CVP and SWP Operations Update
State Water Resource Control Board

May 18, 2016

John Leahigh
CA Department of Water Resources

Ron Milligan
US Bureau of Reclamation
North Sierra Precipitation: 8-Station Index, May 17, 2016

Percent of Average for this Date: 119%

1982-1983 (wettest) 88.5
1997-1998 82.4

1976-1977 (2nd driest & driest thru Aug) 19.0

Average (1922-1998) 50.0

1982-1983 (wettest) 88.5
1997-1998 82.4

Current Daily Precip: 55.6

Cumulative Daily/Monthly Precipitation (inches)

Water Year (October 1 - September 30)
Northern Sierra 8-Station
Precipitation Index for Water Year 2016 - Updated on May 17, 2016 08:45 AM

Note: Monthly totals may not add up to seasonal total because of rounding.
Water Year Monthly totals are calculated based on Daily precipitation data from 12am to 12am PST.
San Joaquin Precipitation: 5-Station Index, May 17, 2016

Percent of Average for this Date: 103%

1982-1983 (wettest) 77.4
1997-1998 65.2

1976-1977 (2nd driest & driest thru Aug)

Current Daily Precip: 39.2

Average (1961-2010) 40.8

2014-2015 Daily Precip 19.0

1976-1977 (2nd driest & driest thru Aug) 15.4

Water Year (October 1 - September 30)
San Joaquin 5-Station
Precipitation Index for Water Year 2016 - Updated on May 17, 2016 08:45 AM

Note: Monthly totals may not add up to seasonal total because of rounding
Water Year Monthly totals are calculated based on Daily precipitation data from 12am to 12am PST
Tulare Basin Precipitation: 6-Station Index, May 17, 2016

Percent of Average for this Date: 93%

Water Year (October 1 - September 30)

Cumulative Daily/Monthly Precipitation (inches)

- BAL - Balch PH
- GNF - Giant Forest
- ASM - Ash Mts.
- SGV - Springville
- PSC - Pascoes
- ISB - Isabella Dam

1968-1969 (Wettest)
- 56.3

1997-1998
- 54.2

Average (1961-2010)
- 29.3

- 13.5

1976-1977 Daily Precip. (Driest)
- 10.9
Tulare Basin 6-Station
Precipitation Index for Water Year 2016 - Updated on May 17, 2016 08:45 AM

Note: Monthly totals may not add up to seasonal total because of rounding
Water Year Monthly totals are calculated based on Daily precipitation data from 12am to 12am PST
8-Station Index (Northern Sierra Precipitation)

Cumulative Actual Precipitation Vs. Cumulative Normal
October 1, 2011 - March 31, 2016

- Actual Cumulative Precip
- Normal Cumulative Precip

2011
2016

241.80 inches
35.49" Deficit
206.31 inches

Normal Annual Precip: 50.0"
5-Station Index (Central Sierra Precipitation)
Cumulative Actual Precipitation Vs. Cumulative Normal
October 1, 2011 - March 31, 2016

196.32 inches
69.68" Deficit

126.64 inches
Reservoir Conditions - Shasta Reservoir

Lake Shasta Levels: Various Past Water Years and Current Water Year, Ending At Midnight May 15, 2016

Total Reservoir Capacity: 4,552,000 AF

4,750,000
4,500,000
4,250,000
4,000,000
3,750,000
3,500,000
3,250,000
3,000,000
2,750,000
2,500,000
2,250,000
2,000,000
1,750,000
1,500,000
1,250,000
1,000,000
750,000
500,000
250,000
0

Lake Shasta Levels
(as of Midnight - May 15, 2016)

Current Level: 4,213,204 AF
93% (Total Capacity) 108% (Historical Avg.)

Data Updated 05/16/2016 08:45 AM
Reservoir Conditions - Folsom Lake

Folsom Lake Conditions
(As of Midnight - May 15, 2016)

Current Level: 840,814 AF
86% (Total Capacity) | 109% (Historical Avg.)

Data Updated 05/16/2016 08:45 AM
New Melones Conditions
(as of Midnight - May 15, 2016)

Current Level: 610,979 AF

<table>
<thead>
<tr>
<th>25%</th>
<th>40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Total Capacity)</td>
<td>(Historical Avg.)</td>
</tr>
</tbody>
</table>

Data Updated 05/16/2016 08:45 AM
Current Regional Snowpack from Automated Snow Sensors

% of April 1 Average / % of Normal for This Date

<table>
<thead>
<tr>
<th>Region</th>
<th>Data as of May 17, 2016</th>
<th>Number of Stations Reporting</th>
<th>Average snow water equivalent (Inches)</th>
<th>Percent of April 1 Average (%)</th>
<th>Percent of normal for this date (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTH</td>
<td></td>
<td>29</td>
<td>4.3</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>SOUTH</td>
<td></td>
<td>27</td>
<td>4.0</td>
<td>15</td>
<td>26</td>
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<tr>
<td>Statewide</td>
<td></td>
<td>96</td>
<td>5.3</td>
<td>19</td>
<td>35</td>
</tr>
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</table>

Statewide Average: 19% / 35%
California Snow Water Content, May 17, 2016, Percent of April 1 Average

North

Percent of Average for this Date: 33%
1982-1983 (max)
2013-2014
1976-1977
2014-2015 (min)
Average
15

Central

Percent of Average for this Date: 43%
1982-1983 (max)
2013-2014
1976-1977
2014-2015 (min)
Average
24

South

Percent of Average for this Date: 26%
1982-1983 (max)
2013-2014
1976-1977
2014-2015 (min)
Average
15

Statewide Percent of April 1: 19%
Statewide Percent of Average for Date: 35%
**SACRAMENTO VALLEY**

**WATER YEAR TYPE INDEX (40-30-30)**

2016 Water Year Forecast as of May 1, 2016

<table>
<thead>
<tr>
<th>Date of Forecast</th>
<th>99%</th>
<th>90%</th>
<th>75%</th>
<th>50%</th>
<th>25%</th>
<th>10%</th>
</tr>
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<tbody>
<tr>
<td>December 1, 2015</td>
<td>2.4</td>
<td>3.3</td>
<td>4.0</td>
<td>5.3</td>
<td>6.8</td>
<td>8.5</td>
</tr>
<tr>
<td>January 1, 2016</td>
<td>3.4</td>
<td>4.1</td>
<td>4.8</td>
<td>5.8</td>
<td>7.2</td>
<td>8.6</td>
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<tr>
<td>February 1, 2016</td>
<td>4.5</td>
<td>5.1</td>
<td>5.8</td>
<td>6.5</td>
<td>8.0</td>
<td>9.5</td>
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<tr>
<td>March 1, 2016</td>
<td>4.5</td>
<td>5.0</td>
<td>5.6</td>
<td>6.1</td>
<td>7.2</td>
<td>8.4</td>
</tr>
<tr>
<td>April 1, 2016</td>
<td>6.4</td>
<td>6.7</td>
<td>7.0</td>
<td>7.3</td>
<td>7.8</td>
<td>8.5</td>
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<tr>
<td>May 1, 2016</td>
<td>6.6</td>
<td>6.8</td>
<td>7.0</td>
<td>7.1</td>
<td>7.4</td>
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**Probability of Exceedance**

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**Index**

\[
\text{Index} = 0.4 \times \text{Current Apr-Jul Runoff} + 0.3 \times \text{Current Oct-Mar Runoff} + 0.3 \times \text{Previous Year's Index}
\]

**Year Classification**

- **Wet**
  - INDEX: 9.2
- **Above Normal**
  - INDEX: 7.8
- **Normal**
  - INDEX: 6.5
- **Below Normal**
  - INDEX: 5.4
- **Dry**
  - INDEX: 5.1
- **Critical**
  - INDEX: 4.8

**Notes:**

1. Runoff is the sum of unimpaired flow in million acre-feet at:
   - Sacramento River above Bend Bridge
   - Feather River at Oroville (aka inflow to Lake Oroville)
   - Yuba River near Smartville
   - American River below Folsom Lake
2. Maximum 10.0 for previous year index term

**Previous Water Year Indices:**

- 2015: 4.0 (49% of avg.)
- 1977 (Min): 3.1 (38% of avg.)
- 1983 (Max): 15.3 (186% of avg.)
- 1961-2010 average: 8.2
**SAN JOAQUIN VALLEY**

**WATER YEAR TYPE INDEX (60-20-20)**

2016 Water Year Forecast as of May 1, 2016

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<td>1.1</td>
<td>1.5</td>
<td>2.2</td>
<td>3.0</td>
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<tr>
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Water Year Index based on flow in million acre feet

**Index** = 0.6 * Current Apr-Jul Runoff

+ 0.2 * Current Oct-Mar Runoff

+ 0.2 * Previous Year’s Index

Notes:

(1) Runoff is the sum of unimpaired flow in million acre-feet at:

- Stanislaus River below Goodwin Reservoir (aka inflow to New Melones Res.)
- Tuolumne River below La Grange (aka inflow to New Don Pedro Reservoir)
- Merced River below Merced Falls (aka inflow to Lake McClure)
- San Joaquin River inflow to Millerton Lake

(2) Maximum 4.5 for previous year index term

**Year Classification**

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**Previous Water Year Indices:**

- 2015 = 0.8 25% of avg.
- 2015 (Min) = 0.8 25% of avg.
- 1983 (Max) = 7.2 215% of avg.
- 1961-2010 average = 3.3
Most Probable: 1390 kaf | 77% of Average

Seasonal Volumes (1000s Ac-Ft)

Water Year 2016 - Day (mm/dd)

Historical Apr-Jul Vol Max: 3530 kaf in 1998
Historical Apr-Jul Vol Min: 726 kaf in 1924

Observed Season to Date Percent of Average: 68% (685 kaf) Season to Date Average: 1010 kaf
FEATHER - OROVILLE (ORDC1) 05/17/2016

Most Probable: 1230 kaf | 72% of Average

Created: 05/17/2016 at 09:43 AM PDT

Historical Apr - Jul Vol Max: 4680 kaf in 1952
Historical Apr - Jul Vol Min: 392 kaf in 1977

Observed Season to Date Percent of Average: 72% (752 kaf)
Season to Date Average: 1040 kaf

ESP Apr - Jul Fct - Season to Date Obs - Daily Obs - Obs Peak
AMERICAN - FOLSOM FNF (FOLC1) 05/17/2016

Most Probable: 1010 kaf | 82% of Average

Created: 05/17/2016 at 09:43 AM PDT

Observed Season to Date Percent of Average: 91% (635 kaf)
Season to Date Average: 701 kaf
Historical Apr-Jul Vol Max: 3070 kaf in 1911
Historical Apr-Jul Vol Min: 229 kaf in 1977
Lake Shasta Isothermobaths - 2016
(Water Temperature, in °F)
San Joaquin River at Vernalis

- **Avg flow (1,002 cfs)**
- **Average flow Apr 15 - May 15 (2,480 cfs)**
- **Avg flow est. (1,200 cfs)**

Total average flow estimated Apr 1 - May 31 (1,820 cfs) & TUACO (2,020 cfs)

Difference of 200 cfs or 23 taf

Total flow includes 2e, 75 taf District water and an additional 32 taf from Stanislaus basin