Recent Precipitation Trends and Impacts to Water Supply Forecasting
The recent trend in spring Precipitation (March-May 1980-2017)

Eastern San Juan Headwaters

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<tr>
<td>1980-2017</td>
<td>5.47 inches</td>
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<td>1980-1999</td>
<td>6.48 inches</td>
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<td>2000-2017</td>
<td>4.54 inches</td>
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Values in inches

~30% decrease in precipitation % of average in the 2000-2017 period compared to 1980-1999 period

~18% decrease in % of average precipitation the 2000-2017 period compared to 1980-1999 period.

Historical Average
- 1980-2017: 7.32 inches
- 1980-1999: 8.02 inches
The recent trend in spring precipitation (March-May)

Decrease in 2000-2017 average precipitation compared to 1980/81 – 1999 period average

- Upper Green: -10 to -20%
- Yampa Basin: -5 to -15%
- Duchesne Basin: -10 to -20%
- Upper Colorado Main: -5 to -10%
- Gunnison Basin: -10 to -30%
- Dolores Basin: -20 to -30%
- San Juan Basin: -25 to -35%

In addition, lower July-September precipitation was observed (40% of average reduction compared to 1980-1999) in the eastern San Juan Basin headquarters.

Analysis based on a subset of representative SNOTEL sites in the Colorado River Basin.
So why do we bring this up and how do we handle it in our forecasting methodology?

**We are aware of such trends.**

*Challenges in addressing long term trends are large as we want to maintain objectivity in the forecast process.*

**Is it possible to address such trends in water supply forecasts?**

*Keep in mind much of our forecast focus is on the upcoming season, above average years will occur.*

*Even in a dry season, it may turn wetter (recall 2015) - record dry early, record wet May-June/July.*

*Important to remember Information about a possible dry scenario is included in the forecast range provided.*

*Re-calibrate at a greater frequency to include recent dry periods and extremes - at least catch in forecast range.*

**What is our ability to realize we are in a dry pattern that might persist into the spring / summer ?**

*It may be possible by mid spring to realize certain weather patterns in the calibration period are unlikely.*

*Possibly adjust weightings to reduce or remove impacts of extreme years on the model guidance.*

**What tools might help us in evolving our forecast methodology in this regard?**

*CPC doing a re-analysis of climate forecast ability using higher elevation sites (recent collaboration).*

*CPC assisting in determining a weighting scheme based on current and near term pattern recognition.*

*Develop in house weather pattern recognition methods to assist in weighting schemes.*

**In Summary:** We remain active in trying to address such issues and evolve our forecast methodology.