King County
Protecting Our Waters
Doing our part on rainy days

Findings of the Water Quality Assessment and Monitoring Study

Jim Simmonds

King County Water and Land Resources Division

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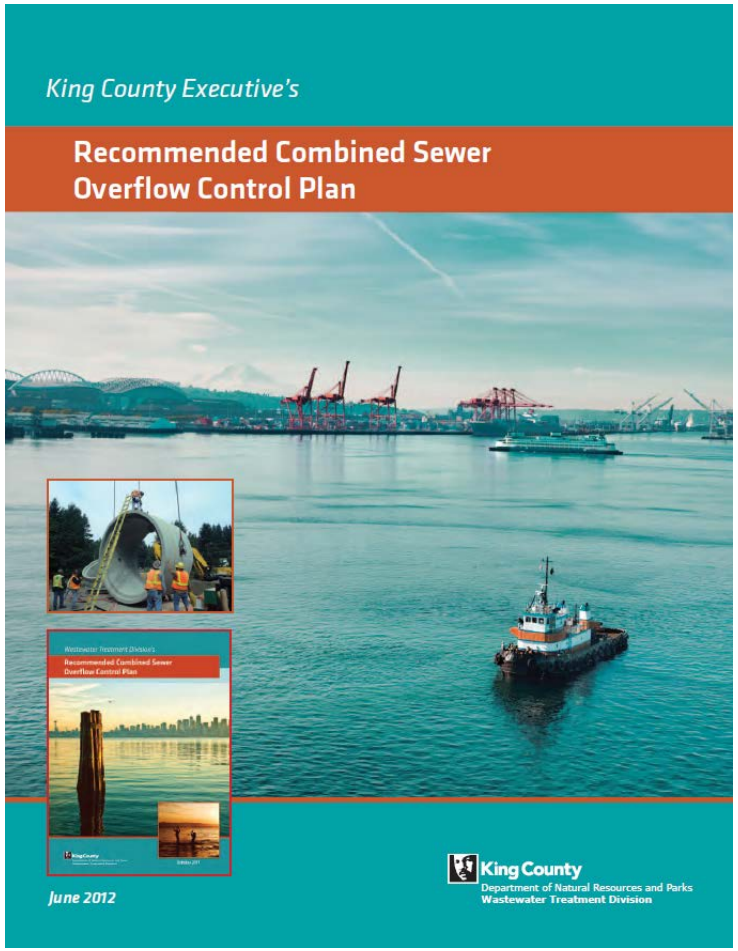
Authorized by King County Council in 2012

- Benefits of CSO control
- Informs next LTCP update
- Baseline conditions for post-construction monitoring



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

Study uses existing data and new science to answer four questions about CSOs and water quality

1. What are the existing and projected water quality impairments in receiving waters (water bodies) where King County CSOs discharge?
2. How do County CSOs contribute to the identified impairments?
3. How do other sources contribute to the identified impairments?
4. What activities are planned through 2030 that could affect water quality in the receiving waters?

2018 CSO Control Plan update will answer next three questions

5. How can CSO control projects and other planned or potential corrective actions be most effective in addressing the impairments?
6. How do various alternative sequences of CSO control projects integrated with other corrective actions compare in terms of cost, schedule, and effectiveness in addressing impairments?
7. What other possible ways, such as coordinating projects with the City of Seattle and altering the design of planned CSO control projects, could make CSO control projects more effective and/or help reduce the costs to WTD and the region of completing all CSO control projects by 2030?

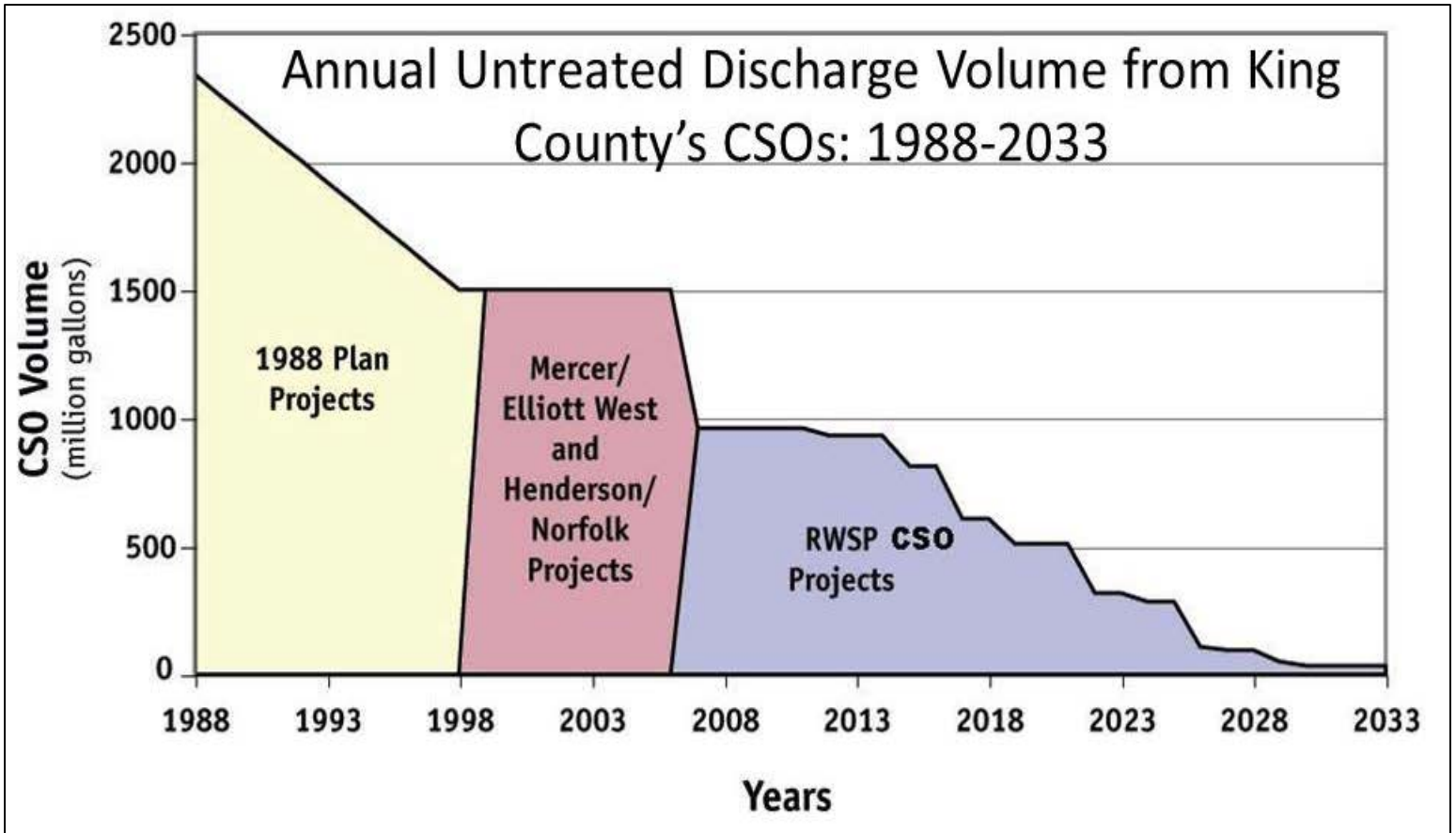
Outside experts provided guidance and review

- **Virgil Adderley,** formerly Portland Bureau of Environmental services now Thames Tideway Tunnel
- **Mike Brett,** University of Washington, Department of Engineering
- **Jay Davis,** US Fish and Wildlife
- **Ken Schiff,** Southern California Coastal Water Research Project
- **John Stark,** WSU Puyallup Research and Extension Center

Synthesis report will present results and findings for a broader audience

1. Past, ongoing, and planned actions are improving regional water quality
2. WQAMS findings show promising water quality trends and room for more improvement
3. Some water quality concerns are likely to persist in 2030 despite planned actions
4. Recommended next steps for the region

We have been working to control CSOs for decades and we are nearly finished



Stormwater management requirements are strengthening and treatment systems are planned

- Stormwater design manual
- Municipal stormwater NPDES permits
- City of Seattle's Integrated Plan
- Many stormwater infrastructure projects

High Point, Seattle

Many additional actions have been or will be taken to improve water quality

- **Industrial wastes are discharged to the sewer system and pre-treated**
- **Contaminated sites and sediments are being cleaned up**
- **Planned removal of over 11,000 creosote-treated pilings**

Many other laws and regulations limit sources of pollution

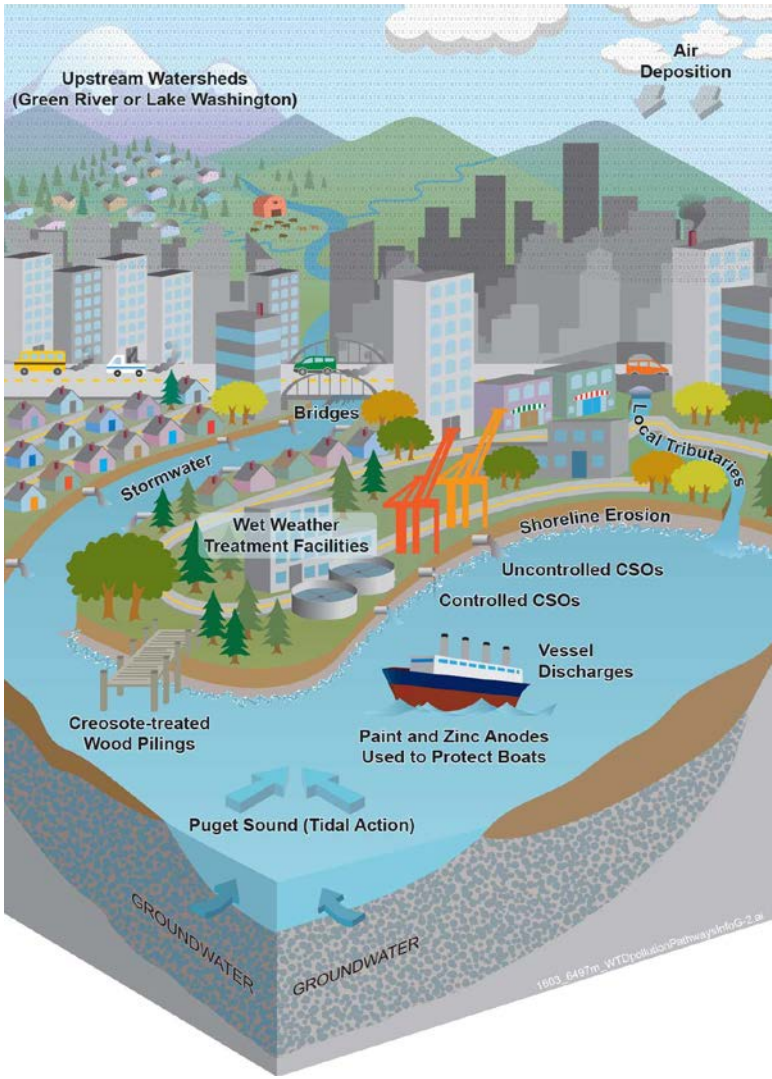
- **Restricting tributyltin (past) and copper (future) in vessel antifouling paint**
- **Bans on production/use of DDT and PCBs**
- **Limiting phosphorus in soaps, detergents, fertilizers**
- **Reducing copper releases from vehicle brake pads**
- **Air quality regulations**
- **Vessel discharge regulations**

Historic trends and current status are contaminant and waterbody specific

Contaminant	Lake Union		Duwamish		Elliott Bay	
	Trends	Status	Trends	Status	Trends	Status
Temperature						
DO/Salinity						
Fecal Coliform						
Nutrients						
Metals / Organics in water						
Metals / Organics in sediment and tissue						

Pollutant loadings are from a variety of pathways

- 85% of bacteria is from uncontrolled CSOs
- Antifouling boat bottom paint is a major source of copper loading
- 98% of PAHs are from creosote-treated pilings
- Upstream watersheds and/or stormwater are largest pathways for other contaminants



CSO control will reduce fecal coliform loading by about 80 percent

- **Pathogen load reduction is a major benefit of CSO control**
- **CSO control has less impact on loadings of other contaminants**

Planned actions will reduce loadings of many contaminants by 2030

Contaminant	Reduction	Primary
Fecal coliform bacteria	80%	CSO control
Copper	50%	Copper regulations
PAHs	30%	Creosote-treated piling removal
PCBs in Duwamish sediments	50-95%	Sediment cleanup
Other contaminants	0-10%	Combination of activities

Some concerns are likely to persist in 2030

- Warmer temperatures
- Low oxygen and high salinity in Lake Union at depth during summer
- Fecal coliform bacteria unlikely to meet standards
- PAHs released by creosote-treated pilings
- Copper released by antifouling paint
- PCBs and other contaminants in Lake Union/Ship Canal sediments
- Stormwater and upstream watersheds remain largest pathways for other contaminants
- Population will continue to grow

Next steps based on findings

Continue investing to improve water quality

- Control remaining CSOs
- Implement planned water quality projects and programs
- Implement wastewater and stormwater permits

Start conversation about additional possible actions to improve water quality

- Construct stormwater treatment where none exist
- Expand public outreach to change behaviors
- Increase efforts to identify and control bacteria sources
- Expand vessel antifouling paint regulations
- Increase shade and summer low flows to limit water temperatures
- Expand contaminated sites cleanups to other areas, especially Lake Union/Ship Canal
- Implement salmon recovery plans
- Preserve priority open space throughout watersheds

Monitor and track progress

- **Monitor water quality over time to verify investments are working**
- **Address uncertainties and conduct water quality modeling**
- **Assess impacts of projected development and redevelopment on stormwater management**
- **Routinely and comprehensively assess progress on water quality improvements**

Synthesis Briefings

- External Experts
- Seattle & Ecology
- Tribes, Port, Enviro Groups
- MWPAAC/RWQC

We are here

Announce and Promote 10 Published Reports

- Summary Document
- Video

Foster Regional Discussion

- Use findings in CSO decisions
- Findings can support other issues

Questions?

Jim Simmonds

206-477-4825

Jim.Simmonds@KingCounty.gov