Assessment of Aquaculture Conflicts and SAV (Submerged Aquatic Vegetation)

In Partial Fulfillment of the Project Entitled: Expanding Virginia's Oyster Industry While Minimizing User Conflict

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For additional information go to: https://cmap22.vims.edu/OysterInfoToolVa/

Introduction

Current regulation restricts aquaculture in areas where submerged aquatic vegetation (SAV) is present. New leases are not permitted in an area that contains SAV, and use within existing leases can be restricted if SAV spreads into the area regardless of SAV density or species present. The Virginia Marine Resources Commission (VMRC) uses data mapped by the Virginia Institute of Marine Science's (VIMS) Submerged Aquatic Vegetation program which annually surveys growth and distribution of SAV from high resolution aerial photography in the Virginia and Maryland portions of the Chesapeake Bay. VMRC uses the criteria of presence/absence of SAV from the most recent 5-year period of data on record.

Method

Distribution maps of SAV data as mapped by the SAV mapping program at VIMS were combined to coincide with the regulatory reporting periods used by VMRC. These data were used as the spatial distribution of SAV and analyzed with respect to the distribution of private lease boundaries and specifically with private leases that reported active intensive harvesting of oysters and clams during the time period analyzed. In all, the study looked at four different 5-year time periods of records with respect to harvest data; 2012-2016, 2013-2017, 2014-2018, and 2015-2019.

Results from the Year 1 analysis showed that within any selected 5-year period, a large proportion of leases with intensive aquaculture production also had SAV present. For Year 2 of the overall study, the data were updated to reflect the current (at that time) 5-year period of record (2013-2017). In the final year (2020), the results were updated to reflect the most recent period of record used for regulatory purposes (2015-2019). The results for those two time periods are quantified in Table 1 for the Chesapeake Bay.

The analysis showed that between the two periods (2013-2017 and 2015-2019) there was a 1% increase in the number of non-riparian leases that contained SAV. SAV had expanded into 34 more leases between the 2013-2017 period and the 2015-2019 period. This analysis reflects the ephemeral nature of SAV as it may be controlled by climate and weather variabilities as opposed to any impacts associated with aquaculture. Full results from the four time periods analyzed in the study can be found in Appendix B[1].

[1] https://cmap22.vims.edu/OysterProject/Reports/AppendixB_AquacultureConflicts&SAV.pdf

	Chesapeake Bay Totals (2013-2017)			Chesapeake Bay Totals (2015-2019)		
Total Leases	3,856			3,856		
Percent Leases	100			100		
	Number of Leases	Percent of Total	Percent of SAV Leases	Number of Leases	Percent of Total	Percent of SAV Leases
Non-Riparian Leases with SAV	1,003	26	100	1,037	27	100
Non-Riparian Leases with No SAV	2,853	74		2,819	73	
Intensive Harvest - Oysters & Clams	Number of Leases	Percent of Total	Percent of Intensive Leases	Number of Leases	Percent of Total	Percent of Intensive Leases
Intensive Harvest with SAV	146	3	41	172	4	44
Intensive Harvest with No SAV	206	5	59	220	6	56
Total Intensive Harvest	352	9	100	392	10	100

Table 1. Assessment of non-riprarian private lease harvest records and the spatial arrangement of SAV beds

Regulatory Conundrum

Bottom conditions that are characteristically good for intensive aquaculture operations are often ideal for SAV colonization and growth. Indeed, the filtering activity of the oysters arguably improves water quality. Most commonly on individual locations, widgeon grass (*Rupia sp*.) was the predominant species of SAV in association with intensive aquaculture. The general progression was for cages to be placed on a location with little or no SAV present, followed by increases in density and coverage of SAV within and around cages. In some cases, widgeon grass would significantly increase around cages within a water body over the summer and disappear during the other seasons in the same year (Figure 1).

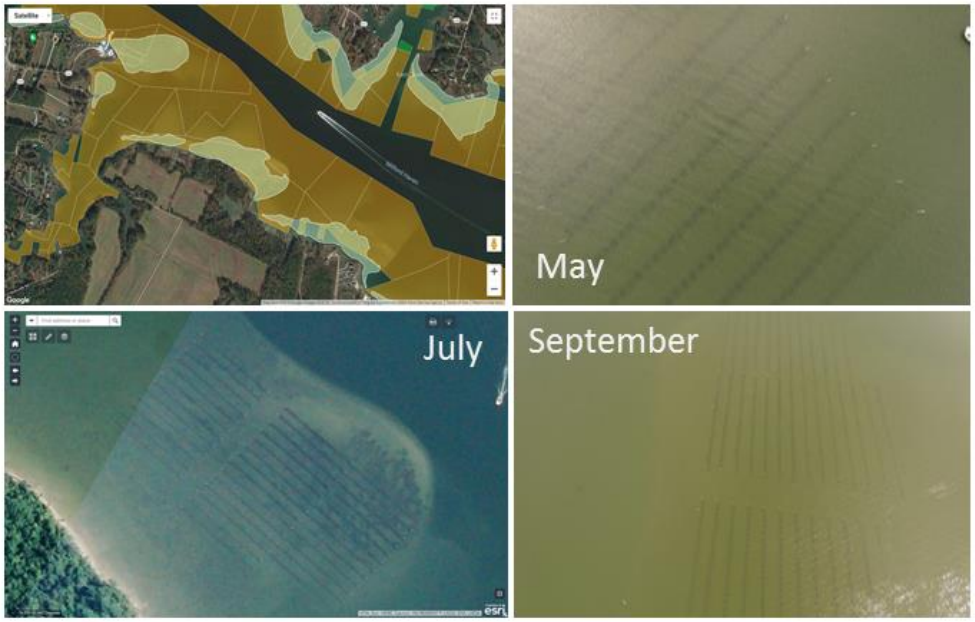

Figure 1. An aquaculture lease in Milford Haven, VA showing progression of SAV coverage over a season

The footprint of intensive aquaculture, using floating or bottom cages, as practiced in the Chesapeake Bay is proportionally quite small. This can be demonstrated mathematically.

Generally, cage density as practiced, is between 100 and 300 cages per acre. Most cages are between 10 and 12 square feet, resulting in footprints for intensive activity of much less than 10 percent of an acre. Based on the time series analysis of multiple, individual aquaculture operations where SAV was present, there did not appear to be impacts from intensive aquaculture activity as currently practiced in the Chesapeake Bay.

The results of this analysis support the assumption that SAV and intensive aquaculture CAN and in fact have been co-existing. Despite all of these findings however, under current regulation, it is within the authority of VMRC to force the aquaculture operation to cease or be relocated regardless of: harvest history, longevity of lease holding, or consistency with approved use plan on file. This has been enforced in more than one instance in Virginia in recent history.