#### NIDIS Intermountain West Drought Early Warning System December 24, 2018

# 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



## **Evaporative Demand**



12/24/18, 2:37 PM



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.

#### Fort Collins, CO

Local outdoor recreation shop manager referenced a lack of selling snow and cold outdoor merchandise because it hasn't snowed much. They have extra inventory of sleds that people aren't buying.

## 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



0 to 2 (D4)
2 to 5 (D3)
5 to 10 (D2)
10 to 20 (D1)
20 to 30 (D0)

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: December 24, 2018

Last week was a warm one for the Intermountain West (IMW). Following a colder than average October - November, and a cold start to December, the warm anomalies across the IMW last week ranged between 4 and 12 degrees above average for most of the region. This warmth brings up the month-to-date average.

In addition to the mild conditions, many locations around the IMW were dry for the week. The Four Corners and surrounding area received no precipitation for the week while the majority of the IMW received less than 0.10 inches. The high elevations of the northern Colorado mountains and in western Wyoming were the exceptions, seeing over half an inch of moisture.

Most of the IMW has been drier than average for December. For most of the lower elevation regions, the dry anomalies come at a time when contributions to total annual precipitation are low anyway. These deficits can still be easily overcome throughout the winter season. Despite a dry 60-90 days, particularly along the Front Range Urban Corridor, impacts are minimal at this time. When looking at the dry anomalies around the IMW in terms of magnitude deficits, the highest elevations pop out, generally showing a 1 to 3 inch precipitation deficit for the month. Most of the low elevation deficits are within a half an inch.

Unfortunately, the region struggling the most this winter is also the region that's had the worst drought conditions for the past year. Basin snowpack for the San Juan mountains is at just under 60% of average, and many of the SNOTEL sites are reporting water-year-to-date precipitation at a 25th percentile or lower.

The good news for high elevation snowpack is that the early season cold temperatures really helped with snow storage. Early snow accumulations and lack of melting have resulted in a solid start for snowpack for most of the IMW. With the exception of the Four Corners basins and the Rio Grande basin, most basin snowpack numbers are around 85% of average or higher.

We are now entering a critical time period where seasonal snowpack accumulations really ramp up. One dry week greatly increases deficits, but one large storm can also help with catching up. While most of the basins are faring okay, there's not a lot of room for error. The northern basins should be closely watched for emerging short-term dryness. The less than stellar numbers for the Four Corners area translate to no drought improvement at this time.

One more bit of good news is the active weather pattern in the forecast. The 7-day outlook shows large areas of decent moisture accumulations. The 8-14 day outlook shows a likely return to colder than average conditions, along with a good chance of wetter than average for the southern portion of the IMW.

#### **Recommendations:**

**UCRB:** Status quo is recommended. Areas in D4 are not showing good snowpack performance, so no improvements should be made at this time. The Wyoming and Wind River ranges in western WY and the Uintas in northeast UT should be watched closely, as SNOTEL SWE percentiles are a bit low. Month-to-date precipitation deficits are between 1-3 inches for some northern CO and northern UT mountains as well, so these areas should also be monitored in the short-term.

**Eastern CO:** Status quo is recommended. Well-timed precipitation with planting of winter wheat has been good news for the plains. Short-term dryness is a developing concern, but extended dry periods are very common for this time of year. Especially given the outlook showing the promise of

ample moisture on its way, it's recommended to hold off on any expansion of D0. Another area to watch would be along the Front Range where negative short-term SPIs are really standing out and snow totals are quite a bit behind for the season.