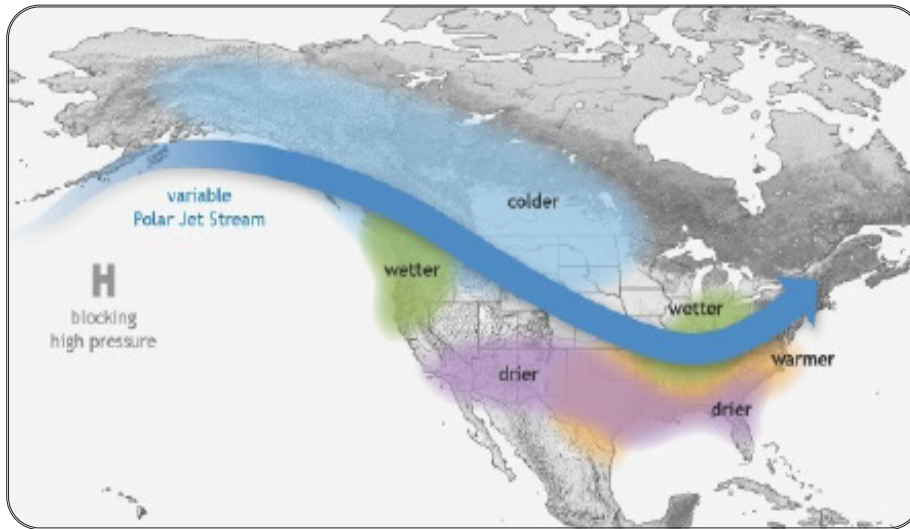




## Typical La Niña Winter Pattern



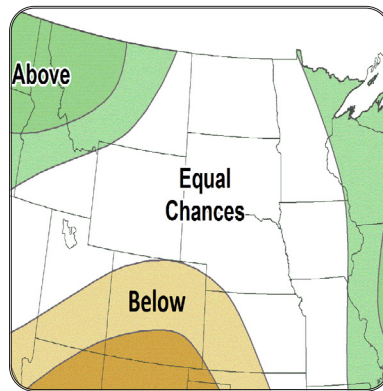
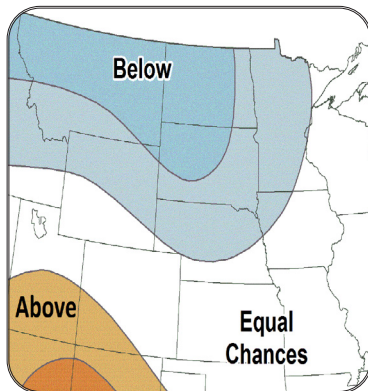
### Highlights for the Basin

There is a 3 in 4 chance of a La Niña developing this winter and a 1 in 4 chance it will not. A La Niña develops when sea surface temperatures in the eastern equatorial Pacific are consistently cooler than average for an extended period of time. These cool waters affect the location of the jet streams, which impacts weather in North America. The most notable impacts occur in winter and early spring.

While no two La Niña events are alike, there are some general patterns that are predictable. For the Missouri River Basin states, the typical winter La Niña pattern leads to increased chances for below-normal temperatures across the northern states. In addition, the northern Rockies often see increased chances of above-normal precipitation.

The image (source: NOAA) above shows the typical pattern in the winter during La Niña events. The polar jet stream, indicated by the thick blue arrow, tends to transverse through the Missouri Basin, making it the dividing line between cold and warm air masses. This means that colder conditions could be in store for areas of the upper Basin, while the southern Basin and the Plains could be warm and dry.

## Winter Outlook -- January - March 2025



Temperature  
**Probability**  
**(Percent Chance)**

Above Normal	Below Normal
33-40%	33-40%
40-50%	40-50%

Precipitation  
**Probability**  
**(Percent Chance)**

Above Normal	Below Normal
33-40%	33-40%
40-50%	40-50%

The winter outlook indicates increased chances for below-normal temperatures across Montana, the Dakotas, and the majority of Nebraska and Wyoming. The rest of the basin has equal chances of above-, below-, and near-normal temperatures.

The precipitation outlook has increased chances of above-normal precipitation in the northwestern portions of the basin. Below-normal precipitation is slightly favored over drought-stricken portions of western Kansas.

A La Niña Watch is currently in effect, which means La Niña conditions are favorable for development. Sea surface temperatures across most of the central and eastern tropical Pacific are currently near average, and the ocean-atmosphere system reflects ENSO-neutral conditions.

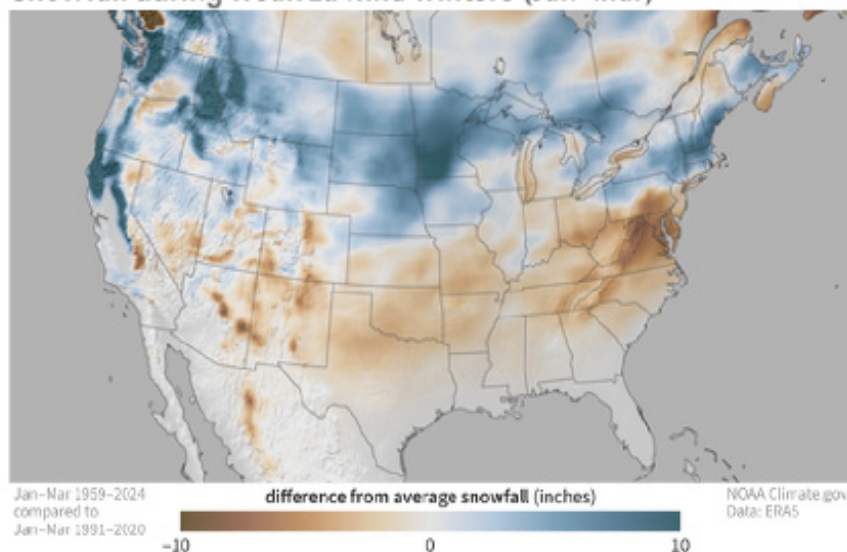
According to the NOAA Climate Prediction Center, there is a 75 percent chance that weak La Niña conditions will develop by the end of November and continue through January-March 2025.

Image courtesy of the National Oceanic and Atmospheric Administration.



## Potential Winter and Spring Impacts

### Snowfall during weak La Niña winters (Jan–Mar)



The image above from the [NOAA ENSO Blog](#) shows areas that tend to receive more (blue) or less (brown) than average snowfall during weak La Niña events from 1959 to 2024.

### Economy

The increased chances of above-normal precipitation in the northwestern part of the basin could lead to enhanced snow activities such as skiing or snowboarding.

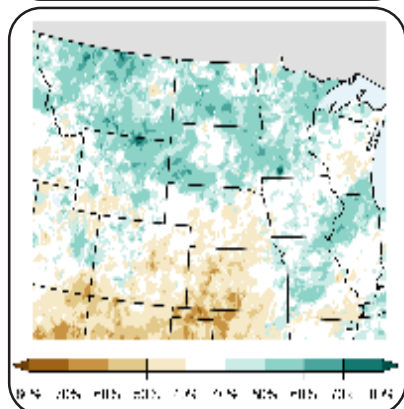
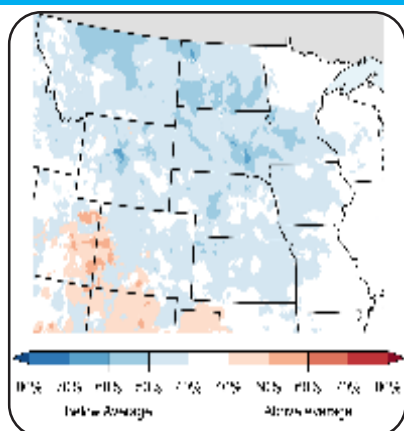
### Missouri River and Streams

Persistent and intense drought is affecting rivers and streams across the region. As a result, the U.S. Army Corps of Engineers expects runoff to be below normal through the winter and anticipates lower releases this winter. Due to the unpredictability of precipitation during La Niña, it is hard to predict any major changes to conditions.

### Agriculture

With much of the Missouri River Basin heading into winter with drought conditions, several potential risks are present. With anticipated cold outbreaks, frost depths could be deeper due to dry soils. With low soil moisture present, agriculture will be heavily dependent on spring precipitation for recharge. The absence of snow cover associated with below-normal precipitation, particularly in drought-stricken areas, would impact winter wheat and alfalfa.

## Comparisons and Limitations



### Variability of Winter Conditions During Past La Niña Years

While there are tendencies for La Niña winters (Jan-Feb-Mar), each event is unique and may not follow this pattern. The top left map shows how frequently winter temperature was warmer (reds) or colder (blues) than normal in 12 past weak La Niña events from 1950-2023. The bottom left map shows how frequently winter precipitation was drier (tan) or wetter (green) than normal. Locations with darker colors more frequently have warmer/colder or drier/wetter conditions during weak La Niña winters, whereas locations with light colors or white indicate variable conditions from event to event.

Past La Niña events can help inform weather forecasts, but there are some limitations. For instance La Niña is not known to impact:

- first freeze in the fall (early or late)
- last freeze in the spring (early or late)
- potential for ice storms or blizzards
- track/intensity of any one weather system
- potential for spring drought or flooding.

### MO River Basin Partners

[High Plains Regional Climate Center](#)

[National Drought Mitigation Center](#)

[National Integrated Drought Information System](#)

[NOAA NCEI](#)

[NOAA NWS- Central Region](#)

[NOAA NWS Climate Prediction Center](#)

[NOAA NWS Missouri Basin River Forecast Center](#)

[American Association of State Climatologists](#)

[U.S. Army Corps of Engineers](#)

[U.S. Bureau of Reclamation](#)

[USDA Northern Plains Climate Hub](#)

Source: NOAA Physical Sciences Laboratory

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