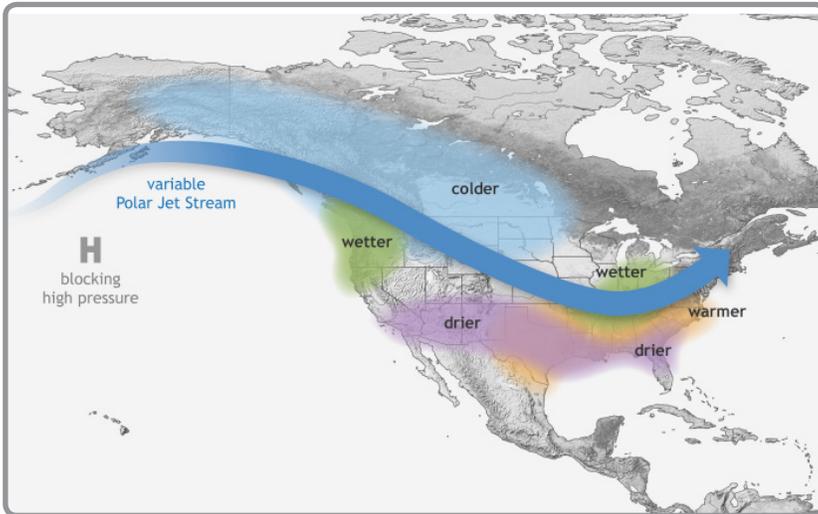


Typical La Niña Winter Pattern



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/departments/enso-blog>

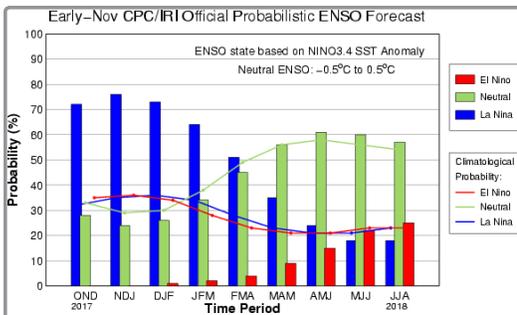
A La Niña develops when sea surface temperatures in the equatorial Pacific Ocean are cooler than average for an extended period of time. This affects the location of jet streams, causing impacts in North America. The most notable impacts occur in the winter, when the wind patterns in the atmosphere are 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 and Great Lakes area. The Ohio River valley, also may see a slight shift toward wetter-than-normal conditions.

Winter Outlook

La Niña Evolution



La Niña conditions emerged in the fall of 2017. Conditions reached a weak La Niña phase when the sea surface temperature anomalies surpassed -0.5°C on the Oceanic Niño Index (ONI). The current La Niña episode is predicted to last through the winter with neutral conditions likely to return in the spring. 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. The highest odds shift to neutral (green bars) in spring and continue through the summer season. El Niño (red bars) chances increase through the summer as well, but remain less likely than neutral conditions. Over the time period shown, the forecast approaches the climatological probabilities for all three categories. For more information please visit: <http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

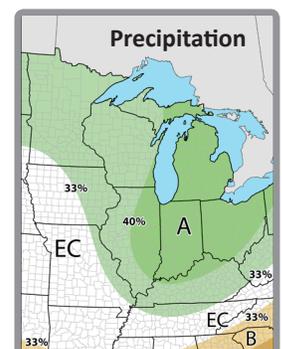
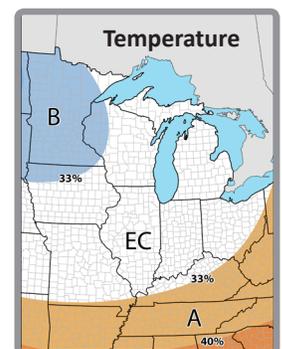
Precipitation and Temperature Outlook

Despite the relative weakness of the forecasted La Niña, the winter outlook for the Midwest largely follows typical La Niña patterns noted in the section above.

The Midwest straddles the boundary of temperature conditions in the outlook, with slightly increased chances for colder temperatures to the northwest and slightly increased chances of warmer temperatures across the southern edge of the region. This outlook is very similar to the typical La Niña temperature pattern.

For precipitation, the outlook indicates wetter than normal conditions possible for much of the Midwest including the Ohio River Basin and over the Great Lakes. Equal chances for below-, near-, or above-normal precipitation are likely in the southwestern parts of the Midwest region. This outlook is largely consistent with the typical La Niña precipitation pattern.

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 be strongest during the winter and then slowly ebb in spring. For more information on the outlooks please visit the Climate Prediction Center at: <http://www.cpc.ncep.noaa.gov>



Outlook for Dec 2017–Feb 2018
A: Above normal
B: Below normal
EC: Equal chances for above-, below-, or near-normal

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. Locally, agricultural issues are less direct because the major La Niña impact occurs in winter, outside the main growing season. Winters associated with La Niña are often colder than normal with above average precipitation, which can negatively impact fall seeded crops that must overwinter and perennials such (e.g. alfalfa, fruit orchards). The overall impact is complicated by snow cover. Snow cover can protect the crop while open conditions with 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 be beneficial to the large amount of corn being stored on the ground. 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 having winter weather will likely see a benefit from increased snowfall. These include winter recreation, snow removal businesses, towing companies, and road salt sales. Colder and snowier conditions could also hamper winter construction in the region.



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

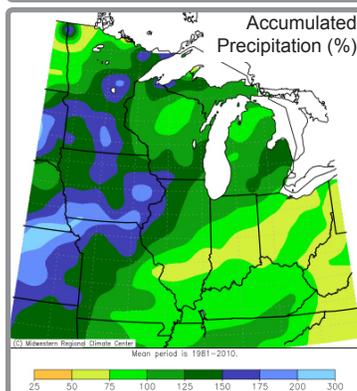
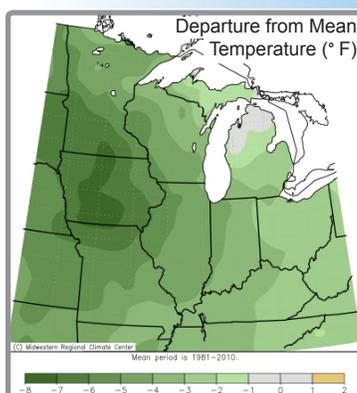


Image courtesy of: Roger Hill, NRCS/USDA
Frost and ice form a conservation barrier.

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.

Comparisons and Limitations



Departure from mean temperature (top) and percent of mean precipitation (bottom) for the winter, Dec 2000-Feb 2001. Maps courtesy of the Midwestern Regional Climate Center.

No Two La Niñas Are the Same

The images on the left show the differences from mean conditions (December 2000–February 2001) during the last weak La Niña event that lasted through the winter season. 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.

Midwest Partners

National Oceanic and Atmospheric Administration
www.noaa.gov
 National Weather Service - Central Region
www.crh.noaa.gov/crh
 National Centers for Environmental Information
www.ncei.noaa.gov
 Climate Prediction Center
www.cpc.ncep.noaa.gov
 Midwestern Regional Climate Center
mrcc.illinois.edu
 National Drought Mitigation Center
www.drought.unl.edu
 National Integrated Drought Information System
www.drought.gov
 American Association of State Climatologists
www.stateclimate.org
 U.S. Department of Agriculture Regional Climate Hubs
www.climatehubs.oce.usda.gov/hubs/midwest
 International Research Institute for Climate and Society
<http://iri.columbia.edu>

While La Niña can affect some temperature and precipitation signals in the region, 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.
- Potential for drought or flood events in the spring.

