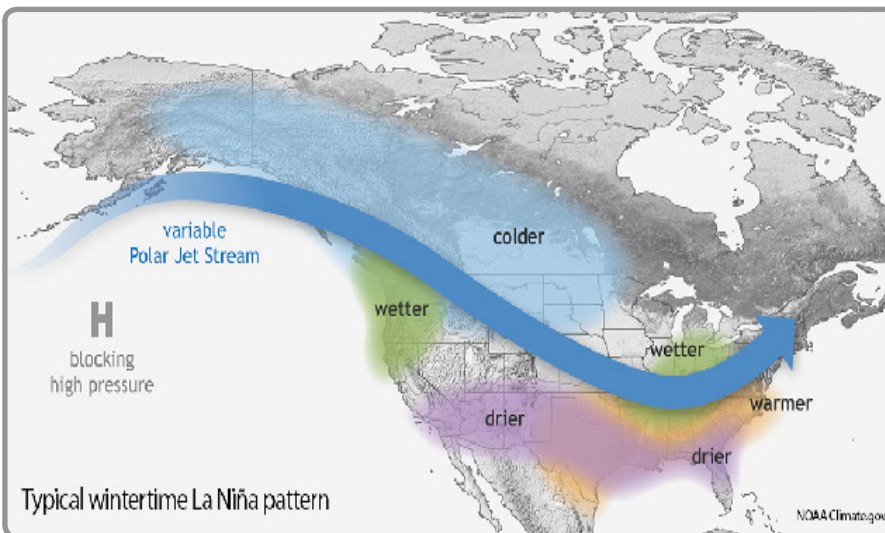




Typical La Niña Winter Pattern



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 Pacific 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.

Highlights for the Midwest

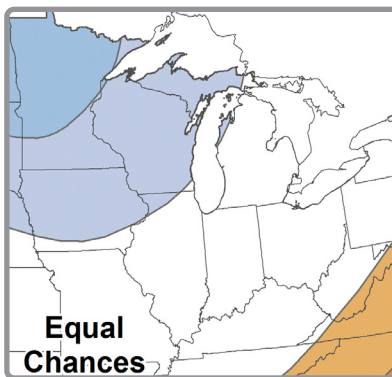
A La Niña develops when sea surface temperatures are cooler-than-average in the central and eastern equatorial Pacific for an extended time. This is important to North America because La Niña can impact our weather patterns, especially in late winter and early spring.

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

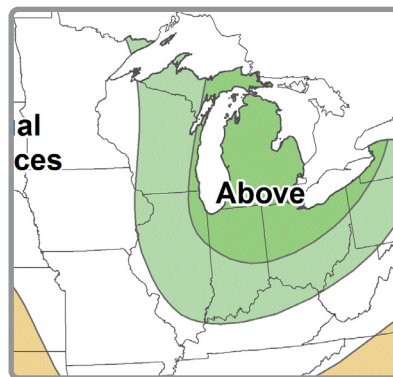
This pattern brings enhanced chances for below-normal temperatures to the Upper Midwest, particularly in the more western areas. The Ohio River Valley also sees enhanced chances of wetter-than-normal conditions, particularly for late winter. Warmer or drier weather events can still occur, but those events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

La Niña Outlook

Winter Temperature and Precipitation Outlooks Valid for December 2022 - February 2023



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 temperature outlook (issued in October) indicates that the northwestern portion of the region has slightly increased chances of below-normal temperatures. The southern and eastern portions of the region have equal chances of above-, below-, and near-normal temperatures.

The winter precipitation outlook shows a slightly increased chance of above-normal precipitation for most of the Midwest east of the Mississippi River and north of the Ohio River. There are equal chances of above-, below-, and near-normal precipitation for the western and far southern portions of the region.

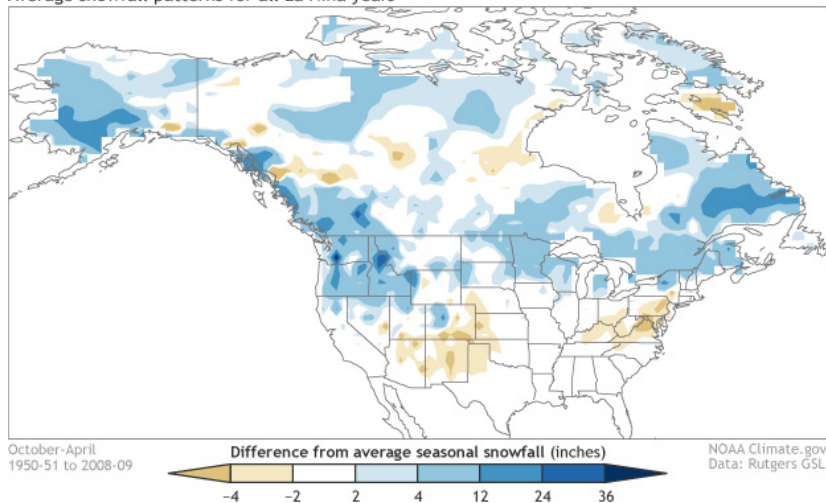
A La Niña Advisory is currently in effect, which means La Niña conditions have developed and are expected to continue. Sea surface temperatures in the east-central tropical Pacific are moderately below normal and near their peak minimum. According to the NOAA Climate Prediction Center, there is a 76 percent chance that La Niña conditions will last through the Northern Hemisphere winter, with a 57 percent chance that conditions will transition to ENSO-neutral by early spring.

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

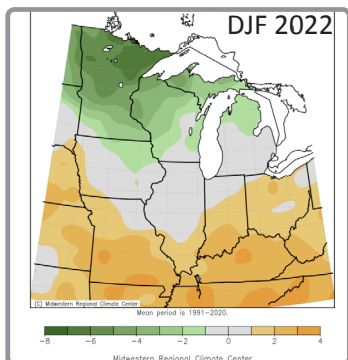
Much of the Midwest is entering winter with below-normal soil moisture, so wetter-than-normal conditions could be beneficial. However, in the north, below-normal temperatures could result in earlier and deeper soil frost, limiting soil moisture recharge. Increased snowpack could insulate crops from harsh 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.

Rivers and Water Supply

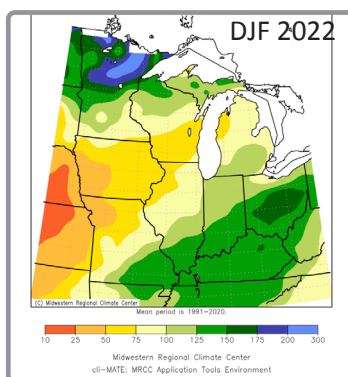
Typically, La Niña brings wetter-than-normal conditions to much of the Midwest. This could be extremely beneficial due to the ongoing drought. Water availability is complex and depends on the rain/snow mix and when the precipitation falls. Winter precipitation on unfrozen soils would be beneficial to recharge streams in the upper Midwest suffering from drought, while a large snowpack on frozen soils may lead to increased runoff and higher stream flows in spring.

Comparisons and Limitations

Winter Conditions During Past La Niña Years



Temperature Departure



Precipitation Percentage

Maps courtesy of MRCC

The maps to the left show winter (Dec.-Jan.-Feb.) conditions during the last La Niña event in 2021-22. The region was split with below-average temperatures across the upper Midwest and above-average temperatures across the lower Midwest (top). Precipitation (bottom) was above-normal across the northwest and southeast, separated by a swatch of drier conditions from western Iowa and northwest Missouri eastward to Michigan. 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 trends 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 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