

Washington Water Supply Outlook Report January 1, 2022



Like big dumps of wet snow? Our SNOTEL precipitation gages do not as is represented in the above before and after pictures of winter snow cap and the resulting damage. We are currently experiencing this problem at several sites around OR and WA so if you notice flat line data, when it should be accumulating, this is generally the culprit.

As the gage caps over with heavy wet snow it covers the orifice preventing the gage from collecting total precipitation. When it gets heavy enough it can destroy the wind screen as the photo on the right depicts, preventing accurate data collection until the site can be visited and fixed. (NRCS file photos, Beaver Pass SNOTEL, circa WY2008)

Water Supply Outlook Reports and Federal - State – Private Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Washington Water Supply Outlook

January 2022

General Outlook

Water year 2022 started off in fits and bounds with a promise of early November snow sports. However, a series of Atmospheric Rivers (warm, wet rain) pounded into the cascades, all but erasing existing snowpack and causing major flooding on many rivers and streams. By early December things had cooled back off to the point that snowpack could slowly start to build back from square one. As the month proceeded snow piled up at near record rates, bringing a rare white Christmas to most of the state.

The most recent forecast through late-January shows a high probability for below normal temperatures and above normal precipitation. NWS 3-month (Jan-Feb-Mar) forecast indicates below normal temperatures and above normal precipitation which is indicative of the forecasted Enso La Nina. The US Drought Monitor indicates the continuation of D0-D3 drought designation from last year in eastern Washington. (see maps on page 4)

Snowpack

The January 1 statewide SNOTEL readings were 107% of normal but increased by 14% within the first 5 days. The lowest readings in the state were at 60% of the 30-year median for January 1 in the Colockum Basin. The Puyallup River Basin had the most snow with 188%. Westside medians from SNOTEL included the North Puget Sound river basins with 106% of normal, the Central and South Puget river basins with 119% and 103% respectively, and the Lower Columbia basins with 118% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 92% and the Wenatchee area with 95%. Snowpack in the Spokane River Basin was at 107% and the Upper Columbia river basins had 99% of the long-term median. The AWS snow plots associated with some of the basin pages below demonstrate the sharp increase in SWE since Jan. 1.

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	107	96
Newman Lake	75	116
Lower Pend Oreille	96	84
Kettle	84	113
Omak	78	112
Methow	112	111
Conconully Lake	67	89
Central Columbia	95	103
Upper Yakima	87	102
Lower Yakima	91	87
Ahtanum Creek	85	107
Walla Walla	114	99
Lower Snake	105	96
Cowlitz	111	110
Lewis	139	107
White	103	106
Green	101	99
Puyallup	188	79
Cedar	118	112
Snoqualmie	126	126
Skykomish	122	135
Skagit	108	104
Nooksack	94	119
Olympic Peninsula	100	112

Precipitation

Precipitation accumulation was above normal across the state except in a few select basins. Statewide average was 120% of average as of January 1. A surge of Atmospheric Rivers (warm rain) in the last half of November brought considerable rain amounts but primarily on the west side, setting new or near record amounts in the North Cascades and Olympic Peninsula. SNOTEL collects all form of precipitation including, rain, snow, sleet and hail.

RIVER BASIN	DECEMBER PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	132	113
Lower Pend Oreille	116	115
Upper Columbia	114	129
Central Columbia	103	116
Upper Yakima	98	106
Naches	113	114
Lower Yakima	101	107
Klickitat	110	110
Walla Walla	126	103
Lower Snake	123	102
Lower Columbia	116	123
South Puget Sound	104	113
Central Puget Sound	112	117
North Puget Sound	105	129
Olympic Peninsula	101	116

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. January 1 Reservoir storage in the Yakima Basin was 505,200-acre feet, 134% of average for the Upper Reaches and 135,600-acre feet or 123% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 61,600-acre feet, 87% of average and 26% of capacity; and Ross lake within the Skagit River Basin at 106% of average and 84% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	26	87
Lower Pend Oreille	36	90
Upper Columbia	33	51
Central Columbia	75	132
Upper Yakima	61	134
Lower Yakima	59	123
Lower Snake	69	104
North Puget Sound	98	104

For more information contact your local Natural Resources Conservation Service office.

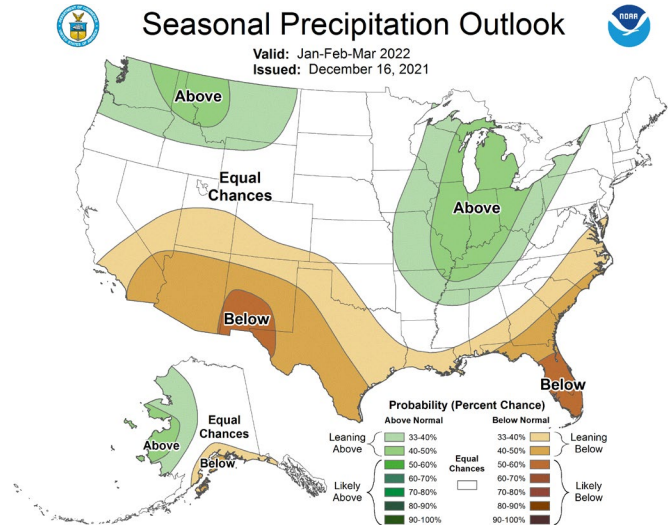
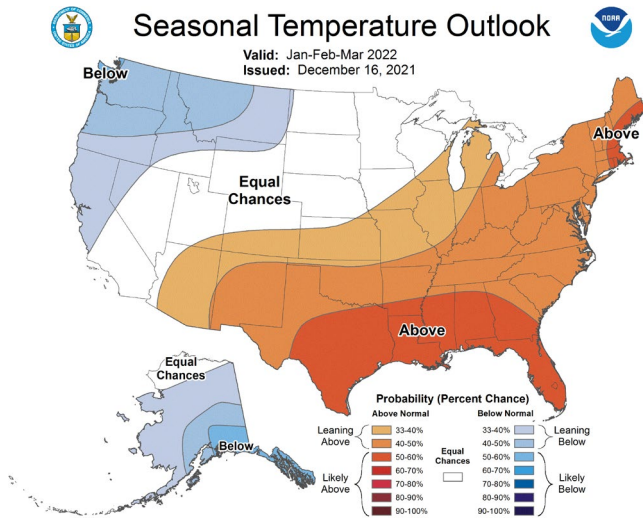
Streamflow

Early winter forecasts for April-September stream flows are never quite as robust as they are later in the season when we know more about the winter climatology. At times only a few degrees warmer or cooler than forecasted can make or break stream flow predictions. Volumetric forecasts are developed using current, historic and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

BASIN	PERCENT OF AVERAGE FORECAST (50% CHANCE OF EXCEEDENCE)
Spokane	76-111
Lower Pend Oreille	95-105
Upper Columbia	83-110
Central Columbia	95-108
Upper Yakima	93-95
Lower Yakima	94-97
Naches	100-102
Klickitat	100-101
Lower Snake-Walla Walla	99-100
Lower Columbia	104-111
South Puget Sound	108-109
Central Puget Sound	108-114
North Puget Sound	103-106
Olympic Peninsula	97-103

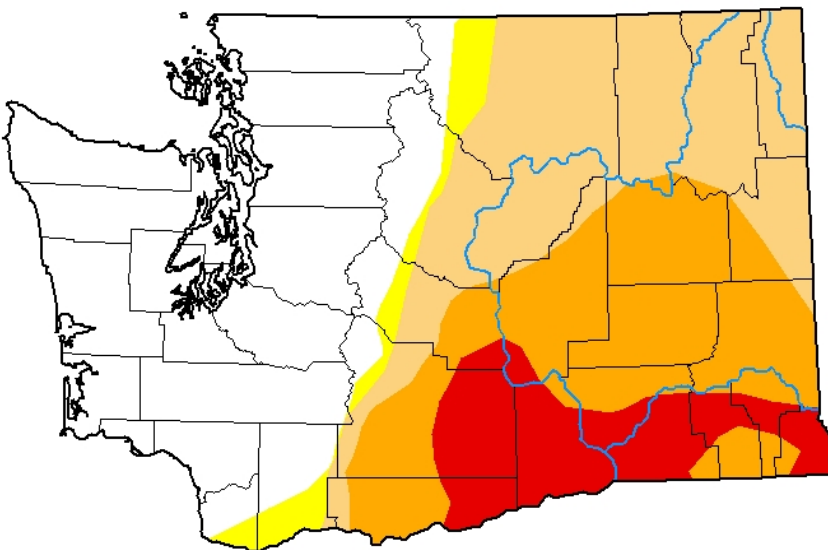
STREAM	PERCENT OF AVERAGE DECEMBER STREAMFLOWS
Priest River - near Priest River	146
Kettle at Laurier	210
Columbia at Birchbank	184
Spokane at Spokane	90
Similkameen at Nighthawk	440
Okanogan near Tonasket	318
Methow at Pateros	284
Chelan at Chelan	228
Stehekin near Stehekin	302
Wenatchee at Pashastin	181
Cle Elum near Roslyn	120
Yakima near Parker	102
Naches near Naches	90
Grande Ronde at Troy	65
Snake below Lower Granite Dam	86
Columbia River at The Dalles	118
Lewis at Merwin Dam	88
Cowlitz below Mayfield Dam	97
Skagit at Concrete	143
Dungeness near Sequim	103

Climate



U.S. Drought Monitor Washington

December 28, 2021
(Released Thursday, Dec. 30, 2021)
Valid 7 a.m. EST



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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droughtmonitor.unl.edu



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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/>

Oregon:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/>

Idaho:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

National Water and Climate Center (NWCC):

<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

USDA-NRCS Agency Homepages

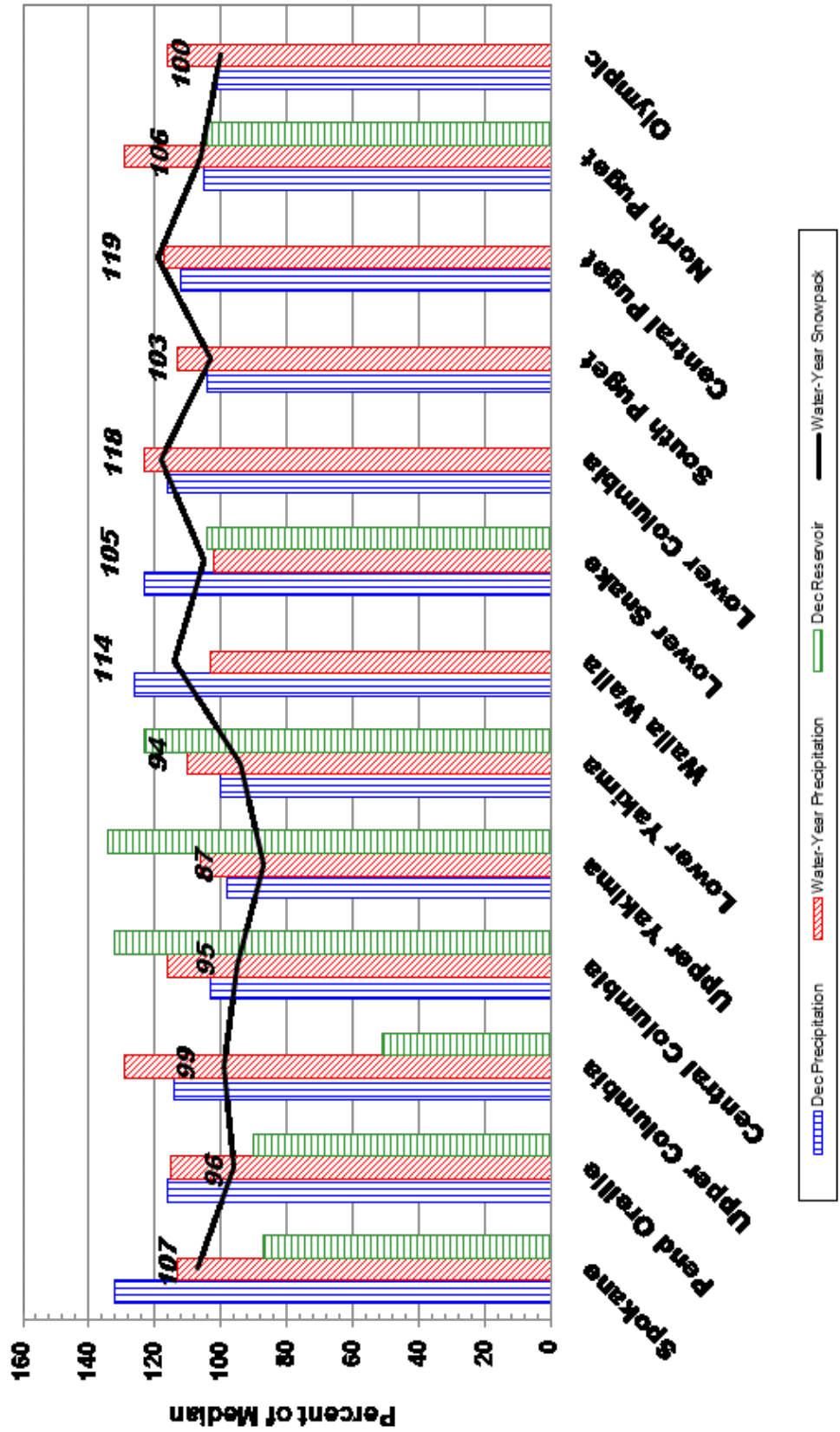
Washington:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/>

NRCS National:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>

January 1, 2022 - Snowpack, Precipitation and Reservoir Conditions at a Glance (Water Year = October 1 - Current Date)



89th Annual Western Snow Conference

April 18-21, 2022

Salt Lake City, Utah

“Drought, Fire, and Precipitation Extremes: Operational Challenges for Snow Water Resources”

Please plan to join us for the 89th Annual Meeting of the Western Snow Conference. The 2022 Meeting will be held at the University of Utah in Salt Lake City, April 18-21, 2022. We invite you to review the Call for Papers and to submit an abstract at the links below:

Please see the [Call for Papers](#) for additional information. Abstracts can be submitted online [HERE](#).

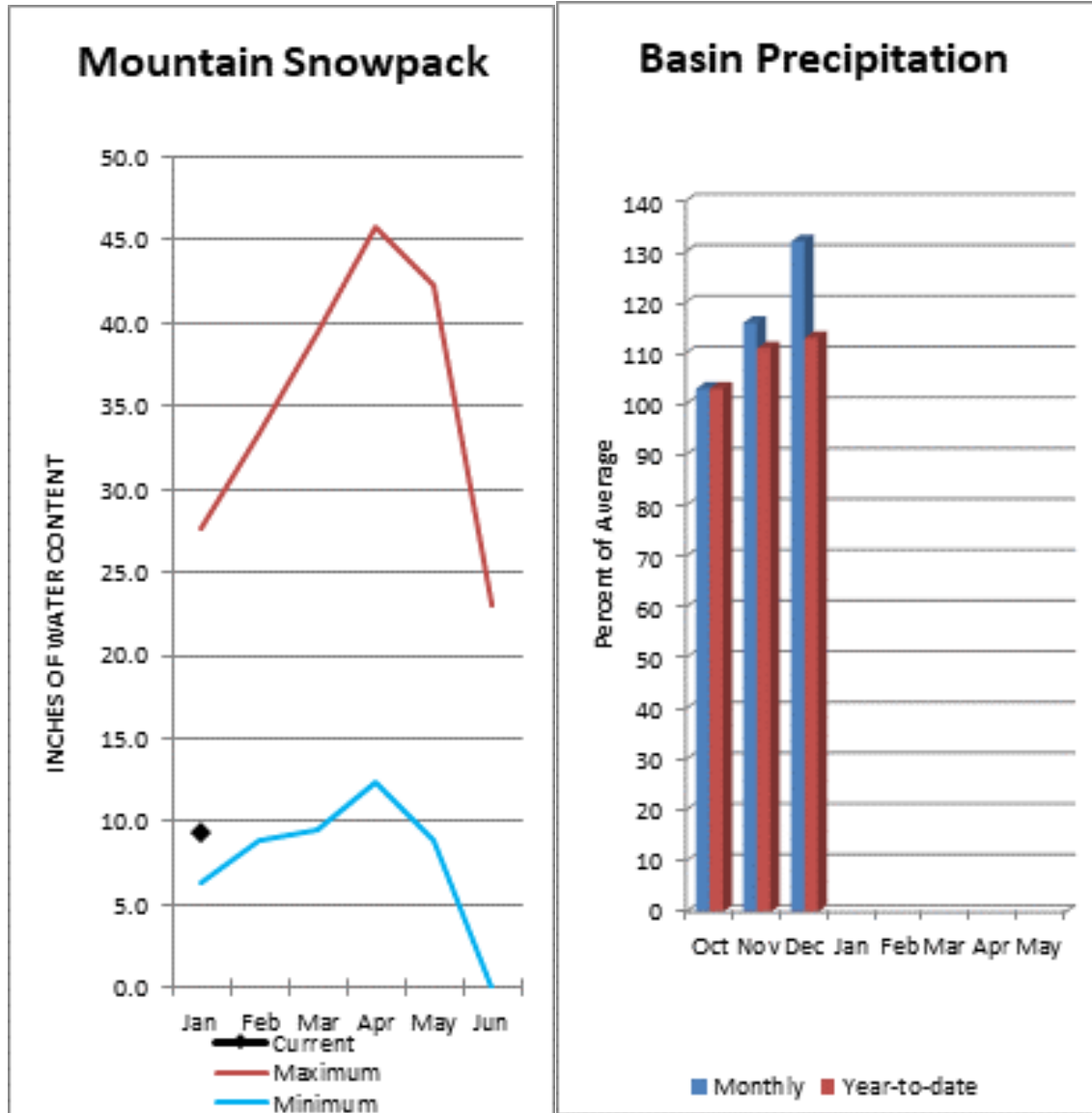
Details of this conference are still being finalized, including formats, platforms, and opportunity for vendor participation.

Noah Molotch
General Chair, WSC

McKenzie Skiles
Conference Chair

Additional information about the conference will be posted on the WSC web page at <http://www.westernsnowconference.org/>

Also find Western Snow Conference on Facebook



Basin snowpack is 106% of normal and precipitation is 113% of normal for the water year. Precipitation for December was 132% of normal. Reservoir storage is currently at 87% of normal.

Spokane River Basin

Data Current As of: 1/7/2022 11:42:36 AM

Spokane Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Spokane	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Spokane R at Long Lake ²	APR-JUL	1770	2510	3010	111%	3520	4260	2720
Chamokane Ck nr Long Lake	APR-SEP	1950	2710	3230	113%	3750	4510	2870
St. Joe R at Calder ²	MAR-JUL	9	16	22	81%	29	40	27
NF Coeur d'Alene R at Enaville ²								
Spokane R nr Post Falls ²	APR-JUL	1530	2240	2720	108%	3210	3920	2510
	APR-SEP	1610	2330	2820	110%	3310	4030	2570

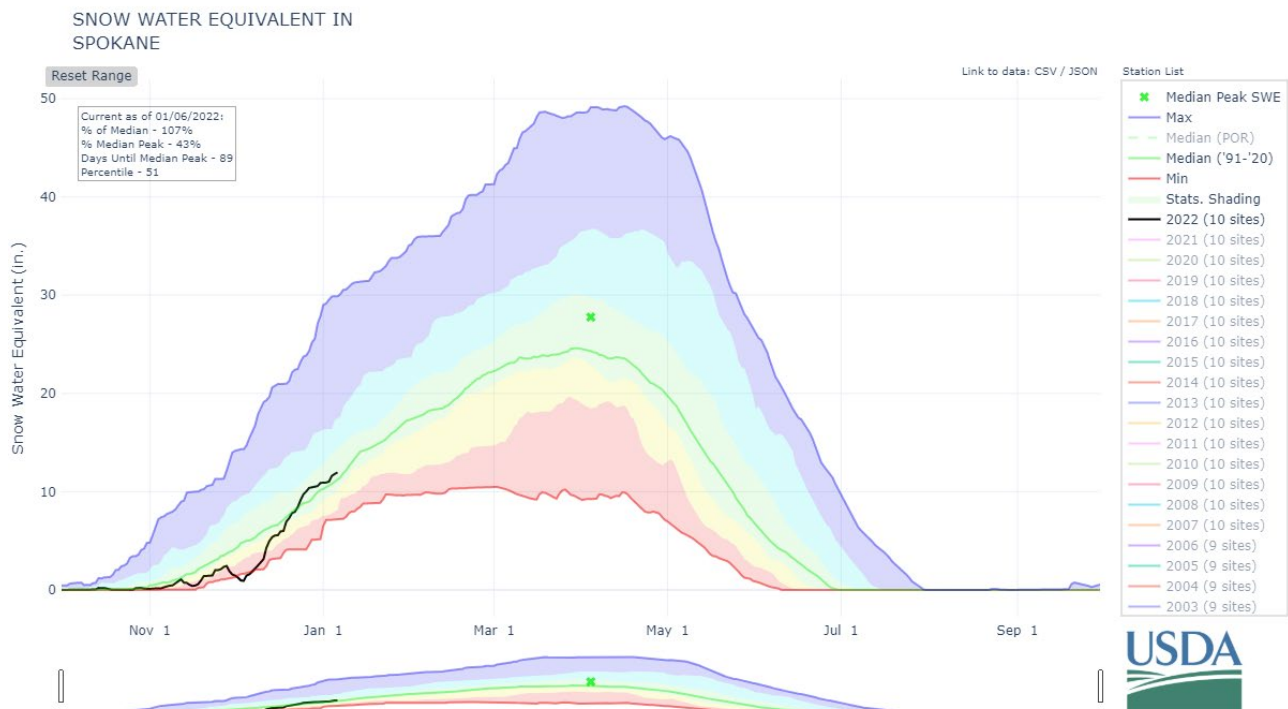
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

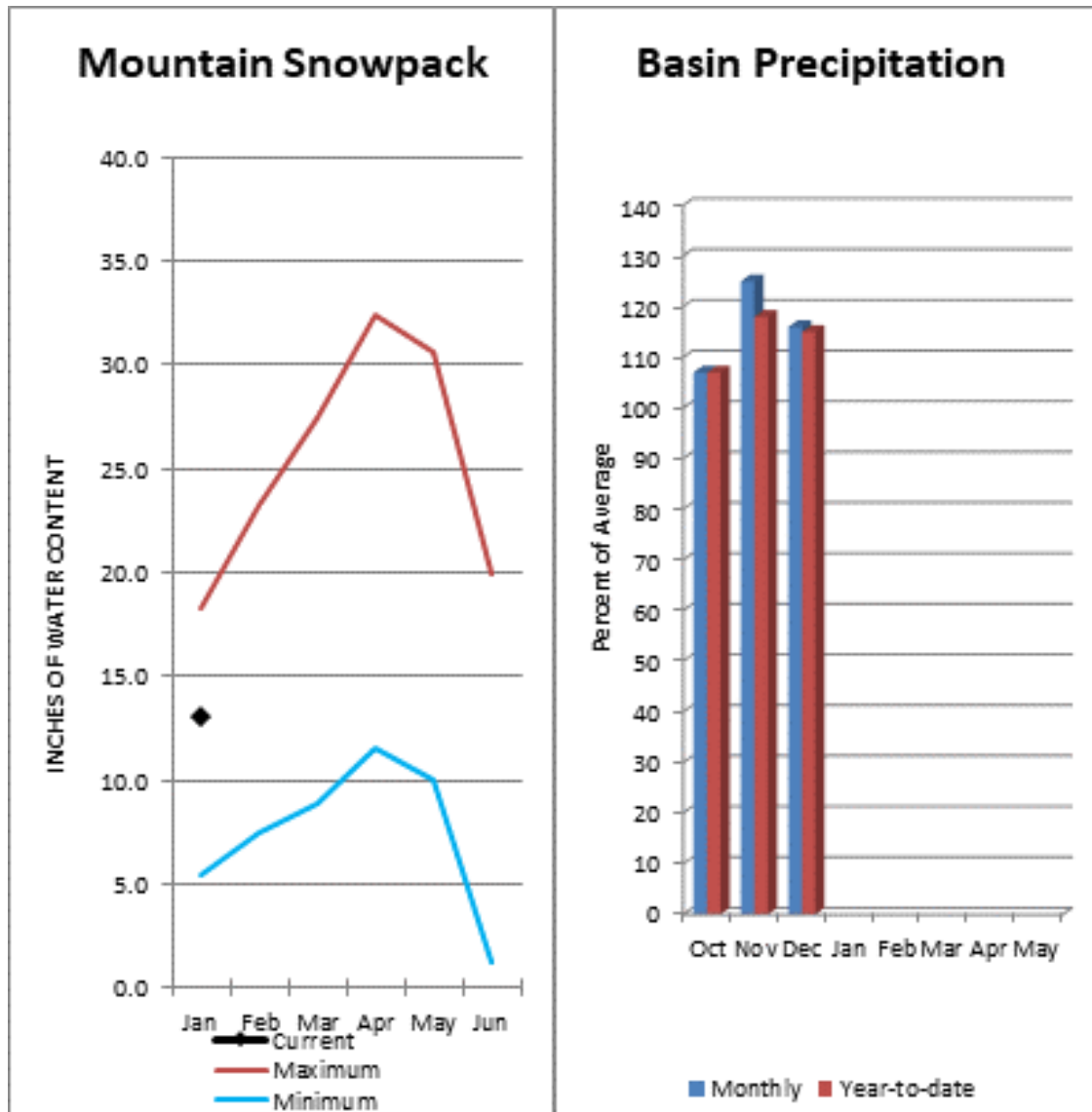
Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Coeur d' Alene	61.6	60.0	70.8	238.5

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Newman Lake	2	75%	116%



Lower Pend Oreille River Basins



January 1 snow cover was 96% of normal in the Pend Oreille Basin River Basin and precipitation during December was 116% of normal, bringing the year-to-date precipitation at 115% of normal. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 90% of normal.

For more information contact your local Natural Resources Conservation Service office.

Lower Pend Oreille River Basins

Data Current As of: 1/7/2022 11:42:41 AM

Lower Pend Oreille Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Pend Oreille	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Pend Oreille Lake Inflow ²	APR-JUL	8960	11400	13100	112%	14700	17200	11700
	APR-SEP	9720	12300	14100	112%	15800	18400	12600
Priest R nr Priest River ²	APR-JUL	475	650	765	91%	880	1050	840
	APR-SEP	510	685	805	91%	925	1100	880
Pend Oreille R bl Box Canyon ²	APR-JUL	9260	11700	13300	114%	14900	17400	11700
	APR-SEP	10000	12600	14300	113%	16100	18700	12700

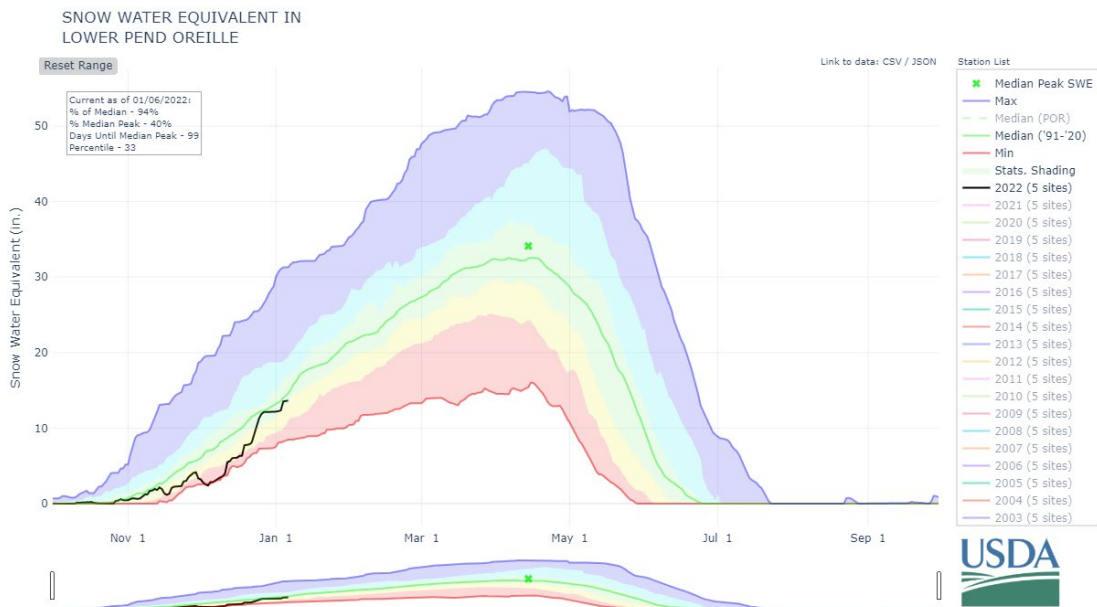
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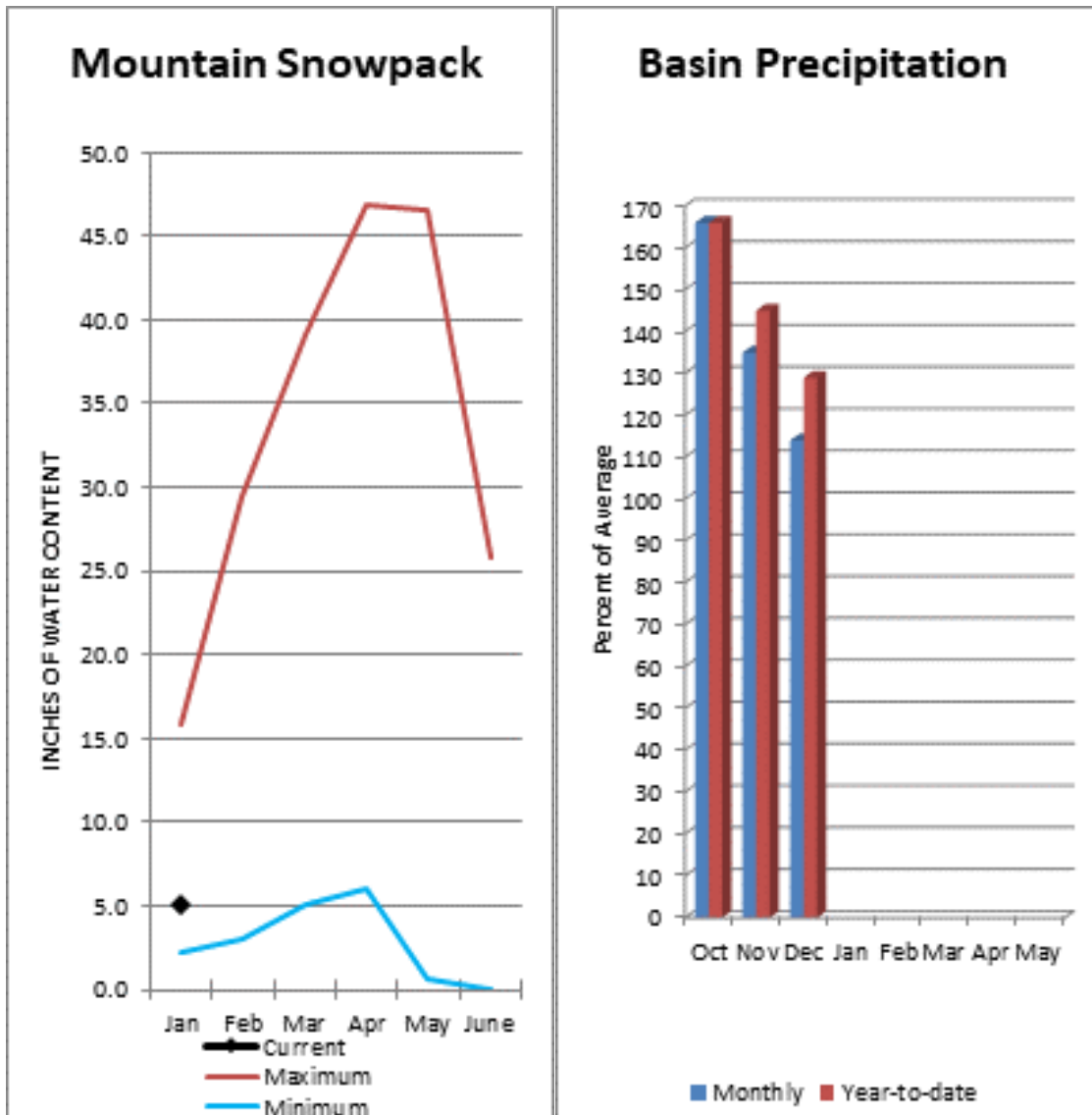
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Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Pend Oreille	543.0	557.8	620.0	1561.3
Priest Lake	63.4	42.6	55.6	119.3

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Sullivan	1	86%	86%





January 1 snow cover on the Upper Columbia basins was 99% of normal and December precipitation was 114% of normal, with precipitation for the water year at 129% of normal. Combined storage in the Conconully Reservoirs was 51% of normal.

Upper Columbia Streamflow Forecasts - January 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Colville R at Kettle Falls	APR-JUL	14.2	71	109	95%	148	205	115
	APR-SEP	17.9	79	120	97%	161	220	124
Methow R nr Pateros	APR-JUL	560	770	910	102%	1050	1260	895
	APR-SEP	605	825	975	101%	1120	1340	965
Okanogan R at Malott	APR-JUL	1100	1480	1740	112%	2000	2390	1550
	APR-SEP	1230	1640	1910	114%	2190	2600	1680
Kettle R nr Laurier	APR-JUL	1170	1560	1830	99%	2090	2480	1840
	APR-SEP	1210	1610	1890	97%	2160	2560	1950
Columbia R at Grand Coulee-NWS ²	APR-JUL	45300		55300	105%		65400	52600
	APR-SEP	54900		66200	109%		76600	60600
Similkameen R nr Nighthawk	APR-JUL	985	1240	1420	113%	1600	1860	1260
	APR-SEP	1060	1330	1510	113%	1700	1970	1340
Okanogan R nr Tonasket	APR-JUL	1080	1450	1700	112%	1950	2320	1520
	APR-SEP	1220	1610	1870	115%	2140	2530	1620

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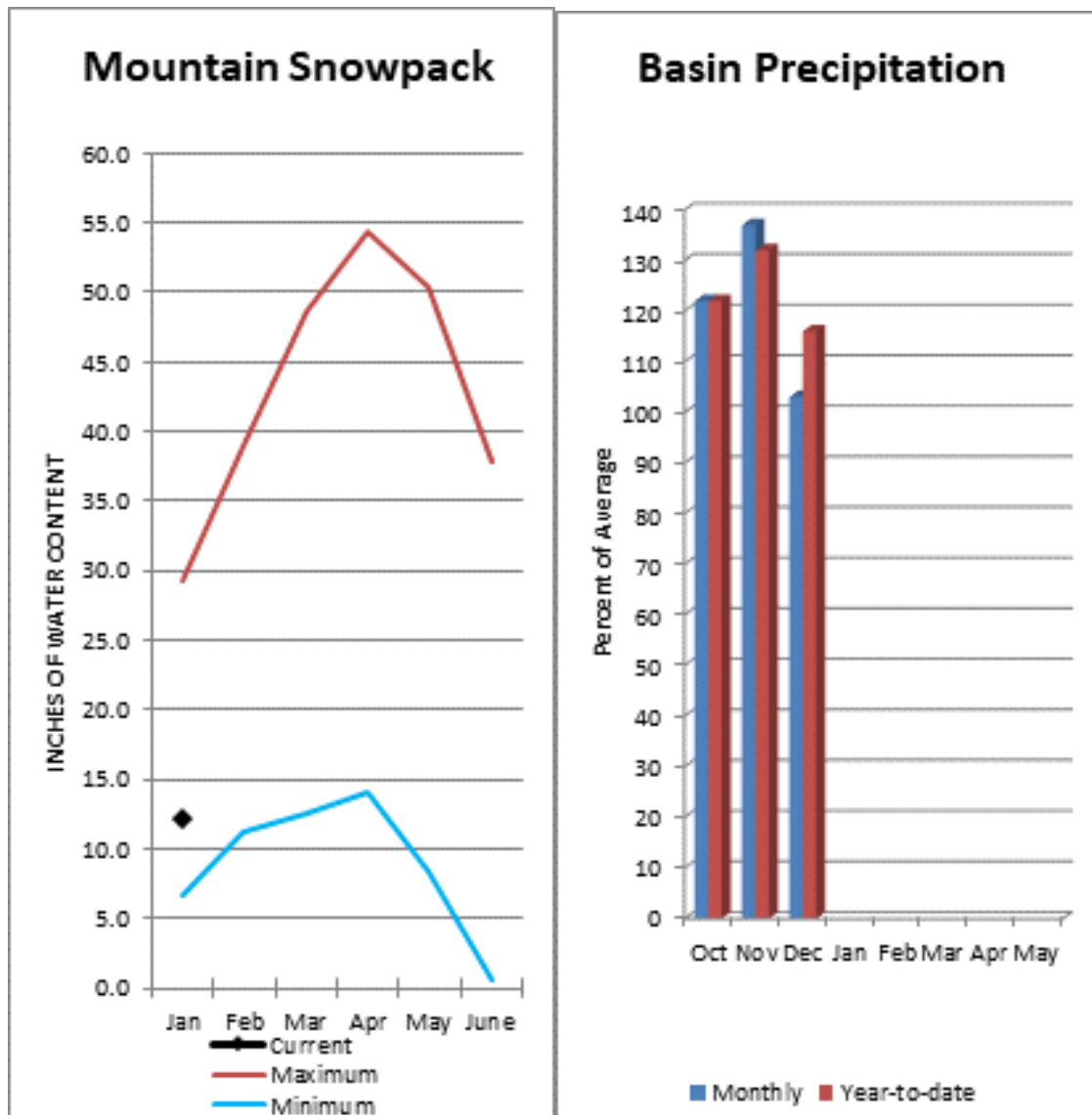
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Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Conconully Reservoir	4.5	6.3	7.6	13.0
Conconully Lake (Salmon Lake Dam)	3.2	6.1	7.7	10.5

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Toats Coulee	7	104%	111%
Sanpoil	1	78%	112%
Omak	1	78%	112%
Methow	4	112%	111%
Kettle	2	78%	110%
Concully Lake	1	67%	89%
Colville	0		

Central Columbia River Basins



January 1 snowpack in the Central Columbia river basins was 95% of normal. Precipitation during December was 103% of normal in the basin and 116% for the year-to-date. Reservoir storage in Lake Chelan was 132% of the median.

For more information contact your local Natural Resources Conservation Service office.

Central Columbia River Basins

Data Current As of: 1/7/2022 11:42:57 AM

Central Columbia Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Entiat R nr Ardenvoir	APR-JUL	131	172	200	91%	230	270	220
	APR-SEP	137	182	215	91%	245	290	235
Icicle Ck nr Leavenworth	APR-JUL	191	240	275	95%	305	355	290
	APR-SEP	205	260	295	95%	330	385	310
Chelan R at Chelan ²	APR-JUL	755	910	1020	98%	1130	1280	1040
	APR-SEP	840	1010	1130	97%	1250	1430	1170
Columbia R bl Rock Island Dam-NWS ²	APR-JUL	50500		61100	106%		72400	57600
	APR-SEP	60600		71900	109%		84100	65800
Wenatchee R at Peshastin	APR-JUL	935	1160	1320	92%	1480	1710	1440
	APR-SEP	1010	1260	1430	93%	1600	1860	1540
Stehekin R at Stehekin	APR-JUL	530	630	700	98%	770	870	715
	APR-SEP	615	730	805	96%	880	995	835
Wenatchee R at Plain	APR-JUL	680	855	975	91%	1090	1270	1070
	APR-SEP	735	930	1060	91%	1190	1390	1160

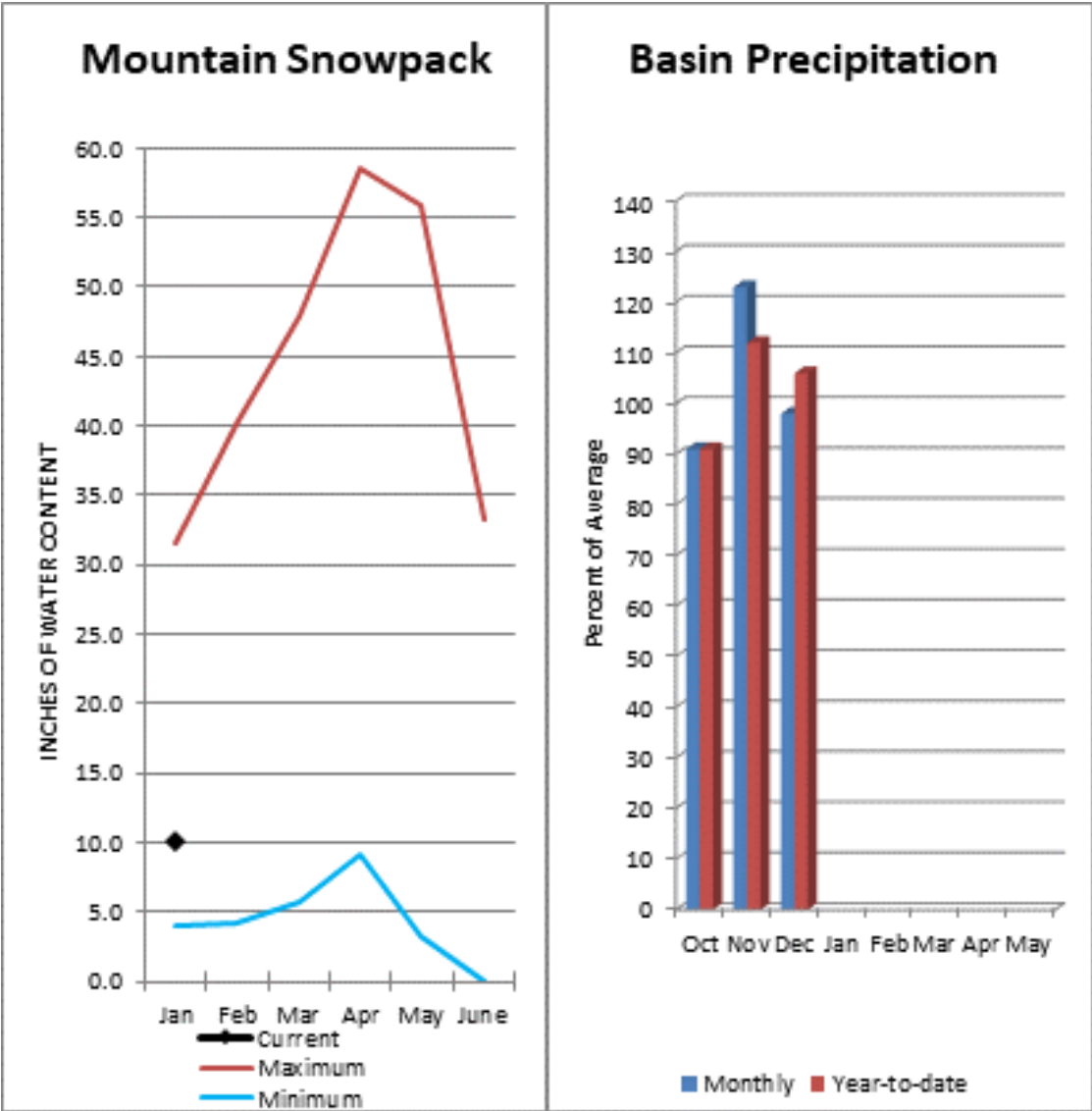
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Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Chelan	510.6	412.6	386.8	677.4

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Wenatchee	11	95%	103%
Stemilt	1	70%	84%
Lake Chelan	3	105%	98%
Entiat	1	77%	128%
Colckum	1	60%	84%



January 1 snowpack was 87% of normal. Precipitation was 98% of normal for December and 106% for the water-year. January 1 reservoir storage for the Upper Yakima reservoirs was 134% of normal.

Upper Yakima Streamflow Forecasts - January 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Cle Elum Lake Inflow ²	APR-JUL	250	320	370	96%	415	485	385
	APR-SEP	275	350	400	95%	450	525	420
Teanaway R bl Forks nr Cle Elum	APR-JUL	62	100	126	96%	151	189	131
	APR-SEP	65	103	128	96%	154	192	134
Keechelus Reservoir Inflow ²	APR-JUL	69	95	113	101%	131	157	112
	APR-SEP	78	105	124	98%	143	170	126
Kachess Reservoir Inflow ²	APR-JUL	60	83	99	100%	114	137	99
	APR-SEP	69	92	108	100%	123	146	108

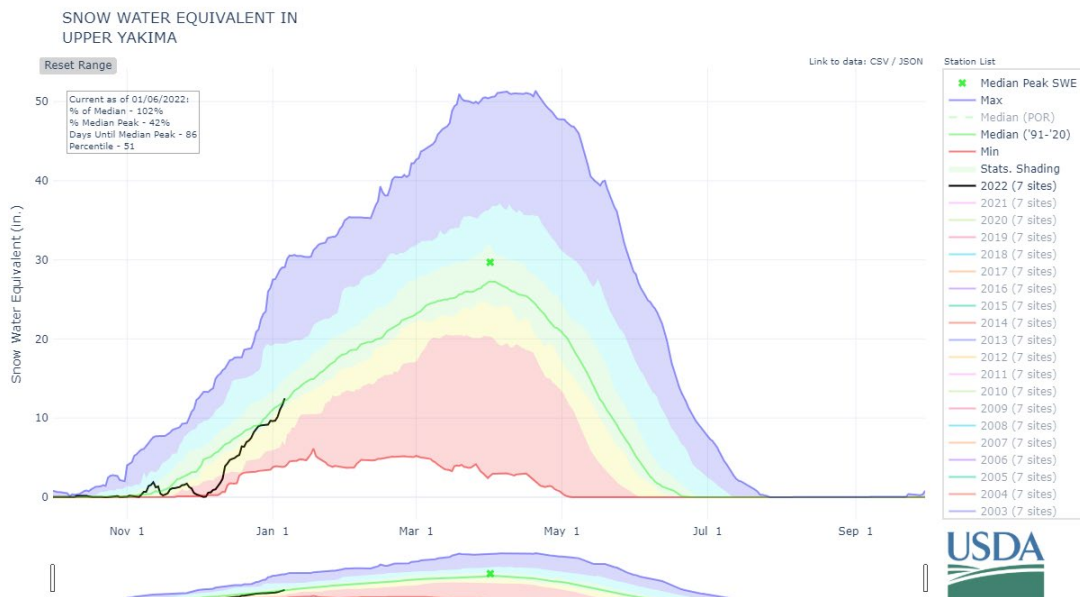
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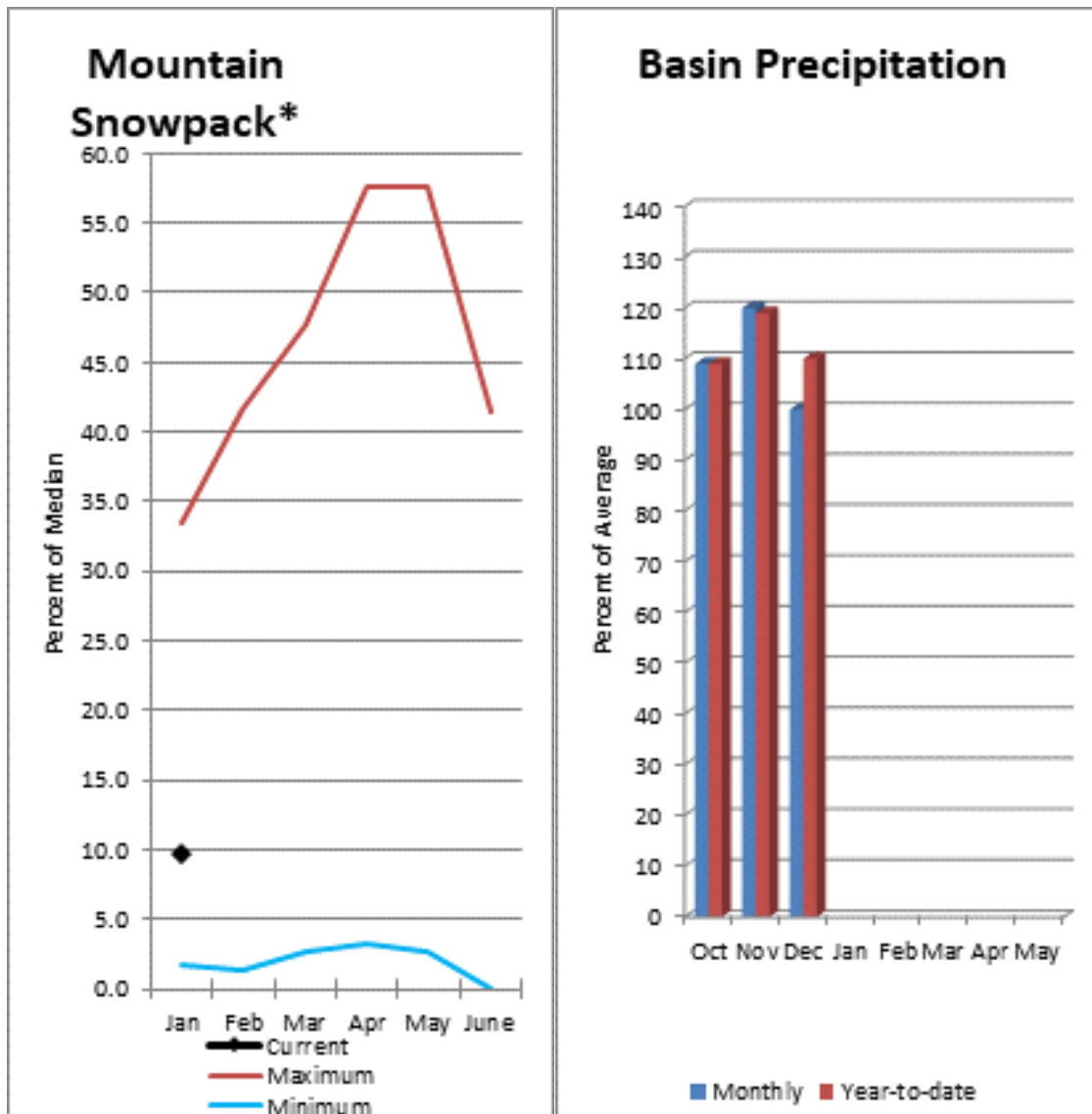
Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Keechelus	102.0	75.9	72.5	157.8
Kachess	162.8	134.2	129.1	239.0
Cle Elum	240.4	167.4	174.2	436.9

Basin Index
 # of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Upper Yakima	7	87%	102%



Lower Yakima - Naches River Basin



January 1 combined basin snowpack was 94% of normal. December precipitation was 100% of normal and 110% for the water-year. January 1 reservoir storage for Bumping and Rimrock reservoirs was 123% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Yakima – Naches River Basin

Data Current As of: 1/7/2022 11:43:02 AM

Lower Yakima Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Yakima R nr Parker ²	APR-JUL	1000	1390	1660	96%	1920	2310	1730
	APR-SEP	1100	1520	1800	95%	2080	2500	1890
Ahtanum Ck at Union Gap	APR-JUL	6	18.4	27	104%	35	48	26
	APR-SEP	8	21	29	104%	38	50	28

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Simcoe-Toppenish	1	88%	106%
Satus	1	101%	58%
Ahtanum	2	85%	107%

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Naches Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Naches	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Rimrock Lake Inflow ²	APR-JUL	134	167	189	97%	210	245	194
	APR-SEP	160	198	225	96%	250	285	235
Naches R nr Naches ²	APR-JUL	460	630	745	103%	860	1030	720
	APR-SEP	505	690	815	105%	945	1130	775
American R nr Nile	APR-JUL	72	92	106	106%	120	140	100
	APR-SEP	77	99	115	106%	130	153	108
Bumping Lake Inflow ²	APR-JUL	78	101	117	103%	133	156	114
	APR-SEP	84	110	127	104%	144	170	122

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Bumping Lake	15.6	16.8	14.7	33.7
Rimrock	120.0	98.2	95.9	198.0

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Naches	8	91%	100%

Klickitat Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

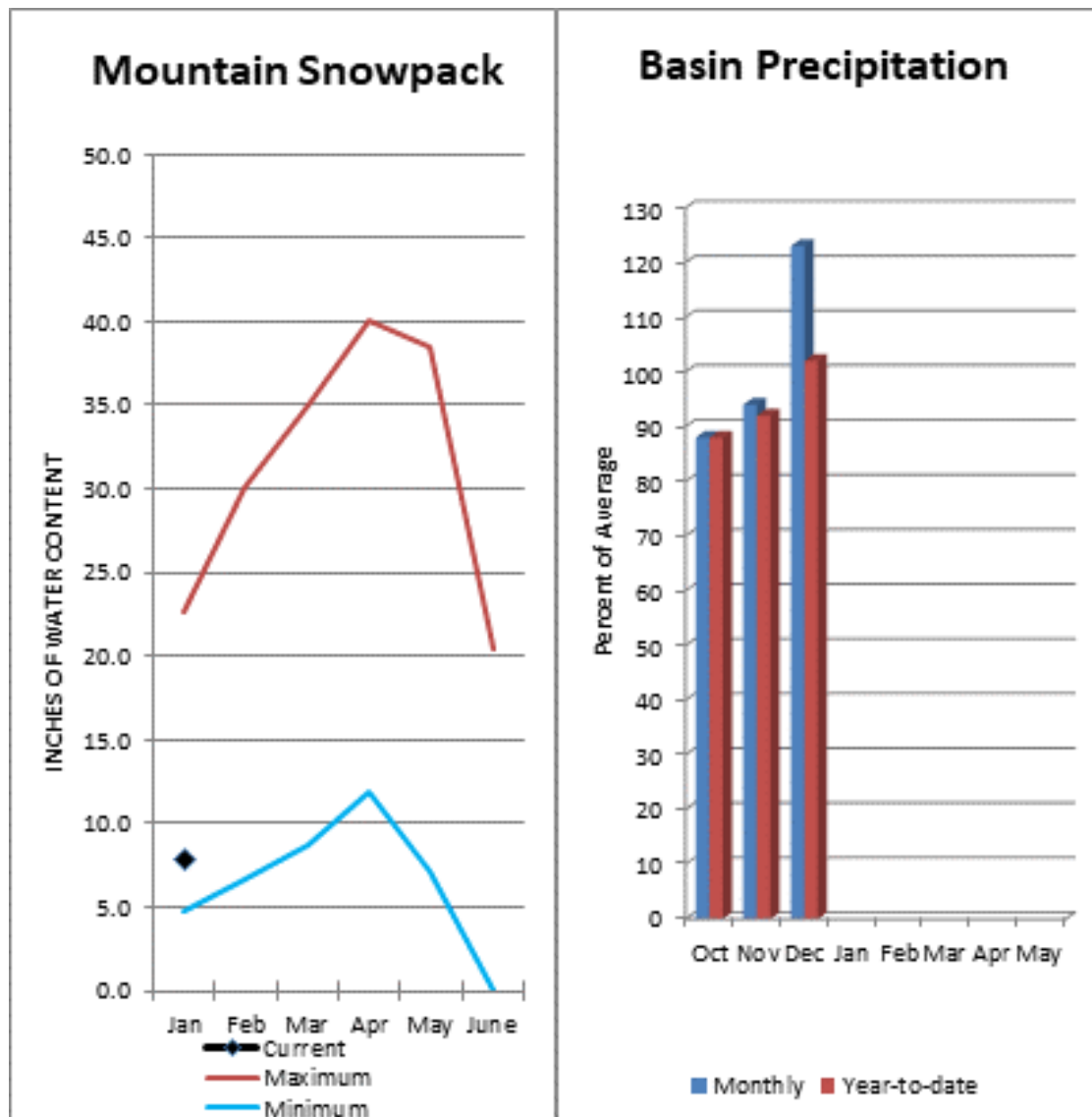
Klickitat	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Klickitat R nr Pitt	APR-JUL	285	390	460	101%	530	635	455
	APR-SEP	360	475	555	102%	635	750	545
Klickitat R nr Glenwood	APR-JUL	79	108	128	97%	149	178	132
	APR-SEP	88	120	141	97%	163	195	145

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Klickitat	4	99%	94%

Lower Snake – Walla Walla River Basin



January 1 snowpack readings were 105% of normal. December precipitation was 123% of normal, bringing the year-to-date precipitation to 102% of normal. Dworshak Reservoir storage was 104% of the median.

Lower Snake – Walla Walla River Basin

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Lower Snake-Walla Walla Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake-Walla Walla	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Grande Ronde R at Troy	MAR-JUL	1010	1340	1560	99%	1790	2110	1580
	APR-SEP	850	1140	1340	99%	1540	1840	1350
SF Walla Walla R nr Milton-Freewater	MAR-JUL	53	64	72	101%	80	92	71
	APR-SEP	53	63	70	100%	77	87	70
Snake R bl Lower Granite Dam-NWS ²	APR-JUL	12900		19400	98%		24400	19700
	APR-SEP	15000		22100	101%		27100	21800
Asotin Ck at Asotin	APR-JUL	17.8	27	35	106%	43	58	33
Mill Ck nr Walla Walla	APR-JUL	14.9	21	26	104%	30	37	25
	APR-SEP	18.2	25	29	100%	34	41	29

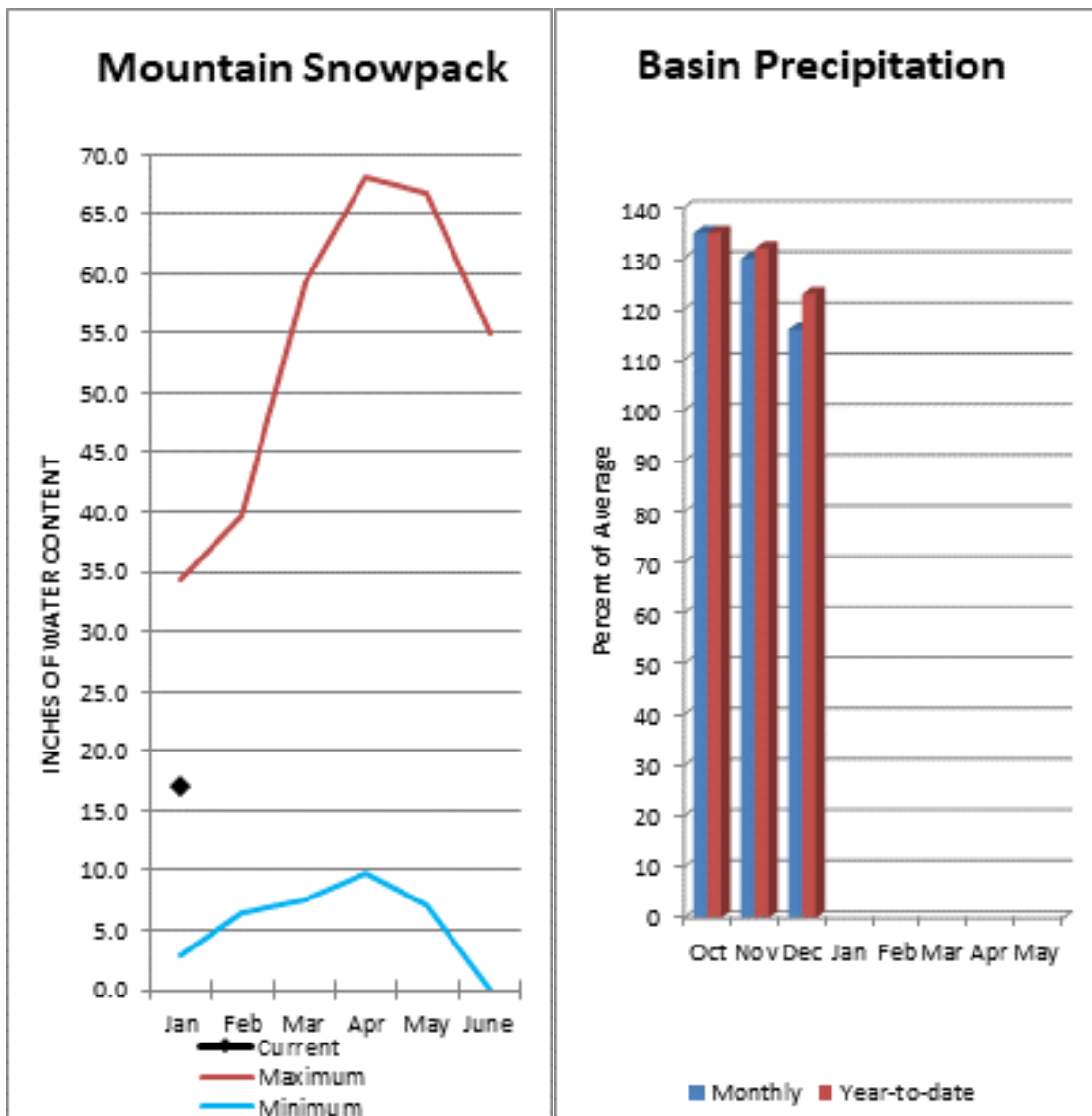
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wallowa Lake	19.4	15.8	15.0	37.5

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Walla Walla	5	114%	99%
Grande Ronde	13	101%	94%
Asotin	2	159%	84%



January 1 snow cover for Lower Columbia was 118% of normal. December precipitation was 116% of normal and the water-year was 123%.

Lower Columbia Streamflow Forecasts - January 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Lower Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Lewis R at Ariel	APR-JUL	785	990	1130	110%	1270	1470	1030
	APR-SEP	895	1110	1250	109%	1390	1610	1150
Cowlitz R bl Mayfield ²	APR-JUL	1200	1520	1740	109%	1950	2270	1600
	APR-SEP	1420	1760	1990	111%	2220	2550	1790
Cowlitz R at Castle Rock ²	APR-JUL	1510	2000	2340	110%	2670	3160	2120
	APR-SEP	1770	2280	2630	113%	2980	3490	2330

1) 90% And 10% exceedance probabilities are actually 95% And 5%

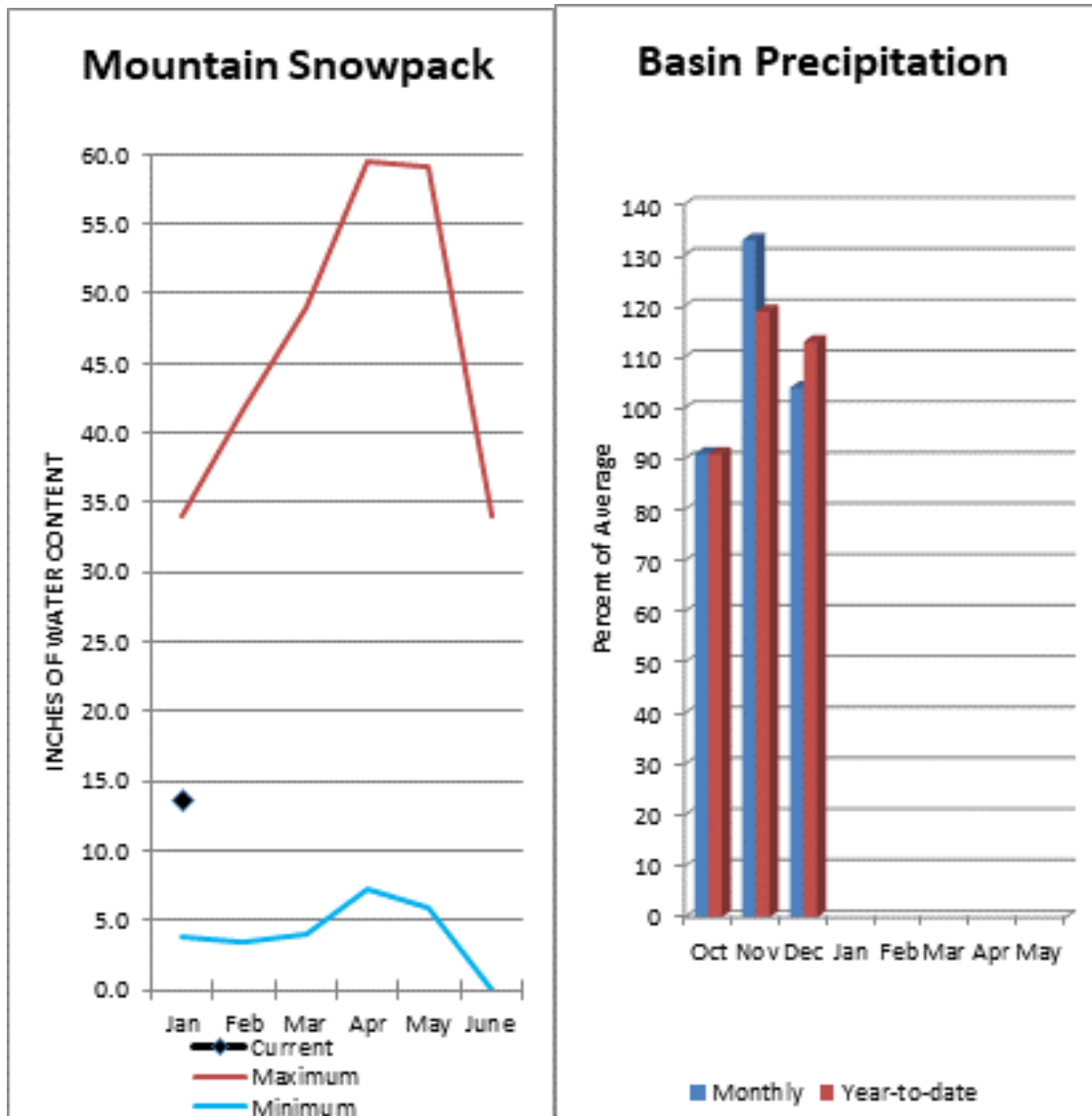
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Mossyrock Dam (Riffe Lk)		818.9	822.2	0.0
Swift			646.6	0.0
Merwin			397.4	0.0
Yale			355.4	0.0
Mayfield		127.0	128.2	0.0

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Lewis	8	139%	107%
Cowlitz	9	111%	110%

South Puget Sound River Basins



January 1 snowpack was 103% of normal for the South Puget Sound. December precipitation was 104% of normal, bringing the water year-to-date to 113% of normal for the basins.

For more information contact your local Natural Resources Conservation Service office.

South Puget Sound River Basins

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South Puget Sound Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
White R bl Clearwater R								
White R nr Buckley ¹¹	APR-JUL	365	440	480	112%	515	595	430
	APR-SEP	440	530	570	110%	610	705	520
Green R bl Howard A Hanson Dam ^{11,2}	APR-JUL	168	230	255	109%	280	340	235
	APR-SEP	193	255	280	110%	305	365	255

1) 90% And 10% exceedance probabilities are actually 95% And 5%

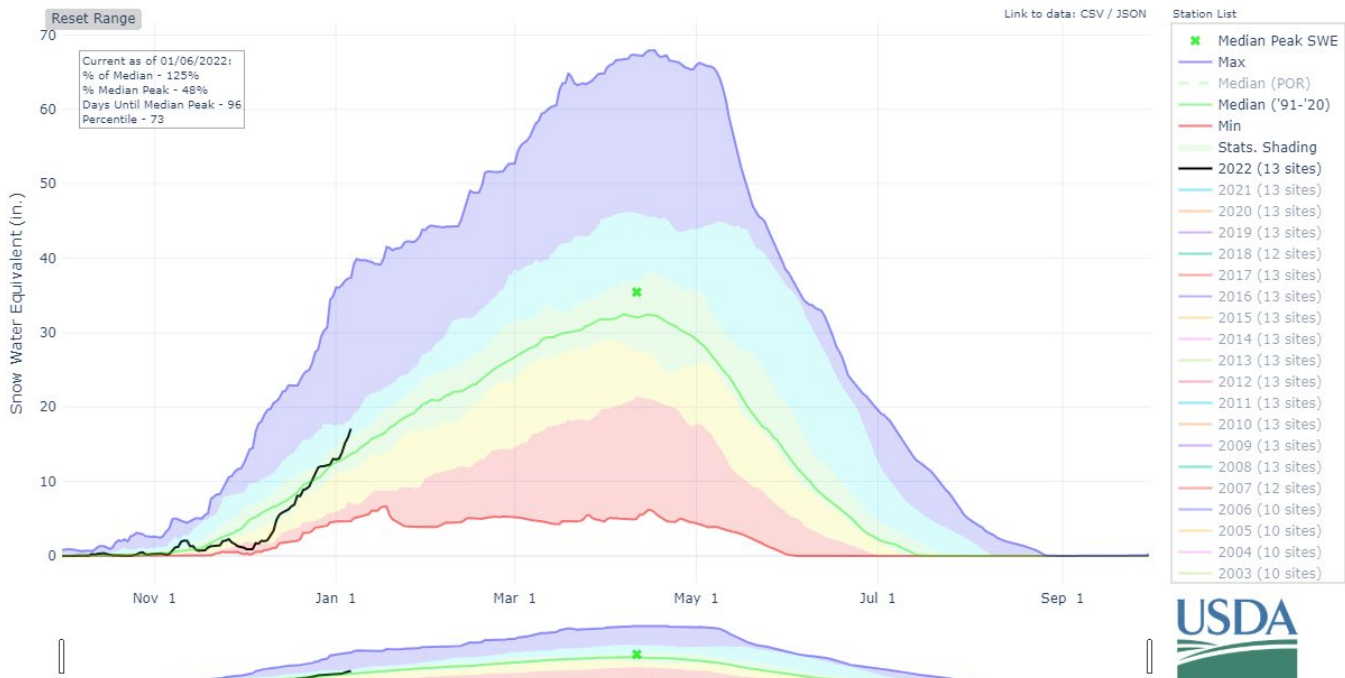
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Howard Hansen	1.7	1.3	2.0	0.0

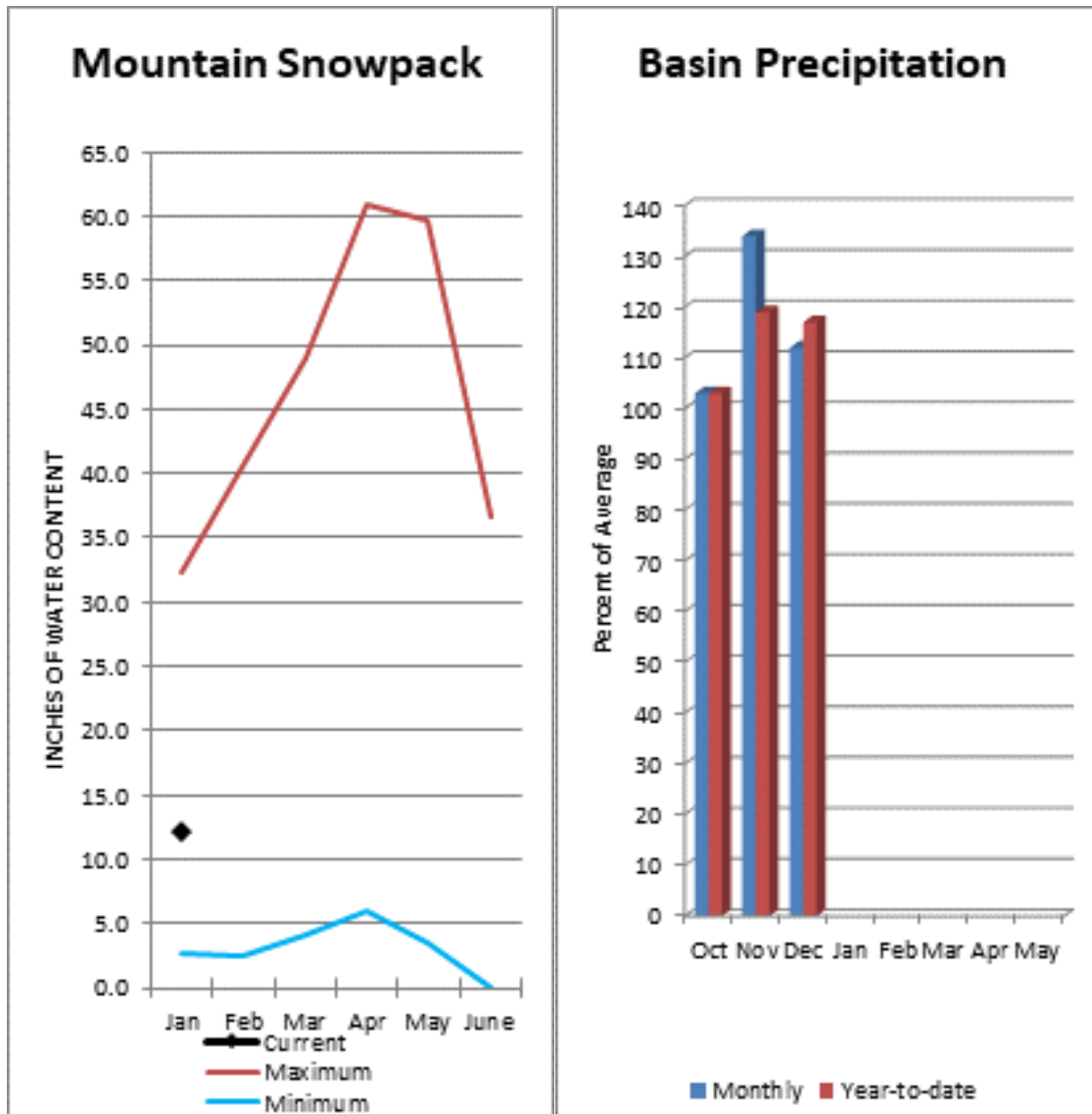
Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
White	5	103%	106%
Puyallup	2	188%	79%
Green	6	101%	99%

SNOW WATER EQUIVALENT IN SOUTH PUGET SOUND



Central Puget Sound River Basins



January 1 median snow cover in Central Puget Sound was 119%. Basin-wide precipitation for December was 112% of normal, bringing water-year-to-date to 117% of normal.

Central Puget Sound River Basins

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Central Puget Sound Streamflow Forecasts - January 1, 2022

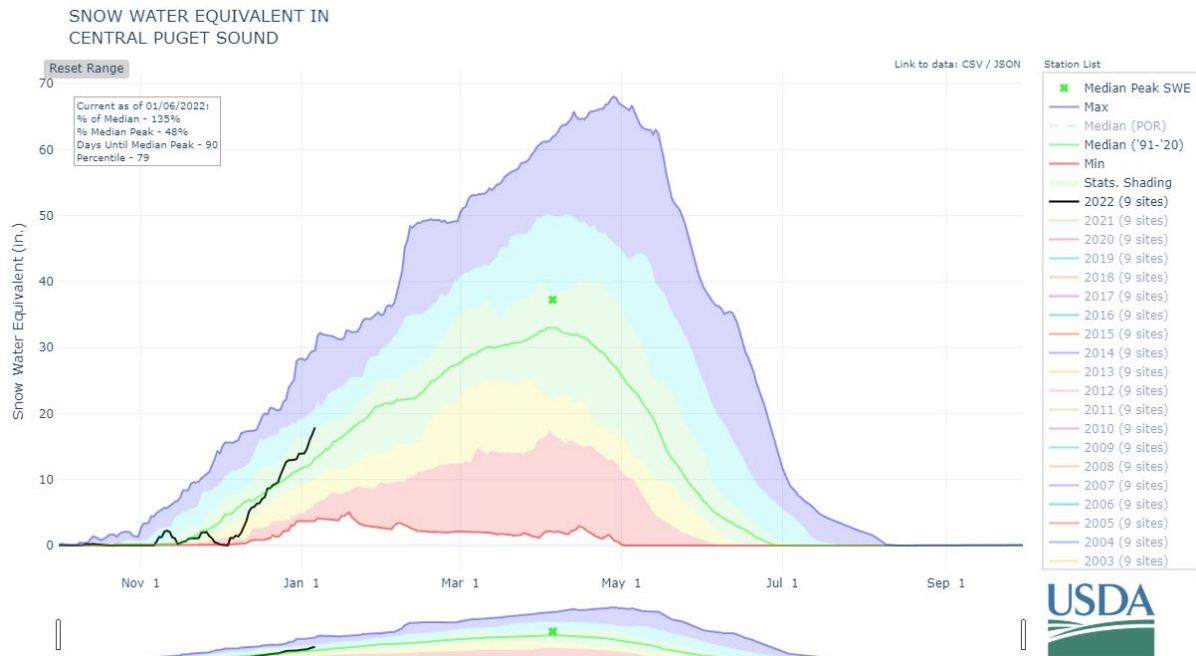
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Taylor Ck nr Selleck	APR-JUL	17.5	21	24	114%	27	30	21
	APR-SEP	20	24	27	113%	30	34	24
Cedar R nr Cedar Falls	APR-JUL	49	66	78	108%	90	108	72
	APR-SEP	54	72	84	109%	96	114	77
SF Tolt R nr Index	APR-JUL	10.6	13.7	15.9	119%	18	21	13.4
	APR-SEP	12.3	15.6	17.9	116%	20	23	15.4
Rex R nr Cedar Falls	APR-JUL	18.8	23	27	117%	30	35	23
	APR-SEP	21	25	29	112%	32	37	26

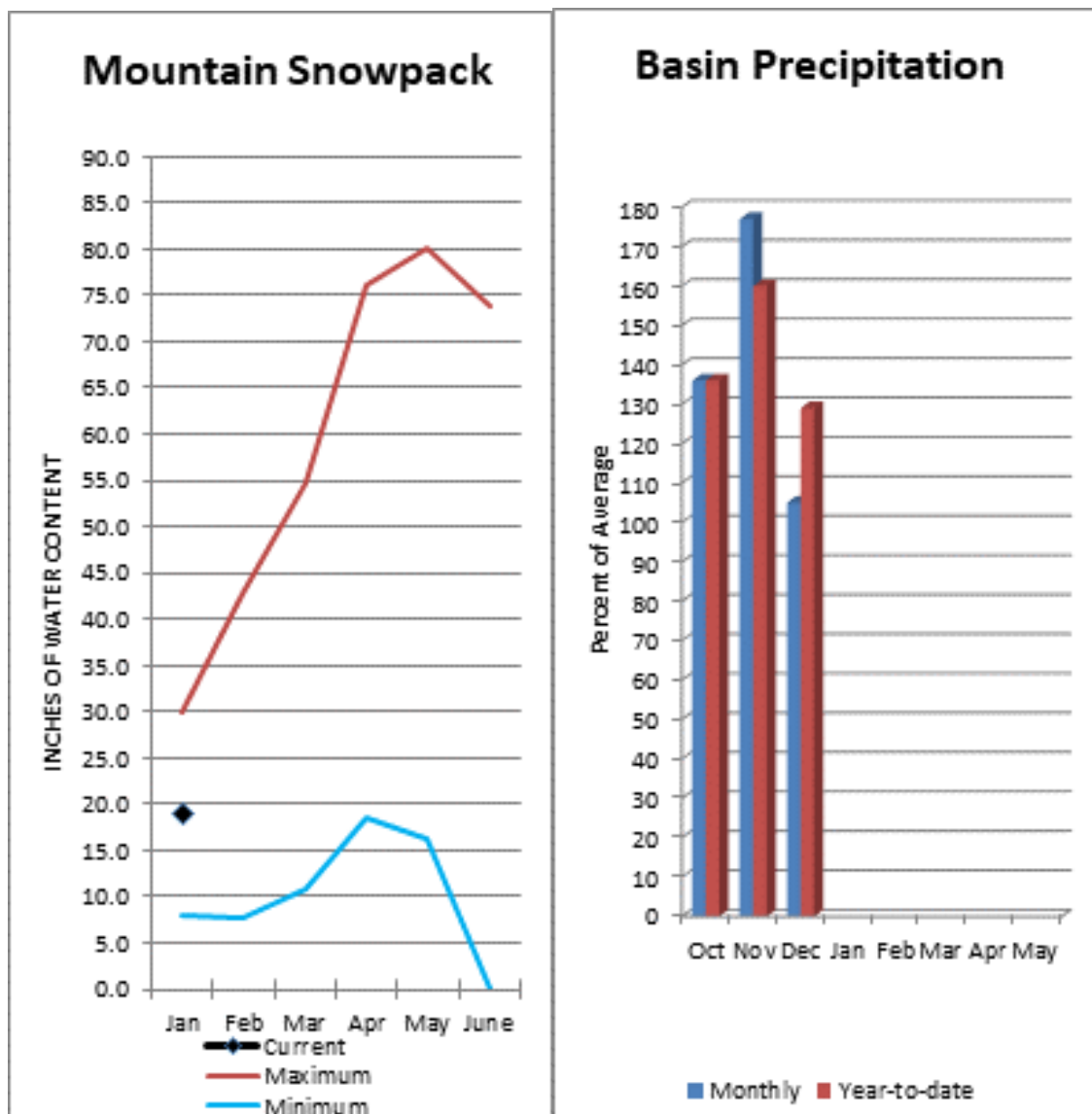
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Tolt	2	133%	146%
Snoqualmie	4	126%	126%
Skykomish	3	122%	135%
Cedar	6	118%	112%



North Puget Sound River Basins



January 1 median snow cover in North Puget Sound was 106%. Basin-wide precipitation for December was 105% of normal, bringing water-year-to-date to 129% of normal. January 1 Basin-wide reservoir storage was 104% of normal.

For more information contact your local Natural Resources Conservation Service office.

North Puget Sound River Basins

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North Puget Sound Streamflow Forecasts - January 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

North Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Skagit R at Newhalem	APR-JUL	1500	1740	1900	109%	2060	2300	1740
	APR-SEP	1790	2050	2220	110%	2390	2650	2020
Baker R at Concrete	APR-JUL	620	725	800	104%	870	980	770
	APR-SEP	820	935	1010	102%	1090	1200	990
Thunder Ck nr Newhalem	APR-JUL	215	240	255	106%	270	290	240
	APR-SEP	315	340	355	108%	370	395	330

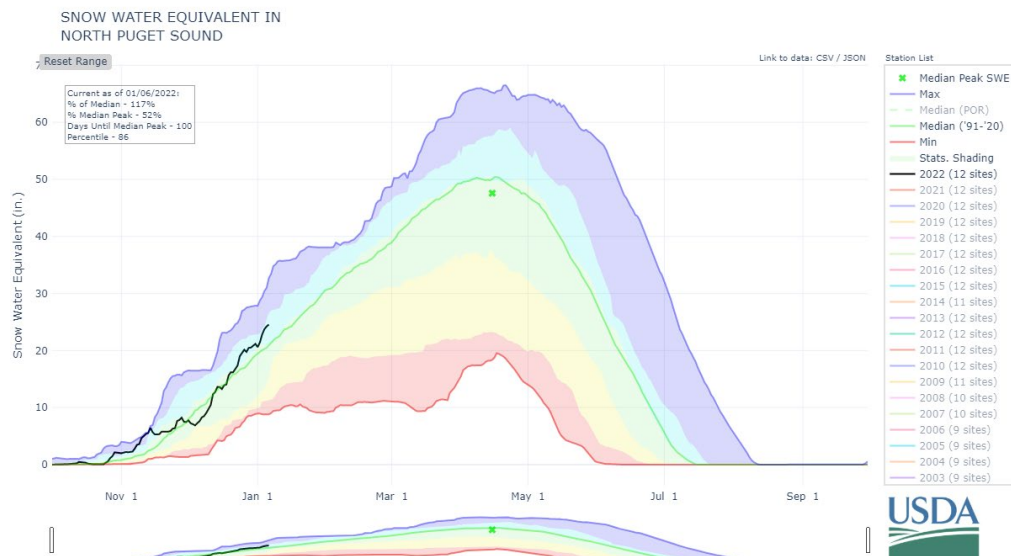
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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

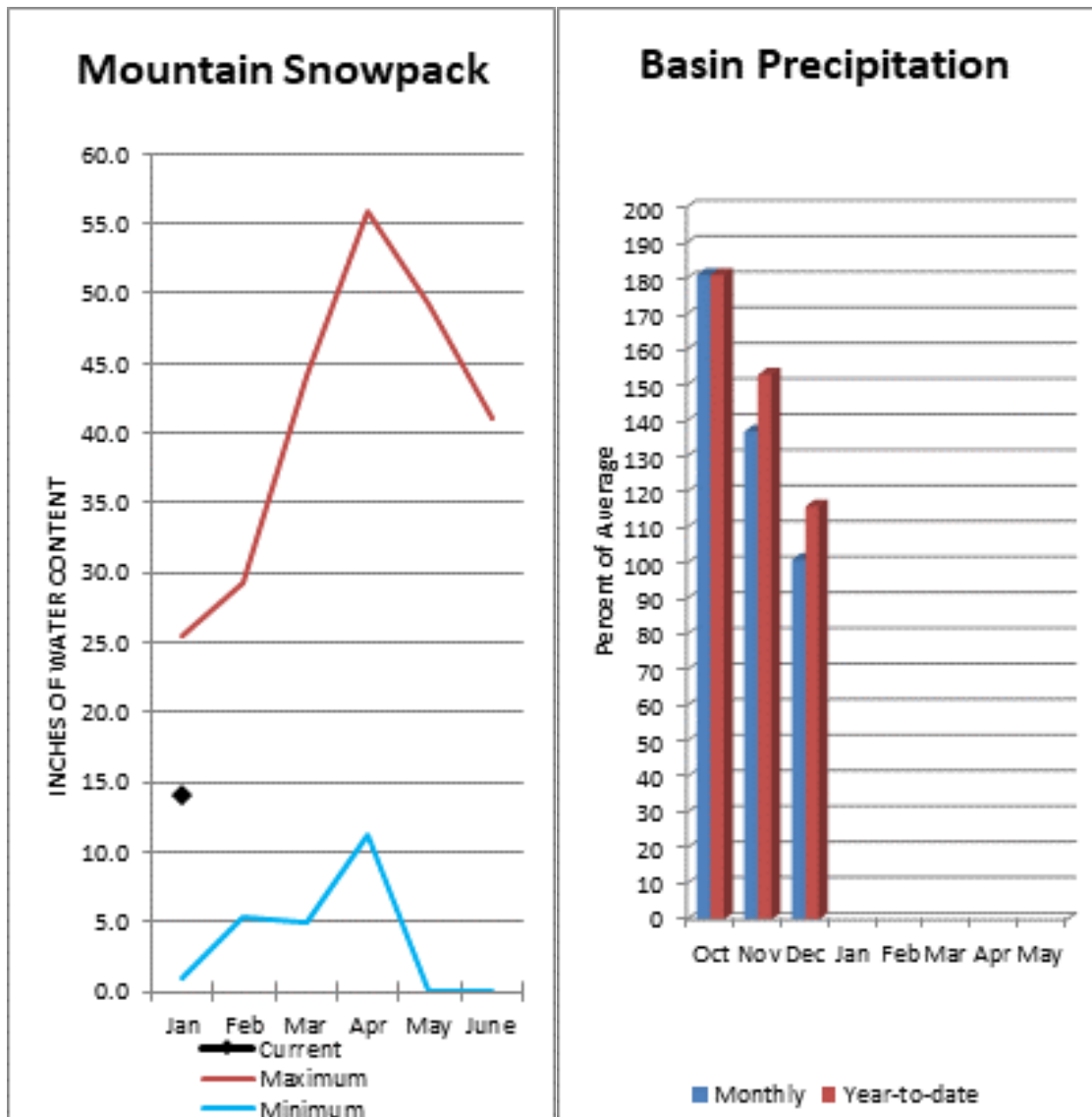
Reservoir Storage End of December, 2021	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Gorge Reservoir			7.7	0.0
Lake Shannon	109.6	85.3	105.0	0.0
Ross	1200.0	1193.4	1133.0	1434.7
Upper Baker	92.8	95.2	107.6	0.0
Diablo Reservoir			85.7	90.6

Basin Index
of reservoirs

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Skagit	6	108%	105%
Nooksack	3	94%	119%
Baker	2	109%	114%



Olympic Peninsula River Basins



Olympic

Peninsula snowpack averaged 100% of normal on January 1. December precipitation was 101% of normal. Precipitation has accumulated at 116% of normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

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Olympic Streamflow Forecasts - January 1, 2022

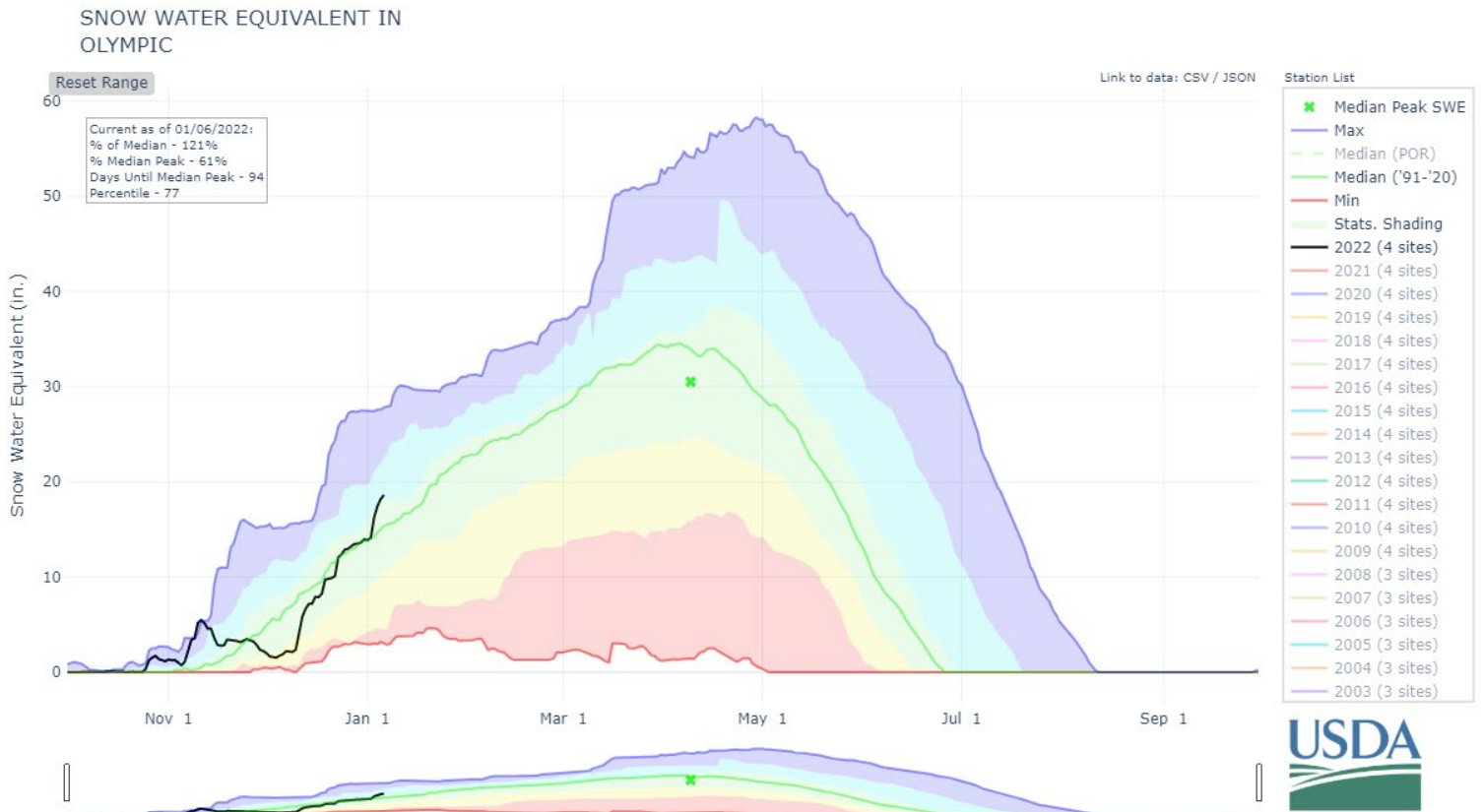
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Olympic	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Elwha R at McDonald Br nr Port Angeles	APR-JUL	270	335	385	104%	430	500	370
	APR-SEP	325	400	455	102%	505	580	445
Dungeness R nr Sequim	APR-JUL	87	109	124	104%	140	162	119
	APR-SEP	104	131	150	108%	168	195	139

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis January 1, 2022	# of Sites	% Median	Last Year % Median
Olympic	4	100%	112%



Issued by

Terry Cosby
Acting Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

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State Conservationist
Natural Resources Conservation Service
Spokane, Washington

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology Washington State Department of Natural Resources Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers U.S. Department of Agriculture, Forest Service U.S. Department of Commerce, NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs U.S. Fish and Wildlife Service
Local	City of Tacoma City of Seattle City of Bellingham Chelan County P.U.D. Pacific Power/PacificCorp Puget Sound Energy Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County Kalispel Tribe of Indians Spokane Indian Tribe Jamestown S’Klallam Tribe Sauk-Suiattle Tribe of Indians Stillaguamish Tribe
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District Kinross Mining

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873



Washington Water Supply Outlook Report

**Natural Resources Conservation Service
Spokane, WA**



Washington Water Supply Outlook Report February 1, 2022



Deer Park looking south into the Olympics. Measured snow conditions described as “spring like” with isothermal snow and high densities. Deer Park snow course was measured on January 26th and recorded at 94% of normal. – Picture by Bill Baccus, Olympic National Park

Water Supply Outlook Reports and Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

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Spokane Valley, WA 99206
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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk, they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Washington Water Supply Outlook

February 2022

General Outlook

January started off with a bang with snow accumulation of +/- 200% of normal, building the statewide pack to 133% of the long-term median. However, the second half of the month brought 0-50% of normal snow fall. The first 11 days of the month carried the weight of the entire month. February is not starting off any better.

The most recent forecast through next week indicates near normal temperatures and below normal precipitation. Climate Prediction Center 3-month (Feb-Mar-Apr) forecast continues on the previous track of below normal temperatures and above normal precipitation which is indicative of the forecasted Enso La Nina. The US Drought Monitor indicates the continuation of D0-D3 drought designation from last year in eastern Washington. (See maps on page 4)

Snowpack

The February 1 statewide SNOTEL readings were 100% of normal. The lowest readings in the state were at 72% of the 30-year median for February 1 in the Status Creek Basin. The Asotin Creek Basin had the most snow with 160%. Westside medians from SNOTEL included the North Puget Sound River basins with 100% of normal, the Central and South Puget River basins with 102% and 100% respectively, and the Lower Columbia basins with 109% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 92% and the Wenatchee area with 98%. Snowpack in the Spokane River Basin was at 101% and the Upper Columbia River basins had 95% of the long-term median.

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	102	86
Newman Lake	90	104
Lower Pend Oreille	100	99
Kettle	96	114
Omak	89	132
Methow	102	109
Conconully Lake	90	106
Central Columbia	98	106
Upper Yakima	101	101
Naches	95	94
Ahtanum Creek	87	99
Walla Walla	105	82
Lower Snake	88	95
Cowlitz	104	100
Lewis	117	93
White	104	94
Green	98	83
Puyallup	123	65
Cedar	105	88
Snoqualmie	113	96
Skykomish	98	90
Skagit	106	109
Nooksack	86	114
Olympic Peninsula	90	118

Precipitation

Precipitation accumulation was mostly near to slightly above normal across the state for February. Statewide water-year average was 117% of average as of February 1. Monthly precipitation ranged from a high of 118% of normal on the Olympic Peninsula to a low of 89% in the Lower Yakima Basin. SNOTEL collects all form of precipitation including, rain, snow, sleet and hail.

RIVER BASIN	JANUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	93	103
Lower Pend Oreille	109	107
Upper Columbia	104	121
Central Columbia	116	116
Upper Yakima	110	108
Naches	110	110
Lower Yakima	89	99
Klickitat	94	102
Walla Walla	97	102
Lower Snake	93	100
Lower Columbia	110	118
South Puget Sound	116	112
Central Puget Sound	118	116
North Puget Sound	98	121
Olympic Peninsula	119	118

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. February 1 Reservoir storage in the Yakima Basin was 134% of average for the Upper Reaches and 123% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 68,000-acre feet, 64% of normal and 29% of capacity; and Ross Lake within the Skagit River Basin at 108% of normal and 84% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	29	64
Lower Pend Oreille	35	85
Upper Columbia	22	32
Central Columbia	63	135
Upper Yakima	69	132
Lower Yakima	68	113
Lower Snake	54	126
North Puget Sound	88	106
South Puget Sound		34

For more information contact your local Natural Resources Conservation Service office.

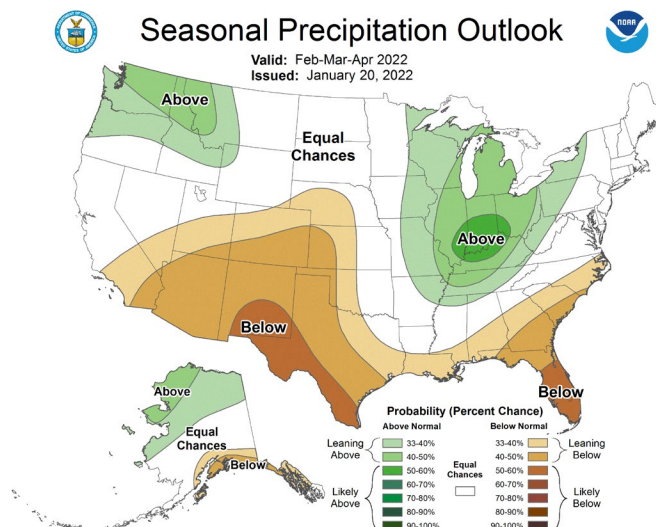
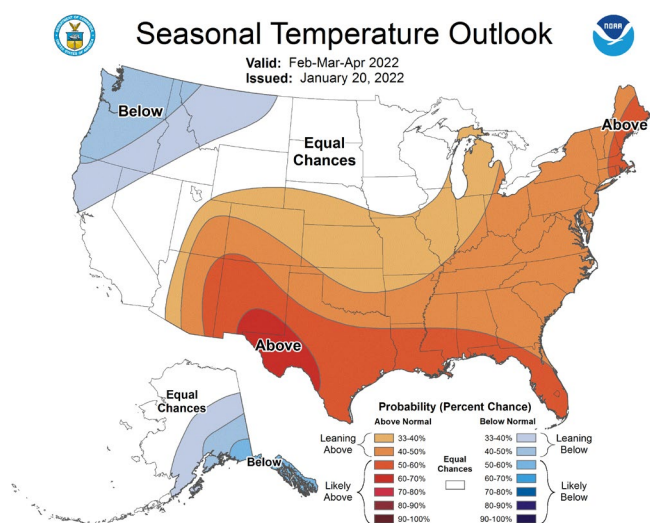
Streamflow

Early winter forecasts for April-September stream flows are never quite as robust as they are later in the season when we know more about the winter climatology. At times only a few degrees warmer or cooler than forecasted can make or break stream flow predictions. Volumetric forecasts are developed using current, historic and median snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

BASIN	PERCENT OF AVERAGE FORECAST (50% CHANCE OF EXCEEDENCE)
Spokane	89-114
Lower Pend Oreille	96-109
Upper Columbia	88-106
Central Columbia	96-104
Upper Yakima	98-104
Lower Yakima	98-107
Naches	98-109
Klickitat	97-102
Lower Snake-Walla Walla	88-106
Lower Columbia	104-107
South Puget Sound	108-109
Central Puget Sound	108-120
North Puget Sound	101-109
Olympic Peninsula	99-109

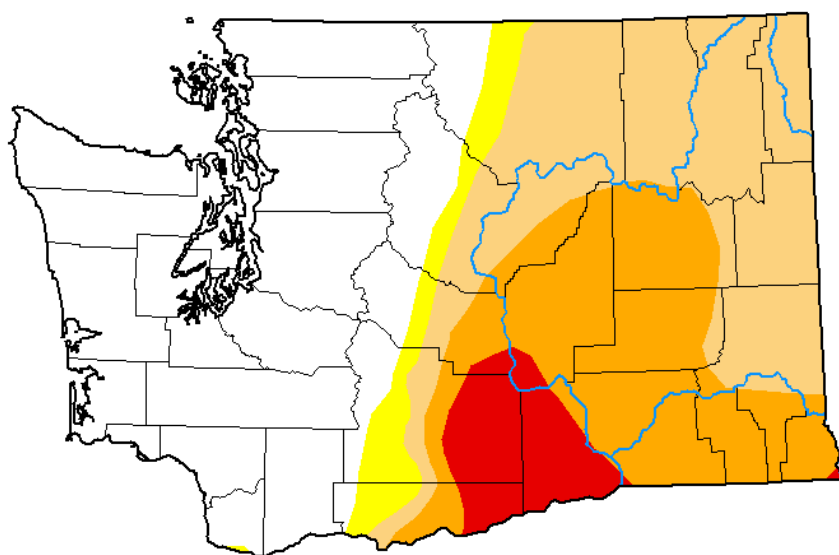
STREAM	PERCENT OF AVERAGE JANUARY STREAMFLOWS
Priest River - near Priest River	88
Kettle at Laurier	134
Columbia at Birchbank	126
Spokane at Spokane	77
Similkameen at Nighthawk	209
Okanogan near Tonasket	156
Methow at Pateros	146
Chelan at Chelan	113
Stehekin near Stehekin	140
Wenatchee at Pashastin	133
Cle Elum near Roslyn	115
Yakima near Parker	103
Naches near Naches	110
Grande Ronde at Troy	69
Snake below Lower Granite Dam	71
Columbia River at The Dalles	114
Lewis at Merwin Dam	116
Cowlitz below Mayfield Dam	135
Skagit at Concrete	118
Dungeness near Sequim	120

Climate



U.S. Drought Monitor Washington

February 1, 2022
(Released Thursday, Feb. 3, 2022)
Valid 7 a.m. EST



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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droughtmonitor.unl.edu



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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/>

Oregon:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/>

Idaho:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

National Water and Climate Center (NWCC):

<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

USDA-NRCS Agency Homepages

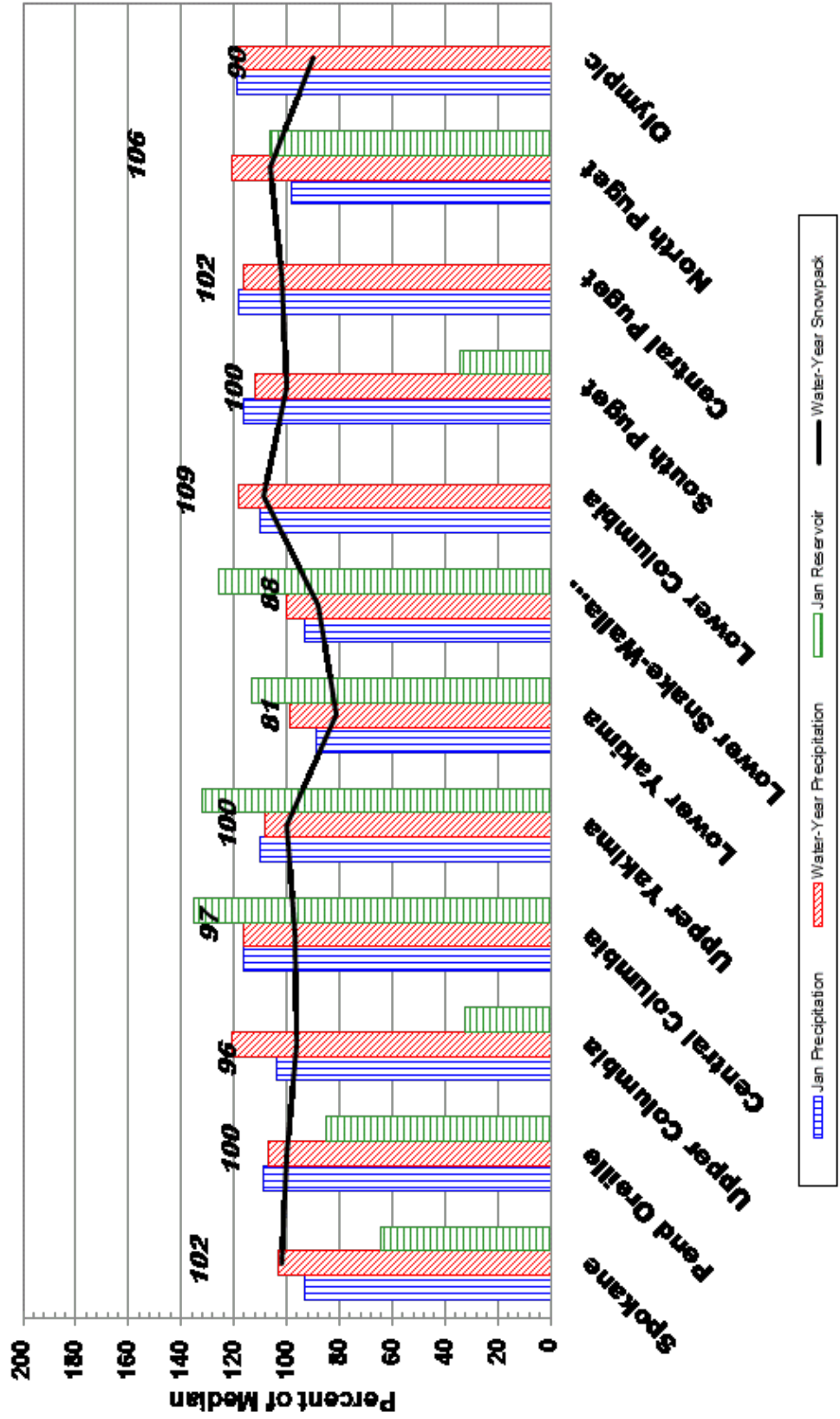
Washington:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/>

NRCS National:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>

February 1, 2022 - Snowpack, Precipitation and Reservoir Conditions at a Glance (Water Year = October 1 - Current Date)



89th Annual Western Snow Conference

April 18-21, 2022

Salt Lake City, Utah

“Drought, Fire, and Precipitation Extremes: Operational Challenges for Snow Water Resources”

Please plan to join us for the 89th Annual Meeting of the Western Snow Conference. The 2022 Meeting will be held at the University of Utah in Salt Lake City, April 18-21, 2022. We invite you to review the Call for Papers and to submit an abstract at the links below:

Please see the [Call for Papers](#) for additional information. Abstracts can be submitted online [HERE](#).

Details of this conference are still being finalized, including formats, platforms, and opportunity for vendor participation.

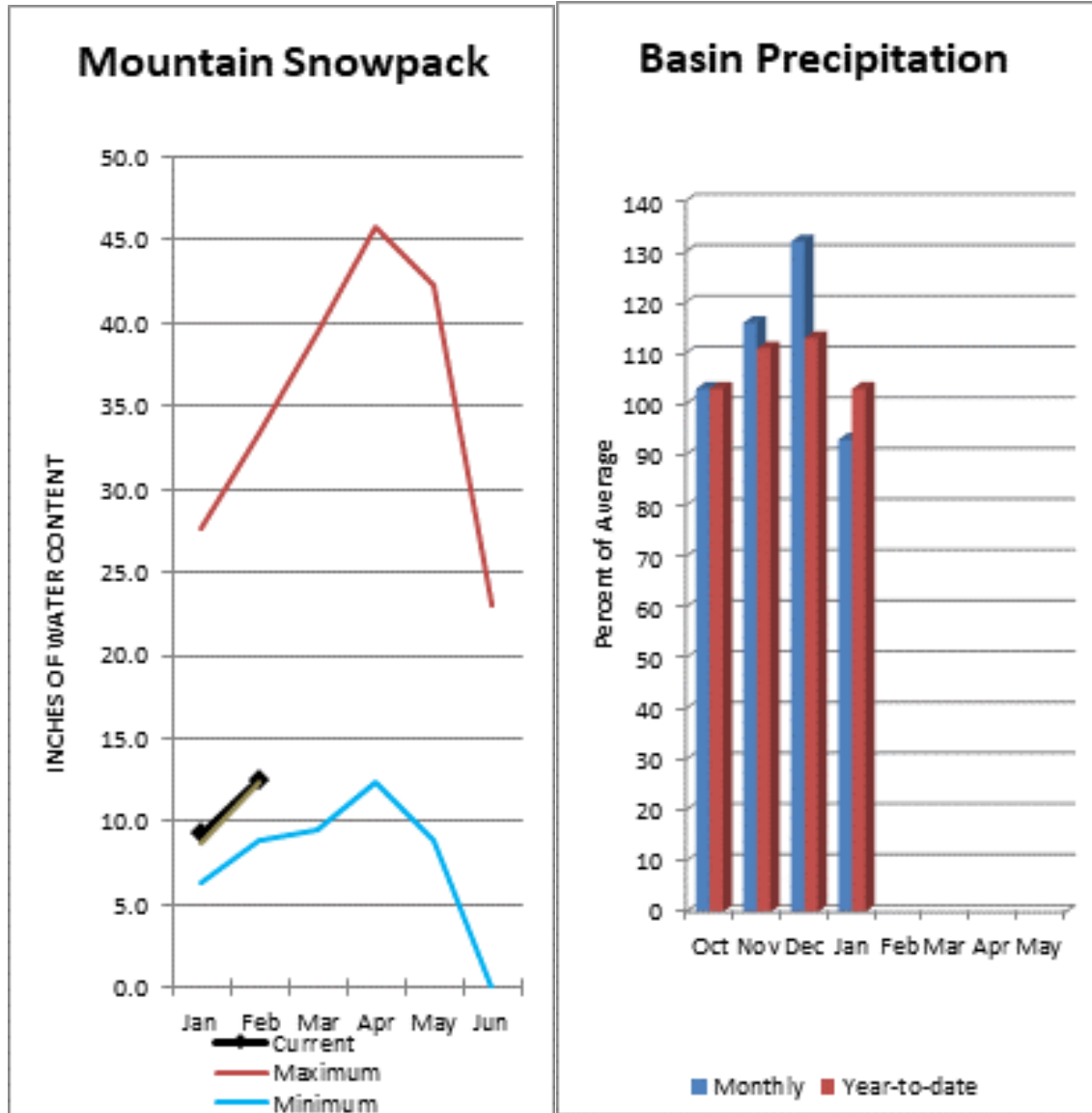
Noah Molotch
General Chair, WSC

McKenzie Skiles
Conference Chair

Additional information about the conference will be posted on the WSC web page at <http://www.westernsnowconference.org/>

Also find Western Snow Conference on Facebook

Spokane River Basin



Basin snowpack is 101% of normal and precipitation is 103% of normal for the water year. Precipitation for January was 93% of normal. Reservoir storage is currently at 64% of normal.

For more information contact your local Natural Resources Conservation Service office.

Spokane River Basin

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Spokane Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Spokane	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Spokane R nr Post Falls ²	APR-JUL	1770	2370	2780	111%	3180	3780	2510
	APR-SEP	1850	2460	2870	112%	3280	3890	2570
NF Coeur d'Alene R at Enaville	APR-JUL	505	690	815	114%	940	1130	715
	APR-SEP	535	725	855	114%	980	1170	750
Chamokane Ck nr Long Lake	MAR-JUL	9.8	17.5	24	89%	32	44	27
Spokane R at Long Lake ²	APR-JUL	2040	2660	3080	113%	3500	4120	2720
	APR-SEP	2220	2850	3280	114%	3720	4350	2870
St. Joe R at Calder	APR-JUL	845	1060	1200	114%	1350	1560	1050
	APR-SEP	905	1120	1270	113%	1420	1640	1120

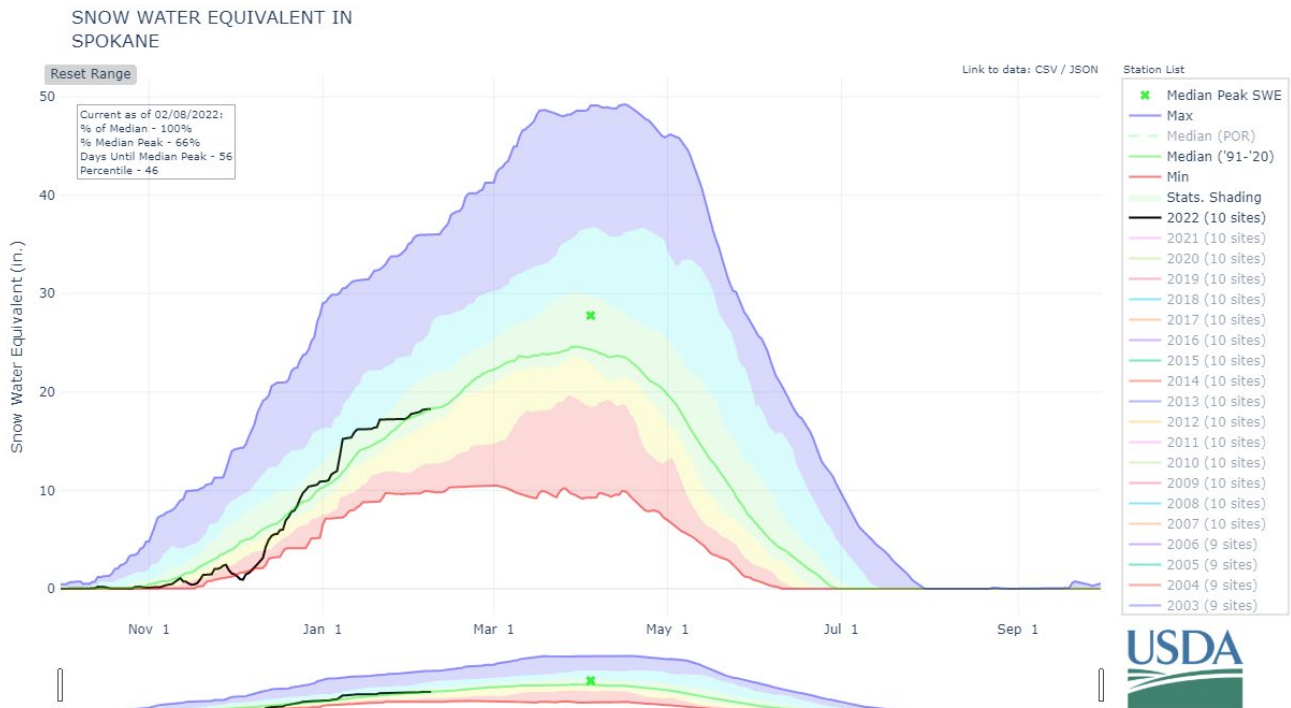
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

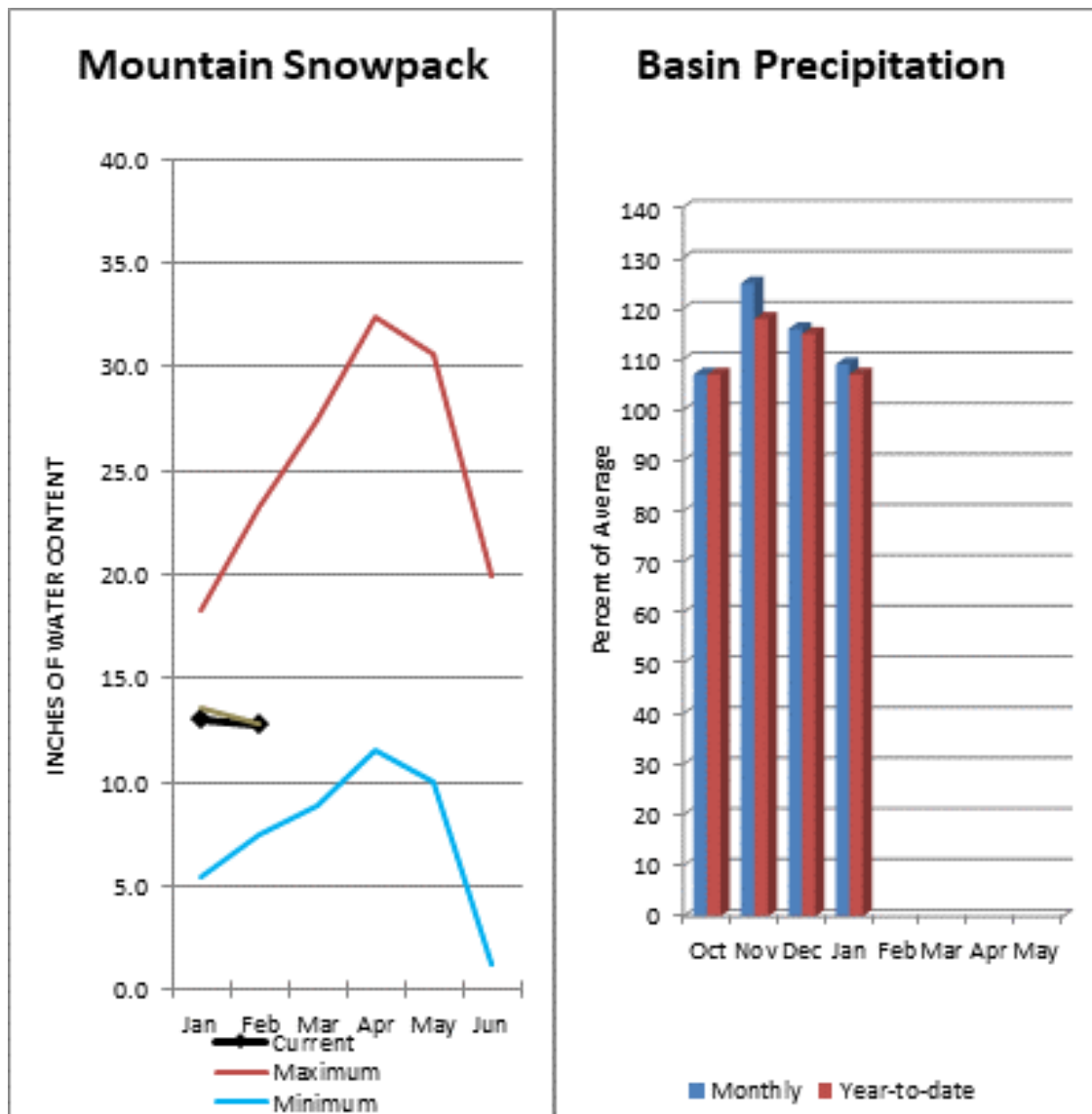
Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Coeur d' Alene	68.0	71.8	106.7	238.5

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Spokane	18	102%	86%
Newman Lake	5	90%	104%



Lower Pend Oreille River Basins



February 1 snow cover was 100% of normal in the Pend Oreille Basin River Basin and precipitation during January was 109% of normal, bringing the year-to-date precipitation at 107% of normal. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 85% of normal.

For more information contact your local Natural Resources Conservation Service office.

Lower Pend Oreille River Basins

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Lower Pend Oreille Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Pend Oreille	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Priest R nr Priest River ²	APR-JUL	525	690	805	96%	915	1080	840
	APR-SEP	560	730	845	96%	965	1140	880
Pend Oreille R bl Box Canyon ²	APR-JUL	9290	11400	12800	109%	14200	16300	11700
	APR-SEP	10100	12300	13800	109%	15300	17500	12700
Pend Oreille Lake Inflow ²	APR-JUL	9080	11200	12600	108%	14100	16200	11700
	APR-SEP	9910	12100	13600	108%	15100	17300	12600

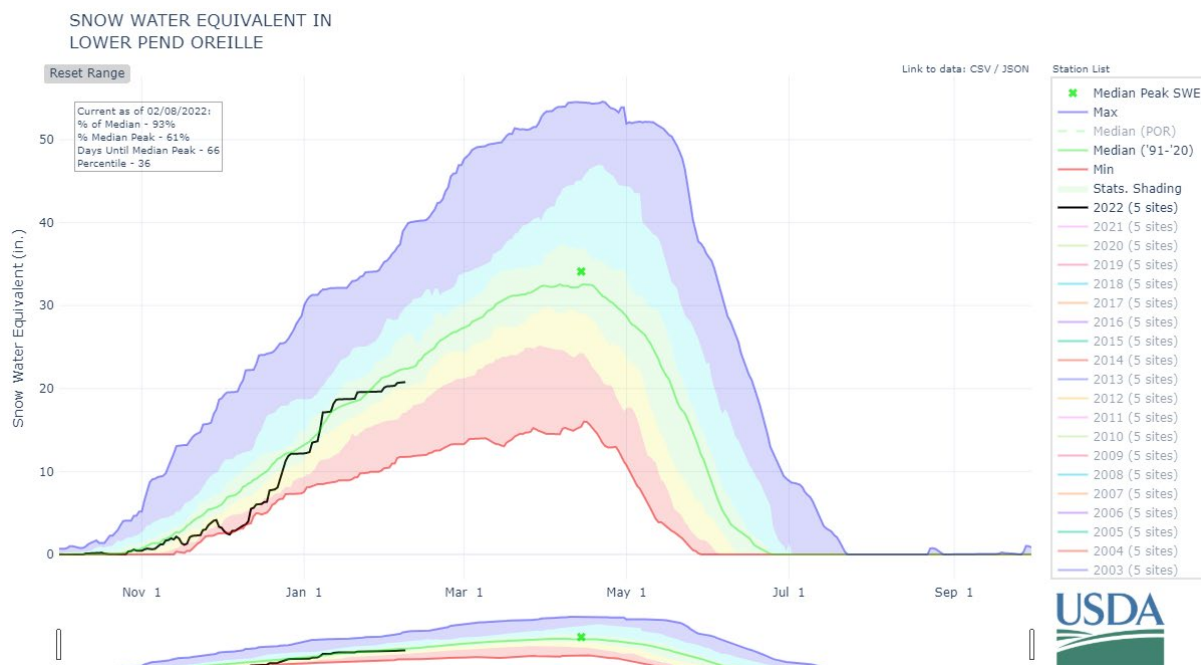
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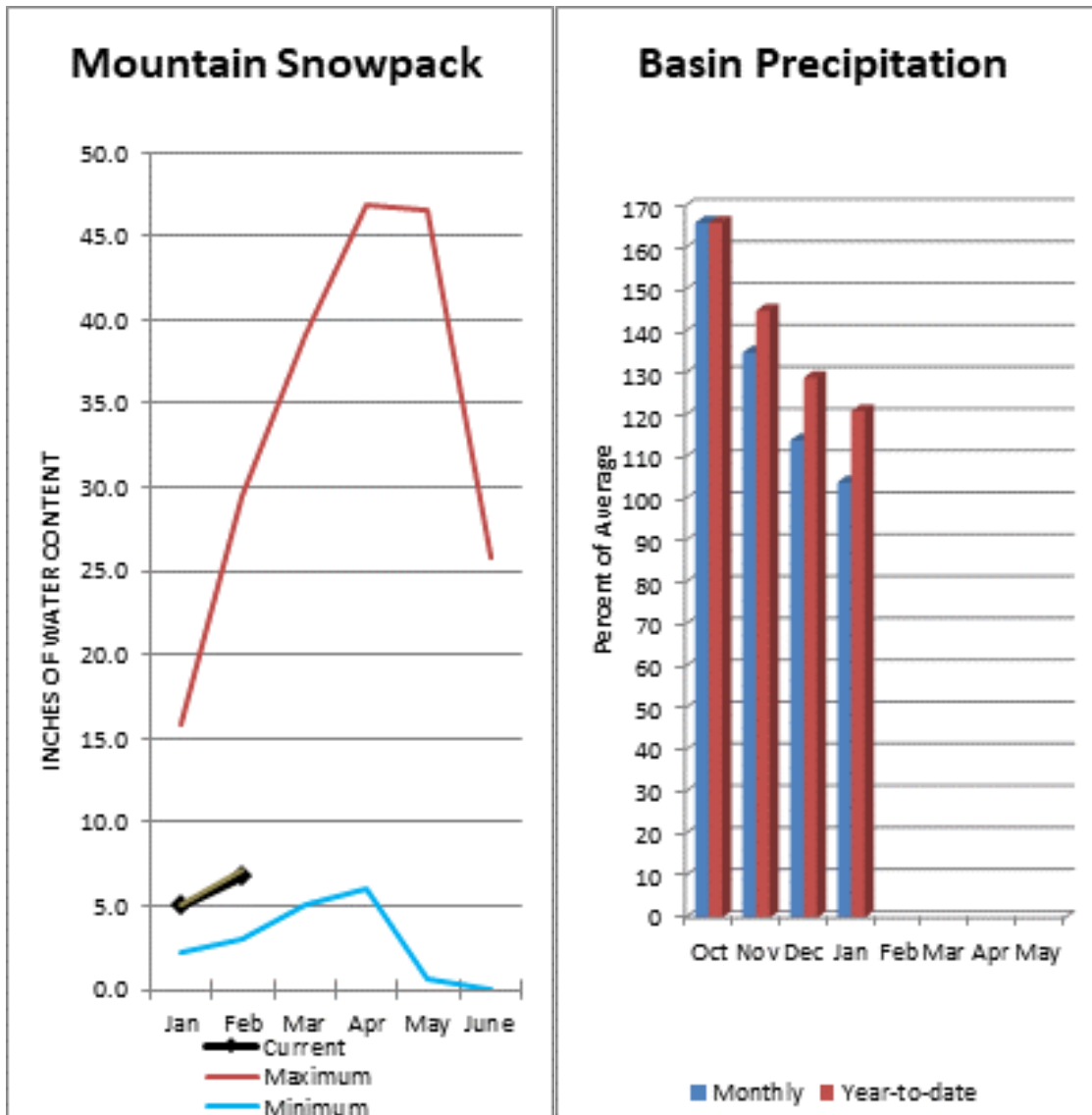
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Pend Oreille	534.3	577.0	630.8	1561.3
Priest Lake	51.8	46.6	55.3	119.3

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Lower Pend Oreille	14	100%	99%
Sullivan	1	90%	101%





February 1 snow cover on the Upper Columbia basins was 96% of normal and January precipitation was 104% of normal, with precipitation for the water year at 121% of normal. Combined storage in the Conconully Reservoirs was 32% of normal.

Upper Columbia Streamflow Forecasts - February 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Similkameen R nr Nighthawk	APR-JUL	970	1190	1340	106%	1490	1720	1260
	APR-SEP	1050	1270	1420	106%	1580	1800	1340
Okanogan R at Malott	APR-JUL	830	1160	1380	89%	1600	1920	1550
	APR-SEP	925	1270	1510	90%	1750	2090	1680
Okanogan R nr Tonasket	APR-JUL	825	1130	1350	89%	1560	1870	1520
	APR-SEP	915	1250	1480	91%	1700	2040	1620
Columbia R at Grand Coulee-NWS ²	APR-JUL	43300		53700	102%		68000	52600
	APR-SEP	51300		63500	105%		80600	60600
Colville R at Kettle Falls	APR-JUL	34	75	103	90%	132	173	115
	APR-SEP	37	83	114	92%	145	190	124
Methow R nr Pateros	APR-JUL	615	790	905	101%	1020	1200	895
	APR-SEP	660	845	970	101%	1090	1280	965
Kettle R nr Laurier	APR-JUL	1080	1430	1660	90%	1900	2240	1840
	APR-SEP	1120	1480	1720	88%	1960	2310	1950

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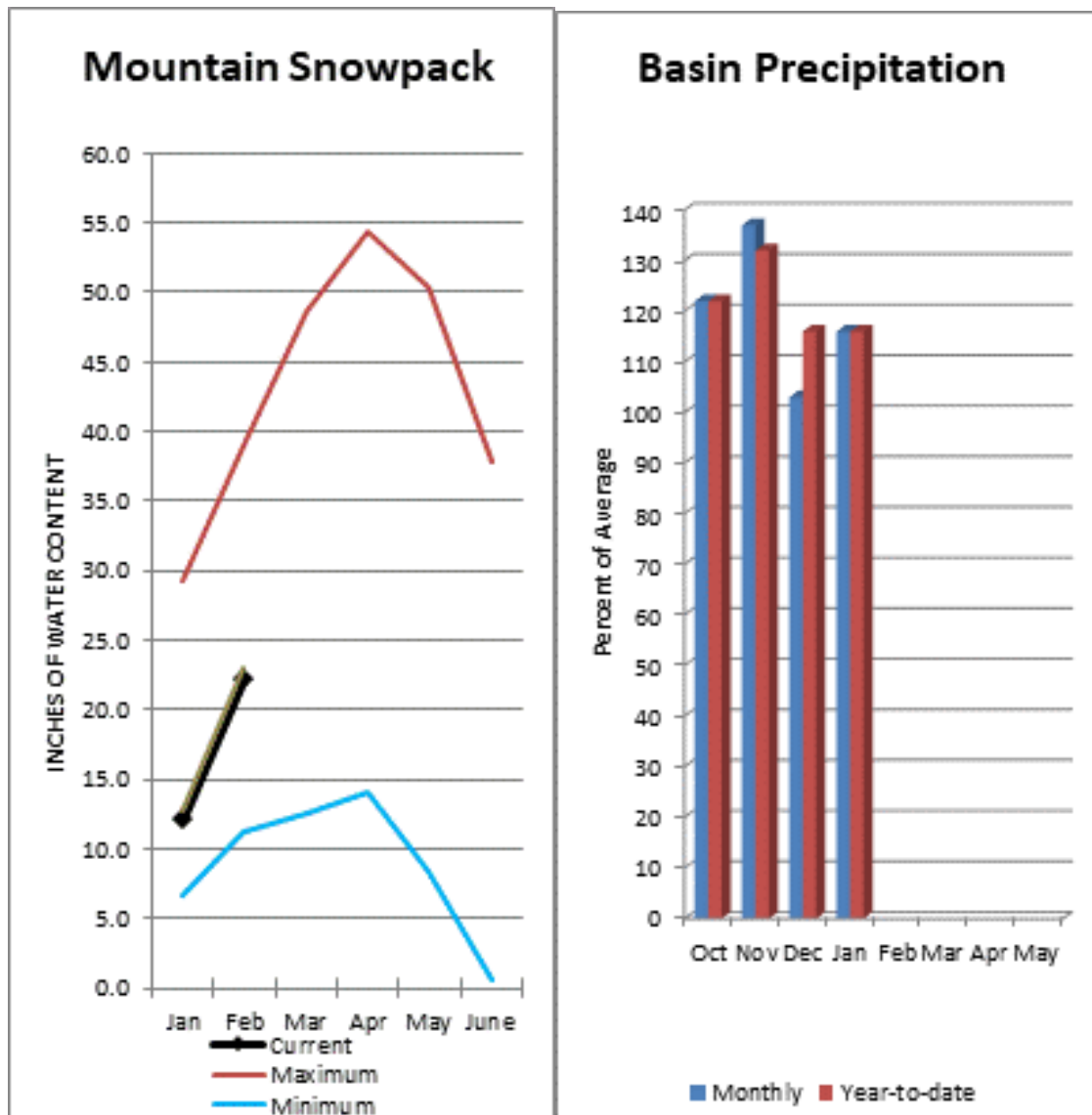
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	3.3	6.1	7.8	10.5
Conconully Reservoir	1.9	7.0	8.4	13.0

 Basin Index
 # of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Upper Columbia	44	96%	115%
Toats Coulee	44	96%	115%
Sanpoil	3	87%	141%
Omak	3	89%	132%
Methow	11	102%	109%
Kettle	9	96%	118%
Concully Lake	4	90%	106%
Colville	3	90%	119%

Central Columbia River Basins



February 1 snowpack in the Central Columbia River basins was 98% of normal. Precipitation during January was 116% of normal in the basin and 116% for the year-to-date. Reservoir storage in Lake Chelan was 135% of the median.

For more information contact your local Natural Resources Conservation Service office.

Central Columbia River Basins

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Central Columbia Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Chelan R at Chelan ²	APR-JUL	810	950	1050	101%	1140	1280	1040
	APR-SEP	895	1060	1170	100%	1270	1430	1170
Wenatchee R at Peshastin	APR-JUL	1090	1280	1420	99%	1550	1750	1440
	APR-SEP	1160	1380	1540	100%	1690	1910	1540
Icicle Ck nr Leavenworth	APR-JUL	215	260	290	100%	315	360	290
	APR-SEP	230	280	310	100%	345	395	310
Columbia R bl Rock Island Dam-NWS ²	APR-JUL	46700		58500	102%		75400	57600
	APR-SEP	55100		68700	104%		88800	65800
Stehekin R at Stehekin	APR-JUL	545	640	700	98%	765	855	715
	APR-SEP	635	735	805	96%	875	980	835
Wenatchee R at Plain	APR-JUL	790	945	1050	98%	1150	1310	1070
	APR-SEP	855	1030	1140	98%	1260	1430	1160
Entiat R nr Ardenvoir	APR-JUL	149	187	210	95%	240	275	220
	APR-SEP	161	200	230	98%	260	300	235

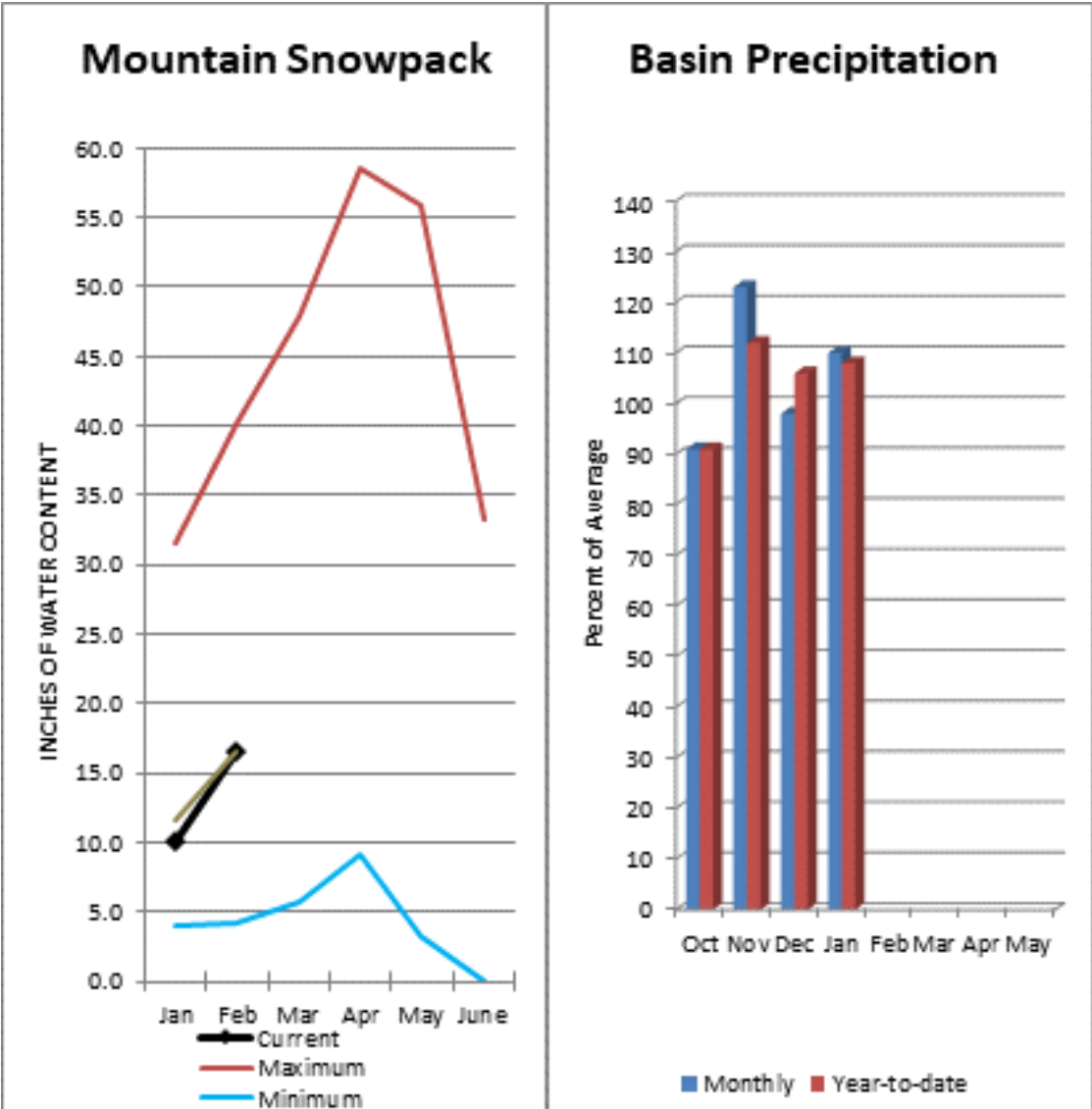
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Chelan		322.3	314.3	677.4

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Central Columbia	12	98%	106%
Wenatchee	12	98%	106%
Stemilt	1	87%	105%
Lake Chelan	3	97%	102%
Entiat	1	97%	130%
Colckum	1	73%	124%



February 1 snowpack was 101% of normal. Precipitation was 110% of normal for January and 108% for the water-year. February 1 reservoir storage for the Upper Yakima reservoirs was 132% of normal.

Upper Yakima Streamflow Forecasts - February 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Keechelus Reservoir Inflow ²	APR-JUL	76	100	117	104%	134	158	112
	APR-SEP	85	111	128	102%	146	171	126
Kachess Reservoir Inflow ²	APR-JUL	68	88	102	103%	116	137	99
	APR-SEP	76	97	112	104%	126	148	108
Teanaway R bl Forks nr Cle Elum	APR-JUL	77	109	132	101%	154	186	131
	APR-SEP	79	112	134	100%	157	190	134
Cle Elum Lake Inflow ²	APR-JUL	280	340	380	99%	420	480	385
	APR-SEP	305	370	410	98%	455	520	420

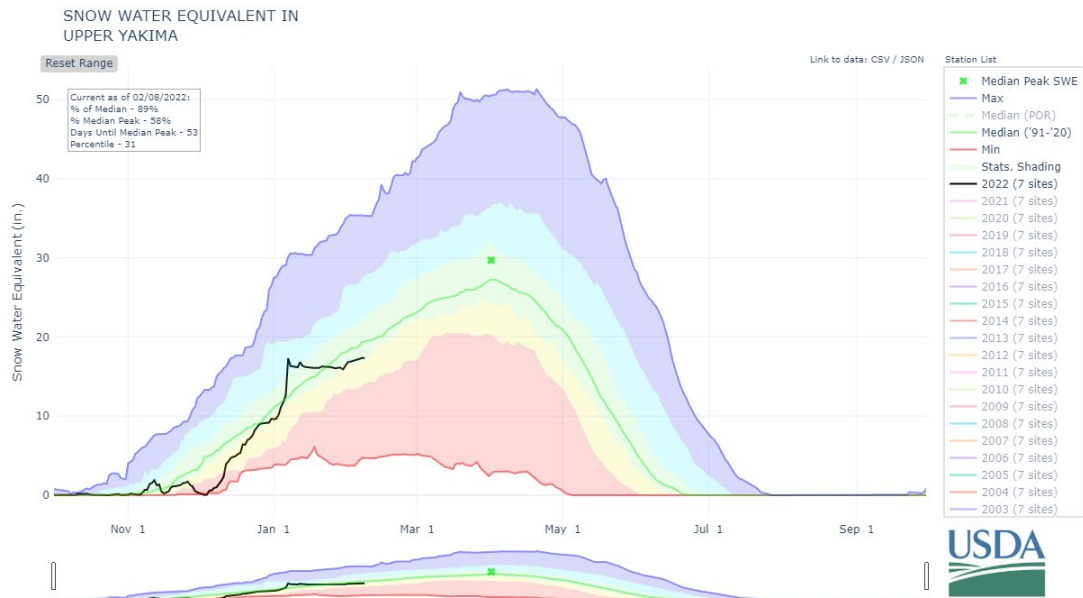
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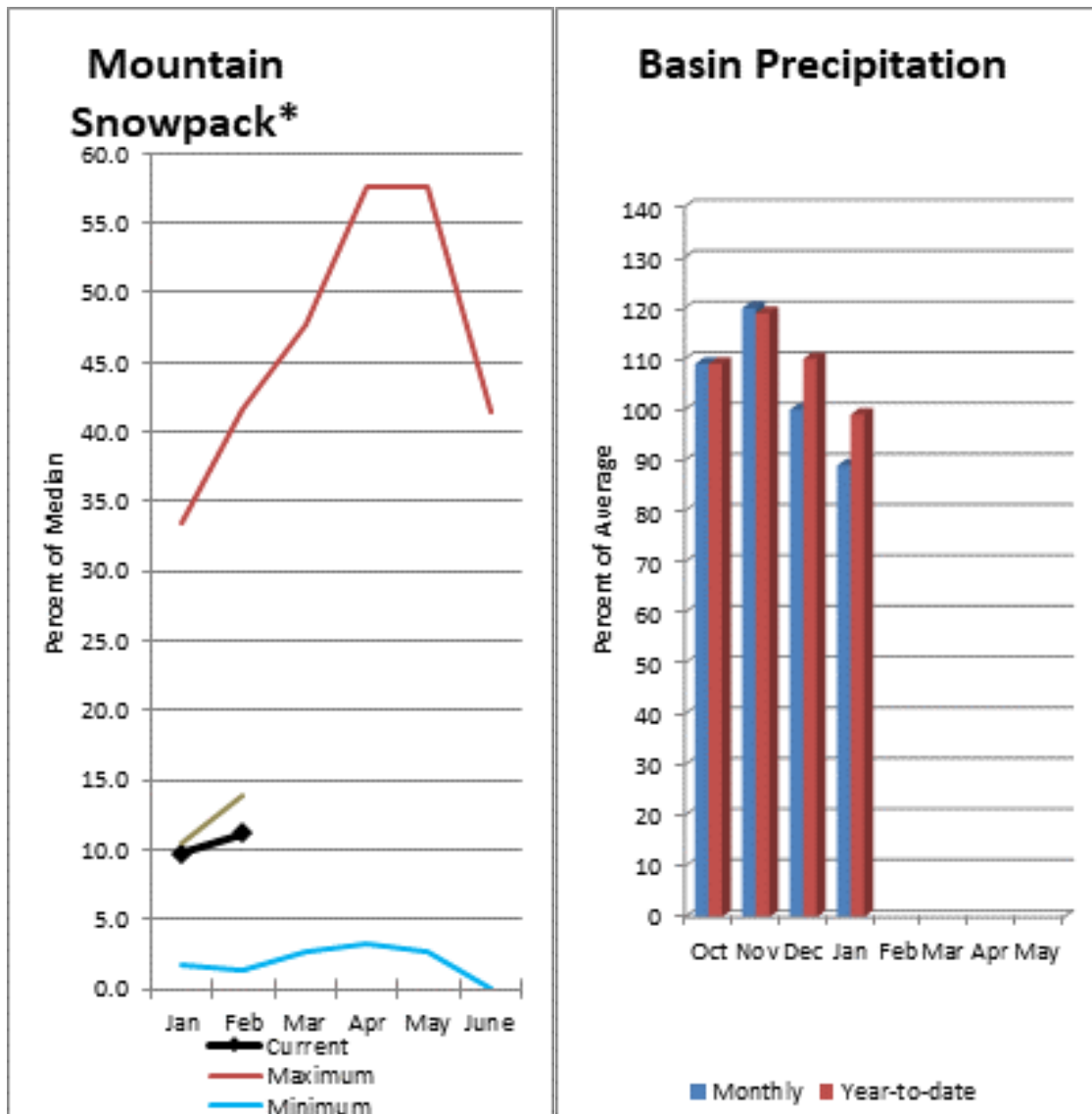
Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Kachess	181.4	151.7	143.5	239.0
Cle Elum	274.5	196.5	208.1	436.9
Keechelus	120.2	90.0	84.3	157.8

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Upper Yakima	10	101%	101%
Upper Yakima	10	101%	101%



Lower Yakima - Naches River Basin



February 1 combined basin snowpack was 89% of normal. January precipitation was 89% of normal and 90% for the water-year. February 1 reservoir storage for Bumping and Rimrock reservoirs was 113% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Yakima – Naches River Basin

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Lower Yakima Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Ahtanum Ck at Union Gap	APR-JUL	9.5	20	28	108%	35	46	26
	APR-SEP	11.5	23	30	107%	38	49	28
Yakima R nr Parker ²	APR-JUL	1130	1470	1710	99%	1950	2290	1730
	APR-SEP	1240	1610	1860	98%	2110	2480	1890

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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Lower Yakima	3	81%	81%
Simcoe-Toppenish	1	87%	94%
Satus	1	72%	54%
Ahtanum	2	87%	99%

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Naches Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Naches	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Naches R nr Naches ²	APR-JUL	525	670	765	106%	865	1010	720
	APR-SEP	570	730	840	108%	950	1110	775
Bumping Lake Inflow ²	APR-JUL	86	107	120	105%	134	154	114
	APR-SEP	93	115	130	107%	146	168	122
Rimrock Lake Inflow ²	APR-JUL	147	175	194	100%	215	240	194
	APR-SEP	173	205	230	98%	250	285	235
American R nr Nile	APR-JUL	79	97	109	109%	121	139	100
	APR-SEP	84	104	118	109%	132	152	108

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Bumping Lake	17.5	21.9	15.1	33.7
Rimrock	141.0	125.7	125.6	198.0

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Naches	9	95%	94%
Naches	9	95%	94%

Klickitat Streamflow Forecasts - February 1, 2022

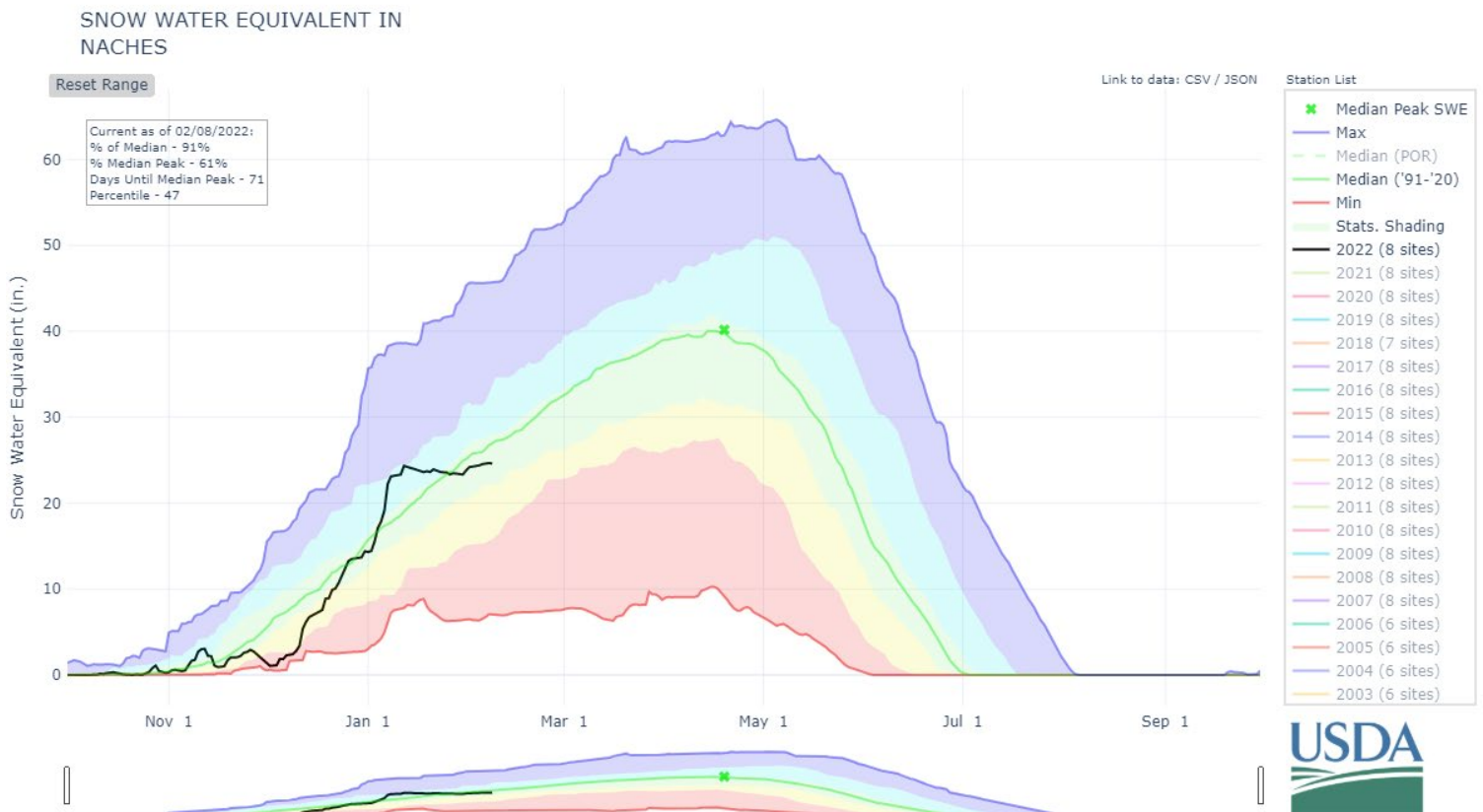
 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Klickitat	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Klickitat R nr Pitt	APR-JUL	305	395	460	101%	525	615	455
	APR-SEP	380	485	555	102%	625	735	545
Klickitat R nr Glenwood	APR-JUL	86	111	128	97%	146	171	132
	APR-SEP	96	123	141	97%	160	187	145

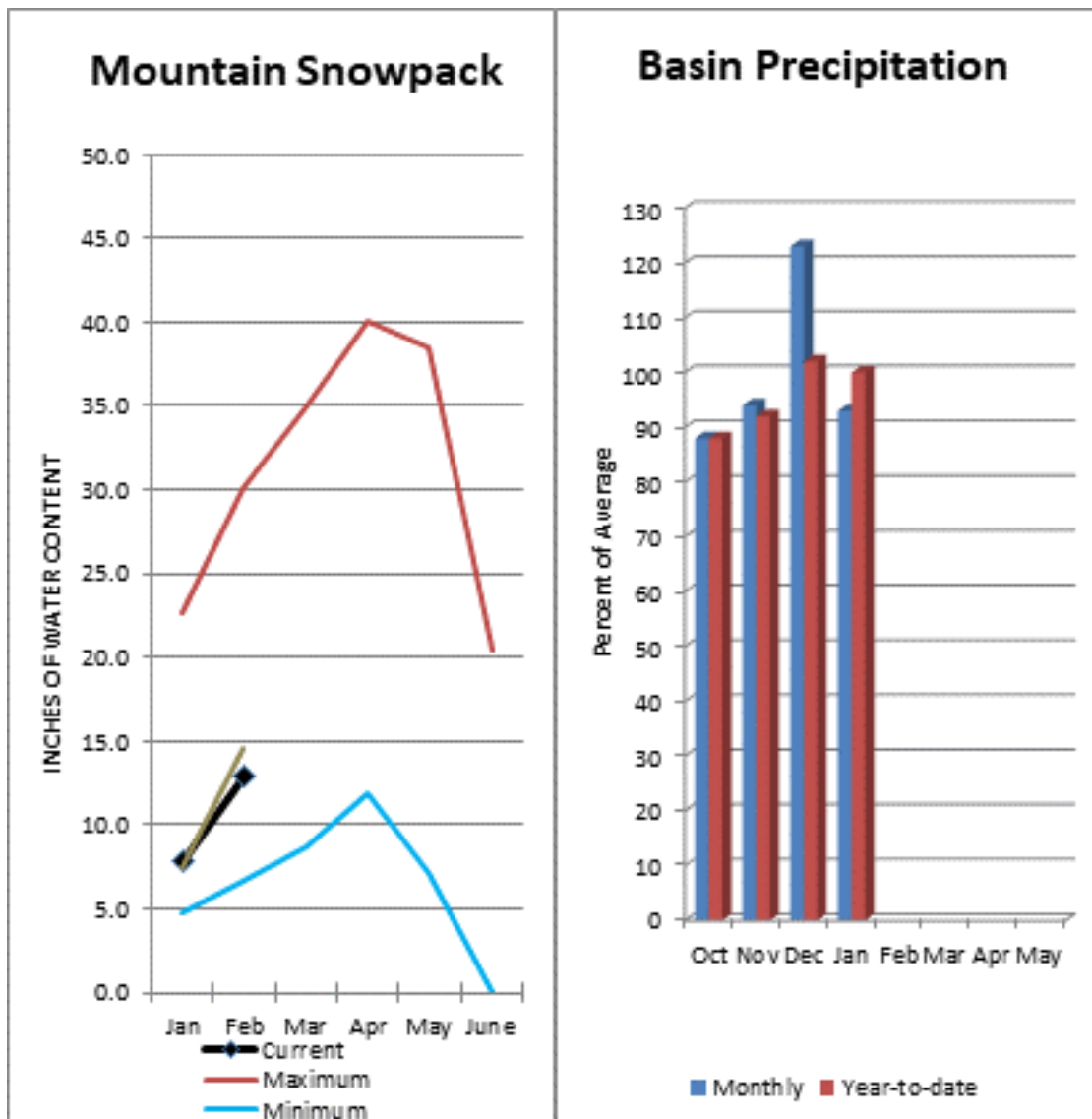
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Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Klickitat	4	92%	89%
Klickitat	4	92%	89%



Lower Snake – Walla Walla River Basin



February 1 snowpack readings were 88% of normal. January precipitation was 93% of normal, bringing the year-to-date precipitation to 100% of normal. Dworshak Reservoir storage was 99% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Snake – Walla Walla River Basin

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Lower Snake-Walla Walla Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake-Walla Walla	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Asotin Ck at Asotin	APR-JUL	19.5	28	35	106%	42	54	33
SF Walla Walla R nr Milton-Freewater	MAR-JUL	52	63	71	100%	78	89	71
	APR-SEP	52	62	68	97%	75	84	70
Snake R bl Lower Granite Dam-NWS ²	APR-JUL	11600		16900	86%		21800	19700
	APR-SEP	13600		19200	88%		24700	21800
Grande Ronde R at Troy	MAR-JUL	945	1240	1430	91%	1630	1920	1580
	APR-SEP	800	1050	1230	91%	1400	1660	1350

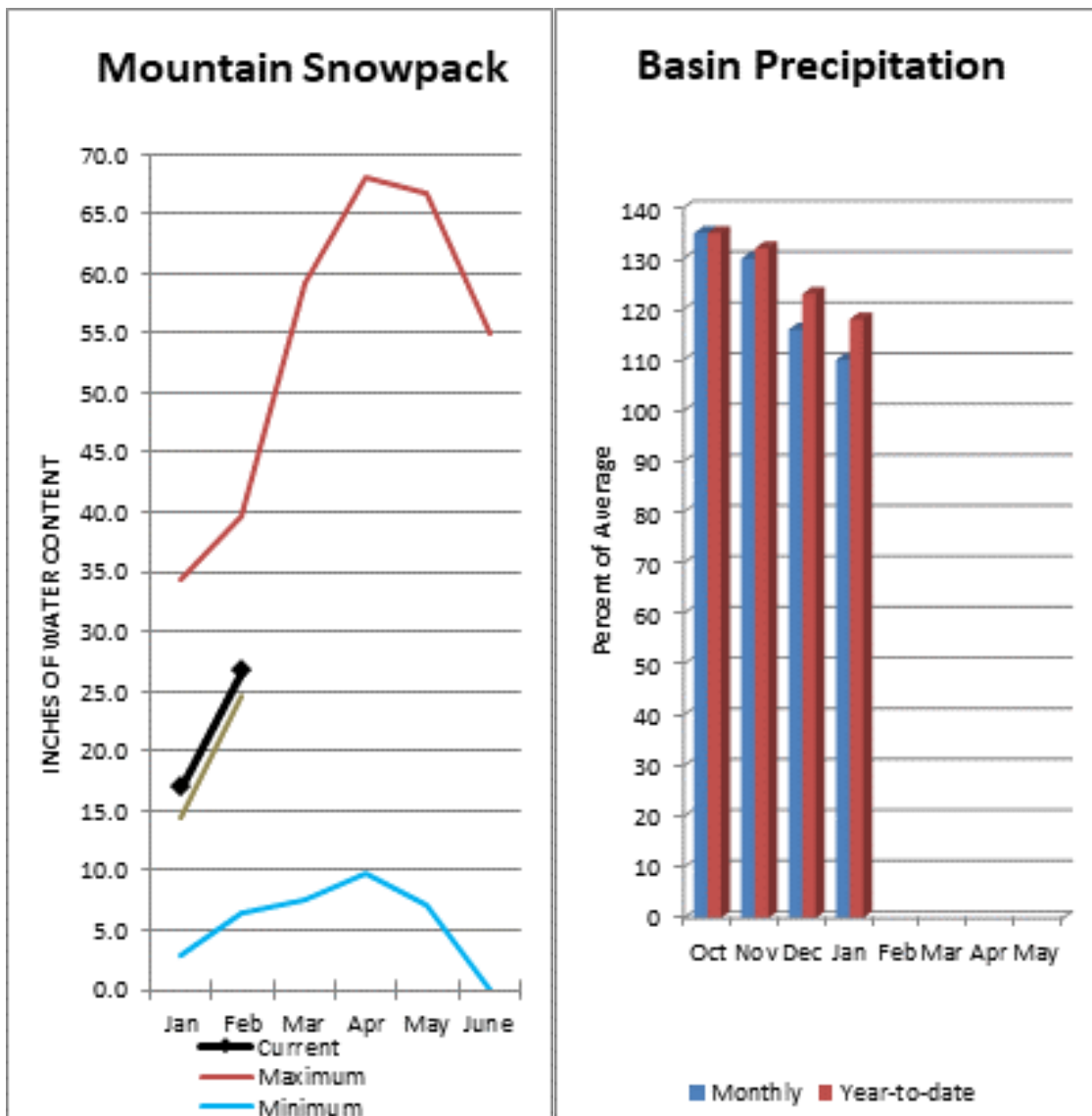
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Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wallowa Lake	20.2	17.3	16.0	37.5

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Lower Snake-Walla Walla	23	88%	95%
Walla Walla	5	105%	92%
Grande Ronde	21	88%	94%
Asotin	2	160%	80%



February 1 snow cover for Lower Columbia was 109% of normal. January precipitation was 110% of normal and the water-year was 118%.

Lower Columbia Streamflow Forecasts - February 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Lower Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Cowlitz R bl Mayfield ²	APR-JUL	1200	1500	1700	106%	1900	2200	1600
	APR-SEP	1370	1680	1900	106%	2120	2430	1790
Lewis R at Ariel	APR-JUL	770	940	1050	102%	1160	1330	1030
	APR-SEP	905	1080	1200	104%	1320	1490	1150
Cowlitz R at Castle Rock ²	APR-JUL	1490	1950	2270	107%	2590	3050	2120
	APR-SEP	1680	2160	2490	107%	2820	3300	2330

1) 90% And 10% exceedance probabilities are actually 95% And 5%

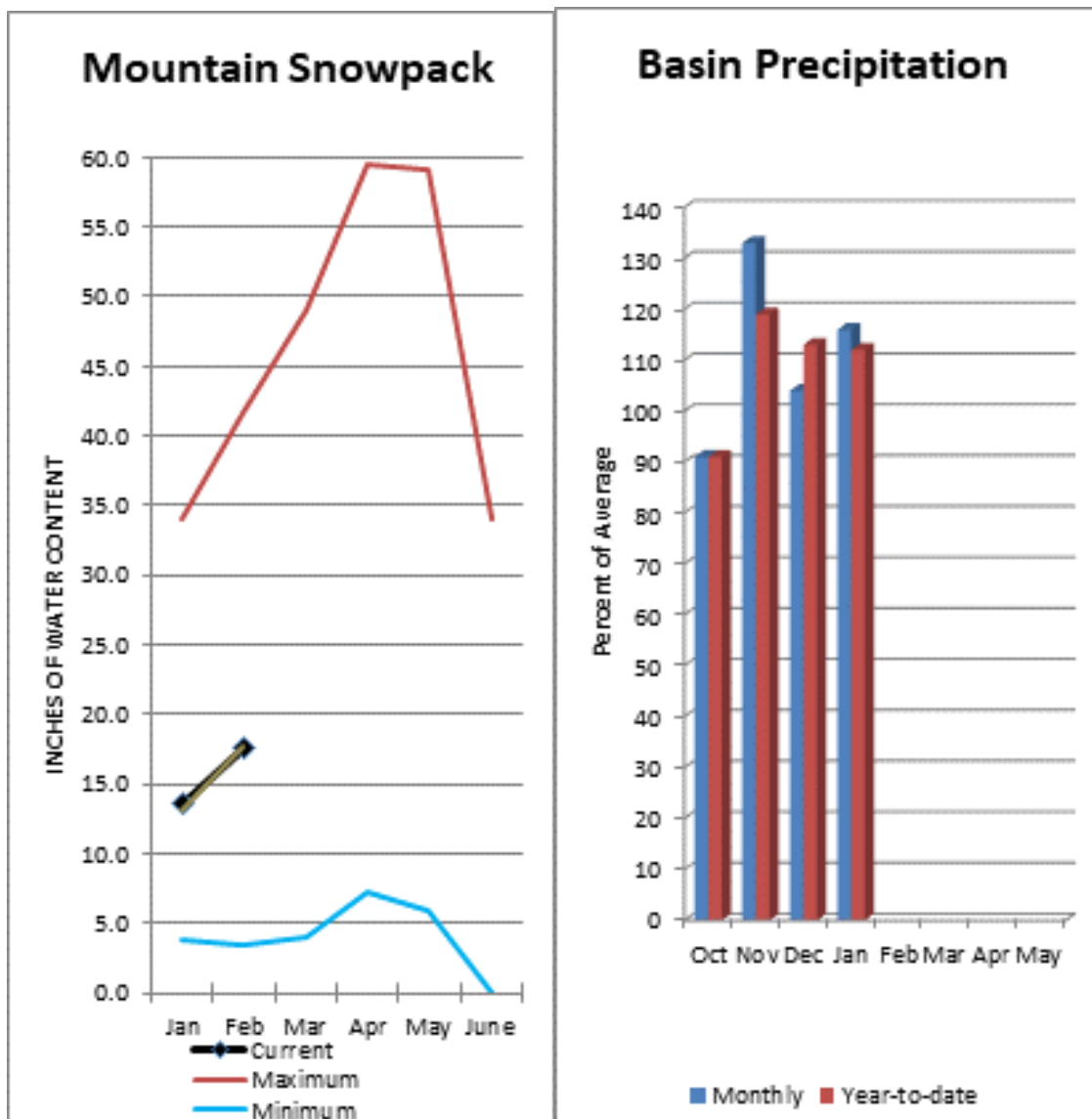
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Mayfield		125.9	128.2	0.0
Merwin			396.6	0.0
Yale			356.5	0.0
Mossyrock Dam (Riffe Lk)		820.8	880.8	0.0
Swift			632.7	0.0

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Lower Columbia	15	109%	98%
Lewis	8	117%	93%
Cowlitz	9	104%	100%

South Puget Sound River Basins



February 1 snowpack was 100% of normal for the South Puget Sound. January precipitation was 116% of normal, bringing the water year-to-date to 112% of normal for the basins. Reservoir storage on the Green River was 34% of the median.

For more information contact your local Natural Resources Conservation Service office.

South Puget Sound River Basins

Data Current As of: 2/4/2022 2:02:08 PM

South Puget Sound Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
White R nr Buckley ¹¹	APR-JUL	360	440	475	110%	510	585	430
	APR-SEP	435	525	565	109%	605	695	520
Green R bl Howard A Hanson Dam ¹	APR-JUL	124	215	255	109%	295	385	235
	APR-SEP	145	235	275	108%	320	410	255

1) 90% And 10% exceedance probabilities are actually 95% And 5%

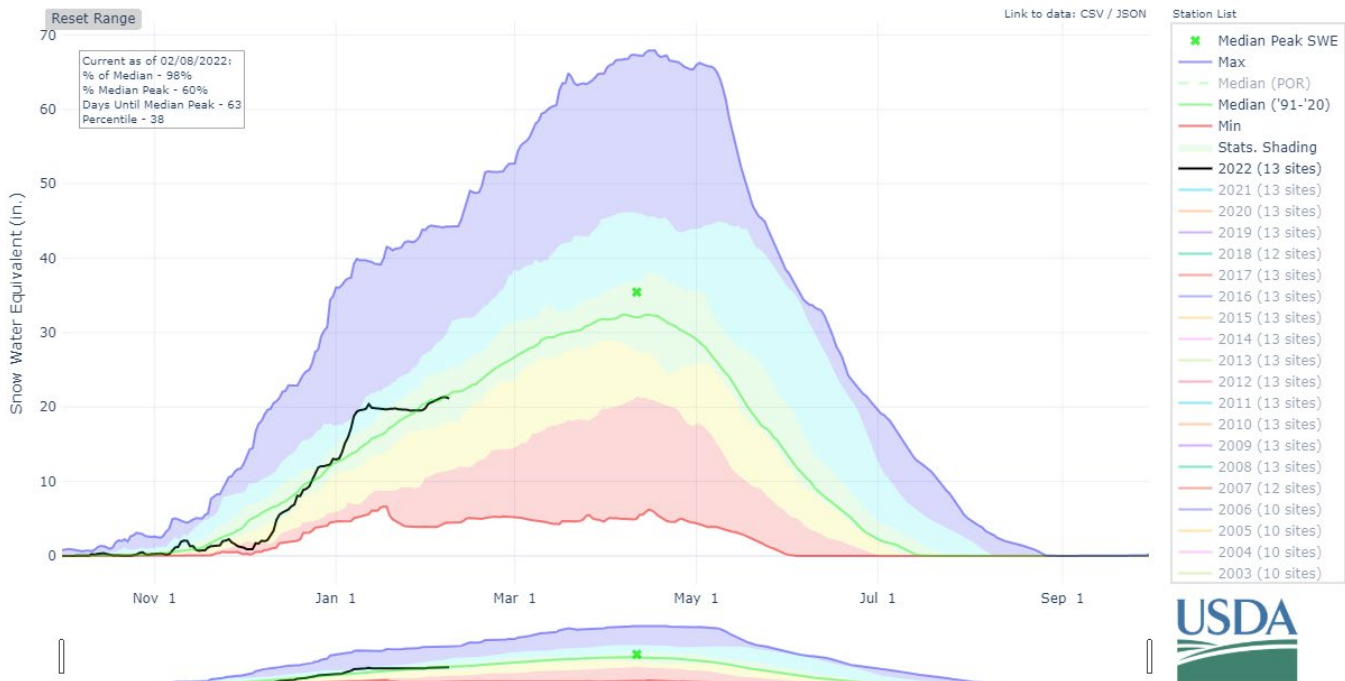
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Howard Hansen	0.7	1.0	2.0	0.0

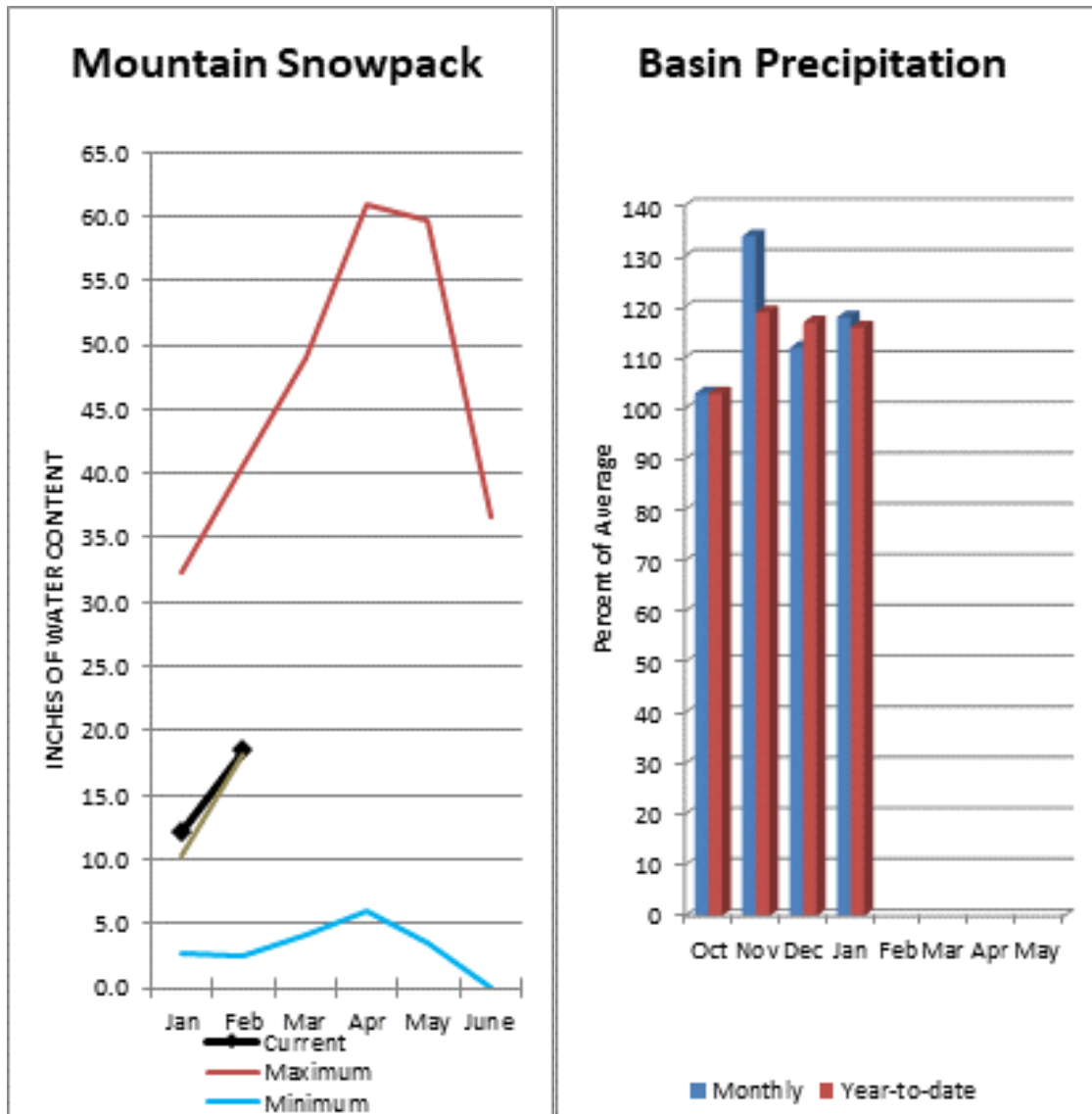
Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
South Puget Sound	15	100%	92%
White	6	104%	94%
Puyallup	2	123%	65%
Green	8	98%	83%

SNOW WATER EQUIVALENT IN SOUTH PUGET SOUND



Central Puget Sound River Basins



February 1 median snow cover in Central Puget Sound was 119%. Basin-wide precipitation for January was 118% of normal, bringing water-year-to-date to 116% of normal.

For more information contact your local Natural Resources Conservation Service office.

Central Puget Sound River Basins

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Central Puget Sound Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

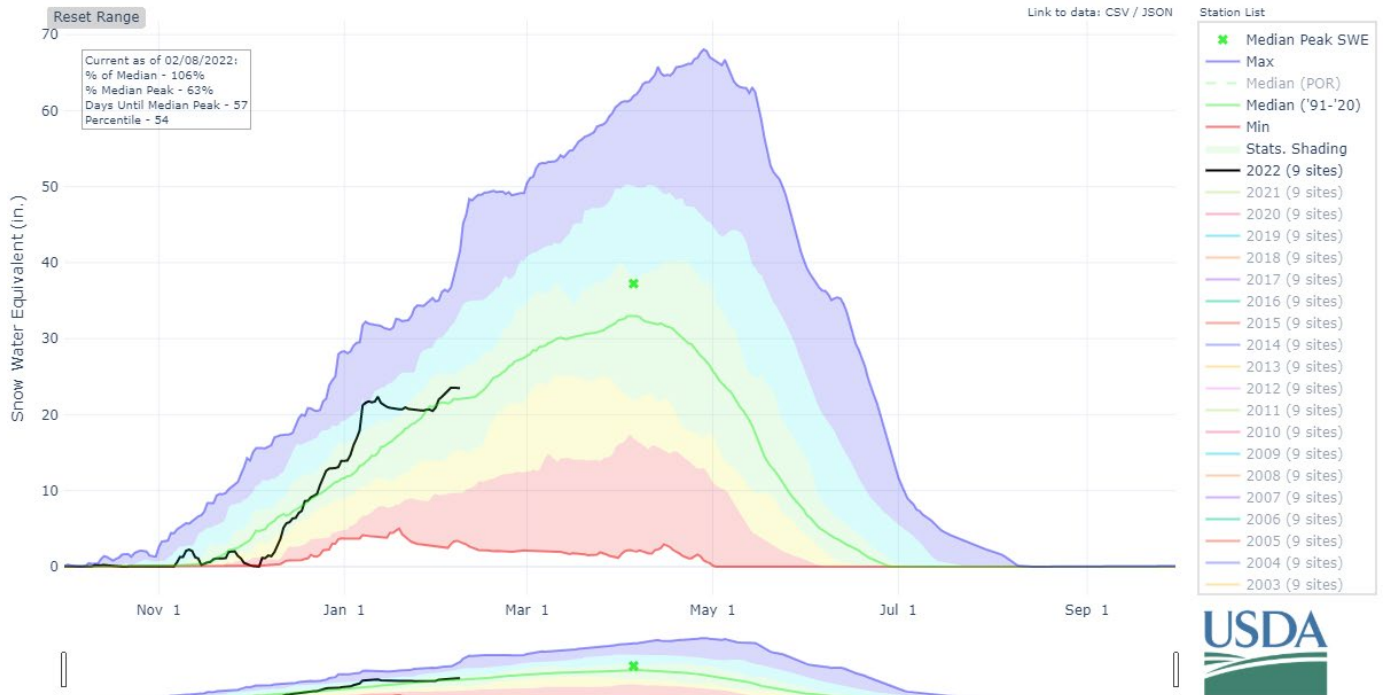
Central Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Taylor Ck nr Selleck	APR-JUL	15.6	19.8	23	110%	26	30	21
	APR-SEP	18.9	23	26	108%	29	34	24
Rex R nr Cedar Falls	APR-JUL	17	22	25	109%	28	33	23
	APR-SEP	19.6	25	28	108%	31	36	26
Cedar R nr Cedar Falls	APR-JUL	51	67	78	108%	89	106	72
	APR-SEP	57	73	84	109%	96	112	77
SF Tolt R nr Index	APR-JUL	11.1	14	16	119%	18	21	13.4
	APR-SEP	13.4	16.4	18.5	120%	21	24	15.4

1) 90% And 10% exceedance probabilities are actually 95% And 5%

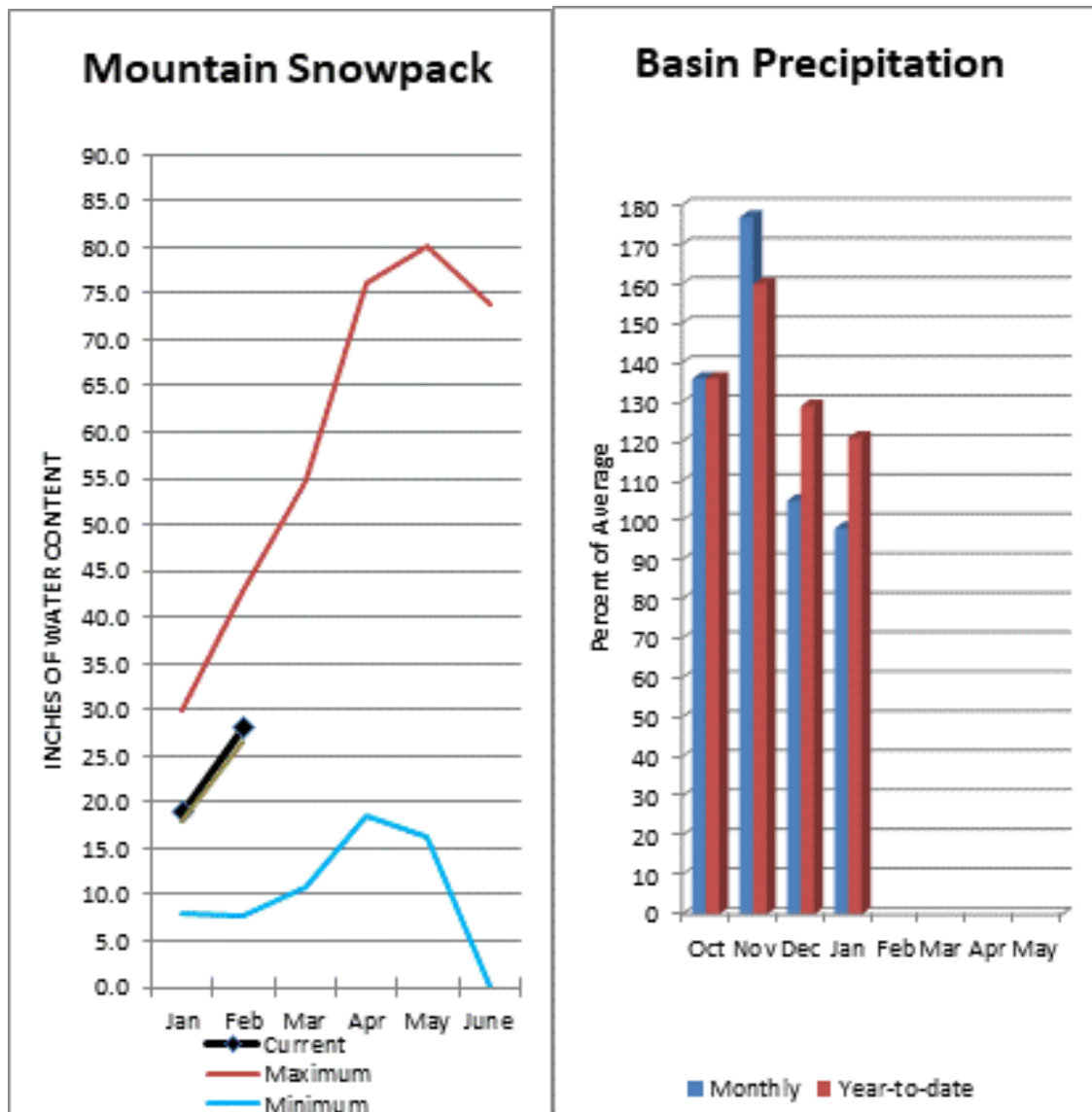
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Central Puget Sound	12	102%	89%
Tolt	3	98%	87%
Snoqualmie	5	113%	96%
Skykomish	4	98%	90%
Cedar	8	105%	88%

SNOW WATER EQUIVALENT IN CENTRAL PUGET SOUND



North Puget Sound River Basins



February 1 median snow cover in North Puget Sound was 100%. Basin-wide precipitation for January was 98% of normal, bringing water-year-to-date to 121% of normal. February 1 Basin-wide reservoir storage was 106% of normal.

For more information contact your local Natural Resources Conservation Service office.

North Puget Sound River Basins

Data Current As of: 2/4/2022 2:02:00 PM

North Puget Sound Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

North Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Baker R at Concrete	APR-JUL	635	725	785	102%	850	940	770
	APR-SEP	830	930	995	101%	1060	1160	990
Skagit R at Newhalem	APR-JUL	1520	1730	1870	107%	2010	2220	1740
	APR-SEP	1800	2040	2200	109%	2360	2600	2020
Thunder Ck nr Newhalem	APR-JUL	210	230	245	102%	260	280	240
	APR-SEP	305	325	340	103%	355	380	330

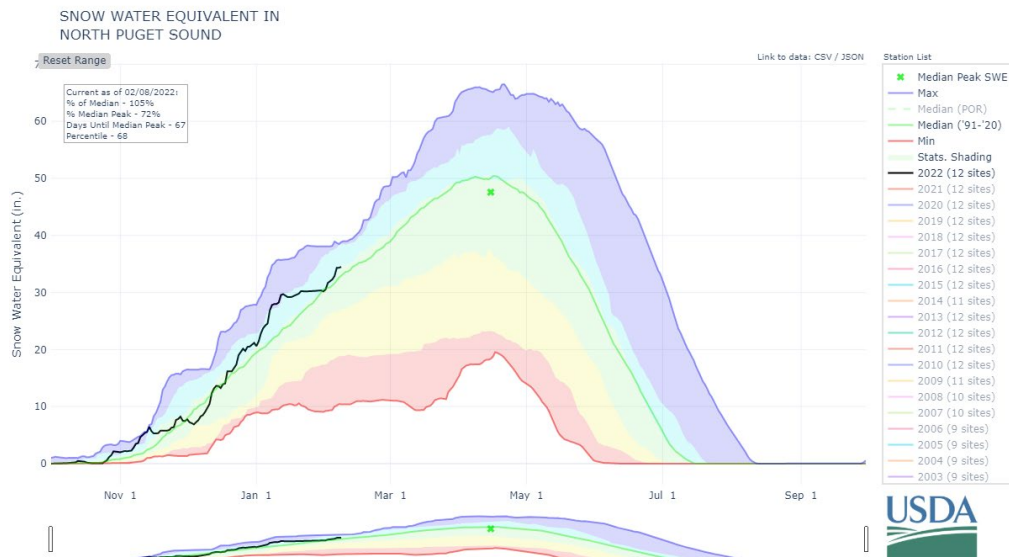
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

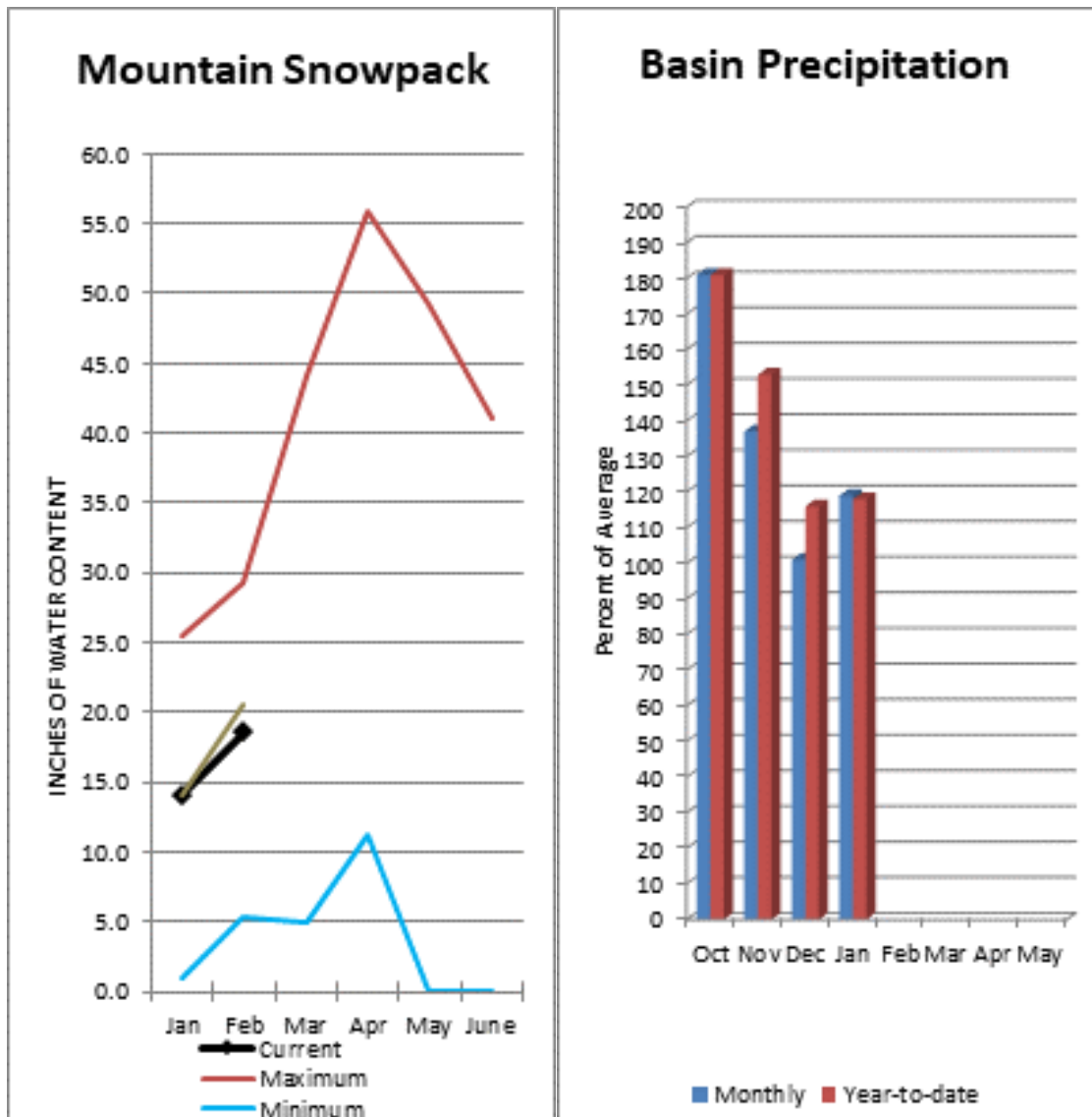
Reservoir Storage End of January, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Upper Baker		99.3	100.2	0.0
Gorge Reservoir			7.8	0.0
Diablo Reservoir			86.1	90.6
Lake Shannon		88.3	100.0	0.0
Ross		1048.2	995.6	1434.7

Basin Index
of reservoirs

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
North Puget Sound	18	101%	109%
Skagit	12	106%	109%
Nooksack	3	86%	114%
Baker	2	101%	109%



Olympic Peninsula River Basins



Snowpack averaged 90% of normal on February 1. January precipitation was 119% of normal. Precipitation has accumulated at 118% of normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

Data Current As of: 2/4/2022 2:02:10 PM

Olympic Streamflow Forecasts - February 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

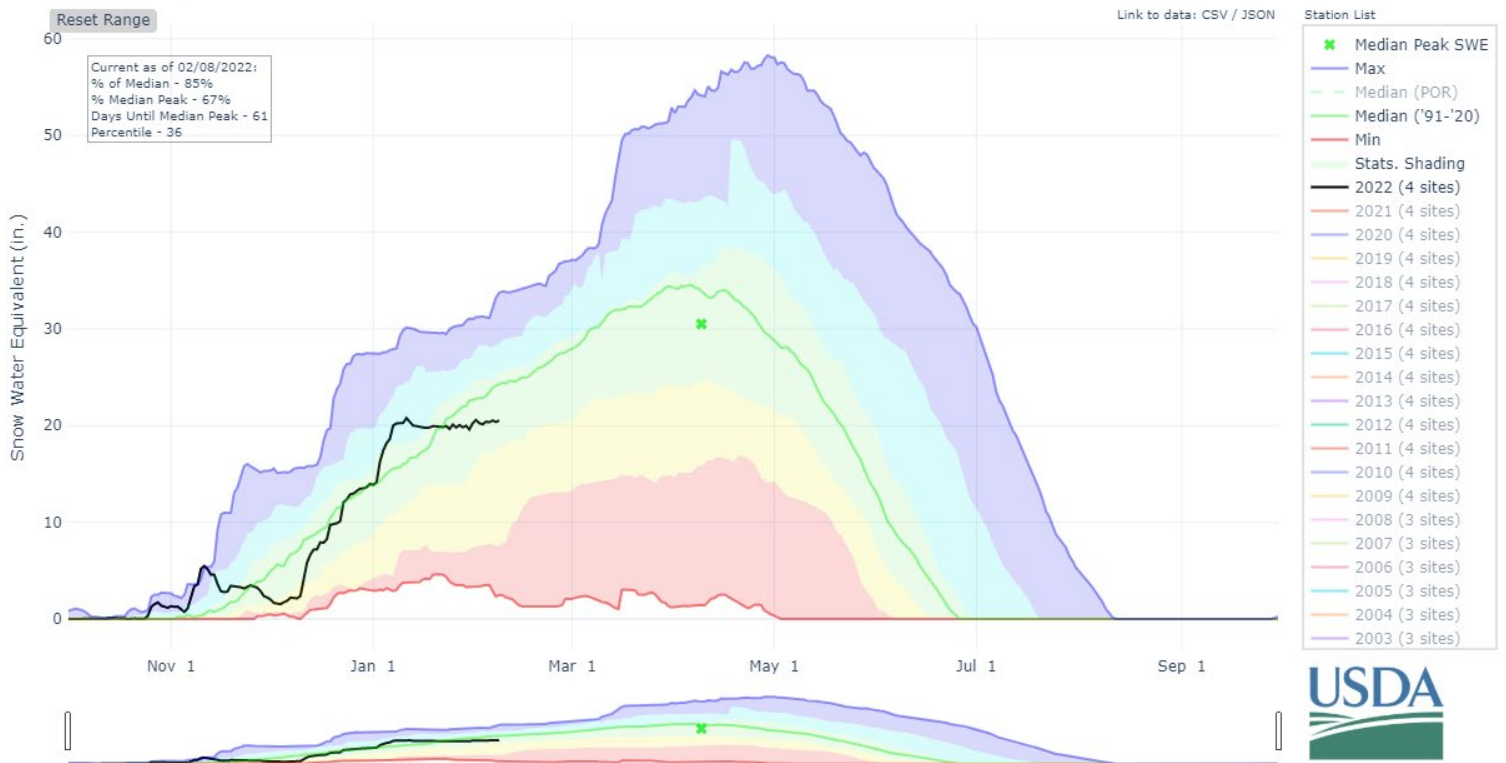
Olympic	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Elwha R at McDonald Br nr Port Angeles	APR-JUL	255	325	375	101%	425	495	370
	APR-SEP	310	385	440	99%	495	570	445
Dungeness R nr Sequim	APR-JUL	88	111	126	106%	141	164	119
	APR-SEP	98	130	152	109%	173	205	139

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis February 1, 2022	# of Sites	% Median	Last Year % Median
Olympic	7	90%	118%
Olympic	7	90%	118%

SNOW WATER EQUIVALENT IN OLYMPIC



Issued by

Terry Cosby
Acting Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Roylene Comes-At-Night
State Conservationist
Natural Resources Conservation Service
Spokane, Washington

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology Washington State Department of Natural Resources Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers U.S. Department of Agriculture, Forest Service U.S. Department of Commerce, NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs U.S. Fish and Wildlife Service
Local	City of Tacoma City of Seattle City of Bellingham Chelan County P.U.D. Pacific Power/PacificCorp Puget Sound Energy Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County Kalispel Tribe of Indians Spokane Indian Tribe Jamestown S’Klallam Tribe Sauk-Suiattle Tribe of Indians Stillaguamish Tribe
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District Kinross Mining

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873

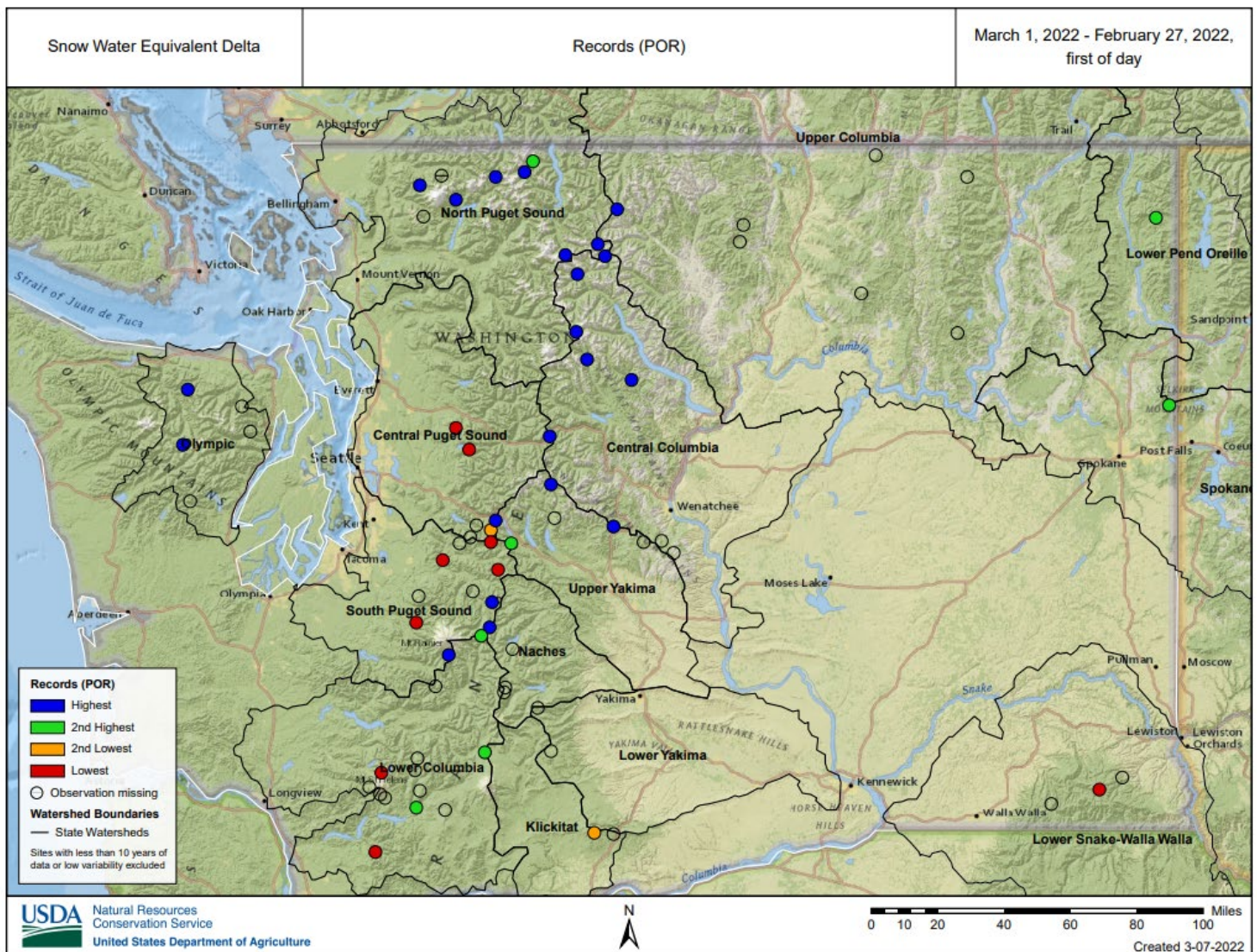


Washington Water Supply Outlook Report

**Natural Resources Conservation Service
Spokane, WA**



Washington Water Supply Outlook Report March 1, 2022



Snow Water Equivalent (SWE) accumulation for the 2-day storm event, February 27-28, gleaned dozens of records for both highest and lowest accumulation. Blue dots are the highest ever accumulated and red dots are the lowest and reflect negative SWE or SWE loss for that period.

Water Supply Outlook Reports and Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or

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(360) 488-4826**

or

**Larry Johnson
State Conservation Engineer
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11707 E. Sprague Ave., Suite 301
Spokane Valley, WA 99206
(509) 323-2955**

How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk, they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

"The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers. If you believe you experienced discrimination when obtaining services from USDA, participating in a USDA program, or participating in a program that receives financial assistance from USDA, you may file a complaint with USDA. Information about how to file a discrimination complaint is available from the Office of the Assistant Secretary for Civil Rights. To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (866) 632-9992 (voice). Persons with disabilities who require alternative means for communication of program information (Braille, Large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). Individuals who are deaf, hard of hearing or have speech disabilities may contact USDA through the Federal Relay service at (800) 877-8339 or (800) 845-6136 (in Spanish). USDA is an equal opportunity provider, employer and lender."

Washington Water Supply Outlook

March 2022

General Outlook

February was an extremely dry month with basin-wide precipitation ranging from 17% - 66% of average through the first 26 days. However, a fresh Atmospheric River blew in on Feb 27-28, soaking the state with record rain, doubling some month-to-date percentages. Over 3 dozen SNOTEL rainfall records led to record snow water equivalent (SWE) records at dozens of SNOTEL sites, many with 40 plus years of record. Fortunately, the storm was relatively short lived, so flooding was minor since the mature snowpack was able to act as a sponge, absorbing and holding the rain long enough for a slow sustained release.

The most recent forecast through next week indicates near normal temperatures with above normal precipitation. Climate Prediction Center 3-month (Mar-Apr-May) forecast continues the previous track of below normal temperatures and above normal precipitation which is indicative of the forecasted Enso La Nina. The US Drought Monitor indicates the continuation of D0-D3 drought designation carried over from last year in eastern Washington. (See maps on page 4)

Snowpack

The March 1 statewide SNOTEL readings were 95% of normal. The lowest readings in the state were at 69% of the 30-year median for March 1 in the Conconully Basin. The Asotin Creek Basin had the most snow with 126%. Westside medians from SNOTEL included the North Puget Sound River basins with 97% of normal, the Central and South Puget River basins with 104% and 97% respectively, and the Lower Columbia basins with 96% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 78% and the Wenatchee area with 96%. Snowpack in the Spokane River Basin was at 95% and the Upper Columbia River basins had 89% of the long-term median.

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	95	102
Newman Lake	76	102
Lower Pend Oreille	93	100
Kettle	87	124
Omak	75	127
Methow	93	130
Conconully Lake	69	132
Central Columbia	96	125
Upper Yakima	96	131
Naches	89	120
Ahtanum Creek	73	112
Walla Walla	97	138
Lower Snake	84	127
Cowlitz	95	129
Lewis	96	128
White	98	128
Green	96	144
Puyallup	91	139
Cedar	105	136
Snoqualmie	102	136
Skykomish	102	144
Skagit	102	121
Nooksack	86	133
Olympic Peninsula	80	125

Precipitation

March precipitation accumulation was below normal in all but the Central and South Puget Sound basin. Statewide water-year average was 113% of average as of March 1. Monthly precipitation ranged from a high of 116% of normal in the Tolt and Skykomish basins to a low of 62% in the Lower Yakima Basin. SNOTEL collects all form of precipitation including, rain, snow, sleet and hail.

RIVER BASIN	FEBRUARY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	79	100
Lower Pend Oreille	91	103
Upper Columbia	84	113
Central Columbia	88	111
Upper Yakima	93	105
Naches	90	106
Lower Yakima	62	93
Klickitat	76	99
Walla Walla	79	94
Lower Snake	68	90
Lower Columbia	88	114
South Puget Sound	101	109
Central Puget Sound	115	117
North Puget Sound	79	117
Olympic Peninsula	76	111

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. March 1 Reservoir storage in the Yakima Basin was 125% of average for the Upper Reaches and 114% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 62,400-acre feet, 62% of normal and 26% of capacity; and Ross Lake within the Skagit River Basin at 106% of normal and 60% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	26	62
Lower Pend Oreille	36	82
Upper Columbia	37	53
Central Columbia	52	143
Upper Yakima	73	125
Naches	76	114
Lower Snake	54	126
North Puget Sound	72	105
South Puget Sound		285

For more information contact your local Natural Resources Conservation Service office.

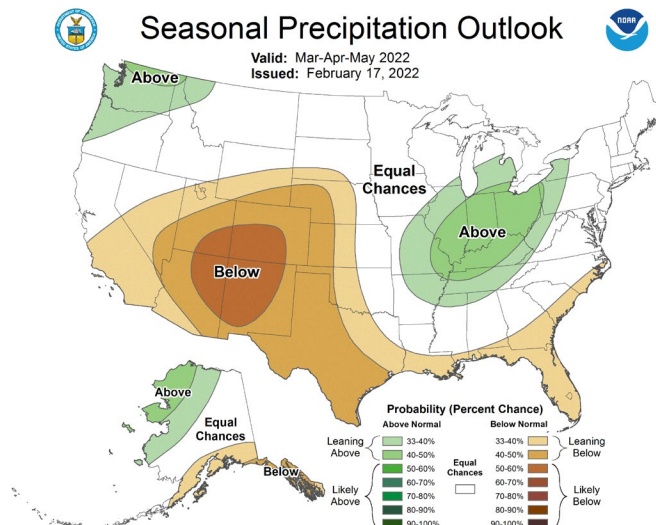
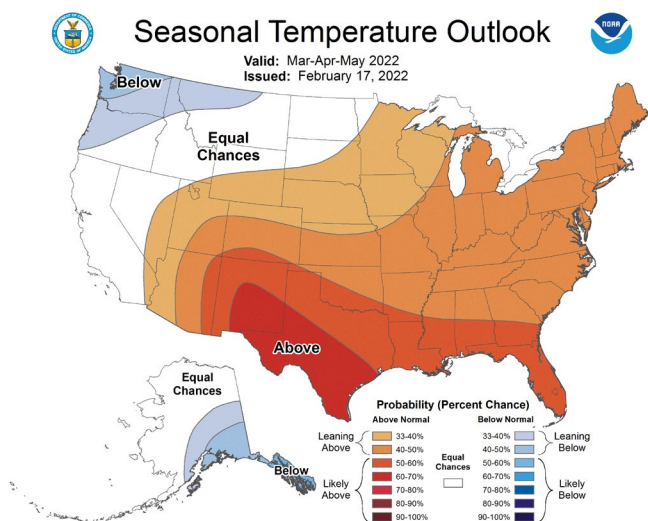
Streamflow

Early winter forecasts for April-September stream flows are never quite as robust as they are later in the season when we know more about the winter climatology. At times only a few degrees warmer or cooler than forecasted can make or break stream flow predictions. Volumetric forecasts are developed using current, historic and median snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

BASIN	PERCENT OF AVERAGE FORECAST (50% CHANCE OF EXCEEDENCE)
Spokane	85-109
Lower Pend Oreille	97-106
Upper Columbia	89-112
Central Columbia	91-109
Upper Yakima	99-104
Lower Yakima	93-95
Naches	91-103
Klickitat	89-94
Lower Snake-Walla Walla	83-100
Lower Columbia	102-109
South Puget Sound	108-112
Central Puget Sound	113-125
North Puget Sound	105-109
Olympic Peninsula	89-90

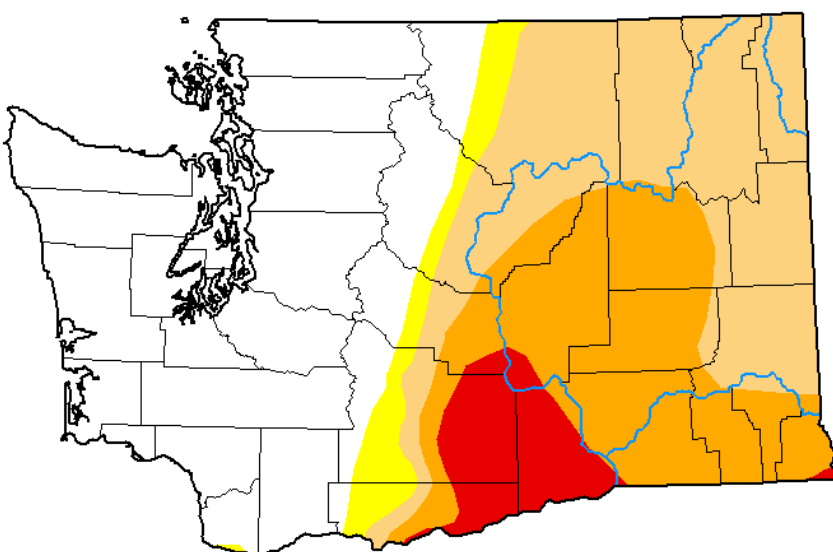
STREAM	PERCENT OF AVERAGE FEBRUARY STREAMFLOWS
Priest River - near Priest River	71
Kettle at Laurier	91
Columbia at Birchbank	105
Spokane at Spokane	47
Similkameen at Nighthawk	134
Okanogan near Tonasket	106
Methow at Pateros	149
Chelan at Chelan	117
Stehekin near Stehekin	123
Wenatchee at Pashastin	100
Cle Elum near Roslyn	91
Yakima near Parker	79
Naches near Naches	90
Grande Ronde at Troy	46
Snake below Lower Granite Dam	54
Columbia River at The Dalles	65
Lewis at Merwin Dam	61
Cowlitz below Mayfield Dam	74
Skagit at Concrete	79
Dungeness near Sequim	76

Climate



U.S. Drought Monitor Washington

March 1, 2022
(Released Thursday, Mar. 3, 2022)
Valid 7 a.m. EST



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Brad Rippey
U.S. Department of Agriculture



droughtmonitor.unl.edu



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Washington State
Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/>

Oregon:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/>

Idaho:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

National Water and Climate Center (NWCC):

<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

USDA-NRCS Agency Homepages

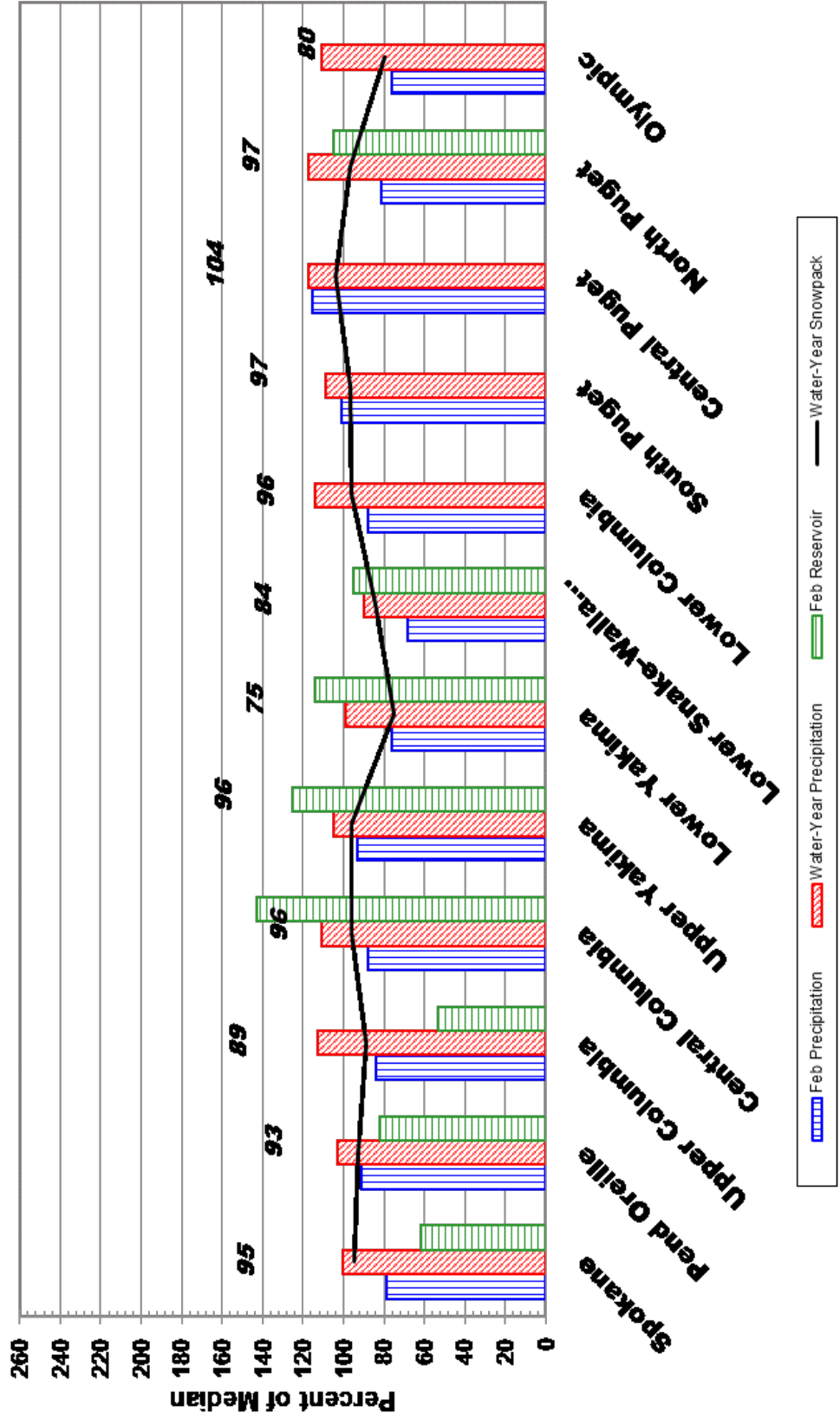
Washington:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/>

NRCS National:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>

March 1, 2022 - Snowpack, Precipitation and Reservoir Conditions at a Glance (Water Year = October 1 - Current Date)



89th Annual Western Snow Conference

April 18-21, 2022

Salt Lake City, Utah

“Drought, Fire, and Precipitation Extremes: Operational Challenges for Snow Water Resources”

Please plan to join us for the 89th Annual Meeting of the Western Snow Conference. The 2022 Meeting will be held at the University of Utah in Salt Lake City, April 18-21, 2022.

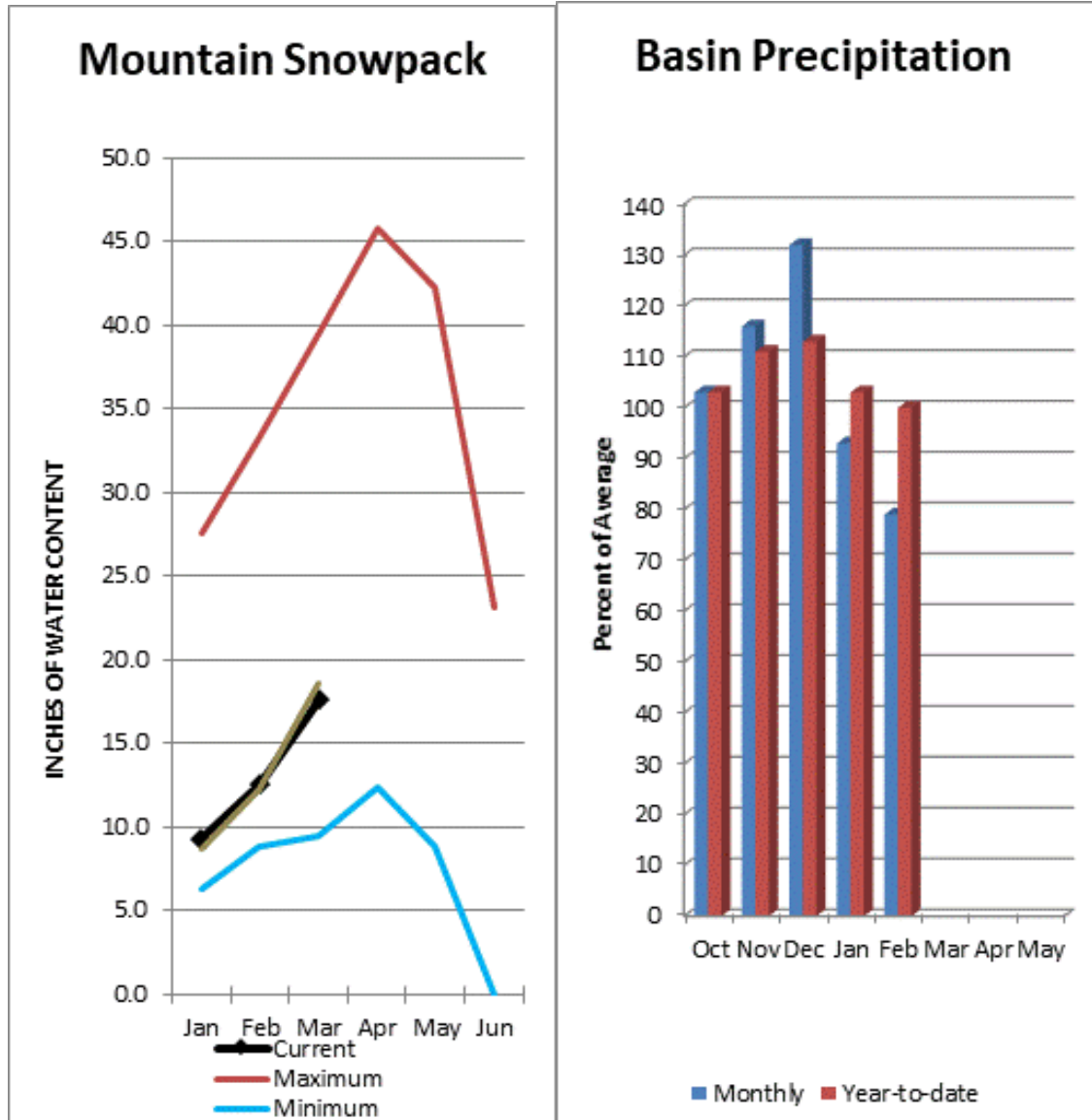
Agenda and registration details are now available on the conference webpage. A virtual option is once again available at a considerably reduced cost.

Noah Molotch
General Chair, WSC

McKenzie Skiles
Conference Chair

Additional information about the conference will be posted on the WSC web page at <http://www.westernsnowconference.org/>

Also find Western Snow Conference on Facebook



Basin snowpack is 95% of normal and precipitation is 100% of normal for the water year. Precipitation for February was 75% of normal. Reservoir storage is currently at 62% of normal.

Data Current As of: 3/4/2022 1:59:24 PM

Spokane Streamflow Forecasts - March 1, 2022

Spokane	Forecast Period	Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast						30yr Median (KAF)
		90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	
Spokane R nr Post Falls ²	APR-JUL	1780	2300	2650	106%	3000	3510	2510
	APR-SEP	1850	2380	2730	106%	3090	3610	2570
NF Coeur d'Alene R at Enaville	APR-JUL	520	675	775	108%	880	1030	715
	APR-SEP	555	705	810	108%	915	1070	750
Chamokane Ck nr Long Lake	MAR-JUL	10.9	17.4	23	85%	29	38	27
Spokane R at Long Lake ²	APR-JUL	2060	2580	2940	108%	3300	3820	2720
	APR-SEP	2230	2770	3130	109%	3500	4040	2870
St. Joe R at Calder	APR-JUL	825	1020	1150	110%	1290	1480	1050
	APR-SEP	880	1080	1220	109%	1350	1560	1120

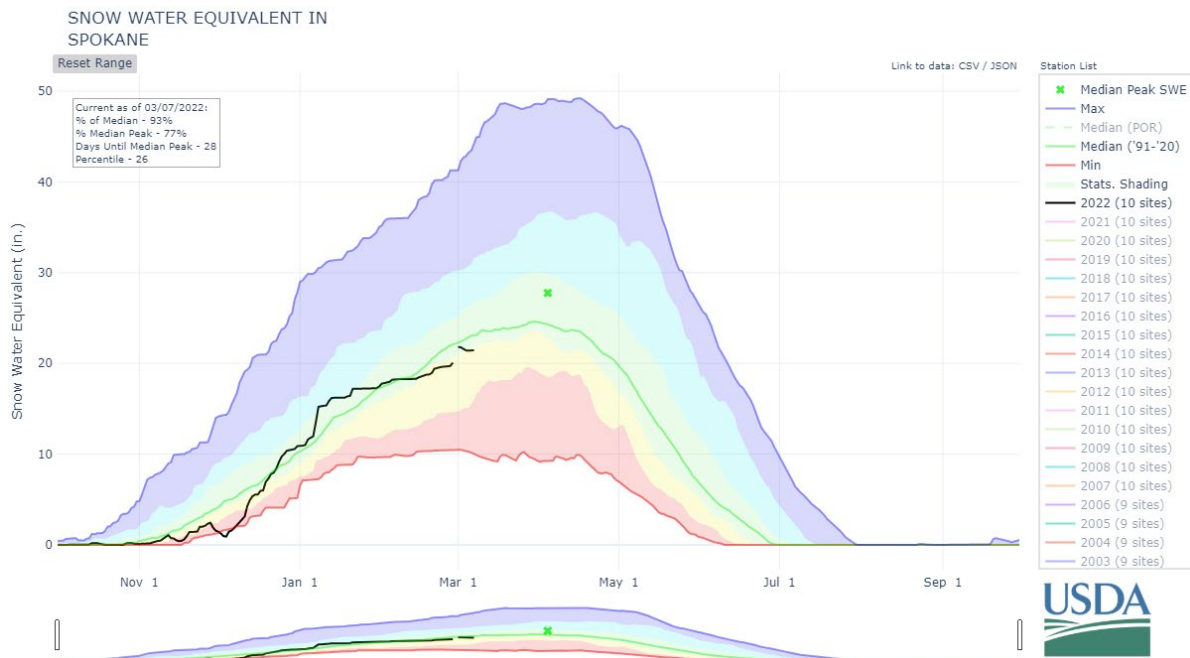
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

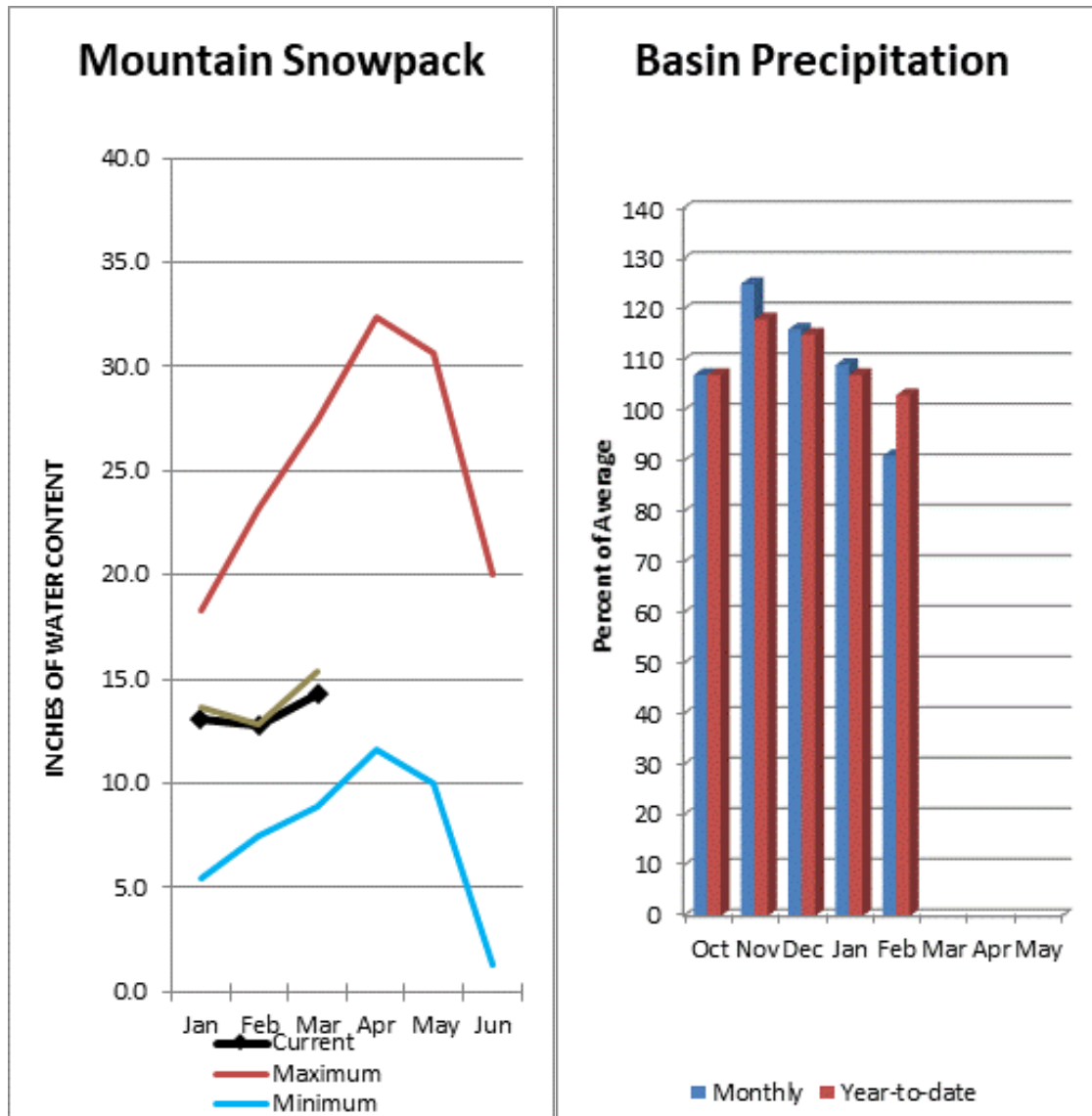
Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Coeur d' Alene	62.4	61.6	101.2	238.5

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Spokane	19	95%	102%
Newman Lake	5	76%	102%



Lower Pend Oreille River Basins



March 1 snow cover was 93% of normal in the Pend Oreille Basin River Basin and precipitation during February was 91% of normal, bringing the year-to-date precipitation at 103% of normal. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 82% of normal.

For more information contact your local Natural Resources Conservation Service office.

Lower Pend Oreille River Basins

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Lower Pend Oreille Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Pend Oreille	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Priest R nr Priest River ²	APR-JUL	585	720	810	96%	905	1040	840
	APR-SEP	620	760	855	97%	950	1090	880
Pend Oreille R bl Box Canyon ²	APR-JUL	9470	11200	12400	106%	13600	15300	11700
	APR-SEP	10200	12100	13400	106%	14700	16600	12700
Pend Oreille Lake Inflow ²	APR-JUL	9230	11000	12200	104%	13400	15200	11700
	APR-SEP	9970	11900	13200	105%	14600	16500	12600

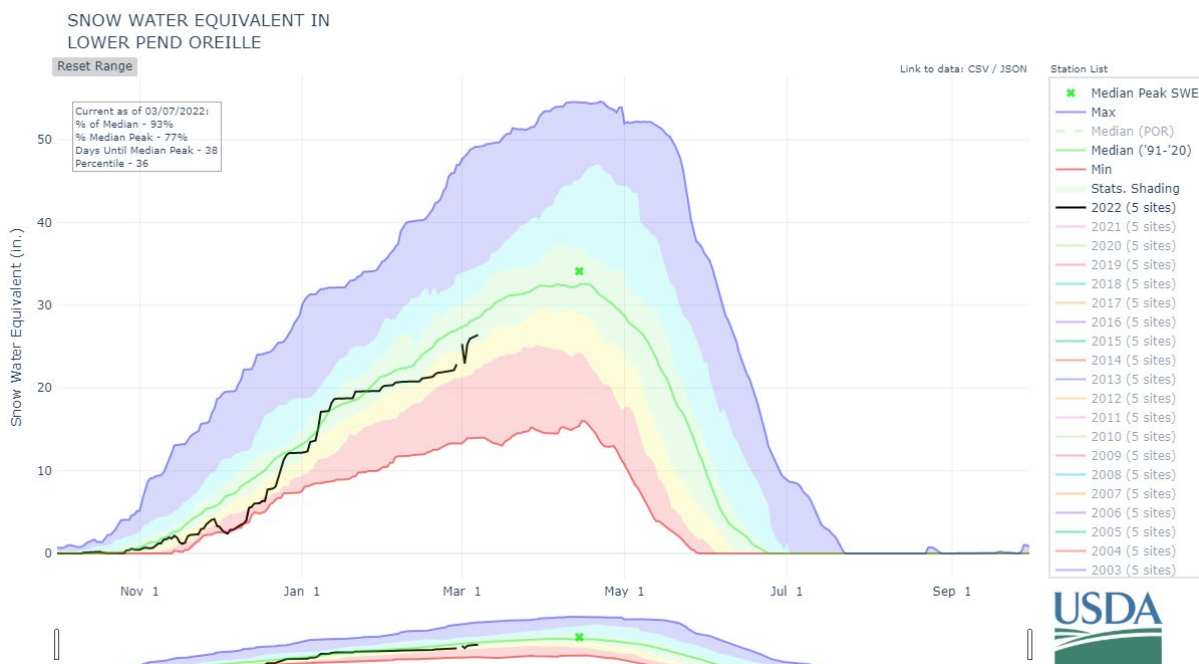
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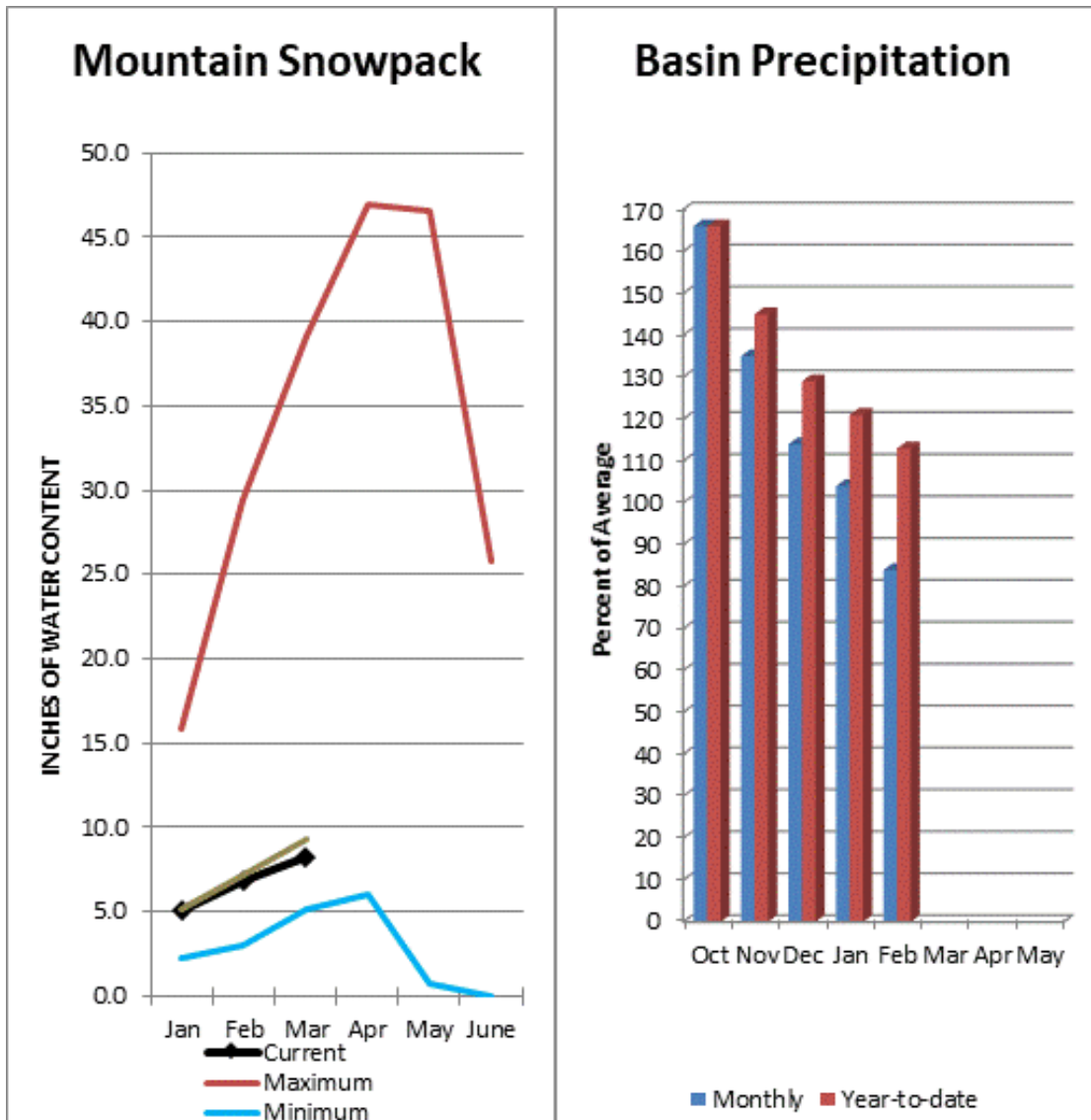
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Pend Oreille	554.4	559.6	682.0	1561.3
Priest Lake	48.0	41.8	55.8	119.3

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Lower Pend Oreille	14	92%	101%
Sullivan	1	89%	97%





March 1 snow cover on the Upper Columbia basins was 89% of normal and February precipitation was 84% of normal, with precipitation for the water year at 113% of normal. Combined storage in the Conconully Reservoirs was 53% of normal.

Upper Columbia Streamflow Forecasts - March 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Similkameen R nr Nighthawk	APR-JUL	1140	1300	1420	113%	1530	1690	1260
	APR-SEP	1200	1380	1500	112%	1620	1800	1340
Okanogan R at Malott	APR-JUL	1040	1310	1490	96%	1670	1940	1550
	APR-SEP	1150	1440	1640	98%	1850	2140	1680
Okanogan R nr Tonasket	APR-JUL	1030	1290	1460	96%	1640	1890	1520
	APR-SEP	1140	1420	1610	99%	1800	2090	1620
Columbia R at Grand Coulee-NWS ²	APR-JUL	44800		56600	108%		67700	52600
	APR-SEP	52900		66500	110%		80200	60600
Colville R at Kettle Falls	APR-JUL	36	74	100	87%	126	165	115
	APR-SEP	40	82	110	89%	139	181	124
Methow R nr Pateros	APR-JUL	575	720	820	92%	920	1070	895
	APR-SEP	620	775	880	91%	985	1140	965
Kettle R nr Laurier	APR-JUL	1220	1510	1710	93%	1910	2210	1840
	APR-SEP	1270	1570	1770	91%	1980	2280	1950

1) 90% And 10% exceedance probabilities are actually 95% And 5%

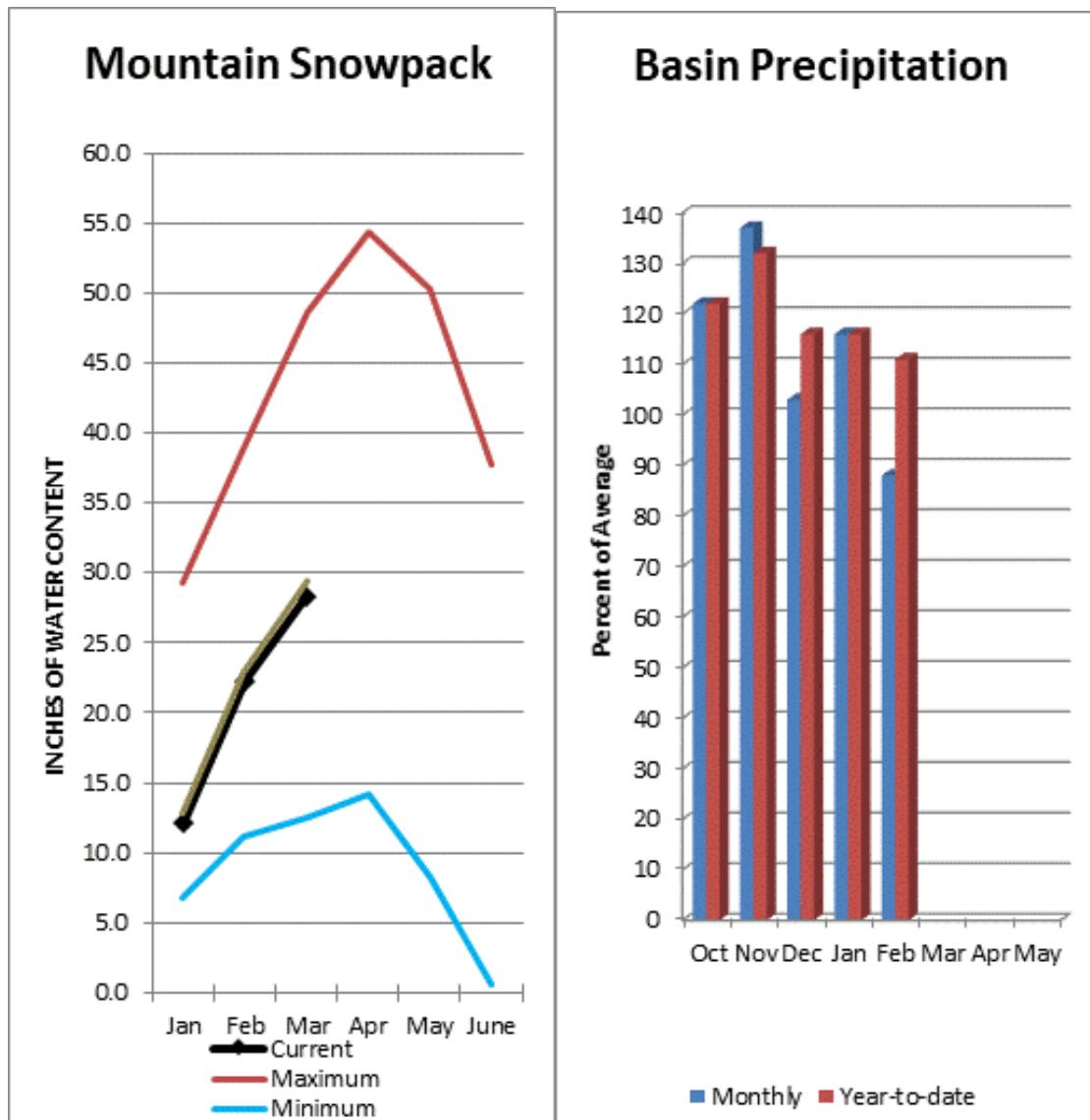
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	3.3	6.2	7.8	10.5
Conconully Reservoir	5.5	7.4	8.7	13.0

 Basin Index
 # of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Upper Columbia	52	88%	126%
Toats Coulee	52	88%	126%
Sanpoil	4	72%	128%
Omak	4	75%	127%
Methow	11	93%	130%
Kettle	10	81%	126%
Concully Lake	4	69%	132%
Colville	2	82%	123%

Central Columbia River Basins



March 1 snowpack in the Central Columbia River basins was 86% of normal. Precipitation during February was 88% of normal in the basin and 111% for the year-to-date. Reservoir storage in Lake Chelan was 143% of the median.

For more information contact your local Natural Resources Conservation Service office.

Central Columbia River Basins

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Central Columbia Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

Central Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Chelan R at Chelan ²	APR-JUL	805	930	1010	97%	1090	1210	1040
	APR-SEP	900	1030	1120	96%	1220	1350	1170
Wenatchee R at Peshastin	APR-JUL	1150	1320	1430	99%	1550	1710	1440
	APR-SEP	1240	1420	1550	101%	1680	1860	1540
Icicle Ck nr Leavenworth	APR-JUL	225	260	290	100%	315	355	290
	APR-SEP	240	285	310	100%	340	385	310
Columbia R bl Rock Island Dam-NWS ²	APR-JUL	48100		61800	107%		74600	57600
	APR-SEP	56600		72000	109%		87800	65800
Stehekin R at Stehekin	APR-JUL	560	640	695	97%	750	830	715
	APR-SEP	650	740	800	96%	855	945	835
Wenatchee R at Plain	APR-JUL	835	965	1060	99%	1140	1280	1070
	APR-SEP	910	1050	1150	99%	1250	1390	1160
Entiat R nr Ardenvoir	APR-JUL	147	178	199	90%	220	250	220
	APR-SEP	160	193	215	91%	240	270	235

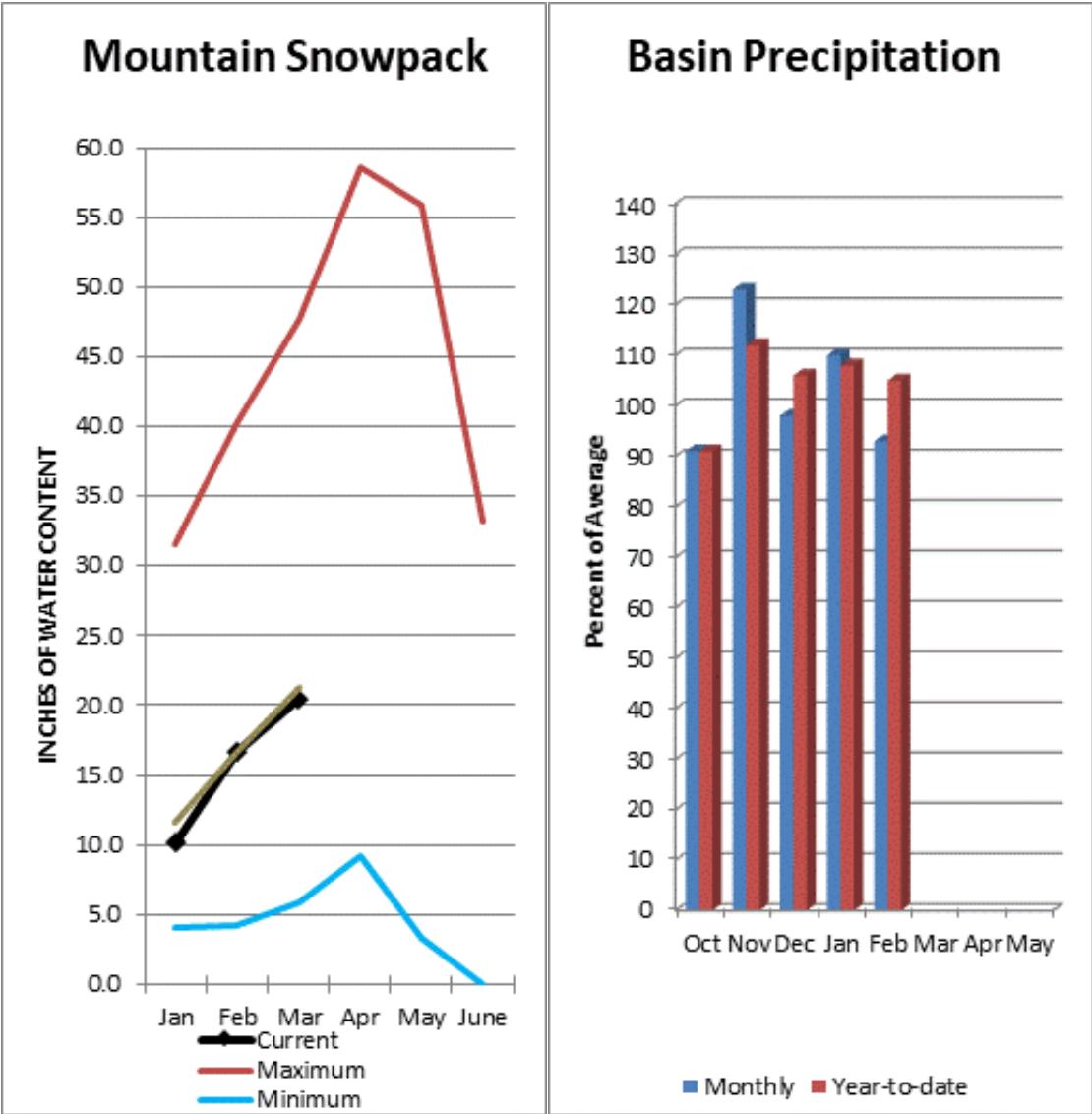
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Chelan	354.6	235.3	248.2	677.4

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Central Columbia	13	96%	125%
Wenatchee	13	96%	125%
Stemilt	1	76%	100%
Lake Chelan	4	91%	116%
Entiat	1	101%	138%
Colckum	1	75%	110%



March 1 snowpack was 86% of normal. Precipitation was 93% of normal for February and 105% for the water-year. March 1 reservoir storage for the Upper Yakima reservoirs was 125% of normal.

Upper Yakima Streamflow Forecasts - March 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Keechelus Reservoir Inflow ²	APR-JUL	81	103	117	104%	132	153	112
	APR-SEP	91	113	128	102%	143	165	126
Kachess Reservoir Inflow ²	APR-JUL	73	91	103	104%	114	132	99
	APR-SEP	82	100	112	104%	124	142	108
Teanaway R bl Forks nr Cle Elum	APR-JUL	87	114	132	101%	150	177	131
	APR-SEP	89	116	135	101%	153	181	134
Cle Elum Lake Inflow ²	APR-JUL	295	345	380	99%	415	465	385
	APR-SEP	325	375	415	99%	450	500	420

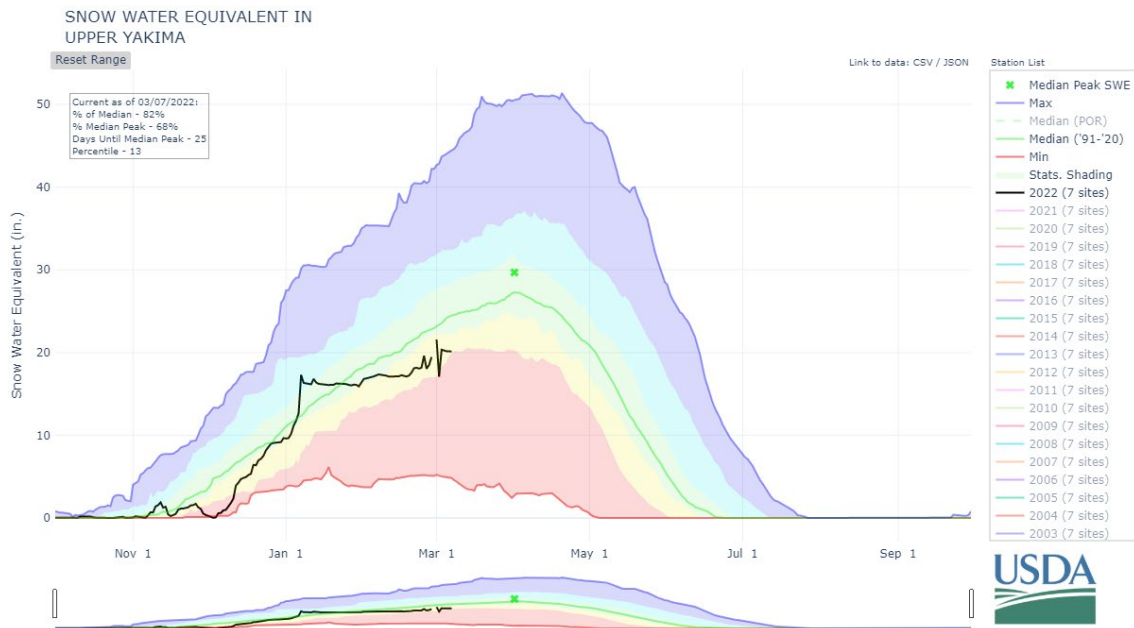
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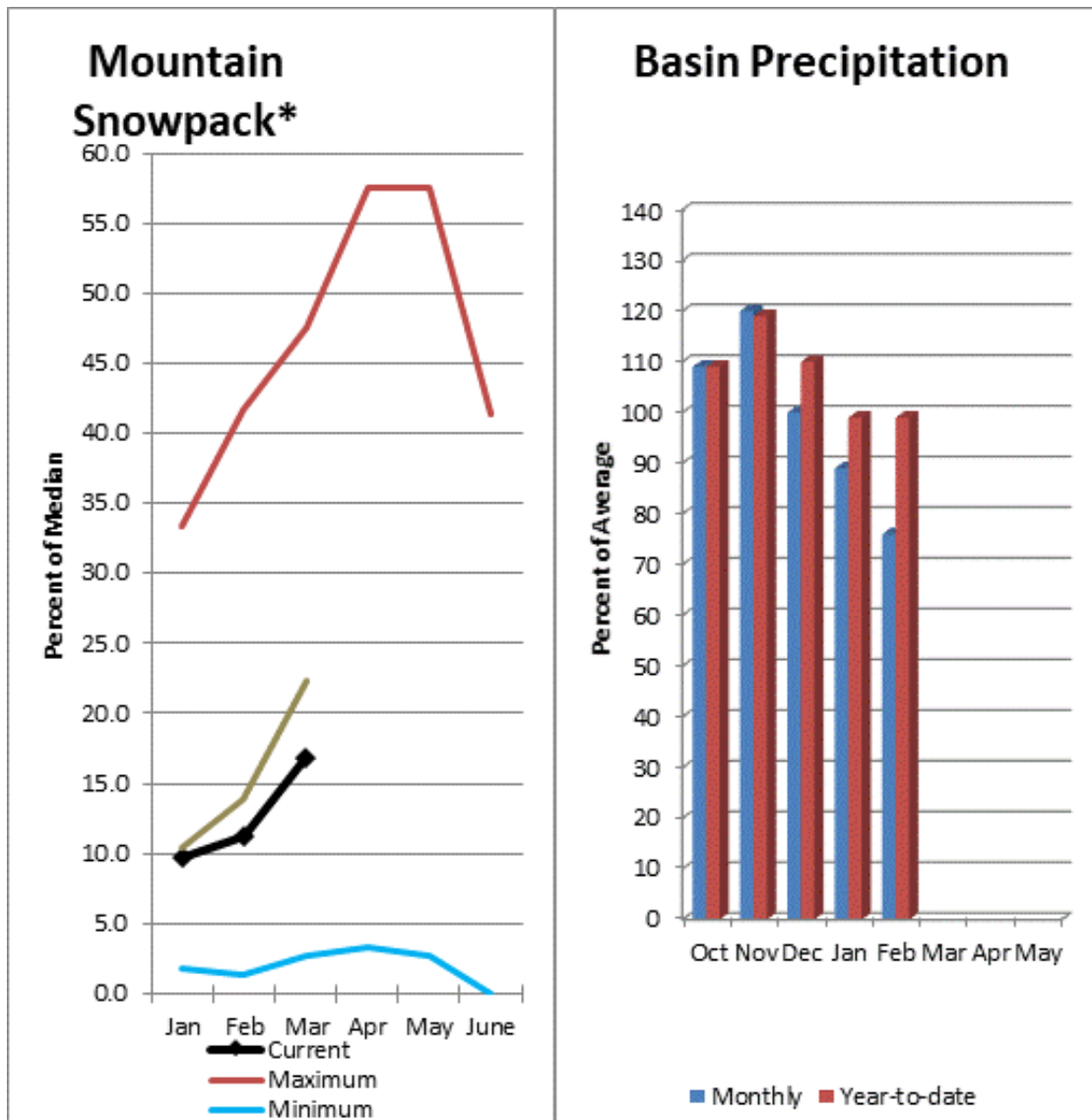
Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Kachess	192.2	165.5	151.8	239.0
Cle Elum	292.6	214.7	235.6	436.9
Keechelus	125.6	99.7	102.4	157.8

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Upper Yakima	10	96%	131%
Upper Yakima	10	96%	131%



Lower Yakima - Naches River Basin



March 1 basin snowpack was 60% of normal for the Lower Yakima and 75% and 89% respectively for the Klickitat and Naches basins. February precipitation was about 75% of normal and 98% for the water-year. March 1 reservoir storage for Bumping and Rimrock reservoirs was 114% of the median.

Lower Yakima – Naches River Basin

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Lower Yakima Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast								
Lower Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Ahtanum Ck at Union Gap	APR-JUL	7.2	17.2	24	92%	31	41	26
	APR-SEP	9.2	19.3	26	93%	33	43	28
Yakima R nr Parker ²	APR-JUL	1130	1440	1640	95%	1850	2160	1730
	APR-SEP	1260	1580	1800	95%	2020	2340	1890

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Lower Yakima	3	60%	89%
Simcoe-Toppenish	1	70%	108%
Satus	1	42%	54%
Ahtanum	2	73%	112%

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Naches Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast								
Naches	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Naches R nr Naches ²	APR-JUL	505	635	720	100%	810	935	720
	APR-SEP	545	685	785	101%	880	1020	775
Bumping Lake Inflow ²	APR-JUL	84	102	114	100%	126	143	114
	APR-SEP	91	110	123	101%	136	155	122
Rimrock Lake Inflow ²	APR-JUL	142	167	184	95%	200	225	194
	APR-SEP	169	198	215	91%	235	265	235
American R nr Nile	APR-JUL	77	92	103	103%	113	129	100
	APR-SEP	82	99	111	103%	123	140	108

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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Bumping Lake	19.6	21.8	15.3	33.7
Rimrock	155.9	137.0	138.5	198.0

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Naches	9	89%	120%
Naches	9	89%	120%

Klickitat Streamflow Forecasts - March 1, 2022

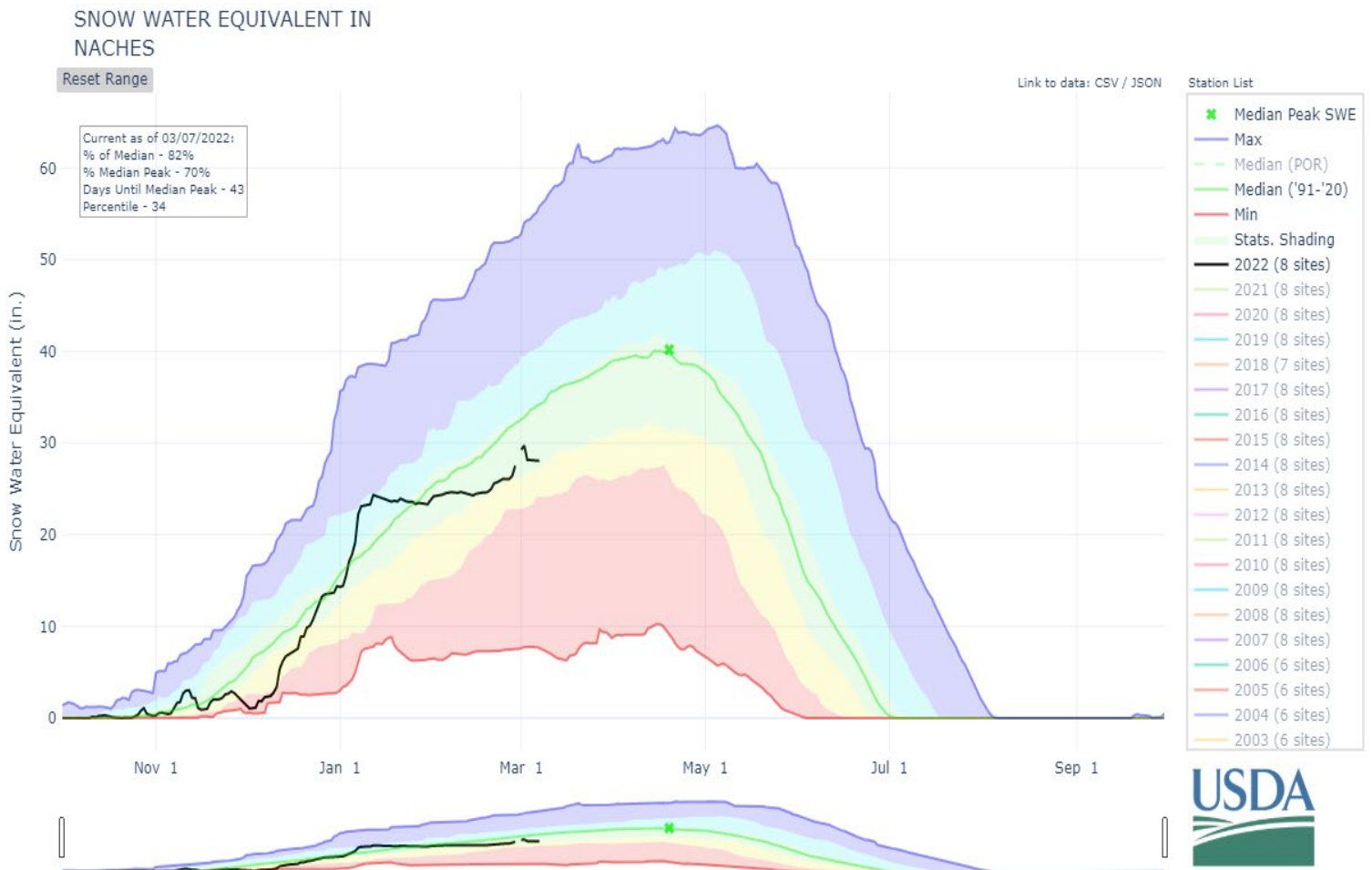
 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Klickitat	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Klickitat R nr Pitt	APR-JUL	290	375	430	95%	485	565	455
	APR-SEP	365	455	515	94%	575	665	545
Klickitat R nr Glenwood	APR-JUL	81	103	118	89%	132	154	132
	APR-SEP	91	114	129	89%	145	168	145

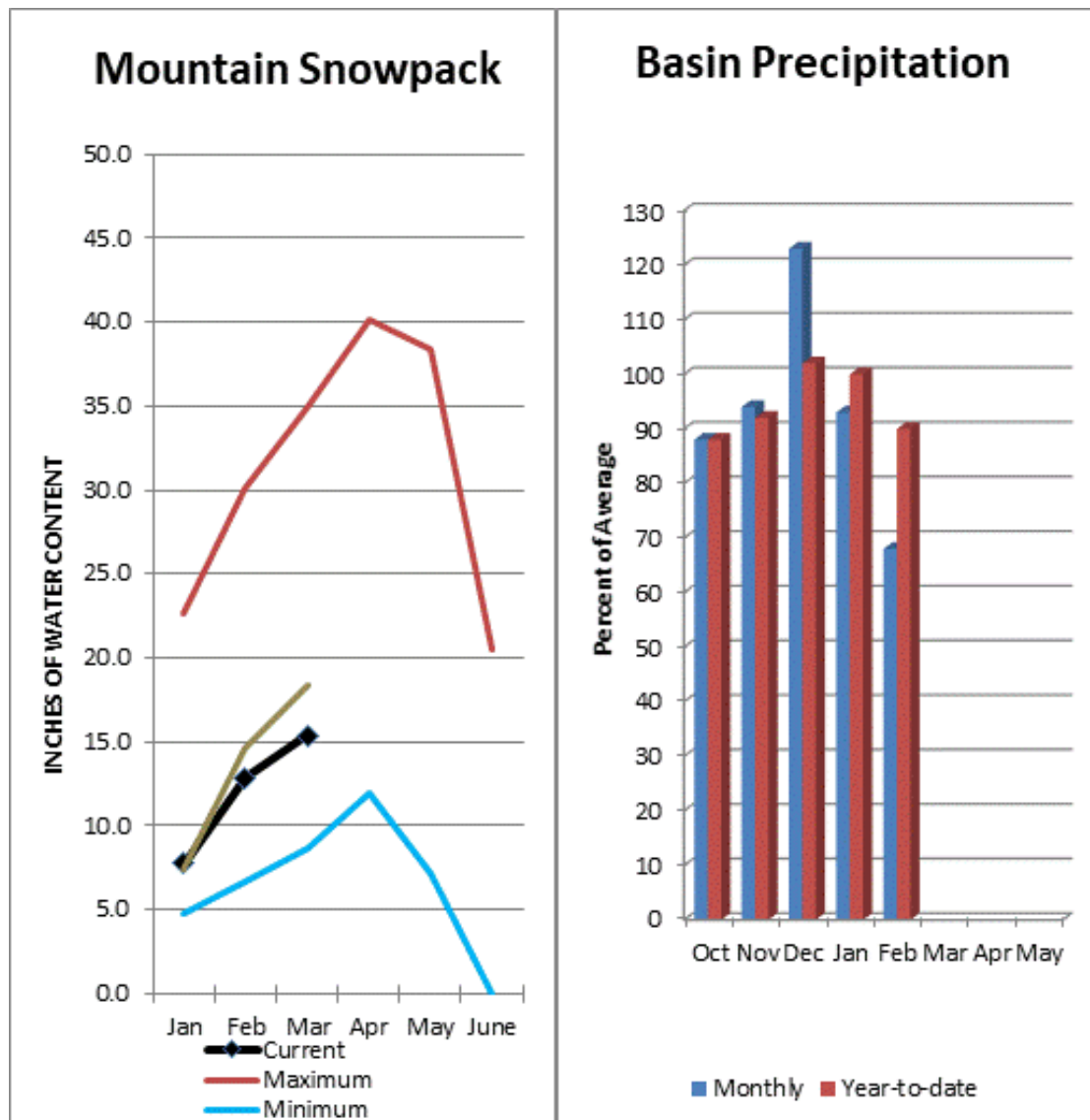
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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis March 1, 2022		# of Sites	% Median	Last Year % Median
Klickitat		4	75%	100%
Klickitat		4	75%	100%



Lower Snake – Walla Walla River Basin



March 1 snowpack readings were 84% of normal. February precipitation was 68% of normal, bringing the year-to-date precipitation to 90% of normal. Dworshak Reservoir storage was 126% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Snake – Walla Walla River Basin

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Lower Snake-Walla Walla Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake-Walla Walla	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)
Mill Ck nr Walla Walla	APR-JUL	13.7	19.9	24	96%	28
	APR-SEP	17.1	23	28	97%	32
Asotin Ck at Asotin	APR-JUL	20	27	33	100%	39
SF Walla Walla R nr Milton-Freewater	MAR-JUL	52	62	69	97%	76
	APR-SEP	52	61	67	96%	73
Snake R bl Lower Granite Dam-NWS ²	APR-JUL	12000		15800	80%	
	APR-SEP	14000		18100	83%	
Grande Ronde R at Troy	MAR-JUL	890	1140	1310	83%	1480
	APR-SEP	730	970	1130	84%	1300

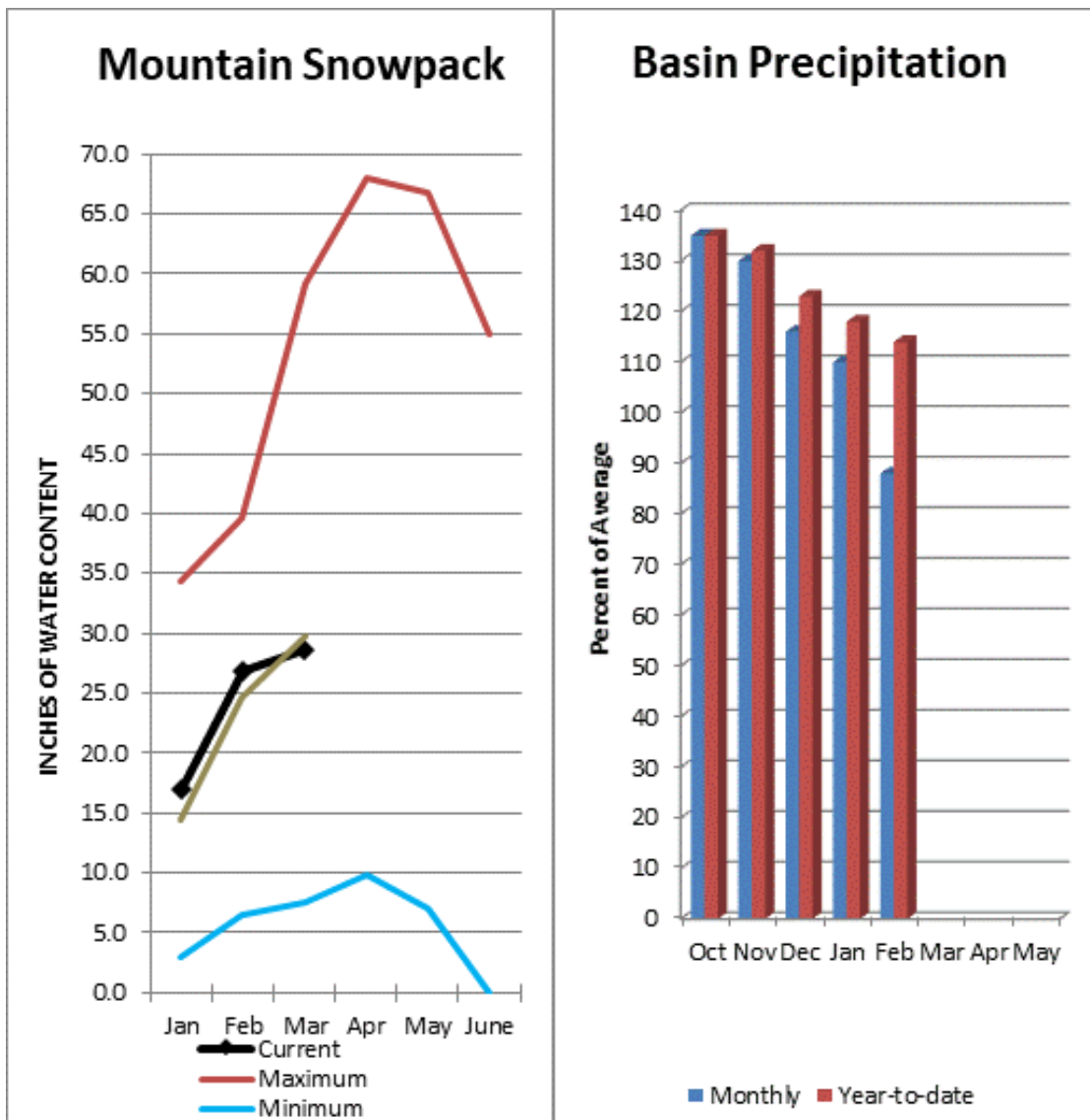
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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wallowa Lake	20.7	18.5	17.6	37.5

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Lower Snake-Walla Walla	20	84%	127%
Walla Walla	5	97%	138%
Grande Ronde	18	85%	131%
Asotin	2	126%	162%



March 1 snow cover for Lower Columbia was 96% of normal. February precipitation was 88% of normal and the water-year was 114%.

Lower Columbia Streamflow Forecasts - March 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Lower Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Cowlitz R bl Mayfield ²	APR-JUL	1160	1430	1610	101%	1800	2070	1600
	APR-SEP	1340	1630	1820	102%	2010	2300	1790
Lewis R at Ariel	APR-JUL	740	920	1040	101%	1160	1340	1030
	APR-SEP	870	1050	1180	103%	1310	1490	1150
Cowlitz R at Castle Rock ²	APR-JUL	1520	1960	2260	107%	2560	3010	2120
	APR-SEP	1770	2230	2550	109%	2860	3320	2330

1) 90% And 10% exceedance probabilities are actually 95% And 5%

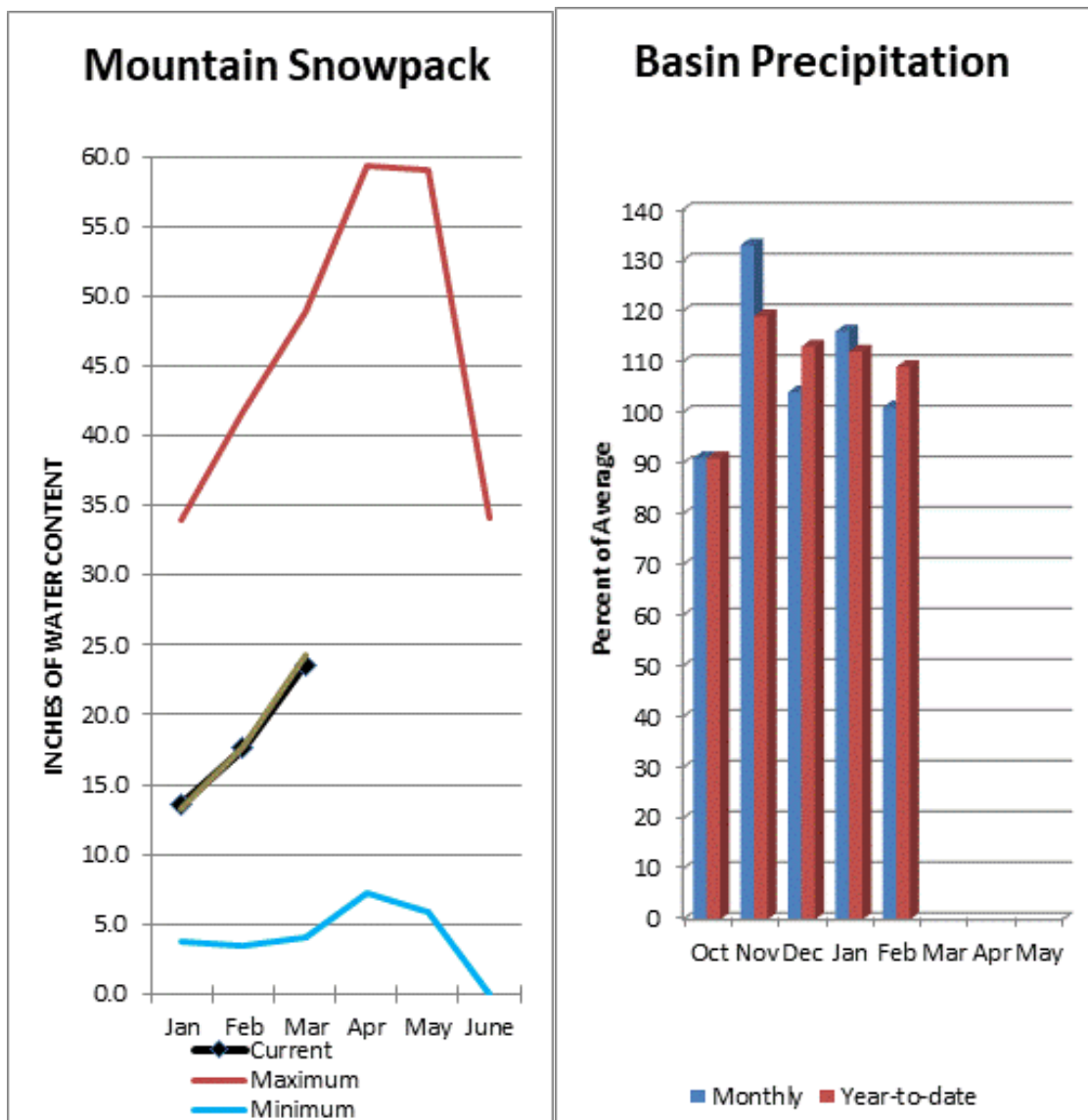
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Mayfield		125.1	127.4	0.0
Merwin			395.9	0.0
Yale			348.0	0.0
Mossyrock Dam (Riffe Lk)		719.8	850.6	0.0
Swift			618.6	0.0

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Lower Columbia	15	96%	126%
Lewis	8	96%	128%
Cowlitz	9	95%	129%

South Puget Sound River Basins



March 1 snowpack was 97% of normal for the South Puget Sound. February precipitation was 101% of normal, bringing the water year-to-date to 109% of normal for the basins. Reservoir storage on the Green River was 287% of the median.

For more information contact your local Natural Resources Conservation Service office.

South Puget Sound River Basins

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South Puget Sound Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
White R nr Buckley ¹¹	APR-JUL	355	430	465	108%	500	580	430
	APR-SEP	430	520	560	108%	600	690	520
Green R bl Howard A Hanson Dam ¹	APR-JUL	144	225	260	111%	295	375	235
	APR-SEP	164	245	285	112%	320	405	255

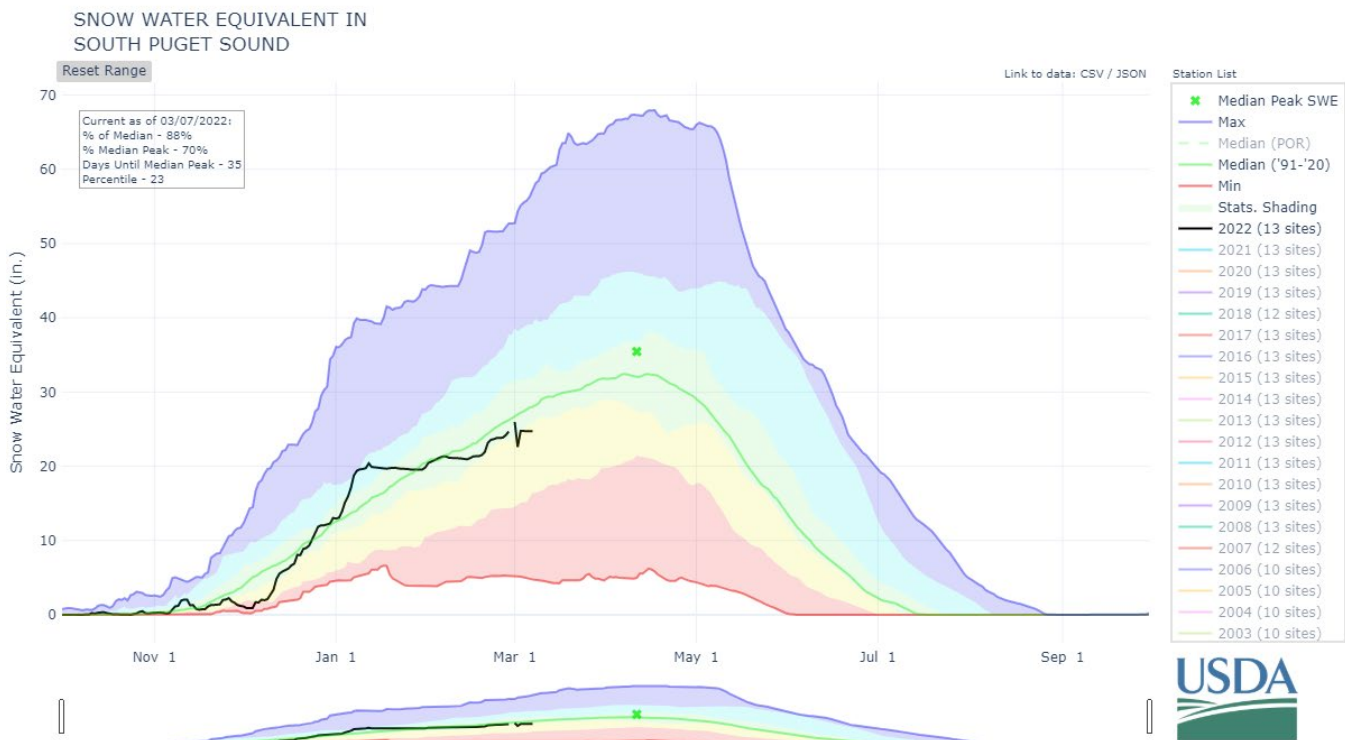
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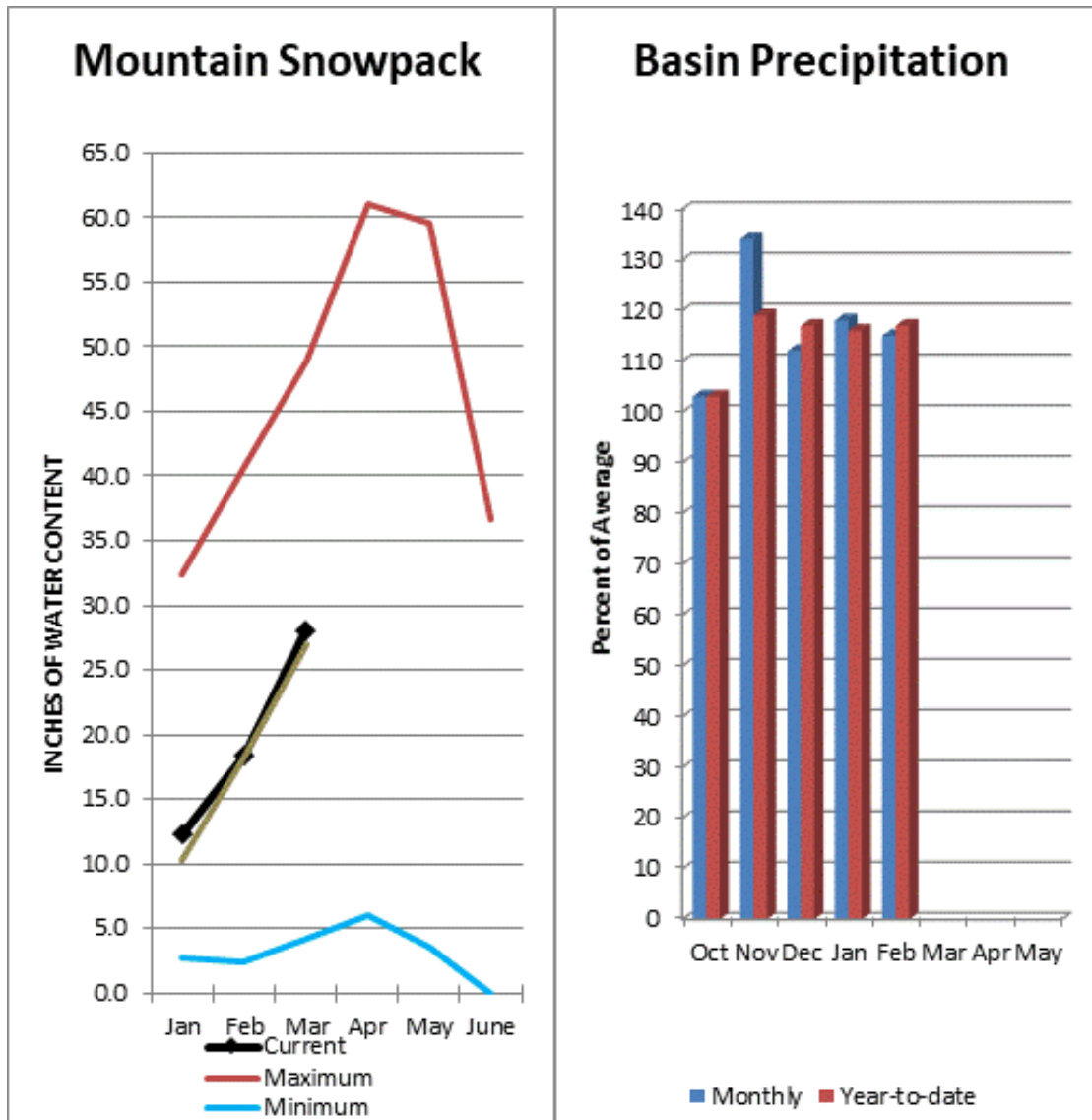
Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Howard Hansen	6.6	3.3	2.3	0.0

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
South Puget Sound	13	97%	134%
White	5	98%	128%
Puyallup	2	91%	139%
Green	6	96%	144%



Central Puget Sound River Basins



March 1 median snow cover in Central Puget Sound was 104%. Basin-wide precipitation for February was 115% of normal, bringing water-year-to-date to 117% of normal.

For more information contact your local Natural Resources Conservation Service office.

Central Puget Sound River Basins

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Central Puget Sound Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

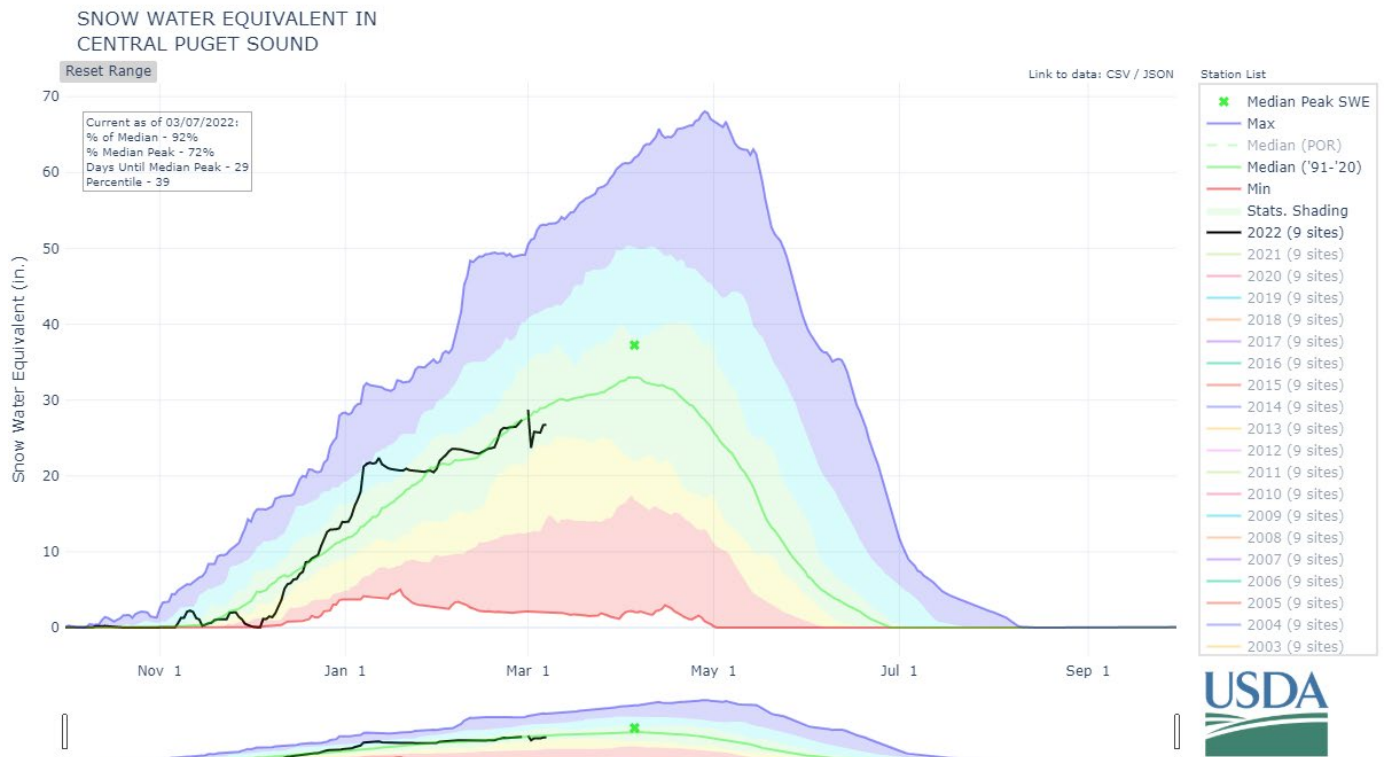
Central Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Taylor Ck nr Selleck	APR-JUL	18.6	22	24	114%	26	29	21
	APR-SEP	19.6	23	27	113%	27	31	24
Rex R nr Cedar Falls	APR-JUL	18.3	24	27	117%	31	37	23
	APR-SEP	19.8	26	30	115%	33	39	26
Cedar R nr Cedar Falls	APR-JUL	57	72	82	114%	93	108	72
	APR-SEP	62	78	88	114%	99	115	77
SF Tolt R nr Index	APR-JUL	12.8	15.5	17.4	130%	19.2	22	13.4
	APR-SEP	14.2	17.2	19.3	125%	21	24	15.4

1) 90% And 10% exceedance probabilities are actually 95% And 5%

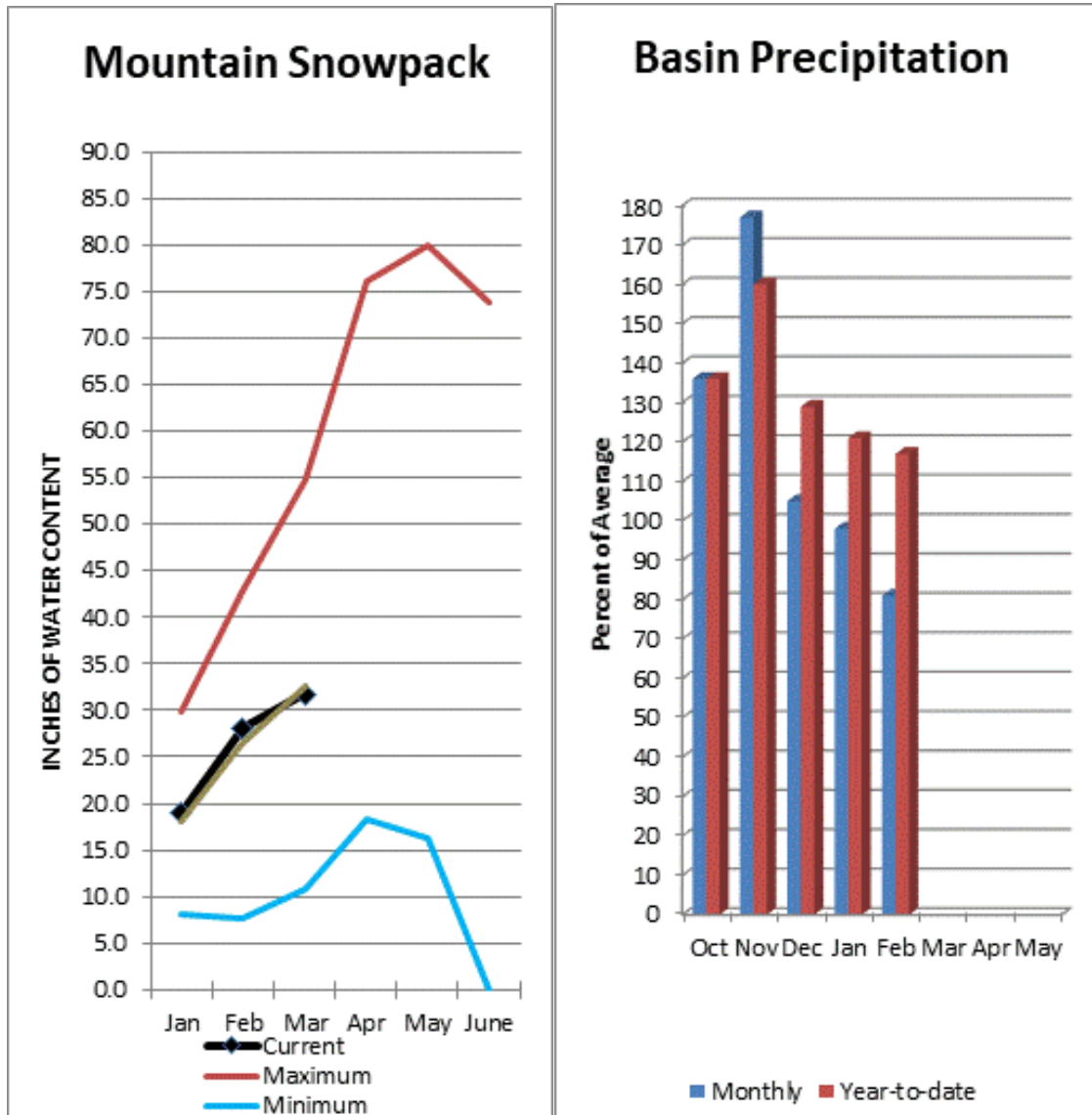
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis March 1, 2022

	# of Sites	% Median	Last Year % Median
Central Puget Sound	12	104%	140%
Tolt	3	92%	140%
Snoqualmie	5	102%	136%
Skykomish	4	102%	144%
Cedar	8	105%	136%



North Puget Sound River Basins



March 1 median snow cover in North Puget Sound was 97%. Basin-wide precipitation for February was 79% of normal, bringing water-year-to-date to 117% of normal. March 1 Basin-wide reservoir storage was 105% of normal.

For more information contact your local Natural Resources Conservation Service office.

North Puget Sound River Basins

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North Puget Sound Streamflow Forecasts - March 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

North Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Baker R at Concrete	APR-JUL	650	745	810	105%	875	970	770
	APR-SEP	865	970	1040	105%	1110	1220	990
Skagit R at Newhalem	APR-JUL	1570	1750	1880	108%	2010	2190	1740
	APR-SEP	1850	2060	2200	109%	2340	2550	2020
Thunder Ck nr Newhalem	APR-JUL	215	235	250	104%	265	285	240
	APR-SEP	305	330	345	105%	360	385	330

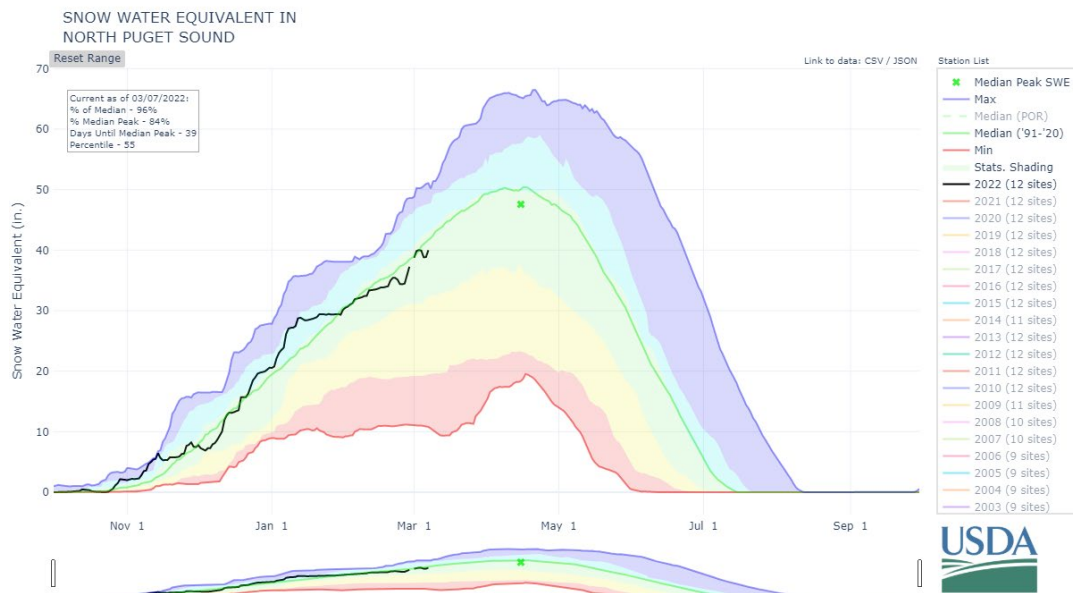
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

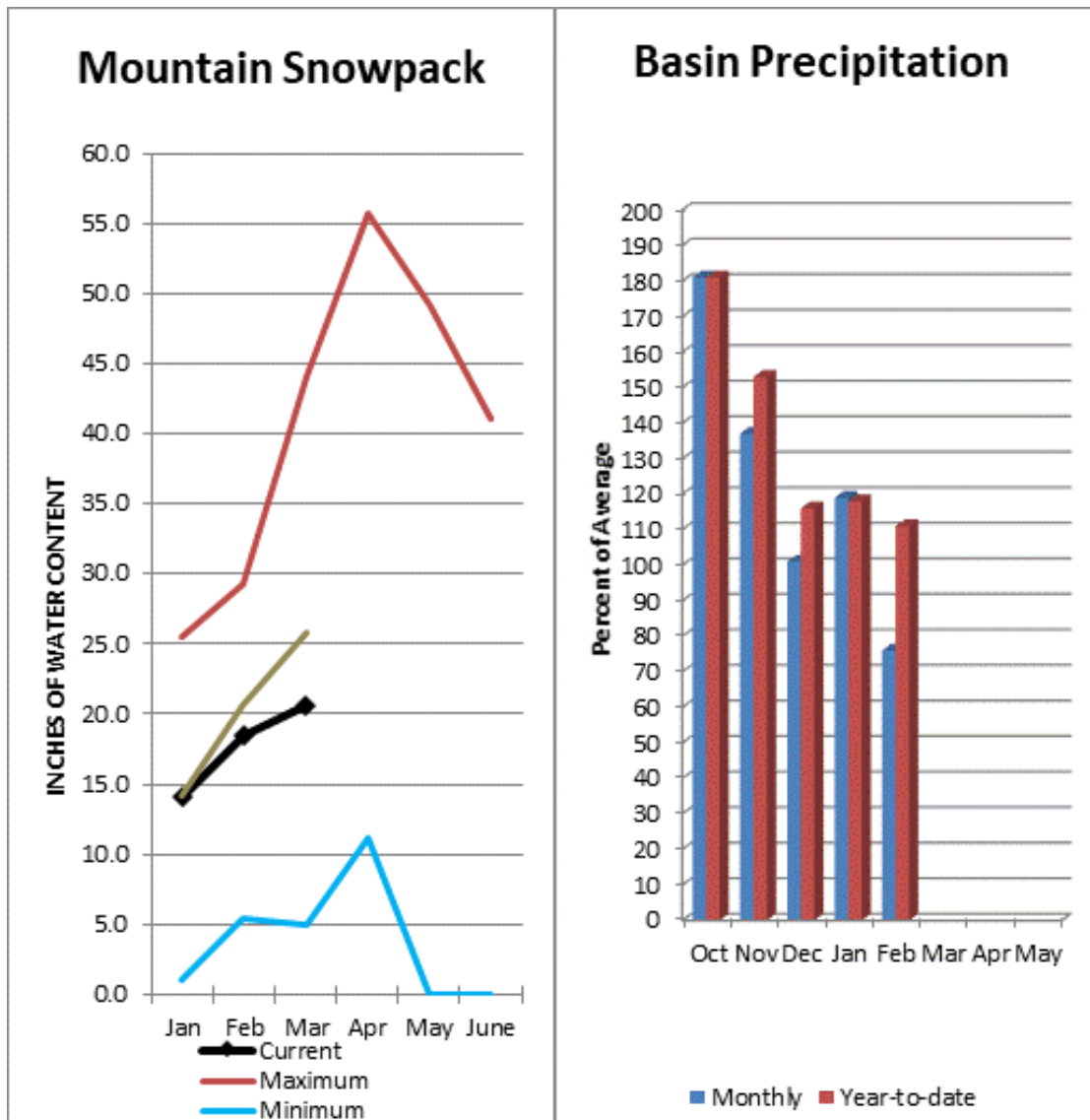
Reservoir Storage End of February, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Upper Baker	74.8	91.1	86.7	0.0
Gorge Reservoir			7.7	0.0
Diablo Reservoir			86.1	90.6
Lake Shannon	91.5	65.3	76.0	0.0
Ross	863.8	781.7	816.3	1434.7

Basin Index
of reservoirs

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
North Puget Sound	21	97%	122%
Skagit	14	102%	121%
Nooksack	3	86%	133%
Baker	2	103%	125%



Olympic Peninsula River Basins



Snowpack averaged 80% of normal on March 1. February precipitation was 76% of normal. Precipitation has accumulated at 111% of normal for the water year.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

Data Current As of: 3/4/2022 2:00:08 PM

Olympic Streamflow Forecasts - March 1, 2022

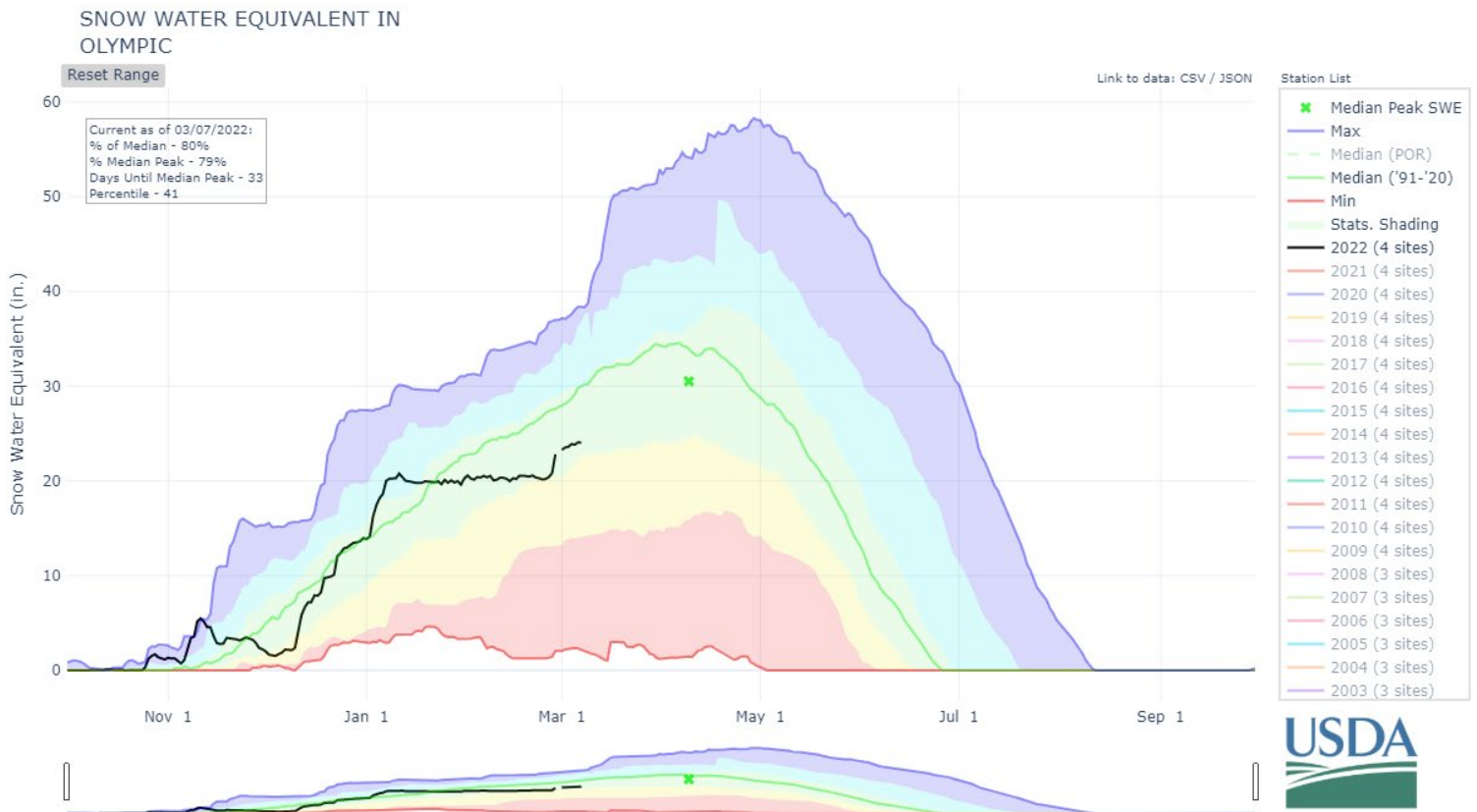
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Olympic	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Elwha R at McDonald Br nr Port Angeles	APR-JUL	235	295	335	91%	375	435	370
	APR-SEP	285	350	395	89%	440	505	445
Dungeness R nr Sequim	APR-JUL	75	93	105	88%	117	135	119
	APR-SEP	87	110	125	90%	140	163	139

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis March 1, 2022	# of Sites	% Median	Last Year % Median
Olympic	7	80%	125%
Olympic	7	80%	125%



Issued by

Terry Cosby
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Roylene Comes-At-Night
State Conservationist
Natural Resources Conservation Service
Spokane, Washington

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology Washington State Department of Natural Resources Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers U.S. Department of Agriculture, Forest Service U.S. Department of Commerce, NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs U.S. Fish and Wildlife Service
Local	City of Tacoma City of Seattle City of Bellingham Chelan County P.U.D. Pacific Power/PacificCorp Puget Sound Energy Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County Kalispel Tribe of Indians Spokane Indian Tribe Jamestown S’Klallam Tribe Sauk-Suiattle Tribe of Indians Stillaguamish Tribe
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District Kinross Mining

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873



Washington Water Supply Outlook Report

**Natural Resources Conservation Service
Spokane, WA**



Washington Water Supply Outlook Report April 1, 2022



Aerial image of Diablo Dam on Skagit River near Newhalem, WA. A sure sign of early spring runoff when dam operators are asked to spill water, 4/1/2022. Snowpack in the Skagit Basin is currently 90% of the long-term median. Photo credit to Keith Kingslien, Elite Productions.

Water Supply Outlook Reports and Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or

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or

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State Conservation Engineer
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Spokane Valley, WA 99206
(509) 323-2955**

How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk, they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

"The U.S. Department of Agriculture (USDA) prohibits discrimination against its customers. If you believe you experienced discrimination when obtaining services from USDA, participating in a USDA program, or participating in a program that receives financial assistance from USDA, you may file a complaint with USDA. Information about how to file a discrimination complaint is available from the Office of the Assistant Secretary for Civil Rights. To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (866) 632-9992 (voice). Persons with disabilities who require alternative means for communication of program information (Braille, Large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). Individuals who are deaf, hard of hearing or have speech disabilities may contact USDA through the Federal Relay service at (800) 877-8339 or (800) 845-6136 (in Spanish). USDA is an equal opportunity provider, employer and lender."

Washington Water Supply Outlook

April 2022

General Outlook

What happened to our miracle March and La Nina, you may ask? Well, the warm dry trend from January and February continued through March. There were only 3-4 significant periods where average temperatures were cold enough for snow accumulation. Otherwise, most days remained above freezing which caused the snowpack to mature and, in most cases, peak 1-3 weeks early. April started out wet with substantial mountain snow however initial indications are that the moisture content was not significant enough to add much to the overall snowpack except at the highest elevations. Snowmelt is well under way in most east side and lower elevation west side basins.

The most recent forecast through next week indicates below normal temperatures with above normal precipitation. Climate Prediction Center 3-month (Apr-May-Jun) forecast continues the previous track of below normal temperatures with equal chances of seasonal precipitation which is indicative of the forecasted Enso La Nina. The US Drought Monitor indicates the continuation of D0-D3 drought designation carried over from last year in eastern Washington. (See maps on page 4)

Snowpack

The April 1 statewide SNOTEL readings were 80% of normal. The lowest readings in the state were at 5% of the 30-year median for April 1 in the Status Creek Basin. The Puyallup River Basin had the most snow with 126%. Westside medians from SNOTEL included the North Puget Sound River basin with 95% of normal, the Central and South Puget River basins with 87% and 82% respectively, and the Lower Columbia basins with 83% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 64% and the Wenatchee area with 80%. Snowpack in the Spokane River Basin was at 83% and the Upper Columbia River basins had 78% of the long-term median.

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	83	102
Newman Lake	70	114
Lower Pend Oreille	83	93
Kettle	77	106
Omak	39	101
Methow	81	109
Conconully Lake	42	94
Central Columbia	80	119
Upper Yakima	79	130
Naches	76	114
Ahtanum Creek	56	111
Walla Walla	74	132
Lower Snake	67	118
Cowlitz	82	126
Lewis	82	129
White	80	118
Green	80	141
Puyallup	95	139
Cedar	83	136
Skykomish	93	153
Skagit	90	108
Nooksack	74	118
Olympic Peninsula	71	126

Precipitation

April precipitation accumulation was below normal in all but the Central and South Puget Sound basins. Statewide water-year average was 106% of average as of April 1. Monthly precipitation ranged from a high of 96% of normal in the Tolt and Skykomish basins to a low of 20% in the Entiat Basin. Some individual site reporting's for the month include Pope Ridge 20% of normal, Dungeness 22%, Lost Horse 21%, Yakima Airport 19%, Winthrop 26% and Forks 70%. SNOTEL collects all form of precipitation including, rain, snow, sleet and hail.

RIVER BASIN	MARCH PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	84	96
Lower Pend Oreille	76	99
Upper Columbia	59	103
Central Columbia	61	103
Upper Yakima	70	99
Naches	64	99
Lower Yakima	34	86
Klickitat	44	93
Walla Walla	57	86
Lower Snake	57	82
Lower Columbia	72	107
South Puget Sound	83	103
Central Puget Sound	96	110
North Puget Sound	82	111
Olympic Peninsula	45	103

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. April 1 Reservoir storage in the Yakima Basin was 126% of average for the Upper Reaches and 127% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 203,100-acre feet, 132% of normal and 85% of capacity; and Ross Lake within the Skagit River Basin at 102% of normal and 64% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	85	132
Lower Pend Oreille	38	78
Upper Columbia	41	57
Central Columbia	43	128
Upper Yakima	86	126
Naches	92	127
Lower Snake	61	124
North Puget Sound	64	105
South Puget Sound		119

For more information contact your local Natural Resources Conservation Service office.

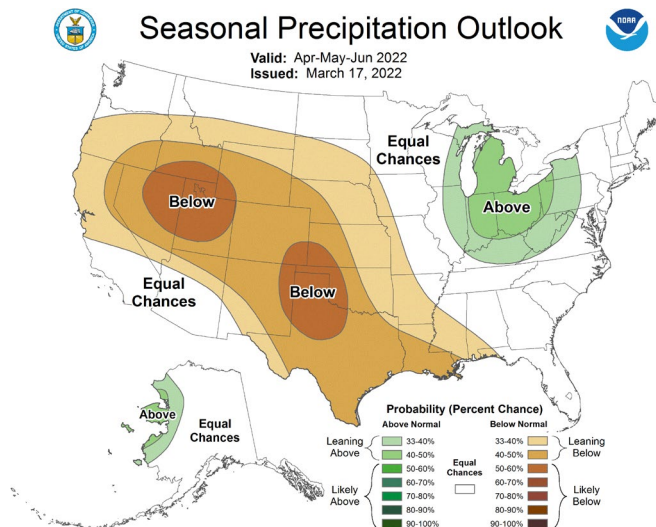
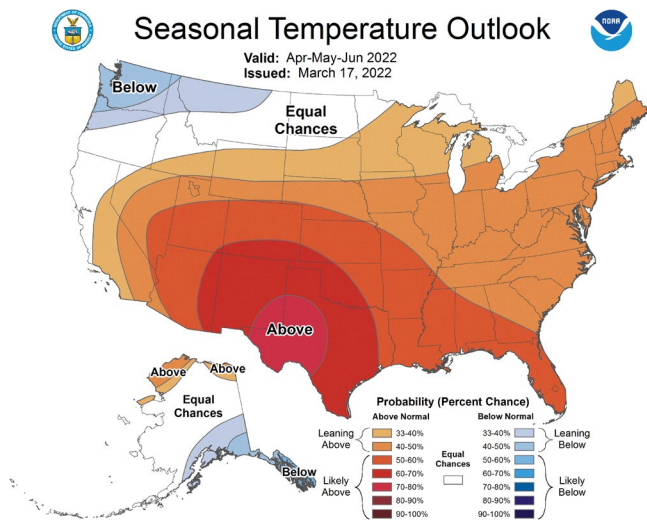
Streamflow

Early winter forecasts for April-September stream flows are never quite as robust as they are later in the season when we know more about the winter climatology. At times only a few degrees warmer or cooler than forecasted can make or break stream flow predictions. Volumetric forecasts are developed using current, historic and median snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

BASIN	PERCENT OF AVERAGE FORECAST (50% CHANCE OF EXCEEDENCE)
Spokane	85-109
Lower Pend Oreille	97-106
Upper Columbia	89-112
Central Columbia	91-109
Upper Yakima	99-104
Lower Yakima	93-95
Naches	91-103
Klickitat	89-94
Lower Snake-Walla Walla	83-100
Lower Columbia	102-109
South Puget Sound	108-112
Central Puget Sound	113-125
North Puget Sound	105-109
Olympic Peninsula	89-90

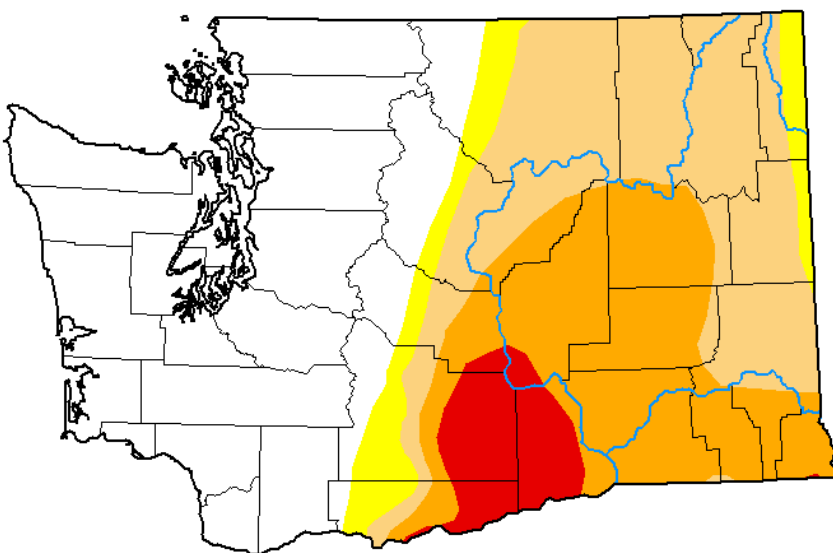
STREAM	PERCENT OF AVERAGE MARCH STREAMFLOWS
Priest River - near Priest River	82
Kettle at Laurier	91
Columbia at Birchbank	114
Spokane at Spokane	151
Similkameen at Nighthawk	146
Okanogan near Tonasket	92
Methow at Pateros	131
Chelan at Chelan	123
Stehekin near Stehekin	142
Wenatchee at Pashastin	141
Cle Elum near Roslyn	160
Yakima near Parker	145
Naches near Naches	188
Grande Ronde at Troy	88
Snake below Lower Granite Dam	86
Columbia River at The Dalles	98
Lewis at Merwin Dam	131
Cowlitz below Mayfield Dam	131
Skagit at Concrete	120
Dungeness near Sequim	94

Climate



U.S. Drought Monitor Washington

March 29, 2022
(Released Thursday, Mar. 31, 2022)
Valid 8 a.m. EDT



Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Deborah Bathke
National Drought Mitigation Center



droughtmonitor.unl.edu



Natural Resources Conservation Service

Washington State
Snow, Water and Climate Services

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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/>

Oregon:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/>

Idaho:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

National Water and Climate Center (NWCC):

<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

USDA-NRCS Agency Homepages

Washington:

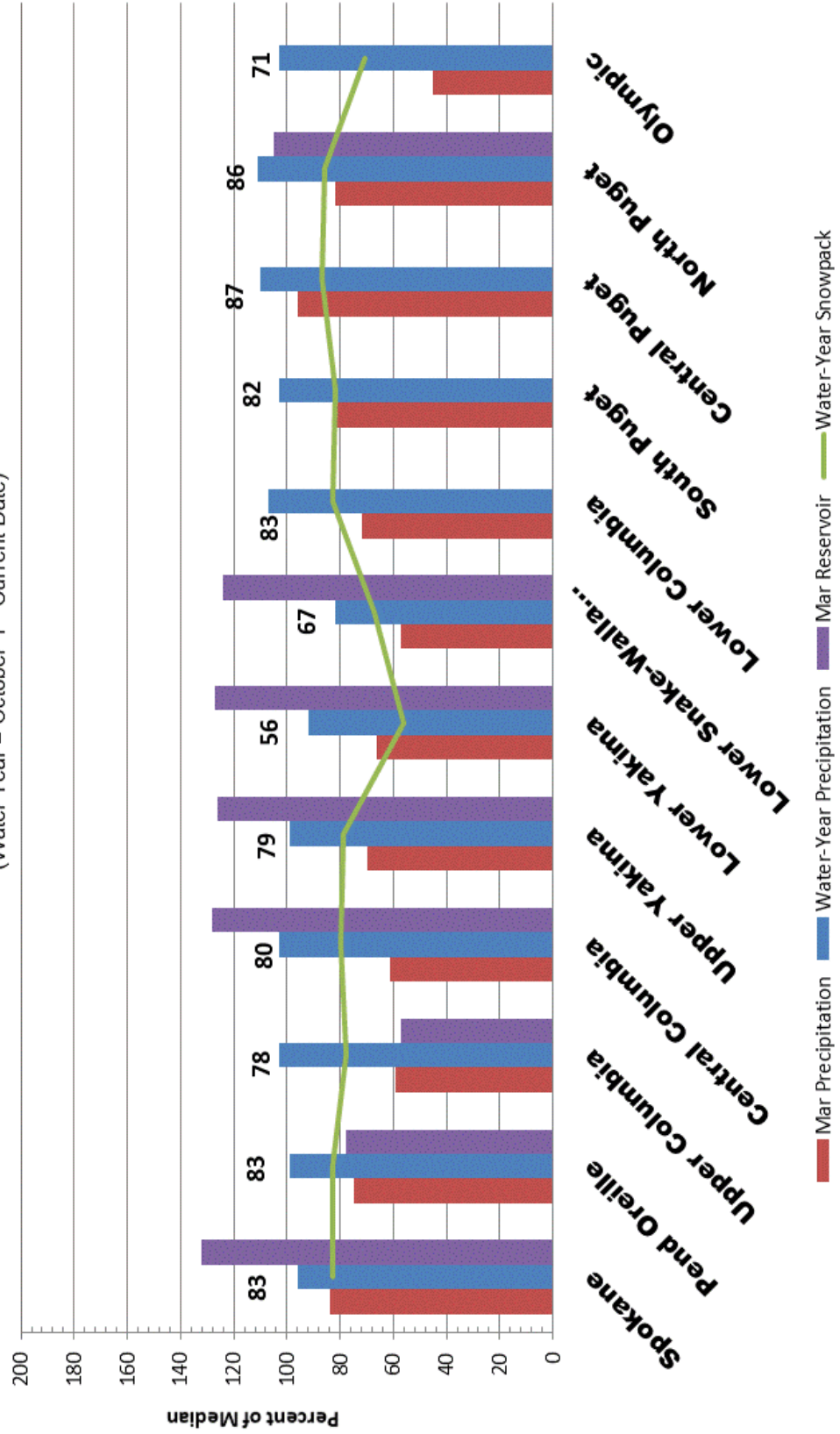
<https://www.nrcs.usda.gov/wps/portal/nrcs/site/wa/home/>

NRCS National:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>

April 1, 2022 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1 - Current Date)



89th Annual Western Snow Conference

April 18-21, 2022

Salt Lake City, Utah

“Drought, Fire, and Precipitation Extremes: Operational Challenges for Snow Water Resources”

Please plan to join us for the 89th Annual Meeting of the Western Snow Conference. The 2022 Meeting will be held at the University of Utah in Salt Lake City, April 18-21, 2022.

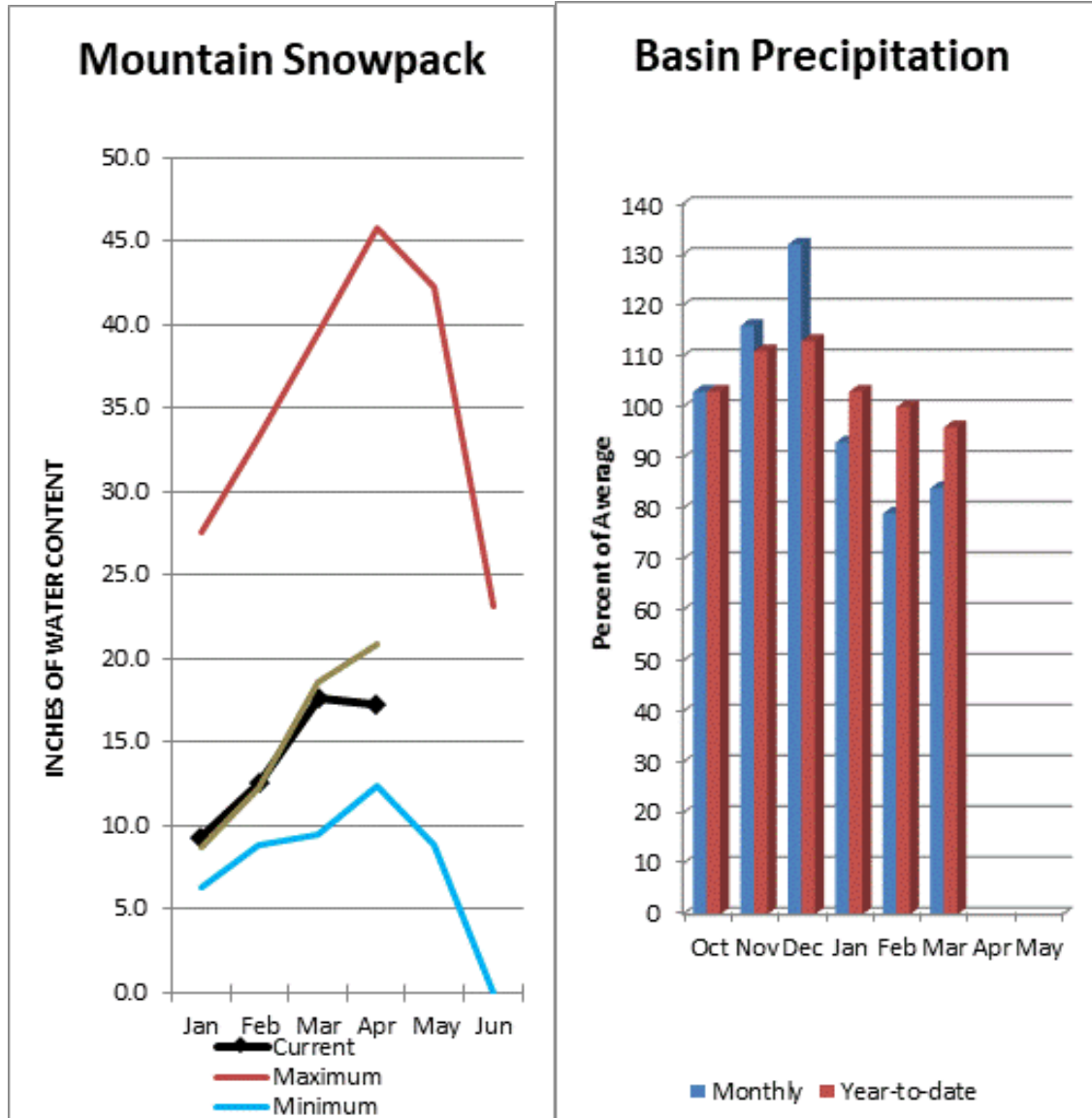
Agenda and registration details are now available on the conference webpage. A virtual option is once again available at a considerably reduced cost.

Noah Molotch
General Chair, WSC

McKenzie Skiles
Conference Chair

Additional information about the conference will be posted on the WSC web page at <http://www.westernsnowconference.org/>

Also find Western Snow Conference on Facebook



Basin snowpack is 83% of normal and precipitation is 96% of normal for the water year. Precipitation for March was 84% of normal. Reservoir storage is currently at 132% of normal.

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Spokane Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Spokane	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Spokane R nr Post Falls ²	APR-JUL	1570	1930	2180	87%	2420	2790	2510
	APR-SEP	1620	1990	2240	87%	2490	2870	2570
NF Coeur d'Alene R at Enaville	APR-JUL	435	530	600	84%	665	765	715
	APR-SEP	460	565	630	84%	700	800	750
Chamokane Ck nr Long Lake	APR-JUL	5.8	9.2	12	83%	15.2	20	14.4
Spokane R at Long Lake ²	APR-JUL	1810	2190	2440	90%	2700	3070	2720
	APR-SEP	1940	2340	2610	91%	2870	3270	2870
St. Joe R at Calder	APR-JUL	805	925	1010	96%	1090	1210	1050
	APR-SEP	855	980	1070	96%	1150	1270	1120

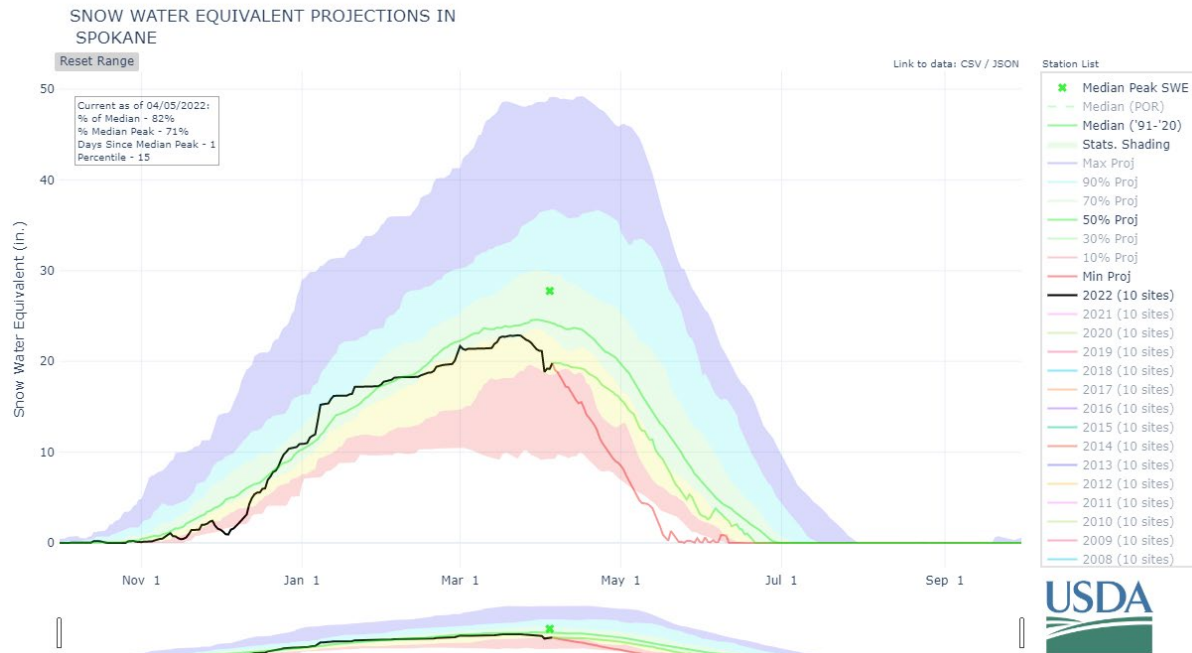
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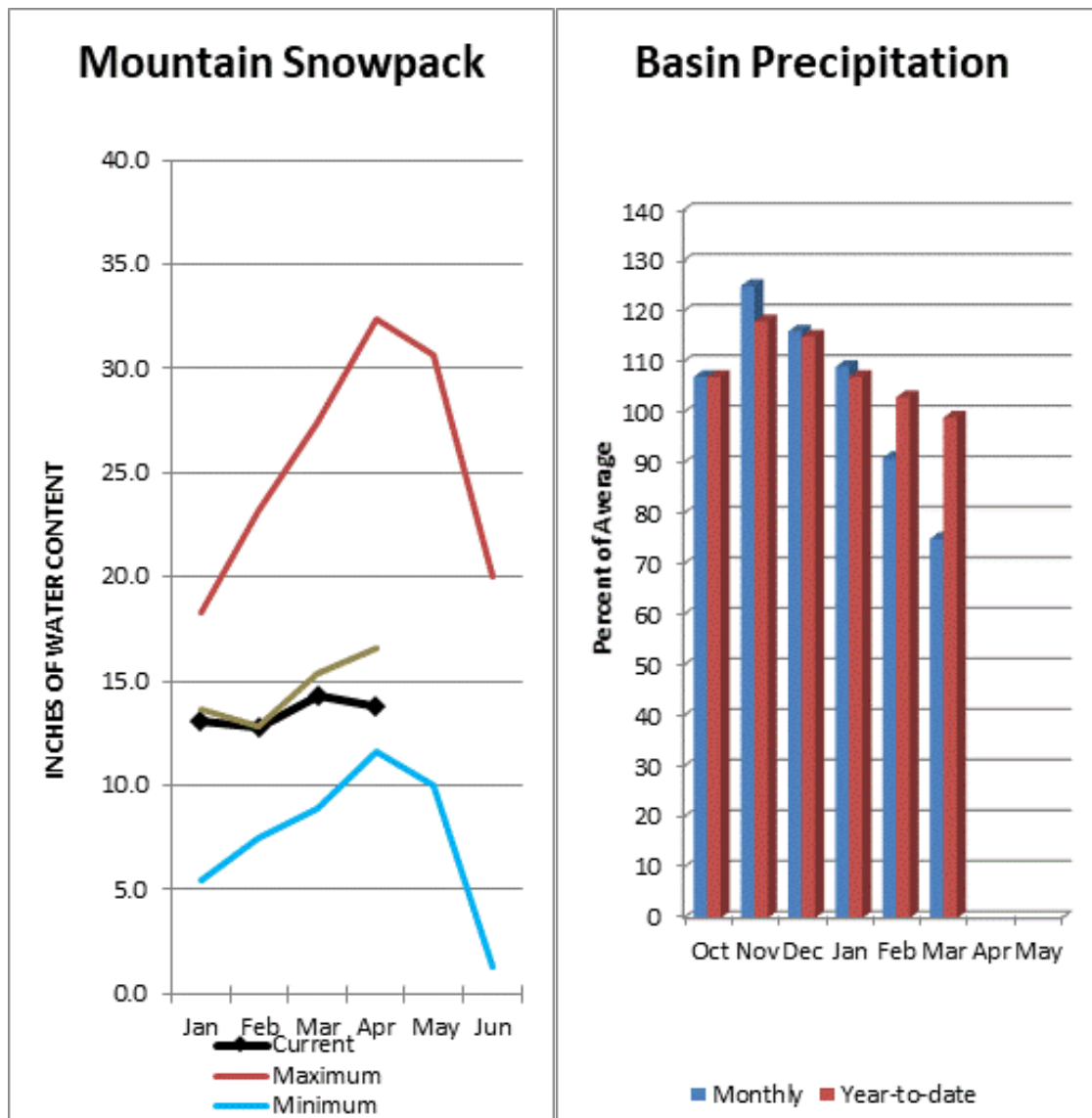
Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Coeur d' Alene	203.1	114.1	153.8	238.5

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Spokane	21	83%	102%
Newman Lake	5	70%	114%



Lower Pend Oreille River Basins



April 1 snow cover was 83% of normal in the Pend Oreille Basin River Basin and precipitation during March was 76% of normal, bringing the year-to-date precipitation at 99% of normal. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 78% of normal.

For more information contact your local Natural Resources Conservation Service office.

Lower Pend Oreille River Basins

Data Current As of: 4/6/2022 2:39:32 PM

Lower Pend Oreille Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Pend Oreille	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Priest R nr Priest River ²	APR-JUL	540	645	715	85%	785	890	840
	APR-SEP	570	680	755	86%	830	940	880
Pend Oreille R bl Box Canyon ²	APR-JUL	9820	11100	11900	102%	12700	14000	11700
	APR-SEP	10500	11900	12900	102%	13900	15300	12700
Pend Oreille Lake Inflow ²	APR-JUL	9520	10800	11600	99%	12400	13700	11700
	APR-SEP	10200	11600	12500	99%	13400	14800	12600

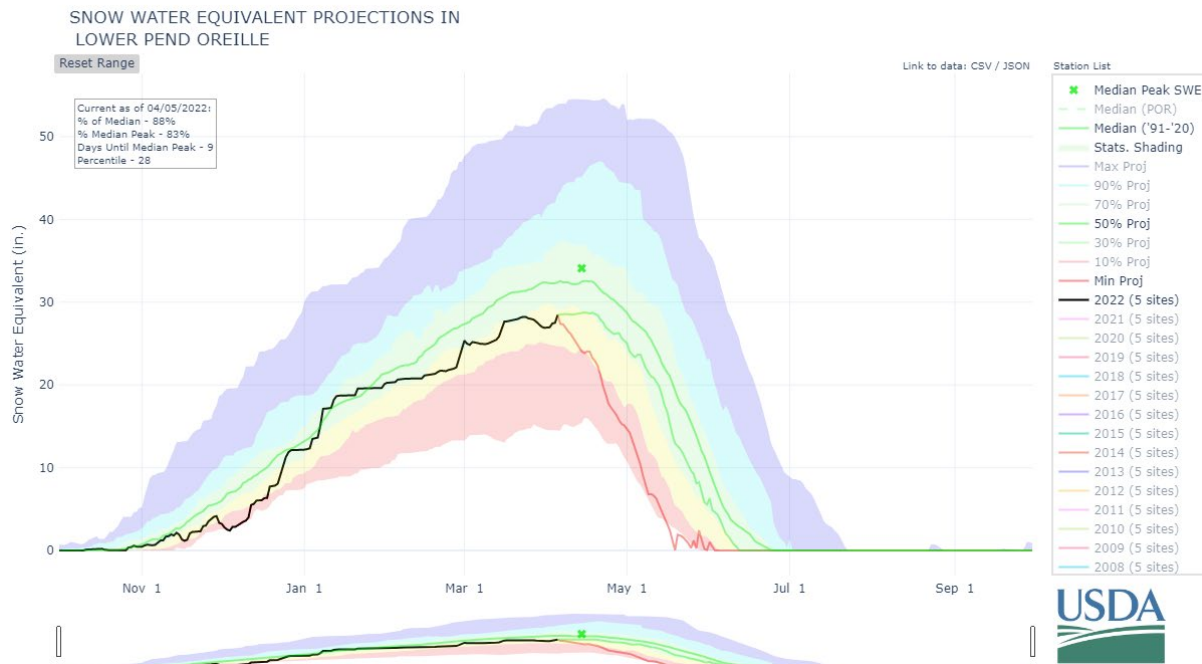
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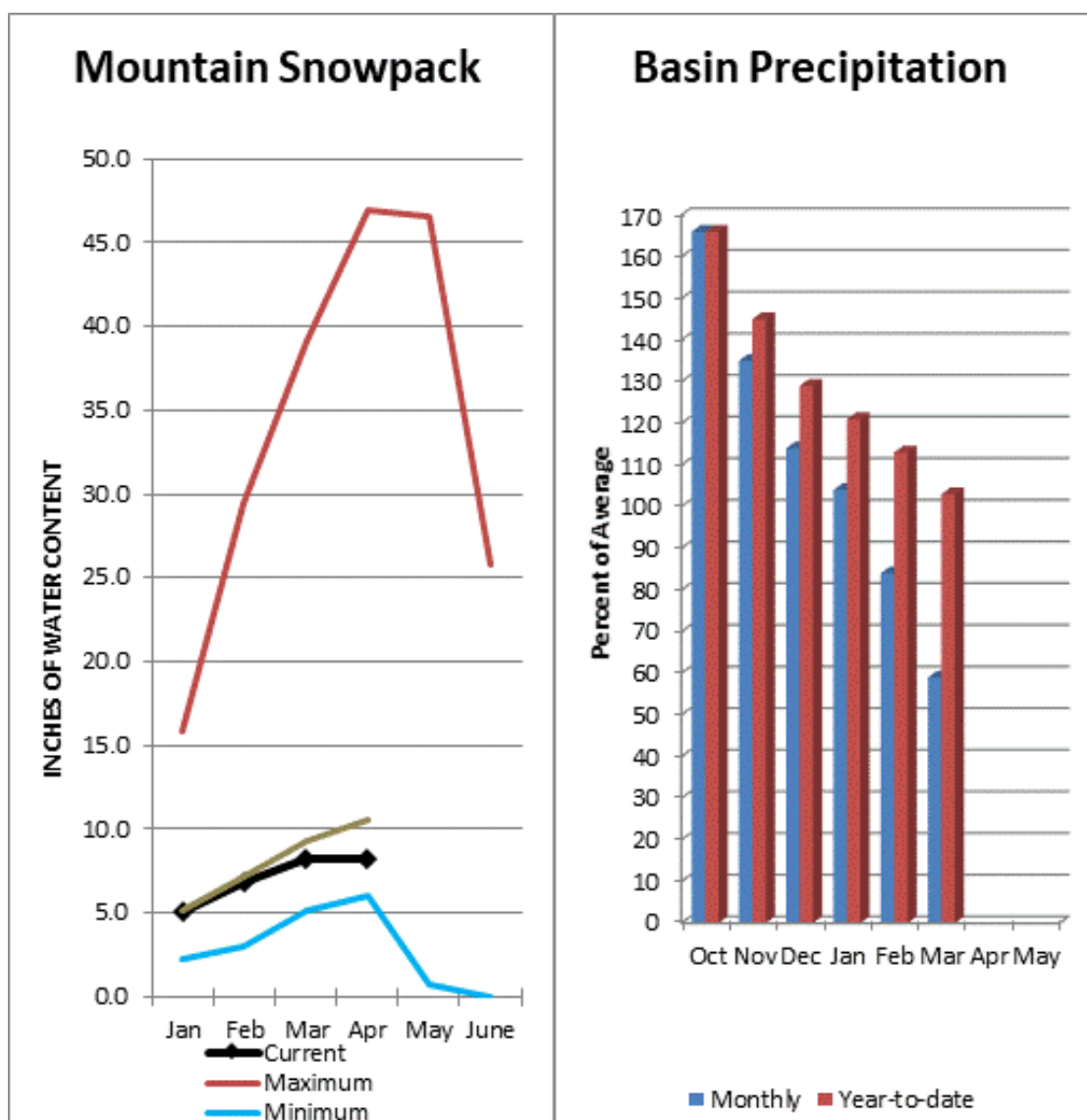
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Pend Oreille	577.9	593.6	755.3	1561.3
Priest Lake	61.1	45.2	64.4	119.3

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Pend Oreille	14	83%	93%
Sullivan	1	77%	84%





April 1 snow cover on the Upper Columbia basins was 78% of normal and March precipitation was 59% of normal, with precipitation for the water year at 103% of normal. Combined storage in the Conconully Reservoirs was 57% of normal.

Upper Columbia Streamflow Forecasts - April 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Similkameen R nr Nighthawk	APR-JUL	1120	1260	1360	108%	1450	1600	1260
	APR-SEP	1190	1340	1440	107%	1540	1690	1340
Okanogan R at Malott	APR-JUL	1230	1420	1540	99%	1670	1850	1550
	APR-SEP	1340	1550	1700	101%	1840	2050	1680
Okanogan R nr Tonasket	APR-JUL	1200	1380	1510	99%	1630	1810	1520
	APR-SEP	1310	1520	1660	102%	1800	2010	1620
Columbia R at Grand Coulee-NWS ²	APR-JUL	46700		55100	105%		66400	52600
	APR-SEP	54700		64800	107%		78700	60600
Colville R at Kettle Falls	APR-JUL	30	66	90	78%	115	150	115
	APR-SEP	34	73	100	81%	126	165	124
Methow R nr Pateros	APR-JUL	590	690	755	84%	825	925	895
	APR-SEP	645	750	820	85%	890	995	965
Kettle R nr Laurier	APR-JUL	1160	1400	1560	85%	1720	1950	1840
	APR-SEP	1200	1450	1620	83%	1790	2040	1950

1) 90% And 10% exceedance probabilities are actually 95% And 5%

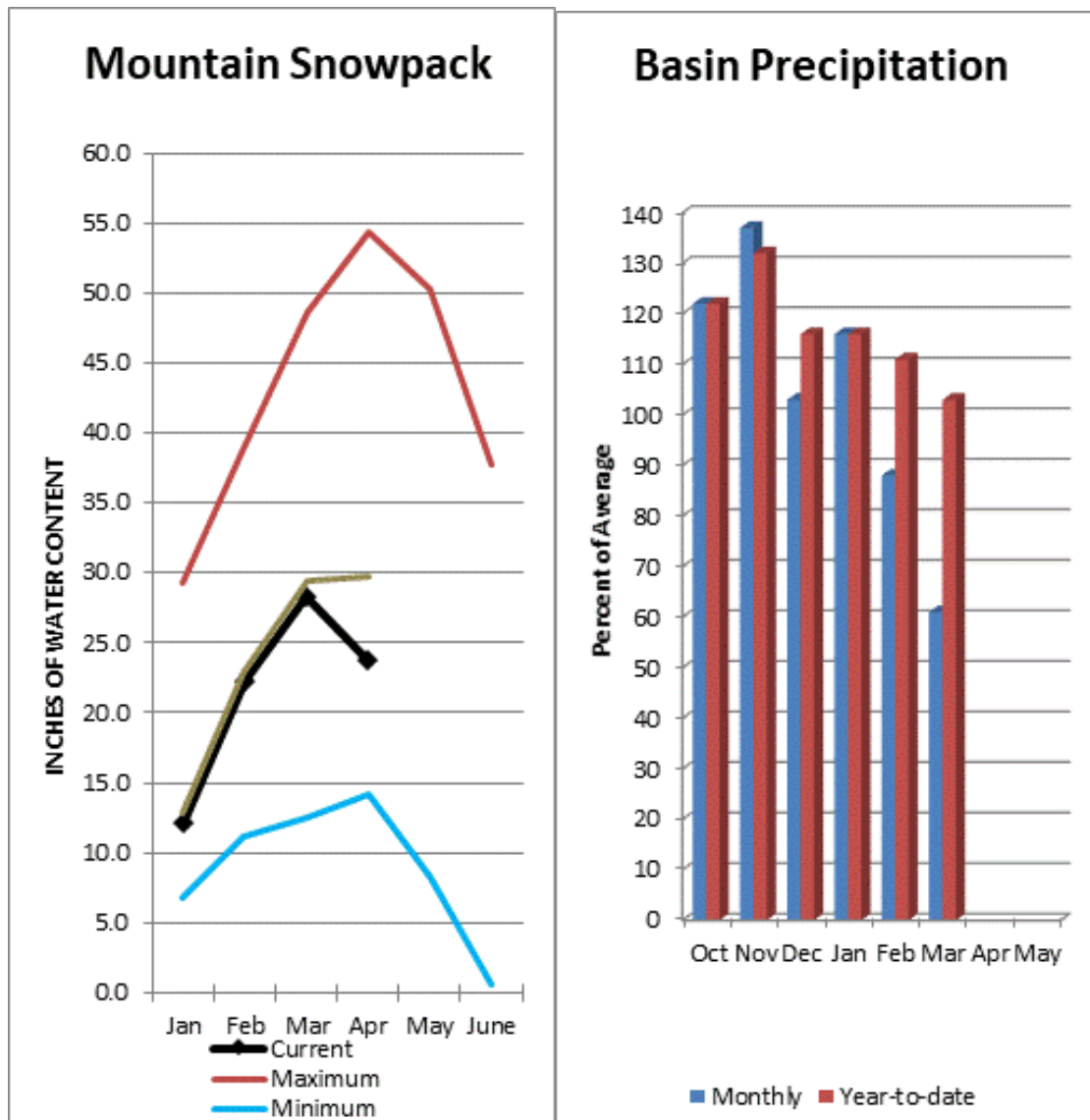
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	3.5	5.6	7.9	10.5
Conconully Reservoir	6.0	5.6	8.8	13.0

 Basin Index
 # of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Upper Columbia	52	76%	105%
Toats Coulee	52	76%	105%
Sanpoil	4	40%	79%
Omak	3	39%	101%
Methow	10	81%	109%
Kettle	11	70%	103%
Concully Lake	3	42%	94%
Colville	2	80%	100%

Central Columbia River Basins



April 1 snowpack in the Central Columbia River basins was 80% of normal. Precipitation during March was 61% of normal in the basin and 103% for the year-to-date. Reservoir storage in Lake Chelan was 128% of the median.

For more information contact your local Natural Resources Conservation Service office.

Central Columbia River Basins

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Central Columbia Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Central Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Chelan R at Chelan ²	APR-JUL	785	875	930	89%	990	1080	1040
	APR-SEP	880	970	1030	88%	1100	1190	1170
Wenatchee R at Peshastin	APR-JUL	1110	1220	1290	90%	1360	1460	1440
	APR-SEP	1200	1310	1390	90%	1470	1590	1540
Icicle Ck nr Leavenworth	APR-JUL	215	245	265	91%	285	315	290
	APR-SEP	230	265	285	92%	310	340	310
Columbia R bl Rock Island Dam-NWS ²	APR-JUL	50500		60300	105%		73200	57600
	APR-SEP	58900		70500	107%		86000	65800
Stehekin R at Stehekin	APR-JUL	540	600	635	89%	675	730	715
	APR-SEP	635	690	730	87%	765	825	835
Wenatchee R at Plain	APR-JUL	805	890	950	89%	1010	1090	1070
	APR-SEP	875	970	1030	89%	1100	1190	1160
Entiat R nr Ardenvoir	APR-JUL	140	164	181	82%	197	220	220
	APR-SEP	152	178	196	83%	215	240	235

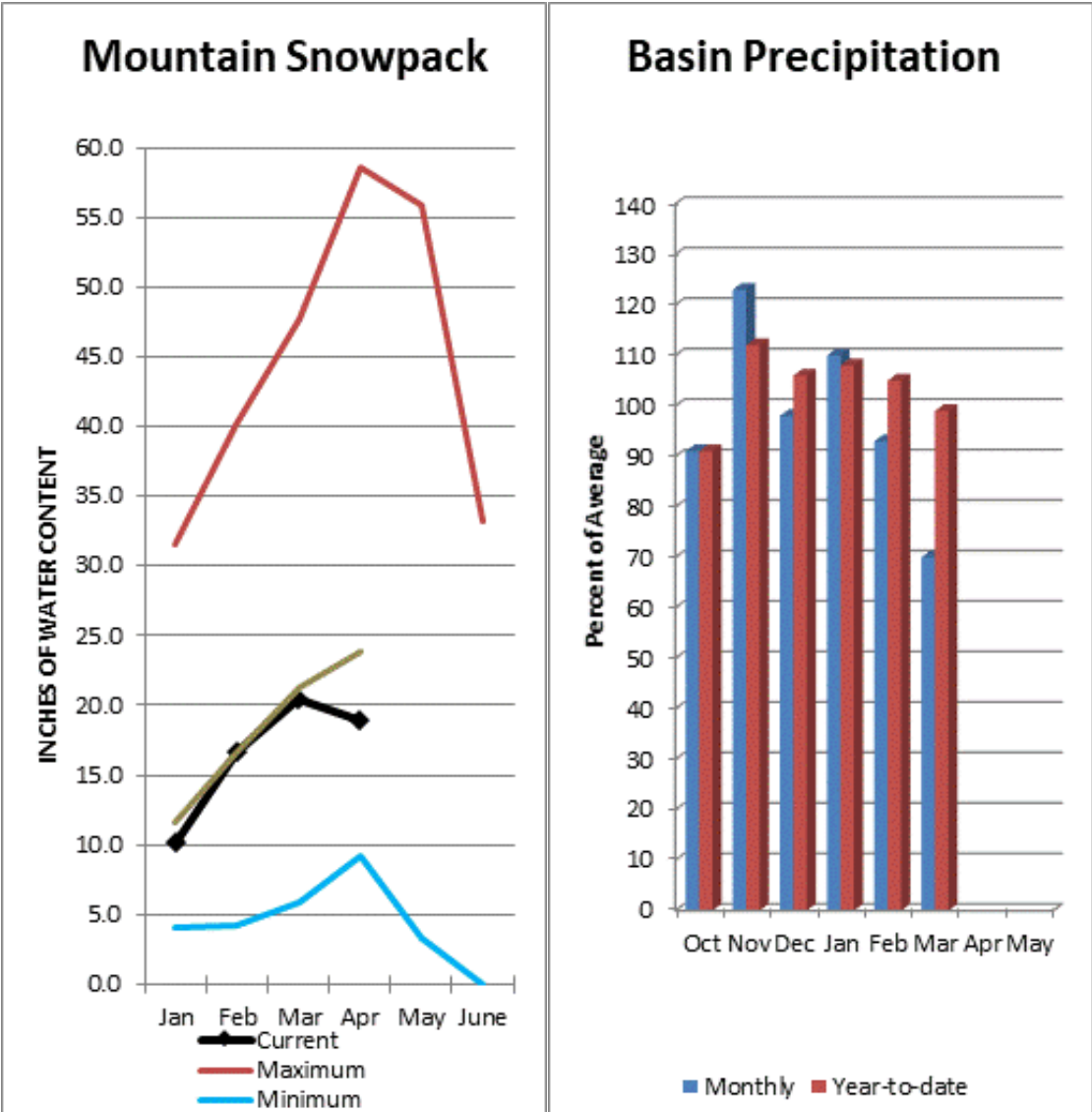
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Chelan	293.3	206.2	228.8	677.4

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Central Columbia	12	80%	119%
Wenatchee	12	80%	119%
Stemilt	1	52%	89%
Lake Chelan	3	82%	108%
Entiat	1	60%	119%
Colckum	1	59%	114%



April 1 snowpack was 79% of normal. Precipitation was 70% of normal for March and 99% for the water-year. April 1 reservoir storage for the Upper Yakima reservoirs was 126% of normal.

Upper Yakima Streamflow Forecasts - April 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Keechelus Reservoir Inflow ²	APR-JUL	80	94	104	93%	113	127	112
	APR-SEP	89	104	114	90%	124	139	126
Kachess Reservoir Inflow ²	APR-JUL	72	83	90	91%	97	108	99
	APR-SEP	80	92	99	92%	107	118	108
Teanaway R bl Forks nr Cle Elum	APR-JUL	78	99	112	85%	126	146	131
	APR-SEP	80	101	115	86%	129	150	134
Cle Elum Lake Inflow ²	APR-JUL	290	320	340	88%	360	390	385
	APR-SEP	315	350	370	88%	390	425	420

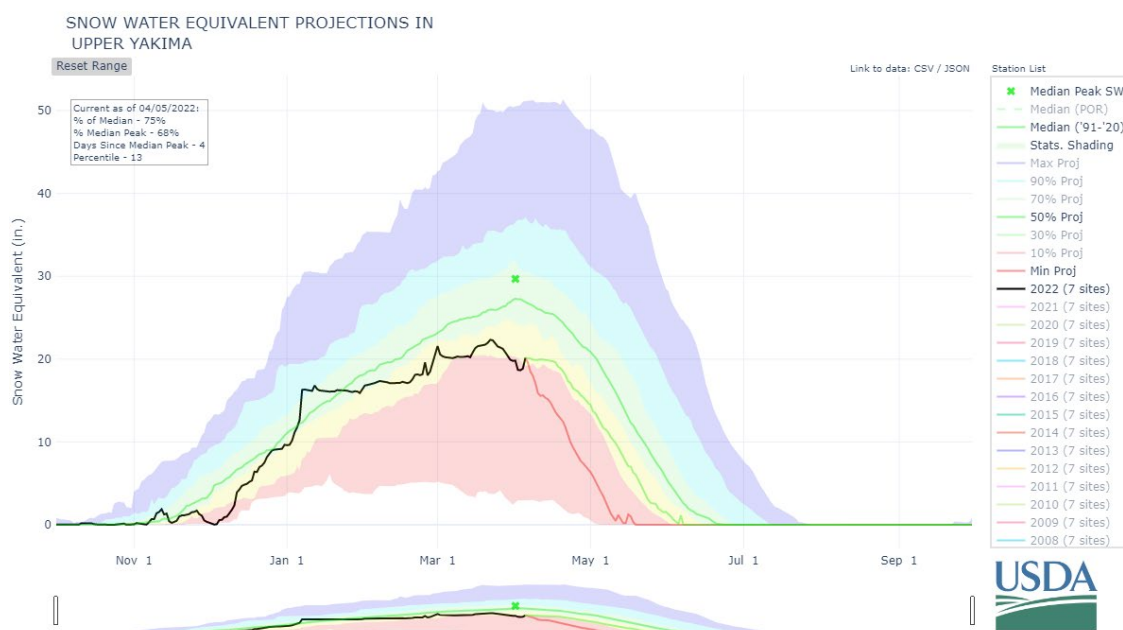
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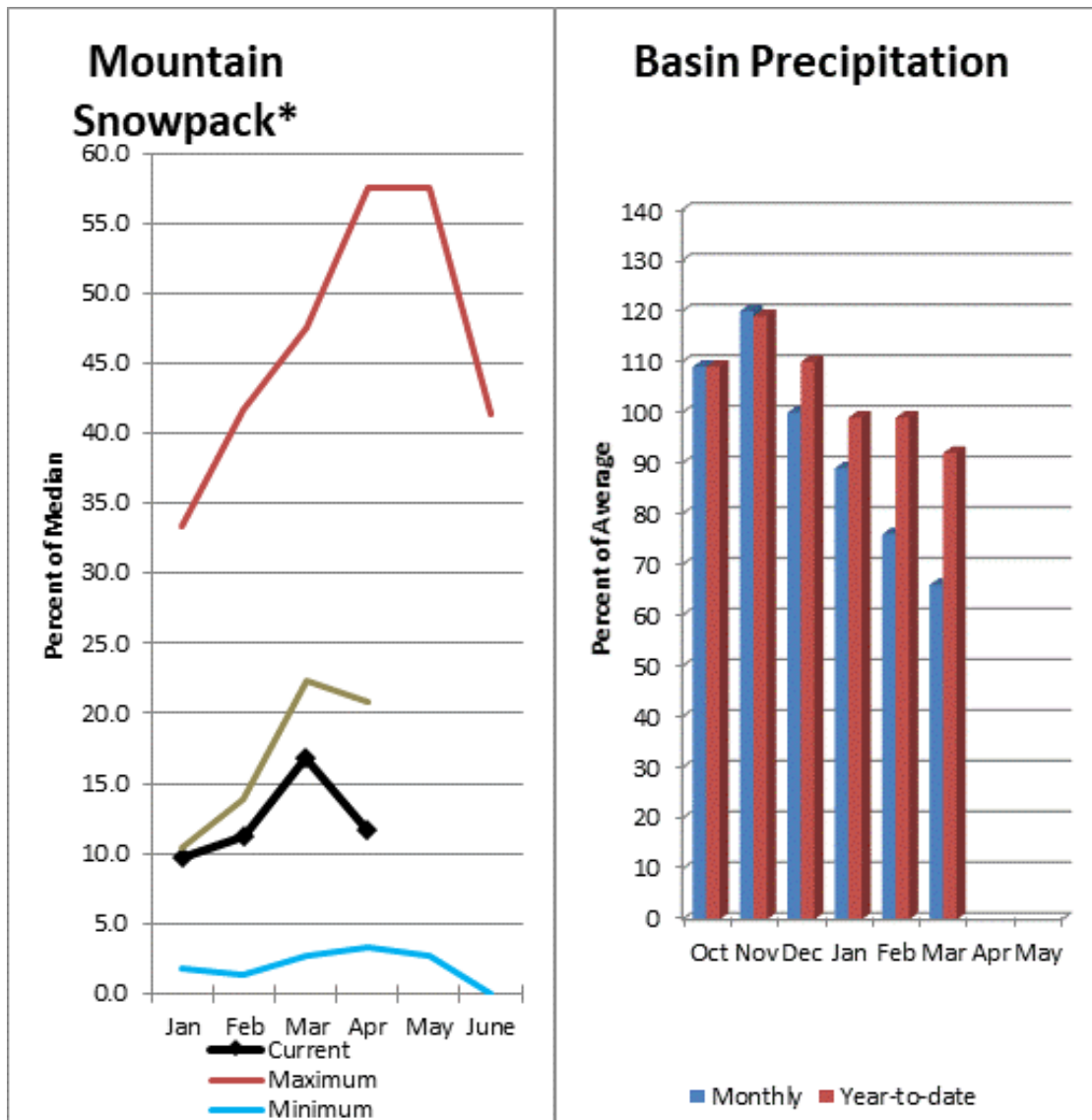
Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Kachess	217.6	174.8	172.4	239.0
Cle Elum	348.9	227.8	277.7	436.9
Keechelus	148.6	103.5	118.1	157.8

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Upper Yakima	10	79%	130%
Upper Yakima	10	79%	130%



Lower Yakima - Naches River Basin



April 1 basin snowpack was 36% of normal for the Lower Yakima and 55% and 76% respectively for the Klickitat and Naches basins. March precipitation was about 49% of normal and 92% for the water-year. April 1 reservoir storage for Bumping and Rimrock reservoirs was 127% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Yakima – Naches River Basin

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Lower Yakima Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Ahtanum Ck at Union Gap	APR-JUL	4.2	13.1	19.1	73%	25	34	26
	APR-SEP	6.1	15.1	21	75%	27	36	28
Yakima R nr Parker ²	APR-JUL	1080	1280	1420	82%	1550	1750	1730
	APR-SEP	1200	1410	1550	82%	1690	1900	1890

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Yakima	3	36%	84%
Simcoe-Toppenish	1	41%	108%
Satus	1	5%	40%
Ahtanum	2	56%	111%

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Naches Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Naches	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Naches R nr Naches ²	APR-JUL	460	560	625	87%	690	785	720
	APR-SEP	500	610	685	88%	755	865	775
Bumping Lake Inflow ²	APR-JUL	78	91	100	88%	108	121	114
	APR-SEP	84	98	108	89%	118	132	122
Rimrock Lake Inflow ²	APR-JUL	135	152	164	85%	175	192	194
	APR-SEP	161	181	194	83%	210	230	235
American R nr Nile	APR-JUL	71	82	90	90%	97	108	100
	APR-SEP	75	88	97	90%	105	118	108

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Bumping Lake	21.8	18.8	14.6	33.7
Rimrock	191.5	147.2	153.5	198.0

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Naches	9	76%	114%
Naches	9	76%	114%

Klickitat Streamflow Forecasts - April 1, 2022

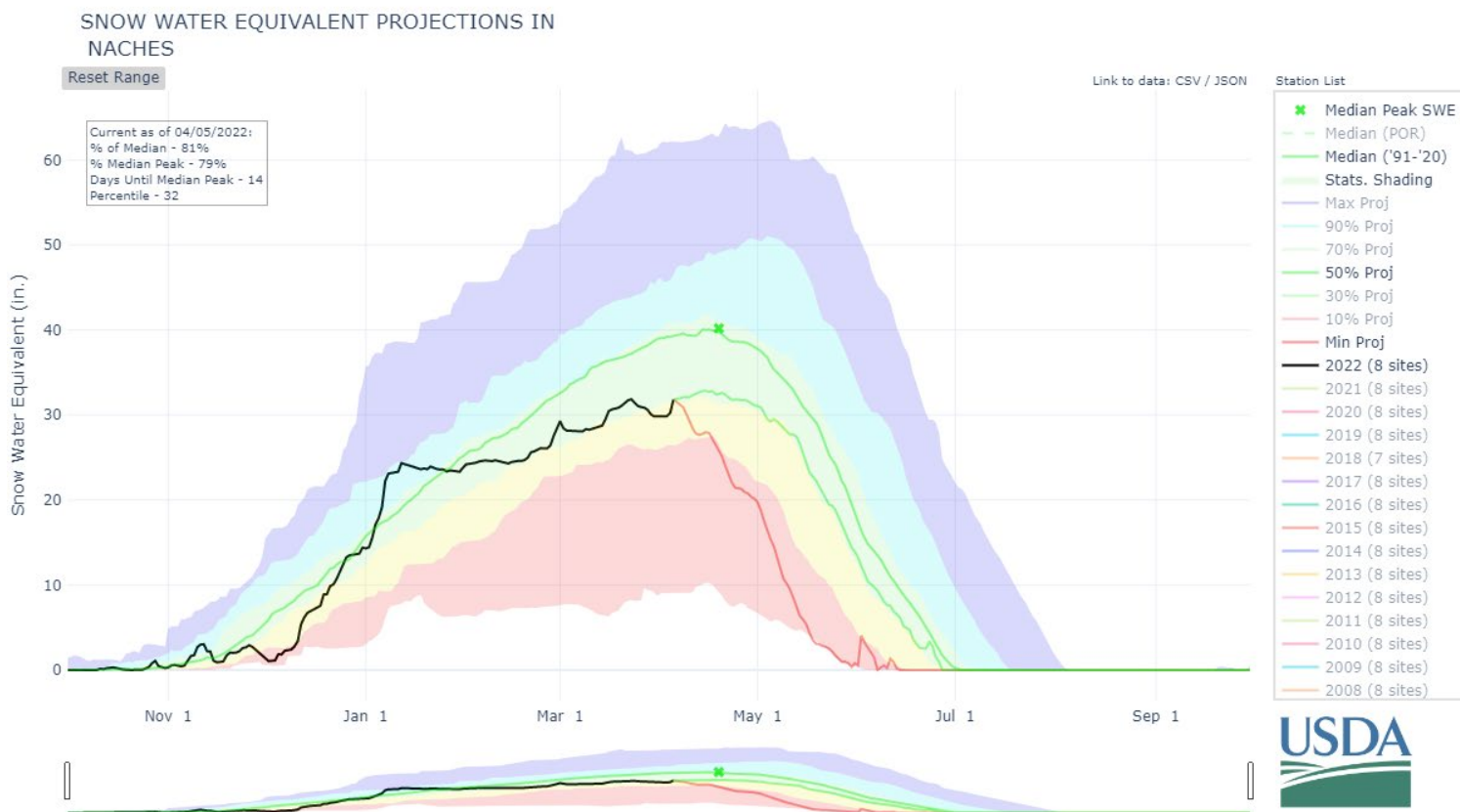
 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Klickitat	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Klickitat R nr Pitt	APR-JUL	265	335	380	84%	425	495	455
	APR-SEP	335	415	465	85%	515	590	545
Klickitat R nr Glenwood	APR-JUL	77	92	103	78%	114	130	132
	APR-SEP	85	102	114	79%	125	142	145

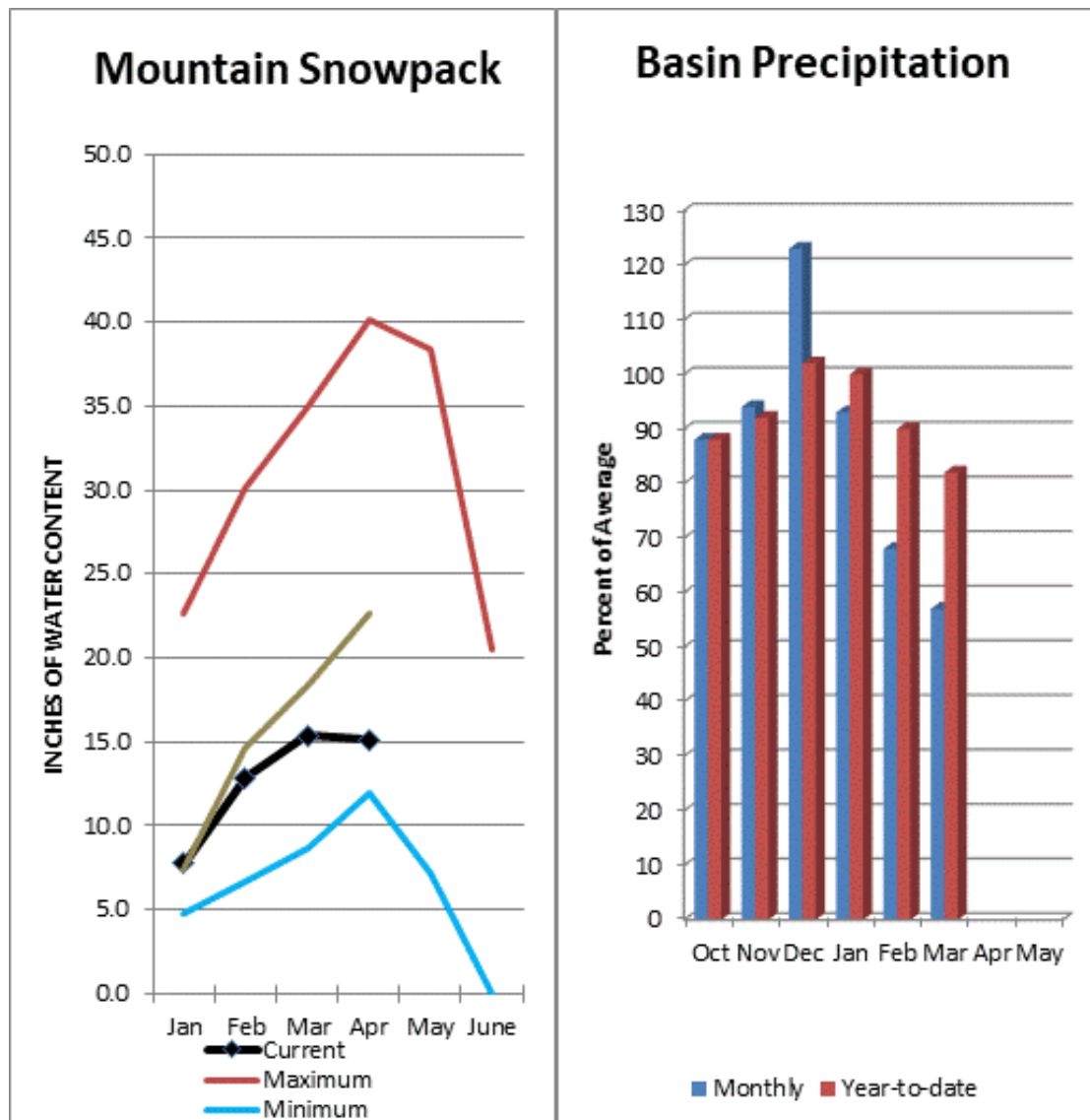
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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022		# of Sites	% Median	Last Year % Median
Klickitat		4	53%	99%
Klickitat		4	53%	99%



Lower Snake – Walla Walla River Basin



April 1 snowpack readings were 67% of normal. March precipitation was 57% of normal, bringing the year-to-date precipitation to 82% of normal. Basin Reservoir storage was 124% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Snake – Walla Walla River Basin

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Lower Snake-Walla Walla Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Snake-Walla Walla	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Mill Ck nr Walla Walla	APR-JUL	12.1	17.5	21	84%	25	30	25
	APR-SEP	15.5	21	25	86%	28	34	29
Asotin Ck at Asotin	APR-JUL	15.3	20	24	73%	28	34	33
SF Walla Walla R nr Milton-Freewater	APR-JUL	37	45	50	88%	55	62	57
	APR-SEP	49	57	62	89%	67	75	70
Snake R bl Lower Granite Dam-NWS ²	APR-JUL	11400		14000	71%		18200	19700
	APR-SEP	13400		16200	74%		20700	21800
Grande Ronde R at Troy	APR-JUL	600	780	895	70%	1020	1190	1270
	APR-SEP	660	840	960	71%	1080	1260	1350

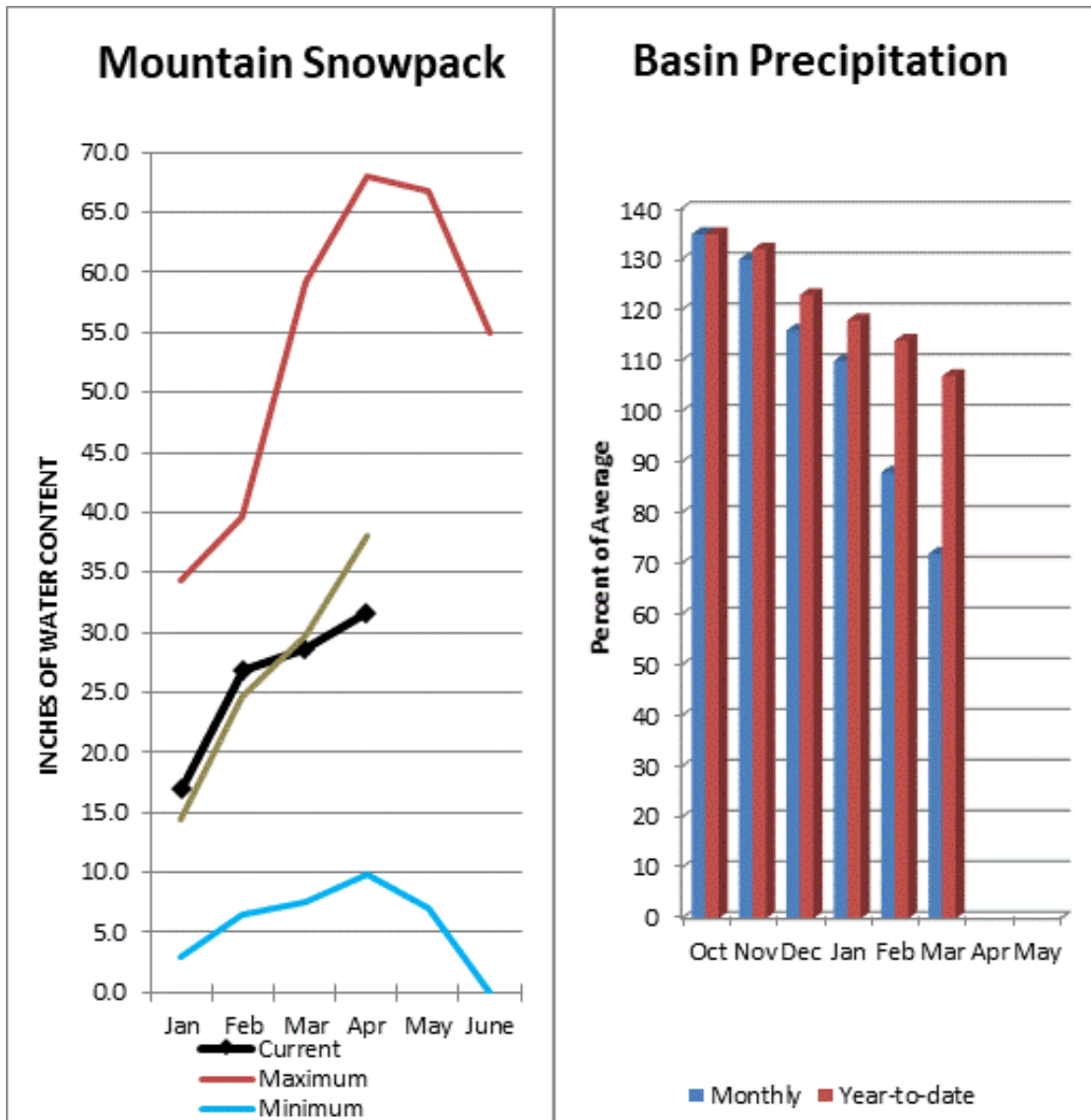
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Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wallowa Lake	22.7	19.0	18.4	37.5

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Snake-Walla Walla	20	67%	118%
Walla Walla	5	74%	132%
Grande Ronde	18	66%	120%
Asotin	2	69%	147%



April 1 snow cover for Lower Columbia was 83% of normal. March precipitation was 72% of normal and the water-year was 107%.

Lower Columbia Streamflow Forecasts - April 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Lower Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Cowlitz R bl Mayfield ²	APR-JUL	1060	1280	1440	90%	1590	1810	1600
	APR-SEP	1230	1470	1630	91%	1790	2030	1790
Lewis R at Ariel	APR-JUL	685	845	950	92%	1060	1210	1030
	APR-SEP	810	975	1090	95%	1200	1360	1150
Cowlitz R at Castle Rock ²	APR-JUL	1350	1730	1990	94%	2250	2630	2120
	APR-SEP	1520	1920	2190	94%	2460	2860	2330

1) 90% And 10% exceedance probabilities are actually 95% And 5%

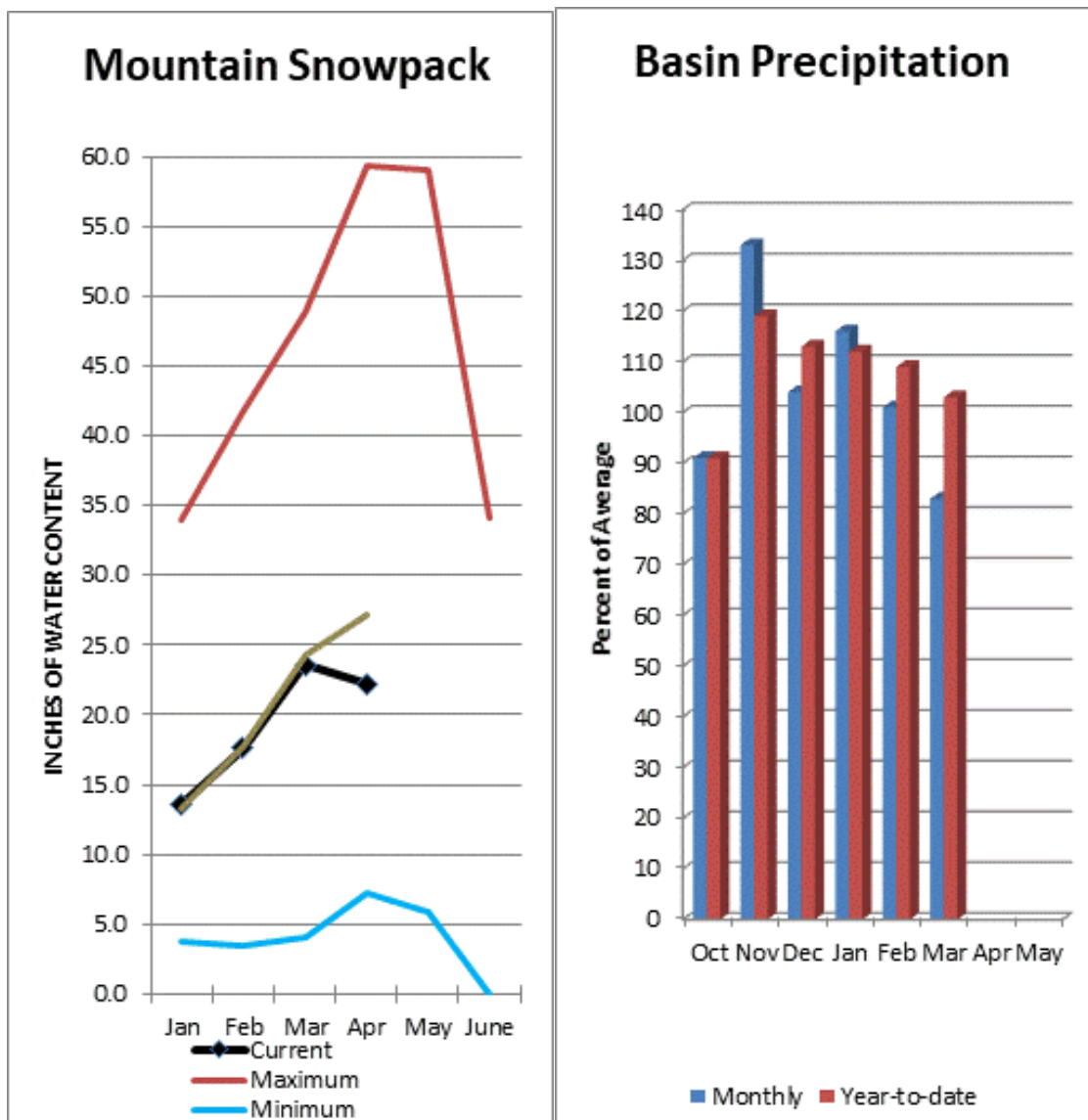
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Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Mayfield		126.1	127.8	0.0
Merwin			396.4	0.0
Yale			365.2	0.0
Mossyrock Dam (Riffe Lk)		588.9	917.0	0.0
Swift			649.9	0.0

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Lower Columbia	15	83%	125%
Lewis	8	82%	129%
Cowlitz	9	82%	126%

South Puget Sound River Basins



April 1 snowpack was 82% of normal for the South Puget Sound. March precipitation was 83% of normal, bringing the water year-to-date to 103% of normal for the basins. Reservoir storage on the Green River was 119% of the median.

For more information contact your local Natural Resources Conservation Service office.

South Puget Sound River Basins

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South Puget Sound Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

South Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
White R nr Buckley ¹¹	APR-JUL	300	370	405	94%	440	510	430
	APR-SEP	385	470	485	93%	545	630	520
Green R bl Howard A Hanson Dam ¹	APR-JUL	145	200	225	96%	250	305	235
	APR-SEP	161	220	245	96%	270	330	255

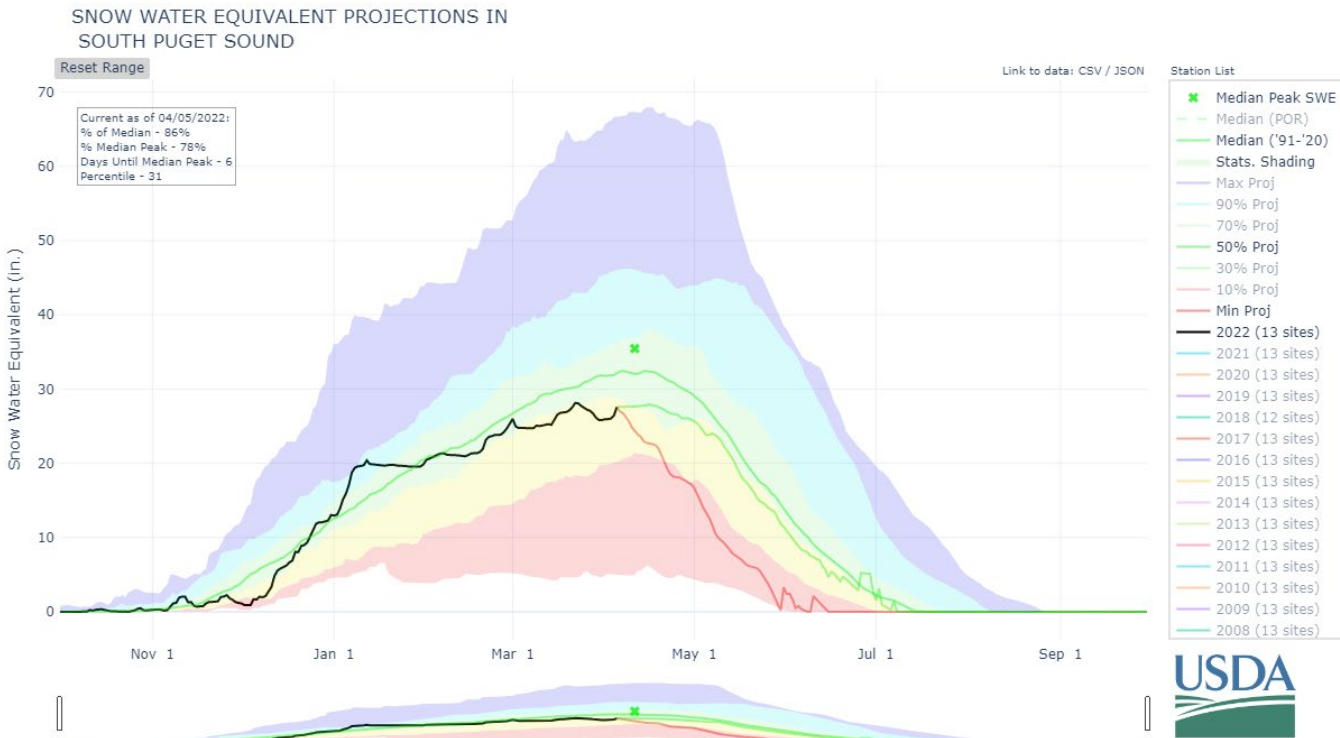
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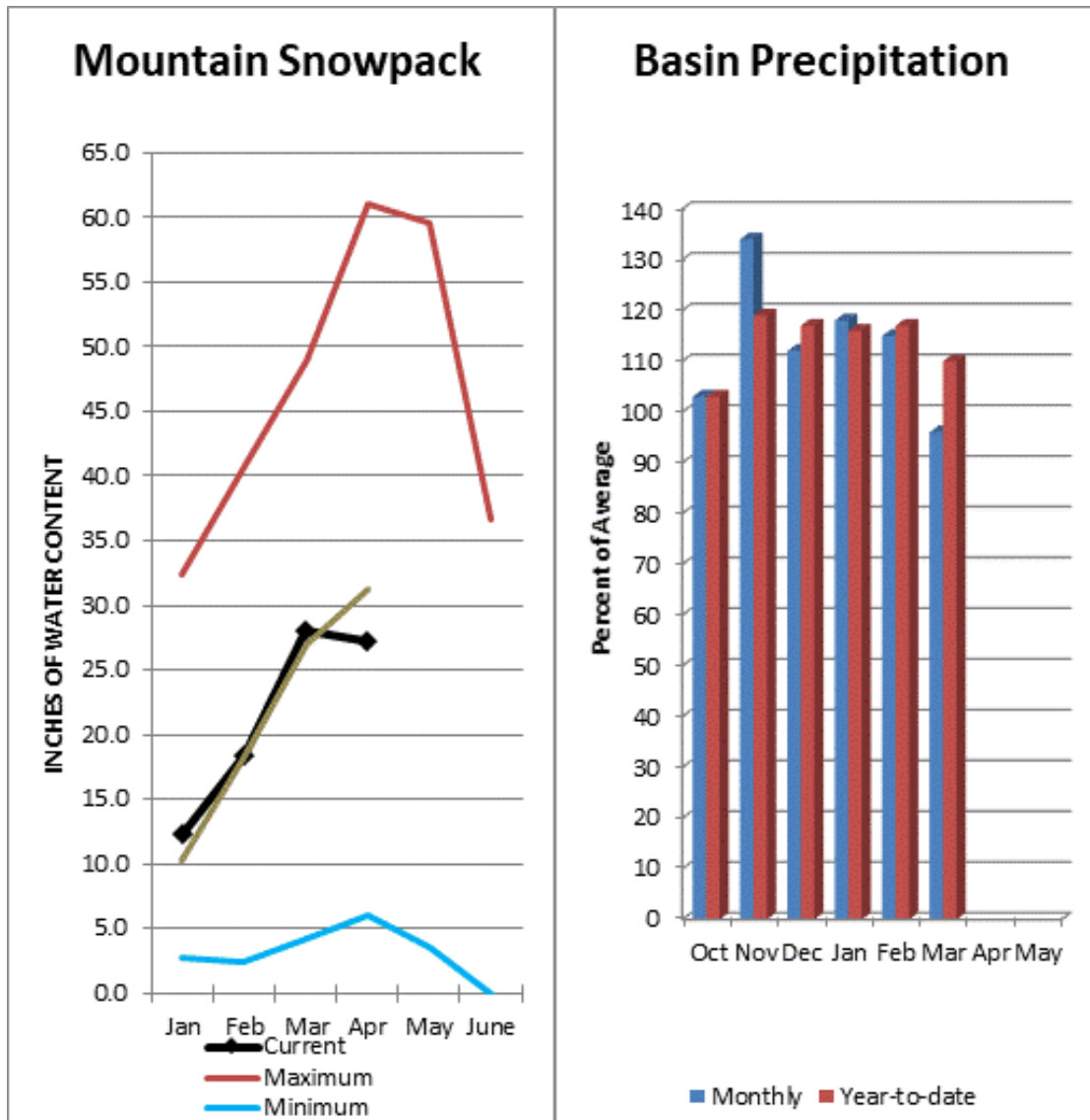
Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Howard Hansen	16.5	18.2	13.9	0.0

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
South Puget Sound	13	82%	127%
White	5	80%	118%
Puyallup	2	95%	139%
Green	6	80%	141%



Central Puget Sound River Basins



April 1 median snow cover in Central Puget Sound was 87%. Basin-wide precipitation for March was 96% of normal, bringing water-year-to-date to 110% of normal.

For more information contact your local Natural Resources Conservation Service office.

Central Puget Sound River Basins

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Central Puget Sound Streamflow Forecasts - April 1, 2022

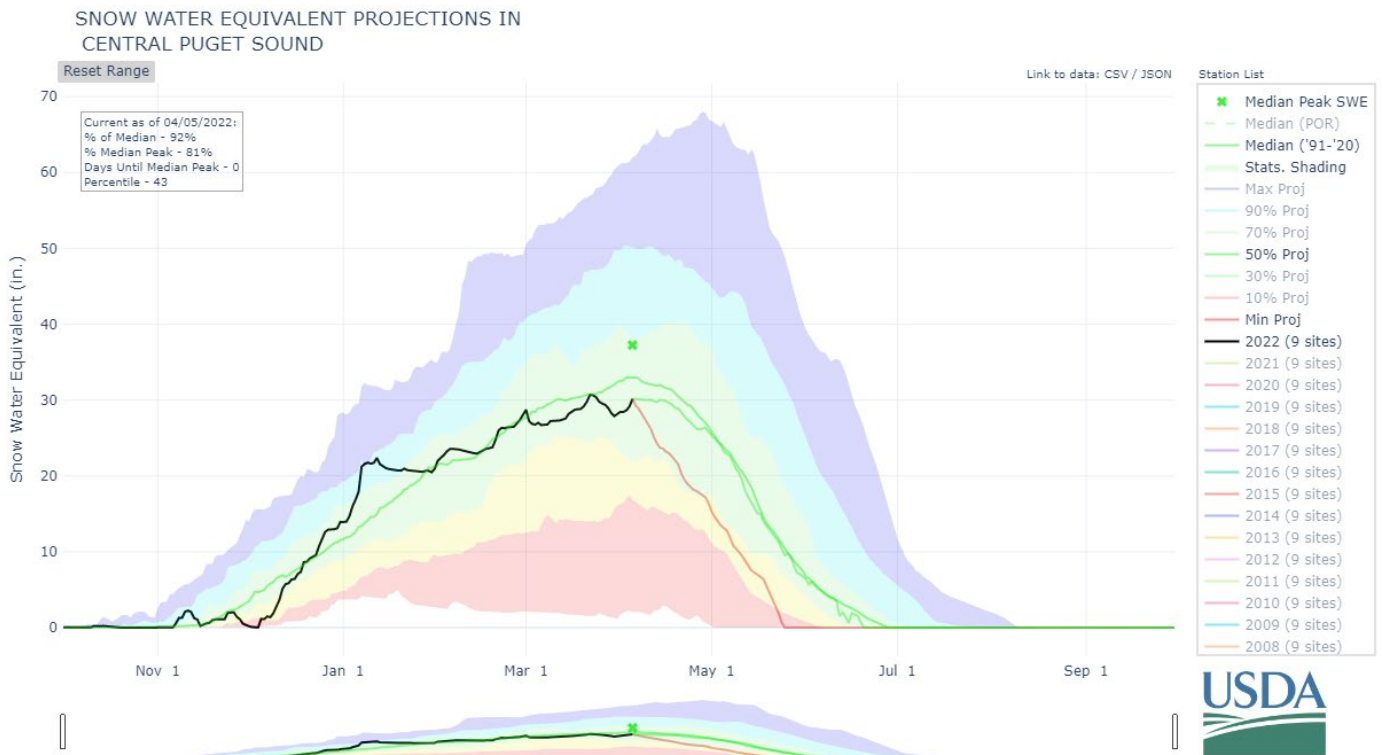
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Central Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Taylor Ck nr Selleck	APR-JUL	16.3	19.1	21	100%	23	26	21
	APR-SEP	18.6	22	24	100%	26	29	24
Rex R nr Cedar Falls	APR-JUL	17	21	24	104%	26	30	23
	APR-SEP	18.1	23	26	100%	29	33	26
Cedar R nr Cedar Falls	APR-JUL	54	65	72	100%	80	91	72
	APR-SEP	58	70	78	101%	86	98	77
SF Tolt R nr Index	APR-JUL	10.1	12.4	14	104%	15.6	17.9	13.4
	APR-SEP	11.4	14.1	16	104%	17.9	21	15.4

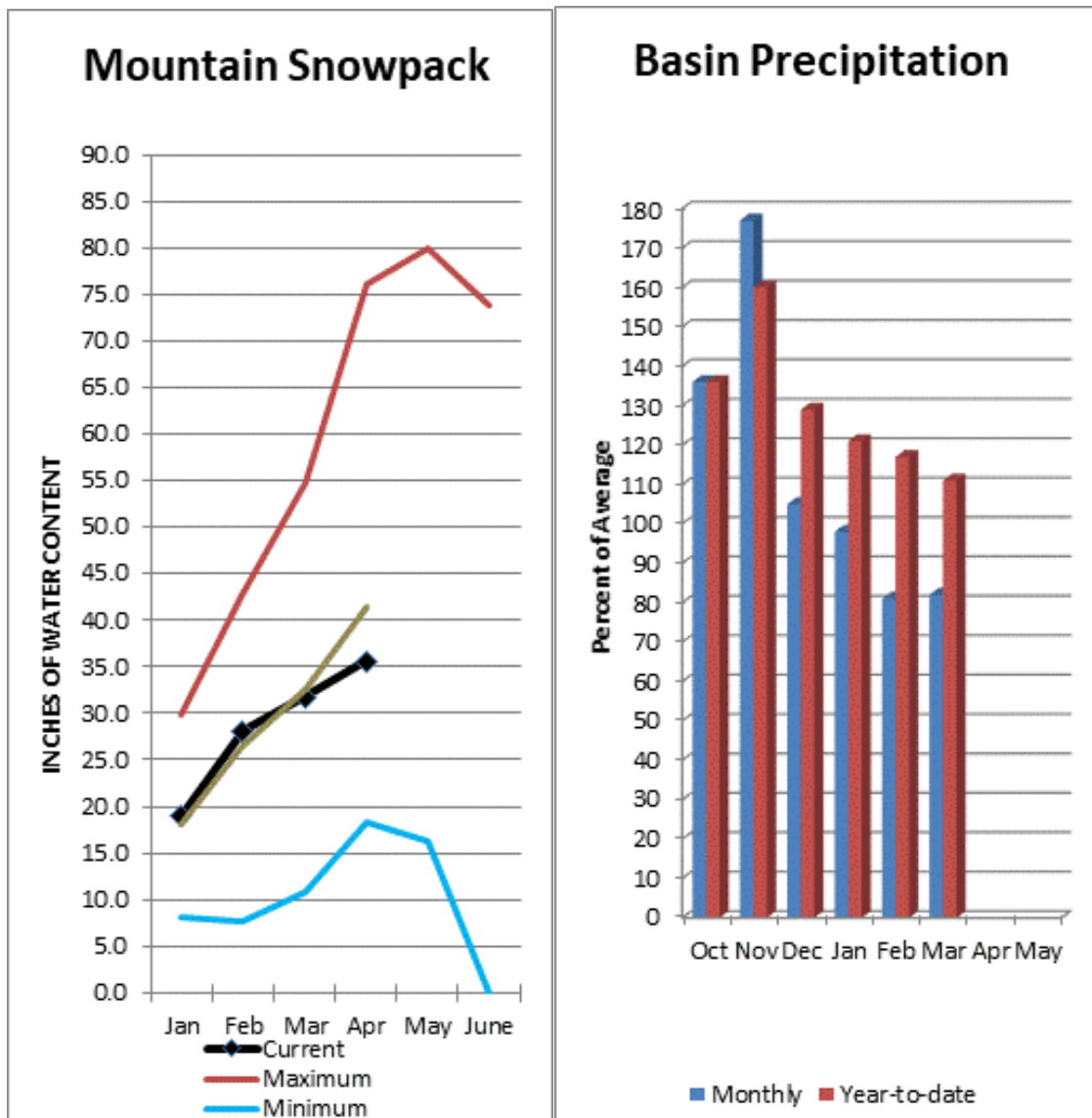
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2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Central Puget Sound	9	87%	143%
Tolt	2	90%	154%
Snoqualmie	4	87%	143%
Skykomish	3	93%	153%
Cedar	6	83%	136%



North Puget Sound River Basins



April 1 median snow cover in North Puget Sound was 87%. Basin-wide precipitation for March was 82% of normal, bringing water-year-to-date to 111% of normal. April 1 Basin-wide reservoir storage was 105% of normal.

For more information contact your local Natural Resources Conservation Service office.

North Puget Sound River Basins

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North Puget Sound Streamflow Forecasts - April 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

North Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Baker R at Concrete	APR-JUL	640	705	750	97%	795	860	770
	APR-SEP	830	905	960	97%	1010	1090	990
Skagit R at Newhalem	APR-JUL	1540	1630	1700	98%	1770	1860	1740
	APR-SEP	1810	1930	2010	100%	2090	2200	2020
Thunder Ck nr Newhalem	APR-JUL	200	220	230	96%	245	265	240
	APR-SEP	285	310	325	98%	340	360	330

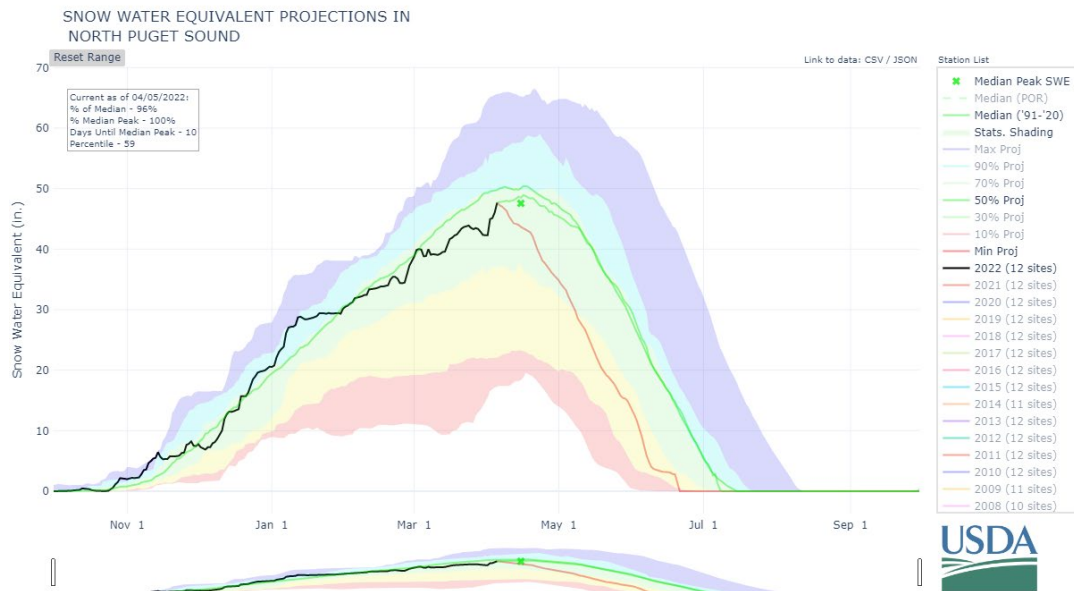
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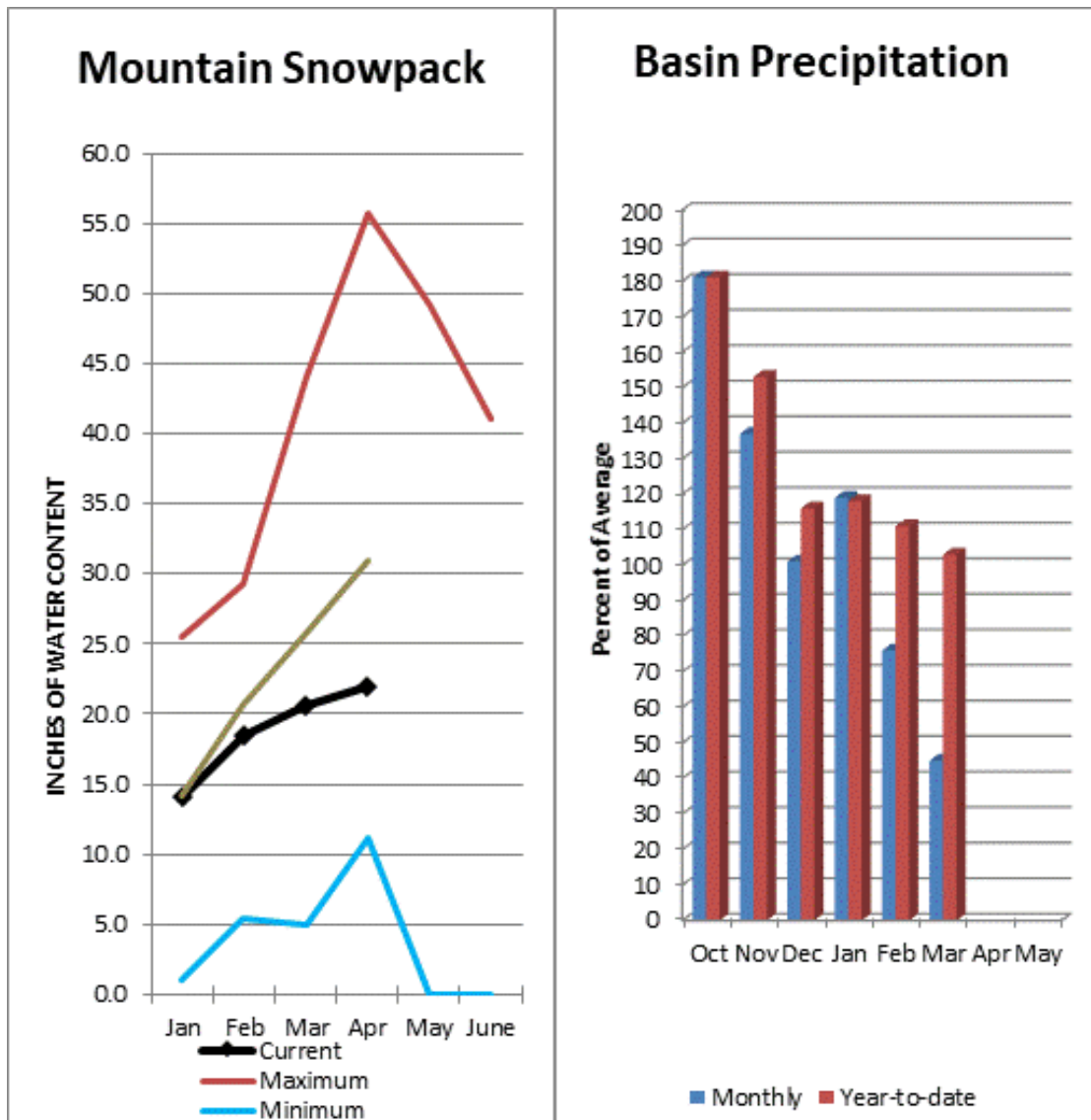
Reservoir Storage End of March, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Upper Baker	104.6	89.1	104.6	0.0
Gorge Reservoir			7.9	0.0
Diablo Reservoir			85.7	90.6
Lake Shannon	92.2	61.7	63.3	0.0
Ross	718.9	559.8	703.5	1434.7

Basin Index
of reservoirs

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
North Puget Sound	19	86%	109%
Skagit	13	90%	108%
Nooksack	3	74%	118%
Baker	2	90%	109%



Olympic Peninsula River Basins



Snowpack averaged 71% of normal on April 1. March precipitation was 45% of normal. Precipitation has accumulated at 103% of normal for the water year. March precipitation at Quillayute was 85% of normal, Sequim was 43% and Forks reported 70%.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

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Olympic Streamflow Forecasts - April 1, 2022

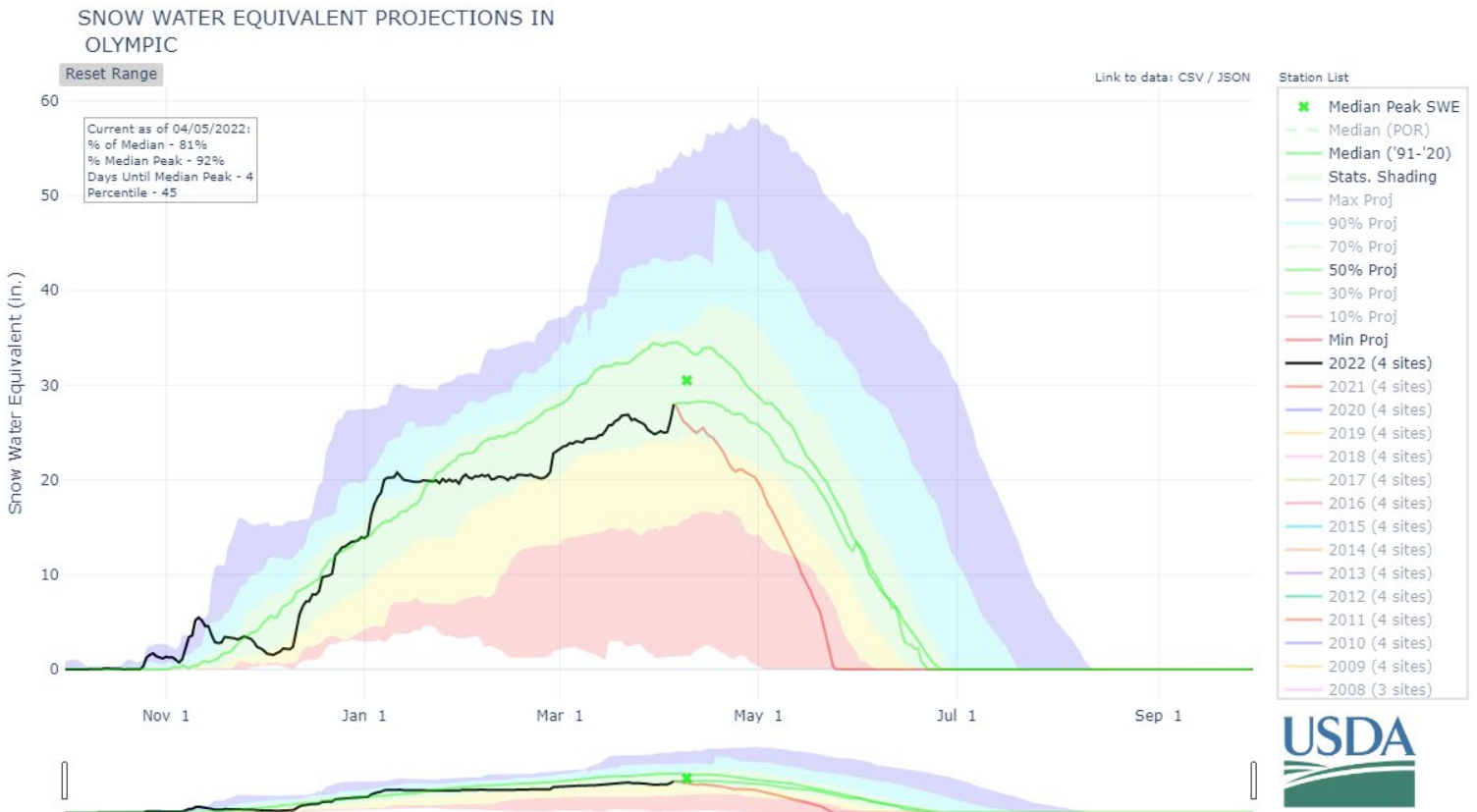
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Olympic	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Elwha R at McDonald Br nr Port Angeles	APR-JUL	260	300	325	88%	350	385	370
	APR-SEP	315	355	380	85%	410	450	445
Dungeness R nr Sequim	APR-JUL	82	92	99	83%	106	116	119
	APR-SEP	94	107	116	83%	125	138	139

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis April 1, 2022	# of Sites	% Median	Last Year % Median
Olympic	7	71%	126%
Olympic	7	71%	126%



Issued by

Terry Cosby
Acting Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Roylene Comes-At-Night
State Conservationist
Natural Resources Conservation Service
Spokane, Washington

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology Washington State Department of Natural Resources Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers U.S. Department of Agriculture, Forest Service U.S. Department of Commerce, NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs U.S. Fish and Wildlife Service
Local	City of Tacoma City of Seattle City of Bellingham Chelan County P.U.D. Pacific Power/PacificCorp Puget Sound Energy Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County Kalispel Tribe of Indians Spokane Indian Tribe Jamestown S’Klallam Tribe Sauk-Suiattle Tribe of Indians Stillaguamish Tribe
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District Kinross Mining

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873



Washington Water Supply Outlook Report

**Natural Resources Conservation Service
Spokane, WA**

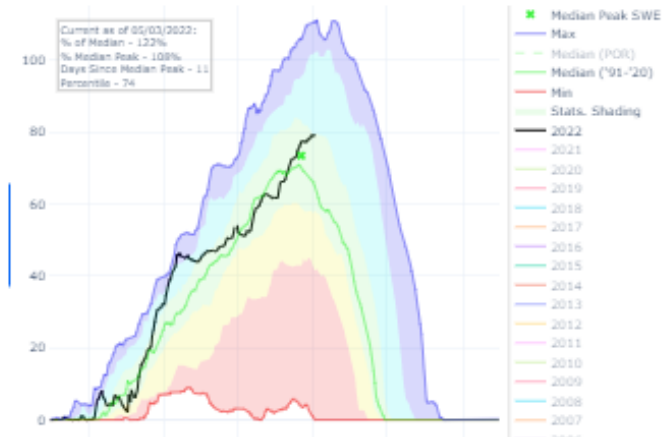


Washington Water Supply Outlook Report May 1, 2022

Swift Creek SNOTEL 4,440 ft.
Snow Water Equivalent Delta
17.4 in.

May 1, 2022 - April 1, 2022, first of day

Current Water Year



- Parameters
- Station Metadata
- Data Reports

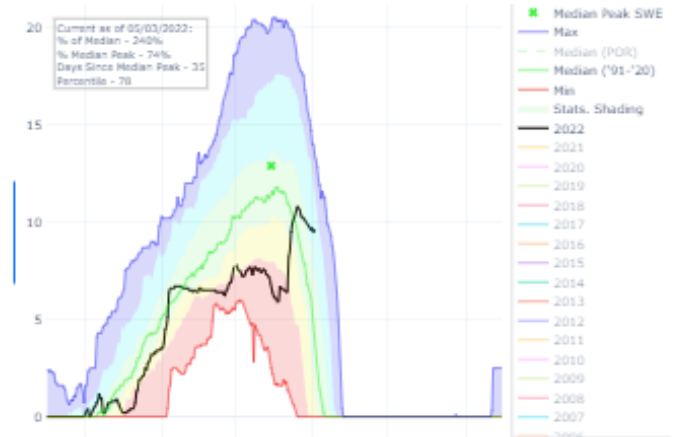
[1991-2020 vs 1981-2010 Normals](#)
[30-year Normals Information](#)



Upper Wheeler SNOTEL 4,330 ft.
Snow Water Equivalent Delta
3.6 in.

May 1, 2022 - April 1, 2022, first of day

Current Water Year



- Parameters
- Station Metadata
- Data Reports

[1991-2020 vs 1981-2010 Normals](#)
[30-year Normals Information](#)



April brought record snow fall to most all parts of the state. The largest accumulated SWE increase was 17.4 inches at Swift Creek SNOTEL, 3 inches shy of the 2011 record. The most dramatic comeback was at Upper Wheeler SNOTEL which was sitting at only 52% of normal on April 1, peaked by April 19, held at 183% of normal by May 1. April 2011 held the previous statewide record for monthly accumulation, however April 2022 broke that record, if only by a slight margin.

Water Supply Outlook Reports and Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk, they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Washington Water Supply Outlook

May 2022

General Outlook

So much for the doom and gloom as reported last month. This Awesome April brought most of the winters missing snow in just one short month. Measured in feet not inches snowpack piled up in record fashion nudging out April 2011 for the king of come backs. Going back to 2009 there have only been 2 significant years where April saved the day. Typical April snowfall is light and often followed by warm weather that simply evaporates it to the atmosphere, not adding to the overall snowpack and subsequent runoff. Below normal temperatures slowed stream runoff to below and much below normal levels.

The most recent forecast through mid-month indicates below normal temperatures with near normal precipitation. Climate Prediction Center 3-month (May-Jun-Jul) forecast of near to below normal temperatures with below normal chances of seasonal precipitation. The US Drought Monitor indicates the continuation of D1-D3 drought designation carried over from last year in eastern Washington. (See maps on page 4)

Snowpack

The May 1 statewide SNOTEL readings increased to 114% of normal. As the state begins to drift into the heart of melt season some basins will react differently to end of season snowfall. Westside medians from SNOTEL included the North Puget Sound River basin with 108% of normal, the Central and South Puget River basins with 132% and 111% respectively, and the Lower Columbia basins with 114% of normal. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 101% and the Wenatchee area with 118%. Snowpack in the Spokane River Basin was at 114% and the Upper Columbia River basins had 107% of the long-term median.

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	114	86
Newman Lake	119	45
Lower Pend Oreille	102	66
Kettle	104	83
Omak	95	74
Methow	128	119
Conconully Lake	400	0
Central Columbia	118	104
Upper Yakima	115	121
Naches	102	96
Ahtanum Creek	107	60
Walla Walla	118	87
Lower Snake	105	83
Cowlitz	110	108
Lewis	123	119
White	104	103
Green	123	140
Puyallup	166	127
Cedar	141	154
Skykomish	123	150
Skagit	118	106
Nooksack	102	116
Olympic Peninsula	113	120

Precipitation

May precipitation accumulation was near normal throughout the state. Statewide water-year average was 109% of average as of May 1. Monthly precipitation ranged from a high of 376% of normal in the Colockum Drainage to a low of 74% in the north-east corner of the state. Some individual site reporting's for the month include Pope Ridge 207% of normal, Dungeness 292%, Lost Horse 230%, Hozomeen Camp 156%. SNOTEL collects all form of precipitation including, rain, snow, sleet and hail.

RIVER BASIN	APRIL PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	101	98
Lower Pend Oreille	84	96
Upper Columbia	118	104
Central Columbia	205	109
Upper Yakima	191	105
Naches	161	104
Lower Yakima	219	95
Klickitat	206	102
Walla Walla	137	93
Lower Snake	137	90
Lower Columbia	147	111
South Puget Sound	129	104
Central Puget Sound	116	109
North Puget Sound	139	113
Olympic Peninsula	188	109

Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. May 1 Reservoir storage in the Yakima Basin was 115% of average for the Upper Reaches and 102% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 170,100-acre feet, 81% of normal and 71% of capacity; and Ross Lake within the Skagit River Basin at 94% of normal and 47% of capacity. Recent climate impacts and management procedures may affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	71	81
Lower Pend Oreille	56	92
Upper Columbia	42	49
Central Columbia	39	91
Upper Yakima	88	115
Naches	83	102
Lower Snake	68	90
North Puget Sound	62	94
South Puget Sound		106

For more information contact your local Natural Resources Conservation Service office.

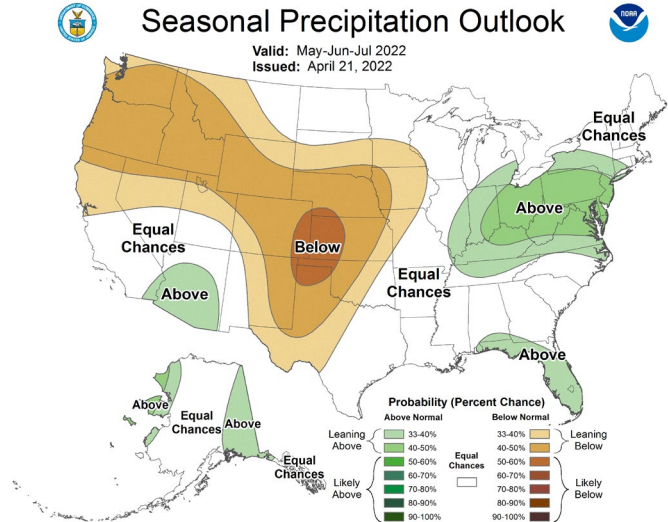
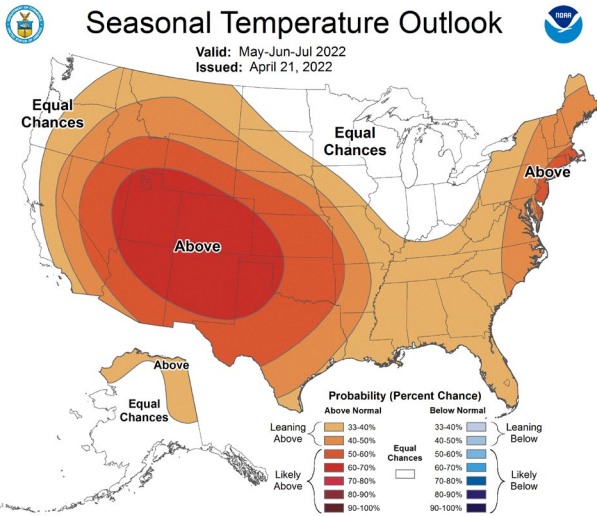
Streamflow

Early winter forecasts for May-September stream flows are never quite as robust as they are later in the season when we know more about the winter climatology. At times only a few degrees warmer or cooler than forecasted can make or break stream flow predictions. Volumetric forecasts are developed using current, historic and median snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Caution should be used when using early season forecasts for critical water resource management decisions since governing conditions are likely to change for the better or the worse.

BASIN	PERCENT OF AVERAGE FORECAST (50% CHANCE OF EXCEEDENCE)
Spokane	85-109
Lower Pend Oreille	97-106
Upper Columbia	89-112
Central Columbia	91-109
Upper Yakima	99-104
Lower Yakima	93-95
Naches	91-103
Klickitat	89-94
Lower Snake-Walla Walla	83-100
Lower Columbia	102-109
South Puget Sound	108-112
Central Puget Sound	113-125
North Puget Sound	105-109
Olympic Peninsula	89-90

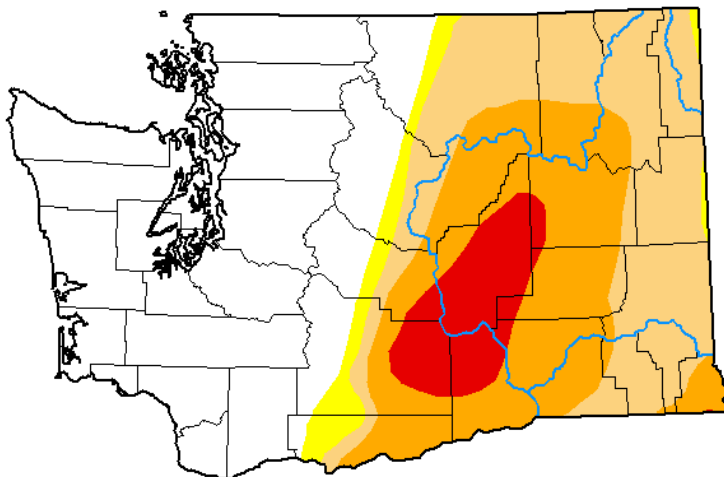
STREAM	PERCENT OF AVERAGE APRIL STREAMFLOWS
Priest River - near Priest River	59
Kettle at Laurier	56
Columbia at Birchbank	58
Spokane at Spokane	67
Similkameen at Nighthawk	101
Okanogan near Tonasket	83
Methow at Pateros	67
Chelan at Chelan	64
Stehekin near Stehekin	64
Wenatchee at Pashastin	74
Cle Elum near Roslyn	60
Yakima near Parker	72
Naches near Naches	75
Grande Ronde at Troy	51
Snake below Lower Granite Dam	54
Columbia River at The Dalles	59
Lewis at Merwin Dam	101
Cowlitz below Mayfield Dam	88
Skagit at Concrete	81
Dungeness near Sequim	86

Climate



U.S. Drought Monitor Washington

April 26, 2022
(Released Thursday, Apr. 28, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	45.80	54.20	50.65	27.37	6.90	0.00
Last Week 04-19-2022	45.80	54.20	50.65	27.37	6.90	0.00
3 Months Ago 01-25-2022	44.01	55.99	51.55	26.04	5.90	0.00
Start of Calendar Year 01-04-2022	42.67	57.33	54.26	26.58	6.13	0.00
Start of Water Year 09-28-2021	0.00	100.00	73.09	54.72	46.85	28.98
One Year Ago 04-27-2021	18.55	81.45	38.95	13.20	0.00	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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U.S. Department of Agriculture



droughtmonitor.unl.edu



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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/wa/snow/>

Oregon:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/>

Idaho:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/id/snow/>

National Water and Climate Center (NWCC):

<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

USDA-NRCS Agency Homepages

Washington:

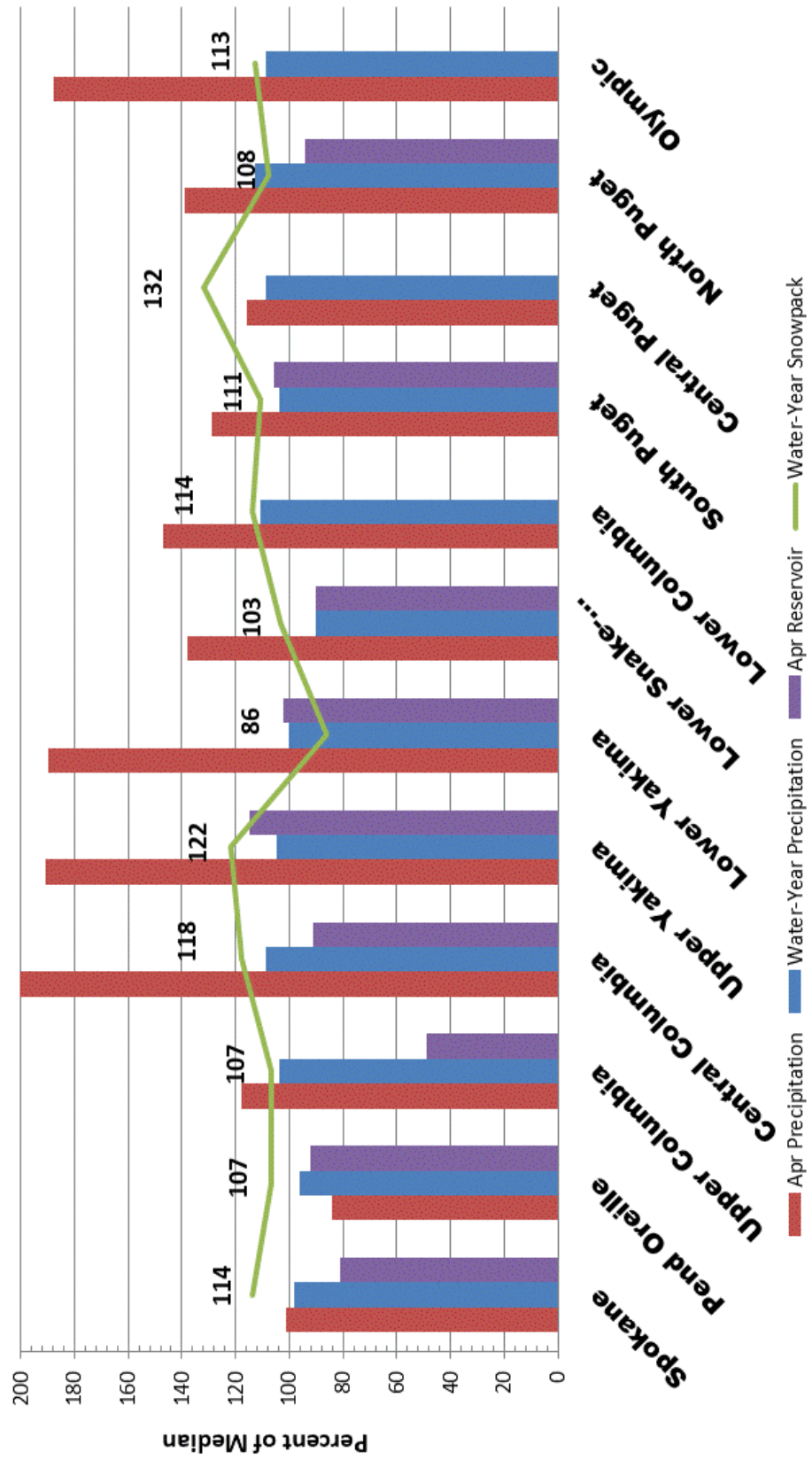
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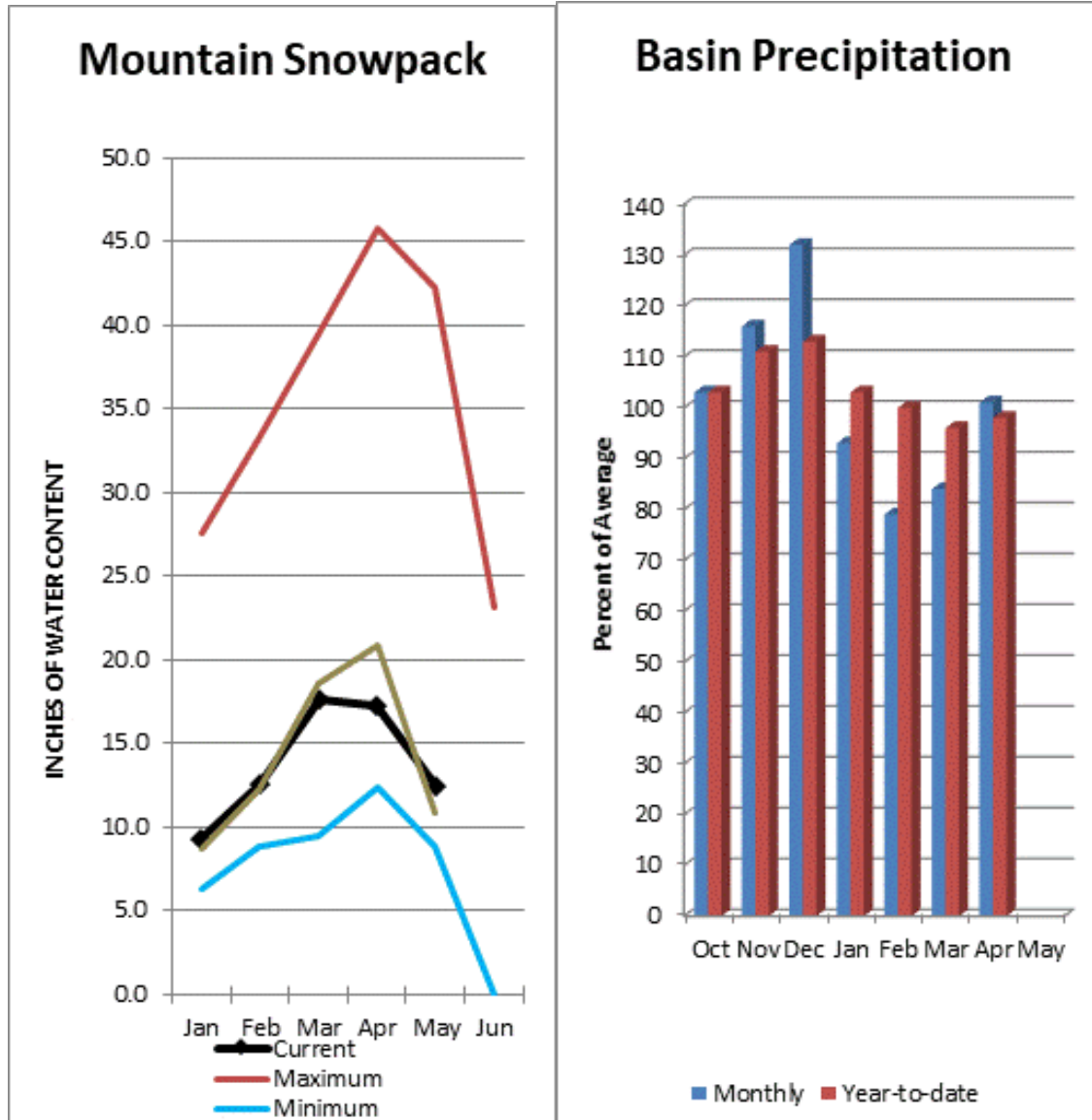
NRCS National:

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>

May 1, 2022 - Snowpack, Precipitation and Reservoir Conditions at a Glance

(Water Year = October 1 - Current Date)





Basin snowpack is 114% of normal and precipitation is 98% of normal for the water year. Precipitation for April was 101% of normal. Reservoir storage is currently at 81% of normal.

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Spokane Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

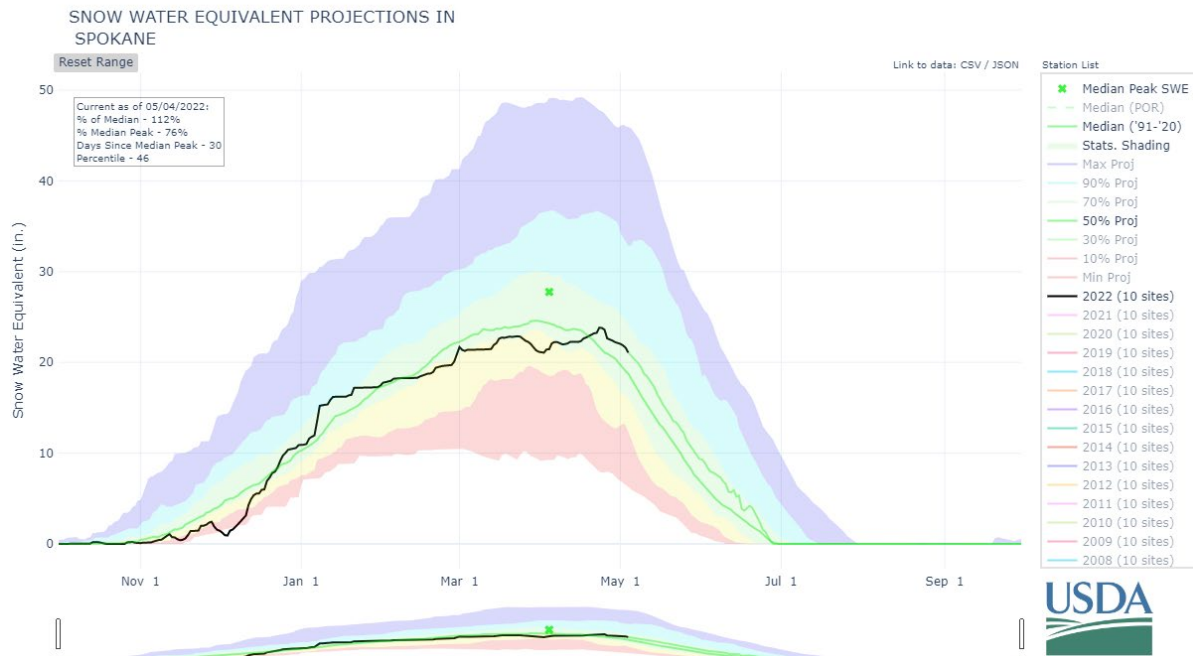
Spokane	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Spokane R at Long Lake ²	MAY-JUL	1430	1720	1920	109%	2120	2420	1760
	MAY-SEP	1610	1920	2130	108%	2340	2640	1970
Spokane R nr Post Falls ²	MAY-JUL	1210	1510	1710	110%	1920	2220	1560
	MAY-SEP	1270	1590	1800	110%	2010	2320	1640
NF Coeur d'Alene R at Enaville	MAY-JUL	325	410	465	122%	525	610	380
	MAY-SEP	355	445	505	122%	560	650	415
Chamokane Ck nr Long Lake	MAY-JUL	4.1	5.7	7	97%	8.3	10.5	7.2
	MAY-SEP	4.1	5.7	7	97%	8.3	10.5	7.2
St. Joe R at Calder	MAY-JUL	595	745	845	114%	945	1100	740
	MAY-SEP	650	805	910	112%	1020	1170	815

1) 90% And 10% exceedance probabilities are actually 95% And 5%

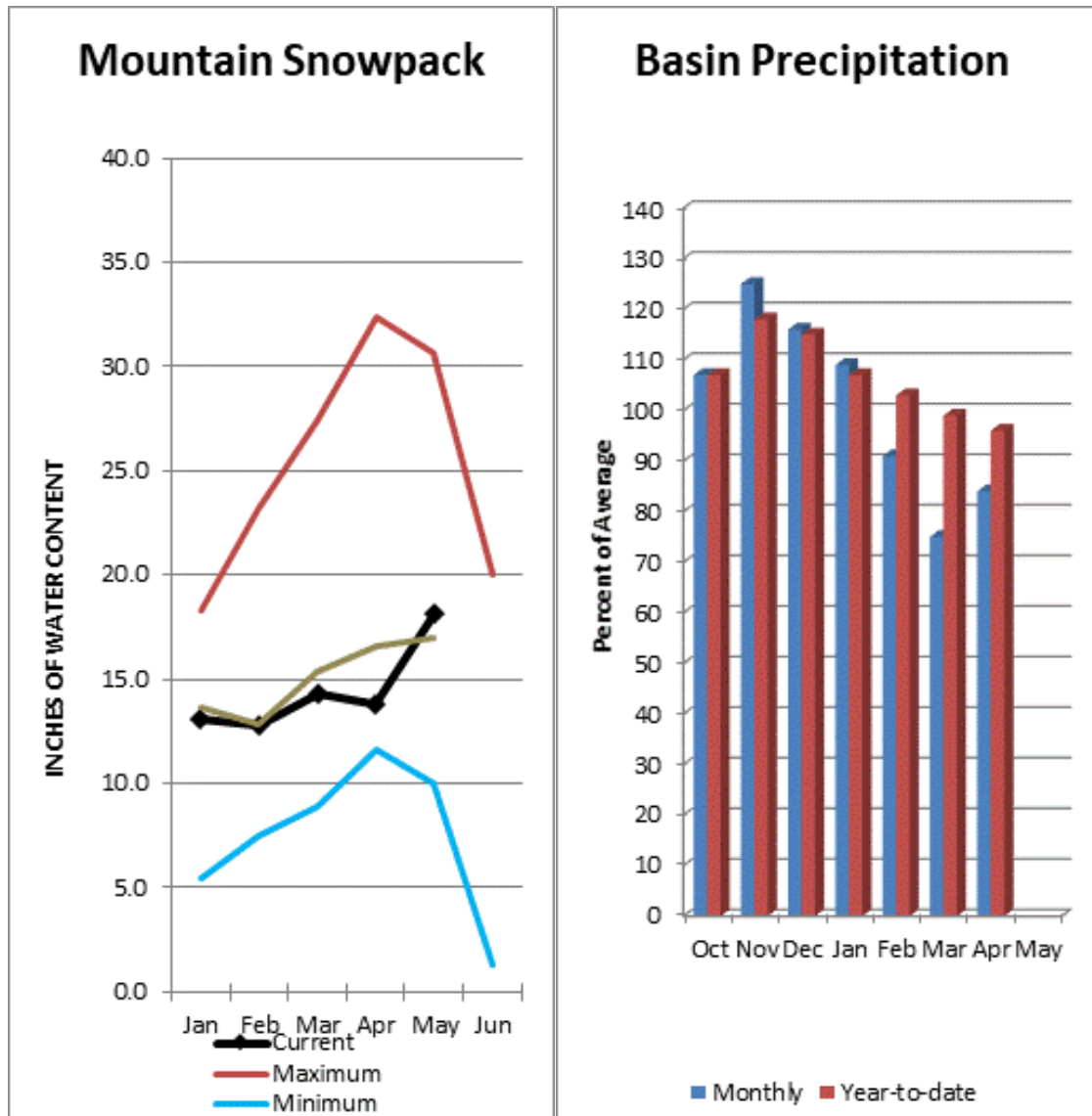
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Coeur d' Alene	170.1	154.3	210.3	238.5

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Spokane	13	114%	86%
Newman Lake	2	119%	45%



Lower Pend Oreille River Basins



May 1 snow cover was 102% of normal in the Pend Oreille Basin River Basin and precipitation during April was 84% of normal, bringing the year-to-date precipitation at 96% of normal. Reservoir storage in the basin, including Lake Pend Oreille and Priest Lake was 92% of normal.

For more information contact your local Natural Resources Conservation Service office.

Lower Pend Oreille River Basins

Data Current As of: 5/5/2022 11:49:08 AM

Lower Pend Oreille Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

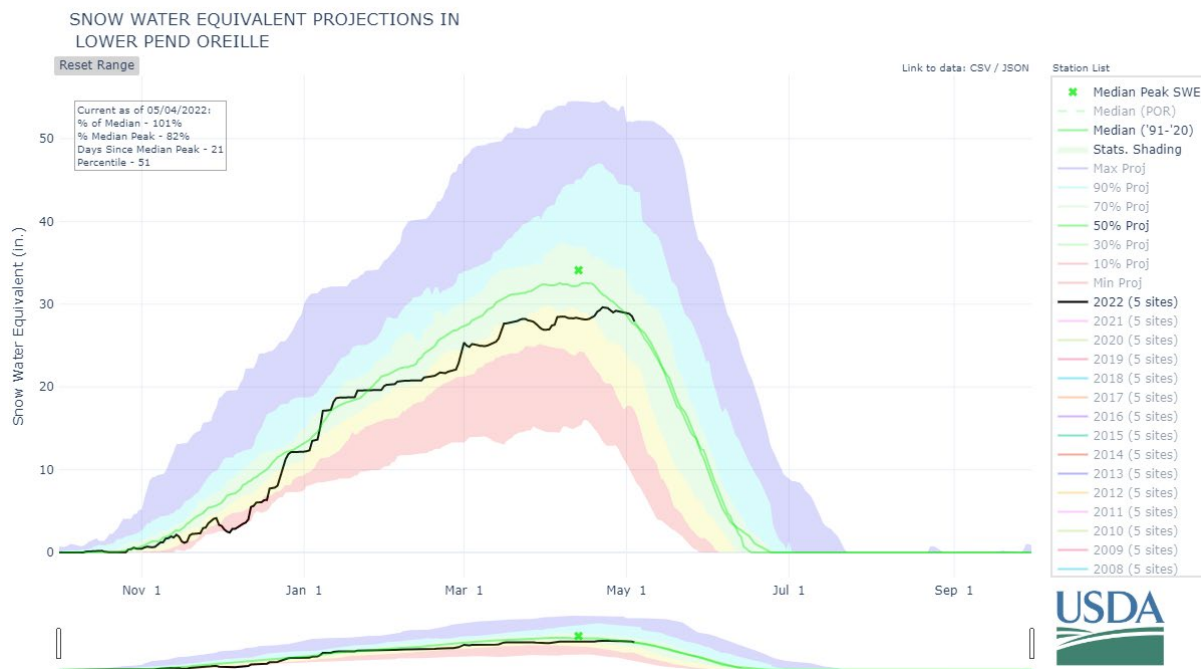
Lower Pend Oreille	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Pend Oreille Lake Inflow ²	MAY-JUL	9110	10100	10700	111%	11400	12300	9640
	MAY-SEP	9810	10900	11700	110%	12500	13600	10600
Pend Oreille R bl Box Canyon ²	MAY-JUL	9210	10200	10800	113%	11500	12500	9600
	MAY-SEP	9940	11100	11900	110%	12600	13800	10800
Priest R nr Priest River ²	MAY-JUL	455	535	590	93%	645	725	635
	MAY-SEP	485	575	635	95%	695	780	670

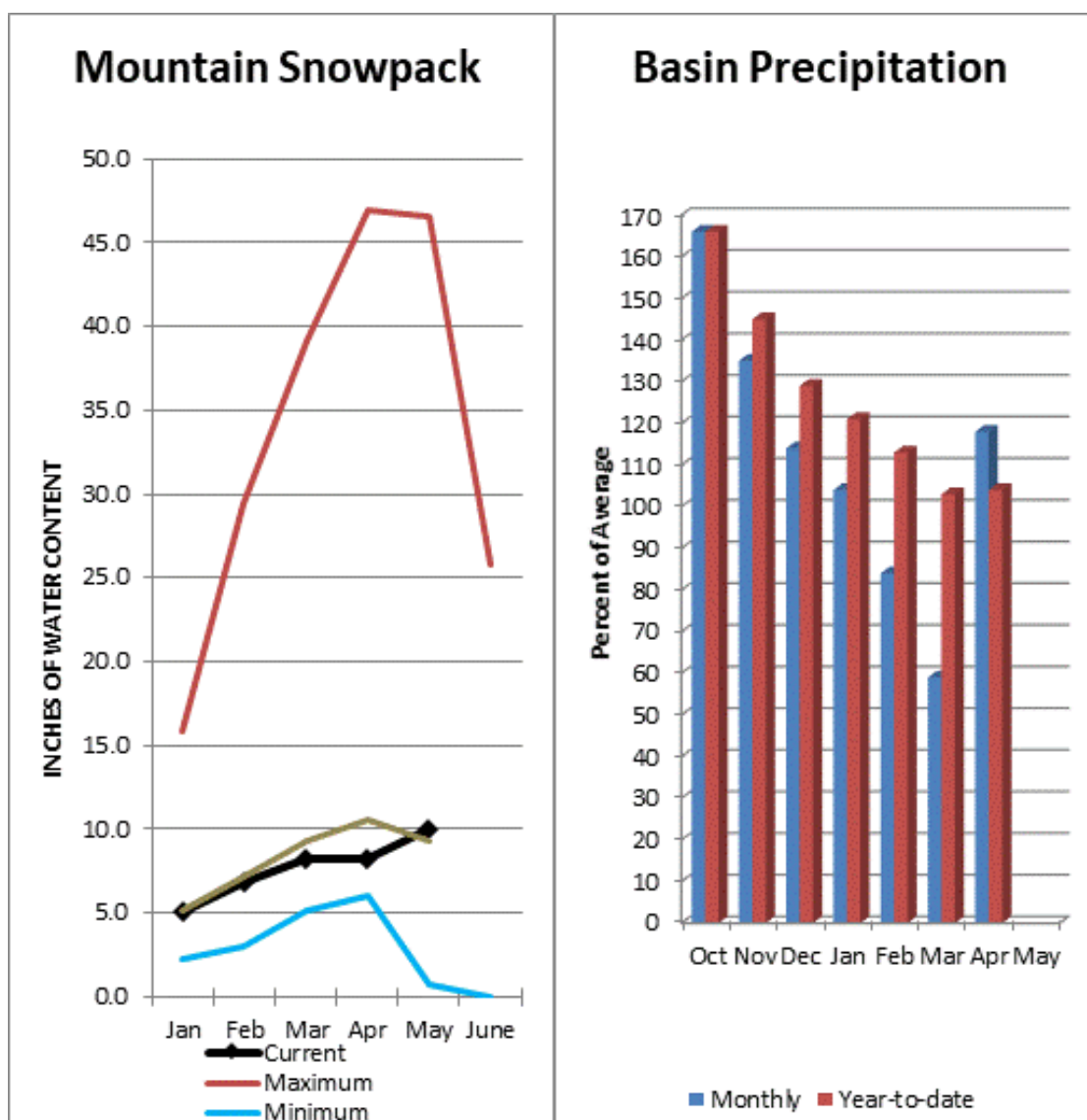
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Priest Lake	71.0	80.8	99.2	119.3
Lake Pend Oreille	866.3	884.2	925.0	1561.3

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Lower Pend Oreille	9	107%	65%
Sullivan	1	91%	68%





May 1 snow cover on the Upper Columbia basins was 107% of normal and April precipitation was 118% of normal, with precipitation for the water year at 104% of normal. Combined storage in the Conconully Reservoirs was 49% of normal.

Upper Columbia Streamflow Forecasts - May 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Upper Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Similkameen R nr Nighthawk	MAY-JUL	1130	1260	1350	122%	1430	1560	1110
	MAY-SEP	1210	1350	1440	121%	1530	1670	1190
Methow R nr Pateros	MAY-JUL	635	735	800	103%	870	965	775
	MAY-SEP	690	795	865	104%	935	1040	830
Okanogan R nr Tonasket	MAY-JUL	1180	1390	1530	116%	1670	1870	1320
	MAY-SEP	1310	1540	1700	117%	1860	2100	1450
Kettle R nr Laurier	MAY-JUL	1140	1340	1480	102%	1620	1830	1450
	MAY-SEP	1180	1400	1550	103%	1700	1920	1510
Colville R at Kettle Falls	MAY-JUL	28	51	67	96%	82	105	70
	MAY-SEP	34	60	78	99%	96	122	79
Columbia R at Grand Coulee-NWS ²	MAY-JUL	41200		46400	105%		53900	44400
	MAY-SEP	49700		56900	109%		66700	52200
Okanogan R at Malott	MAY-JUL	1220	1430	1570	119%	1710	1910	1320
	MAY-SEP	1340	1580	1740	119%	1900	2130	1460

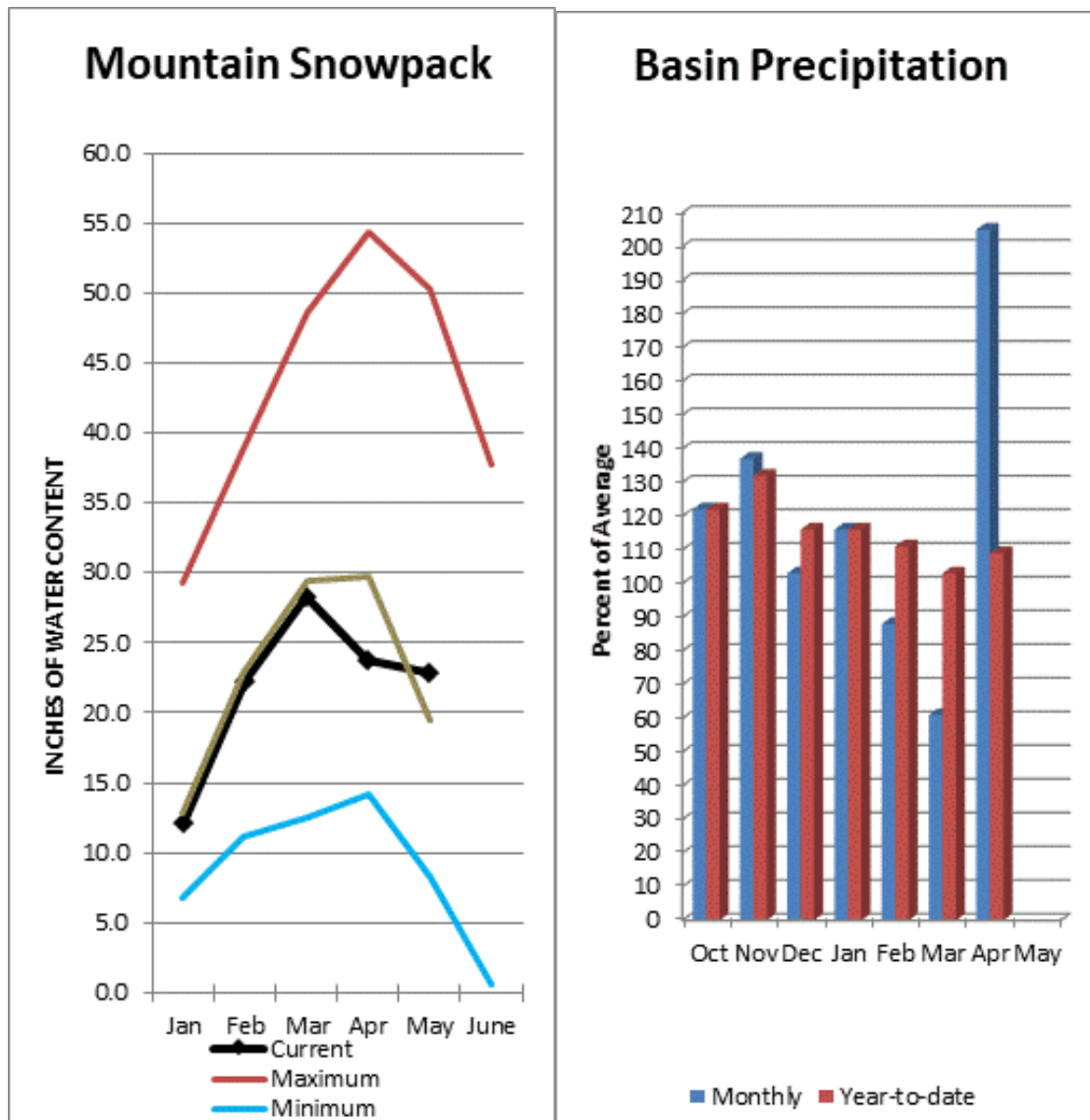
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Conconully Lake (Salmon Lake Dam)	3.8	5.7	9.0	10.5
Conconully Reservoir	6.0	7.2	10.8	13.0

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Upper Columbia	34	106%	96%
Toats Coulee	0		
Sanpoil	1	95%	74%
Omak	1	95%	74%
Methow	4	128%	119%
Kettle	10	104%	83%
Concully Lake	1	400%	0%
Colville	0		

Central Columbia River Basins



May 1 snowpack in the Central Columbia River basins was 118% of normal. Precipitation during April was 205% of normal in the basin and 109% for the year-to-date. Reservoir storage in Lake Chelan was 91% of the median.

For more information contact your local Natural Resources Conservation Service office.

Central Columbia River Basins

Data Current As of: 5/5/2022 11:49:12 AM

Central Columbia Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment Chance that actual volume will exceed forecast

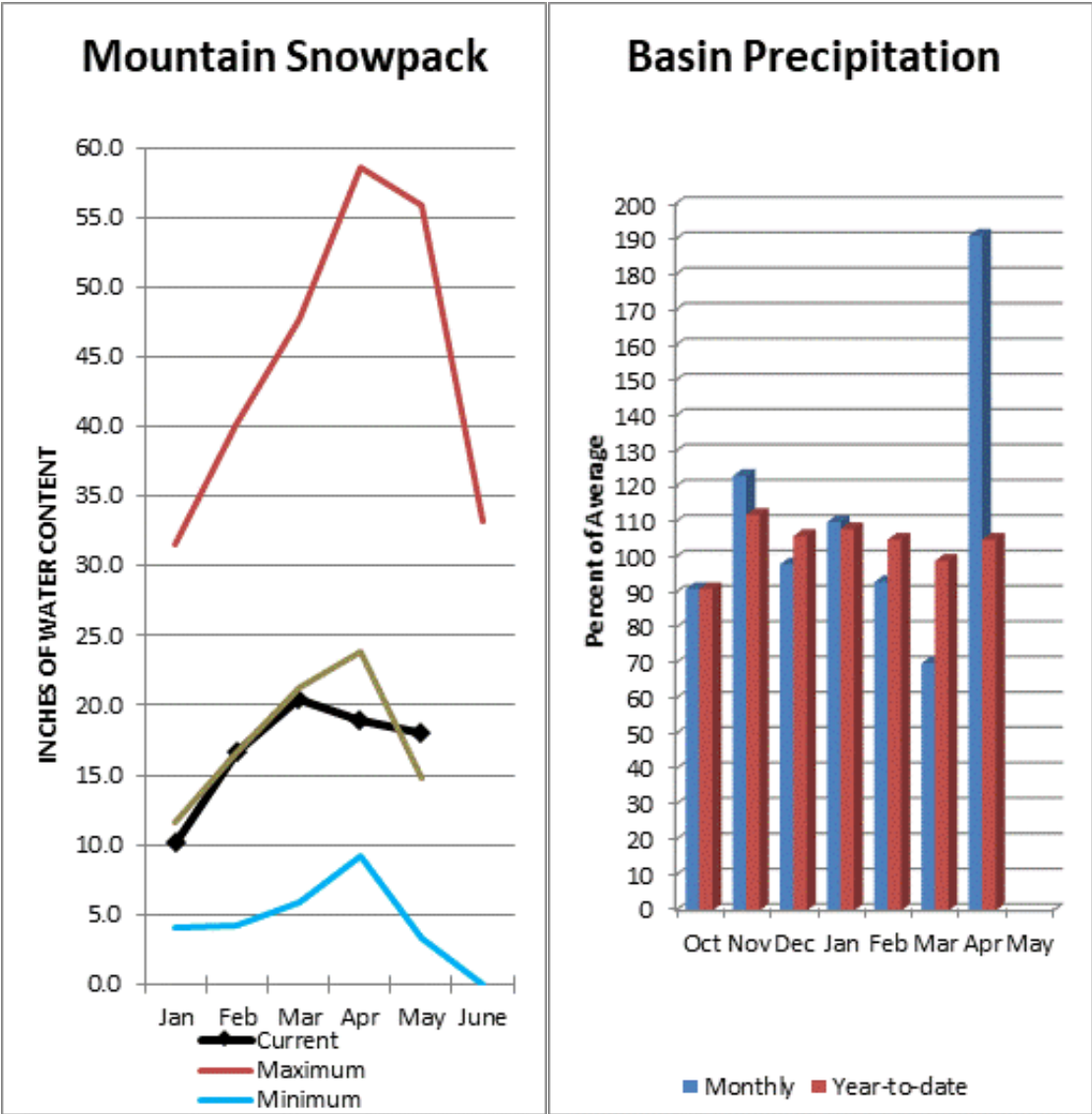
Central Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Wenatchee R at Plain	MAY-JUL	780	860	910	103%	960	1040	880
	MAY-SEP	870	955	1010	103%	1070	1150	980
Chelan R at Chelan ²	MAY-JUL	755	835	885	99%	940	1020	890
	MAY-SEP	860	945	1000	97%	1060	1140	1030
Stehekin R at Stehekin	MAY-JUL	525	575	615	100%	650	705	615
	MAY-SEP	630	685	720	99%	755	810	730
Icicle Ck nr Leavenworth	MAY-JUL	205	230	250	102%	270	295	245
	MAY-SEP	220	255	275	104%	295	325	265
Wenatchee R at Peshastin	MAY-JUL	1070	1160	1220	103%	1290	1380	1180
	MAY-SEP	1180	1280	1350	103%	1420	1530	1310
Entiat R nr Ardenvoir	MAY-JUL	143	165	180	98%	195	215	183
	MAY-SEP	157	181	198	99%	215	240	200
Columbia R bl Rock Island Dam-NWS ²	MAY-JUL	44900		50800	104%		58200	48700
	MAY-SEP	53800		61800	108%		71600	57300

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Lake Chelan	264.3	306.2	291.7	677.4

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Central Columbia	11	118%	104%
Wenatchee	7	120%	105%
Stemilt	1	183%	11%
Lake Chelan	3	103%	104%
Entiat	1	89%	0%
Colckum	1	220%	34%



May 1 snowpack was 115% of normal. Precipitation was 191% of normal for April and 105% for the water-year. May 1 reservoir storage for the Upper Yakima reservoirs was 115% of normal.

Upper Yakima Streamflow Forecasts - May 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

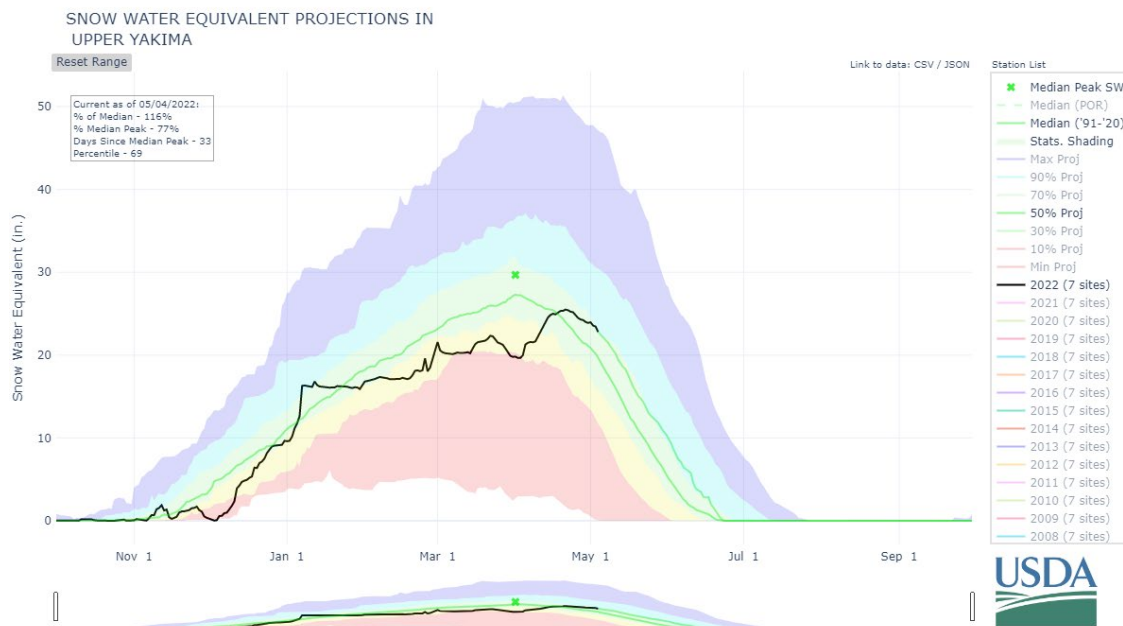
Upper Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Kachess Reservoir Inflow ²	MAY-JUL	70	77	82	114%	87	94	72
	MAY-SEP	79	86	92	115%	97	105	80
Teanaway R bl Forks nr Cle Elum	MAY-JUL	66	80	89	116%	98	111	77
	MAY-SEP	69	82	92	114%	101	115	81
Keechelus Reservoir Inflow ²	MAY-JUL	76	87	95	113%	102	114	84
	MAY-SEP	85	98	106	109%	115	127	97
Cle Elum Lake Inflow ²	MAY-JUL	295	315	330	106%	340	360	310
	MAY-SEP	325	345	365	107%	380	400	340

1) 90% And 10% exceedance probabilities are actually 95% And 5%

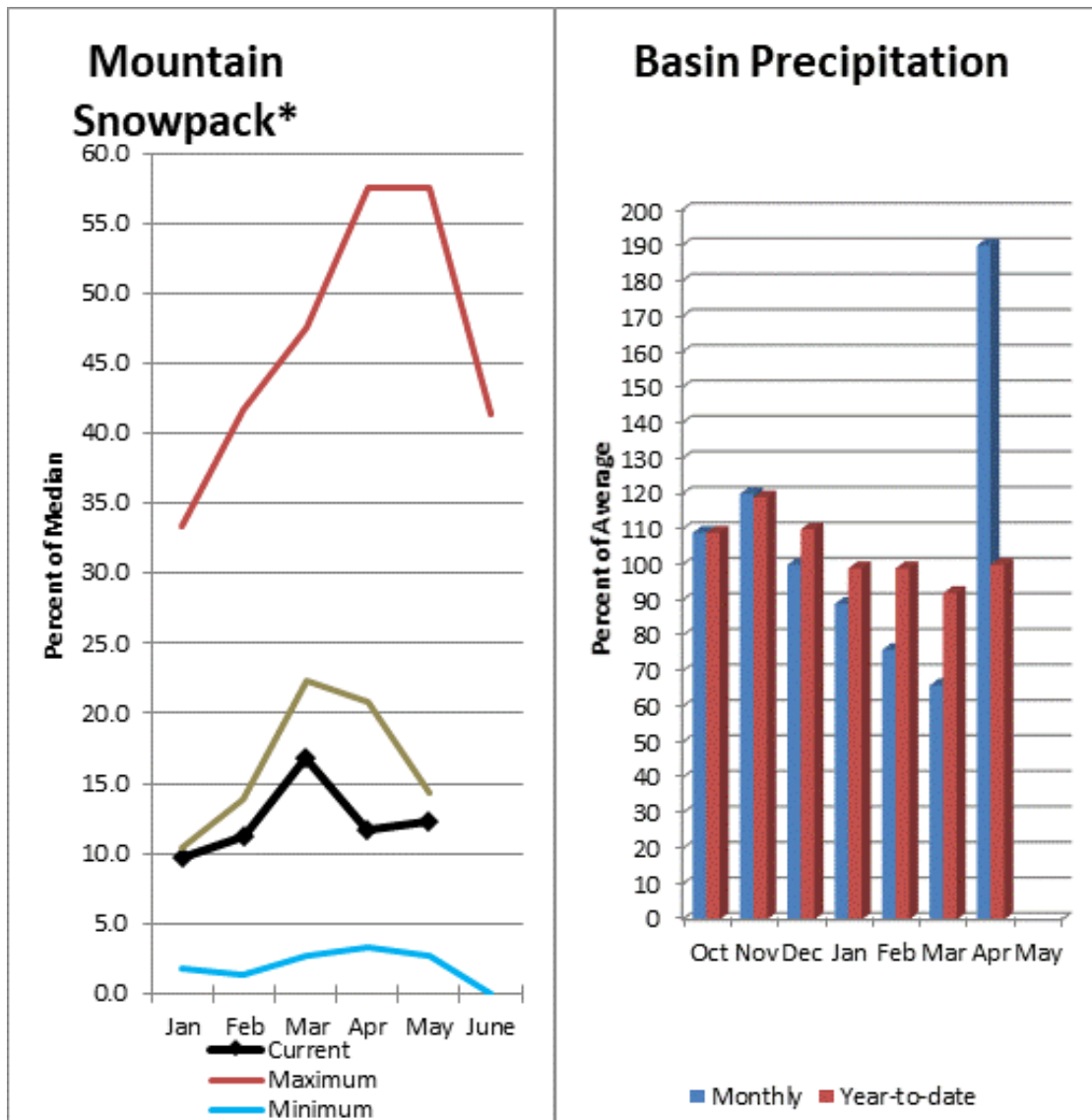
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Cle Elum	371.2	275.3	321.4	436.9
Keechelus	140.7	111.7	123.7	157.8
Kachess	222.8	196.1	194.0	239.0

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Upper Yakima	9	122%	122%
Upper Yakima	9	122%	122%



Lower Yakima - Naches River Basin



May 1 basin snowpack was 86% of normal for the Lower Yakima and 102% and 106% respectively for the Klickitat and Naches basins. April precipitation was about 190% of normal and 100% for the water-year. May 1 reservoir storage for Bumping and Rimrock reservoirs was 102% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Yakima – Naches River Basin

Data Current As of: 5/5/2022 11:49:14 AM

Lower Yakima Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Lower Yakima	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Yakima R nr Parker ²	MAY-JUL	1170	1270	1340	109%	1410	1510	1230
	MAY-SEP	1330	1430	1500	107%	1580	1680	1400
Ahtanum Ck at Union Gap	MAY-JUL	12.1	17.6	21	121%	25	31	17.3
	MAY-SEP	14.1	19.9	24	120%	28	33	20

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis May 1, 2022

	# of Sites	% Median	Last Year % Median
Lower Yakima	3	86%	43%
Simcoe-Toppenish	1	120%	1%
Satus	1	37%	0%
Ahtanum	2	107%	60%

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Naches Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Naches	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
American R nr Nile	MAY-JUL	75	84	90	115%	95	104	78
	MAY-SEP	81	92	98	115%	105	115	85
Rimrock Lake Inflow ²	MAY-JUL	141	151	158	106%	165	175	149
	MAY-SEP	172	185	194	103%	205	215	188
Naches R nr Naches ²	MAY-JUL	480	550	595	117%	640	705	510
	MAY-SEP	530	610	665	116%	715	795	575
Bumping Lake Inflow ²	MAY-JUL	87	94	100	108%	105	113	93
	MAY-SEP	96	104	110	108%	116	124	102

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022

	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Rimrock	173.0	153.5	166.0	198.0
Bumping Lake	18.8	21.8	22.0	33.7

Watershed Snowpack Analysis May 1, 2022

	# of Sites	% Median	Last Year % Median
Naches	9	102%	96%
Naches	9	102%	96%

Klickitat Streamflow Forecasts - May 1, 2022

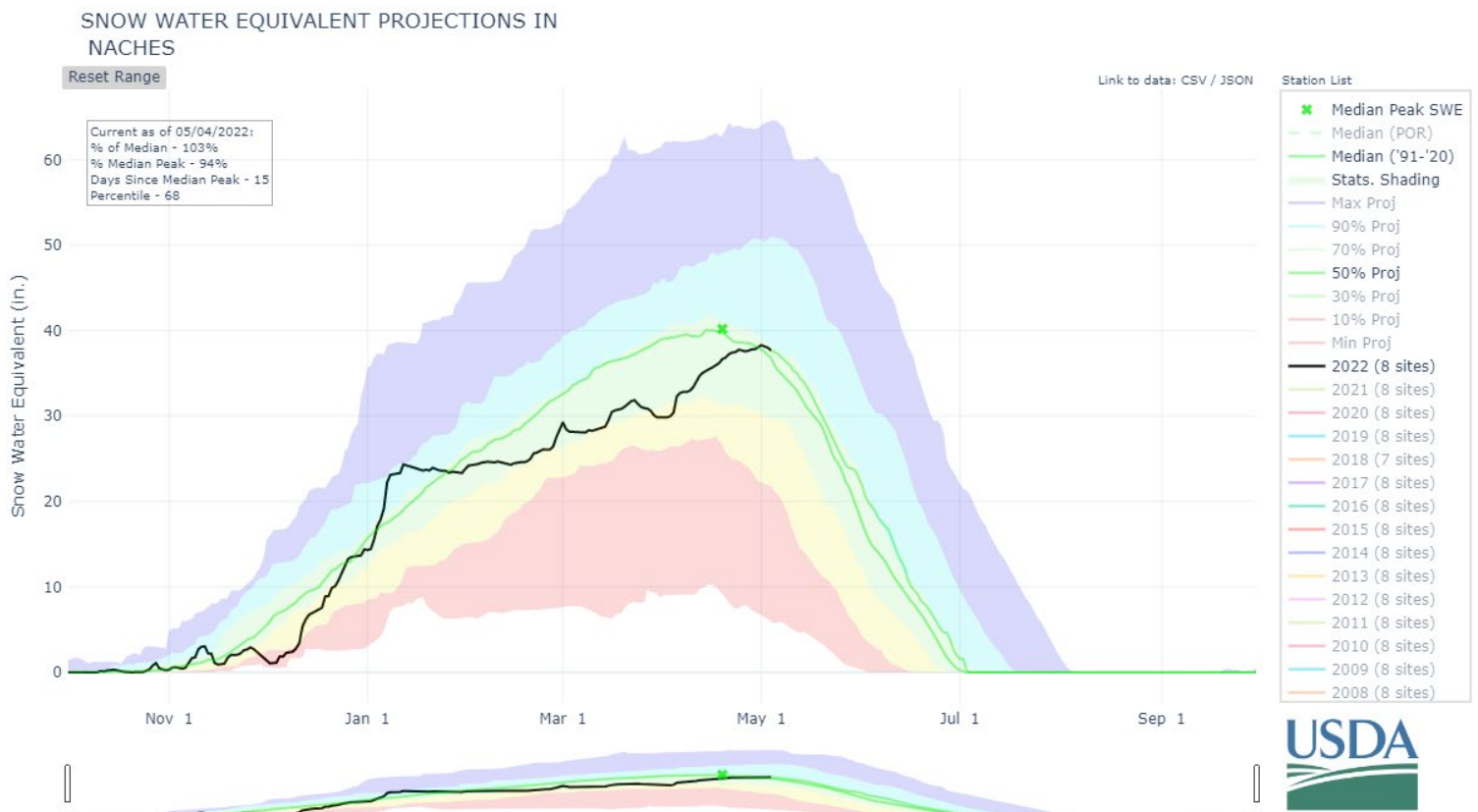
 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Klickitat	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Klickitat R nr Glenwood	MAY-JUL	78	91	100	110%	109	123	91
	MAY-SEP	90	104	113	109%	123	137	104
Klickitat R nr Pitt	MAY-JUL	265	305	330	108%	355	395	305
	MAY-SEP	350	395	425	106%	455	500	400

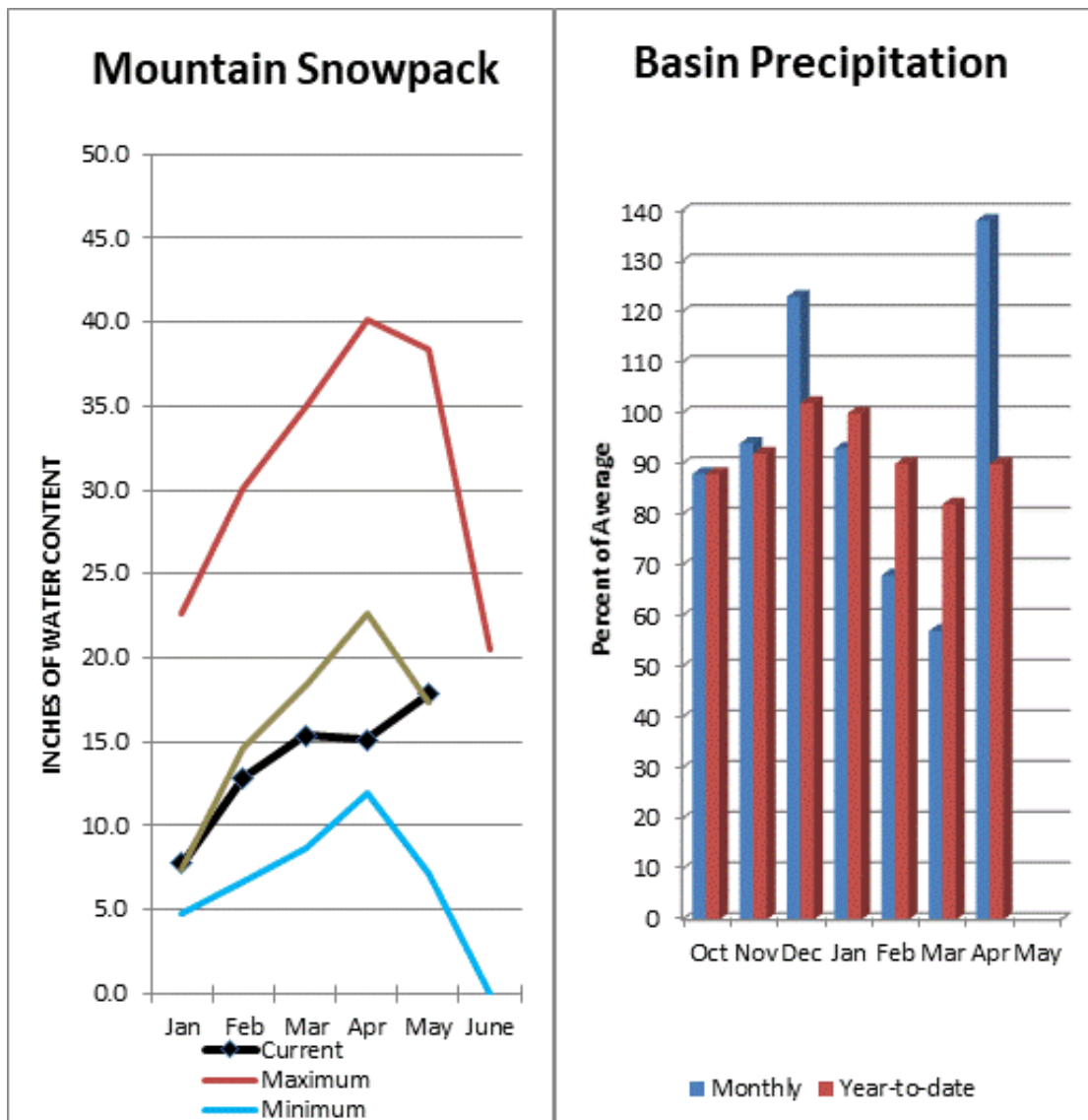
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Klickitat	4	106%	72%
Klickitat	4	106%	72%



Lower Snake – Walla Walla River Basin



May 1 snowpack readings were 105% of normal. April precipitation was 137% of normal, bringing the year-to-date precipitation to 90% of normal. Basin Reservoir storage in Dworshak was 90% of the median.

For more information contact your local Natural Resources Conservation Service office.

Lower Snake – Walla Walla River Basin

Data Current As of: 5/5/2022 11:49:09 AM

Lower Snake-Walla Walla Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

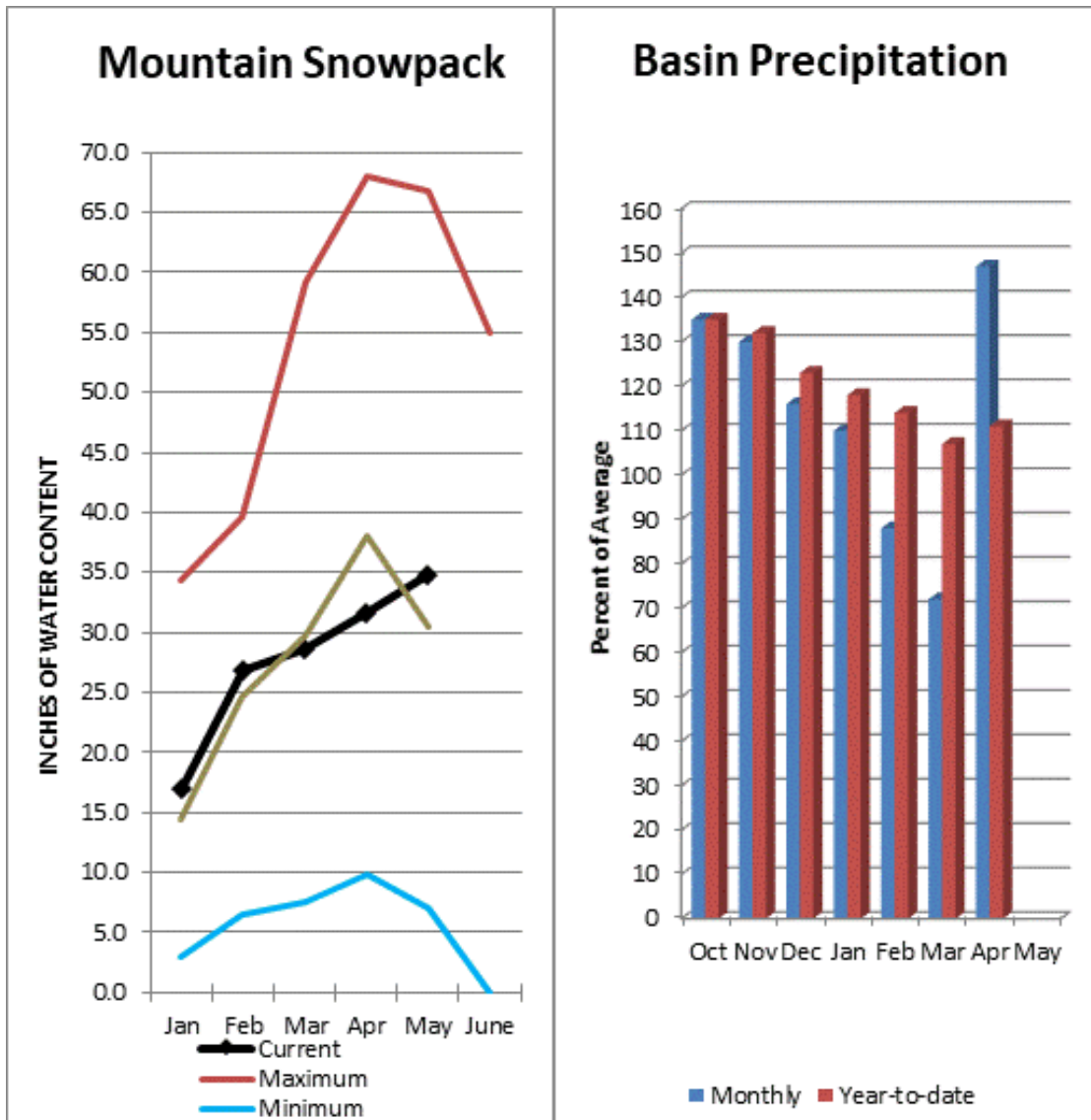
Lower Snake-Walla Walla	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Snake R bl Lower Granite Dam-NWS ²	MAY-JUL	11900		13200	85%		16300	15500
	MAY-SEP	14100		15500	88%		19000	17600
Mill Ck nr Walla Walla	MAY-JUL	8	11.7	14.3	104%	16.8	21	13.7
	MAY-SEP	11.7	15.4	17.9	103%	20	24	17.4
SF Walla Walla R nr Milton-Freewater	MAY-JUL	28	34	38	100%	42	48	38
	MAY-SEP	41	47	51	100%	55	61	51
Grande Ronde R at Troy	MAY-JUL	540	700	810	93%	920	1080	870
	MAY-SEP	605	770	885	93%	1000	1160	950
Asotin Ck at Asotin	MAY-JUL	13.8	17.9	21	105%	24	30	20

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Wallowa Lake	25.5	21.3	21.0	37.5

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Lower Snake-Walla Walla	18	103%	81%
Walla Walla	5	118%	87%
Grande Ronde	16	102%	79%
Asotin	2	188%	0%



May 1 snow cover for Lower Columbia was 114% of normal. April precipitation was 147% of normal and the water-year was 111%.

Lower Columbia Streamflow Forecasts - May 1, 2022

 Forecast Exceedance Probabilities For Risk Assessment
 Chance that actual volume will exceed forecast

Lower Columbia	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Cowlitz R bl Mayfield ²	MAY-JUL	960	1120	1230	107%	1340	1500	1150
	MAY-SEP	1150	1330	1450	106%	1570	1740	1370
Lewis R at Ariel	MAY-JUL	575	670	735	123%	800	895	600
	MAY-SEP	695	805	875	119%	945	1050	735
Cowlitz R at Castle Rock ²	MAY-JUL	1140	1420	1610	107%	1810	2090	1510
	MAY-SEP	1380	1690	1900	107%	2110	2430	1780

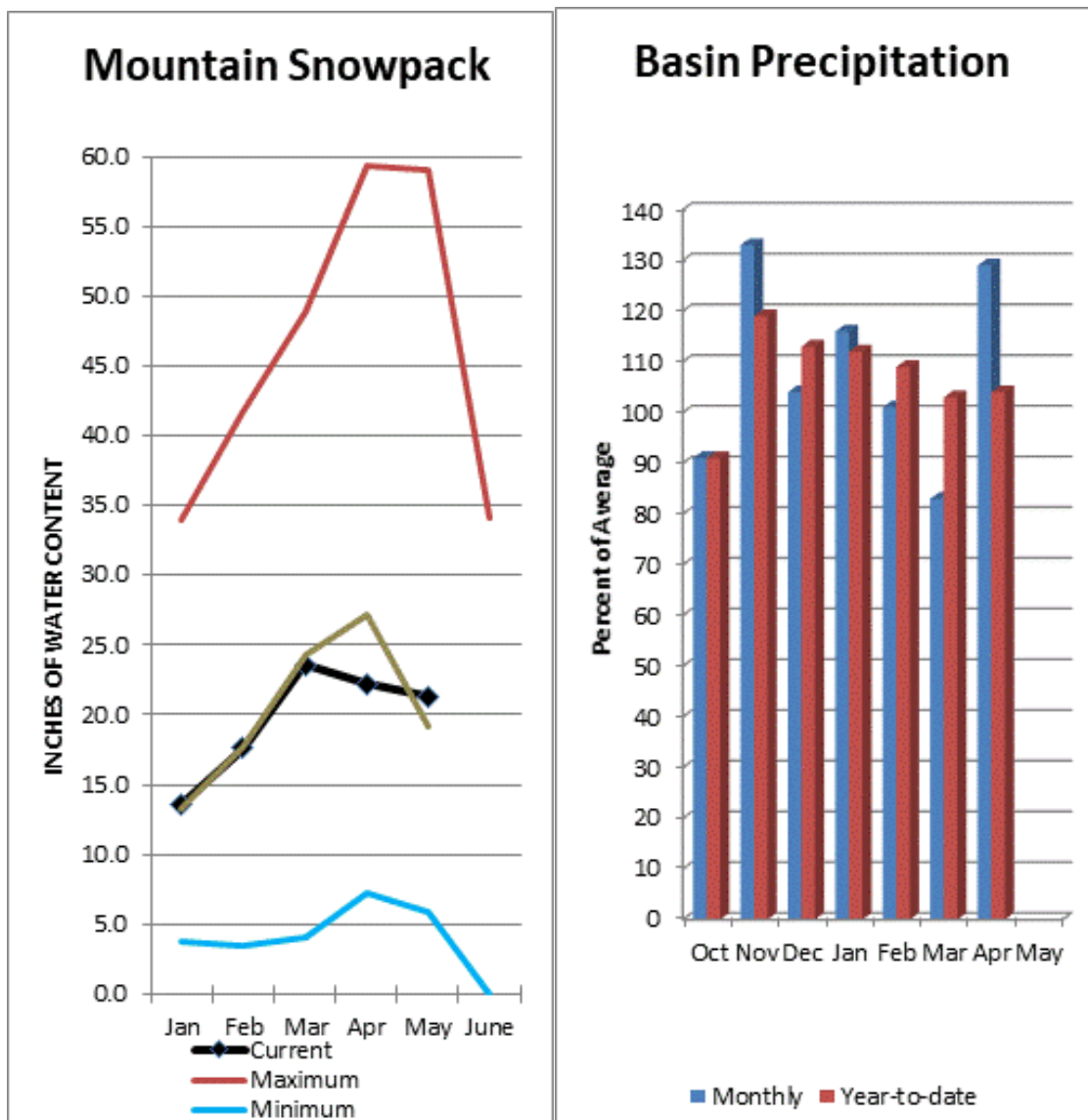
1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Mayfield		128.0	128.2	0.0
Merwin			404.5	0.0
Yale			372.4	0.0
Mossyrock Dam (Riffe Lk)		576.9	969.0	0.0
Swift			683.3	0.0

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Lower Columbia	15	114%	112%
Lewis	8	123%	119%
Cowlitz	9	110%	108%

South Puget Sound River Basins



May 1 snowpack was 111% of normal for the South Puget Sound. April precipitation was 129% of normal, bringing the water year-to-date to 104% of normal for the basins. Reservoir storage on the Green River was 106% of the median.

For more information contact your local Natural Resources Conservation Service office.

South Puget Sound River Basins

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South Puget Sound Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

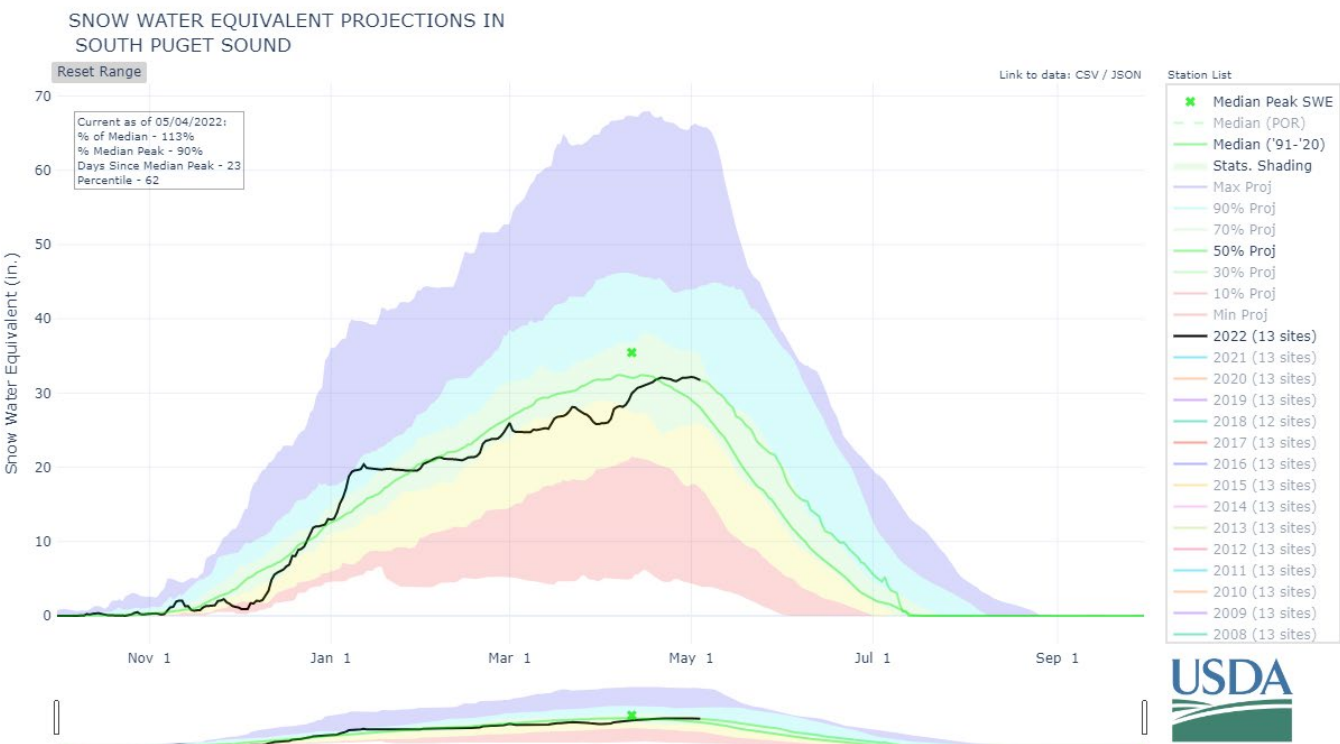
South Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Green R bl Howard A Hanson Dam ^{1,2}	MAY-JUL	115	149	165	112%	181	215	147
	MAY-SEP	132	172	190	112%	210	250	170
White R nr Buckley ¹	MAY-JUL	260	325	355	113%	385	455	315
	MAY-SEP	330	410	445	110%	485	565	405

1) 90% And 10% exceedance probabilities are actually 95% And 5%

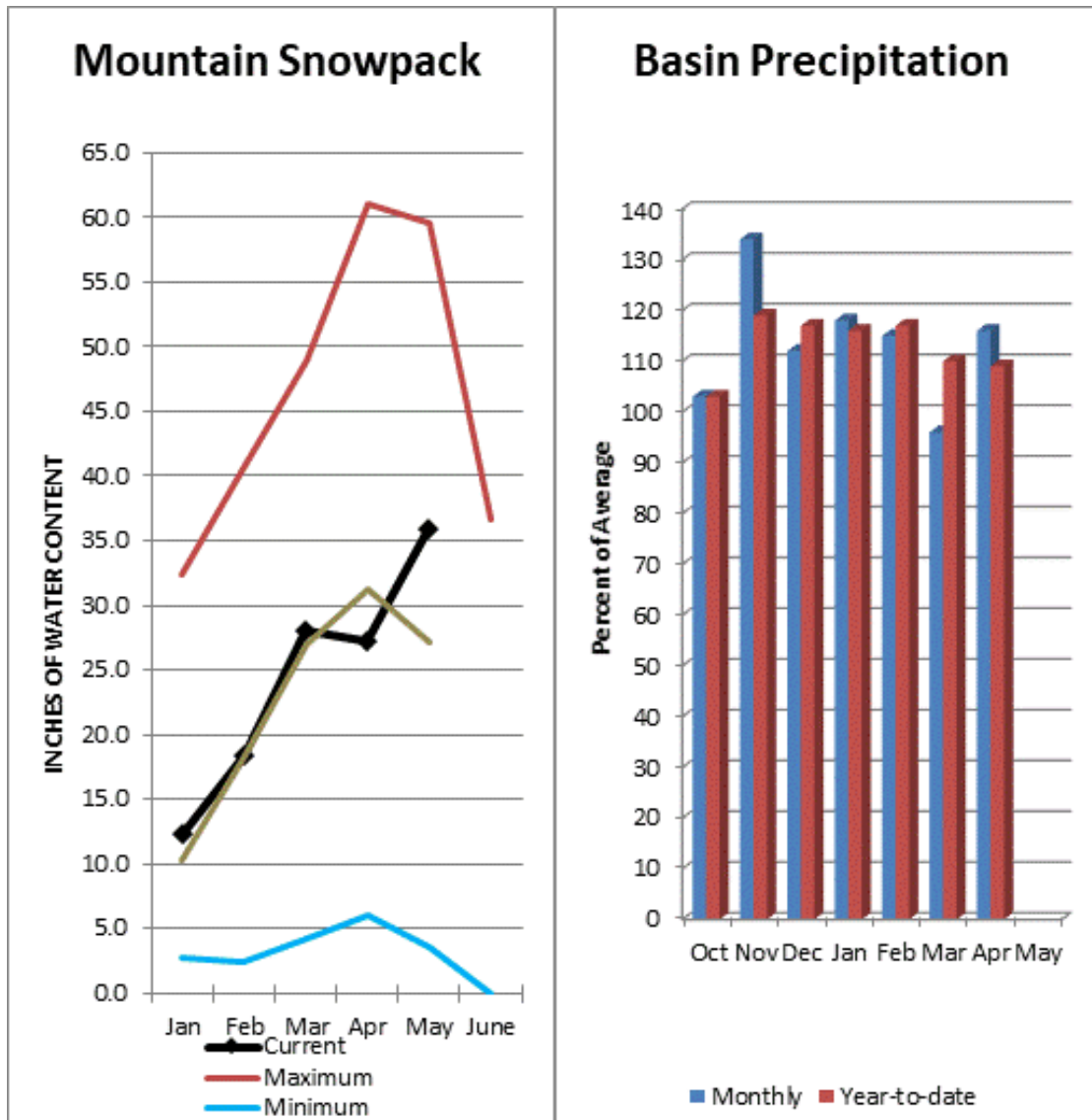
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Howard Hansen	32.9	33.0	31.1	0.0

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
South Puget Sound	13	111%	117%
White	5	104%	103%
Puyallup	2	166%	127%
Green	6	123%	140%



Central Puget Sound River Basins



May 1 median snow cover in Central Puget Sound was 132%. Basin-wide precipitation for April was 116% of normal, bringing water-year-to-date to 109% of normal.

For more information contact your local Natural Resources Conservation Service office.

Central Puget Sound River Basins

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Central Puget Sound Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

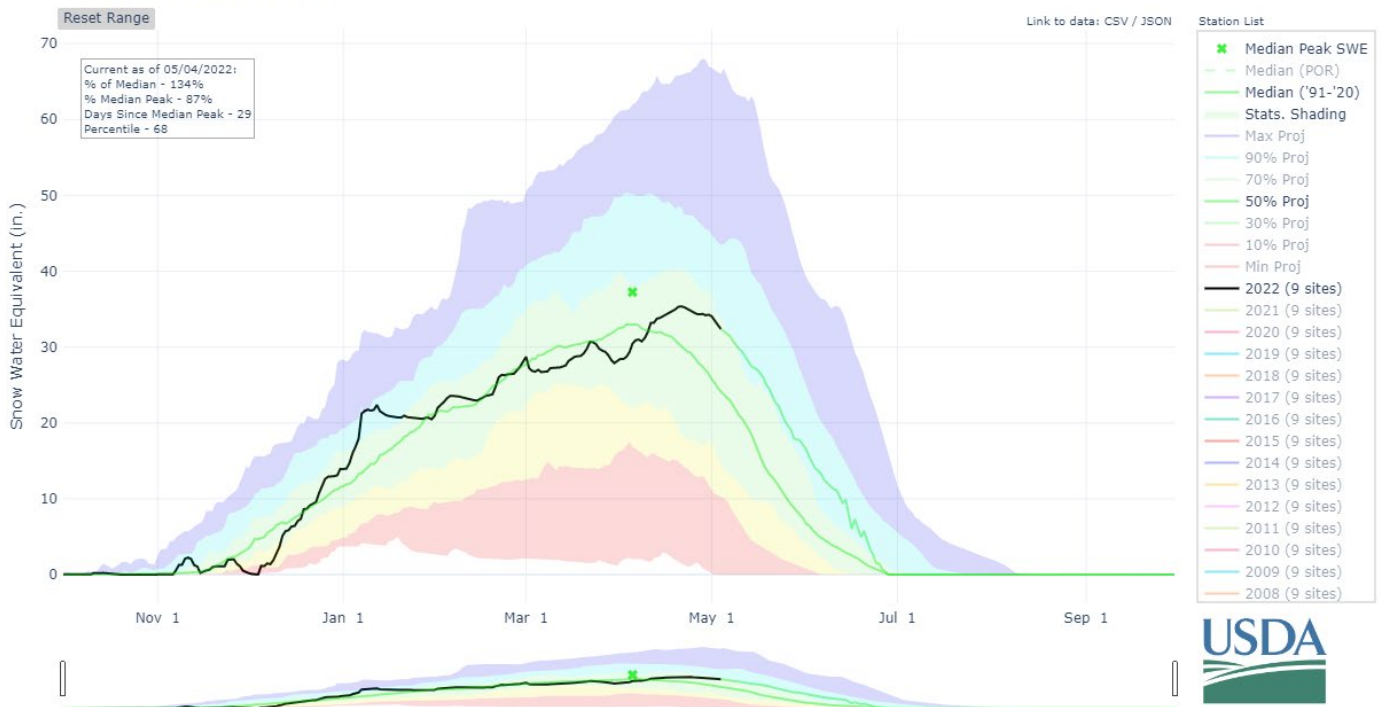
Central Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Taylor Ck nr Selleck	MAY-JUL	12.1	14.4	16	117%	17.6	19.9	13.7
	MAY-SEP	15.4	18.1	20	116%	22	25	17.3
SF Tolt R nr Index	MAY-JUL	8.3	10.9	12.6	134%	14.4	17	9.4
	MAY-SEP	9.1	12.3	14.4	133%	16.6	19.7	10.8
Rex R nr Cedar Falls	MAY-JUL	15.3	18.6	21	141%	23	26	14.9
	MAY-SEP	15.5	19.8	23	138%	26	30	16.7
Cedar R nr Cedar Falls	MAY-JUL	44	53	59	120%	65	74	49
	MAY-SEP	48	58	65	116%	72	82	56

1) 90% And 10% exceedance probabilities are actually 95% And 5%

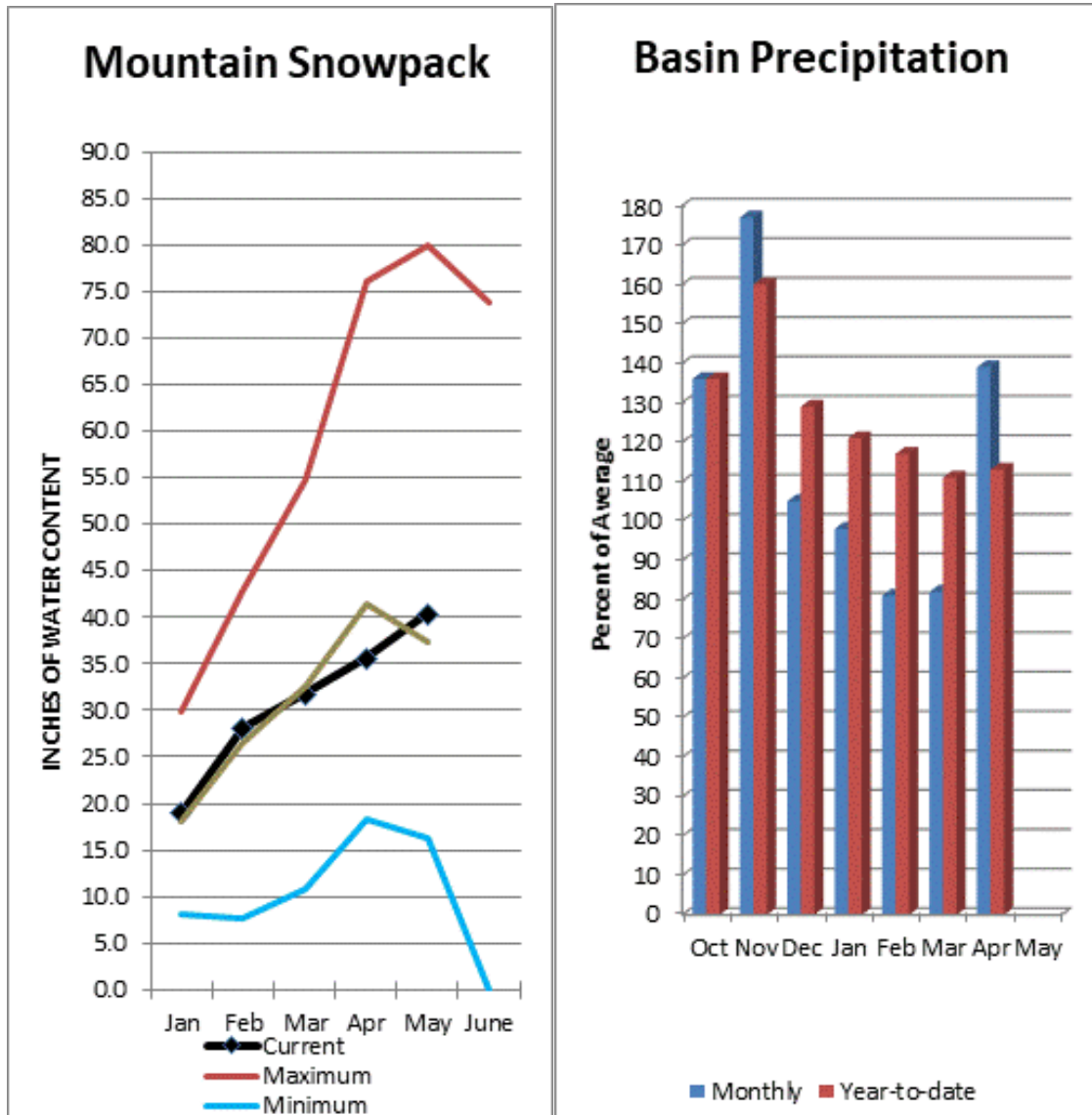
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Central Puget Sound	9	132%	152%
Tolt	2	116%	150%
Snoqualmie	4	130%	155%
Skykomish	3	123%	150%
Cedar	6	141%	154%

SNOW WATER EQUIVALENT PROJECTIONS IN CENTRAL PUGET SOUND



North Puget Sound River Basins



May 1 median snow cover in North Puget Sound was 108%. Basin-wide precipitation for April was 139% of normal, bringing water-year-to-date to 113% of normal. May 1 Basin-wide reservoir storage was 94% of normal.

North Puget Sound River Basins

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North Puget Sound Streamflow Forecasts - May 1, 2022

Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

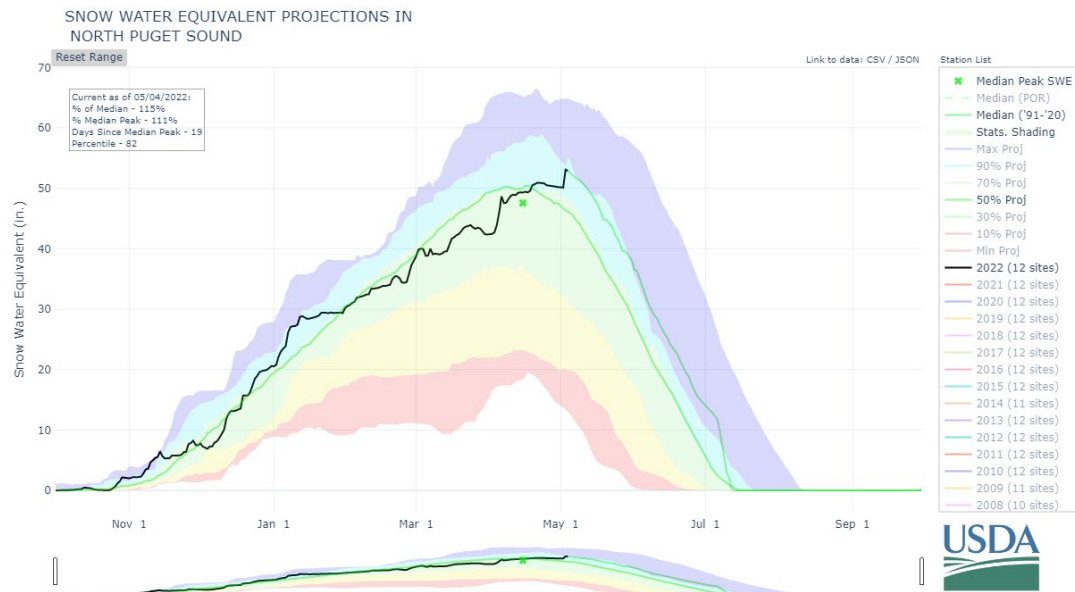
North Puget Sound	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Thunder Ck nr Newhalem	MAY-JUL	215	235	250	116%	265	285	215
	MAY-SEP	325	350	365	118%	380	405	310
Skagit R at Newhalem	MAY-JUL	1560	1660	1720	114%	1780	1880	1510
	MAY-SEP	1880	1990	2060	113%	2130	2240	1820
Baker R at Concrete	MAY-JUL	595	655	695	108%	735	795	645
	MAY-SEP	775	845	895	108%	945	1020	830

1) 90% And 10% exceedance probabilities are actually 95% And 5%

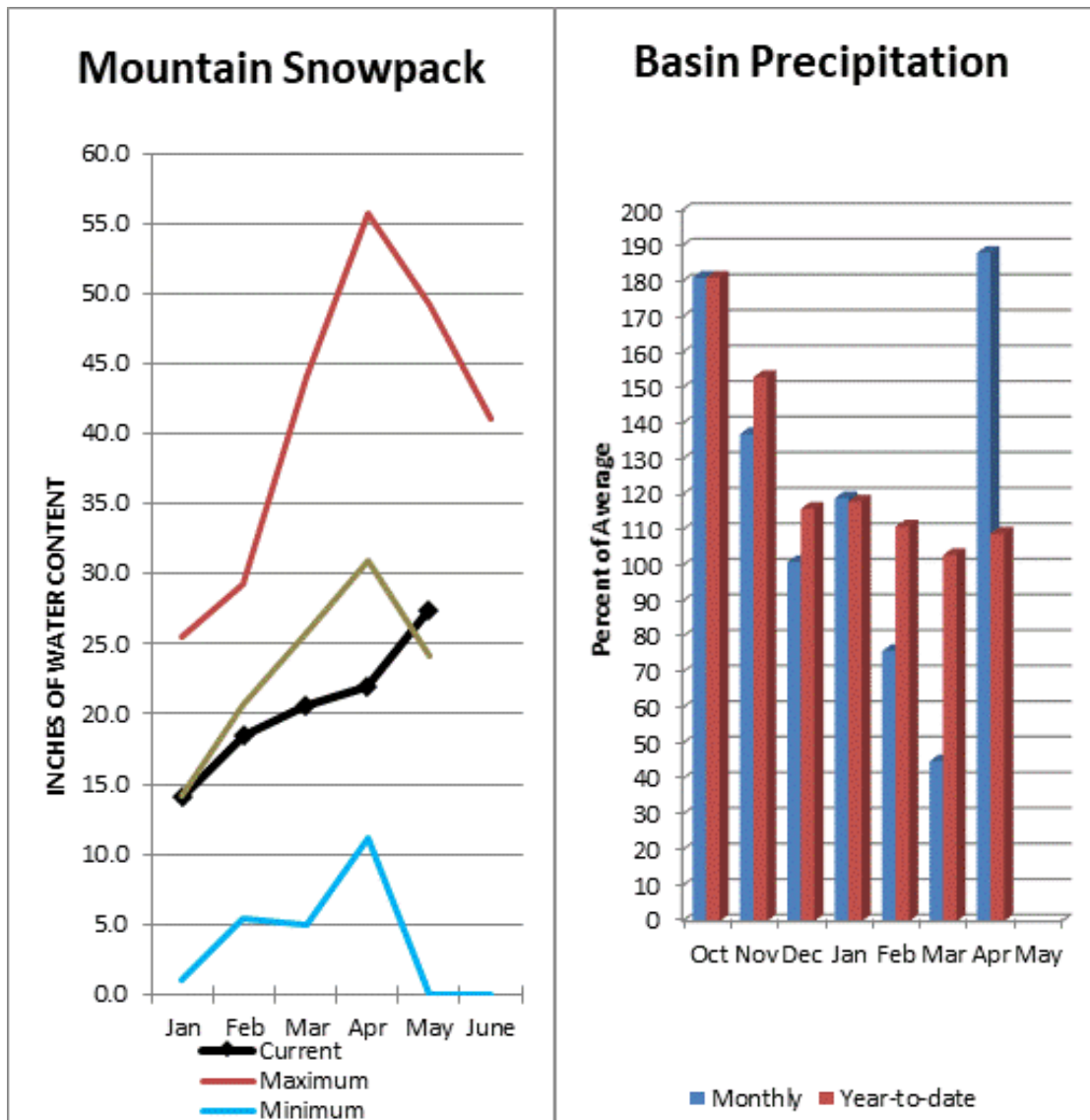
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Reservoir Storage End of April, 2022	Current (KAF)	Last Year (KAF)	Median (KAF)	Capacity (KAF)
Diablo Reservoir			86.0	90.6
Upper Baker	147.9	127.1	144.6	0.0
Gorge Reservoir			8.0	0.0
Ross	670.1	608.3	711.5	1434.7
Lake Shannon	65.5	63.3	83.2	0.0

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
North Puget Sound	16	108%	107%
Skagit	9	118%	106%
Nooksack	3	102%	116%
Baker	2	108%	103%



Olympic Peninsula River Basins



Snowpack averaged 113% of normal on May 1. April precipitation was 188% of normal. Precipitation has accumulated at 109% of normal for the water year. April precipitation at Quillayute was 130% of normal, Sequim was 144% and Forks reported 148%.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

Data Current As of: 5/5/2022 11:49:27 AM

Olympic Streamflow Forecasts - May 1, 2022

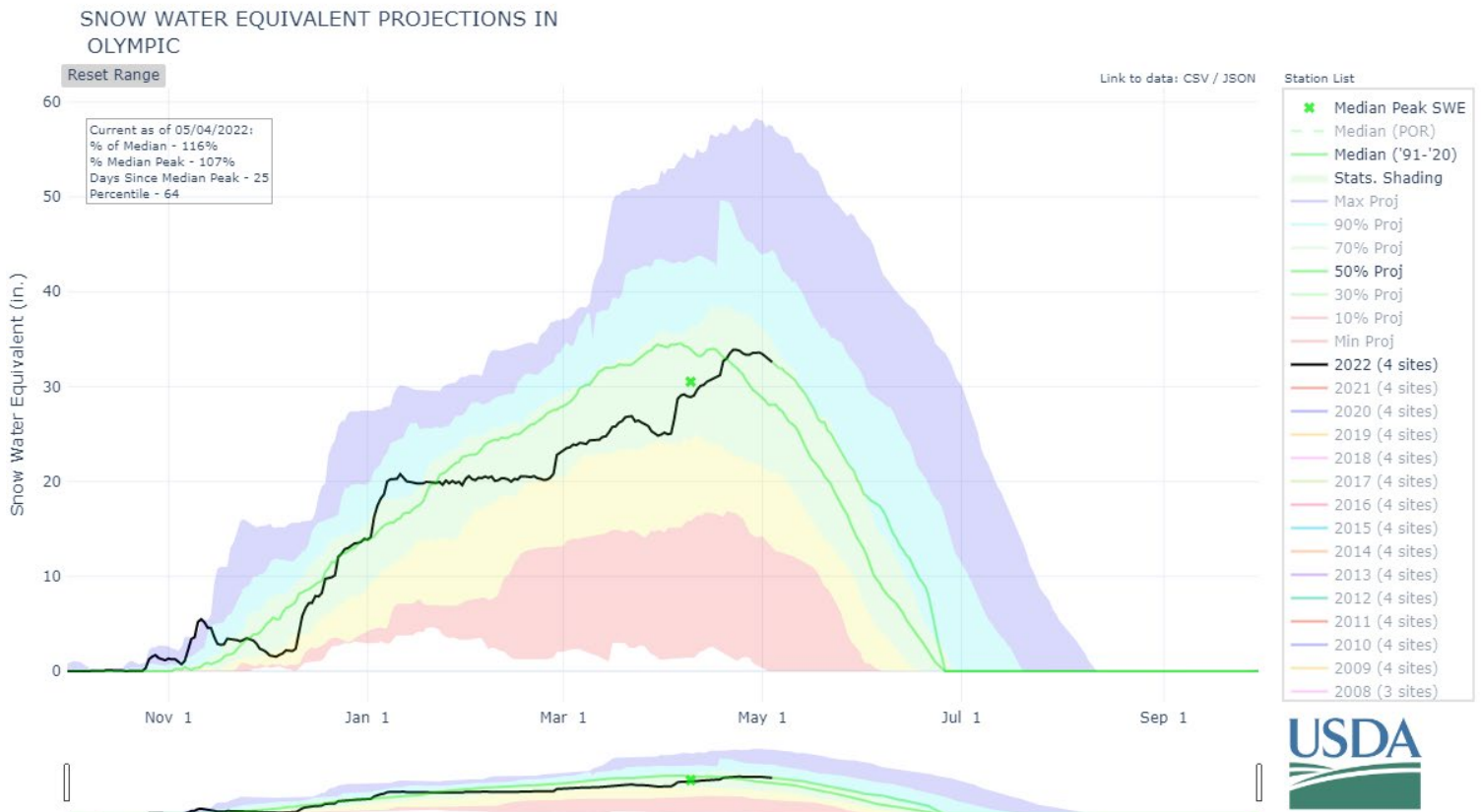
Forecast Exceedance Probabilities For Risk Assessment
Chance that actual volume will exceed forecast

Olympic	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Median	30% (KAF)	10% (KAF)	30yr Median (KAF)
Dungeness R nr Sequim	MAY-JUL	97	107	114	116%	121	131	98
	MAY-SEP	119	132	140	118%	148	161	119
Elwha R at McDonald Br nr Port Angeles	MAY-JUL	285	325	355	116%	385	425	305
	MAY-SEP	345	385	415	115%	445	485	360

1) 90% And 10% exceedance probabilities are actually 95% And 5%

2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

Watershed Snowpack Analysis May 1, 2022	# of Sites	% Median	Last Year % Median
Olympic	7	113%	120%
Olympic	7	113%	120%



Issued by

Terry Cosby
Acting Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

Released by

Roylene Comes-At-Night
State Conservationist
Natural Resources Conservation Service
Spokane, Washington

The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology Washington State Department of Natural Resources Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers U.S. Department of Agriculture, Forest Service U.S. Department of Commerce, NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs U.S. Fish and Wildlife Service
Local	City of Tacoma City of Seattle City of Bellingham Chelan County P.U.D. Pacific Power/PacificCorp Puget Sound Energy Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County Kalispel Tribe of Indians Spokane Indian Tribe Jamestown S’Klallam Tribe Sauk-Suiattle Tribe of Indians Stillaguamish Tribe
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District Kinross Mining

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



Washington Snow Survey Office
2005 E. College Way, Suite 203
Mount Vernon, WA 98273-2873

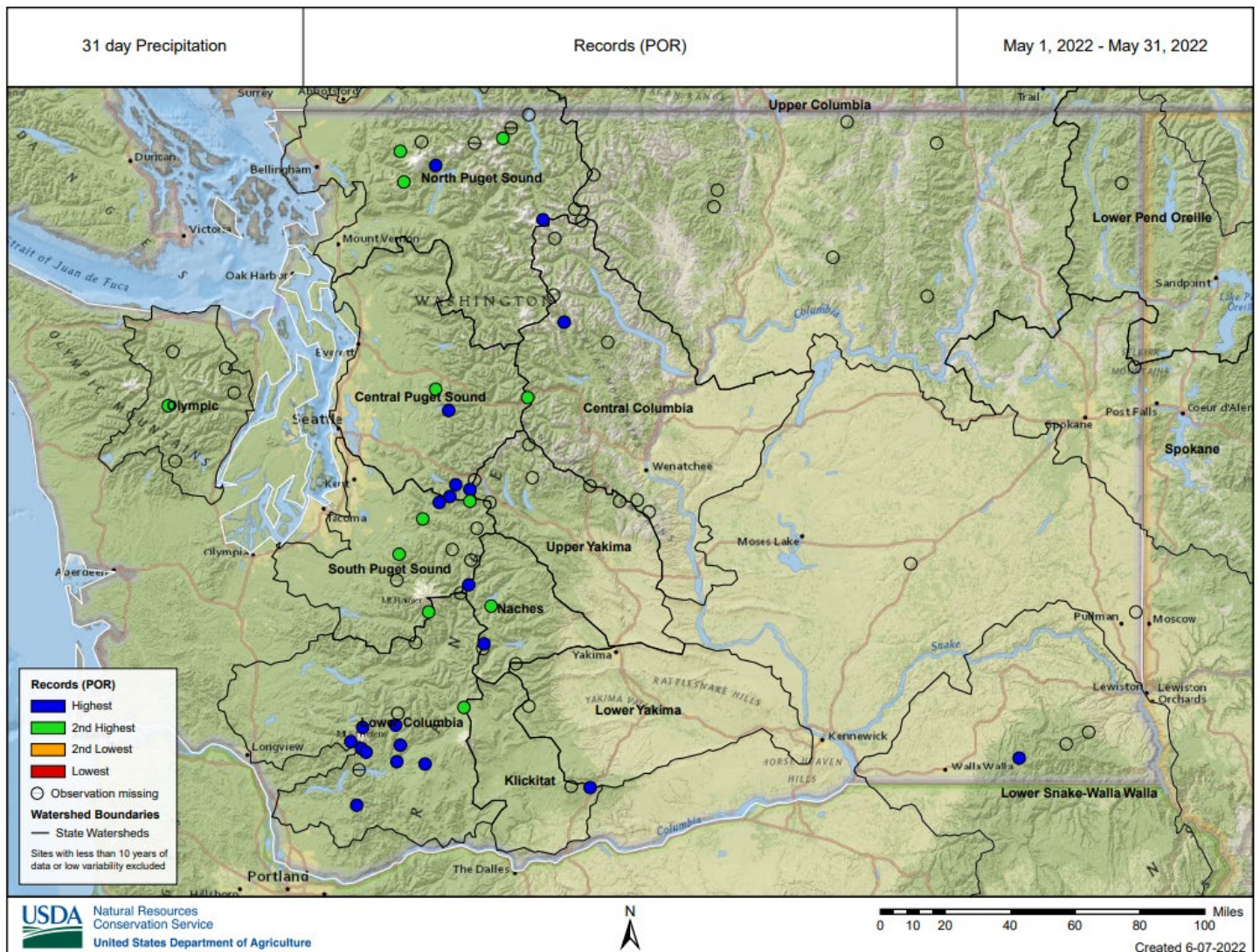


Washington Water Supply Outlook Report

**Natural Resources Conservation Service
Spokane, WA**



Washington Water Supply Outlook Report June 1, 2022



May recorded record or near-record precipitation at over 30 SNOTEL sites in the state. On-going low temperatures helped delay snowmelt onset weeks past normal. With a few warmer days over the last week we may finally be seeing the spring freshet hit.

Water Supply Outlook Reports

and

Federal - State – Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

Local Natural Resources Conservation Service Field Office

or
Scott Pattee
Water Supply Specialist

or
Larry Johnson
State Conservation Engineer

How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk, they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Washington Water Supply Outlook

June 2021

General Outlook

Rare April snow was followed by record May rain, accompanied by very cold temperatures. Mountain snowpack failed to meet normal melt curves, driving the calculated percent of normal to near record levels in most basins of Washington. These conditions are extremely rare in the state, only preceded in scale by the 2010-2011 water year, which set all state level maximum melt out dates.

The most recent forecasts through the end of June shows a likely chance for below normal temperatures and above normal precipitation. National Weather Service 3-month forecast, beginning June 1, are leaning towards equal chances to slightly above normal temperatures and slightly below normal precipitation. The latest US Drought Monitor indicates a complete removal of D0 (Abnormally Dry) to Western Washington. Even with good rainfall on the east side there continues to be evidence of D1 & D2 (Moderate and Severe) drought conditions. (See maps on page 4)

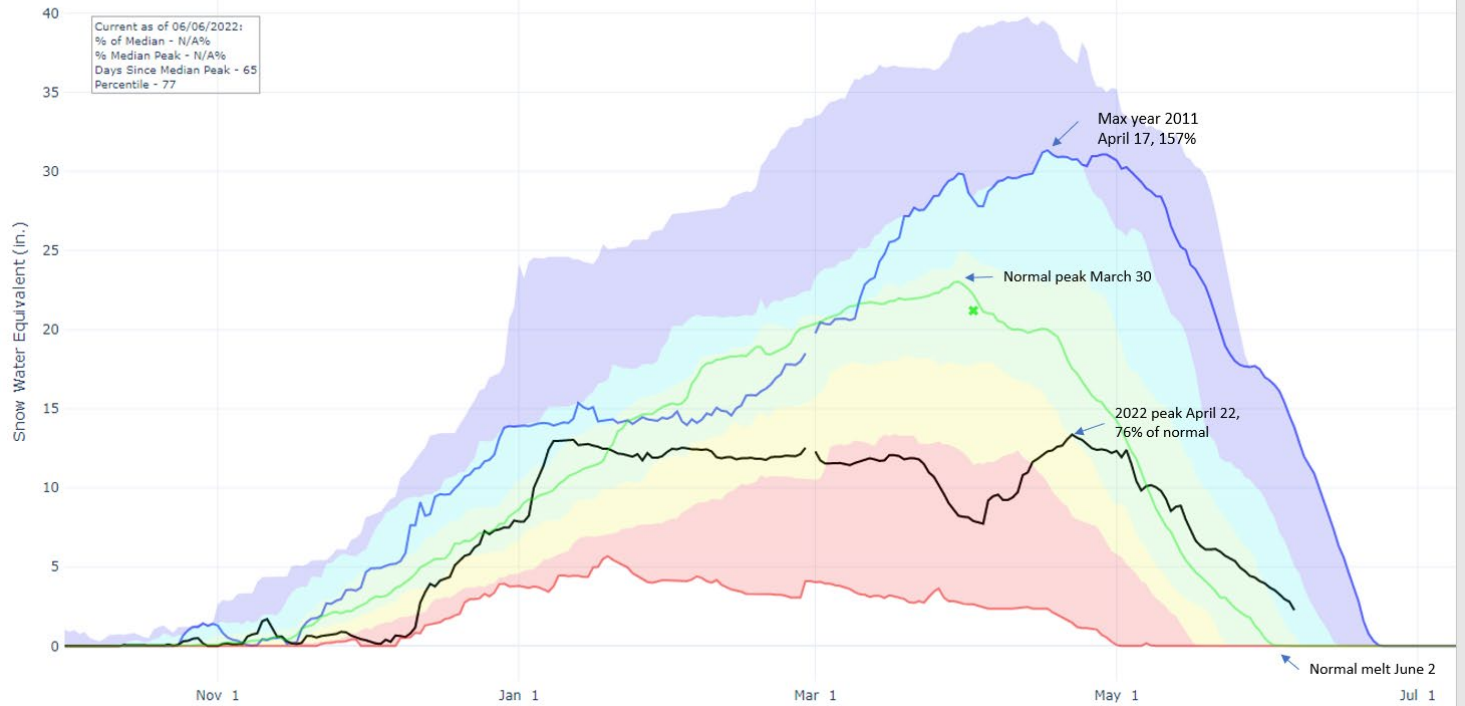
Snowpack

The June 1 statewide SNOTEL readings were 190% of normal. Unseasonably cool temperatures and above normal precipitation, snowpack on the west side as well as the Olympics is holding much later than normal. The east side has, for the most part, melted out with only a hand full of the highest elevation sites holding out. *High or extremely high values can only be attributed to the melt curve being well outside of the norm. In many cases the 2022 peak accumulation was below normal however with the lack of normal melt the data pushed past the normal melt line which calculates to above normal SWE. In some cases, melt is almost a month behind. (See examples on next page) *

BASIN	PERCENT OF MEDIAN	LAST YEAR PERCENT MEDIAN
Spokane	179	73
Newman Lake	0	0
Lower Pend Oreille	209	0
Upper Columbia	205	93
Methow	197	131
Conconully Lake	0	0
Central Columbia	188	97
Upper Yakima	241	203
Naches	167	75
Lower Yakima	1850*	0
Klickitat	1737*	316
Walla Walla	272	0
Lower Snake	243	3
Cowlitz	169	113
Lewis	238	159
White	146	81
Green	711	459
Puyallup	0	0
Cedar	407	327
Snoqualmie	345	345
Skykomish	260	236
Skagit	161	117
Nooksack	162	129
Olympic Peninsula	196	155

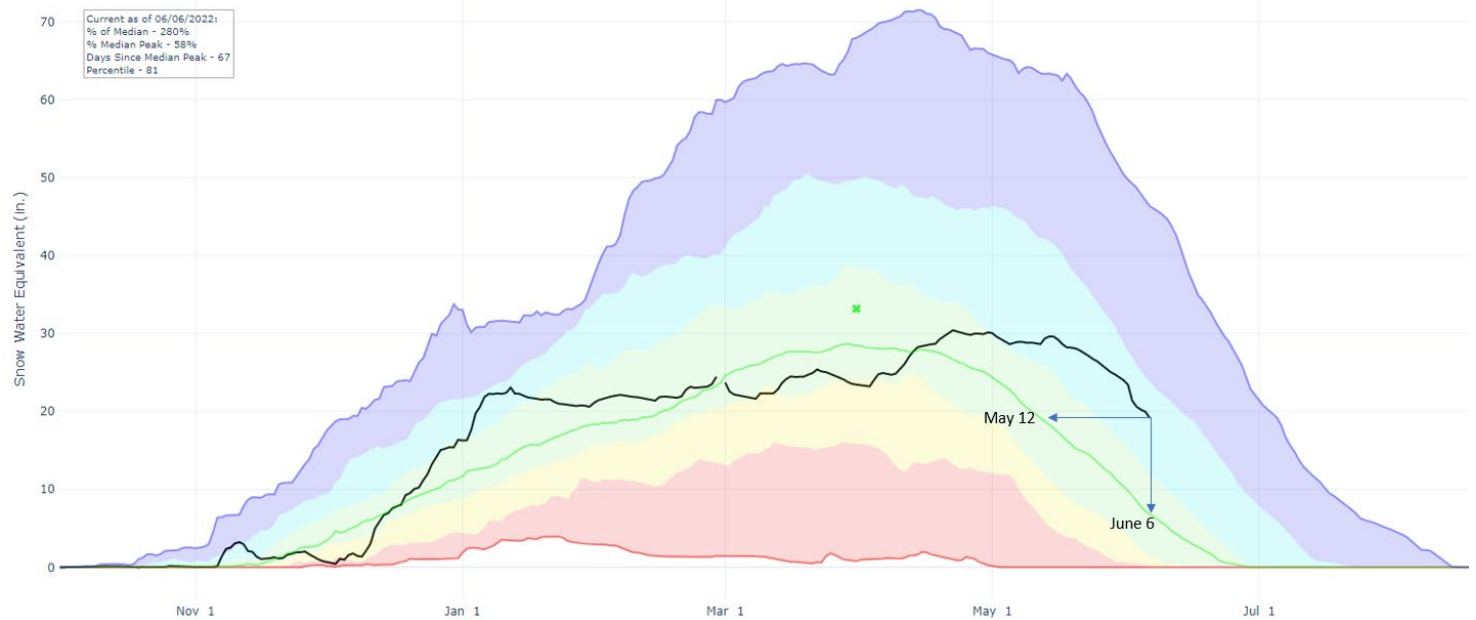
SNOW WATER EQUIVALENT IN LOWER YAKIMA

Reset Range



SNOW WATER EQUIVALENT IN LEWIS

Reset Range

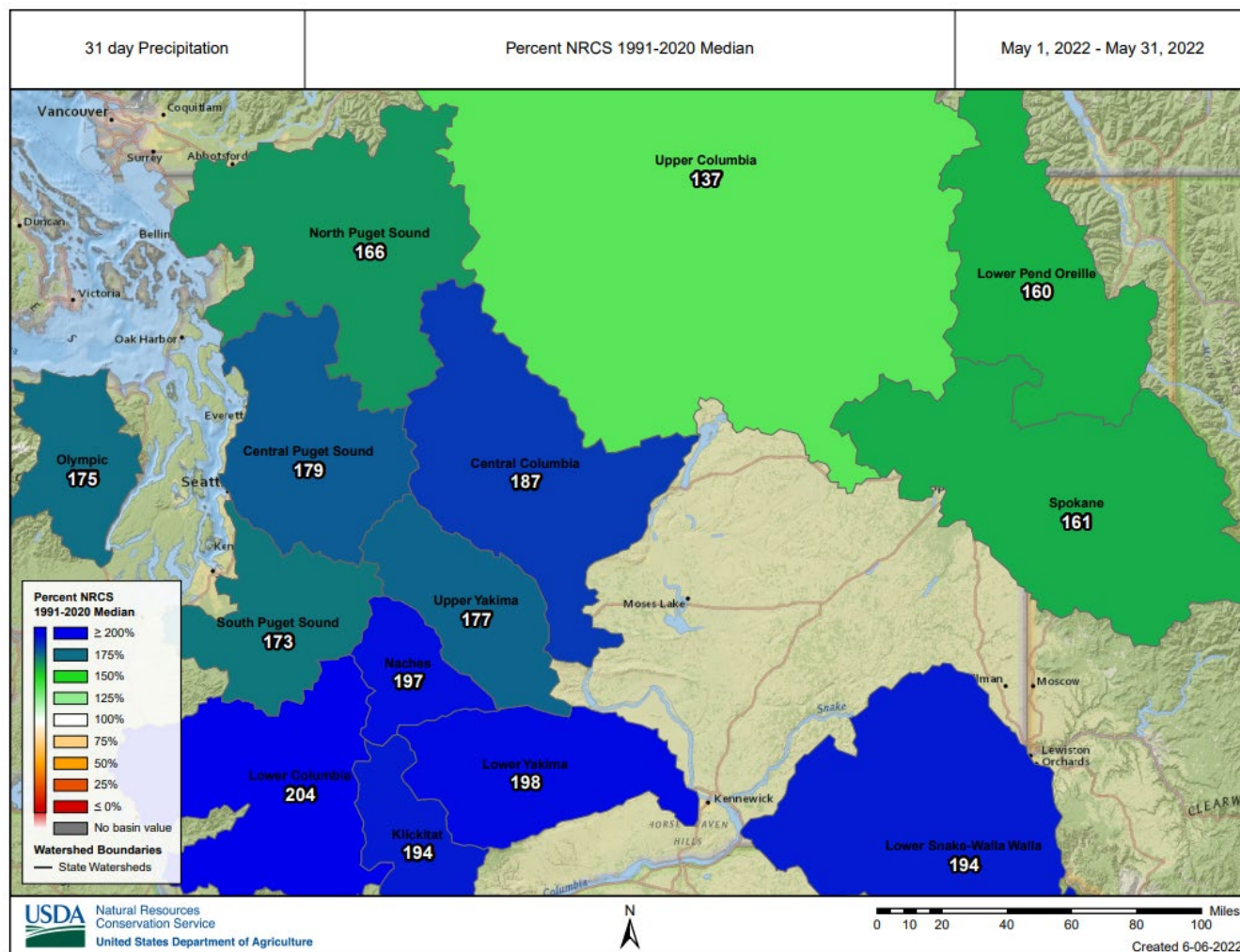


For more information contact your local Natural Resources Conservation Service office.

Precipitation

June precipitation accumulation from SNOTEL was much above normal across the entire state. Individual stations ranged from 300% in the Skagit to a low of 67%% in the Kettle River Basin. Many sites recorded record or near record rainfall last month. Statewide water-year average remained slightly above normal as of June 1. SNOTEL collects all form of precipitation including, rain, snow or sleet and hail.

RIVER BASIN	JUNE PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE
Spokane	159	103
Lower Pend Oreille	160	102
Upper Columbia	133	105
Central Columbia	187	111
Upper Yakima	175	108
Naches	197	109
Lower Yakima	193	97
Klickitat	194	105
Walla Walla	225	103
Lower Snake	197	99
Lower Columbia	204	116
South Puget Sound	173	108
Central Puget Sound	179	113
North Puget Sound	173	116
Olympic Peninsula	175	113



Reservoir

Seasonal reservoir levels in Washington can vary greatly due to specific watershed management practices required in preparation for irrigation season, fisheries management, power generation, municipal demands and flood control. June 1 Reservoir storage in the Yakima Basin was 812,000-acre feet, 105% of average for the Upper Reaches and 210,300-acre feet or 93% of average for Rimrock and Bumping Lakes. The power generation reservoirs included the following: Coeur d'Alene Lake, 227,300-acre feet, 98% of average and 95% of capacity; and Ross Lake within the Skagit River Basin at 81% of average and 80% of capacity. Recent climate impacts and management procedures June affect these numbers on a daily or weekly basis.

BASIN	PERCENT OF CAPACITY	CURRENT STORAGE AS PERCENT OF AVERAGE
Spokane	95	98
Lower Pend Oreille	85	98
Upper Columbia	54	54
Central Columbia	66	87
Upper Yakima	97	105
Naches	91	93
Lower Snake	69	94
North Puget Sound	80	81
South Puget Sound		100

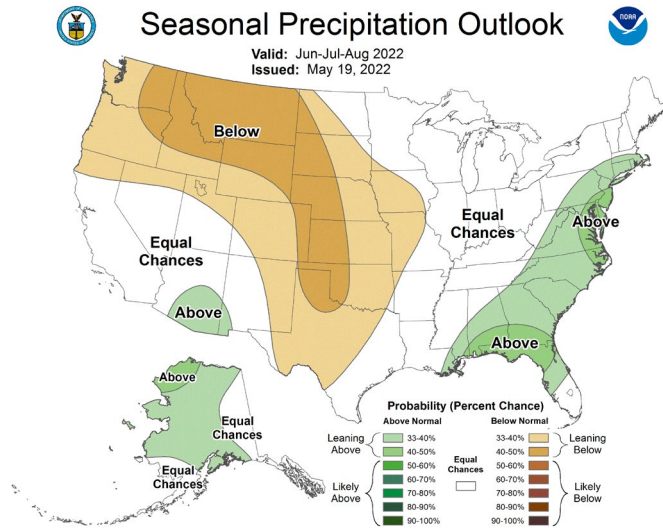
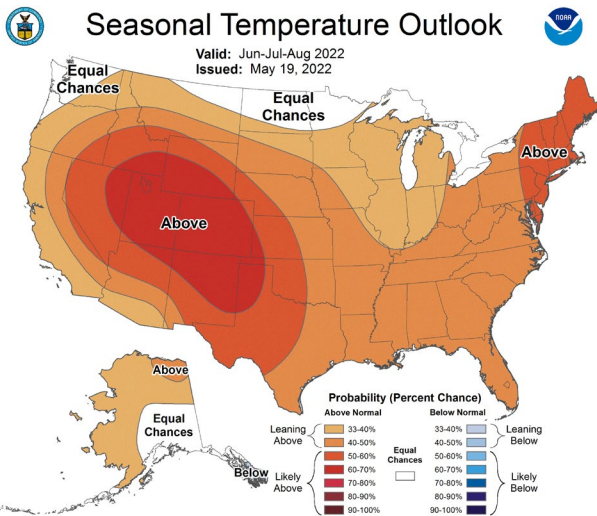
Streamflow

While seasonal forecasts this time of year are generally quite robust, abnormal climate conditions can still affect final outcomes. The lack of or unavailability of certain data sets can also reduce accuracy. Volumetric forecasts are developed using current, historic, and average snowpack, precipitation and streamflow data collected and coordinated by organizations cooperating with NRCS. Below normal temperatures last month highly effected normal snow melt which led too below normal runoff throughout the region, with the exception of reservoir-controlled systems where water was being released in anticipation of expected snow melt or fish migration surges.

BASIN	PERCENT OF AVERAGE FORECAST (50% CHANCE OF EXCEEDENCE)
Spokane	121-139
Pend Oreille	115-131
Upper Columbia	109-175
Central Columbia	125-134
Upper Yakima	128-176
Naches	117-149
Lower Yakima	132-165
Klickitat	122-132
Lower Snake-Walla Walla	106-117
Lower Columbia	133-143
South Puget Sound	119-120
Central Puget Sound	134-178
North Puget Sound	126-130
Olympic Peninsula	125-126

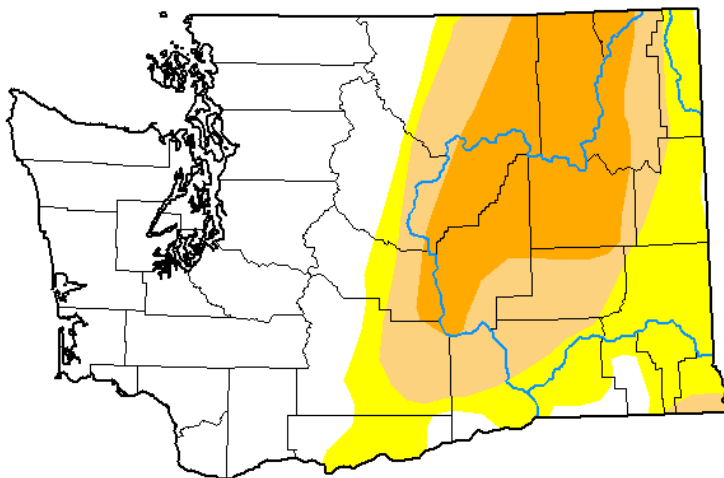
STREAM	PERCENT OF AVERAGE JUNE STREAMFLOWS
Pend Oreille at Albeni Fall Dam	83
Kettle at Laurier	74
Columbia at Birchbank	67
Spokane at Spokane	112
Similkameen at Nighthawk	72
Okanogan at Tonasket	67
Methow at Pateros	67
Chelan at Chelan	62
Stehekin near Stehekin	61
Wenatchee at Pashastin	73
Cle Elum near Roslyn	98
Yakima at Parker	98
Naches at Naches	100
Grande Ronde at Troy	96
Snake below Lower Granite Dam	87
Columbia River at The Dalles	77
Lewis at Merwin Dam	172
Cowlitz below Mayfield Dam	108
Skagit at Concrete	78
Dungeness near Sequim	72

Climate



U.S. Drought Monitor Washington

May 31, 2022
(Released Thursday, Jun. 2, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	49.03	50.97	33.11	17.28	0.00	0.00
Last Week 05-24-2022	49.03	50.97	33.11	17.28	0.00	0.00
3 Months Ago 03-01-2022	44.09	55.91	51.54	26.03	6.04	0.00
Start of Calendar Year 01-04-2022	42.67	57.33	54.26	26.58	6.13	0.00
Start of Water Year 09-28-2021	0.00	100.00	73.09	54.72	46.85	28.98
One Year Ago 06-01-2021	8.32	91.68	68.22	33.58	3.80	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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droughtmonitor.unl.edu

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Released by

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The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Snow Survey Network Program – British Columbia Ministry of Environment River Forecast Center – British Columbia Ministry of Forests, Lands and Natural Resource Operations
State	Washington State Department of Ecology Washington State Department of Natural Resources Washington State Fish and Wildlife
Federal	Department of the Army, Corps of Engineers U.S. Department of Agriculture, Forest Service U.S. Department of Commerce, NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs U.S. Fish and Wildlife Service
Local	City of Tacoma City of Seattle City of Bellingham Chelan County P.U.D. Pacific Power/PacificCorp Puget Sound Energy Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County Kalispel Tribe of Indians Spokane Indian Tribe Jamestown S’Klallam Tribe Sauk-Suiattle Tribe of Indians Stillaguamish Tribe
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District Kinross Mining

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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Washington Water Supply Outlook Report

**Natural Resources Conservation Service
Spokane, WA**

