Stream Health Workgroup April Meeting

Friday, April 15, 2022, 10:00-11:30 ET

Link to Meeting Materials

PARTICIPANTS:

Alana Hartman, WV DEP	**Alison Santoro,** MDNR	**Camille Liebnitzky,** City of Alexandria	**Chris Spaur,** USACE
Claire Buchanan, ICPRB	**Denise Clearwater,** MDE	**Greg Noe,** USGS	**Iris Allen,** MDNR
Katherine Brownson, USFS	**Katlyn Fuentes,** CRC	**Kelly Maloney,** USGS	**Kip Mumaw,** Ecosystem Services
Kristina Hopkins, USGS	**Lydia Brinkley,** Upper Susquehanna Coalition	**Mark Southerland,** Tetra Tech	**Neely Law,** Fairfax County
Pam Mason, VIMS	**Renee Thompson,** USGS	**Rikke Jepsen,** ICPRB	**Rosemary Fanelli,** USGS
Sadie Drescher, CBT	**Sara Weglein,** MDNR		**Scott Phillips,** USGS

MEETING NOTES:

WORKGROUP ANNOUNCEMENTS:

- **STREAM RESTORATION PERMITTING COMMITTEE:** The Stream Restoration Permitting Committee kick-off meeting will be held next week Monday (4/18) at 11:00 ET.
    - **ACTION: If you are interested in stream restoration permitting and would like to participate in this committee, please contact Alison Santoro (alisona.santoro@maryland.gov) & Sara Weglein (sara.weglein@maryland.gov), or Katlyn Fuentes (fuentesk@chesapeakebay.org).**

UPDATE ON THE STREAM RESTORATION STAC WORKSHOP PROPOSAL:

Neely Law (Fairfax County) and Greg Noe (USGS)

- STAC Workshop proposal was approved by STAC
- The title of this workshop will be "*State of the science & practice of stream restoration in the Chesapeake: Lessons Learned to inform better implementation, assessment, and outcomes*"
- The planning process for this workshop will begin in approximately **June 2022**. At this time, the Steering Committee will be expanded to increase greater geographic representation.
- The workshop dates have not been selected, but are anticipating this event to occur in **early 2023**
- **The workshop will be focused on three topics:**

KEY: ACTION ITEMS, KEY TAKEAWAYS

1. Identify the evolution of stream restoration goals, regulations, practices and practice implementation;
2. Present and discuss science and assessment to document holistic impacts and outcomes; and
3. Create a synthesis of the best available science, practices and monitoring to enable adaptive management.

STAC RISING TEMPERATURES WORKSHOP:

Katherine Brownson (USFS)

- Increasing stream and river temperatures have been driven by rising air temperatures, but other drivers have a strong influence
- **ECOLOGICAL IMPACTS – SPECIES:**
  - **Strongest negative impacts** on coldwater species and their habitats
  - Watershed-wide, warmwater aquatic species are most common. Although more tolerant to temperature increases, they are **sensitive to extreme temperatures** including rapid changes and to indirect effects from higher temperatures.
  - **More study needed** of temperature effects on lower foodweb:
    - Algae, biofilms, zooplankton
    - Macroinvertebrates
    - Freshwater mussels & host species
- **ECOLOGICAL IMPACTS – OTHER STRESSORS:**
  - **Co-occurring stressors:** low dissolved oxygen, invasive species, algal blooms, bacterial/viral outbreaks, distribution & toxicity of other pollutants, expansion of invasives
- **MANAGEMENT IMPLICATIONS – PRIORITY INFORMATION NEEDS:**
  - Improved understanding of the relative influence of BMPs and habitat restoration on water temperature, including cost-effectiveness
  - Additional data/modeling capacity to predict future changes in stream temperature
  - Additional research to better understand how stream temperature and living resources will respond to management
- **DAY 2 THEMES FOR DISCUSSION:**
  - Coldwater fisheries and habitats
  - Rural waters and habitats
  - Urban waters and habitats
  - Cross-watershed topics
- **DISCUSSION ON STREAM RESTORATION:**
  - Stream restoration has the potential to cool or warm waters depending on how a project is designed and implemented
  - Restoration can help species adapt to warmer temperatures
  - More research is needed to understand thermal impacts of various restoration approaches in different contexts

  - Better design and siting criteria are needed
- **STATE TEMPERATURE WATER QUALITY STANDARDS (WQS):**
  - Modernize WQS to make them more effective to combat rising water temperatures
  - Improve interstate cooperation through information-sharing, problem solving and monitoring-modeling support
  - Strengthen anti-degradation measures
  - Improve criteria to reflect a better understanding of thermal tolerances and ecology for a broader suite of species
- **MONITORING, MODELING, AND SCIENCE NEEDS:**
  - Better use existing monitoring data, CBP mapping tools and LU/LC data
  - Improve monitoring networks to better include small streams and incorporate more continuous data collection
    - Develop integrated monitoring programs that incorporate air, water, sediment and groundwater temperature monitoring
  - Develop models that better simulate land use and groundwater effects on local steam temperatures
  - Conduct a vulnerability assessment of how climate and land change may affect stream temperatures
  - Establish multi-species prioritization tools and science-based targets for restoration and conservation to mitigate rising water temperatures
- **NEXT STEPS:**
  - Steering Committee will review & synthesize information, including management recommendations and associated science needs, from synthesis papers and both workshop days and draft final report
  - **May-June 2022:** Participant review of draft report
  - **Summer 2022:** release final report
  - Conduct outreach with CBP and partners to discuss strategies to implement the report's recommendations
- **COMMENTS/QUESTIONS: If you have additional questions or comments, please contact Katie Brownson (**Katherine.brownson@usda.gov**).**
  - **Chris Spaur:** Did the workshop cover changing soil moisture of watersheds? It's reported that this can be considered a proxy for balance between increasing precipitation and increasing temperature.
    - **Katie:** This was not covered at the workshop.
    - **Alana Hartman:** I remember someone mentioning that we should pay attention to soil temperature.
- **Katie will be providing another presentation on this topic at the Habitat GIT Spring 2022 meeting May 4th-5th.**

STAC WETLANDS BMP CREDITING WORKSHOP:

Pam Mason (VIMS)

- The workshop ("*Evaluating an Improved Systems Approach to Crediting: Consideration of Wetland Ecosystem Services*") was held March 22-23, 2022, and had both in-person and virtual attendance options
- **Link to workshop website:** https://www.chesapeake.org/stac/events/evaluating-a-systems-approach-to-bmp-crediting-a-stac-programmatic-workshop/
- **The purpose of this workshop was to evaluate:**
    1. Opportunities to incentivize habitat benefits in relation to TMDL and water quality outcomes, and that are part of Chesapeake Bay Agreement commitments; and
    2. The efficacy of a more holistic "systems approach" to BMP accounting, specifically how wetlands are considered in multiple BMPs and multiple workgroups and GITs, and how wetland BMP functions are influenced by other BMP types in the connected landscape.
- **The workshop was broken into 4 sessions:**
    1. **Accounting** (TMDL Incentives, BMP Crediting, etc.)
    2. **Landscape/Systems Approach** (Bay Goals, Agricultural Landscapes, Ranking for Wetland Co-benefits, etc.)
    3. **Wetlands Projects and Co-Benefits and Tradeoffs** (MS4 impacts, systems degradations, unintended consequences, etc.)
    4. **Management Implications and Recommendation Development**
- **COMMENTS/QUESTIONS: If you have additional questions or comments, please contact Pam Mason (mason@vims.edu) or Meg Cole (STAC Coordinator, colem@chesapeake.org).**
    - **Renee Thompson:** There is an opportunity to help inform upstream landscape processes through the high-resolution LU/LC metrics, data, as well as the catchment level landscape metrics within the healthy watersheds assessment. It would be helpful to understand the needs of restoration projects and planning and how we can package and communicate landscape processes that may influence projects. These conversations are very much "Cross outcome". It would be helpful to have recommendations on how to better utilize landscape data to work across these outcomes which would help to develop next steps and improve decision support tools to meet multiple user needs.

LESSONS LEARNED FROM CLARKSBURG, MD: IMPACTS OF SUBURBAN DEVELOPMENT AND DISTRIBUTED STORMWATER CONTROL ON STREAM FUNCTIONS:

Krissy Hopkins (USGS)

- **OBJECTIVES:** What happens to stream health when agricultural land is converted to suburban development with distributed stormwater infrastructure practices incorporated into the design of the neighborhood? How does the use of distributed stormwater facilities on a watershed scale affect: hydrology, water quality, topography, and benthic communities?
- **STUDY AREA:** Clarksbug, MD
    - Control vs. treatment sites

- Tracking changes during and after development
- 100% of impervious surfaces are treated
- Stormwater practices arranged in treatment trains

- **RESULTS:**
  - **Hydrology:** distributed stormwater management can reduce runoff yields and peak flows compared with centralized stormwater management
    - Peak flows were attenuated for small precipitation events (<10 mm)
    - Peak flows were 2-3 higher in treatments than forested site (11-20 mm)
    - Baseflow increased during the construction phase of suburban development
  - **Can distributed stormwater control maintain hydrologic function?**
    - Can attenuate peak flows and runoff volumes, but storage capacity matters
    - Large rain events not adequately controlled in any of the urban sites
    - Baseflow may increase during construction and remain elevated
  - **Baseflow nitrate concentrations:**
    - Nitrate concentration declined but remain elevated
    - Overall export remained about the same due to increased baseflow
    - Declines in concentration may be related to removal of agriculture soils and reduction in fertilizer inputs
    - Rising specific conductance trends in all three treatment watersheds likely driven by imperious cover
  - **Can distributed stormwater control maintain water quality?**
    - In can reduce nitrate concentrations, but concentrations remain high due to ag past
    - It can increase ion loads, because of more impervious cover and winter salting
  - **How does the use of distributed stormwater facilities on a watershed scale affect topography and drainage patterns?**
    - Most topographic change occurred during the construction phase, with substantial excavation and fill across the entire watershed and deposition within the riparian areas
  - **How does the use of distributed stormwater facilities on a watershed scale affect benthic community:**
    - Benthic assemblages may be somewhat protected by stormwater facilities, but sensitive families may not fully recover
- **LESSONS LEARNED:**
  - Distributed stormwater management,
    - Can attenuate peak flows and runoff volumes, but storage capacity matters
    - Can improve water quality for some, but not all constituents
    - Can reduce impacts to biota, but sensitive families may not recover
  - Construction phase is important:

    - Baseflow increased during construction
    - Substantial excavation and fill across the entire watershed during construction
    - Deposition in riparian areas during construction
- **SUMMARY:**
    - Long-term datasets are valuable
    - Need to assess multiple stressors to understand site of impacts on biota
    - Distributed stormwater control can accomplish some goals, but not all
- **Additional study/results details can be found in the Presentation (posted to the CBP Calendar) and the Study Summary.**
- **QUESTIONS/COMMENTS: If you have additional questions or comments, please contact Krissy Hopkins (khopkins@usgs.gov).**
    - **Denise Clearwater:** Are the precipitation events for rainfall in 24-hour period? What might happen with 1" precipitation over a period of several hours in treatment options?
    - **Scott Phillips:** All, link to science summary of Krissy's study results.
        - https://www.usgs.gov/centers/chesapeake-bay-activities/science/unique-20-year-study-assesses-ecosystem-response
    - This open-access paper is in Freshwater Science and is available for free

MEETING ADJOURNED.