

Seasonal Outlook into 2005

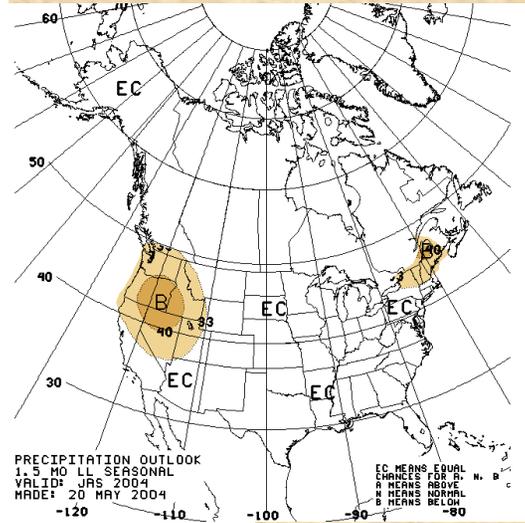
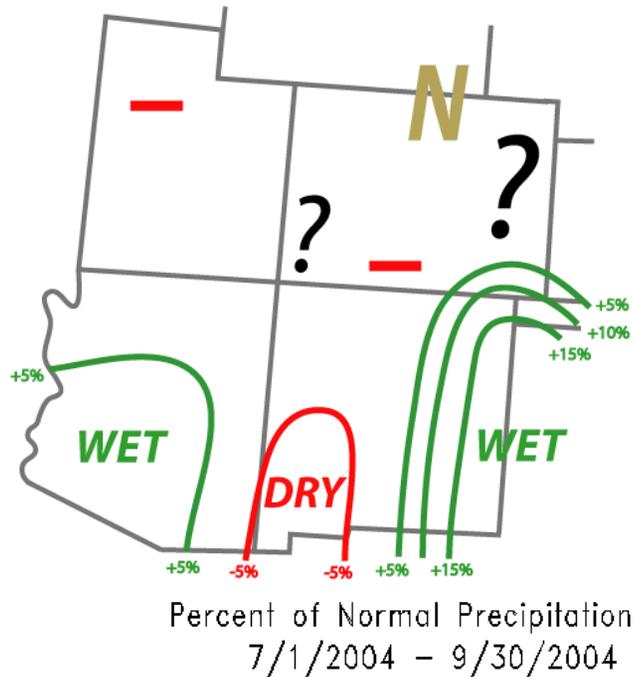
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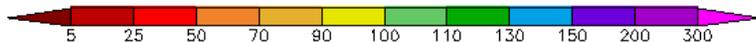
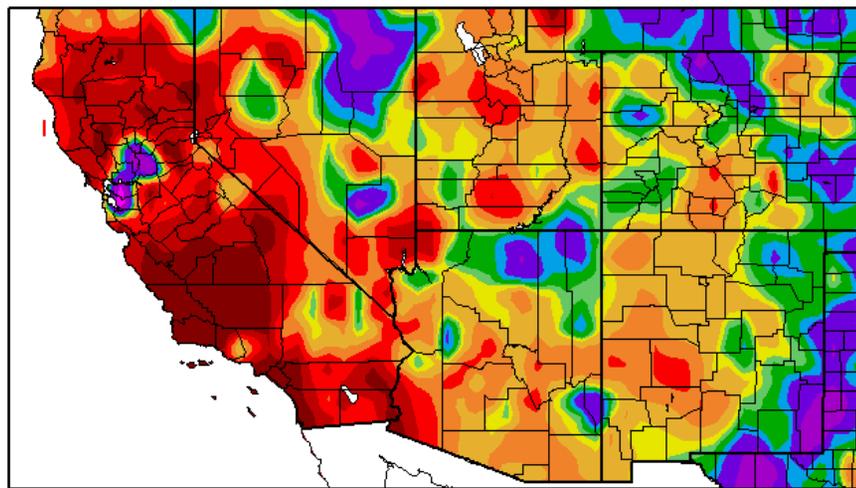
<http://www.cdc.noaa.gov/~kew/SWcasts/>

- **Recent climate anomalies & verifications of forecasts**
- **ENSO: Status & Prospects - what does it mean for us?**
- **CPC+ forecasts for December '04 thru March '05**
- **Experimental forecasts (JAN - MAR'05)**
- **Executive Summary**



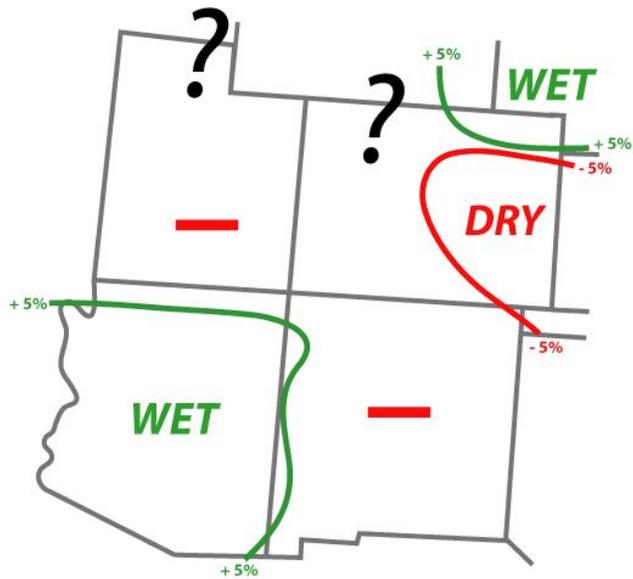
Recap of July-September 04

- After two failed monsoon forecasts, the most complicated one appears to have done the best job so far. This is about as good as it gets, especially compared to official CPC forecasts.

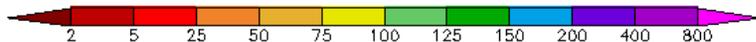
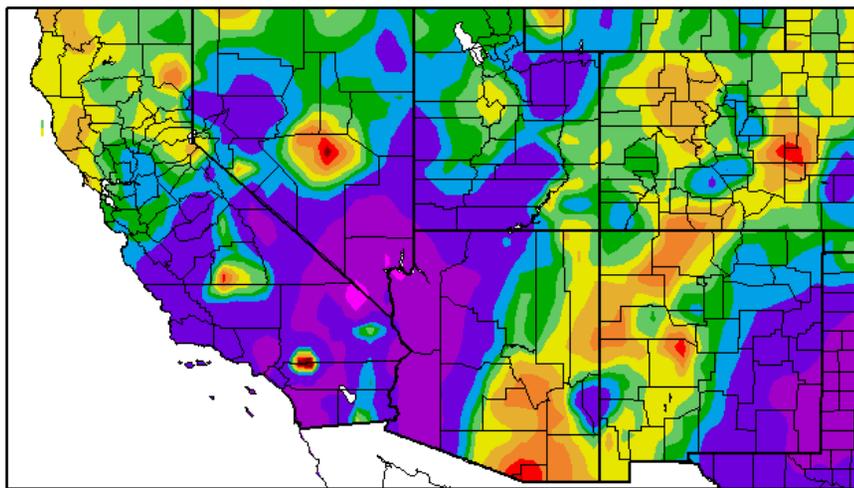


- However, my forecasts still failed to anticipate the potential for a WET summer in much of eastern Colorado.

EXPERIMENTAL CDC OCT-DEC 2004 PRECIPITATION FORECAST
(issued September 13, 2004)



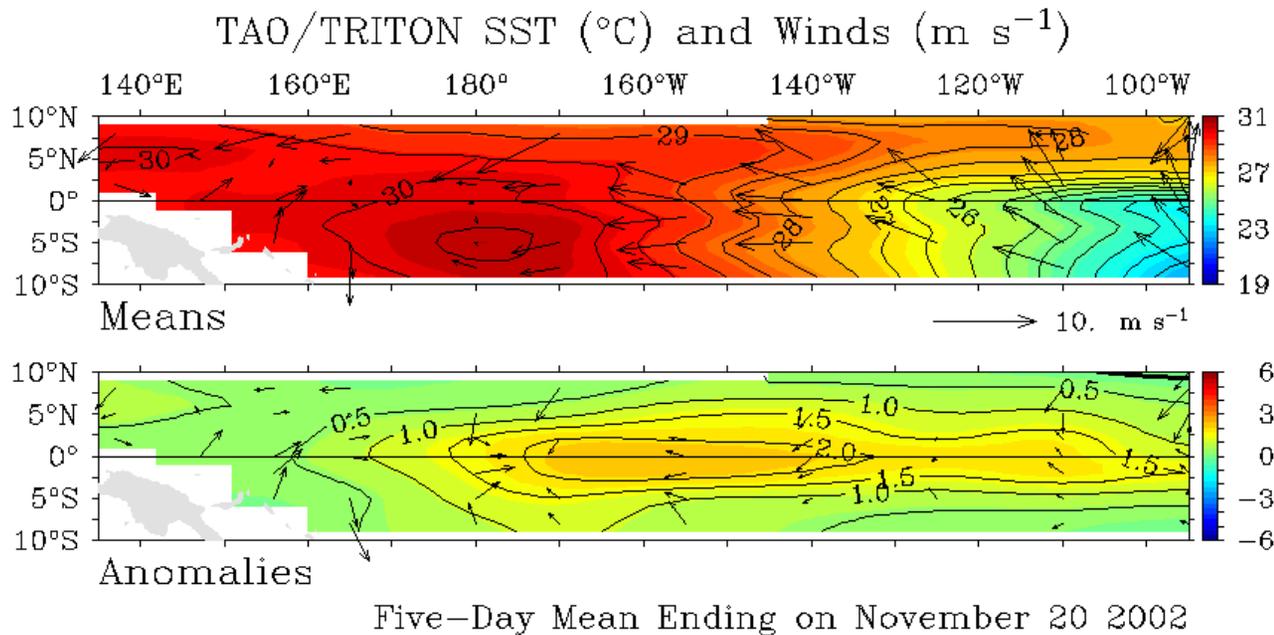
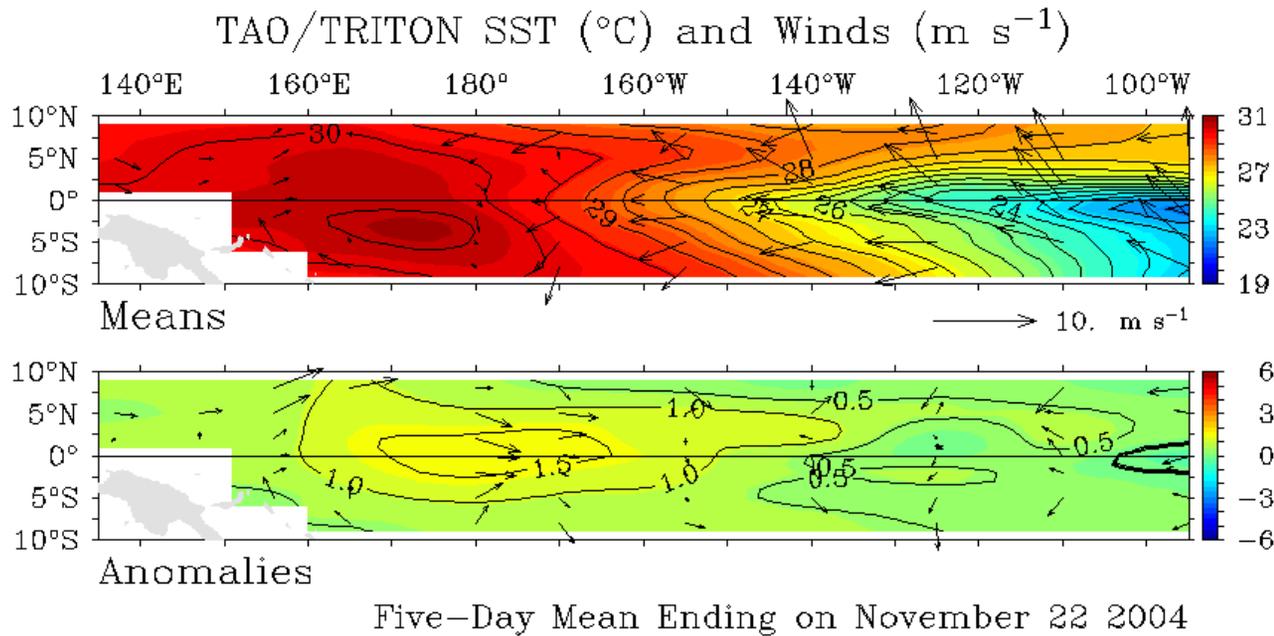
Percent of Normal Precipitation (%)
9/24/2004 - 11/22/2004



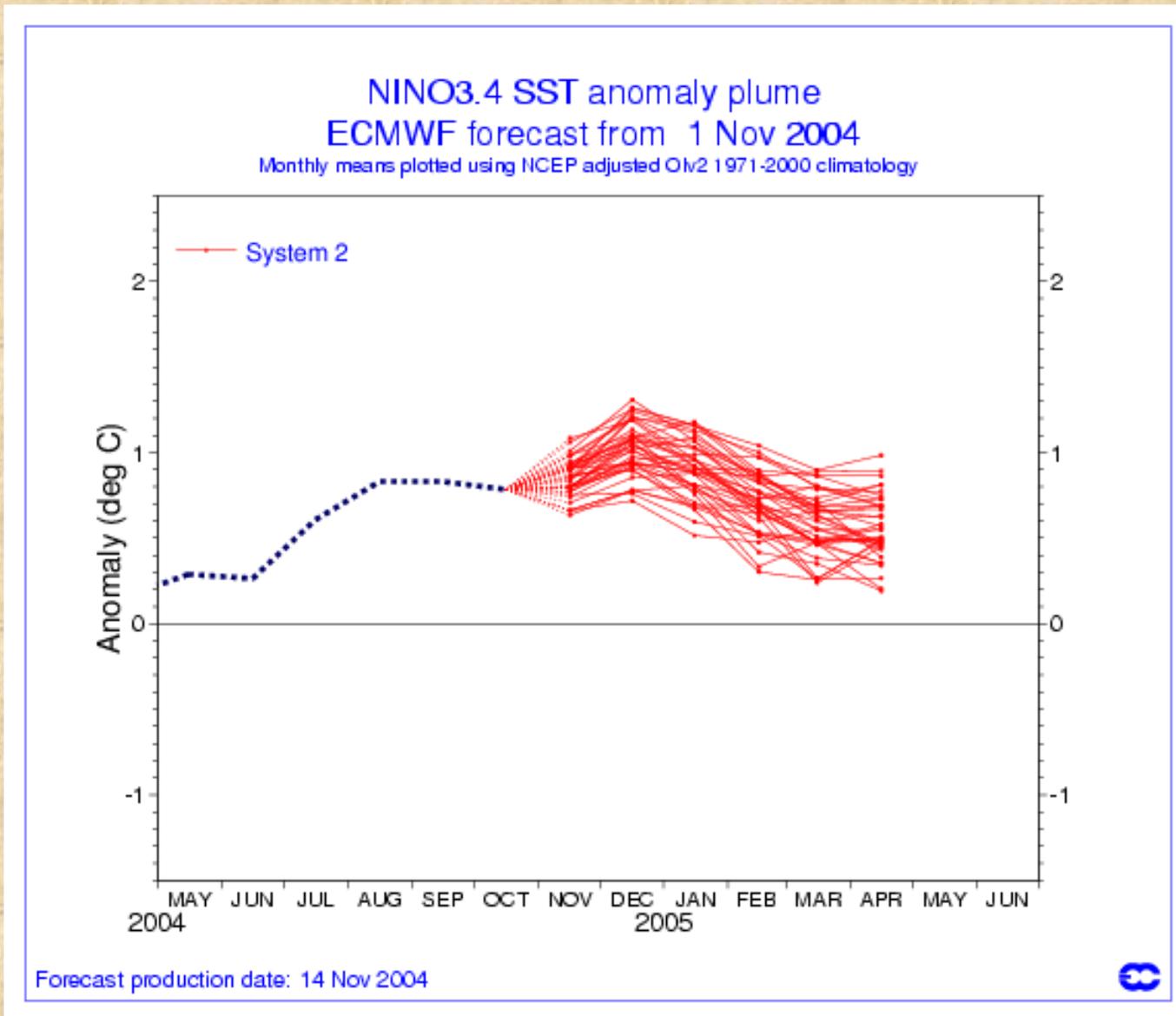
Recap of October-November 04

- So far this fall, much of Arizona and New Mexico have been wet and dry, respectively, more or less as expected. Some dryness over the southeastern plains of Colorado has also materialized.
- However, Utah has been wetter than anticipated, and the dryness over our mountains has not been foreseen.

Source: <http://www.hprcc.unl.edu/products/current.html>

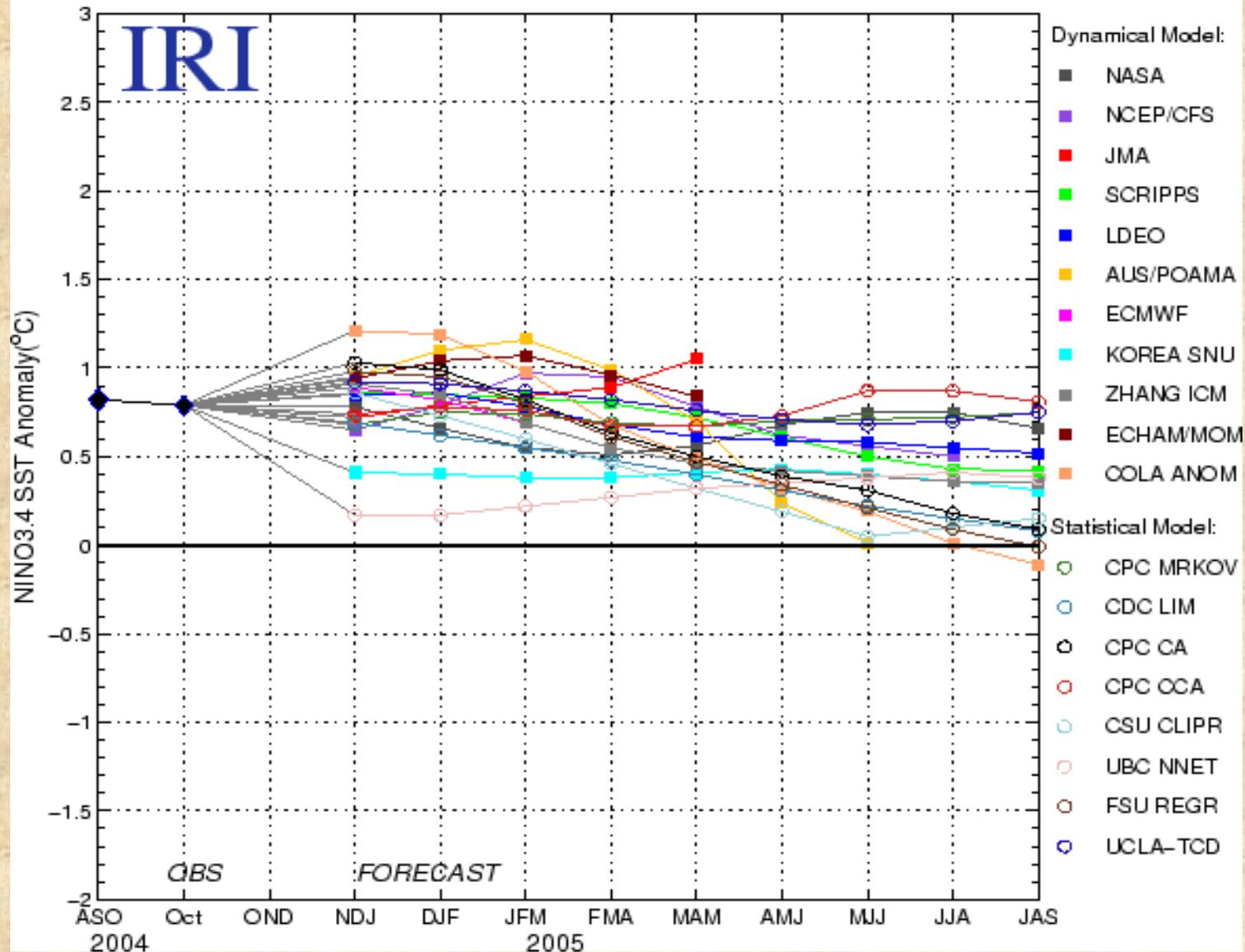


Current state
of ENSO
compared to
two years ago
- El Niño has
made a
comeback,
albeit weaker
than in 2002!



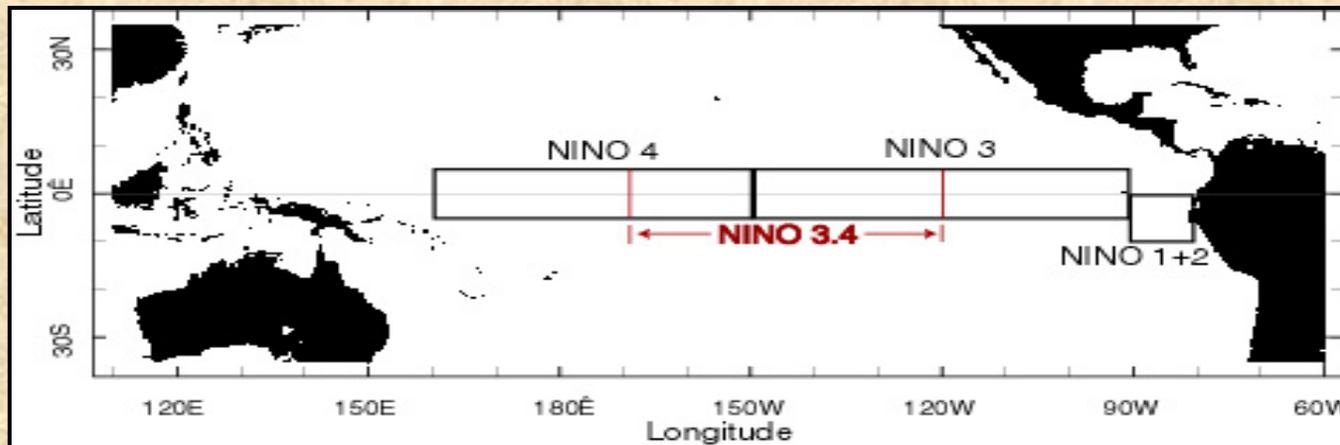
ECMWF forecast for the next half year: Weak to moderate El Niño conditions into early spring!

Model Forecasts of ENSO from Nov 2004



ENSO forecasts from 11 numerical and 8 statistical forecast models: persistence hard to beat into mid-2005! No La Niña!

“Flavors” of El Niño (regular vs. central Pacific)



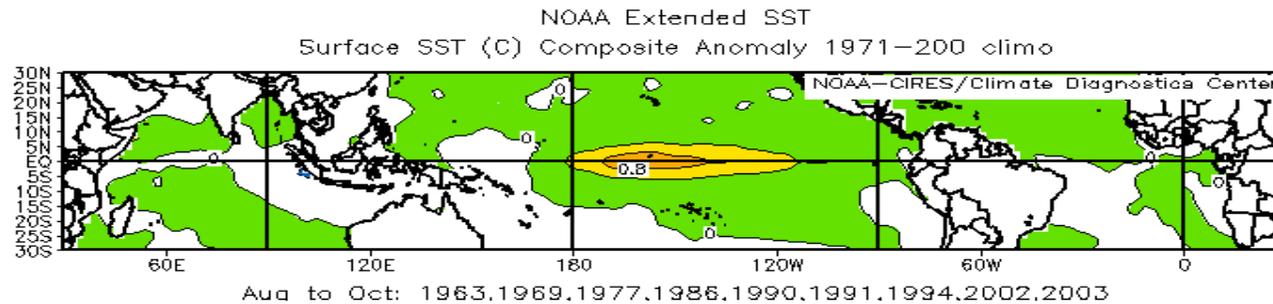
Ranks for ASO 2004 (near the top in Niño 4, below median in Niño 12)

Most similar cases in 1950-2003 (1963, 69, 77, 86, 90, 91, 94, 02, 03)

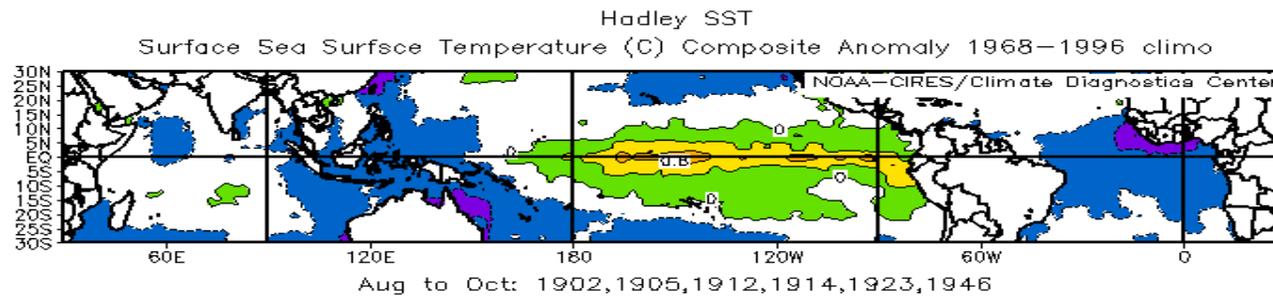
Most similar cases in 1900-49 (1902, 05, 12, 14, 23, 46)

Regular El Niño event cases (1957, 65, 68, 72, 82, 86, 87, 91, 94, 97)

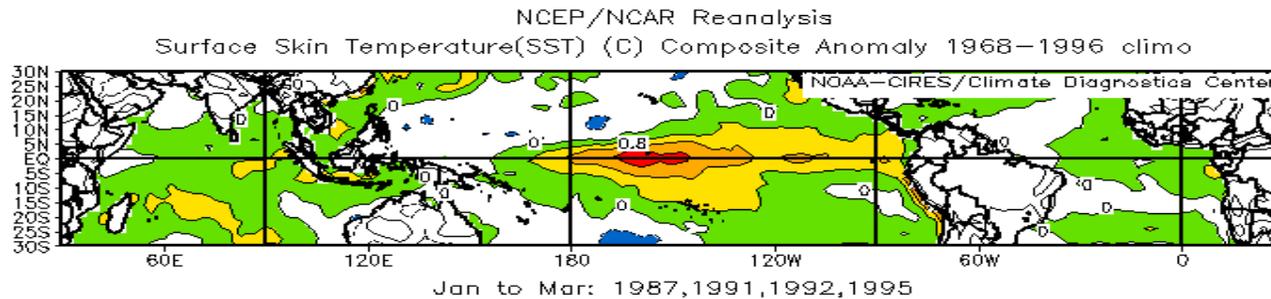
Average analog SST anomalies in August-October 1950-03



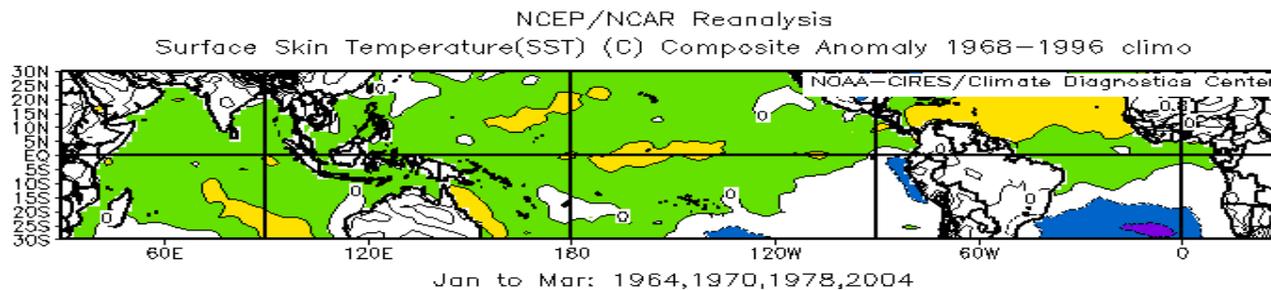
Average analog SST anomalies in August-October 1900-49



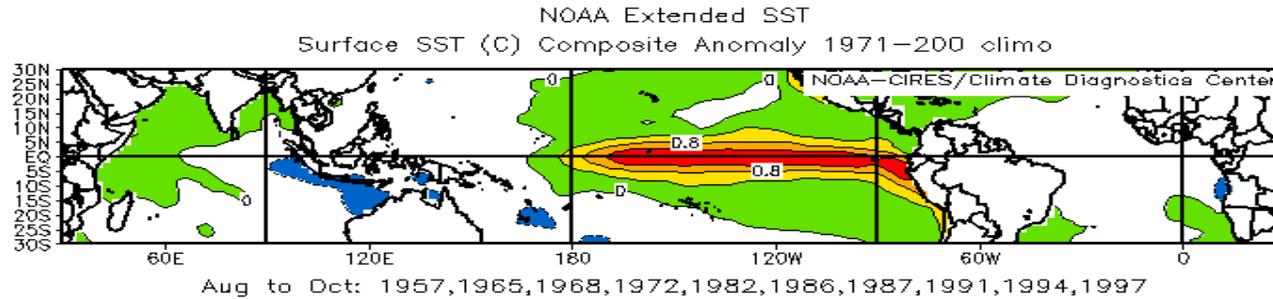
Average analog Δ SST in January-March (4*rising)



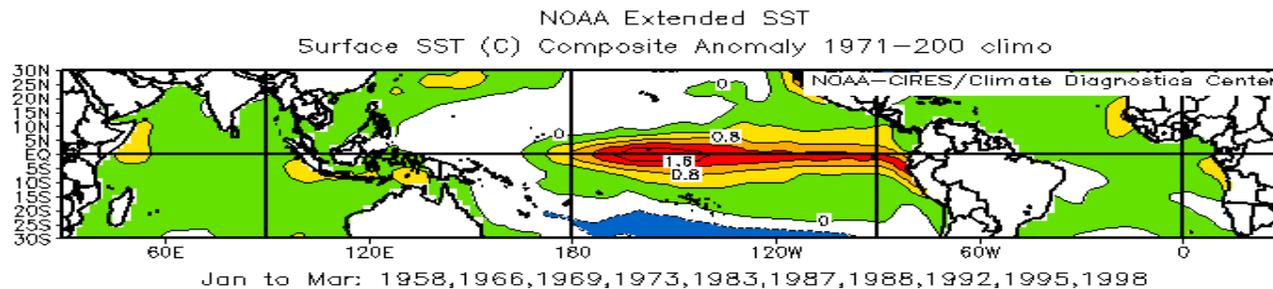
Average analog Δ SST in January-March (4*fizzling)



Average regular El Niño Δ SST in August-October 50-03



Average regular El Niño Δ SST in January-March 50-03

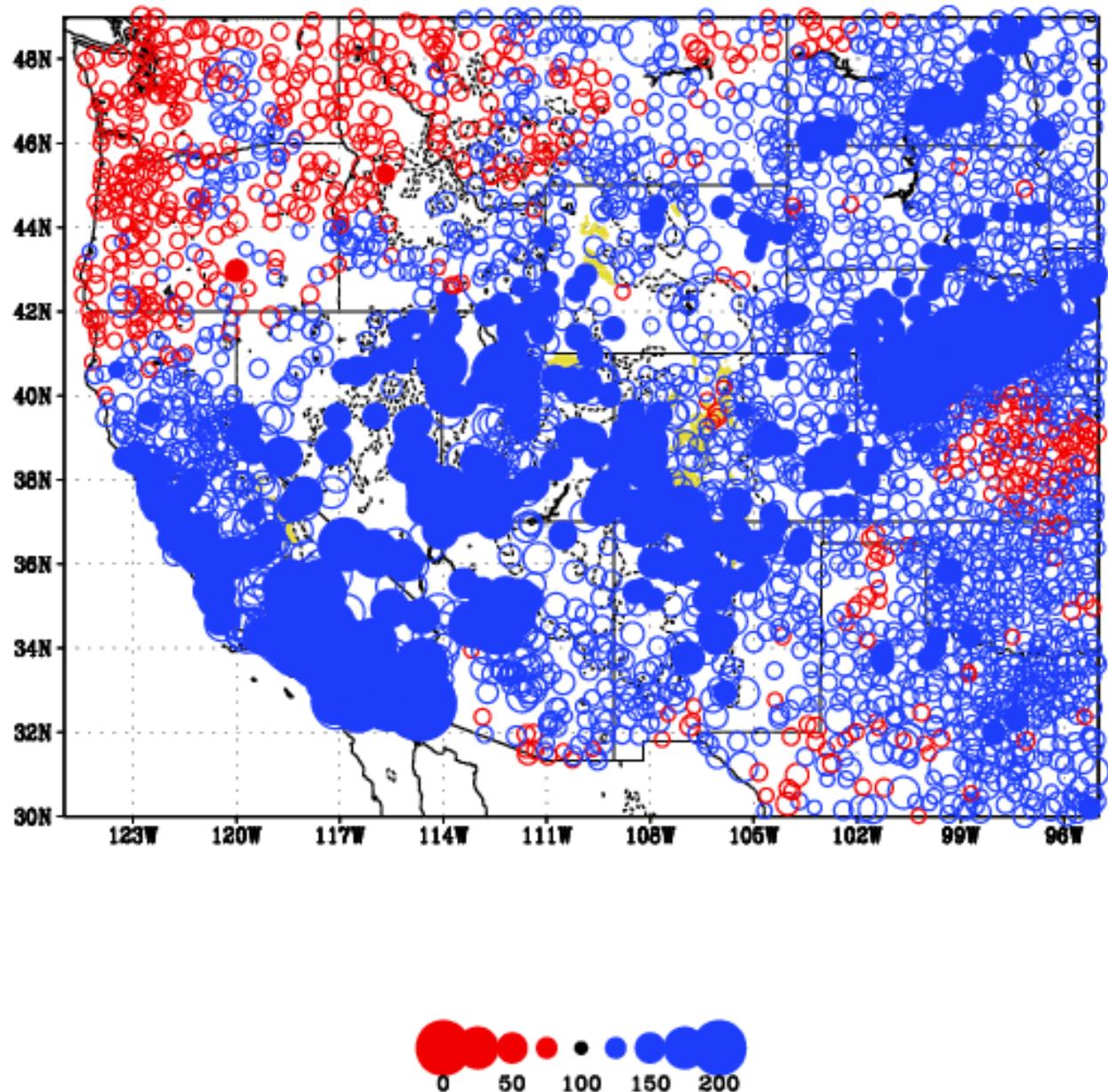


**Percentage of
Significant
Departures
During
El Niño: 18.0%**

10 cases:

**1957, 63, 65, 72, 82, 86,
87, 91, 94, 97**

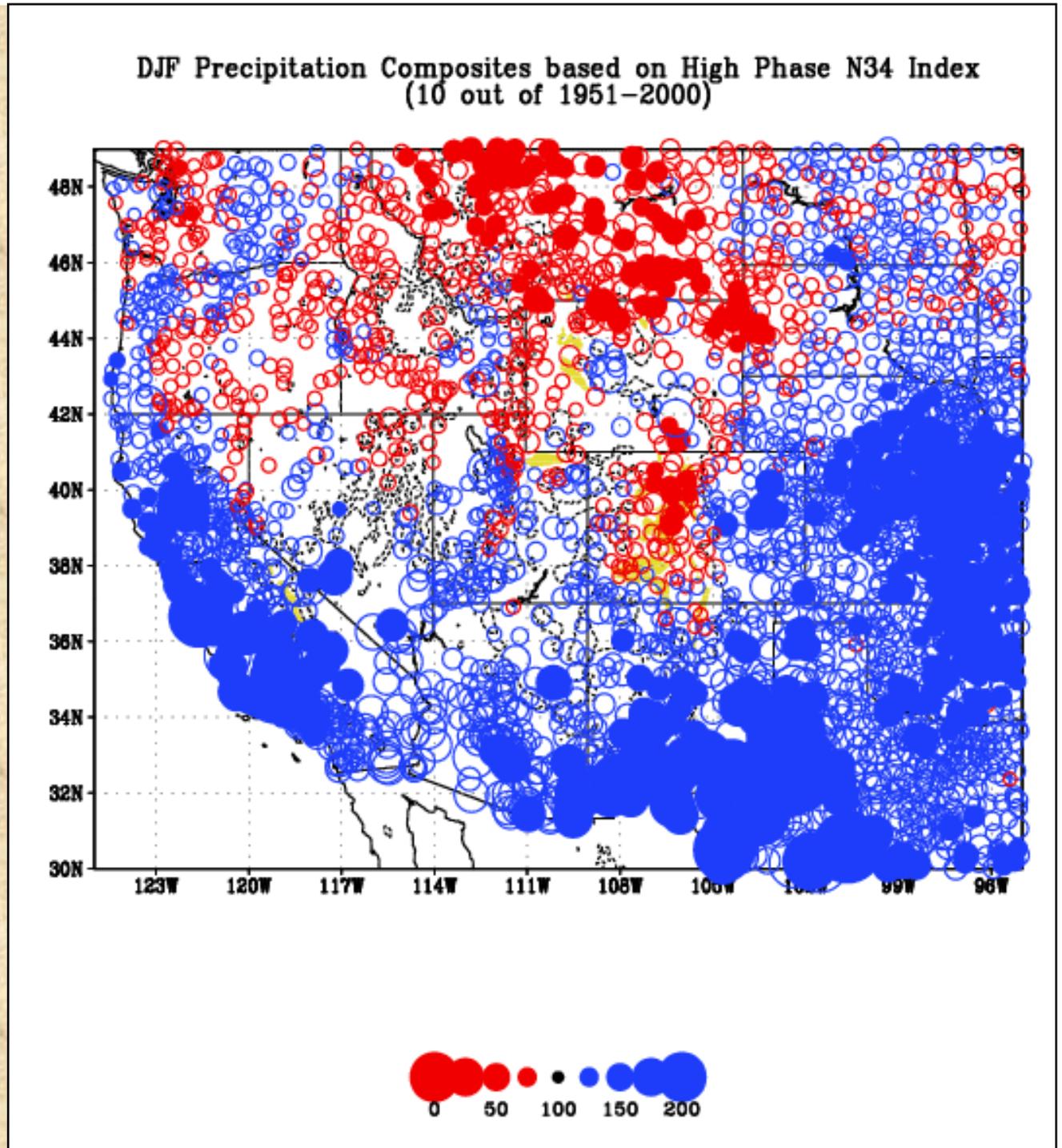
**SON Precipitation Composites based on High Phase N34 Index
(10 out of 1951–2000)**



**Percentage of
Significant
Departures
During
El Niño: 20.5%**

10 cases:

**1957-58, 65-66, 68-69,
72-73, 82-83, 86-87,
87-88, 91-92, 94-95,
97-98**



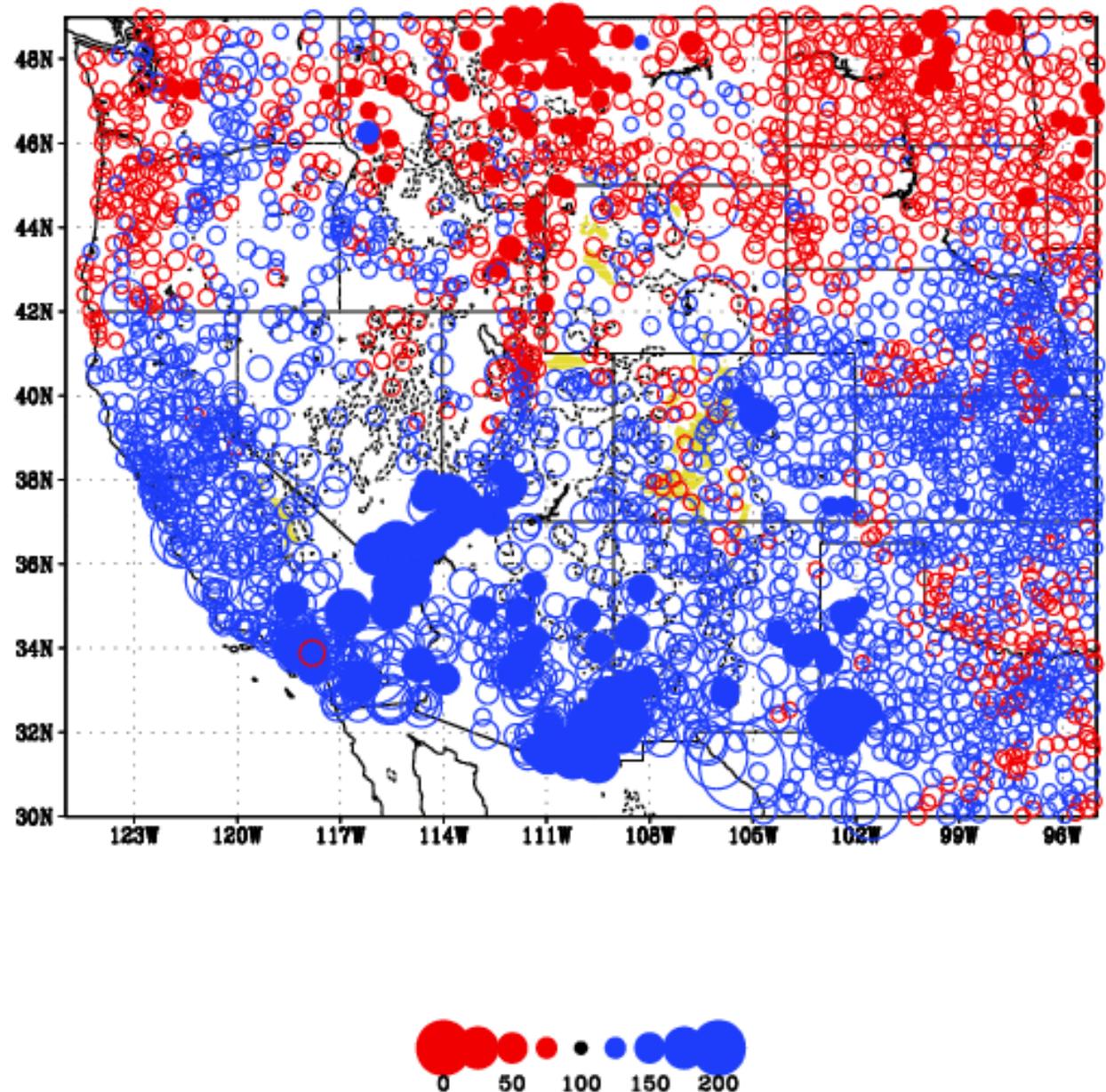
**Percentage of
Significant
Departures
During**

El Niño: 6.1%

10 cases:

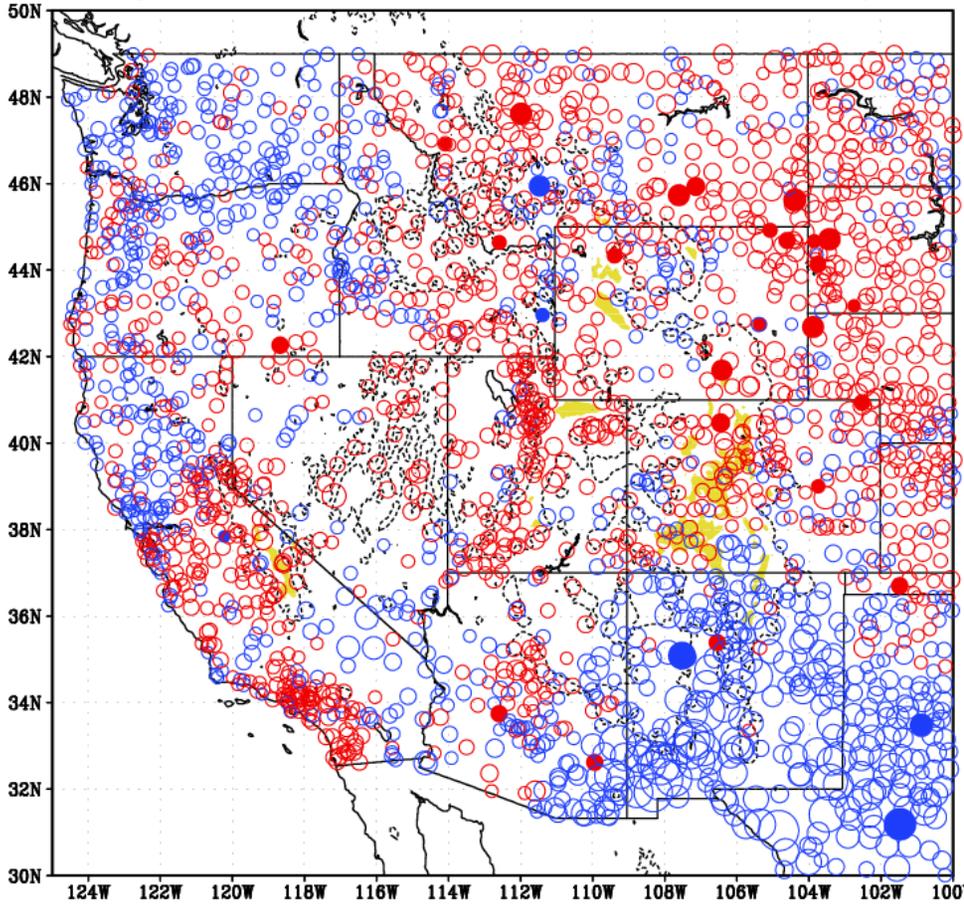
**1958, 66, 69, 73, 83, 87,
88, 92, 95, 98**

**MAM Precipitation Composites based on High Phase N34(ndjf) Index
(10 out of 1951–2000)**

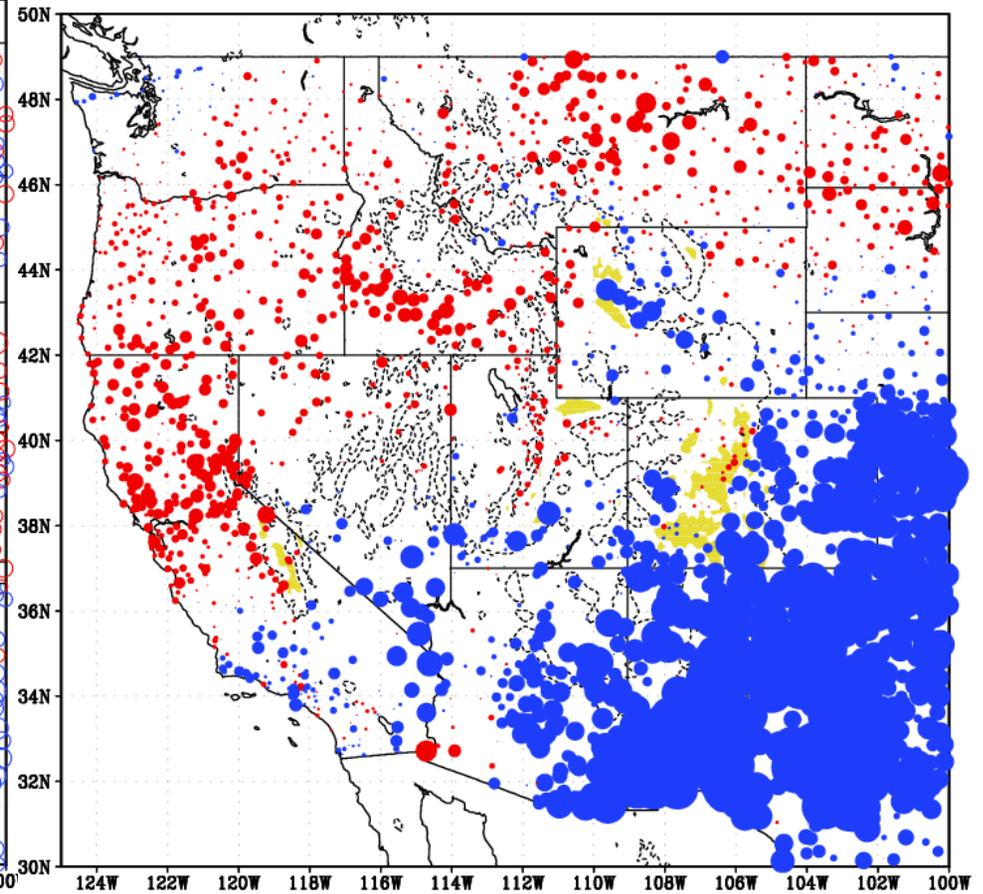


Detailed Analog El Niño Composites for 2004-5

NDJ Precipitation Composites
(1963,1969,1977,1986,1990,1991,1994,2002,2003)



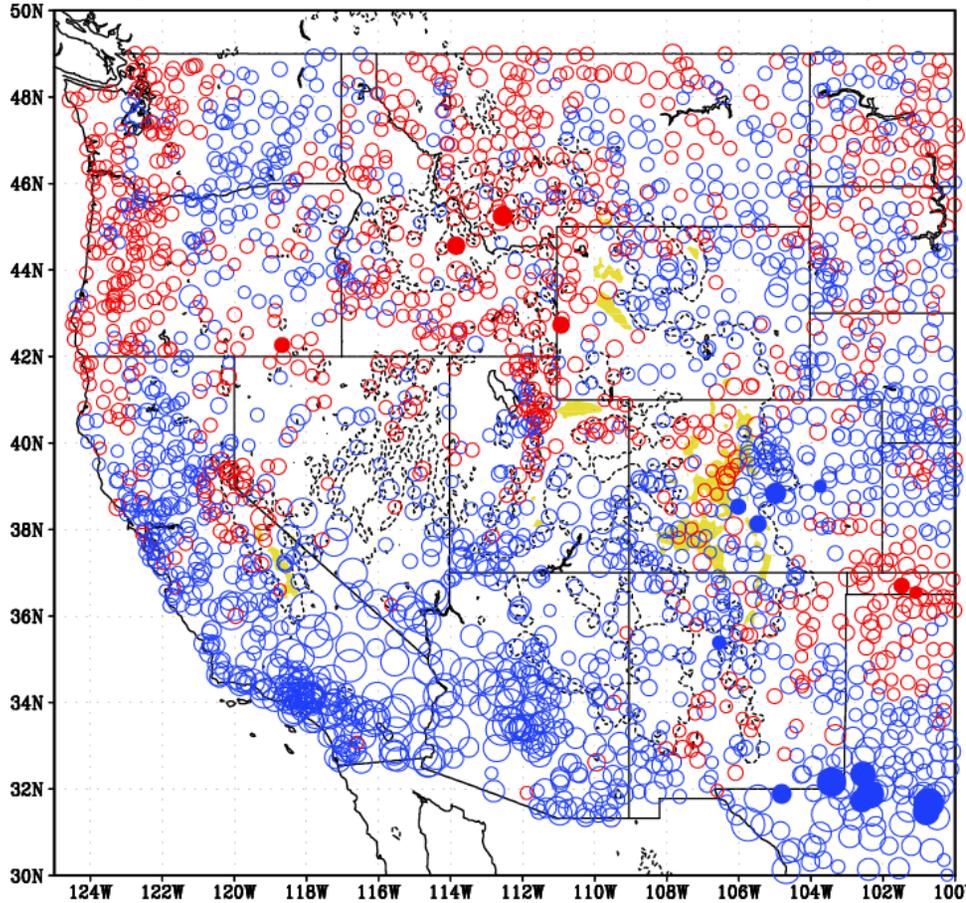
NDJ Precipitation Composites
(1986,1990,1991,1994) minus (1963,1969,1977,2003)



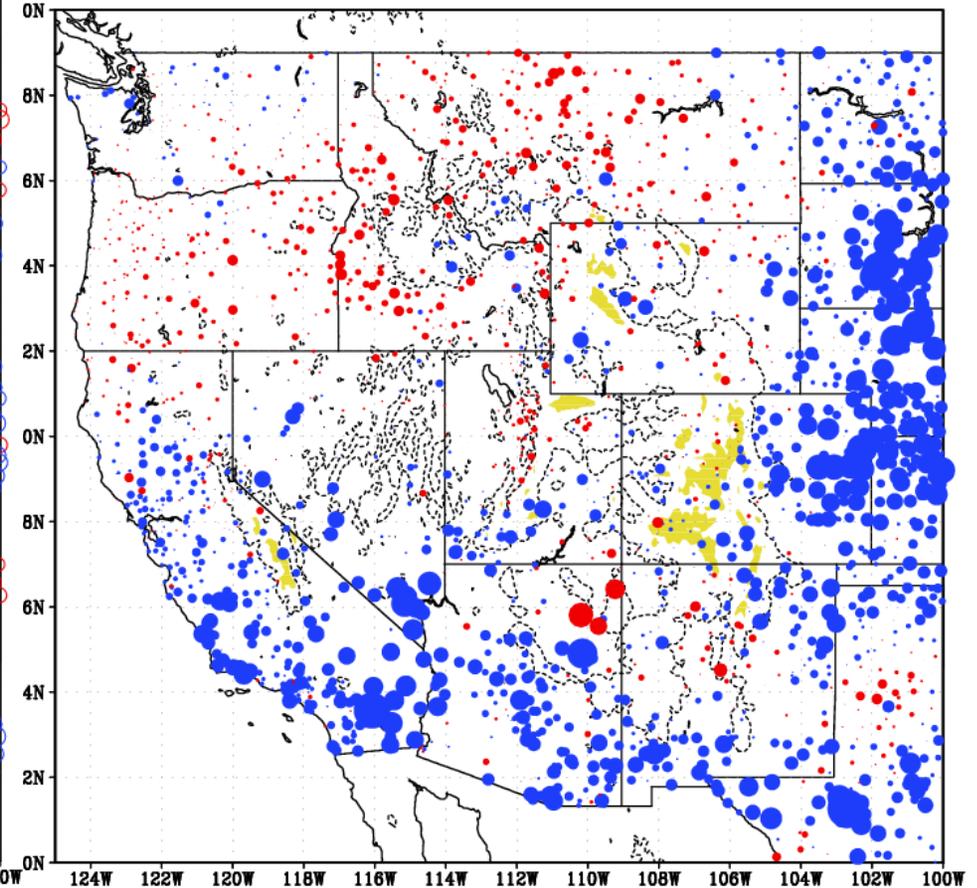
A station-by-station analysis for 9 analog El Niño composite cases (left) looks dry for most of the Upper Colorado basin into early 2005. If the current event were to grow rather than shrink into the winter, there would be a better chance for increased moisture over lower elevations, while NC mountains of UT and CO would be even less likely to receive adequate snowfall (right). These results are not field significant.

Detailed Analog El Niño Composites for 2004-5

JFM Precipitation Composites
(1964,1970,1978,1987,1991,1992,1995,2003,2004)



JFM Precipitation Composites
(1987,1991,1992,1995) minus (1964,1970,1978,2004)

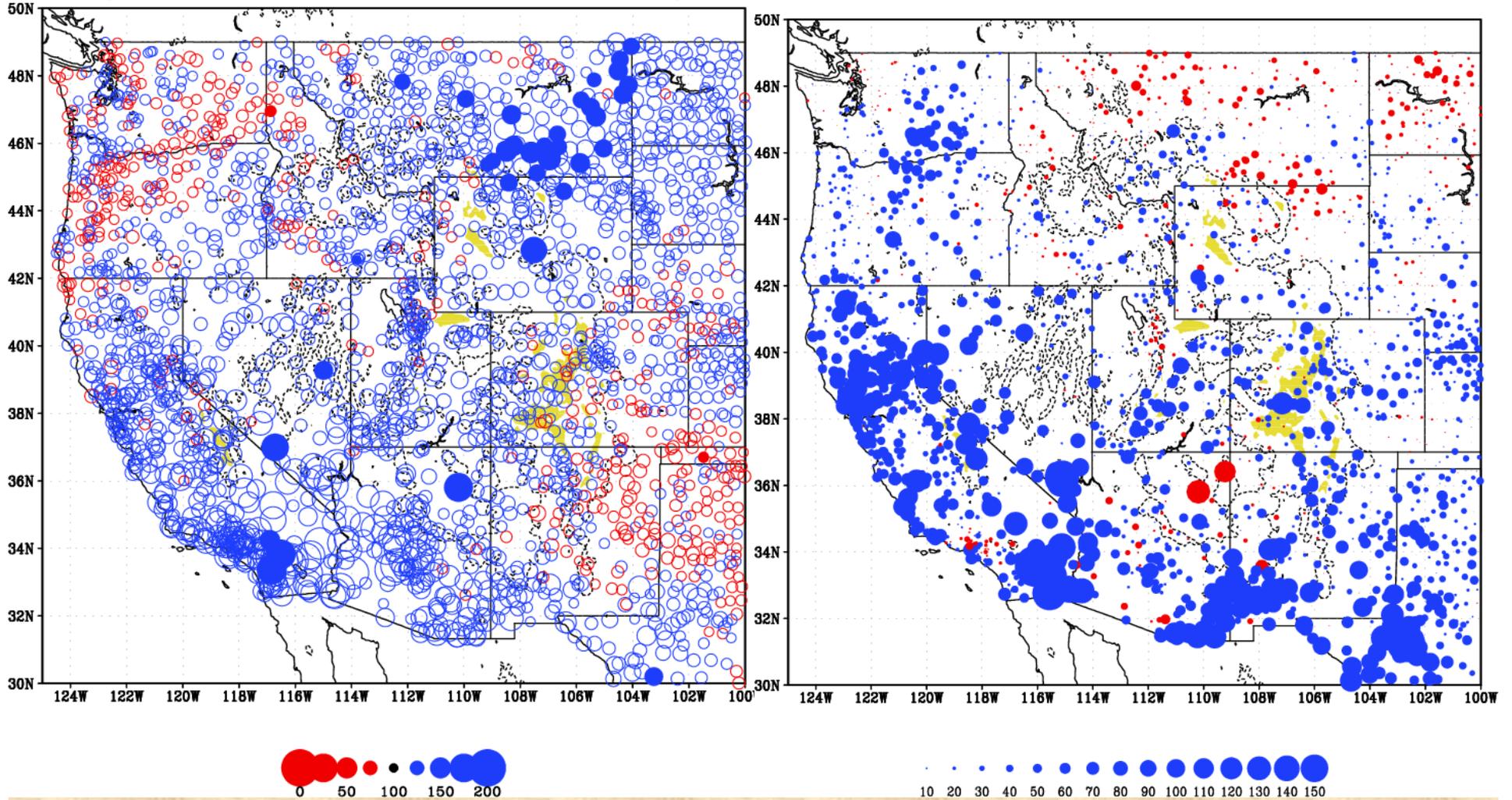


The same analysis for early 2005 (left) looks wetter over a larger fraction of the Colorado River basin, but still not too encouraging for the mountains. If the current event were to grow into the winter, much of the lower elevations of the basin would have an improved chance for moisture, except for NE AZ. (Insignificant) Improvement stems from the tendency of El Niño Marches to be WET over much of the Southwest .

Detailed Analog El Niño Composites for 2004-5

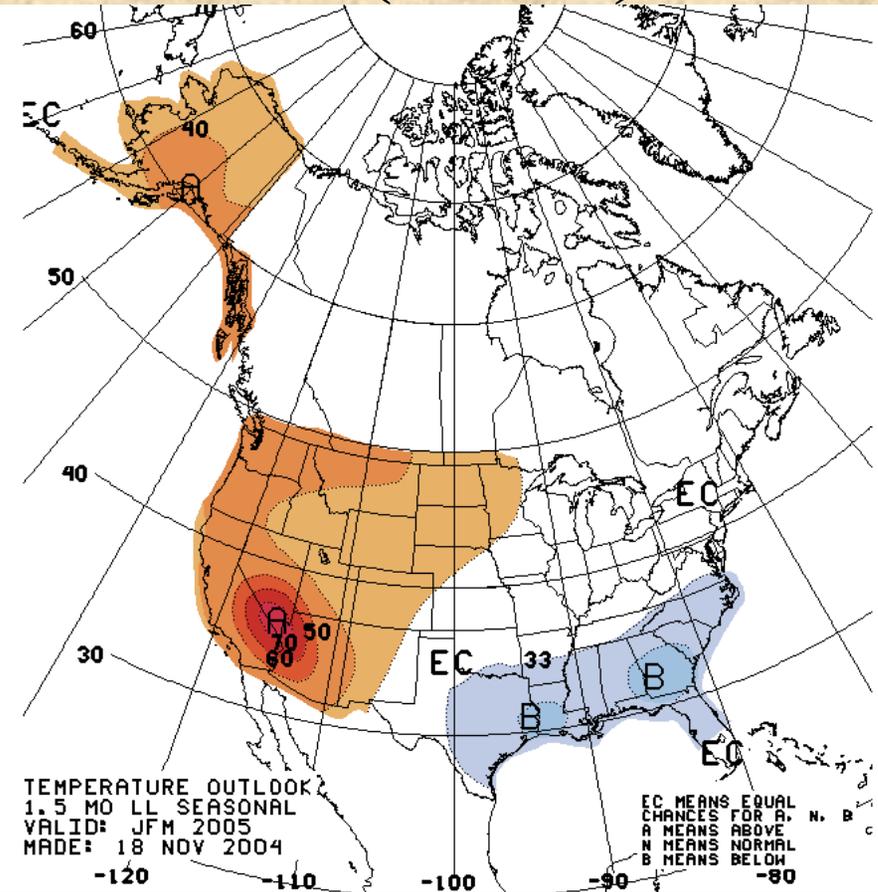
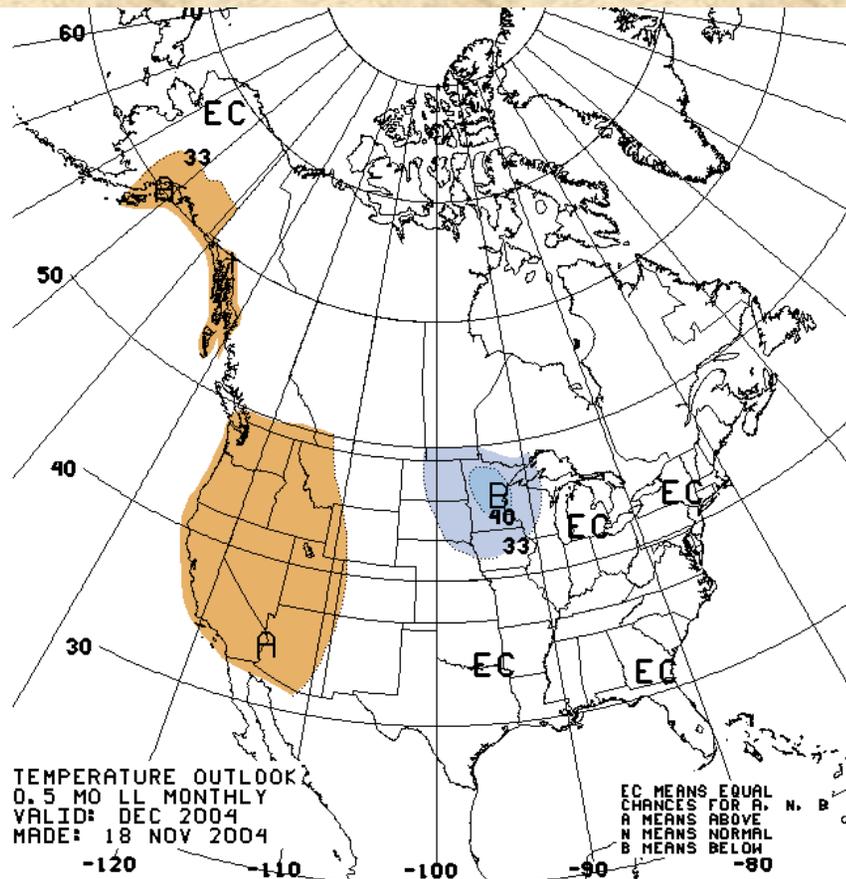
MAM Precipitation Composites
(1964,1970,1978,1987,1991,1992,1995,2003,2004)

MAM Precipitation Composites
(1987,1991,1992,1995) minus (1964,1970,1978,2004)



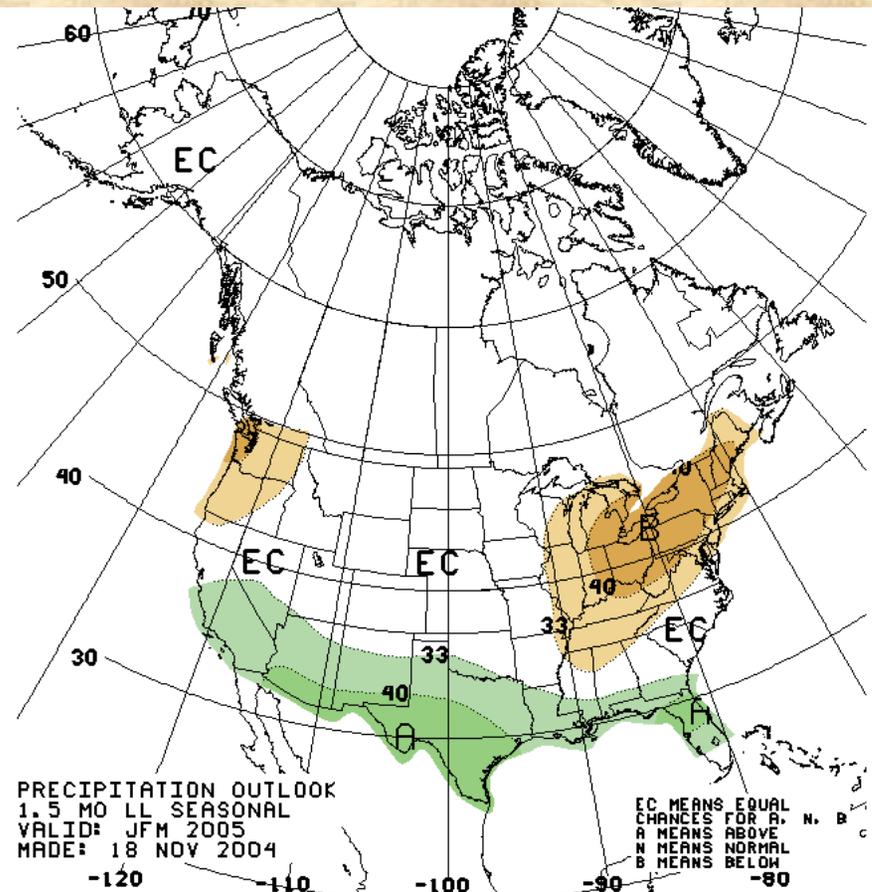
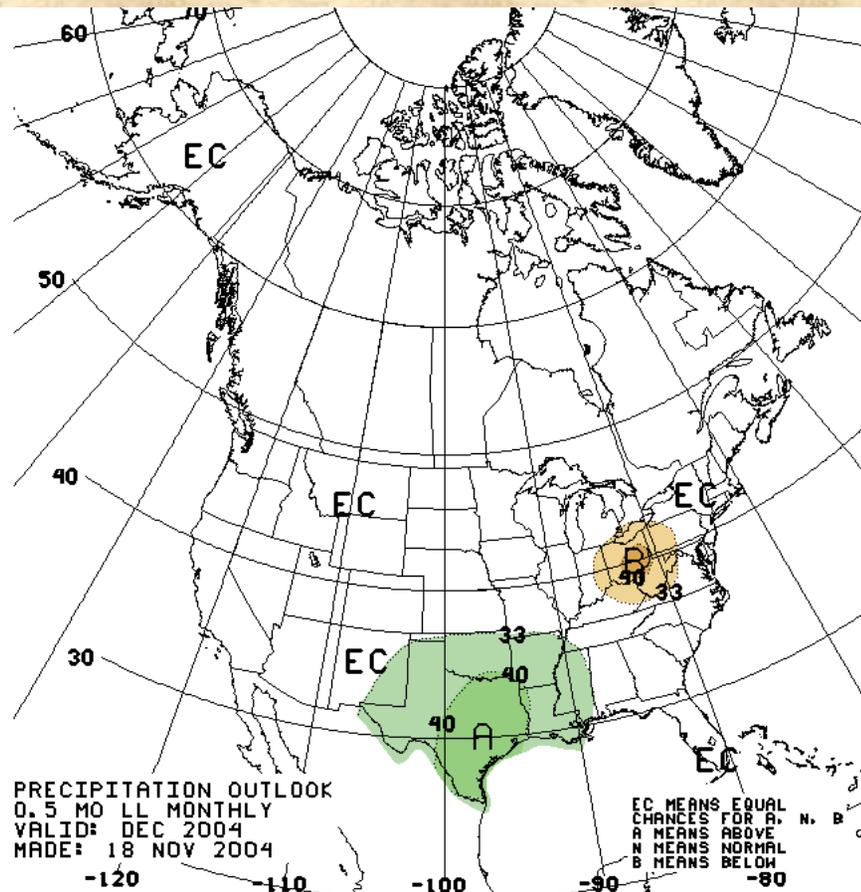
The same analysis for spring (left) shows improved prospects for almost all of AZ, NV, UT, western CO, and SW WY. If the El Niño were to grow into 2005, there would be a better chance for increased moisture over almost all of the Colorado River Basin. Given the average seasonal cycle, the Green River basin would benefit the most from this (followed by mountains of northern UT and CO), while AZ typically gets the least moisture during spring. None of the last three panels are statistically field significant.

Temperature Forecasts (CPC)



According to CPC, the upcoming December and late winter (Jan-Mar) are more likely to be warm than cold over the western U.S., due to a combination of overall trends with El Niño impacts.

Precipitation Forecasts (CPC)

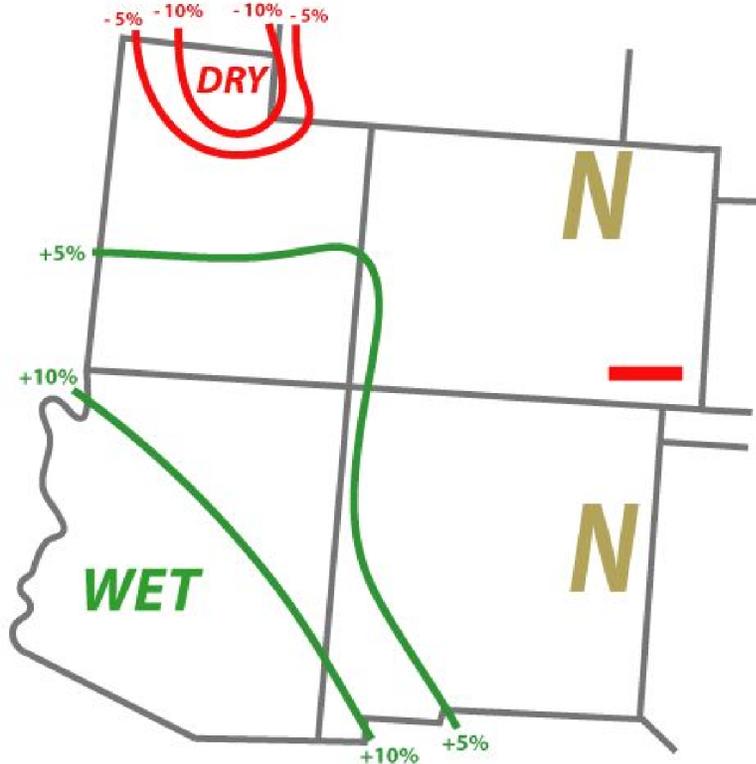


The CPC forecast for DEC'04 has increased precipitation odds over TX and surrounding states, while CO and states to the south and west fall under climatological odds ("EC"). During JAN-MAR'05, the CPC forecast highlights a risk of drier-than-normal conditions over the NW U.S., while keeping wetter-than-normal odds to our south.

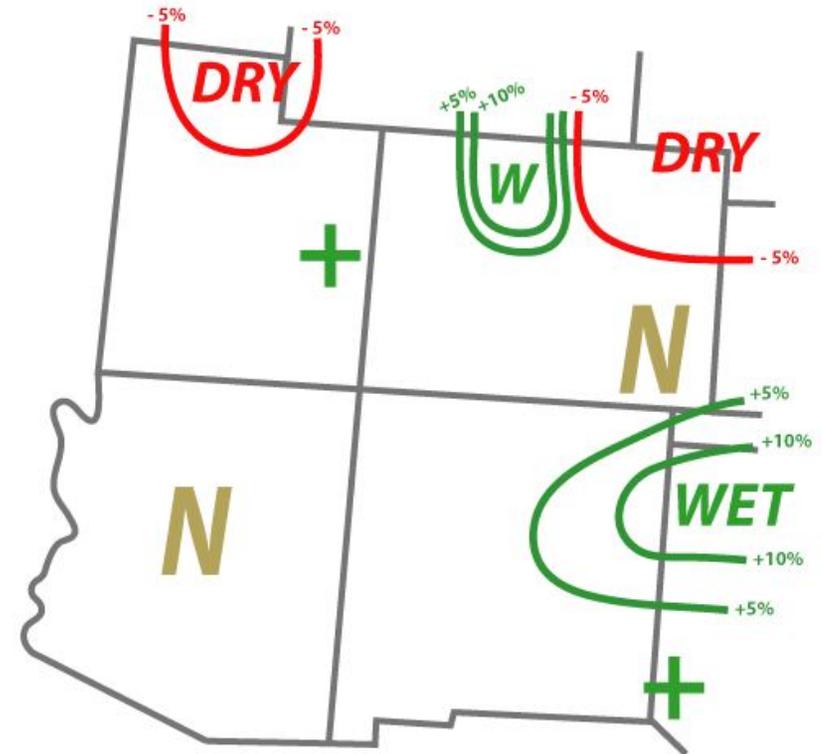
Source (for CPC forecasts): <http://www.cpc.ncep.noaa.gov/products/forecasts/>

Experimental CDC Forecasts

EXPERIMENTAL CDC JAN-MAR 2005 PRECIPITATION FORECAST
(issued September 14, 2004)



EXPERIMENTAL CDC JAN-MAR 2005 PRECIPITATION FORECAST
(issued November 17, 2004)



For JAN-MAR'05, increased odds for a wet season reach significant levels in eastern NM and the TX panhandle (right panel), as well as over the north-central mountains of CO. These are big changes compared to the forecast issued two months ago (left panel), attesting to continued volatility over the tropical Pacific. Some of the forecast features are consistent with El Niño, such as expected dryness over northern UT, and wetness in NM.

Source: Klaus Wolter (303-497-6340; klaus.wolter@noaa.gov;

<http://www.cdc.noaa.gov/people/klaus.wolter/SWcasts/>)

Executive Summary (23 November 2004)

1. The 2002-03 El Niño event ended more than a year ago. Over the last five months, the tropical Pacific has warmed yet again, and a fledgling new El Niño event has indeed developed. The current event will probably stay weaker than the one two years ago.
2. After a mixed spring (dry March, wet April, dry May), our summer ended up being quite wet and cool in the EASTERN half of Colorado, while drought conditions continued in western CO. Fall moisture has mitigated this situation somewhat over western Co, but not nearly as much as over southern CA, western AZ, and much of UT.
5. In my experimental forecasts for Jan-Mar '05, the odds for above-normal precipitation reach significant levels in eastern new Mexico and the Texas panhandle, as well as over the north-central mountains of Colorado, while weaker reverse odds apply to northern Utah and northeast Colorado.
6. Bottomline: El Niño has returned to the Pacific, but is weaker than many historic events, and appears to focus on the central rather than the eastern basin. This tilts the odds weakly towards a dry early winter in Colorado's northern mountains. On the other hand, late winter moisture may balance this out over the same region. If El Niño were to grow into next year, most of Colorado and adjacent states would improve their odds for above-normal moisture during the upcoming spring season.