



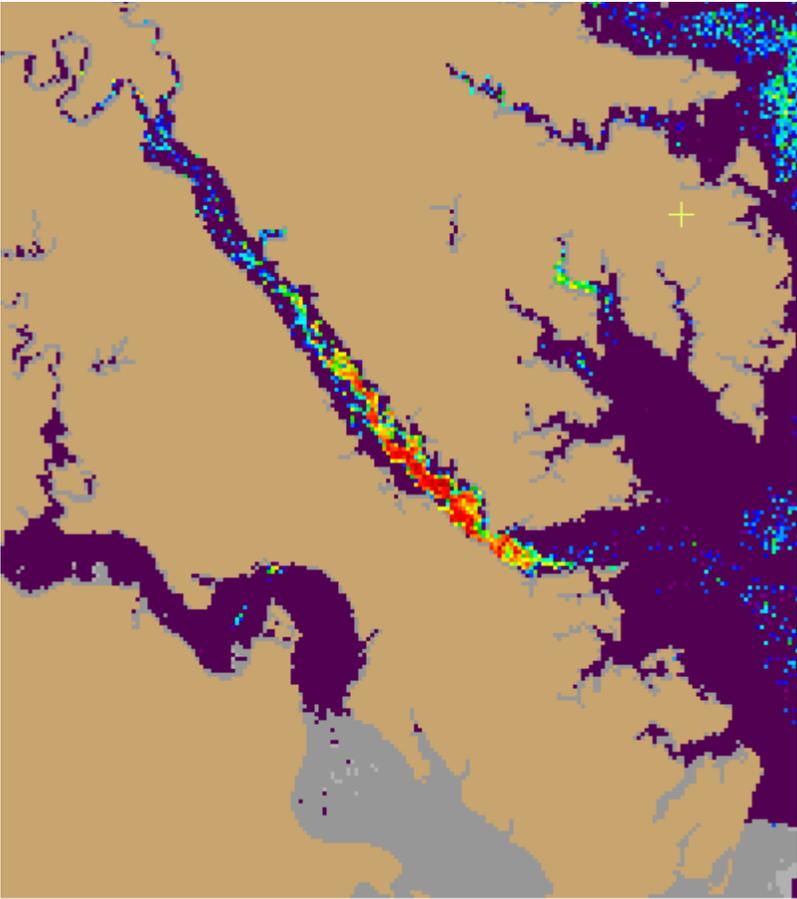
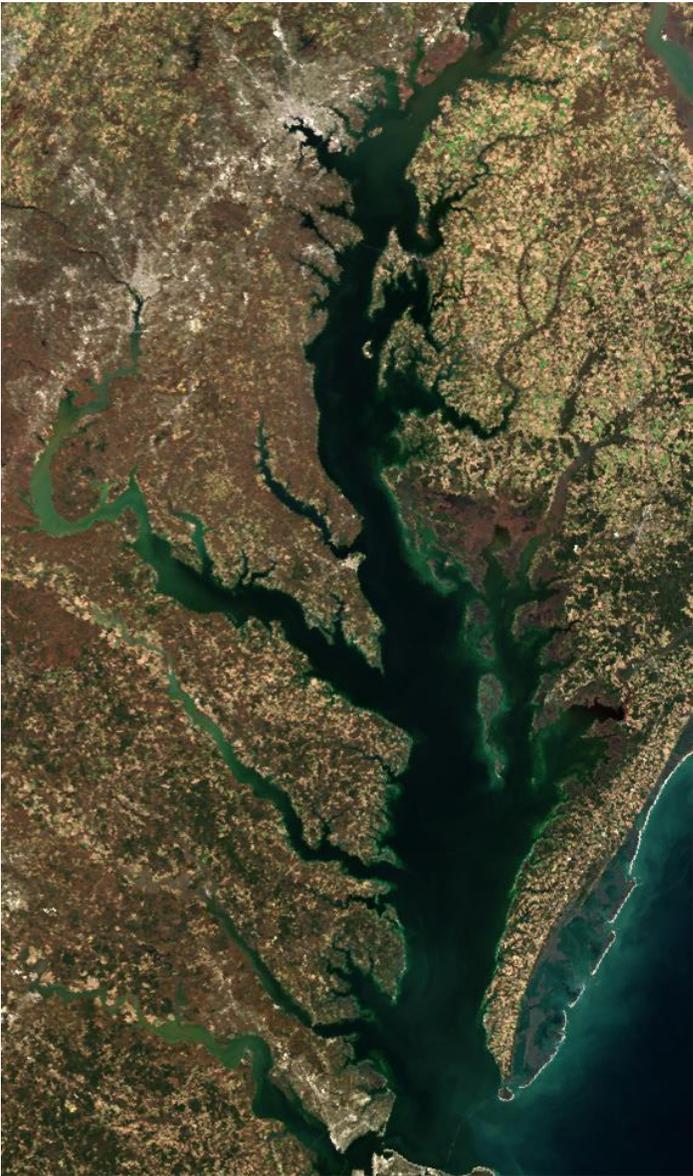
# Harmful Algal Blooms

Rick Stumpf

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NOAA

# NOAA National Ocean Service Work on Chesapeake Bay Rick Stumpf, Shelly Tomlinson



Aug 04, 2017 Sentinel-3 York River  
*Alexandrium monilatum* (reported by  
Kim Reece and Wolfgang Vogelbein)



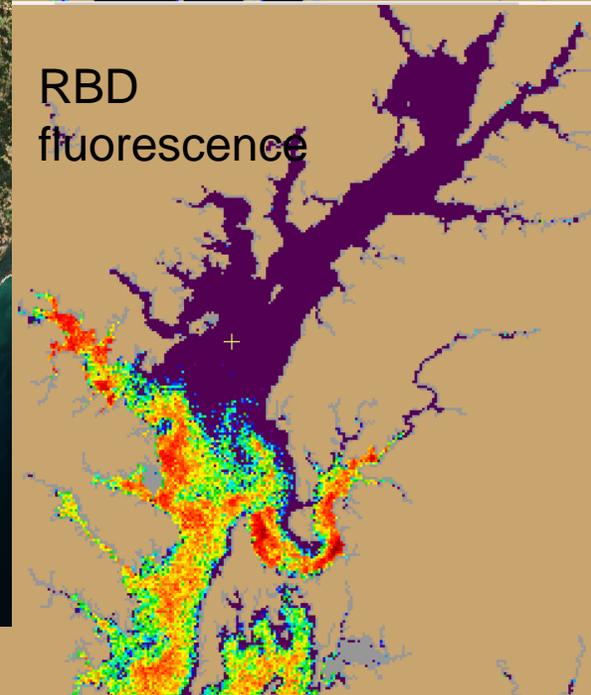
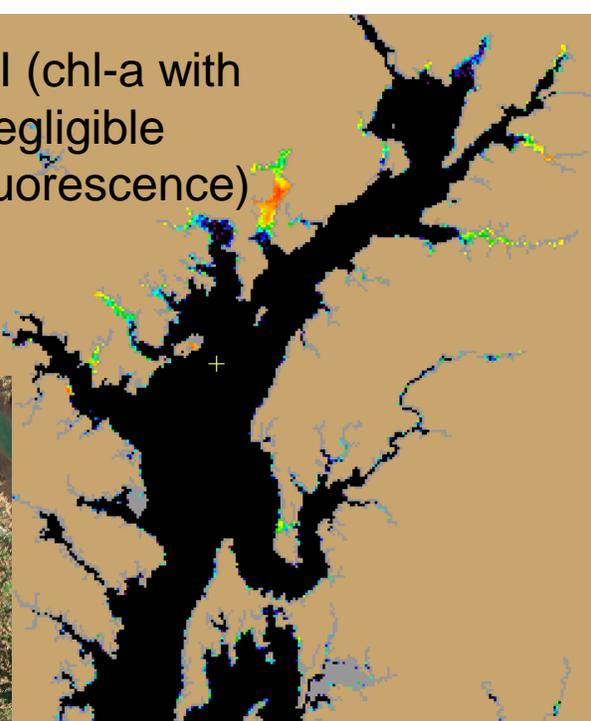
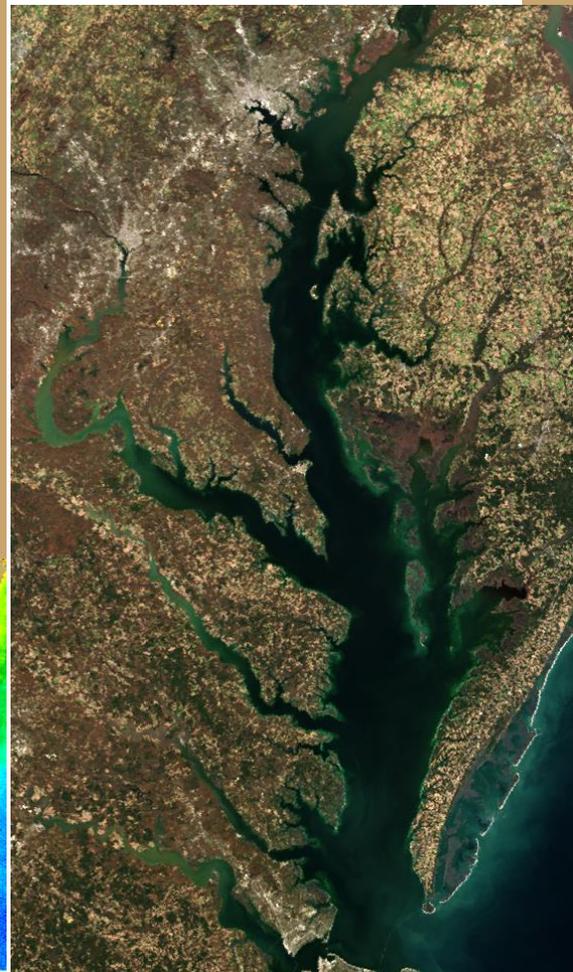
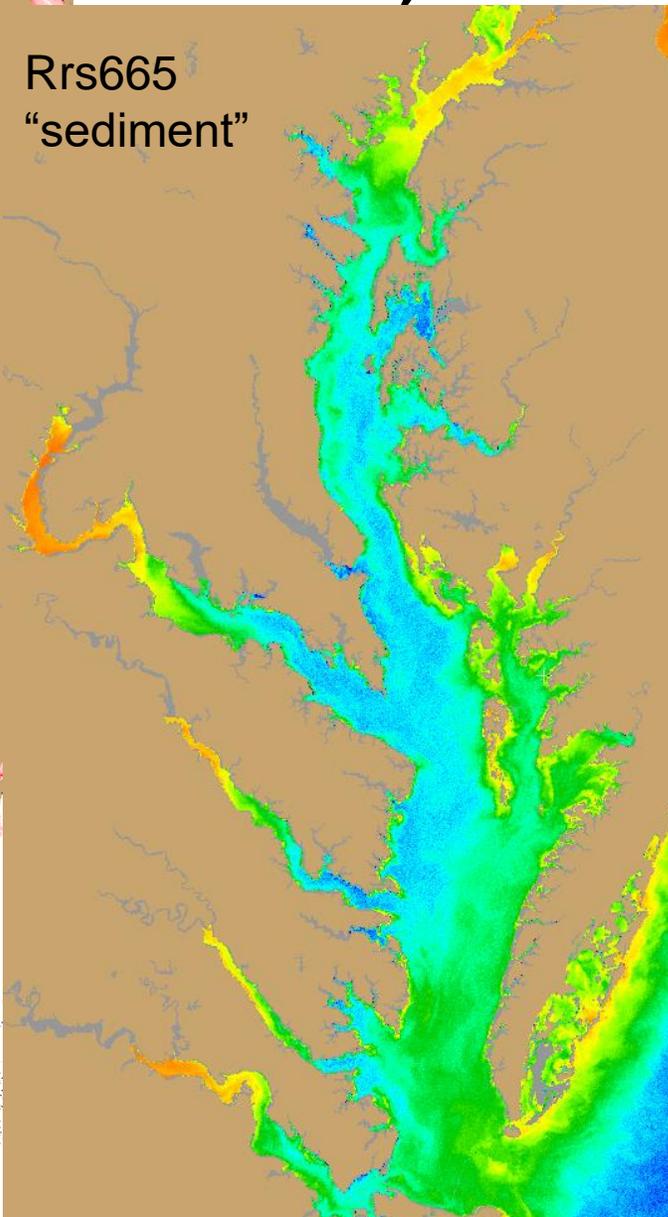
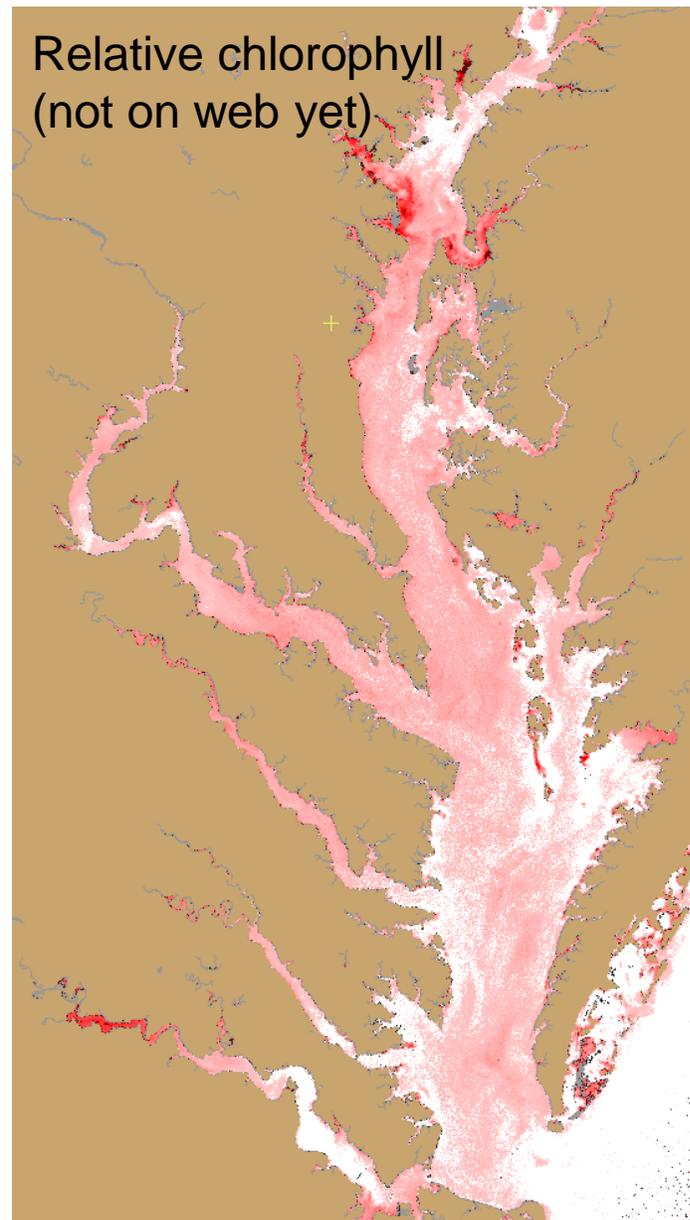
# Nov 24, 2017 S3 OLCI

Relative chlorophyll  
(not on web yet)

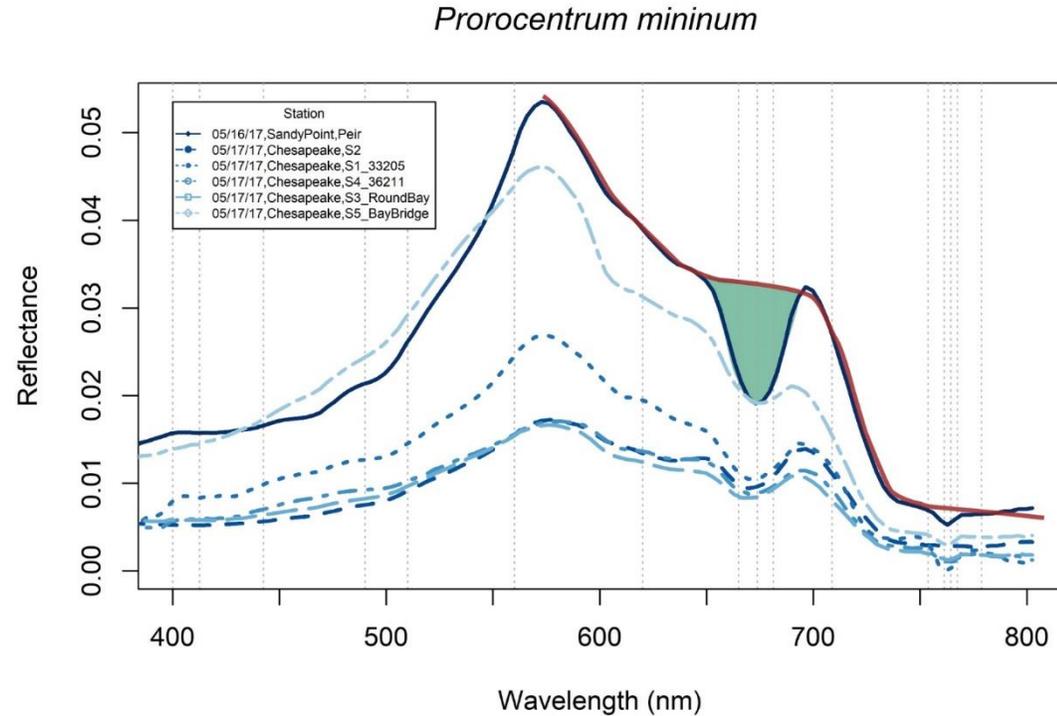
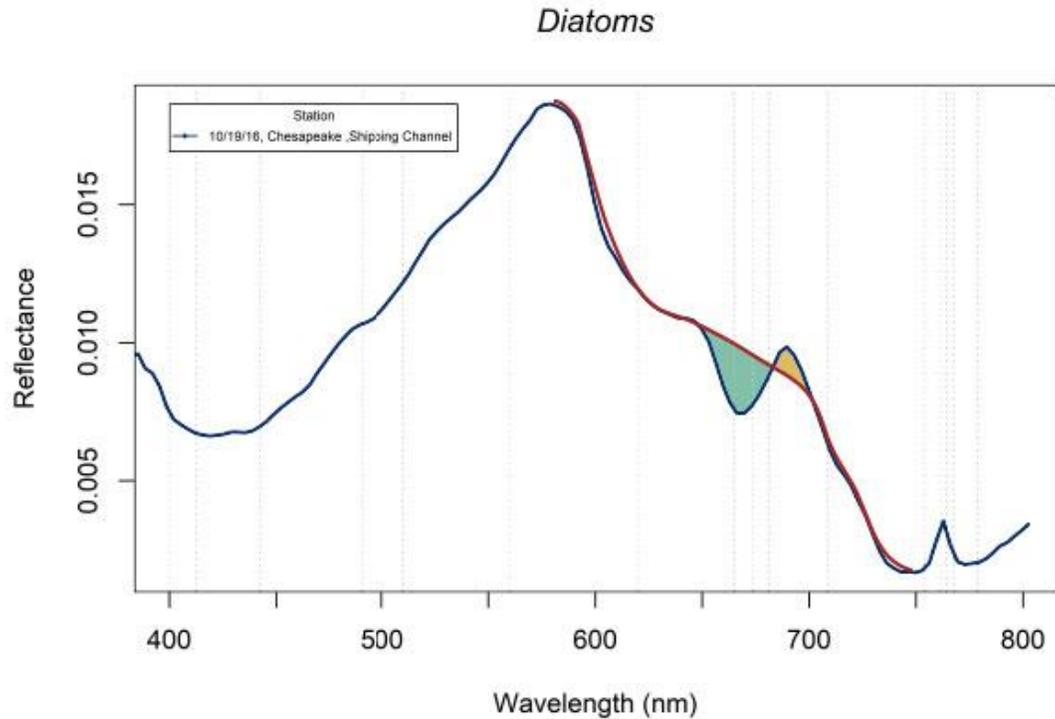
Rrs665  
"sediment"

CI (chl-a with  
negligible  
fluorescence)

RBD  
fluorescence



# Radiometry of Diatoms vs. Dinoflagellates

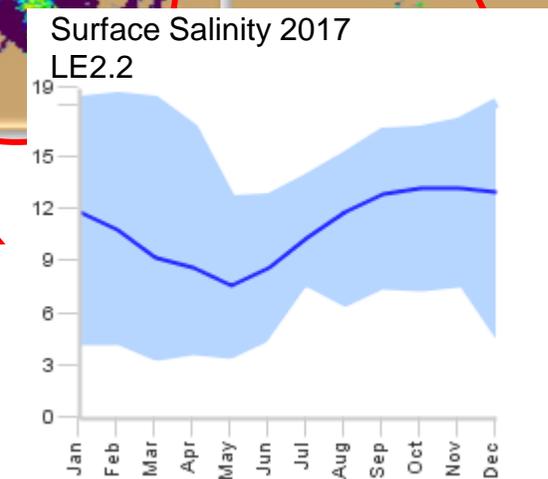
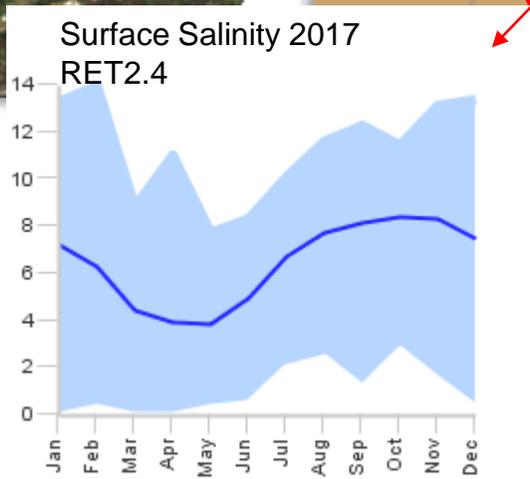
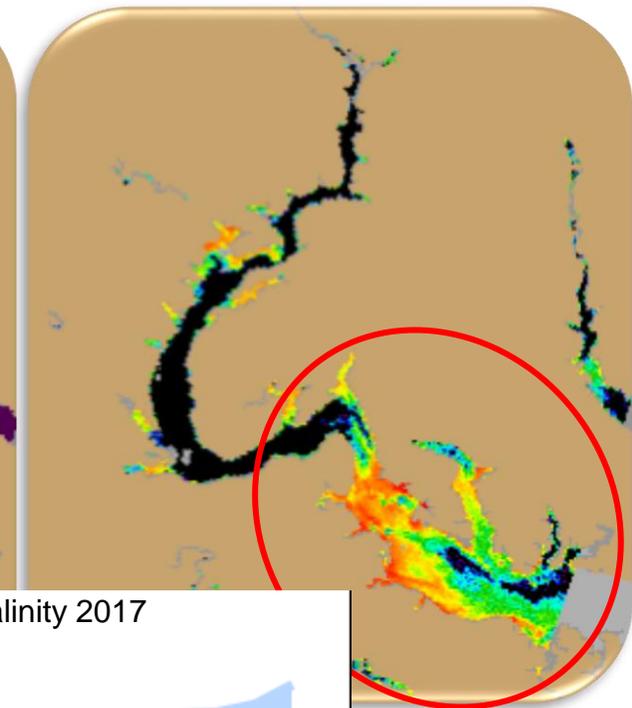
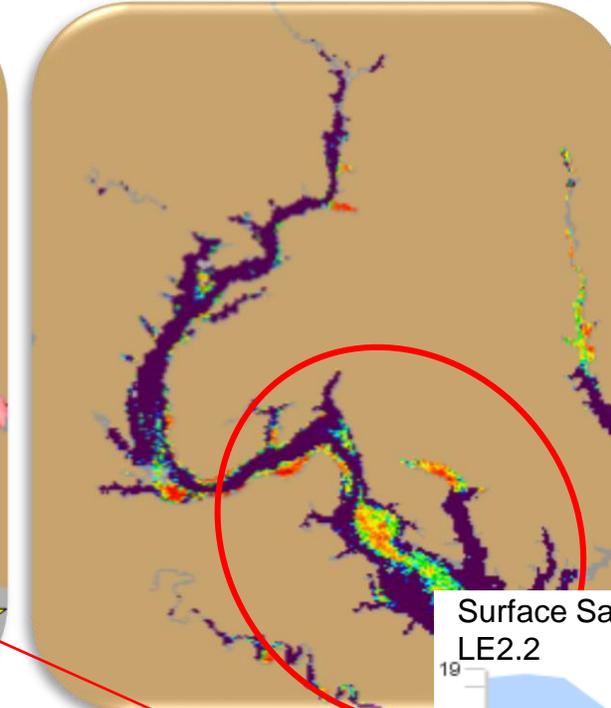
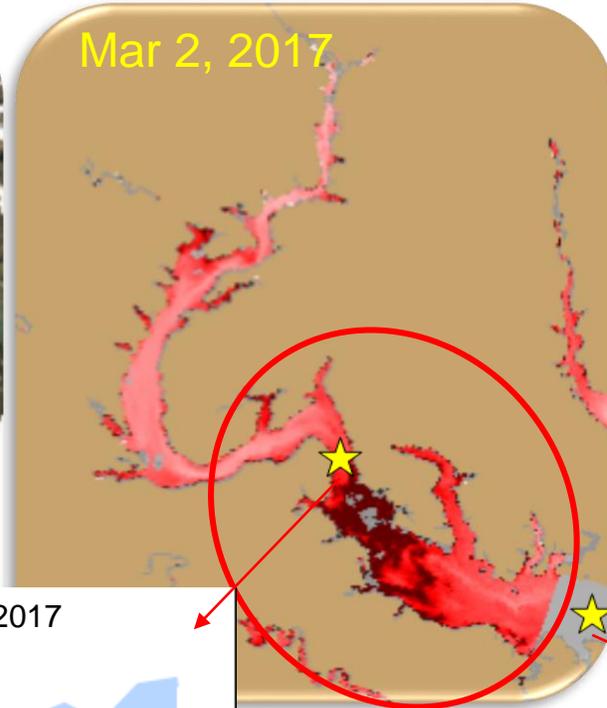
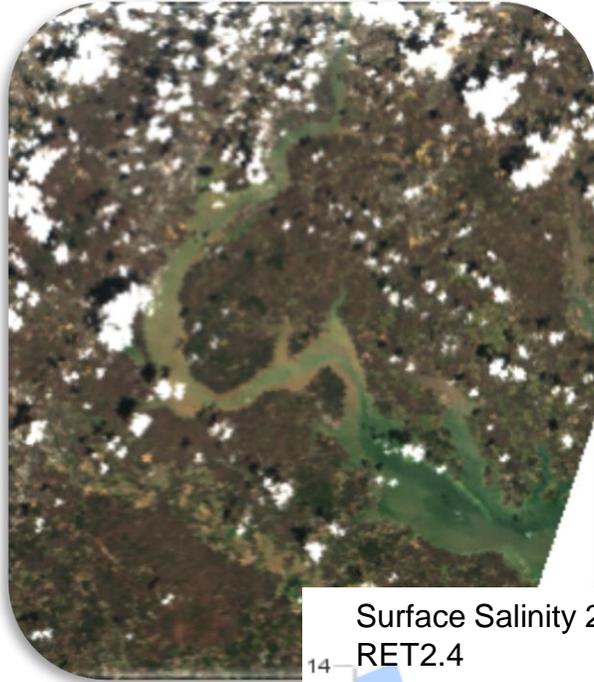


Dinos: Increased peak at 700 nm due to chl absorption in the red (665 nm), scattering in the NIR  
Scattering at the surface overwhelms fluorescence peak at 681 nm (yellow peak)

# Ecological Associations

*Heterocapsa triquetra* associated along salinity fronts

March 6, MD DNR monitoring confirmed salinity change

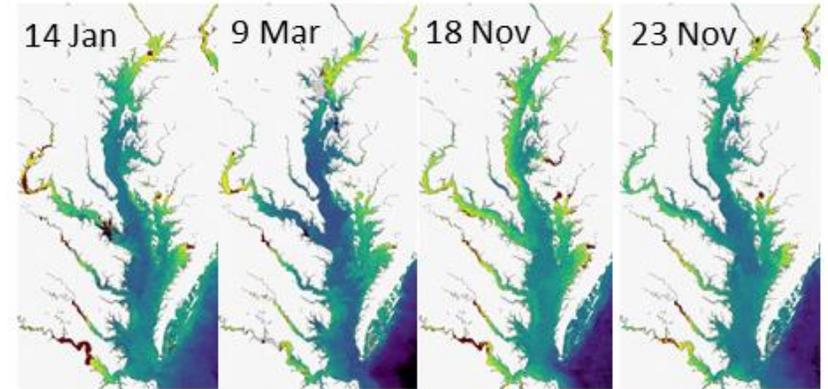


New 250 m Depth attenuation (Kd490) products at NCCOS and available at Coastwatch East Coast Node.

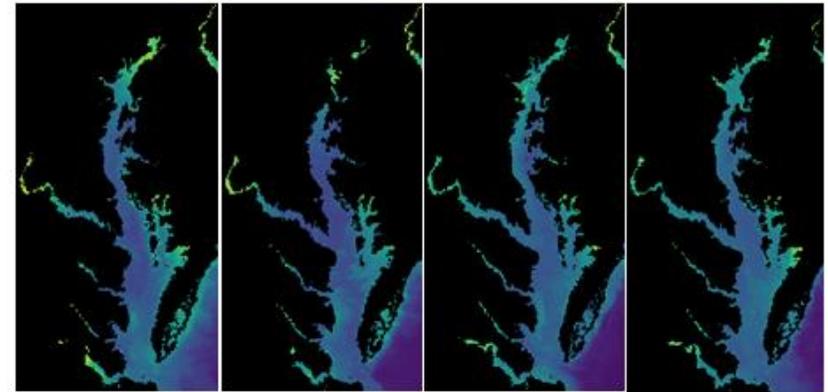
Currently used by:

- for National Geodetic Survey LIDAR planning
- Volunteer Diving group in Daytona, Florida
- Aquaculture planning

New 250 m MODIS



Operational 1km MODIS  
Wang et al. (2009  
JGR)

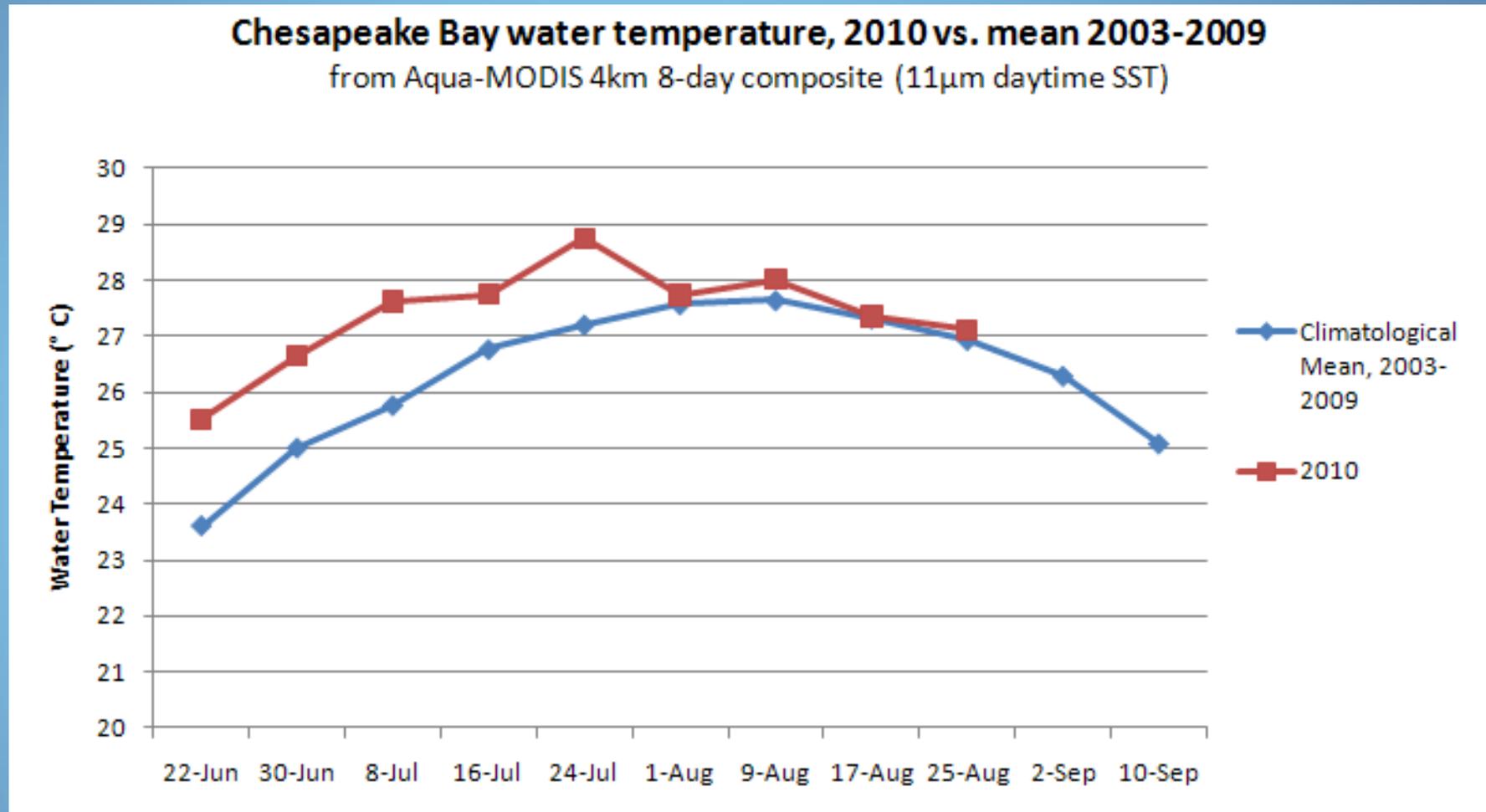


True Color



		<ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a>, <a href="#">3-Day</a>, <a href="#">7-Day</a></li> <li><b>MODIS Chlorophyll</b> (NOAA OC3 NIR-SWIR algorithm) <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a>, <a href="#">7-Day</a></li> </ul> </li> <li><b>MODIS K-490</b> (NASA algorithm) <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a></li> </ul> </li> <li><b>MODIS Rrs667</b> <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a></li> </ul> </li> <li><b>VIIRS Rrs672</b> <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a></li> </ul> </li> <li><b>VIIRS True Color</b> <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a></li> </ul> </li> </ul>
	<p style="text-align: center;"><b>Chesapeake &amp; Delaware Bays</b></p> 	<p style="text-align: center;"><a href="#">Chesapeake &amp; Delaware Bays Product Info</a></p> <p style="text-align: center;"><a href="#">Daily Map Viewer</a></p> <p><b>Direct Download: Data Files &amp; Images</b></p> <p><b>AVHRR SST</b></p> <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a>, <a href="#">3-Day</a>, <a href="#">7-Day</a></li> </ul> <p><b>MODIS Chlorophyll</b> (NOAA OC3 NIR-SWIR algorithm) <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a>, <a href="#">7-Day</a>,</li> <li>▪ <a href="#">Daily Calendar Viewer</a></li> </ul> </p> <p><b>MODIS K-490</b> (NOAA algorithm) <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a>, <a href="#">7-Day</a></li> </ul> </p> <p><b>MODIS Total Suspended Matter (TSM)</b> <ul style="list-style-type: none"> <li>▪ <a href="#">Swath &amp; Daily</a>, <a href="#">7-Day</a>, <a href="#">Monthly</a></li> <li>▪ <a href="#">Daily Viewer</a></li> <li>▪ <a href="#">Time Series Interactive Tool</a></li> </ul> </p> <p><b>VIIRS Rrs672</b> <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a></li> </ul> </p> <p><b>VIIRS True Color</b> <ul style="list-style-type: none"> <li>▪ <a href="#">Daily</a></li> </ul> </p>
	<p style="text-align: center;"><b>South East Coast</b></p> 	<p style="text-align: center;"><a href="#">South East Coast Product Info</a></p> <p><b>Direct Download: Data Files &amp; Images</b></p>

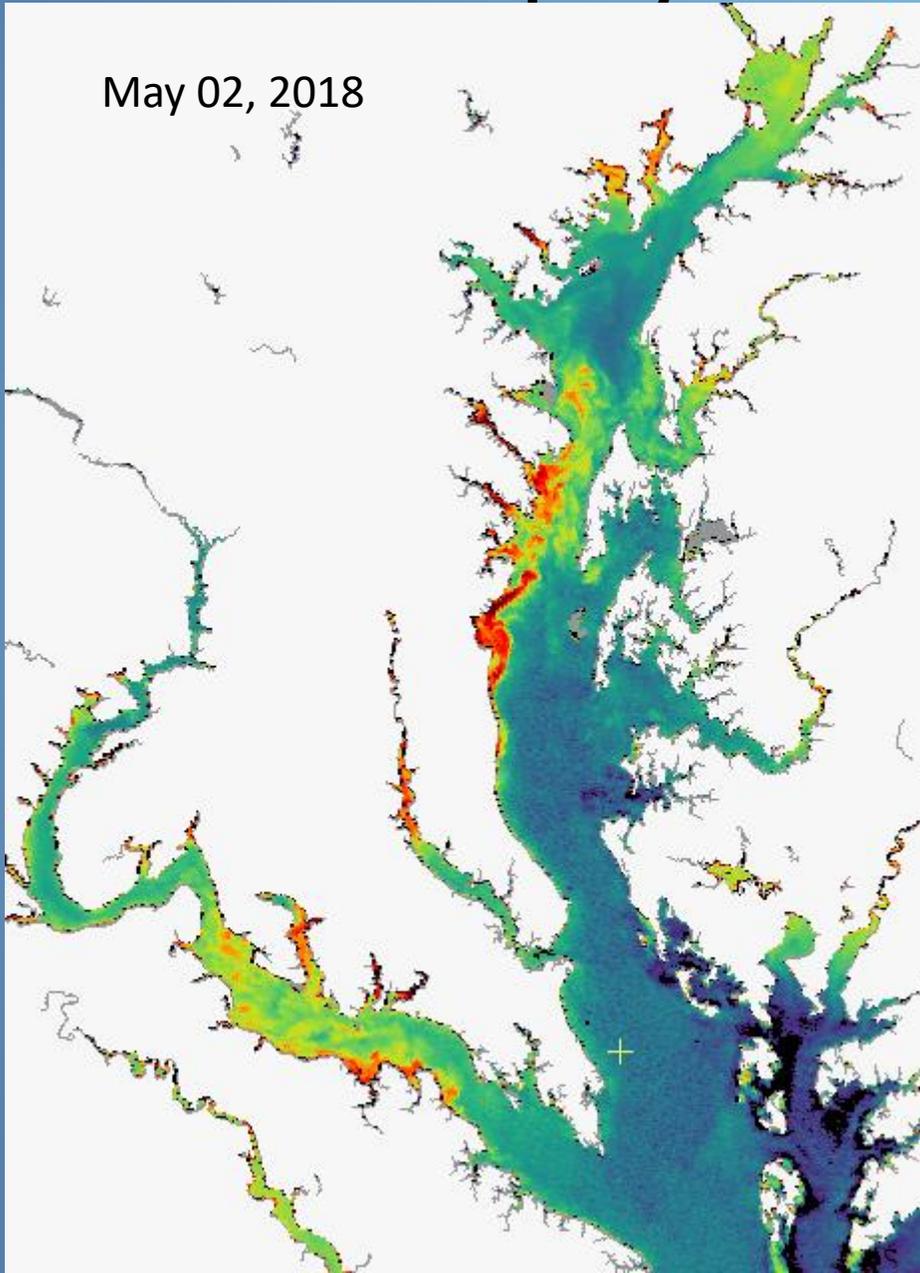
# Time Series Analysis Tool for EPA National Estuaries Program



Anomaly: 2010 was a very warm spring (red) compared to the long-term average (blue)

# Chlorophyll indicator *Prorocentrum* blooms

May 02, 2018



40 million +  
cells/L on  
May 09  
near  
Annapolis

May 09, 2018

