Potentially Attainable

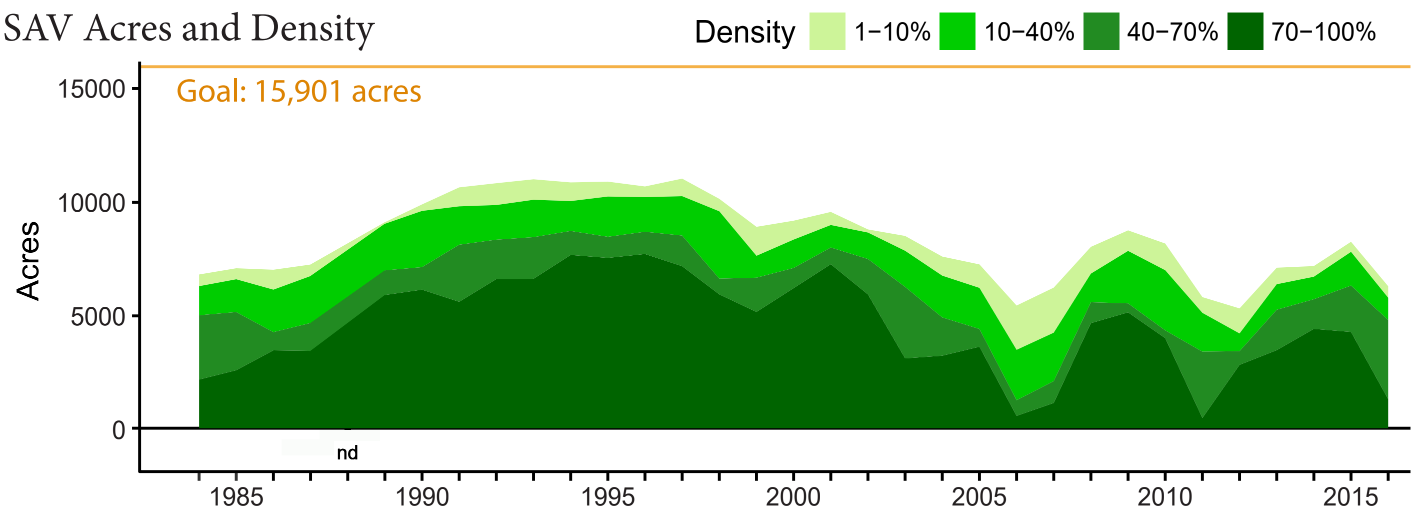
Mobjack Bay (MOBPH)

Expansive submerged aquatic vegetation (SAV) beds are found along the lower western shore of the Chesapeake Bay mainstem, including Mobjack Bay and the Poquoson Flats, consisting of both eelgrass and widgeongrass.

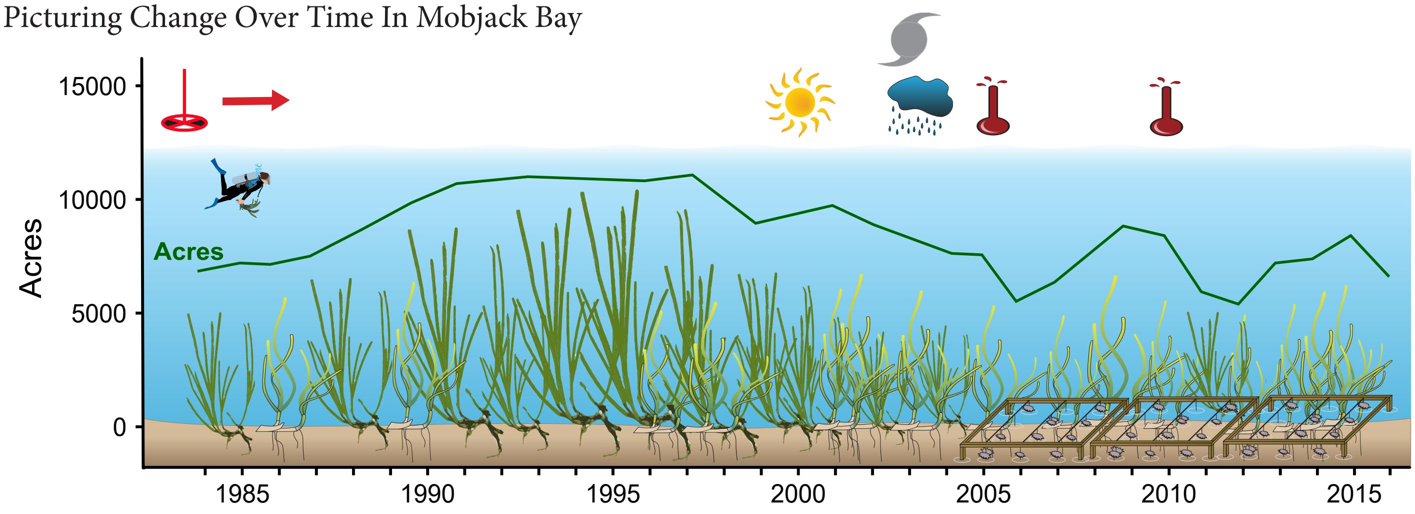
Executive Summary

SAV beds consisting of dense eelgrass and widgeongrass once dominated the shoal areas of this segment. SAV acreage achieved maximum coverage in the 1960s, correlating with the driest period in recent history, before it was reduced dramatically by Tropical Storm Agnes in 1972. SAV began a slow recovery in the 1980s through the mid-1990s, thanks to consistently improving water clarity, which allowed eelgrass to expand. A subsequent decline in water clarity in the late 1990s, however, tempered that expansion and heat events in 2005 and 2010 further exacerbated the decline of eelgrass in this area. The only way SAV will reach the goal of 15,901 acres is with the resurgence of widgeongrass. However, evidence of a warming climate in recent decades suggests that summertime heat events here may become more frequent, requiring even greater water clarity to enhance SAV resilience.

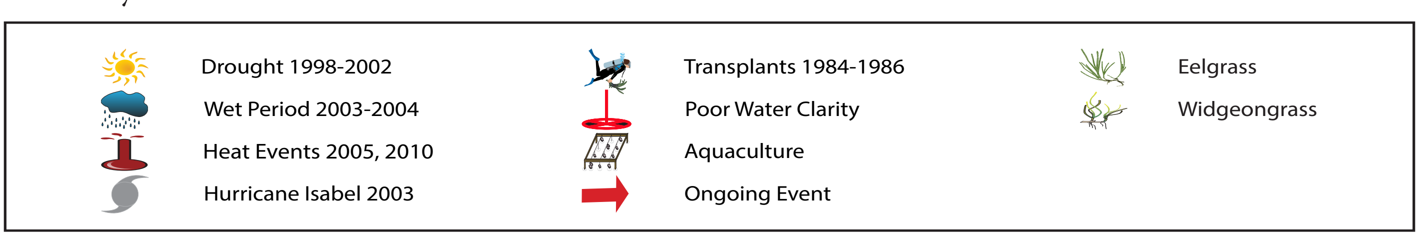
SAV Acres and Density



Picturing Change Over Time In Mobjack Bay



Key



Potentially Attainable

Take Home Points

Goal - Potentially Attainable
The goal of 15,901 acres has never been achieved. Attainment may be possible but improvements in water clarity are crucial along with the continued expansion of widgeongrass.

Historical Coverage
Historical and recent distribution well known
There is good historical information for this segment. Eelgrass has been the dominant species present since the early 1900s. Distribution and abundance were reduced in 1930s following the eelgrass epidemic but recovered through the 1960s. Widgeongrass is now common and abundant in Mobjack Bay as well.

Key Events
Tropical Storm Agnes
Tropic Storm Agnes in June 1972 resulted in the loss or reduction of many eelgrass beds in this segment. Thanks to its persistence in downriver areas, it recovered through the 1990s.

Transplant projects
Eelgrass transplants from 1984-1986 were generally successful and contributed to the resurgence of eelgrass during this time period.

Vulnerability/Resilience
Water clarity
Periods of varying rainfall in the 1980s and 1990s influenced water clarity and facilitated 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 regions in August 2005 and June 2010 led to significant losses of eelgrass, especially in upriver areas 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 from residual populations. Widgeongrass, which is also present in this segment, is much more tolerant than eelgrass of temperature extremes, and has recently shown increases here. However, widgeongrass populations can be highly variable on an annual basis, which could change as the Bay becomes 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
The rapid expansion of oyster aquaculture into this region could provide a boost to the local economy, help replace declining wild stocks and help improve water clarity due to biofiltration. However, shellfish aquaculture, which occupies shallow water habitat that is also potential SAV habitat, could limit the recovery of SAV into those regions because cages and nets would preclude the growth of SAV on that same bottom.

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)