

Utah Climate and Water Report

October 1, 2024



View of Chilly Peak near Liberty, Utah Photo by Kori Mooney

Utah General Summary October 1, 2024

This report is organized to reflect two distinct geographic areas being monitored – the low elevation valley sites (Soil Climate Analysis Network) that are critical for agricultural production and operations, and the high elevation mountainous areas where water supply is generated (SNOw TELemetry). Questions, comments and suggestions are welcome and should be directed to jordan.clayton@usda.gov.

<u>Valley Conditions (SCAN) as of October 1st</u>: The 2024 water year definitely had its ups and downs for Utah's valley locations and ended up pretty close to normal. Utah received 0.3 inches of precipitation at our SCAN sites during September (well below normal), which brought our final value for water-year-todate precipitation down to 99% of median. Statewide soil moisture at Utah's SCAN sites ended the month below normal at 36% of saturation, which was 3% lower than last year at this time. Similar to last year, soils at our SCAN sites ended the water year somewhat wet in some areas but alarmingly low in others. For example, soil moisture in the Uinta Basin, Western Utah, and St George region is in the bottom 10th percentile, in contrast to Southeastern Utah where soils have well above normal moisture content.

<u>Mountain Conditions (SNOTEL) as of October 1st</u>: If you're a fan of seesaws, this summer's mountain precipitation in Utah was for you. June and July were very dry across the state, August saw significant monsoonal moisture and was well above normal, but then September ended the water year with another disappointing rain total (a meager 0.7 inches of rain, which was 42% of normal) Much like in Utah's valley locations, all of this back and forth—combined with an above-average snowpack season—resulted in an end of water year value for mountain precipitation that was essentially 100% of normal. Statewide soil moisture in Utah's mountains ended the water year at 30% of saturation, which was 13% lower than at this time last year. We will need to monitor our soil moisture levels moving forward and hope that conditions improve somewhat before the winter snowpack season to avoid overly dry soils and their adverse impact on runoff quantity during snowmelt. Our overall statewide reservoir storage has remained high; as of October 1st the state was at 72% of capacity, which was only 1% lower than last year's value. While Water Availability Indices (WAIs) for Utah basins are in the top 25th percentile for three of Utah's 18 major basins, six basins have WAIs below the 50th percentile, reflecting below normal water availability conditions. Please refer to the table on page 6 of this report for additional details regarding WAI values across the state.

And finally, welcome to the 2025 water year! Let's hope we are fortunate enough to receive a third consecutive above normal snowpack. Time will tell!

Utah Climate and Water Report

The purpose of the Climate and Water Report is to provide a snapshot of current and immediate past climatic conditions and other information useful to agricultural and water user interests in Utah. The report utilizes data from several sources that represent specific parameters (streamflow data from the United States Geological Survey, reservoir data from the Bureau of Reclamation, and other sources), geography including high elevation United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Snowpack Telemetry (SNOTEL) data, and agriculturally important data from the USDA-NRCS Soil Climate Analysis Network (SCAN). Data on precipitation, soil moisture, soil temperature, reservoir storage, and streamflow are analyzed and presented. These data analyses can be used to increase irrigation efficiency and agricultural production. As with all data and analyses, there are limitations due to data quality, quantity, and spatial application.

SNOTEL

- Mountainous areas
- High elevation (>6,000 ft)
- Water supply forecasting
- Installed where snow pack represents the water supply



SCAN

- Agricultural and range lands
- Mid elevation (3 7,000 ft).
- Irrigation efficiency and rangeland productivity
- Installed on spatially representative soils





Oct 1, 2024 | Utah Reservoir Summary

Watershed/Region	Current Storage (Basinwide KAF)	Reservoir Capacity (Basinwide KAF)	Last Yr % Capacity (Basinwide)	This Yr % Capacity (Basinwide)
Utah (Statewide)	3977	5465	73	72
Utah (Statewide) Incl. Flaming G. & Lk. Powell	16272	32528	49	50
Bear	925	1389	60	66
Weber-Ogden	380	547	80	69
Northeastern Uintas	3191	3852	86	82
Tooele Valley	1	4	39	34
Duchesne	1204	1379	86	87
Provo	1105	1334	83	82
San Pitch	2	20	27	12
Price	114	158	80	72
Upper Sevier	116	382	33	30
Southeast UT	1	2	93	69
Beaver	8	23	59	35
Southwest Utah	79	118	83	66

Reservoir	Current Storage (KAF)	Reservoir Capacity (KAF)	Last Yr % Capacity	This Yr % Capacity
Bear Lake	883	1302	59	67
Big Sand Wash Reservoir	5	25	44	19
Causey Reservoir	3	7	64	45
Cleveland Lake	3	5	80	59
Currant Creek Reservoir	12	15	94	81
Deer Creek Reservoir	109	149	84	73
East Canyon Reservoir	34	49	78	70
Echo Reservoir	39	73	68	53
Flaming Gorge Reservoir	3153	3749	86	84
Grantsville Reservoir	1	3	37	36
Gunlock	4	10	80	42
Gunnison Reservoir	2	20	27	12
Huntington North Reservoir	2	4	67	62
Hyrum Reservoir	7	15	61	47
Joes Valley Reservoir	45	61	81	74
Jordanelle Reservoir	263	314	84	83
Ken's Lake	1	2	93	69
Kolob Reservoir	4	5	100	85
Lake Powell	9141	23314	37	39
Lost Creek Reservoir	15	22	73	68
Lower Enterprise	0	2	67	23
Meeks Cabin Reservoir	4	32	39	15
Miller Flat Reservoir	3	5	70	63
Millsite	9	16	68	54
Minersville Reservoir	8	23	59	35
Moon Lake Reservoir	10	35	65	28
Otter Creek Reservoir	30	52	74	58
Panguitch Lake	9	22	94	43
Pineview Reservoir	74	110	77	67
Piute Reservoir	19	71	49	27
Porcupine Reservoir	7	11	82	69
Quail Creek	23	40	73	59
Red Fleet Reservoir	14	25	77	56
Rockport Reservoir	36	60	79	60
Sand Hollow Reservoir Scofield Reservoir	41 50	50 65	93 82	82 76
Settlement Canyon Reservoir	0	1	46	30
Sevier Bridge Reservoir	56	236	46 13	<u> </u>
Smith and Morehouse	4	8	73	55
Starvation Reservoir	126	0 164	86	76
Stateline Reservoir	4	12	62	35
Steinaker Reservoir	14	33	67	44
Strawberry Reservoir	1034	1105	87	93
Upper Enterprise	3	10	66	38
Upper Stillwater Reservoir	15	32	93	47
Utah Lake	732	870	83	84
Willard Bay	171	215	87	79
Woodruff Creek	1	4	26	38
Woodruff Narrows Reservoir	25	57	87	44
Hoodran Harrows Reservon	20	01	01	77

Oct 1, 2024 | Water Availability Index (WAI)

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Basin or Region	Reservoir Storage ¹ (KAF) ²	Monthly Flow	Flow + Storage (KAF) ²	WAI ³	Percentile⁴ (%)	Similar Years
Bear	883.3	4.0	887.3	1.94	73	[1987, 2019]
Woodruff Narrows	25.3	1.2	26.5	-0.28	47	[1987, 1991]
Little Bear	7.3	1.8	9.1	1.39	67	[1993, 2005]
Ogden	77.8	3.7	81.5	2.5	80	[1998, 2019]
Weber	131.2	11.1	142.3	1.91	73	[2009, 2017]
Provo	373.0	4.2	377.2	1.64	70	[1999, 2006]
Western Uintas	152.0	9.4	161.5	0.09	51	[2006, 2009]
Eastern Uintas	29.2	8.8	37.9	0.28	53	[1992, 2006]
Blacks Fork	4.9	3.1	8.1	-0.6	43	[2015, 2021]
Smiths Fork	4.3	2.4	6.6	-1.39	33	[2001, 2013]
Price	50.6	0.7	51.2	3.24	89	[2011, 2019]
Joes Valley	45.8	6.6	52.4	1.76	71	[1987, 2019]
Ferron Creek	9.1	0.9	9.9	-1.2	36	[2008, 2009]
Moab	1.6	0.4	2.0	2.41	79	[1993, 2022]
Upper Sevier	49.9	0.7	50.6	1.02	62	[1981, 1987]
San Pitch	2.5	0.6	3.1	0.09	51	[1996, 2009]
Lower Sevier	56.8	3.3	60.0	-1.2	36	[1994, 2009]
Beaver River	8.3	1.3	9.6	1.39	67	[1981, 1985]
Virgin River	28.4	4.3	32.7	-0.88	39	[2020, 2021]

¹ End of Month Reservoir Storage; ² KAF, Thousand Acre-Feet; ³ WAI, Water Availability Index; ⁴ Threshold for coloring: >75% Green, <25% Red

What is a Water Availability Index?

The Water Availability Index (WAI) is an observed hydrologic indicator of current surface water availability within a watershed. The index is calculated by combining current reservoir storage with the previous month's streamflow. Note that starting in June, 2022, un-adjusted streamflow values are used in this calculation. Prior to this date, 'naturalized' or 'adjusted' values were used. Please contact Jordan Clayton for details and rationale concerning this methodological change. See Appendix A for details on specific stream gauges and reservoirs used in WAI calculations.

WAI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry) with a value of zero (0) indicating median water supply as compared to historical analysis. WAI's are calculated in this fashion to be consistent with other hydroclimatic indicators such as the Palmer Drought Index and the Precipitation index.

The Utah Snow Survey has also chosen to display the WAI value as well as a PERCENT CHANCE OF NON-EXCEEDANCE. While this is a cumbersome name, it has a simple application. It can be best thought of as a scale of 1 to 99 with 1 being the drought of record (driest possible conditions) and 99 being the flood of record (wettest possible conditions) and a value of 50 representing average conditions. This rating scale is a percentile rating as well, for example a WAI of 75% means that this years water supply is greater than 75% of all historical events and that only 25% of the time has it been exceeded. Conversely a WAI of 10% means that 90% of historical events have been greater than this one and that only 10% have had less total water supply. This scale is comparable between basins: a WAI of 50% means the same relative ranking on watershed A as it does on watershed B, which may not be strictly true of the +4 to -4 scale.



Statewide SCAN | October 1, 2024

Precipitation in September was well below normal, with an average of 0.3" falling region-wide (34% of normal). This brings the water year accumulation (October-September) to 99% of median. Depth averaged soil moisture was calculated to be 36% of saturation compared to 39% at this time last year.



North Central Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.4" falling region-wide (58% of normal). This brings the water year accumulation (October-September) to 97% of median. Depth averaged soil moisture was calculated to be 55% of saturation compared to 54% at this time last year.



Northeast Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.5" falling region-wide (47% of normal). This brings the water year accumulation (October-September) to 100% of median. Depth averaged soil moisture was calculated to be 35% of saturation compared to 36% at this time last year.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: 30 year normal calculation description

Uinta Basin | October 1, 2024

Precipitation in September was well below normal, with an average of 0.2" falling region-wide (18% of normal). This brings the water year accumulation (October-September) to 80% of median. Depth averaged soil moisture was calculated to be 35% of saturation compared to 35% at this time last year.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: 30 year normal calculation description

Southeast Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.4" falling region-wide (42% of normal). This brings the water year accumulation (October-September) to 109% of median. Depth averaged soil moisture was calculated to be 46% of saturation compared to 43% at this time last year.



South Central Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.2" falling region-wide (26% of normal). This brings the water year accumulation (October-September) to 94% of median. Depth averaged soil moisture was calculated to be 36% of saturation compared to 40% at this time last year.



St. George Region | October 1, 2024

Precipitation in September was well below normal, with an average of 0.0" falling region-wide (0% of normal). This brings the water year accumulation (October-September) to 59% of median. Depth averaged soil moisture was calculated to be 5% of saturation compared to 29% at this time last year.



Western Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.2" falling region-wide (34% of normal). This brings the water year accumulation (October-September) to 89% of median. Depth averaged soil moisture was calculated to be 23% of saturation compared to 32% at this time last year.



SNOTEL portion of report



Statewide Snotel | October 1, 2024

Precipitation in September was well below normal, with an average of 0.7" falling region-wide (42% of normal). This brings the water year accumulation (October-September) to 100% of median. Depth averaged soil moisture was calculated to be 30% of saturation compared to 43% at this time last year. Statewide, reservoir storage is 72% of capacity, compared to 73% last year¹.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: 30 year normal calculation description

¹Statewide reservoir percentages exclude Lake Powell and Flaming Gorge Reservoirs.

Bear | October 1, 2024

Precipitation in September was well below normal, with an average of 0.9" falling region-wide (54% of normal). This brings the water year accumulation (October-September) to 102% of median. Depth averaged soil moisture was calculated to be 34% of saturation compared to 52% at this time last year. Reservoir storage is 66% of capacity, compared to 60% last year. The Water Availability Index percentiles are 73% for the Bear, 67% for the Little Bear, and 47% for Woodruff Narrows.



Weber-Ogden | October 1, 2024

Precipitation in September was well below normal, with an average of 0.8" falling region-wide (44% of normal). This brings the water year accumulation (October-September) to 107% of median. Depth averaged soil moisture was calculated to be 24% of saturation compared to 40% at this time last year. Reservoir storage is 69% of capacity, compared to 80% last year. The Water Availability Index percentiles are 73% for the Weber, and 80% for the Ogden.



Precipitation in September was well below normal, with an average of 0.9" falling region-wide (50% of normal). This brings the water year accumulation (October-September) to 107% of median. Depth averaged soil moisture was calculated to be 21% of saturation compared to 30% at this time last year. Reservoir storage is 82% of capacity, compared to 83% last year. The Water Availability Index percentile is 70% for the Provo.



Precipitation in September was well below normal, with an average of 0.5" falling region-wide (34% of normal). This brings the water year accumulation (October-September) to 97% of median. Depth averaged soil moisture was calculated to be 14% of saturation compared to 24% at this time last year. Reservoir storage is 34% of capacity, compared to 39% last year.



Northeastern Uintas | October 1, 2024

Precipitation in September was well below normal, with an average of 1.0" falling region-wide (46% of normal). This brings the water year accumulation (October-September) to 95% of median. Depth averaged soil moisture was calculated to be 43% of saturation compared to 57% at this time last year. Reservoir storage is 82% of capacity, compared to 86% last year. The Water Availability Index percentiles are 43% for the Blacks Fork, and 33% for the Smiths Fork.



Duchesne | October 1, 2024

Precipitation in September was well below normal, with an average of 0.9" falling region-wide (42% of normal). This brings the water year accumulation (October-September) to 96% of median. Depth averaged soil moisture was calculated to be 31% of saturation compared to 48% at this time last year. Reservoir storage is 87% of capacity, compared to 86% last year. The Water Availability Index percentiles are 51% for the Western Uintas, and 53% for the Eastern Uintas.



San Pitch | October 1, 2024

Precipitation in September was well below normal, with an average of 0.6" falling region-wide (37% of normal). This brings the water year accumulation (October-September) to 100% of median. Depth averaged soil moisture was calculated to be 52% of saturation compared to 56% at this time last year. Reservoir storage is 12% of capacity, compared to 27% last year. The Water Availability Index percentile is 51% for the San Pitch.



Price-San Rafael | October 1, 2024

Precipitation in September was well below normal, with an average of 0.5" falling region-wide (34% of normal). This brings the water year accumulation (October-September) to 101% of median. Depth averaged soil moisture was calculated to be 45% of saturation compared to 46% at this time last year. Reservoir storage is 72% of capacity, compared to 80% last year. The Water Availability Index percentiles are 89% for the Price, 71% for Joes Valley, and 36% for Ferron Creek.



Lower Sevier | October 1, 2024

Precipitation in September was well below normal, with an average of 0.5" falling region-wide (35% of normal). This brings the water year accumulation (October-September) to 103% of median. Depth averaged soil moisture was calculated to be 21% of saturation compared to 32% at this time last year. Reservoir storage is 24% of capacity, compared to 13% last year. The Water Availability Index percentile is 36% for the Lower Sevier.



Upper Sevier | October 1, 2024

Precipitation in September was well below normal, with an average of 0.4" falling region-wide (28% of normal). This brings the water year accumulation (October-September) to 92% of median. Depth averaged soil moisture was calculated to be 31% of saturation compared to 45% at this time last year. Reservoir storage is 40% of capacity, compared to 65% last year. The Water Availability Index percentile is 62% for the Upper Sevier.



Southeastern Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.3" falling region-wide (13% of normal). This brings the water year accumulation (October-September) to 89% of median. Depth averaged soil moisture was calculated to be 34% of saturation compared to 38% at this time last year. Reservoir storage is 69% of capacity, compared to 93% last year. The Water Availability Index percentile is 79% for Moab.



Dirty Devil | October 1, 2024

Precipitation in September was well below normal, with an average of 0.3" falling region-wide (21% of normal). This brings the water year accumulation (October-September) to 95% of median. Depth averaged soil moisture was calculated to be 38% of saturation compared to 41% at this time last year.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: 30 year normal calculation description

Escalante-Paria | October 1, 2024

Precipitation in September was well below normal, with an average of 0.2" falling region-wide (13% of normal). This brings the water year accumulation (October-September) to 96% of median. Depth averaged soil moisture was calculated to be 30% of saturation compared to 38% at this time last year.



Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th percentiles. For more information visit: 30 year normal calculation description

Beaver | October 1, 2024

Precipitation in September was well below normal, with an average of 0.4" falling region-wide (27% of normal). This brings the water year accumulation (October-September) to 90% of median. Depth averaged soil moisture was calculated to be 26% of saturation compared to 47% at this time last year. Reservoir storage is 35% of capacity, compared to 59% last year. The Water Availability Index percentile is 67% for the Beaver River.



Southwestern Utah | October 1, 2024

Precipitation in September was well below normal, with an average of 0.5" falling region-wide (41% of normal). This brings the water year accumulation (October-September) to 80% of median. Depth averaged soil moisture was calculated to be 23% of saturation compared to 46% at this time last year. Reservoir storage is 66% of capacity, compared to 83% last year. The Water Availability Index percentile is 39% for the Virgin River.



Appendix A: Data used in WAI Calculations

Watershed/ Region	USGS Gauging Station(s)	Reservoir(s)	Start Date
Bear	Bear R nr Ut-Wy State Line	Bear Lake	1981
Woodruff Narrows	Bear R ab Resv nr Woodruff	Woodruff Narrows Reservoir	1981
Little Bear	Little Bear R at Paradise	Hyrum Reservoir	1993
Ogden	SF Ogden R nr Huntsville	Pineview Reservoir, Causey Reservoir	1981
Weber	Weber R nr Oakley, Chalk Ck at Coalville, East Canyon Ck nr Morgan	East Canyon Reservoir, Echo Reservoir, Lost Creek Reservoir, Rockport Reservoir, Smith And Morehouse Reservoir	1989
Provo	Provo R at Woodland	Deer Creek Reservoir, Jordanelle Reservoir	1993
Western Uintas	Lake Fk R ab Moon Lk nr Mountain Home, Rock Ck nr Mountain Home, Yellowstone R nr Altonah	Starvation Reservoir, Moon Lake Reservoir, Upper Stillwater Reservoir	1988
Eastern Uintas	Big Brush Ck ab Red Fleet Reservoir, Ashley Ck nr Vernal, Whiterocks R nr Whiterocks	Red Fleet Reservoir, Steinaker Reservoir	1981
Blacks Fork	Blacks Fk nr Robertson	Meeks Cabin Reservoir	1984
Smiths Fork	EF of Smiths Fork nr Robertson	Stateline Reservoir	1984
Price	Fish Ck ab Reservoir nr Scofield	Scofield Reservoir	1981
Joes Valley	Seely Ck bl Joes Valley Resv	Joes Valley Reservoir	1981
Ferron Creek	Ferron Ck Upper Station nr Ferron	Millsite	1981
Moab	Mill Ck at Sheley Tunnel nr Moab	Ken's Lake	1988
Upper Sevier	Sevier R nr Kingston	Piute Reservoir, Otter Creek Reservoir	1981
San Pitch	Manti Ck bl Dugway Ck nr Manti	Gunnison Reservoir	1981
Lower Sevier	Sevier R nr Gunnison	Sevier Bridge Reservoir	1981
Beaver River	Beaver R nr Beaver	Minersville Reservoir	1981
Virgin River	Virgin R at Virgin, Santa Clara R nr Pine Valley	Quail Creek, Gunlock	1993

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Utah Water Supply Outlook Report

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