

# Streamflow and Surface Water Monitoring Program



Oregon Water Resources Department (WRD) currently operates approximately 250 gages on waterways including streams, rivers, canals, and reservoirs. These stations provide continuous records of streamflow, lake, and reservoir levels, some going back more than 100 years. WRD's gaging stations represent a portion of the overall statewide gaging network, which includes gages operated by agencies such as the U.S. Geological Survey, Bureau of Reclamation, Idaho Power, and others (see Figure 1). These historical records are valuable for both today's water resource decisions as well as long-term planning. Local, state, and federal entities use this information to make informed decisions related to agricultural and municipal needs, energy production, fisheries, recreation, engineering design, and safety.

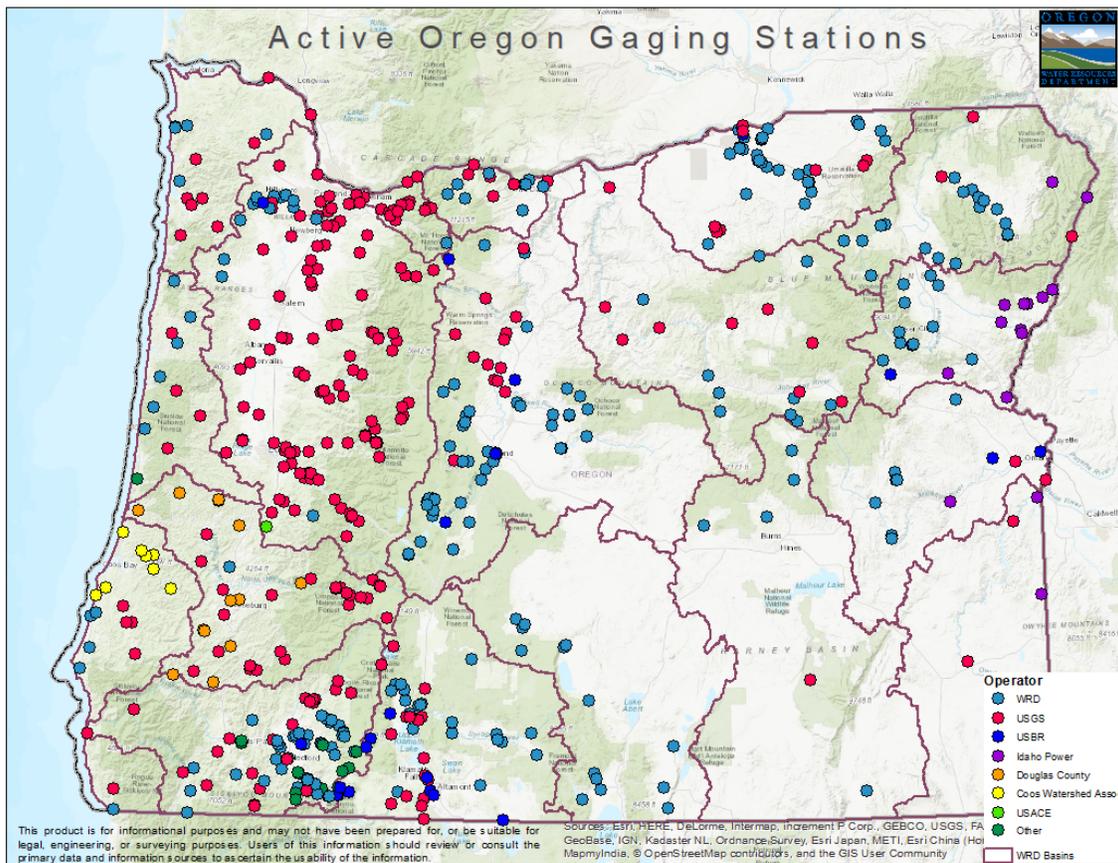


Figure 1: Map of active stream gaging locations represented by the current operator.

Surface water is relatively abundant in Oregon but is unevenly distributed with respect to location and time of year. The increasing number of water users and complexity of water rights and water law over time add further difficulty to meeting needs across the state. Given the pressures on Oregon's water systems and supplies, the gage network has expanded over time. The graph in Figure 2 (see below) shows the number of gages in Oregon that were actively recording and collecting data for each water year since the late 1800s, including those operated by WRD and other agencies. The gages are strategically located, typically to address monitoring missions and priorities, while also maintaining data collection on broad spatial scales throughout Oregon and within watersheds displaying a broad range of climates, sizes, and degrees of human impact.

WRD’s Monitoring Strategy highlights the need for a robust gaging network to provide the data necessary to meet the needs of people, wildlife, and the natural environment. The gage network is designed to address monitoring priorities including water supply, surface water-groundwater interactions, climate change, instream needs and extreme events. However, limited resources, in terms of budget and personnel, require careful planning and prioritization to optimize the gage network. WRD and the U.S. Geological Survey have operated cost-sharing agreements to maximize the number of gaging stations in operation throughout the state.

WRD’s gaging stations are operated and maintained by a team of hydrographers, watermasters, and assistant watermasters. The watermasters of the Field Services Division carry out activities such as measuring stream flow, equipment calibration, and operation and maintenance of gaging equipment, which regularly collect and transmit data. Hydrographers in WRD’s Surface Water Section, which is responsible for data collection and processing protocol, review and publish streamflow records to ensure data-quality standards are upheld.

The gage network collects hydrological data that are important to the management of Oregon’s surface and groundwater resources. Historic and near-real time data are made public and readily available through WRD’s website. The data are utilized by programs at WRD and other agencies which are responsible for decision-making regarding water resource management. The programs typically serve both regulatory and scientific purposes such as effective regulation and distribution of water, monitoring of instream flows, flood- and water-supply forecasting, water-quality assessments, and long-term trend analysis. The table below lists examples of programs at WRD that utilize gage data and indicates how the data support each program.

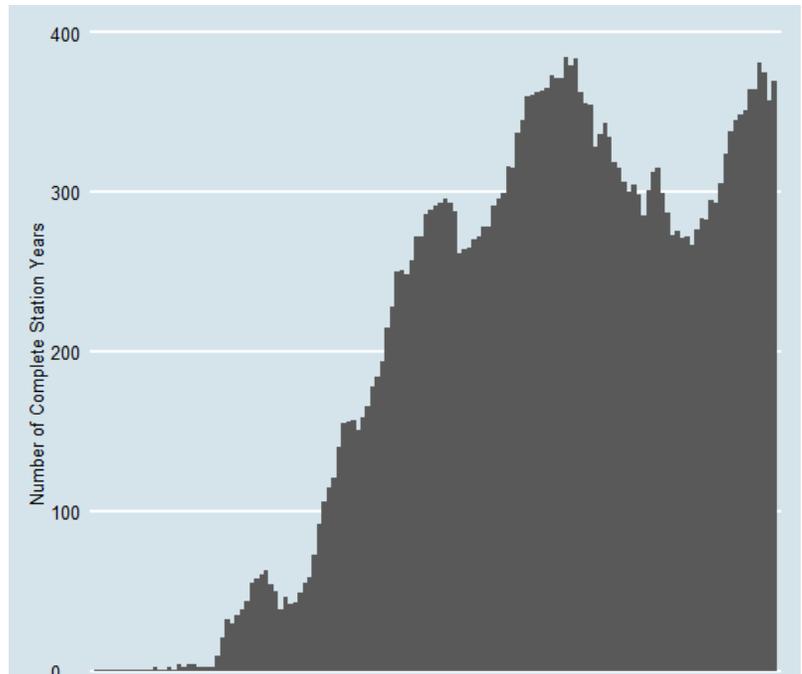


Figure 2: Time series of the multi-agency statewide gaging network showing the increase and fluctuation in number of gaging stations by year.

Table 1: WRD programs supported by gage data.

Program	Use
Water Availability	Determine amount of surface water available for allocation
Peak Flow Estimation	Provide information about flood magnitude and frequency
Seasonally Varying Flows	Estimation of environmental and habitat-forming flows important for establishing permit conditions of water rights
Water Management	Distribution and regulation of water uses
Place-Based Planning	Assist communities with establishing approaches to basin water planning
Basin Studies	Develop water budgets and evaluate surface water-groundwater interactions
Drought	Review local requests for drought declarations

*For more information on WRD's Monitoring Strategy please see the following:*

[Oregon Water Resources Department \(2016\). Oregon Water Resources Monitoring Strategy. Salem, OR.](#)