

Pacific Northwest Water Year Report Finds Drought Conditions Worsening

The recently released *Pacific Northwest Water Year Impacts Assessment* report, a collaboration by several regional agencies, found that the October 1, 2020 to September 31, 2021 water year was one of the worst on record as far as rainfall and heat levels, and will contribute to the already concerning drought conditions we are now experiencing in the Pacific Northwest.

The report was compiled by researchers at the Office of the Washington State Climatologist, Climate Impacts Group, Oregon State Climatologist, Idaho Department of Water Resources, and NOAA National Integrated Drought Information System, with data gathered through meetings and discussions, surveys, and author expertise. The report will be used as a resource for future management of drought and other climate extremes.

Among the initial findings reported in the Executive Summary were the following startling revelations:

- The 2021 water year in Washington, Oregon, and Idaho (the Pacific Northwest; PNW) tied as the 5th warmest and 17th driest since records began in 1895. Parts of western Washington and coastal Oregon were the exceptions, with near-normal water year temperatures and precipitation.
- Drought worsened region-wide throughout the water year and a record dry spring was a major contributor to deteriorating conditions. For the PNW, March-May precipitation was the 2nd driest (45% of the 1981-2010 normal) since 1895 and the driest since 1924.
- An exceptionally warm summer, including a record-breaking heat wave in late June, worsened drought conditions and caused high evaporative demand. Averaged

throughout the PNW, June-August ranked as the warmest on record (+4.5°F above the 1981–2010 normal).

- The exceptionally dry spring and summer combined with the warm summer caused the 2021 PNW drought, and the persistence of drought conditions over at least the last 2 water years in parts of the region also contributed.

The report finds that the drought conditions in the region impact a wide range of economic and social sectors, including agriculture, forestry, drinking water, fisheries, and recreation. Impacts included less surface water available for agriculture and fishes, water rights restrictions, reduced crop yields, plant stress, tree mortality, and voluntary water restrictions. Impacts were particularly widespread in central and southern Oregon, eastern Washington, and the Big Wood, Little Wood, Big Lost, and Little Lost River basins in Idaho. The June heat wave scalded and scorched crops, caused tree seedling mortality, and mortality of shellfish in the intertidal, and damaged transportation infrastructure. Human health impacts from the heat, such as increased hospitalization and even death, were widespread.

In response portions of Idaho, Oregon, and Washington issued State drought declarations as early as March 31 and as late as November 17, 2021. Burn bans were issued for parts of Washington, Oregon, and Idaho and the use of certain recreational areas was limited during the wildfire season. Other responses included water systems requesting voluntary water restrictions, and agricultural operators changing cattle feeding routines and watering schedules.

In its “Lessons Learned” section, the report found:

- Rapid changes in conditions, like the heat wave in June 2021, demonstrate the need to consider a broader set of potential conditions when planning for drought.
- The extreme impacts of those unprecedented conditions show the importance of planning and preparing for short-term extreme temperatures and conditions.
- Water supply conditions were experienced differently by different types of agricultural producers depending on the source of their water supply, revealing a gap in the State drought response.
- Compounded impacts of climate change and variability are becoming more diverse and affecting natural resources, agriculture, and water supplies.
- Multiple-year impacts of drought are becoming possible.
- Regular collaboration on drought conditions and sharing of data is valuable and needed and the information related to climate impacts are becoming more diverse. As an example the general public is becoming more interested in ecological drought and how it impacts water supply beyond drinking water, hydropower, and irrigation.

The report goes on to detail a number of factors relating to how the 2021 Water Year evolved, using colorful graphs and charts to explore data around temperature anomalies, the seasonal progression of temperature and precipitation, and the impact of snowpack. The report summarizes impacts to the specific Water Year sectors, including drinking water (declining groundwater levels, voluntary water conservation, use of backup water sources, harmful algae blooms), agriculture (water rights restrictions, reduced crop yields and values, animal stress), forestry (leaf and needle drop, seedling mortality, limited access for operations and loss of timber due to wildfire, greater incidence in disease), fisheries (reduced stream flow, poor water quality, fish mortality, changes in timing of fish migrations, less food available for fish, fish passage blocked), hydropower (reduced power generation, lower reservoir levels), and recreation (limited sites for activities, closures due to wildfire and smoke, shortened seasons, reduced revenue).

The full report can be found at <https://www.drought.gov/documents/2021-pacific-northwest-water-year-impacts-assessment>.

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