

# Satellite Work Update

SAV Workgroup Meeting 2/19/21

*David Wilcox, VIMS SAV Monitoring and Restoration Program*  
*[dwilcox@vims.edu](mailto:dwilcox@vims.edu)*

# Satellite Work Update

*David Wilcox, VIMS*

## Exploring Satellite Image Integration for the Chesapeake Bay SAV Monitoring Program



A Scientific and Technical Advisory Committee Workshop Report

Session 1, October 2019, Gloucester Point, VA  
Session 2, December 2019 – Gloucester Point, VA  
Session 3, February 2020 – Gloucester Point, VA

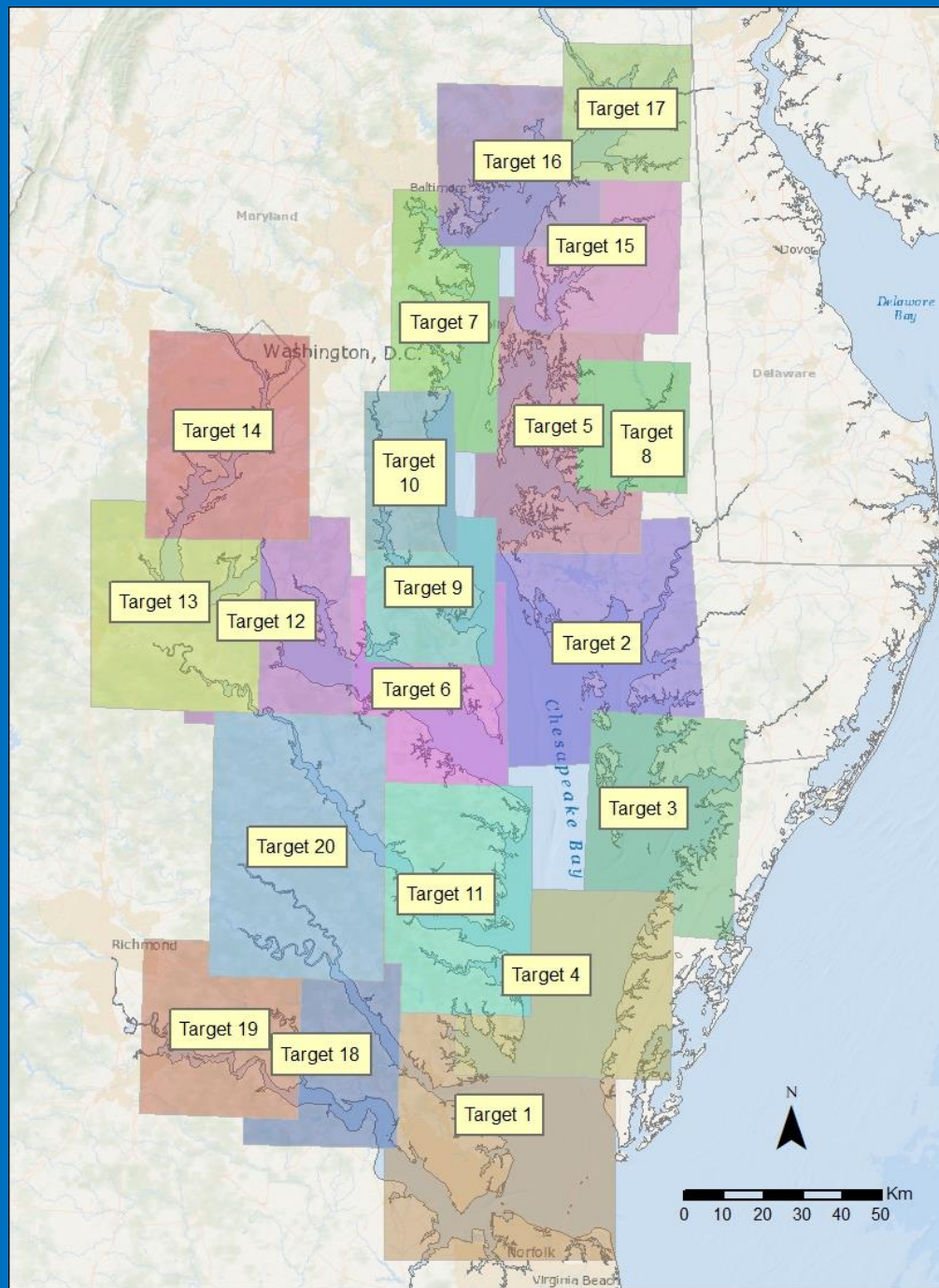


STAC Publication 20-XXX

## STAC SAV Workshop

October 2019, December 2019,  
February 2020

- Trial of full Bay acquisition in 2020
- Comparison of SAV monitoring using satellite and aerial imagery



- We divided the Bay into 20 target areas for potential satellite imagery acquisition.
- Only one area was selected per day to avoid competing with ourselves.
- Little ability to adjust target based on daily conditions.



### WordView-2

Bands: Panchromatic: 450-800 nm  
 8 Multispectral: (red, red edge, coastal, blue, green, yellow, near-IR1 and near-IR2) 400 nm – 1040 NM n, yellow, near-IR1 and near-IR2) 400 nm – 1040 NM  
 Resolution: 0.46 m Panchromatic  
 1.84 Multispectral  
 Swath width: 16.4 km

### GeoEye-1


Bands: Panchromatic: 450 - 800 nm  
 Blue: 450 - 510 nm  
 Green: 510 - 580 nm  
 Red: 655 - 690 nm  
 Near Infra Red: 780 - 920 nm  
 Resolution: 0.46 m Panchromatic  
 1.84 Multispectral  
 Swath width: 15.2 km

### WordView-3

Bands: Panchromatic: 450-800 nm  
 8 Multispectral: (red, red edge, coastal, blue, green, yellow, near-IR1 and near-IR2) 400 nm – 1040 NM  
 Resolution: 0.31 m Panchromatic  
 1.24 Multispectral  
 Swath width: 13.1 km

## Satellite Scenes

	Jun				Jul				Aug					Sep				Oct				2020
Sun	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	
Sat	6	13	20	27	4	11	18	25	1	8	15	22	29	5	12	19	26	3	10	17	24	31
Fri	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2	9	16	23	30
Thu	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	1	8	15	22	29
Wed	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28
Tue	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	29	6	13	20	27
Mon	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	5	12	19	26

 Growing Season

*N.B.* Numbers in cells represent days in the month



## Satellite Scenes

	Jun					Jul					Aug					Sep					Oct					2020
Sun	0	4	0	4		5	3	5	2		5	6	13	6	13	12	16	0	14	0	16	0	0			
Sat	0	4	0	3		5	3	5	2		5	6	15	6	14	12	16	12	14	0	16	0	0	0		
Fri	0	3	0	3		5	0	7	6	8		6	16	12	16	10	17	13	17	0	16	0	0	0		
Thu	0	3	0	0		8	0	7	6	7		9	16	10	16	10	17	13	17	0	0	0	0	0		
Wed	0	0	0	0		0	6	4	9	11		9	17	12	17	13	18	13	17	13	0	0	0	0		
Tue	0	0	0	0	0		6	4	10	11		10	11	13	18	13	18	15	0	13	0	0	0	0		
Mon	0	0	0	0	4		6	4	5	11		5	11	13	18	13		12	14	0	13	0	16	0	0	
99 requested dates																										
<div><div>High Tide</div><div>Targeted</div></div>																										

High Tide Targeted

N.B. Numbers in cells represent different sections of the Bay

## Satellite Scenes

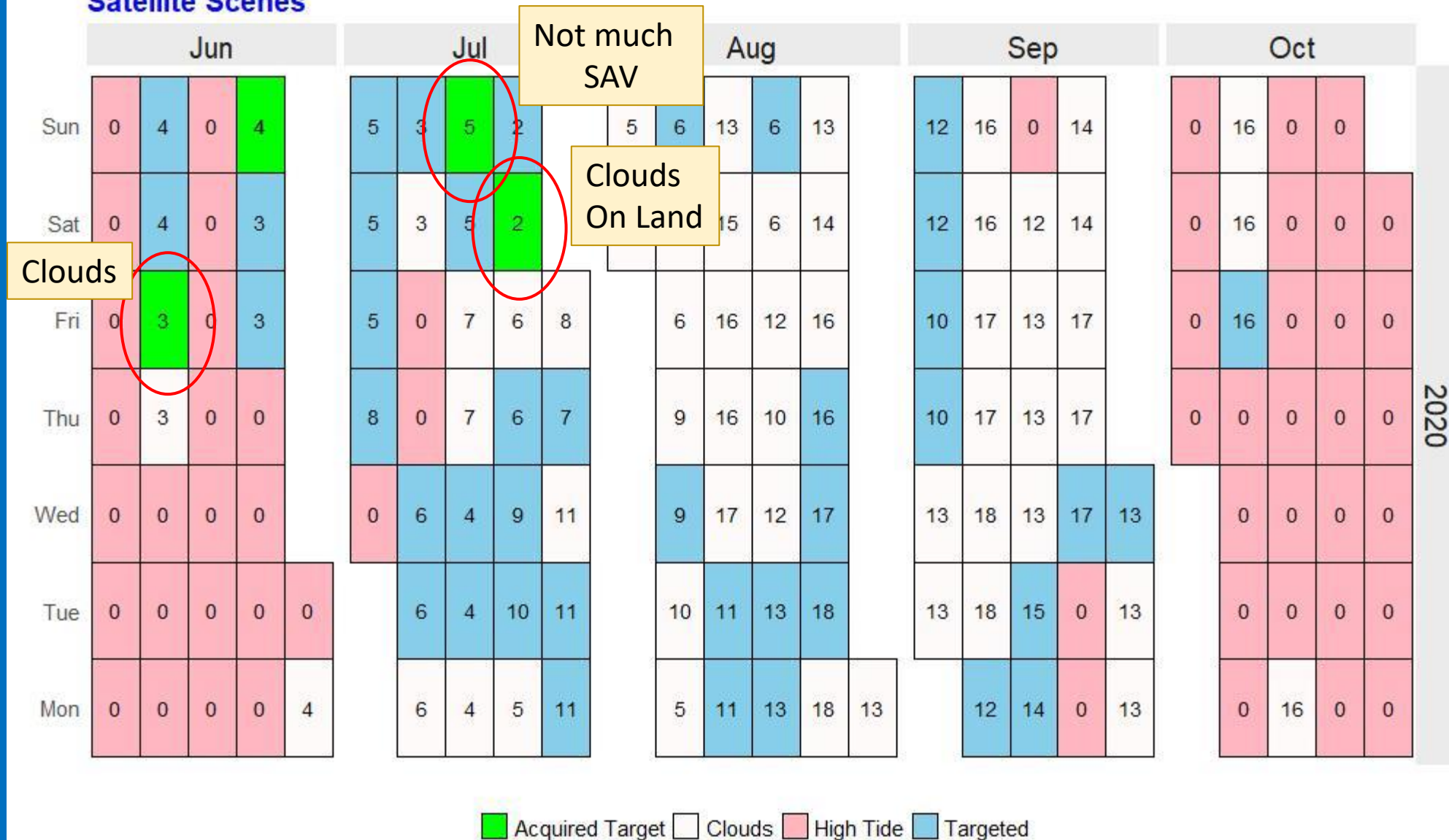
	Jun					Jul					Aug					Sep					Oct					2020
Sun	0	4	0	4		5	3	5	2		5	6	13	6	13	12	16	0	14	0	16	0	0			
Sat	0	4	0	3		5	3	5	2		5	6	15	6	14	12	16	12	14	0	16	0	0	0		
Fri	0	3	0	3		5	0	7	6	8		6	16	12	16	10	17	13	17	0	16	0	0	0		
Thu	0	3	0	0		8	0	7	6	7		9	16	10	16	10	17	13	17	0	0	0	0	0		
Wed	0	0	0	0		0	6	4	9	11		9	17	12	17	13	18	13	17	13	0	0	0	0		
Tue	0	0	0	0	0		6	4	10	11		10	11	13	18	13	18	15	0	13	0	0	0	0		
Mon	0	0	0	0	4		6	4	5	11		5	11	13	18	13		12	14	0	13	0	16	0	0	
															</											

*N.B.* Numbers in cells represent different sections of the Bay

## Satellite Scenes

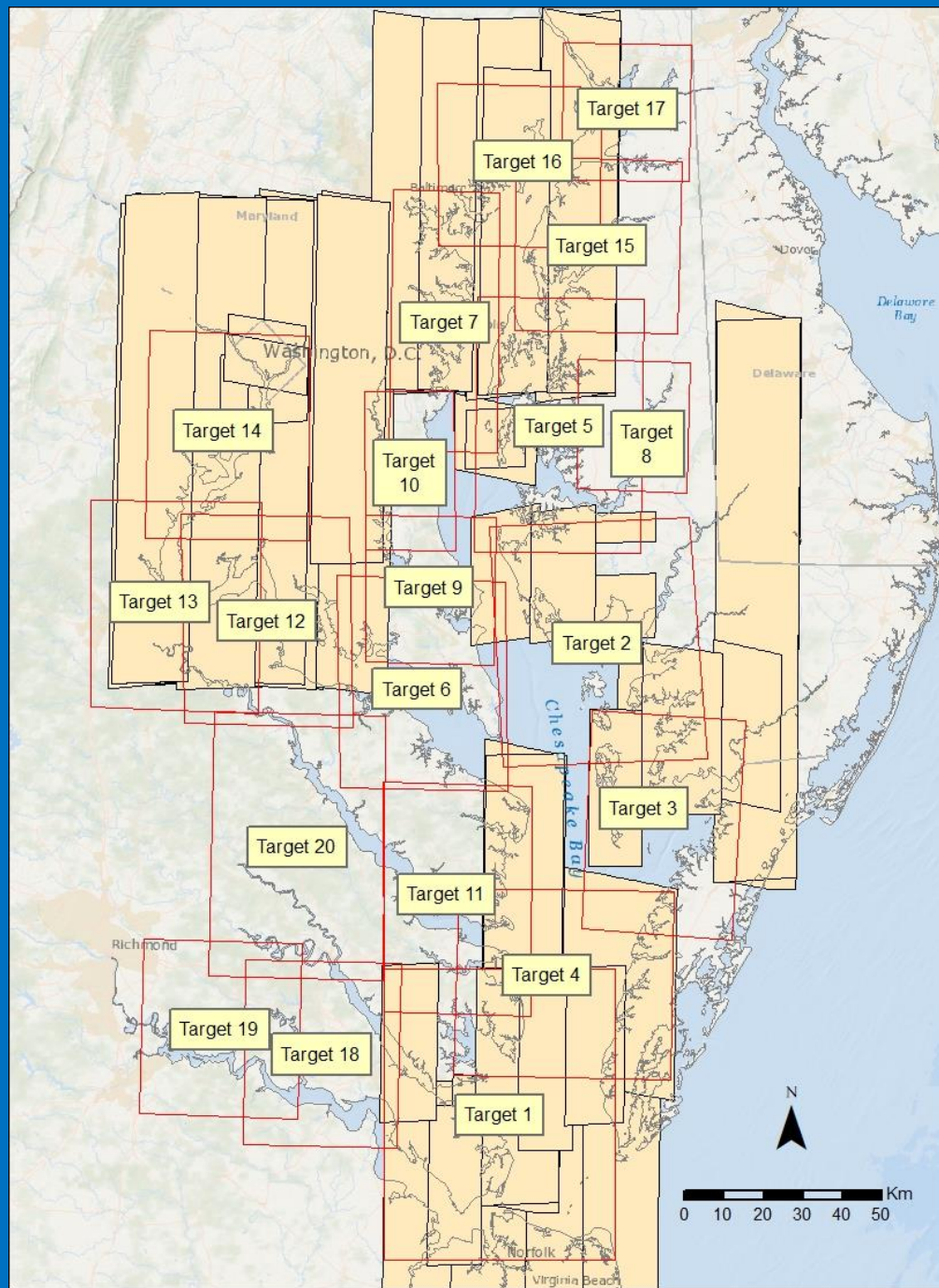
*Four out of 99 requests were successful.*

*One out of four were usable.*



*N.B. Numbers in cells represent different sections of the Bay*





# Satellite Scenes Captured

79 scenes were captured over Chesapeake Bay

- 4 of the scenes were specifically requested
- 75 scenes from areas that may have wrong tide or growing season

26 scenes were rejected immediately

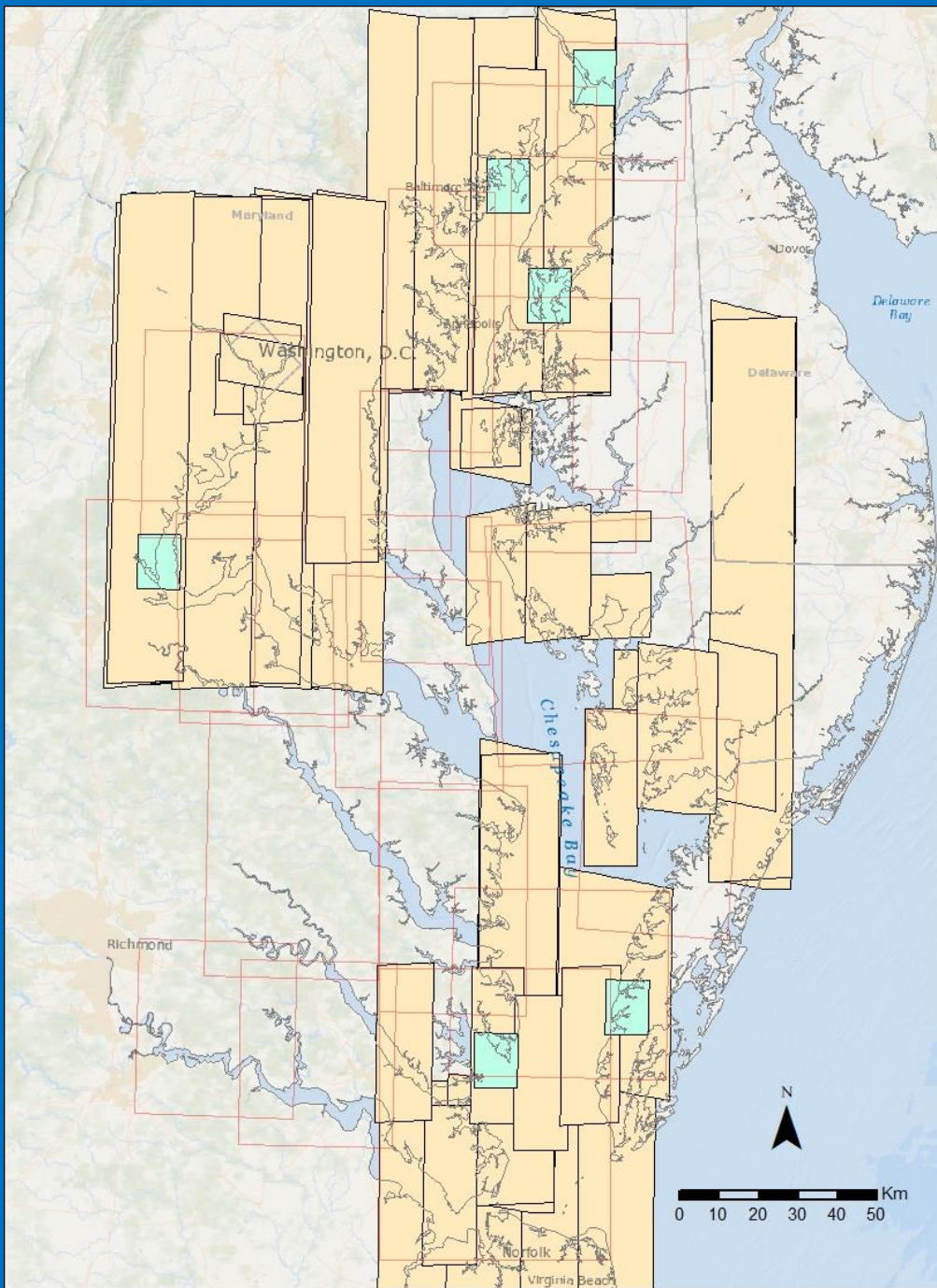
- Covered non-tidal areas only
- Obscured by clouds
- Extensive sun surface reflection

53 scenes were downloaded for a closer look

The scenes

- cover 24 dates
- are large, covering a wide tidal range
- often contain at least some cloud cover
- will require additional funding to fully evaluate usability for SAV monitoring





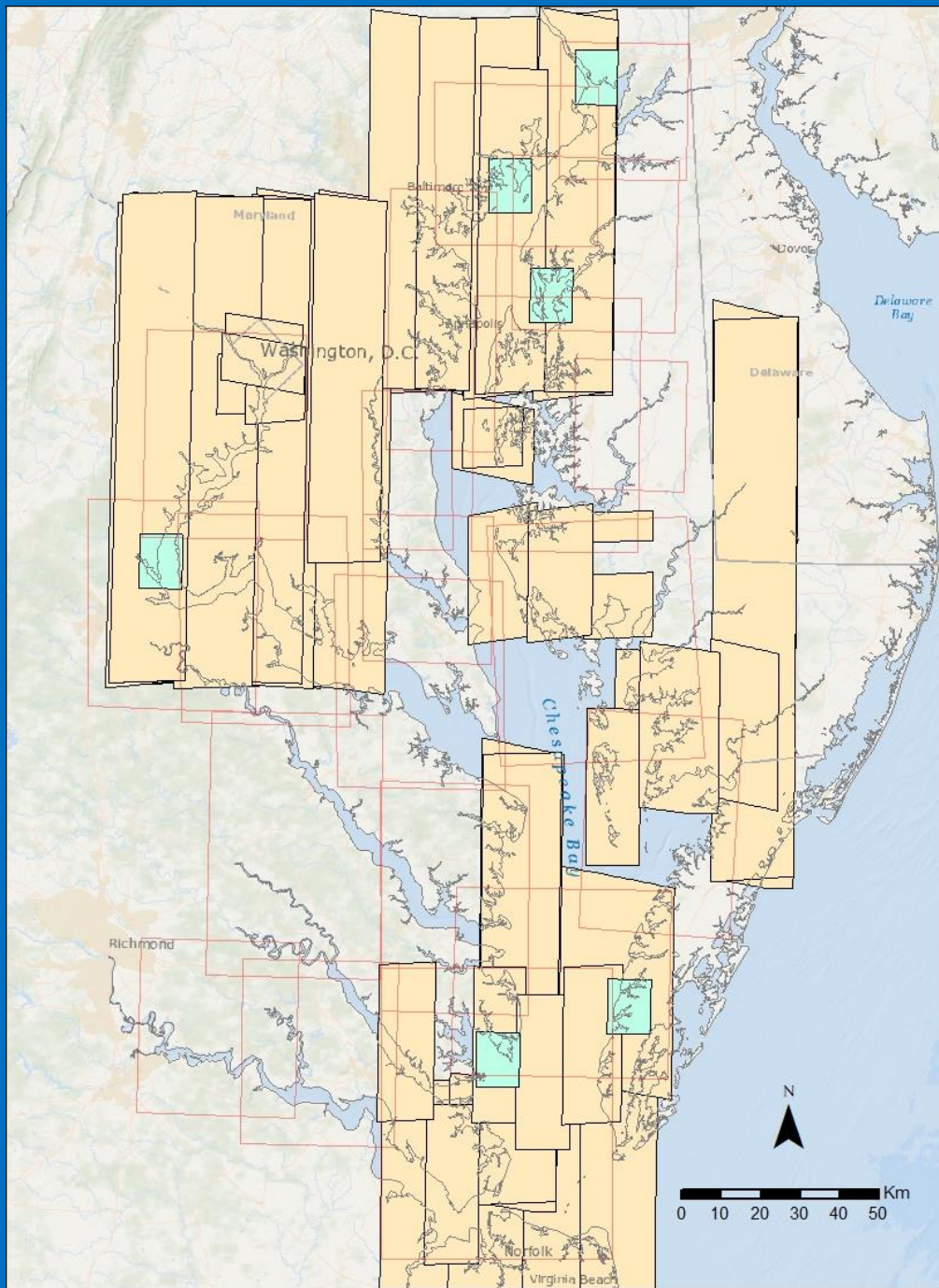
# Satellite vs. Aerial Comparison

## Six areas were selected

- Satellite imagery was available
- Aerial and satellite imagery in the same time frame
- No obvious defects in the satellite imagery
- Covering the majority of a USGS quadrangle
- Fairly large amount of SAV in the area

## Process

- Each area is mapped by two analysts
  - One using the satellite imagery
  - One using the aerial imagery
- The resulting raw SAV polygons are compared
- Once both are complete, the area is reviewed by both analysts and the PI to evaluate potential sources of difference



# Questions?

*[dwilcox@vims.edu](mailto:dwilcox@vims.edu)*

