

Groundwater study of the Duwamish River Valley, Washington

Why is the USGS studying groundwater in the Duwamish River Valley?

The U.S. Geological Survey (USGS) is beginning a study to understand the geology and groundwater in the Duwamish River Valley. Flooding in this area can make it challenging for people to travel to and from homes and businesses. It can also cause damage to properties. As the climate changes with more extreme rainfall, flooding is likely to happen more often and in more areas. The King County Wastewater Division (WTD) wants to learn how these changes (1) can cause groundwater to rise above the land surface and cause flooding, and (2) affect how seawater from Elliot Bay moves up the Duwamish River and mixes with fresh groundwater. The County has many pipes and pump stations in the area that can be damaged by seawater—seawater corrodes metal faster than freshwater does. The USGS study will provide information to King County, other agencies, and the public to help them understand and address these problems. The study began in October of 2023 and will continue through 2026.

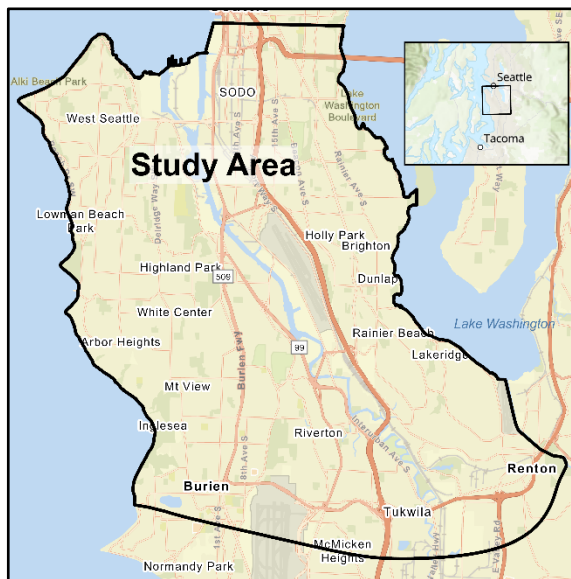


Figure 1. Study area, Washington.

Who is the USGS and what does the USGS do?

The USGS serves the Nation as an independent fact-finding agency that collects and analyzes data and provides scientific understanding to the public. Our scientists bring expertise in observing natural conditions and hazards that can threaten public health and safety, such as flooding rivers. **The USGS provides impartial science** that serves the needs of our changing world. It is the policy of the USGS to carry out the work and to make the results of its scientific studies available in a way that will best serve the whole public, rather than the interest or benefit of any special group, business, or individual.



Figure 2. Photograph of a groundwater-monitoring well. Photo taken by Jack Mitchell, February 2, 2018.

What is the study about?

The study will: (1) collect groundwater data, (2) estimate how much water seeps into the ground, and (3) increase our knowledge of the geology and groundwater. The products from this study are intended to help the County maintain their infrastructure and to plan for future changes of sea levels, tides, rainfall, and seawater moving upriver.

How can well owners help with the USGS study?

If permission is given by the well owner, USGS scientists plan to visit each well once every 3 months for 1.5 years—that is, through the spring of 2025.

- At all wells, USGS scientists will measure the groundwater level during a visit. **Groundwater levels** help us to understand the general direction that groundwater flows and the potential for groundwater flooding.
- At a smaller group of wells, USGS scientists will use data loggers to record the groundwater level or salinity (amount of seawater) at 15-minute intervals. These data help us to understand how the groundwater system responds to influences like the tides and rainstorms. **Groundwater salinity** helps us understand where seawater has moved into the groundwater.

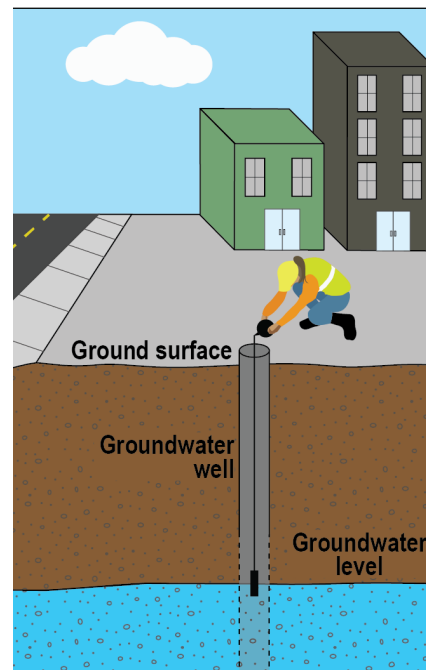


Figure 3. Drawing of a scientist measuring groundwater levels. Image modified from Cinotto (2007).

All data collected by USGS will be made publicly available on the [USGS National Water Information System](https://waterdata.usgs.gov/wa/nwis/nwis) (<https://waterdata.usgs.gov/wa/nwis/nwis>) database soon after collection. A link to the data collected from each well will be provided to the well owner.

Will the USGS be collecting water samples from the wells?

No, USGS will not be collecting any water samples for this study and are not studying contamination.

When will USGS workers be in the area?

USGS will be working in the study area, collecting data from wells, about once every 3 months for 1.5 years. The USGS plans to start work in the study area in the first week of December, around December 4–8, 2023.



Figure 4. Photograph of a groundwater-monitoring well. Photo taken by Jack Mitchell, January 29, 2018.

We would greatly appreciate your help by allowing us access to your property to measure the groundwater level and presence of seawater in your well. The more data we can collect, the more accurate and useful the study is for our current and future studies or uses by others.

Where can you find more information about this study?

For more information about this study, please contact:

- Jack Mitchell of the USGS Washington Water Science Center at (253) 552-1616 or by email at jnmitchell@usgs.gov.

You can also view more details about the study on the [USGS website](https://www.usgs.gov/centers/washington-water-science-center/science/hydrogeologic-framework-lower-duwamish-river-valley#overview) (<https://www.usgs.gov/centers/washington-water-science-center/science/hydrogeologic-framework-lower-duwamish-river-valley#overview>).