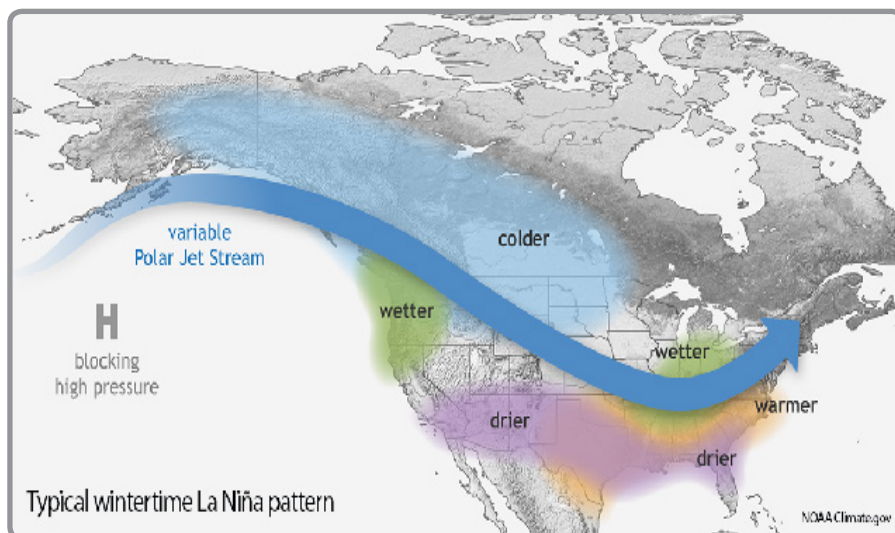




Typical La Niña Winter Pattern



Highlights for the Midwest

A La Niña develops when sea surface temperatures are cooler-than-average in the eastern equatorial Pacific for an extended time. This is important to North America because La Niña can impact our weather patterns, especially in late winter and early spring.

While no two La Niña events are alike, there are some general tendencies that emerge. For instance, the polar jet stream is typically farther south than usual.

This pattern brings enhanced chances for below-normal temperatures to the upper Midwest, particularly in the more western areas. The Ohio River Valley also sees enhanced chances of wetter-than-normal conditions, particularly for late winter. Warmer or drier weather events can still occur, but those events may be milder and less frequent across the region.

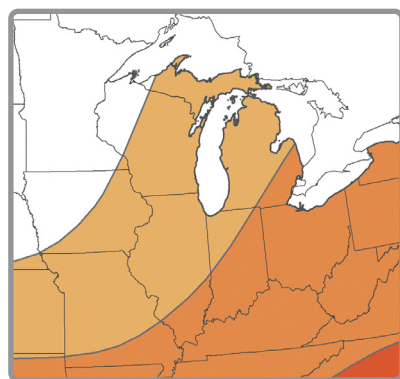
As shown by the thick blue arrow in the above graphic, a typical storm path during La Niña tends to track across the northwestern U.S. and dive just south of the Great Lakes. This generally means increased chances of precipitation for the Northwest, portions of the Great lakes, and the Ohio River Valley, with occasional cold air outbreaks across the north.

Image courtesy of the National Oceanic and Atmospheric Administration.

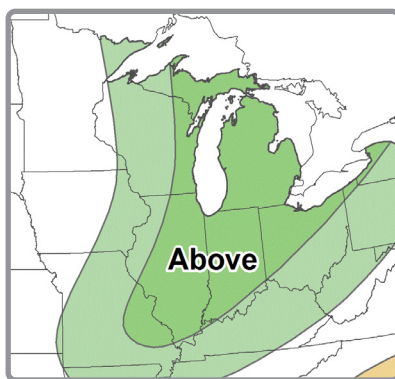
La Niña Outlook

Winter Temperature and Precipitation Outlooks

Valid for December 2021 - February 2022



Temperature



Precipitation

Temperature Probability (Percent Chance)

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

Precipitation Probability (Percent Chance)

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

The winter precipitation outlook shows a slightly increased chance of above-normal precipitation for most of the Midwest, with higher probabilities over the Great Lakes region. There are equal chances of above-, below-, and near-normal precipitation for most of Minnesota and Iowa along with small portions of western Wisconsin and northwest Missouri.

A La Niña Advisory is currently in effect, which means La Niña conditions have developed and are expected to continue. Forecasts indicate this La Niña will strengthen, peaking as a moderately strong event in late fall or early winter. According to the NOAA Climate Prediction Center, there is an 87% chance that these conditions will last through the winter and about a 63% chance that La Niña will continue into the early spring.

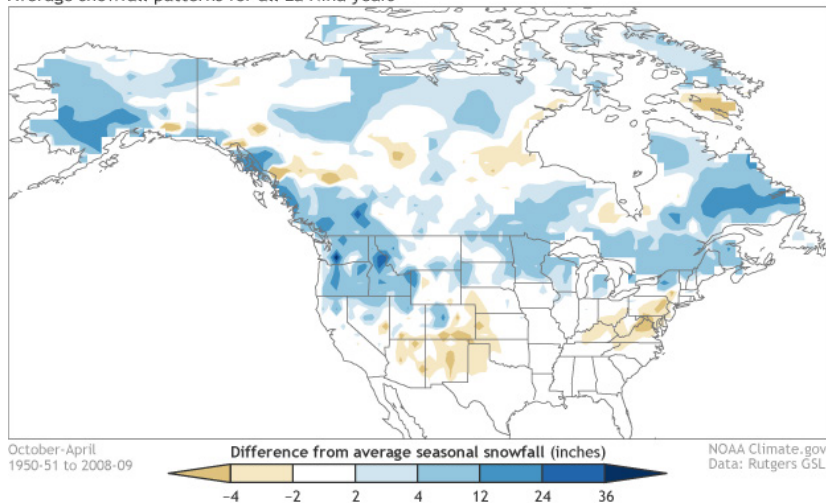
The winter temperature outlook (issued in October) indicates that the majority of the Midwest has slightly increased chances of above-normal temperatures, with higher probabilities in the southeast portion of the region. The extreme northwest portion of the region has equal chances of above-, below-, and near-normal temperatures.

Images courtesy of the National Oceanic and Atmospheric Administration.



Potential Winter and Spring Impacts

Average snowfall patterns for all La Niña years



The image above shows areas that tend to receive more (blue) or less (tan) than average snowfall during a La Niña year. The upper Midwest and Great Lakes tend to have above-average snowfall during La Niña years while the lower Midwest is usually near-average.

Economy

Negative impacts commonly associated with La Niña are increases in heating costs, snow removal, and difficulties in transportation. Colder and snowier weather may also hamper construction. Sectors that depend on winter weather (recreation, snow removal companies, and road salt sales) could see a benefit from increased snowfall.

Agriculture

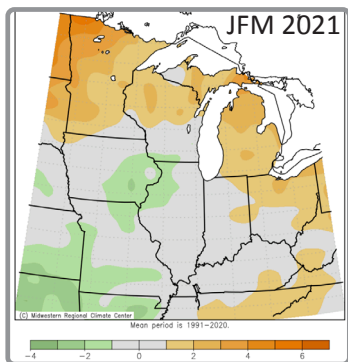
Most La Niña impacts are felt outside the growing season. However, increased snowpack could insulate crops from harsh conditions, and colder temperatures in the upper Midwest could limit certain pests and diseases. Cold outbreaks can adversely impact livestock producers due to increased operating costs and animal stress. Also, with much of the lower Midwest entering winter with abundant soil moisture, wetter-than-normal winter conditions could result in delayed spring planting.

Ecosystems and Rivers

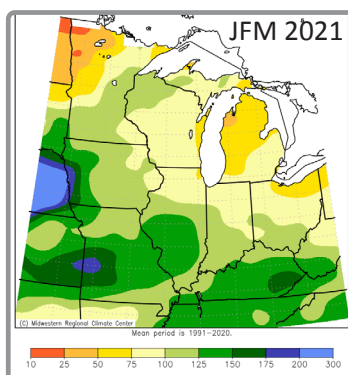
Periods of wintry weather can both benefit and harm native species, some of which thrive/depend on typical cold winter periods. Water availability is complex and depends on both the rain/snow mix and when the precipitation falls. Winter precipitation on unfrozen soils would be beneficial to recharge streams in the upper Midwest suffering from drought, while a large snowpack on frozen soils could lead to increased runoff and higher river levels in spring, depending on how spring weather develops.

Comparisons and Limitations

Winter Conditions During Past La Niña Years



Temperature Departure



Precipitation Percentage

Maps courtesy of MRCC

The maps to the left show late winter (Jan.-Feb.-Mar.) conditions during the last La Niña event in 2020-21. Much of the region had near-normal temperatures (top), with the upper Midwest above-normal (orange) and pockets of below-normal (green) in central and southwest areas. Precipitation (bottom) was above-normal (green) in the lower Midwest and below-normal (yellow) across the Great Lakes. As shown by last year's unexpected pattern, it should be noted that each La Niña is different and other factors may influence the overall winter. La Niña impacts can be limited by many factors, including long-term trend and being overcome by short-term weather events.

While past La Niña events can help inform forecasters about certain conditions, there are limitations. For instance, in the Midwest, 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 drought/flooding in the spring.

Midwest Partners

Midwestern Regional Climate Center (MRCC)
mrcc.purdue.edu

American Association of State Climatologists
www.stateclimate.org

National Integrated Drought Information System
www.drought.gov

USDA Midwest Climate Hub
www.climatehubs.usda.gov/hubs/midwest

National Oceanic and Atmospheric Administration
www.noaa.gov

Great Lakes Environmental Research Laboratory
www.glerl.noaa.gov

National Centers for Environmental Information
www.ncei.noaa.gov

NWS Climate Prediction Center
www.cpc.ncep.noaa.gov

NWS Central Region Headquarters
www.weather.gov/crh

North Central River Forecast Center
www.weather.gov/ncrfc

Ohio River Forecast Center
www.weather.gov/ohrfc