



King County

Protecting Our Waters

Doing our part on rainy days

Water Quality Assessment and Monitoring Study Update

March 2016

Many pathways bring pollution to water bodies

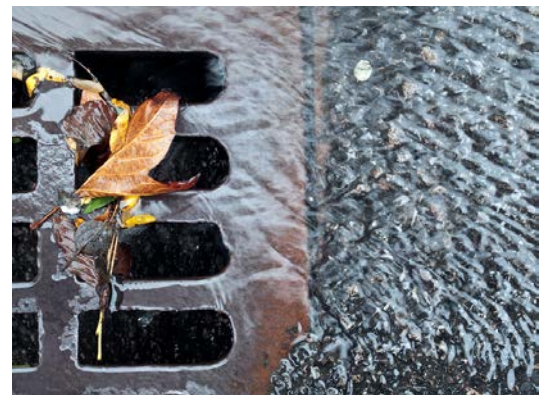
The Water Quality Assessment and Monitoring Study has assembled information on chemicals found in water bodies in Seattle where King County combined sewer overflows (CSOs) discharge. Now the assessment is examining how or whether CSOs and other sources contribute to those chemicals.

The assessment's Loadings Study evaluates the major pathways for contaminants including bacteria, nutrients, solids, metals, and organics. The study examined the following pathways:

- Upstream watersheds (Green River and Lake Washington)
- Stormwater drainage basins
- Local tributaries
- Bridges
- Uncontrolled CSOs
- Controlled CSOs
- Wet weather treatment facilities (used for treating CSOs)
- Atmospheric deposition
- Vessel discharges
- Paint used to prevent organisms from attaching to boats
- Creosote-treated wood pilings
- Groundwater
- Shoreline erosion
- Puget Sound (tidal action)

Why an assessment?

The assessment will inform King County's [Combined Sewer Overflow \(CSO\) Program](#), now called **Protecting Our Waters**. The assessment will help ensure that investments in CSO control are well planned to optimize water quality improvements in Elliott Bay, Lake Union/Ship Canal, and the Duwamish River.



Study Methods

The study team used different methods to evaluate each pathway. For many pathways, they estimated the mass of the contaminant entering the study area. The team used the most recent water quality and flow data to represent current conditions. For vessel discharges, boat-bottom paint, and creosote treated pilings, the team used studies from the literature to estimate leaching and loading rates. Three pathways could not be quantified and were examined through literature review (groundwater, shoreline erosion, and Puget Sound).

The results include a range of uncertainty. The team estimated the upper and lower bounds of loadings with 95 percent confidence intervals or range of data. This approach is useful for comparing the relative magnitudes of loadings from different pathways.

Key Findings

- Uncontrolled CSOs are the largest pathway for bacteria (fecal coliform) to the water bodies.
- Upstream watersheds overwhelm all the other pathways for contributions of nutrients, solids, arsenic, and phthalates (used in plastics).
- Upstream watersheds and stormwater are the largest pathways of lead, mercury, PBDEs (flame retardants), and PCBs (industrial chemicals banned in 1979).
- Boat-bottom paint is the largest pathway for total copper.
- Creosote-treated pilings are the largest pathway of PAHs (found in creosote tar and fossil fuels).

Some of these findings suggest new questions for future study. The findings on boat-bottom paint and creosote-treated pilings surprised the staff scientists and the reviewers on the [Science and Technical Advisory Team](#). These may merit additional study in the future. The study did not examine the pathways of pollutants into water bodies upstream of the areas where King County CSOs discharge. Since the study shows upstream watersheds are the largest pathways for so many pollutants, this may benefit from more detailed study.

Next Steps

The Loadings Report will be published later in 2016, along with the rest of the Water Quality Assessment and Monitoring Study reports. In the meantime, you can see slides describing the draft report on the Web. Check the presentation that the [Science and Technical Review Team](#) reviewed on January 27, 2016. The final Loadings Report will reflect input from the review team and others. At the review team's suggestion it will include another pathway: zinc anodes attached to boats to prevent corrosion.

Find out more on [the Web](#) at <http://www.kingcounty.gov/services/environment/wastewater/cso/projects/water-quality-study.aspx> or by contacting **Erika Peterson**, at 206-477-5525 or Erika.peterson@kingcounty.gov.