



United States Department of Agriculture

2021 Snowpack Status and Streamflow Outlook for the Truckee, Carson, Walker and Humboldt Basins

April 15, 2021
Nevada Division of Water Resources

Jeff Anderson
Hydrologist
NRCS Nevada Snow Survey
Reno, NV
Jeff.Anderson@usda.gov

March 30, 2021
Rubicon #1 Snow Course, 8100ft elevation
92in snow depth, 31.5in SWE 69% median

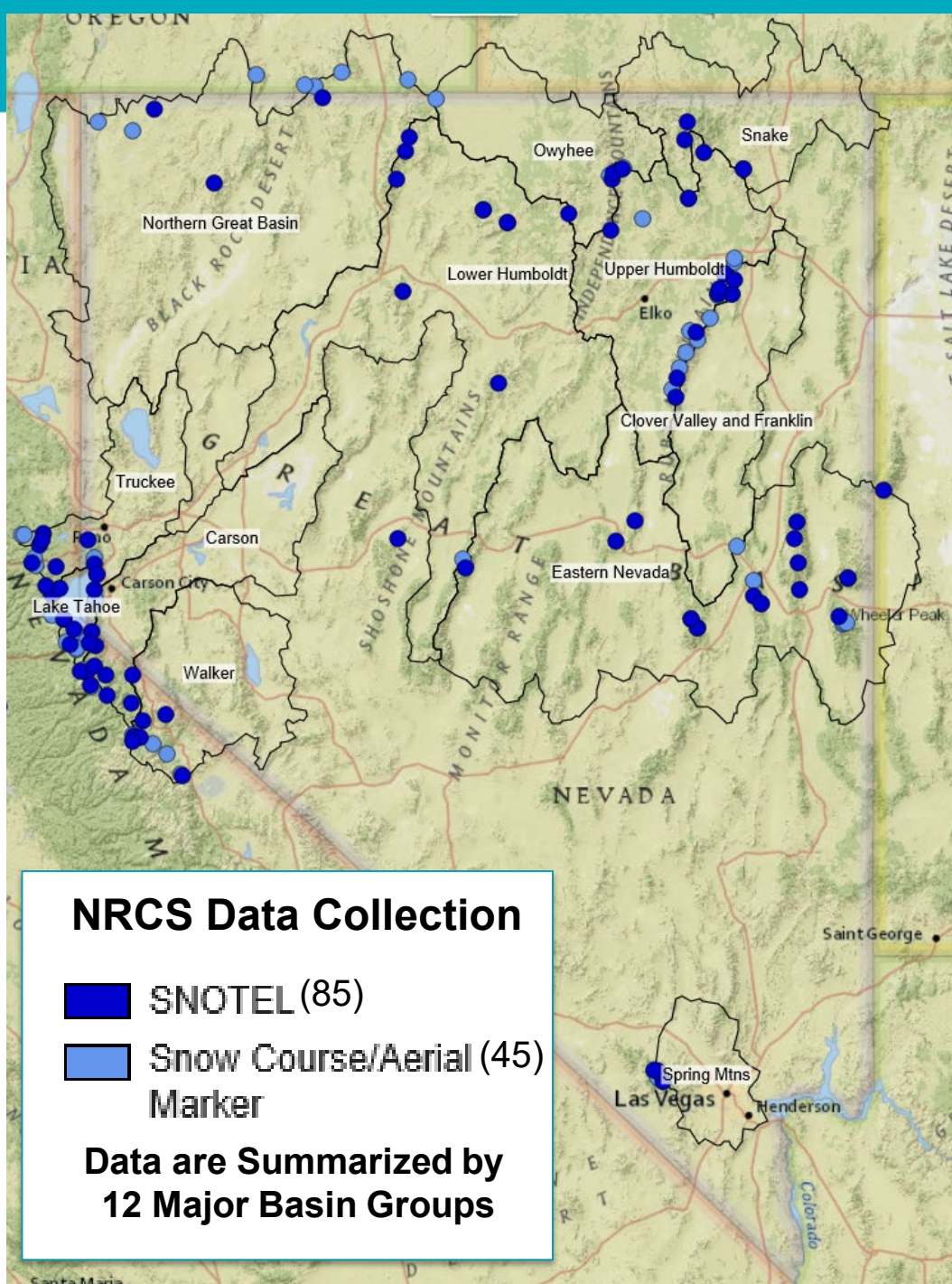


Natural Resources Conservation Service

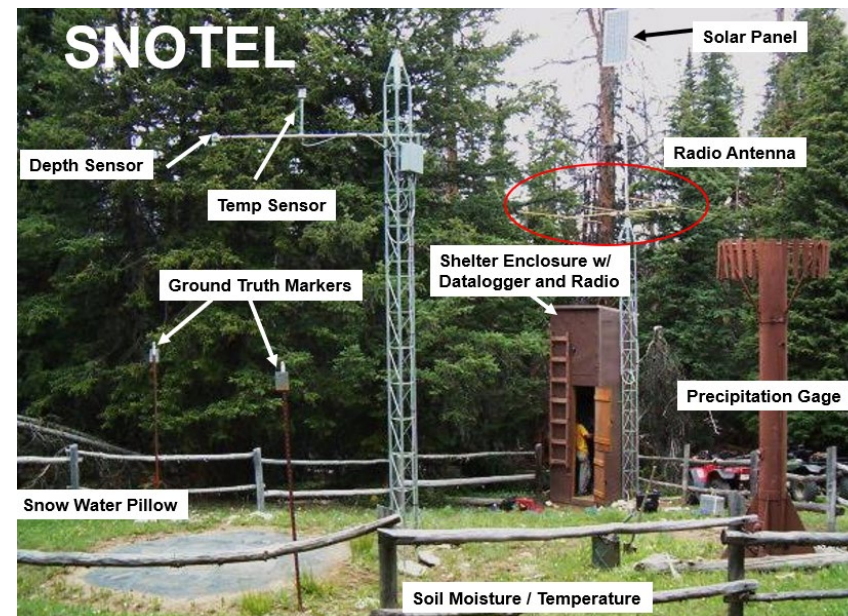
www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/

Snow Survey Overview

Key Vocab: Snow Water Equivalent (SWE)



Snow Course



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Snow Survey

- ☑ Snow Survey Products
- ☑ Water Supply Products

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NRCS - Nevada Helping People Help the Land

Outside the Snow Survey, the NRCS works with private landowners to put conservation practices in place that will benefit the soil, water, air, and wildlife.

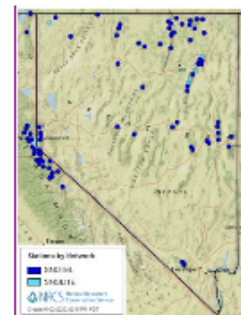
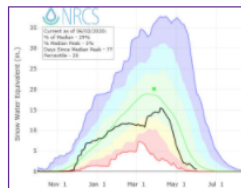
Visit Nevada NRCS - click here

Snow Survey

The Nevada NRCS Snow Survey and Water Supply Forecasting Program provides mountain snowpack data and streamflow forecasts for the state of Nevada, as well as, the Eastern Sierra Nevada. Applications of snow survey products include water supply management, flood control, climate modeling, recreation, and conservation planning.

Nevada Water Supply Outlook Report April 1, 2021

(Click on image to get report)



Latest Outlook Report & Streamflow Forecasts

- > April 1, 2021 Water Supply Outlook Report - *New*
- > April 1, 2021 Streamflow Forecast Update - *New*

Today's Update Reports

- > Snow and Precipitation Percent of Normal
- > Precipitation Month-to-Date
- > Precipitation Percent of Monthly Ave
- > Snowpack Percent of Normal Peak
- > GIS Maps: Snow | Water Year Precip | Monthly Precip

Monthly Basin Data Reports

Select from snowpack, precipitation, and reservoir storage reports

Interactive SNOTEL Charts

Charts for snowpack, precipitation, air temp and soil moisture

- > Basin Summary Charts
- > Individual SNOTEL Charts

Interactive Map

Displays both current and historic data in an easy-to-use, visual interface. Data types include SNOTEL, snow course, streamflow, reservoir storage, and streamflow forecasts and more.

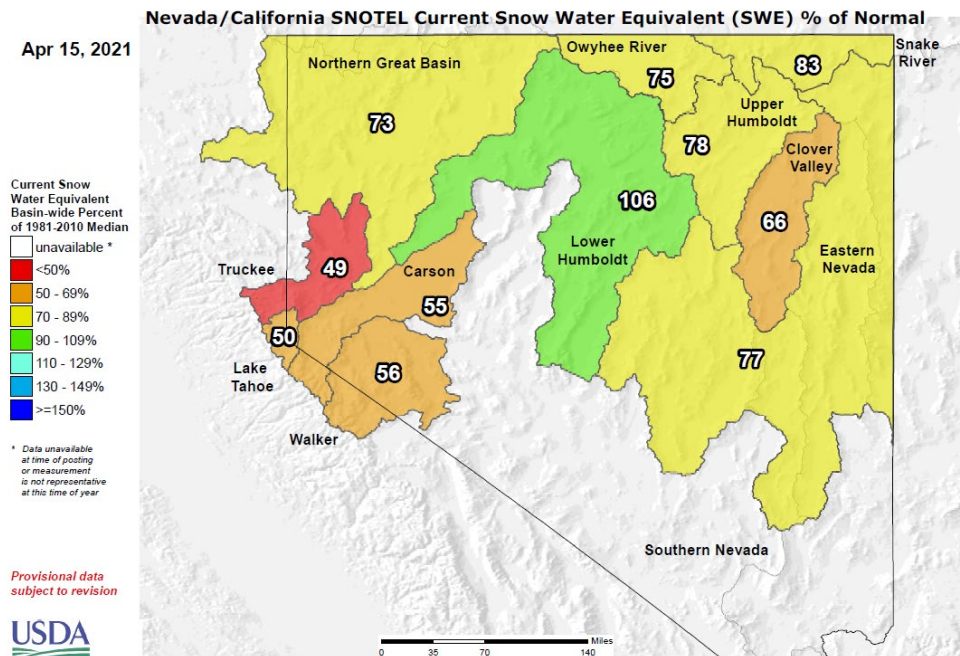
- > Site Inventory
- > Snowpack Percent of Median
- > Water Year Precipitation Percent of Average
- > Additional Pre-Defined Links

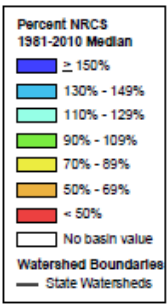
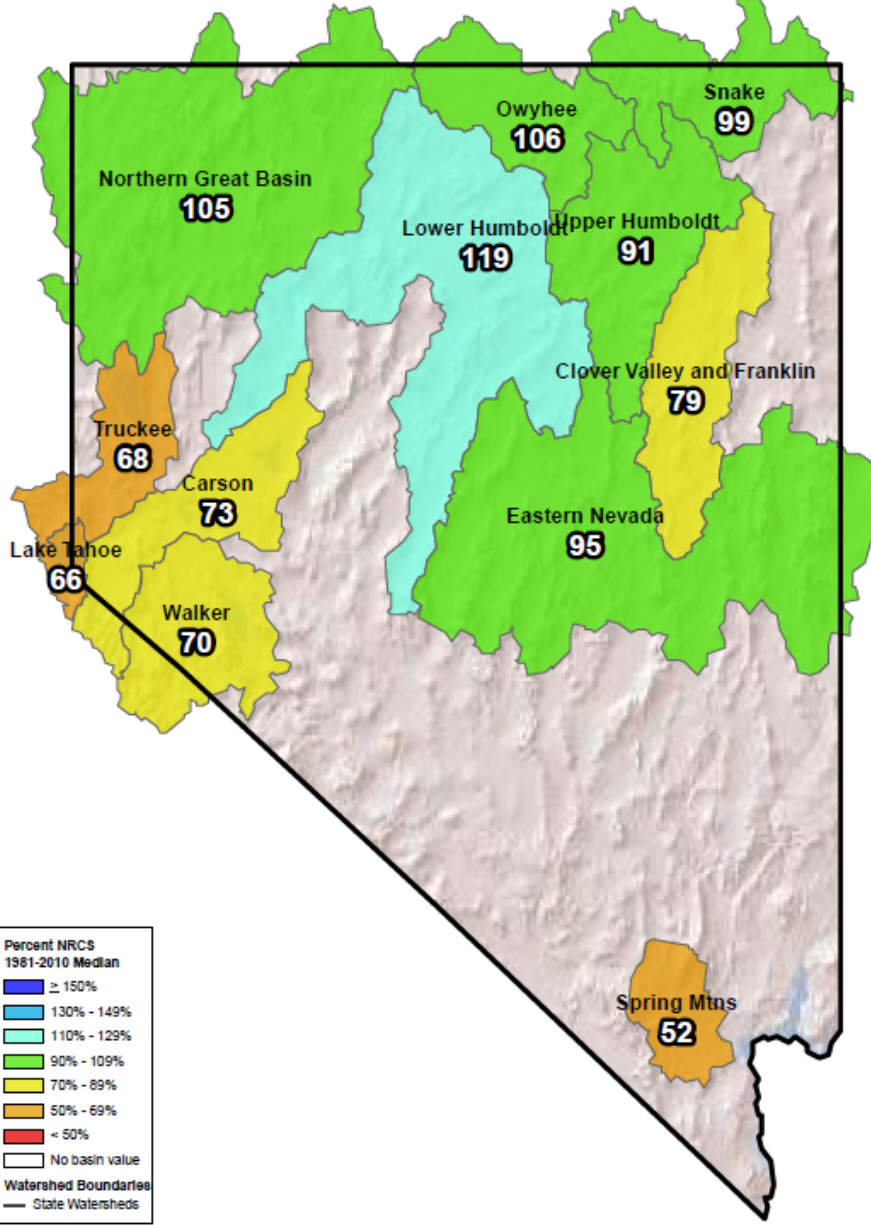
NV Snow Survey Website

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/snow/>

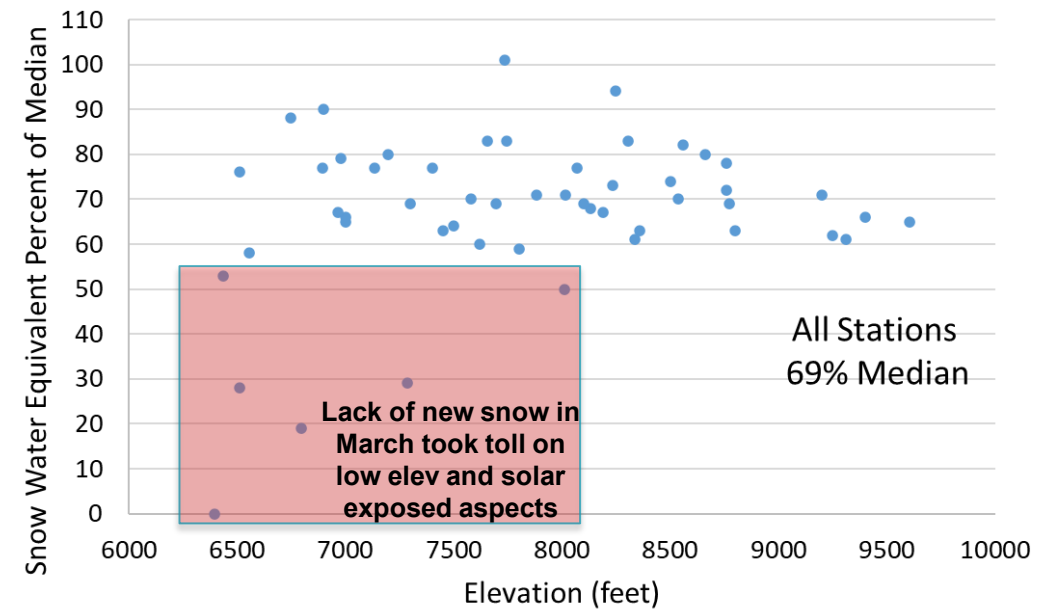
California/Nevada SNOTEL Snow/Precipitation Update Report
Based on Mountain Data from NRCS SNOTEL Sites
Provisional data, subject to revision
Data based on the first reading of the day (typically 00:00) for Thursday, April 15, 2021

Basin Site Name	Elev (ft)	Snow Water Equivalent			Water Year-to-Date Precipitation		
		Current (in)	Median (in)	Pct of Median	Current (in)	Average (in)	Pct of Average
LAKE TAHOE							
Mt Rose Ski Area	8801	19.2	36.3	53	27.3	47.4	58
Heavenly Valley	8534	8.9	19.4	46	18.8	27.4	69
Carson Pass	8360	12.6	31.3 _R	40	21.1	40.4 _R	52
Squaw Valley G.C.	8013	16.2	46.8	35	25.2	55.5	45
Marlette Lake	7884	11.8	16.9	70	16.8	28.3	59
Hagans Meadow	7742	1.2	7.8	15	16.8	25.5	66

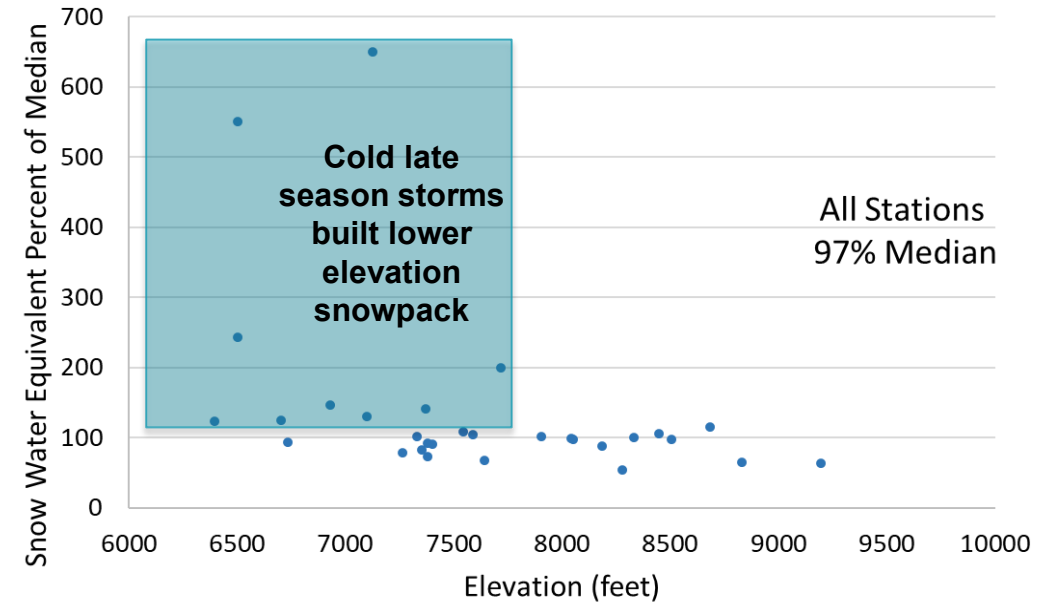


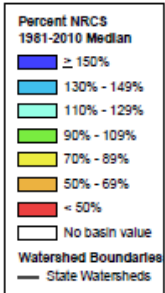
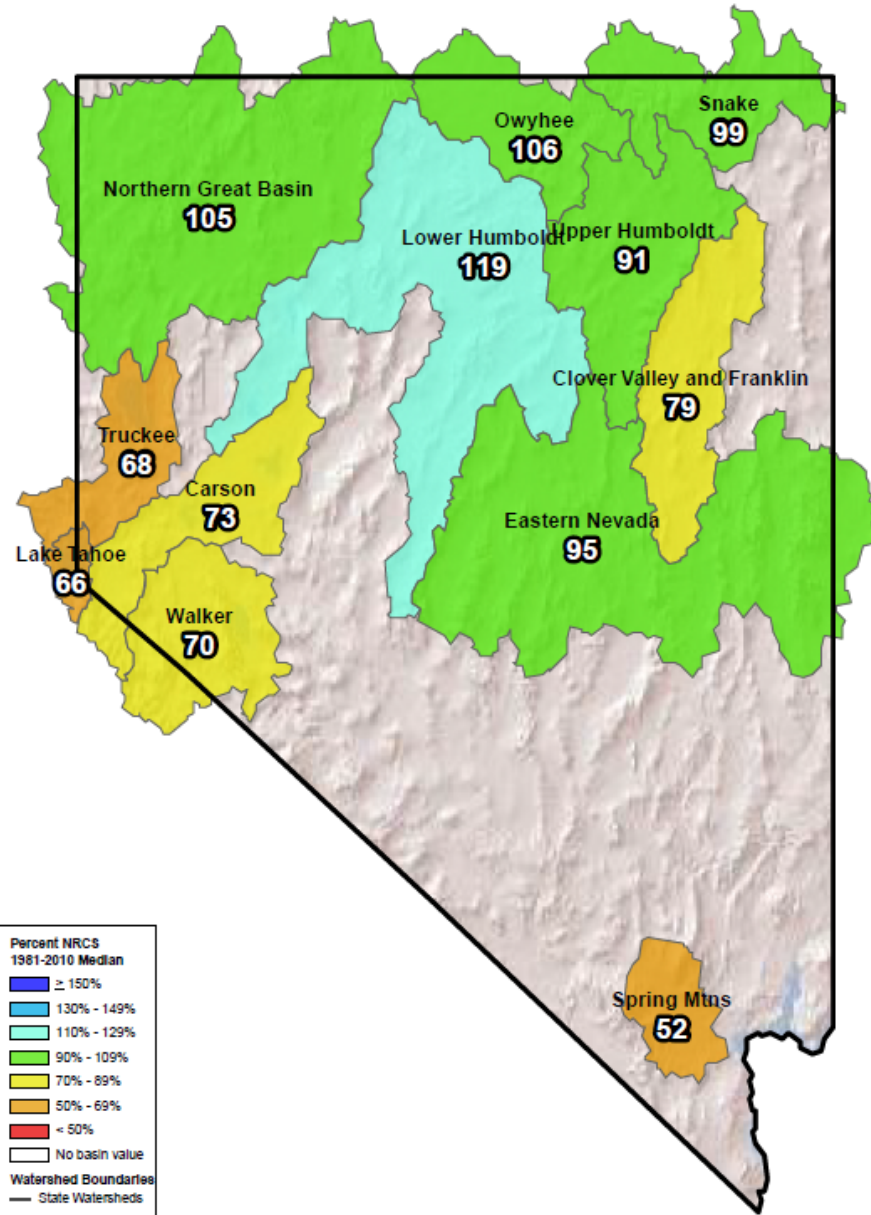


Tahoe, Truckee, Carson and Walker Basins Apr 1, 2021 Snowpack Percent of Median vs Elevation



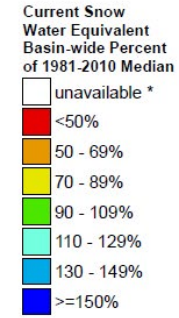
Humboldt Basin above Imlay Apr 1, 2021 Snowpack Percent of Median vs Elevation





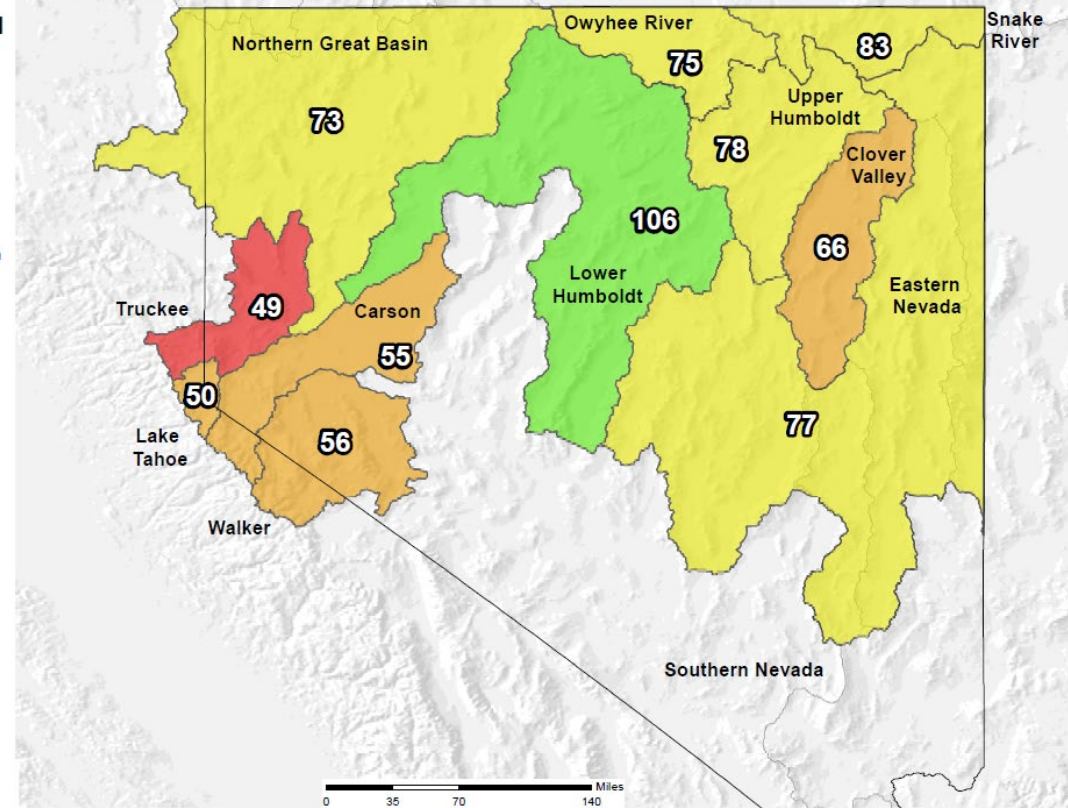
Nevada/California SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 15, 2021

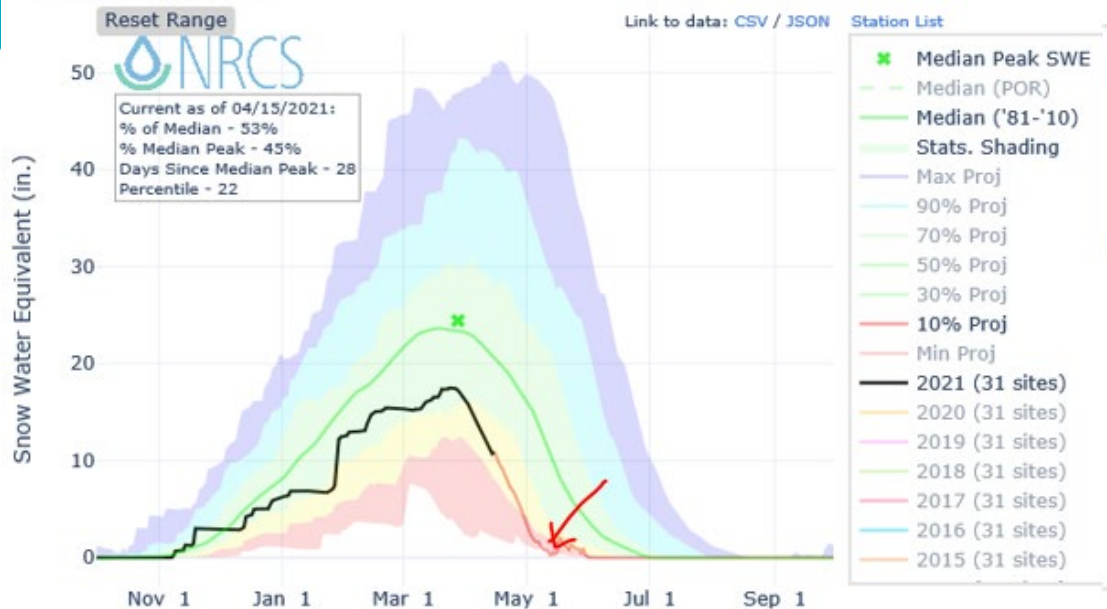


* Data unavailable at time of posting or measurement is not representative at this time of year

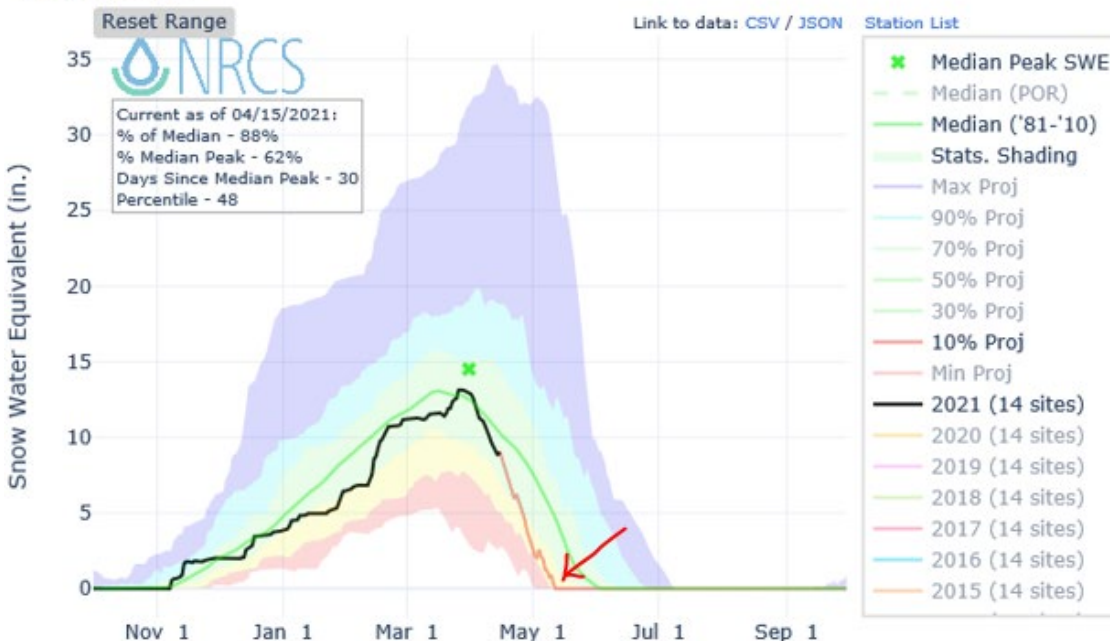
Provisional data subject to revision



SNOW WATER EQUIVALENT PROJECTIONS IN EASTERN SIERRA



SNOW WATER EQUIVALENT PROJECTIONS IN HUMBOLDT



Snowpacks peaked a bit early
 Snowmelt progressing rapidly
 Sierra 5th / Humboldt 9th fastest melt for April 1-15 back to 1981
SNOTEL melt-out possible early to mid-May.
 Represents snow below ~8,500ft, except in Walker

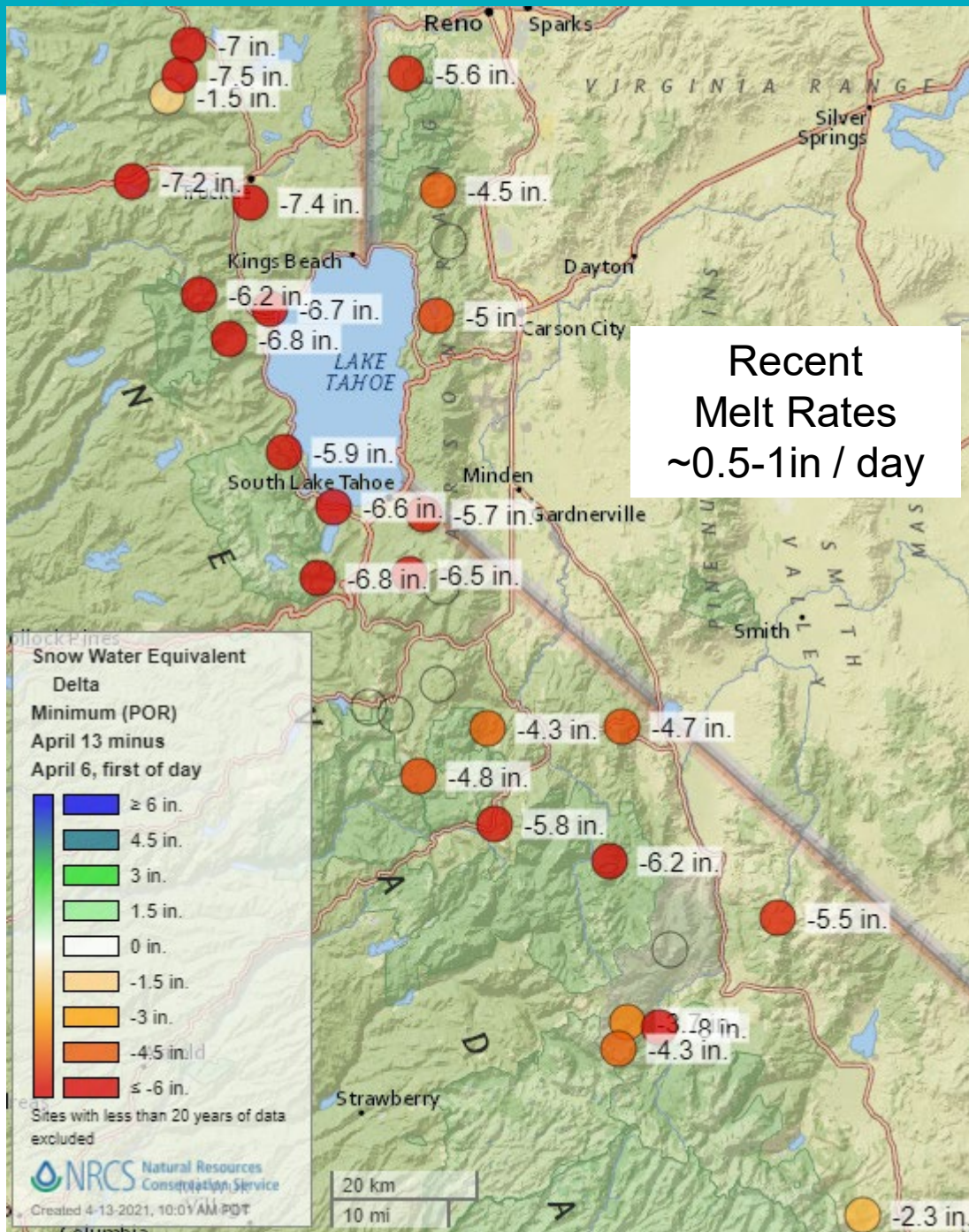
Basin	Basin Snow Water Equivalent				
	2021 Peak SWE (in)	2021 Peak Date	2021 Peak SWE # days early(-) or late(+)	April 15 Basin SWE (in)	Percent of 2021 Peak SWE remaining on Apr 15
Lake Tahoe	18.8	24-Mar	-4	10.8	57%
Truckee	18.9	25-Mar	-3	10.9	58%
Carson	17.0	25-Mar	-3	10.4	61%
Walker	15.2	28-Mar	-1	11.7	77%
Upper Humboldt	12.1	27-Mar	-8	8.1	67%
Lower Humboldt	15.2	27-Mar	+1	10.8	71%

Data derived from the Interactive Basin Charts.
 Median peak values based on period of record SNOTEL data.

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Current SWE 4/15/21

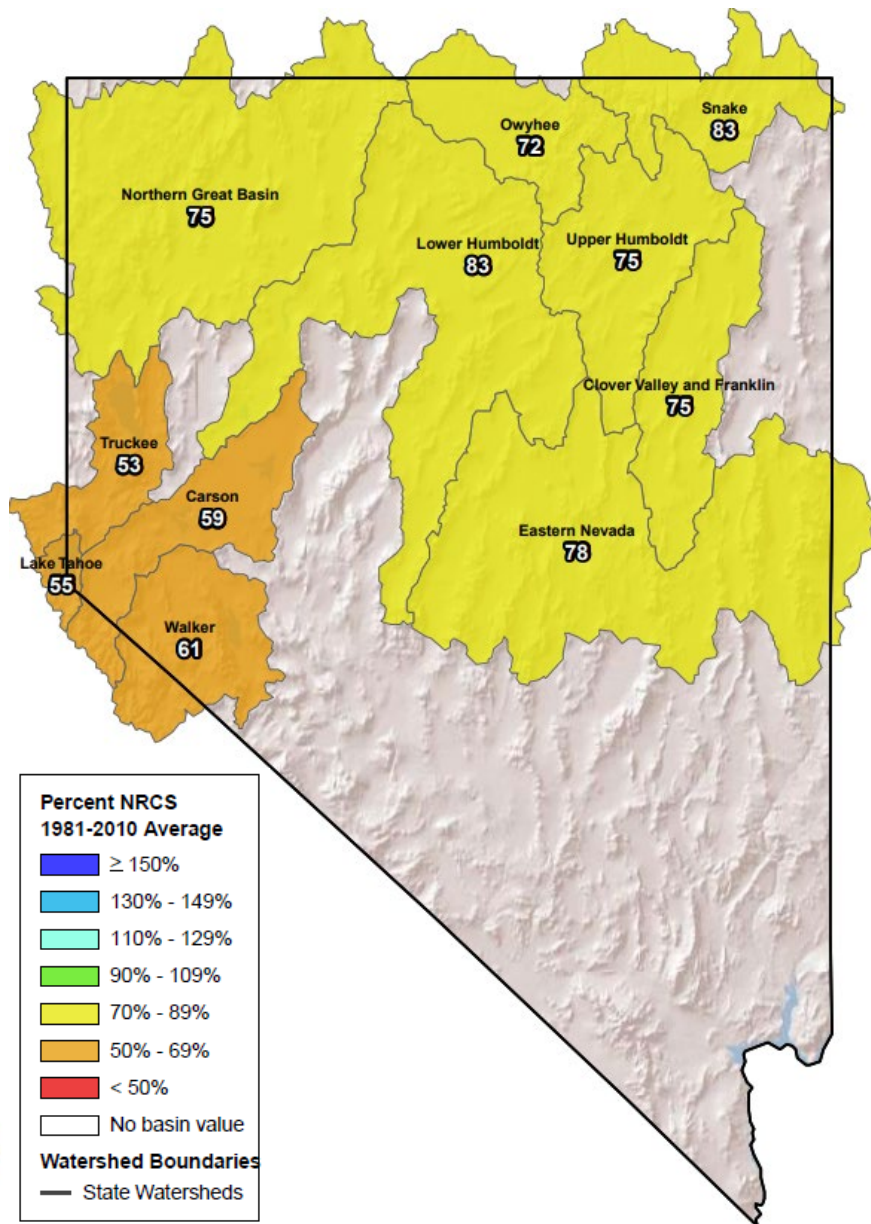


Basin Site Name	Elev (ft)	Current (in)
LAKE TAHOE		
Mt Rose Ski Area	8801	19.2
Heavenly Valley	8534	8.9
Carson Pass	8360	12.6
Squaw Valley G.C.	8013	16.2
Marlette Lake	7884	11.8
Hagans Meadow	7742	1.2
Echo Peak	7653	18.2
Rubicon #2	7619	10.3
Tahoe City Cross	6797	0.0
Ward Creek #3	6745	20.5
Fallen Leaf	6242	0.0
Basin Index (%)		
TRUCKEE RIVER		
Mt Rose Ski Area	8801	19.2
Independence Lake	8338	25.0
Big Meadow	8235	8.6
Squaw Valley G.C.	8013	16.2
Marlette Lake	7884	11.8
Independence Camp	6980	1.2
Css Lab	6894	14.6
Tahoe City Cross	6797	0.0
Ward Creek #3	6745	20.5
Truckee #2	6509	2.3
Little Valley	6493	0.0
Independence Creek	6436	0.0

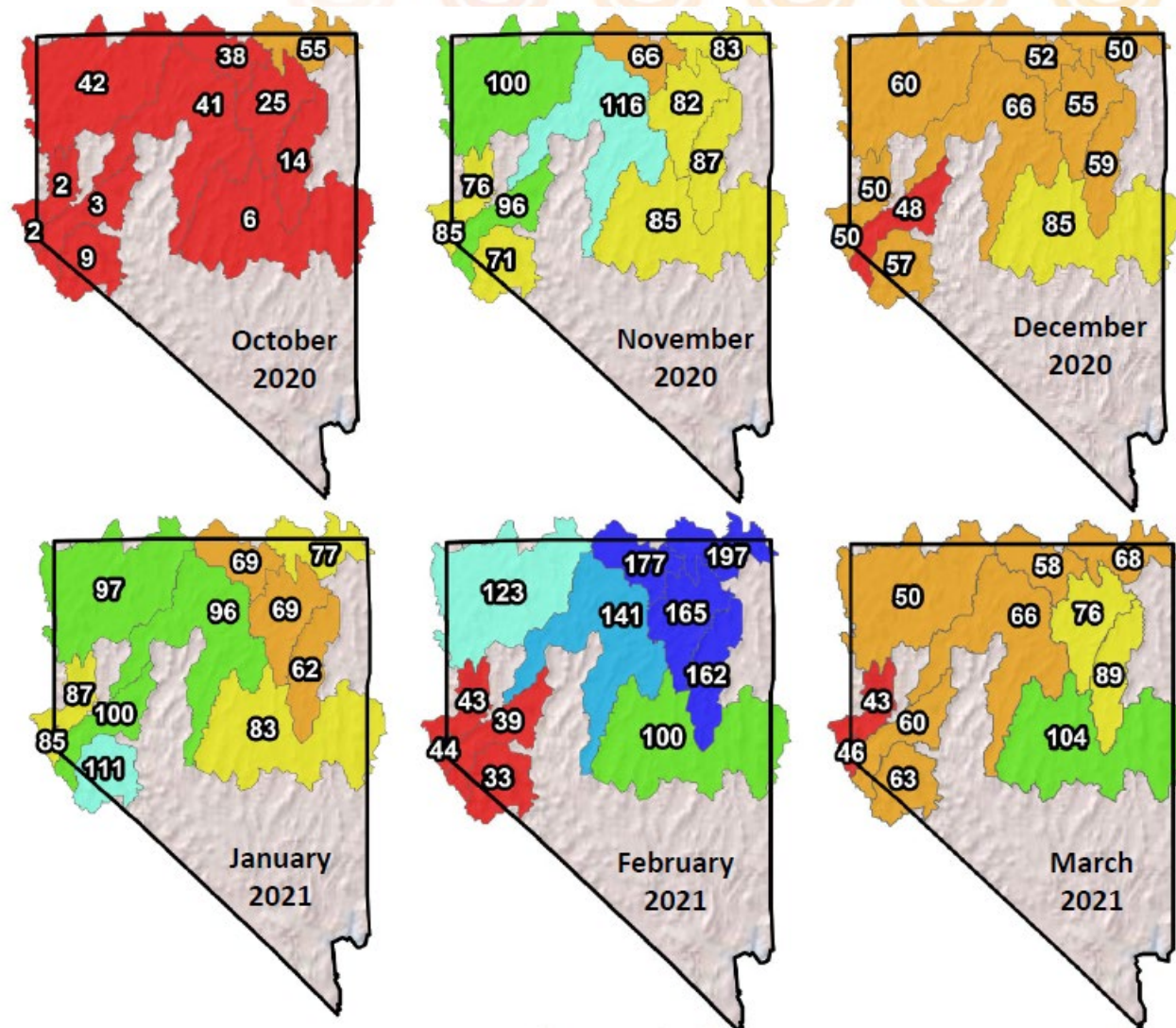
Basin Site Name	Elev (ft)	Current (in)
CARSON RIVER		
Ebbetts Pass	8661	20.2
Horse Meadow	8557	8.5
Heavenly Valley	8534	8.9
Carson Pass	8360	12.6
Monitor Pass	8306	5.0
Burnside Lake	8129	9.3
Blue Lakes	8067	16.9
Forestdale Creek	8017	18.4
Marlette Lake	7884	11.8
Hagans Meadow	7742	1.2
Poison Flat	7736	11.7
Spratt Creek	6063	0.0
Basin Index (%)		
WALKER RIVER		
Leavitt Lake	9604	35.5
Virginia Lakes Ridge	9400	10.2
Summit Meadow	9313	10.3
Lobdell Lake	9249	4.9
Sonora Pass	8770	15.5
Monitor Pass	8306	5.0
Leavitt Meadows	7198	0.0

Basin Site Name	Elev (ft)	Current (in)
UPPER HUMBOLDT RIVER		
Corral Canyon	8445	13.8
Jacks Peak	8424	-M
Green Mountain	8185	5.0
Lamoille #3	8051	4.9
Bear Creek	8040	14.5
Dorsey Basin	7903	8.5
Pole Canyon	7760	6.6
Stag Mountain	7640	-M
Jakes Creek	7380	-M
Jack Creek Upper	7377	14.0
Seventysix Creek	7350	4.3
Draw Creek	7332	7.9
Tent Mtn Lower	7100	-M
Fry Canyon	6798	0.2
Dry Creek	6555	0.5
Taylor Canyon	6325	0.0
Basin Index (%)		
LOWER HUMBOLDT RIVER		
Big Creek Sum	8685	21.6
Granite Peak	8503	17.0
Toe Jam	7690	10.0
Snowstorm Mtn	7403	-M
Lewis Peak	7370	9.2
Porter Canyon	7187	0.0
Buckskin Lower	6930	6.0
Midias	6630	-M
Golconda	6616	0.0
Lamance Creek	6395	0.0

Water Year Precipitation Oct 1, 2019 – Apr 14, 2021



Monthly Precipitation Water Year 2021

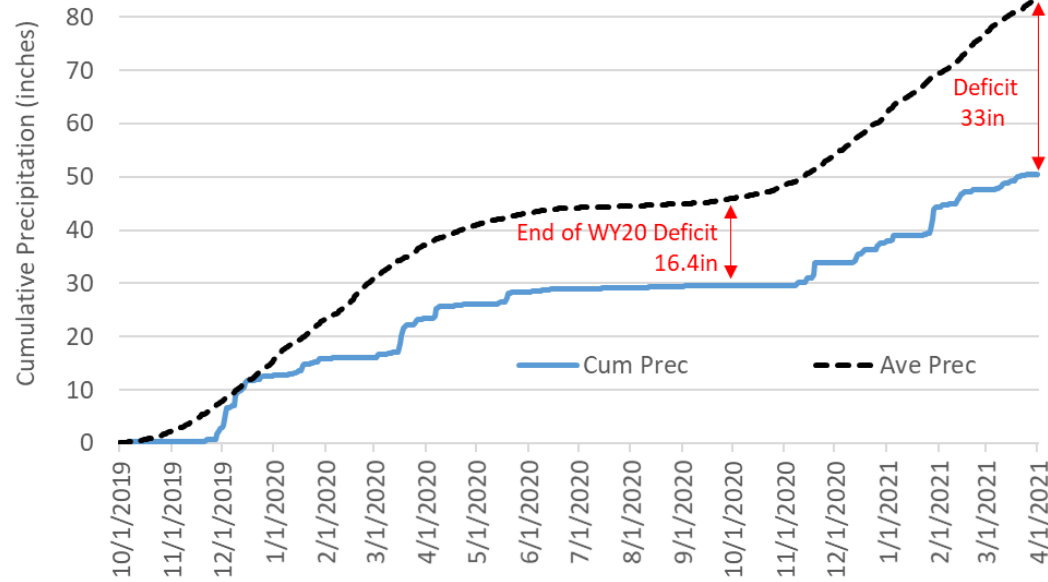


Truckee Basin

18-month Cumulative Precipitation vs Average
10/1/19 through 3/31/21

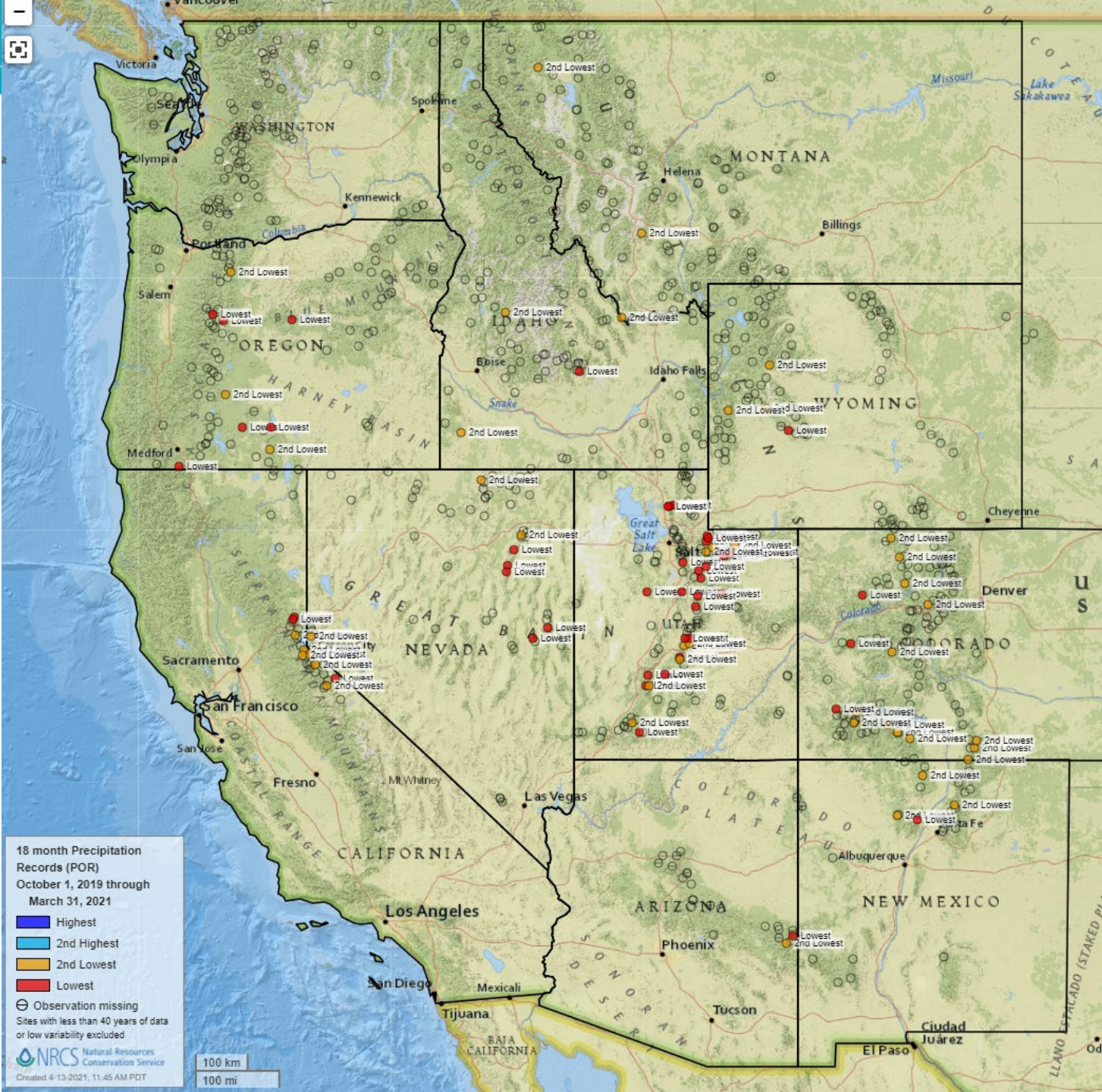


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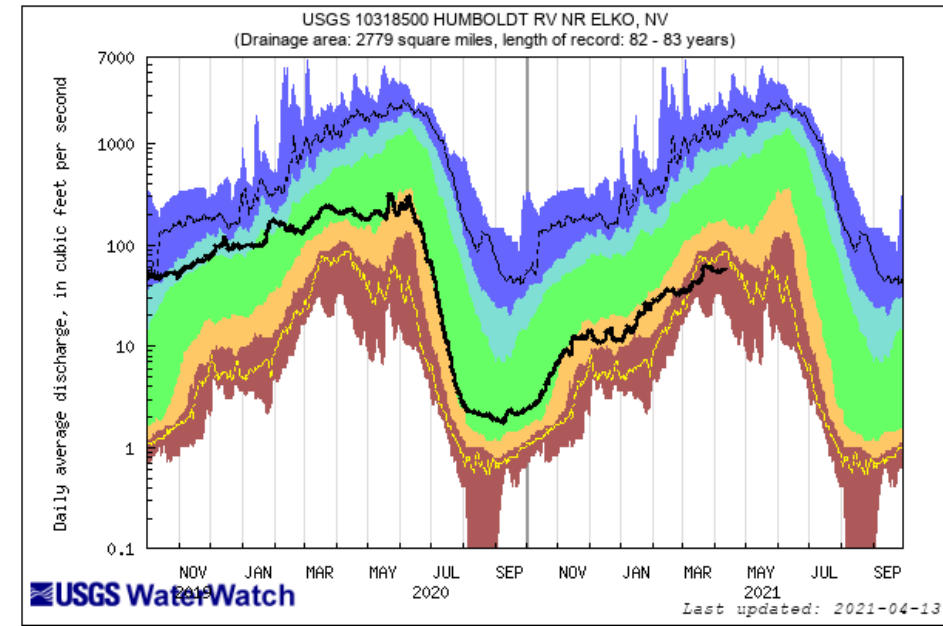
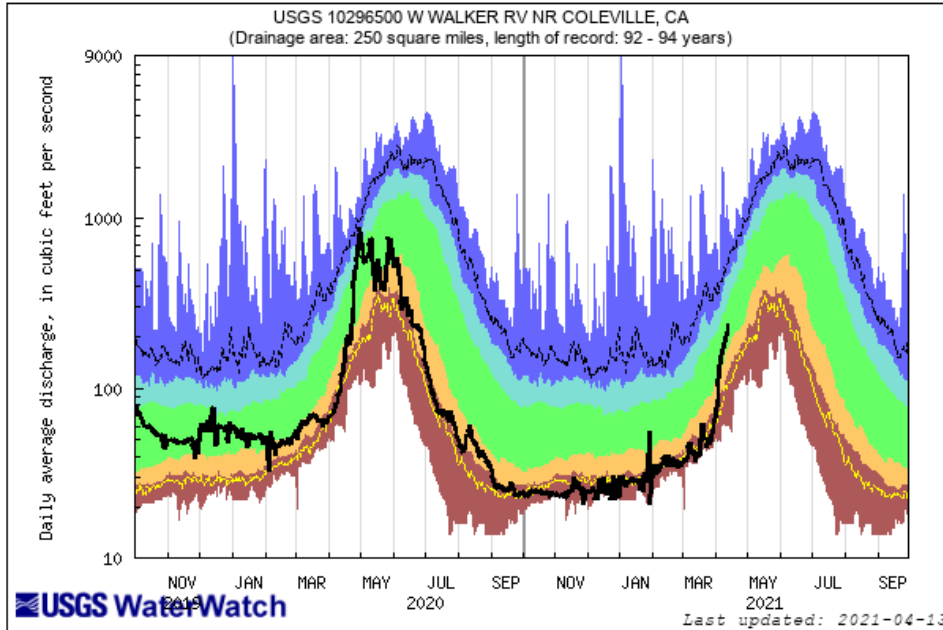
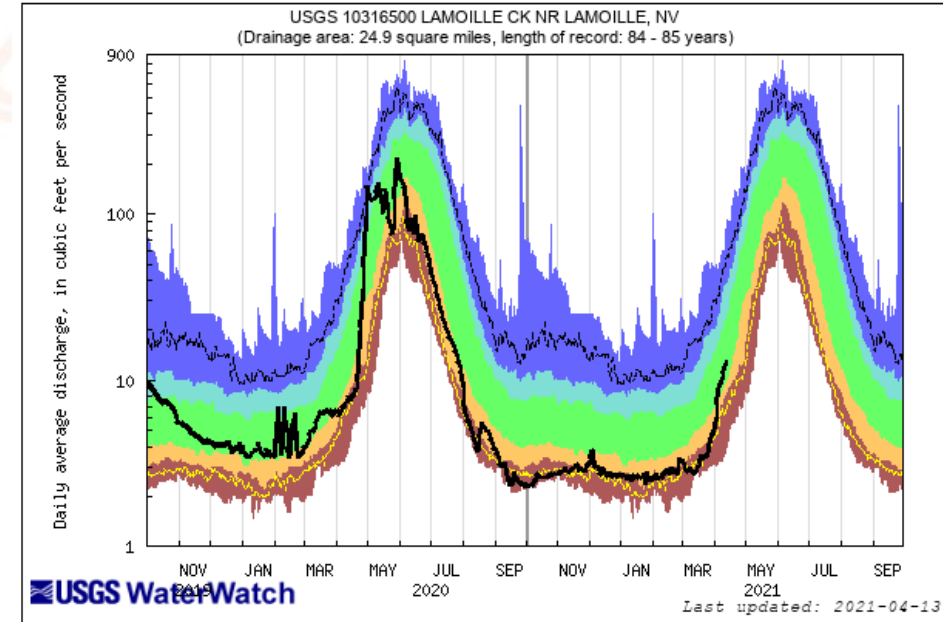
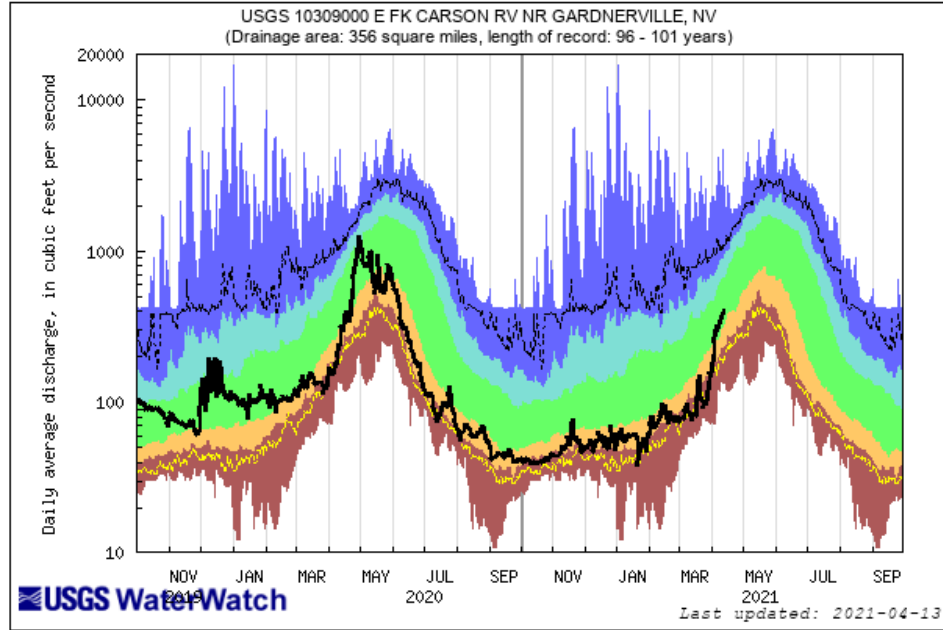


Basin	18 month Precipitation Deficit 10/1/19 to 3/31/21 (inches)	Average Water Year Precip (Oct-Sep)	Precipitation Deficit as Percent of Average Water Year Precipitation
Lake Tahoe	-32.2	45.7	-71%
Truckee	-33.0	46.0	-72%
Carson	-22.7	37.6	-61%
Walker	-21.7	31.9	-68%
Northern Great Basin	-9.7	28.7	-34%
Upper Humboldt	-10.6	28.3	-38%
Lower Humboldt	-9.4	27.5	-34%
Clover Valley	-14.9	32.4	-46%
Snake	-3.6	26.1	-14%
Owyhee	-8.2	26.1	-31%
Eastern Nevada	-12.9	24.7	-52%
Upper Colorado above Glen Canyon	-10.5	31.4	-34%



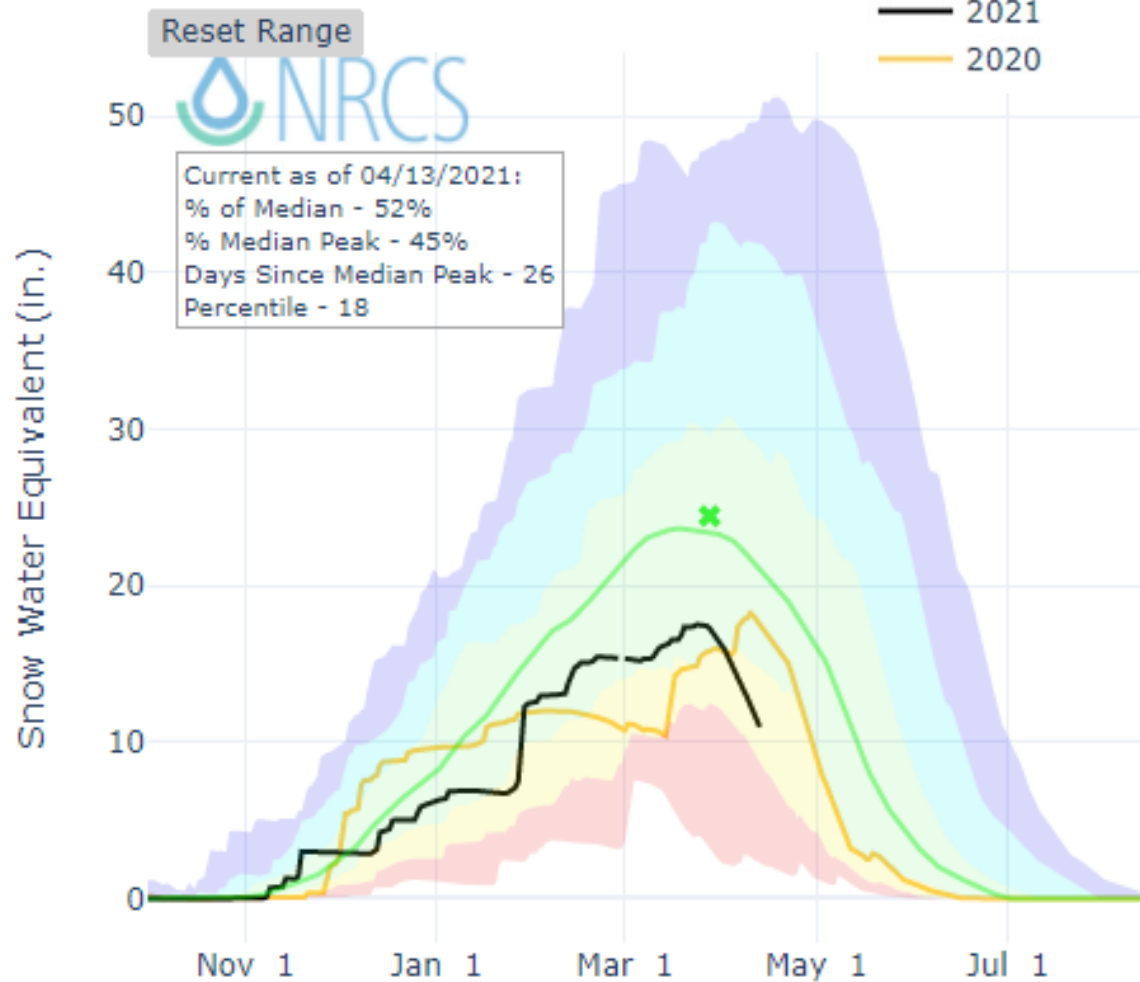


Streamflow 2020 vs 2021

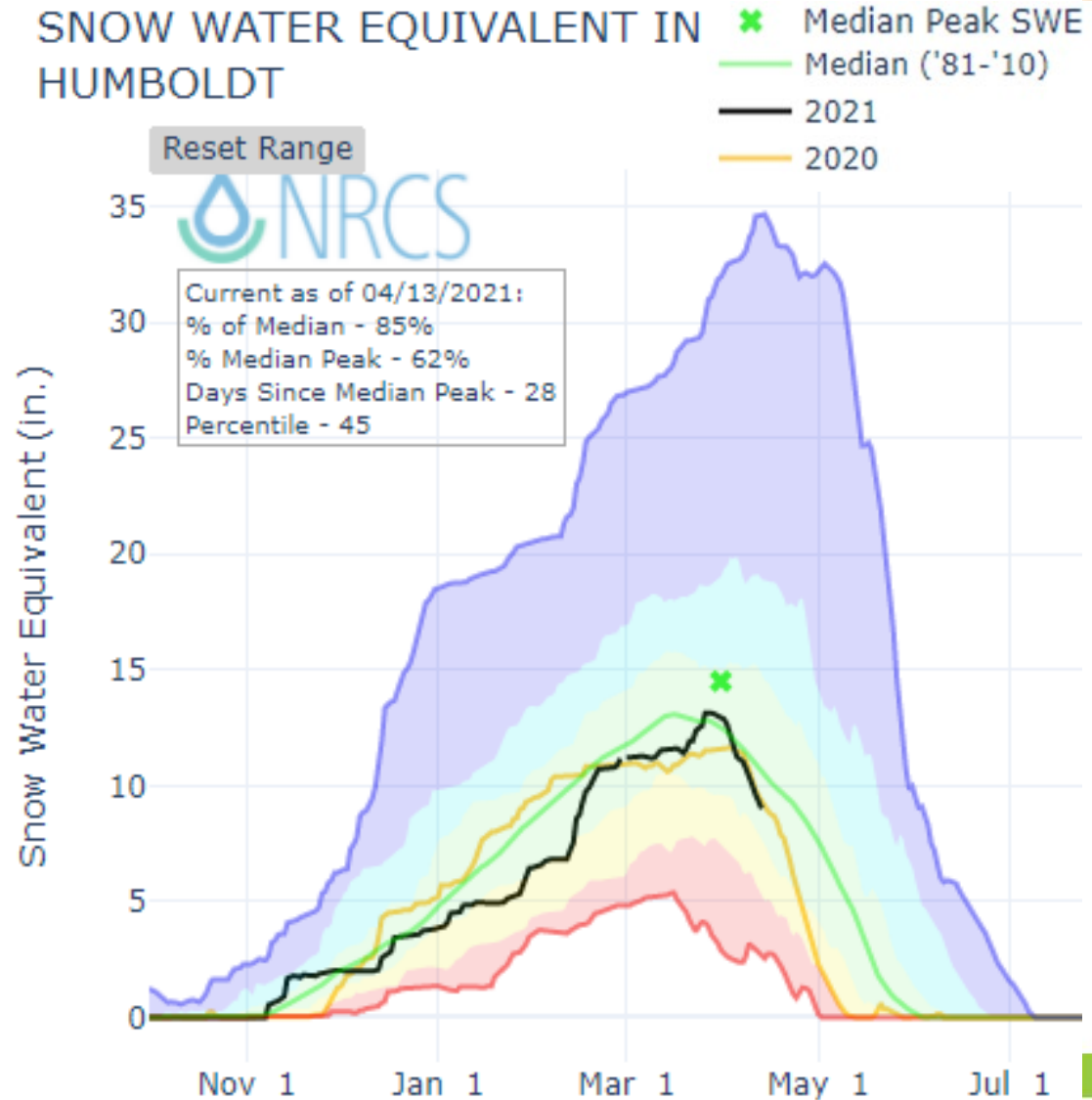


Snowpack 2020 vs 2021

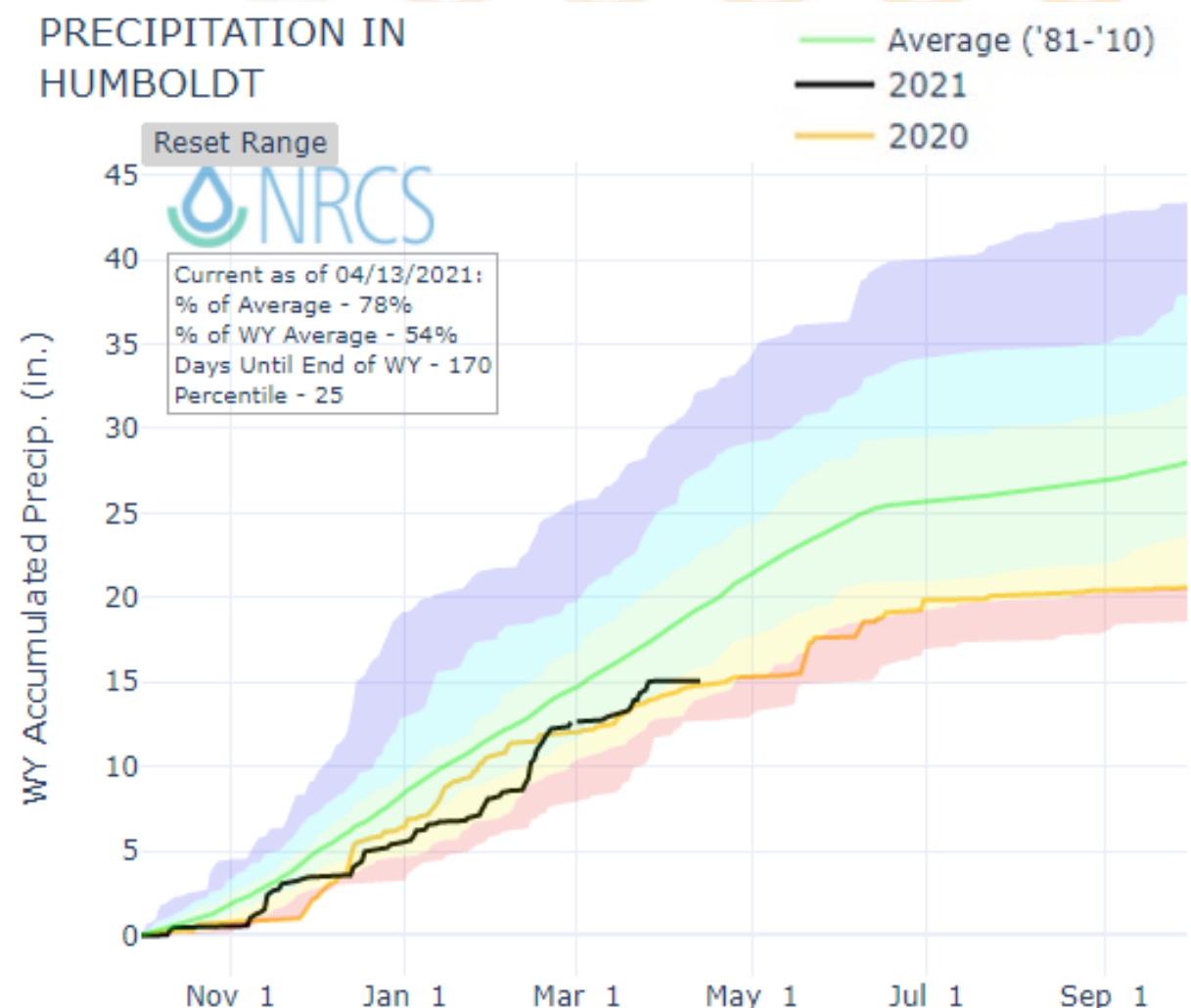
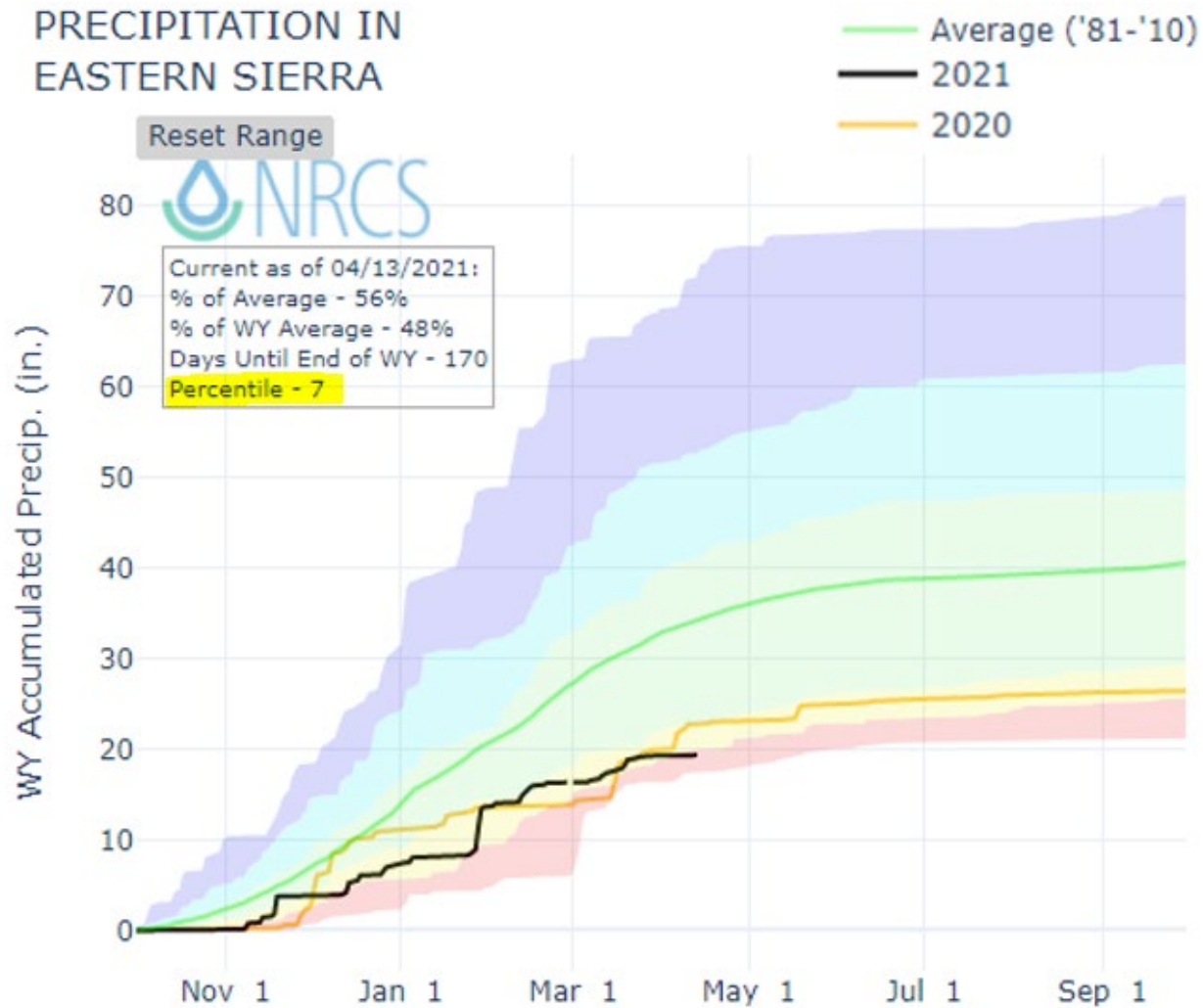
SNOW WATER EQUIVALENT IN EASTERN SIERRA



SNOW WATER EQUIVALENT IN HUMBOLDT



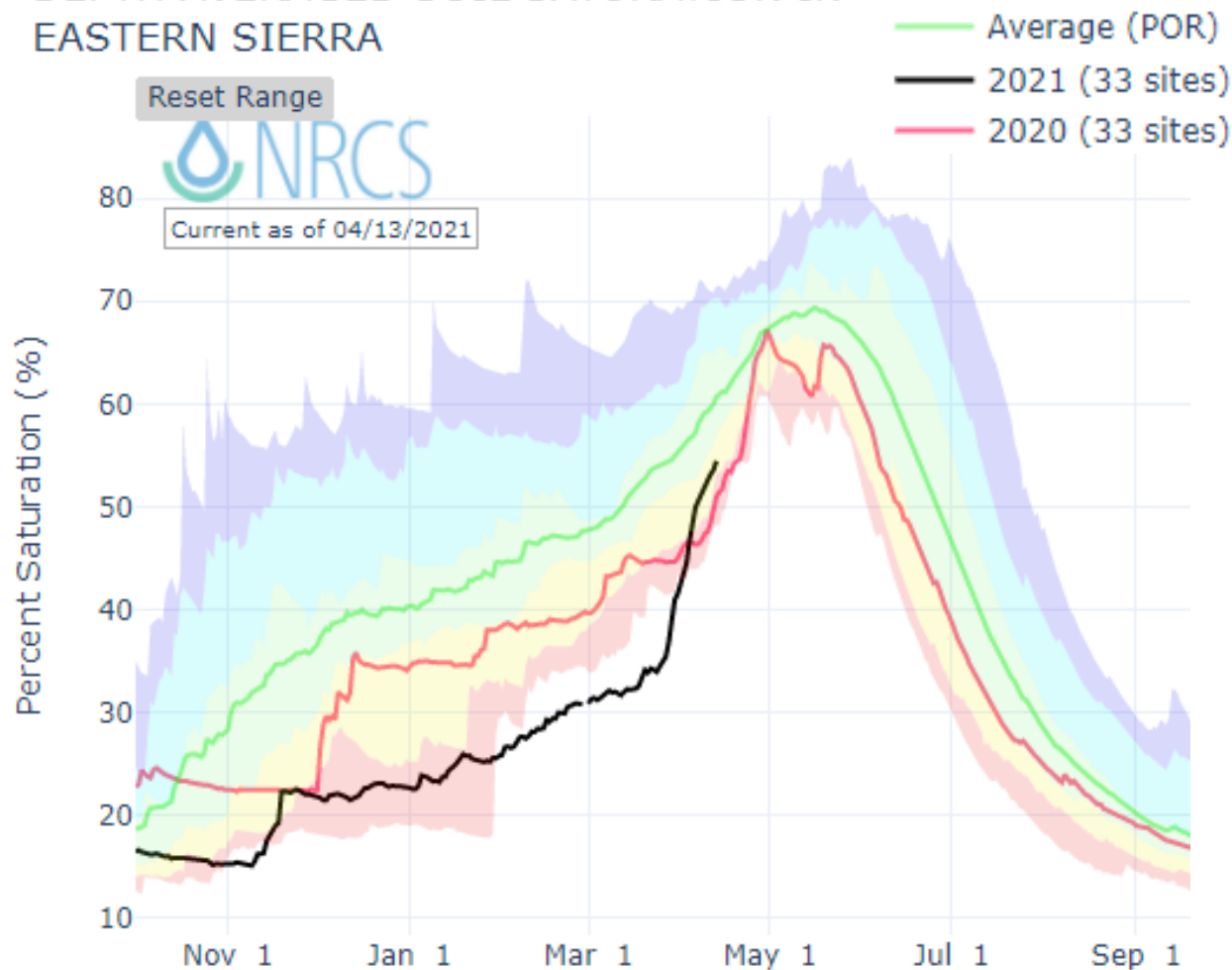
Water Year Precipitation 2020 vs 2021



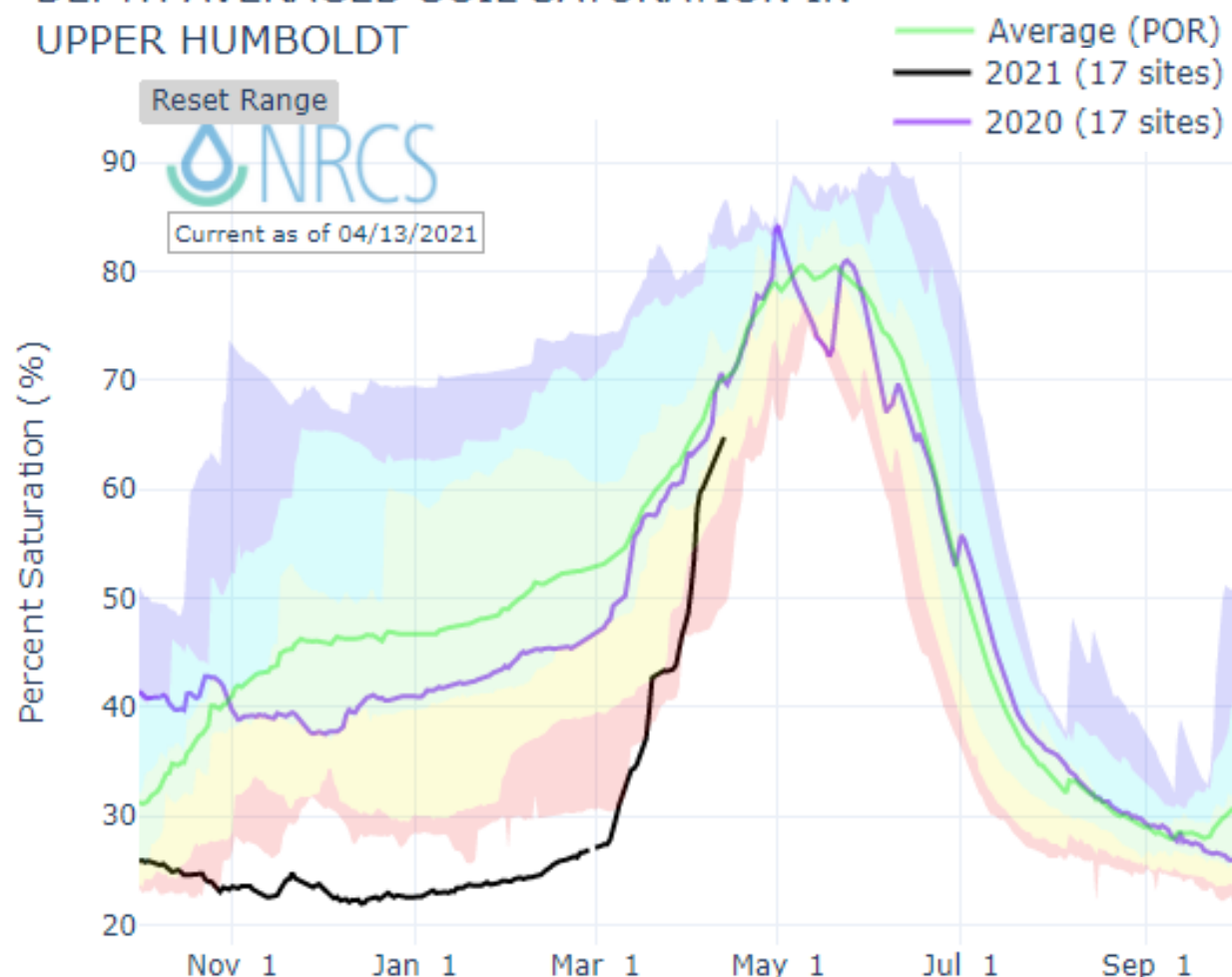
Soil Moisture 2020 vs 2021

*Soil Moisture POR based on data since Oct 2005

DEPTH AVERAGED SOIL SATURATION IN EASTERN SIERRA



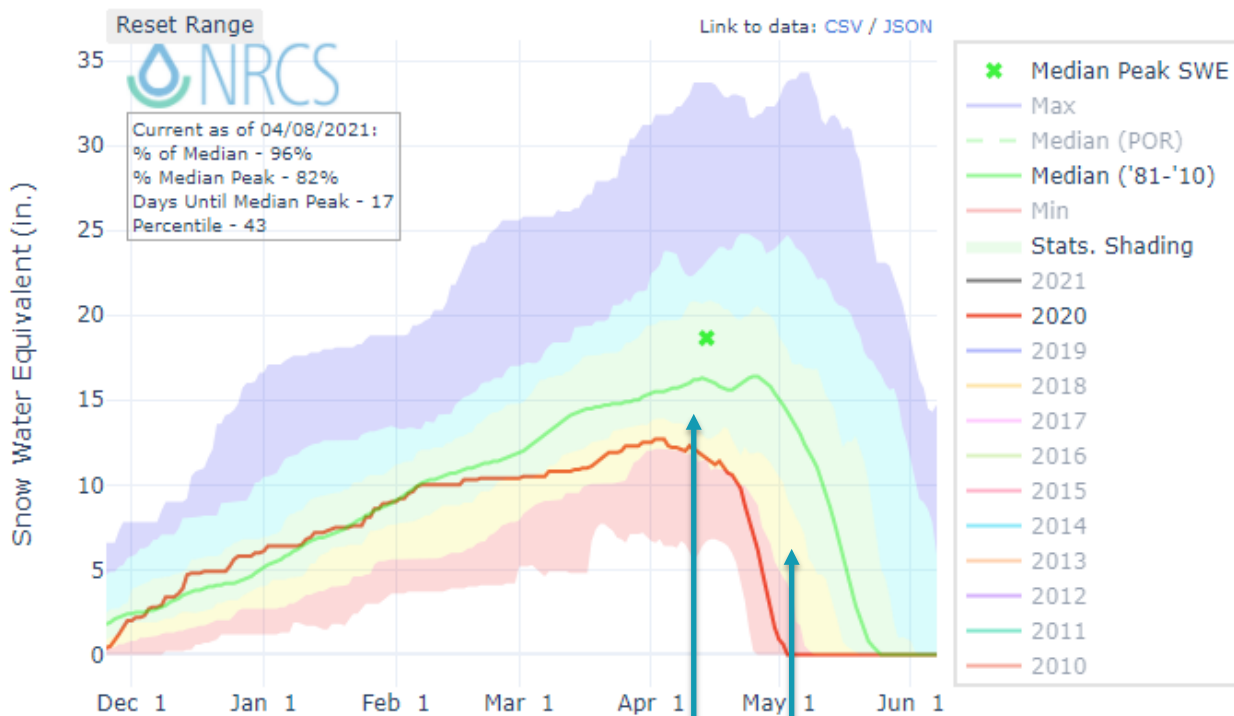
DEPTH AVERAGED SOIL SATURATION IN UPPER HUMBOLDT



How long do dry soils soak up snowmelt?

In 2020, Corral Canyon soil moisture increased for 14 days out of 23 days of melt

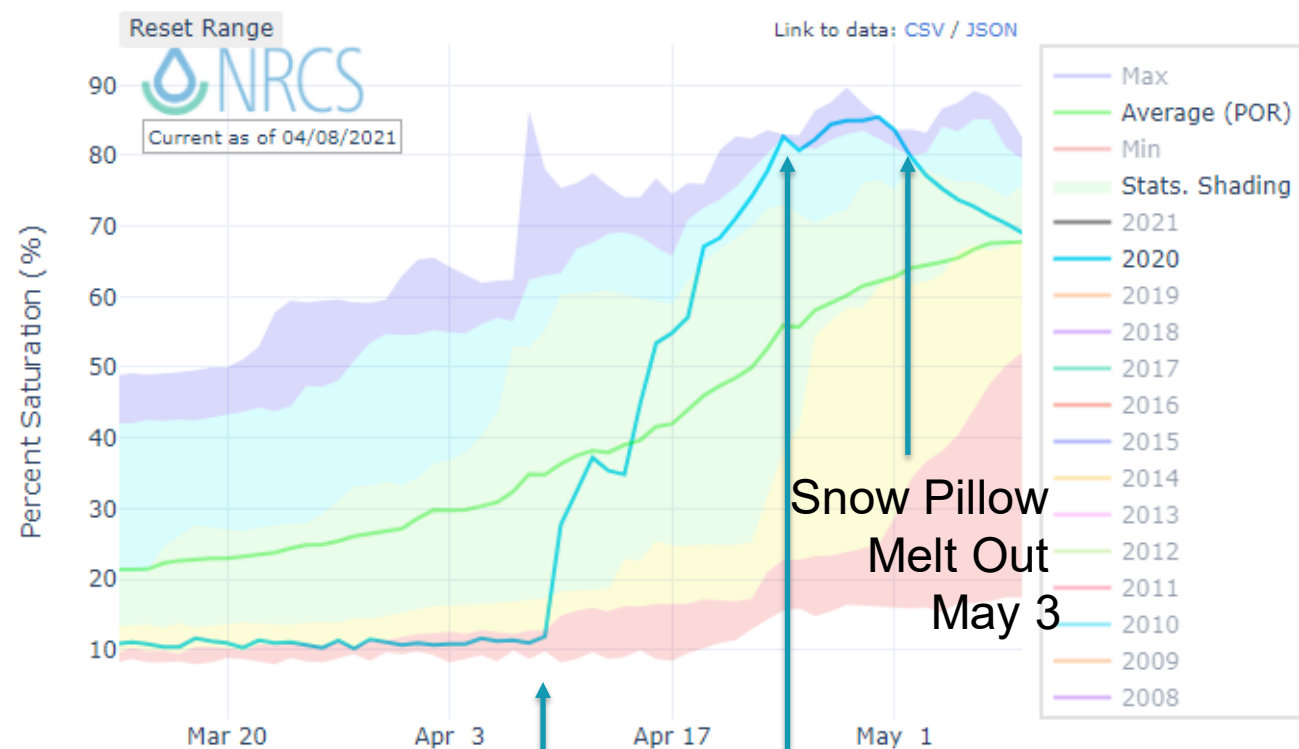
SNOW WATER EQUIVALENT AT CORRAL CANYON



Melt begins Apr 10

Snow Pillow Melt Out May 3

DEPTH AVERAGED SOIL SATURATION AT CORRAL CANYON



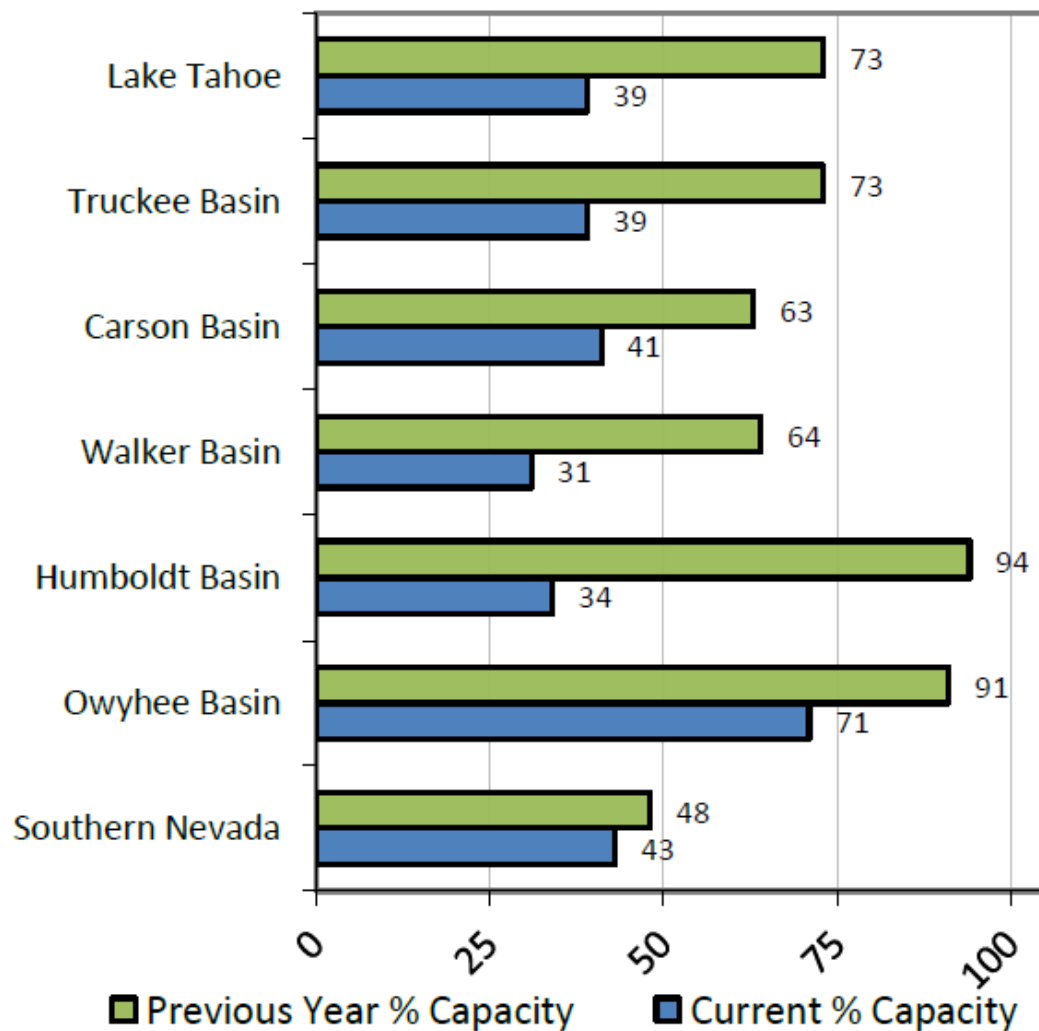
Snow Pillow Melt Out May 3

Melt begins Apr 10

Near Saturation April 24

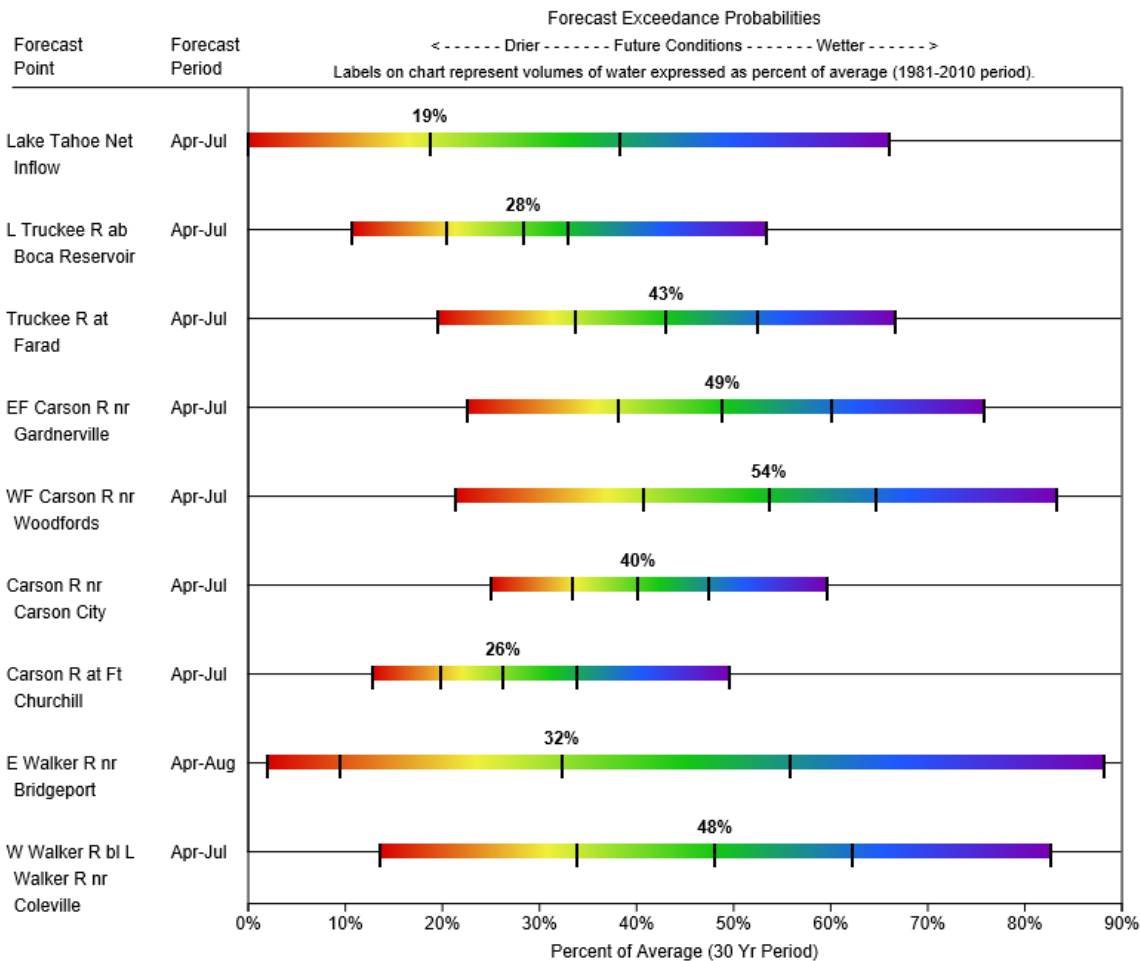


Reservoir Storage 2020 vs 2021

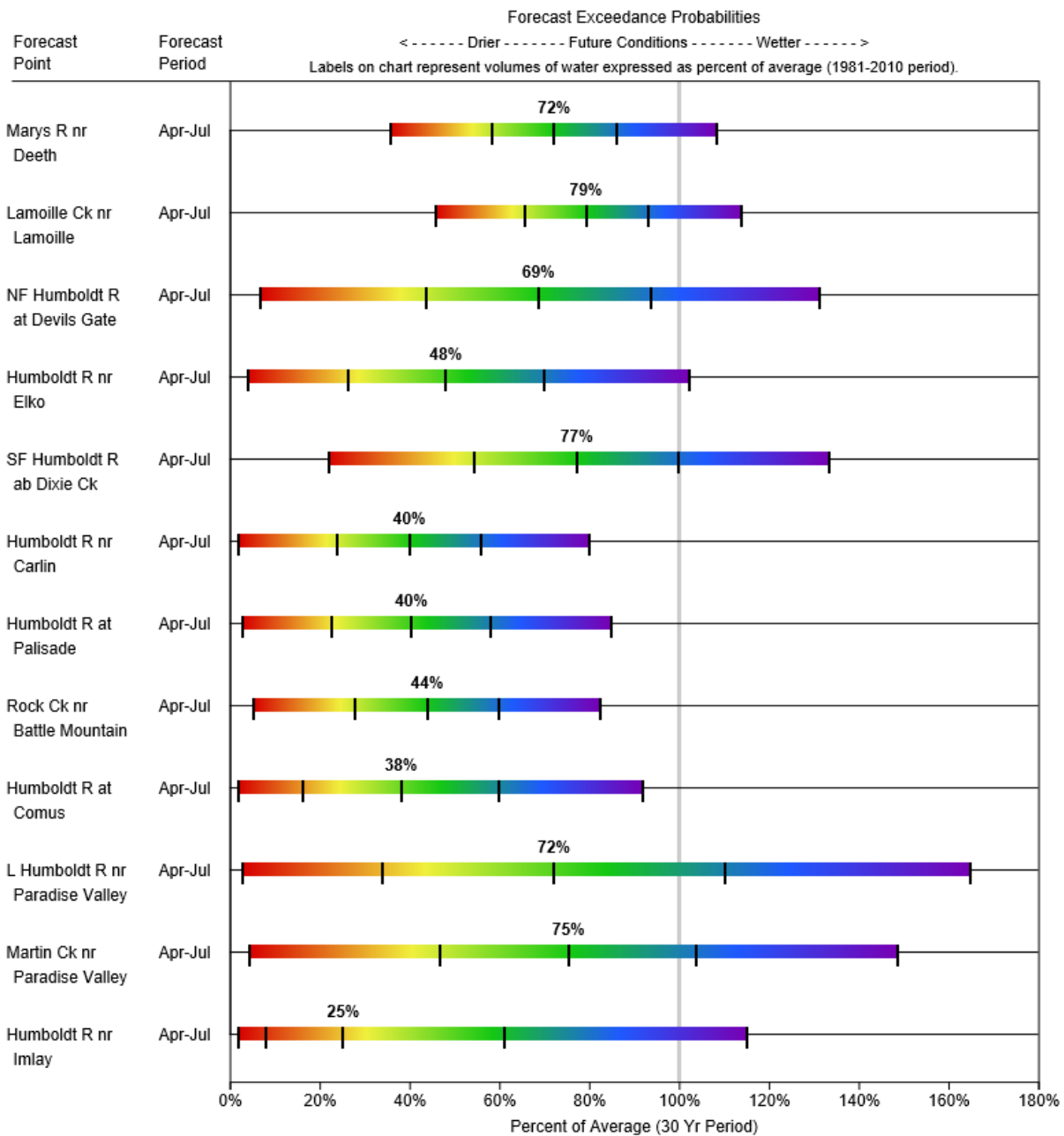


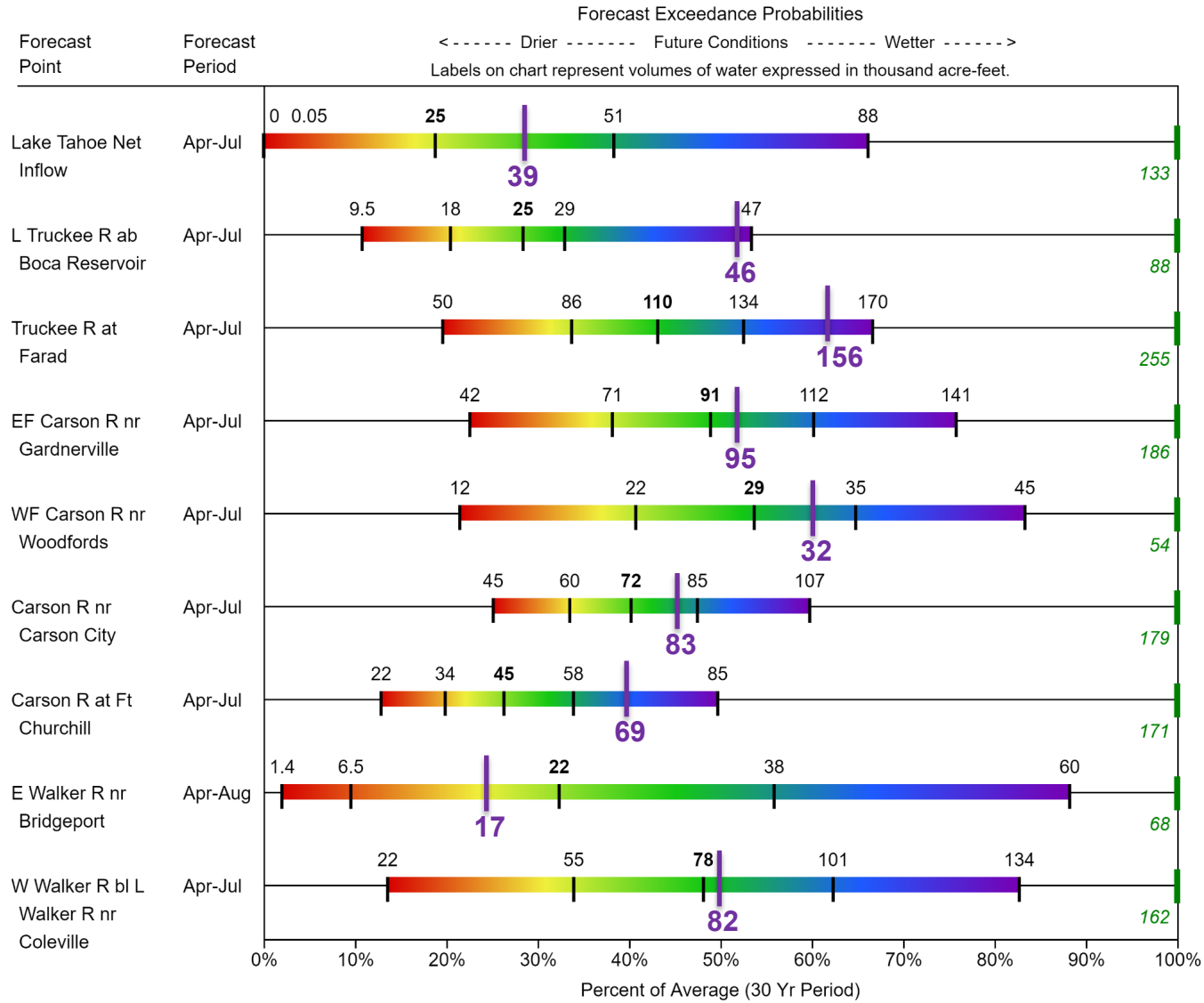
Streamflow Forecasts: **50% exceedance** / **70%** / **90%**
 Sierra: **19-54% average** / **0 - 41%** / **0 - 23%**
 Humboldt: **25-77% average** / **25 - 66%** / **2-46%**

Eastern Sierra Basin Summary
 Water Supply Forecasts
 April 1, 2021



Humboldt River Summary
 Water Supply Forecasts
 April 1, 2021





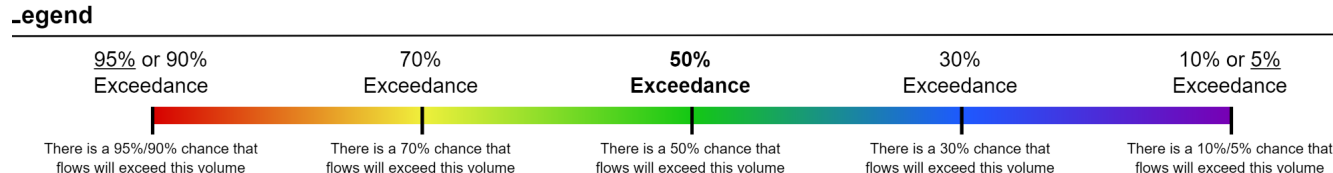
April 1, 2021 Volumetric Forecasts

Compared to 2020 Observed Runoff Volumes

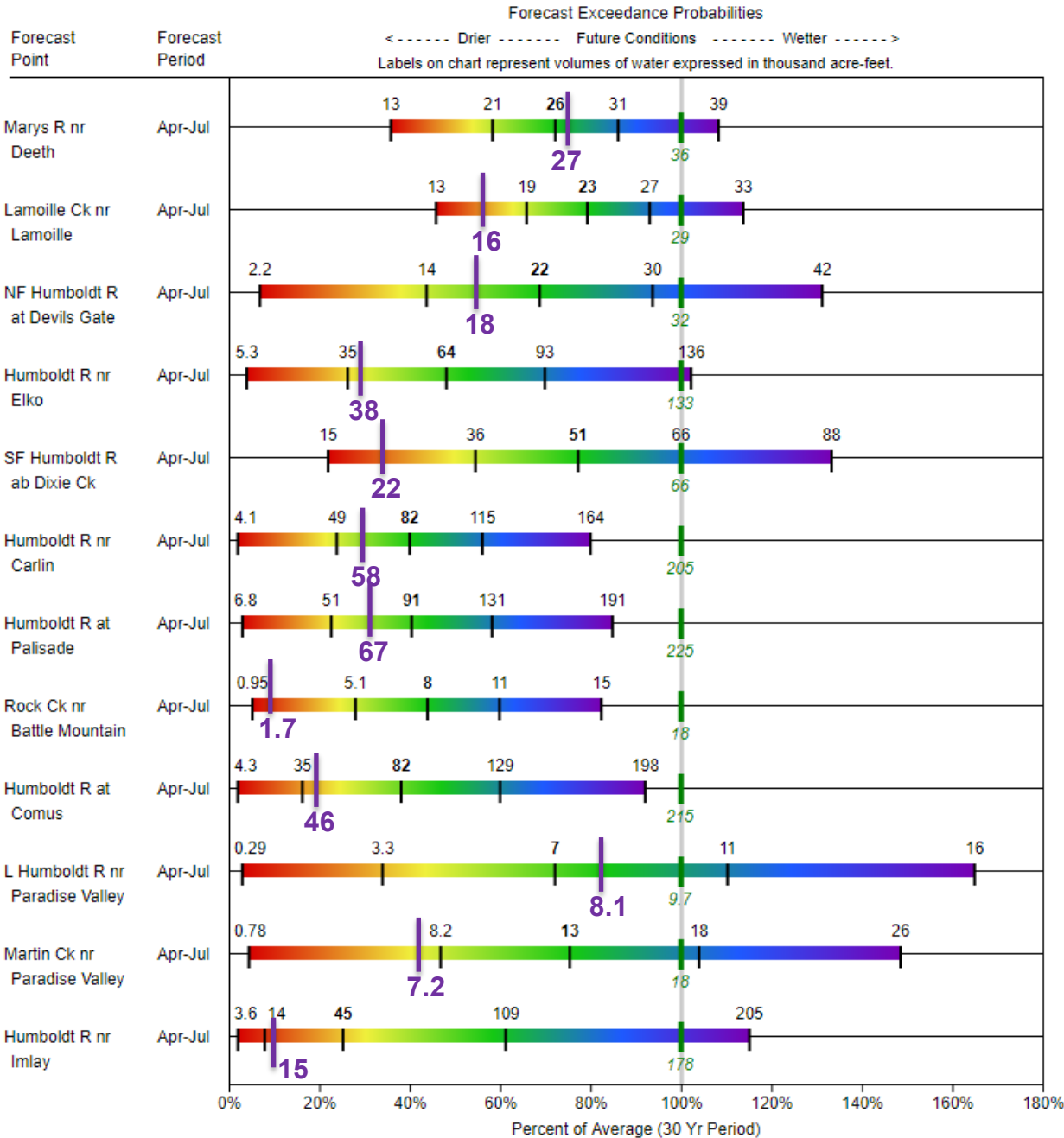
Eastern Sierra

2021 forecasts < 2020 observed

- Reasons:
- Little late snow in 2021
 - Less water year precip
 - Drier soils
 - Lower baseflows
 - Dry spring outlook



2020 Observed



April 1, 2021
Volumetric
Forecasts

Compared to
2020 Observed
Runoff Volumes



Humboldt

2020 observed flows are less than
2021 50% exceedance forecasts

Conditions to note:
Snowpack a bit better in 2021

But...
Soil moisture significantly less
Base flows lower

70 & 90% exceedance volumes likely



2020 Observed

Summary

Eastern Sierra

- 2021 had one large big AR, April 1 snowpack ~70% median. (without AR snowpack ~45%)
- Snowmelt is progressing rapidly, SNOTEL melt-out possible by early to mid-May
- Soil moisture recovering from record low conditions, resulting in reduced runoff efficiency
- 18-month precipitation 2nd lowest in SNOTEL record.
- Streamflow forecasts 19-54% of average based on 50% exceedance.
70% exceedance forecasts result in <40% A-J streamflow, 90% exceedance forecasts <25%.

Humboldt

- April 1, 2021 snowpack a bit better than 2020, thanks to more March snowfall
- 18-month precipitation in Rubies is lowest in SNOTEL record.
- Soil moisture significantly less than any year since Oct 2005, greatly reduced runoff efficiency.
- Streamflow forecasts 25-77% of average based on 50% exceedance.
70% exceedance forecasts result in 25-66% A-J streamflow, 90% exceedance forecasts 2-46%.



New 30 Year Normals - 1991-2020 Period

1. For the 1991-2020 period averages & medians will be calculated and stored.
2. The median will be default central tendency in NRCS products.
3. The median better represents the middle of the dataset, with half the years above and half below.
4. The target publication date for 1991-2020 normals is October 1, 2021
5. Normals will be calculated for sites with ≥ 10 years of data in 30-year period.

Data types:

- Daily SWE & Accumulated Precipitation
- Peak SWE and Peak SWE Date
- Dates for Onset of Snow and Meltout
- Monthly Streamflow Volume and Reservoir Storage

NRCS averages and medians will be calculated and stored for cooperator snow sites in **California** and Canada (MSNT network), rather than waiting for the official normals to be released from the respective agencies. Using the same metric will allow for better comparison of conditions across the western region.

Since 2008 NRCS has added 17 SNOTEL sites

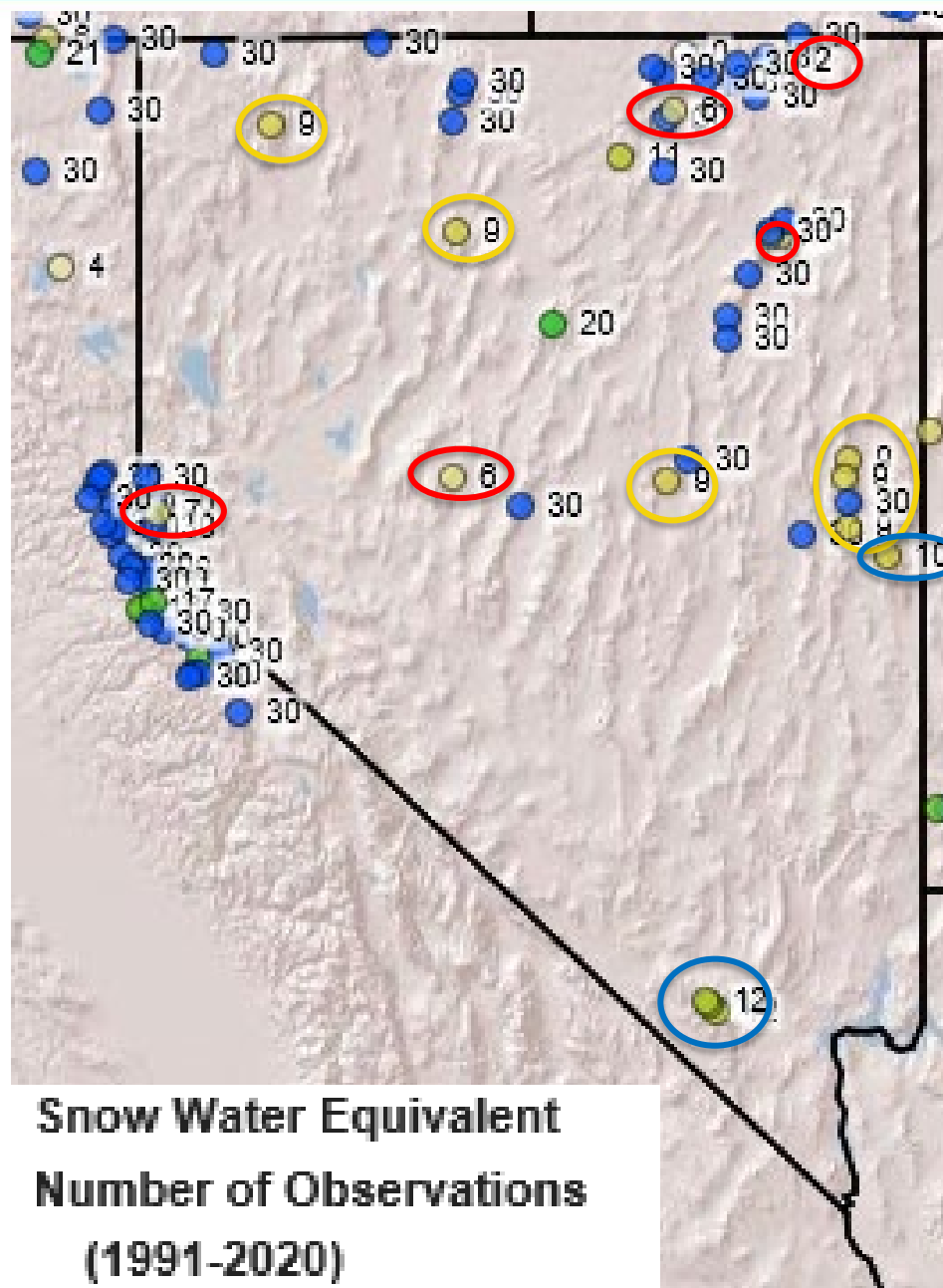
For 1991-2020 normals

5 sites have ≥ 10 years

6 sites have 9 years

6 sites have ≤ 7 years

SNOTEL	Years	Basin
Rainbow Cyn	12	Spring Mtns
Bristlecone Trail	12	Spring Mtns
Lee Canyon	12	Spring Mtns
Toe Jam	11	Lower Humboldt
Wheeler Peak	10	Eastern NV
Summit Lake	9	Northern Great Basin
Golconda	9	Eastern NV
Kalamazoo	9	Eastern NV
Bird Ck	9	Eastern NV
Cave Mtn	9	Eastern NV
Vacarro	9	Eastern NV
Little Valley	7	Truckee
Pole Canyon	7	Clover Valley
Dry Ck	7	Upper Humboldt
Porter Canyon	6	Eastern NV
Fry Canyon	6	Upper Humboldt
Oneil Ck	2	Snake



Contact us anytime with questions and comments



NRCS Hydrologist – Nevada Water Supply Specialist

Jeff Anderson

jeff.anderson@usda.gov

775-834-0913

NRCS Nevada Snow Program Manager

Jim Komar

james.komar@usda.gov

775-834-0891

