Urban Stormwater Workgroup Meeting

Meeting Minutes

Tuesday, March 19th, 2025

10:00 AM – 12:00 PM

Meeting Materials

Summary of Actions and Decisions

Decision: The USWG approved the December USWG Meeting Minutes

Action: USWG Members with additional urban BMPs the workgroup should consider, please email Norm Goulet (ngoulet@novaregion.org), KC Filippino (kfilippino@hrpdcva.gov), and David Wood (Wood.csn@outlook.com)

Action: USWG members should review the draft white paper and provide any comments, questions, or concerns to David Wood (Wood.csn@outlook.com) by Tuesday, April 15th. David Wood proposes that the USWG review final recommendations of the white paper after its review by CSN and make an approval decision at a future workgroup meeting. The targeted completion date is May-June 2025.

Action: If you have further feedback or comments on the sanitary sewer exfiltration or developed sector nutrient sensitivities, please reach out to Joseph Delesantro (jdelesantro@chesapeakebay.net).

10:00 Welcome and Review of December Meeting Minutes
Norm Goulet, Chair

Decision: The USWG approved the December USWG Meeting Minutes

10:05 Announcements and Updates

- STAC workshop proposal
  - CSN and DOEE worked to put forward a STAC Workshop proposal focused on soil health, particularly in the urban and suburban space. KC is also on the steering committee for that workshop. The proposal was submitted February 10. STAC reviewed the proposals and provided comments a week and a half ago, and gave us a week to resubmit on Friday. Comments were mostly positive, awaiting final decision from STAC.
- UNM Panel Update
  - Panel met, discussion was focused mainly on the individual urban nutrient management plan BMPs. There have been many changes in the model structure, including the fertilizer application methods, since the panel was put together in 2013, creating challenges for how to update the practice. There's still a lot for the panel to work through. The group is still putting a lot of emphasis on the challenge of dealing with non-fertilized turf acres

and how to tackle that as well. Additional updates will come in a couple of months.

- "Beyond Bean Counting" Goal Implementation Team Funding Project
    - The project was awarded to A. Morton Thomas and Associates (AMT), KC and David are workgroup representatives for the project. There was a kickoff meeting in February on the 18th. We will be reaching out to workgroup members about possibly helping serve on steering committee for project. The group is putting together questions to ask jurisdictional and other workgroup representatives and will likely reach out to people in April.

10:15 Priority Urban BMPs for Climate Resilience Analysis
David Wood, CSN and Krista Romita-Grocholski, RAND

A project team is currently seeking to quantify the performance of agricultural & urban BMPs in the Chesapeake Bay watershed under current and future climate scenarios. In order to focus that analysis, the USWG will be asked to identify a list of priority BMPs for evaluation. Krista and David shared the approach taken for identifying priority agriculture BMPs, provided options for the stormwater analysis, and asked the workgroup for feedback. The group was asked to consider what practices they care about most and want to see in this project, as well as what work we can meaningfully simulate.

Discussion:
Cecilia Lane (in chat): How would climate changes impact septic disconnection?
Norm Goulet: The septic aspect is something both KC and I thought was something that's really important. Given the climate change function, we know that in the lower lands coastal plain, we're already having problems with rising sea level and high water tables, and that's creating problems with the septic systems. So, we thought that was important to look at. Also when you look at it from the Piedmont and the highland areas, there's more rainfall, higher base flows, more exfiltration into the soil, into the base flow, and into the streams. We just pulled septic disconnection out of the list of BMPs. We could clearly look at other septic BMPs if we needed to. Open vegetated channels was more of a coastal plain issue and they are a fairly significant BMP in the area, and they are very unmanaged, so we thought that was another important aspect to take a look at. Those were the two reasons we threw those into the list. We'll take any feedback on that.
Cecilia Lane (in chat): these work for DC, the list accurately represents the majority of the BMPs we implement.
Lew Linker: It's a good list. If we do this well, we are going to learn things and use that knowledge to improve implementation and, Norm, your explanation of how does climate change influence septic systems and how does that change their efficiency in terms of delivery or load to streams, rivers, and ultimately tidal waters of the Chesapeake, is spot on because this work was initiated by the PSC. The PSC had said we're going to address the challenge of climate change in the Bay Program, but give us tools, help us understand how our BMPs are performing under climate change conditions and the decades of work that stormwater management has put in the ground in terms of not only septic, but their stormwater treatment and the runoff reduction. Ultimately, this is a mechanistic model. We'll have run off reduction, septic systems, stormwater treatment. We'll have a

characteristic treatment system, have it under current hydrology, and then a clear planning horizon of say 25 years. How does that change with that hydrology? Is that a 10% loss of efficiency? Is it a 2% loss of efficiency? Basically, the PSC said give us a stress test of all our BMPs that we've invested in and will invest in the future, and give us guidance on how we should think about this. That's the background to consider in terms of the origin, as well as everything that Dave and others have gone over.
Heather Gewandter: We're talking about, in light of climate change, which of our BMPs are working the best? Especially those that are also good for water quality, right? Me, as a practitioner who is multi-tasking all the time, will know the priority ones to put in the ground if we are trying to achieve both results. That's kind of what I am getting from this, and that's what our aim is. If that's what I want, what are the list of things that we want modeled? Definitely not urban nutrient management. I like your list. I appreciate why you added what you did, Norm, for open vegetative channel and septic disconnection, although it doesn't matter for me. I'm really interested in the difference between runoff reduction practices and stormwater treatment practices, and the more granular we could get on the specific practices, for me, the better.
Jamie Eberl: If we are looking for what will be most beneficial under future climate scenarios and how do we incentivize those BMPs that really improve resiliency, I am questioning stream restoration being on the list- or maybe we should clarify that to not just being bank stabilization stream restoration and lean much more into flood plain restoration. Some of the stuff I'm seeing implemented as stream restoration, I don't see a lot of benefit as far as improving future resiliency with those projects. On the other side of that, those ones that have a very large-scale flood plain restoration, yes, tremendously so.
Heather Gewandter (in chat): I agree with the comment about focusing on stream restoration that includes reconnection to the floodplain and not those that are strictly stabilization.
Norm Goulet: When you talk about what you consider to be the nonproductive, are they following the stream restoration protocols, or is this just stabilization that's occuring that's not being claimed as a BMP through the protocols?
Jamie Eberl: Protocols in the very lightest sense. Crediting with limits armoring on some parts of it and, it fits, but barely. We need to keep in mind the stuff is expensive, so it's going to be that minimum standard that we're going to see implemented in a lot of places.
Norm Goulet: Right. Maybe what we need to look at is a subset, one or two specific protocols within the list of protocols, for stream restoration. Maybe that would help.
Jamie Eberl: If we could look at this under the lens of modeling to compare the two, I think that would be very beneficial. To say it's a little bit more investment to do the floodplain part, but look at all these extra benefits you are getting.
Lew Linker: We have 5 years of a grant, and while we want to look at efficiencies and how those efficiencies change under future climate conditions, the beauty of this grant is that once we have the systems put together by our colleagues at RAND, Carnegie Mellon, and Cornell, that's going to be a public domain model that the USWG or Modeling Workgroup for the nonpoint source can use to explore other features. Once we represent a system, we'll be able to hold on to that representation, that model, and to apply it in the future for other purposes.

Krista Romita-Grocholski: We do have the immediate ask of what do we need to figure out how to model by the end of the year, but we do have time on this task to do some additional work on modeling through the following years as well. The project itself, we are just kicking off year two, so we have four more years left. So, depending on what is needed, we have more time. Right now, we are trying to figure out what the first things are we really need to do. What are the highest priority asks? It's good to remember that this doesn't mean that this is everything that we're going to be able to do.
Dave Montali: Maybe this is semantics, but with respect to septic disconnection, is the intent to evaluate the expert panel report and the way we model septics? The BMP, it's a no brainer. Yes, it's not going to be affected by climate. It will be resilient to climate if the septic is hooked to a POTW, but all the details about how septic systems are loaded, would seem to be your issue that you want evaluated. Is that going to go on?
Norm Goulet: I agree with you, Dave. I put in the septic disconnection basically as a placeholder. The whole subject of septics is what needs to be looked at, not so much maybe the one BMP called disconnection.
Lew Linker: I agree with you, Norm and Dave. I think these are separate tracks. Our BMP panel told us what we're going to do in terms of the credit we'll get for septic system management and loads. This is a look at how a typical septic system behaves under a future climate. With greater precip in and greater infiltration out, how does that load change because of that? So, it provides information. There may be, somewhere down the line, a re-opening of the expert system. Let's say a hypothetical five years down the line, we would have, under this plan, the model that would be put together of performance under different hydrologies, and we would be able to learn something and expand. This falls under the category of we're trying to learn stuff. It could inform an expert panel on how we deal with BMPs.
Dave Montali: I get it, but it's not a BMP review. Septic is not the BMP. This is a "how we represent septics" review.
Lew Linker: Exactly.
Olivia Devereux: I just wanted to provide a little bit more information on the proposed alternative list that's on the screen now. RAND may not know that many states have a preference for one BMP vs. another in terms of reporting. So, while all states were encouraged to use runoff reduction and stormwater treatment, historically, they were using other ones like bio retention or ponds of some sort. The states have theoretically transitioned to runoff reduction and stormwater treatment, but some have not been able to transition to that because there are three units required for those and only one unit required in reporting for older ones like ponds and bioretention. They are essentially equivalent in terms of what is being done, but reported differently, and I wanted RAND to be aware of that. With forest planting and forest buffers, we do have the word urban or non-urban in front of those. However, some states don't use them, and just report them all as one or the other because it doesn't really change the calculation in the model at all. What is important is the land use that is converted. So, in terms of model, some states are not as attentive to whether it's urban or non-urban when they report it. For stream restoration, we do have the four protocols, 1,2,3, and 5, and those all require multiple measures, but stream restoration is also reported as a general BMP with just one unit. So, you may want to pick one from a list but know that sometimes what a state reports is based on how many units they can track. Septic disconnection is driven by the CSO areas

and the expansion of wastewater areas. So, I know that you are looking for one to represent septic, but that's what that one is driven by. I just wanted to mention those few things as you look at these proposed alternatives.

Deborah Cappuccitti: I am also really interested in kind of looking at the difference between runoff reduction and stormwater treatment, and I have a lot of interest in looking at Extended Detention and wet ED, because I think these larger facilities are going to have greater capacity for storage and while they may not be as many numbers that are in the inventory as maybe tree planning, certainly they've got a lot of capacity for greater storage, and that could be an important role in resiliency. I'll also piggyback on what Heather said about looking at some granular information and kind of qualifying the study with drainage area treated, what's the actual treatment volume? In Maryland, ESD practices, their treatment volume can be anywhere from one inch to 2.6 inches. So, if you're looking at microbiome retention, just kind of qualifying how much treatment volume we are looking at. The final thing I have on my wishlist is looking at things a little bit more on a watershed level. BMPs are installed in a treatment train, and that could inform the stream restoration conversation. So, looking at stream restoration in terms of how much treated area there is in the whole watershed and if there is a way to tease that apart.

Lew Linker: This is a great discussion, and I wanted to encourage the USWG to think of this work in the long haul. What David, Norm, and KC have put together are initial BMPs to be looked at, and maybe looking for early wins in terms of the modeling system. It might be something like stormwater reduction and stormwater treatment and septic systems, but that's three. Of those three, you'll be able to get a return as we go through year one, year two, year three. Of course, big deadlines in year one. We want to show some success to ensure that the PSC has a sense that we're addressing the questions that they've laid out for us, but there can be other BMPs. There can be an examination of, yes, but what about this in a treatment system? So, it evolves. It's not one and done. It should be, if it's done well, it's going to inform your work and your implementation. We can build on success as we go forward.

Norm Goulet: I heard complete agreement on runoff reduction and stormwater treatment, queasiness on some of the forest, and some agreements on septic. Are there any other BMPs that David, KC, and I did not put on the list that you think should definitely be on the list? That's an open question to anybody.

Fernando Pasquel: I think it's a great discussion. I don't have another BMP, but what I would suggest as you are looking at quantifying the performance is the question of how are you planning to incorporate the maintenance issues? That's such a huge issue right now in terms of maintenance, and you see w aide variety of maintenance practices being used. The MS4 permits, in some of the states, are starting to incorporate requirements for risk-based approaches to maintenance. But, whether you incorporate maintenance issues in the evaluation, in the quantification of performance, or not, I think a strong statement of the importance of maintenance should go with the work that you are doing because you know the importance of that. Norm, KC, and others have seen some of the systems failing, so I would be interested in hearing your thoughts on the maintenance and how that's going to be incorporated.

Norm Goulet: The basic assumption that we've always taken is that maintenance happens. For good or bad, that's been basically the assumption. As you've said, the MS4s

have permits that require them to do the maintenance and we've kind of backstopped that in the unregulated areas with the verification protocol. Is that sufficient? Probably not, but I haven't heard anybody come up with any other way of trying to look at the maintenance aspect when we talk about BMP efficiency. We can kick it around with the modelers and see what they think, and we won't put the subject on the back burner, but we can definitely talk to them about it.
Lew Linker: Norm, I would say that test #1 is that stress test. Everything being equal, what happens when we change the hydrology to a future hydrology? How does that change the efficiency, or how does that change the performance of, say, a stormwater management BMP? Once we have the process model established, then we can do other tests down the line in terms of what if we had poor, moderate, and good maintenance? What would be the outcomes of that in terms of efficiency? So, it's kind of a two-step process.
Olivia Devereux: On the operations and maintenance, the Bay Program partnership made a decision about the verification and requires inspection of most BMPs every few years, and most of these urban ones are about every five years to make sure that they are performing as expected. So, the inspection is kind of built in to make sure that the operations and maintenance is happening. I think we're good on that, and we can assume that it's working. Otherwise, we would pull it out of the model, and it wouldn't be included.
Norm Goulet: Thanks, Olivia. Let's go ahead and close this out by saying if you have any other BMPs that you think we should be considering, please send an email to David, myself, and KC, and we can talk about some of the other BMPs that other people might be thinking about, versus what we had thought. We'll move forward with RAND and company to start looking at how, and specifically next, what model they should be looking at.
Krista Romita Grocholski (in chat): Thank you all for the discussion! If you have questions about the project, feel free to reach out to us. My email is kristarg@rand.org.

Action: USWG Members with additional urban BMPs the workgroup should consider, please email Norm Goulet (ngoulet@novaregion.org), KC Filippino (kfilippino@hrpdcva.gov), and David Wood (Wood.csn@outlook.com).

11:10 BMP Interpretation White Paper: Biochar as an Amendment to Existing Runoff Reduction Practices Carol Wong, CWP

At the November meeting, the USWG agreed to proceed with a BMP Interpretation for biochar amendments in runoff reduction practices. During this meeting, Carol Wong and Lisa Fraley-McNeal gave a presentation on the draft white paper for USWG review and comment. CSN will convene a review team of 4-5 researchers and practitioners in order to provide further review and feedback on the draft white paper prior to a USWG decision.

Discussion:
Norm Goulet: When we last met, the availability of biochar was difficult. Has that situation gotten any better?

Carol Wong: It's still a moving target. There are more facilities online, but that IBI/EBC testing, that is currently being done under our NFWF grant. So, we're just kind of waiting for the results. Right now, still a potential problem. But, shipping it across the U.S. is still available, so that is still an option by bringing it in from the Pacific Northwest. I understand that that definitely has a carbon footprint associated with it, but the replacement of the sand in the bioretention media would still be carbon negative because you would use less sand by putting in biochar. So, availability locally is still being figured out, but it is available across the U.S.
Charles Hegberg (in chat): FYI - The IBI certification process has been retired. The biochar lab testing standards has not. An ASTM process is in development along with a North America Standard.
Carol Wong: A lot of this is moving as we're moving, especially with IBI moving towards the WBC. A lot of biochars are certified under IBI, and now they have to get certified for WBC. So, we're still accepting IBI because it just happened. So, everything is shifting and moving as we're moving. So, we're hoping that providing a broader IBI or WBC lab testing would help alleviate some of those transitions that are happening right now.
Robert Goo (in chat): who should we send comments to re the draft biochar bioretention whitepaper CWP provided? Carol Wong or Lisa Fraley-McNeal or is there a USWG compiled comment process and link?
David Wood (in chat): Hi Robert - good question, you can send them to me, and I will compile them all (wood.csn@outlook.com).

Action: USWG members should review the draft white paper and provide any comments, questions, or concerns to David Wood (wood.csn@outlook.com) by Tuesday, April 15th. David Wood proposes that the USWG review final recommendations of the white paper after its review by CSN and make an approval decision at a future workgroup meeting. The targeted completion date is May-June 2025.

11:40 Updates on Sanitary Sewer Exfiltration and Developed Sector Nutrient Sensitivities

Joseph provided an update on his work with the Wastewater Treatment Workgroup to model the extent and distribution of sanitary sewer exfiltration. He also re-engaged the workgroup on the desire to revisit nutrient sensitivity values for the urban sector.

Discussion:
Sadie Drescher (in chat): This is such an important topic and thanks for the update on sanitary sewer exfiltration (up to 11% urban load!). Wondering how future climate (agenda item #1) will impact these sources, as well (exfiltration, illicit discharges, etc.). Just food for thought.
Lew Linker: Joseph, this is the first time I've seen everything put together in a single equation, and it just seems very clever. It is, of course, straightforward and includes all the aspects, but it reflects a good bit of development and thought by the CBP. I really appreciate that expression that brings all of the various elements together in a reasonable way.
Joseph Delesantro: Thank you. I think that the large focus in putting together that function was to reduce the data requirements both from the state, but also the Bay Program.

Norm Goulet: I would highly encourage you to keep looking for additional information. This has been an outstanding issue in terms of urban sensitivities for as long as I can remember. The sensitivity for the Phase 6 model for urban was basically based on the Phase 5 model and SPARROW. That's it. So, we have this circular thing going on here where we're not really gaining any additional information, and there is a good deal of uncertainty that's being associated with these uncertainties in the urban sector. We don't have the phosphorous measurements that the ag sector has, and they're using all of that in the modeling to crank out the uncertainties. There has got to be something out there that we can use to help us to hone this in. This has been a point of contention for a number of years or decades. So, I would urge you to continue looking as to what's out there. Even if we have to come up wth a new methodology, so be it. We've got to hone this in.
Joseph Delesantro: It was really a process of prioritizing sensitivities. There are some of the sensitivities, especially in the ag sector, for which there's a lot of literature. Simply, the literature did not necessarily support revisiting those values. Maybe there's a potential to use a different model or a completely different method to get at the sensitivities, besides literature review, and that is not something that I've investigated at this point.
Lew Linker: It could be one perspective that if we look at land uses that are fairly well characterized, for example urban lands have a history of manure and fertilizer and the buildup of P and that P removal of those active sites in the soil column takes decades. What about land that once was agricultural and was converted to urban? There could be a representation of that depuration of phosphorous from the soil column associated with that land because it was one land use, it was well tracked for nutrient stocks, and now became another land use. Lots of nuances in terms of is it now impervious and does it go away to some extent? Forest lands are pretty well characterized in terms of the large storage of organic nitrogen. Essentially about two tons per acre of organic nitrogen is in the soil there, and that gets burned out over time. So, we have nine months in Phase 7. This may not be something that we can do in Phase 7, but it might be worth exploring for some future use and expanding the literature review to other areas, knowing that developed land came from somewhere.
Norm Goulet: In theory, you are correct. Unfortunately, in that real world scenario when that farm or past farm becomes an urban development, the very first thing that happens is the contractor comes in and strips off all the top soil, and it's gone.
Lew Linker: So it's a product? It's a commodity?
Norm Goulet: Yes, definitely. So, all of that highly ladened soil nitrogen and phosphorous doesn't exist anymore where that urban development is. It's gone.
Dave Montali: I've got thoughts similar to what you said, Norm, on the conversion of ag to urban. My main point is that, especially with respect to phosphorous, I believe our existing sensitivities are mostly based on the amount of phosphorous that we put down on the ground every year. Is that true, Joseph?
Joseph Delesantro: There's a sensitivity to phosphorous on turf for fertilizer.
Olivia Devereux: It's the change in inputs over the change in runoff. So, that helps calculate it, Dave, and that will probably help you here. But, I think it's wrong to say it's just the inputs. It's really the change in input over the change to runoff is the sensitivity calculation.
Dave Montali: In the end, what our model says is highly dependent upon how much we put on every year, and we found that not to be true on ag lands. I don't know if there's

any way to look at the literature to see is it more about runoff and sediment than it is about annual applications, in a way, to potentially lower the effect of annual inputs? What causes the increased export in ag lands is the over saturation of the soil and then the loss. I'm not really sure that we have that going on in urban environments where the amount that gets put on is greatly in excess of the agronomic need. Is there any other way to look at the literature to say is our way the best for the available science, or should we somehow adjust how we do it?

Joseph Delesantro: The overwhelming focus on the literature being in identifying these land use loading rates supports the existing model structure where we apply these land use loading rates across the watershed. I think what gets tricky is that, because that's the most important factor, simply the percent, the acreage of impervious or turf grass or other urban categories, or is it simply because the other inputs are not well known? It's hard to say, but I think it's possible that both are true here. That is something more specific that I can look into if there's any specific evidence that's able to compare that variation in time versus the typical loading rate.

Action: If you have further feedback or comments on the sanitary sewer exfiltration or developed sector nutrient sensitivities, please reach out to Joseph Delesantro (jdelesantro@chesapeakebay.net).

12:30 Adjourn

Participants

David Wood, CSN
Norm Goulet, NVRC
KC Filippino, HRPDC
Julia Fucci, CRC
Lewis Linker, EPA
Olivia Devereux, Devereux Consulting/CBPO
Elaine Webb DNREC
Ginny Snead, AMT
Joseph Delesantro, EPA/CBPO
Charles Hegberg, RES
Joe Parfitt, VDOT
Greg Hoffman, CWP
Tyler Trostle, PA DEP
Ho-Ching Fong, MCDEP
Auston Smith, EPA
Eugenia Hart, Tetra Tech
Lisa Fraley-McNeal
Ellen Egen, Aqua Law
Devon Kosisky, MDE
Allie Wagner, NVRC
Adrienne Kotula, CBC
Jamie Eberl, PA DEP
Martin Hurd, Fairfax County
Camille Liebnitzky, Alexandria VA
Cecilia Lane, DOEE
Krista Romita Grocholski,, RAND
Rebecca Winer-Skonovd,, Biohabitats
Sophia Grossweiler, MDE
Carol Wong, CWP
Andrea Krug, DOEE
Cassie Davis, NYSDEC
Michelle Berry, CSN
Nathan Forand, Baltimore County
Gillian Adkins, MDE
George Doumit, DNREC
David Rounce, CMU
Helen Golimowski, Devereux Consoluting/CBPO
Monique Dykman, Londonderry PA
Sushanth Gupta, MWCOG
Sabine Miller, MDE
Gopal Bhatt, CBPO
Heather Gewandter, City of Rockville
Fernando Pasquel, Arcadis
Scott Crafton, VDOT
Allison Ng, EPA
Sydney Hall, DNREC
Mark Symborski,, M-NCPPC
Brock Reggi, VA DEQ
Aaron Porter, USGS

Ivy Ozmon, HRPDCVA
Dave Montali, TetraTech
Tyler Monteith, VA DEQ
Deborah Cappuccitti, MDE
Ari Engelberg, MD DNR
Sadie Drescher, CBT
Samuel Canfield, WV DEP
Sami Khan, CWP
Adrienne Cizek, CWP
Paige Buzard, CWP
Reid Garner, Spring Hill Partners
Beth Uhler, CWP
Robert Goo, EPA
Andy Oetman, GSA