

## THE ROLE OF ABIOTIC FACTORS IN SUBMERGED AQUATIC VEGETATION CHANGE IN THE HUDSON RIVER

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**Keywords:** submerged aquatic vegetation, *Vallisneria americana*, aerial photograph interpretation

**Abstract:** In the Hudson River, New York State, submerged aquatic vegetation (SAV) beds, which are dominated by *Vallisneria americana* (water celery); provide habitat for fish and invertebrates as well as foraging areas for waterfowl. These beds are also indicators of water quality and contribute significantly to the midsummer oxygen budget of the river. Determining what factors affect the presence of beds, their size and composition provides information about how to manage river resources for SAV and the organisms it supports. We interpreted aerial photographs of the Hudson River estuary taken during summer 1997 and 2002 and created polygons of SAV coverage. Using ArcGIS we divided the Hudson River into twenty 10 km blocks. Each of these blocks was bisected longitudinally following the center of the navigable channel as mapped on the digital raster graphics of USGS 7.5 min topographic maps to determine if east-west river position was also a factor in the change of SAV bed size. Within each half block we calculated percent change in area between 1997 and 2002. We also counted the number of sewage treatment plants, combined sewage overflow areas, water intake areas, marinas and tributaries present. Overall SAV coverage in 2002 was 164 ha less than in 1997, a 9% loss. The largest absolute change in coverage in one SAV bed occurred at river km 175 (Inbocht Bay, Catskill, New York) where 100 ha were lost. In general, SAV loss occurred throughout the southern two thirds of the study area while northern sections showed gains in coverage. Variables examined to date such as presence of tributaries or wastewater treatment facilities do not show strong relationships with change in SAV. More complex analyses considering, for instance, the physical nature of the shoreline remain to be examined. Knowing where and why SAV change occurs is an important prerequisite for assessing future management actions or consequences of climate change.

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*Proceedings of Coastal Zone 09  
Boston, Massachusetts  
July 19 to 23, 2009*

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