Water Year (WY) 2017 (Oct. 2016 through Sept. 2017) was California’s (CA) 2nd wettest and Nevada’s (NV) 7th wettest in a 122-year record. Measured by climate division precipitation aggregates, northern CA and northern NV experienced some of their wettest WYS while the southern parts of both states experienced nearer-to-normal precipitation amounts (Fig. 1). This extraordinarily wet year followed the modestly wet 2016 (ranked 51st and 28th wettest WYS in CA and NV respectively), and followed the remarkably dry four years 2012-2015 (driest and 29th driest 4-year period in CA and NV respectively). While nearly all areas in CA and NV experienced drought recovery this year, southern California, particularly Santa Barbara and Ventura counties, continue to face drought impacts and remain classified as moderate drought by the US Drought Monitor. These regions identified by the US Drought Monitor do not fully map onto the counties that remained in drought emergency under the CA Governor Brown’s executive order (see back), highlighting how different agencies determine drought based on different information.

A major driver of the overall wetness in WY 2017 was the unprecedented number of atmospheric rivers (ARs), narrow bands of high water vapor transport, that made landfall along the West Coast. ARs deliver large amounts of precipitation, especially in mountainous regions where terrain lifts the moist air they carry, producing enhanced precipitation. During WY 2017, 53 ARs delivered some amount of precipitation to CA (Fig. 2). An unusually large number of these ARs also traversed the Sierra and produced abundant precipitation in northwest Nevada as well (Fig. 1). The number of ARs in 2017 greatly exceeded that in previous years, which averaged 34% higher compared to average from 1949-2017. The total water vapor transport (a measurement of AR strength) delivered to the West Coast by WY 2017 ARs was estimated to be 2.4 times more than average (more than 3 standard deviations above average) during Jan. through Mar. True to form for CA and NV a relatively few wettest days of 2017 were the dominant source of the annual total precipitation. For example, at the Lake Tahoe Basin, this year the 12 wettest days contributed 50% of the total precipitation for Oct. through March (the wettest months of the water year; Fig. 3), which is close to the 1981-2016 average. These 12 wettest days were all associated with ARs.

**ESNO FORECASTS & EXTREMES**

Seasonal, 3-month forecast issued in November for winter (December, January, and February) by various sources, including Climate Prediction Center and North American Multi-Model Ensemble, showed a greater chance of drier than normal precipitation for the southern half of CA and NV. These forecasts were in part influenced by the weak La Niña that occurred during winter of 2017. Although La Niña has historically been linked to drier conditions in Southern CA and NV, the largest historical stream flows in many parts of central to northern CA and NV have occurred during weak La Niña events (Fig. 3). This indicates a historical precedent for extreme precipitation events or series of extreme events, along with major flooding, during weak La Niña events.

Improving monthly to seasonal forecast has long been requested of decision makers in all sectors. The large contributions of the unusually large number of landfalling ARs in 2017 (Fig. 2) highlights how improving capabilities of monthly to seasonal prediction of ARs and extreme events is important to forecasting if a month or season will be wet or dry.

**PRECIP. & POLICY DECISIONS**

The extremely dry 2014 and extremely wet 2017 have been occasions and motivations for many policy and decisions to be made regarding drought, flood and water management in CA. Some of the significant decisions are listed below.

**WY 2014**
1. For the first time in the 54-year history, DWR announced a zero State Water Project (SWP) allocation to all 29 public water agencies that buy from the SWP, Jan. 31, 2014 (1a) SWP allocations were 5%, Apr. 18, 2014 (1b).
3. Federal and state governments provide aid in order to provide relief.

**WY 2017**
1. SWP allocations were 85% on Apr. 14, 2017 (1a).
2. Flood Responses: Governor Brown issued 2 emergency proclamations on Jan. 23, 2017 (2a); Brown requested presidential major disaster declaration on Feb. 10, 2017 (2b).
3. State drought emergency is declared officially over on Apr. 7, 2017, except for Fresno, Kings, Tulare, and Tuolumne counties. The State Water Resources Control Board maintained urban water use reporting requirements and prohibitions on wasteful practices such as watering during or after rainfall and hosing off sidewalks.

**SNOW LEVELS**

Historically, one of CA and NV’s wettest years was WY1983, ranked wettest in CA and third wettest in NV. Both 1983 and 2017 had extraordinary amounts of precipitation but WY2017 did not produce as much snow pack as accumulated in 1983. Looking at the observations, the differences in the WY 2017 snow pack relative to WY 1983 were mostly the lesser snowpack in 2017 at elevations below 2500 meters (8200 ft) (Fig. 4). This difference follows a trend toward rising snow levels in recent years during which median snow levels in the northern Sierra Nevada have increased by approximately 500 m since 2008. Higher snow levels can be attributed to relatively warm storms and storm interludes this last winter—as a whole. Winter 2016-17 was +0.3°F above 1949-2005 long term average.