COLORADO
Colorado Water Conservation Board
Department of Natural Resources

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TO: CWCB Board

FROM: Emily Adrid - Water Supply Planning Section, Water Planning and Climate Impacts Specialist
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DATE: March 19, 2025

ITEM: Agenda Item 10 - Spring Drought and Flood Outlook

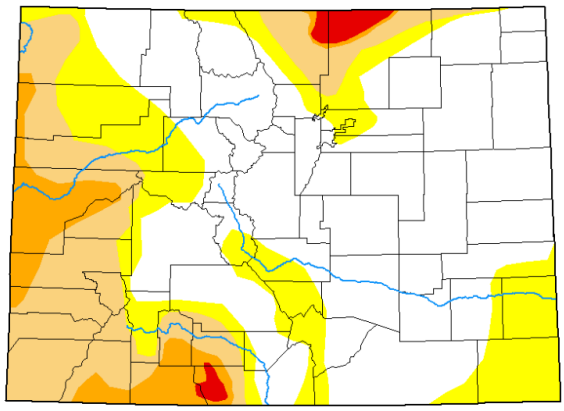
This is an informational item only. No Board action is required.

Background
Staff will be co-presenting the latest data and information on current drought and flood conditions and outlooks for the coming spring and early summer months. Staff will share long-term regional forecasts and possible impacts from current conditions, including snowpack, reservoir storage levels, stream flow forecasts, and related data.

The next Water Conditions Monitoring Committee (WCMC) meeting, formerly the Water Availability Task Force, will be on March 25, 2025 at 9:30am. Meeting information for upcoming and past meetings can be found online (https://cwcb.colorado.gov/Water-Conditions-Monitoring-Committee). Like all meetings, the next WCMC meeting will include CWCB staff updates and science experts will share a current water and climate update.

The summary below covers water supply indicators that will be reflected in the presentation and provides a brief overview of the spring forecasts. Please note that conditions may change between the memo due date (March 7) and the Board meeting presentation (March 19). Therefore, the conditions outlined in this memo, which uses data from March 7, may differ from those presented at the Board meeting.

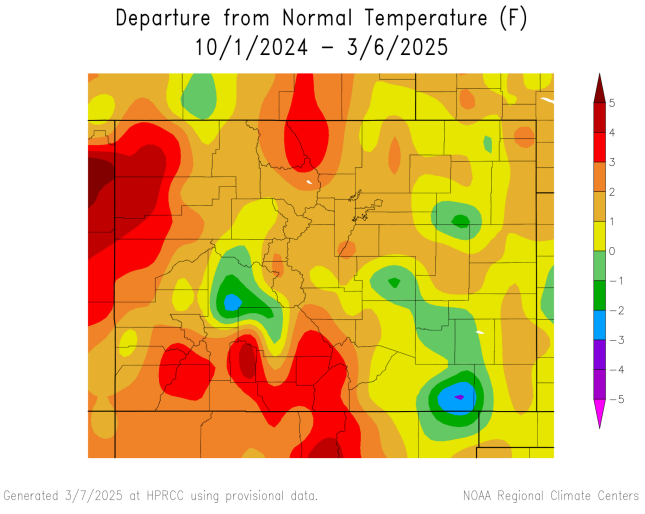
Drought
The latest US Drought Monitor map (posted Thursday, March 6, 2025) is shown at right. There are two notable areas of the state experiencing more severe drought conditions. In northern Colorado, Larimer and Weld counties have been experiencing D3 conditions since October 2024 due to a very dry summer and early fall. Although drought conditions have improved in the northern Front Range area, the lingering effects of the dry start to the water year is still evident. In southwestern Colorado, drought conditions have worsened to D3 in parts of Conejos, Rio Grande, and Archuleta counties. Drought conditions have been rapidly worsening along the West Slope due to well below average snowpack accumulation this winter.

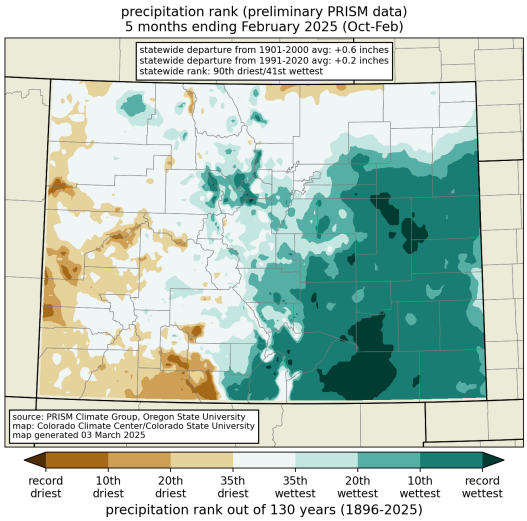


Temperature and Precipitation

The two maps below illustrate the average temperatures (left) and precipitation accumulations (right) in Colorado since the start of Water Year 2025.

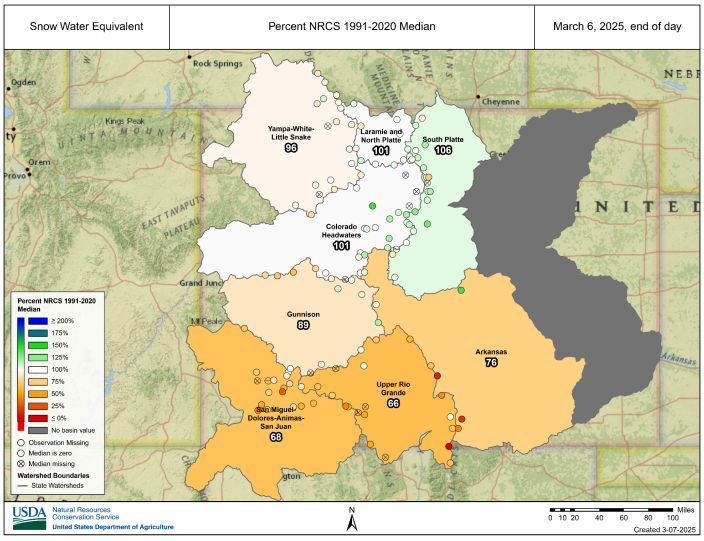
- Temperatures this Water Year have been above normal across most of the state, with exceptions in parts of the Eastern Plains and in Gunnison County. Parts of northwestern Colorado and the San Luis Valley have experienced temperatures at least 3°F above normal since October 2024.
- Precipitation accumulation this Water Year has been very wet in the southeastern quadrant of the state, largely due to a near-record breaking November snowstorm across the southeastern Plains. In fact, this has been a record wet water year so far for parts of Las Animas, Otero, and Lincoln counties. However, there are areas in western Colorado, especially in Archulta and Conejos counties, that have experienced drier than normal conditions this water year so far.





Snowpack, Streamflow, and Soil Moisture

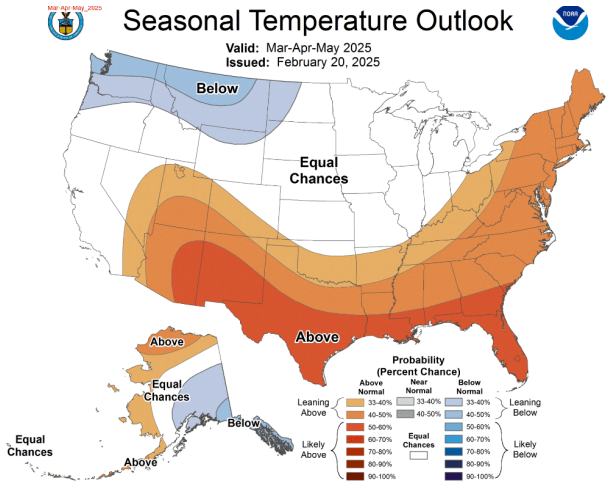
- Snowpack this winter has been relatively normal in the northern basins and significantly below normal in the southern basins. Snowpack statewide is **90%** of the median as of March 7, 2025, with the South Platte at 106% of the median and the Upper Rio Grande basin at 66% of the median.
- Steamflow 50% exceedance forecasts as of February 1 project statewide streamflows at 89%. This follows the same pattern as snowpack with lower streamflow in the southern basins and normal streamflow in the northern basins.
- Soil moisture is wetter than normal across much of the state, especially in the southern basins due to the strong monsoon season in summer 2024. In contrast, some northern regions received minimal late summer precipitation in 2024 and remain drier, particularly the South Platte.

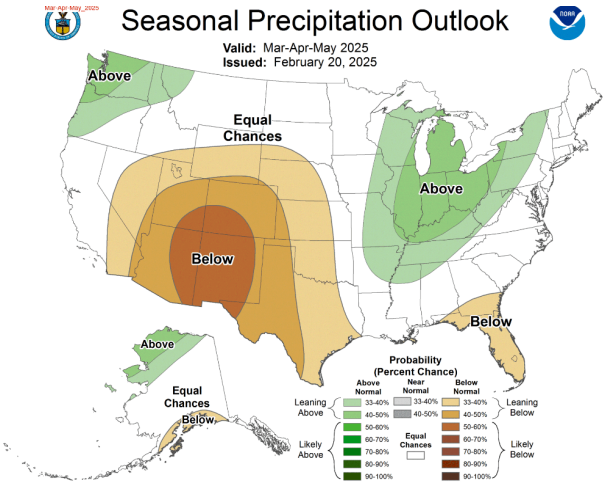


Seasonal Outlook

NOAA's Climate Prediction Center issues monthly seasonal precipitation outlooks. These outlooks use models to predict the likelihood of areas across the US experiencing warmer or cooler and wetter or drier conditions than usual in the upcoming months. The darker colors on the map indicate greater confidence in the model's prediction of a specific temperature or precipitation anomaly, rather than the severity of the anomaly itself.

The images below depict spring 2025 outlooks (March-April-May). Spring will likely be warmer than normal in southwestern Colorado, with equal chances of above or below normal temperatures for northeastern Colorado. There is relatively high confidence that spring 2025 will be drier than normal across all of Colorado, with even higher confidence of drier than normal conditions for spring 2025 in southwestern Colorado.





Flood Outlook

Every year at this time as the winter season slowly transitions over to the rainy season, a great deal of attention turns to the potential for spring and summer flooding. In recent years, this has also included increasing attention towards the threat of wildfires, which can themselves lead to increased flooding and debris flows. Flooding in Colorado generally results from any of five causes.

First is snowmelt flooding, which is a function of both the amount of snowfall on the ground and a catalyst short-term weather event, typically a 5+ day warm spell. Despite the attention placed on this threat every spring, it is worth a reminder that wide-scale snowmelt flooding is very rare in Colorado, with the last one occurring in 1984 on the western slope. While high water often occurs, in the large sense spring runoff is remarkably well-behaved in Colorado, especially when compared to other states. Based on snowpack in all of the river basins combined with the seasonal outlook, this looks to be very unlikely to occur anywhere in the State this year.

Second is spring-based flooding generally caused by lower-intensity, longer-duration spring rains. An example of this type of event is the 2015 May floods that occurred in eastern Colorado. These typically peak around Memorial Day but have been known to occur from April through June. These are generally

unable to be forecasted in advance, but likelihoods can be inferred from climate signatures and seasonal outlooks. Based on the outlooks provided, these look less likely to occur in Colorado this year.

Third is high-intensity, often localized thunderstorm events. An example of these events would be the 1976 Big Thompson Flood, which killed 144 people. These typically peak within one week either side of July 31, but have been known to occur from May through August. As with the above, these are generally unable to be forecasted in advance, but because of their erratic, localized nature, it is difficult to even predict likelihoods.

Fourth is the tropical-type events that can occur, which are rare and generally occur during September. A recent example of this is the 2013 Front Range floods. These are also nearly impossible to predict in advance.

The fifth and final flood type is post-wildfire flooding and debris flows. This has become a much more common occurrence in the past 25 years due to the significant increase in large-scale, high-intensity burns. It is worth noting that it has now been over four years since the disastrous fall wildfires of 2020, which included the Pine Gulch, East Troublesome, Grizzly Creek, and Cameron Peak wildfires among others. Each of these, especially Cameron Peak, were still causing some problems during the Summer of 2024, although with each passing year, further vegetative and soil recovery limits flooding potential from the prior year. There are no wildfires from years prior to 2020 that are still causing widespread problems, and wildfire activity since 2020 has been isolated (notwithstanding the very impactful Marshall Fire, which destroyed approximately 1,000 homes but because it happened on flatter terrain, did not significantly increase flood potential) and has not resulted in significant further problems, although some events have occurred. For this reason, post-wildfire flooding is expected to be limited this summer unless it follows a wildfire that has not yet occurred.

As a summary, all signs point to a quieter than usual flood potential for the State this summer based on predictive tendencies that are known. That said, it is always a good reminder that floods can, and do, happen anytime and anywhere during the traditional rainy season, which can extend from April through September. Even with today's improved forecasting capabilities, flooding events often can't be forecasted with any degree of skill more than a few days in advance at most. It is always wise to be prepared.

One final note in regards to wildfire potential…it does look like southern basins (Arkansas and especially Rio Grande and Southwest) may have elevated potential due to lower snowpack and poor climate outlook for temperatures and precipitation during the remaining snow accumulation season. Mitigating this was a very wet late summer and fall in 2024, which allowed soil moisture to be very good in these very areas before the ground froze. This will limit fire potential in the absence of other factors. However, as with flooding, fires are unpredictable and it is impossible to know where or when the next big wildfire will occur. However, CWCB is trying to address these unknowns through programs like Wildfire Ready Watersheds.