



King County

Protecting Our Waters

Doing our part on rainy days



Water Quality Assessment and Monitoring Study

Briefing

December 3, 2015



Agenda

1. Review Assessment Purpose and Scope
2. Project Status
3. Science and Technical Review Team (STRT)
4. Initial findings for Elliott Bay and Lake Union/Ship Canal
5. Upcoming milestones



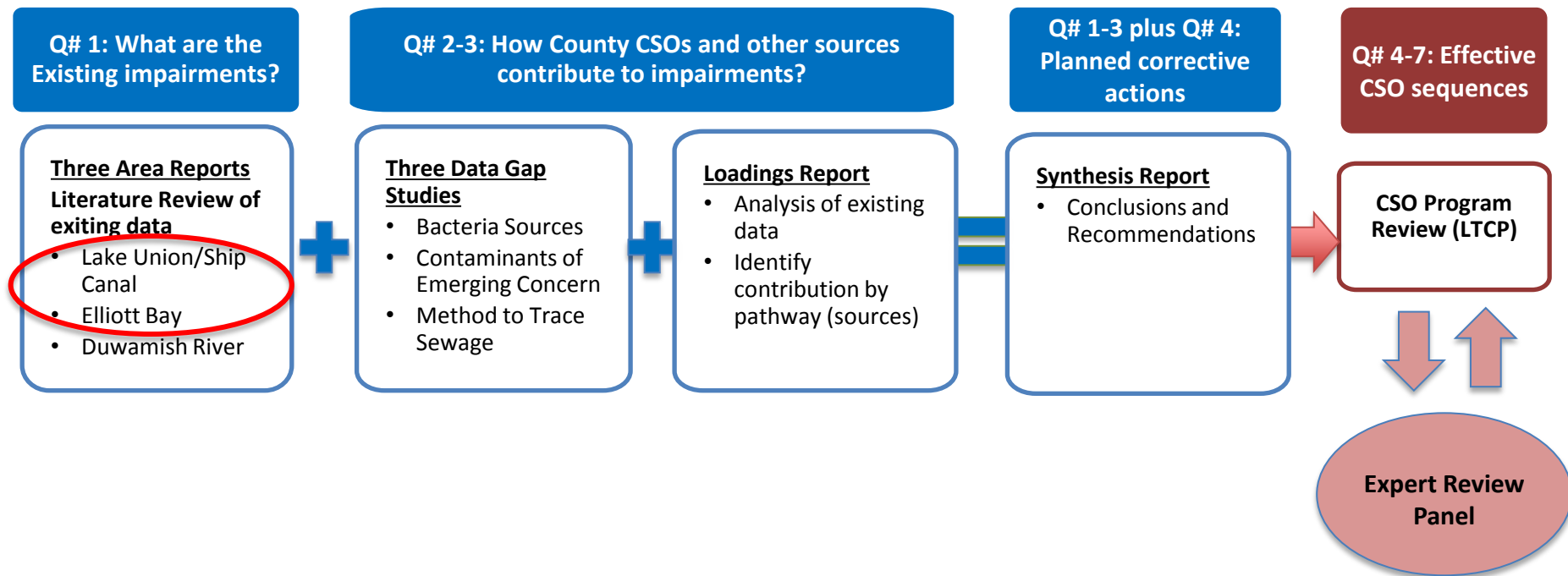
Water Quality Assessment and Monitoring Study (WQA/MS)

- **Purpose:** To ensure that future CSO projects to control pollution are well-planned and timed to improve water quality.
- King County Council approved with Long Term Control Plan (LTCP) adoption in September 2013.
- Scope was developed through RWQC
- Four year project: 2013-2017
- Findings will be input into the CSO Program Review due to Ecology in 2018
- Some tasks were necessary for the update of the LTCP that is underway



WQA/MS Process:

How the reports will respond to study questions





Progress To Date

1. **Launched the Science and Technical Review Team**
2. **Completed Literature Review**
3. **Identified and prioritized Data Gaps**
4. **Selected and completed three data gap studies (Bacteria, Contaminants of Emerging Concern, Conservative Sewage Tracer)**
5. **Drafted three existing data reports (Elliott Bay, Lake Union/Ship Canal, Lower Duwamish)**
6. **Drafted three Data Gap study reports**
7. **Loadings assessment report draft**
8. **Started the Synthesis report**
9. **Ongoing project updates with key stakeholders**



Science and Technical Review Team

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



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Elliott Bay Area Report of Existing Data



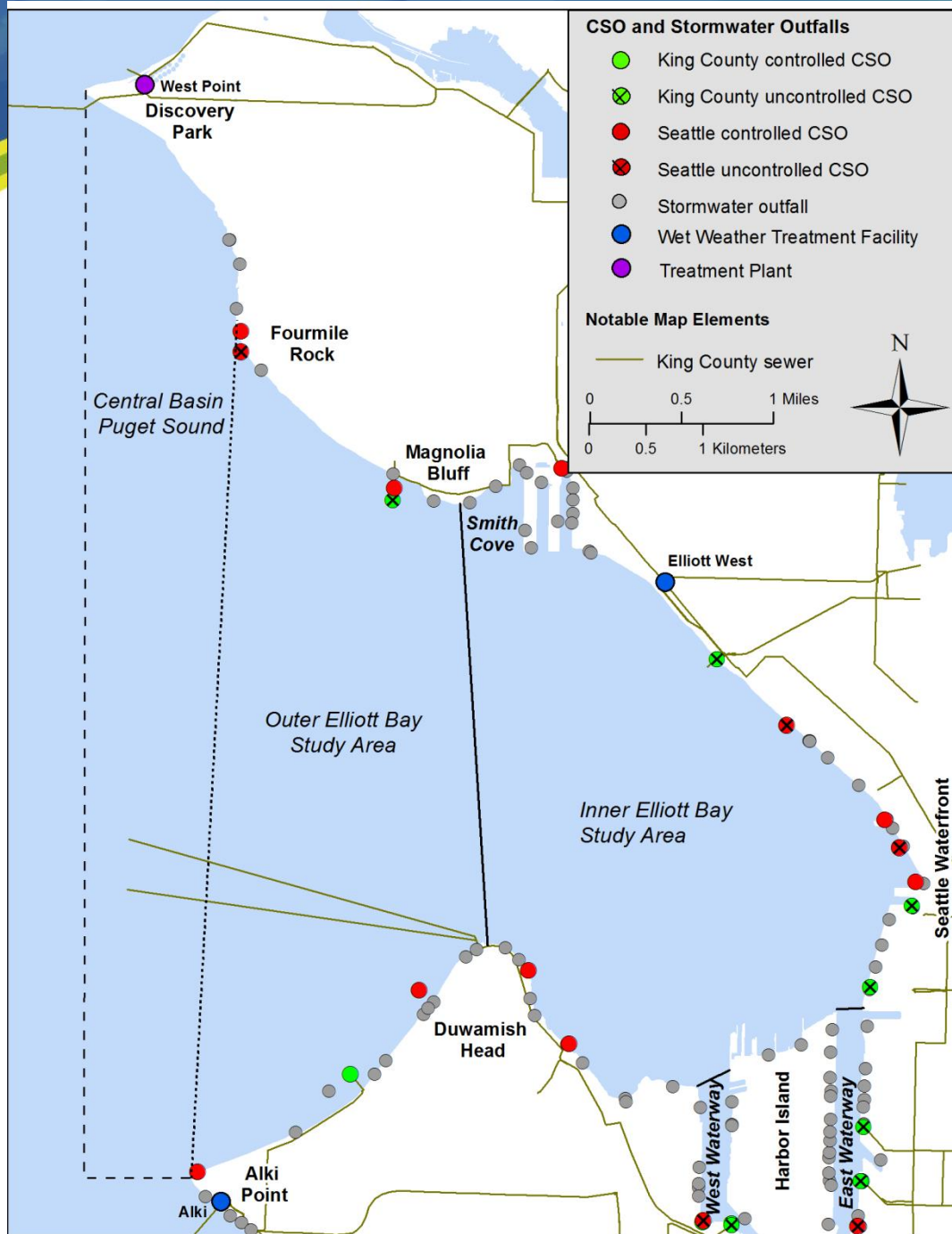
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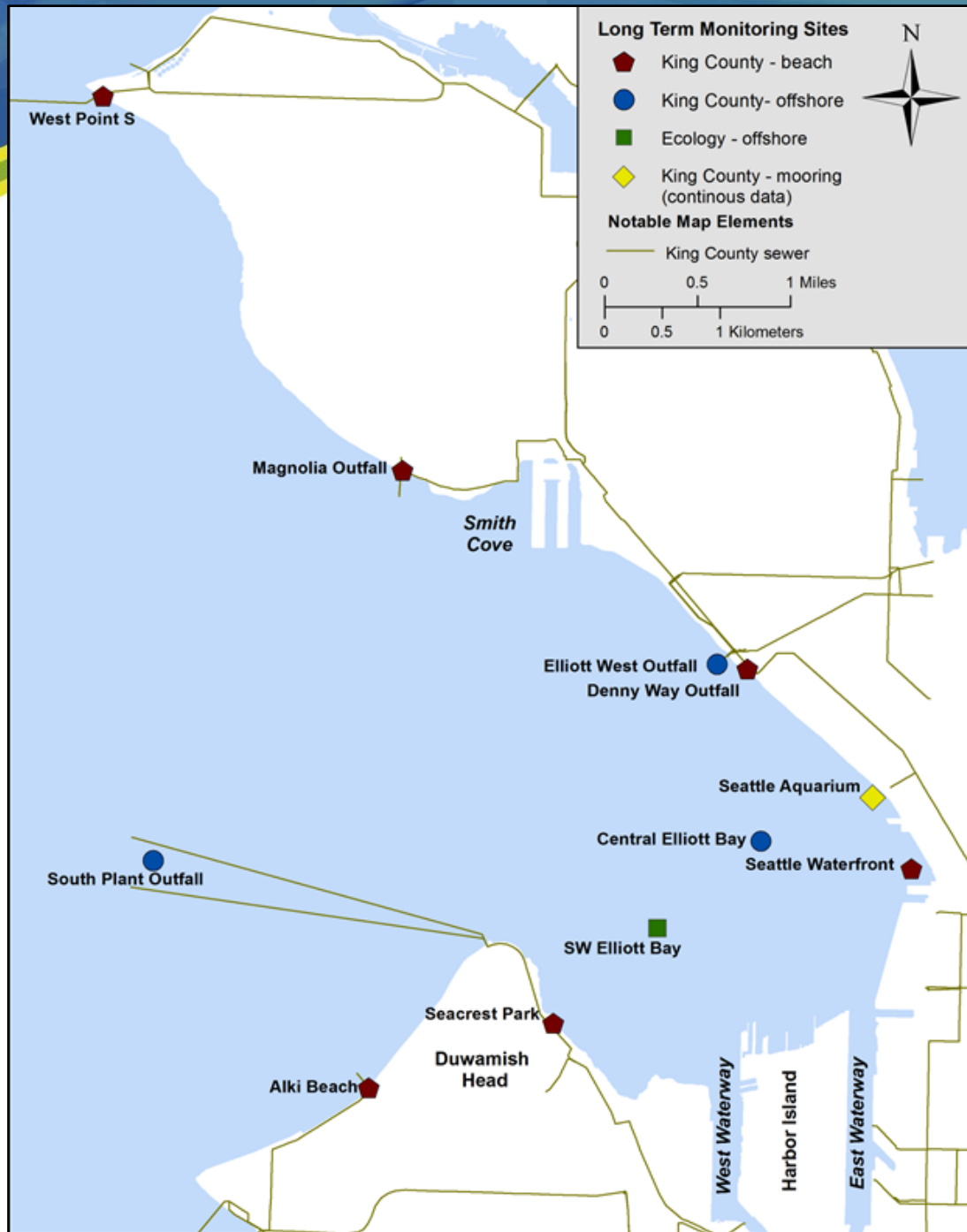
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Study Area

- 5 KC CSOs
 - 1 controlled
 - 1 to be controlled in 2015
 - 1 undergoing operational modifications
 - 2 to be controlled by 2030
- 12 Seattle CSOs
 - 3 uncontrolled
 - 9 controlled





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Water Quality Monitoring

- Monthly
- 10 sites in greater Elliott Bay in last 5 yrs
 - Offshore sites
 - Nearshore (beach) sites
- Some parameters (temp) at sites from 1970-present, most added in 1997
- Some parameters (turbidity, Ortho-P) no longer measured
- One mooring station (15 min data)



Elliott Bay Summary

Water Quality

- Bacteria is the biggest human health concern especially at beach sites
- High summer temperature may threaten migrating salmon
- Dissolved Oxygen may be an issue at depth

Sediment Quality

- High PAHs, PCBs, metals (mercury), and phthalates may threaten benthic species. Potential for movement through trophic levels.

Benthos

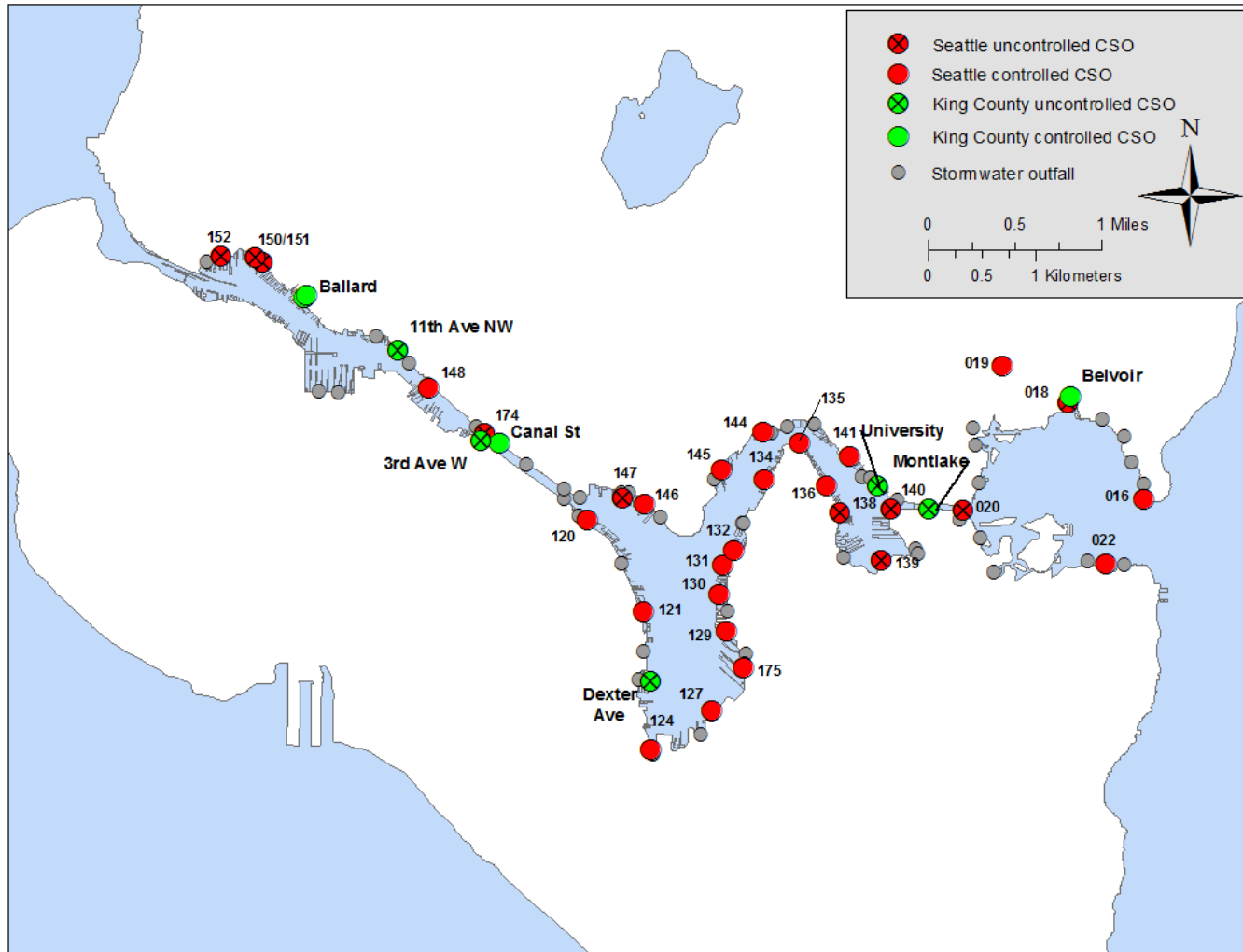
- Limited data, some areas with “affected” benthos

Shellfish Tissue

- Issues: PCBs, PAHs, PBDEs, DDT



Lake Union/Ship Canal Area Report of Existing Data



Lake Union/Ship Canal Study Area

7 KC CSOs

- 2 controlled
- 1 near-controlled
- 4 to be controlled by 2030

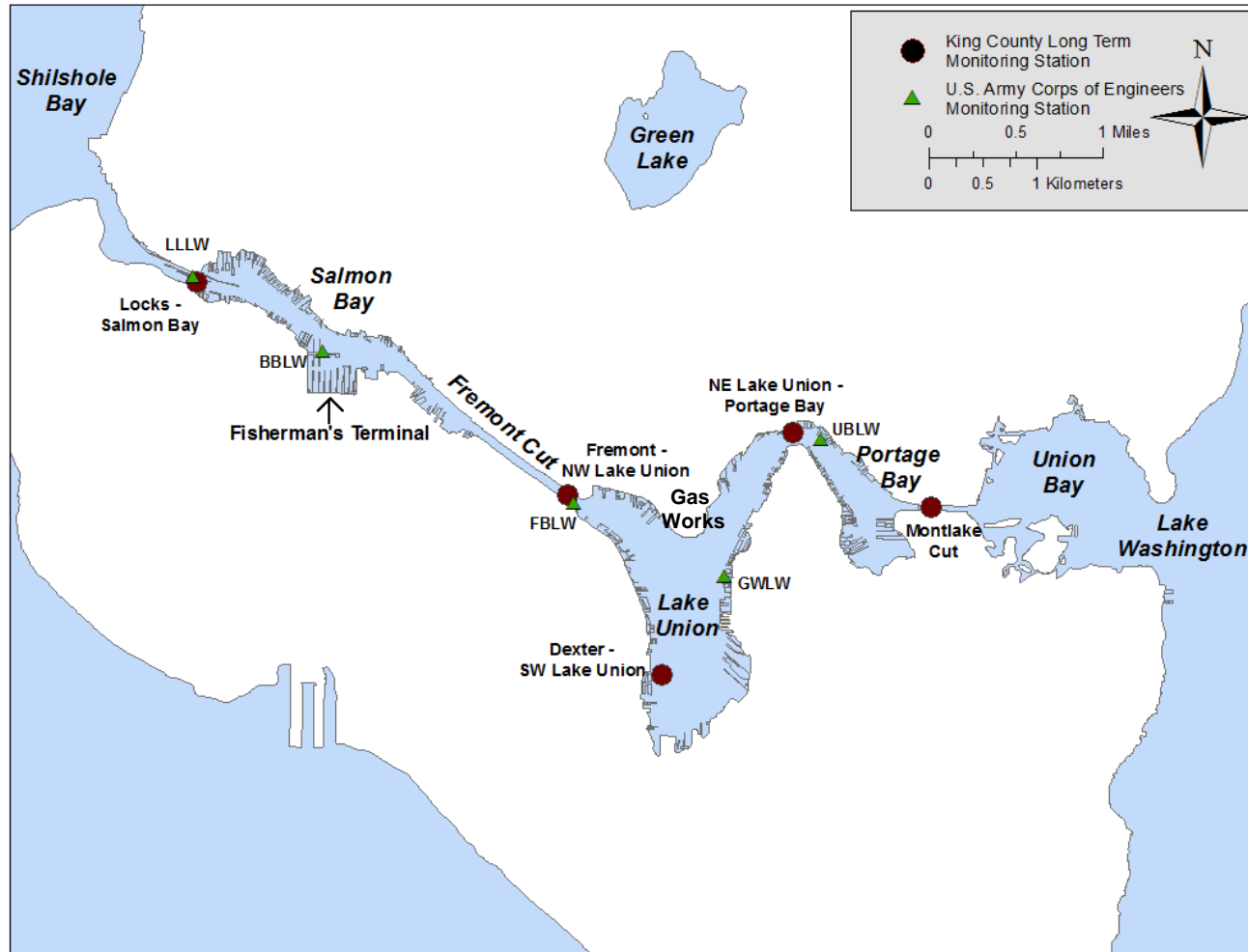
26 Seattle CSOs

- 17 controlled
- 9 uncontrolled

47 known stormwater outfalls



Water Quality Monitoring Stations



- Monthly /bi-monthly April-October
- 3 sites in greater Lake Union/Ship Canal in last 5 yrs
- 2 sites discontinued in 2008 (Fremont & NE Lake Union)
- KC data goes back to 1970s and 80s.
- 5 US ACOE sites since ~2000
 - Temperature, conductivity, salinity



Lake Union/Ship Canal Summary

Water Quality

- Bacteria is the biggest human health concern
- High temperature and low dissolved oxygen in summer may threaten migrating salmon

Sediment Quality

- High PAHs, PCBs, metals (mercury, silver, arsenic), butyltins, and phthalates may threaten benthic species. Potential for upward movement through the food web.

Saltwater Intrusion

- Strengthened and prolonged stratification
- Low to no dissolved oxygen, build-up of nutrients
- Increases in organic compounds detected



STRT Input

- Impressed by decline in bacteria
- Evidence that CSO work and other improvements have reduced contaminants
- Suggestions for improvements of the monitoring program – sediments, biology
- Interested in salmon passage and hydrodynamics
- Strong interest in contaminants of emerging concern and conservative sewage tracers
- Pleased with the County's coordination with Seattle



Study Schedule

2013	2014	2015	2016	2017-18
Involve interested parties and public				
Develop Study questions & Scope				
	Perform scientific analysis & produce synthesis report (literature search; fill data gaps; synthesis report)			
		Independent Science and Technical Team review of technical work		
			Document production	
			Use study results next CSO control program review and plan update due to regulators in 2018	



Brief MWPAAC
and RWQC



Findings to CSO Program



Brief King County Council