



Western Washington University
Western CEDAR

Salish Sea Ecosystem Conference

2018 Salish Sea Ecosystem Conference
(Seattle, Wash.)

Apr 6th, 1:30 PM - 1:45 PM

Past, present, and future water quality in Lake Union/Ship Canal, Elliott Bay, and the Duwamish Estuary and the benefits of combined sewer overflow control and other projects

Jim Simmonds
King County, United States, jim.simmonds@kingcounty.gov

Follow this and additional works at: <https://cedar.wwu.edu/ssec>



Part of the [Fresh Water Studies Commons](#), [Marine Biology Commons](#), [Natural Resources and Conservation Commons](#), and the [Terrestrial and Aquatic Ecology Commons](#)

Simmonds, Jim, "Past, present, and future water quality in Lake Union/Ship Canal, Elliott Bay, and the Duwamish Estuary and the benefits of combined sewer overflow control and other projects" (2018). *Salish Sea Ecosystem Conference*. 552.
<https://cedar.wwu.edu/ssec/2018ssec/allsessions/552>

This Event is brought to you for free and open access by the Conferences and Events at Western CEDAR. It has been accepted for inclusion in Salish Sea Ecosystem Conference by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.

Monitoring Stormwater Impacts on Contaminants in Receiving Waters

Jim Simmonds, King County

Dr. Bob Johnson, US Navy

Mariko Langness, Washington Department of Fish and Wildlife

Bob Black, United States Geologic Survey

Kathleen Conn, United States Geologic Survey

Rich Sheibley, United States Geologic Survey



King County

Protecting Our Waters

Doing our part on rainy days

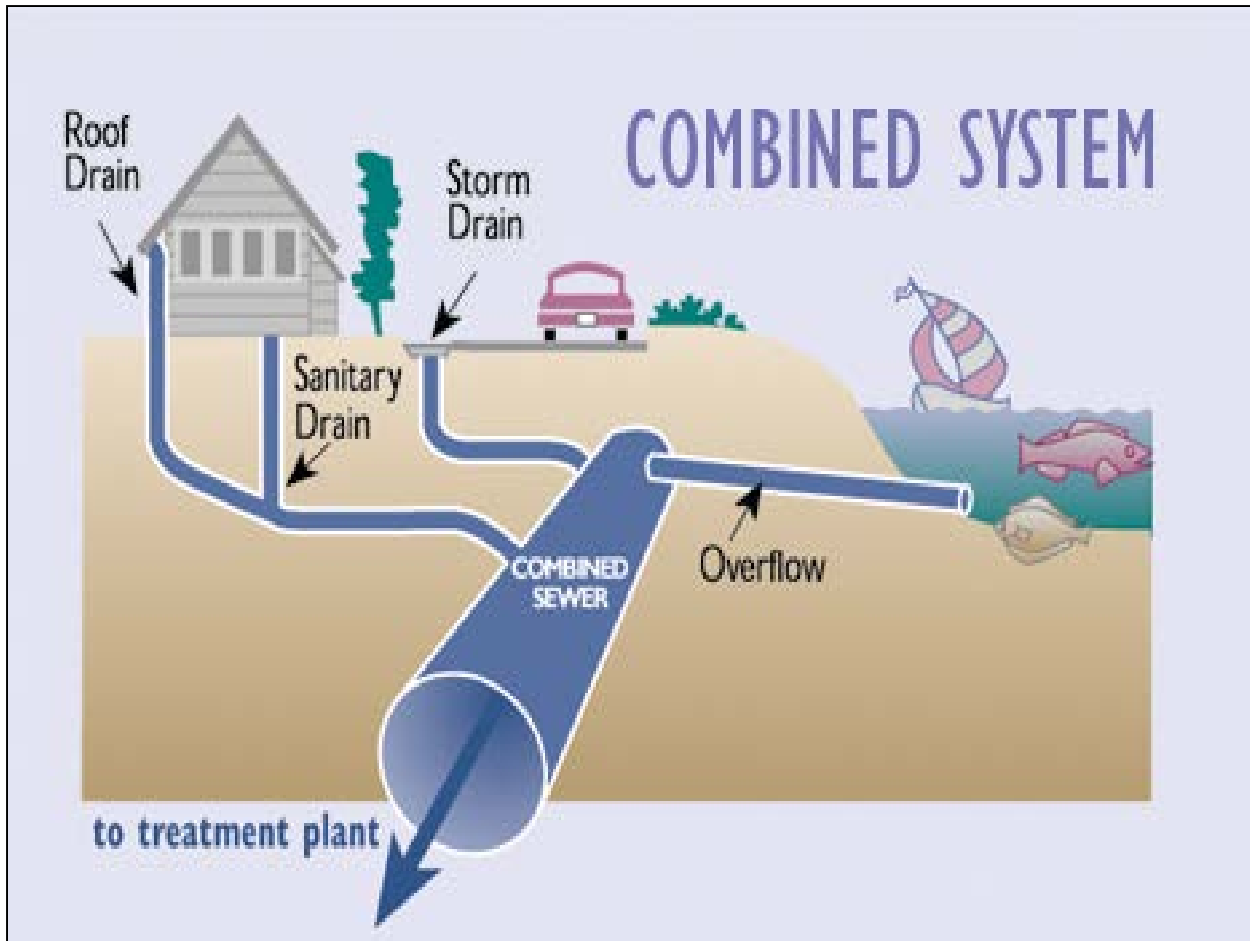
Past, present and future water quality in Lake Union/Ship Canal, Elliott Bay, and the Duwamish Estuary and the benefits of combined sewer overflow control and other projects

Jim Simmonds, King County

Presented at the Salish Sea Ecosystem Conference

April 6, 2018

What are Combined Sewer Overflows (CSOs)?



- Sewage and stormwater are managed together.
- CSOs are designated relief points designed into the combined system.
- CSO events occur during heavy rains.



King County

Protecting Our Waters

Doing our part on rainy days



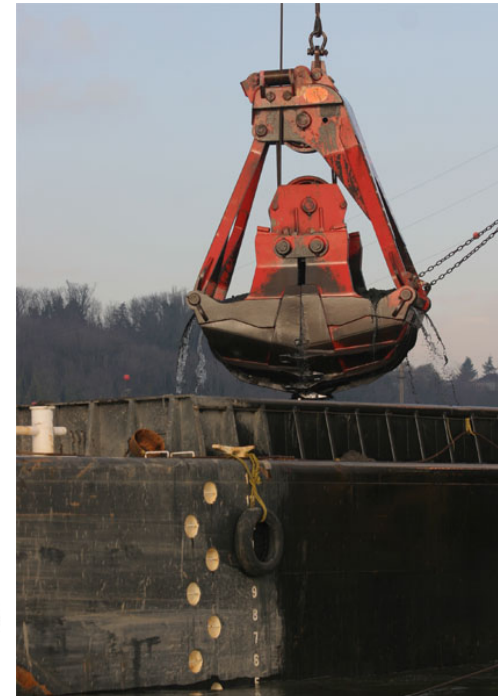
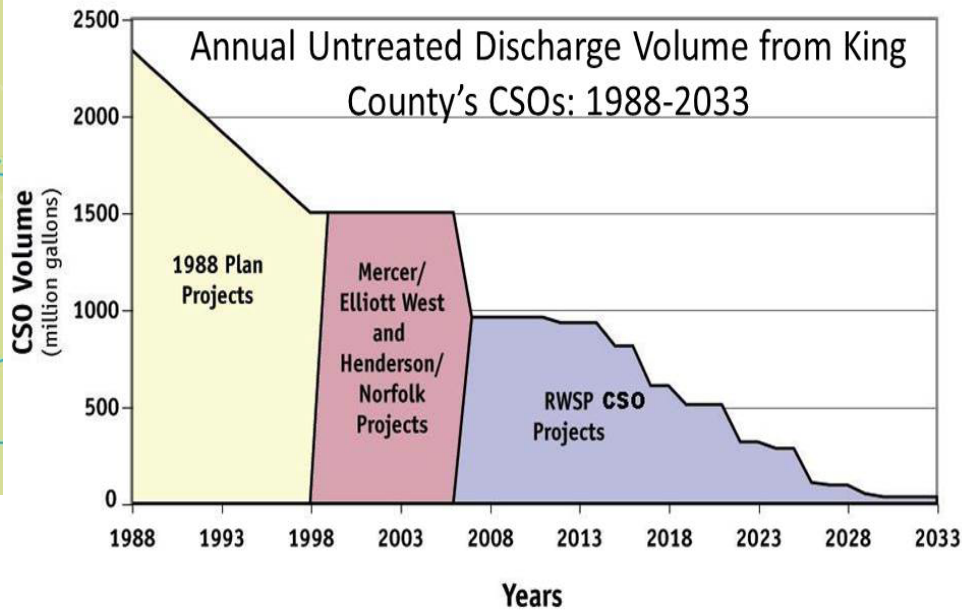
The study focuses on the water bodies where King County has uncontrolled combined sewer overflows, or CSOs.



Questions We Answered

- **Has water quality gotten better or worse the past several decades?**
- **Does water quality meet standards or other goals?**
- **How do pollutants get into the water and how do CSOs contribute?**
- **How will CSO control and other planned projects affect water quality by 2030?**

The Region has made significant investments to improve water quality



Water quality has improved over time for some parameters

Contaminant	Lake Union	Duwamish	Elliott Bay
Temperature	X	↔	↔
Oxygen and Salinity	↔	✓	↔
Fecal Coliform Bacteria	✓	✓	✓
Nutrients	✓	✓	↔
Metals / Organics in water	?	?	?
Metals / Organics in sediment and tissue	?	✓	✓

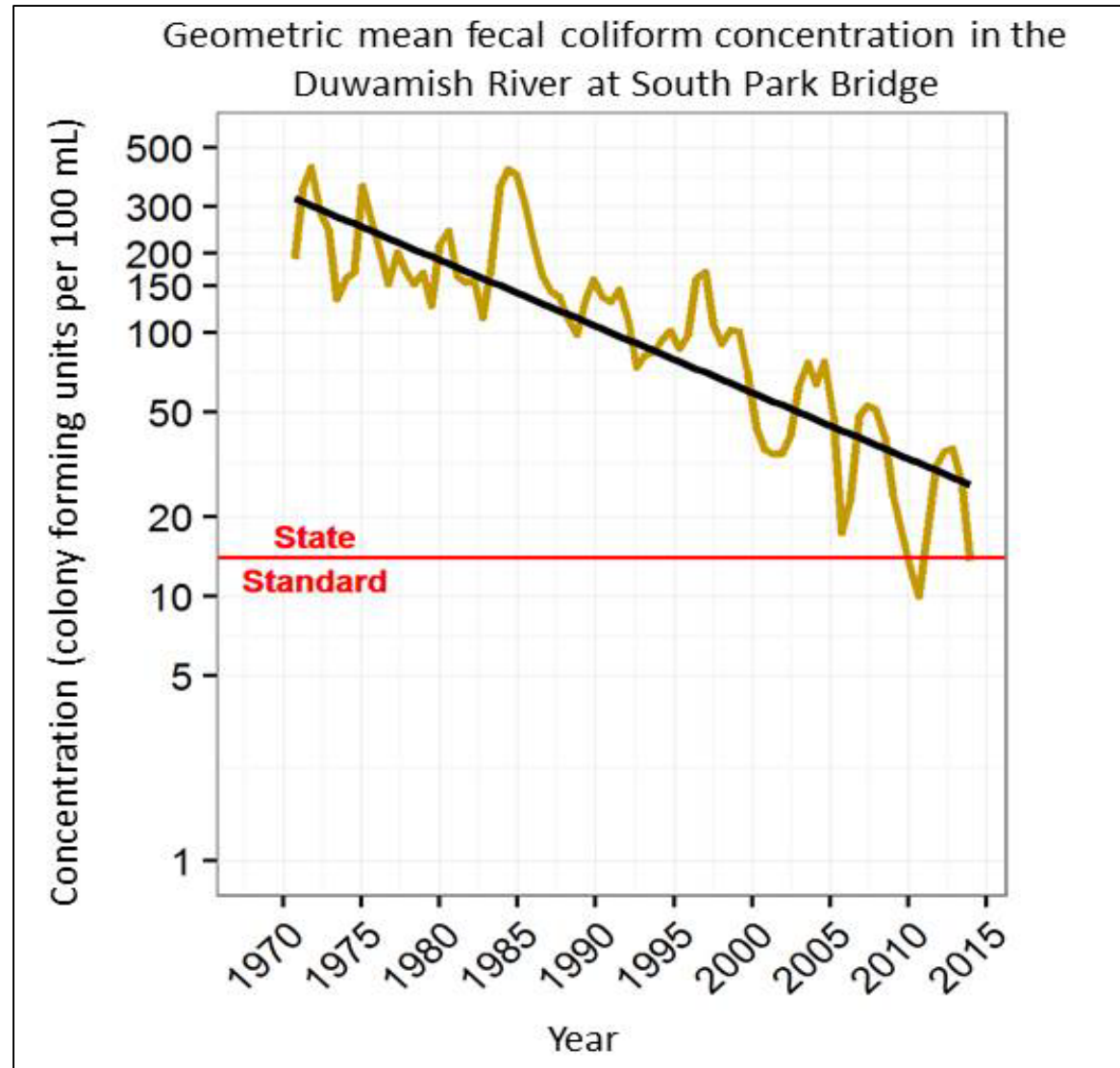


Challenges still remain in meeting water quality standards and goals

Contaminant	Lake Union	Duwamish	Elliott Bay
Temperature	X	↔	↔
Oxygen and Salinity	X	X	X
Fecal Coliform Bacteria	X	X	X
Nutrients	✓	✓	↔
Metals / Organics in water	↔	↔	↔
Metals / Organics in sediment and tissue	X	X	X



Fecal coliform bacteria levels have improved but do not routinely meet standards.



Upstream Watersheds
(Green River or Lake Washington)

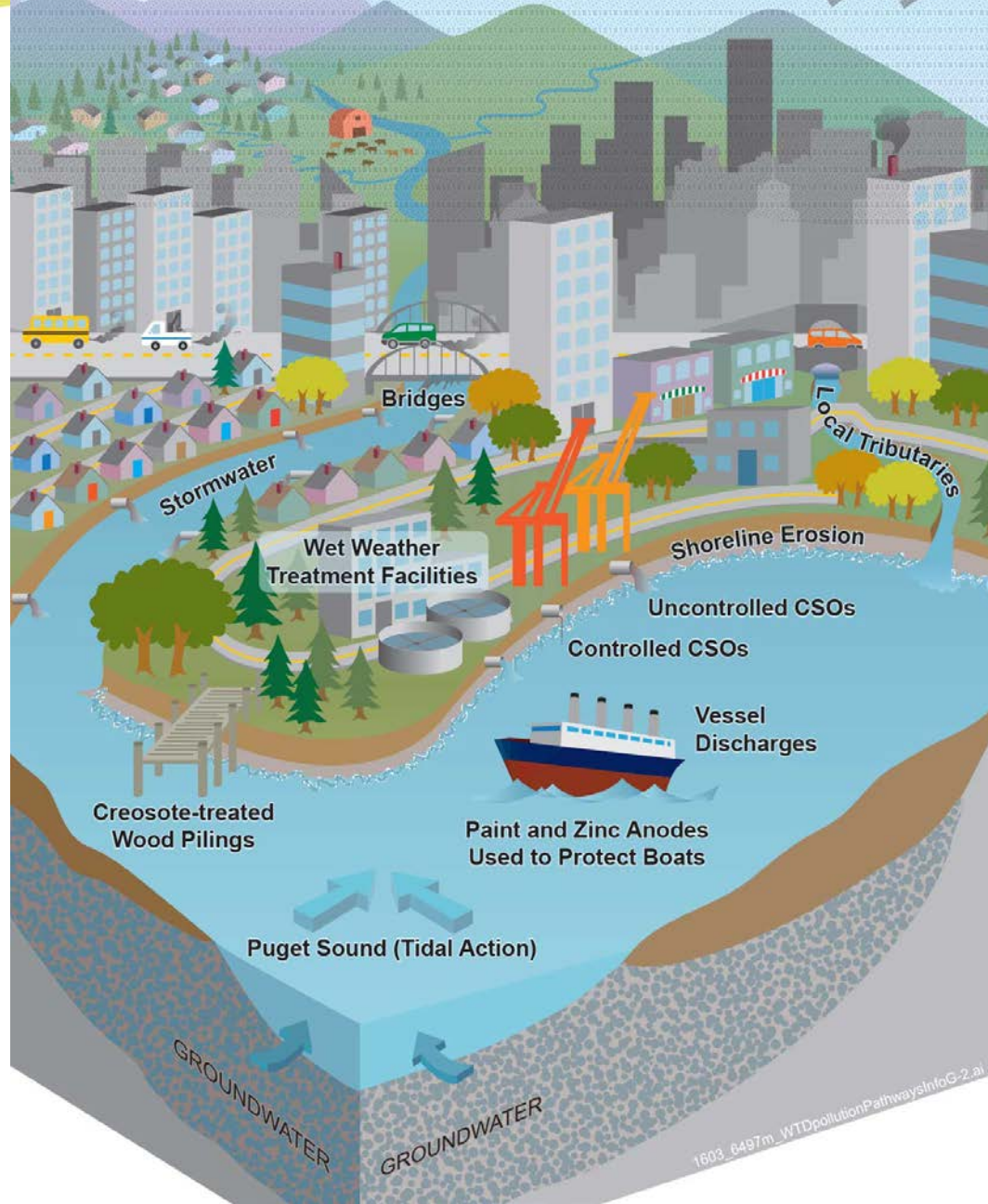
Air
Deposition



King County

Protecting Our Waters

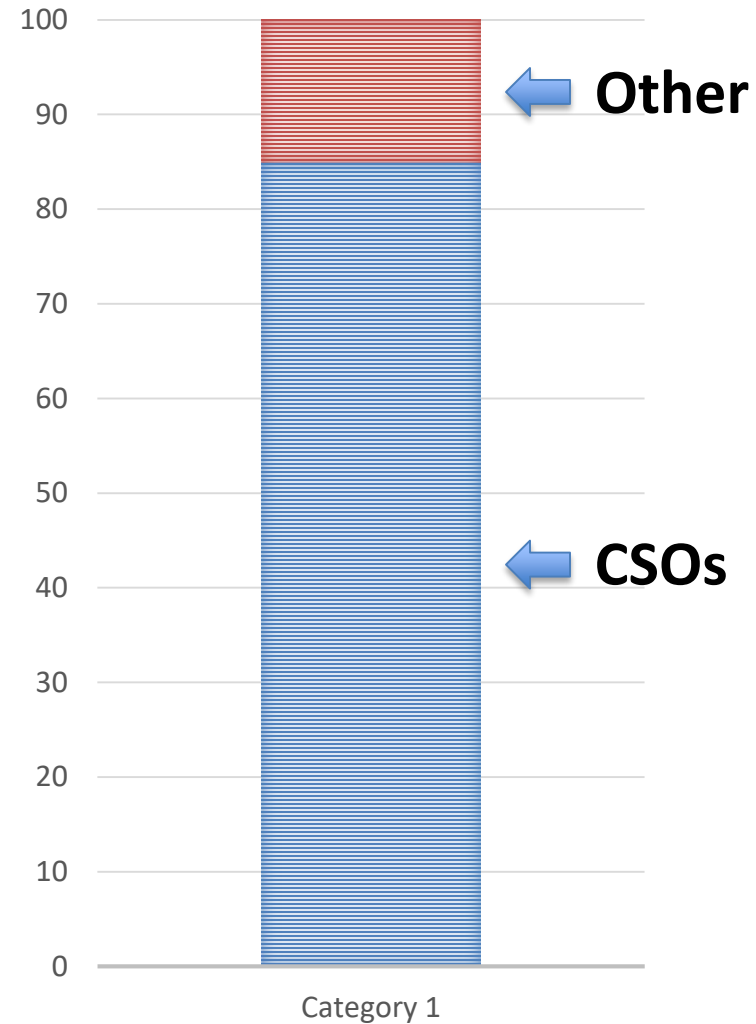
Doing our part on rainy days



To figure out where pollutants came from we studied 14 pathways that contribute 14 key pollutants.

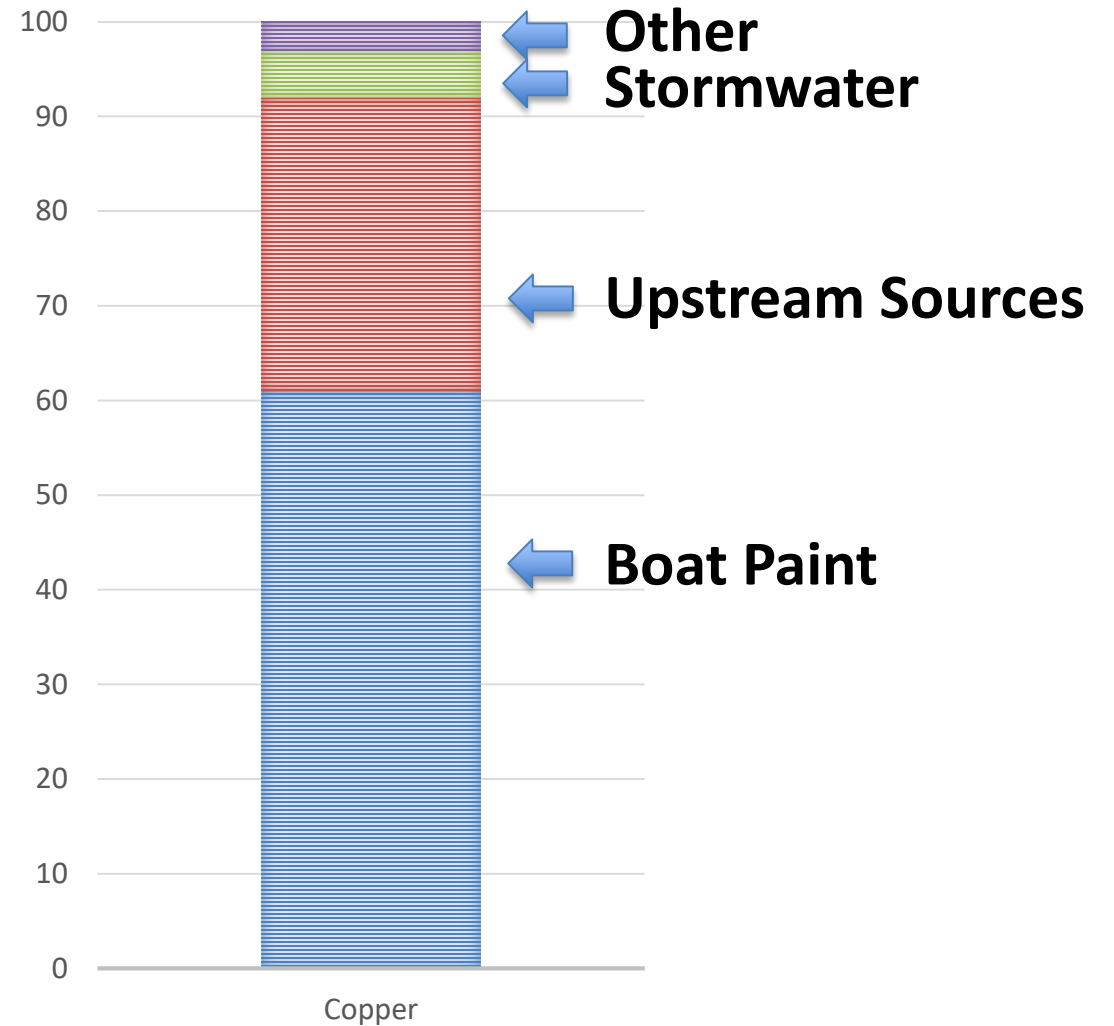


Uncontrolled CSOs contribute 85% of the fecal bacteria to the water bodies.



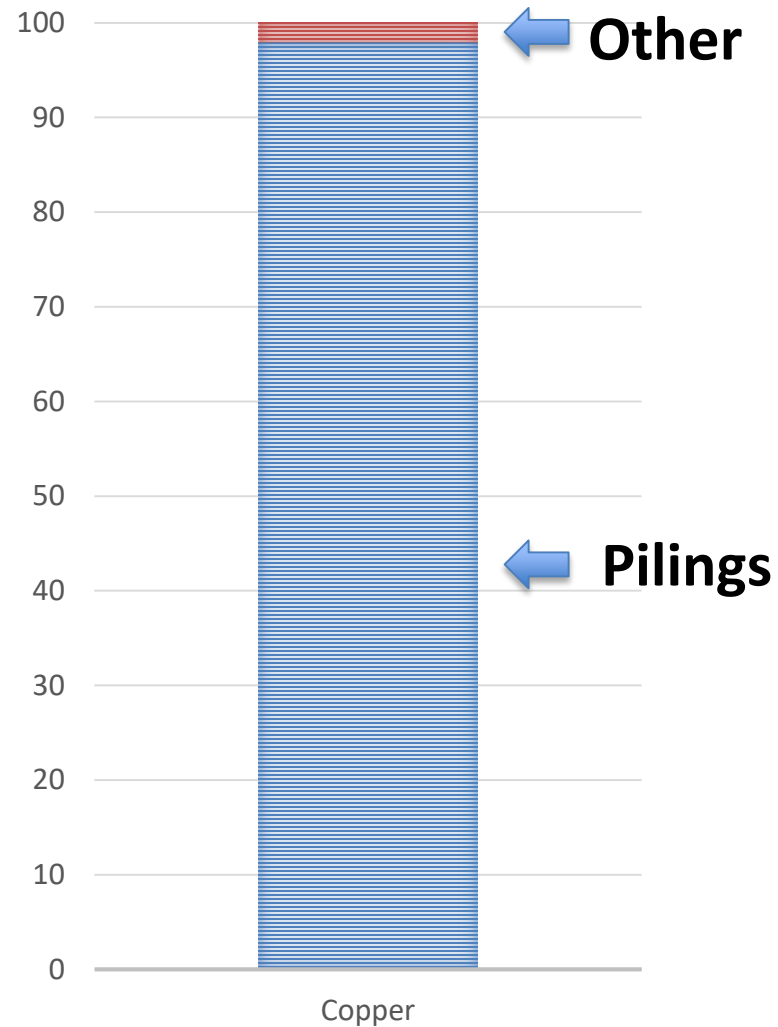


Leaching from boat bottom paint contributes 61% of the copper to the water bodies.





Leaching from creosote-treated pilings contributes 98% of the PAHs to the water bodies.





King County

Protecting Our Waters

Doing our part on rainy days

Other pollutants come primarily from stormwater and upstream sources





Planned actions are projected to reduce loadings of many contaminants by 2030

Contaminant	Reduction	Most Important Actions
Fecal coliform bacteria	80%	CSO control
Copper	50%	Copper regulations
PAHs	30%	Creosote-treated piling removal
Other contaminants	0-10%	Combination of activities



King County

Protecting Our Waters

Doing our part on rainy days



Sediment cleanup in Lower Duwamish Waterway will reduce sediment PCB concentrations by 50%-95% below current levels.



Water quality concerns likely to remain in 2030

Contaminant	Lake Union	Duwamish	Elliott Bay
Temperature	X	X	X
Oxygen and Salinity	X	X	X
Fecal Coliform Bacteria	✓	X	↔
Nutrients	✓	✓	↔
Metals / Organics in water	↔	↔	↔
Metals / Organics in sediment and tissue	X	X	X



Next steps

- **Use findings in future reviews of CSO control plan. No change to the CSO plan are recommended at this time.**
- **Use findings to work with others to ID and implement additional water quality improvement projects.**
- **Continue tracking water quality.**



King County

Protecting Our Waters

Doing our part on rainy days

For More Information:

Jim Simmonds

Water Quality and Quantity Unit Supervisor

Water and Land Resources Division

Jim.Simmonds@kingcounty.gov

<http://kingcounty.gov/services/environment/wastewater/cso/projects/water-quality-study.aspx>