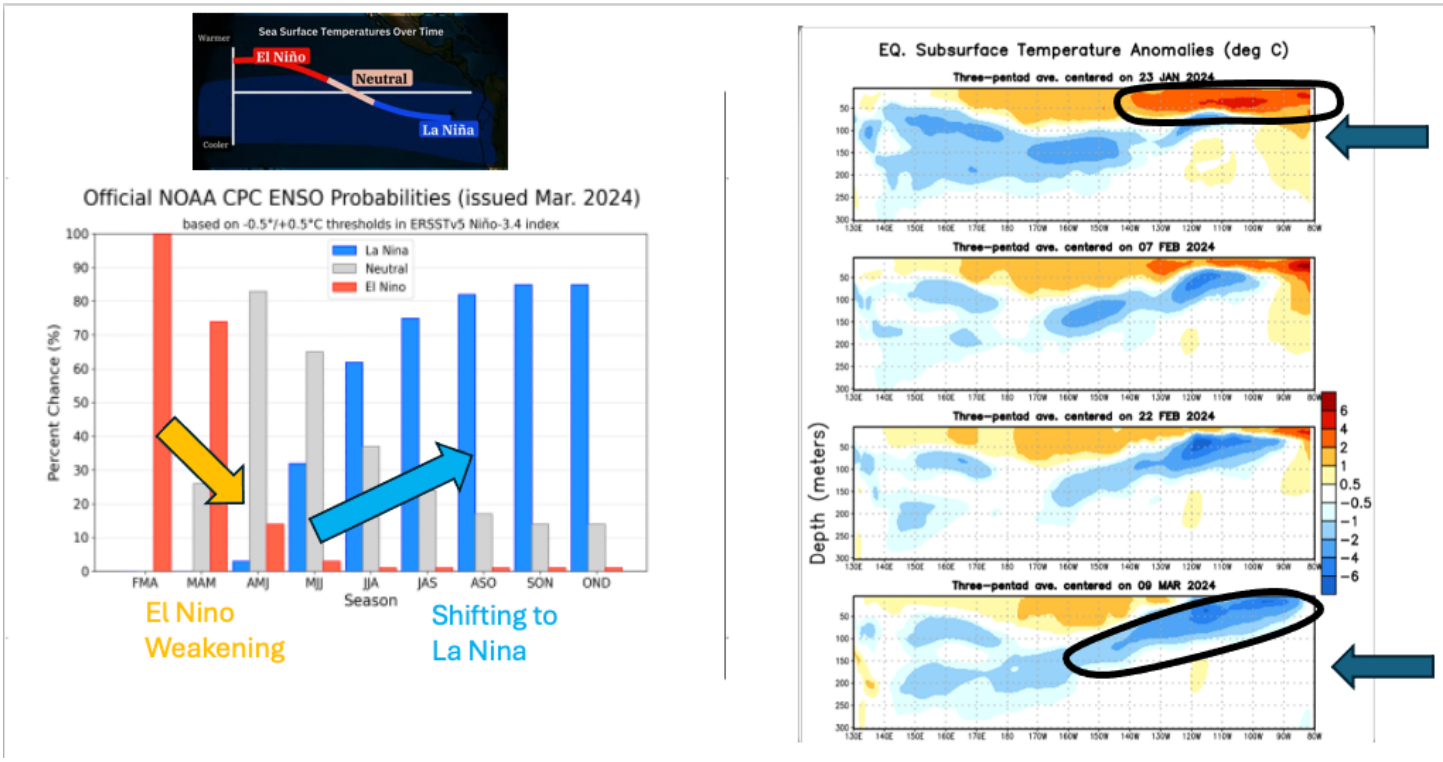
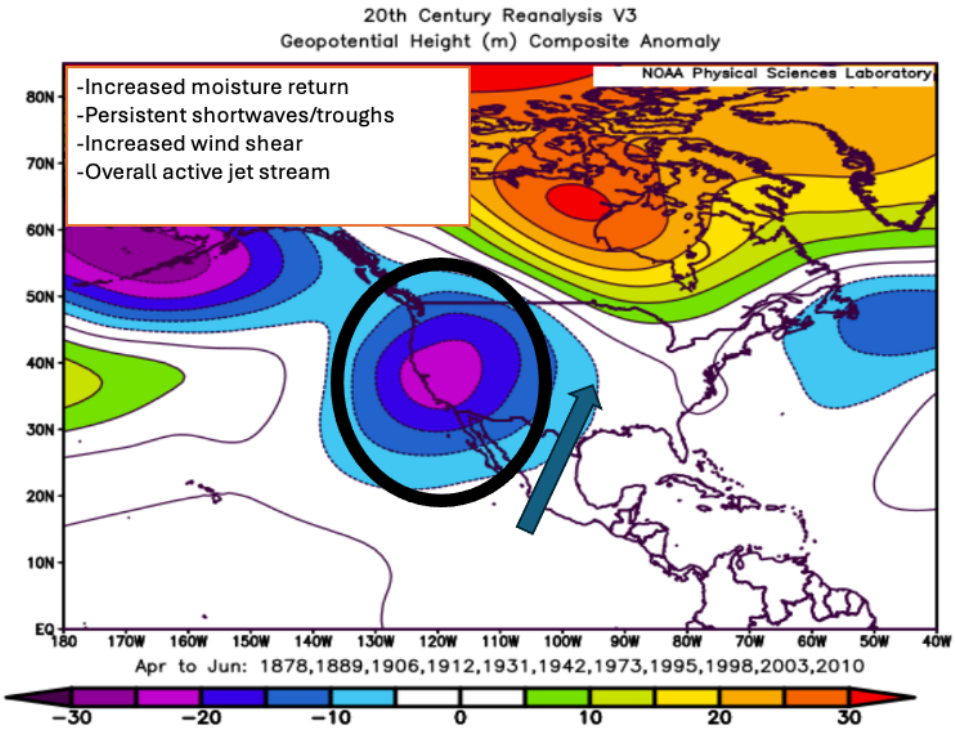
# Severe Weather This Spring Looks To Perk Up As El Nino Fades



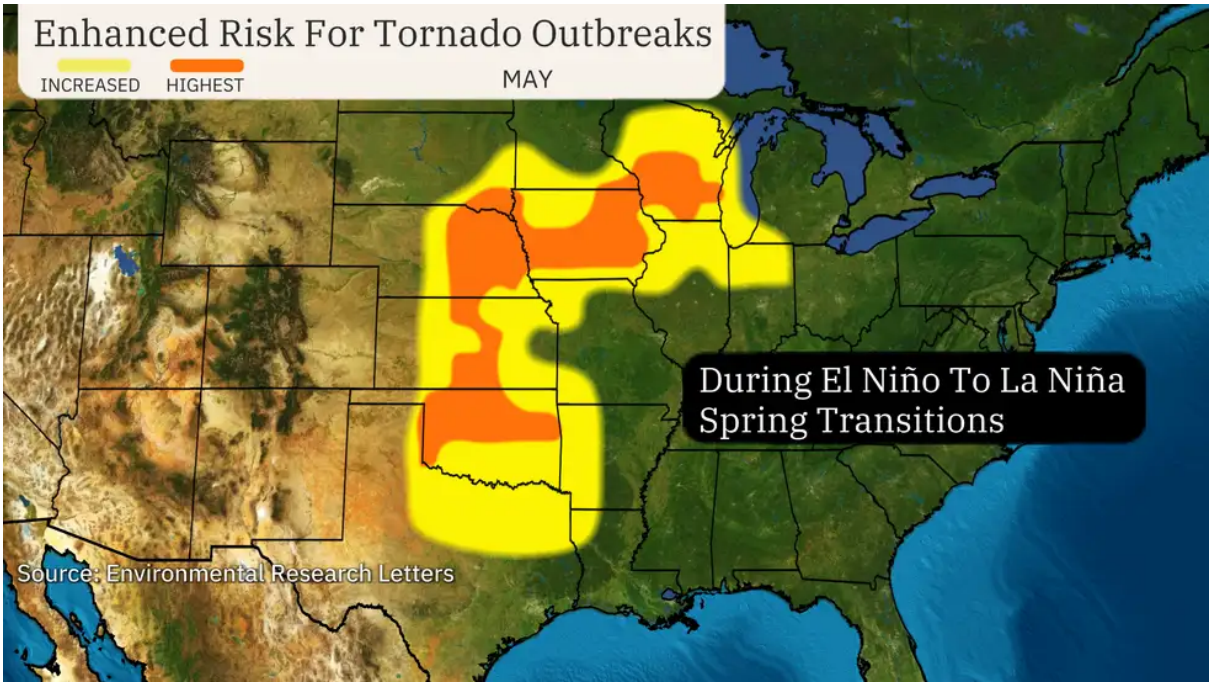

According to the CPC, visually we can analyze the fluctuations that's ongoing across the equatorial Pacific as a result of daily mechanisms acting to shift our El Nino to a La Nina. This is somewhat of a mildly "long" process that occurs physically. Nonetheless, on the left above you'll see the probabilities of the weakening El Nino toward a neutral state before seeing the La Nina become firmly cemented in place by summer. On the right, we can confirm this by just looking at the upwelling of cooler and deeper waters in the eastern Pacific that lay dormant below the surface. This will act to replace the warmer temperatures, and we've seen this process occur since January. Notice the expansive cooler pool now most prevalent in this region.

Since ENSO governs our weather patterns across the globe, it'll begin to influence weather patterns across the U.S. For instance, analog years (credit to John Homenuk) where El Nino's gave way to La Nina's by

summer featured a mid-level height pattern (500mb or 18,000 ft) seen below. The blue and purples represent the average positioning of a trough (indicative of unsettled and active weather), where the cyclonic flow ejects important features and parameters like moisture, energy, and wind shear - all necessary to culminate severe weather across various regions such as the Midwest, Southeast, the Plains, and portions of the Ohio Valley.



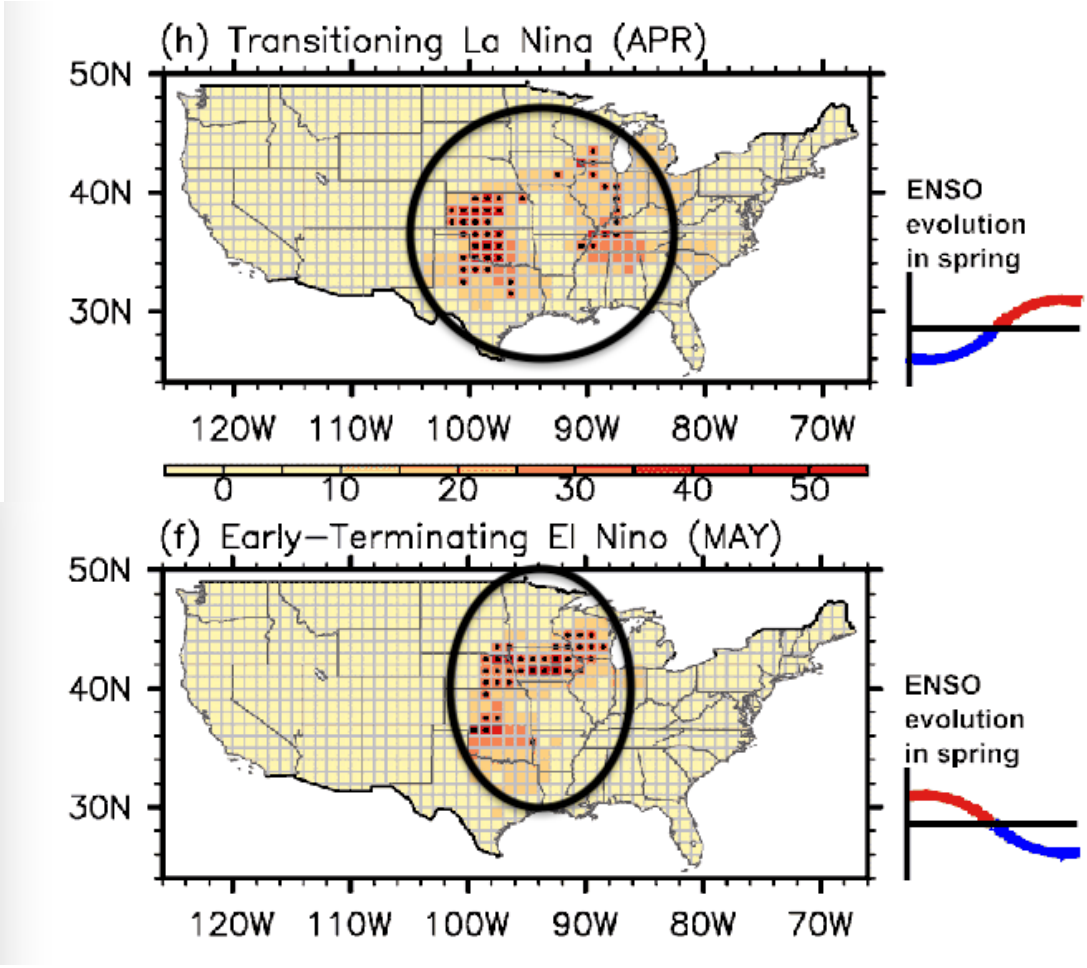

Statistically, it's shown through some literature during these ENSO transitions that we tend to see several prominent active severe weather events occur. This includes enhanced tornado outbreaks, especially across the central Plains and upper Midwest, and an overall increase in wind shear and instability (i.e. CAPE). In fact, according to research done by S.-K. Lee et. al, we see approximately a 60% boost in tornado outbreaks across regions such as the Ohio Valley, parts of the Southeast, and upper Midwest. Below shows this from a visual perspective indicating where the risk becomes greatest during terminating El Nino's.




Similarly, we can see the spatial shifts in where the greatest probability occurs for tornadoes for the upcoming months of April and May below. During this transition as the warmer waters in the eastern Pacific cool while the Gulf of Mexico sea surface temperatures remain relatively much warmer, moisture and heat are transported further northward. This is because there's now a lesser focus for convection (e.g. thunderstorms) in the Pacific since we begin to see an adjustment of the Walker Circulation (i.e. a circulation that focuses thunderstorms in one area with sinking air in another). With sinking air shifting across the eastern Pacific, that air will now be flowing toward the Gulf because it's warmer (since air will be rising there). All that "bubbling" warm air with lots of moisture is now ready to be carried northward right into the U.S.

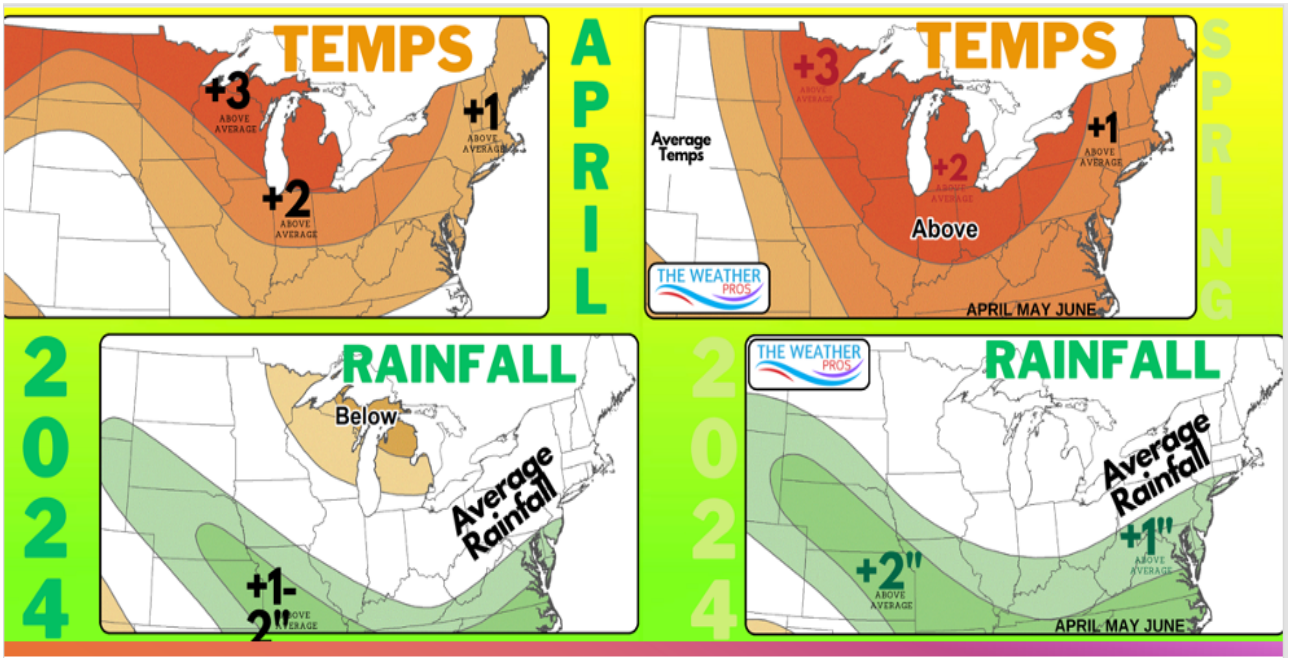
Under this phase shift, in April we tend to see a focus of above average severe weather across the southern Plains, Midwest, and the Ohio Valley. By May, we'll see another leap northward with moisture and "heat" that is conducive for thunderstorm development across portions of the upper Midwest and into the Plains. All the while this occurs, prone areas such as "Tornado Alley" and across the Southeast also get a boost due to this type of persistent weather pattern like shown from the analogs. When you position a trough west of the Mississippi River with positive heights (ridging) across the East, you get a favorable flow in between. These ingredients

entail moisture (instability), pieces of energy from the jet stream (acts as the “trigger” to form severe weather), and usually dry air from places like the mountains of Mexico coined “Elevated Mixed Layers” (EML’s) that act as a “lid” to trap the building instability making the possibility of dangerous supercells to occur. Dry air also plays a role in severe weather since it can enhance evaporative processes, creating ultimately stronger updrafts. It’s the trough in the west, ridge in the east pattern that many severe weather enthusiasts and forecasters look for during the Spring and it’s this pattern that is typically featured during these ENSO changeover’s.



# What The Weather Pro's Anticipate This Spring

In conclusion, we're anticipating an active to above average severe weather season from April through May and likely into June. As we trek deeper now into April with the leftover effects from winter finally abating, we'll begin to see a more persistent severe weather pattern develop. Below is our forecast outlook for this current month in terms of both precipitation and temperature departures from average along with the three-month temperature and precipitation average of April, May, and June. Those involved with outdoor work can begin to get a general idea of what you're looking at this coming spring season.




As we also continue to see the El Nino weaken and a solid shift into La Nina, this also has possibly large implications for this year's hurricane season that at this juncture could be quite an active year given the widespread favorable ingredients beginning to align.