



La Niña Expected to Influence Southeast Texas Winter

Key Points

- There is an increasing chance of a **warmer and drier** than normal winter.
- Growing concerns for persistent drought conditions.
- Severe cold waves and winter storms can still occur in generally warm and dry winters.

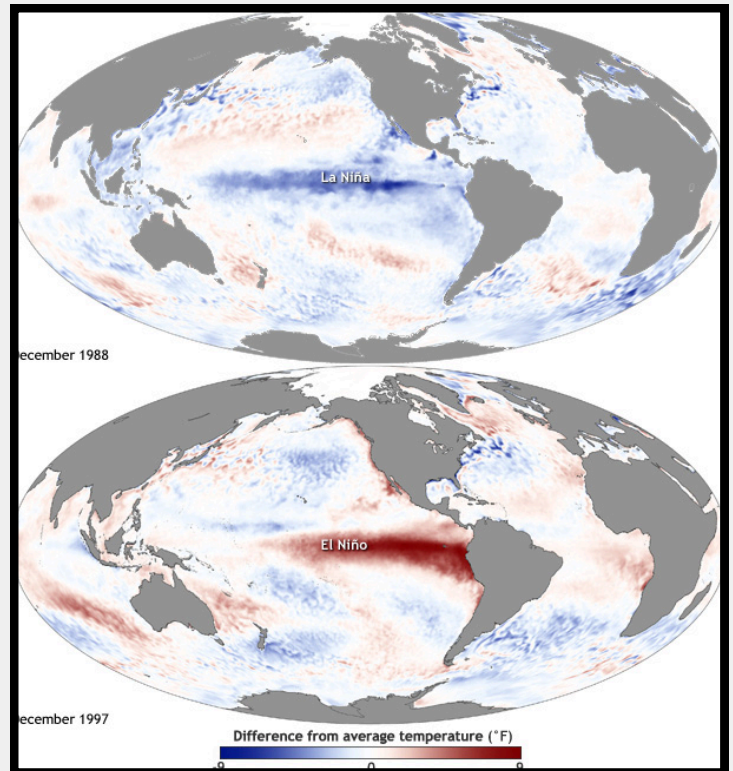
ENSO 101

Before going into the Winter Outlook, let's review what ENSO is and how it affects us. The El Niño-Southern Oscillation (ENSO) is a climate oscillation that occurs across the tropical Pacific Ocean and impacts weather patterns worldwide. There are three phases to ENSO:

- **Neutral:** no strong ENSO signal
- **La Niña:** cool phase of ENSO where the sea surface temperature (SST) anomalies across the tropical Pacific is ≤ -0.5 °C
- **El Niño:** warm phase of ENSO where the SST anomalies across the tropical Pacific is ≥ 0.5 °C

ENSO typically reaches peak intensity during the winter and the biggest impacts on the United States are seen during the winter months. **It should be noted that each winter is different and is not determined solely by the phase of ENSO.**

LA NIÑA



EL NIÑO

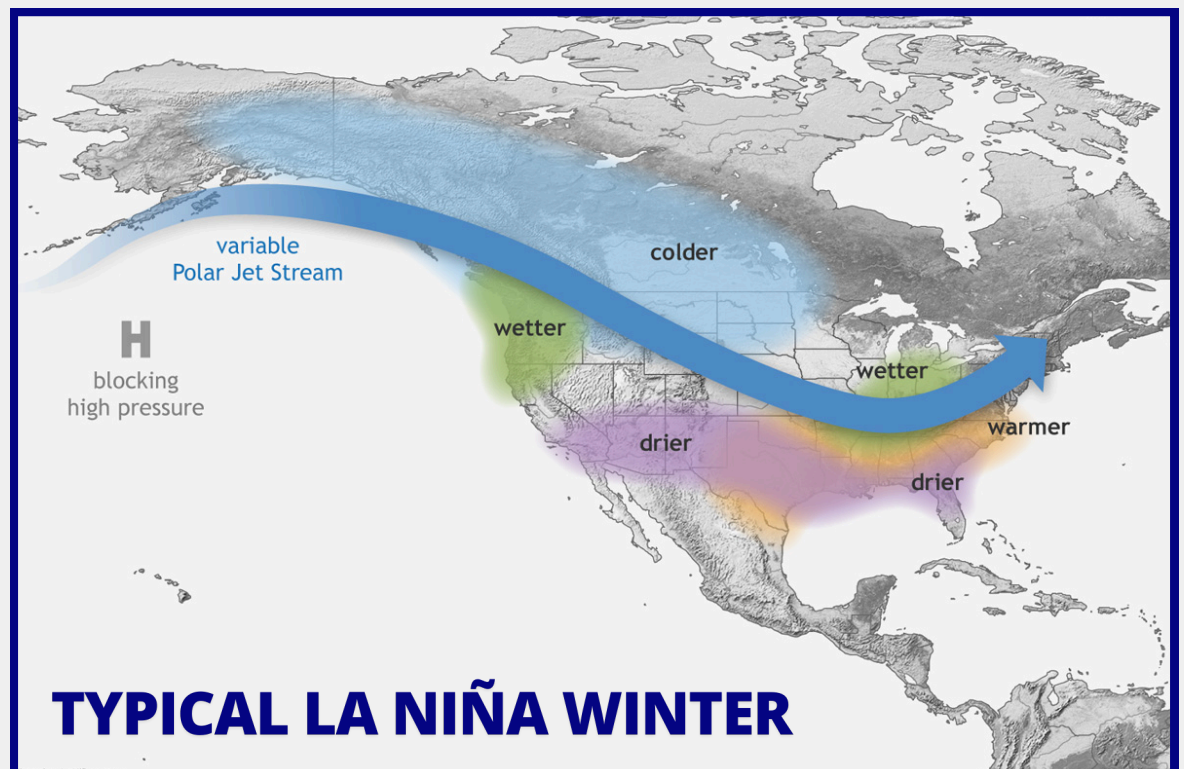
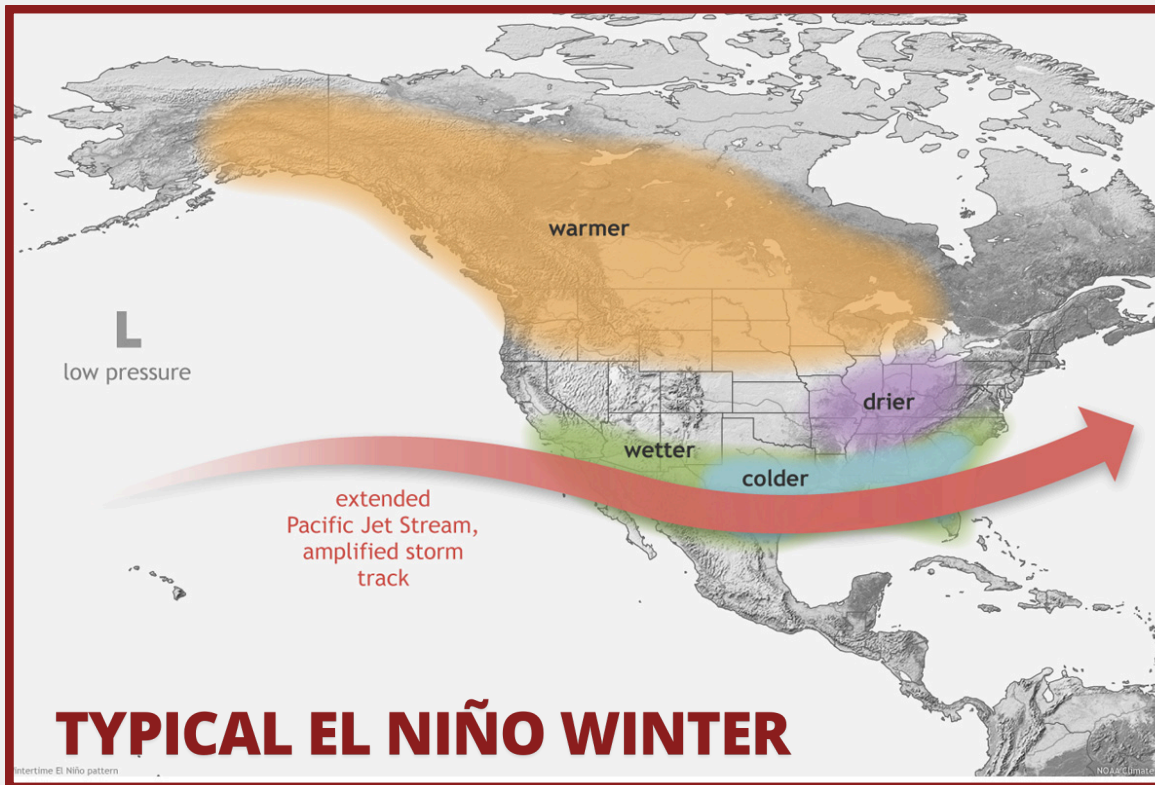


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ENSO IMPACTS

Over the course of the past few decades, a relationship has been found between the type of winter the US experiences and the phase of ENSO.

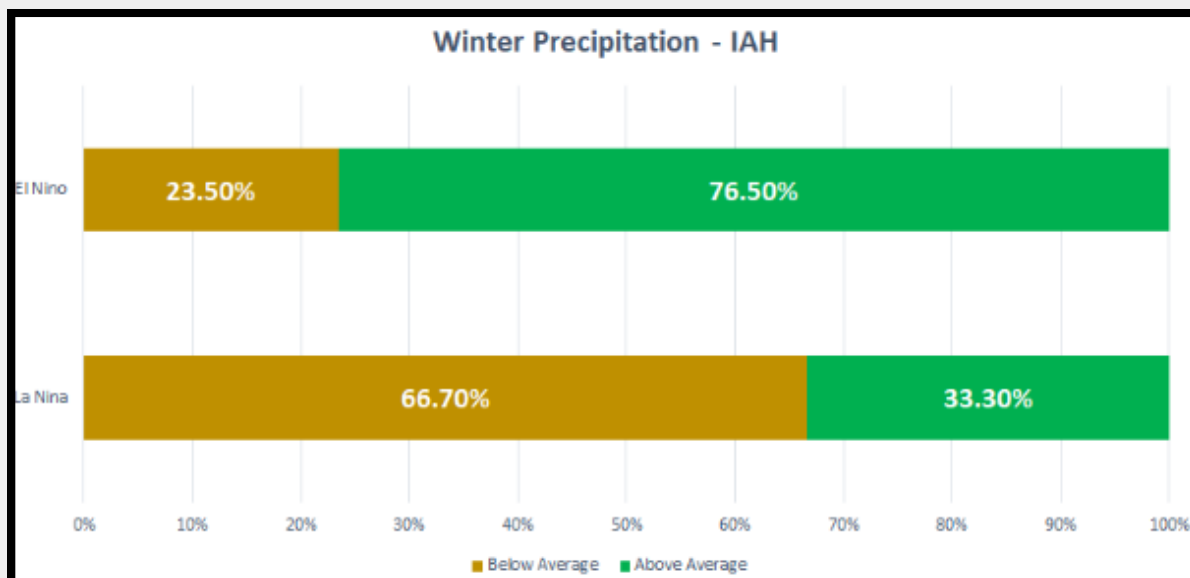
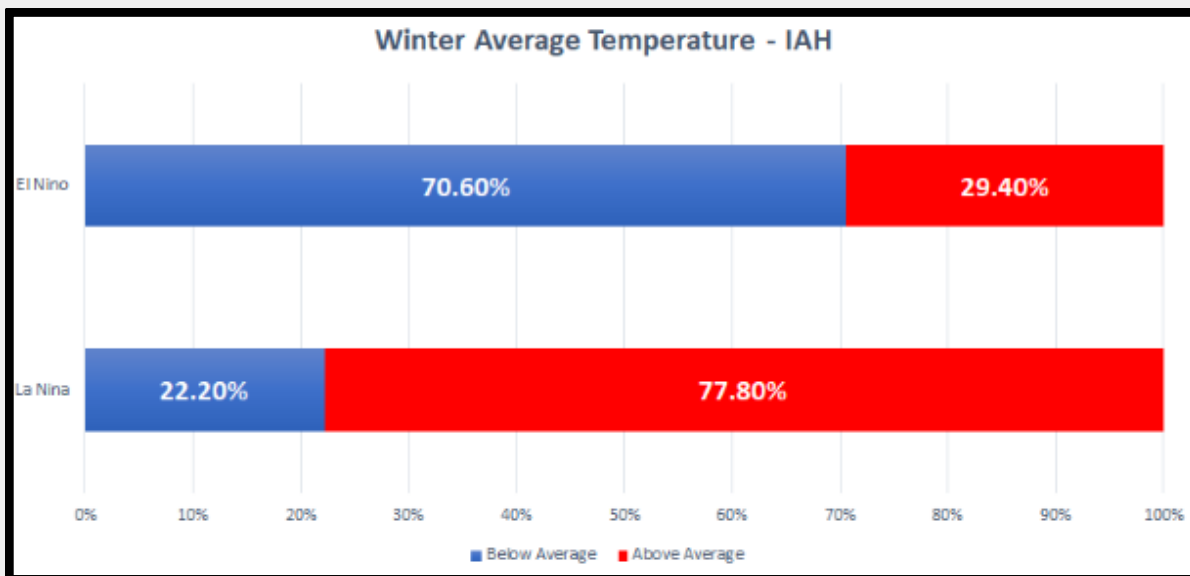




LOCAL ENSO IMPACTS

We completed a local study to see how the ENSO phase correlated with temperature and precipitation patterns during the Winter months (December-January-February).

- During El Niño Winters, Bush Intercontinental Airport (IAH) experienced below-average temperatures about 70% of the time.
- During La Niña Winters, IAH experienced above-average temperatures about 78% of the time.
- A similar pattern was observed for precipitation where about 77% of El Niño Winters had above-average precipitation, and about 67% of La Niña Winters had below-average precipitation.





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WHAT ENSO CAN AND CAN NOT TELL US ABOUT THIS WINTER

One of the forecasting benefits of ENSO is its relative predictability. Thanks to decades of data and research, ENSO phases can be predicted many months in advance. However, there are other atmospheric and oceanic oscillations that can enhance or counteract ENSO's effects. These oscillations tend to occur on much smaller timescales (days to weeks) than ENSO. In certain phases, the oscillations can bring very cold temperatures and hazardous winter weather to southeast Texas regardless of the ENSO phase. In fact, the significant freezes of 1983, 1989, 1996, 2018, and 2021 all occurred in La Niña winters.

It may seem paradoxical that the generally warmer and dry La Niña years can be accompanied by hard freezes. But once you consider that La Niña favors colder than normal conditions over our usual arctic blast source region (northern and western Canada), then all it takes is a temporary change in the pattern to bring the cold air south into Texas. Unfortunately, we are not able to predict these types of patterns and oscillations more than a few weeks in advance. ENSO can give us an idea of the general conditions this winter. But it can NOT predict the day-to-day or week-to-week variability in the weather.

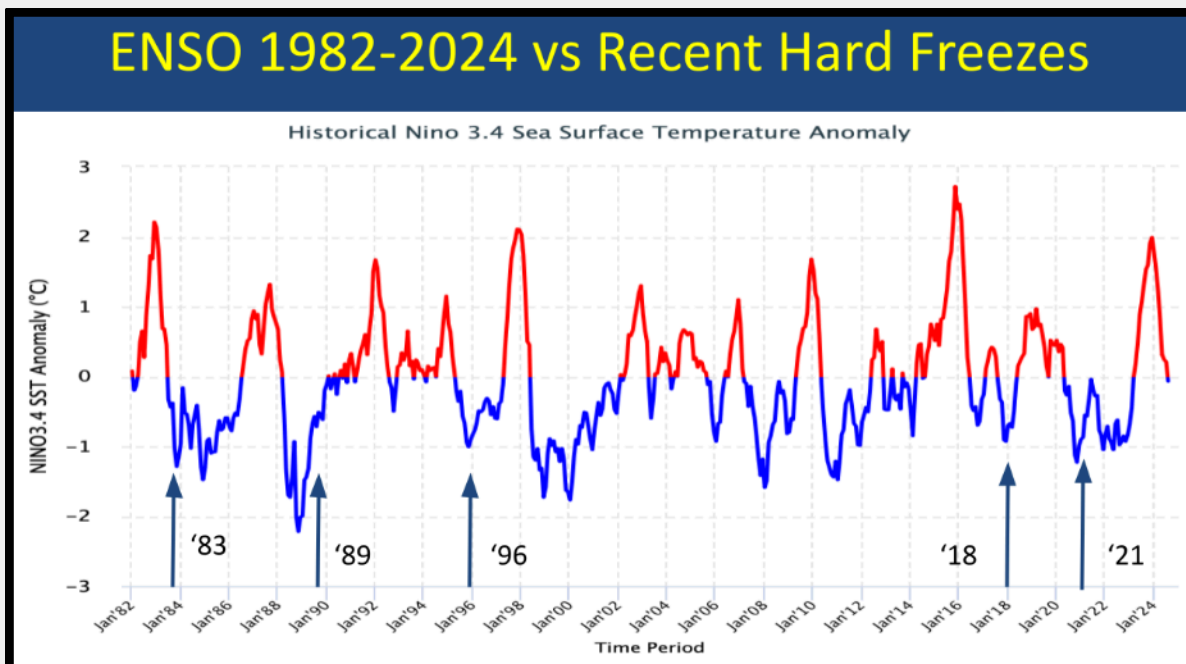


Image above shows the oscillations between El Niño (red) and La Niña (blue) since 1982. The arrows point out significant freezes that occurred in southeast Texas during La Niña years. Each of the freezes labeled were accompanied by frozen precipitation.

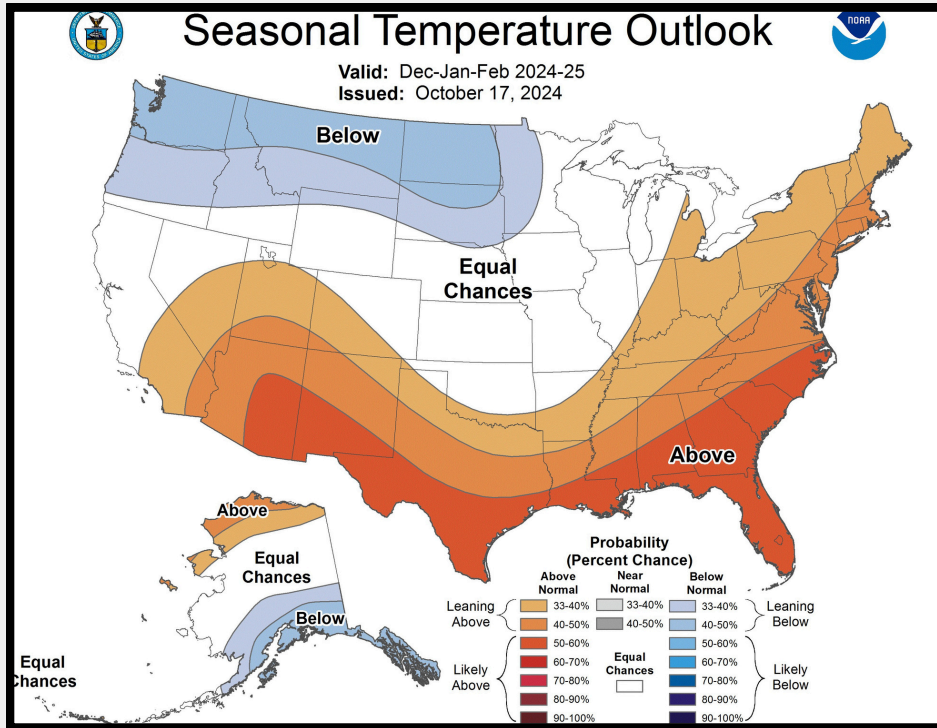


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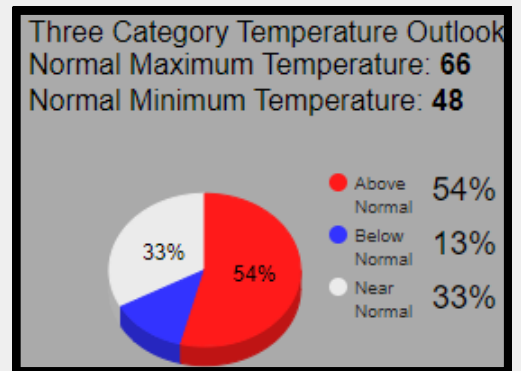
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WINTER OUTLOOK OVERVIEW

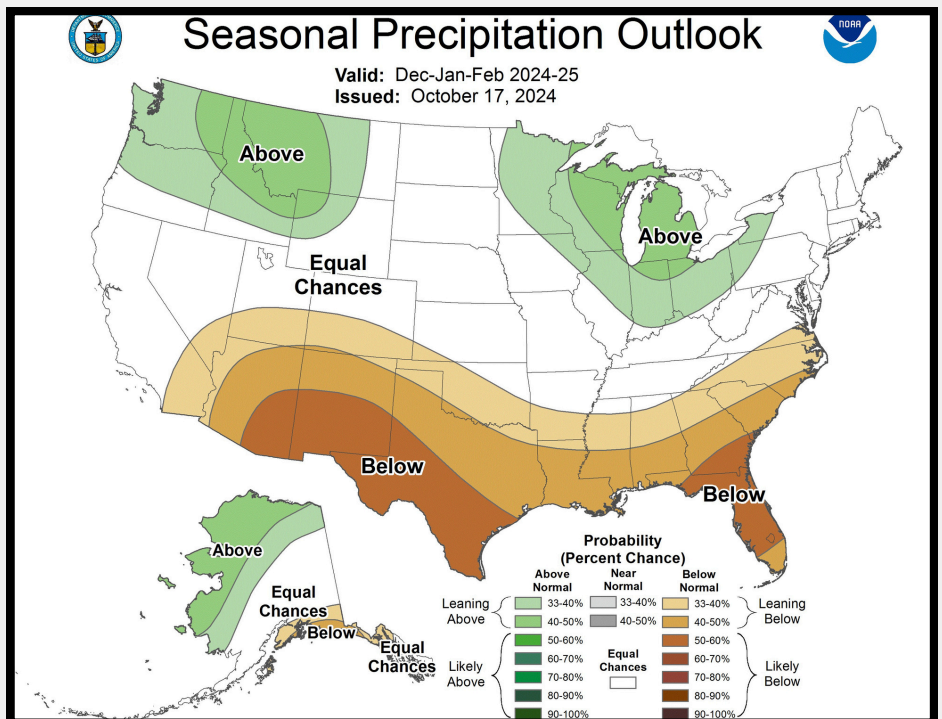
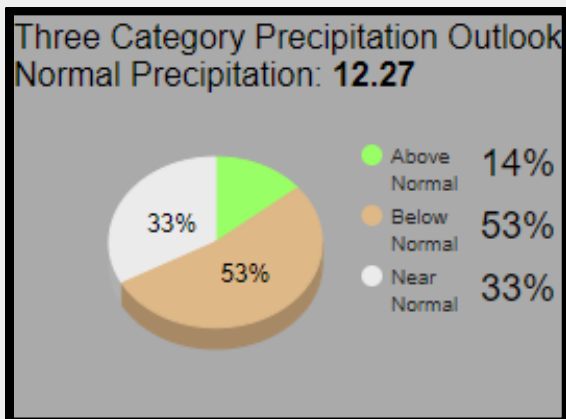
With La Niña conditions developing and expected to continue through the Winter, the Climate Prediction Center Winter Outlook favors above-normal temperatures and below-normal precipitation for the southern third of the United States.



Specifically for the Houston Area, the Winter Temperature Outlook breakdown is:



Specifically for the Houston Area, the Winter Precipitation Outlook breakdown is:





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DROUGHT CONCERNS

Considering that much of the region is already under Moderate Drought (D1) conditions, a warm and dry Winter will likely lead to persisting and worsening drought conditions. To the right is the Drought Monitor as of October 15th, and below is the newly released Drought Outlook through January 2025 from the Climate Prediction Center.

