



**STAC Workshop:
Understanding and Explaining 30+ Years of Water Clarity Trends
In the Bay's Tidal Waters**

February 6-7th, 2017

University of Maryland Center for Environmental Science
Chesapeake Biological Laboratory
Bernie Fowler Laboratory Building
142 Williams St, Solomons, MD 20688

Workshop goal/objective:

10:00 am **Coffee and light Breakfast at UMCES-CBL**

10:30 am **Workshop Introduction – Jeni Keisman (USGA)**
How did we get here?
3-pronged approach
Workshop goals

10:40 am **Motivation for the synthesis – Rich Batiuk (EPA-CBPO)**
Batiuk will give an opening introductory presentation on motivation for this synthesis, the importance of explaining trends in water clarity, and relevance to the TMDL Midpoint Assessment.

Synthesis Presentations – Current State Of The Science (40 minute presentation; 20 minutes for discussion)

11:00 am **Synthesis: Understanding of Chesapeake Bay Water Clarity Patterns - Carl Friedrichs (VIMS), Peter Tango (USGS), Jessie Turner (VIMS), Marjy Friedrichs (VIMS), Rebecca Murphy (UMCES), and others TBD**

12:00 pm **Catered Lunch at UMCES-CBL**

1:00 pm **Synthesis: Processes and feedbacks especially important to shallow water clarity – Jeff Cornwell (UMCES), Larry Sanford (UMCES), Chuck Gallegos (SERC), Elka Porter (UBALT)**

2:00 pm **Synthesis: Long-term Riverine Inputs from the Major Tributaries to Chesapeake Bay Relevant to Water Clarity – Qian Zhang (UMCES-CBPO), Joel Blomquist (USGS)**

This presentation will provide a synthesis of long-term fluxes and trends of riverine inputs to Chesapeake Bay that are relevant to water clarity, including traditional constituents (namely, suspended sediment, total phosphorus, and total nitrogen) and additional constituents (namely, fine sediment, chlorophyll-a, and organic carbon). Conceptual models on the interconnections between these inputs and estuarine water clarity will be presented and discussed.

3:00 pm **Afternoon Break**

3:15 pm **Group Discussion – Key messages from “Current State” Syntheses - All**

4:15pm **Day 1 Wrap-Up, Goals for Day 2, Dinner Plans**

5:15pm **Recess**

Day Two

8:30 am **Light Breakfast at UMCES-CBL**

9:00 am **Discussion and Agreement on Key Messages from Current State of Knowledge; Guiding Future Work** (*All*)

10:00 am **Break**

New Analysis Presentations – Moving the Science Forward

10:15 am **Linking fall-line sediment and chlorophyll-a inputs to estuarine water clarity** – *Jeremy Testa (UMCES-CBL), Slava Lyubchich (UMCES-CBL), Qian Zhang (UMCES-CBPO)*

11:30 **Break (Boxed Lunches Provided)**

12:00 pm **“Working Lunch” Group Discussion (All)**

- 1. Next Steps**
- 2. Plans for Part II of the Workshop (Spring 2017?)**
- 3. Communication of results**
 - a. Report/White Paper/Product**

1:00 pm **Adjourn**

Questions Raised:

- Which measure of light availability – secchi depth or k_d – do SAV and algae respond to?
- Aside from oysters, do benthic organisms in Chesapeake Bay package sediment into large (fast-settling) biodeposits?
- What are temporal and spatial patterns in (concentration? biomass?) of small organic particles in Bay's surface waters?
- What is the source of small organic particles in Chesapeake Bay? Can they be characterized?
- How have benthic communities changed over time? What is the potential for changes in benthic communities to have affected filtering capacity?
- How has phytoplankton community composition changed over time?
- Have TSS, turbidity, and secchi depth changed in similar ways in different regions of the bay?
- Has there been a turnaround in the product of k_d and secchi in the past 5-6 years? Can the product of k_d and secchi be used as a proxy for particle-type change over time?
- Do temporal trends in any/all of the following correlate with trends in water clarity:
 - Sediment particle size distribution; sediment loads; chlorophyll *a* loads; water temperature; phytoplankton community composition; benthic community composition
- Are temporal trends in mid-channel water clarity consistent with temporal trends in near-shore, shallow-water clarity?
- Why do we see/not see improvements in water clarity in certain places where we do/don't expect responses? Examples include the Back R. where there have been massive WWTP improvements, and the Chester River where column particulates have crashed and SAV is abundant.