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Drought Update for the Week of Sept. 6

SALT LAKE CITY (Sept. 9, 2021) – Shorter days and cooler nights have reduced evaporative demand, which means we aren't losing as much water to the air. As a result, outdoor watering can be reduced. About 88% of the state is still in “extreme” or “exceptional” drought, as categorized by the [U.S. Drought Monitor](#). However, 4% was downgraded from “exceptional” to “extreme.”

“Late-season rains have helped vegetation green-up, but long-term effects are still very visible in reservoir storage and the environment,” said Utah Department of Natural Resources Executive Director Brian Steed. “We appreciate those who have used less water this season. Being mindful of water use is essential to stretch the limited supply.”

The following [drought](#) impacts from the week of Sept. 6 are compiled by the Utah Divisions of [Water Resources](#), [Water Rights](#), [State Parks](#), the [Department of Environmental Quality](#) and the [Department of Agriculture & Food](#).

At-a-glance changes for the week:

- Due to low water levels, the Division of Water Quality was unable to access the Palisade Reservoir for waterborne pathogen testing. Visitors can learn how to keep themselves and their families safe in recreational waters [here](#).
- Thirty-one of Utah's largest 42 reservoirs are below 55% of available capacity (32 last week, with Lower Enterprise improving due to upstream releases.) Overall statewide storage is 50% of capacity, slightly less than last week.
- Of the 98 measured streams, 44 flowed below normal this week compared to 46 last week.
- Boat ramp closures remain the same as last week, with 12 closures at 10 state parks, including Jordanelle, Antelope Island, Echo, Hyrum, Millsite, Piute, Rockport, Quail Creek, Willard Bay and Yuba. However, at least one additional closure is expected. Gunlock is scheduled to close its boat ramp by this weekend. Caution advisories have been issued for seven additional state park boat ramps. View conditions [here](#).



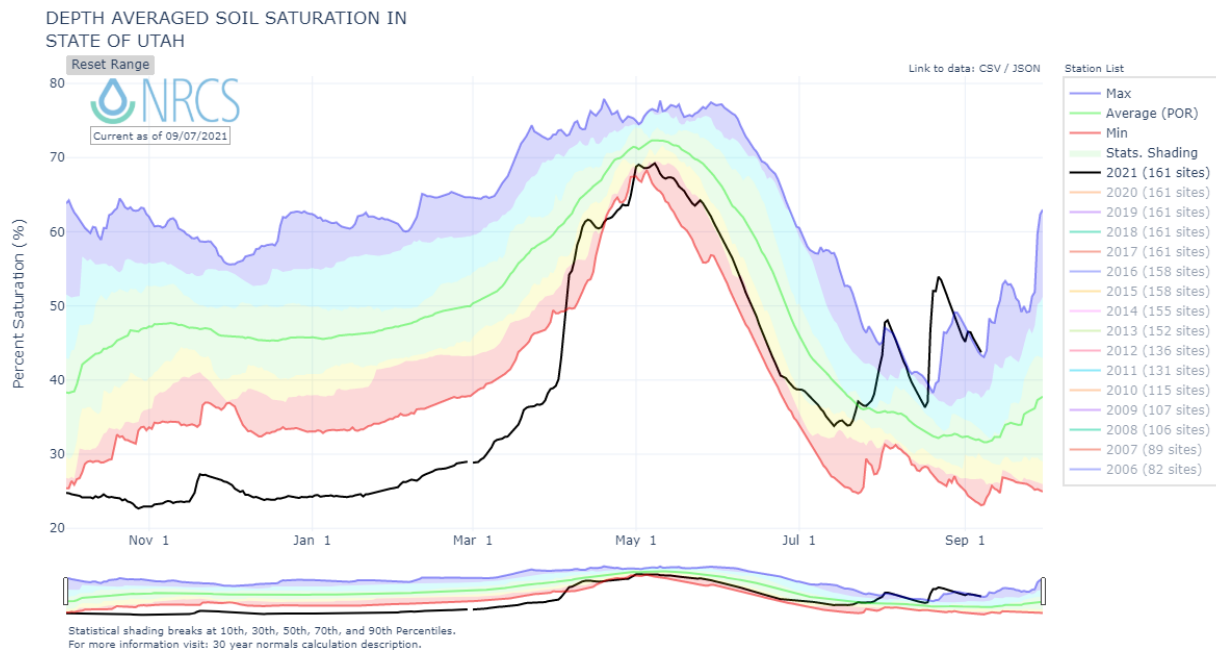
- Drought pressures continue to negatively impact Utah farmers and ranchers causing decreased yields and extreme additional expenses for feed, transportation and water hauling.
- Due to limited water and forage, livestock are being moved from pasture earlier than average across the state.
- Recent monsoonal rains brought a slight reprieve to ranchers relying on rangeland in Central and Southern Utah with reports that some areas have more forage growing now than when cattle began to graze in the area in early June.

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FULL REPORT: WEEK OF AUG. 30

Precipitation and soil moisture

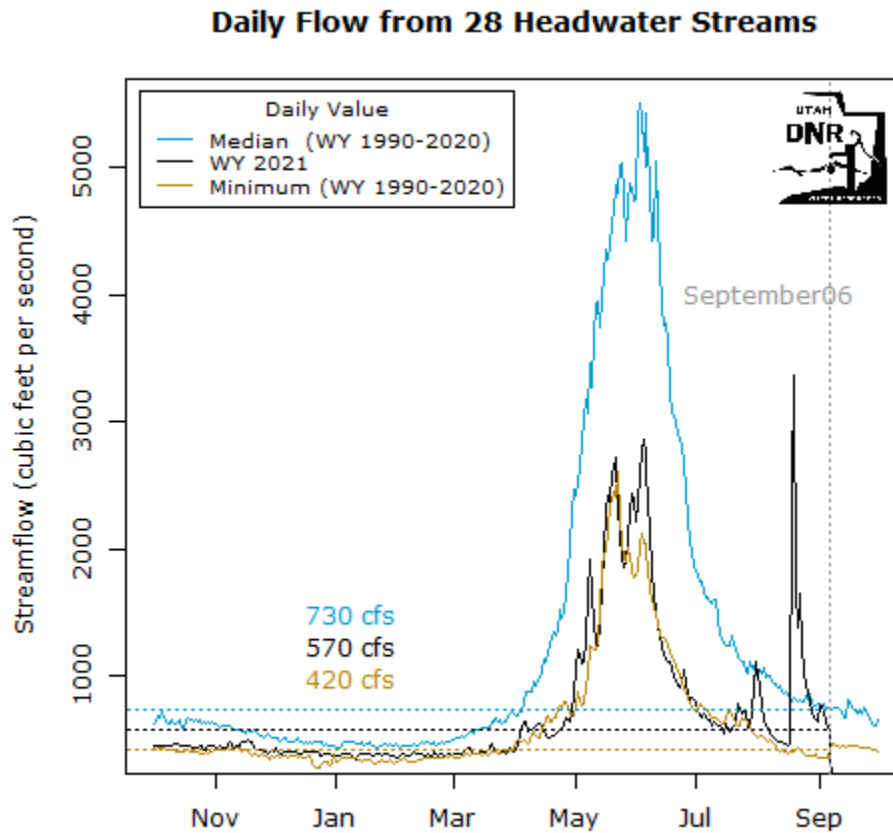
- Precipitation accumulation (as measured at NRCS SNOTEL sites) continues to be well below average. To restore conditions to “average” for the year, Utah still needs about 8 inches of rain between now and the end of September.
- Overall (mountain and valley locations), the state has seen 76.5% of the precipitation typically received in a normal water year (Oct. 1 through Sept. 30).
- To get streams running at healthy levels while filling reservoirs, Utah needs late summer and early fall storms to return soil moisture levels to normal, which will help snowpack runoff make it to streams and reservoirs rather than get absorbed by dry soils. The state also needs an above-average snowpack to refill reservoirs.
- Air temperatures for the week were 0.5 degrees Fahrenheit below average.
- Soil moisture remains high at 11.8% above average (14.1% last week) for this water year. Wet soils are critical in the fall as the state begins to accumulate its winter snowpack. As seen in the chart below, significant increases and decreases in soil moisture are typical for late summer.



Recent rainstorms are reflected as a significant increase in soil moisture followed by a significant decline in the state soil moisture sensors (found at mountain [SnoTel sites](#)). Healthy soil moisture levels allow snowpack runoff to enter the streams and reservoirs rather than get absorbed by dry soils. Monsoonal patterns never occurred the last two years, leading to record dry soils in October 2020 and throughout the winter (reflected in the graph above).

Streamflows

- Cumulative flow of 28 headwater streams is tied for the lowest on record for the previous 30 years.
- Forty-four (46 reported last week) of Utah's 98 streams reporting data are flowing below normal. Temporary high flows due to rainstorms have receded and streams are returning to lower flows typical of this year.
- Five streams are flowing at their lowest levels ever recorded, two more than last week.
- Daily flow from 28 headwater streams has decreased as the effect from rainfall recedes. Flow is currently between the 30-year median and minimum.



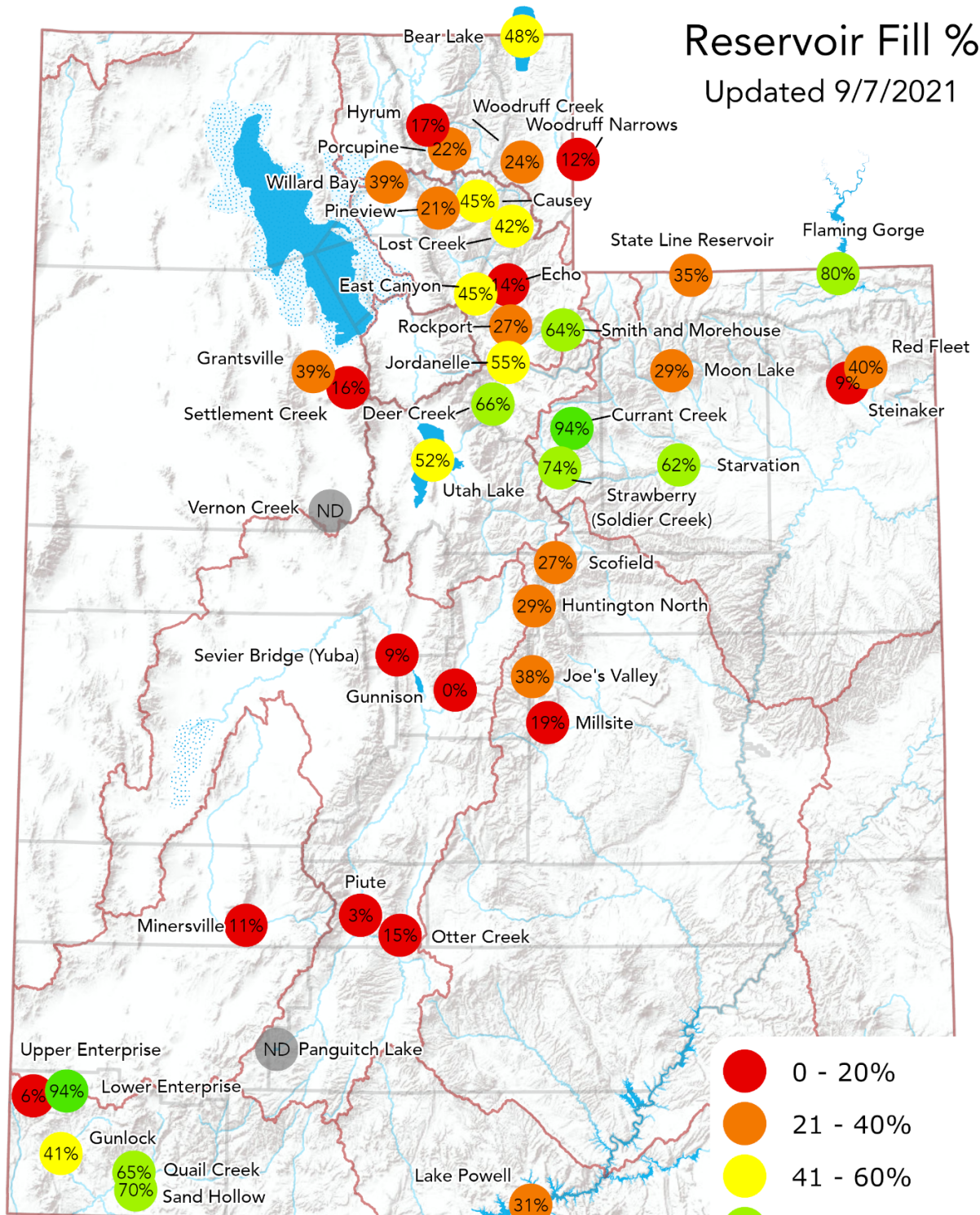
Flows for 28 headwater streams were added together to show how Utah's water supply is being affected. This chart shows the Water Year (WY) from October to September as compared to the median and minimum values (1990-2020). Significant increases from recent storms can be seen. Unfortunately, a few days of high flows don't make up for over a year of near-record low flows.

Reservoir and Lake Levels

- The capacity of major reservoirs statewide dropped to 50% (51% last week).
- Thirty-one of Utah's largest 42 reservoirs are below 55% of available capacity (32 last week with Lower Enterprise increasing due to upstream releases).
- The Great Salt Lake's elevation dropped to 4190.8, about 7 inches below the record low.

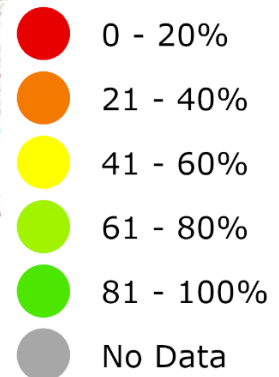
Reservoir Fill %

Updated 9/7/2021



Data Sources

Bureau of Reclamation, Bear River Commission,
Emery Water Conservancy District,
Sevier River Water Users Association,
Washington County Water Conservancy District



Drought Effects on Priority Distribution of Water Rights in Utah (updated Sept. 7)

Water rights are distributed by the state engineer with priority going to the earliest rights. For example, a water right established in 1889 is entitled to receive its full flow before water rights established in 1890 or later can receive any water. This principle is called the “Prior Appropriation Doctrine” or “first in time, first in right.” The earliest water rights in Utah are called “direct flow” rights, meaning they cannot be stored. Storage reservoirs were built later on, so storage rights generally have priority dates later than direct flow rights. However, some “high” water rights (direct flow rights with late priority dates) exist.

While public water suppliers own some water rights, others are held by individuals like farmers and ranchers. Priority distribution happens every year, not just during droughts, and occurs irrespective of the type of use. Most water rights are fully or partially curtailed by mid-summer when the natural flow of a stream drops following spring runoff. The term “natural flow” refers to the total supply of a stream, which is generally different from the flow of the stream at any particular point.

Natural flow on complex systems is determined using accounting models developed by the Division of Water Rights. Water can be stored on the system when the natural flow is greater than 100% of the direct flow rights. When the natural flow drops below 100% of the direct flow rights, these rights are reduced according to priority date. Storage, if available, can be released to make up all or part of the deficit. The amount of storage available on each system is a function of the specific projects developed on the system over the last hundred-plus years. This year has seen an early decrease in natural flow because of very little spring runoff. In previous years systems were generally storing water in mid-June, sometimes in considerable amounts, while 2021 has seen some of the earliest water rights being curtailed.

While statewide, there are many different river systems, the information below highlights water rights priorities, natural flow and direct flow on just four of them. CFS below stands for cubic feet per second.

Middle Bear River – Priorities: Direct Flow (1860 - 1909), Storage (1911), High Rights (1914 - 1989)

<i>Date</i>	<i>Priority from River</i>	<i>Natural Flow</i>	<i>% Direct Flow Rights</i>
Aug 26, 2019	1899	689 cfs	49%
Aug 26, 2020	1899	740 cfs	53%
Aug 26, 2021	1897	651 cfs	47%

- Currently, only 47% of the direct flow water rights are being met with earliest priority rights being fulfilled from 1860 to 1897.

Upper Provo River – Priorities: Direct Flow (1st Class - 17th Class), Storage

<i>Date</i>	<i>Priority from River</i>	<i>Natural Flow</i>	<i>% Direct Flow Rights</i>
Sep 7, 2019	50% 1 st Class	78 cfs	17%
Sep 7, 2020	40% 1 st Class	62 cfs	14%
Sep 7, 2021	60% 1 st Class	94 cfs	21%

- Currently, 21% of the direct flow water rights are being met, consisting of 60% of 1st Class rights.

Upper Duchesne River – Priorities: Direct Flow (1900 - 1964), Storage (1964)

<i>Date</i>	<i>Priority from River</i>	<i>Natural Flow</i>	<i>% Direct Flow Rights</i>
Sep 6, 2019	Storage	374 cfs	34%

Sep 6, 2020	1910	173 cfs	16%
Sep 6, 2021	1918	312 cfs	28%

- Currently, 28% of the direct flow water rights are being met with the earliest priority rights being fulfilled from 1900-1918.

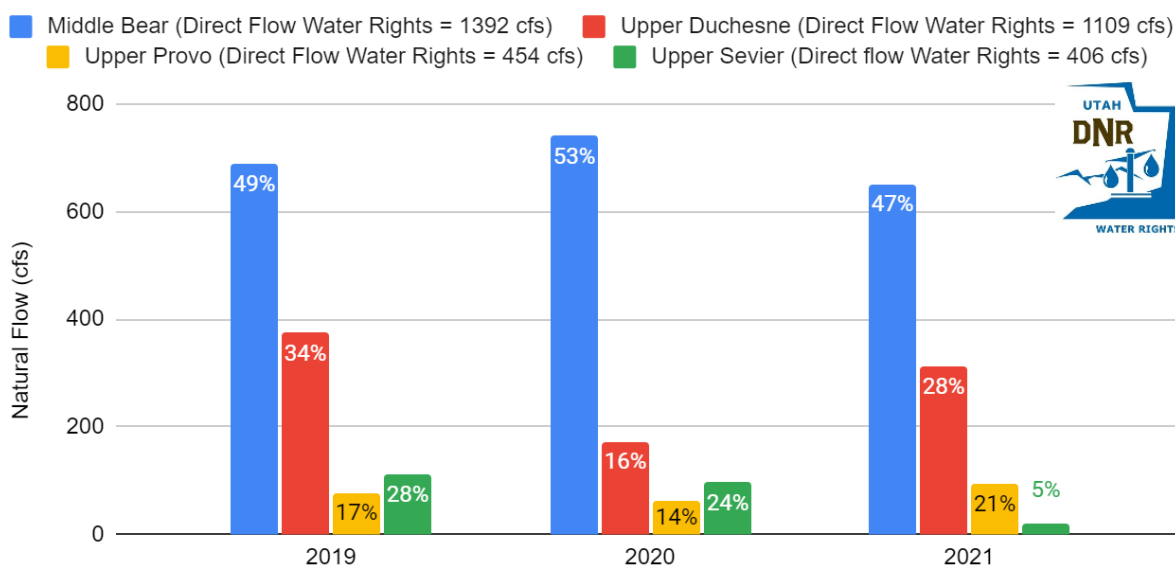
Upper Sevier River – Priorities: Direct Flow (1st Class – 3rd Class), Storage

Date	Priority from River	Natural Flow	% Direct Flow Rights
Sep 6, 2019	37% 1 st Class	112 cfs	28%
Sep 6, 2020	32% 1 st Class	96 cfs	24%
Sep 6, 2021	6% 1 st Class	19 cfs	5%

- Currently, 5% of the direct flow water rights are being met, consisting of 6% of 1st Class rights.

Natural Flow Distribution on Four River Systems (Sep 7)

Percent Values Greater than 100 Indicate Water Being Stored



Well Replacements

In addition to surface water rights, the state engineer oversees groundwater appropriation and construction of groundwater wells. As groundwater conditions change, well owners may need to replace their well. This may be due to issues with the existing well or the need to drill deeper. When this happens, a water user files either a replacement or renovate application. In some cases, a change application may need to be filed. This is dependent on the individual status of the user's water right.

- One new well-replacement application was filed in the last week. The total number of replacement and deepening requests this year is 108 statewide.
- As a comparison, there were 113 in 2020 and 102 in 2019. The average annual count during the past five years is 107.