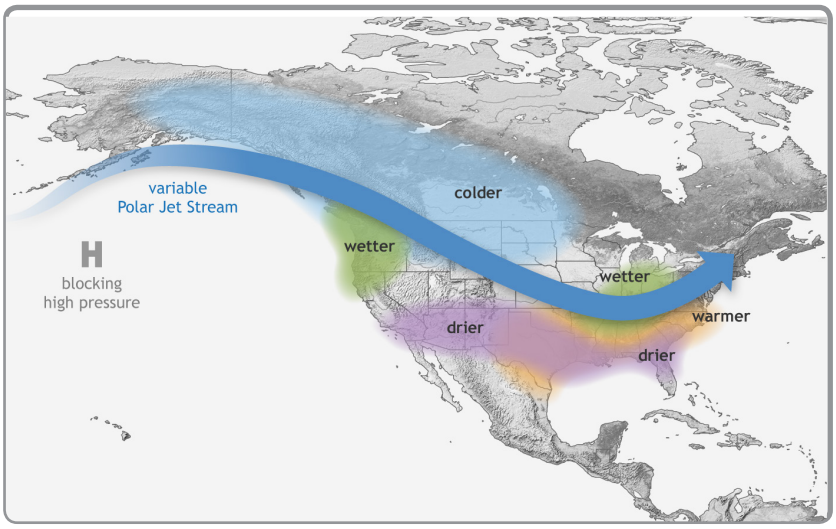
La Niña Impacts and Outlook

Midwest
November 2016

Typical La Niña Winter Pattern



Typical impacts of La Niña on U.S. winter temperature and precipitation. Such impacts have been associated with past episodes, but all impacts aren't seen with every episode. NOAA Climate.gov drawing by Fiona Martin. (Image Source: NOAA Climate.gov) For more information please visit: https://www.climate.gov/news-features/department/enso-blog

La Niña in the Winter

A La Niña develops when sea surface temperatures in the equatorial Pacific Ocean are cooler than average for an extended period of time. This affects the location of jet streams, causing impacts in 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, the typical winter weather pattern (image) brings the polar jet stream into Alaska, then plunging into the central and eastern United States. This path can bring colder-than-normal temperatures into the northern United States, especially the northern Rockies across the northern plains and into the Great Lakes. Meanwhile, the southern Great Plains often are left warm and dry. The Pacific jet stream tends to track close to the Pacific Northwest, bringing increased chances for moisture there. Finally, odds increase slightly for wetter-than-normal conditions in the Ohio River valley.

The result for the Midwest is that odds shift toward chances to be cooler than normal, especially in upper Midwest to Great Lakes area. The Ohio River valley, also may see a slight shift toward wetter-than-normal conditions.

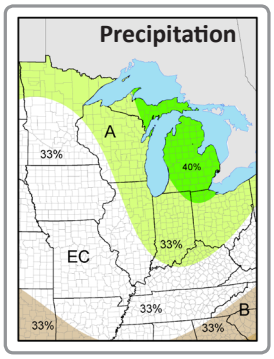
Winter Outlook

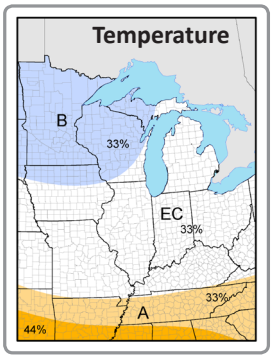
Climate Prediction Center Precipitation and Temperature Maps

Despite the relative weakness of the La Niña, the winter outlook largely follows typical La Niña patterns for the Midwest. The Midwest straddles the boundary of temperature conditions, with slightly increased chances for colder temperatures to the north and a slightly i Despite the relative weakness of the La Niña, the winter outlook largely follows typical La Niña patterns for the Midwest. The Midwest straddles the boundary of temperature conditions, with slightly increased chances for colder temperatures to the north and a slightly increased chance of warmer temperatures across the southern Ohio Valley. Note that these probabilities are quite small because of uncertainty in the strength and position of the La Niña as well as other potential influences

For precipitation, the typical La Niña pattern indicates wetter than normal conditions possible over the Great Lakes into the Ohio River Basin. Equal chances for below-, near-, or above-normal precipitation are likely further south and west in the Midwest region.

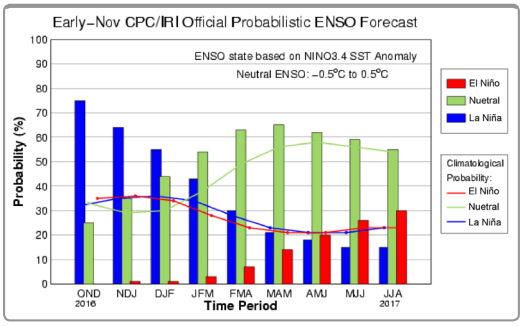
The temperature and precipitation outlooks are consistent with a more active storm track across the northern portions of the region this winter, leading to more cold outbreaks and precipitation chances. Complicating the outlook are the likely weakness of the La Niña, as well as the potential for other climate effects (such as the North Atlantic Oscillation) to play a larger role from time to time. This and other influences can overwhelm the La Niña pattern and are much more difficult to forecast. The La Niña impacts will likely reach their climax early in the winter and then slowly ebb as spring approaches. Please visit the Climate Prediction Center at: http://www.cpc.ncep.noaa.gov





Valid for Dec 2016–Feb 2017
EC: Equal chances for above-, below-, or near-normal
A: Above normal
B: Below normal

La Niña Evolution



La Niña conditions were officially declared in the fall of 2016. Conditions strengthened enough to reach a weak La Niña phase as predicted when the sea surface temperature anomalies surpassed −0.5°C on the Oceanic Niño Index (ONI). This La Niña episode is not predicted to last very long and the equatorial Pacific Ocean may revert back to a neutral condition in the later winter. The bar chart shows the likelihood of La Niña, El Niño, and neutral conditions over the upcoming seasons. The odds are highest for La Niña (blue bars) through winter but decreasing. The highest odds shift toward neutral (green bars) in early spring through the summer months. El Niño (red bars) chances increase through the summer as well but remain relatively small. This is a typical evolution of the ENSO pattern. For more information please visit: http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

Contact: Doug Kluck (doug.kluck@noaa.gov)

Climate Outlooks from NOAA's Climate Prediction Center



Image courtesy of: Jeff Vanuga, NRCS/USDA
Feeding cattle in winter.

Agriculture

La Niña has worldwide impacts to the agricultural sector, which can influence markets. More locally the agricultural issues are less direct because the major La Niña impact occurs in the winter, outside the main growing season. Winters associated with La Niña are often colder than normal with above average precipitation, which could negatively impact any fall seeded crop that must overwinter or perennials such as alfalfa or fruit orchards. The overall impact is complicated by cold combined with a lack of snow cover. Snow cover can protect the crop while open conditions under severe cold are more problematic. Harsh winter temperatures can be adverse to livestock producers through increased operating costs, potential stress to animals and snow removal issues. The cold would also be beneficial to the large amount of corn being stored on the ground this year due to the surplus. Another benefit of colder than normal temperatures would be to limit certain pests (insects and plants) and diseases.

Economic

Cold and wet winters with above-average snowfall can have sector-specific impacts on the economy. The largest negative impacts associated with La Niña are increases in heating costs, costs associated with snow removal, and difficulties in transportation. Sectors that depend on normal winter weather will likely see a benefit from increased snowfall. These include winter recreation, snow removal businesses, towing companies, and road salt sales. Additional cold and snow would also hamper winter construction in the region.



Image credit: ©iStockPhoto.com/FLDphotos
Traffic jam due to snow.

Ecosystems and Rivers

Similar to the potential issues with livestock, more severe winter conditions could be detrimental to wildlife but beneficial to others that depend on very cold temperatures. The overall availability to water is complex with widely varying soil conditions around the Midwest. Early winter precipitation on unfrozen soils would be beneficial, while snow on the wet soils could add to the potential flooding in the spring. With a slight above-normal in chance for precipitation this winter across the upper Midwest, the situation will have to be monitored closely for greater chances for flooding this spring.



Image courtesy of: Roger HIll, NRCS/USDA
Frost and ice form a conservation barrier.

No Two La Niñas Are the Same

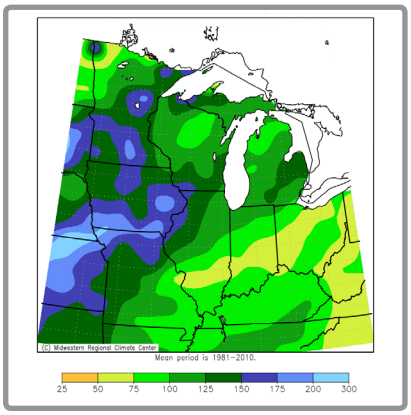
The images below show the differences from normal in the last weak La Niña event from the winter of 2000–2001 (December–February). In many ways the cooler-than-normal temperatures and mainly wetter conditions across much of the Midwest and Great Lakes is typical. There is no guarantee this or anything close to it will be the pattern this year. There are limits to our predictability of La Niña impacts. As mentioned previously short-term climatic influences, that are not predictable beyond a week or two, can play havoc with the three-month forecasts and can overshadow the "typical" La Niña pattern. Even the strength of the La Niña (weak versus strong) has an influence on whether temperatures will be cold or warm in some cases. Below are some additional common limiting factors of La Niña:

- It may not fully develop.
- It may be weak, with little or no discernible influence on weather patterns.
- It may be masked by other weather and climate signals.
- Single extreme events can "buck the trend" of the averages for the rest of the season, with one or two high-impact events overshadowing the average conditions.

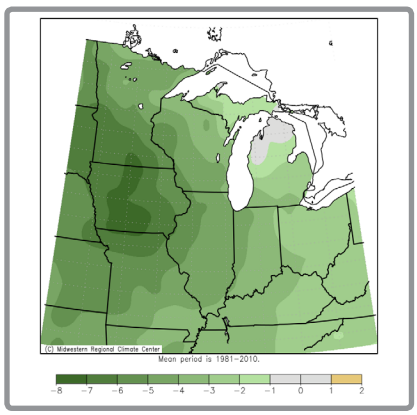
La Niña can affect some temperature and precipitation signals in the region, but it is not known to affect:

- First freeze date in the fall (either early or late).
- Last freeze date in the spring (either early or late).
- Potential for ice storms or blizzards.
- Track or intensity of any single weather system.

Accumulated Precipitation (%)
12/1/2000–2/28/2001



Departure from Normal Temperature (° F)
12/1/2000–2/28/2001



Images courtesy of: Midwestern Regional Climate Center, Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana-Champaign

Midwest Partners

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