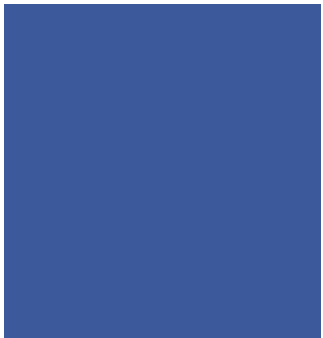
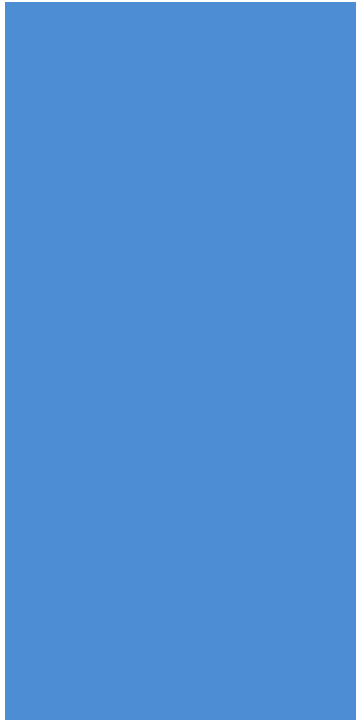




Hartree

2025/26 Winter Thoughts

© Hartree Partners, all rights reserved

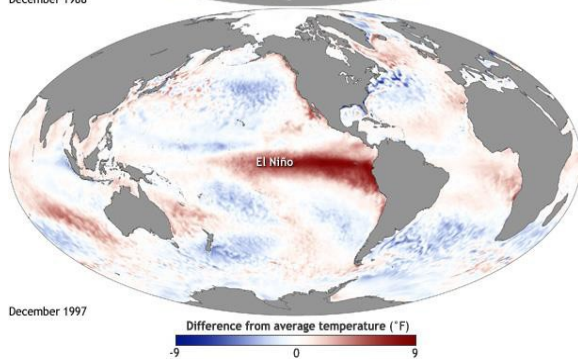
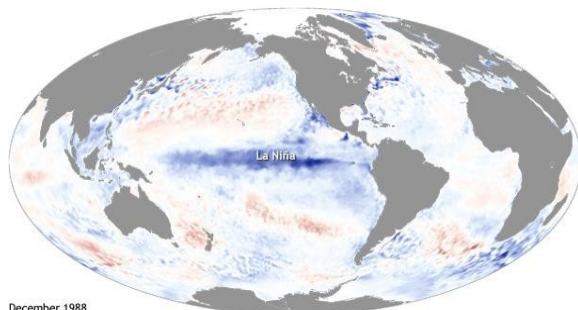
www.hartreepartners.com

Keys To Winter 2025/26

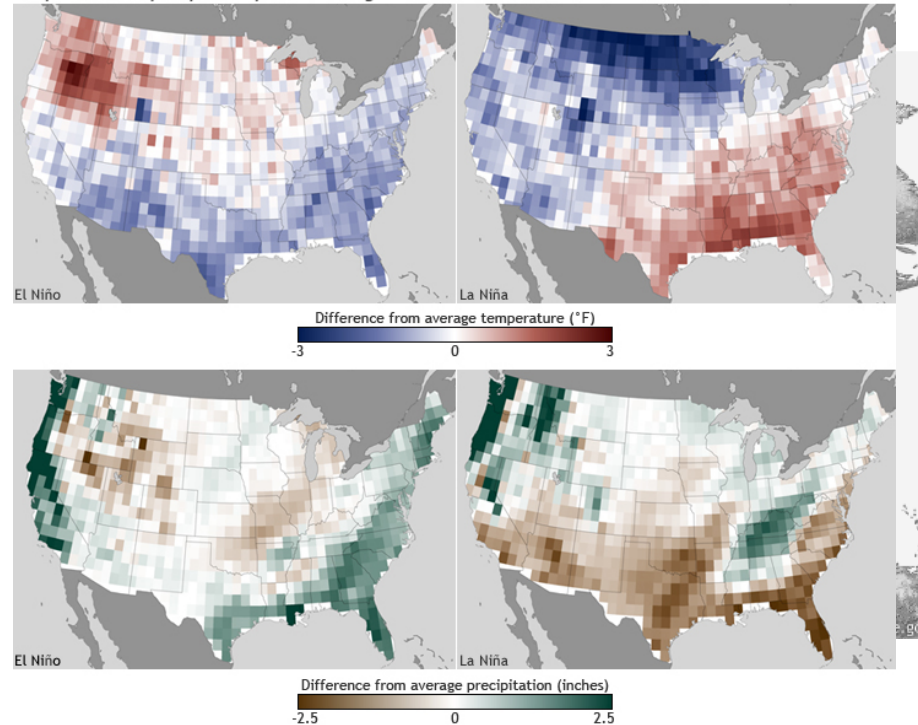
- ✓ **El Niño Southern Oscillation (ENSO)**
- ✓ **Tropical Convection Patterns**
- ✓ **Sudden Stratospheric Warming (SSW)**
- ✓ **Long-Term Climate Trends**

Keys To Winter 2025/26

- ✓ **El Niño Southern Oscillation (ENSO)** is a cyclical pattern of warming and cooling in the tropical central Pacific Ocean. This year we are in a weak/moderate La Niña, which tends to favor cold air buildup in the northern Plains/Rockies and a drier pattern for California and much of the southern US. There is still a lot of interannual variability though!



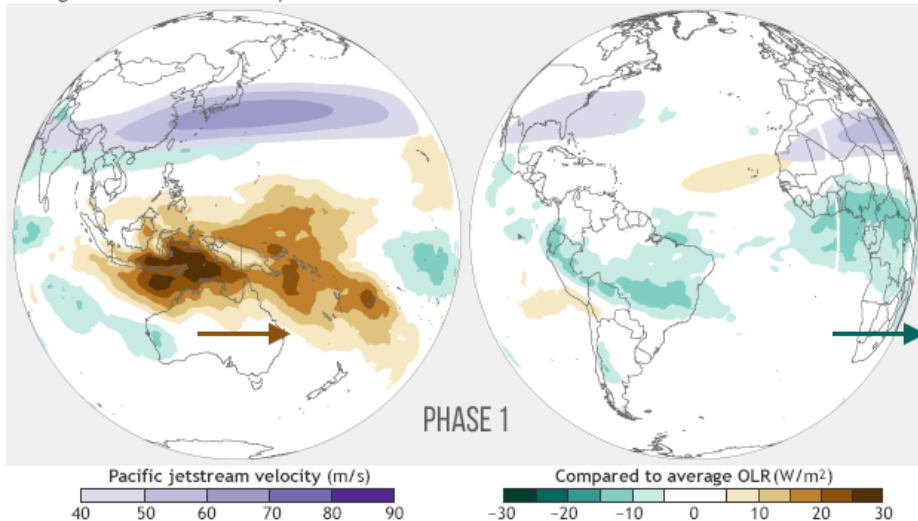
Temperature and precipitation patterns during El Niño and La Niña events from 1950-2010



Keys To Winter 2025/26

- ✓ **Tropical Convection Patterns** matter because it impacts the jet stream, or the current of air that divides cool and warm air. If more thunderstorms focus over Southeast Asia the Pacific jet stream slows opening the door for cold air to flow south, something we're already seeing this fall thanks to La Niña. The Madden-Julian Oscillation (MJO) pushes these storms around the globe every 30-45 days and is very active this year, favoring both **cool and warm** periods in the Consuming East

Average MJO cloud and wind patterns



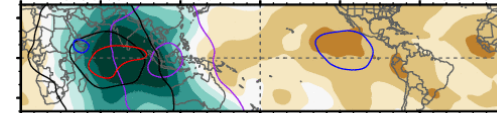
Jan-Mar 1979-2016

Hartree®

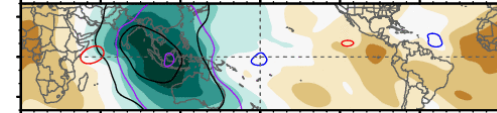
NOAA Climate.gov
Data: NCEP/NCEI

© Hartree Partners, all rights reserved

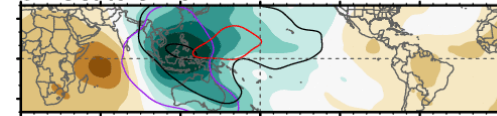
17-Oct to 23-Oct CFS Forecast



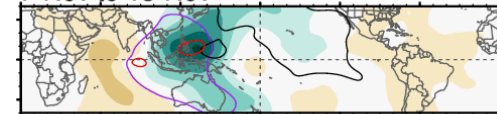
24-Oct to 30-Oct



31-Oct to 6-Nov



7-Nov to 13-Nov

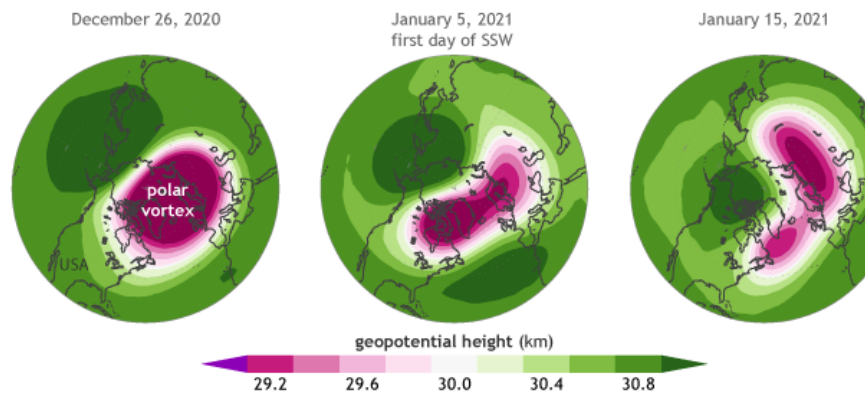


0 60E 120E 180 120W 60W 0

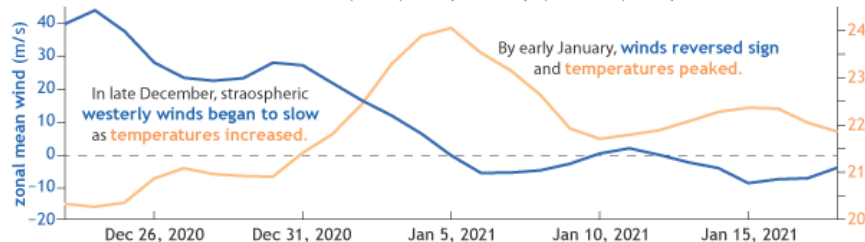
Keys To Winter 2025/26

- ✓ **Sudden Stratospheric Warming (SSW)** events happen when the stratospheric Polar Vortex ~10 miles above the Arctic suddenly breaks apart and weakens. This happens once every 1.5 years, but is most likely when the Quasi-Biennial Oscillation (QBO) is easterly as it is this year; historically 92% of La Niña + Easterly QBO had an SSW. Impacts can last up to 80 days (!) post-SSW event, and timing is key for potential gas storage impacts

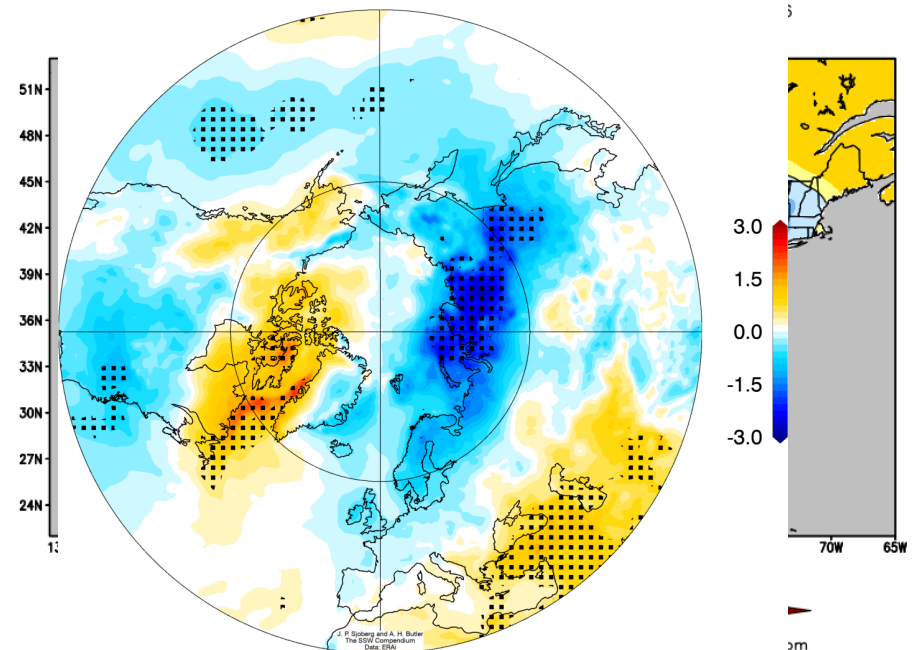
Disruption of stratospheric polar vortex in early January 2021



Evolution of 10mb zonal mean winds (60°N) and polar cap (60-90°N) temperatures

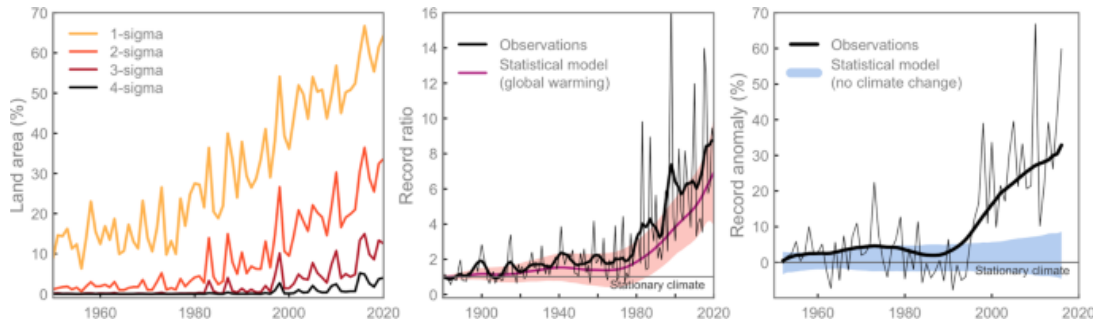


Tsfc anomaly [°C] - Day 000 to 030

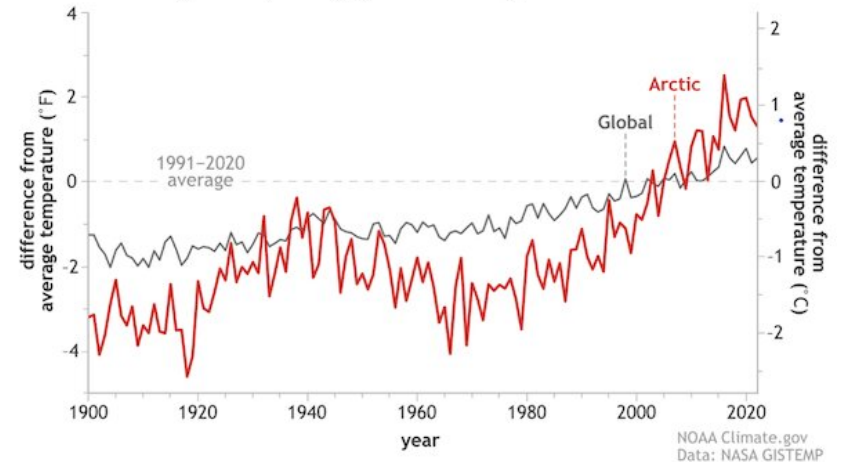


Keys To Winter 2025/26

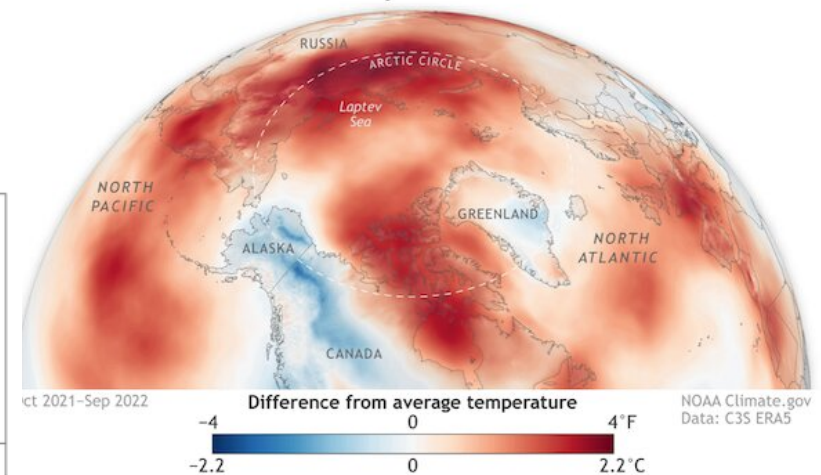
- ✓ **Long-Term Climate Trends** are something we can't ignore- there's roughly 70% of the areal extent of true (-35°C @ 850 hPa) Arctic air now compared to 30 years ago. Recent research has shown that the Arctic is warming 4x faster than the rest of the globe, with the lesser temperature gradient slowing the jet stream. This has helped coin this era as the 'Era of Extremes'- where it's not warm everywhere all the time, but the distribution in weather events is widening even as global mean temperatures continue to rise



Arctic warming is outpacing global average

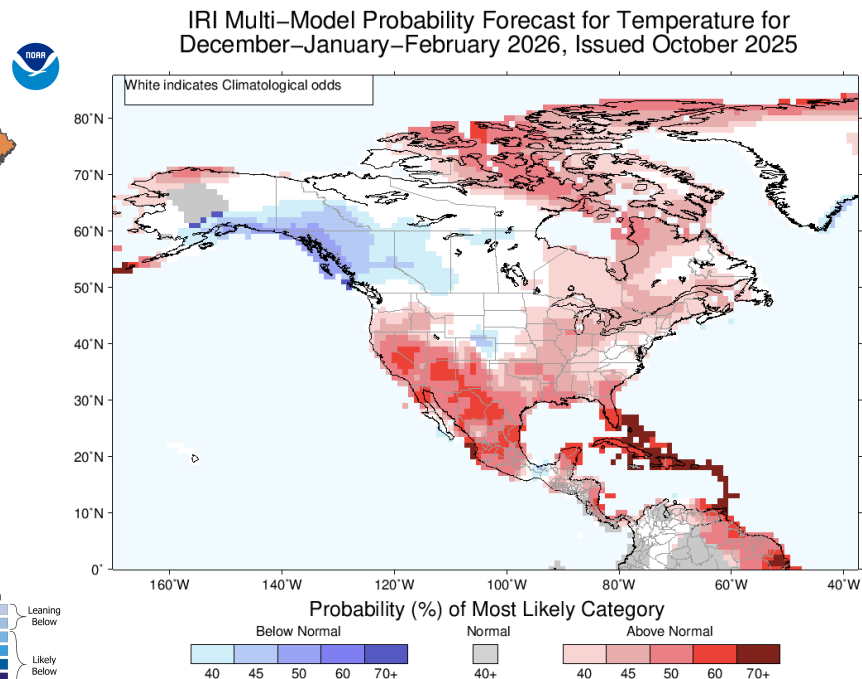
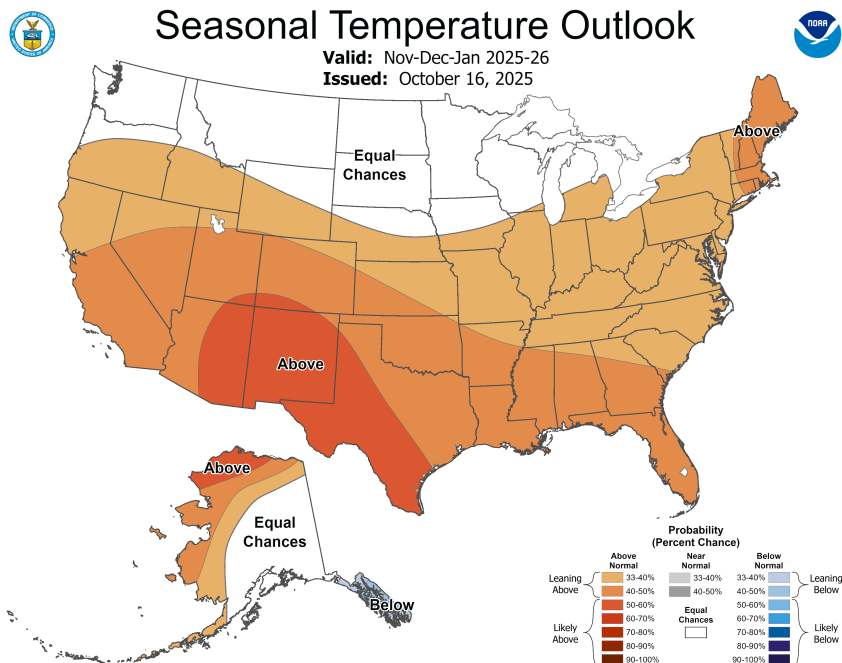


2022 was Arctic's 6th-warmest year on record



Keys To Winter 2025/26

- ✓ **Market Outlooks** will generally follow the La Nina playbook, with a general lean warmer South and Southeast. The nuance and trickiest part of seasonal forecasting is when to deviate from the playbook and how to build conviction around it!



A low-angle, upward-looking photograph of several tall skyscrapers in a city, likely New York City, with the Empire State Building prominently visible. The image is overlaid with a semi-transparent blue filter.

Hartree[®]

Questions?

© Hartree Partners, all rights reserved