

# Letter of intent (LOI)

Interested parties should submit a Letter of Intent (LOI) on or before February 28, 2020 for each individual proposal. Letter of intent should include applicant contact information and seven questions about proposed study. More details about SAM study selection process, eligibility and funding availability can be found in SAM REF guidelines in SAM Effectiveness webpage.

Email address \*

Nigel.Pickering@wsu.edu

Applicant contact information

Applicant Full Name \*

Nigel Pickering

Organization \*

Washington Stormwater Center

Phone number \*

509-335-8624

Proposed Study Information

**1. Proposed Study Title \***

Stormwater Pond Retrofits to Preserve Both Design Effectiveness and Habitat

**2. Which topic(s) from the SWG's priority list do you propose to address? \***

The proposed study topic should be in the SWG's priority list

13. 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?

**3. Select type of project being proposed \***

- Survey
- Literature Review & Synthesis
- Environmental Sampling Study
- Other

#### 4. Short Description of the Proposed Study \*

250 word limit: describe how results will assess effectiveness and advance regional understanding and permittees' implementation of specific stormwater management approaches

Stormwater ponds can lose their design function for runoff treatment and flow control as the pond matures and loses volume either by vegetation growth or sediment accumulation. A traditional approach would remove the vegetation and accumulated sediment to restore the stormwater pond to its original design. But many stormwater ponds naturally become stormwater wetlands over time creating multiple co-benefits like runoff treatment of more pollutants, bird and frog habitat, natural cooling of the water by shade, recreational use and aesthetic appearance. What if some of the wetlands components could be left in place and the pond could be retrofitted in a way that accommodates the original design effectiveness without disturbing these co-benefits? For example, selective dredging at the pond inlet could have multiple functions: increase volume, promote deep water habitat, and serve as a future sediment trap. Increasing the berm height and changing the outlet controls are other options for restoring the design effectiveness. If periodic and selective redesign were an accepted approach, then it might also have the benefit of minimizing the need for significant annual maintenance. Some of these co-benefits could potentially be credited to permittees in the future, as is currently required using Appendix 12 of the Phase 1 municipal stormwater permit for runoff treatment and flow control.

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#### 5. What type information will be collected or analyzed for this proposed study? \*

If existing permittees' data are needed, specify the type, and the expected timing of a request for existing information from Permittees

The initial part of this study would include a literature review of existing data and a field evaluation of local stormwater ponds and wetlands using typical habitat metrics and DNA techniques. DNA analysis would be used to survey microbial communities to determine the biological contribution to contaminant removal for multiple pollutants in existing stormwater ponds and wetlands. We will also assess additional ecosystem services provided by these stormwater ponds by surveying environmental DNA to identify the diversity and abundance of organisms. Using these findings, an existing mature stormwater pond in Western Washington will be selected. Pre- and post-retrofit monitoring of the chosen stormwater pond would be used to document the effectiveness of the redesign and habitat changes. The literature review and field evaluation could be completed during the first year while pre-retrofit monitoring is being conducted. In the second year, the pond will re-designed and retrofitted while in the third year the post-retrofit monitoring and reporting will be completed. It is possible this proposed project could be done in two years, however, at this stage, it seems like that three years would be more feasible.

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6. What are the anticipated measurable outcomes and key deliverables that will be produced by the proposed study, and how will they be used by Permittees and the Washington State Department of Ecology? \*

The first outcome of this work will be a review of the existing literature plus our new survey data from local stormwater ponds. The review will document how stormwater ponds change over time, how habitat and other co-benefits increase, the best way to measure habitat, and use life-cycle costing to compare frequent maintenance versus delayed maintenance with expected retrofit. Using this information, we will examine and use design criteria to retrofit the chosen pond. Two years of water quality monitoring will document runoff treatment and flow control effectiveness for pre- and post-retrofit conditions. Because these types of comparisons can be influenced by weather, some water quality calibration and scenario modeling might be necessary to remove the effect of weather differences. Anticipated deliverables include a review report on the issues associated with stormwater pond maturation and a data report on runoff treatment and flow control effectiveness.

7. Permittees or agencies you are proposing to coordinate with (provide staff names and contact information, if known) \*

Enter "NA" if not applicable.

Ecology, any WW permittee with a suitable stormwater pond site

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