Potentially Attainable

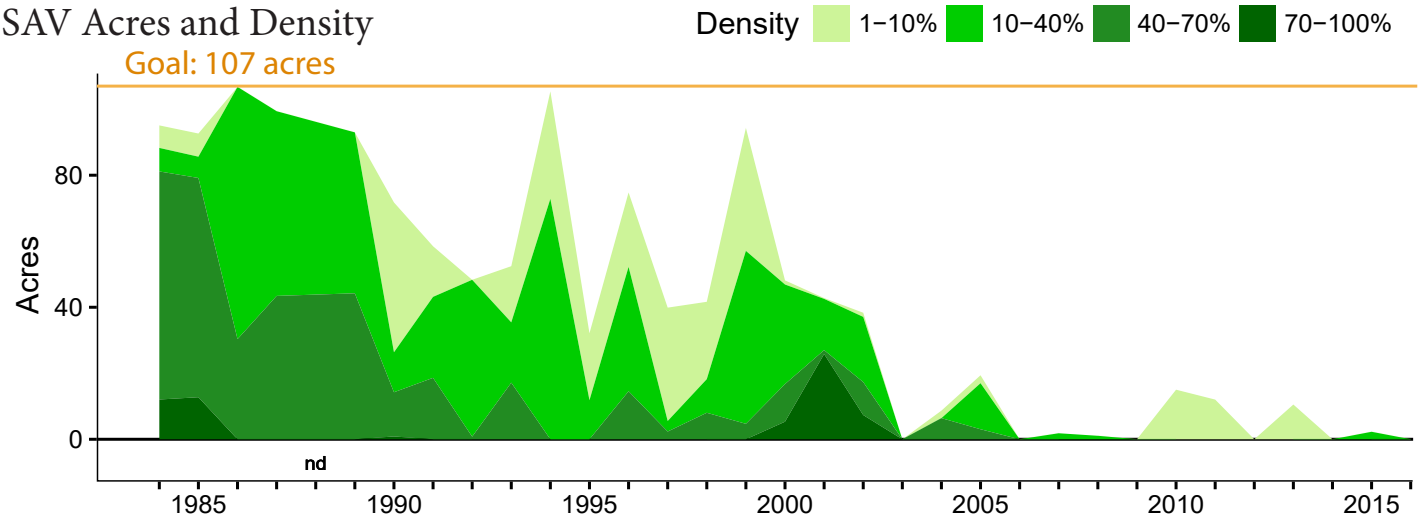
Lynnhaven River System (LYNPH)

Submerged aquatic vegetation (SAV) beds consisting of eelgrass and widgeongrass currently have very limited distribution.

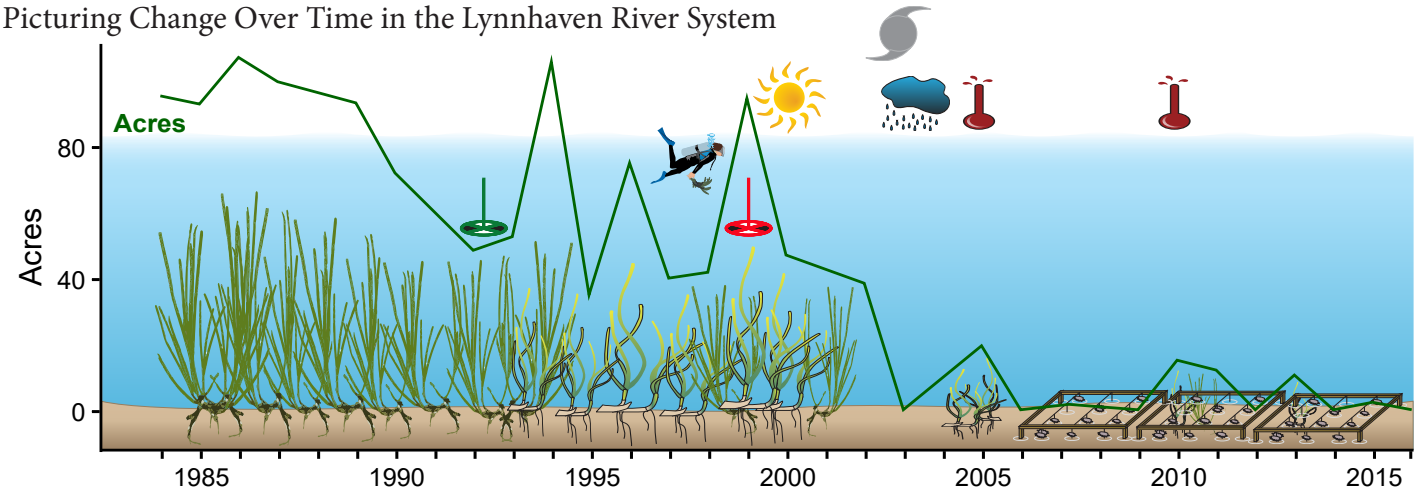
Executive Summary

SAV acreage achieved maximum coverage in the Lynnhaven River in the 1960s but Tropical Storm Agnes triggered a dramatic decline in 1972. It began a slow recovery in the 1980s and remained relatively abundant through the late 1990s, thanks to consistently improving water clarity. In the early 2000s, however, SAV began to decline as water clarity worsened. Heat events in 2005 and 2010 contributed to an even further decline of any remaining eelgrass. The goal of 107 acres is potentially attainable but only with significant water quality improvements and the resurgence of widgeongras, which can tolerate warmer temperatures than eelgrass. However, evidence of a warming climate in recent decades suggests that summertime heat events may become more frequent, requiring even greater water clarity to enhance SAV resilience. The rise of oyster aquaculture is becoming a significant issue in the Lynnhaven River.

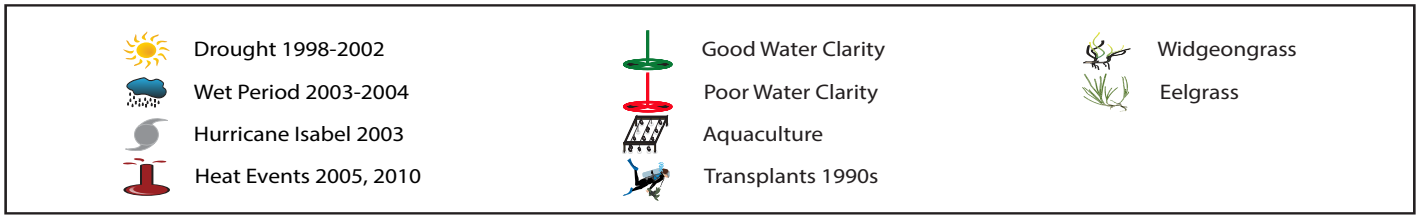
SAV Acres and Density



Picturing Change Over Time in the Lynnhaven River System



Key



Potentially Attainable

Take Home Points

Goal - Potentially Attainable

The goal of 107 acres was nearly achieved on two occassions. It is potentially attainable if water clarity can be significantly improved and the recent expansion of widgeongrass noted in other segments occurs here.

Historical Coverage

Historical and recent distribution generally well known

Eelgrass, long the dominant species, was present in the early 1900s. Distribution and abundance were reduced in 1930s following the eelgrass epidemic, but recovered, reaching peak distribution in the 1960s. Distribution and abundance have varied over the last few decades with the expansion of widgeongrass, but in recent years SAV has all but disappeared due to warming temperature and poor water quality.

Key Events

Tropical Storm Agnes

Tropical Storm Agnes in June 1972 resulted in the loss or reduction of many eelgrass beds in this segment.

Transplant projects

Beginning in the late 1990s, small-scale efforts to transplant eelgrass beds in the Lynnhaven River and Broad Bay were generally unsuccessful.

Vulnerability/Resilience

Water clarity

Periods of varying rainfall throughout 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 Chesapeake Bay near its southern distributional boundary in the mid-Atlantic. Extreme summertime temperatures in August 2005 led to the loss of any remaining eelgrass. Widgeongrass 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 and could fluctuate more so 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; aquaculture

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. By improving water clarity, however, eelgrass may be able to tolerate periods of warmer water. In addition, resource managers will have to find ways to balance aquaculture lease requests and maintain SAV habitat.

References

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