

## U.S. WINTER HAZARDS OUTLOOK 2023-2024

Outlook for the 2023-2024  
Winter Season  
Issued: December 2023

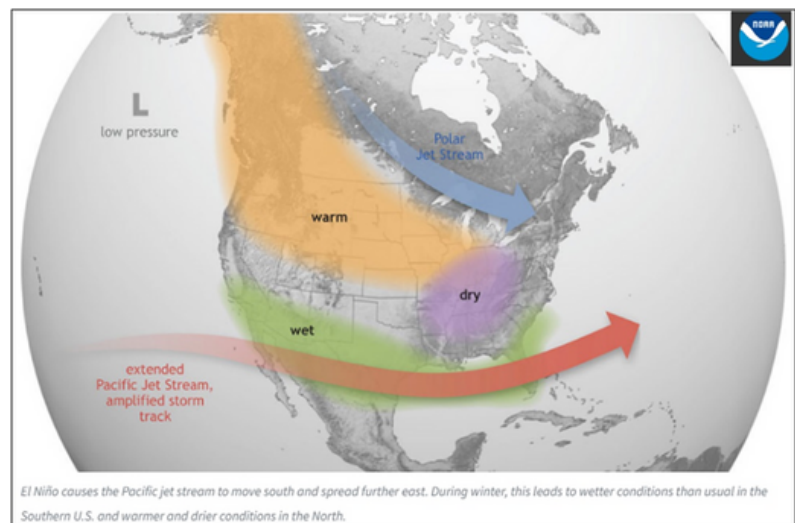
We are likely to see a strong El Niño (e.g., warmer than normal water over the Tropical Pacific) conditions for the upcoming winter season. El Niño seasons typically have a pronounced influence on the flow pattern with a stronger than normal southern storm track and a weaker northern or polar storm track. This type of pattern usually keeps much of North America milder than normal due to a high frequency of milder Pacific air rather than colder Canadian air. Wetter conditions typically prevail over the southern states and drier conditions over the northern U.S. into southern Canada. The graphic above shows how a typical El Niño pattern works over North America.

For the upcoming winter weather season we continue to see signs this will not be a typical El Niño. First, the upcoming El Niño will likely see the warmest water shift westward into the central Pacific resulting in what is called a Modoki El Niño. These types of El Niño usually result in higher frequency of colder Canadian air over North America as the winter season matures. Secondly, we are seeing signs that a significant Sudden Stratospheric Warming (SSW) event may impact North America early next year. If this occurs, the normal polar vortex will likely weaken increasing the risk of colder Arctic air intrusions into the Lower 48 and Mexico.

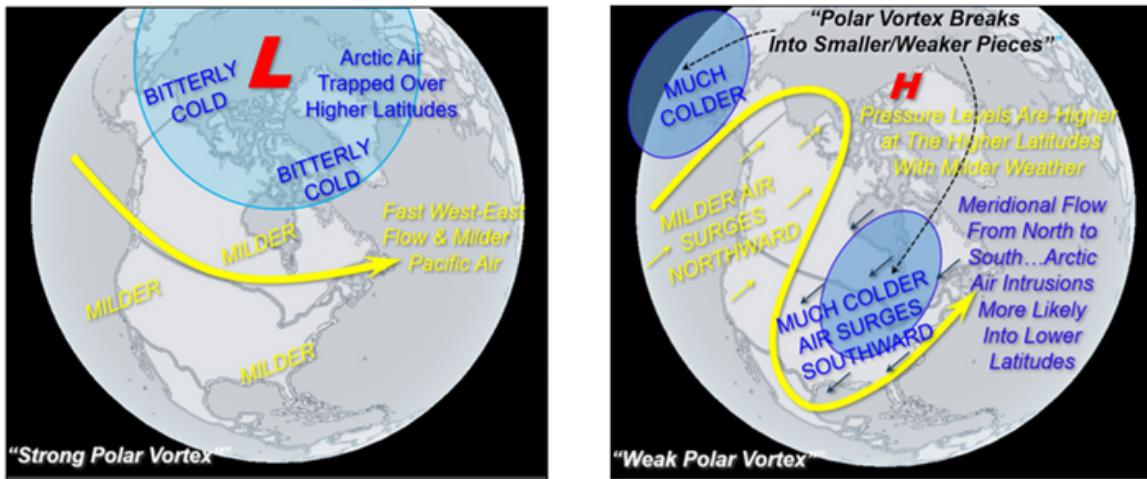
Report Compiled By:



**Fred Schmude**  
Senior Meteorologist



The graphics below demonstrate the weather pattern over the Lower 48 during strong and weak polar vortex winter seasons. Under a strong polar vortex there tends to be a higher risk of milder Pacific air flooding across the Lower 48 with the coldest Arctic air remaining trapped over northern Canada. This is indicated in the lower left graphic. When the polar vortex weakens, it usually contracts and breaks into small pieces resulting in intrusions of much colder Arctic air southward into the lower latitudes. The graphic in the lower right shows the typical flow pattern under the influence of a weaker polar vortex. If the proposed SSW event materializes in January of 2024, we will likely see the flow pattern shift towards this much colder regime.

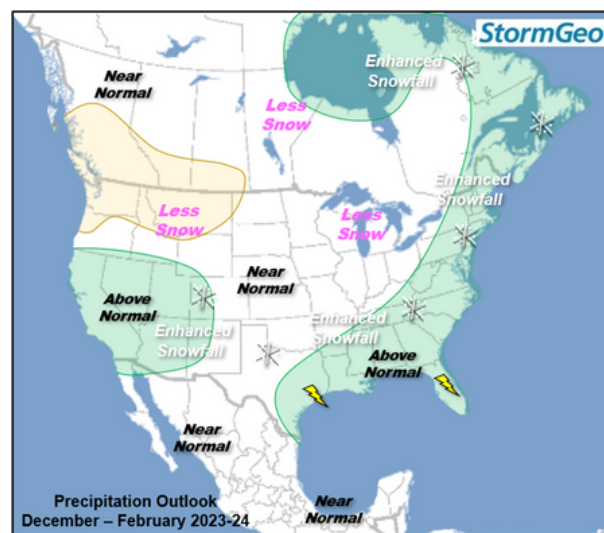
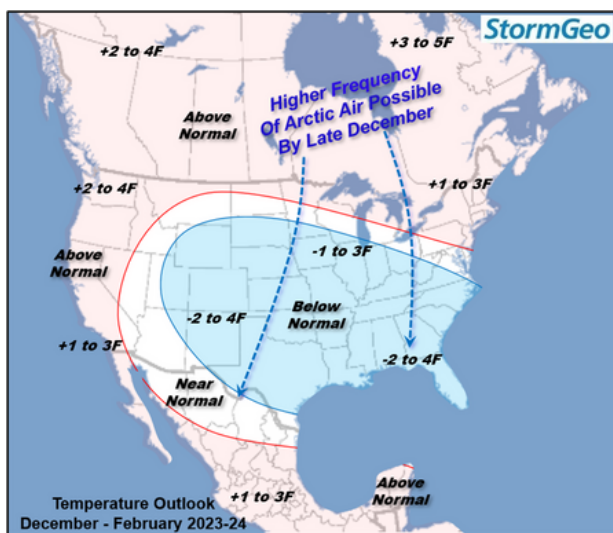


In addition to these weather factors, stratospheric wind anomalies combined with tropical weather indices also favor a more meridional (e.g. north to south) and colder than normal weather pattern as the winter season matures in late December into January and February. Of prime importance is the Madden Julian Oscillation (MJO), which is a tropical pressure index we usually follow during the tropical season but can have a huge impact on the winter weather season. Overall, data indicates the MJO may remain in some of the colder zone regarding North America for longer stretches of time compared to the warmer ones.

Based on this data, our updated forecast relies partially on the the upcoming El Niño forecast and all of the other indices listed above. Overall, it appears the winter weather pattern will see a higher than normal volatility due to the uncertainty of how the El Niño interplays with some of these other long-term weather features. For now, it appears we will see a significant change toward colder than normal weather over much of the Lower 48 during the last week to 10 days of December with an increasing risk of severe cold at times during January and possibly into February, especially if the above mentioned SSW event materializes.

## // 90 Day Temperature Outlook

Temperatures are forecast to average above normal across most of Canada extending south across the northeast U.S. to the northern Great Lakes and from the Pacific Northwest southward across most of Mexico. Temperatures in all these areas are forecast to average from 1 to 4F above normal with the warmest across northeast Canada where anomalies could reach up to 5F above normal. Below normal temperatures of 1 to 4F are forecast from the central Rockies eastward across a large part of the Great Plains and Texas to the Deep South and Mid Atlantic. As indicated above, there will be a higher-than-normal risk of Arctic air intrusions by late December into January and February. If this Arctic air turns out to be more frequent, then temperature anomalies may trend colder than indicated above and more widespread over the central and eastern U.S. extending northward into Canada. Elsewhere near normal temperatures are forecast from northern Mexico northward across southeast Idaho and southern Montana, then sharply east across central Wisconsin to the Delmarva Peninsula.



## // 90 Day Precipitation Outlook

The long-range outlook favors above normal precipitation extending from northern Quebec to Atlantic Canada southward across the eastern and southeastern U.S. to eastern and southern Texas. Above normal precipitation is also forecast from California to western New Mexico and Colorado. Be advised that enhanced snow is forecast over parts of the southern U.S. Rockies to the northern Deep South and over the northeast U.S. to eastern Canada. Below normal precipitation is forecast from southern British Columbia to northern Oregon eastward to Montana and southern Saskatchewan. Near normal precipitation is forecast from northern British Columbia to central Quebec southward across the Great Lakes to the Central and Northern Plains. Near normal precipitation is also forecast from eastern New Mexico and western Texas southward across Mexico.

GET STARTED >>

**Ready to see how StormGeo can turn weather data into actionable insights?**

Contact us to request a free demo, or to speak with a StormGeo representative.