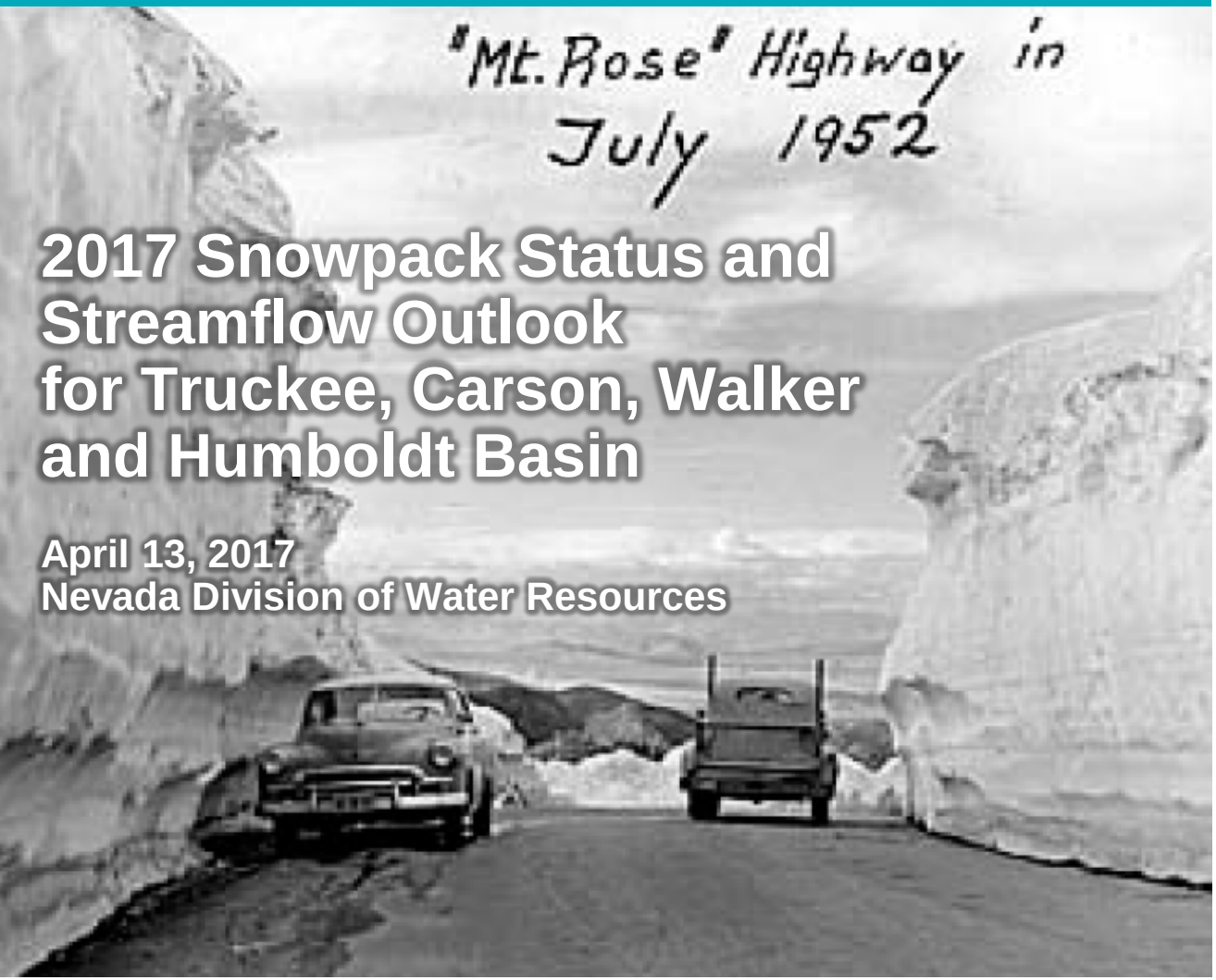
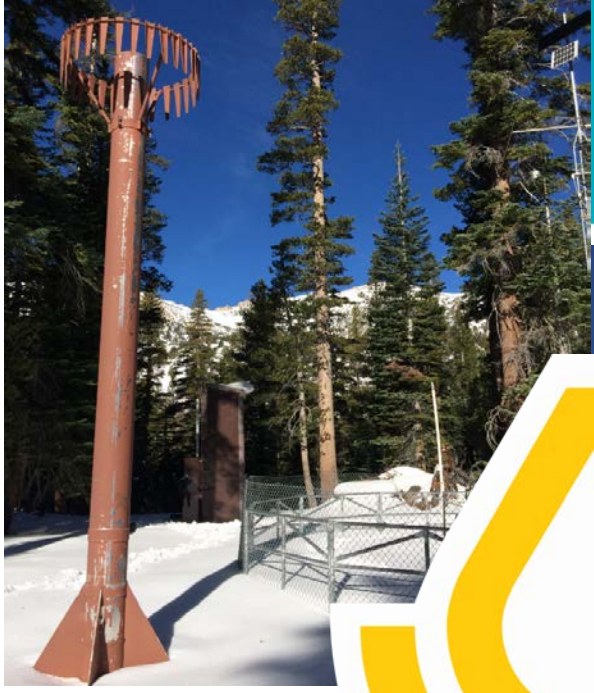
United States Department of Agriculture



2017 Snowpack Status and Streamflow Outlook for Truckee, Carson, Walker and Humboldt Basin

April 13, 2017
Nevada Division of Water Resources



Natural Resources Conservation Service
www.nv.nrcs.usda.gov/snow

Jeff Anderson
Nevada NRCS Snow Survey

(775) 857-8500 x152
jeff.anderson@nv.usda.gov

Key Points:

- Snow:
  - Sierra basins snow peaked at about twice normal.
  - Higher elevation stations are at, or near, record amounts.
  - Humboldt Basin snow peaked above normal, similar to 1997.

- Precipitation:
  - 2017 is a record water year at many Sierra SNOTELs.
  - Humboldt Basin has already received a normal water year of precipitation.

- Streamflow Forecasts (April-July):
  - 200-310% for main points on Truckee, Carson and Walker rivers.
  - 228-282% for main stem Humboldt River, much higher than 1997.

- Basin-wide soil moisture and snow pack density is ahead of schedule. A ripe snowpack could bring an early and efficient runoff if the sun returns.

- If storms continue the increased albedo (reflectiveness) of new snow may delay melt.

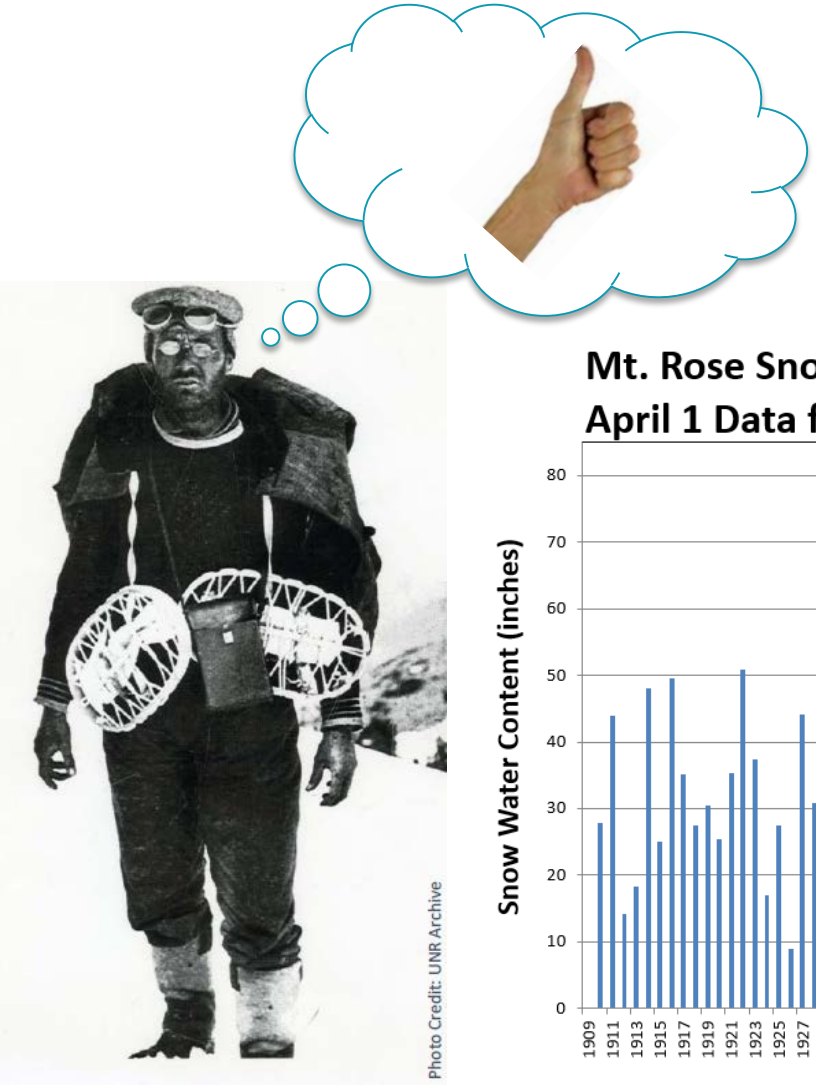
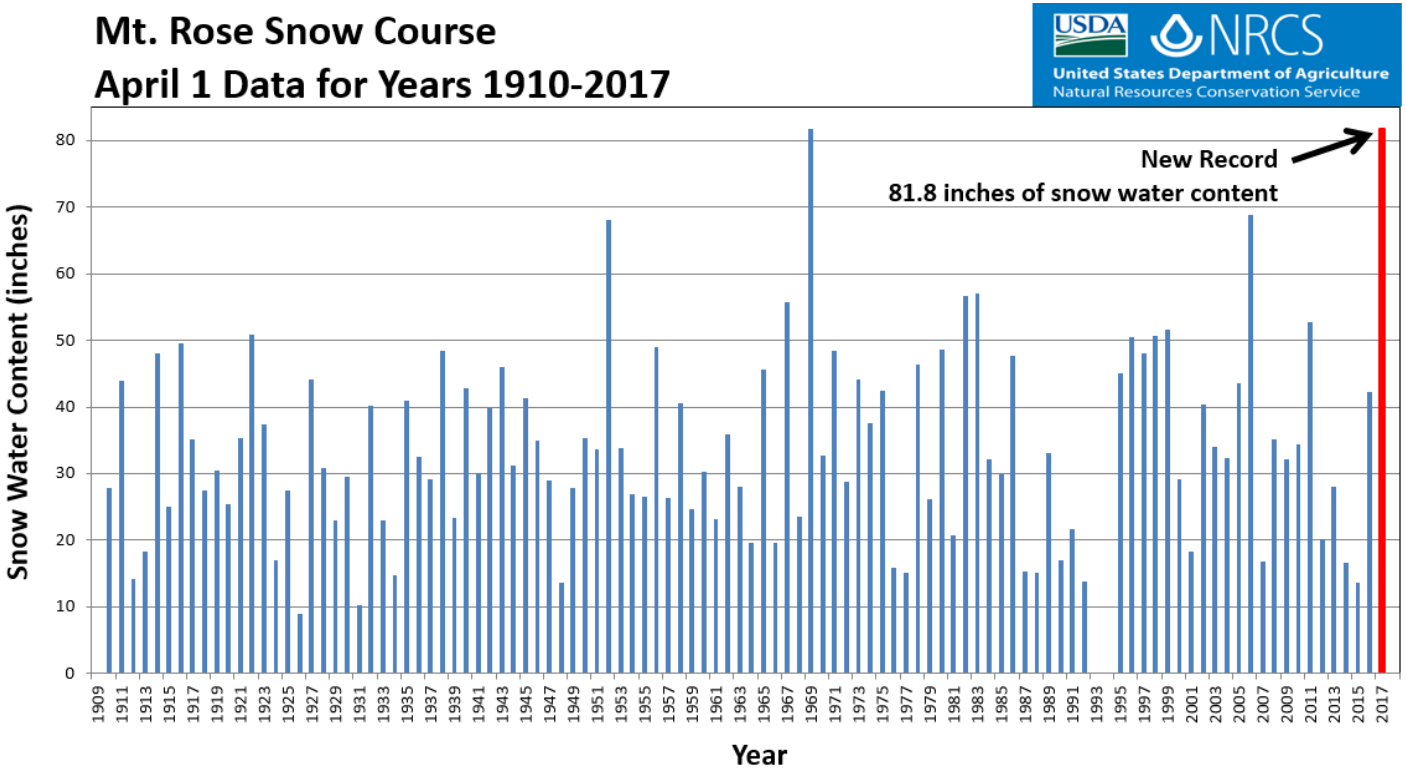


Photo Credit: UNR Archive


Mt. Rose Snow Course
April 1 Data for Years 1910-2017
USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service
New Record
81.8 inches of snow water content
Snow Water Content (inches)
0
10
20
30
40
50
60
70
80
1909 1911 1913 1915 1917 1919 1921 1923 1925 1927 1929 1931 1933 1935 1937 1939 1941 1943 1945 1947 1949 1951 1953 1955 1957 1959 1961 1963 1965 1967 1969 1971 1973 1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Year

Long-term Snow Course Data Summary

April 1, 2017

Snow Course	Basin	Elev (ft)	4/1/17 Snow Depth (in)	4/1/17 Water Content (in)	April 1 Rank	Years of April 1 Data	Years that were bigger
Lake Lucille	Lake Tahoe	8,200	217	107.8	3rd Highest	104	1983 & 1952
Rubicon #1	Lake Tahoe	8,100	204	93.0	2nd Highest	85	1983
Rubicon #2	Lake Tahoe	6,900	130	64.0	2nd Highest	93	1952
Squaw Valley #2	Truckee	7,700	174	70.2	3rd highest	62	1983 & 1969
Mount Rose	Truckee	9,200	156	81.8	New Record	106	-
Carson Pass Upper	Carson	8,500	116	66.0	3rd Highest	88	1969 & 1952
Sonora Pass	Walker	8,750	129	50.0	New Record	83	-
Willow Flat	Walker	8,230	47	21.1	5th highest	82	'69, '83, '52, '95
Sawmill Flat	Walker	8,760	84	39.9	New Record	41	-
Virginia Lakes Ridge	Walker	9,300	86	35	3rd Highest	49	1983 & 1969

Lake Lucille SC - Lake Tahoe

4/1/17

Point 5:

255 in depth (21 feet)

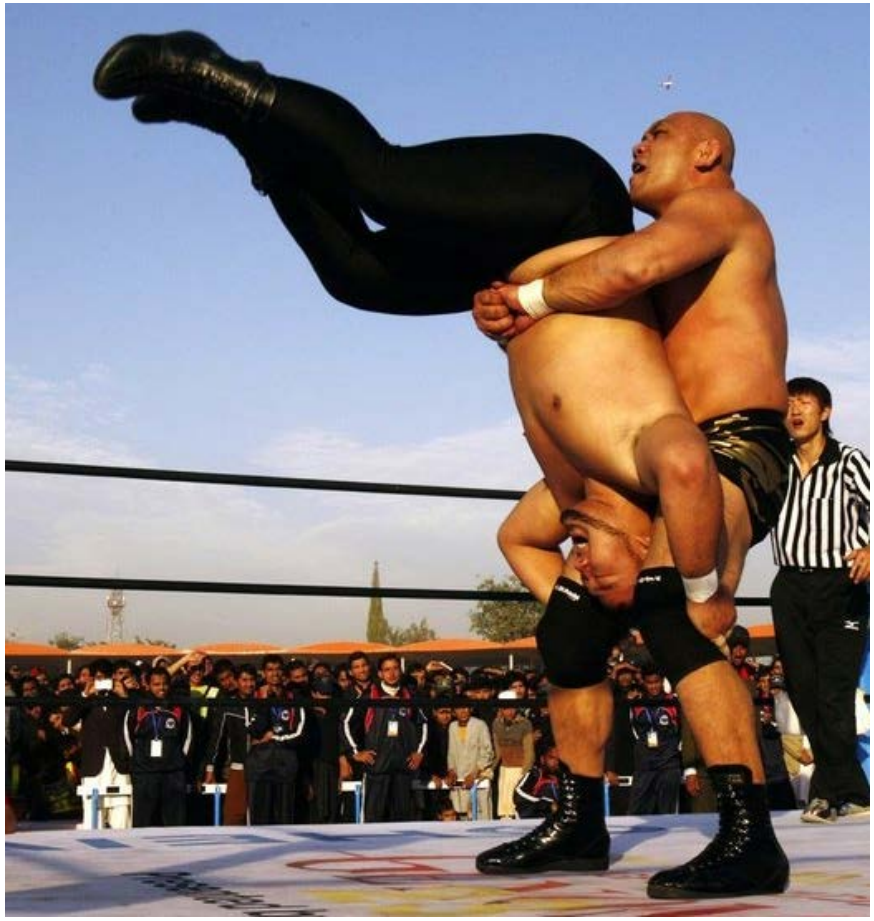
124 in Snow SWE (10 feet of water)

9 sections of Tubes

Professional Wrestling Inspired Sampling Technique

Seth Collins
Signature Curb Stomp

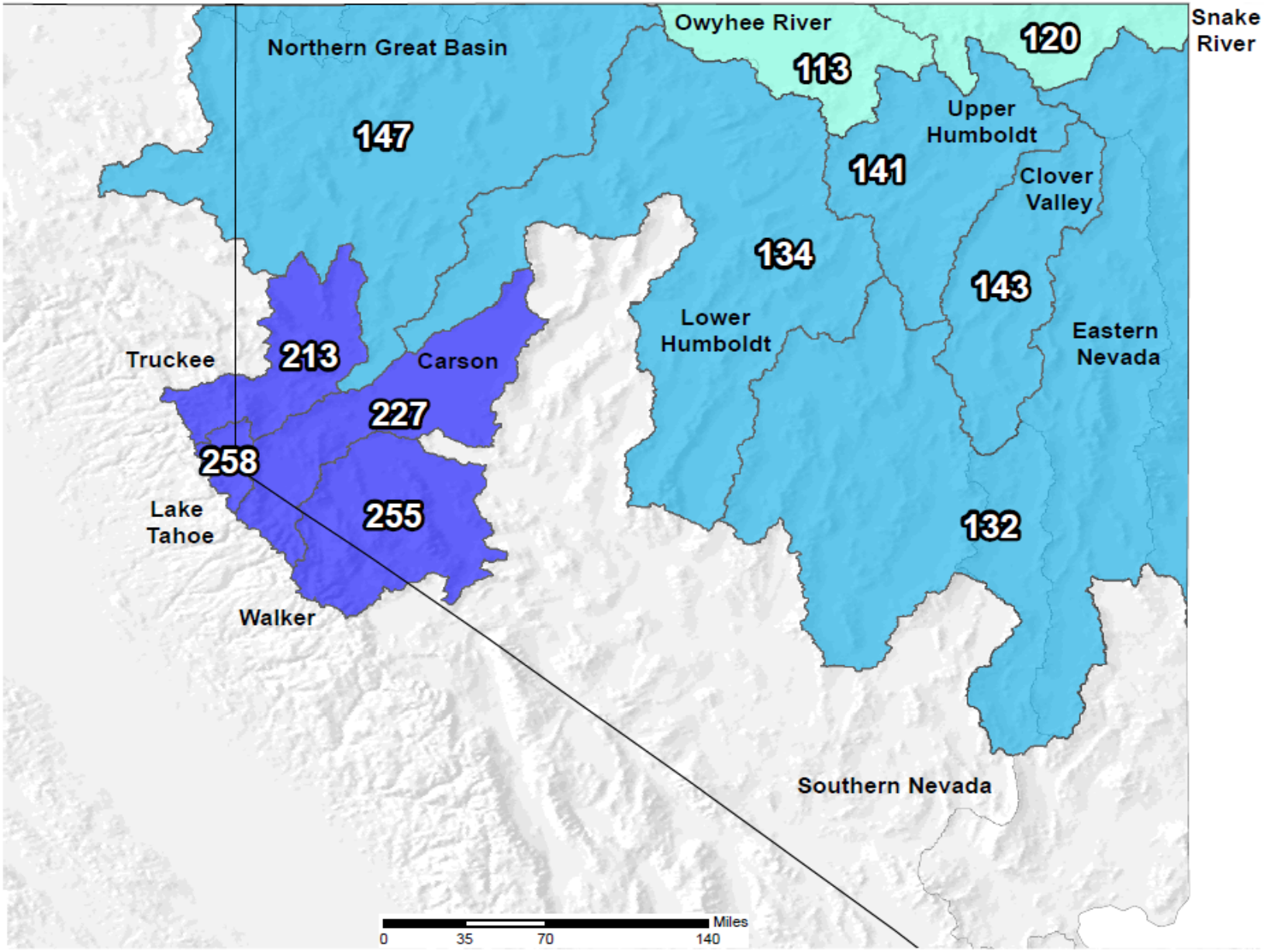
Jeff Anderson
Signature Tube Stomp



Dr. Church’s best Pile Driver

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

Apr 11, 2017



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

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

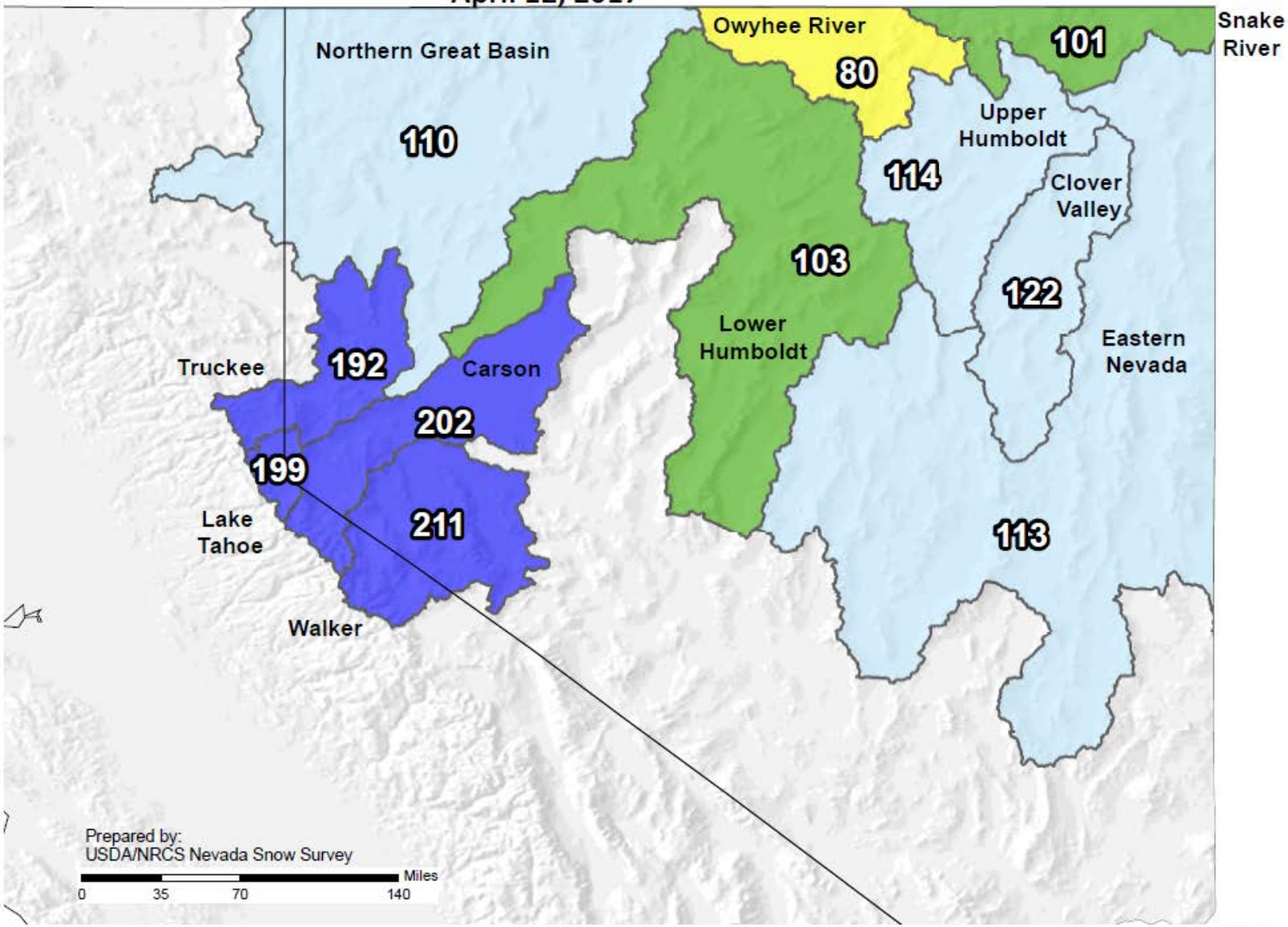
* *Data unavailable at time of posting or measurement is not representative at this time of year*

Provisional data subject to revision

The current snow water equivalent percent of normal represents the snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

Nevada & Eastern Sierra
Percent of Normal Peak Snowpack Amounts
April 12, 2017



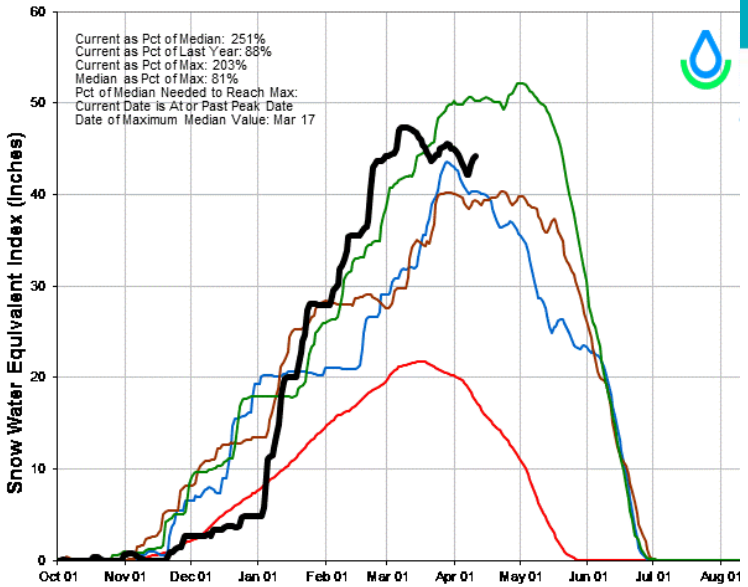
1st of Month Snow Water Equivalent Basin-wide Percent of 1981-2010 Median

- <50%
- 50-69%
- 70-89%
- 90-109%
- 110-129%
- 130-150%
- >150%

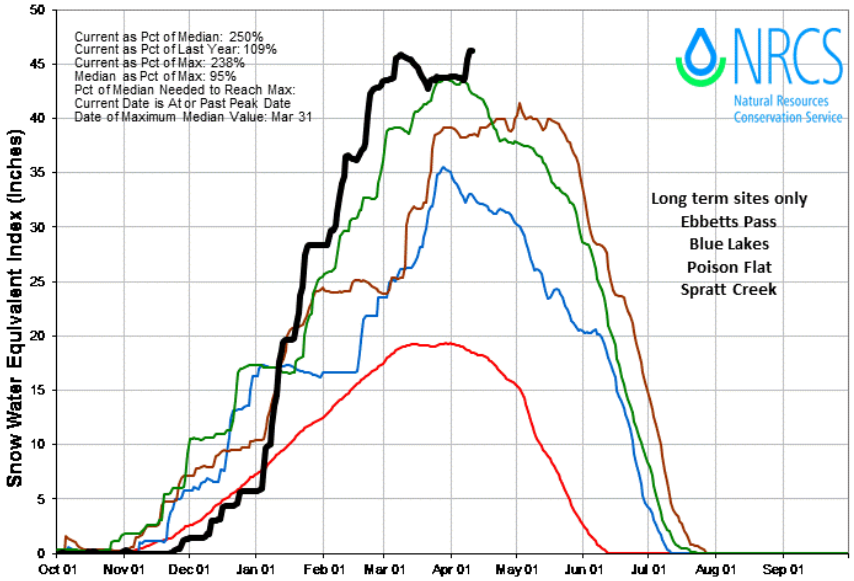
Provisional data subject to revision

USDA

LAKE TAHOE BASIN Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 10, 2017

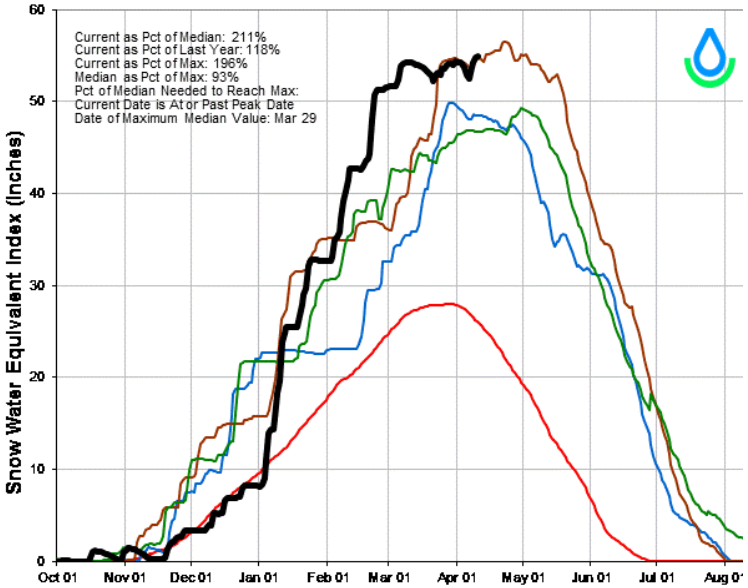


CARSON RIVER BASIN Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 10, 2017

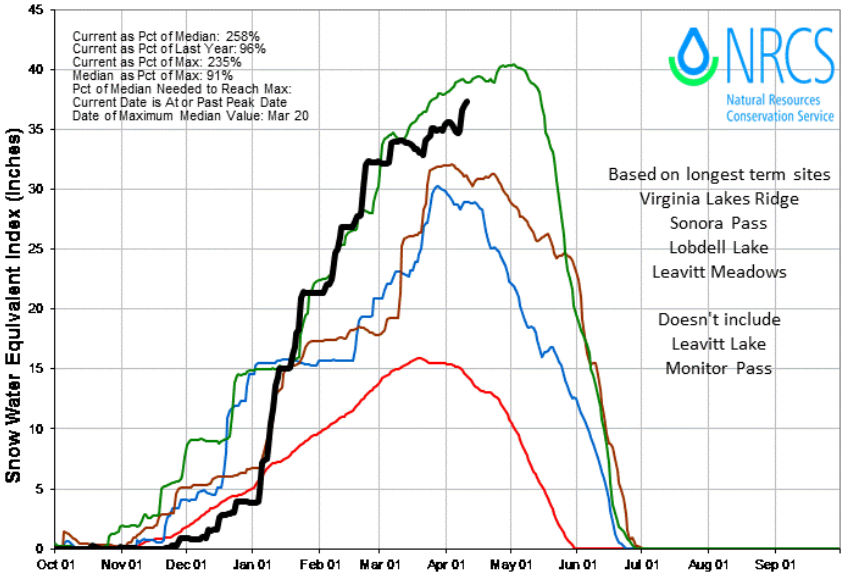


Median WY 2011 WY 1995 WY 1983 WY 2017

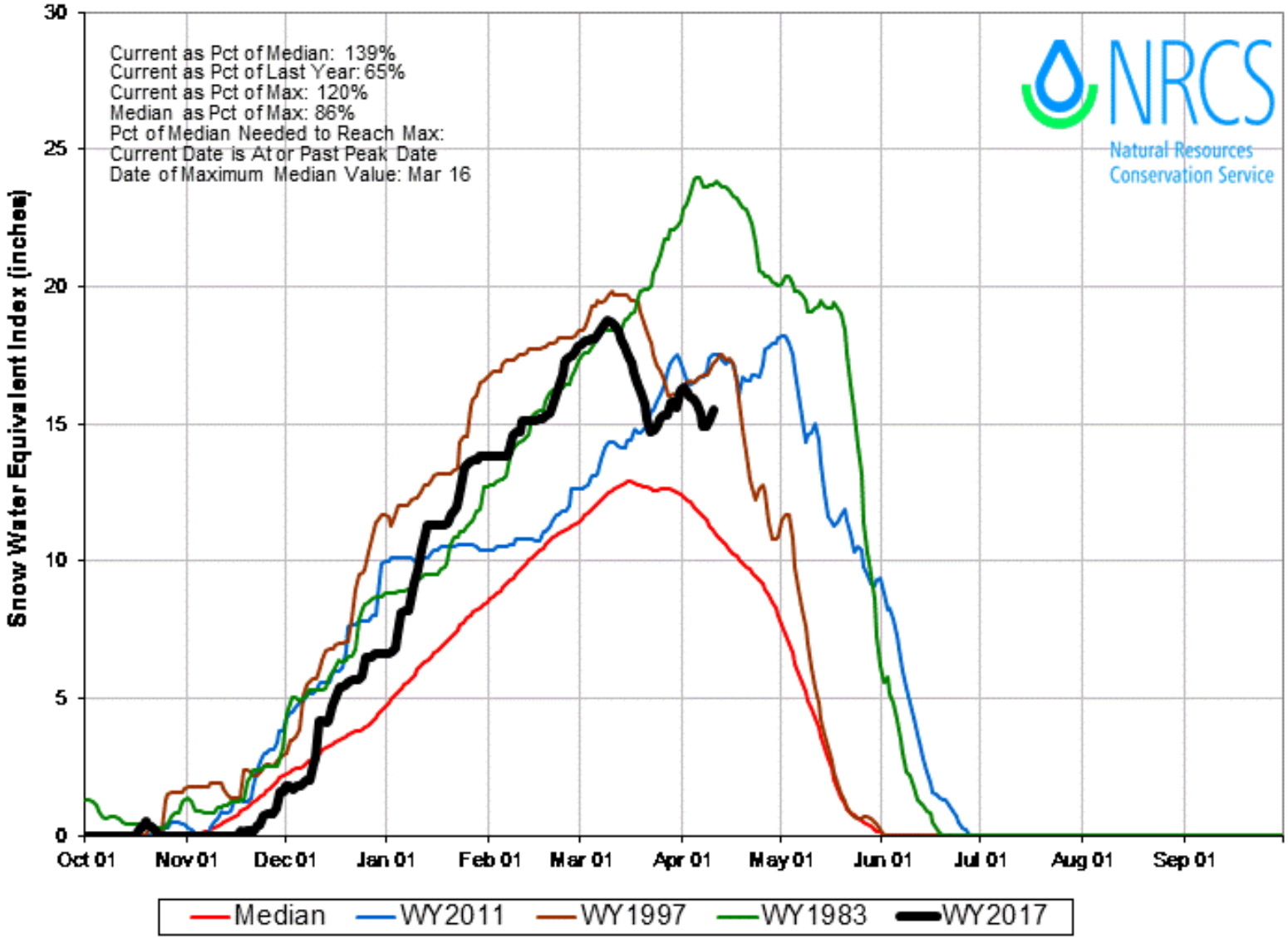
TRUCKEE RIVER BASIN Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 10, 2017



WALKER RIVER BASIN Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 10, 2017

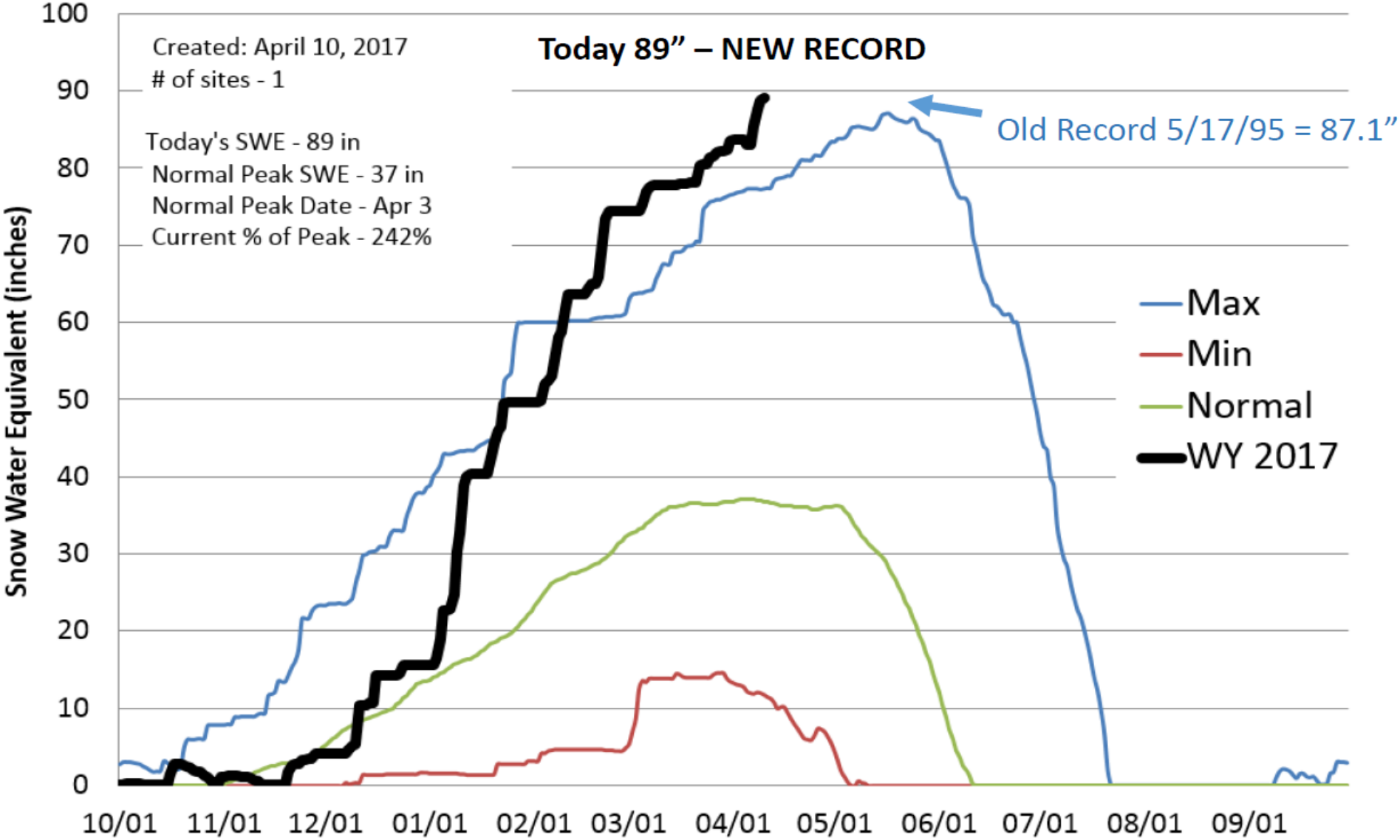


UPPER HUMBOLDT RIVER BASIN Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 10, 2017



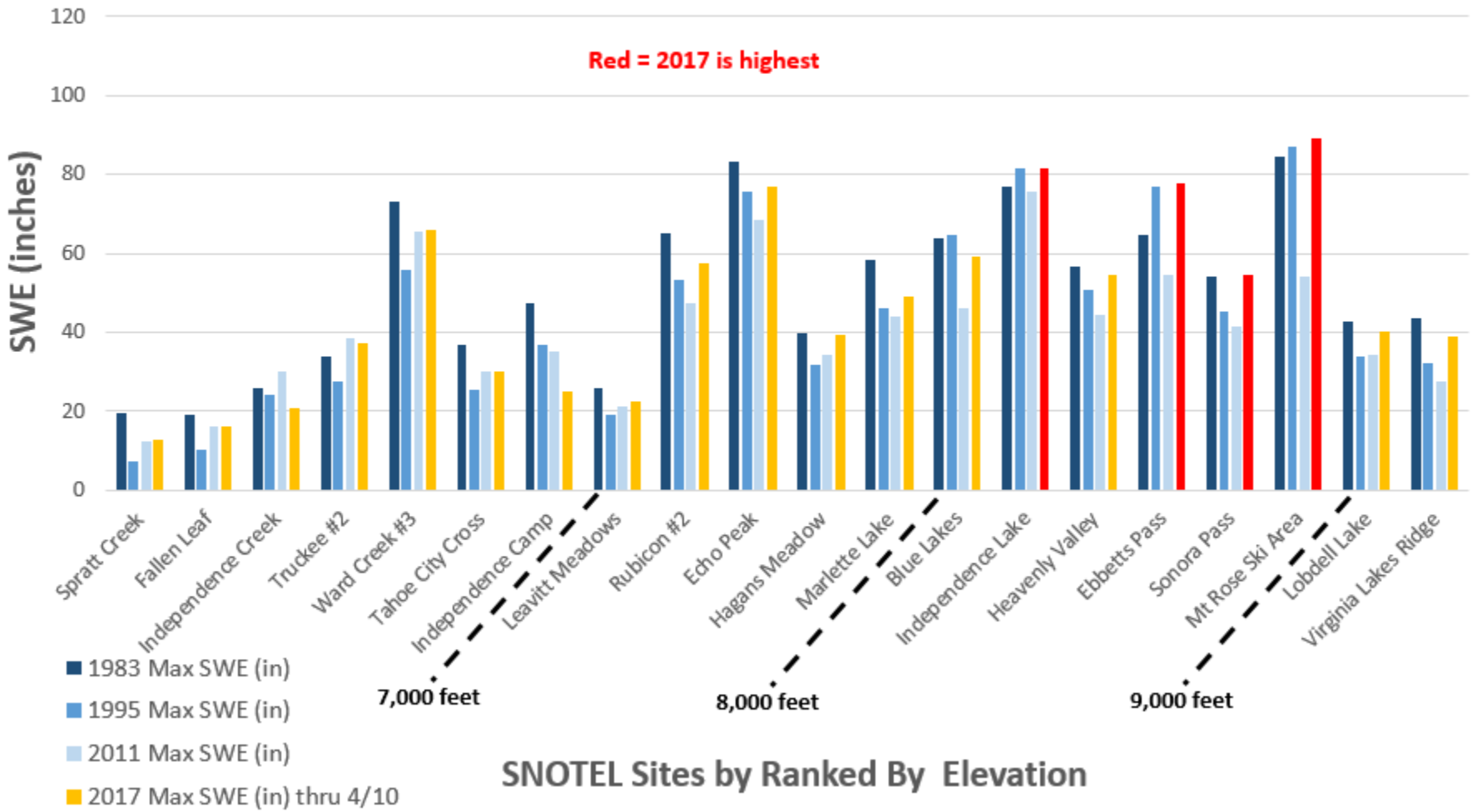
Mt Rose Ski Area SNOTEL

USDA NRCS Natural Resources Conservation Service



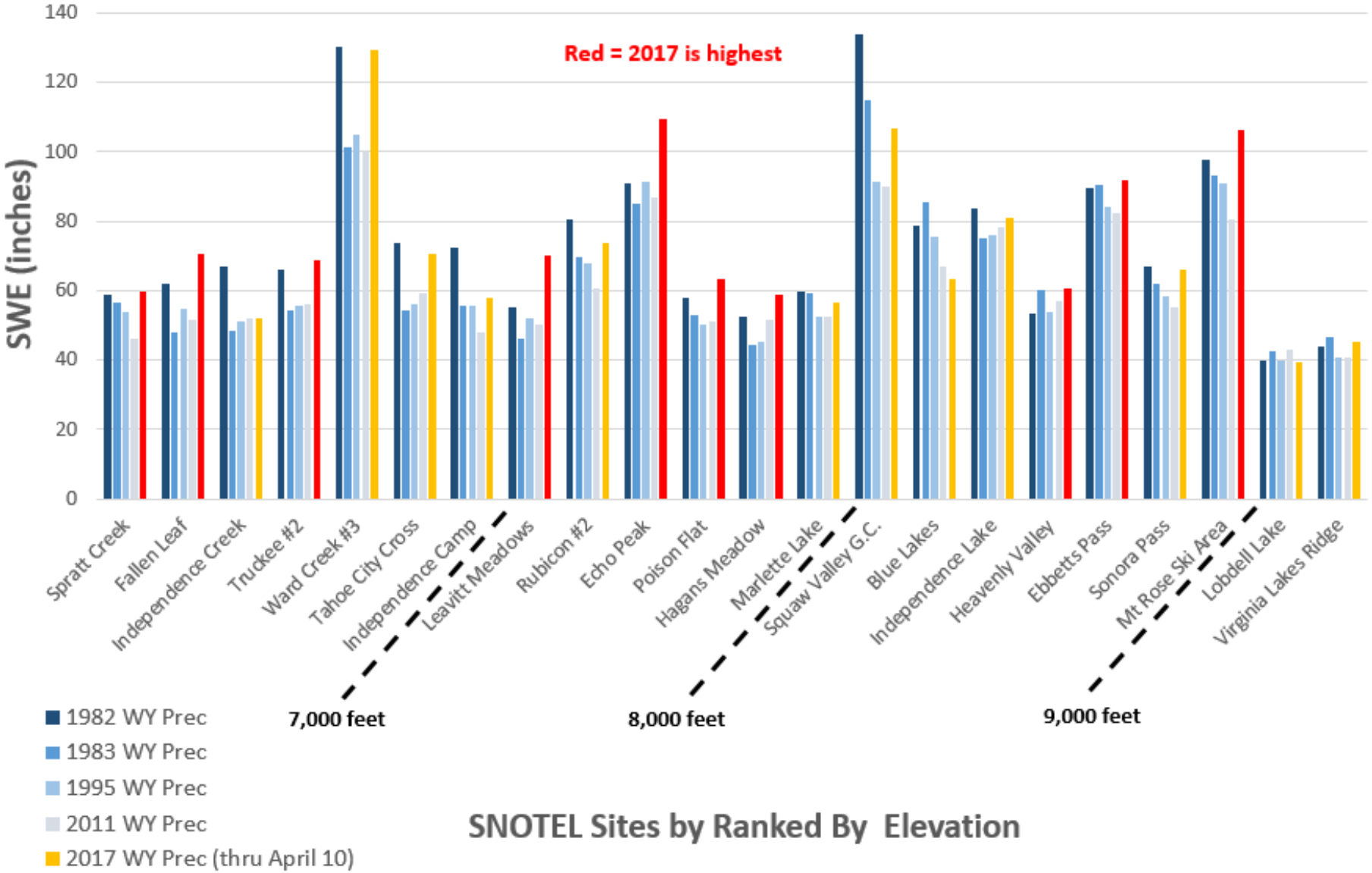
SNOTEL Water Year Max SWE for 1983, 1995, 2011 vs 2017 (thru April 10)

USDA NRCS Natural Resources Conservation Service



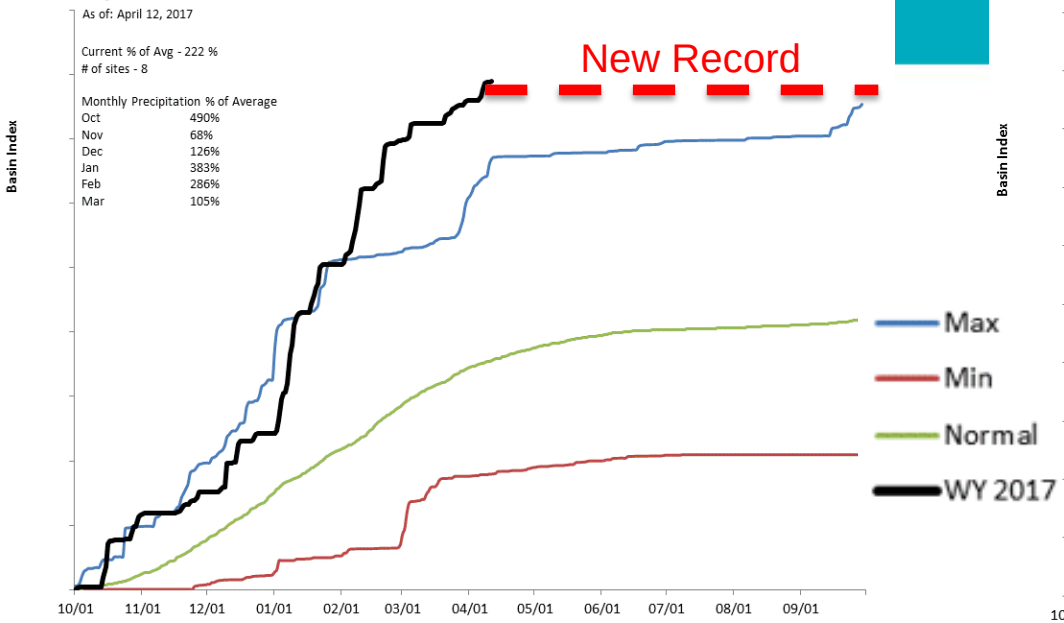
SNOTEL Water Year Precipitation
1982, 1983, 1995, 2011 vs 2017 (thru April 10)

USDA NRCS Natural Resources Conservation Service

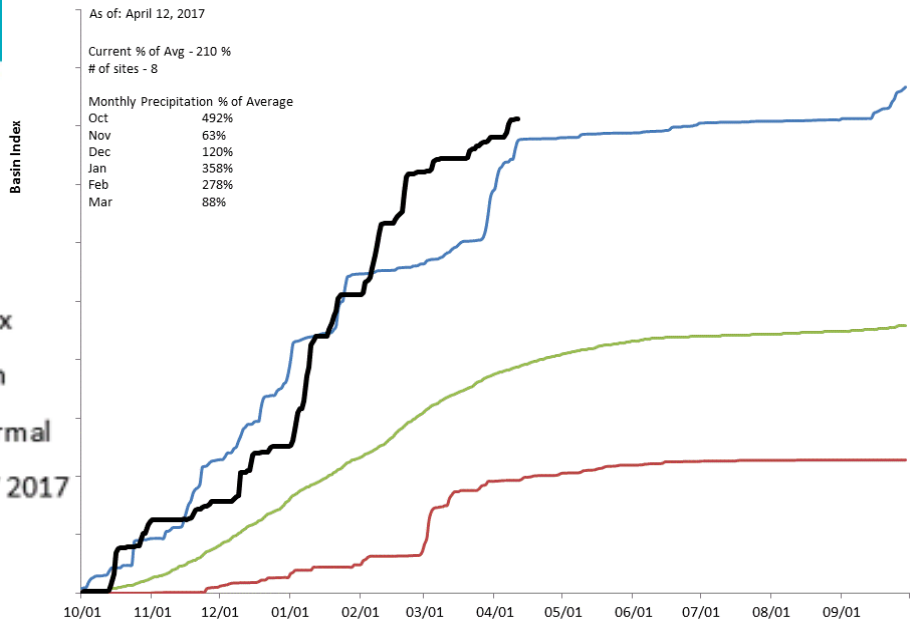


SNOTEL Sites by Ranked By Elevation

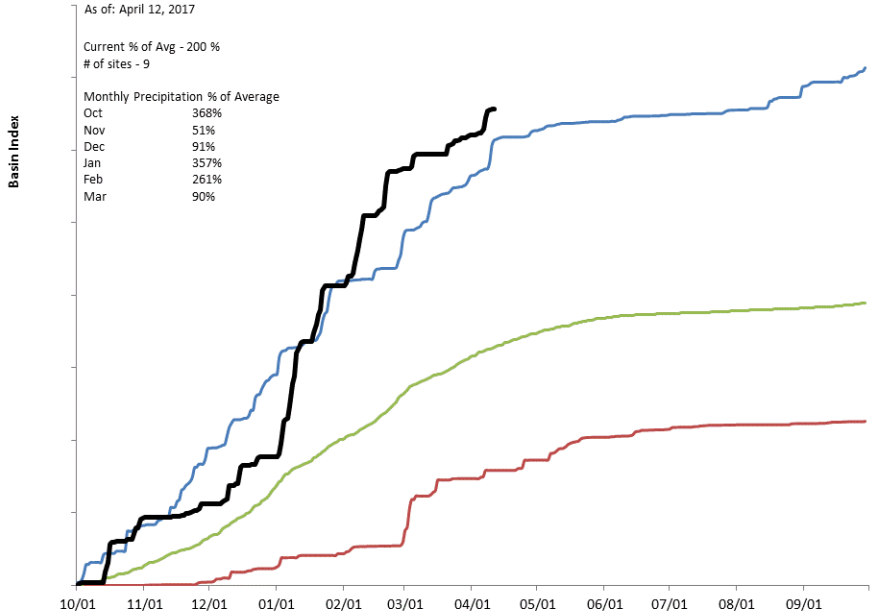
Lake Tahoe Basin Precipitation



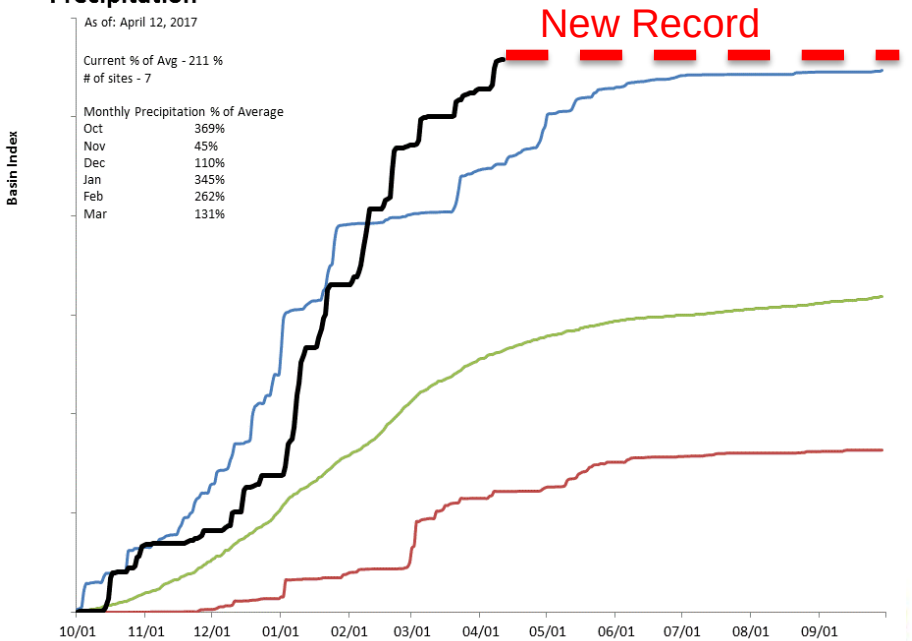
Truckee River Basin Precipitation



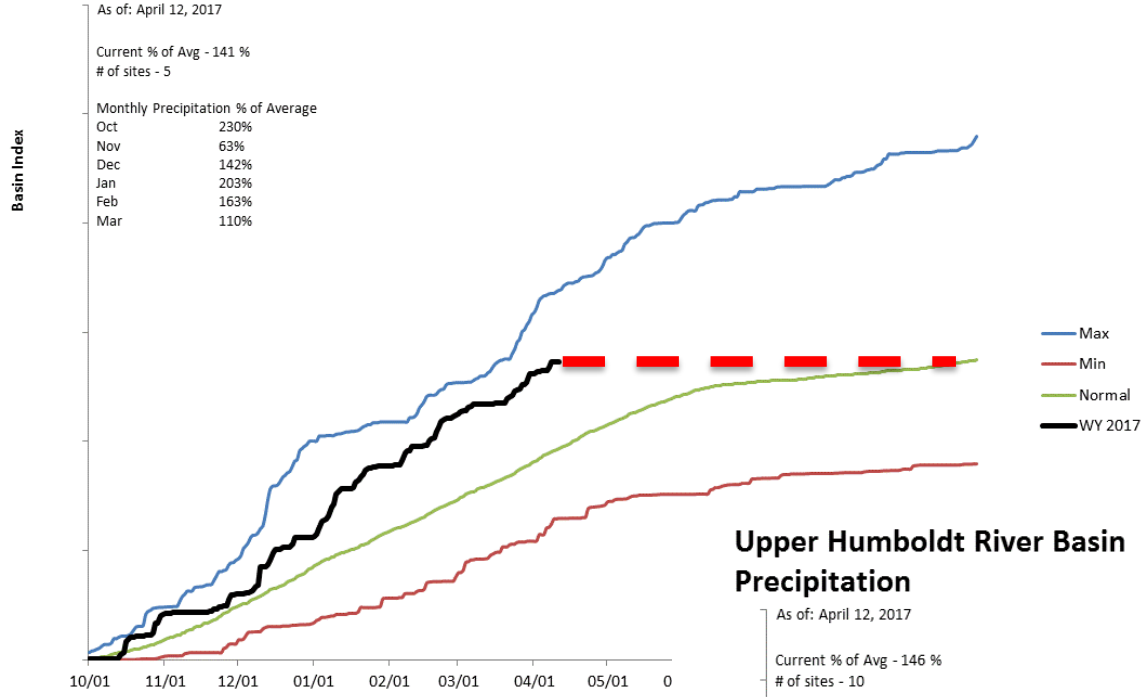
Carson River Basin Precipitation



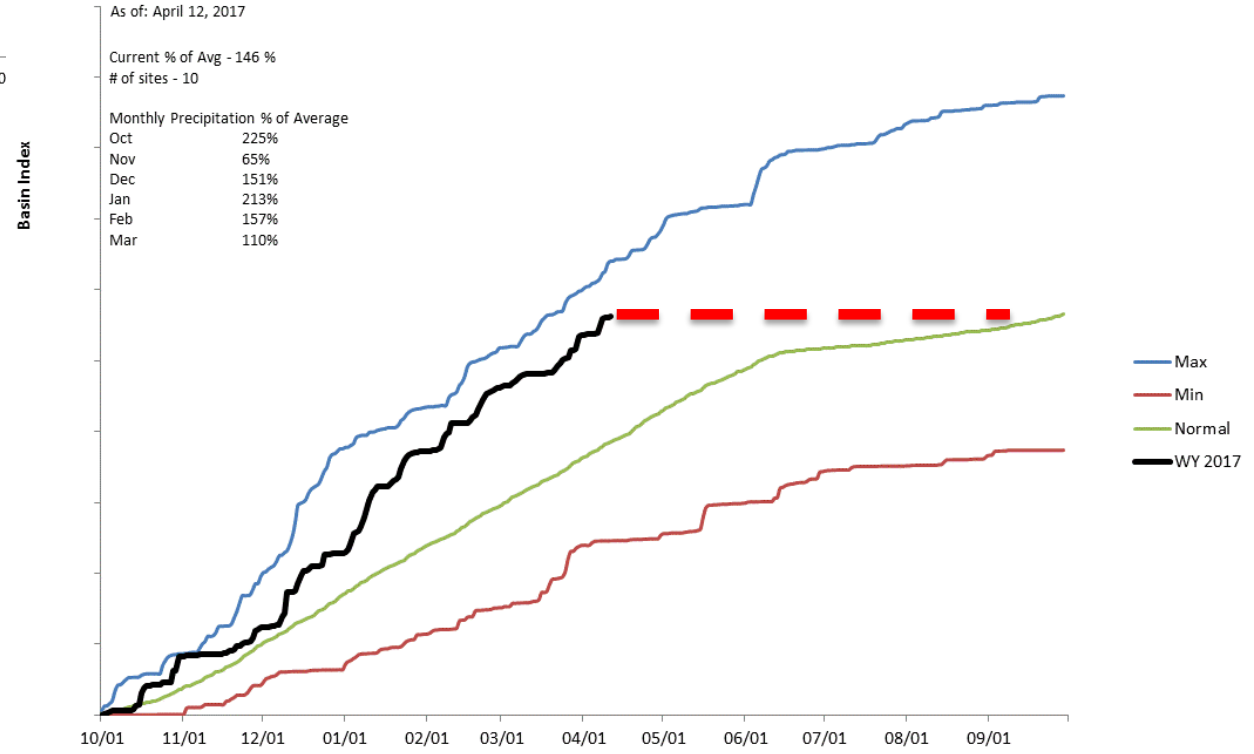
Walker River Basin Precipitation

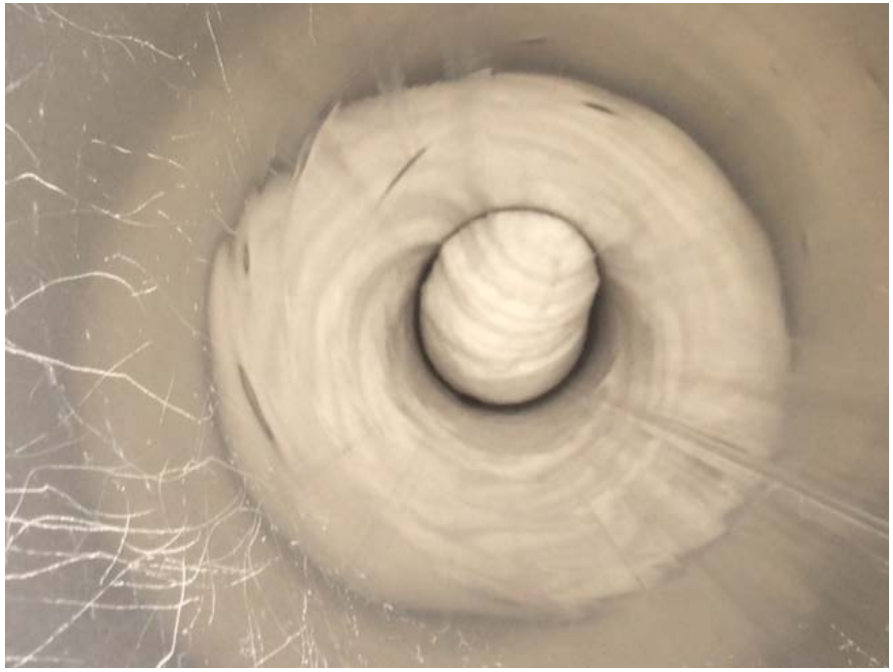


Lower Humboldt River Basin Precipitation



Upper Humboldt River Basin Precipitation





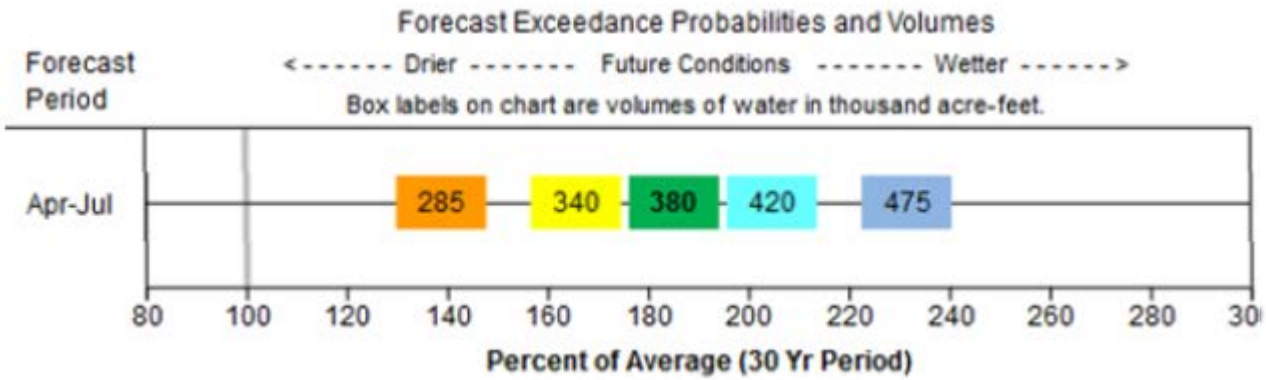
3/27/2017
Leavitt Lake SNOTEL
Precipitation Gage Snow Plug

Mixing in plug caused a rise of ~50in in reading

Leavitt Lake SNOTEL - 28ft tall precipitation gage

Why is Leavitt Lake not reporting?
We found coaxial cable going to the antenna gnawed on by a critter.
We taped it up, but Murphy's Law struck and the site shorted and went down.

New Forecast Graphic

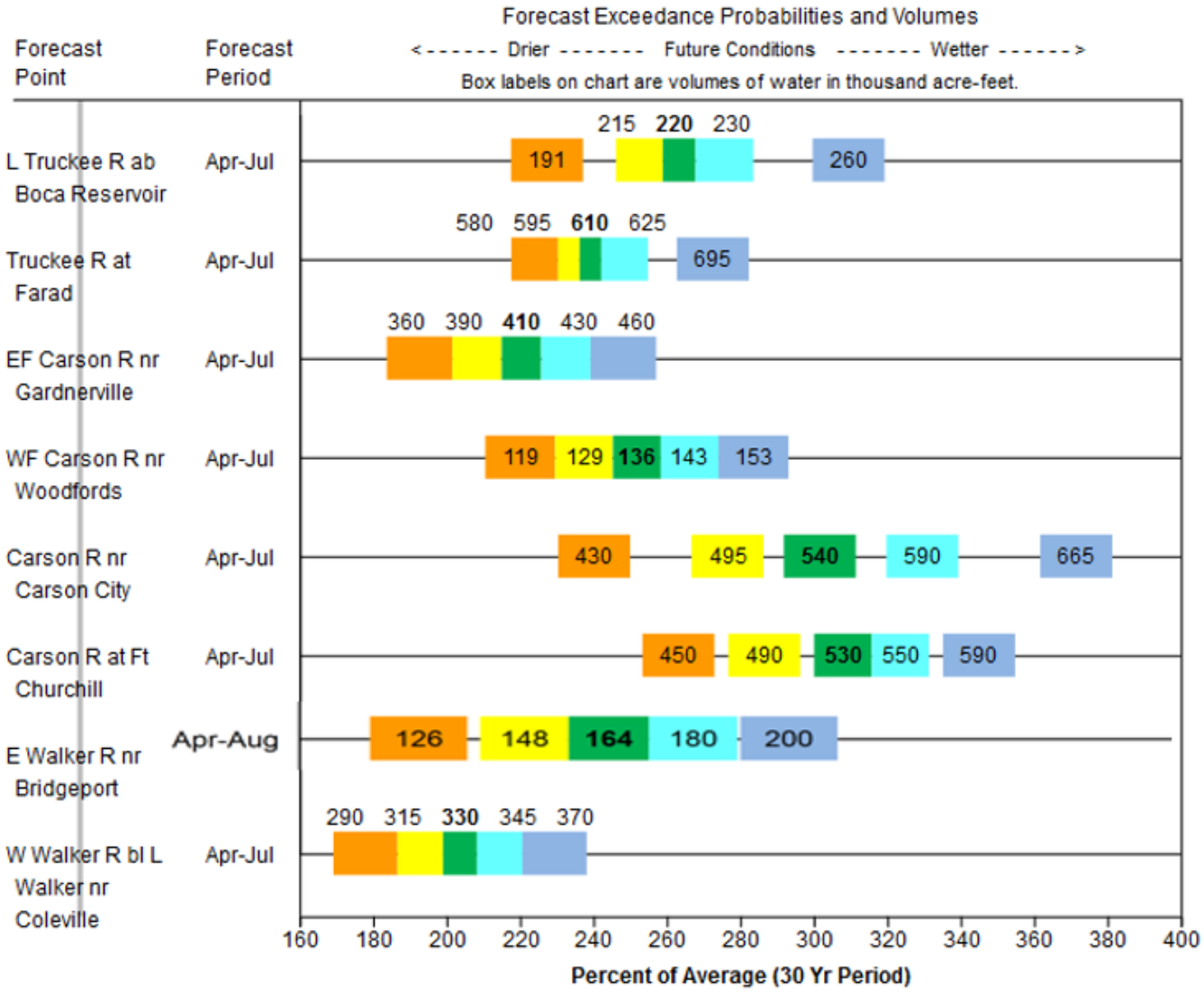


Numbers inside boxes are KAF for 5 exceedances

Below Average Volume ← **Average Volume** → **Above Average Volume**

Each colored box represents different exceedance forecasts

Eastern Sierra Basin Summary
Water Supply Forecasts
April 1, 2017

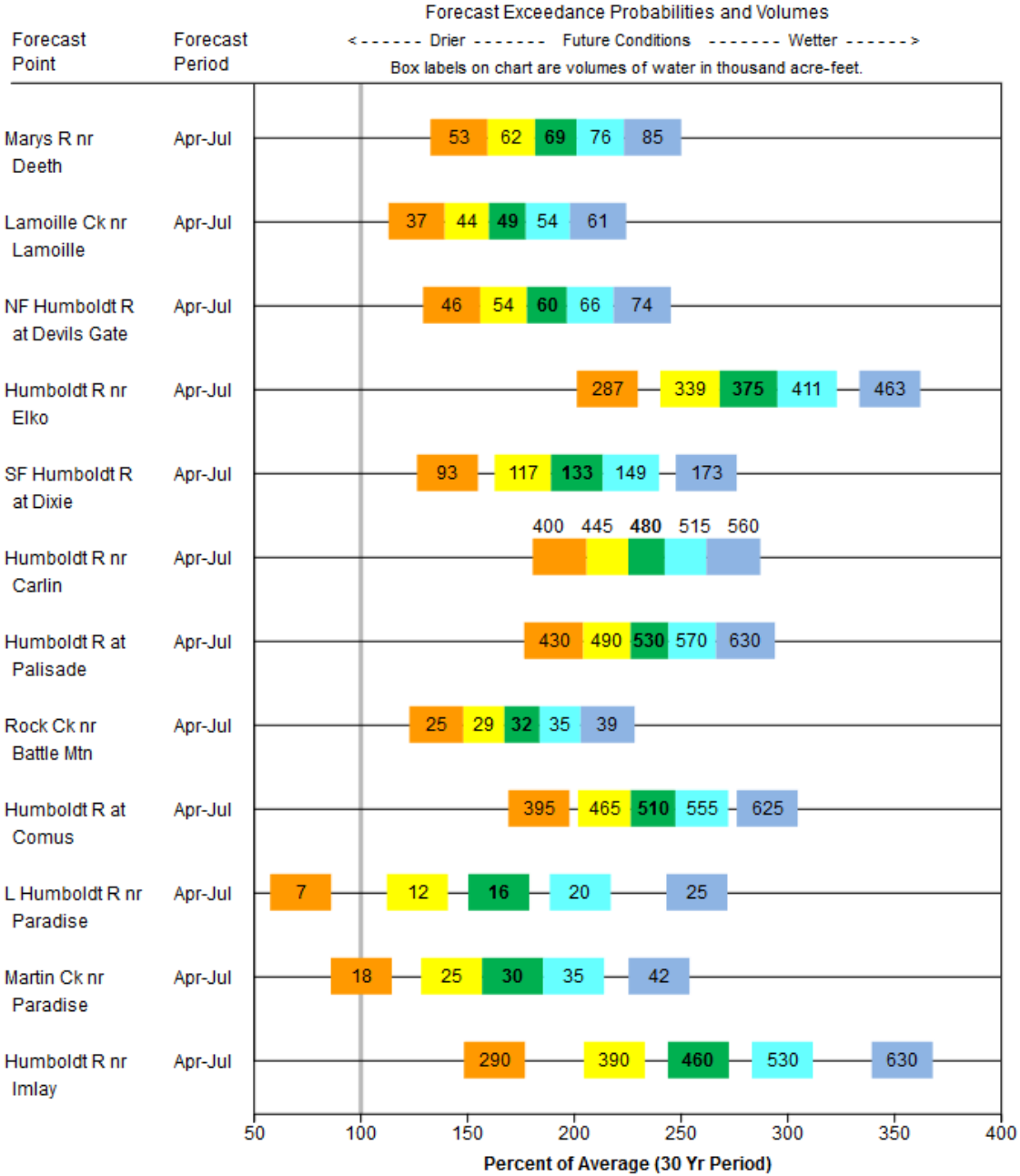


April 1, 2017 NRCS Forecasts vs. 2011, 1983 & Record Volumes

Forecast Point	Forecast Period	April 1, 2017 Forecast Exceedances - KAF <---drier future----------wetter future--->					2011 KAF	1983 KAF	Record	Record Year
		90%	70%	50%	30%	10%				
Truckee R at Farad (Adj)	Apr-Jul	580	596	610	627	696	568	674	674	1983
EF Carson R nr Gardnerville	Apr-Jul	362	390	410	430	459	336	443	467	1890
WF Carson R at Woodfords	Apr-Jul	119	129	136	143	153	89	130	153	1907
Carson R nr Carson City	Apr-Jul	431	494	540	589	666	399	528	528	1983
Carson R nr Fort Churchill	Apr-Jul	450	490	530	550	590	390	513	513	1983
E Walker R nr Bridgeport	Apr-Aug	126	148	164	180	202	133	219	223	1969
W Walker R nr Coleville	Apr-Jul	289	314	330	346	371	280	292	372	1907

>2011	>1983	New Record

Humboldt River Summary
Water Supply Forecasts
April 1, 2017

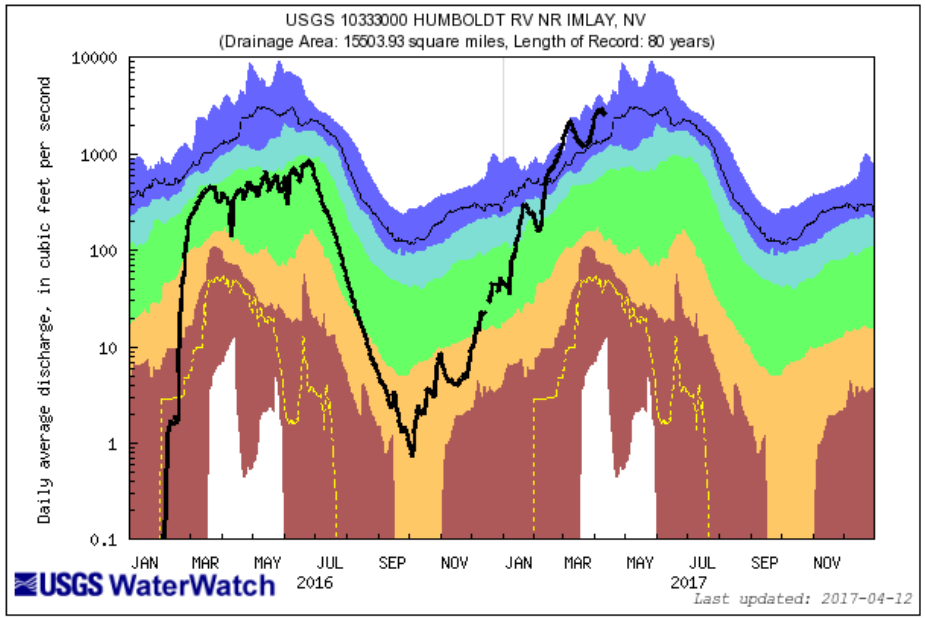


April 1, 2017 NRCS Forecasts vs. 2011, 1997, 1983 & Record Volumes

Forecast Point	Forecast Period	April 1, 2017 Forecast Exceedances - KAF <---drier future----------wetter future--->					2011 KAF	1997 KAF	1983 KAF	Record KAF (1984)
		90%	70%	50%	30%	10%				
Humboldt R nr Elko	Apr-Jul	287	339	375	411	463	270	197	301	613
Humboldt R nr Comus (Winnemucca)	Apr-Jul	394	463	510	557	626	310	348	735	1093
Humboldt R nr Imlay (Rye Patch Inflow)	Apr-Jul	288	390	460	530	632	214	292	641	1112

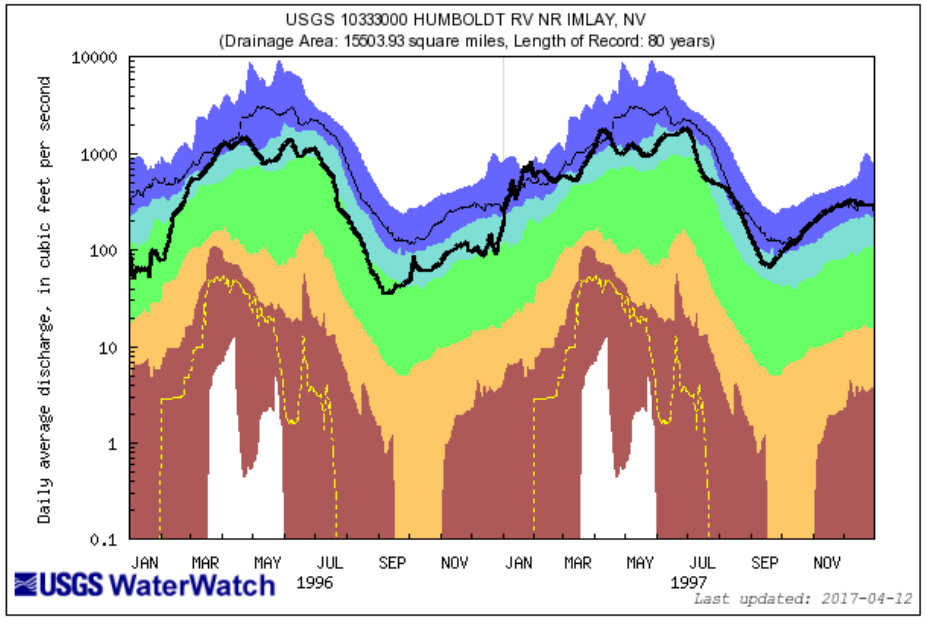
>2011	>1997	>1983

2016-2017

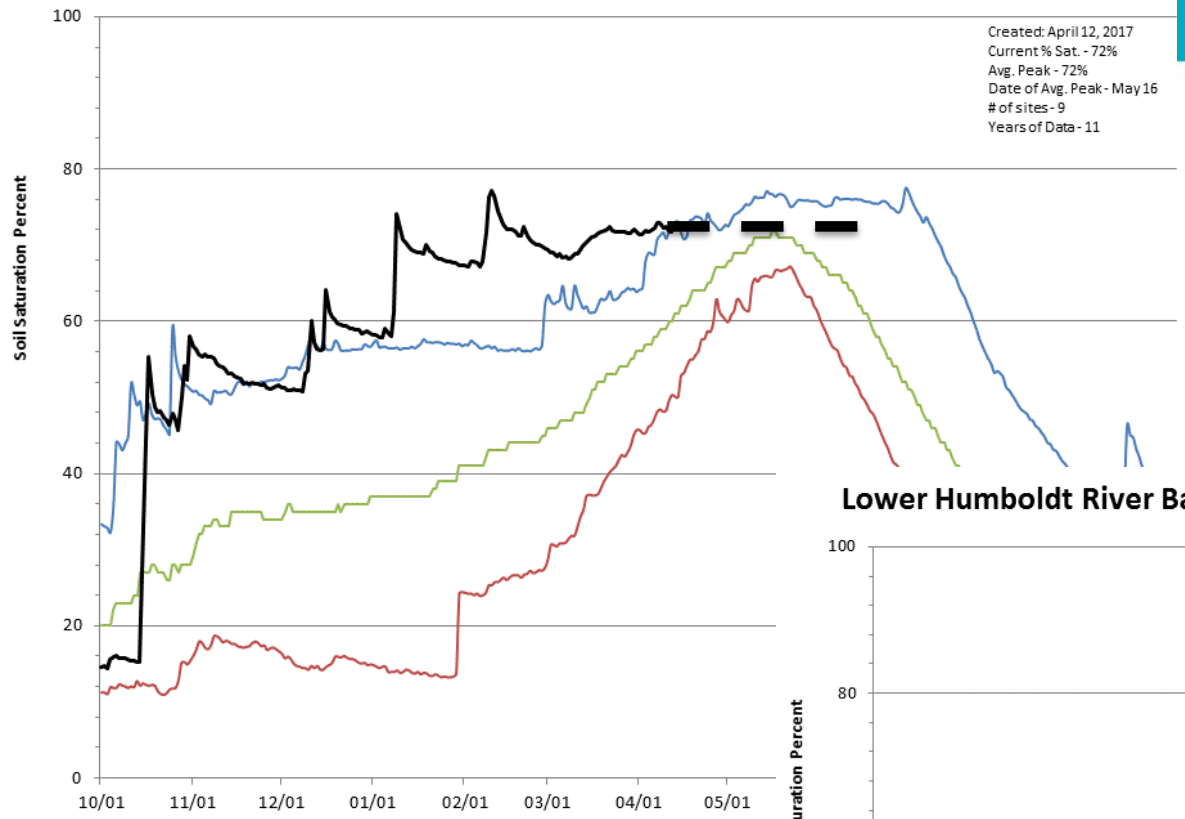


Explanation - Percentile classes							
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile -highest	Flow
Much below Normal		Below normal	Normal	Above normal	Much above normal		

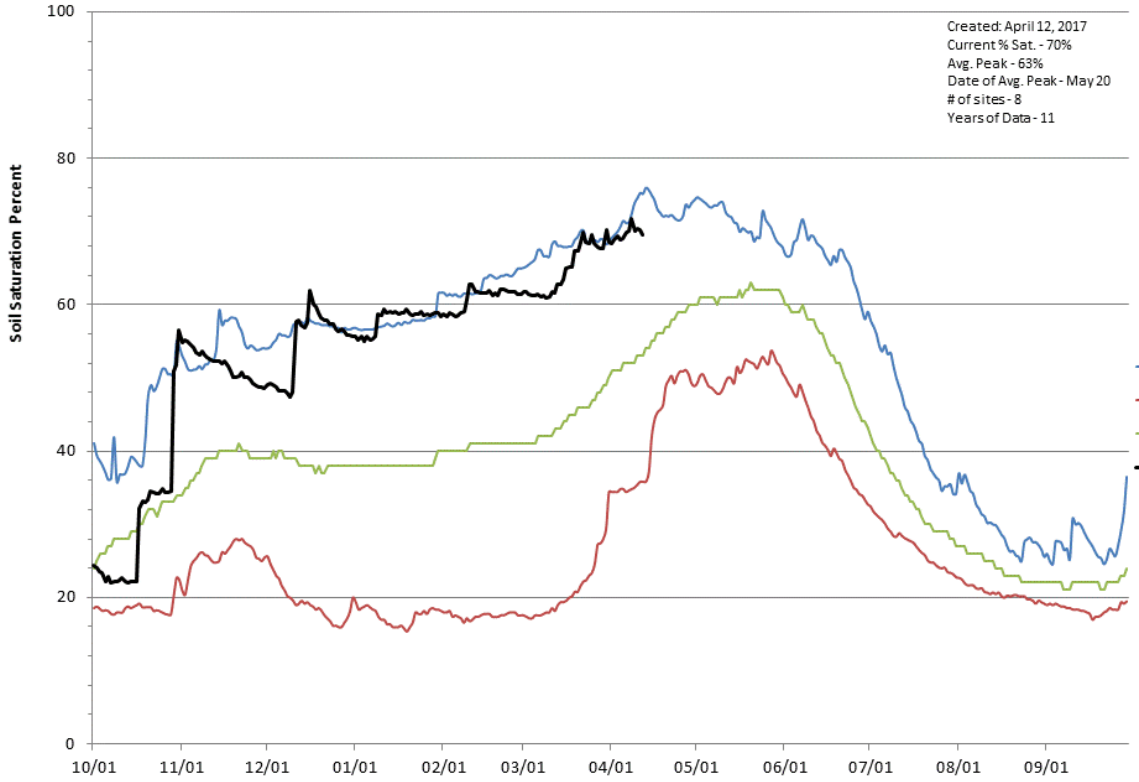
1996-1997



Carson River Basin - Soil Saturation



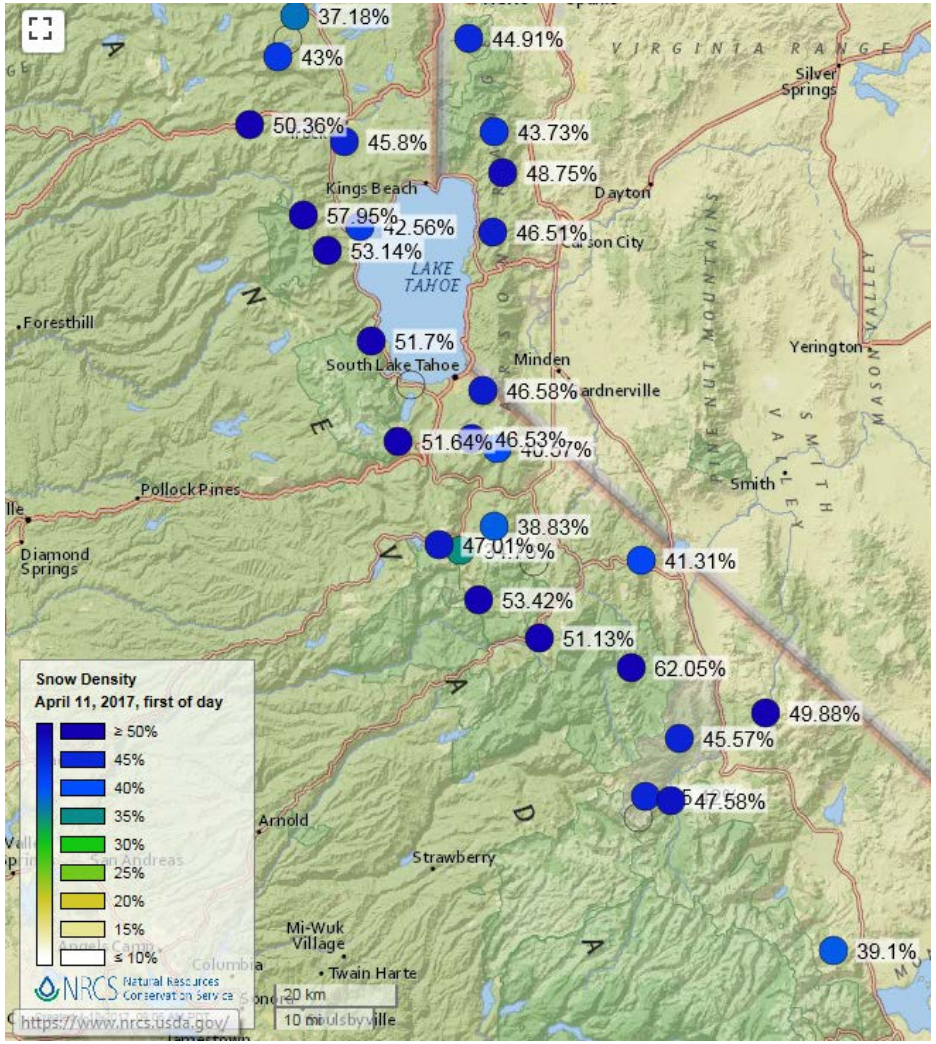
Lower Humboldt River Basin - Soil Saturation

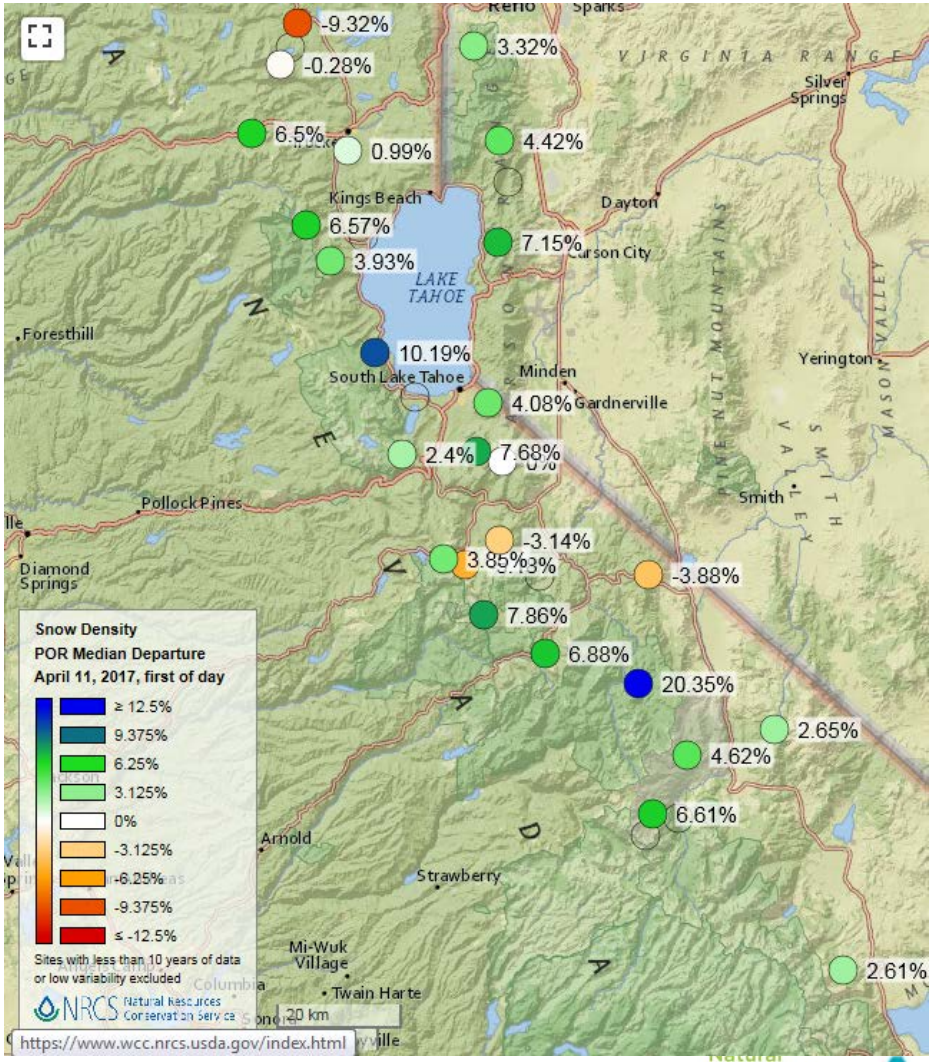


Soil moisture across Sierra and Humboldt basins continues to be near past maximum snowmelt percentages

Snow Density

April 11, 2017

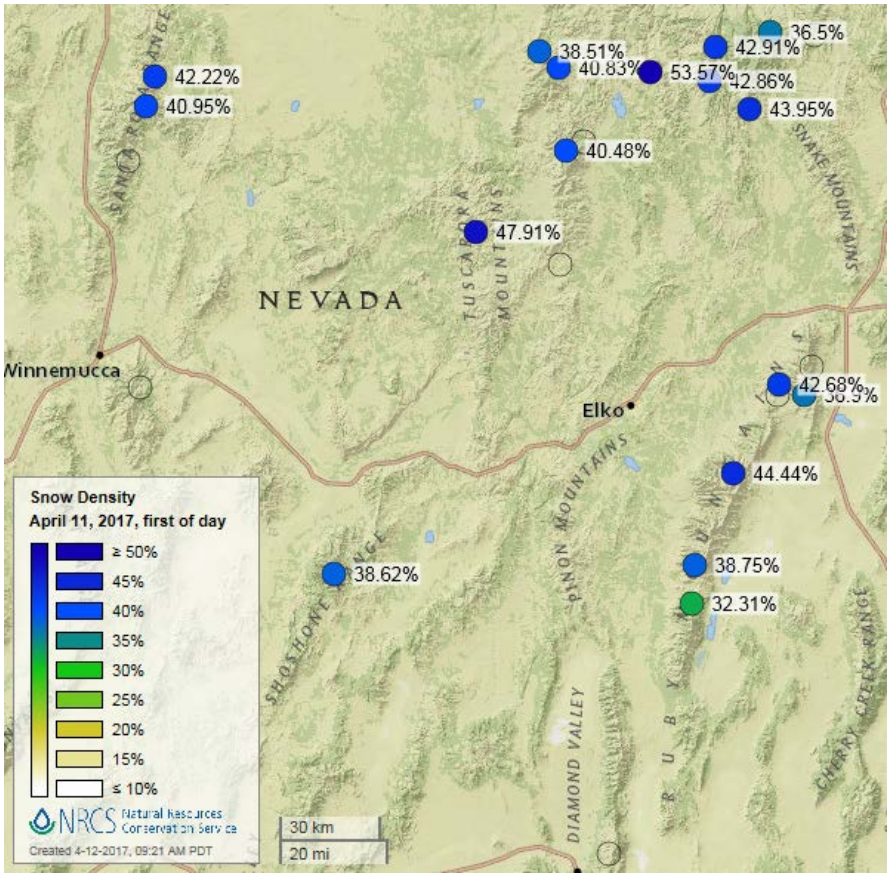


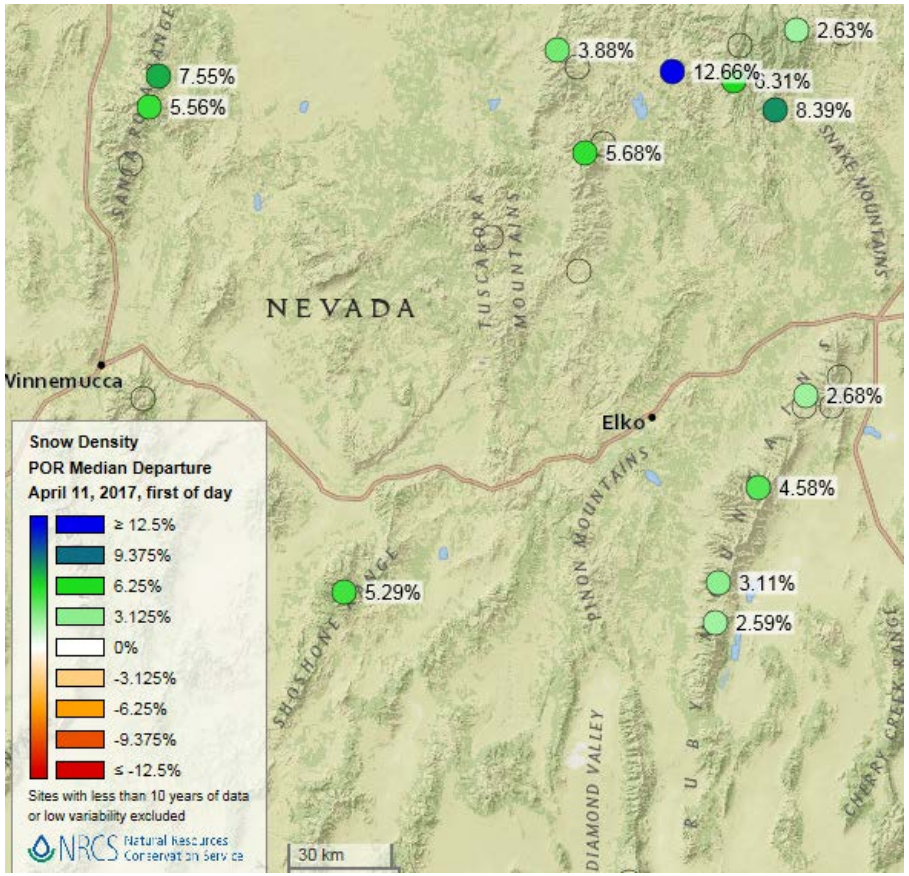


Snowpack Density is ~3-7% higher than normal for April 11

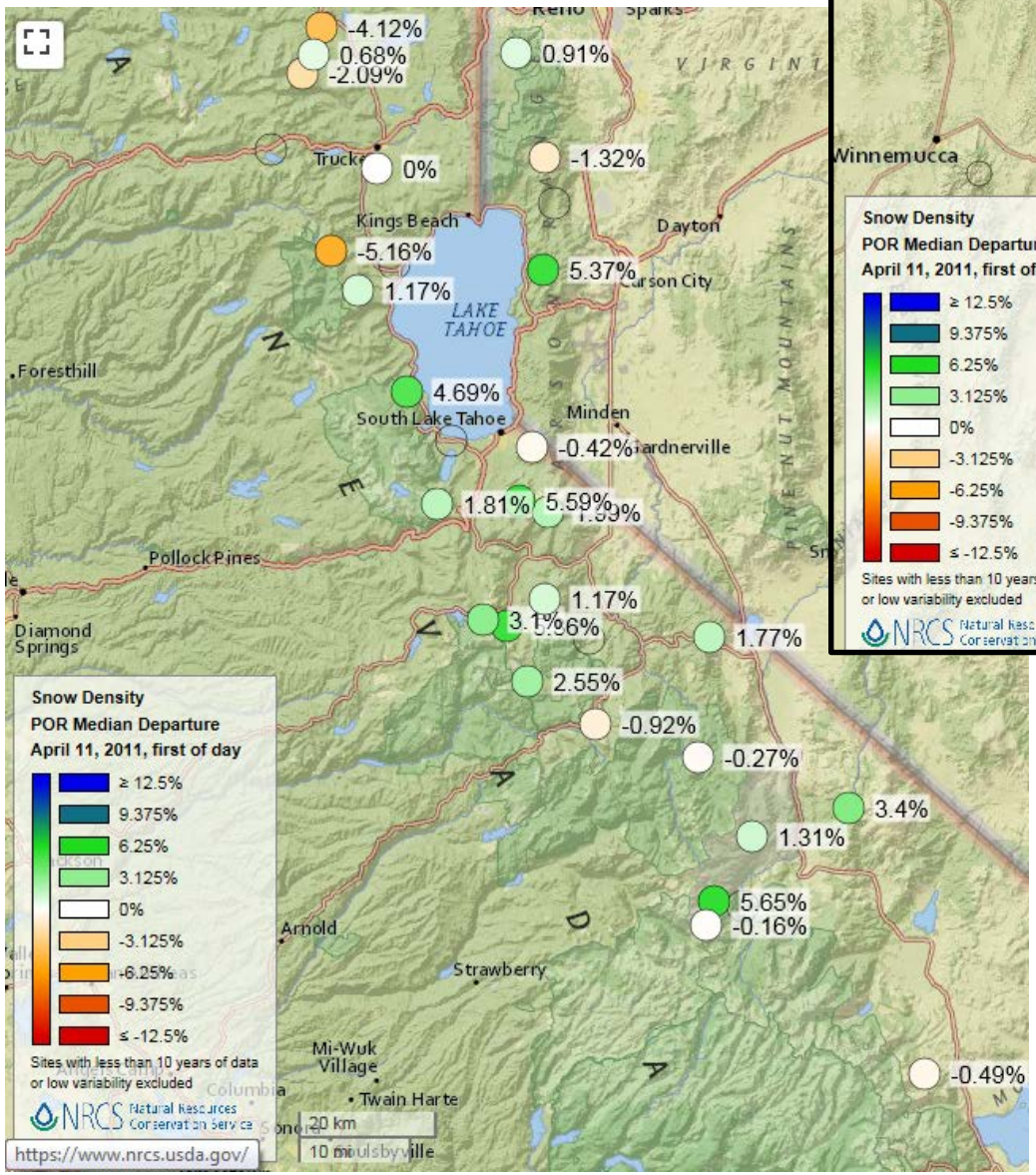
Snow Density

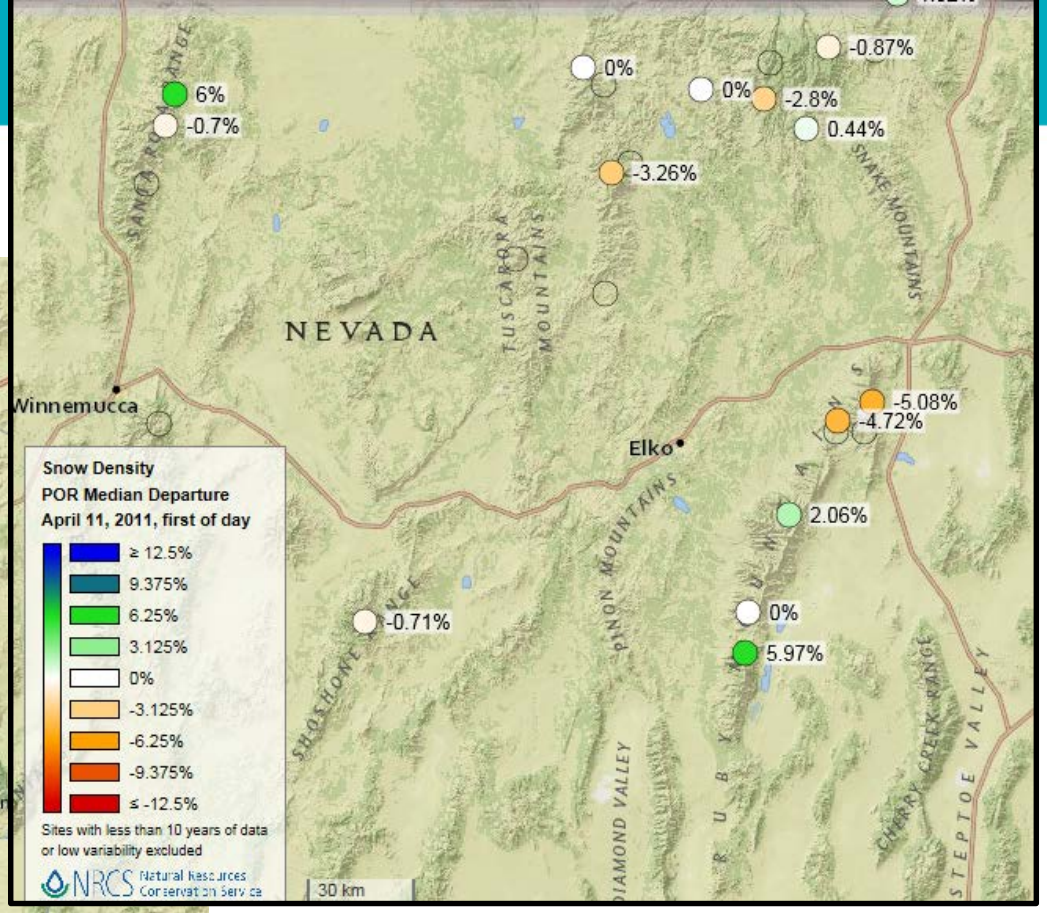
April 11, 2017





Snowpack Density is ~3-7% higher than normal for April 11





Snow Density Departure

April 11, 2011

In comparison 2011 the snow was less dense than normal

Natural Resources Conservation Service

USDA United States Department of Agriculture

www.nv.nrcs.usda.gov/snow/

USDA **Natural Resources Conservation Service**
Nevada
United States Department of Agriculture

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Snow Survey

Nevada NRCS Snow Survey Program

The NRCS Snow Survey Program provides mountain snowpack data and streamflow forecasts for the western United States. Applications of snow survey products include water supply management, flood control, climate modeling, recreation, and conservation planning.

Natural Resources Conservation Service
Nevada Water Supply Outlook Report
April 1, 2017
Same State, Same Winter

Latest Snow & Water Supply Information:

April 1, 2017 Water Supply Outlook Report - NEW

Snowpack Graphs - 2017 vs Big Years - updated 4/4

NWS Spring Flood Briefing - Recording - 3/23

Interactive Map 3.0 (beta) options include delta function, snow density, water year peak, streamflow forecasts, basin reporting.

News Release: Hole-in-Mtn SNOTEL - updated 3/1

Today's Snow & Precipitation Update Reports

- Snow and Precipitation - Percent of Normal
- Precipitation - Month to Date | % of Monthly Ave
- Snowpack - Percent of Normal Peak
- Maps: Snow | Water Year Prec | Monthly Prec

Natural Resources Conservation Service

Boom or Bust