2018 Snowpack Status and Streamflow Outlook for the Truckee, Carson, Walker and Humboldt Basins

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Nevada Division of Water Resources

My 2017 Souvenir

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Natural Resources Conservation Service
www.nv.nrcs.usda.gov/snow
Leavitt Lake
6/6/2017
Depth 180in (15ft)
SWE 102.5in (8.5ft)
57% overall density

Density near the ground was much greater, where the snow/ice was translucent.
How much trouble does a record snowpack cause?

Effects of Snow Creep at Leavitt Lake SNOTEL

Snow pillow seems failed at Burnside Lake SNOTEL & Forestdale Creek SNOTEL

Perimeter fences bent and/or compressed into ground at a number of sites
Sometimes it helps to know you have company…
Nevada/California SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal

Jan 11, 2018

Water Year (Oct 1) to Date Precipitation Basin-wide Percent of 1981-2010 Average

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

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

Provisional data subject to revision

The water year to date precipitation percent of normal represents the accumulated precipitation 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
January Precip mostly OK

Snow Drought Signature
SWE Delta < Precip
Soil Moisture Response to January Rain

Average Soil Saturation in Truckee River Basin

- Max
- Normal (POR)
- Min
- Stats. Shading
  - 2018
  - 2017
  - 2016
  - 2015
  - 2014
  - 2013
  - 2012
  - 2011
  - 2010
  - 2009
  - 2008
  - 2007
  - 2006
  - 2005
  - 2004

Resources Conservation Service
Record or Near Record Low SWE

All sites are below 8,000ft

Based on SNOTEL data (last ~37 years)
Tahoe, Truckee, Carson and Walker Basins
Jan 11, 2018 Snowpack Percent of Median vs Elevation

All stations together 45%

<8000 feet
average 19%

>8000 feet
average 58%

Snow Water Equivalent Percent of Median

Elevation (feet)

6000 6500 7000 7500 8000 8500 9000 9500 10000

<8000ft
>8000ft
Humboldt Basin
January 11, 2018 Snowpack Percent of Median vs Elevation

All stations together 42%

- <8000feet
  - Average 36%
- >8000feet
  - Average 46%
Snow Water Equivalent Projections in Humboldt River above Imlay

Current:
- % of Normal: 46%
- % Normal Peak: 21%
- Days Until Normal Peak: 65
- Percentile Rank: 7th

Median Peak SWE

SWE gain exceeds 9 of 10 years
SWE gain exceeds 7 of 10 years

Past
Today
Future

Nov 1  Jan 1  Mar 1  May 1  Jul 1
No winter that started <50% of median on Jan 1 has recovered to Apr 1 median peak.

2018 is 9th lowest Jan 1 SWE since 1981.

16 of 18 winters that started >100% of Jan 1 median were still near median or better on April 1.
4th worst start since 1981 in Tahoe and Humboldt Basins
Summer Streamflow Forecasts

Generally ~30-80% of average

Key Points (50% exceedance):

- Lake Tahoe Net Inflow 56%
- Truckee River at Farad 65%
- Carson R near Fort Churchill 64%
- E Walker R near Bridgeport 81%
- W Walker R near Coleville 77%
- Humboldt near Imlay 28%
Still a wide range of possible outcomes between 90% and 10% exceedances

Center of box = % of Average

Colored boxes are 5 exceedance forecasts - Numbers in box are KAF

For an detailed explanation of this graphic visit: https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd1371355&ext=pdf
For most main stem Humboldt River points only 10% exceedance is near average for Apr-Jul Period

Colored boxes are 5 exceedance forecasts - Numbers in box are KAF

For an detailed explanation of this graphic visit: https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd1371355&ext=pdf
2017 Forecast Review

Same tool displays observed flow for past years

https://www.wcc.nrcs.usda.gov/wsf/Fcst_Chart/
Eastern Sierra and Humboldt River Basin

2017 Streamflow Forecast Review

*Based on Actual Streamflow vs April 1, 2017 NRCS Streamflow Forecasts*

- **Humboldt**
- **Sierra**

Count

- <90% Exd
- Between 90-70%
- Between 70-50%
- Between 50-30%
- Between 30-10%
- >10% Exd

Actual Streamflow falling in each Exceedance Bin
Summary

Slow start combined with snow drought
• WY Precip 70-85% average, SWE 30-60% median
• Jan 1-11 precip near normal, but little new SWE.
• Sierra snowpack <8000ft is ~20% of median, near record low

Soil moisture has increased significantly with recent rain
• Lack of snowpack means a small sponge to soak up rain compared to last year.

Snow Recovery
• Statistically, <30% chance for SWE recovery by spring
• History shows low years tend to remain low, recovery unlikely.

Streamflow forecasts
• Plan for below average seasonal runoff this spring
Bonus Slides
Most sites have ~37 years of data
Average Snow Water in Truckee River Basin Jan 1 vs Apr 1
1981-present, sorted low to high

- 1/1/2016
- Jan 1 Median
- Apr 1 Median
- 4/1/2016
Average Snow Water in Walker River Basin Jan 1 vs Apr 1
1981-present, sorted low to high

- 1/1/2016
- Jan 1 Median
- Apr 1 Median
- 4/1/2016

Yearly snow water values are represented by bars, with higher values indicating more snow water in the basin. The chart shows a trend over time, with some years indicating significantly higher snow water than others.