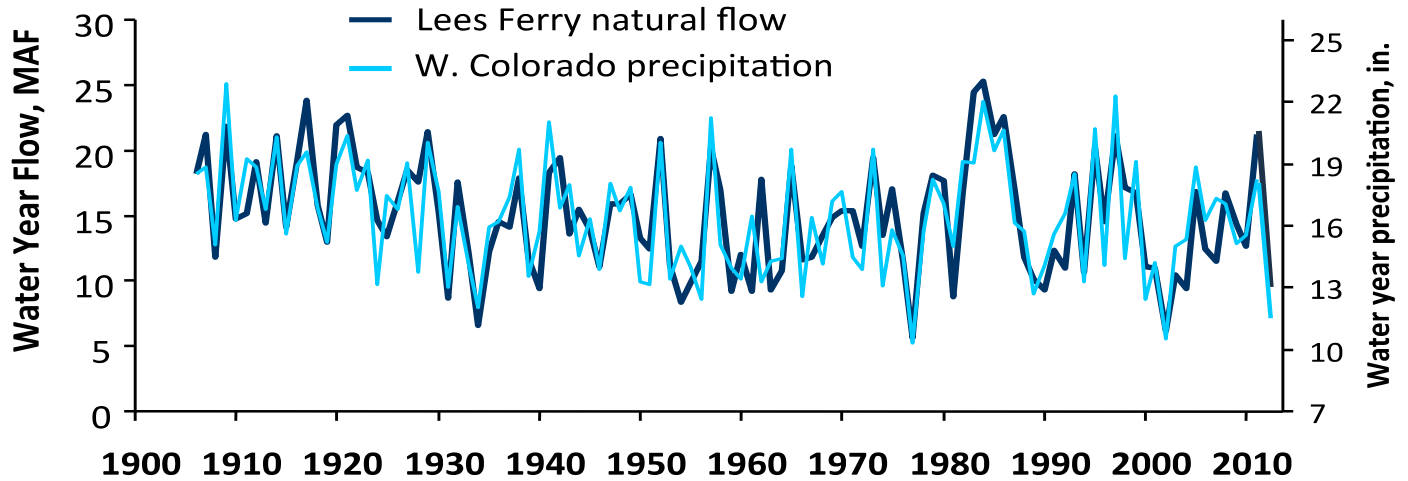


Current Conditions and Water Supply Outlook for the Colorado River Basin

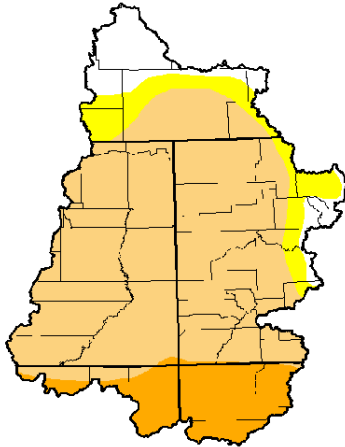
Rebecca Smith, University of Colorado Boulder – resm1653@colorado.edu – 3/7/15

Ben Livneh, CU-CIRES Western Water Assessment – ben.livneh@colorado.edu – 3/20/13



Historical context – Runoff in the CRB is tightly controlled by precipitation over a relatively small mountain headwaters area, mostly in western Colorado. Headwaters precipitation varies >2-fold from driest to wettest years with the frequency and location of Pacific jet stream/storm tracks. The precipitation variability gets amplified during conversion to runoff, so that flow at Lees Ferry varies >4-fold from driest to wettest years.

U.S. Drought Monitor Upper Colorado Watershed



March 3, 2015
(Released Thursday, Mar. 5, 2015)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

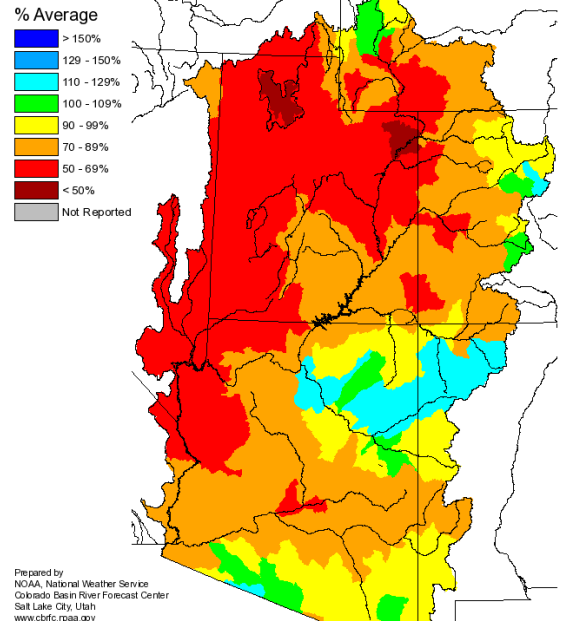
	None	D0	D1	D2	D3	D4
Current	8.80	9.08	68.85	13.28	0.00	0.00
Last Week 2/24/2015	8.80	9.08	63.94	14.04	4.14	0.00
3 Months Ago 12/2/2014	56.43	13.17	12.24	14.02	4.14	0.00
Start of Calendar Year 12/29/2014	56.43	13.17	12.24	14.02	4.14	0.00
Start of Water Year 9/26/2014	56.35	12.64	12.84	9.21	8.95	0.00
One Year Ago 3/2/2014	9.72	67.88	12.39	10.01	0.00	0.00

Intensity

 D0 Abnormally Dry	 D3 Extreme Drought
 D1 Moderate Drought	 D4 Exceptional Drought
 D2 Severe Drought	

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Seasonal Precipitation, October 2014 - February 2015
(Averaged by Hydrologic Unit)



The U.S. Drought monitor shows persistently dry conditions. Drought severity in the Upper CRB has worsened compared with this time last year, with 50% of the basin changing from D0 (abnormally dry) conditions to D1 (moderate drought). There has also been an increase in the area classified as D2 (severe drought).

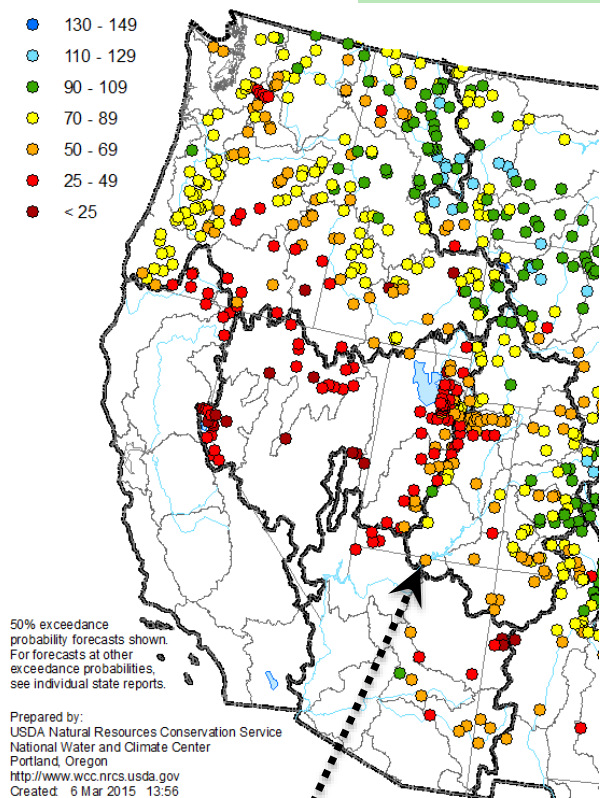
WY2015 Precipitation (above, right) – The cumulative precipitation from October 1 through February 28 has been below average for many of the important contributing subbasins in Wyoming, Utah, and Colorado. Though much of the Little Colorado River basin (cyan-colored, in New Mexico and Arizona) is above average, it contributes a smaller proportion than the basins to the north. Currently we’re in a neutral phase of ENSO (potentially transitioning to El Niño) and positive Arctic Oscillation and North Atlantic Oscillation phases. Oscillations are important for moisture sources and for pushing the jet stream north or south.

Upper Colorado River Basin SNOTEL, March 7: Precipitation (since 10/1): **84%** of average
Snow Water Equivalent (SWE): **88%** of median

Spring and Summer Streamflow Forecasts as of March 1, 2015

Percent of 1981-2010 Average

- > 180
- 150 - 180
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- 25 - 49
- < 25

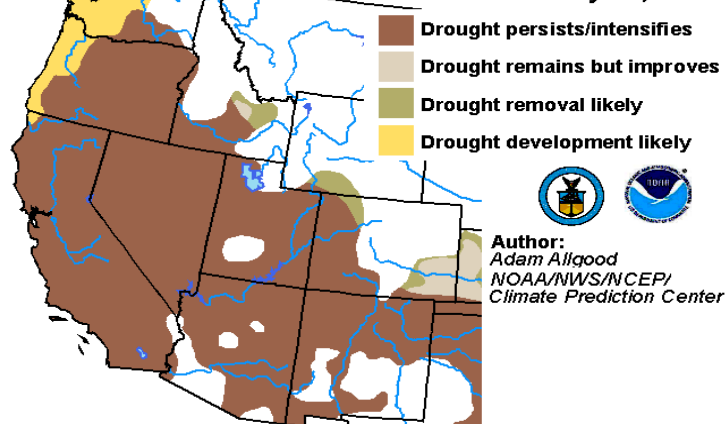


Spring-Summer 2013 Streamflow Forecasts (below, left) – conditions significantly below average are predicted to persist for all but the eastern-most locations in the Upper CBR (where there is a group of average to slightly above average forecasts).

Drought Outlook through 5/31 (below, right) – the entire Colorado River Basin is predicted to remain in drought with potential for worsening conditions through May.

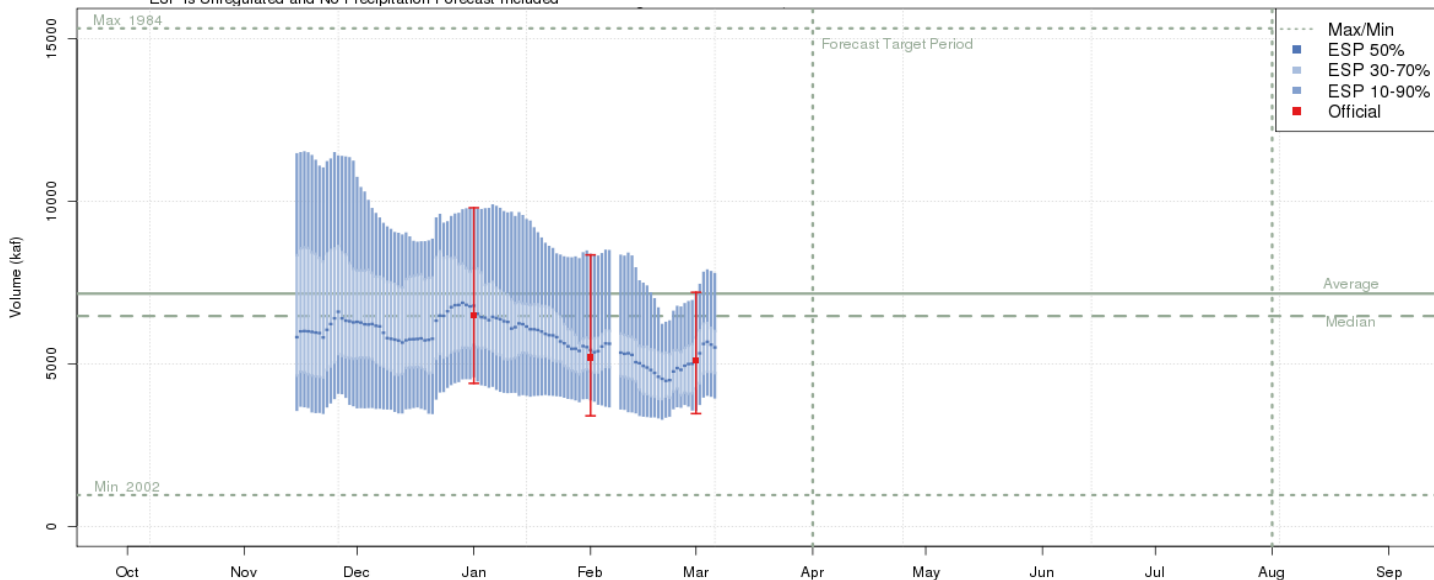
U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period
 Valid for February 19 - May 31, 2015
 Released February 19, 2015



Forecasting Inflows to Lake Powell (below) – The Bureau of Reclamation begins forecasting inflows to Lake Powell in November based on Ensemble Streamflow Prediction (ESP). The prediction spread is calculated using current conditions and simulations of soil moisture, snow pack, regulation, and streamflow. The latest official April-through-July inflow forecast is 5.1 MAF (71% of average).

Colorado - Lake Powell- Glen Cyn Dam- At (GLDA3)
 2015-03-01 Apr-Jul Official 50% Forecast: 5100 kaf (71% of average)
 ESP is Unregulated and No Precipitation Forecast Included



Overall - The Colorado River Basin water supply outlook is not good due to several years of below average precipitation draining reservoirs (Powell is 45% full). Although the snowpack in the Upper Basin is close to average for this time of year, it is not enough to overcome the conditions created by long term slack in supply. With continued or worsening drought conditions predicted for the remaining snow-accrual months, a system rebound seems unlikely this year.