



**MEMORANDUM**  
**DECEMBER 28, 2018**

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**TO:** BOARD OF DIRECTORS  
**CC:** ANDY MUELLER, GENERAL MANAGER  
**FROM:** DAVE “DK” KANZER, P.E. & DON MEYER, P.E. <sup>DK DM</sup>  
**SUBJECT:** COLORADO RIVER BASIN WATER SUPPLY CONDITIONS UPDATE AND WATER YEAR IN REVIEW – 2018/2019

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***NO ACTION:** Informational status report on water supply conditions for Colorado River Basin  
No action is requested*

**STRATEGIC INITIATIVE(S):**

- 3. B. The River District will engage in support efforts aimed at understanding climate change and how it may affect water supplies.*
  - 3. C. The River District will engage in and support water supply planning efforts, local and regional, which include adapting to climate change impacts.*
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This memorandum provides a summary of the preliminary CRB water supply outlook for 2019 and a brief review of the 2018 Water Year in the Colorado River Basin (CRB).

**Colorado River Basin Hydrology and 2019 Water Supply Outlook**

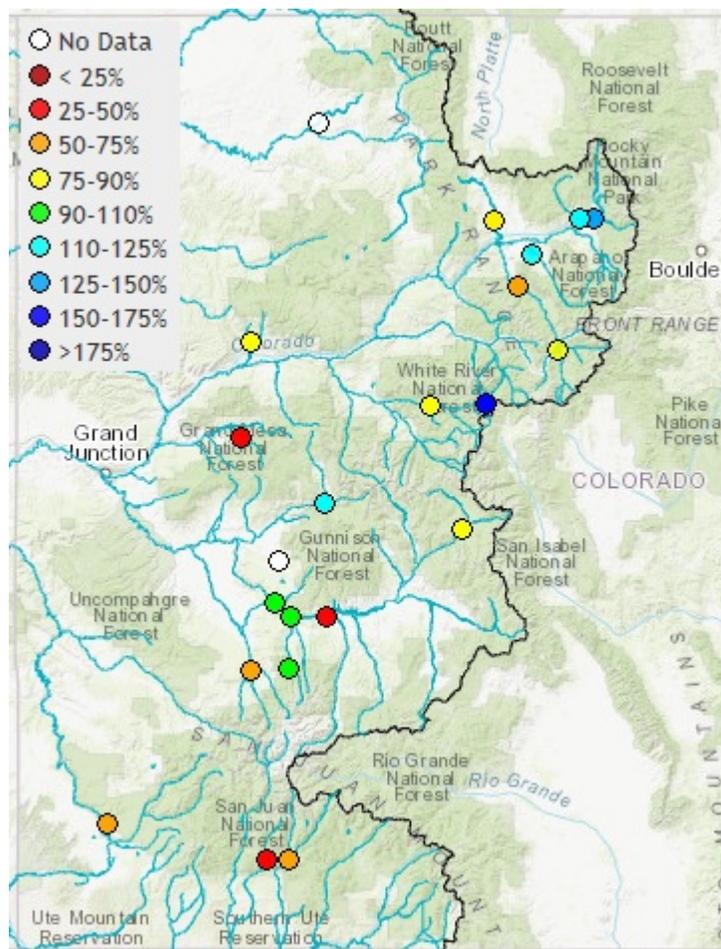
The snow accumulation season has begun and although it is early, many water watchers remain concerned.

The early 2019 water supply forecasts across the CRB are average or below the long term average. Like 2018, snow conditions are generally better in the northern and eastern portions of the Upper Basin. Additionally, some tributary basins to the Green River, are also above average. In areas south of I-70 in Colorado, snowpacks remain below average (see Figure 2 on page 3).

The near term forecast is dry and warm and according to the Climate Prediction Center’s December 20 outlook, drought conditions are projected to likely remain through the end of March in the Upper CRB.

This outlook, combined with current below average storage levels following last year’s extremely dry year, does not bode well. Again, although it is early, several key water storage facilities are not expected to fill, especially in the Gunnison basin. In the Gunnison Basin, water supply concerns are the highest at Blue Mesa, Taylor Park and Ridgway Reservoirs.

Across the River District, the current reservoir storage conditions, as a percent of average, are shown graphically in Figure 1 below. The low reservoir levels generally reflect the below average 2018 water supply conditions.



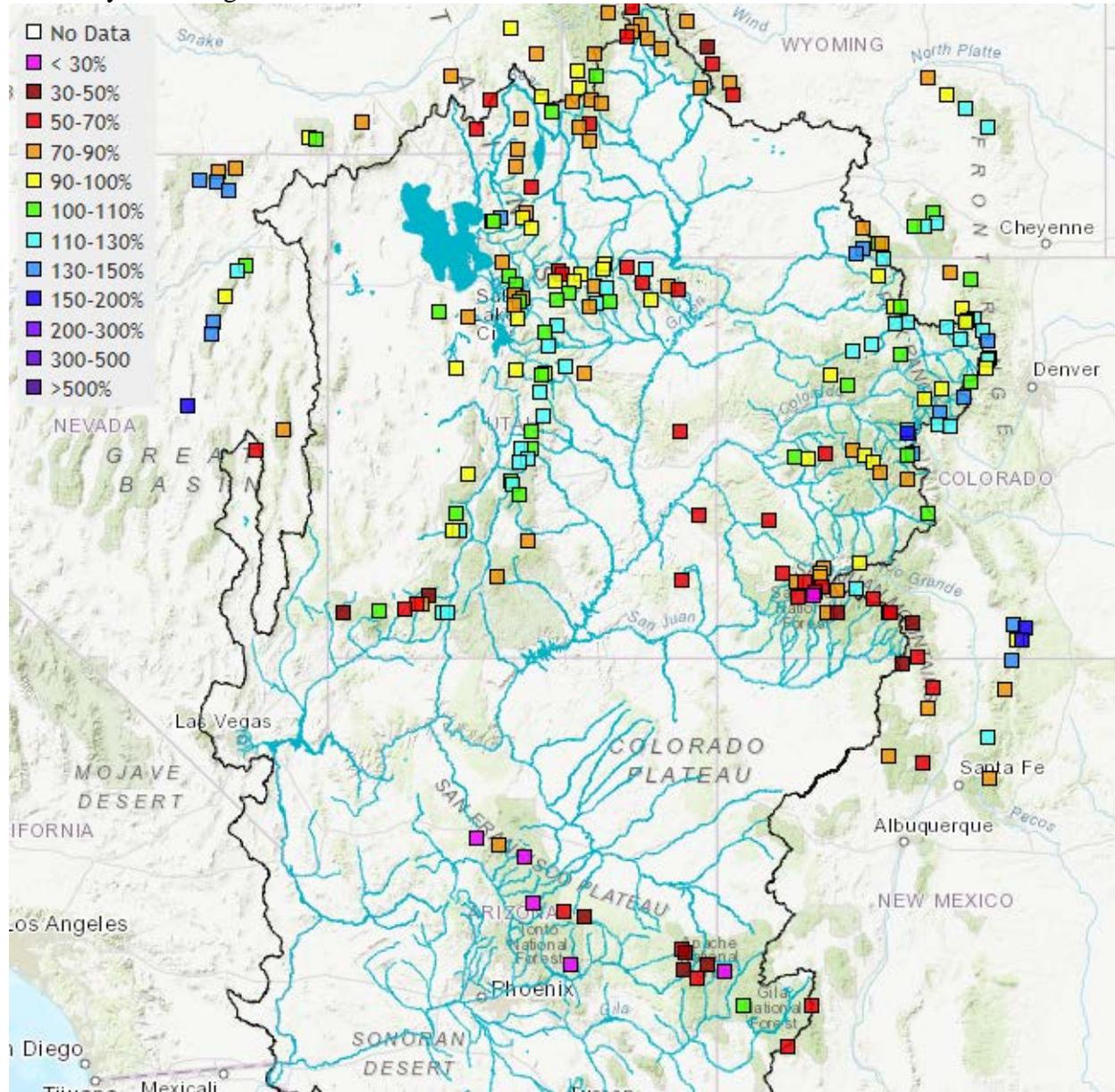
**Figure 1:** Reservoir Storage Conditions, as compared to long term averages – Colorado Basin River Forecast Center; December 28, 2018

**Lake Powell Inflow Forecast Discussion**

Looking down basin, the preliminary April-July inflow volume forecast for Lake Powell is also well below average at 7.1 million acre-feet (maf), or 66 percent of the 30-year average. Based on the most probable inflow forecast, the December 24-Month Study projects a balancing release of 8.66 maf in water year 2019; consistent with the Interim Operating Guidelines. If the operating tier is not changed in the April 24-Month Study performed by the USBR, it would be the fifth straight year of greater than 8.23 maf releases (2014 was a 7.48 maf release). Additional information is anticipated with the next 24-month study, relevant updates will be provided at the Board meeting.

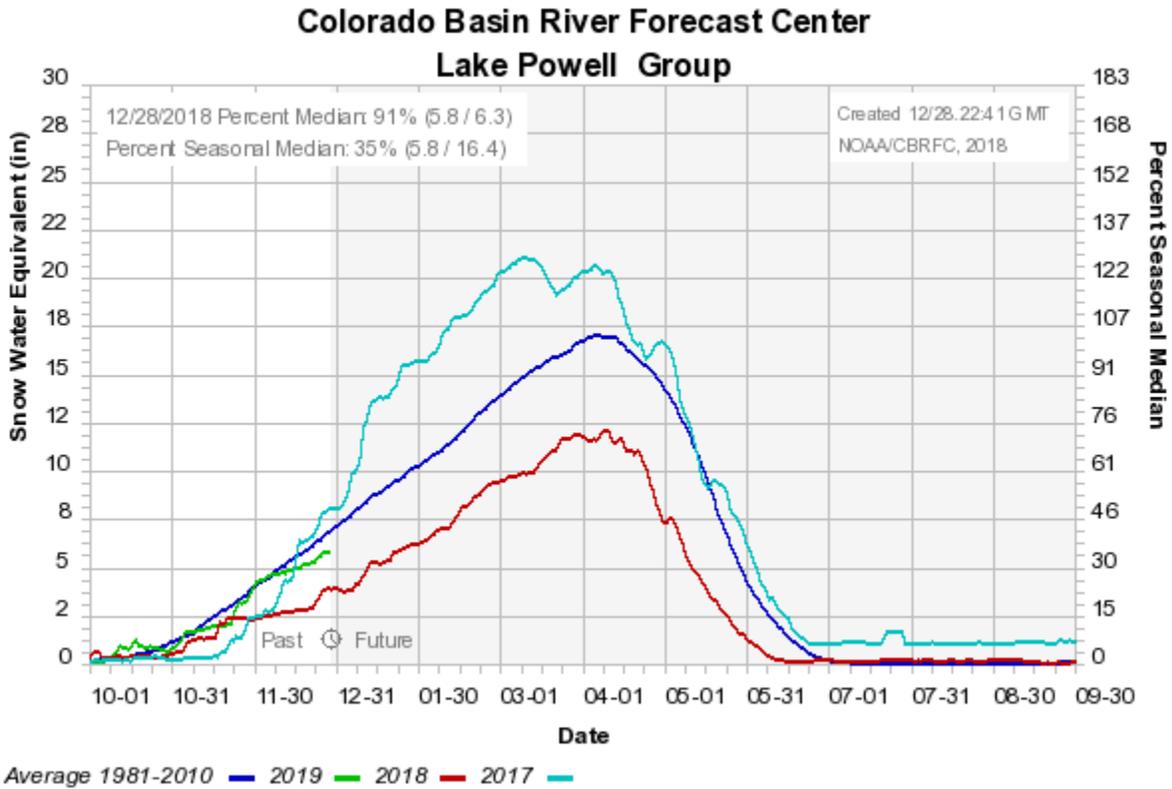
One potential piece of good news is the increased chance for El Nino conditions. Defined by increasing Pacific Ocean surface temperatures, El Nino conditions can favor increased springtime precipitation in parts of Colorado. Although, El Nino neutral conditions currently exist, there is a 65-70 percent chance of El Nino onset during winter 2018-19. El Nino conditions typically favor more seasonal precipitation in the southern US (including the 4-corners area) and for the Front Range.

This regional water supply outlook is consistent with current snowpack conditions at SNOTEL sites throughout the basin; these are shown in the map below (Figure 2) as compared to the long-term 30-year average.



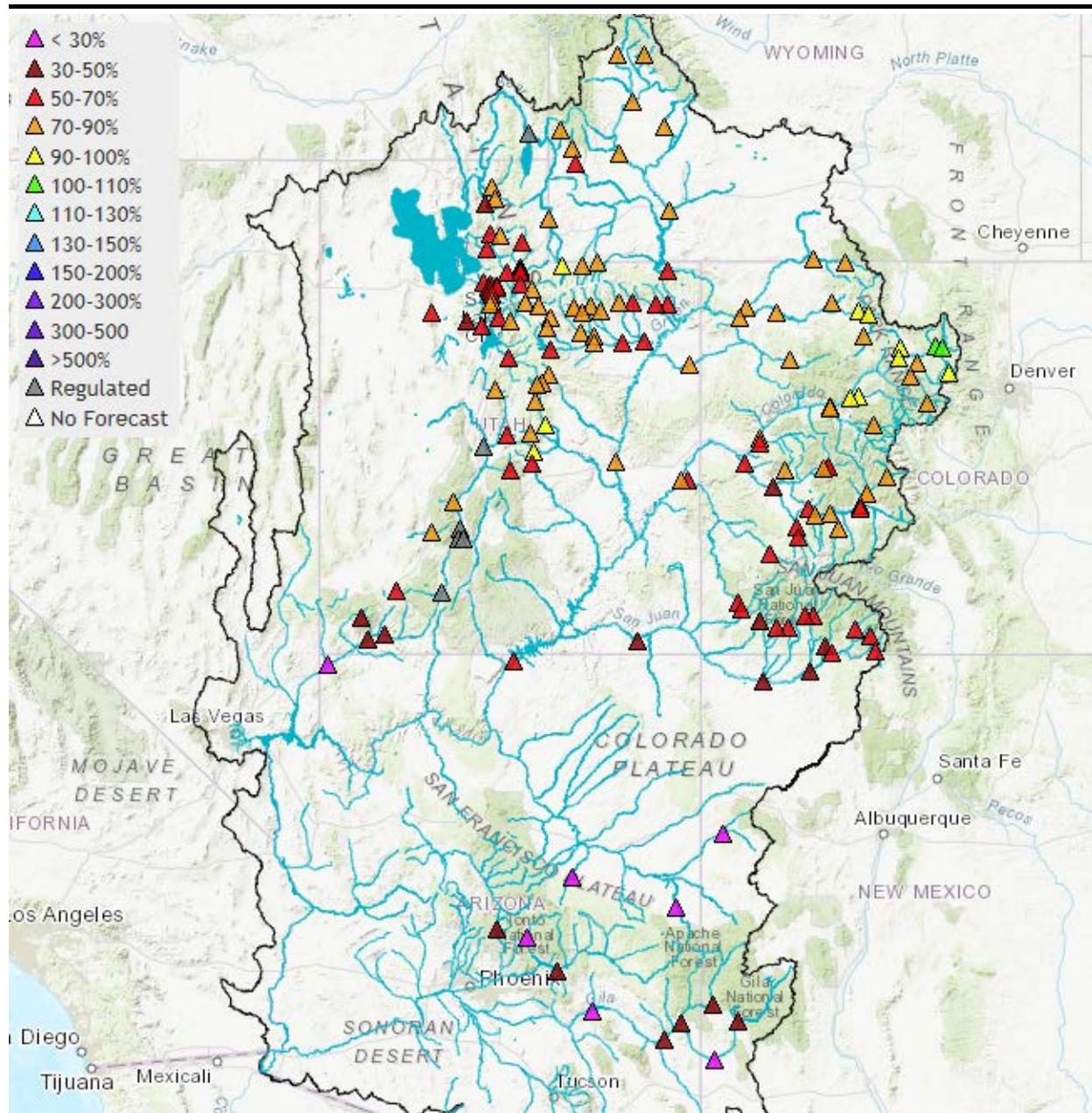
**Figure 2:** Snowpack Conditions as percent of long-term averages – Colorado Basin River Forecast Center; December 28, 2018

When combined into a regional assessment, the conditions measured for all the SNOTEL stations above Lake Powell are slightly below average as shown in the time series plot (Figure 3) shown on the following page.



**Figure 3:** Comparison of Snowpack Conditions above Lake Powell on December 28, 2018; Colorado Basin River Forecast Center

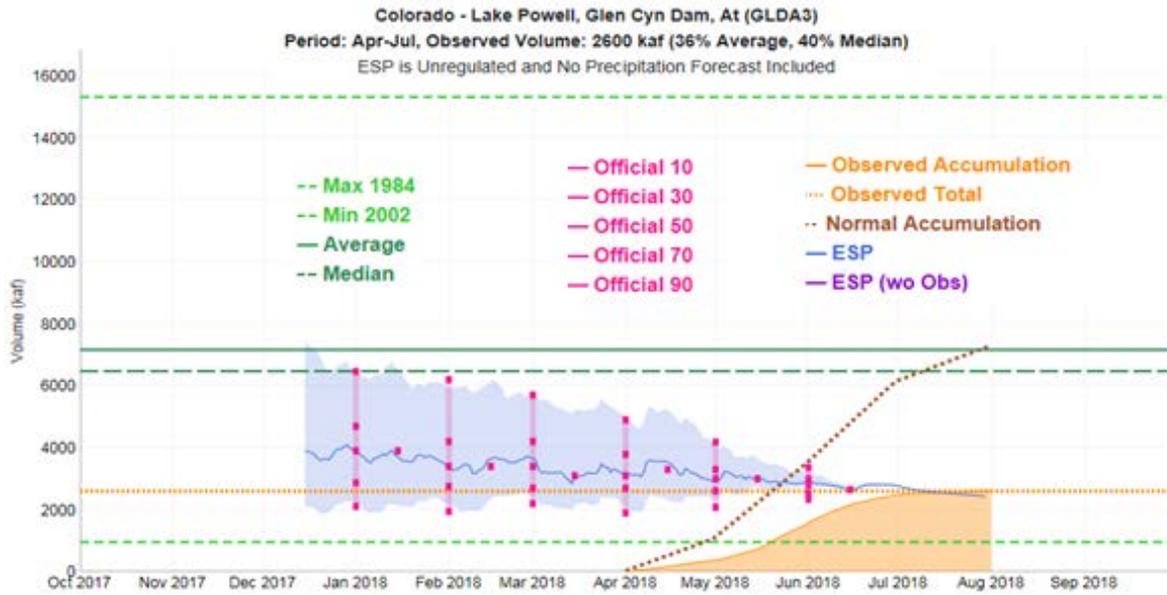
As previously discussed in the Lake Powell inflow forecast, these average-to-below-average snowpack levels throughout the CRB combined with low antecedent soil moisture conditions suggest a below average runoff volume across the CRB. Figure 4 below shows extent of the poor conditions for the projected water supply season. It should be noted, that this assessment is based upon very preliminary, early season conditions.



**Figure 4:** 2019 Water Supply Outlook / Projected April-July Runoff Volumes as percent of average, December 28, 2018 – Colorado Basin River Forecast Center

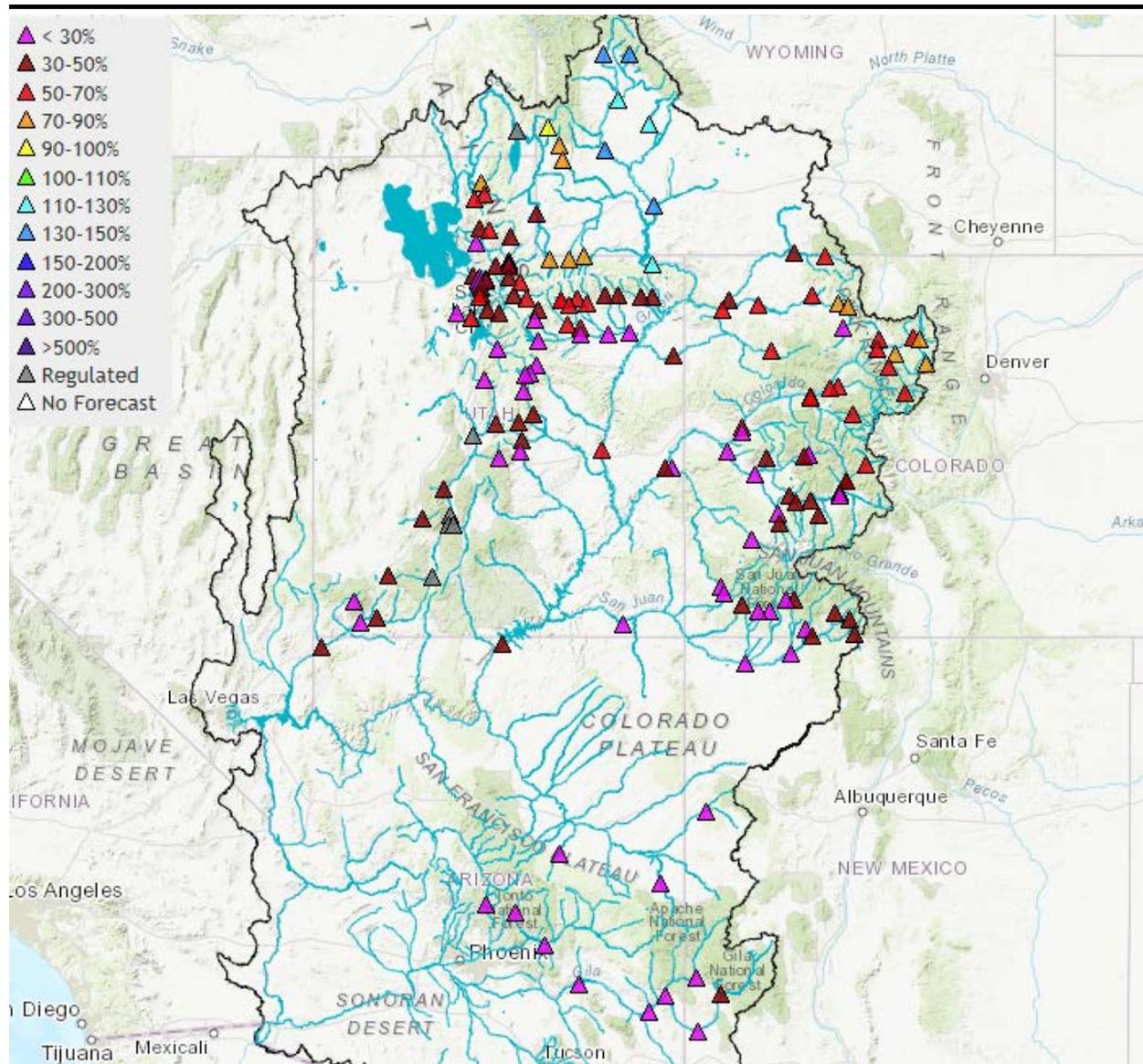
**2018 Colorado River Basin Water Supply Review**

Looking back to the previous water year, the evolution of 2018 inflow forecasts into Lake Powell is shown in the graph below (Figure 5). The April – July observed inflow was only 2.6 maf or 36 percent of average.



**Figure 5:** 2018 Evolving Runoff Forecasts for Lake Powell, Colorado Basin River Forecast Center

The final observed April – July 2018 runoff, as a percent of average, is depicted at various locations in the Colorado River Basin in the map below.



**Figure 6: 2018 April-July Observed Runoff Volumes**

The bright point in the entire basin was the Upper Green River above Flaming Gorge Reservoir where runoff was 114% of average. But for this, inflow to Lake Powell would have been significantly lower. La Nina Southern Oscillation (ENSO) conditions persisted throughout 2017 and the spring of 2018.