CVP and SWP Operations
Drought Update
State Water Resource Control Board

April 19, 2016
Hydrologic Conditions Update

(as of April 18, 2016)

Arthur Hinojosa, Chief
Division of Integrated Water Management
Department of Water Resources
916-653-4736 or hinojosa@water.ca.gov
### 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 April 18, 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>
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<tbody>
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<td><strong>NORTH</strong></td>
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<td></td>
<td></td>
<td>63</td>
<td>71</td>
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<td><strong>CENTRAL</strong></td>
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<td><strong>SOUTH</strong></td>
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<tr>
<td><strong>STATE</strong></td>
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<td>60</td>
<td>65</td>
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*Statewide Average: 60% / 65%*

Data as of April 18, 2016

Updated 04/18/2016 08:45 AM
California Snow Water Content, April 18, 2016, Percent of April 1 Average

North

- Percent of Average for this Date: 71%
- 1982-1983 (max)
- Average

Central

- Percent of Average for this Date: 69%
- 1982-1983 (max)
- Average

South

- Percent of Average for this Date: 52%
- 1982-1983 (max)
- Average

Statewide Percent of April 1: 60%
Statewide Percent of Average for Date: 65%
Percent of Average Precipitation (\%)  
10/1/2015 - 4/16/2016

Generated 4/17/2016 at WRCC using provisional data.
NOAA Regional Climate Centers

http://www.wrcc.dri.edu/cgi-bin/anomimage.pl?calOctPpct.gif
North Sierra Precipitation: 8-Station Index, April 18, 2016

Percent of Average for this Date: 121%

1982-1983 (wettest) 88.5
1997-1998 82.4
Average (1922-1998) 50.0
2014-2015 Daily Precip 37.2
1976-1977(2nd driest & driest thru Aug) 19.0

Cumulative Daily/Monthly Precipitation (inches)

Water Year (October 1 - September 30)
Northern Sierra 8-Station
Precipitation Index for Water Year 2016 - Updated on April 18, 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.

- Average
- WY 2016
San Joaquin Precipitation: 5-Station Index, April 18, 2016

Percent of Average for this Date: 105%

- 1982-1983 (wettest) 77.4
- 1997-1998 65.2
- Average (1961-2010) 40.8
- 2014-2015 Daily Precip 19.0
- 1976-1977 (2nd driest & driest thru Aug) 15.4

Cumulative Daily/Monthly Precipitation (inches)

Water Year (October 1 - September 30)

Map of California with stations labeled:
- CVT - Calaveras Big Trees
- HTH - Hetch Hetchy
- YSV - Yosemite Headquarters
- NFR - North Fork RS
- HNT - Huntington Lake
San Joaquin 5-Station
Precipitation Index for Water Year 2016 - Updated on April 18, 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.

Average
WY 2016
Tulare Basin 6-Station
Precipitation Index for Water Year 2016 - Updated on April 18, 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
Reservoir Conditions

Ending At Midnight - April 17, 2016

CURRENT RESERVOIR CONDITIONS

Trinity Lake: 59% / 72%
Shasta Reservoir: 92% / 109%
Lake Oroville: 93% / 117%
Folsom Lake: 80% / 115%
New Melones: 27% / 43%
San Luis Reservoir: 50% / 56%
Don Pedro Reservoir: 64% / 88%
Exchequer Reservoir: 41% / 72%
Millerton Lake: 57% / 82%
Perris Lake: 36% / 43%
Castaic Lake: 44% / 48%

Legend:
- Capacity (TAF)
- Historical Average

Graph Updated 04/18/2016 08:45 AM
Lake Shasta Conditions
(as of Midnight - April 17, 2016)

Current Level: 4,172,990 AF
92% (Total Capacity) 109% (Historical Avg.)

Lake Shasta Levels: Various Past Water Years and Current Water Year, Ending At Midnight April 17, 2016

Total Reservoir Capacity: 4,552,000 AF
4,172,990 AF

Historical Average - Total Reservoir Capacity

2015-2016

Data Updated 04/18/2016 08:46 AM
Lake Oroville Conditions
(as of Midnight - April 17, 2016)

Current Level: 3,285,993.5 AF
93% (Total Capacity)
117% (Historical Avg.)

Total Reservoir Capacity: 3,537,577 AF

Data Updated 04/18/2016 08:45 AM
Current Level: 785,592 AF

Historical Average - Total Reservoir Capacity
- 1976-1977 (Driest)
- 1977-1978
- 1982-1983 (Wettest)
- 2014-2015

Historical Average: 785,592 AF
Reservoir Conditions - New Melones

New Melones Conditions
(as of Midnight - April 17, 2016)

Current Level: 646,219 AF
27% (Total Capacity) 43% (Historical Avg)

Data Updated 04/18/2016 08:46 AM
CVP and SWP Operations Update

John Leahigh
State Water Project
Department of Water Resources

Ron Milligan
Central Valley Project
US Bureau of Reclamation
SACRAMENTO VALLEY
WATER YEAR TYPE INDEX (40-30-30)
2016 Water Year Forecast as of April 1, 2016

Date of Forecast

<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>
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<td>2.4</td>
<td>3.3</td>
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<td>April 1, 2016</td>
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<td>6.7</td>
<td>7.0</td>
<td>7.3</td>
<td>7.8</td>
<td>8.5</td>
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</table>

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 33% of avg.
1983 (Max) = 15.3 166% of avg.
1961-2010 avg %ge = 8.2
SAN JOAQUIN VALLEY
WATER YEAR TYPE INDEX (60-20-20)
2016 Water Year Forecast as of April 1, 2016

Date of Forecast

<table>
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<tr>
<th>Date of Forecast</th>
<th>99%</th>
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<th>75%</th>
<th>50%</th>
<th>25%</th>
<th>10%</th>
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<td>2.4</td>
<td>2.5</td>
<td>2.9</td>
<td>3.3</td>
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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

Year Classification

<table>
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<tr>
<th>TYPE</th>
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<td>Wet</td>
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<td>Above Normal</td>
<td>3.1</td>
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<tr>
<td>Below Normal</td>
<td>2.5</td>
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<tr>
<td>Dry</td>
<td>2.1</td>
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Notes:
(1) Runoff is the sum of unimpaired flow in million acre-feet at:
- Stanislaus River below Goodwin Reservoir (aka inflow to New Melones Reservoir)
- 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

Previous Water Year Indices:
- 2015 = 0.8
- 2015 (Min) = 0.8
- 1983 (Max) = 7.2
- 1961-2010 average = 3.3
Old and Middle Rivers
Hourly Flow Data

MIDDLE RIVER AT MIDDLE RIVER (MDM)
Date from 04/11/2016 17:40 through 04/18/2016 17:40 Duration: 7 days
Max of period: (04/12/2016 15:00, 13100.0) Min of period: (04/18/2016 03:00, -15500.0)
Hourly Tidally Filtered OMR

OLD & MIDDLE RVRS TIDALLY FILTERED EST (OMR)

Date from 04/11/2016 17:42 through 04/18/2016 17:42 Duration: 7 days

Max of period: (04/16/2016 07:00, -451.14) Min of period: (04/18/2016 01:00, -2214.43)
Daily Average OMR

OLD & MIDDLE RVRS TIDALLY FILTERED EST (OMR)

Date from 04/11/2016 06:40 through 04/18/2016 06:40 Duration: 7 days
Max of period: (04/15/2016 00:00, -846.92) Min of period: (04/17/2016 00:00, -2210.89)

FLOW, MEAN DAILY - CFS (18041)
14-day Average OMR Flow

OLD & MIDDLE RVRS TIDALLY FILTERED EST (OMR)
Date from 04/04/2016 17:44 through 04/18/2016 17:44 Duration: 14 days
Max of period: (04/15/2016 00:00, -846.92) Min of period: (04/07/2016 00:00, -3195.43)

-1,740 cfs
## Biological Opinion Actions

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<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
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<th>Mar</th>
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<td><strong>salmon out-migration - OMR</strong></td>
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Net Delta Outflow Index

![Net Delta Outflow Index Graph]

- **CFS** (Cubic Feet Per Second)
- **NDOI (Actual)**
- **NDOI (Required)**

Graph shows the Net Delta Outflow Index from 1/1/16 to 4/1/16, with peaks on 3/1/16 and 4/1/16.
OMR Flow Regulation
Effect on Exports

CFS

1/1/16 2/1/16 3/1/16

NDOI (Actual) Exports (Actual) Exports (No OMR constraints)