NIDIS Intermountain West Drought Early Warning System March 5, 2019

Precipitation



The images above use daily precipitation statistics from NWS COOP, CoCoRaHS, and CoAgMet stations. From top to bottom, and left to right: most recent 7-days of accumulated precipitation in inches; current month-to-date accumulated precipitation in inches; last month's precipitation as a percent of average; water-year-to-date precipitation as a percent of average.

Standardized Precipitation Index



Standardized Precipitation Index standardizes precipitation accumulations for a specified time period into percentile rankings. -1.0 to -1.5 is equivalent to a D1 to D2. -1.5 to -2.0 is equivalent to a D2 to D3. -2.0 and worse is equivalent to a D3 to D4. 30- and 60-day SPIs focus on short-term conditions while 6- and 9-month SPIs focus on long-term conditions. SPI data provided by High Plains Regional Climate Center.

Snotel and Snowpack





The above image shows SNOTEL snowpack percentiles for each SNOTEL site in the Intermountain West. The images below show accumulated snow water equivalent in inches (green) compared to average (blue) and last year (red) for several different sub-basins across the UCRB (and were created by the Colorado Basin River Forecast Center).



Streamflow





The top left image shows 7-day averaged streamflows as a percentile ranking across the UCRB. The top right image shows 7-day averaged discharge over time at three key sites around the UCRB: The Colorado River at the CO-UT state line; the Green River at Green River, UT; and the San Juan River near Bluff, UT. All streamflow data provided by United States Geological Survey.

Surface Water



The top left image shows VIC modeled soil moisture as a percentile ranking. The top right image shows satellite-derived vegetation from the VegDRI product (which updates on Mondays).

The graphs shown below are plots of reservoir volumes over the past full year and current year to date (black). The dashed line at the top of each graphic indicates the reservoir's capacity, and the background color-coded shading provides context for the range of reservoir

levels observed over the past 30 years. The data are obtained from the Bureau of Reclamation. Some of the reservoir percentiles don't line up at the new year due to differences in reservoir levels at the beginning of 1985 and the end of 2014. Dead storage has been subtracted. Note: Lake Granby data are obtained from the Colorado Division of Water Resources, and only goes back to the year 2000.



Evaporative Demand





The above images are available courtesy of NOAA's Evaporative Demand Drought Index (EDDI). Drought classification listed is a function of the depth of reference evapotranspiration accumulated over a given period of record with respect to a climatology of 1981-2010. The drought categories displayed are in line with the <u>US Drought Monitor's Percentile Ranking Scheme</u>. Data used to generate these maps come from the North American Land Data Assimilation System Phase-2 (NLDAS-2) project, which assimilates observations of temperature, wind speed, radiation, and vapor pressure deficit. The date indicates the last day of the period of record, and the week number indicates the window size for the period of record.

Temperature



All images show temperature departures from average over different time periods (last 7 days on top left; month-to-date on top right; last full month on bottom). Temperature departure maps provided by HPRCC ACIS.



Condition Monitoring and Impacts



Map of current condition monitoring reports submitted to CoCoRaHS in the last week overlaid on the

current U.S. Drought Monitor depiction. Specific impacts reports from local experts listed below.

Utah FSA

The impact to springs and rivers is really yet to be seen. We have however made it through what could have been a disastrous winter for my little town alone. My county's sheriff's office is still wanting to declare a drought status and I have encouraged them to hold off until streams start to run again and we can see if they are still lower than normal flows when runoff begins. I would be hesitant to remove the D0 because as you know recovery from the driest year on record is going to take some time, and unfortunately the last ten years has created a "new normal" and this one normal year may not be enough to recharge springs and aquifers.

Also – Tooele County feels like there shouldn't be a D2 there at all.

Outlook





The top two images show Climate Prediction Center's Precipitation and Temperature outlooks for 8 - 14 days. The middle image shows the Weather Prediction Center's Quantitative Precipitation Forecast accumulation for seven days. The bottom left image shows the 3-month precipitation outlook from Climate Prediction Center, and the bottom right image shows the Climate Prediction Center's most recent release of the U.S. Seasonal Drought Outlook.



Summary and Recommendations



Above is the most recent release of the U.S. Drought Monitor map for the UCRB region. Below shows the proposed changes for this week, with supporting text.



Summary: March 5, 2019

Last week widespread precipitation accumulated across many parts of Utah and Colorado. Additional snow blanketed the higher elevations of the Upper Colorado River basin (UCRB) and surrounding ranges. These areas continued to be dominated by colder than average temperatures, especially northern Wyoming, which experienced temperatures more than 10° below average. In the southern part of the Intermountain West (IMW), precipitation amounts were more meager, and temperatures trended toward near average and above average.

For most of the IMW, the winter pattern of colder and wetter than average continued, with the exception of southeast NM and parts of WY. For the plains, the cold is a double-edged sword. It limits any possible early evapotranspiration off of crops, lowers the risk of wildfires, and keeps vegetation in dormancy. But the extreme cold has been hard on cattle. The

good news about drier than average or near average conditions is that they've been confined to places that are typically dry during the winter. Regions that should get their bulk of moisture in the winter have risen to the occasion.

Basin-wide snowpack throughout the IMW is mostly above average now, after a stellar February, with repeated large snow events. Below average snowpack is confined to the central and southern mountains of AZ and NM. For the UCRB, not only are all the basins near to above average, but several basins (Duchesne, Gunnison, and San Juan) have already reached their normal peak snowpack, with still a month of accumulating to go.

At the beginning of last month, the main areas of concern were low streamflows, very dry soils (at the beginning of the cold season), and low water supply. With each passing storm, each of these becomes less of a concern. While streamflows are still low right now, it is expected that the snowpack can more than make up for the soil moisture deficits, bring flows back to normal, and replenish some of the water supply. While reservoir inflows will be better off this spring, depending on the size of the reservoirs, they may not fully bounce back.

A continued cold and wet pattern is expected well into March. Good news for snowpack and future water supply. But no sign of spring in sight.

Recommendations:

Utah: Based on recommendations from local experts and well above average precipitation in February, it is recommended to remove the spot of D2 from Tooele County (green outline).

Western Colorado: A large scale improvement from D2 to D1 (green outline) is recommended across the San Juan Mountains, into the Gunnison basin, and extending north into the Colorado Mainstem. The San Juans received well above average precipitation for February, and basin-wide snowpack is already past the normal seasonal peak, with more on the way. The Gunnison basin is also already past the normal seasonal peak for snowpack, and saw considerable precipitation in and around Gunnison County last week. Throughout the region, SPIs are mostly positive out to 6 months, and SPEIs (which incorporate temperature) are very positive for the water year.

San Luis Valley: Similar to last week, we are recommending a removal of D2 from the valley in southern CO (green outline). Alamosa is at 168% of normal precipitation since the beginning of the water year. Water-year-to-date accumulation is their 4th wettest on record. They are almost halfway to their normal total water year accumulation, and their wet season is still yet to come.

Yampa, North Park: A trimming of D1 is recommended in northern CO and

southern WY. The North Park Valley in Jackson County, CO saw well above average precipitation for February, and the area outlined in blue received an additional 1-2 inches of moisture last week.

Eastern Colorado: A trimming of the D1 around El Paso and Elbert counties in CO is recommended (blue outline). While the area only received modest precipitation over the past week, SPIs on most timescales are positive, and the area is showing above average precipitation for the water year.