

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 *

anand.jayakaran@wsu.edu

Applicant contact information

Applicant Full Name *

Anand Jayakaran

Organization *

Washington Stormwater Center

Phone number *

2534454523

Proposed Study Information

1. Proposed Study Title *

The role of ditches in pollutant management and how ditch cleaning impacts their biogeochemical function

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

14 & 15 {Compare cleaned/uncleaned ditches to assess effectiveness of ditch cleaning at removing legacy pollutants. Include evaluation of likely release of pollutants. }{Evaluate effectiveness of ditch enhancement techniques (i.e., turning ditches in to bioswales) at removing pollutants.}

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

Roadside ditches and swales are the first responders to stormwater runoff emanating from road runoff. Additionally, ditches and swales receive runoff from upstream stormwater BMPs, BMPs that do not always function as designed due large events or poor maintenance. Ditches and swales, therefore, offer a vital yet under-exploited potential to mitigate stormwater quality emanating from catchments of varying sizes. There is a critical need to evaluate the potential for ditches to manage stormwater, as well as to determine what are the most suitable maintenance and ditch-enhancement techniques to ensure peak water quality performance. Additionally, when sediment removal or regrading is required, installing alternative ditch configurations could increase contact times between water and the plant/soil interface thereby providing water quality benefits. We therefore propose to evaluate extant concentrations of pollutants in ditches with time since last maintenance. Additionally, we will determine the potential of ditches to treat pollutants, evaluate the impacts of differing maintenance practices, and lastly, evaluate the potential for alternate ditch configurations. The results of this study will characterize the pollutant load in uncleaned ditches, the inherent pollutant remediation capacity of uncleaned ditches compared to their cleaned counterparts, what extent of pollutant is likely to be released when a ditch is cleaned out, and the potential for alternative ditch configurations that might address both water quality and quantity issues.

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

- To quantify existing pollutant concentrations within uncleaned ditches we propose to collect pollutant concentrations in soil and vegetation samples obtained from ditch beds and banks – pollutants measured will range from the labile (nutrients: N and P), to the more persistent like heavy metals. Polycyclic aromatic hydrocarbons (PAHs) content will also be measured.
 - To quantify the potential for ditches to remediate influent pollutants, we will measure soil infiltration rates, microbial populations in the soil known to bioremediate pollutants, and build a computational model to simulate contact time between the water and the soil/plant interface in the ditch system.
 - We will ask permittees for water/soil quality information, and dates of ditch maintenance from the ditches that will be studied.
 - We will ask permittees for any land use information upstream of the studied ditches.
-

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? *

Measurable outcomes will be:

- The range of pollutants measured within ditch sediments and banks for a range of upstream land use condition, and therefore likely to be released. Pollutant concentrations within the ditch system with age (or since last maintenance) will reveal their potential to release pollutants at the time of cleaning.
- Pollutant mitigation potential of ditches derived from characterizing flow regime, soil infiltration and microbial population capable of remediating specific pollutants.
- We will also develop 2-dimensional flow model to simulate alternative ditch configurations that are likely to increase contact time between stormwater in the ditches, and the plant/soil interface.

Key deliverable will be a technical report that outlines ranges of pollutant in stormwater ditches across the Puget Sound region, including pollutant release rates during maintenance activities (vegetation removal, sediment removal, and regrading). The report will also characterize pollutant mitigation potential of those ditches based on the analysis of microbial populations and modeling-derived contact times between water and the soil/plant interface.

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

Enter "NA" if not applicable.

To be determined

This content is neither created nor endorsed by Google.

Google Forms