tidal reaches of tributary rivers and the Chesapeake Bay itself is poorly understood, as is their impact on water clarity, which is critical for SAV growth. Defensible management strategies for both the maintenance and restoration of SAV in the Chesapeake Bay system require a fuller understanding of the linkages between these phenomena.

Objectives: The objective of this task is to examine the relationship between regional patterns in water clarity conditions in the tidal tributary rivers of the Chesapeake Bay region and the seasonal variation and trends in river discharge, in-stream suspended sediment, as well as non-tidal sediment loads, with respect to assessing the potential effects on SAV growth.

Approach: Report on an assessment of the regional variation and trends in discharge and non-tidal sediment loads, as well as suspended sediments (solids) and water clarity conditions in the tidal tributary rivers of the Chesapeake Bay region with respect to a seasonal living resource/SAV (submersed aquatic vegetation) time scale.

Provide technical advice for a cooperative project between USGS and MD DNR to assess nontidal water quality trends and regional factors affecting nutrient and sediment delivery to the Chesapeake Bay.

Provide technical advice for a CBP/USGS project to discern proportional contributions of sediment from various regional sources in a Chesapeake Bay watershed.

Selected Reports and Other Products:

Carter, V., Rybicki, N.B., Landwehr, J.M., and Naylor, M., 2000, Light requirements for SAV survival and growth, chapter III of Batiuk, R., and others, Chesapeake Bay Submerged Aquatic Vegetation Water Quality and Habitat-Based Requirements and Restoration Targets - A Second Technical Synthesis, printed by the United States Environmental Protection Agency for the Chesapeake Bay Program, p. 11-33.

Report can be found at <http://www.chesapeakebay.net/pubs/sav/index.html>.

Gellis, A., J.M. Landwehr, W.S.L. Banks, and M.J. Pavich, 2004, Sediment yields and sources in selected parts of the Chesapeake Bay watershed, Paper No. 49-4, in Symposium "Appalachian Geomorphology" at Northeastern Regional Meeting of the Geological Society of America, March 26, 2004.

Kemp, W.M., Batiuk, R., Bartleson, R., Bergstrom, P., Carter, V., Gallegos, C.L., Hunley, W., Karrh, L., Koch, E.W., Landwehr, J.M., Moore, K.A., Murray, L., Naylor, M., Rybicki, N.B., Stevenson, J.C., and Wilcox, D.J., 2004, Habitat requirements for submerged aquatic vegetation in Chesapeake Bay—Water quality, light regime, and physical-chemical factors: *Estuaries*, v. 27, no. 3, p. 363-377.

Landwehr, J.M., Reel, J.T., Rybicki, N.B., Ruhl, H.A., and Carter, V., 1999, Chesapeake Bay habitat criteria scores and the distribution of submersed aquatic vegetation in the Tidal Potomac River and Potomac Estuary, 1983-1997: U.S. Geological Survey Open-File Report 99-219, 34 p.

The report can be found at <http://water.usgs.gov/pubs/of/ofr99-219/>.

Report, Planned: Landwehr, J.M., Seasonal water clarity in the major tidal tributary rivers of the Chesapeake Bay as a function of sediment, no-tidal reach load contributions, chlorophyll and discharge conditions.

Report, Planned: Landwehr, J.M., Compendium of statistical tables supporting an assessment of seasonal water clarity in the tidal tributary rivers of the Chesapeake Bay.

Presentation, Delivered: Rybicki, N., and J.M. Landwehr, Assessing changes in a submersed aquatic vegetation community following the appearance of an exotic in an estuarine-river with improving water quality, Estuarine Research Foundation Symposium, September 2003.

Report, Planned: Rybicki, N. and Landwehr, J.M., Improved water quality may increase productivity and diversity in an estuary containing exotic submerged aquatic vegetation.

Relevance and Benefits: This research is consistent with USGS Chesapeake Bay Science Goal "Understand the sources and impact of sediment on water clarity and biota".