



United States Department of Agriculture

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

February 11, 2021
Nevada Division of Water Resources

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

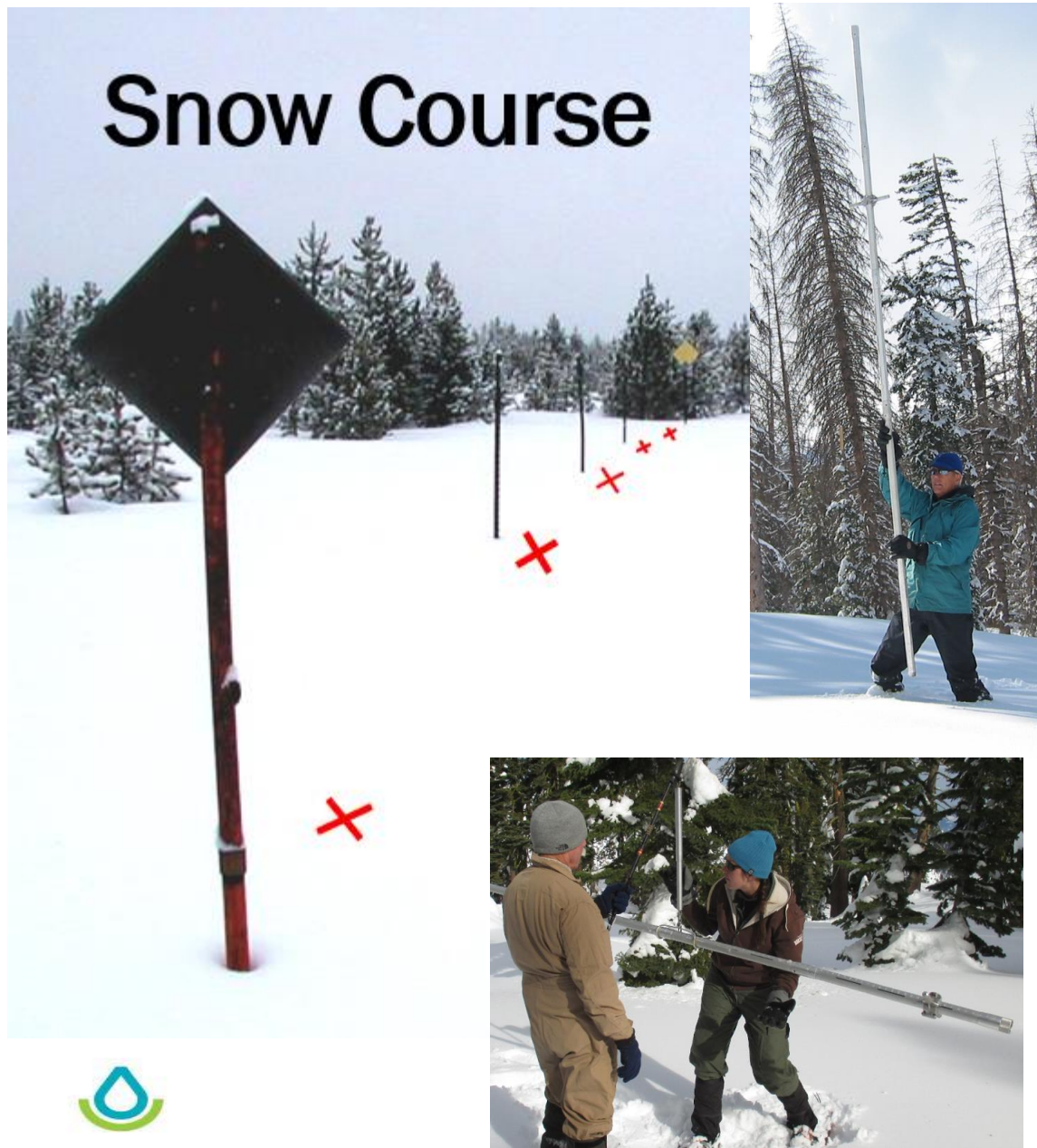
*Dave Doughty at
Freel Bench Snow Course
7132ft elevation
29in snow depth, 6.5in SWE
89% median
Lake Tahoe Basin
January 29, 2021*



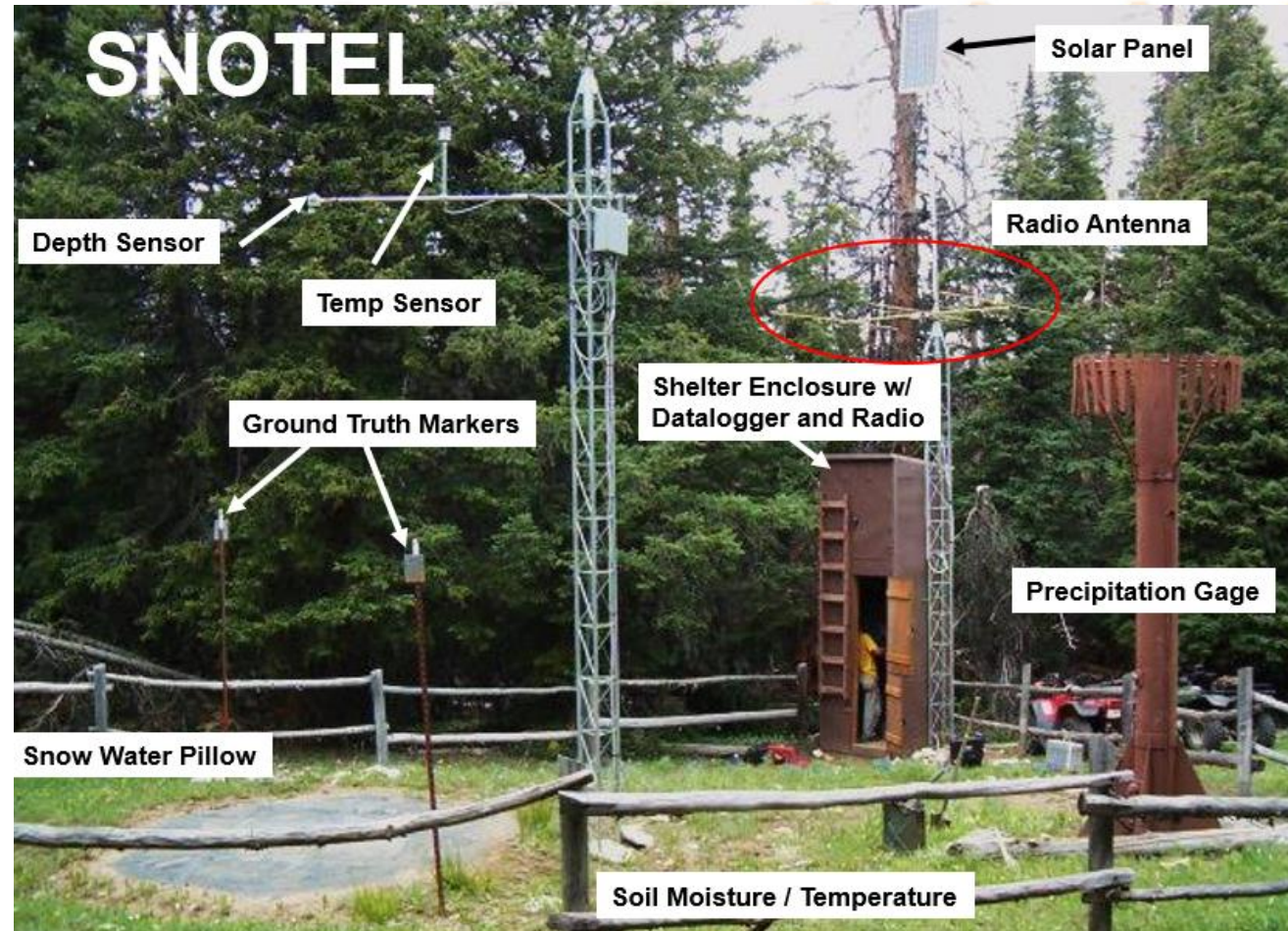
Natural Resources Conservation Service

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

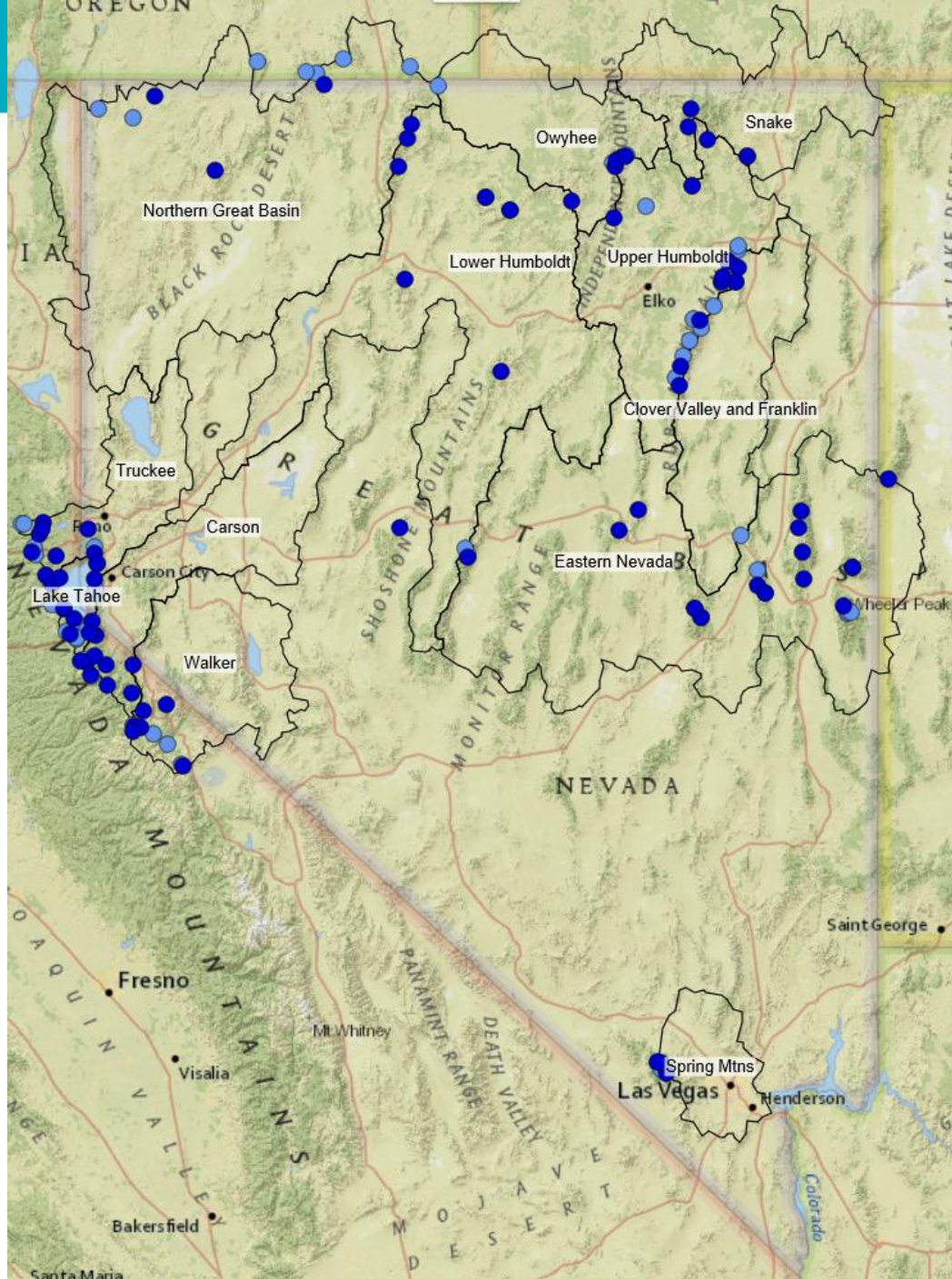
Snow Course



SNOTEL



**Key Vocabulary:
Snow Water Equivalent (SWE)**



Stations by Network

- SNOTEL (85)
- Snow Course/Aerial (45)
Marker

**Data are Summarized by
12 Major Basin Groups**



NV Snow Survey Website

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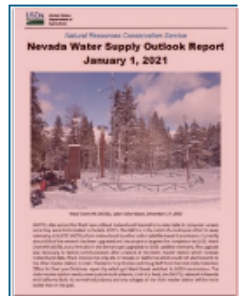
NRCS - Nevada
Helping People Help the Land

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.

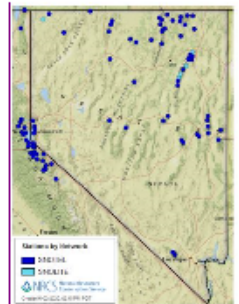
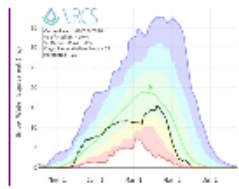
Visit Nevada NRCS - [click here](#)

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.



(Click on image to get report)



Latest Outlook Report & Streamflow Forecasts

- [January 1, 2021 Water Supply Outlook Report - New](#)
- [January 1, 2021 Streamflow Forecast Table - New](#)
- [What is new for 2021? - New](#)
- [2020 Forecast Review - Powerpoint | Table | Map - 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](#)

California/Nevada SNOTEL Snow/Precipitation Update Report

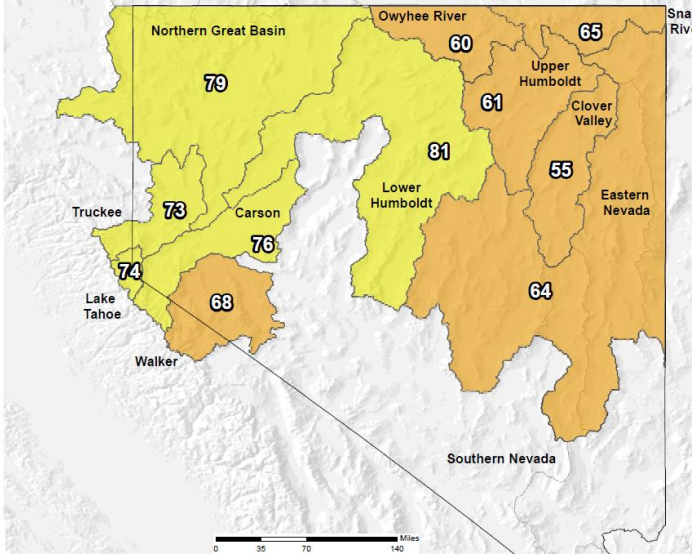
Based on Mountain Data from NRCS SNOTEL Sites

Provisional data, subject to revision

Data based on the first reading of the day (typically 00:00) for Thursday, February 11, 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	18.5	27.3	68	20.2	30.6	66
Heavenly Valley	8534	11.8	16.5	72	13.4	17.5	77
Carson Pass	8360	15.7	21.5 _R	73	15.6	25.9 _R	60
Inyo Valley G.C.	8013	17.1	34.4	50	17.7	36.8	48
Marlette Lake	7884	11.3	16.0	71	11.9	18.3	65
Hagans Meadow	7742	12.0	12.2	98	11.7	16.5	71
Echo Peak	7653	21.7	27.9	78	20.2	34.3	59
Rubicon #2	7619	13.4	17.4	77	13.2	23.0	57
Tahoe City Cross	6797	6.5	11.8	55	13.8	20.8	66
Ward Creek #3	6745	23.5	23.3	101	23.2	39.7	58
Fallen Leaf	6242	6.4	5.9	108	10.9	18.9	58

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



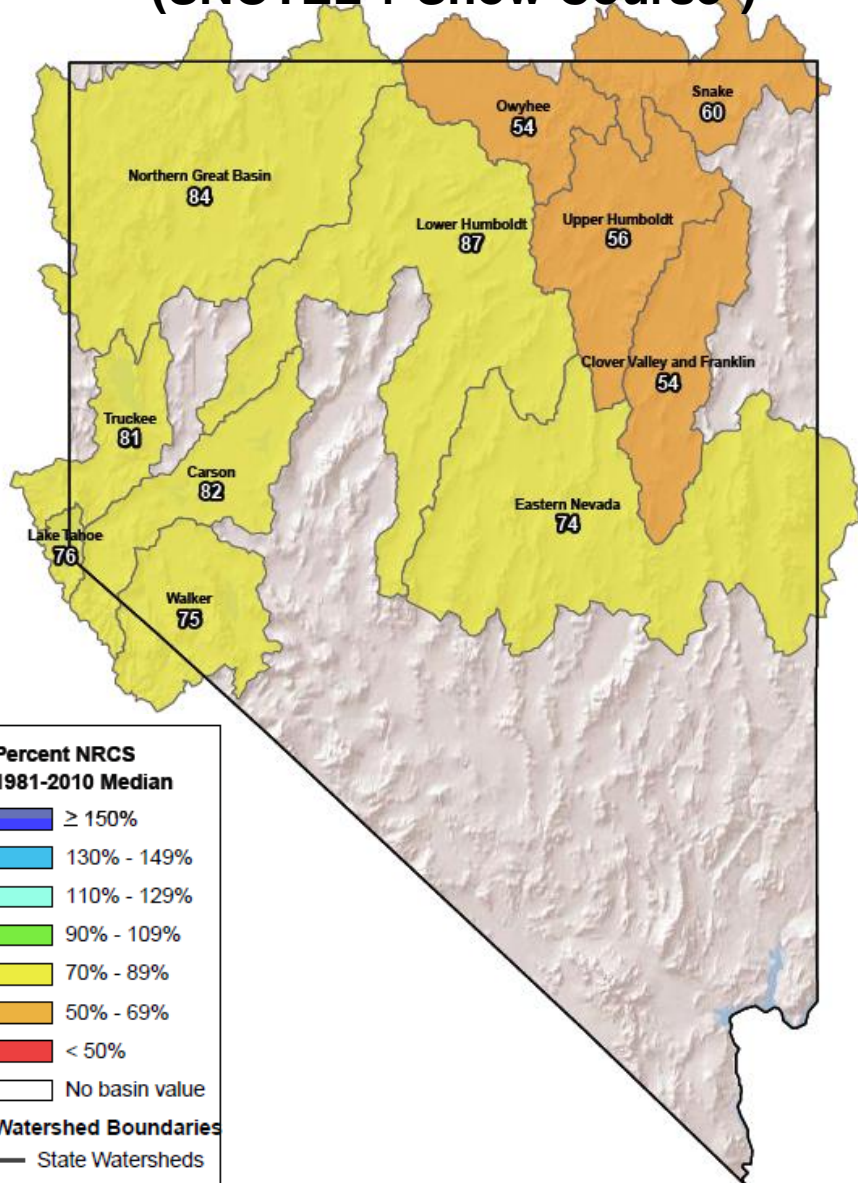
Feb 11, 2021

Current Snow Water Equivalent Basin-wide Percent of 1981-2010 Median

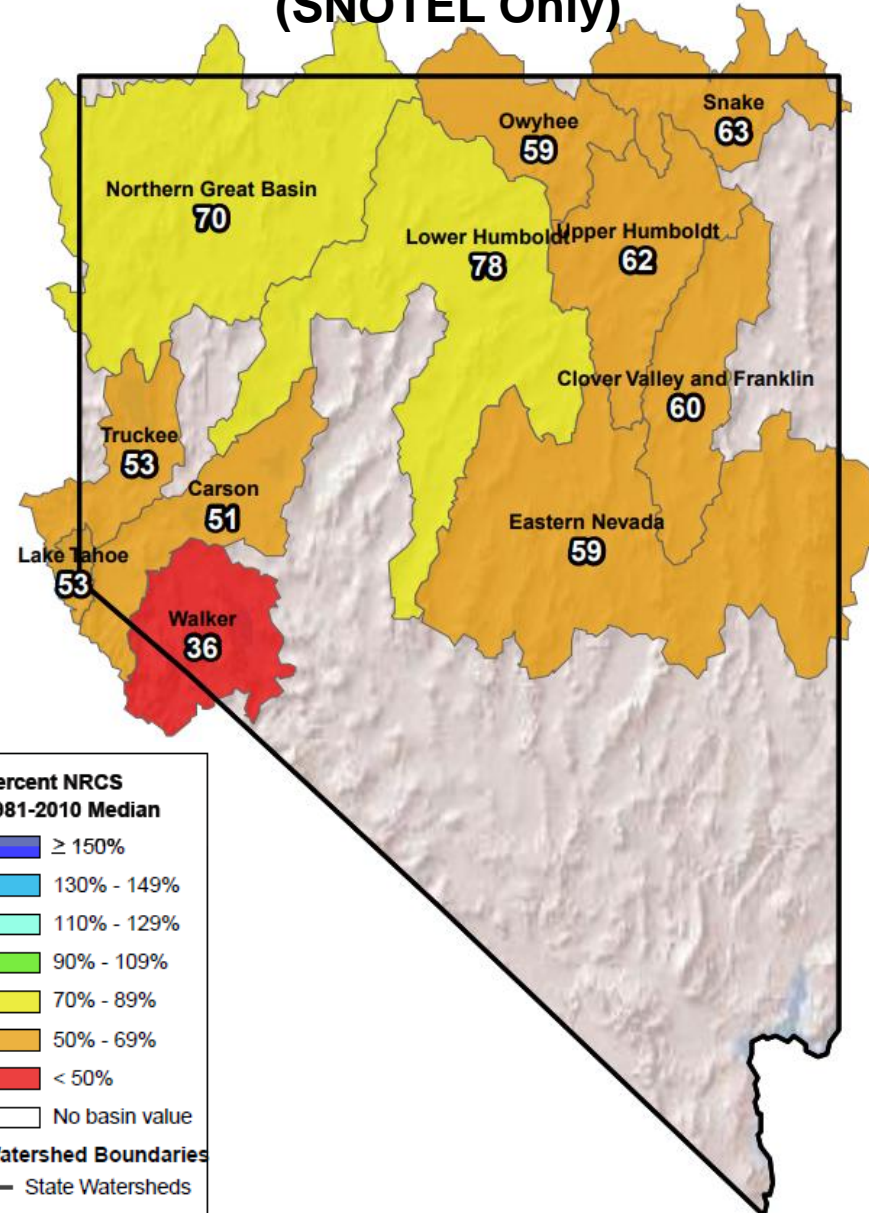
- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

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

February 1, 2021 Snowpack (SNOTEL + Snow Course*)



January 24, 2021 Snowpack (SNOTEL Only)



How bad is it? February 10 Snowpack – Minimum Rank

Snow survey list



Neil McQueary <mcquearyranch@gmail.com>

To ● Anderson, Jeff - NRCS, Reno, NV

You replied to this message on 2/3/2021 11:56 AM.

Hi Jeff

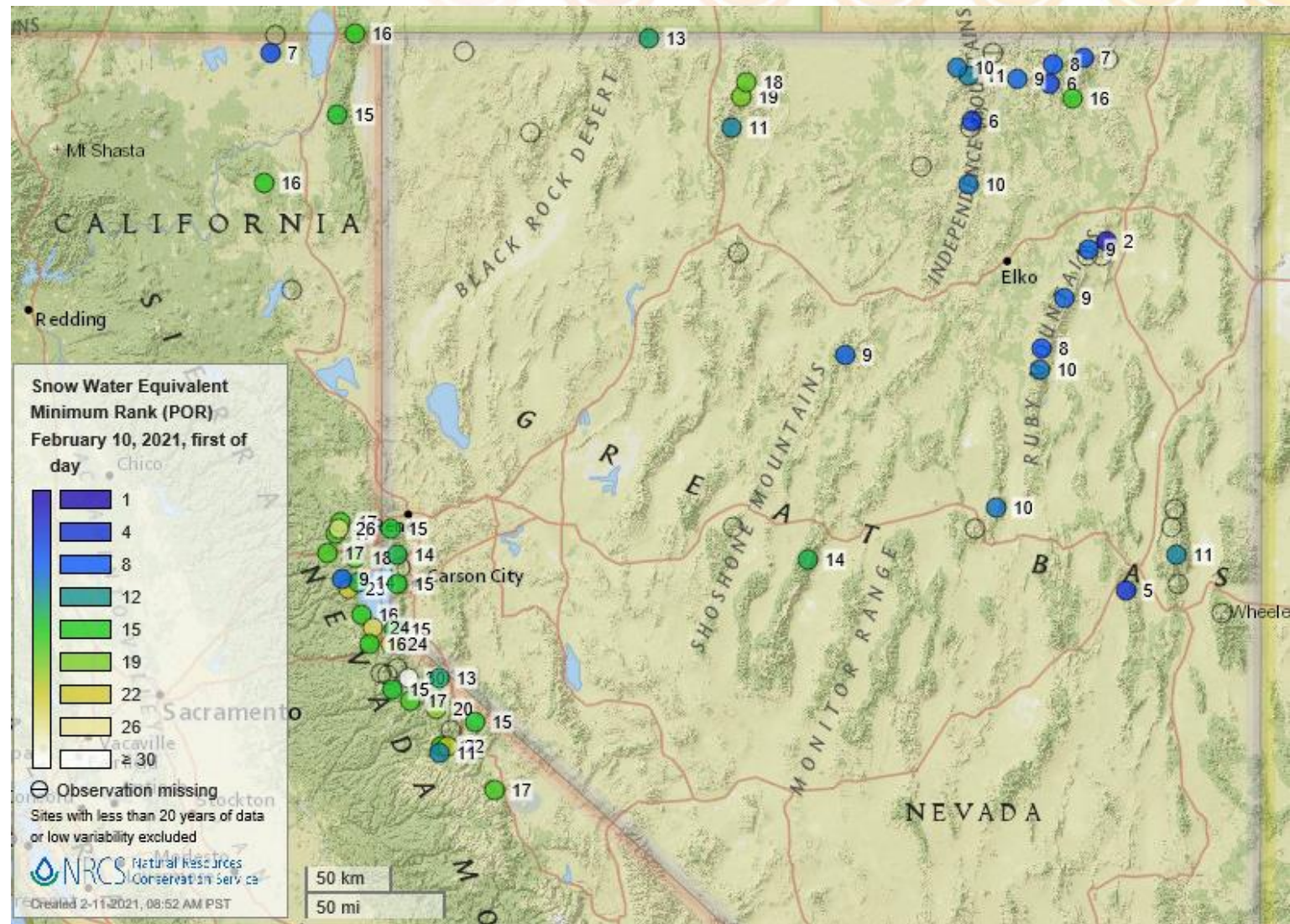
I had to get a new email.

Please add me to the list for snow survey results.

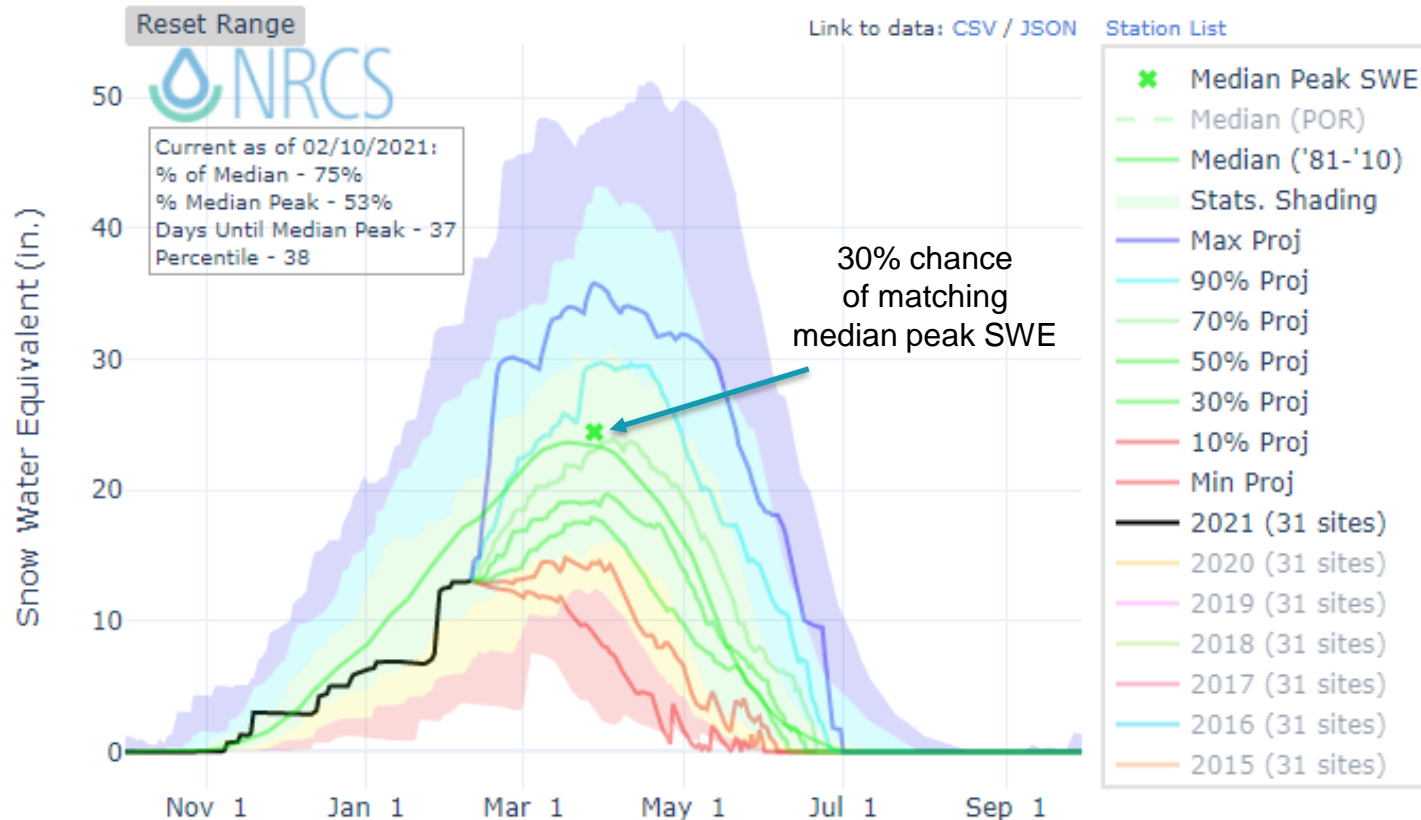
East side of Rubies looks horrible. Maybe worst in modern history.

Thank you,

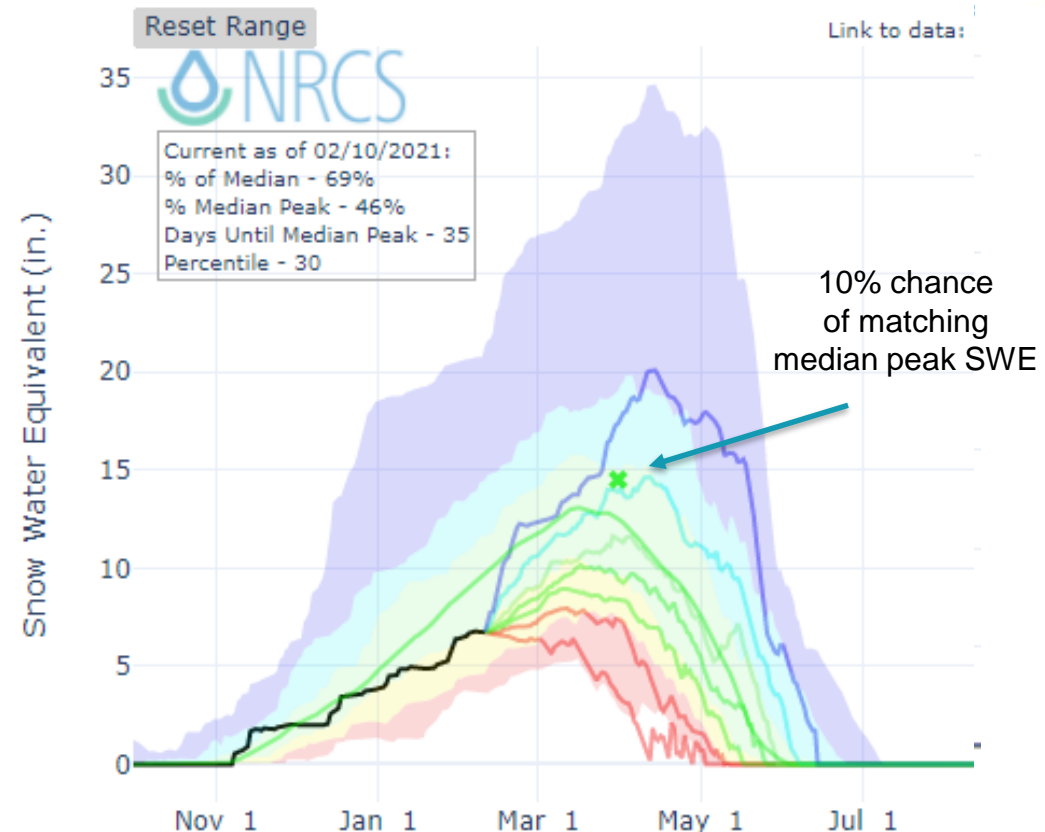
N



SNOW WATER EQUIVALENT PROJECTIONS IN EASTERN SIERRA



SNOW WATER EQUIVALENT PROJECTIONS IN HUMBOLDT



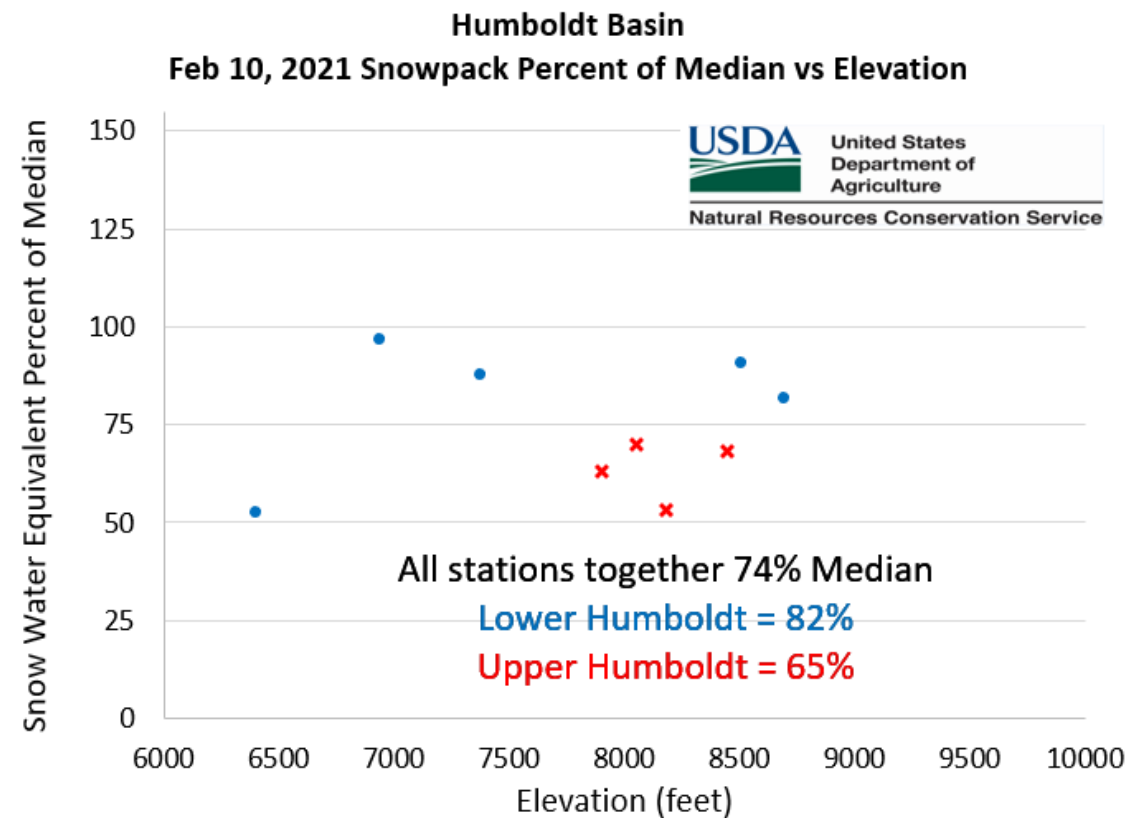
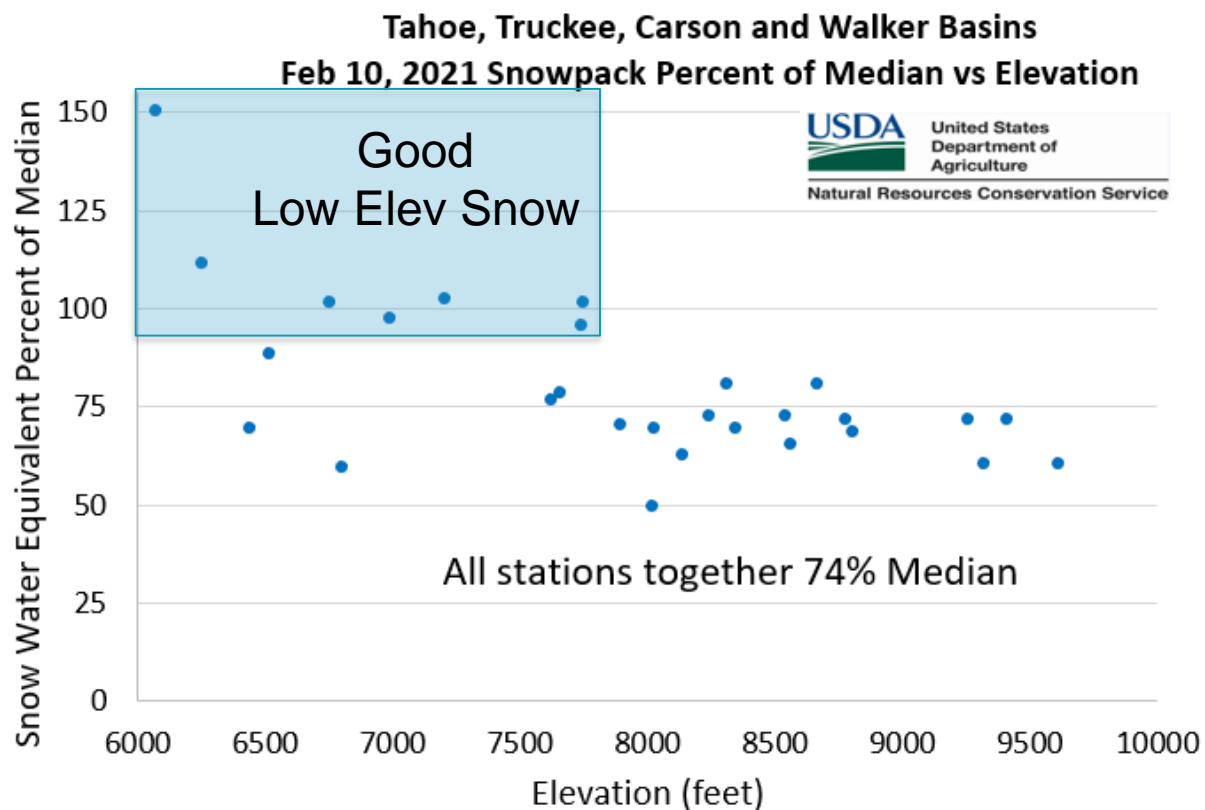
We are currently 2/3's through winter

Nov 1 – Apr 1 = ~152 days

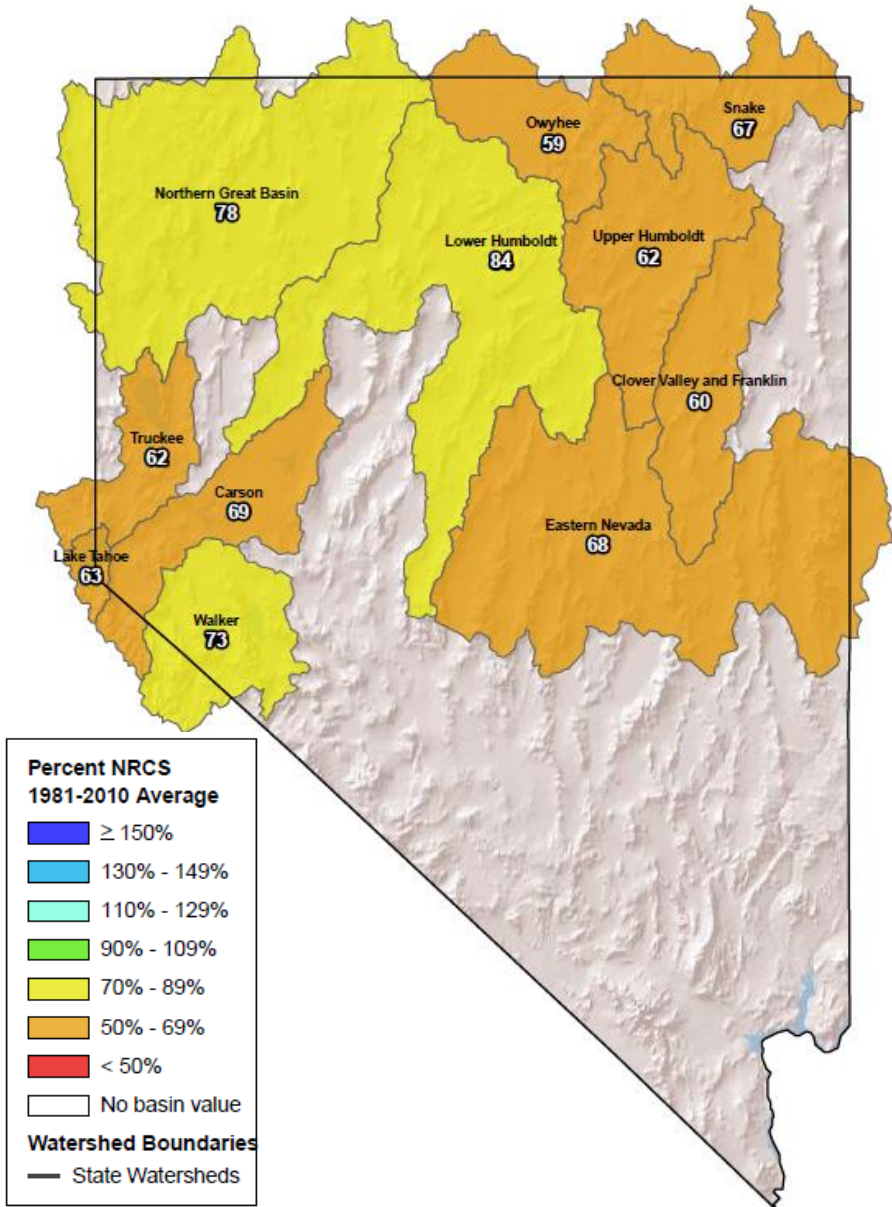
Nov 1 – Feb 11 15 = 102 days

Dec, Jan, Feb are the biggest months, Nov and Mar typically half as large as DJF

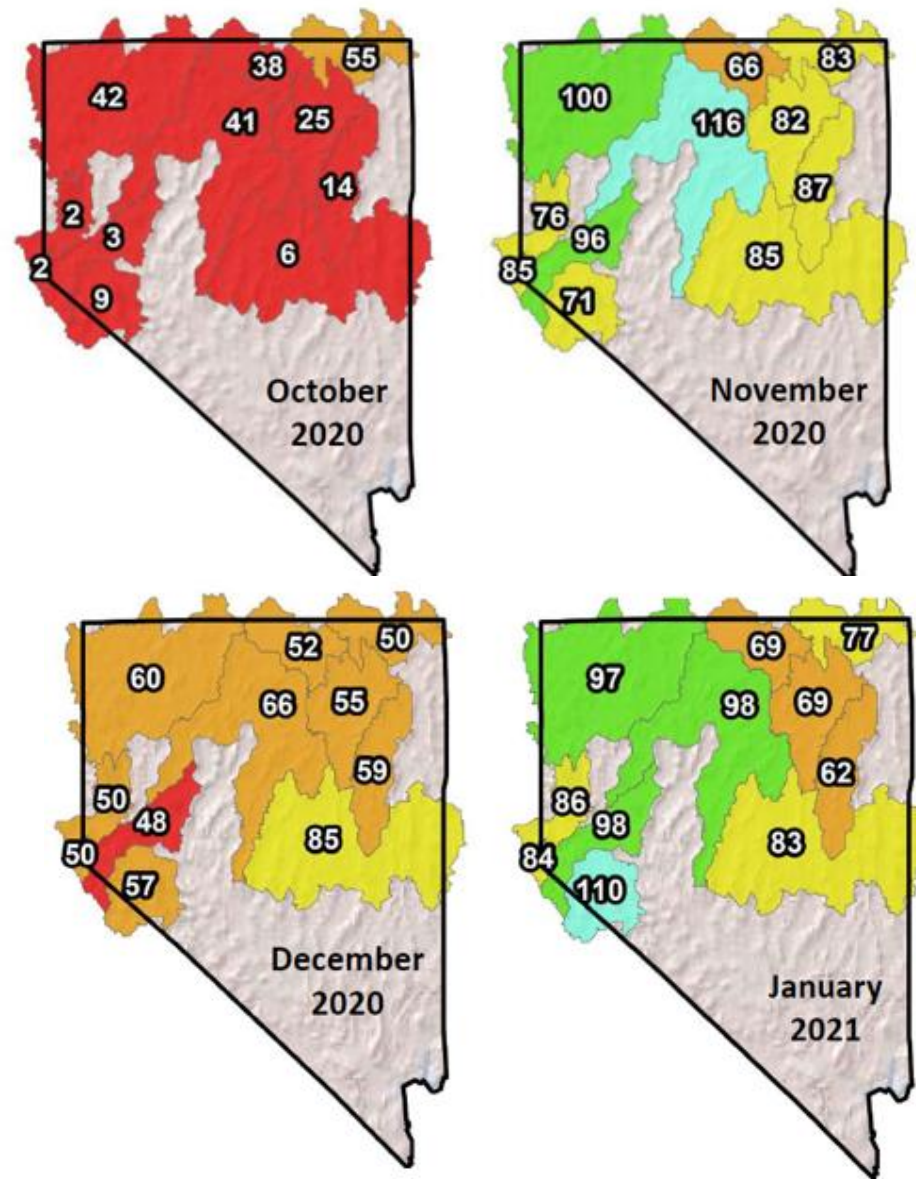




Water Year Precipitation Oct 1, 2019 – Feb 1, 2020



Monthly Precipitation Water Year 2021



2020 Water Year Precipitation Records

Water Year to Date
Precipitation
Records (POR)
October 1, 2019 through
September 30, 2020

- Highest
- 2nd Highest
- 2nd Lowest
- Lowest

Sites with less than 20 years of data
or low variability excluded

 **NRC** Natural Resources
Conservation Service

Created 10-20-2020, 12:25 PM PDT



**Record dry at
Lobdell Lk**

**2nd Driest at
Leavitt Mdw,
Leavitt Lake,
Poison Flat**



Record dry WY precip in Ruby Mtns

Lamoille #3
Green Mtn
Corral Canyon

2nd Driest

Lewis Peak (nr Battle Mtn)

Also Record Dry from Austin to Ely

Big Creek Summit
Diamond Peak
Berry Creek

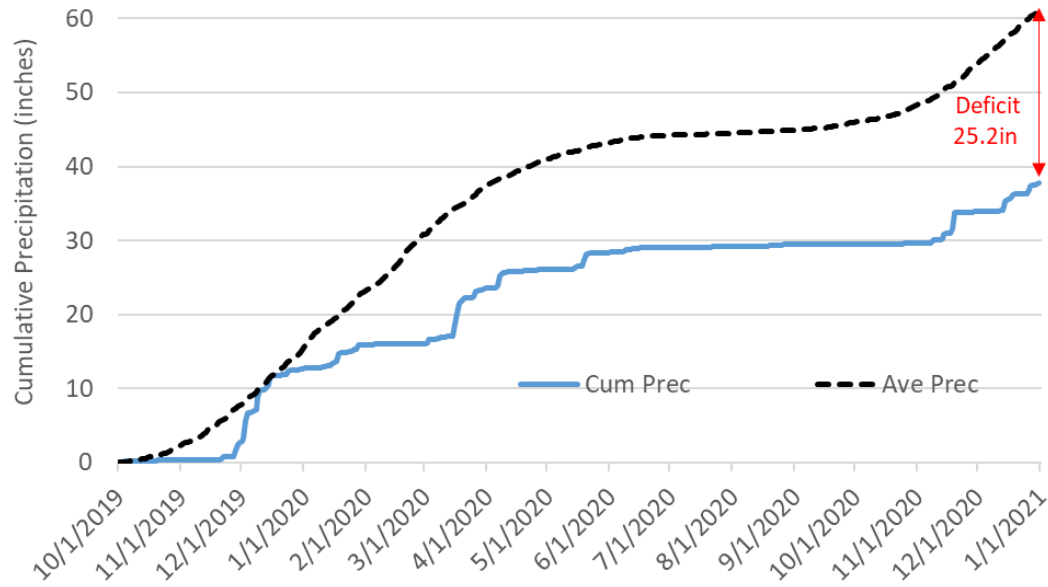
Natural
Resources
Conservation
Service

nrcs.usda.gov/

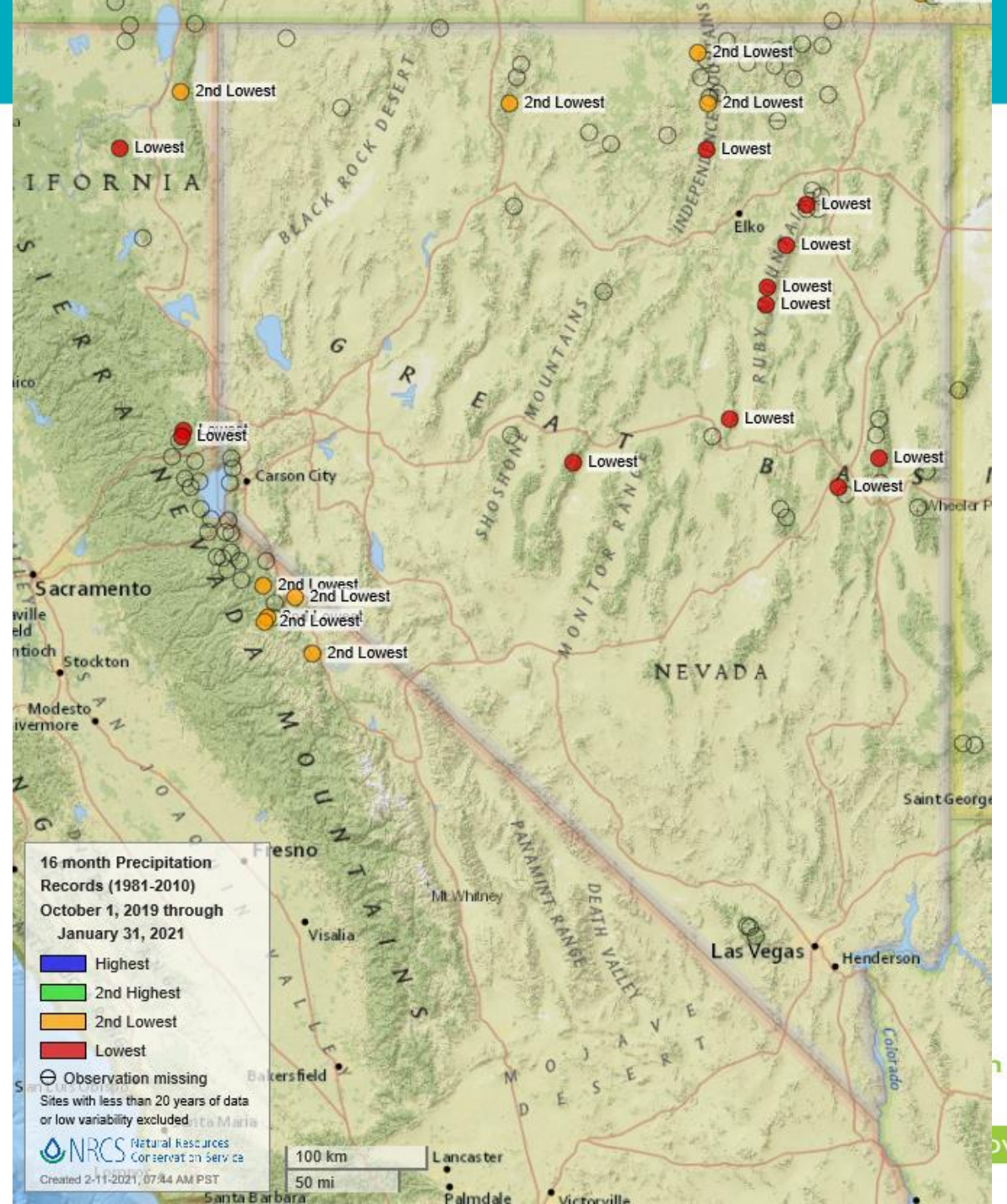
Truckee Basin

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

USDA United States
Department of
Agriculture
Natural Resources Conservation Service



Basin	Precipitation Deficit 10/1/19 to 1/31/21 (inches)	Average Water Year Precipitation (inches)	Precipitation Deficit as Percent of Average Water Year Precipitation
Truckee	-25.2	46.0	-55%
Lake Tahoe	-24.9	45.7	-54%
Eastern Nevada	-13.1	24.7	-53%
Walker	-16.7	31.9	-52%
Clover Valley	-16.6	32.4	-51%
Carson	-17.3	37.6	-46%
Upper Humboldt	-11.9	28.3	-42%
Lower Humboldt	-9.6	27.5	-35%
Owyhee	-9.0	26.1	-35%
Upper Colorado above Glen Canyon	-10.7	31.4	-34%
Northern Great Basin	-8.9	28.7	-31%
Snake	-5.3	26.1	-20%

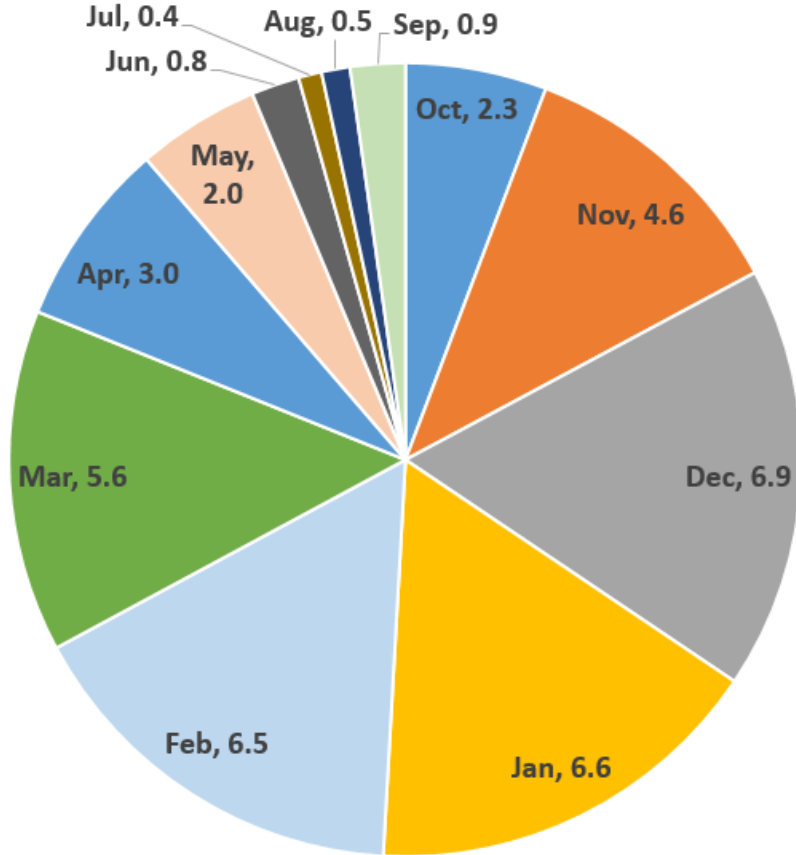


Water Year Precipitation Broken into Monthly Averages



Eastern Sierra SNOTELS

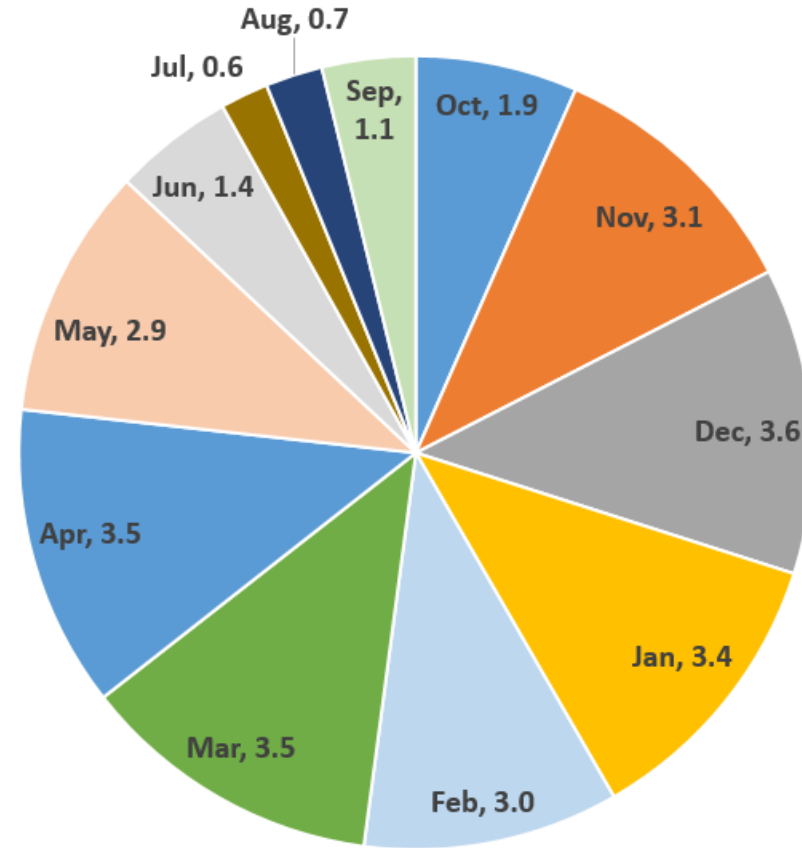
1981-2010 Average Monthly Incremental Precipitation (inches)



Oct-Mar = 81%
Apr-Sep = 19%

Humboldt Basin SNOTELS

1981-2010 Average Monthly Incremental Precipitation (inches)



Oct-Mar = 64%
Apr-Sep = 36%

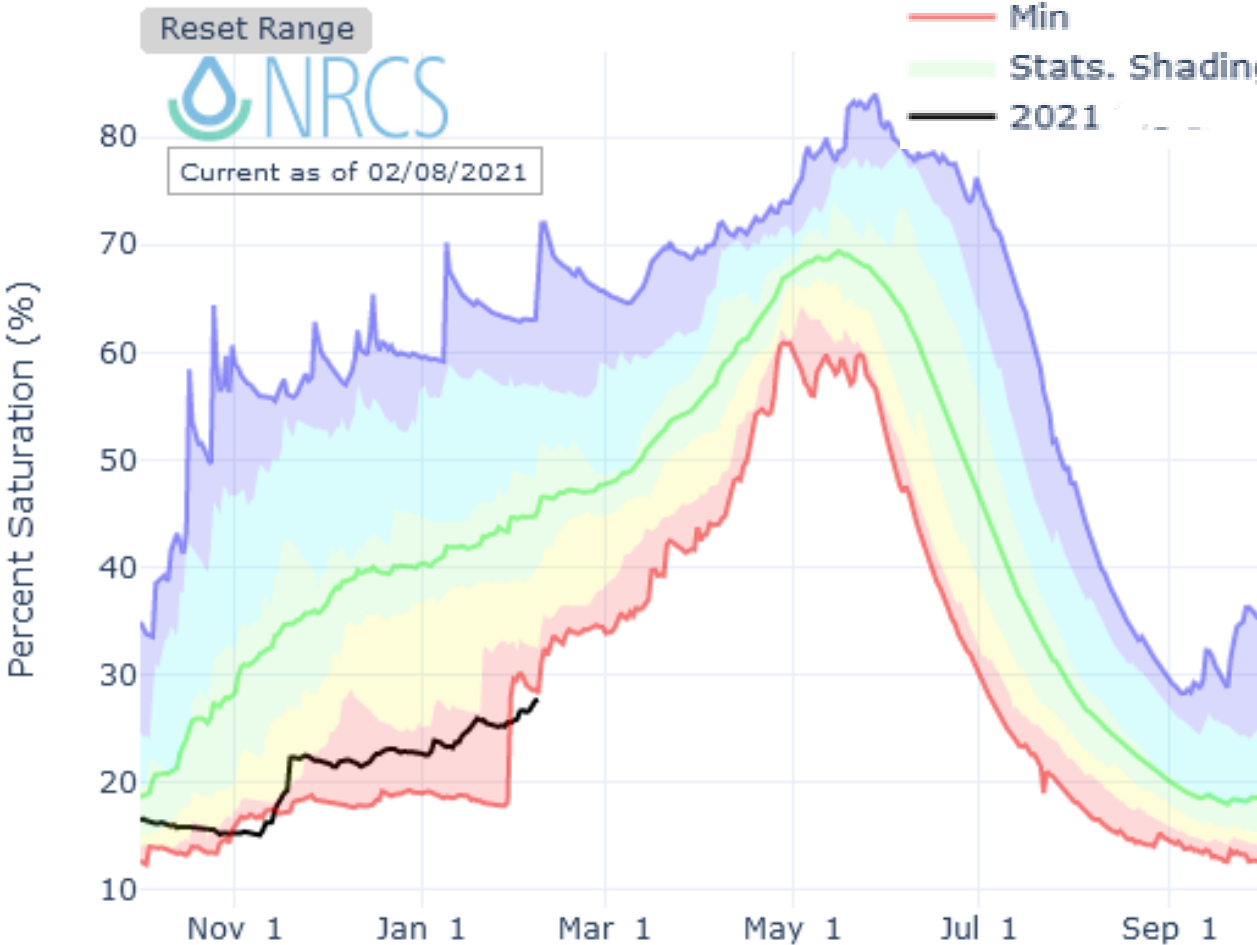


Soil Moisture

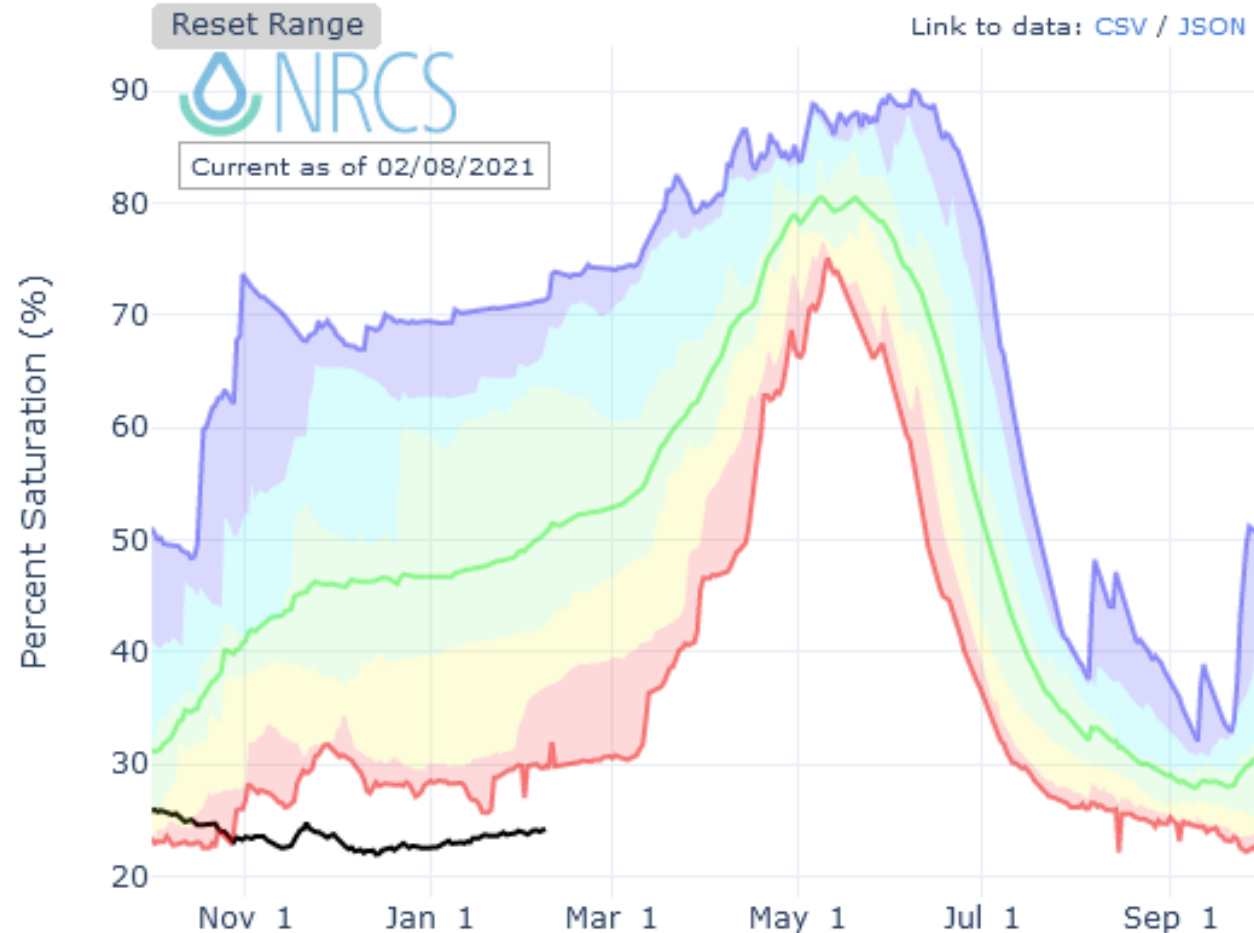
*Soil Moisture POR based on data since Oct 2005

DEPTH AVERAGED SOIL SATURATION IN EASTERN SIERRA

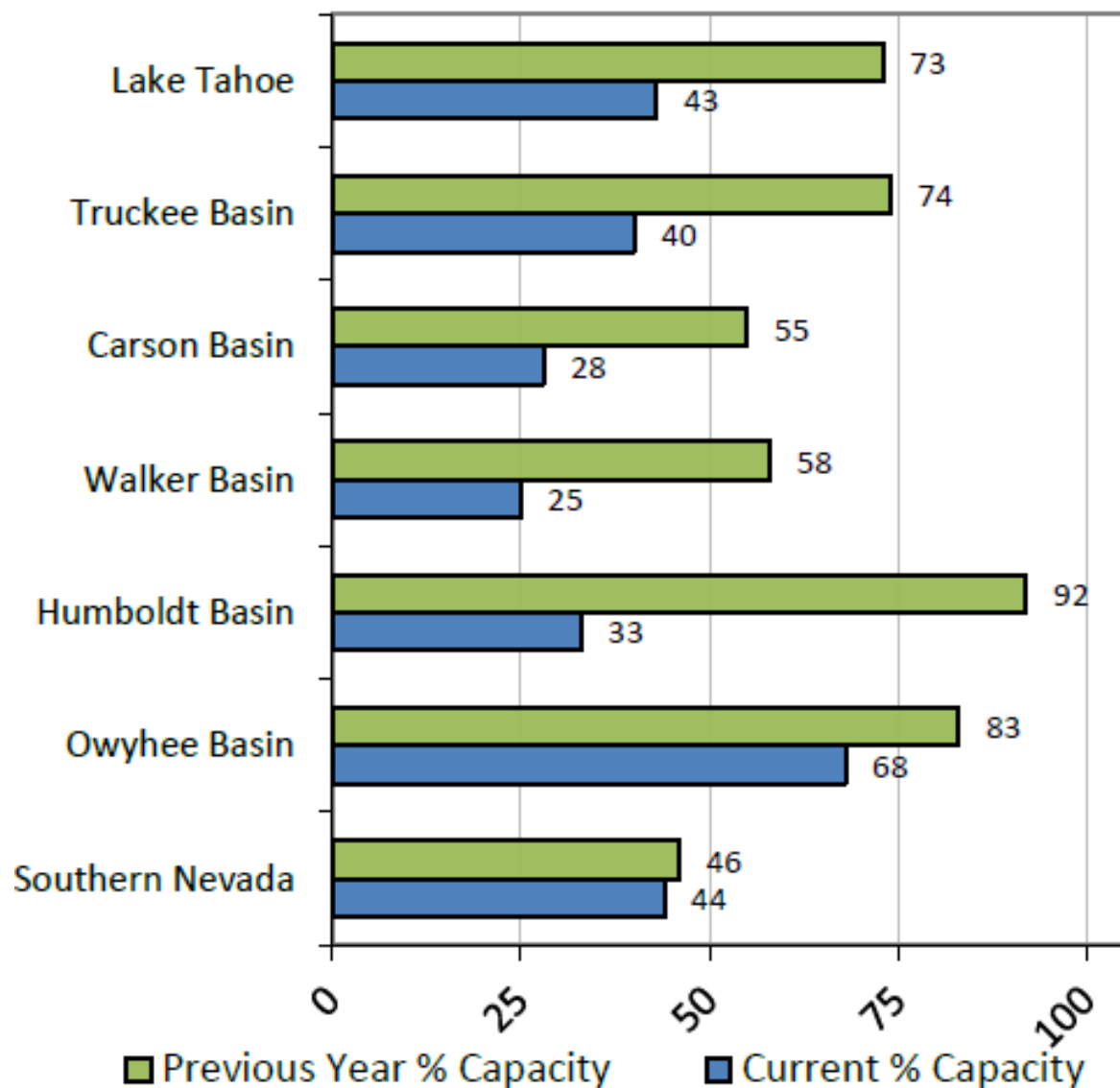
- Max
- Average (POR)
- Min
- Stats. Shading
- 2021



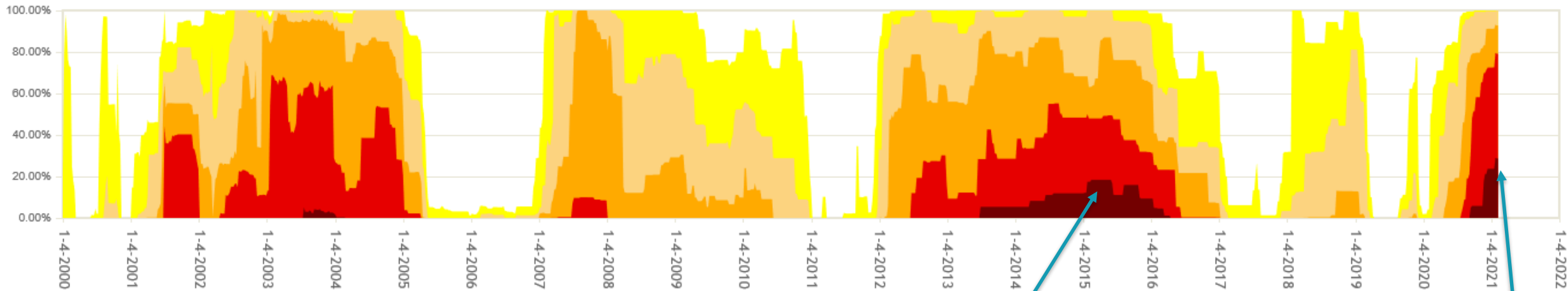
DEPTH AVERAGED SOIL SATURATION IN UPPER HUMBOLDT



Reservoir Storage



US Drought Monitor – Time Series Nevada Percent Area



March 31, 2015

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	99.93	79.50	47.96	18.38

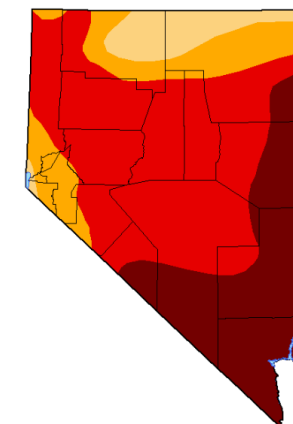
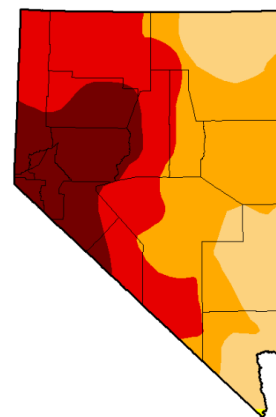
February 9, 2021

Drought Conditions (Percent Area)

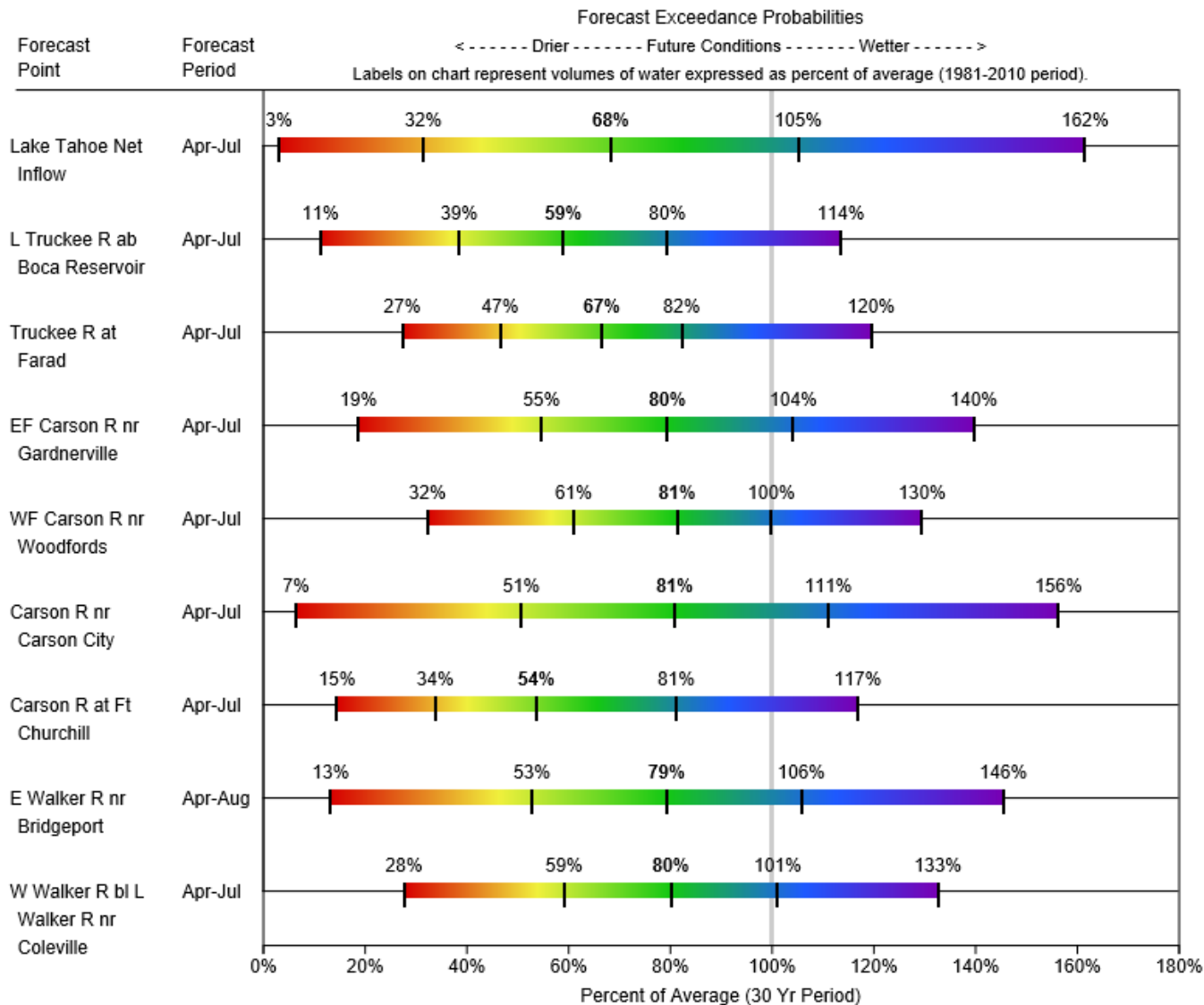
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	92.74	79.16	28.69

Intensity:

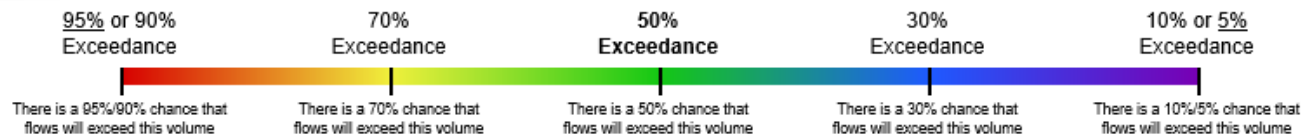
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought



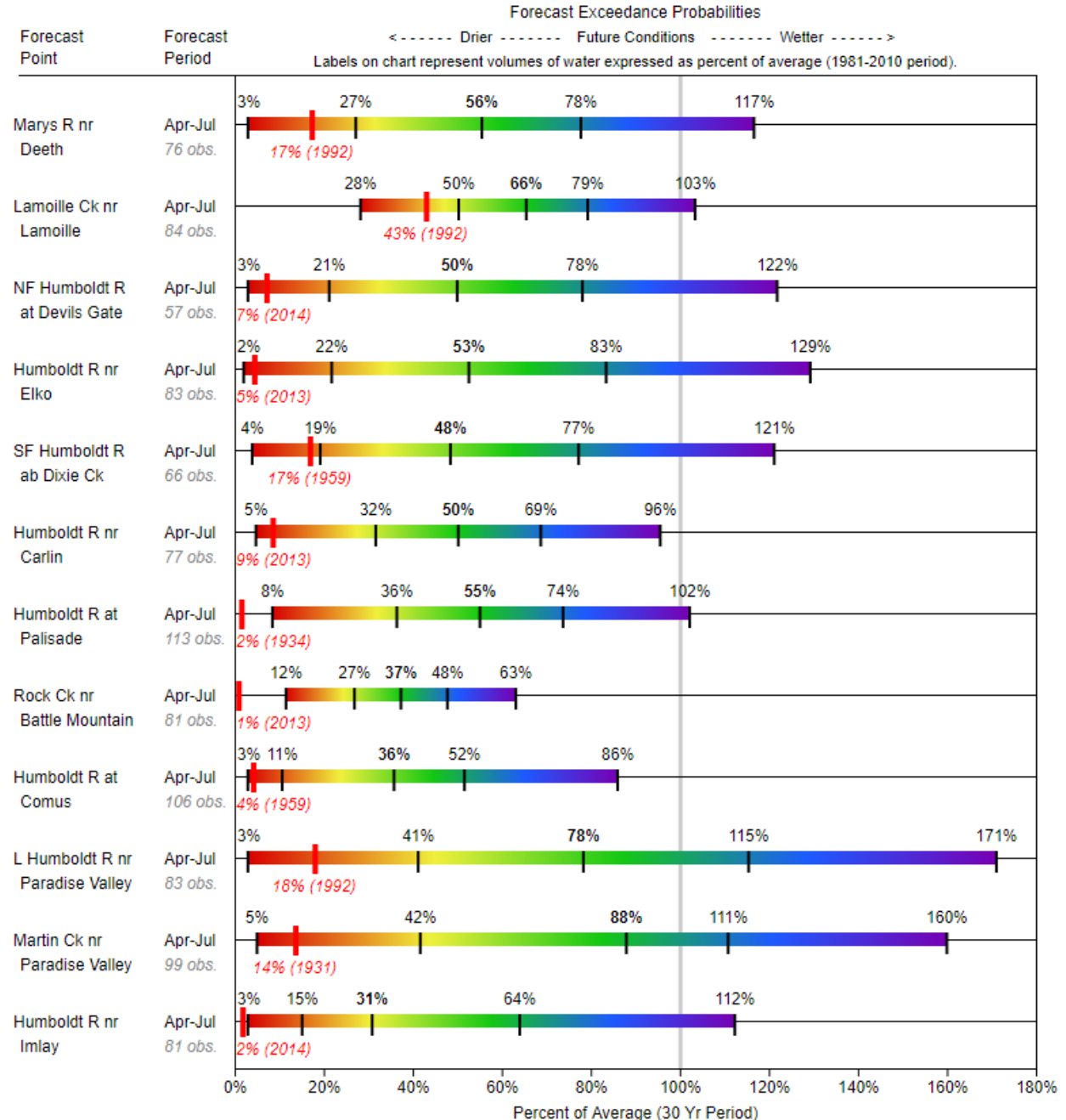
Eastern Sierra Basin Summary
Water Supply Forecasts
February 1, 2021



Legend



Humboldt River Summary
Water Supply Forecasts
February 1, 2021



If dry conditions persist
Ruby Mtn tributaries
could see
new minimum
Apr-July runoff



Period of Record Minimum
Streamflow KAF (Year)



Eastern Sierra Basin Summary
Water Supply Forecasts
February 1, 2021

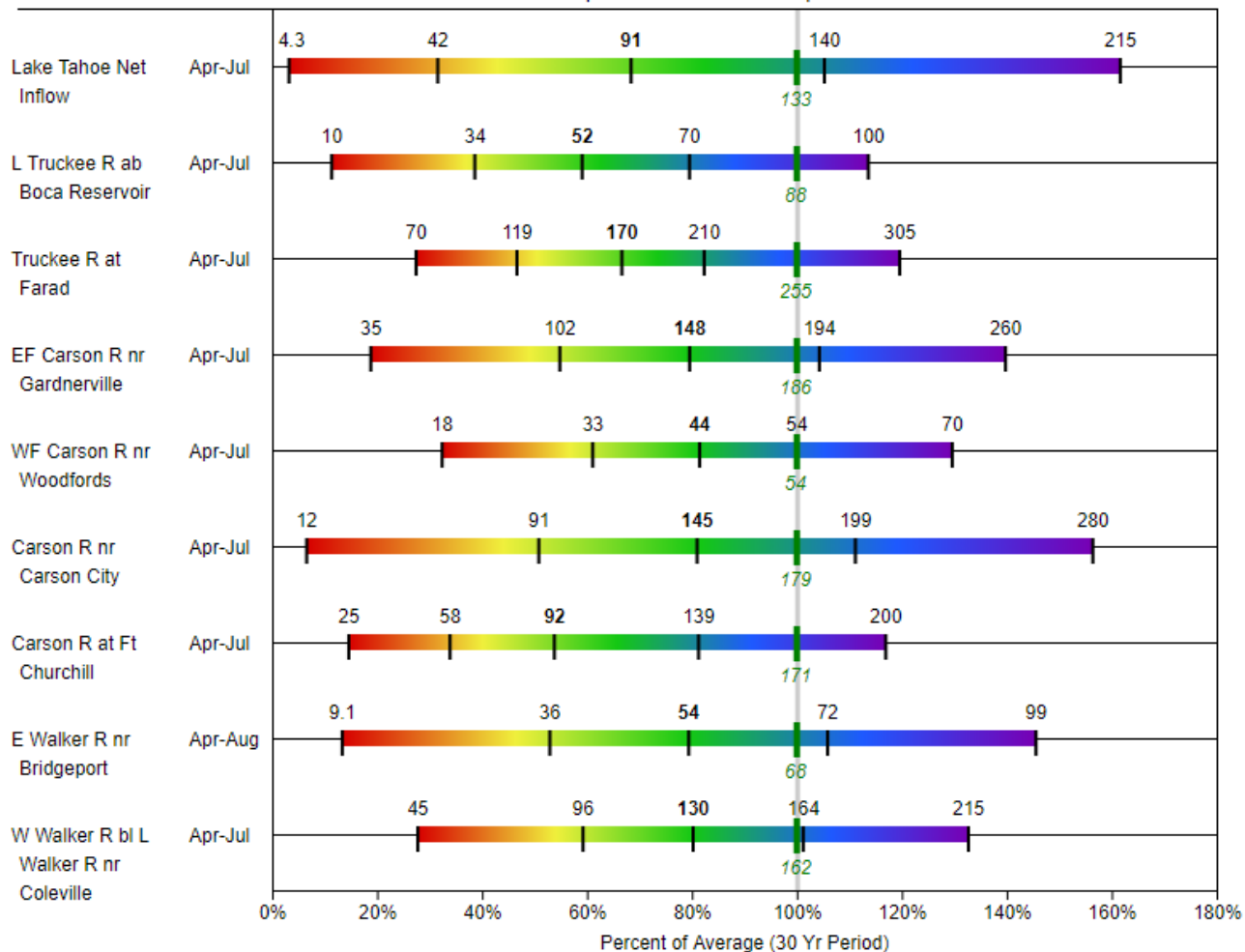
Forecast Volumes (KAF)

Humboldt River Summary
Water Supply Forecasts
February 1, 2021

Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->

Labels on chart represent volumes of water expressed in thousand acre-feet.



Percent of Average (30 Yr Period)

1981-2010 Normal Streamflow KAF

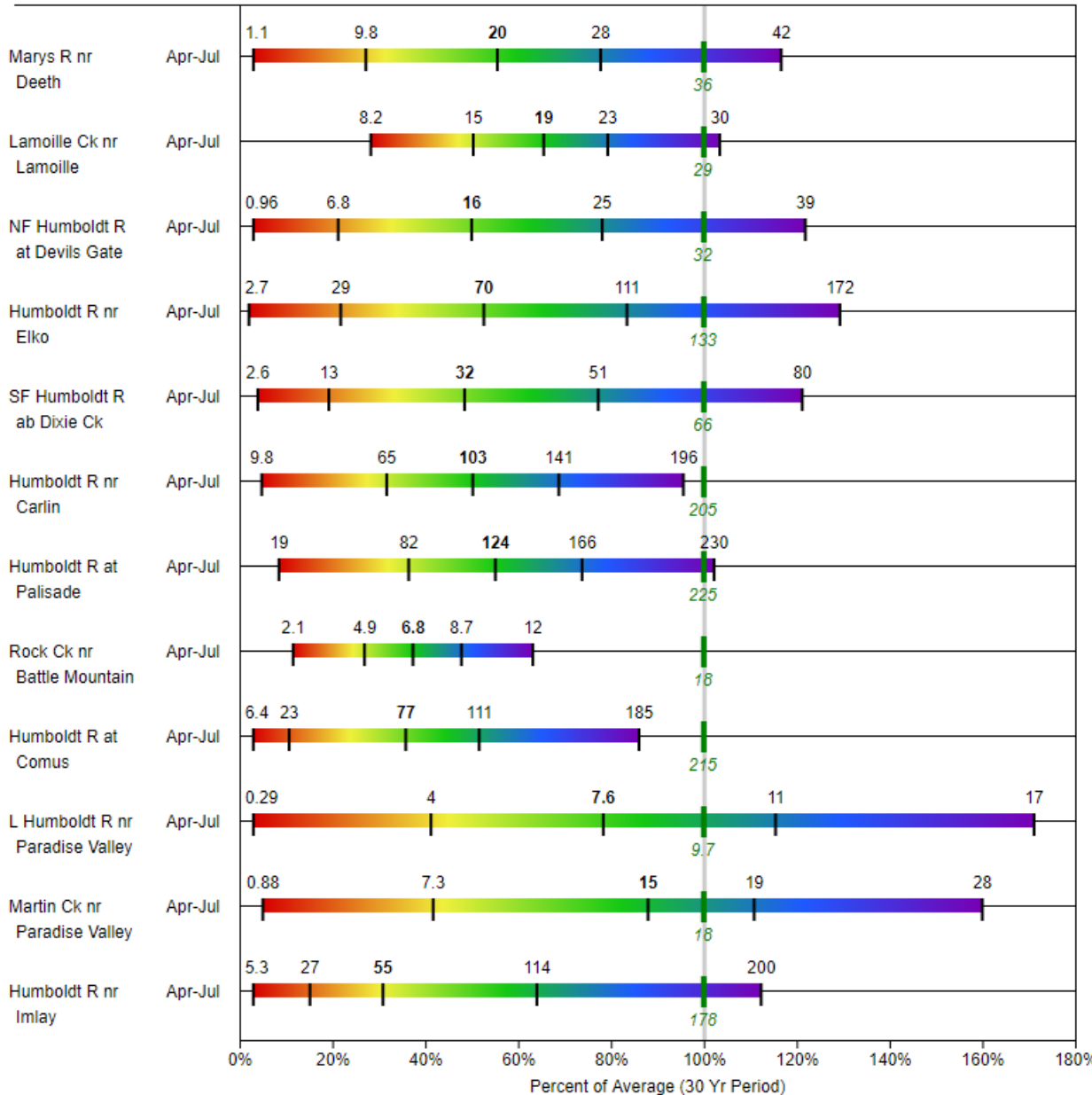
95% or 90% Exceedance 70% Exceedance 50% Exceedance 30% Exceedance 10% or 5% Exceedance

There is a 95%/90% chance that flows will exceed this volume There is a 70% chance that flows will exceed this volume There is a 50% chance that flows will exceed this volume There is a 30% chance that flows will exceed this volume There is a 10%/5% chance that flows will exceed this volume

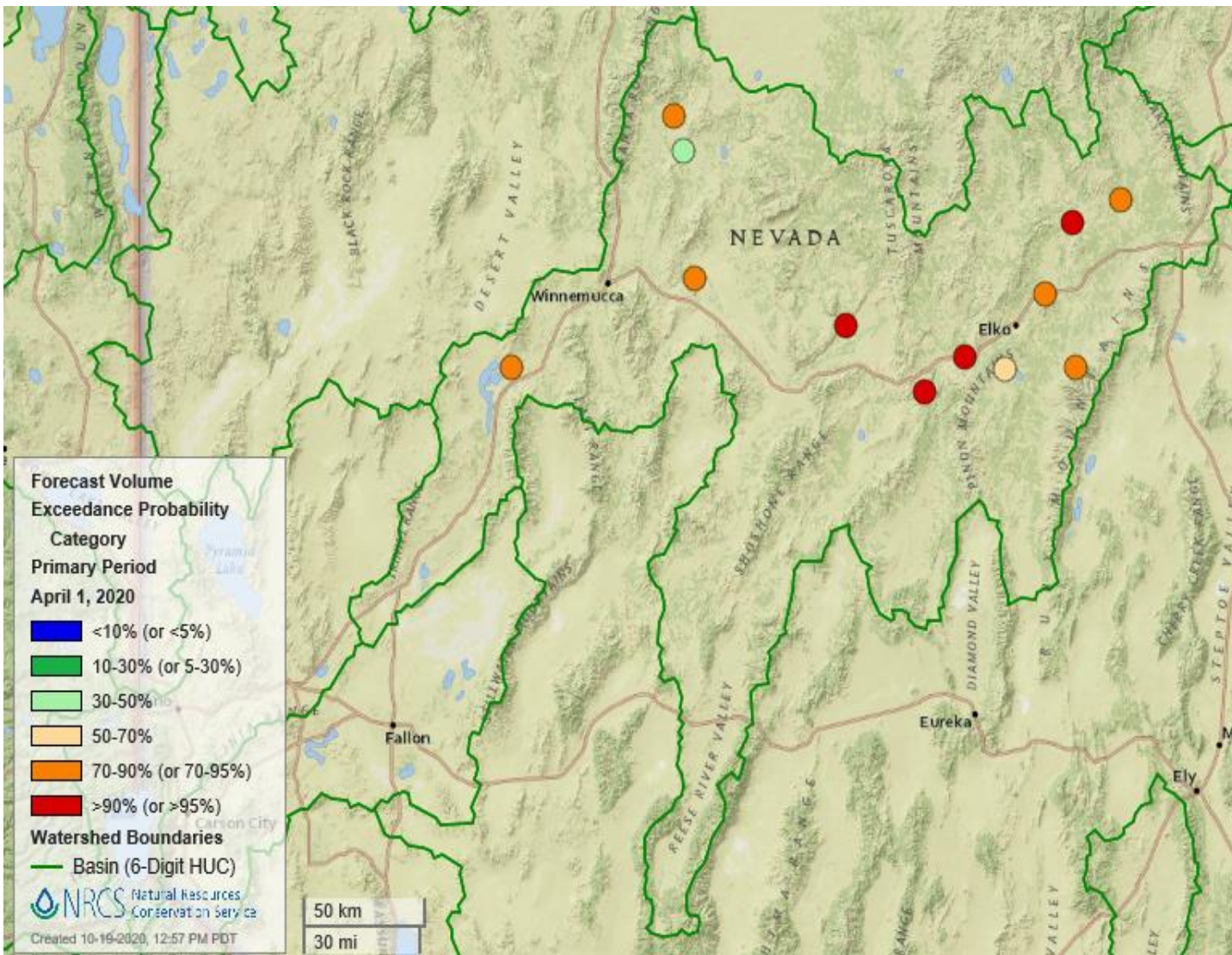
Forecast Exceedance Probabilities

<----- Drier ----- Future Conditions ----- Wetter ----->

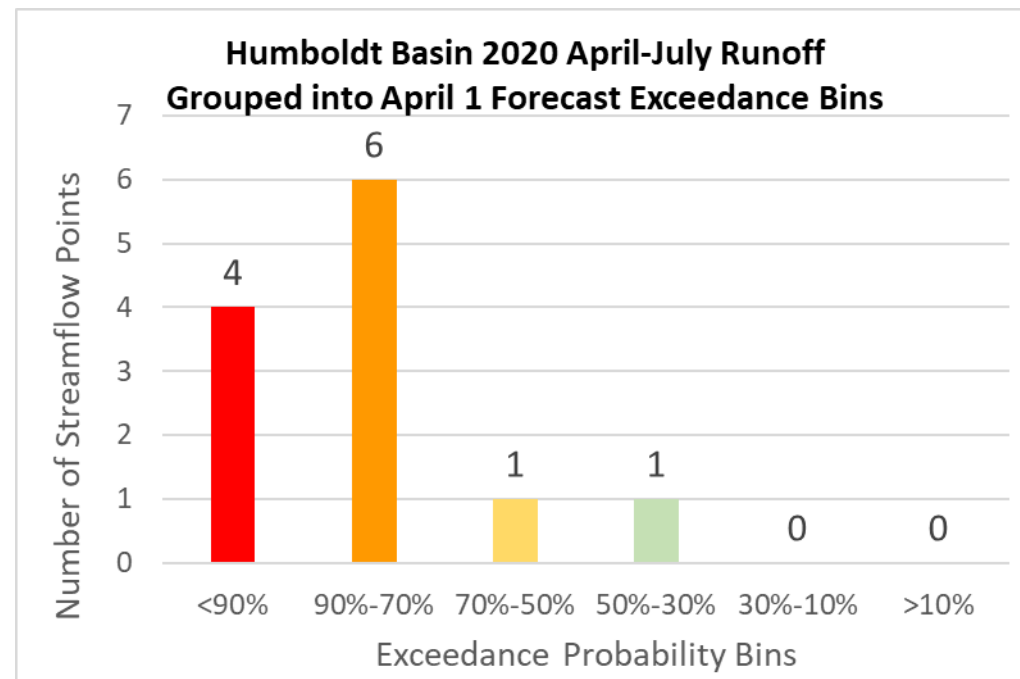
Labels on chart represent volumes of water expressed in thousand acre-feet.



Percent of Average (30 Yr Period)



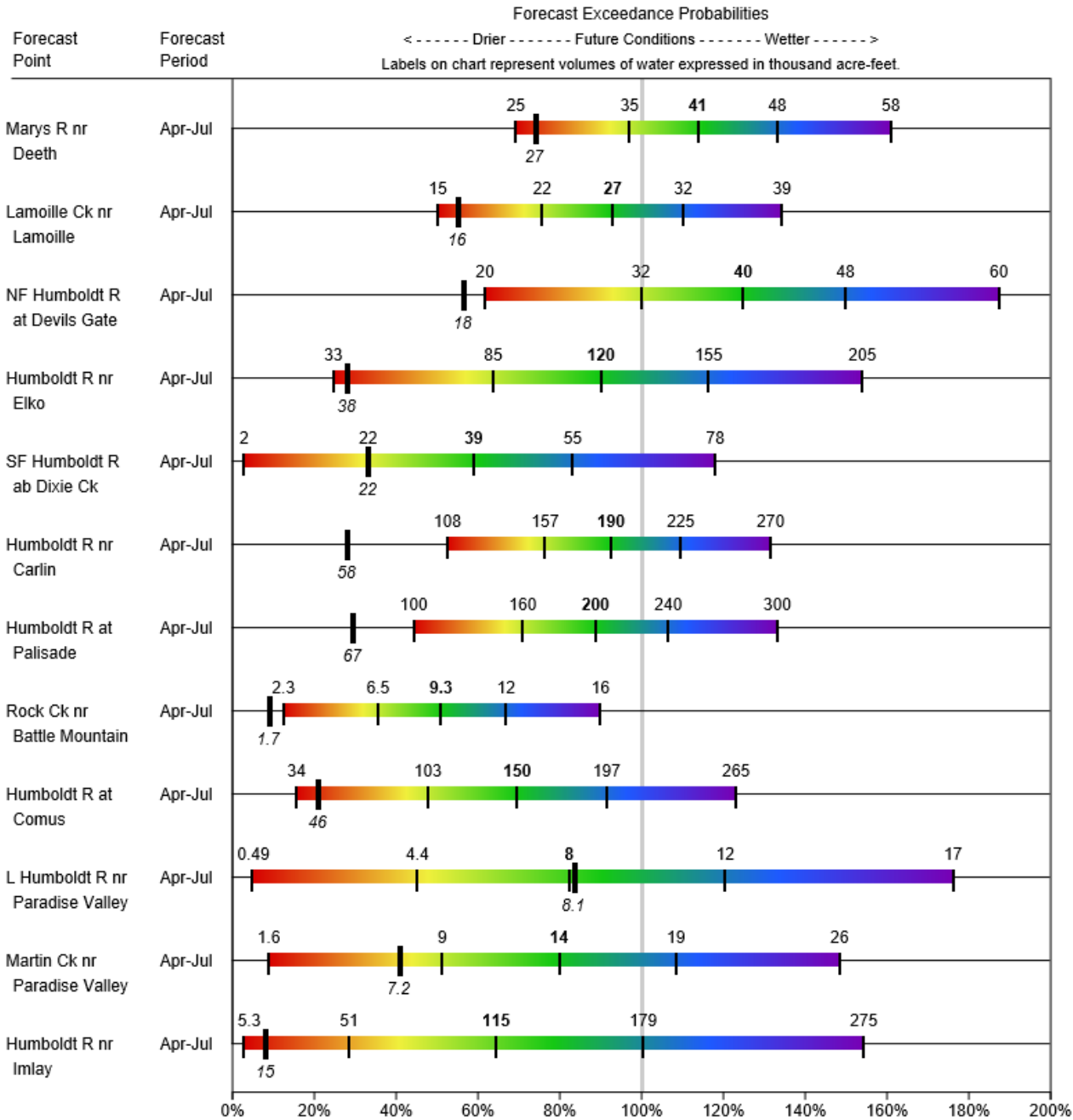
Last Year Humboldt Basin



Observed streamflow generally
Well less than 50% exceedance forecasts



Humboldt River Summary
Water Supply Forecasts
April 1, 2020



Last Year Humboldt Basin

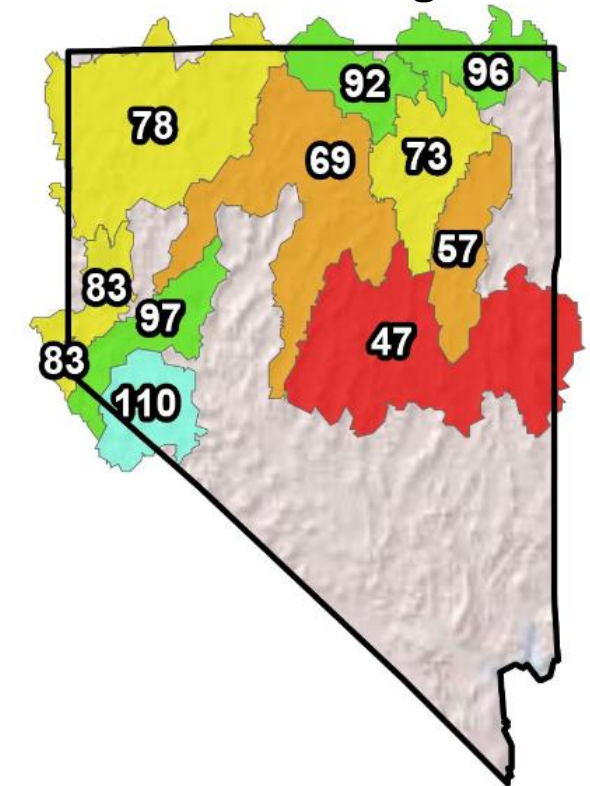
April – July 2020
Precipitation as % of Average

4 month Precipitation
Percent NRCs 1981-2010
Average
April 1, 2020 through July 31, 2020

- ≥ 150%
- 130% - 149%
- 110% - 129%
- 90% - 109%
- 70% - 89%
- 50% - 69%
- < 50%
- No basin value

Watershed Boundaries
— State Watersheds

NRCs Natural Resources Conservation Service
Created 10-02-2020, 01:51 PM PDT



Summary



Sierras – Could be worse

- Major snowpack boost last week of January, percentages up from 36-53% to 75-82% on Feb 1
- We need 2-3 more big ARs to lay down snow to reach median peaks (~30% chance)
- Precipitation deficits are greater than half a water year behind
- Soil moisture near all time low for this time of year
- Most streamflow forecasts currently ~60-80% of average

Humboldt Basin – Can it get worse?

- Little increase in snowpacks in January, February has been dry. Snowpacks 61% & 80% today.
- Anecdotally, locals saying how bad it looks in the Rubies. ~10% chance to reach median peak.
- Record dry precipitation for last 16 months
- Soil moisture significantly less than any year since Oct 2005
- Streamflow forecasts in upper basin only ~50% of average (dry exceedances are ~20-30%)
- If dry pattern persists, forecasts hint towards new min A-J runoff for Lamoille Ck and SF Humboldt
- Glimmer of Hope – Spring/summer precip can be significant. Apr-July Ave Precip 8.4”



How can you help?



Provide local insights

- Share drought / flooding impacts in your area
- Photos that tell the current water supply story

Spread the Word

- Raise awareness: Water Supply Report / Website
- Communicate ways to collaborate with Snow Program to serve new user groups





Contact us anytime with questions and comments



Hydrologist – Nevada Water Supply Specialist

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Jim Komar

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