RSMP Effectiveness Study Full Proposals Ranked by Permittee Survey
April 24, 2014

1. Mining the existing Western Washington catch basin inspection and maintenance data for maintenance needs and cost-efficiencies: This study will compile and evaluate catch basin inspection and maintenance data from Western Washington jurisdictions having sufficient data. The objectives are to conduct data analysis that supports proposals of more cost-effective inspection schedules and to identify transferable cost-efficiencies in the design and implementation of various inspection and maintenance programs.
2. Paired Urban Small Stream Watershed Restoration Effectiveness Study: This study will quantify the cumulative benefits of stormwater retrofits and in-stream projects in urbanized small stream watersheds. Redmond's Citywide Watershed Management Plan leverages redevelopment requirements and capital funds to expedite construction of retrofits in priority watersheds. This provides an opportunity to study retrofit effectiveness for restoring beneficial uses.
3. Effectiveness of Bioretention in Reducing Stormwater Flows, Pollutants and Toxicity: This study evaluates how large rain gardens treat urban runoff in Federal Way. Water quality (conventionals, metals, nutrients, PAHs, PCBs, toxicity) will be analyzed from flow-weighted samples over three years. Performance of individual gardens and their effects on receiving waters, West Hylebos Creek, will inform regional bioretention design and monitoring.
3. Stormwater Source Control at Small Businesses: Regional Analysis and Framework: This study will analyze data from several jurisdictions' business inspection programs to address many of the source control effectiveness questions. A return-on-investment approach will be used to identify water quality benefits where possible. A regional advisory committee will be formed and a framework developed for combined inspections with other agencies for stormwater source control.
5. Bioretention Hydrologic Performance Study: The study will be designed to look at the factors that affect the performance of bioretention facilities. In particular, the study is to quantify, and hopefully explain, the variability in hydrologic effectiveness between design and actual field performance. The proposed case studies will be drawn from multiple jurisdictions within the Greater Puget Sound area while maintaining consistency in study framework and methodology.
6. Can bioretention prevent toxicity to coho salmon exposed to road runoff? We will test the ability of bioretention to prevent toxicity in coho salmon exposed to highway runoff. Adults will be acutely exposed to untreated, bioretention-treated, or well water during the autumn spawning season. Eggs will be similarly exposed episodically over the winter. Chemistry, mortality, and sublethal effects will be measured.
6. Field test of plants and fungi on bioretention performance over time: We will test the impact of plants and fungi on hydraulic properties, water quality, and toxicity of runoff treated in bioretention cells using soil mix recommendations leveraged from current state-funded studies. Replicated columns will be operated under field conditions with road runoff and tested monthly over at least two years.
8. Effectiveness of treating highway runoff to Echo Lake with LID retrofits: This study measures the effectiveness of highway stormwater retrofits (including rain gardens, Filterra®) in reducing pollutant concentrations (nutrients, bacteria, metals, PAHs, PCBs) in stormwater entering a small urban lake. These results and measurements in the lake itself will inform future retrofit design and the expectations we have for their performance.
9. Quantifying the Impact of Voluntary Private Property Rain Gardens across Puget Sound: We will develop a rain garden assessment protocol for easy implementation at large geographic scales, collect and quantify data on effectiveness, installation methods, and maintenance practices. Deliverables will be a validated protocol, quantitative impact data based on pilot study and design of a scaled-up region-wide study.
10. Efficacy of current rain garden installations at interrupting PCB cycling: This study uses rain garden water and soil sampling to measure their efficacy at treating PCBs in stormwater, a significant contributor to PCB fish consumption advisories in receiving waters. The study will test the hypothesis that rain gardens sequester PCBs in soils and only small amounts re-volatilize into the atmosphere.