

## CBP STAC 2017 Proactive Workshop Proposal:

### Reassessing Habitat Conditions in Sub-estuaries of the Chesapeake Bay and Responses to Resource Management

#### **Steering Committee Members:**

Kathy Boomer – TNC, STAC (co-lead)  
Amy Jacobs – TNC (co-lead)  
Denise Breitburg – SERC  
Walter Boyton (UMCES)

Jim Upoff – MD DNR  
Kevin Sellner – Hood College  
Marjy Friedrichs – VIMS, STAC member  
Bruce Vogt – NOAA

**Workshop Goal and Objectives:** The proposed two-day workshop is intended to refine our collective understanding of how advanced watershed management affects sub-estuarine Bay habitat conditions. Specifically:

- Review current research relevant to advancing Chesapeake Bay habitat goals, including:
  - Distribution and health of sub-estuarine species of concern
  - Effects of freshwater discharge on sub-estuary circulation, including dynamic salinity temperature, and other patterns of water quality concern affecting habitat condition
  - Effects of watershed management on freshwater discharge to Bay sub-estuaries
  - Role of coastal wetlands as transition or buffer zones
- Determine appropriate spatial scale to evaluate responses of estuarine circulation patterns and Bay habitat condition to land and water management.
- Define Bay habitat metrics that have a measureable response to cumulative effects of watershed condition and watershed discharge.
- Recommend a strategy for identifying sub-watershed areas that have a disproportionate influence on Bay habitat condition/metrics of concern, and where broad-scale application of advanced land management practices is expected to provide measureable habitat benefits.
- Identify high priority research gaps emerging from workshop discussions.

#### **Description of Workshop Topics and Degree of Urgency:**

Coastal resource and watershed managers seek guidance on where land use and land management disproportionately influence aquatic species of concern, and thus where broad application of field-scaled practices are most urgently needed to advance Bay habitat goals. CBP land-river segments or published hydrologic units (e.g., HUC12/14) historically used to delineate such high impact areas are difficult to link directly to Bay conditions. Further, high resolution topography and land cover data suggest that relatively few small creeks, perhaps by virtue of hydrogeomorphology, watershed condition, and/or location relative to a tributary and its sub-estuary, impose a disproportionate influence on Bay water quality and Bay resources of concern. Our knowledge of such land-water connections, however, remains limiting.

Recent studies of sub-estuarine Bay habitats condition, circulation patterns, and watershed hydrology, much of which has been highlighted at previous STAC workshops, provide an opportunity to advance integrated understanding of land-to-water linkages and improve resource management outcomes. First, high resolution remote sensing data and coordinated field studies, such as those highlighted at the monitoring networks workshop (STAC 16-010) and the habitat workshop (STAC 14-003), have allowed more thorough characterizations of sub-estuarine conditions and a more sophisticated understanding of how coastal wetlands affect Bay water quality and habitat condition. At the same time, investigators continue to advance our

collective understanding of how sub-estuarine circulation patterns relate to sub-estuarine shape, watershed discharge, and location along the Bay main stem (e.g., May 20, 2015 workshop). Finally, major advances in watershed modeling reflect our growing understanding of how land management practices influence quantity, quality, and timing of watershed discharge (e.g., multiple models workshop, STAC 14-004). Our proposed workshop will capitalize on these discussions by allowing researchers to explore linkages among the individual efforts so as to define the nature of and spatial scale at which we can link Bay habitat conditions directly to management action.

***Anticipated Sessions and Targeted Speakers:***

- I. Historic and current habitat trends across Chesapeake Bay sub-estuaries
  - a. Key questions:
    - At what spatial scale have we characterized condition and distribution?
    - Which species/communities have a measurable response to variation in sub-estuarine gradients driven by freshwater discharge?
    - What are key (manageable and quantifiable) human impacts affecting species/community status?
  - b. Potential speakers: Bruce Vogt (zooplankton; NOAA), Cassie Gurbisz (SAV; UMD), Denise Breitbart (SERC); Ji Li (HAB; UMD); Kevin Sellner (Hood); Tom Cronin (USGS)
  
- II. Updating our understanding sub-estuarine circulation patterns
  - a. Key questions:
    - What is the relative influence of creeks vs major tributary main stem vs Chesapeake Bay main stem in affecting sub-estuarine circulation patterns?
    - How does salinity, temperature, turbidity, and other water quality indicators vary in relation to freshwater inputs and circulation patterns?
    - To what extent must we manage marine biota and/or watershed discharge to improve sub-estuarine conditions and/or habitat status?
  - b. Potential speakers: Marjy Friedrichs (VIMS), Andrew Mueller (USNA), Jeremy Testa (UMCES), Harry Wang (VIMS)
  
- III. The importance of coastal wetlands as transition zones
  - a. Key questions:
    - Do coastal wetlands function as major sinks, sources, or transformers of nutrients and other Bay contaminants of concern?
    - How do these functions change across space and time?
    - How are these functions influenced by estuarine circulation, perhaps especially by changes in sea level or salinity patterns?
    - How do coastal wetlands influence shallow marine resources of concern?
  - b. Potential speakers: Debra Willard (USGS); Greg Noe (USGS); Donna Bilkovic (VIMS); Keryn Gedan (UMD); Kate Tully (UMD); Cynthia Gilmour (SERC); Maria Tzorziou (CUNY)

- IV. The influence of local vs mainstem watershed discharge on sub-estuary habitat?
  - a. Key questions:
    - How does watershed discharge (quantity, quality, and timing of main stem, creeks, and groundwater inputs) vary across space and time?
    - How much needs to be done (e.g., how many practices) to achieve Bay goals.
  - b. Potential speakers: Don Weller (SERC), Tom Fisher (UMCES), Scott Phillips (USGS)
  
- V. Tying the Pieces Together to Advance an Integrated Understanding - Discussion Questions:
  - Is there evidence to suggest Bay habitat conditions within a sub-estuary of the Chesapeake Bay reflect effects of watershed discharge on estuarine circulation or shoreline condition?
  - Are there other proximate causes of shallow marine habitat degradation that we're not considering?
  - Can we identify more refined connections between habitat condition and patterns in sub-estuarine physical-chemical conditions?
  - Can we identify where concentrated efforts to improve watershed management might have measurable effects on Bay habitat conditions?
  - What are key research/knowledge gaps which should receive priority support?

**Workshop Products:** The final report will summarize workshop findings, identify important research gaps, and outline a strategy for identifying sub-watershed areas that have a disproportionate impact on key Bay resources.

**Workshop Logistics:**

**Timeline:** The workshop will convene a diverse group of approximately 75 scientists and restoration managers in July, 2017. A draft report will be ready for review and comment by workshop participants and the broader STAC membership in September, 2017; and the final report will be completed by November, 2017.

**Location:** Chesapeake College, Queen Anne’s County, MD (Choptank River watershed)

**Requested Budget:**

Item	Estimated Cost
Venue: Chesapeake College (capacity: 75)	\$500
Travel and Lodging	\$5,000
Food	\$2500
<b>Total</b>	<b>\$8,000</b>

**A brief history of previous STAC-sponsored workshop success:** As co-leaders of the proposed workshop, Kathy Boomer and Amy Jacobs can build on previous successful efforts to facilitate dialogues among researchers and practitioners toward advancing resource management. For example, the STAC-sponsored workshop, “Re-plumbing the Chesapeake Watershed: Improving roadside ditch management to meet TMDL water quality goals,” provided justification for a \$0.5M grant award to Talbot County and was widely recognized by LGAC. The products of this workshop also sparked efforts by the CBP to recognize water quality benefits of advanced roadside management explicitly. Sellner and Friedrichs have been involved in several STAC workshops focusing on small watershed monitoring, modelling, and climate change all resulting in shifts in CBP focus and consideration in management approaches. We have generated similar successes and opportunities to advance watershed management through workshops of similar scope sponsored outside of STAC.