Attainable

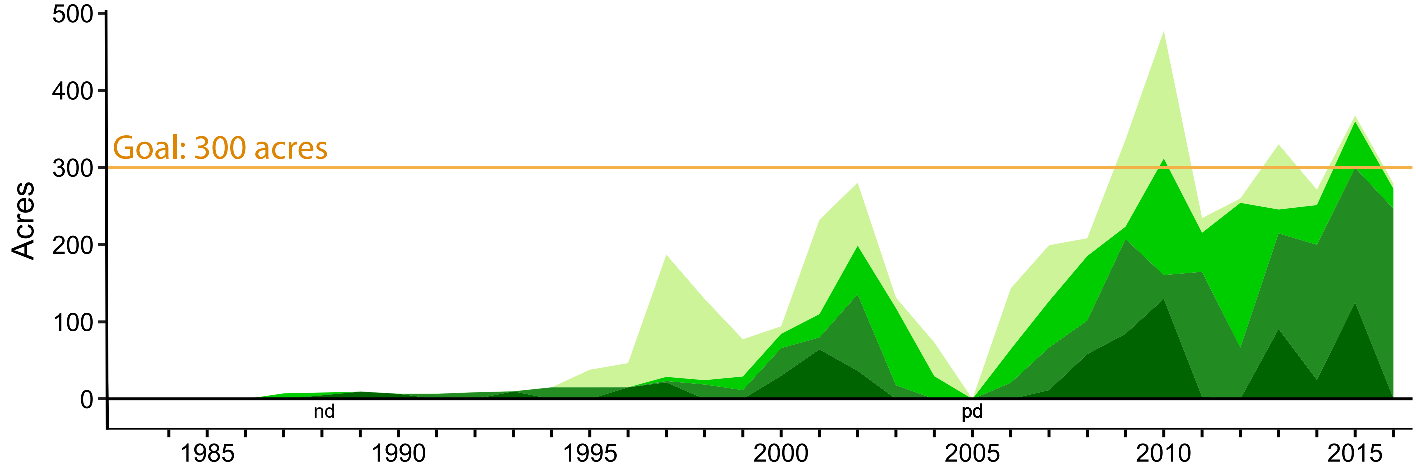
Mouth of the James River (JMSPH)

Moderately dense beds of eelgrass are found along the north shore of Hampton Roads and were facilitated by a successful submerged aquatic vegetation (SAV) transplant project.

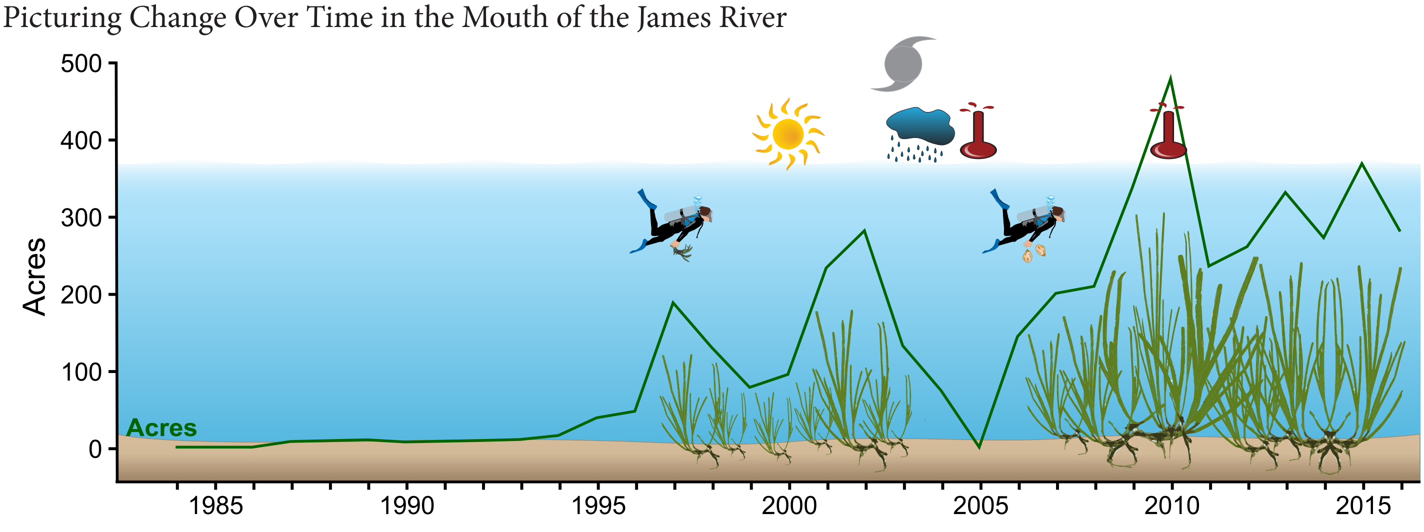
Executive Summary

SAV beds consisting of dense eelgrass once dominated the shoal areas of the mouth of the James River segment (generally referred to as the Hampton Roads area). Eelgrass was abundant in the early 1900s, recovered from the eelgrass epidemic that occurred in the 1930s, and remained abundant through the mid-1960s. Unfortunately, eelgrass began to decline in the late 1960s because of poor water quality from increasing nutrients and sediment and in 1972 when Tropical Storm Agnes swept over the Bay, the remainder of the eelgrass in this segment was lost. SAV began a slow recovery in the late 1990s, in part due to a large-scale eelgrass restoration project that occurred from 1996-1998. The restoration effort was enhanced by planting eelgrass seeds between 1998 and the present which also contributed to the recovery. Eelgrass continued to expand in response to consistently good water clarity and achieved its restoration goal of 300 acres in 2009, 2010, 2013 and 2015.

SAV Acres and Density



Picturing Change Over Time in the Mouth of the James River



Key

Drought 1998-2002	Heat Events 2005, 2010
Wet Period 2003-2004	Seeding Efforts 1998-2015
Hurricane Isabel 2003	Transplants 1996-1998
Eelgrass	

Attainable

Take Home Points

Goal - Attainable

The goal of 300 acres was achieved in four different years—2009, 2010, 2013 and 2015. The proximity of this region to the clearer, cooler waters of the Chesapeake Bay undoubtedly plays a significant role in sustaining the eelgrass populations as eelgrass thrives in cooler water temperatures in this part of the river. Continued good water quality and clarity should allow this segment to be at or near its restoration goal in subsequent years.

Historical Coverage

Minimal data on past SAV abundance

Although there is limited historical information, we do know that eelgrass is the dominant species at the mouth of the James River. It was present in the early 1900s, retreated in the 1930s following the eelgrass epidemic, and recovered somewhat through the 1960s. At that time, it was present only along the north shore from Hampton Roads Bridge Tunnel to just above the James River Bridge.

Key Events

Tropical Storm Agnes

In 1972, Tropical Storm Agnes resulted in the loss of any remaining eelgrass in this segment.

Eelgrass recovery was facilitated by a large-scale transplant project

Eelgrass was rare in this segment even before Tropical Storm Agnes. It remained sparse until a large-scale eelgrass restoration program was initiated in 1996 and continued through 1998. Recovery was facilitated by the addition of adult plants at multiple sites that continued to grow and expand related to consistently good water clarity. Between 1998 and 2015, eelgrass restoration efforts continued in which eelgrass seeds were broadcast into several locations along the shoreline. This effort contributed to the expansion of eelgrass that we see today.

Vulnerability/Resilience

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. In August 2005 and June 2010, extreme summertime temperatures in the shallow waters of the Bay led to the significant loss of eelgrass. However, small remnant populations persisted in this region and contributed to its recovery, along with seed input from natural populations and restoration efforts. One surprising aspect of eelgrass in this region is that the decline following the heat events of 2005 and 2010 was not as severe as in other areas of the lower Bay. We attribute this difference to the physical location of this segment as it is in the lower mainstem Bay with the cooler, clearer water that enters the north shore on each flood tide.

Shoreline alterations

This region of the James River has been most influenced by human activities since early colonization with significant shoreline modifications and hardening that have eliminated shallow water habitat, e.g., Fort Monroe, Newport News Shipbuilding and Drydock Company, Naval facilities.

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 new and existing aquaculture leasing requests in areas where SAV is currently present, and in unvegetated areas where SAV was once abundant and may begin recolonizing in future years.

References

Stevenson and Confer 1978; Orth and Moore 1983, 1984; Moore et al. 1999, 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)