Stormwater Work Group
Meeting Summary

Wednesday July 16, 2025 from 1:00 p.m. to 3:00 p.m.

Meeting Overview

The Stormwater Work Group (SWG) held a virtual meeting on July 16, 2025.
Meeting topics included:

- Overview of the Stormwater Action Monitoring (SAM) Round 5 Study Selection Process
- Review of SAM Round 5 Research Questions

Meeting Participants

75 people participated in this SWG meeting. People included:

16 Voting Members

Present: Rae Eaton, Meiring Borcherds, Nick Hehemann, Rich Sheibley, Jeff Killelea, Dana de Leon, Lori Blair, Jess Huybregts, Jane Dewell, Maureen Meehan, Abby Barnes, Dara Osborne, Don McQuilliams, Katrina Radach, Jessica Atlakson, Trey George

Absent: Gary Bahr

There are 26 total voting member spots in the SWG. Currently, there are 17 filled positions. There are vacancies in the state, federal, Tribal, environmental, and business caucuses.

5 Ecology Administrative Staff

Madison Bristol, Raghu Namburi, Chelsea Morris, Emma Froembling, Shelby Giltner

Ecology administrative staff support the SWG through membership outreach, coordinating PRO-C and SAM, organizing the agenda, notetaking, meeting facilitation, virtual meeting technical support, updating the SWG website, and managing the SWG listserv.

54 Additional Attendees

Laurie Larson-Pugh	Rebecca Springer	James Packman	Sarah Murt
Kevin D. Fitzgerald	River Wan	Jennifer Bare	Justin Cohee
Chuck Geissel	Megan Folkers	Aaron Burkhart	Carly Michiels
Brian Egan	Madison Hattaway	Hannah Mittelstaedt	George Reed-Harmon
Meaghan Owens	Emma Froembling	Tammie Wilson	

Dorie Sutton	Sandra Dorning	Chad Hoxeng	Anurag Mishra
Russell Betteridge	Emma Trewhitt	Brian Hite	Cindy Callahan
Heather Martin	Cha Thao	Aislin Gallagher	Stella Collier
Caroline Najarian	Graham Simon	Charles Dewey	Zack Holt
Frances Bothfeld	Jim Loring	David Batts	Shannon McClellan
Cameron Chapman	Chris Korwel	Morgan Maupin	Eli Mackiewicz
Julian Carroll	Evan Dobrowski	Patricia Johnson	Abbey Stockwell
Blaine Chesterfield	Larry Schaffner	Mike Ehlebracht	Jessica Schwing
Rachel Konrady	Amy Waterman		

Thank you as always to our voting representatives, members, staff, and partner organizations for your commitment to the SWG community.

Sincerely,

Don McQuilliams, SWG Chair

Abby Barnes, SWG Chair

Madison Rose Bristol, SWG Interim Coordinator

Full Meeting Summary

SAM Round 5 Study Selection Process

- Introduce members of the SAM Study Selection Subgroup, aka S4
    - Chair: Meiring Borcherds, City of Mukilteo
    - Co-Chair: Emma Trewitt, Pierce County
    - Jess Huybregts, City of Seattle
    - Cha Thao, Skagit County
    - Jane Dewell, Port of Seattle
    - Eli Mackiewicz, City of Bellingham
    - James Packman, Herrera Environmental Consultants
    - Abby Barnes, WA Department of Natural Resources
    - Scott Treber, City of Tacoma
    - Susan McCleary, City of Olympia
    - Erin Hamilton, City of Selah
    - Martin Nelson, City of Kennewick
    - Hugo Morales, City of Sunnyside
    - Jack Wells, County of Yakima
    - Royce Young, City of Lacey
    - Olen Anderson, City of Lake Stevens
    - Amy Georgeson, City of Battle Ground
    - Cory Olson, City of Spokane Valley
    - Aimee Navickis-Brasch, Evergreen StormH2O Consulting, Inc.
    - Bill Taylor, Raedeke Associates, Inc.

- Tentative schedule of the Round 5 study selection process. There are distinct stages to proposal submittal, evaluation, and project selection process:

Project Selection Stage	Description	Target
Stage 0	SWG votes to approve Round 5 research questions	September 10 SWG meeting
	Request for study proposals advertised **(SWG-Sep 10th)**	Soon after SWG meeting or Last week of Sep 2025
Stage 1	Letter of intent (LOI) from project proponent due to SAM Coordinator	October 24, 2025
	SAM Coordinator provides feedback to all project proponents and each proponent as to whether their project will move to Stage 2	Nov 19th, 2025
Stage 2	Full proposal from project proponent due to SAM Coordinator	Jan 16, 2026
Stage 3	SAM Staff coordinate for scoring and technical reviews and send back to project proponents	March 13, 2026
Stage 4	SAM Round 5 Project Selection Workshop with presentations by proponents and stakeholder voting in week after the workshop	Week of April 6th, 2026
Stage 5	SWG approves project list for SAM funding (with a May meeting or the target date moves to Sep 2026)	July, 2026

Q&A

Question: Who can submit a proposal?

Answer: State and federal agencies, Tribes, and universities, not just permittees, are eligible for funding. Contractors can subcontract, but the project needs to be managed by the governmental organization. Further details will be provided in the RFP funding guidelines. You can also view requirements in the Round 4 RFP.

SAM Round 5 Research Questions

During this part of the meeting, participants provided feedback on individual research questions for Round 5. Some Round 4 proposals are included below for consideration and questions highlighted in yellow were supported by S4 to include in Round 5. Proposed research questions and feedback are included below.

Permit-New Ideas

1. Where are the geographic priorities for stormwater retrofits necessary to intercept road-derived toxics (6PPD-quinone, PAHs, etc.) to protect salmonid populations in Puget Sound (i.e. coho and Chinook), especially important prey populations for Southern Resident Killer Whales? (supplement existing research on this topic)
2. Conduct a study to evaluate if the estimated effective impervious area is a better predictor than total impervious area of stormwater quality.

Feedback on #2

- Effective Impervious Areas (EIA) are the ones that drain to the stormwater (SW) system. All impervious areas may not drain to the SW system as it may be intercepted by some kind of treatment or not directly connected to the SW system.
- Total is going to include areas that might infiltrate or maybe goes to a combined system.
- There was discussion among S4 regarding the implications of a study on EIA. Some jurisdictions based their stormwater assessments on FULL impervious (or "hard" surface) as it relates to ERUs (equivalent residential units). Therefore, there was question about whether or not an EIA study would someday have an impact on how assessments are structured.
- Let's see if we can get a subject expert talk about it at a regional NPDES meeting please.
- There is a definition for effective impervious surface in the stormwater manual - in case that is helpful.

3. How can existing GIS data and aerial imagery be used to identify locations for stormwater banking and other BMPs?
4. Evaluate the effectiveness of MS4 Permit-required-staff training efforts in meeting intended outcomes. Measured outcomes could be participant knowledge, skills, behaviors, or program outcomes. Include assessment from the perspectives of the trainers, trainees, and program managers. Review lessons learned to glean what works and what doesn't.

5. To what extent may stormwater infrastructure impact the effectiveness of physical habitat restoration projects (e.g., culvert replacements)? Consider using a Before-After-Control-Impact (BACI) study design and evaluating the potential for inadvertently creating ecological traps where habitat-like features may attract wildlife without supporting their long-term survival.

Feedback on #5

- How does this relate to MS4 permits and flow control requirements?
    - Culvert replacement is often co-located with stormwater treatment. We are seeing this with WSDOT. This removes a physical and a toxics barrier for salmon passage - both of which impact Tribal Treaty Rights and co-management responsibilities.
- As we review all questions, SWG should think about how research questions could improve the permits – even if it is not included in the permits already.
- Don't most culvert retrofit projects trigger MR's 1-5 at a minimum? some 1-9? if so, is there a nexus? Some must tie into nearby MS4s?
- Ditch and culvert systems are a part of MS4s – however, terminology for streams is different. When framing this question, it will be important to get our terminology correct.
    - Ensure the phrasing is permit-related, not fish barrier-related
- When Tribes review culvert replacement, oftentimes stormwater treatment also comes up. Understanding impacts of stormwater BMPs on stream road crossings could be permit related research topic on culverts. From a Tribal perspective, this is an important, even if complicated, topic to look into.
- Regarding culverts, those not associated with MS4 conveyances would not be subject to the MS4 Permit's regulatory scope.

Permit-Round 4 Ideas (i.e. Ideas from the 2023 Study Selection Process)

6. Fill gaps on benefits of retrofitting, restoration of riparian buffer, property acquisition, removal of impervious surfaces, floodplain reconnection or other actions used to address stormwater runoff not otherwise required in S.5.C (from Structural Stormwater Controls, Science Review and Synthesis Project)

Feedback on #6

- I don't understand the Gaps analysis of App 12? that aren't required under S5C? We have App 12 (retrofitting) because there is a huge gap and time lag with S5C development/redevelopment.

7. Investigate other NPDES permit thresholds to see if they are appropriate for 6PPDQ; also review reporting data from other permits for information pertinent to treating 6PPDQ

The SWG did not fund idea 8 in Round 4, so this will not be included in Round 5 research questions. Idea 9 is active (hence the strikethrough):

8. ~~Improve future Permit annual report questions for quantifying data for regional learning by analyzing Annual Report data, including analysis of narrative questions.~~
9. ~~Regional stormwater discharge monitoring study (Appendix 9, WWA Permit) to characterize emerging pollutants in stormwater, e.g. 6-PPDQ, PFAS/PFOS, micro- and nano- plastic contamination in stormwater.~~

Source Control-New Ideas

1. Conduct a stormwater discharge monitoring study to characterize stormwater pollutant at different traffic volumes (e.g. low, medium, high traffic areas). Consider building on previously collected data under the 2013 WSDOT highway characterization study and the on-going SAM study Stormwater characterization.
2. Which source control BMPs are most effective at reducing pollutants from key land uses? Identify other sinks of tire wear particles (TWPs) that are not mitigated through street sweeping.

Feedback on #2

- "Key land uses" seems vague. Would help to define.
    - "A range of land use types" or something like that
- "Tire wear road particles" is used nationally aka TWRP
    - Agree re: need to be looking at tire wear & tire & road wear particles along with 6PPDQ
- Instead of focusing on 6PPD for questions, could also include tire crumb particles
    - We've had issue with people dumping tires in our MS4 (ditches).
    - Be mindful that there are also many other sources for TWPs. Some even include asphaltic surface treatments. As an example, one road has a 35% tire rubber modified chip seal coating over it that could be contributing. Many jurisdictions have used this surface treatment for road preservation.
    - Not to mention that chip seal likely causes more tire wear than regular HMA and PCC surfaces.
    - Pretty sure that chip seal road surfaces cause more tire wear than regular HMA and PCC surfaces. Happy to have that investigated to be sure.

- Crumb rubber soccer fields are watered all summer for cooling down for athlete safety, this water is filtering through the crumb rubber, usually recycled tires; And of course rainfall during storm events filters through.
- large particles don't release 6PPD but may attract 6PPDQ

3. Develop guidance and methods for capturing and containing PCBs. Which source control BMPs are the most effective at minimizing PCB's entering the MS4? What onsite or small treatment devices could be used to remove PCBs from washwater? What can be done to prevent the PCBs from entering the MS4 passively (i.e. when the building is just sitting in place and not being washed or demolished)?
4. What are the most accurate, feasible, and/or cost-effective test options to distinguish bacteria from wildlife, livestock, septic, pets, WWTP, boats, etc. Is it Microbial Source Tracking or is there a better method? What proportion of "positive" tests are due to non-fecal coliform bacteria? What are the hurdles to existing methods and realistic expectations of effectiveness?
5. How effective are public outreach and behavior change campaigns at reducing actions that contribute to stormwater pollution, and which specific strategies yield the greatest impact?

Source Control-Round 4 Ideas (i.e. Ideas from the 2023 Study Selection Process)

6. What are the most effective approaches to source control for bacteria? In what situations do E&O, IDDE, and O&M activities most effectively address bacteria problems.
7. What do we know about the impacts of homeless camps on aquatic resources? Research water quality impacts with the goal of developing relationships with social services.
8. Research and compile examples of innovative stormwater management – e.g. –public private partnerships, watershed planning, use of technology tools, Strategic Asset Management. (White paper)

Maintenance/Manual-New Ideas

1. A white paper on how jurisdictions approach stormwater management on properties that do not drain to MS4s? Are there local codes for stormwater management that apply? What non-stormwater regulations apply (e.g. UIC)?

2. In many areas of Western Washington, growth management resulted in slower new development and more redevelopment in already developed areas. To what extent does redevelopment—compared to new development—result in measurable improvements in stormwater management, and how do these improvements scale regionally? Conduct a study reviewing redevelopment projects (large to small) to quantify the improvements in flow and water quality control that resulted. Demonstrate how this information could be used to scale up expected benefits from redevelopment across the region.

Feedback on #2

- I feel like #2 is almost questioning SWMP components. S4 group, let's think more about how to re-word this to get at the intent, if it's the right intent.

3. Adapt TAPE's definition of qualifying storm conditions to EWA climatic conditions so that more treatment devices could be considered for approved use in drier climates.

Maintenance/Manual-Round 4 Ideas (i.e. Ideas from the 2023 Study Selection Process)

4. What is the minimum maintenance frequency for bioretention required to achieve full benefits of the facilities? Build on the previous SAM work on hydrologic performance of bioretention facilities (SAM Fact Sheet #33).
5. What is the range of options to address spills on permeable pavement, and what are the most effective and lower cost methods?
6. Develop or modify a model to predict catch basin accumulation for predicting maintenance frequencies.
7. Research related to adaptations for the Stormwater Management Manuals; e.g., maintenance needs for new GULD/TAPE BMP's, vetting feasibility of new BMP design screening methods.

BMP Effectiveness-New Ideas

1. Assess effectiveness in terms of both cost and pollution reduction, of street waste disposal procedures in Appendix 6 . In particular, assess effectiveness of discharging liquids removed from the street to stormwater collection systems while sweeping during rain events.
2. Synthesize current understanding of how contaminants of emerging concern (CECs) behave within existing BMPs, focusing on mechanisms like sorption, degradation, transformation, and plant uptake. Include the implications for BMP design and soil reuse. Identify opportunities or challenges for reuse and disposal of spent media.

Consider consulting contaminants listed in the CEC Prioritization Report published by the Puget Sound Ecosystem Monitoring Program (PSEMP) Toxics Work Group.

Feedback on #2

- "Identify opportunities and challenges for reuse and disposal of spent media" part might be beyond scope. Maybe just reuse back into BMPs.
- 6PPD disposal is still uncertain depending on if it is classified as typical or hazardous waste
- Could there be an opportunity to summarize research about disposal, such as through the 6PPD Steering Committee?
- Some plants are hyperaccumulators of some pollutants.
- They are street waste from the perspective that they have the same source of pollutants as street wastes. they will be contaminated since it is their job to remove the pollutant. And as in the street waste disposal, you have to test the waste and get a waste disposal authorization which is highly regulated and new CEC would be regulated under waste disposal not MS4.

3. Determine biochar specification that produce the best water quality treatment. Consider that feedstock type, pyrolysis temperature, particle size, and post-processing treatments can influence biochar's physical and chemical properties and thus, its effectiveness in treating contaminants such as nutrients, metals, hydrocarbons, PFAS and 6PPDQ.

Feedback on #3

- On biochar - is there a study needed or a literature research made? I know we've had a consultant do quite a bit of biochar research and then also did pilot study comparisons on treatment performance between biochar and GAC.
- Biochar isn't a singular substance. I agree with BMP Effectiveness- New Ideas: #2 in that regard.
- The new High Performance Bioretention Soil Media (HPBSM) is now approved for use by private and public entities and the spec for biochar in it needs to be improved for phosphorus treatment purposes. Doug Howie from Ecology has recently made it clear that it's a priority for Ecology and the SWMMWW implementation by permittees

4. Collect data and evaluate the potential for PFAS migration to groundwater via infiltration BMPs and Underground Injection Control (UIC) wells, particularly in areas with vulnerable aquifers or drinking water sources

Feedback on #4

- Agree #4 is a good idea

5. Determine the percent removal rate of TSS for a few typical Eastern Washington catch basin designs to identify and demonstrate which catch basin designs qualify as "pre-treatment" BMPs. Consider building on previous SAM study on catch basin maintenance (SAM Fact Sheet #15)

BMP Effectiveness-Round 4 Ideas (i.e. Ideas from the 2023 Study Selection Process)

6. Study existing BMPs (gray or green) to verify capture or treatment of 6PPDQ; e.g. solids and dissolved constituents removal.
7. Create a matrix comparing the effectiveness, costs, constructability, and maintainability of BMPs.
8. Quantify the habitat and other benefits and reduced O&M provided by mature vegetation in stormwater ponds. Are we still getting the pollutant removal? What are the tradeoffs?
9. A study that identifies appropriate BMPs for managing polluted pressure washing runoff and how to use them effectively in the variable situations that you find at different sites to better establish regional compliance consistency for both regulators and contractors.

Q&A

Question: Can you talk more about how these research questions will be used?

Answer: These research questions will be a part of the grading rubric in the RFP. To score points, proposals must address a research topic. See the Round 4 RFP as an example.

Question: Will the research questions be specific enough that RFP applicants will understand what to include in the proposal?

Answer: Applicants more than likely know the terminology, and should know the terminology, as this shows they are qualified to do this research. If research proposals need to be refined or changed, there is opportunity to do so throughout the SAM Round 5 process through feedback from the SAM team, S4, permittees, and the SWG. Questions are received through an

anonymous survey, and the S4 does its best to ensure that final research questions are relevant, make sense, and are priority research questions.

Question: Confirming that these proposals if selected are funded by S.8.B in the Phase I permit?

Answer: Yes, the pooled funding for these studies comes from the BMP effectiveness pot, not the Status & Trend pot.

Reminder: These are recommended research questions. If no one submits a topic, it will not be funded. Permittees vote to approve projects – not the SWG.

Feedback – new study idea from Lori Blair: Exploring engagement opportunities between industrial permittees and the MS4 where there are associated discharges. This can include maintenance and stormwater management opportunities. FYI - if this idea becomes reality, I absolutely want to be part of the team that works this!!!

- The MS4 Permittee jurisdiction would have ordinances that require the ISGP Permittee (if they discharge to the MS4), through the Source Control Program, to implement stormwater pollution prevention and follow the jurisdiction's O&M Manual.

Question: When will the vote be to approve research questions?

Answer: September SWG meeting.

Future Meeting Dates

The next SWG meetings are on September 10 and November 12, 2025 – Wednesdays, from 9am – 12pm.

At our meeting on Wednesday, September 10 we will:

- Introduce the new SWG Project Manager!
- View SAM presentations, potentially including:
    - Longevity of biological protection using bioretention, Washington State University
- Hear updates from our partners, PRO-C, and SAM studies
- PSEMP One-on-One Presentation in preparation of survey at November meeting
- **Vote** to approve a new PRO-C member: Aaron Burkhart, City of Bellingham
- **Vote** to approve SAM Round 5 Research Questions
- **Vote** to approve new SWG voting members, including but not limited to the EPA
- Accept nominations for new SWG Co-Chairs and voting members
- **Vote** to approve 2026 meeting dates and an in-person meeting: February 11, May 13, September 9, November 11

Stay in Touch by Joining these Email Distribution Lists

You can join any or all of our email lists on your GovDelivery Subscriber Preferences Page. Enter your email address, click to add subscriptions, and navigate to the Water Quality Program list to find: **STORMWATER-WORK-GROUP** meeting agendas, materials, and summaries of our meetings, and additional announcements related to our work; **STORMWATER-ACTION-MONITORING**: up to three newsletters per year to hear about SAM study findings and upcoming workshops; and **SWG-6PPD-SUBGROUP** for meeting agendas and notes of those discussions.

View the SWG Website

We regularly update the SWG website with information about upcoming meetings, past meeting materials, and important SWG documents. If you have additional questions about the SWG, contact madison.bristol@ecy.wa.gov.