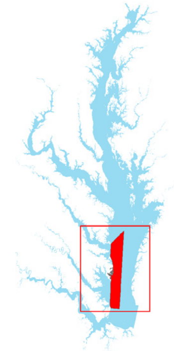
Potentially Attainable

Western Lower Chesapeake Bay (CB6PH)



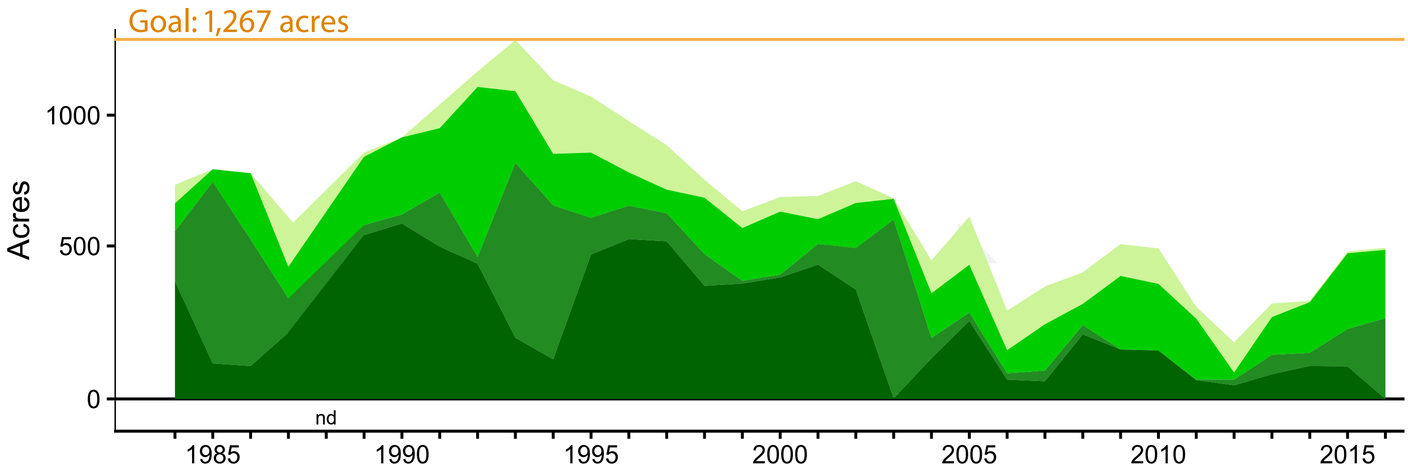
Expansive submerged aquatic vegetation (SAV) beds consisting of both eelgrass and widgeongrass are found in the rivers and along the mainstem lower western shore of Chesapeake Bay.

Executive Summary

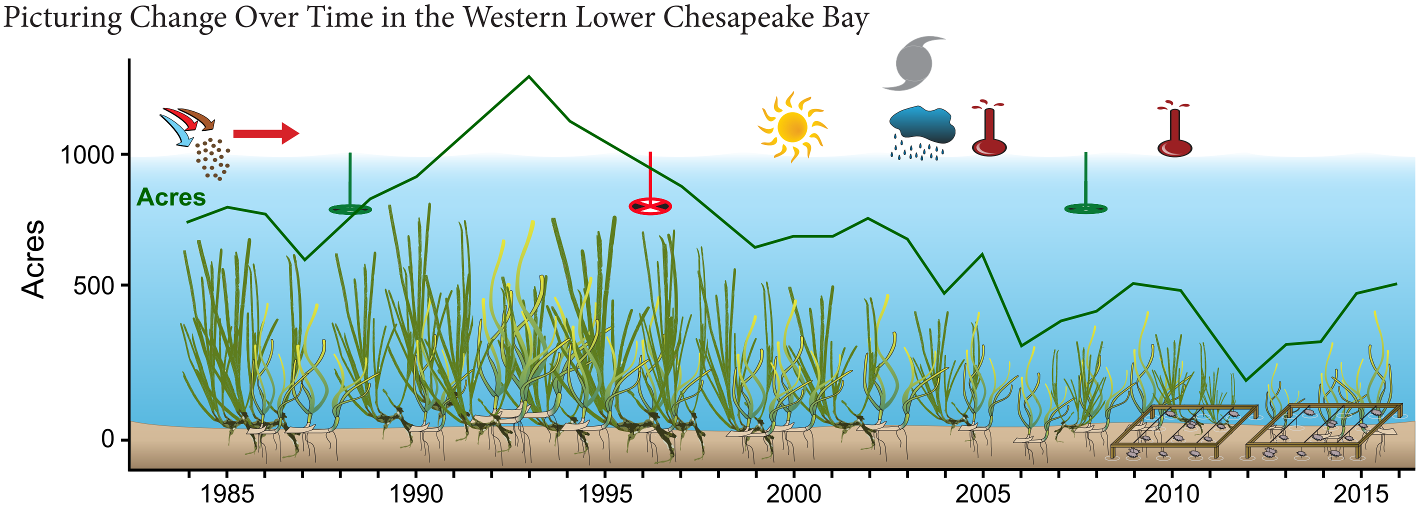
SAV beds consisting of dense eelgrass and widgeongrass once dominated the extensive shoal areas of the numerous rivers entering the lower Bay, as well as the shallow water areas adjacent to the shoreline from the mouth of Back River to the mouth of the Rappahannock River. SAV acreage achieved maximum coverage in the 1960s, in correlation with the driest period recorded in recent history. In 1972, Tropical Storm Agnes triggered a dramatic decline in SAV in this segment, but then began a slow recovery in the 1980s, thanks in part to consistently good water clarity. This allowed eelgrass to expand, reaching peak abundance in 1993. SAV began declining in the mid-1990s due to deteriorating water clarity. Heat events in 2005 and 2010 contributed to significant declines of eelgrass in 2006 and 2011. Recovery did occur in the interim of these two periods but was more related to improving water clarity. Attainment of the 1,267-acre goal of for this segment will be possible but only with significant improvements in water clarity, and with a resurgence of widgeongrass. 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

Density 1−10% 10−40% 40−70% 70−100%



Picturing Change Over Time in the Western Lower Chesapeake Bay



Key

- Drought 1998-2002
- Wet Period 2003-2004
- Hurricane Isabel 2003
- Heat Events 2005, 2010
- Good Water Clarity
- Poor Water Clarity
- Nutrient and Sediment Loading
- Aquaculture
- Ongoing Event
- Widgeongrass
- Eelgrass

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Take Home Points

Goal - Potentially Attainable

The goal of 1,267 acres has never been achieved. Attainment may potenially be reached if there are significant improvements in water quality.

Historical Coverage

Historical and recent distribution well known

Eelgrass has been the dominant species in this segment since the early 1900s. Distribution and abundance of eelgrass were reduced, however, in the 1930s following the eelgrass epidemic but recovered through the 1960s when it reached peak distribution along both shores of the lower York River. Chesapeake Bay-wide aerial surveys show eelgrass as well as widgeongrass persisting through the years but staying well below the restoration target.

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, helping to contribute to its recovery through the 1990s.

Vulnerability/Resilience

Water clarity

Varying periods of rainfall in the 1980s and 1990s influenced water clarity and contributed to the changes noted 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. Extreme summertime temperatures in the shallow water areas led to significant losses of eelgrass in August 2005 and June 2010. This was especially prevalent in the upriver areas of the historical SAV distribution where turbidity is highest. However, populations did persist, especially near the mouth of the York River, and vegetative regrowth within these beds contributed to its recovery in this region, along with seeds produced from remaining eelgrass populations. Widgeongrass is much more tolerant than eelgrass of temperature extremes and has shown recent increases in this segment. However, widgeongrass populations can be highly variable on an annual basis, which could change as the Bay grows increasingly warmer. They also typically require more light for growth than eelgrass, and therefore 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 sediment and nutrients. Managers will be unable to do much about temperature as this is a 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 new and existing aquaculture leasing requests in areas where SAV is currently present, and in unvegetated areas where SAV once was abundant and may begin recolonizing in future years.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 2000, 2001, 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)