

# H<sub>2</sub>O ops

- P2 Emergency Drinking Water Sources
- P3 Water Shortage Response Plan
- P4 What's Your Drought Risk Number?
- P5 High 5!
- P6 Wildfire Effects

THE DROUGHT ISSUE

SUMMER 2019

## DROUGHT 2019

On April 4, Governor Jay Inslee declared a drought emergency in three basins in Eastern Washington due to below normal snowpack and poor summer streamflow forecasts. Each met two factors considered for any emergency drought declaration: water supply conditions currently or projected to be at or below 75 percent of average, and a projection of undue hardships.

Then, on May 20, Governor Inslee expanded the drought emergency declaration to cover nearly half of Washington state due to worsened, poor water supply conditions and warmer and drier weather predictions through the summer.

The expansion included 24 more watersheds, bringing the total to 9 in Eastern Washington and 18 in Western Washington.

In Washington, there are three “flavors” of drought:

1. Low winter precipitation.
2. Dry summer.
3. Warm winter temperatures.

So far this year, the State Climatologist’s Office says we’re having a low winter precipitation drought. But, forecasts call for warmer than normal temperatures this summer continuing into the fall, which could worsen already dry conditions across the state.

The governor’s drought declaration authorizes state funds to help eligible water systems address water shortage-related hardships. Eligible projects include:

- ◆ Reimbursement for trucking water when a municipal supply has been exhausted.
- ◆ Developing new sources of water supply, or mitigating use of existing emergency sources to supplement an insufficient source.
- ◆ Transportation of emergency water supplies for public health and sanitation.
- ◆ Implementing water conservation strategies.
- ◆ Water-use reduction programs and activities, including leak detection or other water conservation actions that can lead to demonstrable reduction in water demand or increased availability.

Applicants must pay a cost-share of at least 50 percent, unless they qualify for an exemption (WAC 173-167-030(3)). Ecology will award these funds on a first-come, first-served basis. More information is available at [ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Drought-emergency-grants-2019](http://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Drought-emergency-grants-2019).

Our Drinking Water State Revolving Fund Program will allow water systems to get loans for emergency recovery activities. The program will assist water systems that lose critical drinking water services or facilities during an emergency and demonstrate substantial financial need. For information, please contact Janet Cherry at [Janet.Cherry@doh.wa.gov](mailto:Janet.Cherry@doh.wa.gov) or 360-236-3153. ◆

## HELP IS CLOSER THAN YOU THINK!

During a drought, one of your best allies is your customers and their efforts to use water wisely. If your water shortage response plan depends on customers reducing demand, make sure your governing body adopts curtailment measures and ways to enforce them before a shortage occurs. You need to have them ready before you need to use them.

### Ways customers can help:

- ◆ If you water your lawn, keep water off sidewalks and avoid watering between 9 a.m. and 5 p.m. Sun evaporates water quickly, so if you water during the day, you’re not watering your lawn, you’re watering the sky. Instead, water in the early morning, evening, or night and keep the water where you want it—on your lawn.
- ◆ Keep a pitcher of water in the refrigerator. When you want a drink of water, you won’t have to wait for the tap to run cold.
- ◆ Fix a dripping tap. A dripping tap can waste 1,400 gallons of water per year.
- ◆ Taller grass uses less water. Set the blade on your mower slightly higher and save on watering time.
- ◆ Take shorter showers. Showers can use 1.5 to 11 gallons per minute. Consider getting an aerated shower head, which combines water and air, or inserting a regulator, which puts an upper limit on flow rates.
- ◆ Always run full loads in your washing machine and dishwasher.

Whether it’s a good water year or a bad one, water-wise consumers are helpful. We have bill stuffers you can use to educate your customers. You can get free copies from us, or print your own. Please contact Linda Kuntz at [linda.kuntz@doh.wa.gov](mailto:linda.kuntz@doh.wa.gov) or 360-236-3088. ◆

## EMERGENCY DRINKING WATER SOURCES: ARE THEY READY?

More than 700 Group A public water systems in Washington have at least one emergency water source in case they need additional supply. An emergency source is:

- ◆ Approved by the Department of Health (DOH) for emergency purposes only.
- ◆ Not used for routine or seasonal water demands.
- ◆ Physically disconnected from the system.
- ◆ Identified in the water system's emergency response plan.

During a drought, water systems and their customers should first conserve as much water as possible. Water systems should use emergency sources only when conservation efforts are unable to balance demand with dwindling supplies. If you anticipate possibly using an emergency source, we recommend that you act in advance—before the shortage—to ensure water from the source will provide a safe and reliable level of production.

The primary health concern associated with a well not recently used or tested is acute microbiological and chemical contamination. Bacteria and other microorganisms can cause immediate and severe illness. Unfiltered or inadequately treated surface

water, shallow hand-dug wells, wells directly influenced by surface water, unsealed wells, and poorly constructed or protected springs are examples of sources with a high risk of microbiological contamination.

Additionally, nitrate levels above the drinking water standard pose an immediate risk to unborn babies and children under 12 months of age.

If you are considering the possibility of bringing an emergency water source online as a response to drought conditions, please take the following actions:

- ◆ **Contact your drinking water regional office.** Call us to discuss construction of the source, potential sources of microbiological contaminants in the wellhead area or watershed, and the pumping and pump-control system. The source may need physical improvements before you use it, even if you only plan to use it for a short time.
- ◆ **Disinfect wells.** If your emergency source is a well, plan to disinfect it before placing it into service.
- ◆ **Sample sources and treat accordingly.** Collect at least two coliform samples and one nitrate sample

Before you need it, ensure your emergency source water is clean, safe, and reliable!

from each emergency source before bringing it online. If the samples are coliform-present or exceed the nitrate standard, you must appropriately treat the source. Continuous chlorination with sufficient contact time before the first point of service will be required for wells with detected coliform. Your regional office can advise you about disinfection treatment.

- ◆ **Warn your customers.** If you plan to use an unfiltered surface water source, you must issue a health advisory to all customers before and during the period the source is in service. Using an unfiltered surface source, or an inadequately treated groundwater source under the direct influence of surface water, requires close coordination with your regional office.

Finally, if for any reason you bring an emergency source online without any advanced planning or sampling, you must immediately issue a health advisory to your customers. Consult with your regional office about appropriate tools and language for a health advisory. ◆

## WHAT'S YOUR WATER LEVEL?

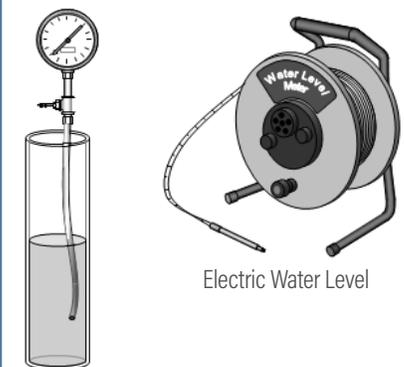
Surface water operators have a visible advantage over groundwater systems; they can see their water supply every time they go to work. Most surface water systems also have gauges to give them an instant update on their water supply. Wells do not have those visual cues unless the water system installed pressure transducers to give them real time water level data. If your wells do not have dedicated measuring devices, are you taking regular water level measurements to know the status of your supply?

Collecting water level information is good, sound, water system management. In the end, it saves time and money. When water system production changes abruptly, pumps fail, capacity drops, or reliability falters, water level measurements can be the key to determining if the problem is the pump, the aquifer, or the well. Knowing the difference is the first step in getting the right fix for the problem.

Water levels in many aquifers follow a natural pattern of seasonal fluctuation, typically rising during the winter

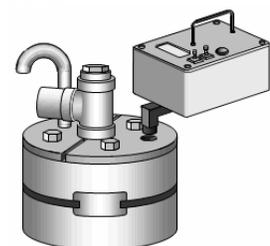
and spring due to greater precipitation and recharge, then declining during the summer and fall due to less recharge, greater demand, and greater evaporation. The magnitude of fluctuation in water levels can vary greatly from season to season and from year to year as climatic conditions vary. Changes in groundwater recharge and storage caused by climatic variability commonly occur over decades, and water levels in aquifers generally have a delayed response to the cumulative effects of drought. ◆

### TYPES OF MEASUREMENT DEVICES



Air Line Device

Electric Water Level



Sonic Well Sounder

## DO YOU HAVE A WATER SHORTAGE RESPONSE PLAN?

We require all Group A water systems to have a Water Shortage Response Plan. So, if you don't have one, it's time to act—especially with the governor's April 4 drought emergency declaration covering nearly half of our state!

The purpose of a Water Shortage Response Plan is to prevent a drinking water emergency by reducing demand during times of limited supply. It's worked well for many water systems and their communities.

**True events at fictional water systems:** When its creek ran dry, Blue Lagoon Water System lost its main source of supply. When Taylor Valley Water System had to replace its water treatment plant, it lost almost half of its supply for an entire summer. Both water systems and their customers endured by following their Water Shortage Response Plan.

In the end, Blue Lagoon only needed voluntary use restrictions to weather the shortage without resorting to trucking

water. A mandatory outdoor water use ban allowed Taylor Valley to outlast a 40 percent supply deficit without any outages. By knowing the effect a water shortage will have on your community, you can be prepared for that event and prevent a drinking water emergency.

Of course, to prevent an emergency, you must have the plan in place before the shortage occurs. To develop your plan, follow the steps below. See "Resources" for templates and other assistance. 💧

## BUILDING YOUR WATER SHORTAGE RESPONSE PLAN

**Identify events that could cause water shortages.** Using your system's location and experience, develop a list of events that could cause a water shortage. Develop an action plan for each, and assign specific duties to each employee. At a minimum, we recommend that you evaluate the potential for drought, earthquake, high winds, ice storm, flood, equipment failure, construction accident, unusual high customer usage, and variable source production.

**Know supply and demand.** Source and service meters are the best way to get supply and demand information. Meters can show seasonal changes and may identify problems such as declining source production or increasing summer demand due to changing use patterns. This information can help you understand the magnitude of different water shortage events. Your Water Use Efficiency Program also requires source and service meters.

**Define water shortage stages and criteria.** Response requirements vary by event, type, and severity. You need to consider the number of response stages appropriate for the size and complexity of your water system. For example, a voluntary restriction may be enough to reduce demand by 5 percent; but, if you need to reduce by 10 percent or more, mandatory restrictions may be necessary.

**Identify emergency water sources.** First, identify alternate water supply options and determine what, if anything is needed to make the water safe for customers. Will you connect and sample an emergency well, construct an intertie with a neighboring system, truck water in, or provide bottled water? Then, determine the requirements for supplying each type of emergency source to your customers, including public notification.

**Develop a communication plan.** What do customers need to know and how will you tell them? Be sure to explain the response stages, what they mean, and why you developed them. Because customers' actions help to make the event less severe, tell them!

**Plan for demand reduction.** Consider the measures you can use to reduce demand. How will you educate your customers about their responsibilities? Will there be outdoor water use restrictions? Will you increase monitoring and enforcement? Will different customer classes have different restrictions? Will there be rate surcharges?

**Put it all together.** If your response plan includes the expectation that customers will reduce demand, make sure the governing body formally adopts curtailment measures and ways to enforce them before a water shortage occurs. Don't wait until the shortage occurs—you need to have everything ready before you need to implement it. 💧

## RESOURCES

### Call our nearest regional office.

Spokane Valley	509-329-2100
Kent	253-395-6750
Tumwater	360-236-3030

Reference the following publications at [doh.wa.gov/odwpubs](http://doh.wa.gov/odwpubs).

[Preparing Water Shortage Response Plans \(331-301\)](#) 54-page guidance document explains how to develop a short-term emergency water shortage response plan.

[Water shortage response plans for small public drinking water systems \(331-316\)](#) 33-page guidance document helps you

prepare a water shortage response plan. Includes a template.

[Water shortage \(331-463\)](#) 4 pages explain how to prepare, provides key messages for customers, and explains the difference between conservation and water use efficiency. 💧

# WHAT'S YOUR DROUGHT RISK?

## Answer

**Yes:** 3 points.

**No:** 0 point.

**Don't know:** 1 point.

1. Does your system rely on a single source (groundwater or surface water)?
2. Does your system use only surface water?
3. Is your primary source a shallow well (less than 50 ft deep), a spring, or an infiltration system?
4. Do you have a spring or infiltration system with a flow rate (capacity) of less than 10 gallons per minute, or unknown?
5. Do you have a well with a flow rate (capacity) of less than 10 gallons per minute or unknown?
6. Have you experienced water shortages in the past or has your well failed?

7. Is your water supply in the current declared drought emergency watersheds? (Red or pink on Map 1.)
8. If you answered *no* to question 7: Is your water supply in a high-risk watershed? (Orange on Map 2.)

## Bonus Questions

9. Do you have a Water Shortage Response Plan? (If yes, subtract 3 points.)
10. Are you currently measuring the water levels in your wells? (If yes, subtract 3 points.)

**Total Score:** \_\_\_\_\_

## If you scored...

**Less than 4.** Looking good! Dust off your water use efficiency goals and fill in the blanks in your data. Consider monitoring water levels as part of a smart system

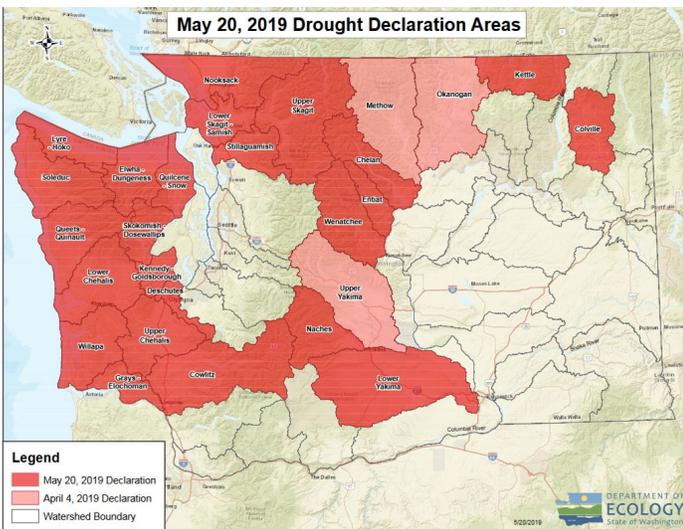
operational plan. Sit back and enjoy the nice weather.

**5-10.** Don't get too comfortable. Recheck what you don't know. Build a Water Shortage Response Plan and start monitoring water levels to help mitigate your risks.

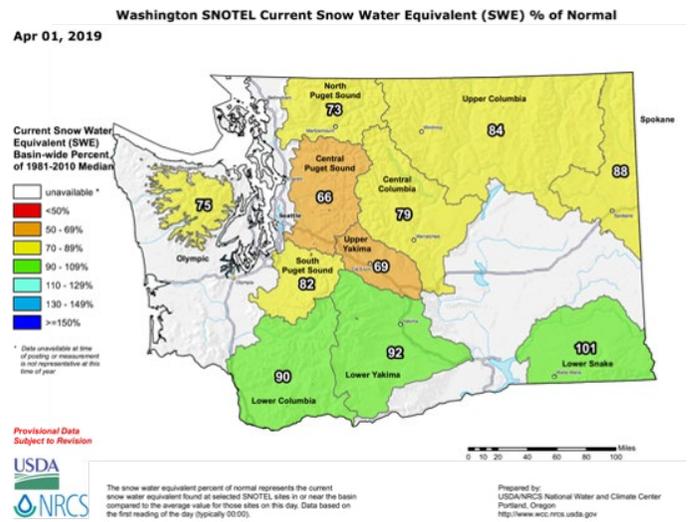
**10 or above.** It is time to pull out that Water Shortage Response Plan and update it! If you don't have one, start one! Monitor your water levels. Talk to your customers and build a conservation strategy to help manage demand if needed. Reach out to our regional office and talk about what you might do to reduce your risks.

**Remember,** just because you have risks doesn't mean you have to end up in an emergency. Smart operators manage risks every day! 💧

Map 1



Map 2



## HIGH 5! INTRODUCING THE COLUMBIA BASIN SUSTAINABLE WATER COALITION

Hats off to the folks at the Department of Commerce who facilitated the establishment of a coalition of stakeholders to help the drinking water systems facing groundwater depletion in the Mid-Columbia Basin. The area of focus includes Adams, Franklin, Grant, and Lincoln counties. Our former Eastern Regional Office Planner, Ben Serr, is working with Cathi Read and Jon Galow, from Commerce's Small Communities Initiative, to lead the outreach effort.

Although the root cause of this problem is more complex than seasonal drought conditions, steps taken to address the issue serve as a model for addressing current and future drought elsewhere.



Ben Serr, Senior Planner, Department of Commerce

More than 130 Group A community water systems in the area, serving about 92,000 residents, rely on groundwater for drinking water.

The demand these communities and agricultural irrigation place on area aquifers is causing the water table to drop significantly in some areas of the basin. Many of these water systems don't know if or how this situation affects their wells.

The aquifers in the basin do not readily recharge because of the complex geology of the area. The Columbia Basin Ground Water Management Area conducted a carbon dating study of the water from 77 municipal wells and found, on average, the water was 9,200 years old with little to no recharge of the aquifers occurring.

This places water systems in a predicament. They are in an area where water is being withdrawn faster than it can be replaced, they have little control over the demand placed on the aquifers, the cities and towns are economically linked to the farmers using the majority of the groundwater, and there is a lack of data for water systems to use for decision-making purposes.

### Outreach over the last 20 months:

- ◆ A survey of the systems.
- ◆ Analysis of existing data.
- ◆ Informational meetings for stakeholders in each of the four counties.
- ◆ Presentations to the mayor's group in Lincoln County, the Eastern Washington Planners' Forum, and the Columbia Basin Development League.
- ◆ Hosting an agency meeting on long-term monitoring.

- ◆ Facilitating a series of meetings to form a broad-based stakeholder coalition.

The coalition building meetings have been very productive. This spring, a group of stakeholders decided to create the [Columbia Basin Sustainable Water Coalition](#). This is an opportunity for water systems to advocate for themselves around this issue. By getting the attention of policy makers and bringing state and federal resources to the table, the coalition can work to increase local knowledge about the aquifers and promote projects that slow the level of decline.

The coalition established a steering committee of six members and identified a mission.

*The mission of the Columbia Basin Sustainable Water Coalition is to protect and maintain the water supply for present and future generations through active support and involvement of stakeholders to influence policy decisions and water delivery methods.*

Commerce will submit a final report summarizing the project, the status of ongoing local efforts, and recommendations for us before the project ends this summer. ◆

## WAIT, HOW CAN THERE BE A DROUGHT WHEN IT'S RAINING?

BY RYAN LANCASTER, COMMUNICATIONS CONSULTANT, DEPARTMENT OF ECOLOGY

For the past few months, Washington's weather has been all over the map.

Residents of Spokane and the southeast experienced a damp spring, while those in most of western and central Washington have seen unusually warm temperatures and low precipitation since April.

This summer, the usually fire-resistant west side has had a higher risk of wildfires relative to historical norms than most of Eastern Washington, [according to the National Interagency Fire Center](#).

In mid-July, the U.S. Drought Monitor showed abnormally dry to severe drought conditions in all but the southeast corner of our state. Five percent of rivers are at record low, and many western and north central Washington locations expect [50 to 75 percent of normal stream flow](#) through September.

Jeff Marti, Ecology's Water Resources Program drought coordinator, says recent precipitation was a welcome change, but it didn't make up the deficit caused by abnormally warm conditions and a lack of snowpack.

"Parts of the state got some good shots of rain, and some places, like the Olympic Peninsula, really needed it," Marti said. "Some rivers rebounded nicely, but about a quarter are still experiencing flows much below normal."

While cooler weather and some rain bumped up flows that supply irrigation water and support important fish migration in Central Washington, water supply remains in flux. Yakima Basin reservoir levels are at the seventh lowest storage volume in 44 years.

Weather patterns east of the Columbia River varied widely. Northeast Pend Oreille and Stevens counties are in severe drought, while the east side's midsection saw thunderstorms

and flash flood warnings several times over the past few weeks.

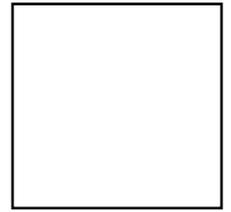
Although NOAA's National Weather Service shows total regional precipitation hovering just under average for the past month, Okanogan and Ferry counties reported crop damage from heavy rains.

Conditions in the southeast mirror most of the U.S., and are wetter than usual. Walla Walla basin water users have seen some low flows, but that's mainly due to normal demand across the border in Oregon.

Taken as a whole, Washington stands in stark contrast to the rest of the country. We just experienced the thirteenth driest July-June period ever recorded while, [according to NOAA](#), the continental U.S. had its wettest 12 months on record. With much of the summer yet to come, resolving this drought will require more than scattered showers. ◆



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*H<sub>2</sub>Ops* is a publication of the Washington State Department of Health Office of Drinking Water, 331-500. If you want to receive this publication in an alternative format, call 800-525-0127 (TDD/TTY call 711). This and other publications are available at [doh.wa.gov/drinkingwater](http://doh.wa.gov/drinkingwater).

♻️ Printed on recycled paper.

A photograph of a wildfire at night, with bright orange and yellow flames and smoke rising from a forested hillside.

## WILDFIRE AND ITS EFFECTS ON DRINKING WATER QUALITY

Drought often fuels wildfire and creates a myriad of challenges for water systems. While certified waterworks operators and owners work hard to provide safe and reliable drinking water for their communities, the unpredictable nature of wildfire can affect many aspects of the water delivery system. Consequences range from immediate effects during a fire to long-term alteration of watersheds.

During a fire, power outages, closed or damaged roads that limit access to water treatment plants, and damage to facilities may make it difficult to ensure the safety of a water supply. After a fire, the potential effects of wildfire on municipal water supplies and the surrounding areas include:

- ◆ Changes in the magnitude and timing of snowmelt runoff, which influence filling of water-supply reservoirs.
- ◆ Increased turbidity (cloudiness caused by suspended material), or heightened iron and manganese concentrations, which may increase chemical treatment requirements and produce larger volumes of sludge. Both would raise operating costs.
- ◆ Changes in source-water chemistry that can alter drinking-water treatment.
- ◆ Fire can soften plastic distribution piping which may cause it to release benzene making the water nonpotable.
- ◆ Fire retardant could increase levels of phosphate, nitrite and nitrate in soil and water.
- ◆ Post-fire erosion and transport of sediment and debris to downstream water treatment plants, water supply reservoirs, and aquatic ecosystems.

If a wildfire burns in the watershed that supplies your system, contact our nearest regional office to discuss steps you can take to ensure your system suffers no lasting effects. ◆