Expanding Virginia's oyster industry while minimizing user conflict:

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STAR Meeting, 2020

Today's discussions

Status of Baylor Grounds:

- Delineation of productive versus non-productive regions.
- Constitutional and statutory framework and options for change.

Status of Private Lease Grounds:

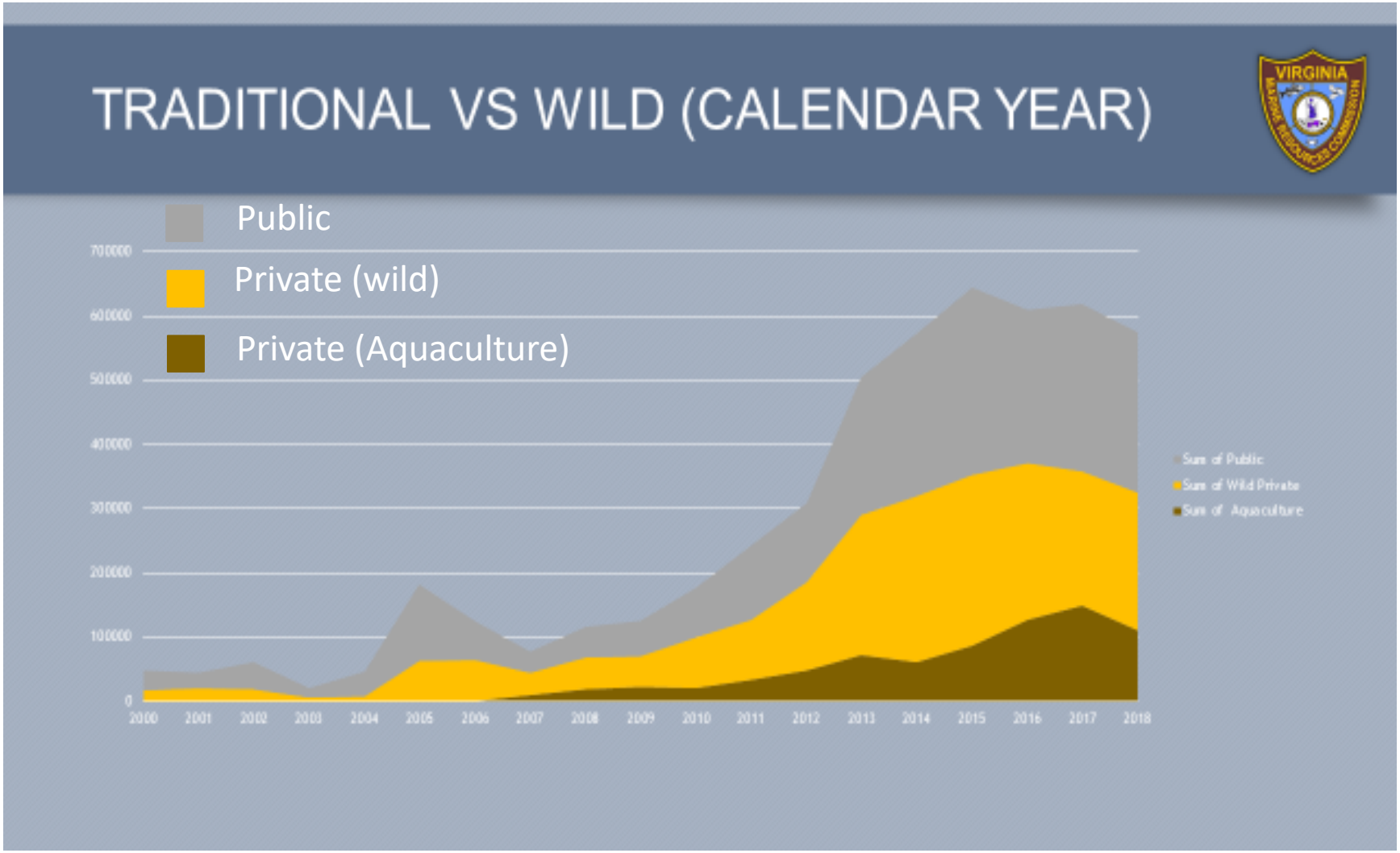
- Current productivity, active versus non-active lease use.
- Statutory and regulatory framework and options for change.

Ecological Conflicts:

- Coexistence of SAV and Aquaculture, past and future options.

- Virginia has a rich history of oyster harvest on public (Baylor) grounds and private lease grounds.
- The public fishery is limited by natural shell reefs (such as in the James) and available shell for replenishment by VMRC.
- The private fishery is limited by shell, availability of seed oysters and access to leasable ground.
- Cultured oysters represent the largest opportunity for future increase in production.

Oyster Production in Virginia

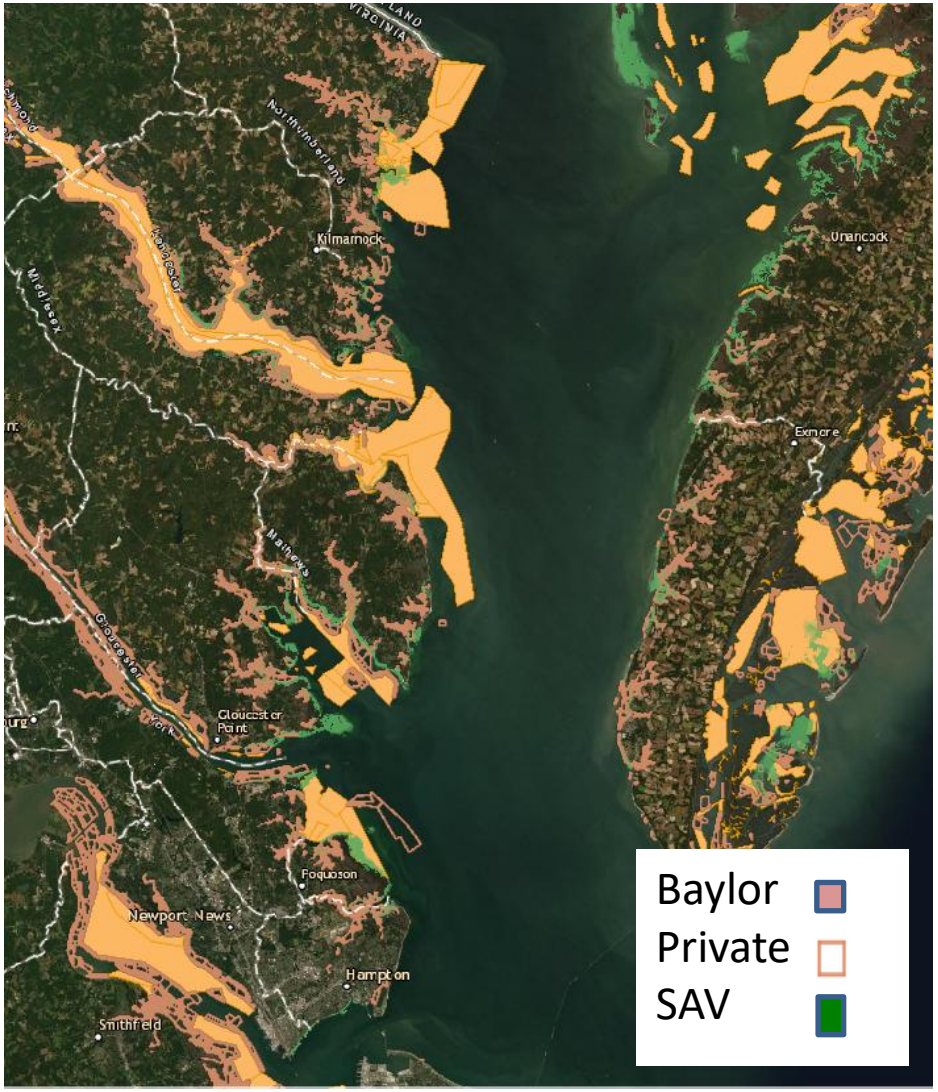


Traditional fisheries areas are bounded by Baylor.

Private lease bottoms are historically defined.

Yet not all of this bottom is productive and never has been.

Can we optimize shellfish production without conflicts with historical fisheries and/or SAV?



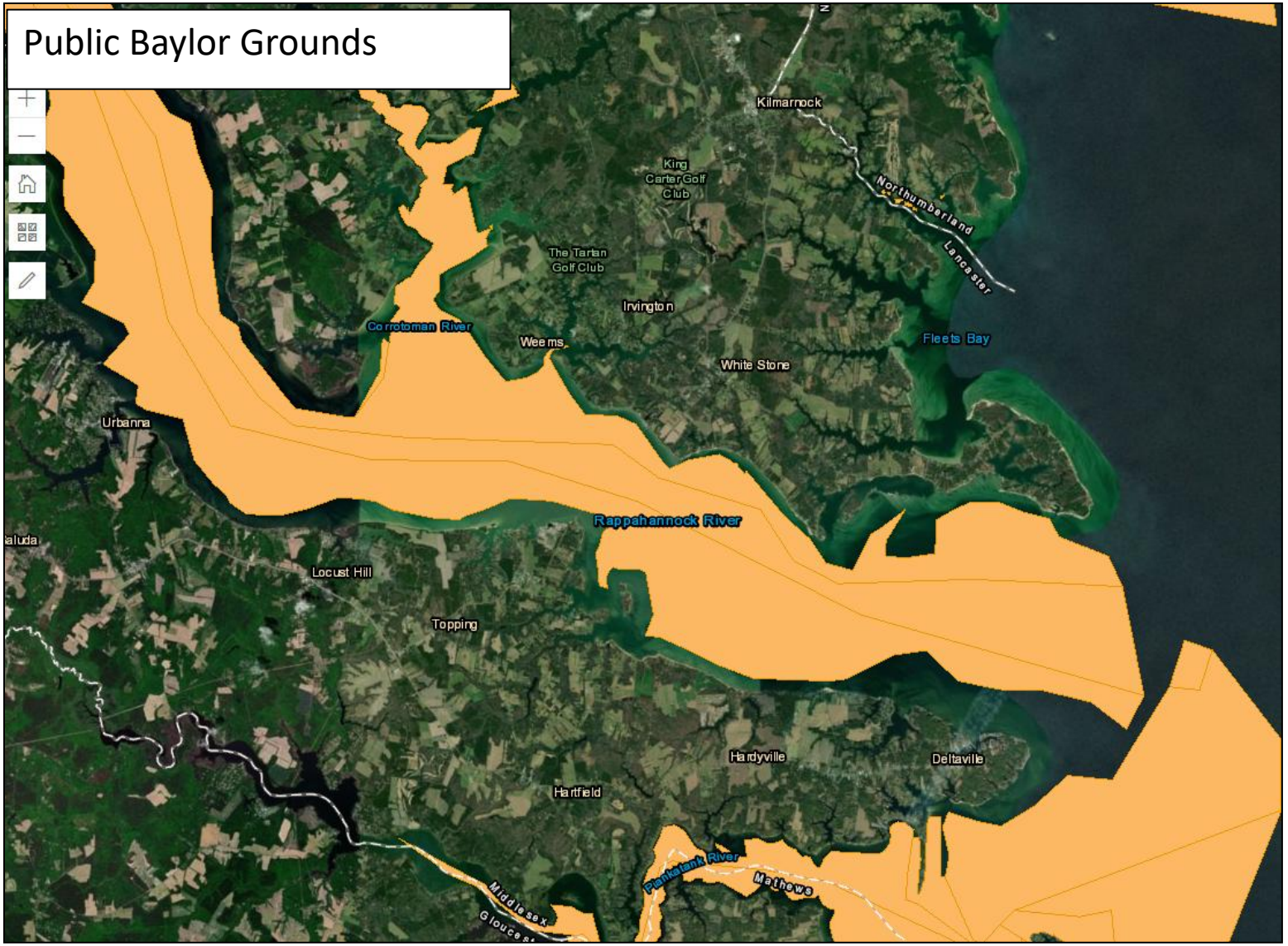
The Status of Baylor Grounds?

- How productive are Baylor Grounds?
- Where should replenishment occur?
- Are there alternative uses for unproductive Baylor that could support aquaculture expansion?

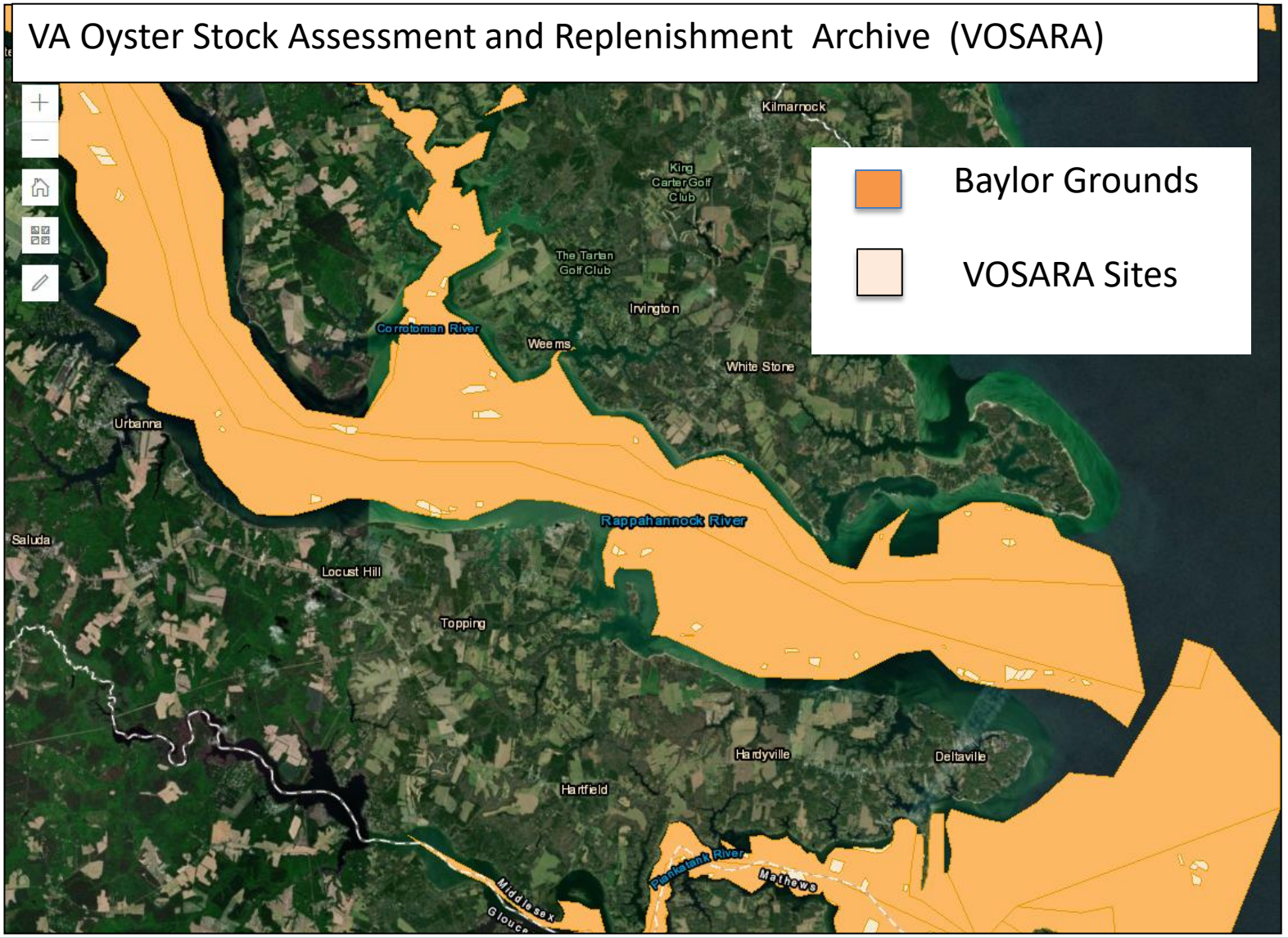
Criteria for Mapping Productive Bottom within Baylor Grounds in the VA Chesapeake Bay

- VOSARA (VA Oyster Stock Assessment and Replenishment Archive)
- Surveys of bottom type material
- Oyster reef restoration sites

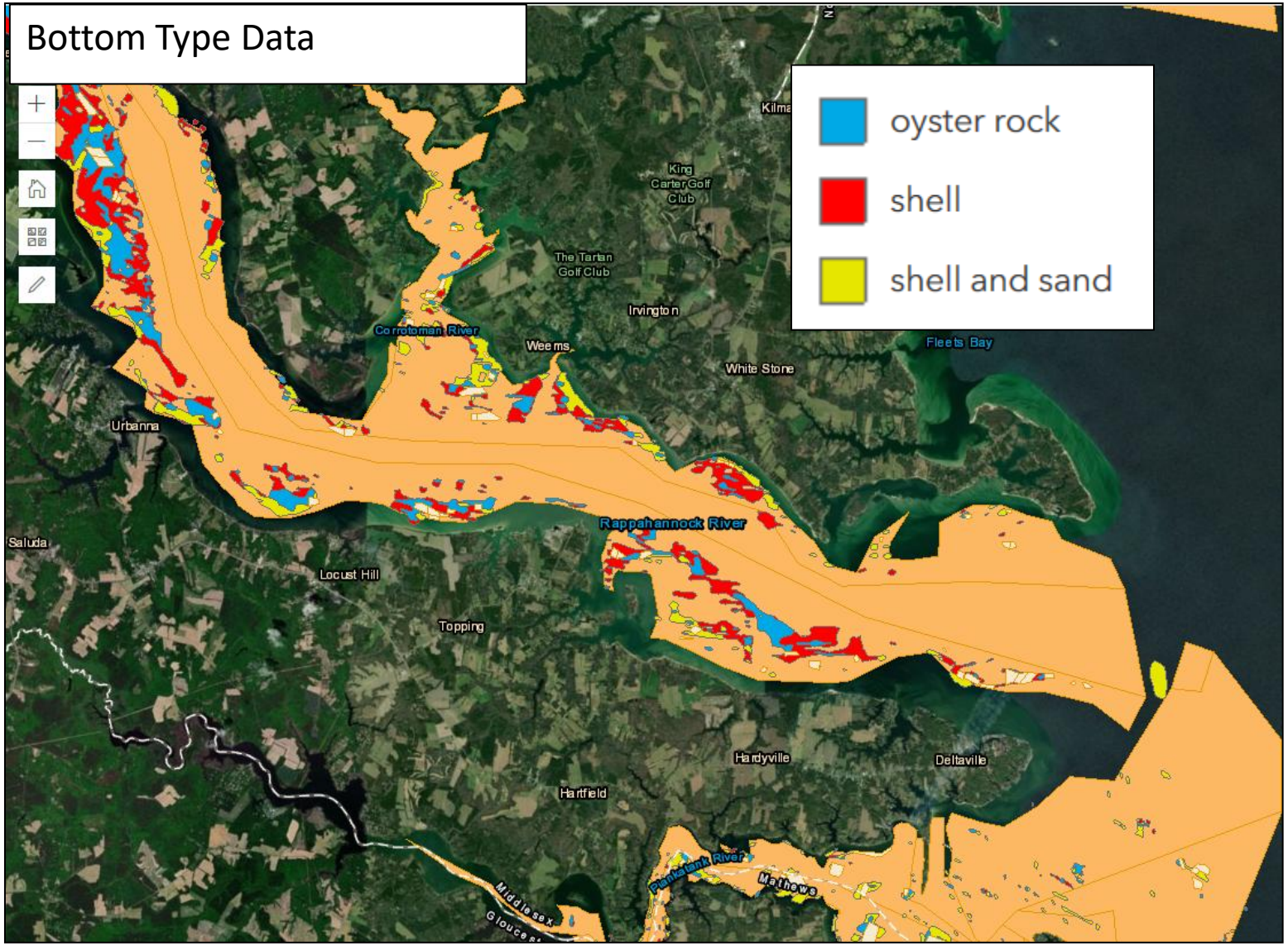
Public Baylor Grounds



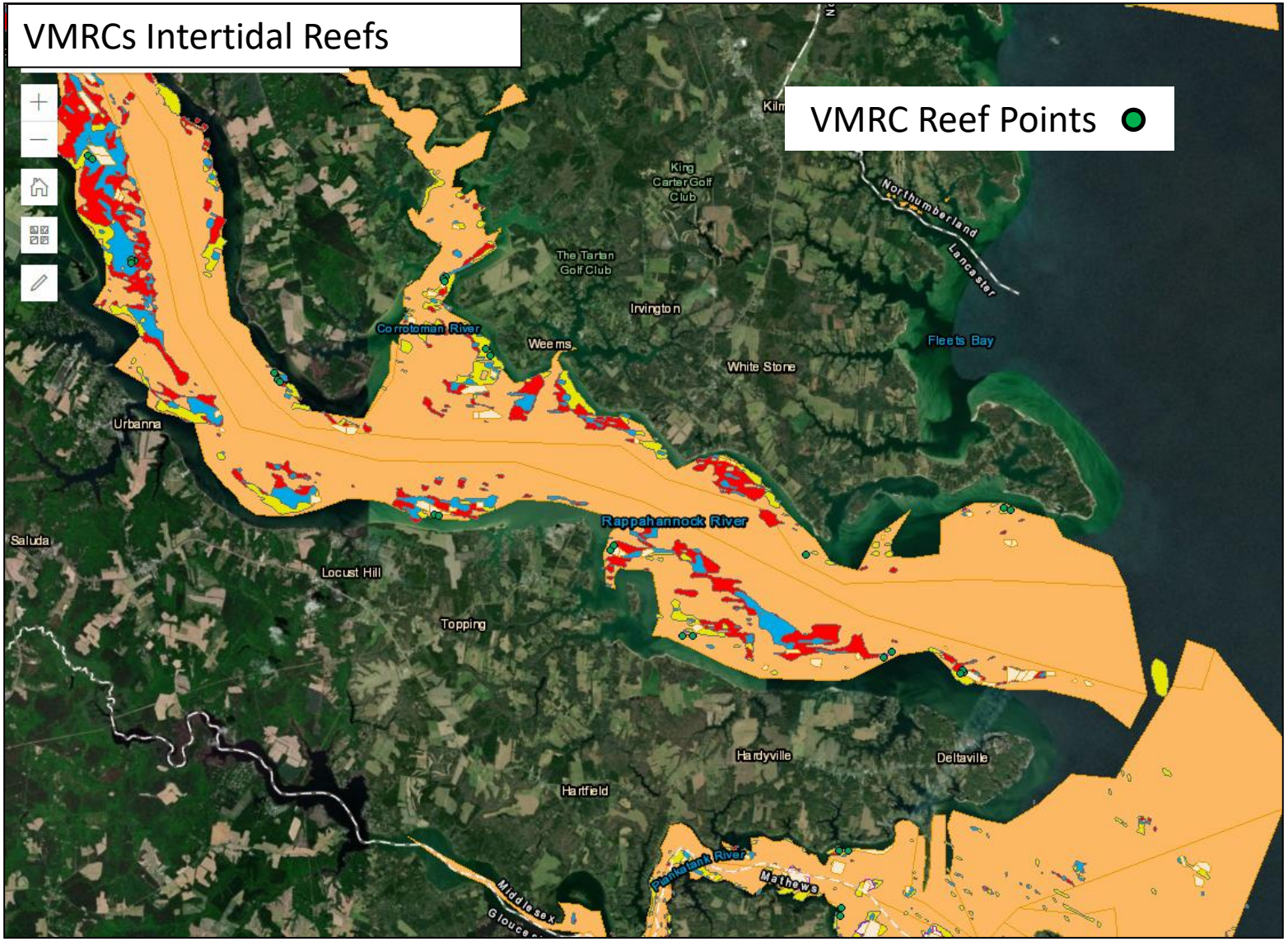
VA Oyster Stock Assessment and Replenishment Archive (VOSARA)



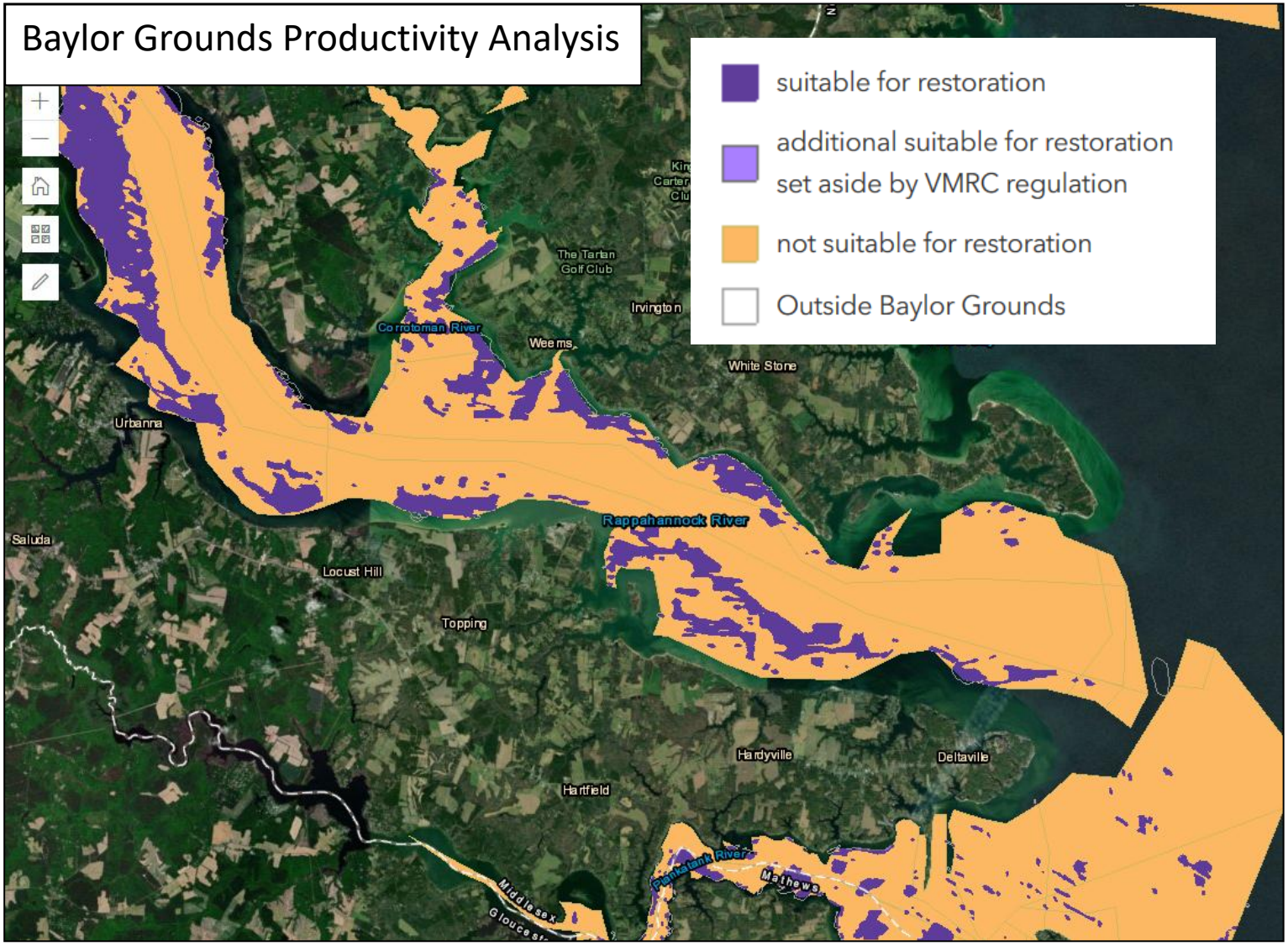
Bottom Type Data



VMRCs Intertidal Reefs



Baylor Grounds Productivity Analysis

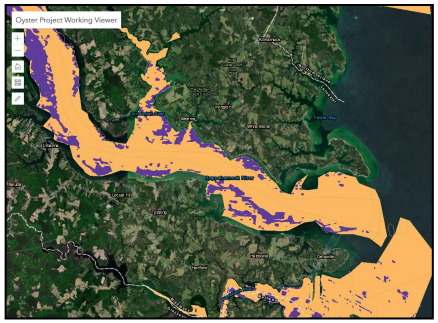


Summary Statistics of Productivity Analysis

Location	Suitable for Restoration (acres)	Additional Suitable bottom set aside by VMRC (acres)	Not Suitable for restoration (acres)	Total Acres	% Suitable of Total
Chesapeake Bay Lower West and Poquoson	785	0	8,124	8,909	8.8
Chesapeake Bay Upper West and Fleets Bay	721	11	35,608	36,341	2.0
Great Wicomico River	455	1	2,238	2,694	16.9
James River and Tributaries	17,977	110	12,960	31,047	57.9
Lynnhaven Bay	0	48	19	67	0.0
Piankatank River and Milford Haven	915	12	7,450	8,377	10.9
Pocomoke/Tangier Sounds and Chesapeake Bay Upper East	5,862	6	26,779	32,647	18.0
Potomac River Tributaries	704	1	2,563	3,268	21.5
Rappahannock River and Tributaries	9,953	0	33,467	43,420	22.9
York River and Mobjack Bay (with tributaries)	1,745	0	10,400	12,145	14.4
Chesapeake Bay Total	**39,117**	**189**	**139,608**	**178,915**	**21.97**

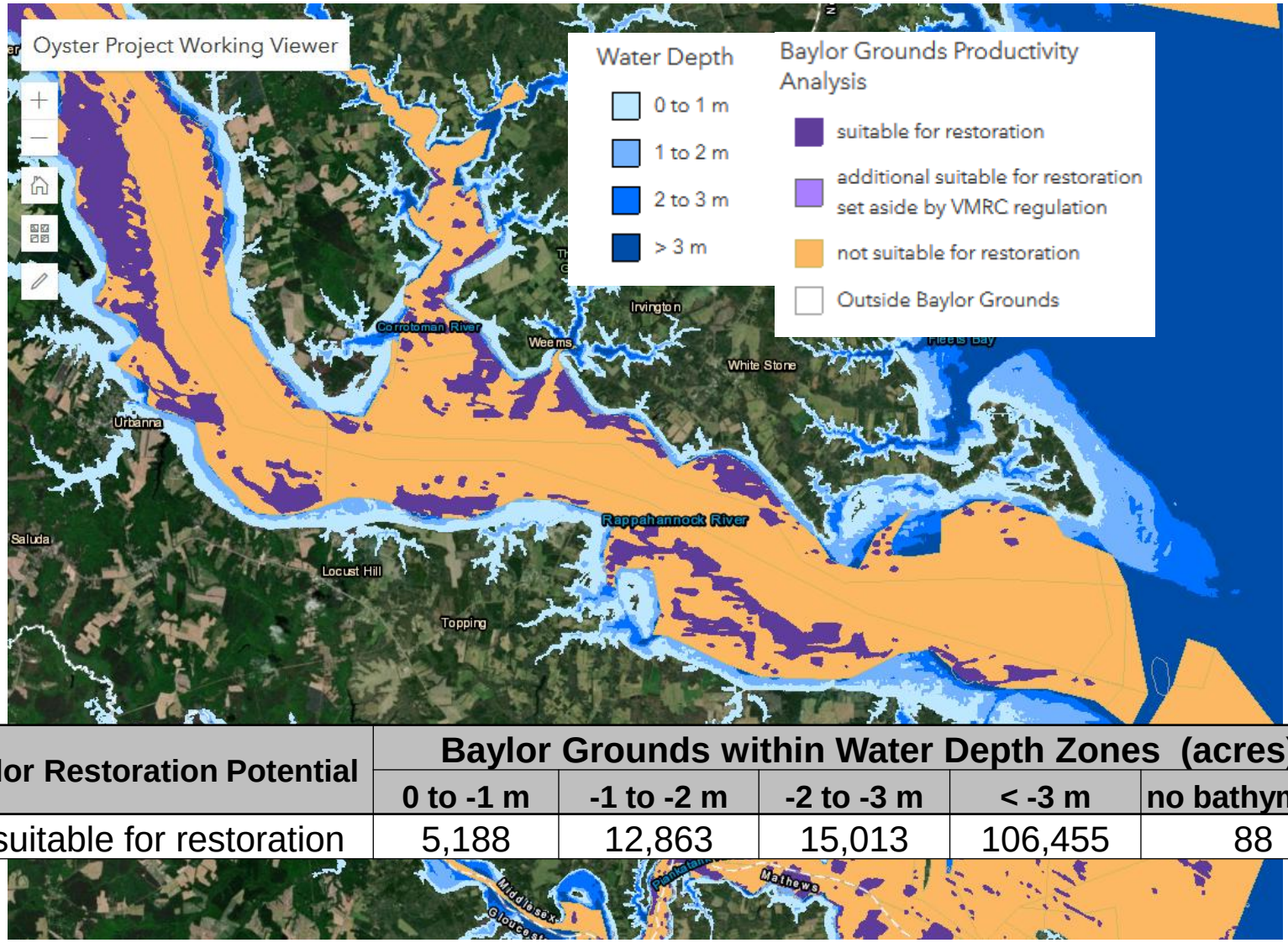
The Bottom Line

- Acreage of Baylor in the Bay: 178,915
- Acreage of suitable bottom: 39,307 (22%)
- Acreage of unsuitable bottom: 139,608 (78%)



Take Home Points

- Sites with the potential for restoration should be targeted for future replenishment efforts
- Replenishing areas classified as “Unsuitable for Restoration” would waste limited funding and shell resources
- Areas Classified as “Unsuitable” offer excellent locations for expansion of aquaculture



Baylor Restoration Potential	Baylor Grounds within Water Depth Zones (acres)				
	0 to -1 m	-1 to -2 m	-2 to -3 m	< -3 m	no bathymetry
Not suitable for restoration	5,188	12,863	15,013	106,455	88

Opportunities Moving Forward

- Approximately 78% of Baylor is unproductive
- Equates to ~ 140,000 acres of bottom

Can we redefine the Baylor Grounds or repurpose unsuitable/unproductive areas of the Baylor Grounds to support aquaculture expansion?

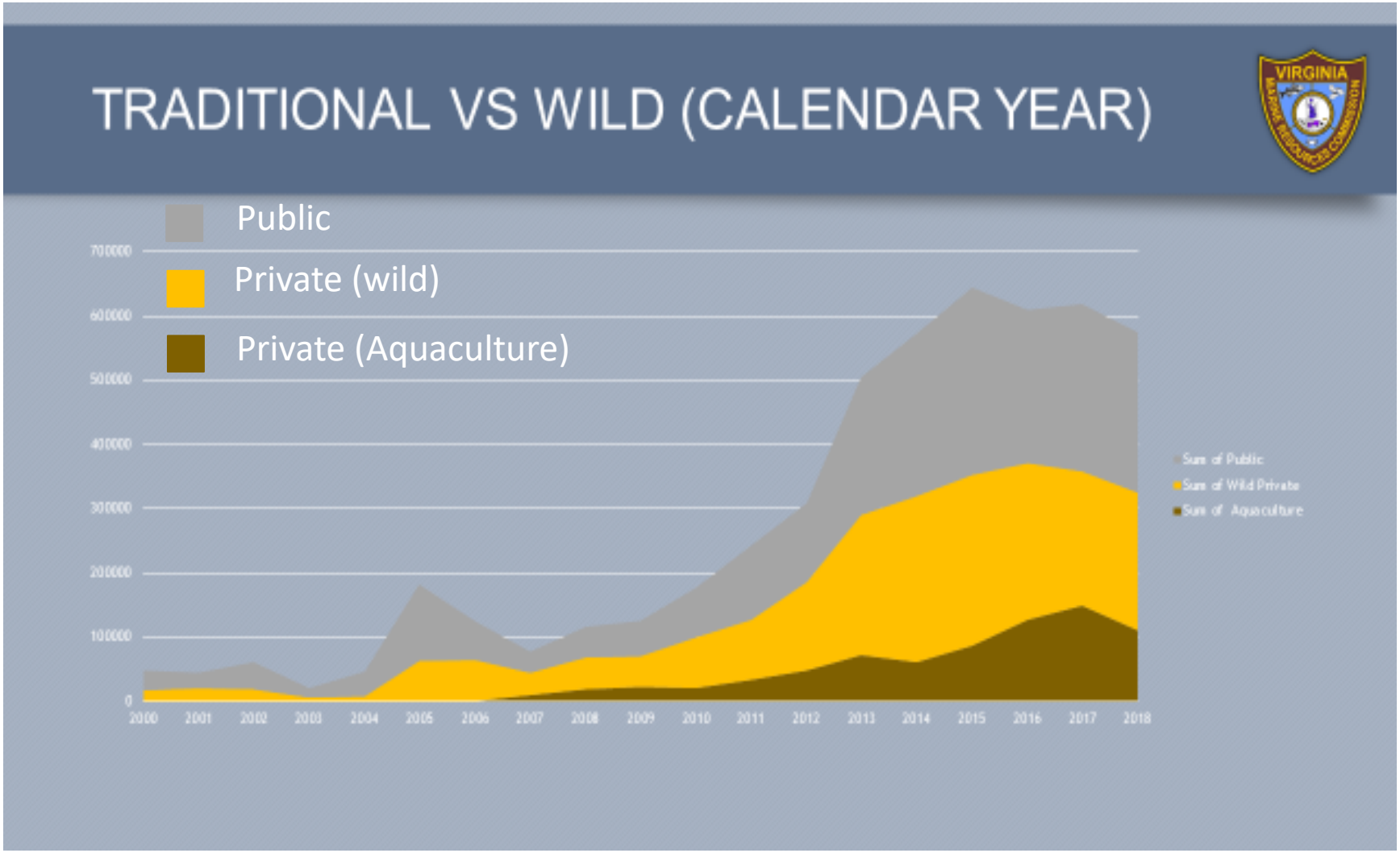
Redefine the Baylor Grounds

- General Assembly Authority
  - ". . . define and determine . . . by surveys or otherwise." (Va. Const., Art. XI, Sec. 3)
  - Examples of adding and, more rarely, removing grounds
- Virginia Marine Resources Commission Limited Authority
  - In limited circumstances, may reestablish or alter parameters
- The Scale of Redefining?
  - Complete Overhaul
  - Piecemeal Approach

Repurpose Unproductive Areas

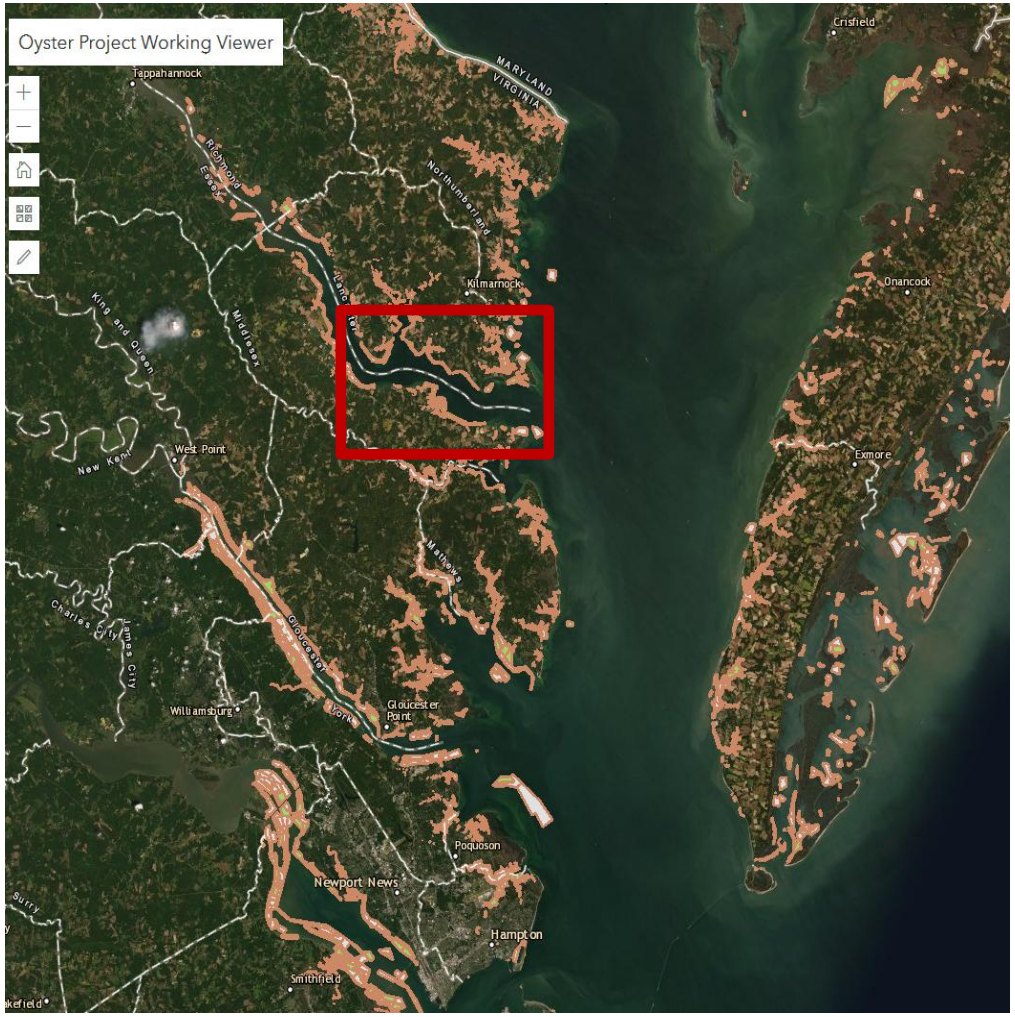
- Current Uses
  - No leases, easements
  - VMRC regulates as public fishery (harvest seasons and areas, day/time limits, etc.)
  - VMRC also regulates acquisition of other seafood, such as finfish (fixed fishing devices)
- Potential Other Uses?
  - Experimental approach – test whether aquaculture would work in these unproductive areas?
  - Create a licensing program for private aquaculture within these unproductive areas (fixed fishing device regulations as a guiding framework)

Oyster Production in Virginia



Analysis of active harvesting on private leases

Reviewed harvest reporting records from the VMRC Mandatory Harvest Reporting Database between 2013-2017



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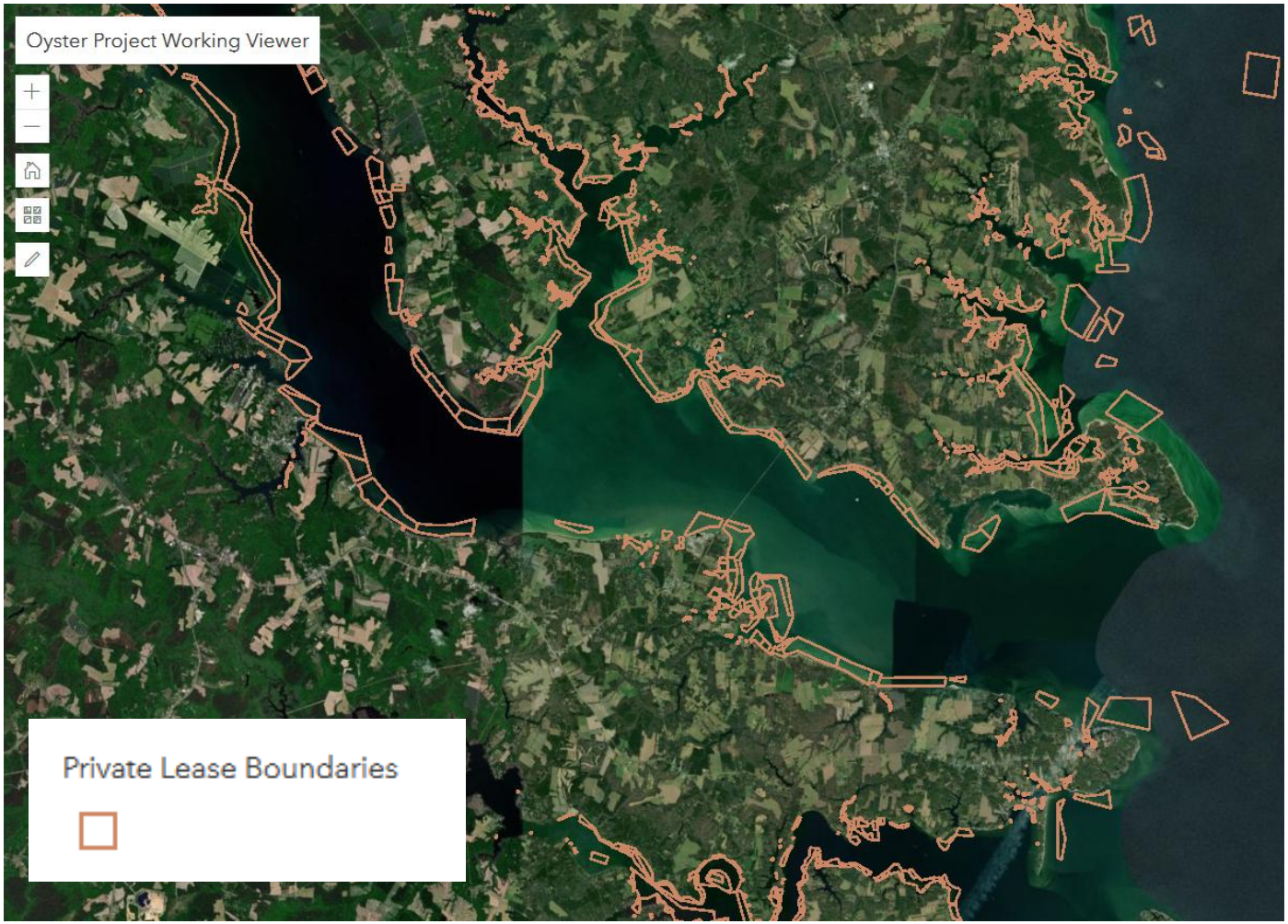

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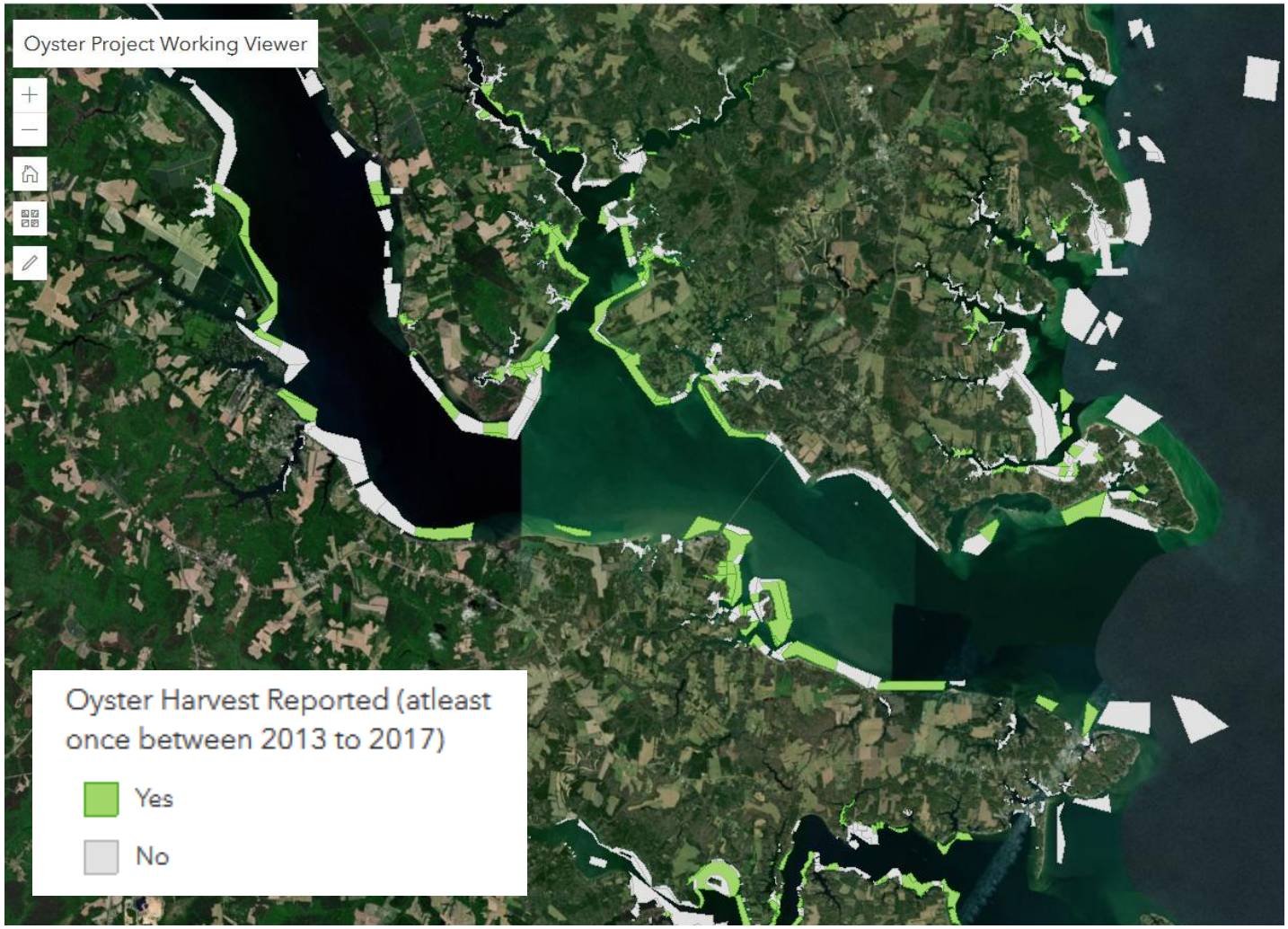


Assessment of current aquaculture metrics

River Area Name	Number of Leases	Acres of Private Leases	Water Area Acres	% of Water Area that is Leased	Active (reporting) Private Lease Acres	Inactive Private Lease Acres	Intensive Aquaculture Acres	Extensive Aquaculture Acres	Number of Leases Reporting Intensive Harvest
Chesapeake Bay Lower East	162	2797.03	103409.24	2.70	1323.41	1473.62	1196.32	730.72	48
Chesapeake Bay Lower West	68	3495.52	228474.56	1.53	375.02	3120.51	57.12	323.27	6
Chesapeake Bay Upper East	335	5339.07	183874.03	2.90	2172.81	3166.27	1883.03	990.06	100
Chesapeake Bay Upper West	142	2283.02	253747.78	0.90	419.96	1863.06	121.81	371.73	6
Fleets Bay	114	1899.94	5780.79	32.87	275.71	1624.24	20.50	255.20	2
Great Wicomico River	250	2003.67	7987.41	25.09	837.88	1165.80	202.79	694.14	15
James River	542	30353.23	129103.13	23.51	8771.14	21582.14	27.40	8743.74	1
Lynnhaven Bay	167	2378.61	5015.98	47.42	491.37	1887.24	321.39	291.99	20
Piankatank River	235	3394.35	16302.48	20.82	1276.49	2117.87	285.95	1126.52	18
Poquoson/Back Rivers	228	4599.71	10626.37	43.29	1680.89	2918.83	402.77	1510.73	16
Potomac Tributaries	514	9678.36	30027.75	32.23	3707.20	5971.17	1414.21	2972.99	87
Rappahannock River	448	10689.02	90299.94	11.84	4379.54	6309.50	1348.73	3315.19	26
Tangier/Pocomoke Sound	70	3254.65	149851.85	2.17	2479.59	775.07	210.65	2341.02	8
York River/Mobjack Bay	702	28176.97	84354.09	33.40	9204.87	18972.15	1168.95	8202.62	28
Chesapeake Bay Total	3,977	110,343	1,298,855		37,396	72,947	8,662	31,870	381
Percent					33.89	66.11	7.85		9.58

The Bottom Line

- There were 110,343 acres (n = 3,977) of private leases analyzed
- Between 2013 and 2017 only **34%** of these leases reported harvest
- Approximately **10% (381/3,977)** of those reporting were practicing intensive aquaculture

Assessment of current aquaculture metrics within shallow water zones

- **75%** (286/381) of leases reporting intensive aquaculture harvest are within 100 ft of the shoreline

- **93%** (355/381) of leases reporting intensive aquaculture harvest are within 500 ft of the shoreline

Oysters and clams combined	100 ft Buffer	200 ft Buffer	300 ft Buffer	500 ft Buffer	Chesapeake Bay Totals
Total Leases	2,545	2,835	2,997	3,215	3,977
Percent Leases	63.99	71.28	75.36	80.84	100.00
Total Intensive Harvest	286	321	333	355	381
Percent Intensive Harvest (of total)	7.19	8.07	8.37	8.93	9.58
Percent Intensive Harvest	75.07	84.25	87.40	93.18	100.00

Current Approach

- Initial Application (Currently 100% Taken)
  - Location and Acreage; Traditional Shelling or Cultivate Existing Shell; Planting Spat or Seed Oysters; Install (< 12 inches)On-Bottom Structures; $300-$1,000 application fee, $750 Survey Fee, minimal use plan,10 year lease
- Transfer Request
  - Current holder can easily subvert the 10 year use requirement by transferring after 9 years; $300-$1,000 per transfer.
  - Requesting party: Traditional Harvest or Planting; On-Bottom Structure Less Than 12 Inches; and Other Uses
- Renewal Request (Considering 1 Bu/Ac)
  - Percentage of Lease Used; Planting/Harvest Effort Made During Past 10 Years; Additional Effort or Reason for No Significant Production

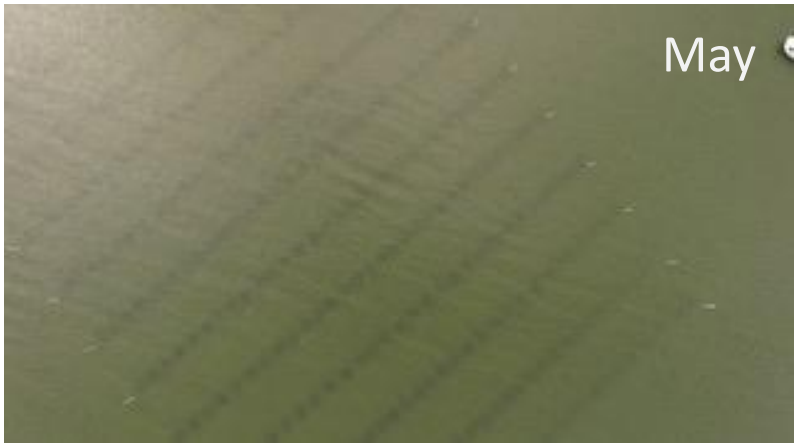
More Detailed Use Plans?

- Other states require more detail regarding production activities – seeding, tending, site visits, harvest techniques, intended recipients of product, etc.
  - Examples: Maine and Rhode Island
- Would require revision of application forms
- Balance level of detail with simplicity and flexibility
- Consider unintended consequences?

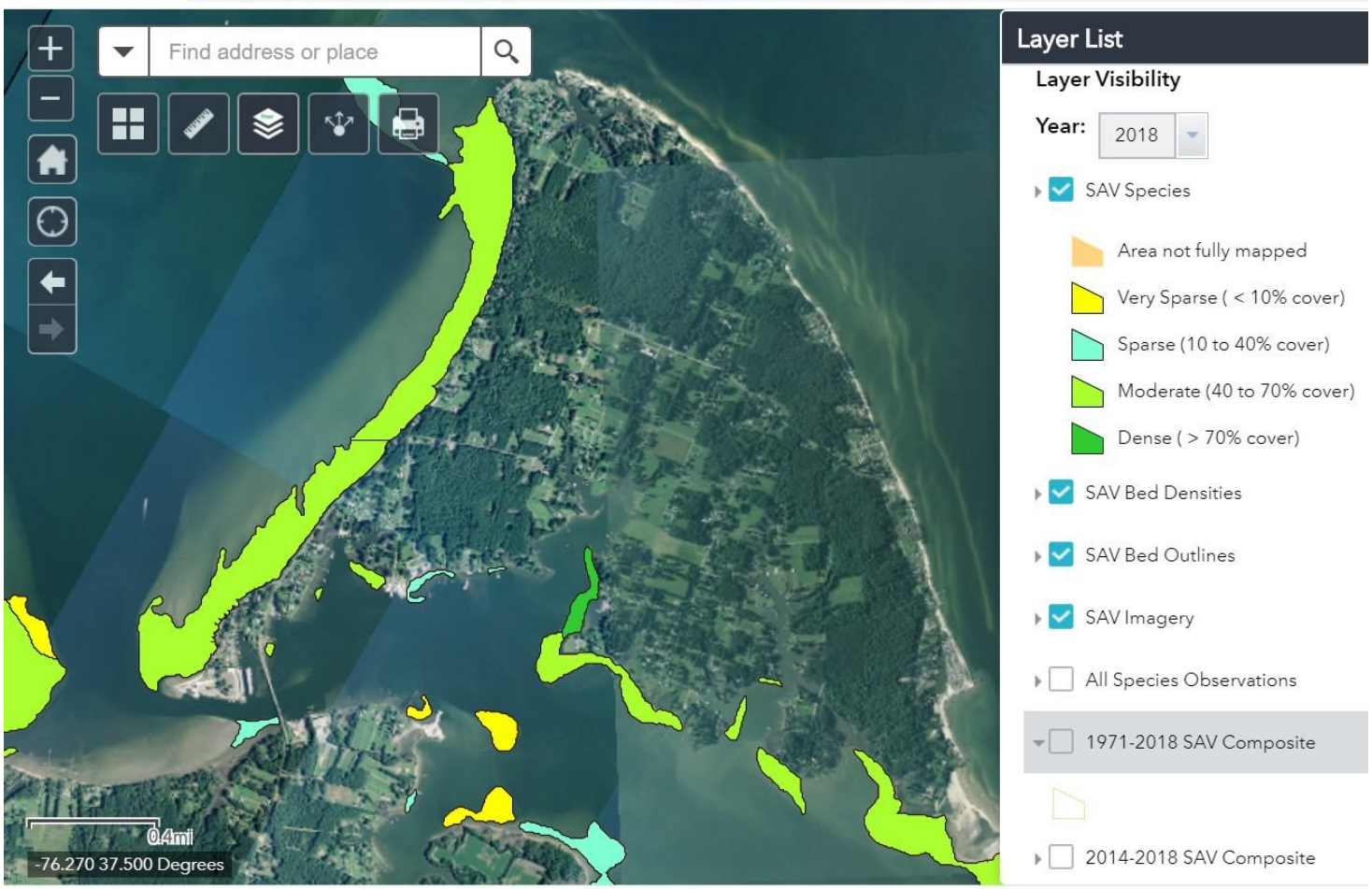
Develop Specific Use Criteria

- VMRC authority when reviewing renewal and transfer requests
  - Recent amendments to Va. Code 28.2-613 and -625
- Approaches in Other States
  - Quantitative Input or Output Requirements (i.e., Maryland)
  - More Open-Ended Active Use Criteria (i.e., New Jersey, Suffolk County, NY)
- What is meant by “beneficial use”?

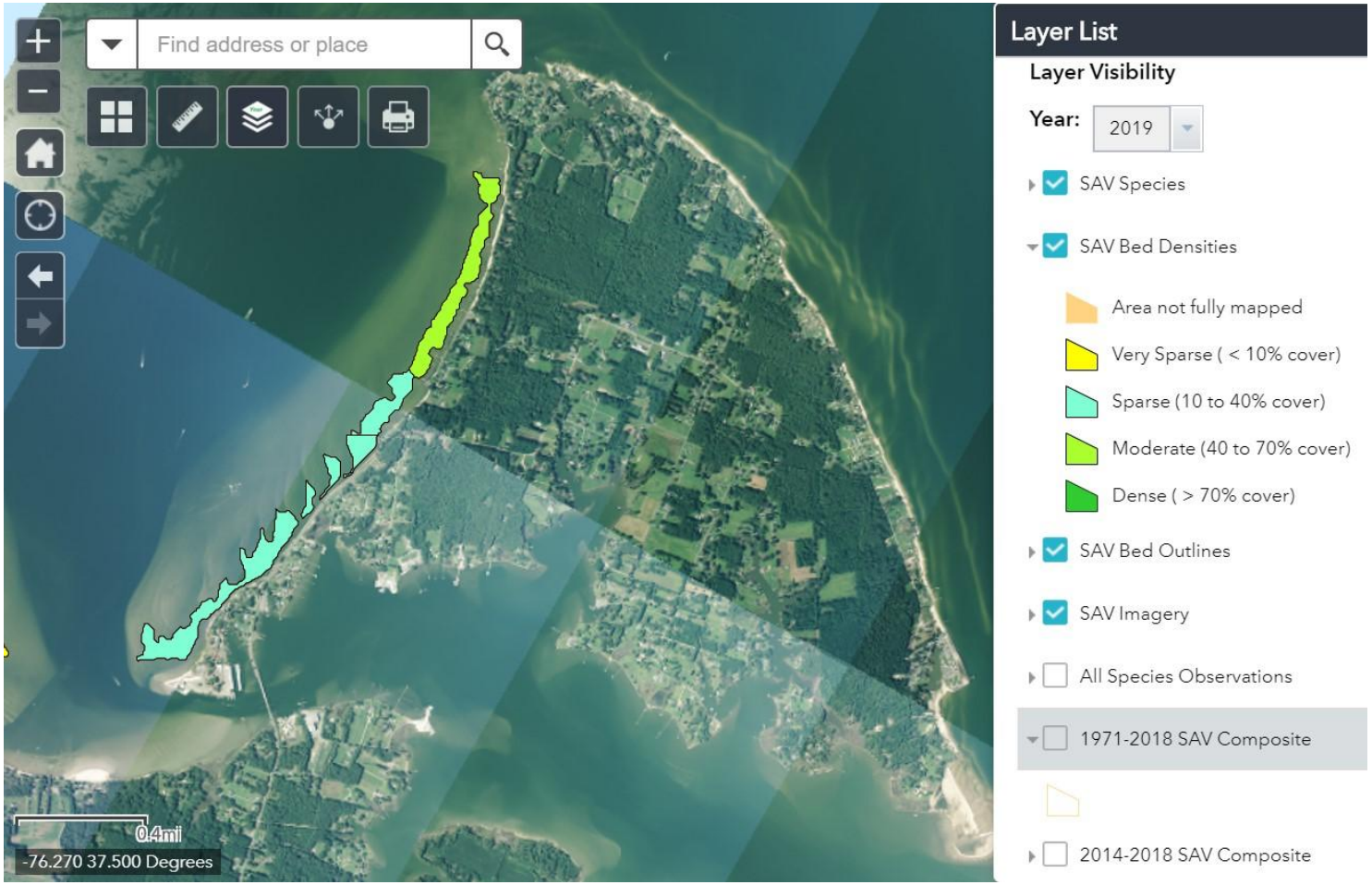
Regulatory impediments and conflict analysis: SAV and intensive aquaculture



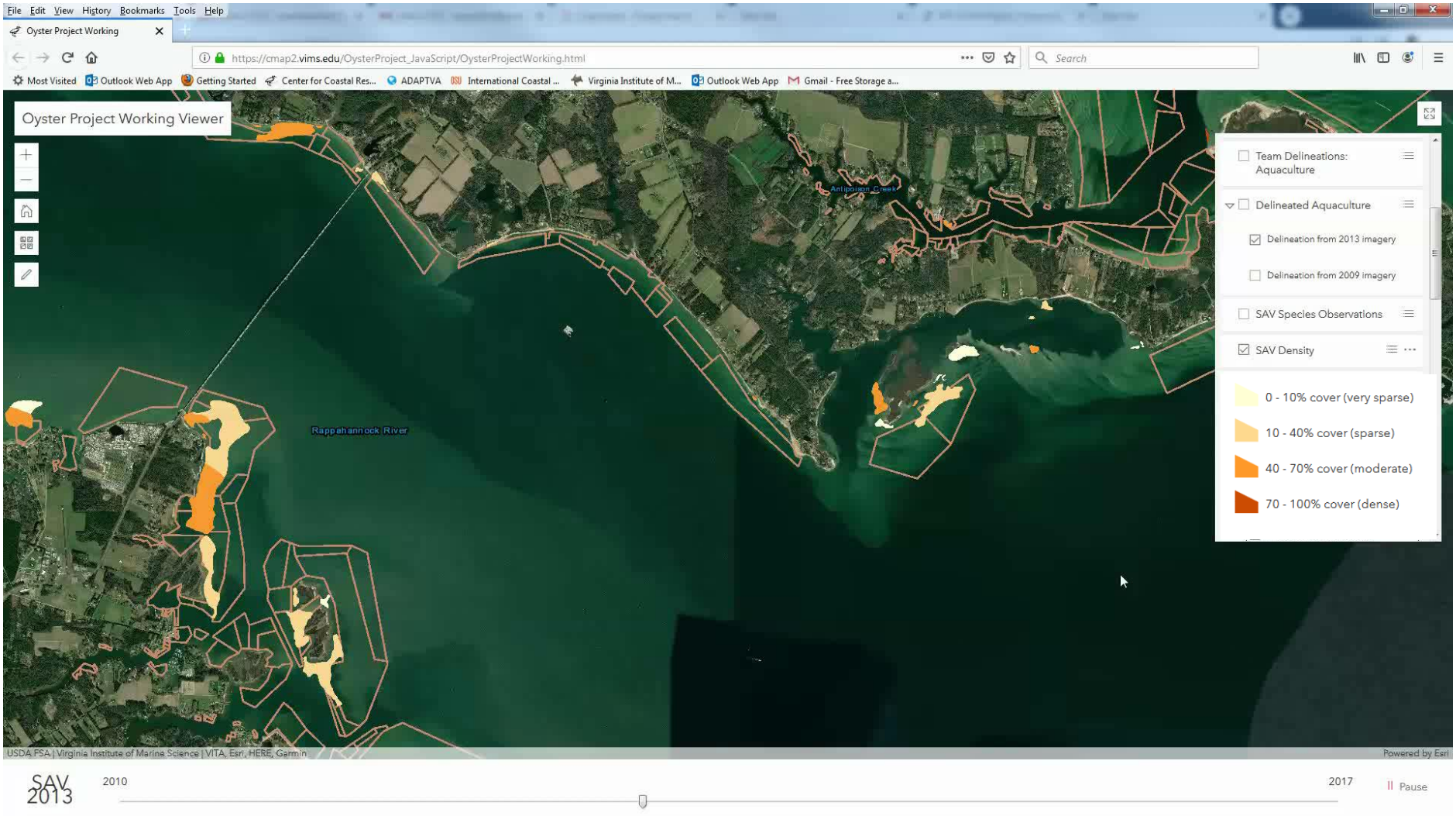
SAV Distribution 2018



SAV Distribution 2019



Distribution Patterns of SAV (2010-2017)
Lower Rappahanock River



Data courtesy of the VIMS SAV Mapping Program

Assessment of regulatory impediments and conflict analysis (SAV presence 2012-2016)

	Chesapeake Bay Totals		
Total Leases	3977		
Percent Leases	100.00		
	Number of Leases	Percent of Total	Percent of SAV Leases
Non-Riparian Leases with SAV	1031	25.92	100.00
Non-Riparian Leases with No SAV	2946	74.08	
Intensive Harvest - Oysters & Clams	Number of Leases	Percent of Total	Percent of Intensive Leases
Intensive Harvest with SAV	158	3.97	41.47
Intensive Harvest with No SAV	223	5.61	58.53
Total Intensive Harvest	381	9.58	100.00

Maryland House Bill 841
Effective October 1, 2019

Aquaculture – Submerged Aquatic Vegetation – Placement of Shellfish, Bags, Nets, and Structures

Section 4-11A-10

(C–1) IN APPROVING THE PLACEMENT OF SHELLFISH, BAGS, NETS, OR STRUCTURES ON SUBMERGED AQUATIC VEGETATION UNDER SUBSECTION (C)(1) OF THIS SECTION, THE DEPARTMENT:

(1) MAY NOT AUTHORIZE HARVESTING BY DREDGE IN AREAS WHERE SUBMERGED AQUATIC VEGETATION IS PRESENT;

(2) SHALL AUTHORIZE FOR WATER COLUMN LEASES THE PLACEMENT OF SHELLFISH, BAGS, NETS, OR STRUCTURES IN AT LEAST 10% OF THE AREA WHERE SUBMERGED AQUATIC VEGETATION IS PRESENT

The Bottom Line

- Aquaculture and SAV can co-exist.

The Bottom Line-Perspective

- 2019 66,387 acres SAV in the Bay, 2018 108,078 acres
- In Virginia, less than 900 acres of intensive aquaculture is currently producing 100,000 bushels of oysters
- Intensive aquaculture provides complex habitat and ecological services that remain in place regardless of environmental conditions

The Bottom Line-Perspective

- If placed on optimum locations, production should be 500 to 1000 bushels of oysters per acre, requiring only 600 to 1200 acres of intensive aquaculture to produce Virginia's current annual production