

# 2017 Hydro Storm Response



January 30, 2017

## Mid-December 2016 Storms

- Atmospheric River Event
- ~ 11,000 cfs at Avery
- ~8,500 cfs spill at McKays
- Collierville curtailed / forced out due to high tail water

## McKays Spill



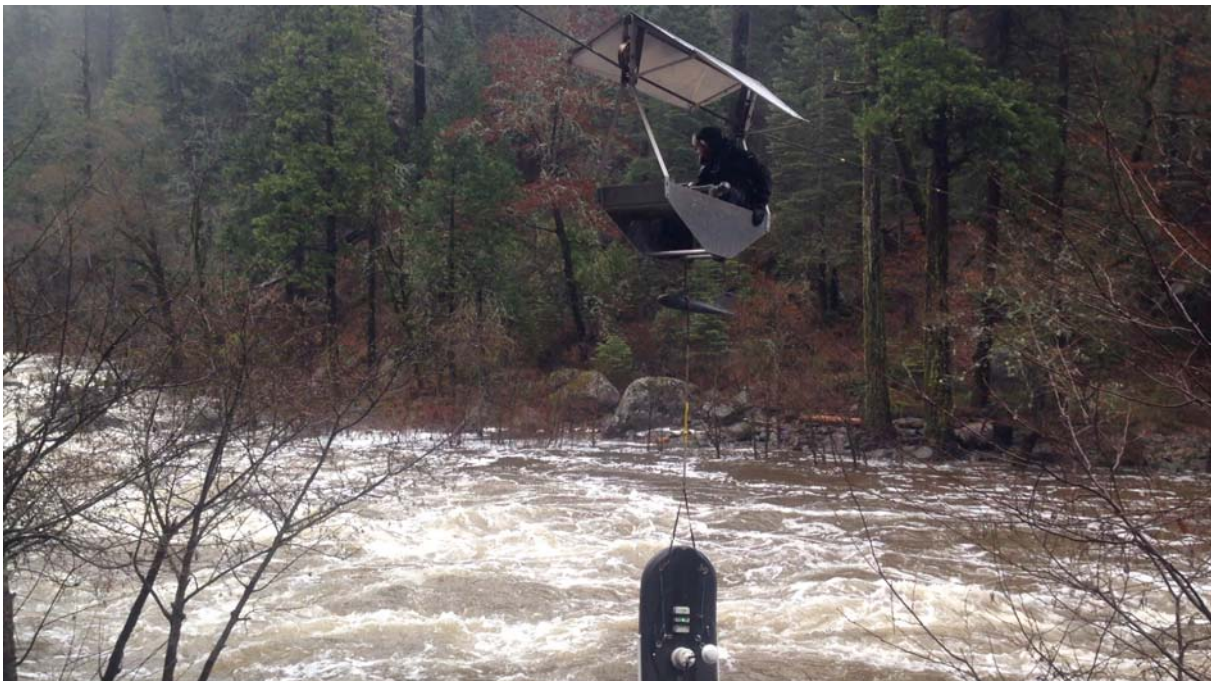
January 30, 2017

VIDEO

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## Stream Gaging

VIDEO



## Early January 2017 Storms

- Atmospheric River Event
- 20,000+ cfs at Avery
- ~17,000 cfs spill at McKays
- Beaver Creek (Backwards) Sluicing
- Collierville curtailed / forced out due to high tail water

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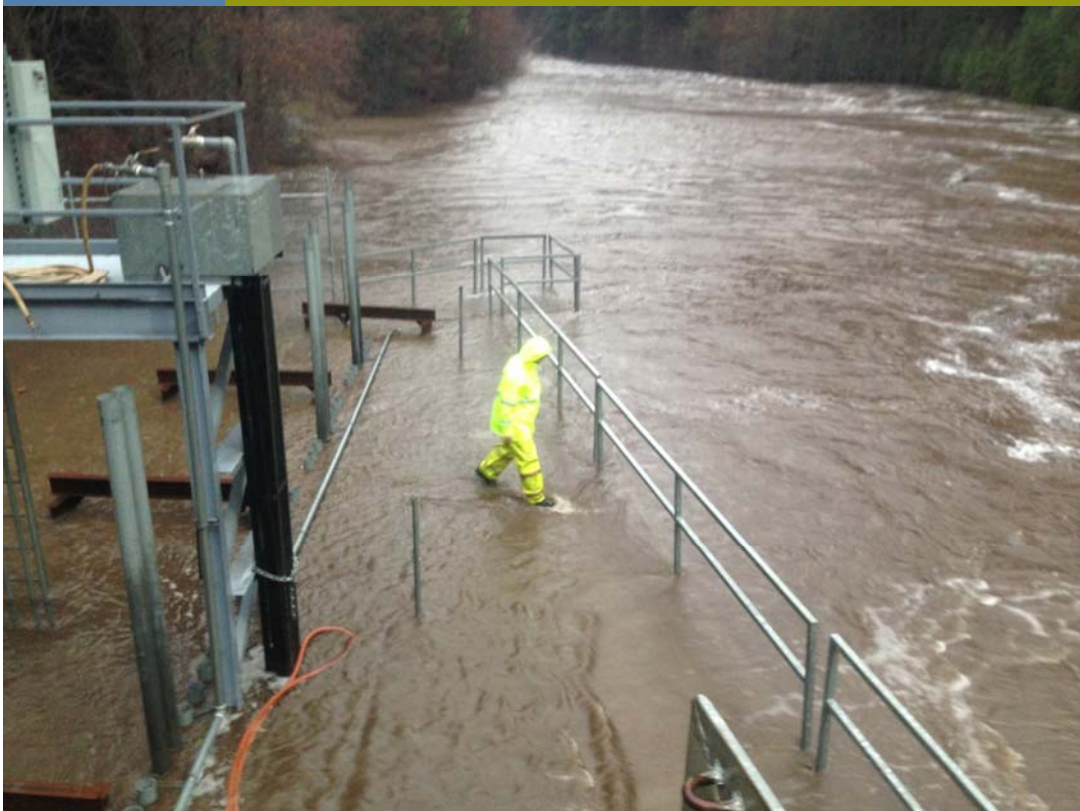
VIDEO

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## Mid January 2017 Storms

- Cold Storm
- 10+ feet of snow
- Prolonged power outages.
- McKays, Beaver Creek, and NSM all inaccessible for days.



## Where did Mother Nature hide the snowcat?



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NORTHERN CALIFORNIA POWER AGENCY



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NORTHERN CALIFORNIA POWER AGENCY





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VIDEO

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VIDEO

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## Liberty Hill



## Liberty Hill



## New Spicer Meadow







N O R T H E R N   C A L I F O R N I A   P O W E R   A G E N C Y



N O R T H E R N   C A L I F O R N I A   P O W E R   A G E N C Y

## New Spicer Meadow







## New Spicer Meadow



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## Remote Telemetry



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## Remote Telemetry

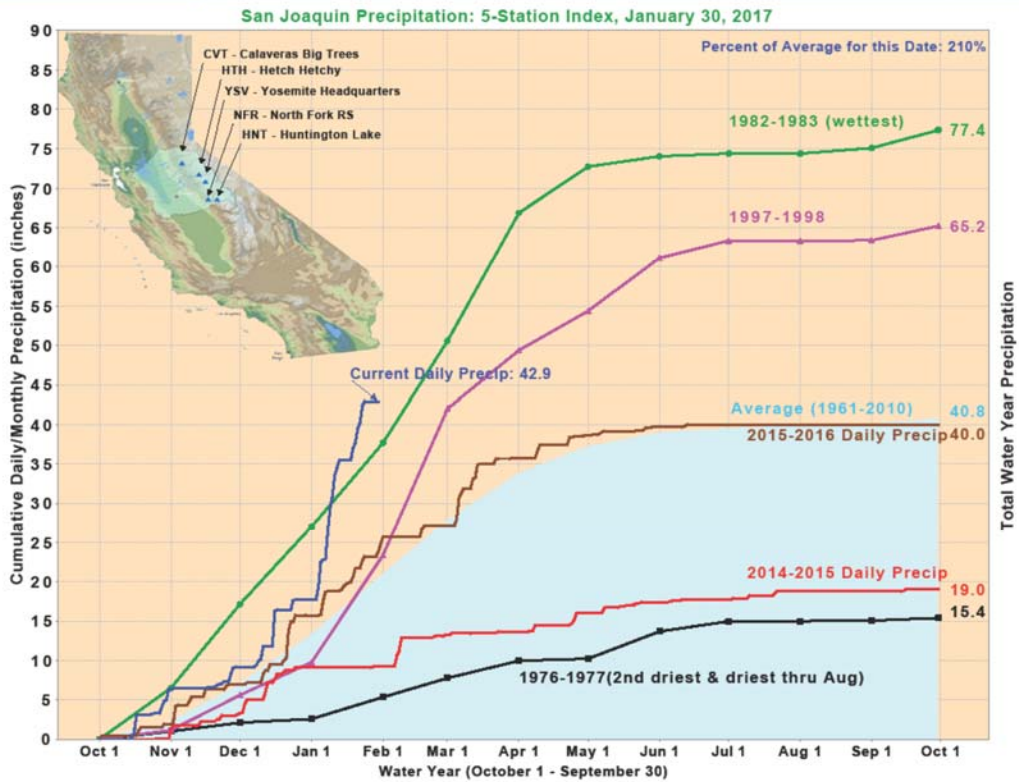


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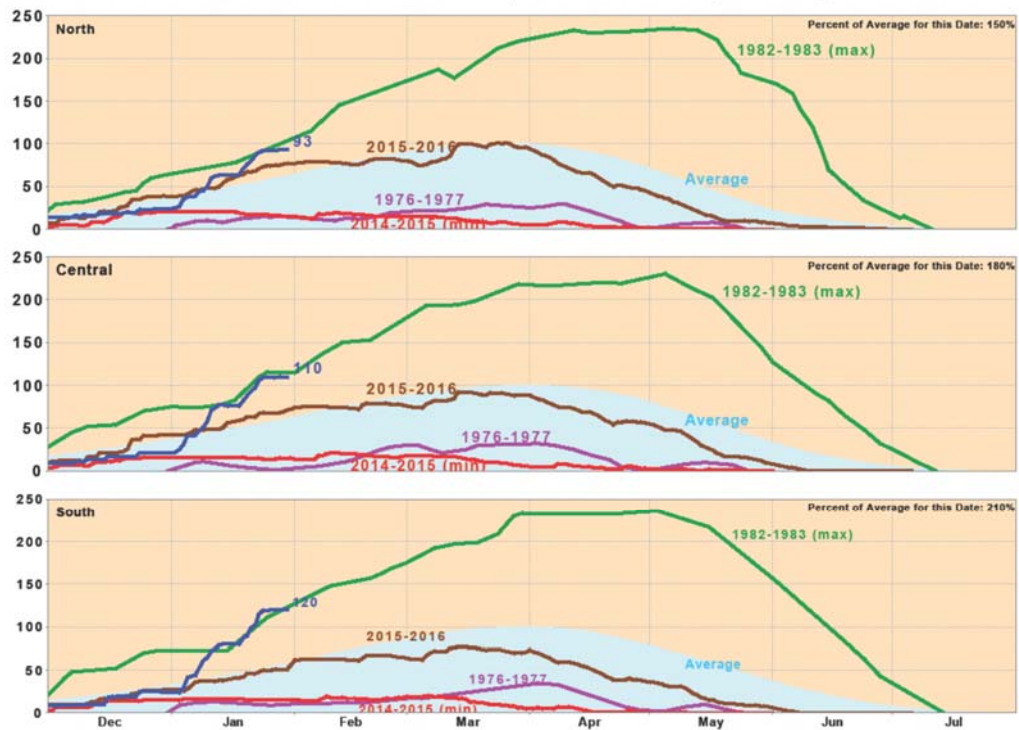
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**California Snow Water Content, January 30, 2017, Percent of April 1 Average**



Statewide Percent of April 1: 108%

Statewide Percent of Average for Date: 180%

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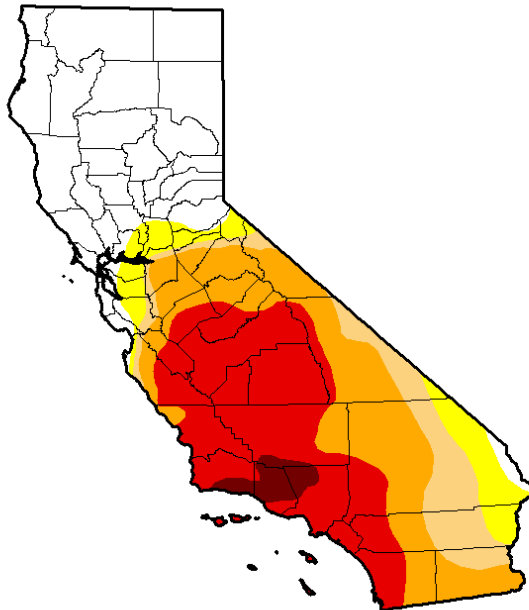
## A Little Historical Perspective

- U.S. snowfall record for one month:
  - 390 inches (32.5 feet)
  - Tamarack, CA. January 1911
- U.S. seasonal snow depth record
  - 454 inches (37.8 feet)
  - Tamarack, CA. March 1911
- Sierra Nevada record snowfall during one season
  - 884 inches (73.7 feet)
  - Tamarack, CA. 1906-07
- Drought – not yet declared over



# U.S. Drought Monitor California

**January 10, 2017**  
(Released Thursday, Jan. 12, 2017)  
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	34.62	65.38	58.22	49.22	27.80	2.13
<b>Last Week</b> 1/2/2017	18.07	81.93	67.61	54.02	38.17	18.31
<b>3 Months Ago</b> 10/1/2016	0.00	100.00	83.59	62.27	42.80	21.04
<b>Start of Calendar Year</b> 1/2/2017	18.07	81.93	67.61	54.02	38.17	18.31
<b>Start of Water Year</b> 9/27/2016	0.00	100.00	83.59	62.27	42.80	21.04
<b>One Year Ago</b> 1/2/2016	0.00	100.00	97.33	87.55	69.07	42.66

## Intensity

■ D0 Abnormally Dry     ■ D3 Extreme Drought  
■ D1 Moderate Drought     ■ D4 Exceptional Drought  
■ D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

**Author:**  
David Miskus  
NOAA/NWS/NCEP/CPC

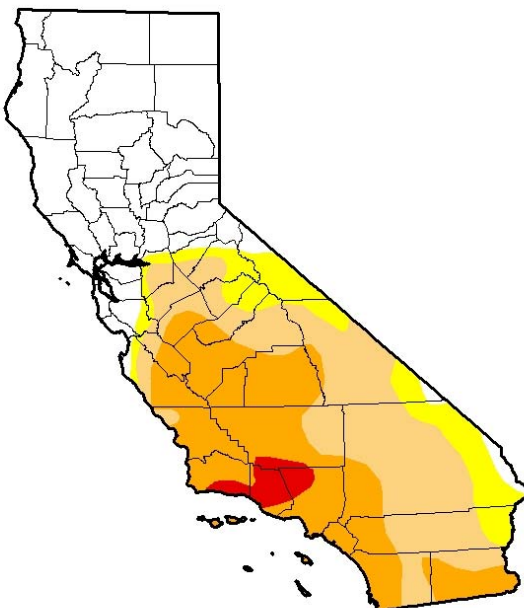


<http://droughtmonitor.unl.edu/>

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# U.S. Drought Monitor California

**January 24, 2017**  
(Released Thursday, Jan. 26, 2017)  
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	38.73	61.27	51.40	26.46	2.16	0.00
<b>Last Week</b> 1/17/2017	35.56	64.44	57.51	44.35	24.30	2.13
<b>3 Months Ago</b> 10/25/2016	8.96	91.04	81.12	61.80	42.80	21.04
<b>Start of Calendar Year</b> 1/2/2017	18.07	81.93	67.61	54.02	38.17	18.31
<b>Start of Water Year</b> 9/27/2016	0.00	100.00	83.59	62.27	42.80	21.04
<b>One Year Ago</b> 1/26/2016	0.00	100.00	95.35	86.13	63.96	40.21

## Intensity

■ D0 Abnormally Dry     ■ D3 Extreme Drought  
■ D1 Moderate Drought     ■ D4 Exceptional Drought  
■ D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

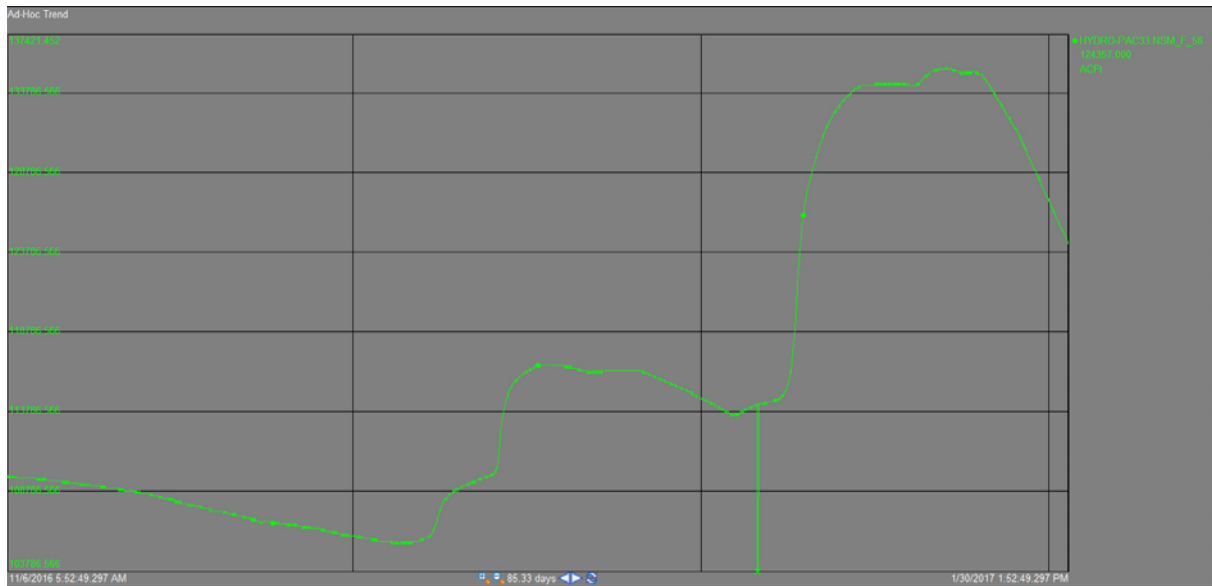
**Author:**  
Richard Tinker  
CPC/NOAA/NWS/NCEP



<http://droughtmonitor.unl.edu/>

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## NSM Trend



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## NSM 48" HBV





## Challenges

- Beaver Creek
  - Sediment & Debris – Fish Screen Non-Operational
  - Emergency Dredging Needed
- Collierville / McKays
  - High Trash Rack Differential
  - Tailwater Interference
- New Spicer Meadow
  - ~800 – 1,200 cfs release/bypass limit
  - Already bypassing generation
- CAISO – over generation / curtailment / negative prices anticipated during runoff

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