Urban Stormwater Workgroup Meeting Minutes

Tuesday, June 19, 2018
10:00 AM to 1:30 PM

Summary of Actions and Decisions:

Decision: May USWG Meeting minutes were approved.

Action: Group discussion on the call was abbreviated due to time constraints. Local jurisdictions interested in collaborating with the Michelle Price-Fay (EPA) to work on stream restoration and floodplain reconnection should contact Michelle Williams (williams.michelle@epa.gov). USWG members and interested parties should also contact Michelle Williams with questions, comments and responses to the presented RSC topics **by COB July 5.** Feedback should use the following discussion questions as a guide:

- What next steps do we think are important to use the data and information that we have gathered thus far to evaluate RSCs?
- What organizations are critical to help define the path forward?
- Are there any other research or data needs that we need to consider as we work collaboratively to use the data and apply it to our work?
- What role and/or resources do we need from the Chesapeake Bay Program partnership?
- Do we need to create guides or tools for implementation efforts?
- Can these research findings be addressed along with the action items identified at the June 4 joint USWG/Stream Health Workgroup meeting?
- Next Steps/Action items

10:00 Welcome and Review of May Meeting Minutes.
Norm Goulet, Chair. Attach A.

Decision: May USWG Meeting minutes were approved.

10:05 Stream Restoration Research Special Session

EPA and MD DNR have been working on research to better characterize the ecology and pollutant removal performance of RSC projects. This special session is designed for them to share the findings from this research.

10:05 Welcome & Introductions – Michelle Price-Fay/Jeff Lapp

- Michelle Price-Fay: We have state partners and EPA coming together today to share information and knowledge that has been gathered. We want to address some of the challenges that we are seeing with these projects.

- Jeff Lapp: This is the beginning of identifying additional research needs. This is not a treatise on anything, just information exchange to improve our Bay restoration work.

10:10 1. Basics of RSCs and Results of Water Quality/Riparian Monitoring– Rebecca Cope (EPA R3-Philadelphia ORISE)

Rebecca reviewed background of RSCs, scientific questions and unintended ecological consequences of RSCs. Ecological consequences can include tree loss, iron flocculate (blooms of iron oxidizing bacteria), etc. Rebecca summarized previous literature published on RSC functions: decrease in peak flows; load reductions of sediment and nitrogen; only 30% of hydrological function is restored in projects. Highly variable hydrological responses of projects (3 watersheds in Anne Arundel County); iron floc influenced by addition of organic C in woodchips and iron-containing materials used in construction.

Discussion:

- Study design on 15 restored sites in AACo. Studied various restored and unrestored perennial streams. Preliminary results: low dissolved oxygen (below 5 mg/liter) in restored streams in fall and summer, unrestored streams were above 5 mg DO more often than restored sites. High variability in restored sites; woody vegetation lower in recently restored sites than in longer sites, correlation between woody vegetation cover and low summer DO; higher relative abundance of upland plants rather than wetland plants in recently restored sites; more woody debris and leaf litter at unrestored control sites vs restored sites.
- Lou Etgen: Perhaps we need to agree on a definition of what an RSC is—because they mean different things to different practitioners
    - Cope: You're right, it's difficult to go out in the field and determine what is an RSC, versus a natural channel design since the definition is murky. We did our best to select sites that had as many elements of a traditional RSC as possible.
- Norm Goulet asked how frequent the DO measurements were.
    - Cope: These are single data points taken only once or twice in a season.
    - Price-Fay: That is a data need, where we need to do pre-restoration and post-restoration monitoring continuously.
    - Goulet: I am concerned if we put too much stake on these projects when all we have are these single data points. We don't know if those single points are really representative of chronic stream conditions or are an outlier.
- Erik Michelson: These were not perennial streams before they were restored, and AACO WPRP has done a lot of the monitoring as the implementing agency. However, we were not consulted by Region III. We reached out several times but have not gotten any response.
    - Price-Fay: we have reached out in the past, but today we are starting the collaborative process.
    - Goulet: We need to improve the collaborative process from here on out, especially with the communication between the state, federal governments and

local governments. Usually the local governments have the best on-the-ground knowledge and are implementing the projects.
    - Price-Fay: We need to work on the communication here, and perhaps developing a communications strategy around projects like this. Today, at this meeting, is the first step for that communication process.
- Matt Myers, Fairfax County: Was monitoring done on the receiving stream downstream? Was the receiving stream or embayment monitored to see the overall benefit downstream of the restored reach? Did the practice dissipate energy/flashiness of stormwater runoff to help protect or heal downstream reach?
    - Cope: No, we have not done that yet. We were just getting a baseline at the site of the restoration itself.
    - Matt Meyers suggested monitoring also downstream, to assess the effects of the RSCs on downstream conditions.

10:20 2. Effects of RSCs on Macroinvertebrates– Greg Pond (EPA R3-Wheeling)

- The study authors hypothesized biological uplift of RSCs vs non-restored streams, measured with benthic macroinvertebrates in IBI assessments. Using space for time assumptions, reference sites vs RSCs vs before and after. Used MD IBI and the Chessie BIBI. Found no sig diff between restored and unrestored streams, with high variability in benthic macroinvertebrate taxa richness and abundance. Found taxa richness and abundance decline with percent impervious, regardless of RSC vs unrestored. Found that taxa hypoxia tolerant increased with impervious only in the RSCs—not same pattern with reference sites. Shredders especially showed decline in RSCs. Found habitat was improved in RSCs. Conclusions included: little to no functional uplift in RSCs vs references; impervious surface coverage is the best predictor of benthic biology. Recommendations to work to improve DO through the year and eliminating iron bacteria mats in order to promote macroinvertebrate growth, and proximity considerations for macroinvertebrate colonization from nearby areas.
- Goulet: On the salt, we are seeing a lag now in new research on salt in the winter—lag time in seeing spikes in salt.
    - Price-Fay: Is there is a correlation with imperviousness and salt spikes?
    - Goulet: Anywhere with roads is showing those increases in salt in the winter.
- Pond: Describing DO, the concern is that DO is a kill switch—all it takes is one or two events of hypoxia to affect the biota in the stream. These are one time sampling events, and we need more consistent monitoring to understand if the low DO data is a one time or if this is a chronic problem.
- Pond: We found counter-intuitive responses where improving habitat conditions correlated with a decrease in sensitive organisms. Here, DO is the limiting factor in RSCs.

10:40 3. Effects of RSCs on Water Quality– Paul Mayer (EPA-ORD) [presenting remotely]

Paul reviewed the objectives of the study: to look at effect of C on N and P retention, and mobilization of metals like iron (Fe) and manganese (Mn), looking at microbial

denitrification—requires organic C under the surface. However, anoxic and acidic conditions from organic C may release additional P. Also developed mesocosm in-vitro tests for DOC release and DO decreases, and Fe release. Only under conditions of 20% organic matter and Fe-containing sand was Fe released. Conclusions and recommendations included: avoid using iron-containing sand and gravel; reduce organic matter addition in RSCs. Tradeoffs of RSCs are low DO, iron floc, and P release and riparian flooding. Efficacy of RSCs in the field are highly variable.

Discussion:

- Lou Etgen: Since RSCs are designed to reconnect the floodplain, are there studies on environmental uplift in the floodplain? Won't a lot of the nutrient reductions come from retention in floodplain wetlands.
    - Rob: Many of these practices are under protocol 1 vs protocol 3, which focus on the in-stream conditions rather than the floodplain. In many cases, protocol 3 is not used.
- ____: asked if Greg is planning to look more at biology of wetlands for reconnected floodplains, and if so, whether Greg's team is planning on assessing reference wetland sites, if the goal is restoring floodplain wetland functions.
    - Greg Pond: A lot of the rolling coastal plain has those kinds of wide floodplains, but our sites were more headwater streams at a higher gradient, with narrow U-shaped valleys. I'm sure there are some of those types of broader floodplain wetland systems. However, a lot of the RSC's we are studying are definitely riffle-run and pool systems.
    - ____: I think the ecological reference we are using should be matched to the project. For instance, if we are looking at intent for creating beaver dam type wetland meadows. In addition, I think that Anne Arundel County has a lot of pre-restoration monitoring data that might be important to this kind of pre- and post-project.

11:00 4. Muddy Creek RSC – Water Quality and Macroinvertebrates Study - Kyle Hodgson & Scott Stranko (MDNR)

Scott Stranko and Kyle Hodgson reviewed a restoration of Muddy Creek at SERC, several water monitoring and benthic monitoring sites along the reach. Observed several Fe oxidizing bacteria blooms, evidence from literature that FE oxidized blooms negatively impact benthic macroinvertebrates. They found low initial BIBI scores after restoration, but seeing increases in BIBI score after about two years post-restoration. Kyle detailed the BIBI assemblages pre- and post-restoration; high abundance of chironomids immediately post restoration, chironomids falling off with time, but no mayfly recovery in the restored stream.Mixed results show that it's too early at this point to determine if the restoration is positive or negative.

Discussion:

- Etgen: Will you continue with this research out for another few years?
    - Kyle Hodgson: Yes, we will be continuing the shared monitoring approach
- Chris Biprap, Underwood and Associates: definition of an RSC is very important to come up with a standard definition, and we would be happy to have more discussions to better

define RSC systems. That is a critical piece to understand the context of the monitoring and restoration assessments.

- Ralph Spagnolo: Did they show that the stream was intermittent prior to restoration?
    - Hodgson: The stream was almost perennial before the restoration.
    - Price-Fay: We need this kind of science to understand what the standards for restoration should be. We don't want to target AACO, it's simply because AACO has been so proactive in implementing stormwater projects.

12:05 Lunch Break

12:30 Announcements

- CSN Webcast Series (Wood)
- MTD Update (Goulet)
- Unregulated Stormwater WQGIT Discussion (Schueler)
- Other Announcements

12:45 Draft Executive Council Stormwater Directive (Norm Goulet) Attach B.

The Bay Program's Executive Council was considering a "Directive in Support of Stormwater Technical Assistance" (along with a second on Agric Tech Assistance) to sign at their summer meeting on July 9th. The draft directive was circulated for workgroup review and comment on May 31st.

The draft EC directive was not approved at the June 14 Management Board meeting. The directive may be reconsidered at a later date but will not move forward in 2018.

1:00 Joint USWG/SHWG Meeting (David Wood)

David provided a brief summary of the key takeaways and follow-up items that came out of the June 4th meeting on stream restoration.

- David Wood: We will be working through the summer to develop follow-up items and plan to move forward. There was some interest in developing plans to do long-term verification of projects. Tom is working now on a revised memo to send out for review later this summer to keep doing iterative refinements to the verification protocols for stream restoration projects. The permitting session included information sharing about best practices to speed projects along and ensuring communication early and often. The SHWG is developing a survey to characterize the challenges and successes in implementing these projects. The last session included consideration of functional uplift in TMDL projects. There was general agreement to include functional uplift in verification practices going forward, including in improvements to the guidance for crediting protocols and improving verification guidance.
    - Schueler: The long-term verification plans would be to continue TMDL credits for nutrients and sediment.

- Tom Schueler: The functional uplift session was very good, and the SHWG is taking that on, and some of those present today are involved in that. The design community is looking for a simple way to estimate functional uplift in stream restoration projects.
- Rob Spagnolo: Is there any effort to incentivize floodplain reconnection and the protocol specifications? I know that Protocol 1 gives you the most bang for your buck for local MS4s, so there is disincentive now to work outside the channel and most projects will just do channel restoration under Protocol 1 and not consider floodplain reconnection under Protocol 2 or 3. Perhaps that incentive could come through wetland banking, the 404 program or other policy incentives?
    - Schueler: The restoration protocols will not be re-opened for revision. Protocol 2 and 3 are reach dominated. At the time the expert panel met, the hyporheic zone was not well understood and that was not included in the original specifications. However, there may be room to come together to update the stream restoration practice to reflect new science.
- Goulet: The restoration specifications are generic; you need to account for the site-specific conditions and quality of work at each site. We need to be careful about only studying one or two sites at a time and expand our focus.
- Norm asked what the EPA's vision is for next steps in research and synthesis.
    - Michelle Price-Fay: We would like to collaborate with state and local entities on functional uplift and floodplain reconnection. We had originally considered developing a white paper, but we are interested in any ways we can collaborate more with local partners.
    - Norm Goulet: Fairfax County and other local governments within the states would be good partners to work with. We also need to expand our focus and discussions beyond the coastal plain. We need to be careful about making generalizations without doing the research at different geographies and with the limited scale of monitoring that you have. We don't have time for discussion today, but we are asking everyone to consider the discussion guidance questions and send any questions, comments to Michelle Williams (williams.michelle@epa.gov). We will collect those comments and send back out to the workgroup to develop a path forward. Please also make sure you identify yourself to Michelle Williams if your jurisdiction is interested in participating in the collaboration with Michelle Price-Fay's work.
- Dianne McNally asked about the path forward and whether we should plan to bring this back at another call, or forming a committee or task force to work on this.
    - Goulet: We would like to move this through the existing channels. This will be a slow moving, evolving project. The next chance we will have to discuss this in September at the next USWG meeting. We will be working and discussing over email and collecting comments in the meantime.
    - Schueler: The USWG does not address a lot of these scientific questions, and this might be appropriate for a STAC workshop to bring together all the science and partners for a two-day meeting.
- Goulet: We could consider whether there is potential for another avenue for a workshop like this but we would need to identify resources, funding, venues, and staff time for planning and running the meeting.

- Dianne McNally: Penn State is also finding similar concerns with restored streams not providing functional uplift in primarily ag watersheds.
- Goulet: There are competing issues here— for instance, do we focus more on N and P and ignore other ecological aspects? That is an ongoing debate. Rigorous permitting and regulatory standards do tend to force one over the other.
- Greg Pond: I wonder what drives the decision to put these RSCs in large perennial streams, rather than smaller projects in more headwater streams, and why there is such a focus on organic matter as part of the design process.
    - Schueler: There was a policy decision to allow several practices including Rosgen, natural channel design, and RSCs. Local jurisdictions also feel the squeeze to do these projects to meet their permit and regulatory requirements.
- ___: note that in this area, there are often not large streams with defined channels, and a lot of times you will have shallower meandering streams that run through floodplain wetlands. Those might be natural conditions that we can set a goal to emulate, and that may be a component to developing a better definition for an RSC and what it is or is not.

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1:15 Outfall Restoration Ad Hoc Team Charge (Tom Schueler) Attach C.

Tom reviewed the proposed charge for the ad hoc team that will work to further review and develop a new "protocol" to credit outfall stabilization projects.

- As of the June 19 USWG conference call, all positions for the ad-hoc team have been filled.
- Norm Goulet asked how this fits in with the Phase III WIP development timeline, and with ongoing business of the USWG.
- Schueler: We are trying to limit our to-do list here. Our priorities also include bacteria TMDLs and climate change, although the RSC is not in our purview to make decisions.

- Tom Schueler: We also approved the conservation landscaping credit in May. David will notify the WTWG in July for approval, and then get approval from the WQGIT by the end of July.

Note: We plan not to have a meeting in July or August. Unless absolutely critical, we will reconvene in September.

1:30 Adjourned

Attachments.

- Attach A. May Meeting Minutes
- Attach B. Draft Executive Council Stormwater Directive
- Attach C. Draft Charge for Outfall Stabilization Ad Hoc Team

Call Participants:

Name:	Affiliation:
Norm Goulet	NoVA Regional Commission
Tom Schueler	CSN
David Wood	CSN
Michelle Williams	CRC
Sebastian Donner	WV DEP
Christina Lyerly	MDE
Chris Victoria	AACO WPRP
Diron Baker	Rockville MD
Fred Kelly	Severn Riverkeeper
Alison Santoro	MDNR
Mark Southerland	
Josh Burch	DOEE
Marty Hurd	Fairfax
Neely Law	CWP
Jesse Maines	Alexandria VA
Karen Coffman	
Karl Berger	MSWCOG
Jessica Walters	Rockville MD
KC Filipino	HRPDC
Heather Gewandter	Rockville MD
Lisa Fraley-McNeal	CWP

Robert Goo	EPA
Paul Mayer	EPA ORD
Jeremy Cox	CB Journal
Chuck Brown	
Paul Mayer	US EPA
Bill Jenkins	EPA CBPO
Bill Stack	CWP
Keith Binstead	Underwood and Associates
Neil Weinstein	
Kyle Hodgson	MDNR
Scott Stranko	MDNR
Greg Pond	EPA Region III
Michelle Price-Fay	
Matt Myers	Fairfax County VA
Nancy Roth	
Jeff Lapp	
Blake M	
Chris Biprap	Underwood and Associates
Kevin Smith	
Rob Spagnolo	
Rebecca Cope	EPA ORISE
Lou Etgen	Alliance for the Bay
Michelle Price-Fay	
Lucinda Power	EPA CBPO
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Chris Ruck	Fairfax
Keith Underwood	Underwood and Associates
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Neil Weinsetin	
Randy Greer	DE DNREC
Elaine Webb	DE DNREC

Ray Badami	AACo WPRP
Sara Caldes	Severn Riverkeeper staff
Ted Brown	BioHabitats
Sara Weglein	
Ruth Minich-Hobson	VA DEQ