Potentially Attainable

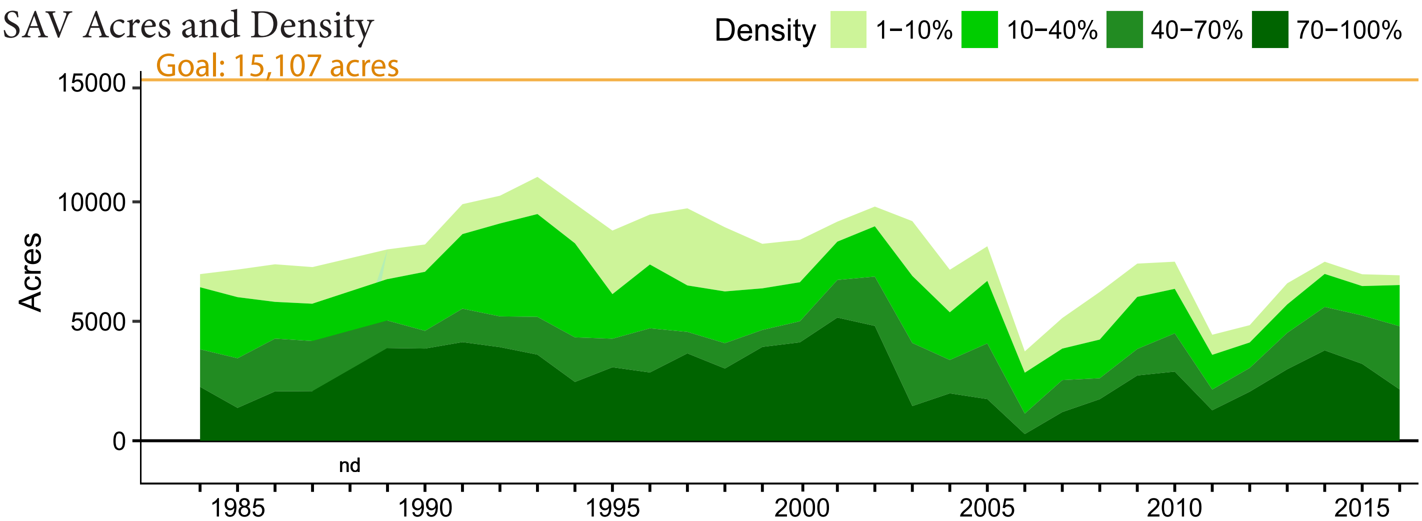
Eastern Lower Chesapeake Bay (CB7PH)

Expansive submerged aquatic vegetation (SAV) beds consisting of both eelgrass and widgeongrass are found in the rivers and along the mainstem, lower eastern shore Chesapeake Bay.

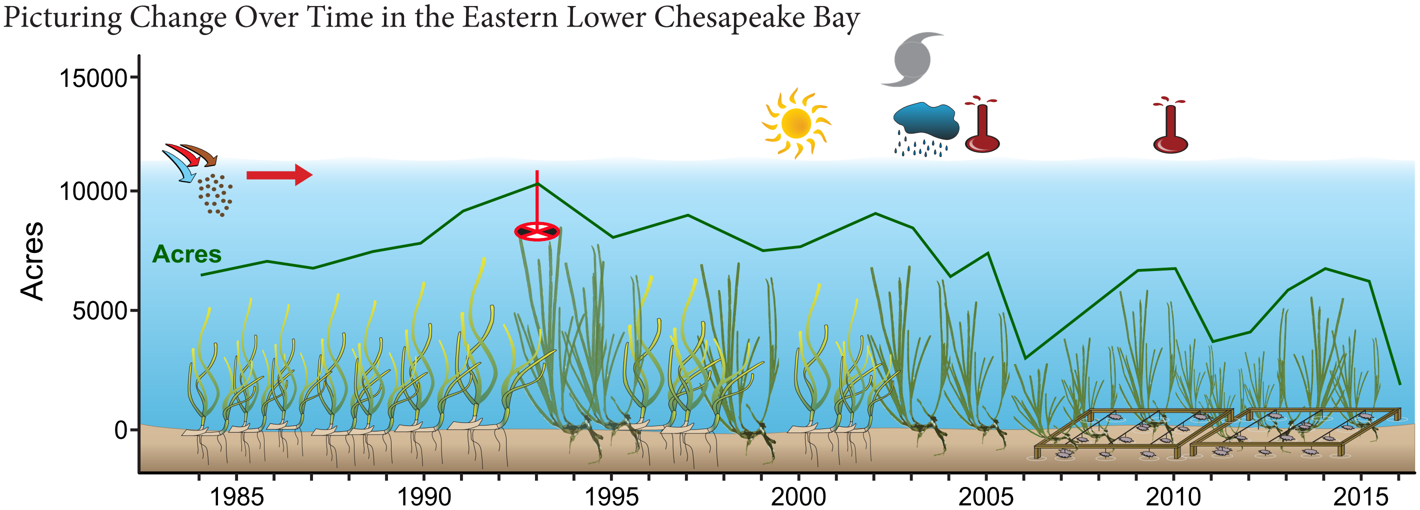
Executive Summary

SAV beds consisting of dense eelgrass and widgeongrass once dominated the extensive shoal areas of the numerous rivers entering the lower Bay, as well as the shallow water areas adjacent to the shoreline from Cape Charles to just above Chesconessex Creek. Acreage achieved maximum coverage in the 1960s correlated with the driest period recorded in recent history. The passage of Tropical Storm Agnes in 1972 triggered a dramatic decline in SAV in this segment. SAV began a slow recovery in the 1980s coupled with consistent good water clarity. This allowed eelgrass to expand, reaching peak abundance in 1993. SAV began declining in the 1990s due to declining water clarity. Heat events in 2005 and 2010 contributed to significant declines of eelgrass in 2006 and 2011. Some recovery did occur between these two events as a result of improving water clarity. Even with the resurgence of widgeongrass, attainment of the 15,107-acre SAV goal for this segment will require a major improvement in water clarity. However, evidence of a continuing, warming climate in recent decades suggests that summertime heat events here may become more frequent, requiring even greater water clarity to enhance SAV resilience.

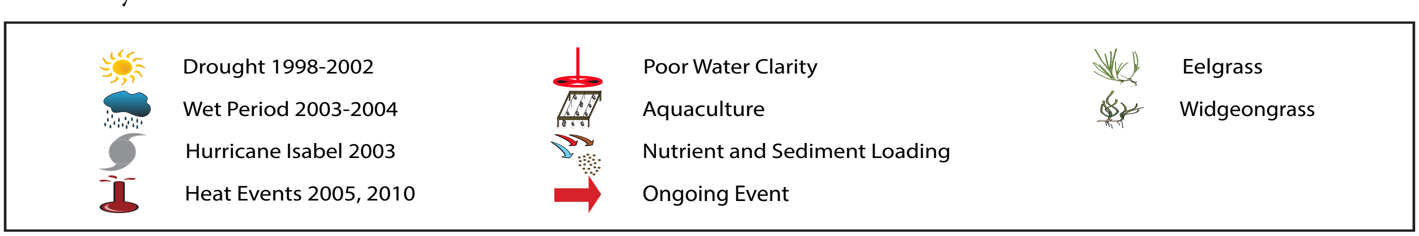
SAV Acres and Density



Picturing Change Over Time in the Eastern Lower Chesapeake Bay



Key



Potentially Attainable

Take Home Points

Goal - Potentially Attainable

The goal of 15,107 acres has never been achieved. If the recent expansion of widgeongrass continues, goal attainment may be reached if there is a significant water quality improvement.

Historical Coverage

Historical and recent distribution well known

There is good historical information for this segment. Eelgrass has been the dominant species and was present in the early 1900s. Distribution and abundance were reduced in 1930s following the eelgrass epidemic, but recovered through the 1960s, reaching peak distribution along the creeks and bayside mainstem. The current Bay-wide aerial survey has shown extensive meadows of the two main species, eelgrass and widgeongrass, at the mouths of the major creeks and behind many of the large, protective sandbars typical of this region.

Key Events

Tropical Storm Agnes

In June 1972, Tropical Storm Agnes resulted in the loss or reduction of many eelgrass beds in this segment. Eelgrass persisted in downriver areas and contributed to its recovery through the 1990s.

Vulnerability/Resilience

Water clarity

Periods of lower and higher rainfall in the 1980s and 1990s, respectively, influenced water clarity and facilitated the noted changes in eelgrass distribution.

Eelgrass is susceptible to heat events

Eelgrass is a cold-water SAV species in the Bay, near its southern distributional boundary in the mid-Atlantic. Shallow water summertime extreme temperatures in August 2005 and June 2010 led to significant losses of eelgrass. However, populations did persist, and vegetative regrowth within these beds contributed to its recovery in this region, along with seed input from residual populations. Widgeongrass, which is present in this segment, is much more tolerant than eelgrass of temperature extremes and has shown recent increases here. However, widgeongrass populations can be highly variable on an annual basis. Widgeongrass populations are expected to fluctuate in an increasingly warmer Bay. They also typically require more light for growth than eelgrass, meaning their expansion would likely be most evident in the shallowest nearshore SAV habitats.

Aquaculture

Oyster aquaculture has been rapidly expanding and could provide a boost to the local economy, help replace declining wild stocks and lead to water clarity improvements due to biofiltration. Shellfish aquaculture that occupies shallow water habitat, however, has the potential to limit SAV recovery into those areas.

Management Implications

Nutrient and sediment reductions

Managers will need to focus on improving water clarity by reducing both sediments and nutrients. Managers will be unable to do much about temperature, as this is a more global issue. However, by improving water clarity, plants may be able to tolerate periods of warmer water. In addition, managers will have to deal with aquaculture requests, as well as existing leases where SAV is currently present and in unvegetated areas where SAV once was abundant but may begin recolonizing in future years.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 2000, 2003, 2004; Orth et al. 2010a, 2010b, 2017; Patrick and Weller 2015; Lefcheck et al. 2017, 2018

www.vims.edu/bio/sav/SegmentAreaChart.htm (abundance data)

www.vims.edu/bio/sav/maps.html (species information)

http://vecos.vims.edu/ (Virginia water quality data)