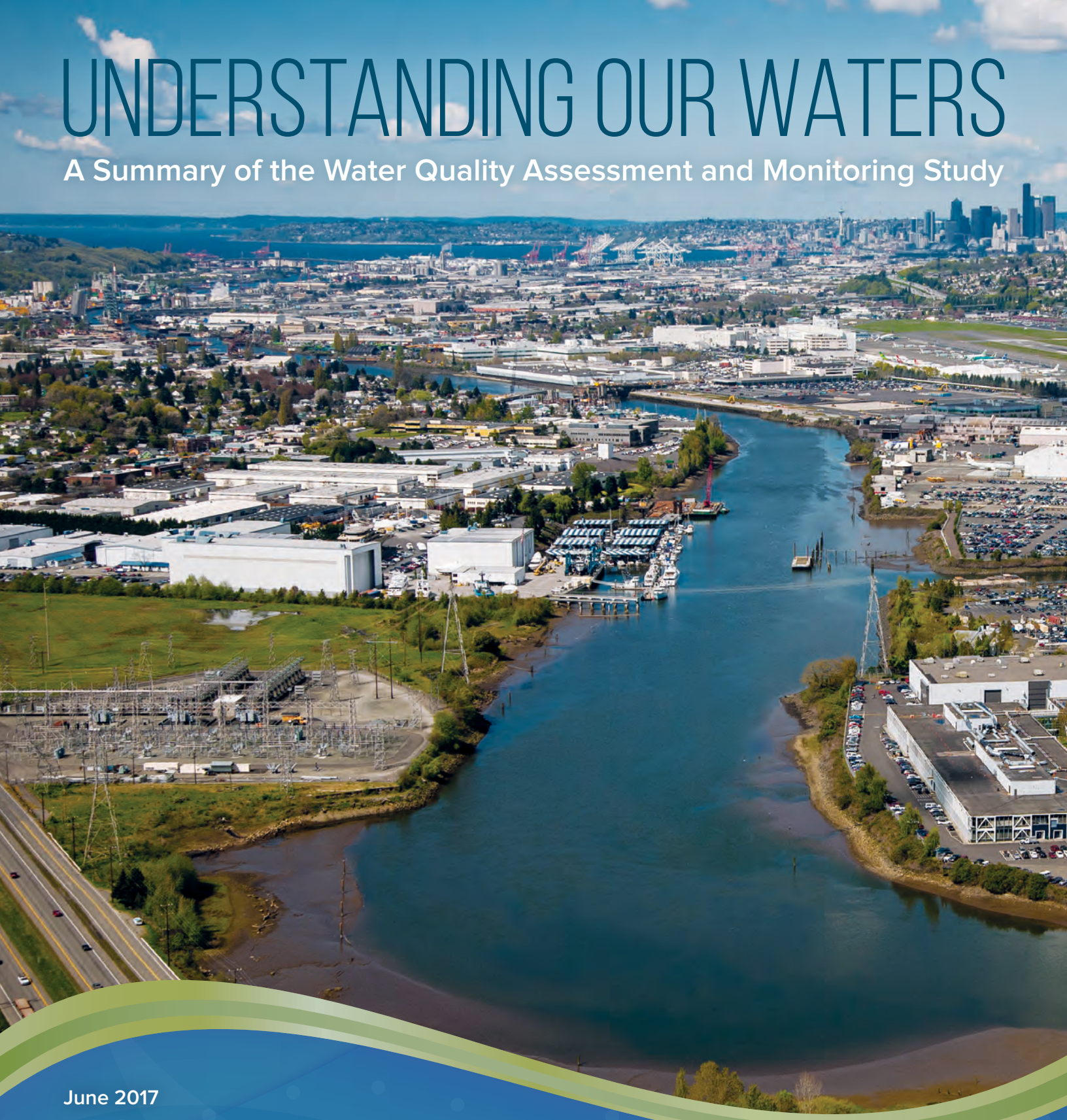
UNDERSTANDING OUR WATERS

A Summary of the Water Quality Assessment and Monitoring Study



June 2017

Why study water quality? Because our quality of life here in the Northwest depends on water. Our lakes, rivers and Puget Sound give us food, transportation, jobs, and fun.

A new study shows water quality has been improving – even as the region has grown. Completing the combined sewer overflow control program by 2030 will improve water quality further. And the region has more work to do to achieve water quality goals.

www.kingcounty.gov/water-quality-assessment

King County
Protecting Our Waters
Doing our part on rainy days

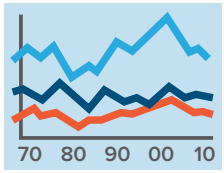
WATER QUALITY ASSESSMENT AND MONITORING STUDY

EXPLORES KING COUNTY'S WATER QUALITY PAST, PRESENT, AND FUTURE

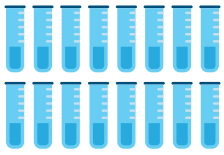
A new comprehensive look at water quality in Elliott Bay, Lake Union, the Lake Washington Ship Canal, and the Duwamish Estuary is now available.

Find out about King County's new **Water Quality Assessment and Monitoring Study** at *www.kingcounty.gov/water-quality-assessment*

THE SCIENTIFIC ANALYSIS BRINGS TOGETHER...



decades of data to understand long-term trends



results from hundreds of new water samples to understand water quality today

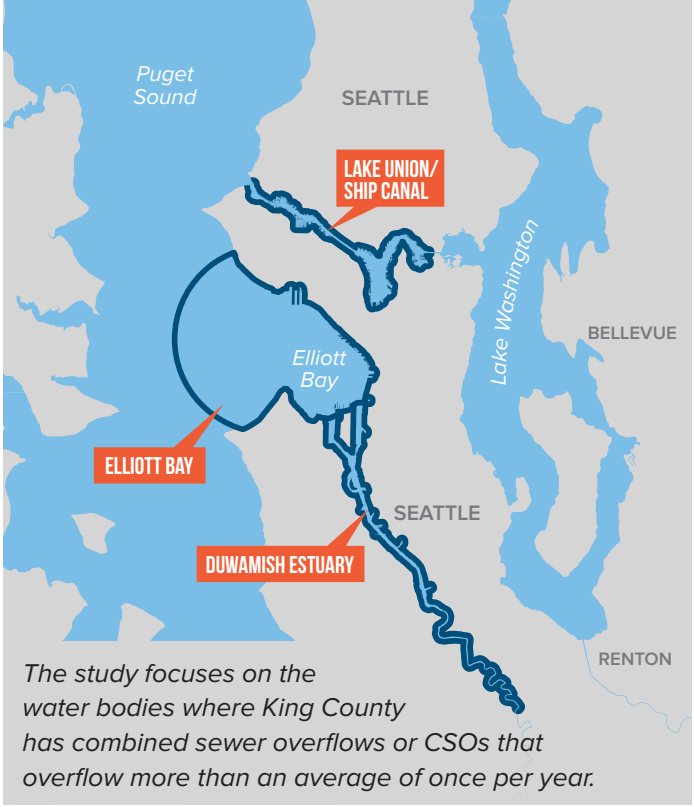
estimates of how planned programs will affect water quality in the future.

HIGH QUALITY SCIENCE

Five independent experts on a Science and Technical Review Team reviewed every aspect of the project. They asked hard questions and made suggestions to make sure the methods and results are high-quality, thorough, and objective.

Many others commented throughout the project.

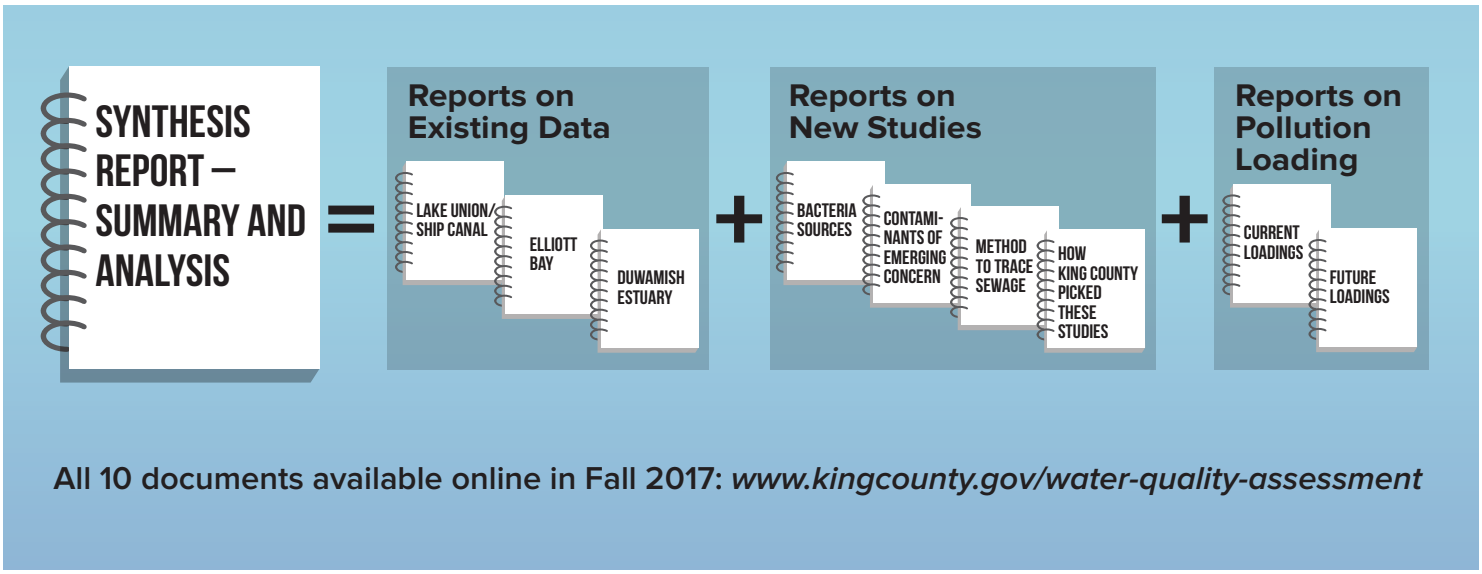
"King County has been monitoring many local lakes and streams for several decades. They have the most detailed and high-quality dataset for urban lakes that I am aware of."
– Mike Brett, PhD, University of Washington, member Science and Technical Review Team



The study focuses on the water bodies where King County has combined sewer overflows or CSOs that overflow more than an average of once per year.

ASSESSMENT PUBLISHED IN 10 REPORTS

The **Synthesis Report** brings together the findings from nine technical reports.



All 10 documents available online in Fall 2017: *www.kingcounty.gov/water-quality-assessment*

"The data collection, the data analysis, the data presentation, and the management of the Water Quality Assessment have been very professional."

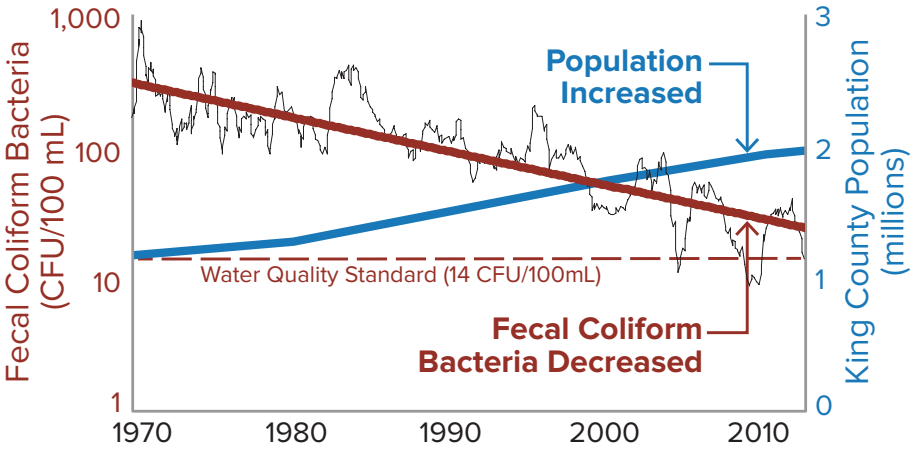
– Virgil Adderley, Thames Tideway Tunnel, formerly with Portland Bureau of Environmental Services, member Science and Technical Review Team

LONG-TERM TRENDS: WATER QUALITY IS IMPROVING – AND WE HAVE MORE TO DO

DATA FROM THE LAST 40 YEARS SHOW:

Some long-term water quality trends show improvements – even as our region has grown.
The water quality investments over the last 40 years have paid off.

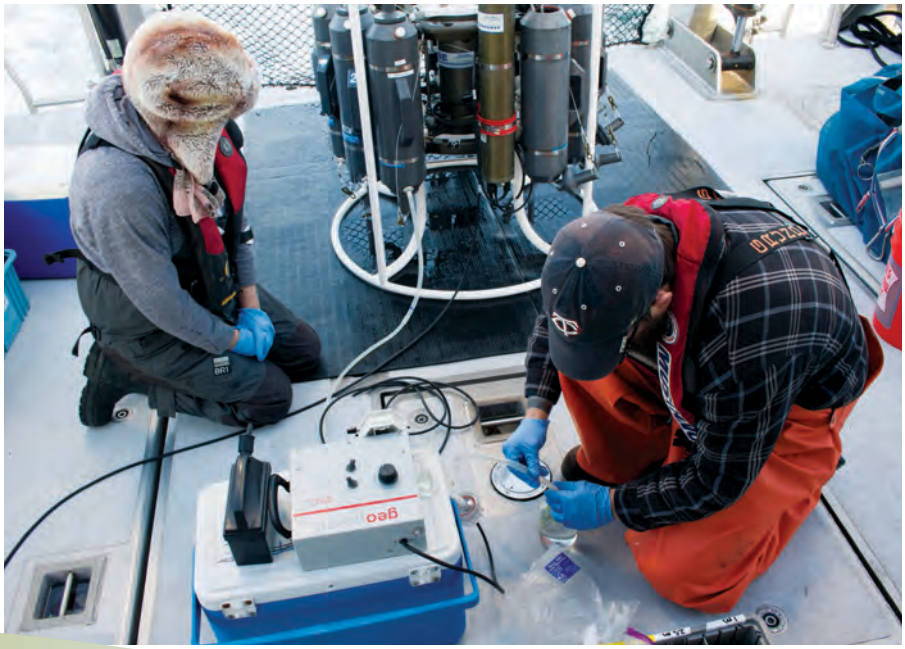
- ✓ Less bacteria that can make people sick.
- ✓ Fewer nutrients that can cause toxic algae blooms.
- ✓ More dissolved oxygen for fish to breath.



*Monitoring shows that **fecal coliform bacteria has decreased** in the Duwamish River since 1970 as **King County population growth increased**.*

There is more to do to achieve water quality goals.

- ✗ Water temperature is getting warmer, which is worse for fish.
- ✗ Even with the long-term improvements, water does not always meet state water quality standards for bacteria, dissolved oxygen, temperature or human health standards for banned industrial chemicals called PCBs.
- ✗ Historically contaminated sediments need to be cleaned up or contained.



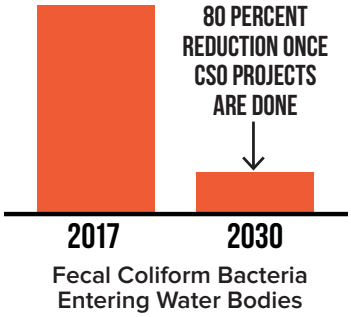
The crew of King County's SoundGuardian gathers water samples for testing.

"Great progress in water quality has already been made. Fecal coliform bacteria have been declining for decades. That indicates to me that they are on the right track. King County is doing the right thing."

– John Stark, PhD, Washington Stormwater Center, member Science and Technical Review Team

STUDY SHOWS COMPLETING COMBINED SEWER OVERFLOW (CSO) PROJECTS WILL PROTECT WATER QUALITY.

By 2030, King County and the City of Seattle are scheduled to finish CSO projects to meet state standards. This will reduce the amount of fecal coliform bacteria entering the water bodies by 80 percent.



STUDY SUPPORTS THE CSO CONTROL PROGRAM

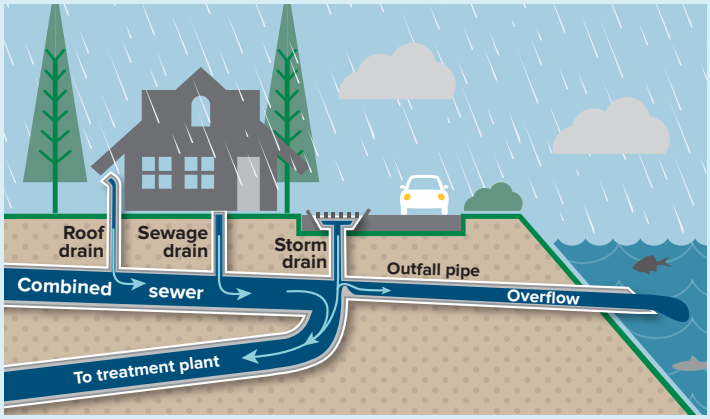
King County will use the study results in its plan to "control" (see sidebar) CSOs by 2030. The Water Quality Assessment will provide a baseline to measure future water quality improvements.

IT WILL TAKE MORE THAN CSO CONTROL TO ACHIEVE WATER QUALITY GOALS

Stormwater runoff, upstream watersheds, and occasional untreated CSO discharges (less than one time per year on average at each CSO location) will continue to bring bacteria to the water bodies.

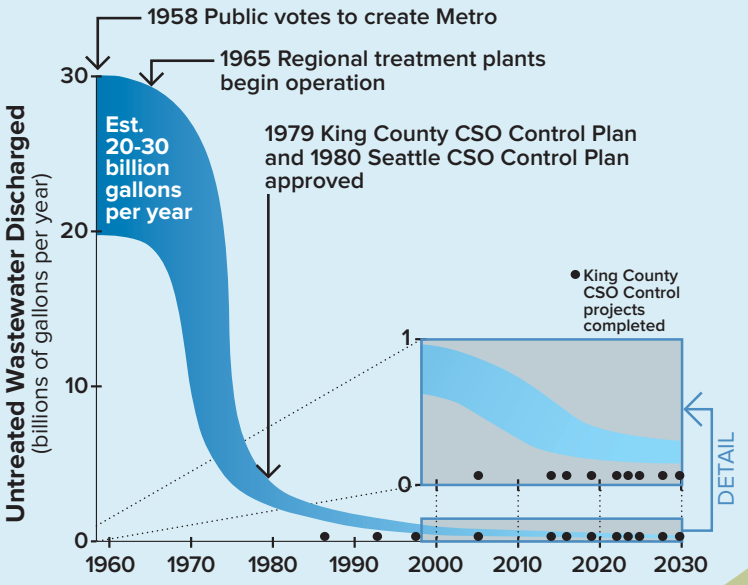
Fecal coliform bacteria come from warm blooded animals and humans. CSOs are only one pathway for bacteria. Stormwater runoff can carry bacteria from animal waste.

To find out more about CSOs, go to ***www.kingcounty.gov/protectingourwaters***



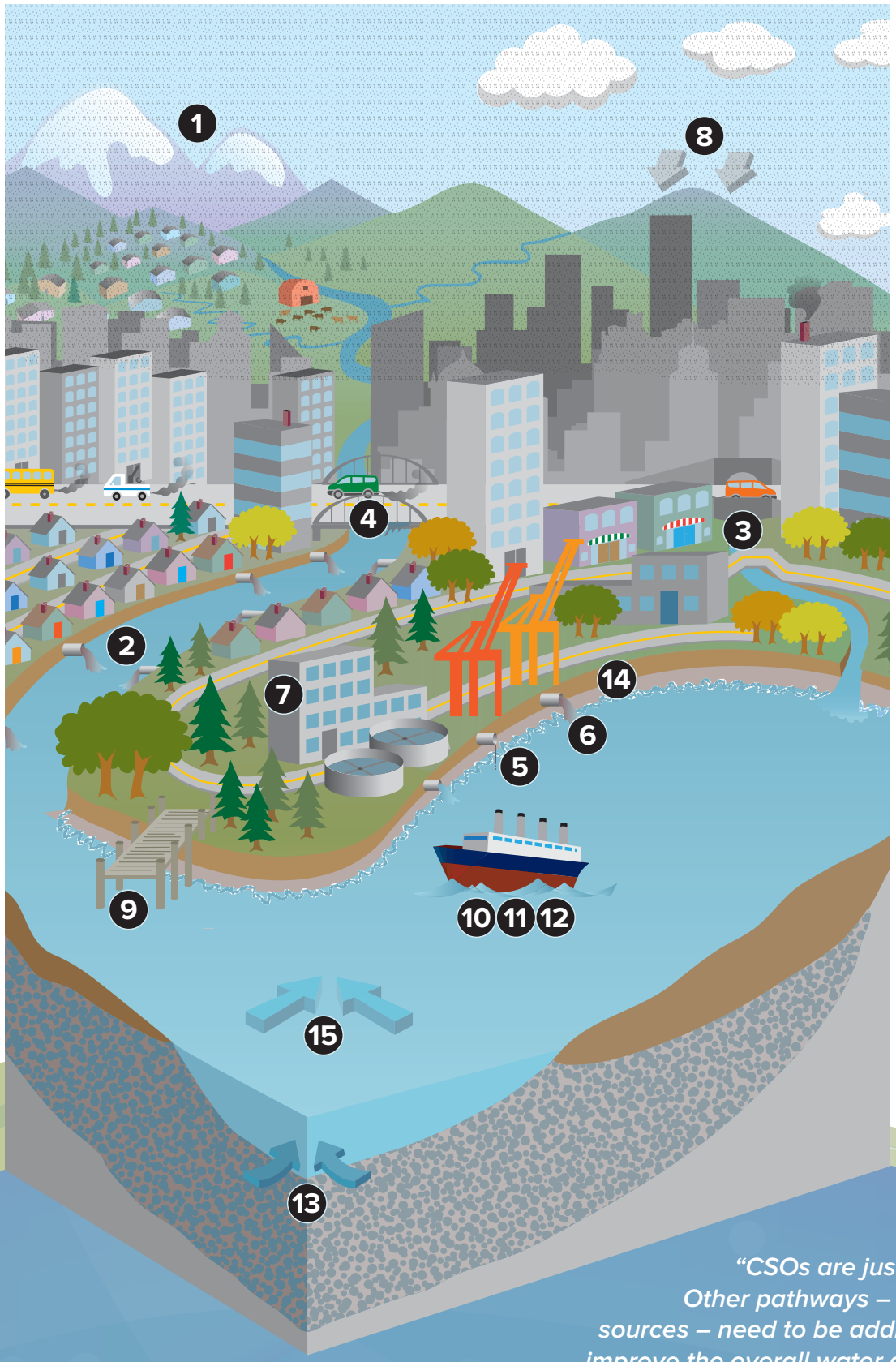
CSOs are relief points in sewer systems that carry sewage and stormwater in the same pipe. When heavy rains fill the pipes, they release sewage and stormwater into lakes, rivers, and Puget Sound. King County and Seattle are scheduled to control all CSOs by 2030. A "controlled" CSO overflows no more than one time each year, based on a long-term average.

DRAMATIC DECLINE IN UNTREATED DISCHARGES OVER TIME



We've been building CSO projects for decades. Future projects will further reduce discharges.

MANY PATHWAYS BRING POLLUTION TO OUR WATER BODIES



The study looked at

15 pollution pathways

These **pathways** transport pollutants from **sources**. For example, CSOs and stormwater are **pathways** but the **sources** are from human activities.

1. Upstream Watersheds (Green River and Lake Washington)
2. Stormwater
3. Local Creeks and Streams
4. Bridges
5. Controlled CSOs
6. Uncontrolled CSOs
7. Wet-weather Treatment Facilities
8. Air Pollution that Settles on Water Bodies
9. Creosote-treated Wood Pilings
10. Copper-based Boat Paint
11. Vessel Discharges
12. Zinc Anodes Used to Protect Boats
13. Groundwater
14. Shoreline Erosion
15. Puget Sound Tidal Action

"CSOs are just one of the problems.... Other pathways – stormwater and upland sources – need to be addressed in order to really improve the overall water quality of Puget Sound."

– Jay Davis, U.S. Fish and Wildlife Service, member Science and Technical Review Team

CSO CONTROL ALONE WON'T BRING WATER QUALITY INTO COMPLIANCE WITH STANDARDS

CSOs are only one pathway for pollution. Other pollution pathways will require continued attention and additional action. The assessment shows how important this work will be to improving water quality.

POLLUTANT	WHY IS THIS A PROBLEM?	WHERE MOST OF IT COMES FROM	WHAT SOLUTIONS ARE PLANNED BY 2030?	WHAT REMAINS?
Bacteria	Can make people sick.	**Uncontrolled CSOs** 	King County and Seattle are scheduled to complete all CSO projects by 2030.	Other pathways convey bacteria.
Nutrients	Can cause algae blooms that kill fish.	**Stormwater and water coming from upstream** 	Planned stormwater projects include street sweeping, rain gardens, retrofitting and replacing aging stormwater infrastructure, reducing flooding, and stormwater treatment.	Many jurisdictions developing new stormwater rules and regulations. A regional commitment and investment to address stormwater runoff, similar to wastewater treatment, will be needed.
Suspended Solids	Can carry pollution and settle to the bottom and smother habitat for fish and small animals.			
Metals (Arsenic, Lead, Mercury)	Can harm fish and cause human health problems.			
Organic Chemicals (Phthalates from plastics, PBDEs from flame retardants, and PCBs – banned industrial chemicals)	Can make people and fish sick.			
Copper	Can harm fish.	**Paint used to protect boats** 	New state rules will limit copper in boat paint for small boats and automobile brakes.	Large boats are exempt from rules.
PAHs (chemicals found in creosote tar and fossil fuels)	Can harm fish and cause human health problems, including cancer.	**Creosote-treated pilings** 	Creosote pilings no longer built in the study area. Planned projects will remove some pilings.	Many creosote pilings will remain.

MORE WORK TO DO FOR WATER QUALITY

OUR REGION HAS A GOOD TRACK RECORD TACKLING TOUGH WATER QUALITY PROBLEMS. WE'VE DONE IT BEFORE.

Many people work hard to improve water quality. And the long-term improvements in bacteria, nutrients, and dissolved oxygen show the work is paying off.

In the 1950s, Lake Washington was polluted. Thanks to our wastewater system, it is now one of the cleanest urban lakes in the world.

LET'S KEEP DOING IT.
THE ASSESSMENT SHOWS OTHER ISSUES WILL CONTINUE TO NEED OUR REGION'S ATTENTION AND RESOURCES:

The region's water quality does not always meet standards. At King County, we are committed to doing our part. And we are committed to sharing what we learn and partnering with others to achieve our region's goals. The data and analysis in the **Water Quality Assessment and Monitoring Study** are now available at ***www.kingcounty.gov/water-quality-assessment*** to support efforts like these:

- Stormwater management
- Contaminated sediment remediation
- Land use and source control
- Boat paint controls
- Creosote-treated pilings removal
- Ballard Locks Upgrade
- Methods for lowering surface water temperatures
- Actions individuals can take to protect water quality

"The reason this is important to me? I'd like to see my family be raised in an area where the environment will support them and the other folks in Seattle."

- Ken Schiff, Deputy Director, Southern California Coastal Water Research Project (SCCWRP) member Science and Technical Review Team

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