



## Living Resources and Factors Affecting Submersed Aquatic Vegetation

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**Collaborators:** U.S. EPA Chesapeake Bay Program, U.S. Army Corps of Engineers, the U.S. Army Adelphi Facility, Washington Metropolitan Council of Governments, Interstate Commission on the Potomac River Basin, DC Government-Fisheries, U.S. Navy, Indian Head, Md., facility, Maryland Department of Natural Resources, and University of Maryland.

**Statement of Problem:** Submersed aquatic vegetation (SAV) plays a major role in aquatic ecosystems. In addition to providing habitat and food for aquatic life, macrophytes alter flow dynamics, enhance sedimentation rates, and contribute to the cycling of carbon, nitrogen and phosphorus. More information is needed on the role of SAV in ecosystem processes, physical and biological factors governing annual variations in plant communities and the habitat conditions required to restore and sustain large and diverse populations of SAV. Both synthesis of monitoring data and intensive field and lab studies are necessary to improve our understanding of the role of SAV in aquatic ecosystems.

**Objectives:** To develop an understanding of 1) the factors leading to change in submersed aquatic vegetation distribution and abundance and 2) the effect of vegetation on sediment nutrients, nutrient transport and hydrology in estuarine and freshwater environments.

**Approach:** The approach is broadly interdisciplinary, employing techniques from the hydrologic, geomorphic, chemical and ecologic sciences. The research is designed to enhance the understanding of 1) the factors leading to change in submersed aquatic vegetation distribution and abundance and 2) the effect of vegetation on water quality, sediment nutrients, nutrient transport, and hydrology in estuarine and freshwater environments. We will analyze and summarize data to improve our understanding of the relationships among nutrients, sediment, water clarity and SAV in the Chesapeake Bay. This information will help decision makers develop strategies and assess progress in meeting restoration goals for aquatic ecosystems.

### 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>.

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.

Rybicki, N.B., McFarland, D.G., Ruhl, H.A., Reel, J.T. and Barko, J.W., 2001, Investigations of the availability and survival of submersed aquatic vegetation propagules in the Tidal Potomac River: *Estuaries*, v. 24, no. 3, p. 407-424.

Report, planned: Rybicki, N.B., Baldizar, J., and Lombana, A., Water quality, propagule availability and submersed aquatic vegetation transplant attempts in the Chesapeake Bay.

**Relevance and Benefits:** Results from hyperspectral remote sensing of SAV can be used to evaluate this technology for future SAV mapping. These and other results of the study improved the understanding of SAV habitat requirements. This should be useful for developing tributary strategies for restoring living resources and their associated habitat.

For further information on SAV investigations in the Chesapeake Bay, please access <http://water.usgs.gov/nrp/proj.bib/sav/CBproj.htm>.