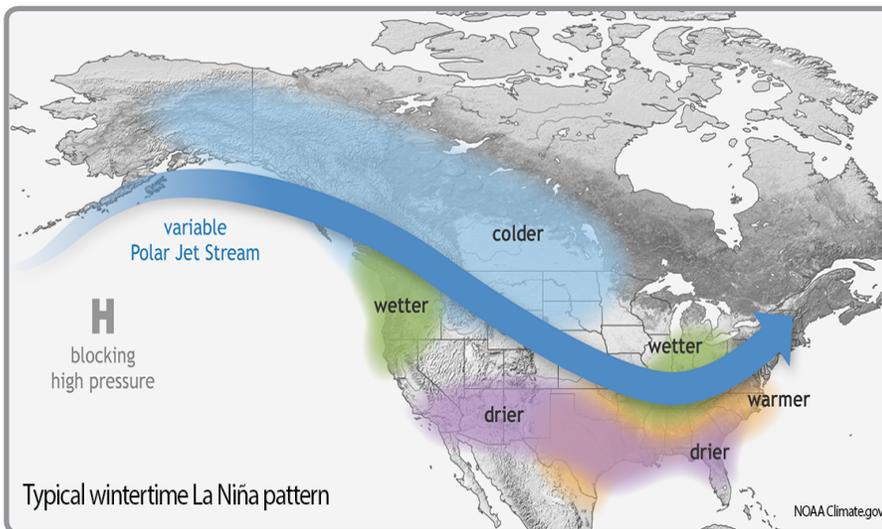




Typical La Niña Winter Pattern



The image above shows the typical pattern in the winter during La Niña events. The polar jet stream tends to stay to the south of the Great Lakes region, while the Pacific jet stream tends to track closely along the Pacific Northwest, bringing increased chances for moisture during the winter in the Great Lakes basin.

Image courtesy of the National Oceanic and Atmospheric Administration.

Highlights for the Basin

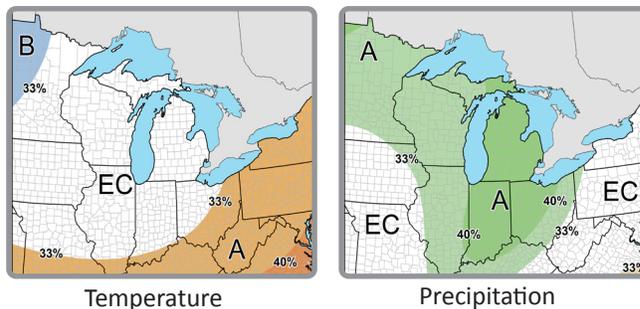
A La Niña develops when sea surface temperatures in the eastern equatorial Pacific are consistently cooler than average for an extended period of time. These cool waters affect the location of jet streams, which impacts North America. The most notable impacts occur in the winter, when the wind patterns in the atmosphere are strongest.

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

This pattern typically brings below-normal temperatures to much of the Great Lakes region, particularly across the western Great Lakes area. The southern Great Lakes may also see a slight shift toward wetter-than-normal conditions.

La Niña Outlook

Winter Temperature and Precipitation Outlooks Valid for December 2020 - February 2021

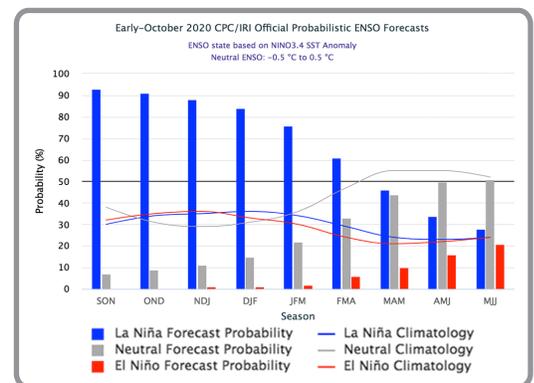


EC: Equal chances of above, near, or below normal
A: Above normal, **B:** Below normal

As of October, the temperature outlook indicates that most of the western and central region of the Great Lakes basin has equal chances for above-, below- and near-normal temperatures while the Lake Erie and Ontario basins have a slightly enhanced chance for above-normal temperatures.

Meanwhile, there is an enhanced chance for above-normal precipitation for a majority of the Great Lakes region, except for the far eastern region around the Lake Ontario basin which has equal chances for above-, below- and near-normal precipitation. Increased precipitation may have positive implications, such as increased snowpack and winter recreation, along with negative impacts like increased runoff in the spring.

La Niña Probability Winter 2020-2021



La Niña conditions have continued this fall and forecasts indicate that this La Niña will strengthen, peaking as a moderate or even strong event in late fall or early winter. According to the Climate Prediction Center, there is a greater than 85% chance that these conditions will last through the winter and about a 60% chance that La Niña will continue into the early spring, as shown in the image above. A La Niña Advisory is currently in effect.



Potential Winter and Spring Impacts

Agriculture



Courtesy of M. Longstroth.

Winters associated with La Niña tend to be cold with above-average precipitation and could negatively impact winter wheat and fruit orchards. However, because La Niña winters typically result in increased snowpack, this could insulate these crops to cold air outbreaks and harsh wind. Harsher winter temperatures could be negative for livestock producers due to increased operating costs and animal stress. La Niña could affect commodity prices due to negative impacts internationally.

Economy



Courtesy of Illinois-Indiana Sea Grant

Cold and wet winters with above-average snowfall can impact some economic sectors. The largest negative impacts are increases in home heating costs, snow removal expenses and difficulties in overland transportation. Sectors that depend on winter weather conditions, like winter recreation, snow removal businesses, towing companies and road salt sales, will likely see a benefit from increased snowfall. More ice on the Great Lakes could potentially delay the navigation season for shipping in the spring.

Water Levels and Ice

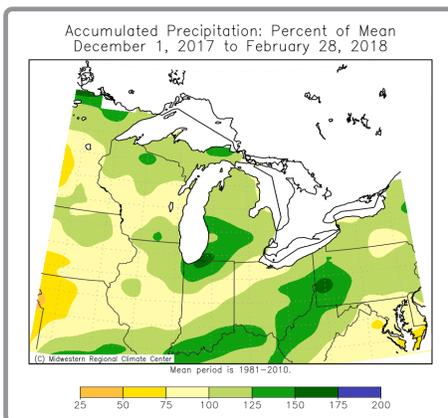
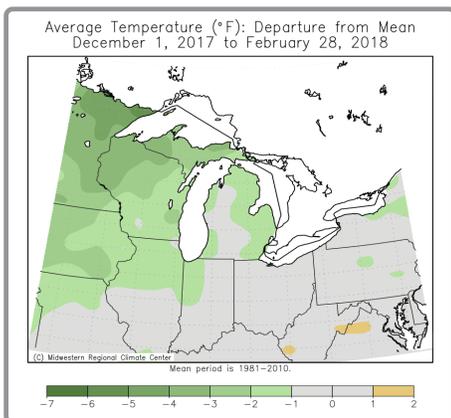


Courtesy of Illinois-Indiana Sea Grant.

With the increase in chances for above-normal precipitation, the likelihood of more snow accumulation is greater. The potential for increased snowpack may lead to a higher chance for more runoff and flooding in the spring. The potential for more ice later in the winter due to cooler-than-normal conditions may result in less evaporation, thus keeping lake levels high. Increased runoff and decreased evaporation may take less water away from the system than normal. These factors could lead to higher lake levels.

Comparisons and Limitations

Winter Conditions During Past La Niña Years



Maps courtesy of the Midwestern Regional Climate Center

The maps above illustrate the winter conditions of the most recent La Niña event in 2017-2018. Much of the western basin was cooler than average (above left) and precipitation was near-to-above normal (above right). Please note that each La Niña is different and La Niña impacts can be limited by many factors, including being overcome by short-term and local weather and climate events.

While past La Niña events can help inform forecasters about certain conditions, there are some limitations. For instance, in the Great Lakes La Niña is *not* known to impact: 1) first freeze in the fall, 2) last freeze in the spring, 3) potential for ice storms or blizzards, 4) track or intensity of any single weather system, or 5) potential for springtime drought or flooding.

Great Lakes Partners

Midwestern Regional Climate Center
mrcc.illinois.edu

National Oceanic and Atmospheric Administration
www.noaa.gov

NOAA NCEI
www.ncei.noaa.gov

Great Lakes Environmental Research Lab
www.glerl.noaa.gov
NOAA NWS Climate Prediction Center
www.cpc.ncep.noaa.gov

NOAA Great Lakes Sea Grant Network
www.seagrants.noaa.gov

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

Ohio River Forecast Center
www.weather.gov/ohrfc

Great Lakes Integrated Sciences and Assessments
glisa.umich.edu

American Association of State Climatologists
www.stateclimate.org

National Integrated Drought Information System
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USDA Midwest Climate Hub
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