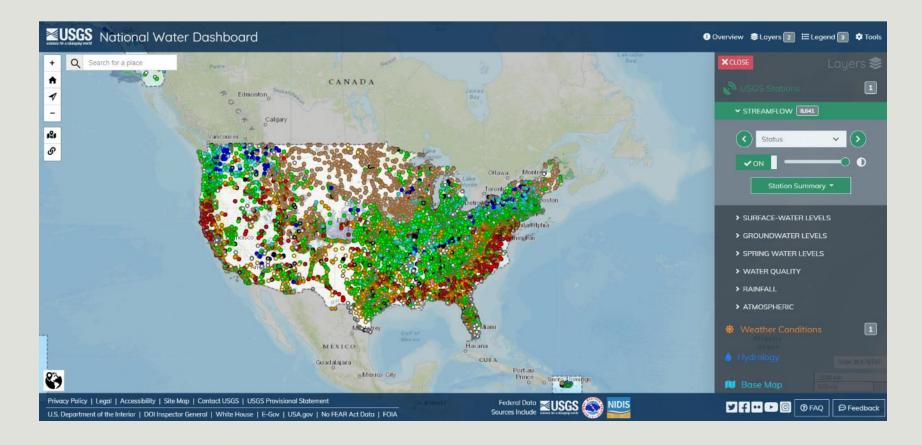


This is a companion document to the presentation given to McKenzie Flyfishers on April 14, 2022. Many thanks to Toby Welborn of the USGS. (See the video, "National Water Dashboard Presentation")

## **The USGS National Water Dashboard**



U.S. Department of the Interior U.S. Geological Survey

# The USGS Mission

- Founded in 1879, the USGS is part of the Department of the Interior and is a nonregulatory scientific agency
- The USGS mission is to monitor, analyze, and predict current and evolving dynamics of complex human and natural Earth-system interactions and to deliver actionable intelligence at scales and timeframes relevant to decision makers.





## The USGS Water Resources Mission Area

- The USGS is a non-management, unbiased science agency.
- Water Resources Mission Area of the USGS works with partners to monitor, assess, conduct targeted research, and deliver information on a wide range of water resources and conditions including streamflow, groundwater, water quality, and water use and availability.

https://www.usgs.gov/science/mission-areas

## USGS Streamgaging Network

The USGS Groundwater and Streamflow Information Program supports the collection and delivery of streamflow and water-level information at approximately 8,500 sites and water-level information alone for more than 1,700 additional sites. The data are served online—most in near real-time—to meet many diverse needs.

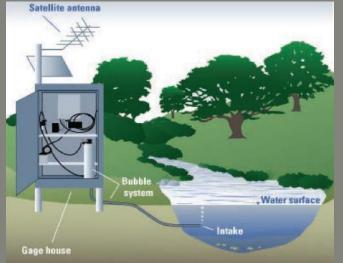


Diagram showing a streamgage installation with a bubbler system used to measure stream stage. (Credit: L.S. Coplin, USGS)



Streamgage on McKenzie River near Vida, Oregon (Site number 14162500)

(Photo Credit: James King, USGS)

Coast Fork Willamette River and gage house at State Highway 58 near Goshen, Oregon, above flood stage on December 18, 2015.

(Photo Credit: USGS)

https://www.usgs.gov/mission-areas/waterresources/science/usgs-streamgagingnetwork#overview

# How do I interpret gage height and streamflow values?

**Gage height** (also known as stage) is the height of the water in the stream above a reference point. Gage height refers to the elevation of the water surface in the specific pool at the streamgaging station, not along the entire stream. Gage height also does not refer to the depth of the stream. Measurements of gage height are continually recorded by equipment inside a gage house on the streambank.

https://help.waterdata.usgs.gov/tutorials/surface-water-data/how-do-iinterpret-gage-height-and-streamflow-values



# How do I interpret gage height and streamflow values?

**Streamflow** (also known as **discharge**) is the volume of water flowing past a given point in the stream in a given period of time. Streamflow is reported as cubic feet per second (ft<sup>3</sup>/s). Streamflow values are better indicators than gage height of conditions along the whole river. Measurements of streamflow are made about every six weeks by USGS personnel; they wade into the stream to make the measurement or do so from a boat, bridge, or cableway over the stream.

## 1 cubic foot per second = 7.5 gallons flowing by a particular point in 1 second.

https://help.waterdata.usgs.gov/tutorials/surface-water-data/how-do-iinterpret-gage-height-and-streamflow-values



# What is turbidity?

**Turbidity** is the measure of relative clarity of a liquid. It is an optical characteristic of water and is a measurement of the amount of light that is scattered by material in the water when a light is shined through the water sample. The higher the intensity of scattered light, the higher the turbidity. Material that causes water to be turbid include clay, silt, very tiny inorganic and organic matter, algae, dissolved colored organic compounds, and plankton and other microscopic organisms.

https://www.usgs.gov/special-topics/water-science-school/science/turbidityand-water

https://or.water.usgs.gov/will\_morrison/secchi\_depth\_model.html





Close-up of coastal cutthroat from Camp Creek, western Oregon (Photo Credit: David Leer, Oregon State University) Gage Height and Streamflow, Why do I care?

How safe is it to wade or drift?

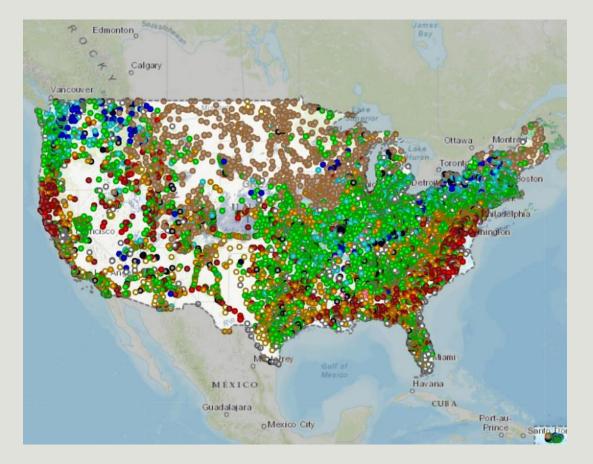
Where are the fish holding?

Are conditions optimal for a hatch?

What reach is potentially fishable?

Am I bringing the right equipment for conditions?





https://dashboard.waterdata.usgs.gov/

## The National Water Dashboard

Integrates all USGS current conditions water data and other Federal water information together in one streamlined mobile-friendly interface

Extended to include all U.S. states and territories

Includes:

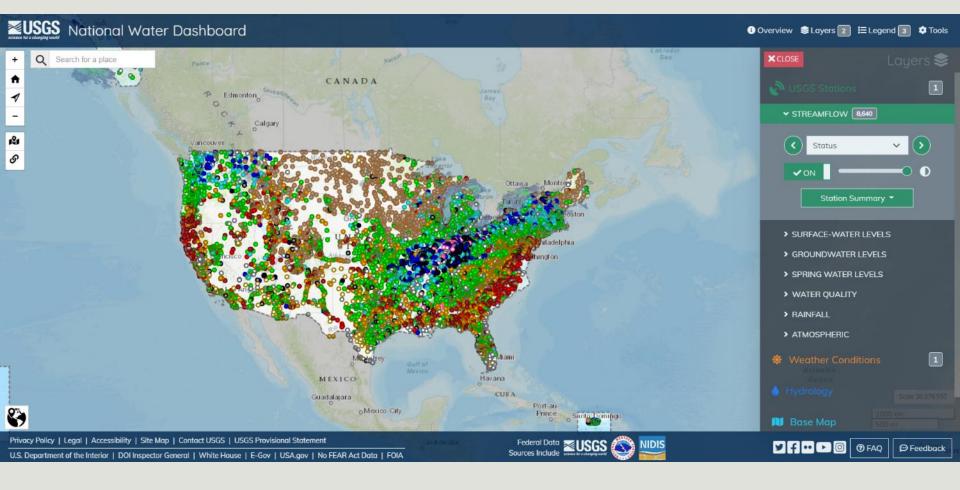
- Flow statistics, weather patterns, forecasts
- Hydrologic context layers



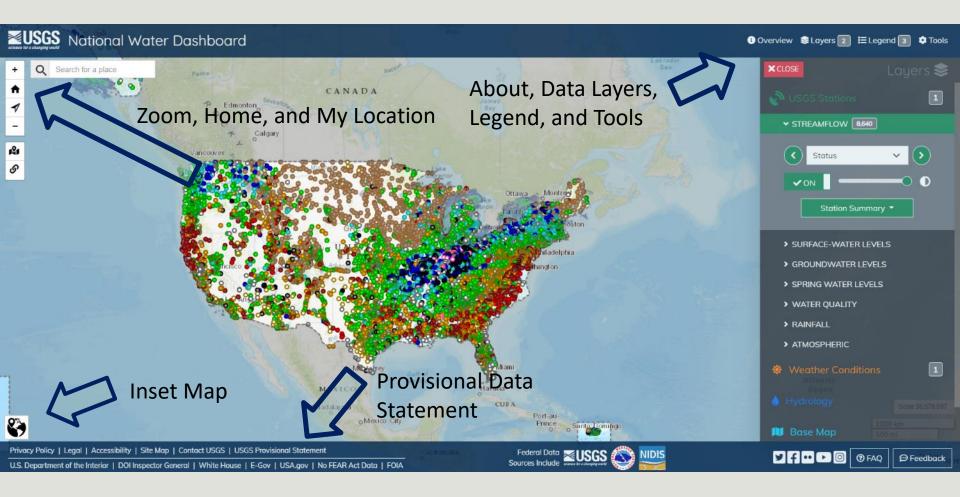
# Start Application Demonstration

https://dashboard.waterdata.usgs.gov/

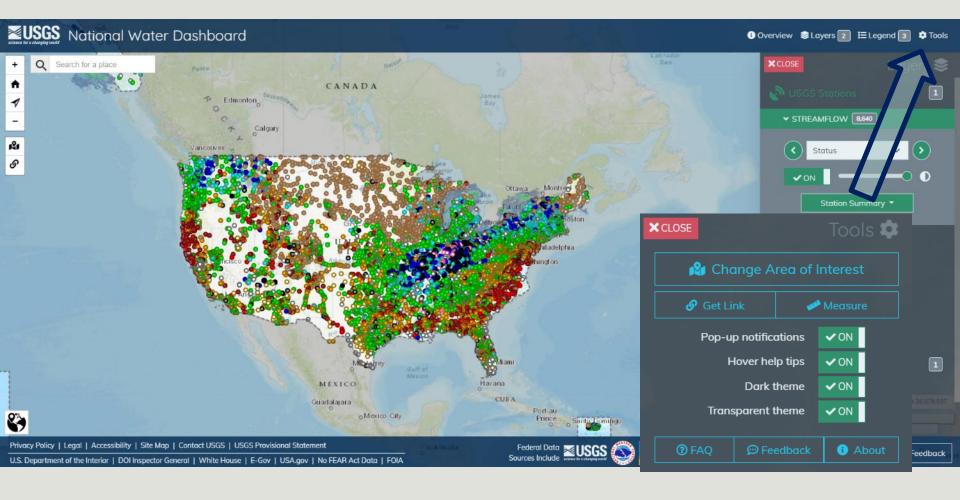




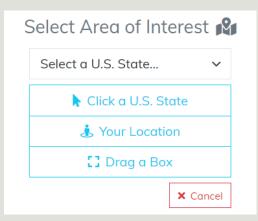


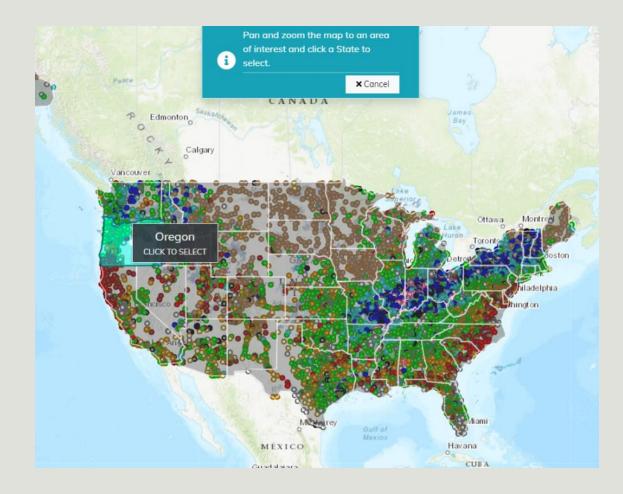




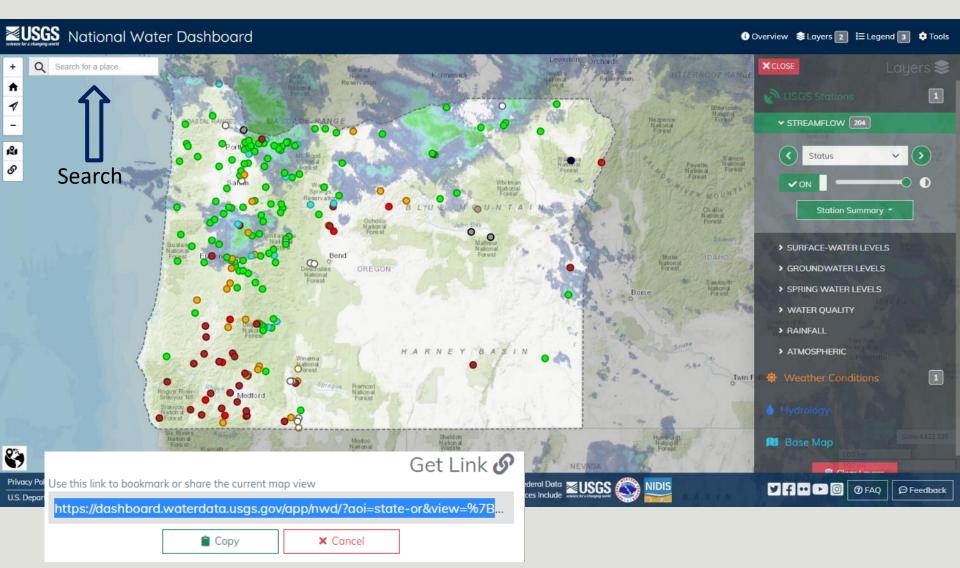






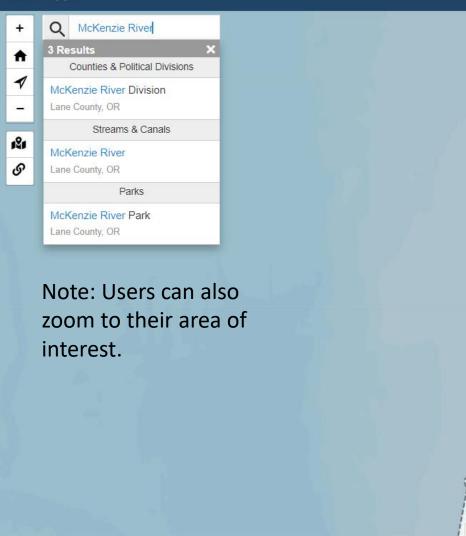


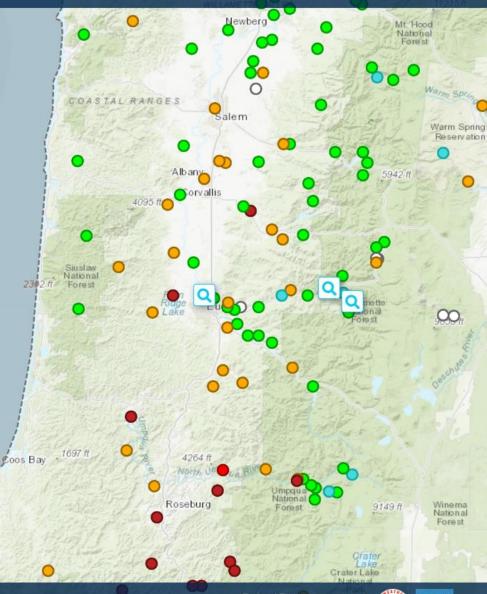






## Science for a changing world National Water Dashboard





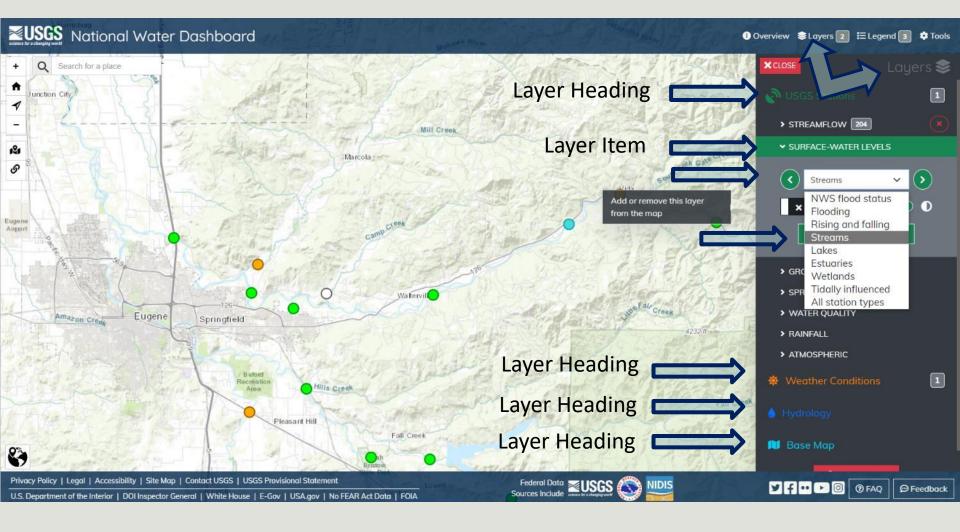


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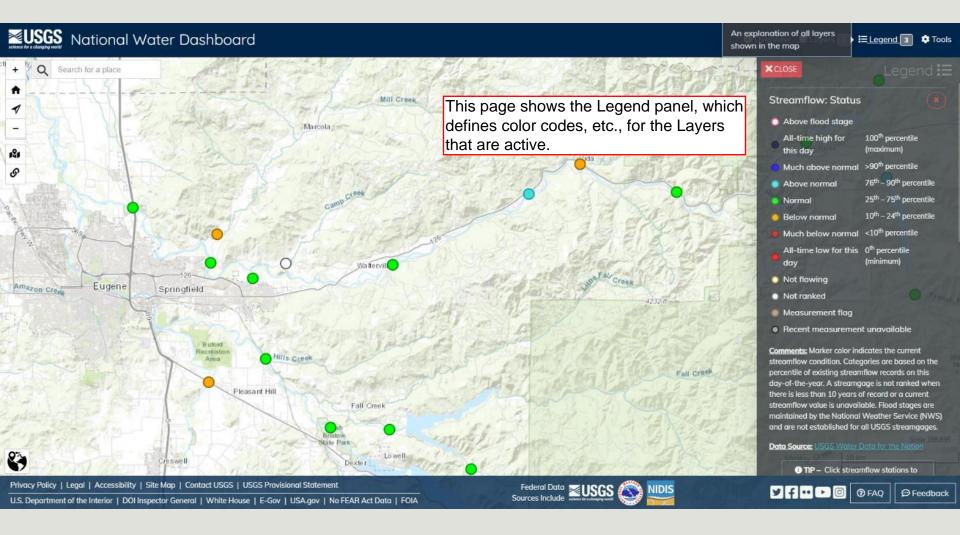
U.S. Department of the Interior | DOI Inspector General | White House | E-Gov | USA.gov | No FEAR Act Data | FOIA



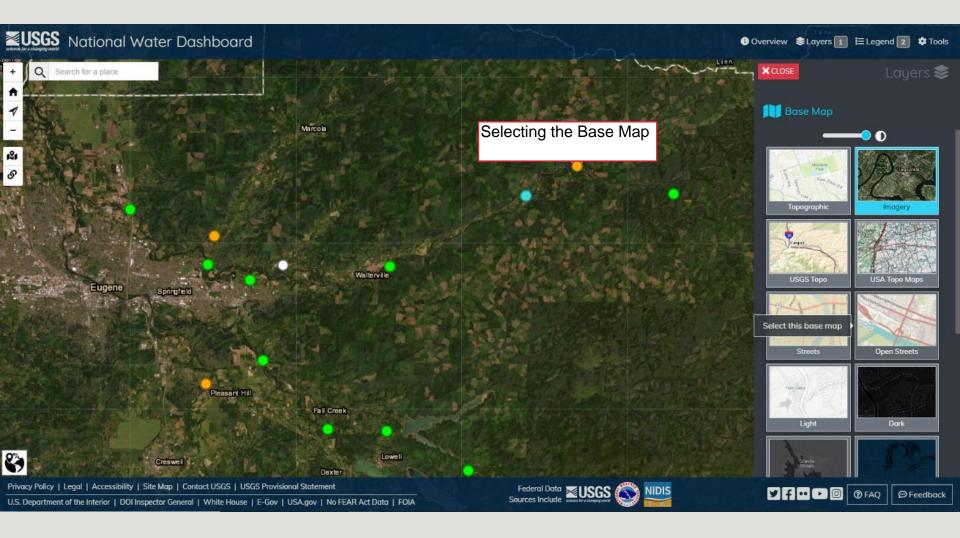








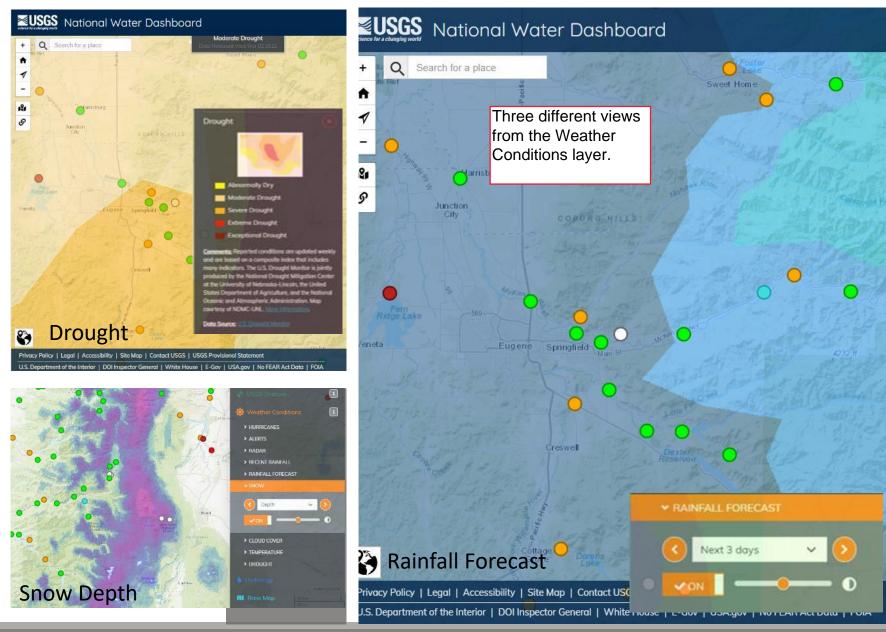




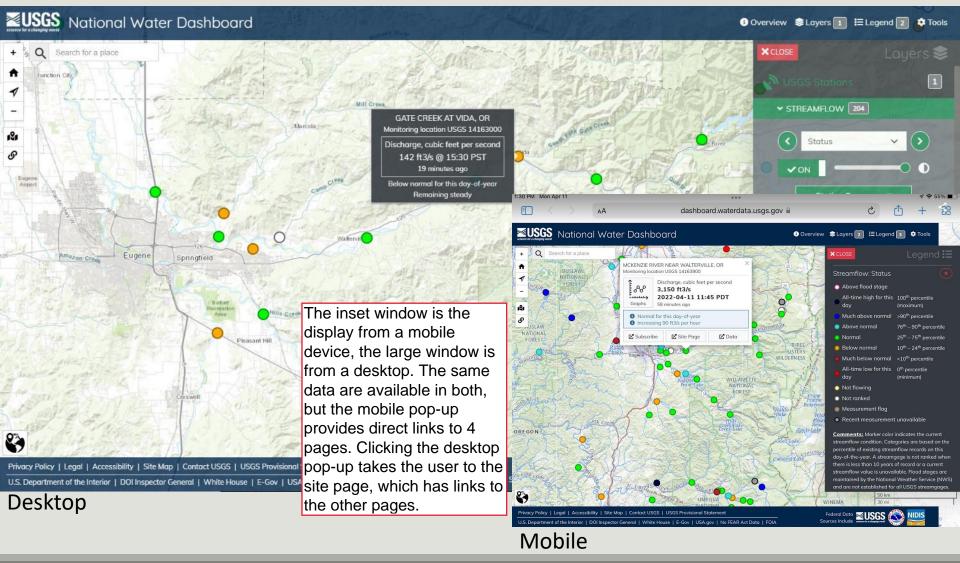














#### Q Search for a place **X**CLOSE Junction City Streamflow: Status Above flood stage GATE CREEK AT VIDA, OR All-time high for 100<sup>th</sup> percentile Marcola Monitoring location USGS 14163000 (maximum) this day 2 Discharge, cubic feet per second Much above normal >90th percentile S 142 ft3/s @ 15:30 PST 76<sup>th</sup> - 90<sup>th</sup> percentile Above normal 19 minutes ago Eugen 25th - 75th percentile Below normal for this day-of-year Normal MCKENZIE RIVER NEAR VIDA, OR Remaining steady 10<sup>th</sup> - 24<sup>th</sup> percentile Below normal Monitoring location USGS 14162500 Much below normal <10th percentile Discharge, cubic feet per second 3.810 ft3/s @ 15:45 PST All-time low for this 0th percentile MCKENZIE RIVER NEAR WALTERVILLE, OR 6 minutes ago (minimum) Monitoring location USGS 14163900 day Eugene Normal for this day-of-year Amazon Crea Springfield Discharge, cubic feet per second Not flowing Decreasing 200 ft3/s per hour 1,670 ft3/s @ 14:45 PST Not ranked 1.1 hours ago Normal for this day-of-year Measurement flag Decreasing 70 ft3/s per hour Recent measurement unavailable Hills Creek Fall Creek Comments: Marker color indicates the current Pleasant Hill streamflow condition. Categories are based on the Fall Creek percentile of existing streamflow records on this day-of-the-year. A streamgage is not ranked when It is not possible to display there is less than 10 years of record or a current streamflow value is unavailable. Flood stages are more than one pop-up Christy Cf maintained by the National Weather Service (NWS) Dexter and are not established for all USGS streamgages. window at a time in the Data Source: USGS Water Data for the Na tool. These were compiled 23 for demonstration TIP - Click streamflow stations to Privacy Policy | Legal | Accessibility | Site Map | Contact USGS | USGS Provisional Statement purposes. ♥ f •• ▶ ◎ @ FAQ @ Feedback U.S. Department of the Interior | DOI Inspector General | White House | E-Gov | USA.gov | No FEAR Act Data | FOIA

Overview Stayers 1 ⊟ Legend 2 Stayers

### Elevent for a charging work

## **USGS**





#### Q Search for a place + 4 A Junction City 1 Mill Creek > STREAMFLOW Marcola ✓ SURFACE-WATER LEVELS 276 121 S (>)All station types VON "All station types" Station Summary \* in the Surfacewater Levels layer. > GROUNDWATER LEVELS Amazon Crer gene Springfield In this example > SPRING WATER LEVELS lake stations are > WATER QUALITY shown as squares. > RAINFALL II Creek FALL CREEK LAKE NEAR LOWELL, OR > ATMOSPHERIC Pleasant Hill Monitoring location USGS 14150900 Fall Creek Lake or reservoir water surface elevation above NGVD 1929, feet 700.59 ft @ 15:00 PST Christy Creek 17 minutes ago Remaining steady 🔰 Base Map 23 Privacy Policy | Legal | Accessibility | Site Map | Contact USGS | USGS Provisional Statement Federal Data Sources Include NIDIS ¥f•••© @ FAQ @ Feedback U.S. Department of the Interior | DOI Inspector General | White House | E-Gov | USA.gov | No FEAR Act Data | FOIA

Overview Stayers 1 ⊟ Legend 2 Stayers

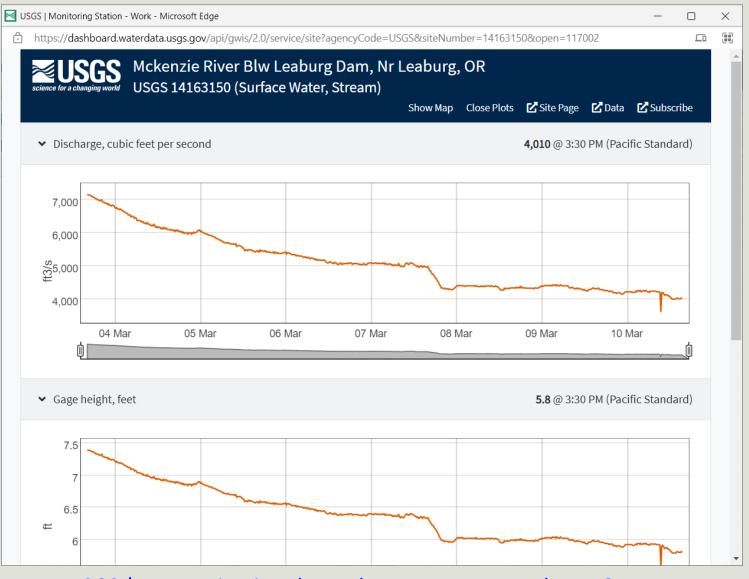
### National Water Dashboard



#### National Water Dashboard + 4 Q Search for a place X CLOSE A Junction City, Mill Creek > STREAMFLOW GATE CREEK AT VIDA, OR Rarcola > SURFACE-WATER LEVELS 276 121 Monitoring location USGS 14163000 Temperature, water, degrees Celsius > GROUNDWATER LEVELS S 7.1 deg C @ 15:30 PST 24 minutes ago > SPRING WATER LEVELS Increasing 0.4 deg C per hour ✓ WATER QUALITY 135 MCKENZIE RIVER NEAR VIDA, OR Monitoring location USGS 14162500 Water temperature V Temperature, water, degrees Celsius Waltervil 6.4 deg C @ 15:45 PST Amazon Cres gene 15 minutes ago VON Springfield Increasing 0.4 deg C per hour > RAINFALL Fall Creek Pleasant Hill > ATMOSPHERIC Fall Creek Christy Creek 🔲 Base Map 23 Privacy Policy | Legal | Accessibility | Site Map | Contact USGS | USGS Provisional Statement Federal Data Sources Include NIDIS ¥ f •• • 0 2 @ FAQ @ Feedback U.S. Department of the Interior | DOI Inspector General | White House | E-Gov | USA.gov | No FEAR Act Data | FOIA

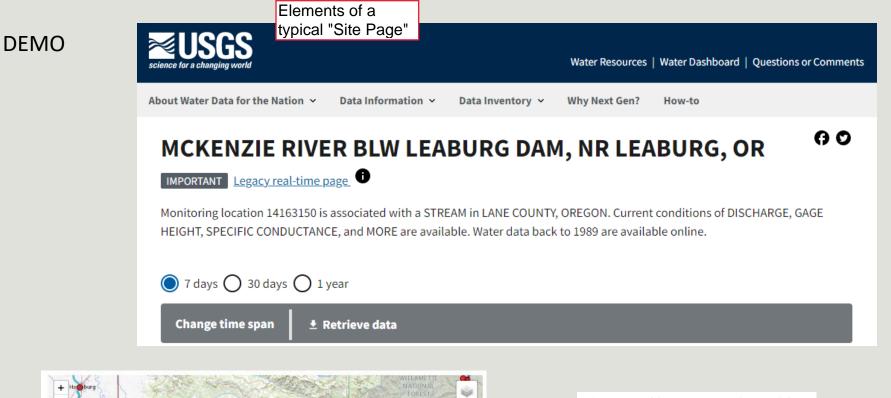
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USGS | McKenzie Rivr Blw Leaburg Dam near Leaburg, OR







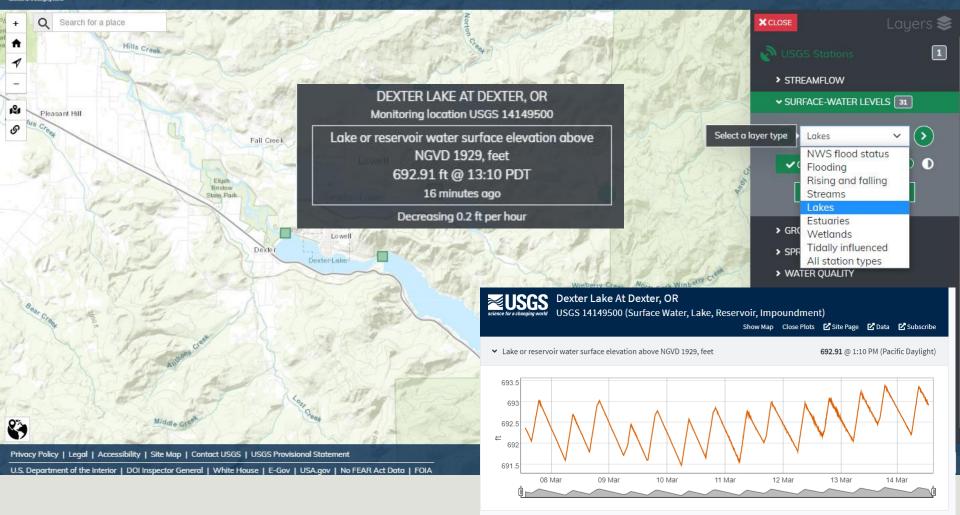




The inset window shows this station's detail page.

#### **USGS** National Water Dashboard

Overview 象Layers 1 ☵ Legend 2 ‡Tools







**≊USGS** 

Science for a changing world Middle Fork Willamette River Near Dexter, OR USGS 14150000 (Surface Water, Stream)

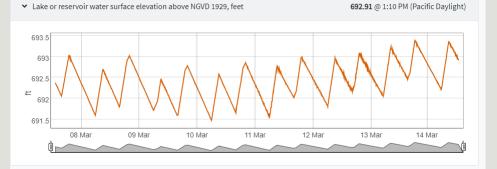
Show Map Open Plots 🗹 Site Page 🗹 Data 🗹 Subscribe





Show Map Close Plots 🗹 Site Page 🗹 Data 🗹 Subscribe

You can open multiple detail station pages simultaneously. In this example Dexter lake's level and its downstream outflow in the MF Willamette.



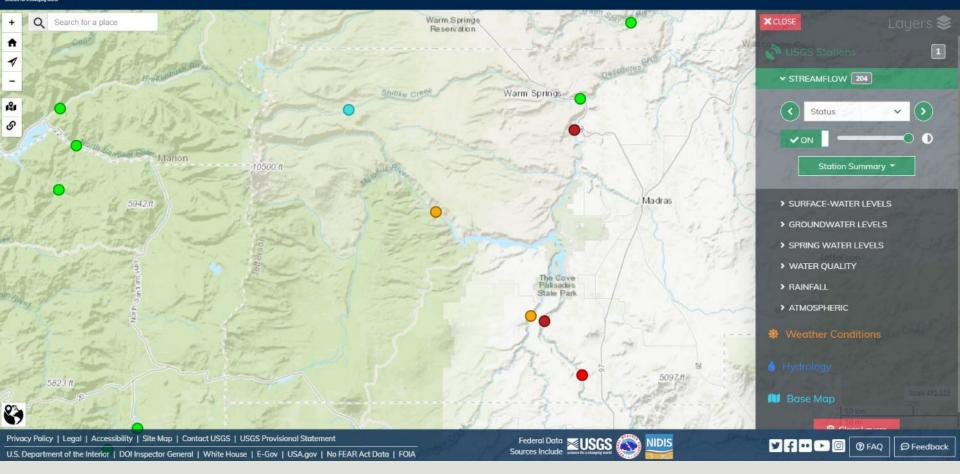
USGS 14149500 (Surface Water, Lake, Reservoir, Impoundment)

**≥USGS** 

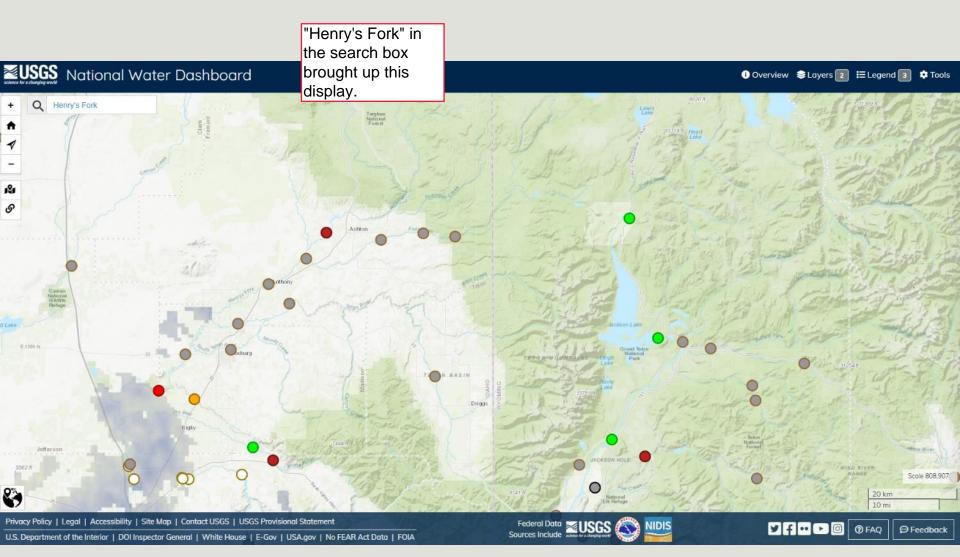
## Viewing another geographic area.

**USGS** National Water Dashboard

Overview Stayers 1 IE Legend 2 Overview Stayers 1 IE Legend 2 Overview









#### Glacier National Park search.

#### **USGS** National Water Dashboard Overview SLayers 2 ⊟ Legend 3 Tools Q Glacier National Park + Kimberley **3 Results** A Lethbridge **Counties & Political Divisions** 1 Glacier National Park Division Cranbrook Flathead County, MT -0 Glacier National Park Division 121 Glacier County, MT RIVER MILK o Parks RIVER RIDGE RIDGE Glacier National Park LEWIS RANGE Flathead County, MT C OUNITE STATES MOUNTAINS 6986 ft Forest Blackfeet M F FLATHEAD RIVER NEAR WEST GLACIER MT Indian Q Monitoring location USGS 12358500 Reservation Priest Discharge, cubic feet per second 0 1.900 ft3/s @ 16:45 MST Lake Elwell 38 minutes ago Much above normal for this day-of-year Mariles RUM Sandpoint Remaining steady RANGE Cebel MOUNTAINS NE Finths Valional Spokane 0 Reservation 0 Inke Coeur DAlene 000 National Scale 2.311,162 Lat 48.4976 Lon -114.0271 Ookane O SWANRANGE Coeur D'Alene 8 50 km 50 mit Falls Privacy Policy | Legal | Accessibility | Site Map | Contact USGS | USGS Provisional Statement Federal Data SUSGS NIDIS @ FAQ D Feedback Sources Include U.S. Department of the Interior | DOI Inspector General | White House | E-Gov | USA.gov | No FEAR Act Data | FOIA



# Further Information

What Does a USGS Hydrologic Technician Do to Inspect Streamgages? -

https://www.youtube.com/watch?v=UQIBR5vbqyw

How does a USGS Streamgage Work - <a href="https://pubs.usgs.gov/fs/2011/3001/pdf/fs2011-3001.pdf">https://pubs.usgs.gov/fs/2011/3001/pdf/fs2011-3001.pdf</a>

Water Data for the Nation - <u>https://waterdata.usgs.gov/nwis</u>



# Acknowledgments

- Network Operations Management System (NOMS) Team
- **USGS** Water Mission Area
- Oklahoma-Texas Water Science Center
- **Oregon Water Science Center**
- Integrated Information Dissemination Division (I<sup>2</sup>D<sup>2</sup>)



# Questions

