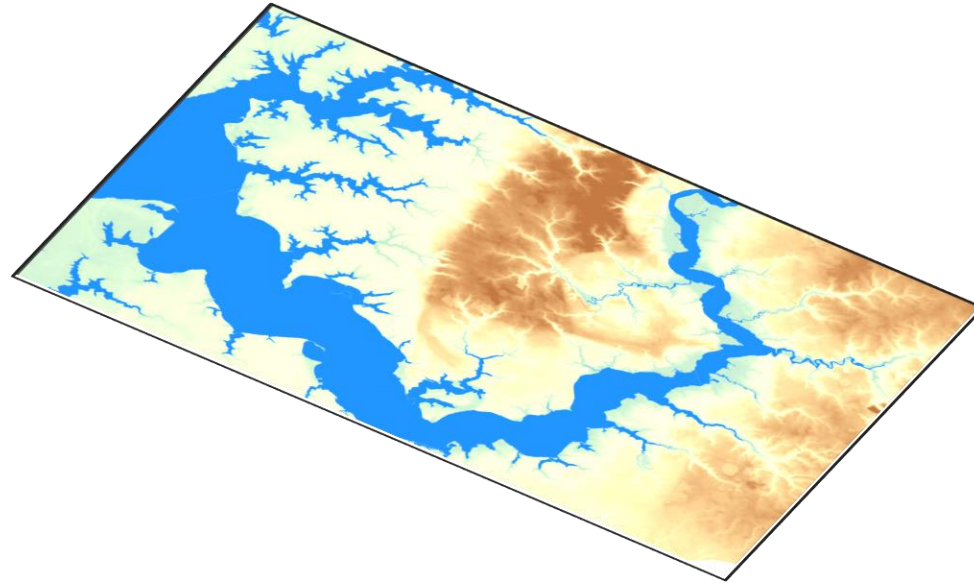


# Revisiting Coastal Land-Water Interactions: The Triplet Connection



STAC Workshop

23-24 May 2018

Hood College, Frederick MD

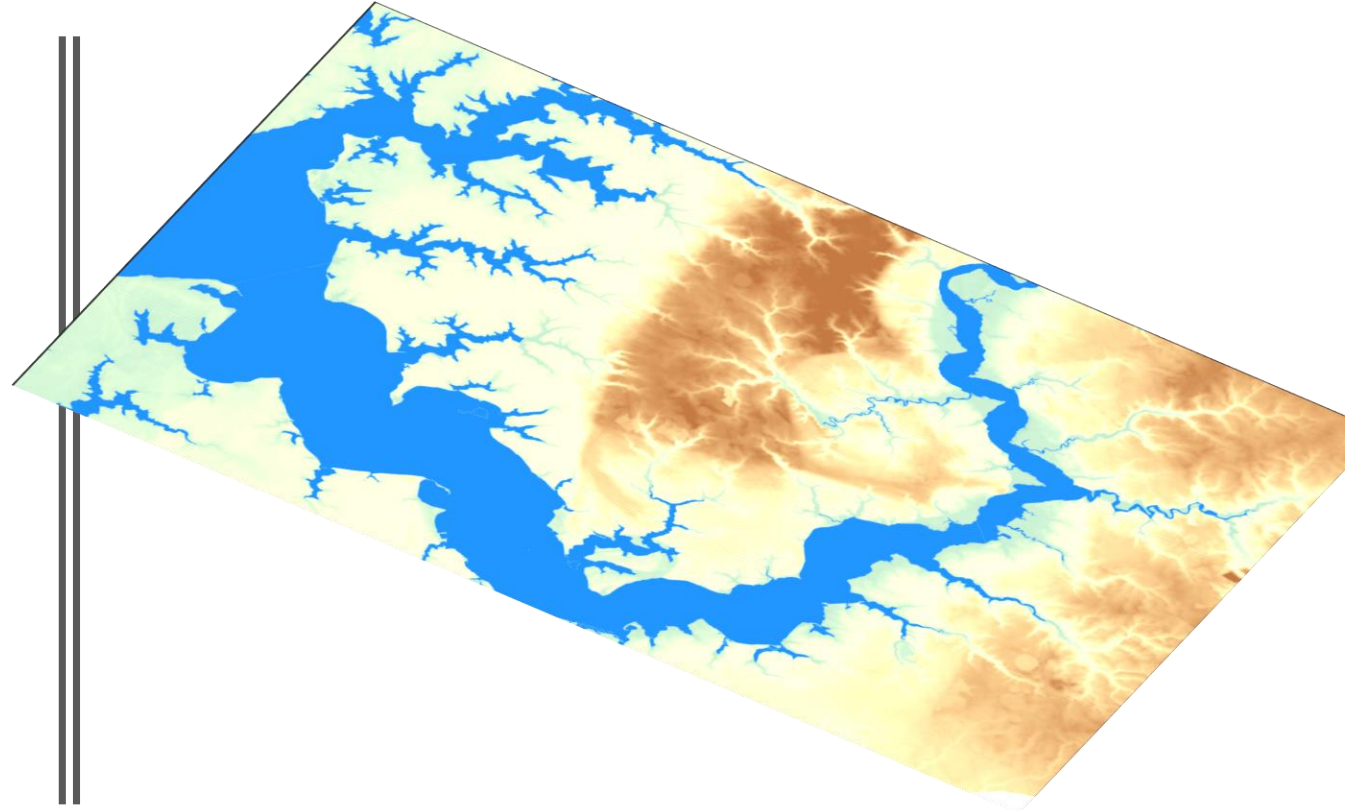
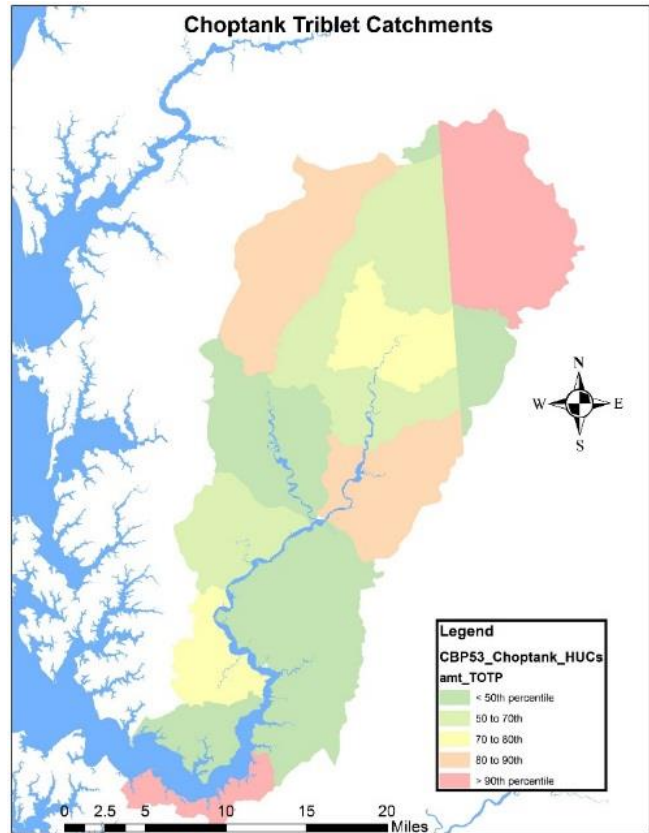


The Nature  
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HOOD COLLEGE  
Center for Coastal and  
Watershed Studies

# Envision the Choptank Watershed Partnership: Potential Watershed Restoration Strategies



# The Triplet Connection: Workshop Goals & Objectives

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- Define triplets (*sensu Walter Boyton*)
- Describe the role of triplets as river-estuary linkages
- Evaluate triplets as landscape units for watershed and coastal management
  - Discuss relevance/utility for CBP regulatory model.
- Outline critical knowledge gaps and research opportunities 1) to improve our understanding of river-estuarine linkages; and 2) refine tools/mapping strategies for watershed and coastal management

## Bay Journal

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Chesapeake Notebook

### Bay scientist Boynton honored for his research, commitment

Mathias medal recipient lauded for helping guide cleanup efforts with studies and public engagement

By Rona Kobell on September 06, 2016

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Comments are closed for this article. <sup>2</sup>



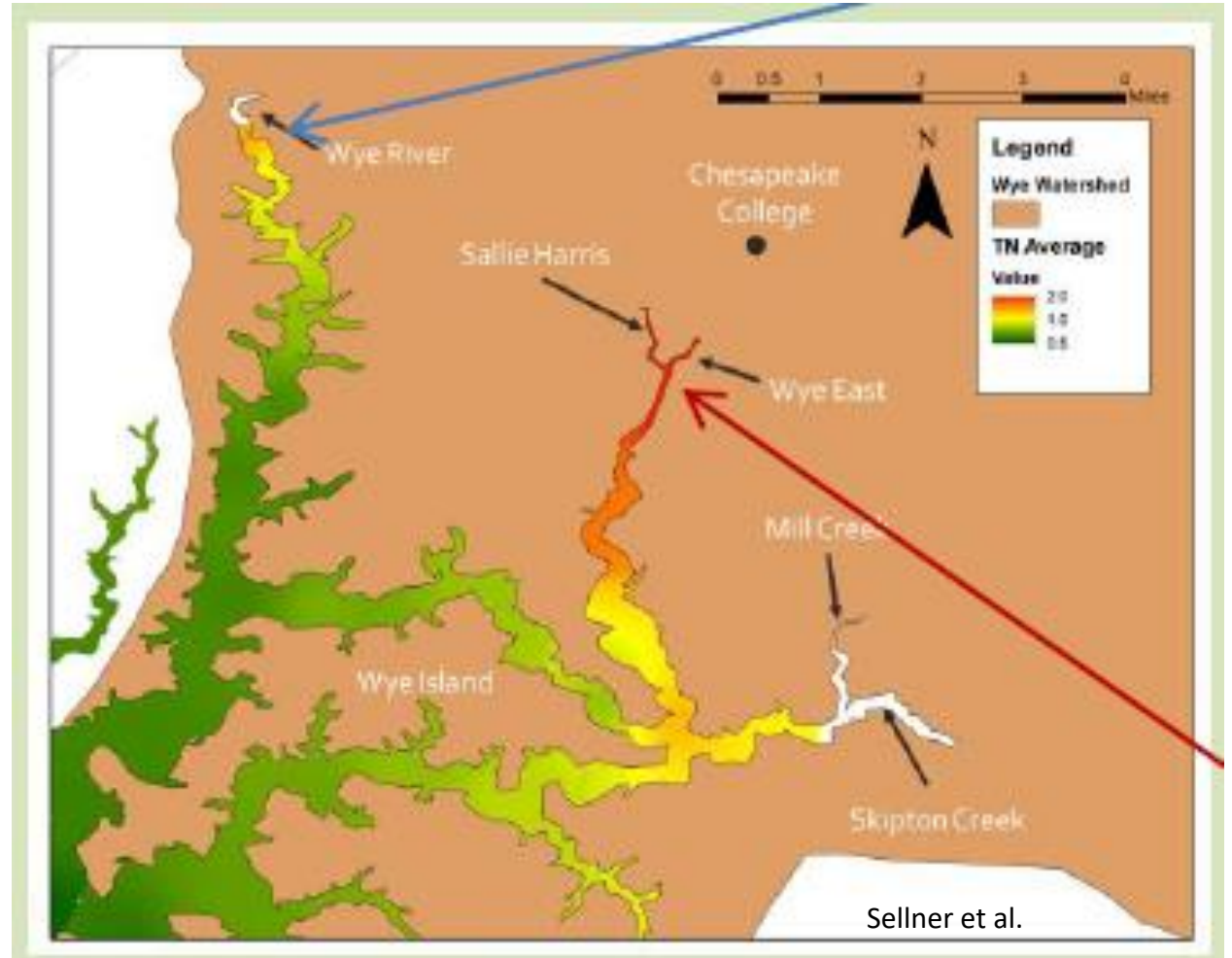
# The Triblet Connection: Agenda Overview

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- **SESSION I: Evidence of Triblet Linkages**  
Kevin Sellner (Hood), Michael Mallin (UNC),  
Denise Sanger (SCDNR), Andrew Muller (USNA)
- **SESSION II: Triblets from an Estuarine Perspective**  
Larry Sanford (UMCES), Lora Harris (UMCES), Harry Wang (VIMS)
- **SESSION III: Triblets from a Watershed Perspective**  
Diana Muller (Maritimus), Tom Jordan (SERC), Kathy Boomer, (TNC)
- **SESSION IV: Additional Evidence/Insights of Triblet Roles**  
Ray Najjar (PSU), Jeff Cornwell (UMCES), Vicki Blazer (USGS),  
Margaret Muholland (ODU), Liz Van Dolah (UMD)
- **Facilitated Discussion:** Lisa Wainger (UMCES), Lew Linker (USEPA)

# WORKSHOP CONCLUSIONS:

Triblets *absolutely* provide powerful framework for managing and studying land-water interactions in the terrestrial–estuarine transition zone.

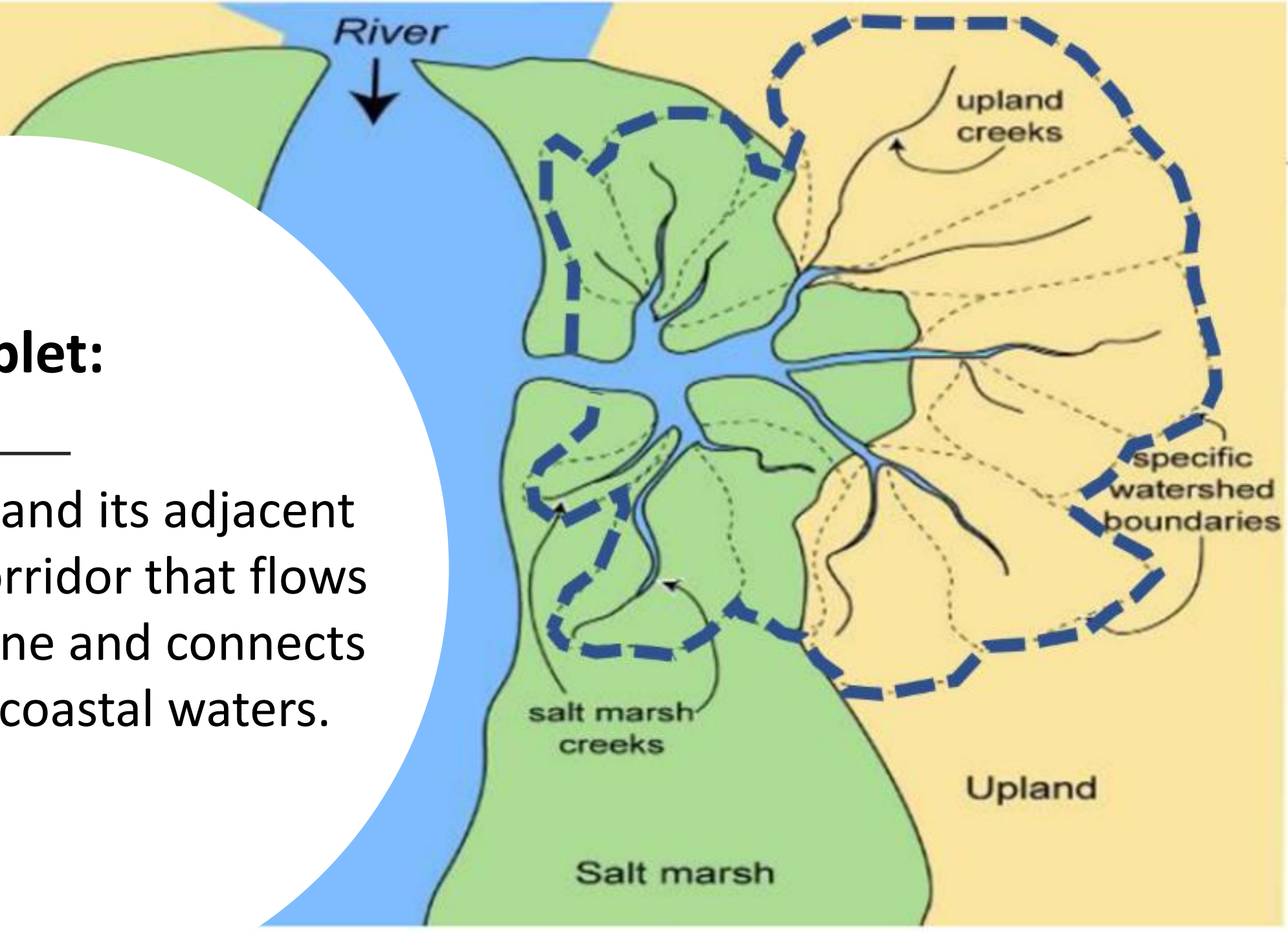






## **Triblet:**

A waterway and its adjacent floodplain corridor that flows through T-zone and connects uplands to coastal waters.





# *THE TROUBLE WITH TRIBLETS*

*Triblets are:*

- *Adored*
- *Numerous*
- *Troublesome!*

*Lora Harris – UMCES CBL*







Greenwood Creek

Greenwood Creek

Google

*Triblet Troubles:  
#1. They're adored.*

© Amy Jacobs



# Triblets Provide Critical Habitat

Habitat health strongly tied to catchment health of small (0, 1<sup>st</sup>, 2<sup>nd</sup> order) streams.

## Concerns in Small Tributaries

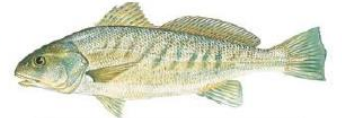
- 🐟 **May have higher concentrations due to proximity to sources as well as less dilution**
- 🐟 **These are often areas used as nursery areas – fish moving into smaller tribs to spawn – means young fish, most sensitive stage for developmental, reproductive and immune effects are exposed**

Negative correlation with % developed land and % hardened shoreline

**Blue Crab**  
(*Callinectes sapidus*)



**Atlantic Croaker**  
(*M. undulatus*)



**Silver Perch**  
(*Bairdiella chrysoura*)



**Hogchoker**  
(*Trinectes maculatus*)



**Spot**  
(*Leiostomus xanthurus*)



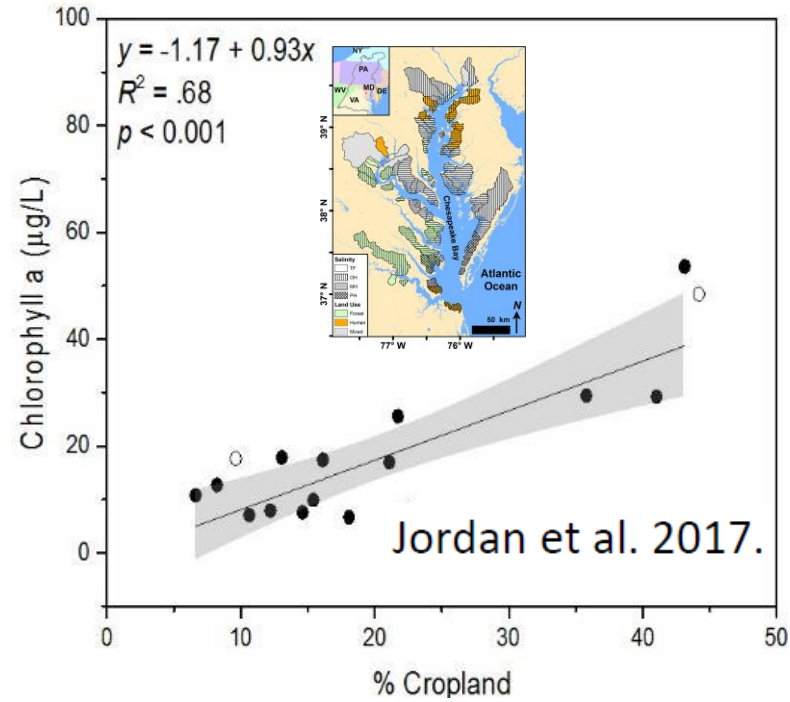
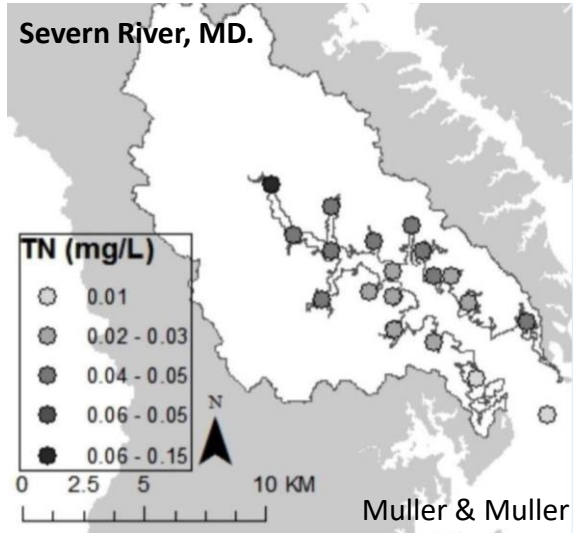
**American Eel**  
(*Anguilla rostrata*)



**Grass Shrimp**  
(*Palaemonetes pugio*)

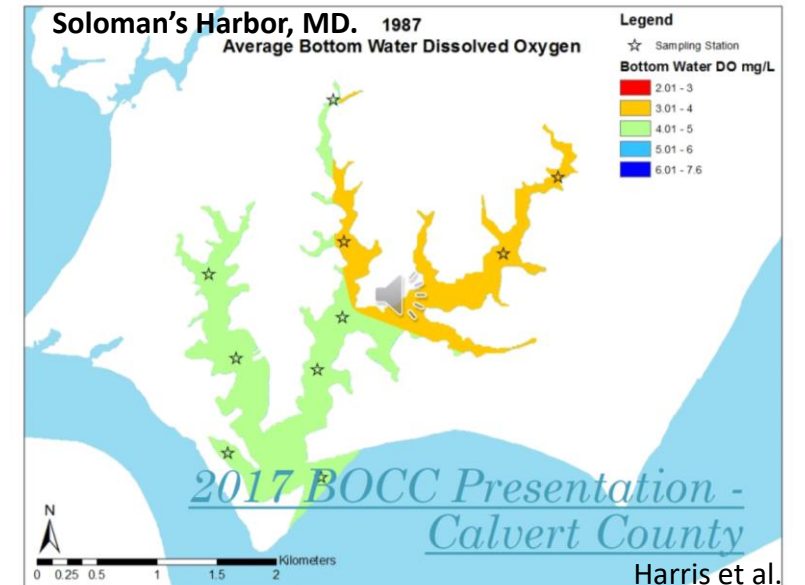
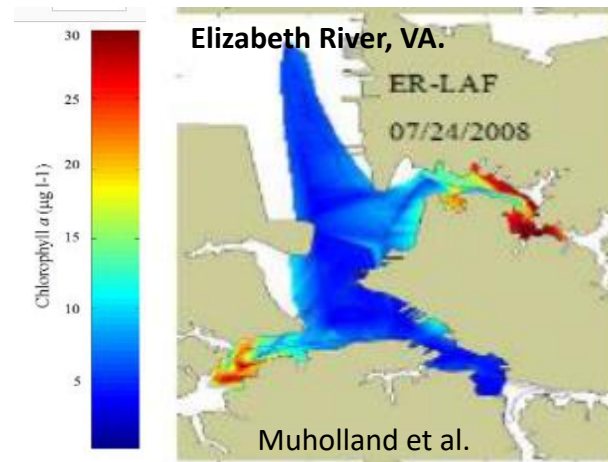
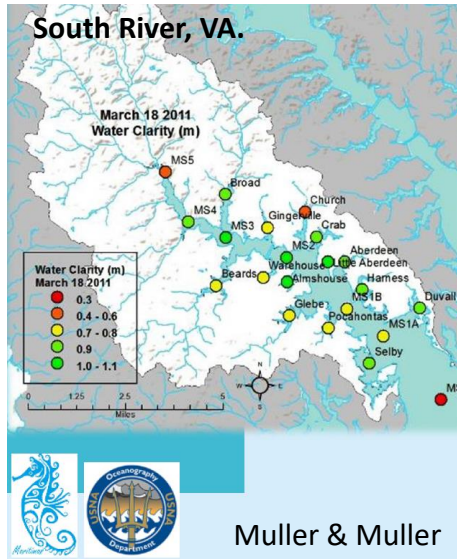
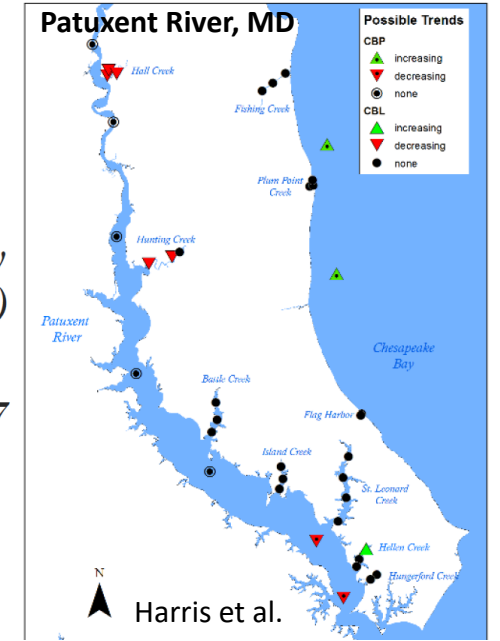


# Triblets are highly sensitive to human activities.



Water Clarity (Secchi)

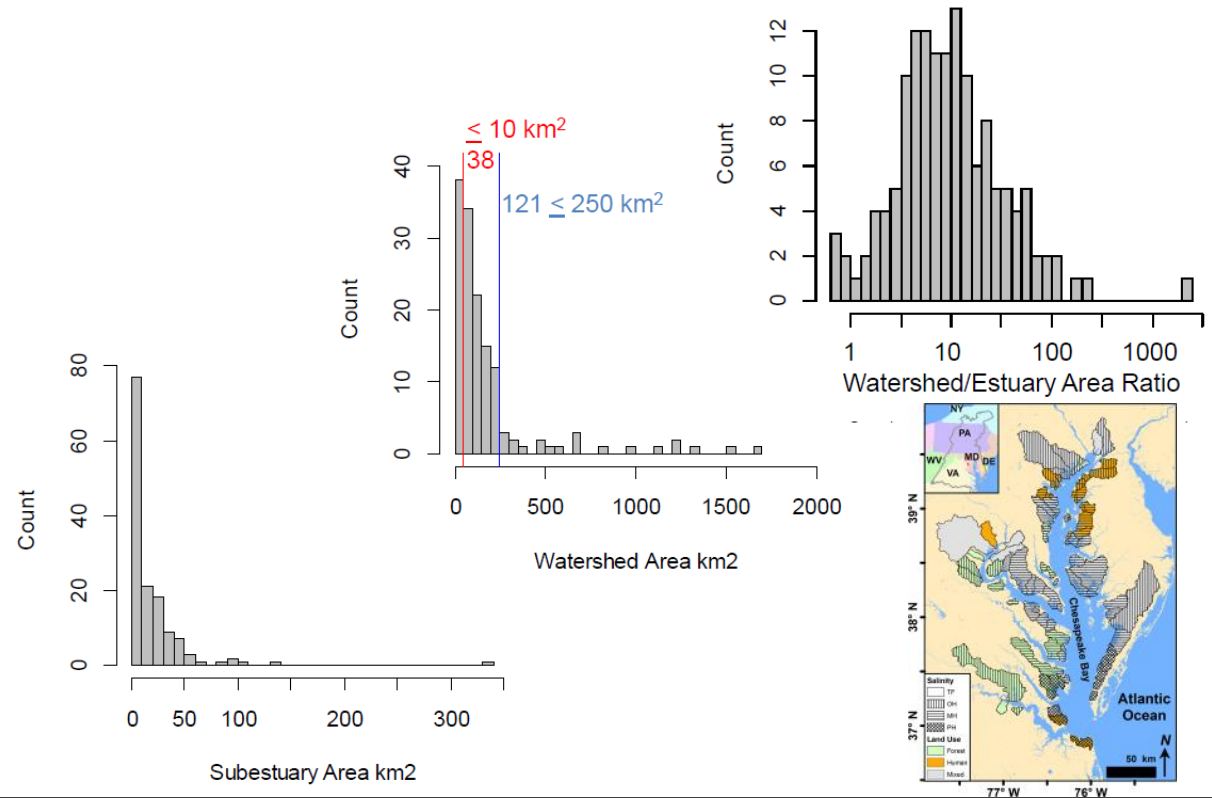
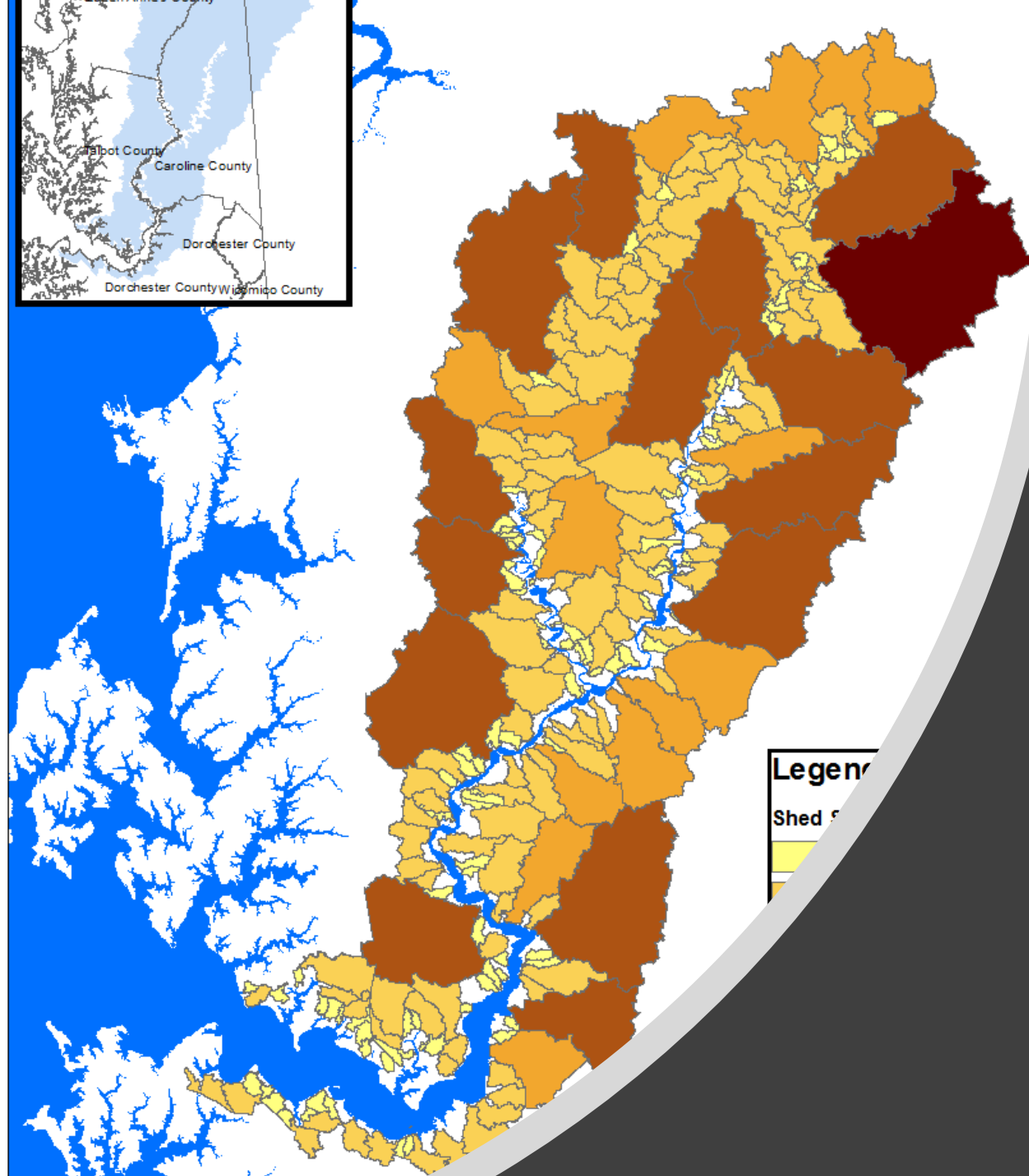
~2010-2017



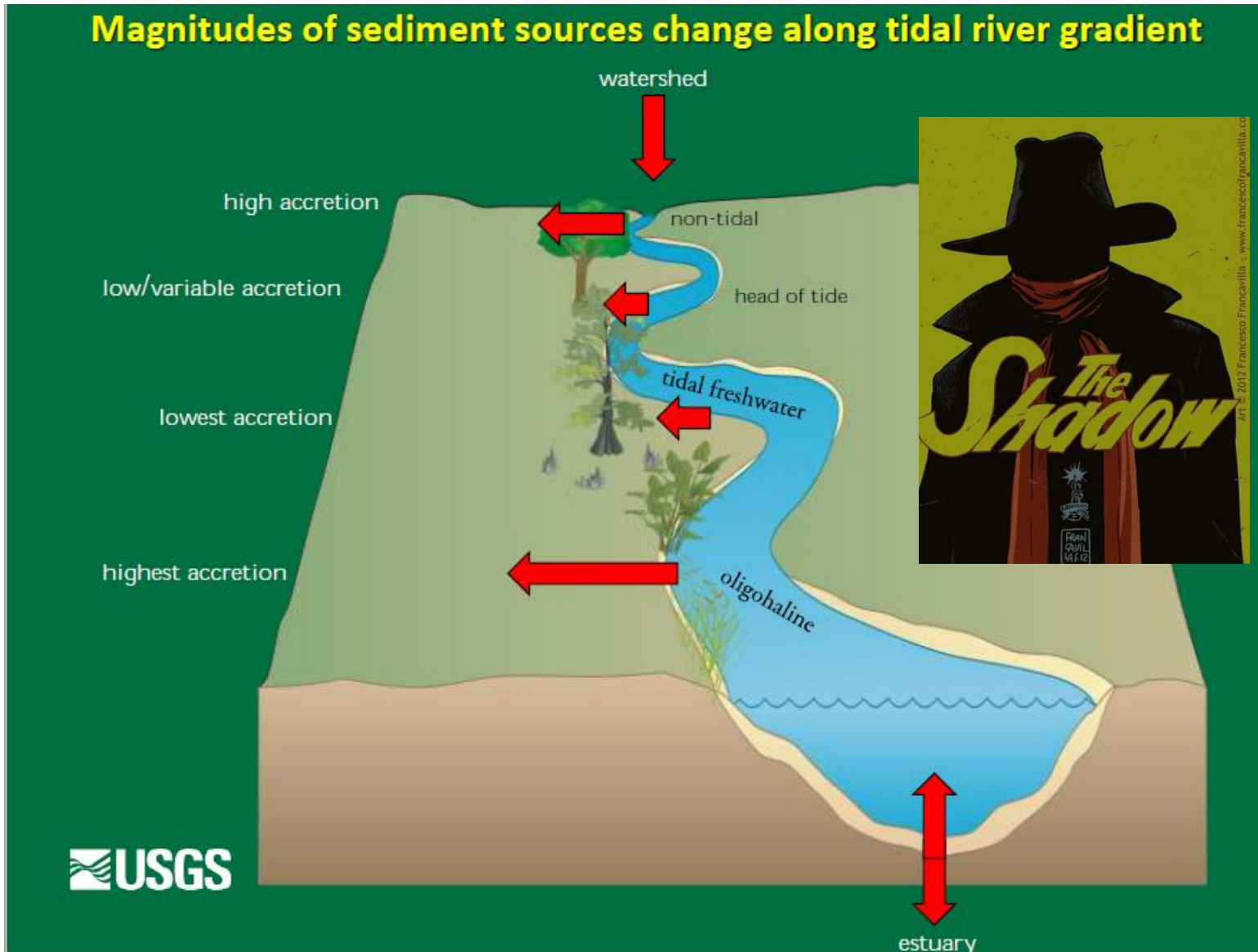


# Triblet Troubles: #2 They're Numerous

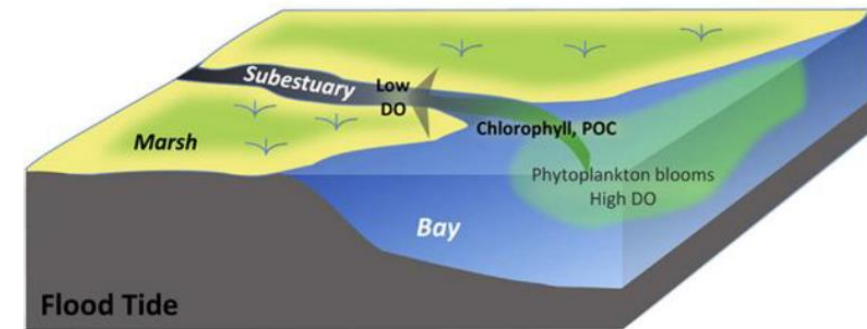
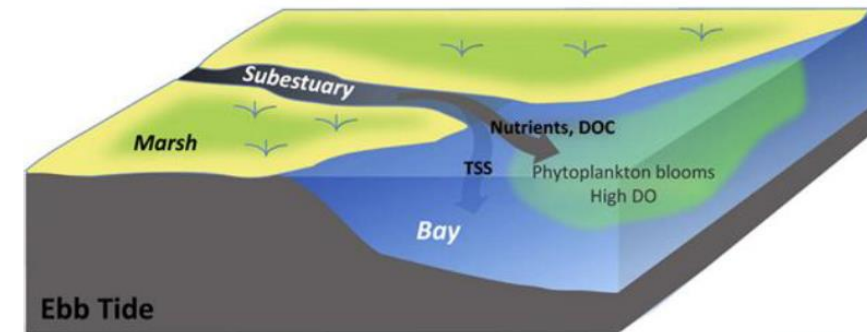
## Subestuary size distributions



# Triblet Troubles: #3. They're ~~troublesome~~ complicated.



### Tidally Coupled Biogeochemical Reactor



# Final Verdict on Triblets:

## Powerful Framework for Watershed Management –

- They're adored.
  - Important recreational, cultural, and aesthetic value
  - Critical habitat for species of concern
- They're sensitive to human activities.
  - Watershed condition
  - Shoreline management
  - Human infrastructure (bridges and navigation channels)
  - Sediment resuspension
- They're important bioreactors!

## • Powerful Framework for Research Collaborations -

- Each triblet is unique, presenting a challenge (and opportunity) to 100's or 1000's of triblet units.
- They're understudied.
  - Mapped conditions show wide variability.
  - Complex biogeochemical gradients drive T-zone connectivity and triblet conditions.
  - Currently, limited capacity to predict system response to management alternatives.

B. Hydrodynamic and v

Upper Chesapeake Bay

