Bioretention Hydrologic Performance Study: Assessment of Facilities Ten Years or Older

SAM Stormwater Action Monitoring

Effectiveness Study

Prepared for Ecology on behalf of the Stormwater Workgroup by City of Olympia, Raedeke Associates, Associated Earth Sciences, & Clear Creek Solutions

Study Highlights

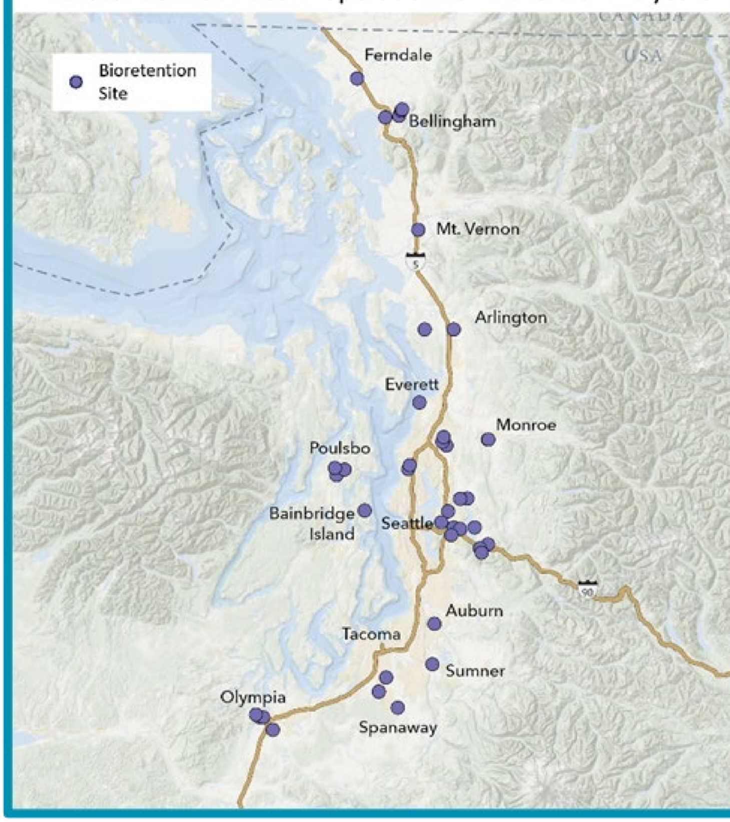
- **Infiltration rates overall remained high with no indication of clogging or sediment accumulation except areas near the inflow.**

Goal & Background

While the use of bioretention facilities in new and re-development is increasing rapidly, there has been little formal scientific assessment of the hydrologic performance of locally-constructed facilities. Local governments want to know the possibility of clogging and soil compaction in bioretention facilities over time, both of which can result in an overall reduction in permeability. Slow draining facilities increase the risk of hydrologic failure and can also create stagnant water, aesthetic problems, and vegetation failures.

This field study assessed 50 bioretention facilities in operation for more than 10 years by measuring infiltration rates, soil composition, vegetation, and comparing maintenance practices. The goal was to provide engineering guidance and recommendations for bioretention system design.

Bioretention facilities in operation for more than 10 years



Project Findings

Overall, findings from this study echoed findings from the previous two bioretention hydrologic performance studies, further strengthening those conclusions. For more background, see Fact Sheet #12: Bioretention Hydrologic Performance Study, Phase 1 and Fact Sheet #20: Bioretention Hydrologic Performance Study, Focus on Current Designs.

Of the 50 sites evaluated 28 were typical design bioretention facilities (i.e., infiltrating to native subgrade) and 22 were underdrained because subsoils drained extremely slowly. Infiltration rates overall remained high with no indication of clogging or sediment accumulation except localized areas near the point of inflow. Underdrained sites showed a generally higher range of infiltration rates than for typical sites.

Collectively improving stormwater management

Stormwater Action Monitoring (SAM) is a collaborative, regional stormwater monitoring program that is funded by more than 90 Western Washington cities and counties, the ports of Seattle and Tacoma, and the Washington State Department of Transportation. SAM's goal is to improve stormwater management to reduce pollution, improve water quality, and reduce flooding. We do this by measuring stormwater impacts on the environment and evaluating the effectiveness of stormwater management actions.