

Stormwater Work Group

Meeting Summary

Wednesday May 15, 2024, from 9:00 a.m. to 12:00 p.m.

Voting Members and Alternates Present (14 people)

Stella Collier, Todd Hunsdorfer, Jessica Huybregts, Don McQuilliams, Dana Deleon, Abby Barnes, Nick Hehemann, Jeff Killelea, Katrina Radach, Lori Blair, Meiring Borchers, Carol Falkenhayn Maloy, Tony Bush, Zack Holt

Participants (72 people)

Aimee Navickis-Brasch, Ali Brown, Annamaria Clark, April Hardy, Jennifer Arthur, Morgan Baker, Abby Barnes, Bill Taylor, Blaine Chesterfield, Frances Bothfeld, Madison Rose Bristol, Tony Bush, Cindy Callahan, Carol Falkenhayn Maloy, Chakong Thao, Leslie Connelly, Daniel Vlad, Dara Osborne, Dana Deleon, Dimitrios Athanasiou, Elizabeth Brinkman, Meghan Elkey, Emily Gonzalez, Emma Trehitt, Eric Bayani, James Flies, Geoff Miller, George Reed-Harmon, Nick Hehemann, Todd Hunsdorfer, Tariq Hussain, Jessica Huybregts, Zoe Irish, Ani Jayakaran, Jeff Davis, Jennifer Bare, Jennifer Saltonstall, Jesse Barham, Jesus Adame, Patricia Johnson, Keith Estes, Keunyea Song, Kevin Du, Jeff Killelea, Mariko Langness, Larry Schaffner, Joanna Larson, Laurie Larson-Pugh, Carolina Lizana, Lora Petso, Lori Blair, Eli Mackiewicz, Mauro Heine, Erin McCabe, Don McQuilliams, Meiring Borchers, Mike Vermeulen, Teizeen Mohamedali, Chelsea Morris, Cleo Neculae, Katrina Radach, Katie Rathmell, Jonathan Eb Schnore, Shawn D. Christensen, Rich Sheibley, Shuhui Dun, Stella Collier, Taylor Pesce, Nicholas Wegener, Rachel Yonemura, Zack Holt

SAM Study Presentation: Hydrologic performance of bioretention –
Jesse Barham, City of Olympia; Bill Taylor, Raedeke Associates; and
Jenny Saltonstall, AESI

Presentation: Bioretention Hydrologic Performance Study III

- This study tested **50 bioretention cells for longevity**. Among research questions, they were seeking to understand if cells started to clog after 10 years, and if sediment clogged them.
- After a survey, they found that **infiltration rates overall remained high** with no indication of clogging or sediment accumulation except localized areas near the point of inflow.
- They also assessed the grain size and organic matter content by comparing the standard 60:40 bioretention mix distribution range to samples. **Most of the samples were consistent with the distribution range of the 60:40 mix or were even finer.**
- Some cells were observed to be leaking and not infiltrating into the ground. There was also minor bypass for some older systems.
- The high infiltration rate for the 60:40 mix was consistently good with time
- Witnessed some compaction and additional minor problems – which can all be addressed with maintenance
- In this study, they also assessed **impacts on vegetation**:
 - After 10 years they often saw a shift from wetter planted plants to drier planted. 75% of wet plants shifted to dry plants over 10 years.
 - Very few sites were able to retain groundwater for 18 or 20 inches. At those sites, they also saw more wetter planted plants because they had more groundwater.
 - Woody plants were able to persist longer than non-woody plants.
 - Why is vegetation important?
 - Structurally support infiltration
 - Plants are expensive – You can do less maintenance and spend less money if plants are better matched with the design of the bioretention cell.
 - Based on study results, the researchers recommend that stormwater planners should not plant wet plants.
- **Final takeaway of study:** Bioretention is being used more often, especially to address 6PPD-q. When designing bioretention cells, simplify the plans and aim for less maintenance needs. Based on study results, simpler designs that required less maintenance had greater longevity over time.

SAM Study Presentation: Improving roadside ditches and maintenance – Ani Jayakaran, WSU-Puyallup; Jonathan Schnore, WSU; Michael Neff, WSU

Presentation: [Plant Selection for Ditch Retrofits in Washington State](#)

- Ditches are critical to stormwater conveyance and treatment. A few reasons why they are critical include that they:
 - Are a very common stormwater feature
 - Potentially intercept many tire wear particles and 6PPD
- However, many current maintenance practices might not optimize water quality
- Their work focused on this research question: **What is the best plant palette to have in roadside ditches to decrease maintenance needs?**
- Tested different vegetation blends (see **Figure 1** below)
 - **PT442 BES Grassy Swale Native Mix** – This mix was only composed of native plants to Washington. This blend was designed by the City of Tacoma.
 - **WSDOT Blend** – This blend was developed by WSDOT for erosion control.
 - **6 blends were also developed by WSU**
 - Yarrow was included in several blends because it is drought tolerant and has a wide native range
 - Some of these blends include native plants like Roemer’s fescue and yarrow
 - Fescues are often used to capture heavy metals and could provide this benefit – and potentially positive treatment benefits for other contaminants
 - Developed these blends in order to avoid a monocrop. In other words, they wanted to ensure that plants did not outcompete others and that many different plant species were able to establish together.

Blend ID	% of Blend By Weight	Species	Common Name
PT442 BES Grassy Swale Native Mix	25%	<i>Hordeum brachyantherum</i>	Meadow Barley
	15%	<i>Danthonia californica</i>	California Oatgrass
	10%	<i>Elymus glaucus</i>	Blue Wildrye
	10%	<i>Bromus carinatus</i>	California Brome
	10%	<i>Festuca idahohensis</i>	Roemer's Fescue
	10%	<i>Deschampsia cespitosa</i>	Tufted Hairgrass
	10%	<i>Agrostis exarata</i>	Spike Bentgrass
	5%	<i>Alopecurus geniculatus</i>	Water Foxtail
	5%	<i>Deschampsia elongata</i>	Slender Hairgrass
WSDOT Blend	50%	<i>Lolium perenne</i>	Perennial ryegrass
	40%	<i>Festuca rubra</i>	Creeping Red Fescue
	10%	<i>Trifolium repens</i>	White Clover
WSU Blend 1	50%	<i>Festuca rubra</i>	Creeping Red Fescue
		<i>Festuca rubra ssp. commutata</i>	Chewings Fescue
	10%	<i>Agrostis tenuis</i>	Highland Bentgrass
WSU Blend 2	50%	<i>Festuca trachyphylla/ovina</i>	Hard/Sheep Fescue
	35%	<i>Trifolium fragiferum</i>	Strawberry Clover
	15%	<i>Achillea millefolium</i>	Yarrow
WSU Blend 3	35%	<i>Festuca idahohensis</i>	Roemer's Fescue
	35%	<i>Deschampsia cespitosa</i>	Tufted Hairgrass
	30%	<i>Trifolium fragiferum</i>	Strawberry Clover
WSU Blend 4	70%	<i>Festuca rubra</i>	Creeping Red Fescue
	15%	<i>Achillea millefolium</i>	Yarrow
	15%	<i>Alopecurus pratensis</i>	Meadow Foxtail
WSU Blend 5	50%	<i>Agrostis gigantea</i>	Redtop Bentgrass
	50%	<i>Agrostis tenuis</i>	Highland Bentgrass
WSU Blend 6	50%	<i>Festuca rubra ssp. molate</i>	Molate Red Fescue
		<i>Festuca rubra ssp. commutata</i>	Chewings Fescue
	10%	<i>Agrostis gigantea</i>	Redtop Bentgrass

Figure 1: List of vegetation blends tested in this study (WSU).

- **Summary of Study Results**

- WSDOT blend and WSU blends 1 and 6 had good performance across multiple sites
- The most expensive mix – PT442 – did not perform well across sites
 - This highlights the challenge of using native species – they are highly adapted to specific environmental conditions but are not generalists and have a hard time competing against other species.
 - The researchers were concerned that this was a germination issue, and therefore tested the mix in a laboratory. However, the blend germinated well, and therefore the problem was that it could not establish at sites.

- **Results from the Fife Study Site**
 - The WSDOT and WSU Blends 1, 2, 5, and 6 established well across all seasons
 - Due to the poor performance of WSU blends 3 and 4, these blends were not tested for additional sites
- **Results from the 78th Ave Site**
 - The WSDOT and WSU Blends 1, 2, and 6 established well across all seasons
 - Within these blends, the species that established the most included the fine fescues, perennial ryegrass, and clover
 - Planted the PT442 Blend at 6 times its seeding rate – however, still performed poorly with less than 10% of the mix establishing
 - The WSDOT blend likely had high establishment because of the perennial rye grass, which can germinate quickly within 1 week
 - This site was adjacent to a forest, which increased the amount of shade at the site
 - WSU Blend 5 includes bentgrass, which is shade intolerant. Therefore, even though this blend had high establishment at the beginning of the study, it was almost entirely wiped out after the summer drought
- **WSU Pullman Site**
 - The initial study design included sampling at this site. However, because of heavy standing water, they couldn't collect usable data at this site.
- **Final Recommendations**
 - **PT442 Blend:** There is likely a niche for this blend of native plants, like the Olympic Peninsula. However, this blend did not perform well for the study sites due to competition with other plants and frequent disturbances.
 - **WSDOT Blend:** Had the widest range of conditions where it could establish and proliferate. This blend can maintain soil stability over many conditions.
 - **WSU Blend 1 and 6:** These blends performed well across conditions and would perform well in shady sites.
 - **WSU Blend 2:** This blend performed well in shade and drought conditions, was slow growing, and could improve water quality conditions. The researchers recommended that hard and sheep fescue would be good candidates for further water quality research – like for addressing 6PPD-q.
 - **WSU 5:** This blend is recommended for sites with full sun and where bentgrass is already established.

Updates from our partners

Puget Sound Ecosystem and Monitoring Program (PSEMP) - Katrina Radach, PSEMP Manager

- **Lunch and Learn Presentation: Use of Science in Ecosystem Recovery Partnerships, June 10, 2024, 12pm:** Co-hosted between PSEMP and the Stormwater Strategic

Initiative Lead (SIL), we are excited to announce a lunch and learn opportunity focused on a study that surveyed partners across the region about the use of science in conservation and stewardship policy and action. Lead researchers for this project who will be presenting include Katherine R. Cheng, Tomas M. Koontz, and Craig W. Thomas from the University of Washington. [Register here](#).

- **Strategic Plan:** In the May PSEMP Steering Committee meeting, we launched our finalized Strategic Plan (link still TBD).
- **Dialogue Series:** PSEMP is hosting a Dialogue Series this Summer. Each Dialogue Series session will be an opportunity to learn from selected panelists and for participants to ask panelists questions about the subject matter. The sessions include:
 - May 21 (See link for a recording of the session): [Environmental Justice](#)
 - June 11, 10am - 12pm: [Indigenous Knowledge, Science, and Collaboration](#)
 - July 16, 10am - 12pm: [Human Health](#)
 - August 13, 10am - 12pm: [Social Science](#)
 - September 17, 10am - 12pm: [National Estuary Programs \(NEPs\) + other organizations with similar efforts](#)

National Estuary Program Stormwater Strategic Initiative Lead (NEP SIL) - Dustin Bilhimer, Stormwater SIL Toxics in Fish Implementation Lead

- The Stormwater SIL's grant solicitation for [Innovative BMP Installations in toxic hotspots and transportation areas](#) closed on May 22. This investment focuses on innovative techniques and pilot efforts for Best Management Practice (BMP) installations in toxic chemical hotspots and transportation environments. For more information, reach out to dustin.bilhimer@ecy.wa.gov.
- **A new RFP** will be announced in late May focused on **wastewater treatment plants and contaminants of emerging concern**. It is anticipated that the RFP will be open from July to October 2024. For more information, reach out to frances.bothfeld@ecy.wa.gov.

Washington Department of Ecology (Ecology) - Madison Rose Bristol, 6PPD Stormwater Planner; Morgan Baker, 6PPD Management Analyst

6PPD Work

- **SAM Full Proposal 1: Synthesis of Street Sweeping Research & Practices** is seeking input from SWG members and additional stormwater managers through [this survey](#). The survey closed on May 23 at 5pm. This project aims to produce a guidance manual that will help permittees meet the new street sweeping requirements in the 2024-2029 MS4 permits.
- **3 new 6PPD BMP effectiveness research projects** will begin in Spring 2024. Partners and project descriptions:

- Snoqualmie Indian Tribe: Floating wetlands, native vegetation, and characterizing parking lot runoff
- Pierce County: Decant facilities and granular activated carbon
- King County: Grassy embankments and a screening model for road types
- We are in the early stages of **scope negotiations for [vendor pool](#) participants** who bid on Ecology’s 6PPD solicitation
- The **[draft Aquatic Life Toxics Criteria](#)** comment period closed on May 7th. The water quality standard for 6PPD-q in freshwater and for acute mortality is 0.008 ug/L. Though the State of Washington might implement this standard in 2024, changes to stormwater permits will only happen after completion of an EPA review and Section 7 ESA consultations. Therefore, any changes that could impact permittees will go into effect in the next permit cycle (e.g., 5 years from now for municipal stormwater general permits).
- **[6PPD Action Plan](#)**: Last month, the 6PPD Action Plan Advisory Committee finalized their recommendations to include in the December Legislative report. Ecology and other state agencies are currently writing their budget packages to include several recommendations from the Advisory Committee.
- **Permit and manual progress**
 - **MS4 Phase I and II Permits and Stormwater Management Manuals**: The permits and manuals are currently being finalized, and the response to public comments and final permits and manuals will be published in July 2024. For more information: [permit reissuance process, manuals](#).
 - **[Draft Industrial Stormwater General Permit \(ISGP\)](#)**: We are proposing a number of important updates, including requiring 6PPD monitoring and reporting for some facilities within 3 years of reissuing the ISGP. The ISGP will not include benchmarks. The ISGP will expire in December 2024. Ecology has started the reissuance process and will hold a formal comment period in late Spring 2024. 6PPD-q considerations are included in the draft ISGP. Review the [permit fact sheet](#), [draft permit language](#), [blog post](#) or [focus sheet](#) for more information.

PRO-C Updates – Todd Hunsdorfer, PRO-C Chair

- The SWG **voted to appoint Dana Osborne, City of Walla Walla, and Emma Trehwitt, Pierce County, to become PRO-C members**. They were approved via a consensus of 11 votes.
- Abby Barnes will be stepping down as a PRO-C member
- **PRO-C is welcoming new members**. If interested, please reach out to Todd at thunsdorfer@kingcounty.gov

- **Ecology is still hiring for a [SAM Coordinator – Environmental Engineer 5](#).** They have only received 1 qualified application and are looking for other competitive applicants. This position will remain open until filled.
- SAM develops and publishes report cards and quarterly financial reports. [View this website](#) for these resources.
- **USGS will be developing 6PPD-q monitoring methods.** USGS approached the SAM program with a proposal to assess the occurrence of 6PPD-q and identify tire particles in urban streams in the Green-Duwamish Watershed. This work is being led by Andrew Spanjer and will be entirely funded by USGS. They will launch a website for the study in the Fall. [Current study proposal is on the SAM website](#).
- **Updates on SAM studies:**
 - [Puget Small Streams Study](#): USGS released their first status report under the new study design. This covered monitoring done at 33 sites in the summer of 2020. Sites were selected across an urban gradient, based on the percentage of impervious surface in the contributing watershed. While the status reports are not designed to be robust trend analyses, USGS did compare these new results with the previous study results from 2015. Although not statistically significant, data from 2020 show decreased quality in terms of bioassessments and sediment metals since 2015, with largest declines in the most urban category (40–100 TIA%). The full report is available on the SAM website.
 - [Puget Sound nearshore mussel monitoring study](#): WDFW successfully retrieved caged mussels in their 4th survey with the SAM program. They wrapped up the mussel tissue processing and are awaiting the lab results. While waiting for those 2024 lab results, they're crunch data from their 3rd survey. There will be a presentation at the September SWG meeting.
 - [Lower Columbia urban streams study](#): SAM signed the contract amendment with Clark County to extend monitoring into the next permit cycle. There will be a presentation on findings from the past three years at the November SWG meeting.

Status and Trends Subgroup – Chelsea Morris, SAM Scientist

- We are reconvening the Status & Trend subgroup of the Stormwater Work Group to discuss ongoing adaptations and clarifications to the Stormwater Action Monitoring (SAM) program's study design. The subgroup will make plans for trends analyses and tee up recommendations for future monitoring.
- We are currently seeking membership from SWG and other PSEMP workgroups for scientists, statisticians, and ecologists. We are also looking for a subgroup chair from SWG membership. If interested in participating, please reach out to Chelsea at chelsea.morris@ecy.wa.gov.
- We will also be reaching out to people who participated in the past to join the subgroup

Internal SWG Affairs – Don McQuilliams and Abby Barnes, SWG Co-Chairs

Presentation: [SWG Voting Members](#)

Presentation: [SWG 2024-2025 Work Plan](#)

- **SWG Voting Members**
 - Abby shared an up-to-date list of active SWG voting members. Currently, there are several open slots, and the SWG will need to fill the following voting members spots:
 - State agencies – 1 more voting member needed
 - Federal agencies – 1 more voting member needed
 - Tribes – 2 more voting members needed
 - PSEMP indicated that it has been working closely with Tribes and are willing to help assist with recruitment
 - Environmental community – 2 more voting members needed
 - Business – 2 more voting members needed
 - Agriculture – 1 more voting member needed
 - **If you are interested in becoming a voting member or voting member alternate, please reach out to abby.barnes@dnr.wa.gov.** Several SWG members also indicated their interest in a survey at the last meeting, and Abby will be reaching out to these people specifically to follow-up on their interest.
 - What is expected of voting members?
 - Review meeting materials prior to meeting
 - Vote during meetings
 - Advise SAM projects and funding choices
 - Have robust discussions about NPDES permit reissuance language
- **SWG Work Plan**
 - The SWG voted to approve the [2024-2025 SWG Work Plan](#). This work plan was approved with a consensus vote of 9 people.
 - To improve Task 4: Regional Monitoring of Runoff from Agricultural Sources, it was advised that the SWG connect with public health organizations and Pollution Identification & Correction programs.
- **SWG Charter and Work Plan Subgroup**
 - A new subgroup will be formed in Summer or Fall of 2024 to revise the SWG Charter. This subgroup will also update the SWG work plan every 2 years.
 - At least 1-2 people from PRO-C will be included in the charter development process
- **Eastern WA Permittees**
 - After the stormwater permits are reissued this year, Eastern WA permittee will have three options: Continue to coordinate with other permittees to perform

effectiveness studies, pay into SAM on or before August 15, 2025, or conduct stormwater discharge monitoring that meets the requirements in S8.E.

Permittees have until December 1, 2024 to inform Ecology of their choice.

- Dara Osborn, Walla Walla, stated that she is a member of a stormwater group in Eastern WA and is willing to reach out to the group
- The co-chairs will be developing an outreach plan for Eastern WA Permittees, which might include:
 - Hosting an informational meeting for Eastern WA permittees. Could share the history of the SWG, SAM projects, SAM presentation focused on E WA geographic area, and discuss with permittees the preferred form of representation within the SWG and caucuses.
 - Create informational materials to recruit Eastern WA members
 - Distributing information via listservs and Eastern WA permit writers

6PPD Subgroup – Eli Mackiewicz, SWG 6PPD Subgroup Chair

- The next subgroup meeting will be on June 12 from 1-3pm PST. [See this page](#) for more information.
- The meeting will include a presentation on integrating 6PPD-q into the VELMA model

Future Meeting Dates

The next regular SWG meeting is **September 11, 2024**. Please mark your calendars for September 11 and November 13, 2024 – all Wednesdays, from 9am-12pm. We may occasionally extend our meeting time; any extended meeting time will be determined at the previous meeting.

At our meeting on Wednesday, September 11, we will:

- Meet in-person as a SWG community (hybrid option available, location TBD)
- View a presentation on the [Puget Sound nearshore mussel monitoring SAM study](#)
- Develop a strategy for welcoming Eastern WA permittees into the SWG
- Hear PRO-C and SAM study updates
- Hear updates from our partners

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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.