



Backgrounder

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Underwater Grasses and the Chesapeake Bay

The shallow waters of the Chesapeake Bay's littoral zone shelter numerous species of submerged aquatic vegetation, or SAV. These underwater grasses provide food for waterfowl and bottom-dwelling organisms and habitat for fish, crabs and invertebrates; remove suspended sediments from the water; protect shorelines from waves and erosion; and re-oxygenate the waters of the Bay. Sufficient levels of sunlight must reach the leaves of underwater grasses in order for them to grow.

Scientists believe that underwater grasses once covered more than 600,000 acres of Bay bottom. However, increasing quantities of nutrients, such as phosphorus and nitrogen, as well as sediment in the water – some still due to significant runoff from Tropical Storm Agnes in 1972 – have choked or eliminated the growth of SAV in many areas, and contributed to declines in grass acreage throughout the Bay.

Chesapeake Bay Underwater Grasses

Sixteen species of underwater grasses are common to the Chesapeake Bay and its tributaries. The distribution of these species depends on their individual habitat requirements. Salinity is the chief factor that influences where particular species will grow and thrive. Eelgrass (*Zostera marina*) and widgeon grass (*Ruppia maritima*) prefer the high salinity waters of the lower Bay, close to its confluence with the Atlantic Ocean. Redhead grass (*Potamogeton perfoliatus*) and sago pondweed (*Potamogeton pectinatus*) grow in the lower salinity or brackish waters of the upper Bay.

Underwater bay grasses provide an important habitat for many aquatic organisms. These plant communities supply food and shelter for many species of fish, shellfish, invertebrates and waterfowl. Minnows dart among the plants and graze on the tiny organisms that grow on the stems and leaves. Microscopic zooplankton feed on decaying grasses and, in turn, are food for larger Bay organisms. Small fish, mollusks and crustaceans, such as blue crabs and clams, find refuge here from larger predators. SAV beds also serve as protective nurseries for many juvenile fish including menhaden, herring, shad, spot, croaker, weakfish and white perch.

Many SAV species are a valuable food source for waterfowl. In fall and winter, migrating waterfowl such as the American wigeon, green-winged teal, and canvasback ducks search the sediment for nutritious seeds, roots and tubers. Resident waterfowl feed on the grasses year-round.



Chesapeake Bay is home to sixteen different types of underwater grasses which serve as vital nursery habitat to many different species of Bay fish and shellfish.

Underwater grasses do more than provide sustenance and habitat to other Bay aquatic species; they also improve water quality by adding oxygen to the water and by anchoring loose soil that otherwise would impair water clarity. Submerged grasses filter excess nutrients, whose overabundance could fuel the unwanted growth of algae in surrounding waters.

The single most important factor determining the growth and survival rates of SAV species is the amount of light that reaches the plants. When light is inhibited from filtering down through the water to the plants' leaves and stems, the plants are not able to produce enough food and energy to grow. High sediment levels due to land erosion caused by careless construction, forestry and agricultural practices will block light and hamper SAV growth. High sediment loads can also release more nutrients into the water. Increased nutrients contribute to algal growth, and result in blooms such as the "mahogany tide," which further block light. High nutrient levels are also caused by the excessive use of fertilizers, runoff from livestock operations and outflow from sewage treatment facilities.

Chesapeake Bay Program: Working to Restore Underwater Bay Grasses

Bay grasses are a unique yardstick for measuring the progress of Chesapeake Bay restoration efforts, because they are not under harvest pressure and their health is closely linked to water quality. Historically, up to 600,000 acres of underwater grasses grew in the shallows of Chesapeake Bay. But by 1983, surveys of bay grasses documented only about 38,000 acres.

In the late 1980s, the Bay Program began targeting underwater grasses for special protection and restoration. Discovery of further damage to existing underwater grass beds prompted action in the Maryland and Virginia legislatures in 1998. In Maryland, the legislature adopted laws that prohibit hydraulic clam dredging in bay grass beds in the Chesapeake Bay and the state's coastal bays (outside of the Chesapeake Bay's watershed). Virginia never has allowed hydraulic dredging. In Virginia, the Marine Resources Commission adopted regulations which prohibit clamming within 200 meters of grass beds in Chincoteague Bay (a coastal bay) and regulations which prohibit the placement of new aquaculture structures within grass beds.

In the *Chesapeake 2000* agreement, the Chesapeake Bay Program agreed to restore bay grasses to all areas where they were mapped from 1971-1990, a total of 114,000 acres baywide. By 2001, more than 85,000 acres of SAV existed, more than half-way meeting the goal.

The Chesapeake Bay Program continues to work to increase bay grass acreage by improving water quality. Nitrogen and phosphorus loads to the Bay have declined due to improvements in technology at wastewater treatment plants, decreased fertilizer and manure run-off from agricultural lands and reductions from industries. Phosphorus loads from point sources declined 53 percent between 1985 and 2000, as a result of improved treatment capability and the implementation of phosphate detergent bans. Increased miles of stream and river forest buffers that prevent erosion have also helped restore water quality for Bay grasses.

For more information about underwater grasses in the Chesapeake Bay, please visit our website at <http://www.chesapeakebay.net/baygras.htm>.