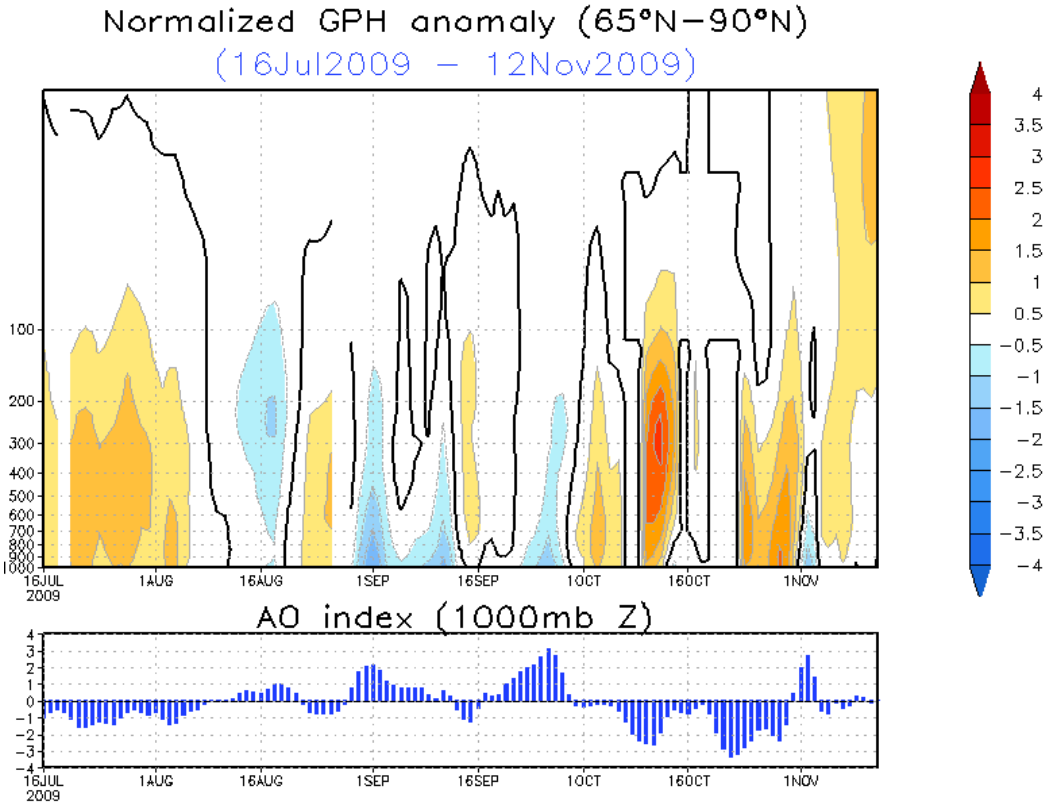
## *Stratospheric Warming Beginning – if it persists, suggests cold coming end of November and December US and Europe*

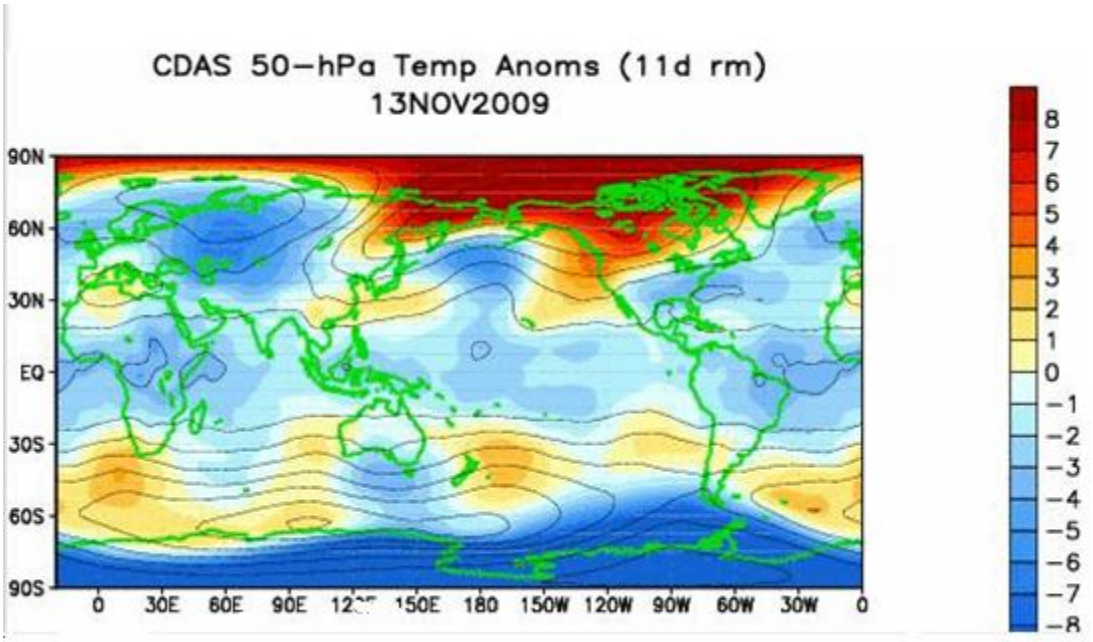
*By Joseph D'Aleo, November 16, 2009*

Below is a cross section of height/temperature anomalies for the Polar Regions (65-90N). Note each time the warming reached into the mid Troposphere, the AO Index tanked. The negative AO was why October was 3rd coldest in 115 years for the United States.

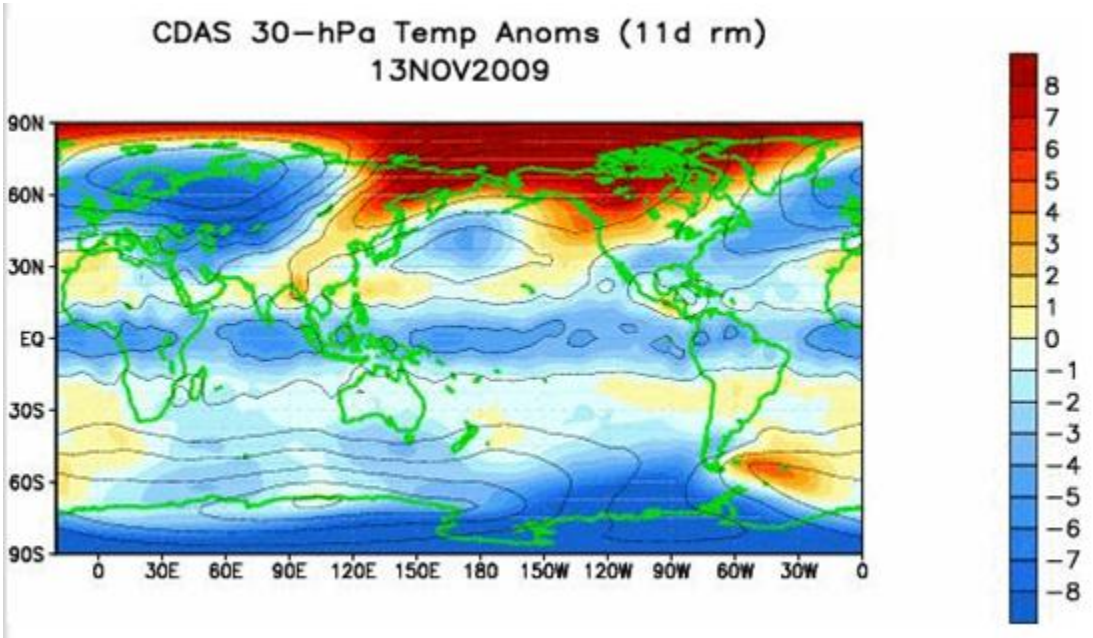



It has retreated to higher levels and the AO has recovered for the time being. That is why the US turned warmer this month.

See that warming spread into the arctic high atmosphere (50mb) from the Pacific side here.

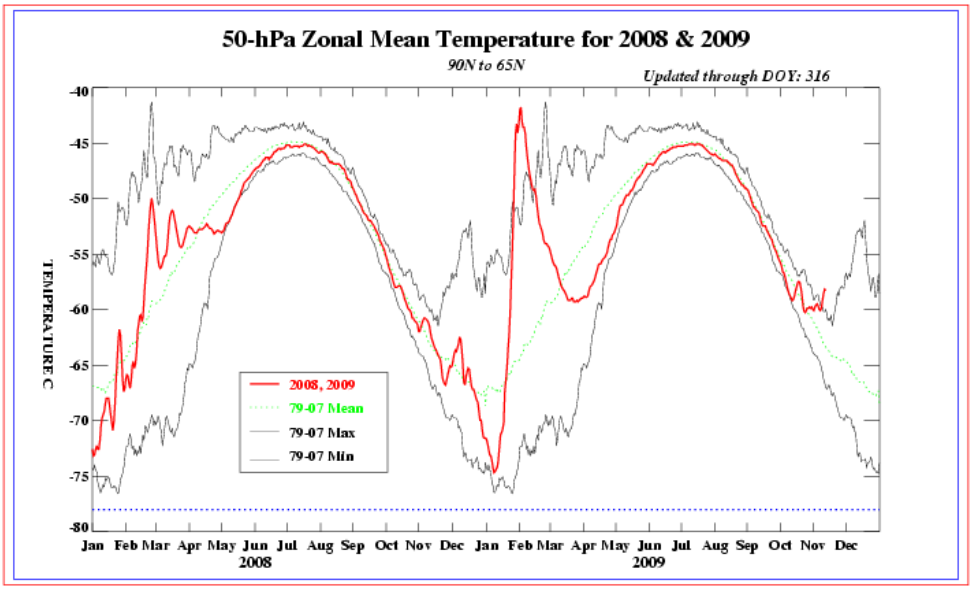


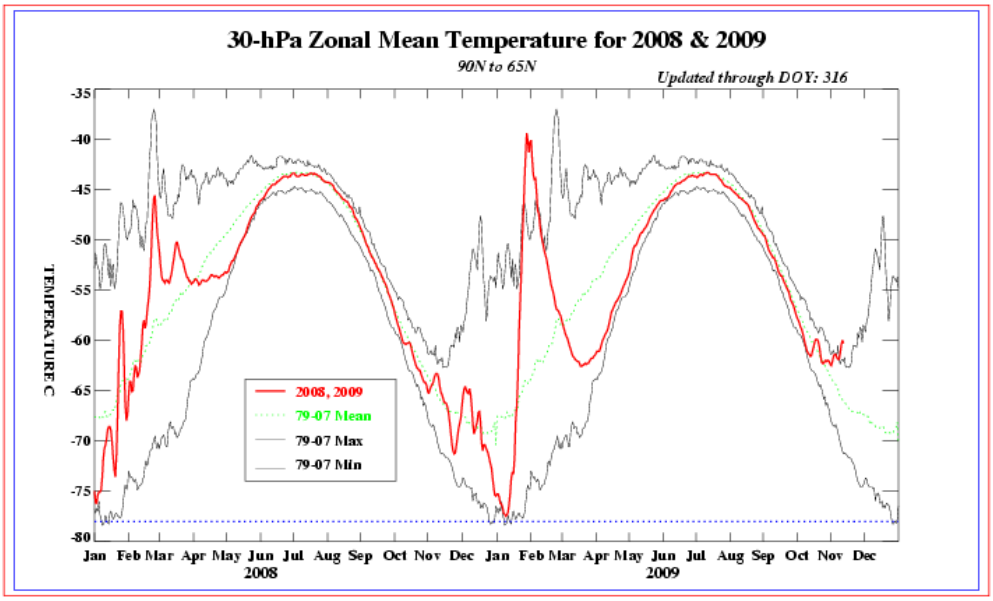

See animation for 50 mb here
http://www.cpc.noaa.gov/products/intraseasonal/temp50anim.shtml



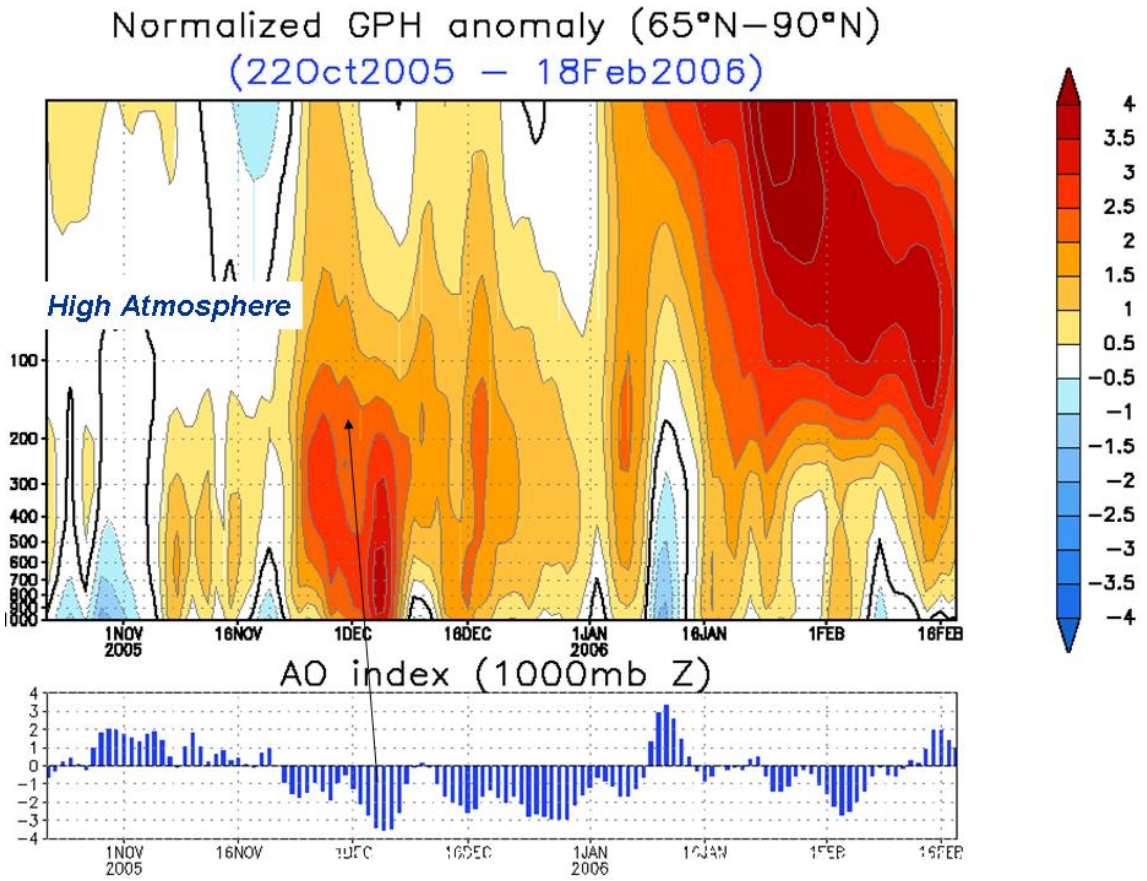

See animation from early October for 30 mb here.
http://www.cpc.noaa.gov/proVducts/intraseasonal/temp30anim.shtml

See in the following charts how the temperature has exceeded long term maximum for those levels.

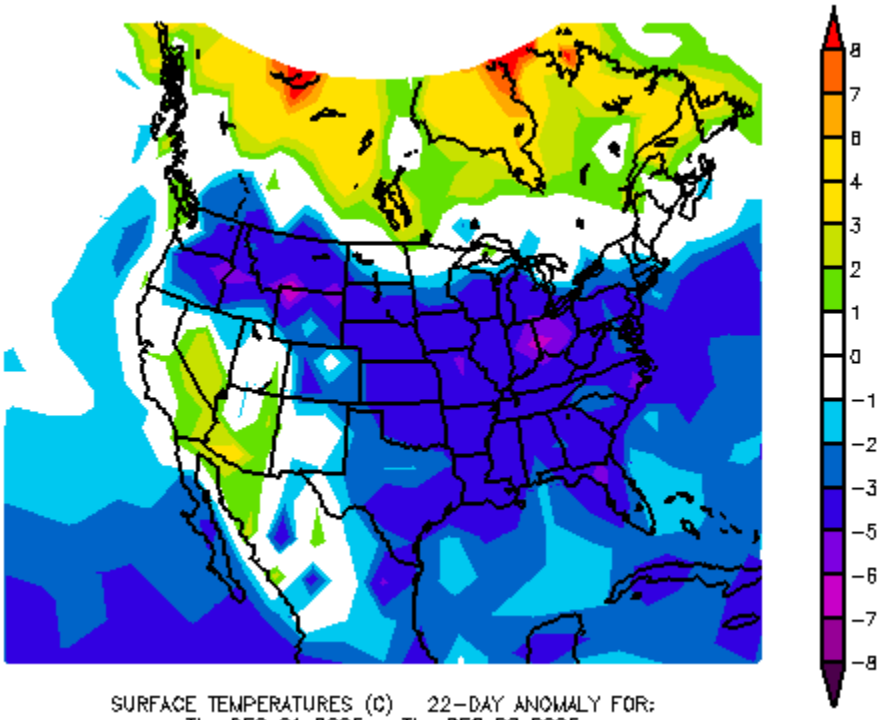



See here how this developed in 2005 in this cross section. Note the big mid tropospheric warming in late November and December with a collapse of the AO.

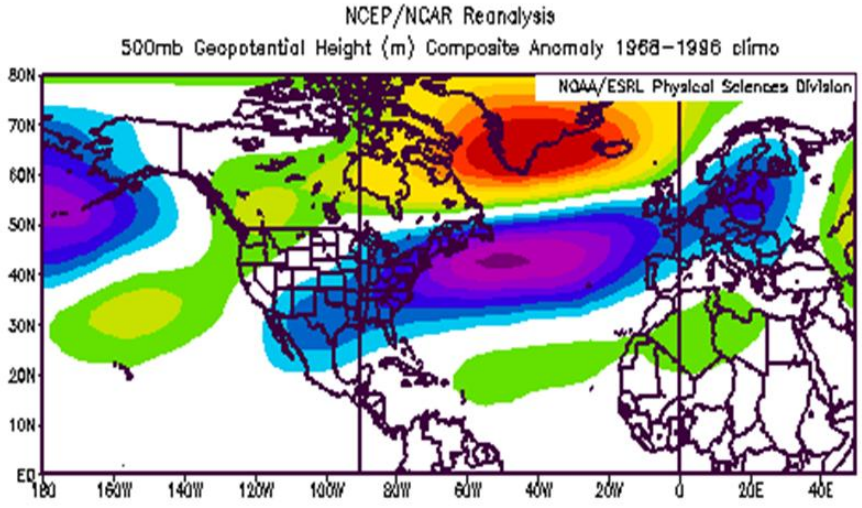



See the result in the December 1-22 period.

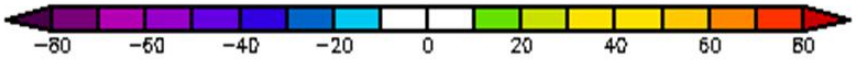



SURFACE TEMPERATURES (C) 22-DAY ANOMALY FOR:
Thu DEC 01 2005 - Thu DEC 22 2005

## El Nino East Low Solar

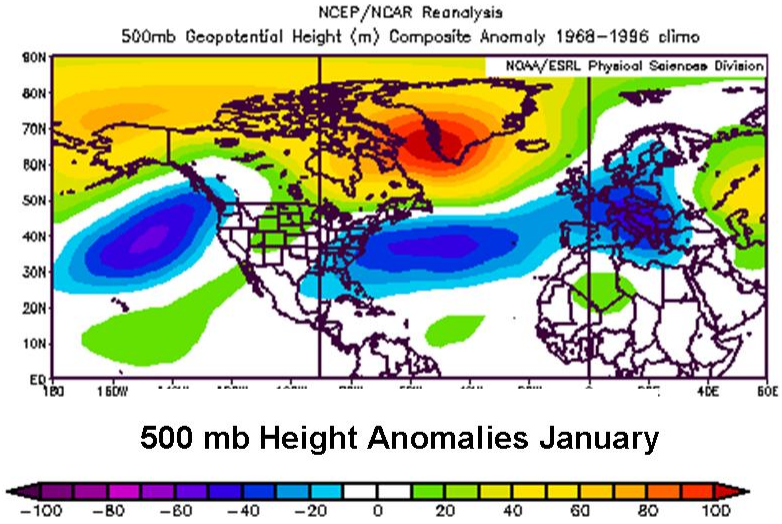



## 500 mb Height Anomalies December to February

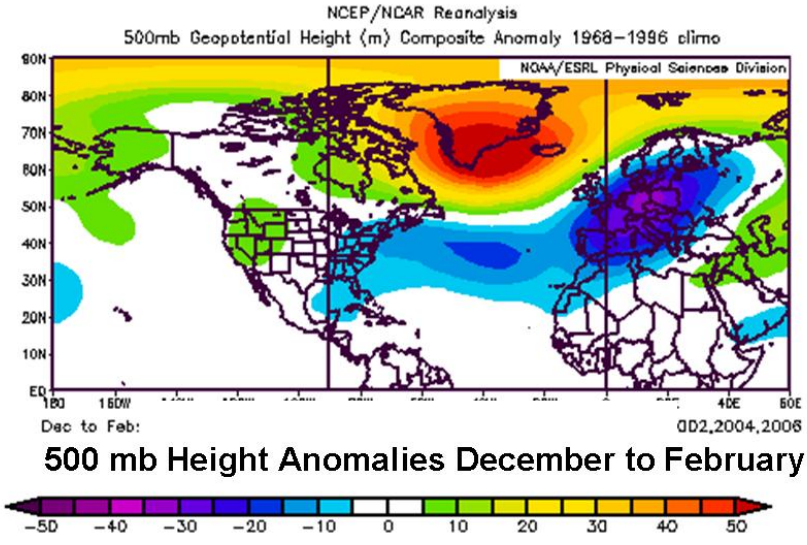


Amazingly similar to winters when the warmest waters were located in central Tropical Pacific and cold eastern areas.

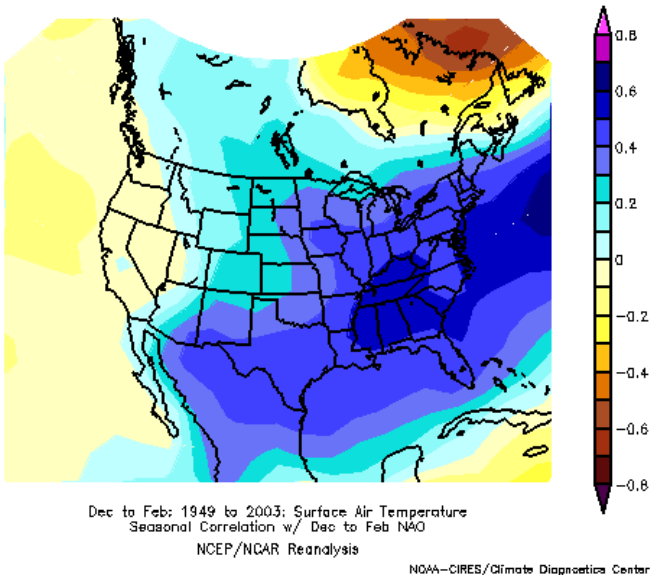
## Warm Central, Cool East TROPAC




## Warm Central, Cool East TROPAC




Note the tendency in both for a negative NAO (positive heights to the north in the Atlantic and lower height south). The negative NAO correlates to cold in the eastern half of the US (and western Europe).




What could go wrong? A false alarm with the warming for one. A stronger El Nino with more warming in the east would change the story (currently we expect it to peak early late November or early December and indeed the strong westerly wind bursts causing this second surge has turned back to tropical easterlies which should enhance upwelling and mix the warm water up and see the Kelvin wave return west as a Rossby wave which will elevate the thermocline and dissipate the El Nino by mid-winter it like it did in 2002/03 and other low solar east QBO years with a cold PDO). If this warming in the stratospheric persists, look for a rapid cooling to begin around Thanksgiving.
Time will tell.