

We've finished the April 1, 2016 Water Supply Index (WSI) and Bulletin 120 (B120) forecasts. The forecasts include observed conditions through the end of March.

The forecasts are posted at:

WSI: <http://cdec.water.ca.gov/cgi-progs/iodir/wsi>
 B120: <http://cdec.water.ca.gov/cgi-progs/iodir?s=b120>

Forecast Summary:

March was wet, with above average gains in precipitation and snowfall for the majority of the state.

The projected median April-July runoff in the major Sierra river basins ranges from 52 percent on the Tule River to 102 percent on the East Carson River. Forecasted median water year runoff in the Sierra ranges from 55 percent on the Kern River to 116 percent on the Trinity River.

The wet conditions which resulted in significant runoff during March boosted the statewide April-July and Water Year type forecasts by 6 and 15 percent of average, respectively. Forecast changes since the March 1 forecast range from a drop of 14 percent (Tule River) to an increase of 14 percent (American River, Yuba River, and Sacramento River at Bend Bridge). According to the snow sensors, the percent of April 1 snow pack increased by roughly 11 percent over the March 1 observations. The largest gains hydrologically were seen in the precipitation and Full Natural Flow runoff rates during March which both played a role in boosting the seasonal and water year forecasts in many watersheds.

The WSI forecast is based on hydrologic conditions observed through March 2016 and can be summarized as follows:

Sacramento River Unimpaired Runoff Water Year Forecast (SRR) (50 percent exceedance)	19.0 MAF (104 percent of average)
Sacramento Valley Index (SVI) (50 percent exceedance)	7.3 (Below Normal)
San Joaquin Valley Index (SJI) (75 percent exceedance)	2.4 (Dry)

Runoff:

For the Water Year to date, flows in the northern and central regions of the Sierra have been above average thanks to an extremely wet March. The southern half of the state has not fared so well, flowing below average. For March, flows were quite elevated in the north and central, but again below average in the southern Sierra and portions of the state.

Unimpaired flows for the 2015-2016 water year:

Region	October-March Runoff (%)	March Runoff (%)
Sacramento Valley Index (4 rivers)	111	196
San Joaquin Valley Index (6 rivers)	105	159
Tulare Lake Basin (4 rivers)	71	91

Precipitation:

March brought some very wet storms to the State, especially in the Northern Sierra Nevada where 16.4 inches (238 percent of average) of precipitation were observed in the Northern Sierra 8-Station Index. As is evident in the updated runoff forecasts, the Northern Sierra and its watersheds continue to outpace those in the Central and Southern Sierra in terms of accumulated precipitation. Nonetheless, precipitation fell at a rate greater than the statewide average for March (boosted largely by the North Coast, Northern Sierra, North Lahontan, San Joaquin, and San Francisco Bay/Central Coast regions); a nice change from the dry conditions in February. The heavy March precipitation in the Northern Sierra resulted in impressive gains in the Northern Sierra’s major reservoirs, pushing each of the reservoirs at Shasta, Oroville, New Bullard’s Bar, and Folsom to above normal storage levels during the month.

Precipitation for the 2015-2016 water year accumulated at the following rates of average:

Region/Index	WY accumulated precipitation (%) through April 8, 2016	Precipitation (%) for March 2016
Sacramento River	120	218
San Joaquin River	115	162
Tulare Lake	111	103
Statewide	166	108
Northern Sierra 8-Station Index	122 (51.9 inches)	238 (16.4 inches)
San Joaquin 5-Station Index	104 (35.8 inches)	143 (8.7 inches)
Tulare Basin 6-Station Index	95 (23.7 inches)	87 (4.1 inches)

For the water year, the Northern Sierra 8-Station Index has already reached its average, standing at 104 percent of an average water year (50.0 inches) while the San Joaquin 5-Station (88 percent) and Tulare Basin 6-Station (81 percent) indices are currently below their water year averages (40.8 inches and 29.3 inches, respectively).

Snowpack:

Snowpack is monitored using two complementary methods: automatic snow sensor (or “pillow”) readings and manual snow course measurements. The snow sensors give us a daily snapshot of snow conditions while the manual snow course measurements provide a monthly verification of snow conditions in locations where snow has been measured in the same manner as far back as 100 years.

The wet conditions in March may have boosted precipitation totals in many regions across the state, but did not produce as significant of a boost in the snowpack since most storms were relatively warm in nature. As such, all hydrologic regions have dipped below their April 1 average. The statewide average according to the manual snow surveys is 85 percent of the historic April 1 average. Despite the below average numbers for April 1, conditions are a far cry from the 5 percent of the April 1st historic average that we observed a year ago.

The results of the April 2016 statewide snow surveys are as follows:

Region	No. Courses Measured	Avg WC	% Average April 1
North Coast	14	29.9	96
Sacramento	78	26.8	85
San Joaquin Valley	70	28.8	88
Tulare Lake	38	20.1	77

North Lahontan	17	24.2	80
South Lahontan	19	15.6	65
Statewide Average (weighted)			85

On April 1, the snow sensor network showed similar numbers, though significantly lower for the Southern region than the snow survey results. The April 1 snowpack gained in water content according to the sensors in all regions since March 1. The snowpack as of the morning of April 1, 2016 stands at the following (based on snow sensors):

Region	Snow Water Equivalent (inches)	% of Average (Apr 1)
Northern	27.4	95
Central	25.1	88
Southern	19.1	71
Statewide	24.0	85

As snowmelt is occurring in most mountain regions, it is likely that the snowpack has peaked for this season. The peak accumulation thus far occurred on **March 15** for all mountain regions of the state:

Region	Peak Snow Water Equivalent (inches)	% of Average (Apr 1)
Northern	28.5	100
Central	26.7	92
Southern	20.9	77
Statewide	25.5	93

Weather and Climate Outlooks:

The 6-day weather forecast includes a series of storms approaching California from the south with more precipitation expected in Southern California than in the north. The heaviest days for precipitation are today and Saturday with as much as 1.5 to 2 inches expected in the San Joaquin and Tulare Lake regions. Precipitation in the Central and Northern Sierra Nevada tapers off a little from these amounts with QPF amounts ranging closer to 1 to 1.5 inches – mostly on Saturday. Beyond that periodic light precipitation is expected throughout the 6-day forecast period. During this time, freezing elevations are at or well above 9500 feet across the state. Minimal snow accumulation is expected due to these high levels.

The NWS Climate Prediction Center (CPC) one-month outlook for April, issued March 31, indicates increased chances of above normal temperatures statewide and above normal precipitation for all of the state except for the Southern California coastline and the Inland Empire region of Southern California.

The CPC three-month (April-May-June) outlook, last issued on March 17, indicates increased chances of above normal precipitation statewide except for the California-Oregon border, the Southern California coastline from Santa Barbara southward, as well as the Inland Empire region of Southern California where equal chances of above or below normal precipitation are expected. The three month outlook also predicts increased chances of above normal temperatures statewide.

The CPC's El Niño-Southern Oscillation Index outlook was updated on April 4. It indicates that strong El Niño conditions are present but weakening. Positive equatorial sea surface temperature (SST) anomalies continue across most of the Pacific Ocean. A transition to ENSO-neutral is likely during late Northern

Hemisphere spring or early summer 2016, with close to a 50 percent chance for La Nina conditions to develop by the fall. The next update of this outlook is April 14.

Next Update:

A Bulletin 120 update for conditions as of April 12 will be available, Thursday, April 14. The May 1, 2016 Bulletin 120 and Water Supply Index forecasts will be available on Monday, May 9, 2016. If you have any questions regarding this forecast, please contact a member of the Snow Surveys staff.