



CO WATF
25 March '10
Denver



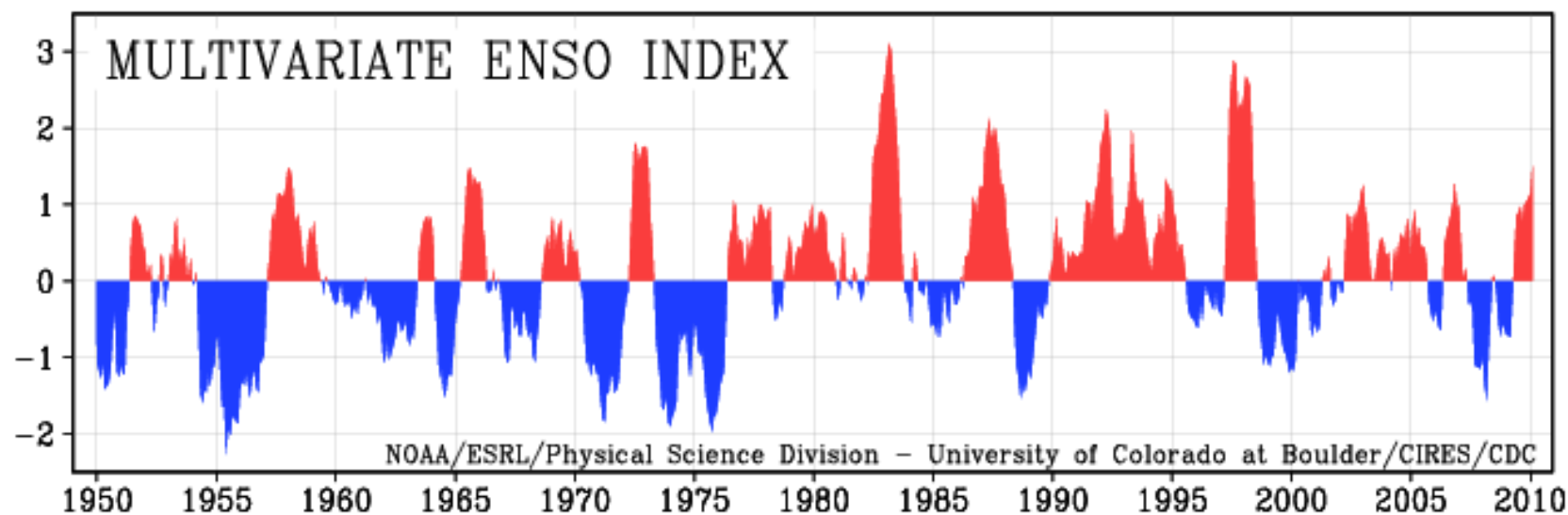
Seasonal Outlook through June 2010

Klaus Wolter (Presenter: Gary Bates, gary.bates@noaa.gov)

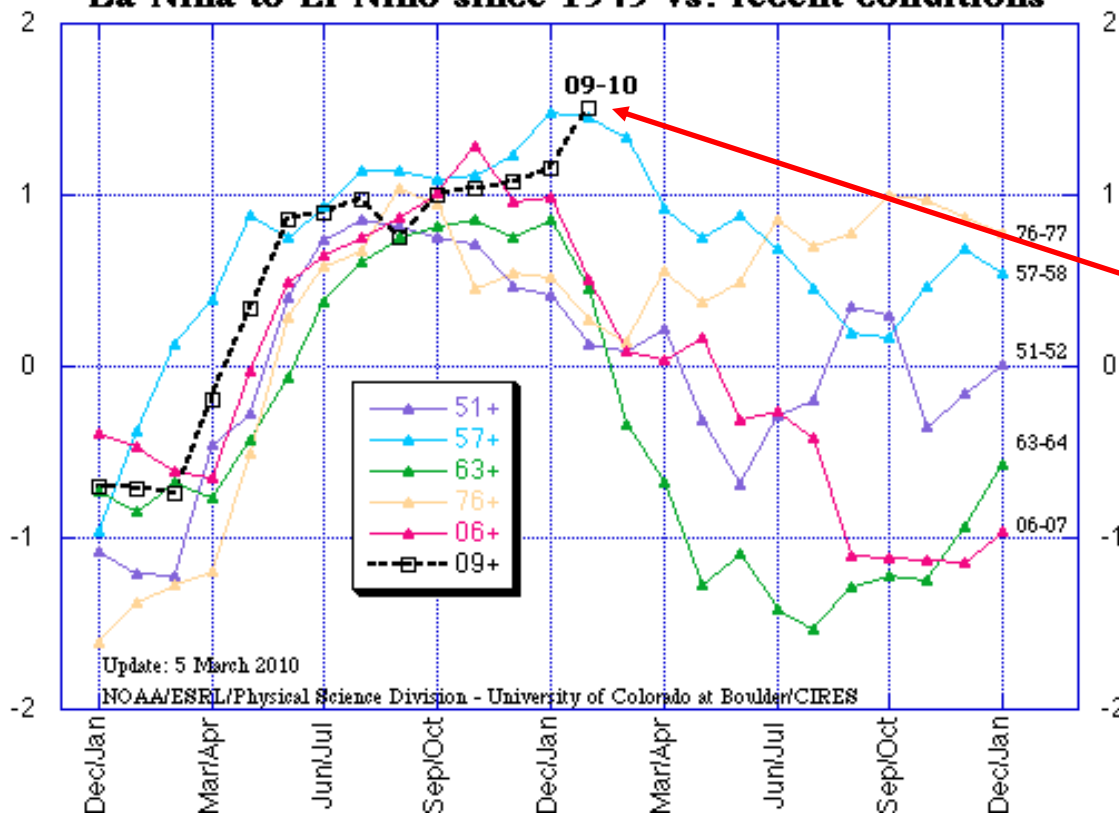
University of Colorado, CIRES & NOAA-ESRL PSD 1, Climate Analysis Branch

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

- El Niño continues...
- Recent weather & comparison with forecasts
- Expectations for next 2 weeks
- Experimental Seasonal Guidance
- CPC forecasts for April-June 2010
- Executive Summary



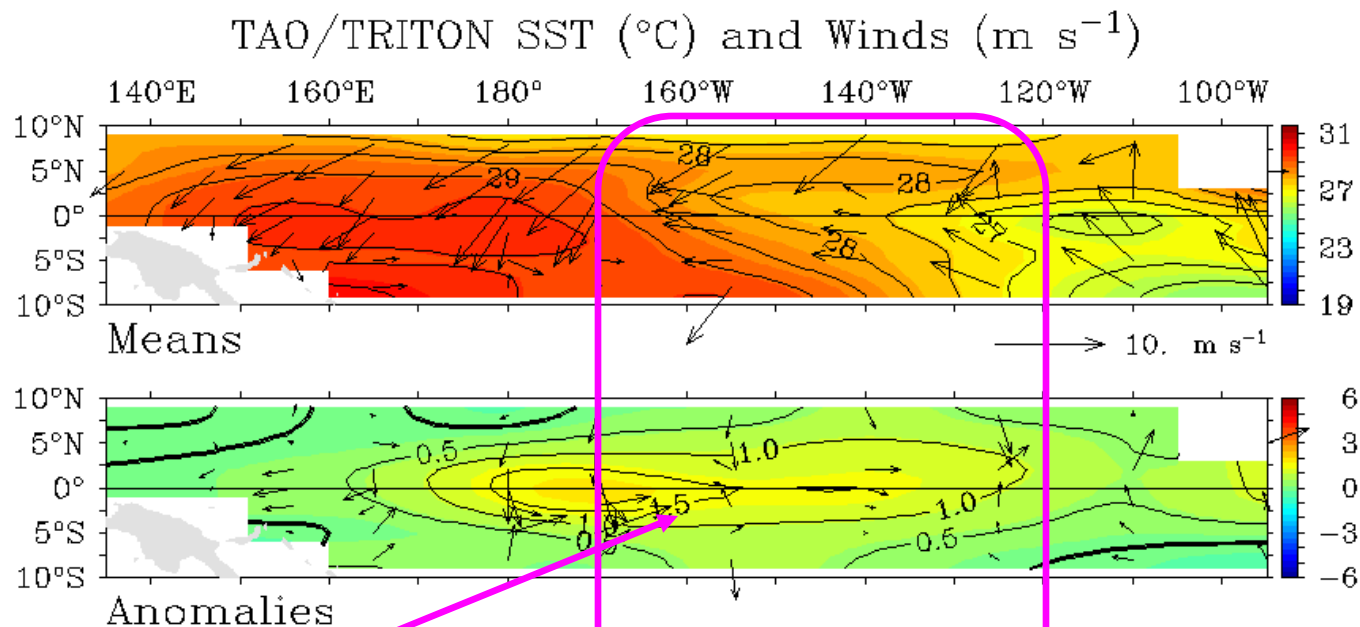
Multivariate ENSO Index (MEI) for 5 transitions from La Niña to El Niño since 1949 vs. recent conditions



**El Niño going steady,
probably peaked in
January-February - its
strength was highest
since 1997-98**

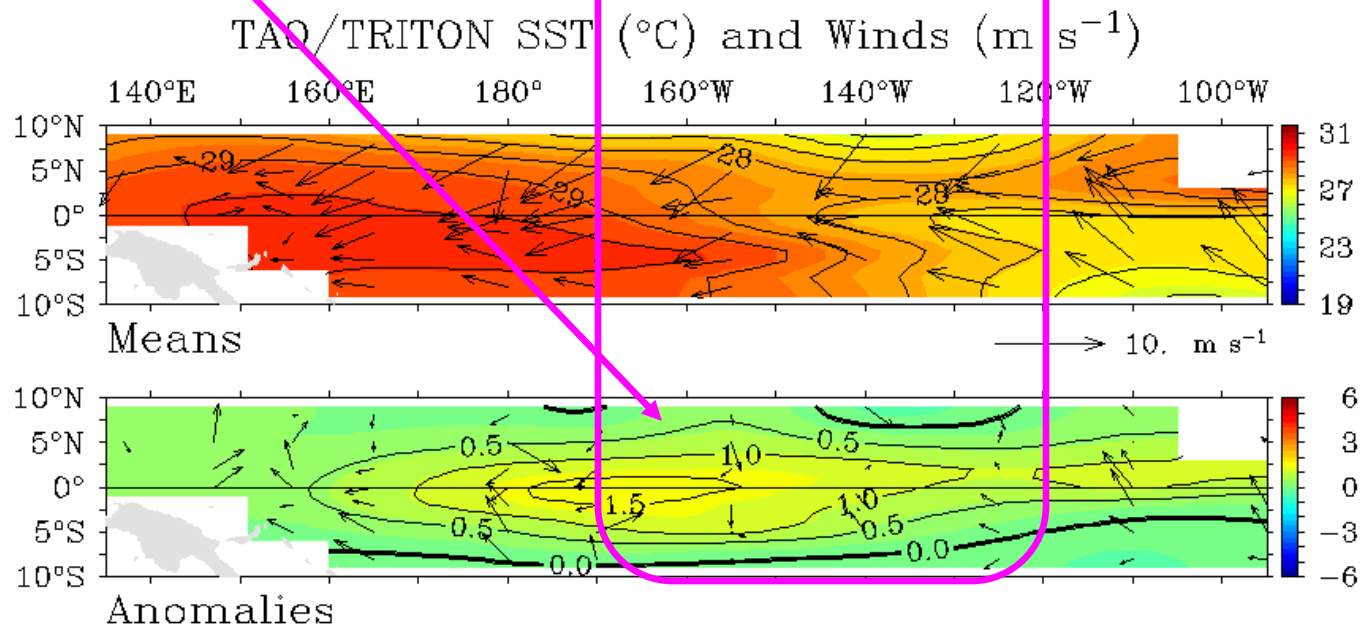
Current state of ENSO (bottom) compared to last month (top): warm event hasn't changed much.

Warm anomalies still concentrated in central Pacific, with a little warming east of the Niño 3.4 region; wind anomalies are mostly weak.



Five-Day Mean Ending on February 23 2010

Niño 3.4

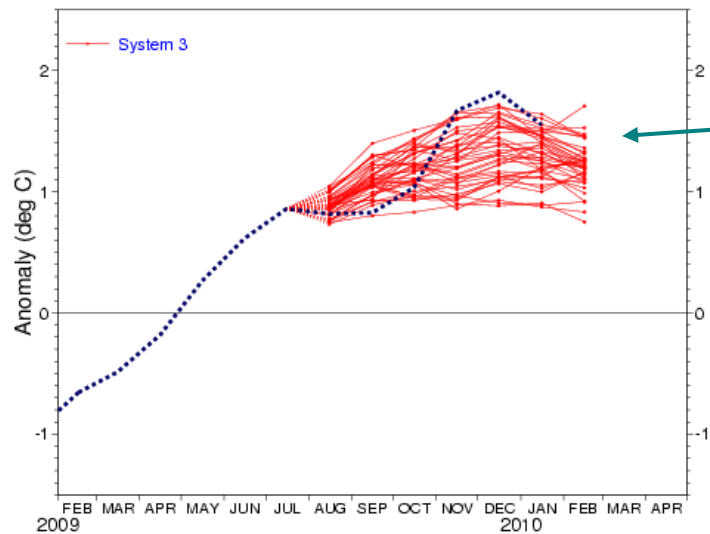


Five-Day Mean Ending on March 23 2010

NINO3.4 SST anomaly plume

ECMWF forecast from 1 Aug 2009

Monthly mean anomalies relative to NCEP adjusted Olv2 1971-2000 climatology



Forecast issue date: 15 Aug 2009

ECMWF

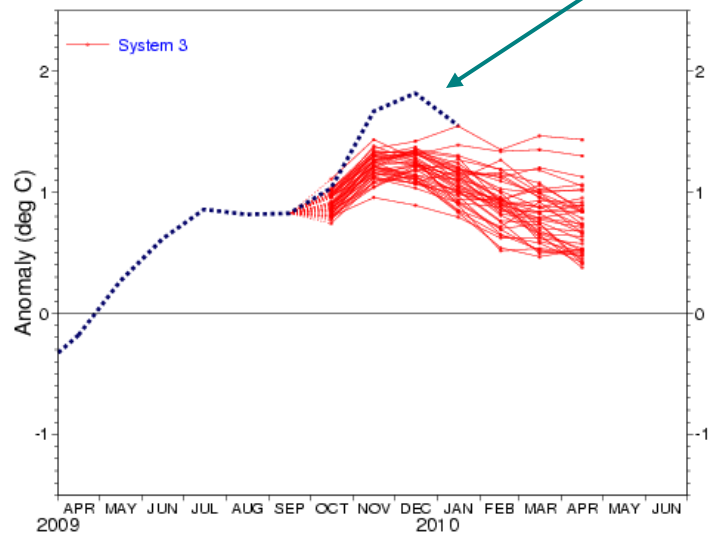
The European model's August '09 forecast (left) had the right idea about a moderate-sized El Niño event;

It did not get all the details right (bottom left) – in particular the two growth spurts in early summer and fall;

NINO3.4 SST anomaly plume

ECMWF forecast from 1 Oct 2009

Monthly mean anomalies relative to NCEP adjusted Olv2 1971-2000 climatology



Forecast issue date: 15 Oct 2009

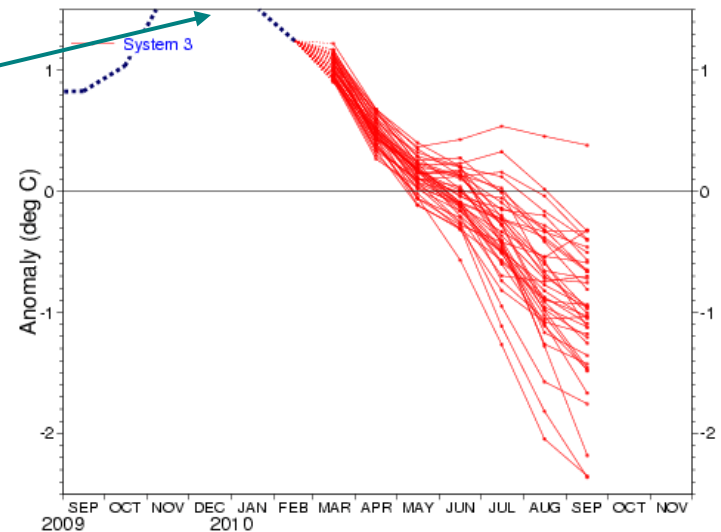
ECMWF

After January's peak, nearly all ensemble members show a rapid transition to La Niña by the summer.

NINO3.4 SST anomaly plume

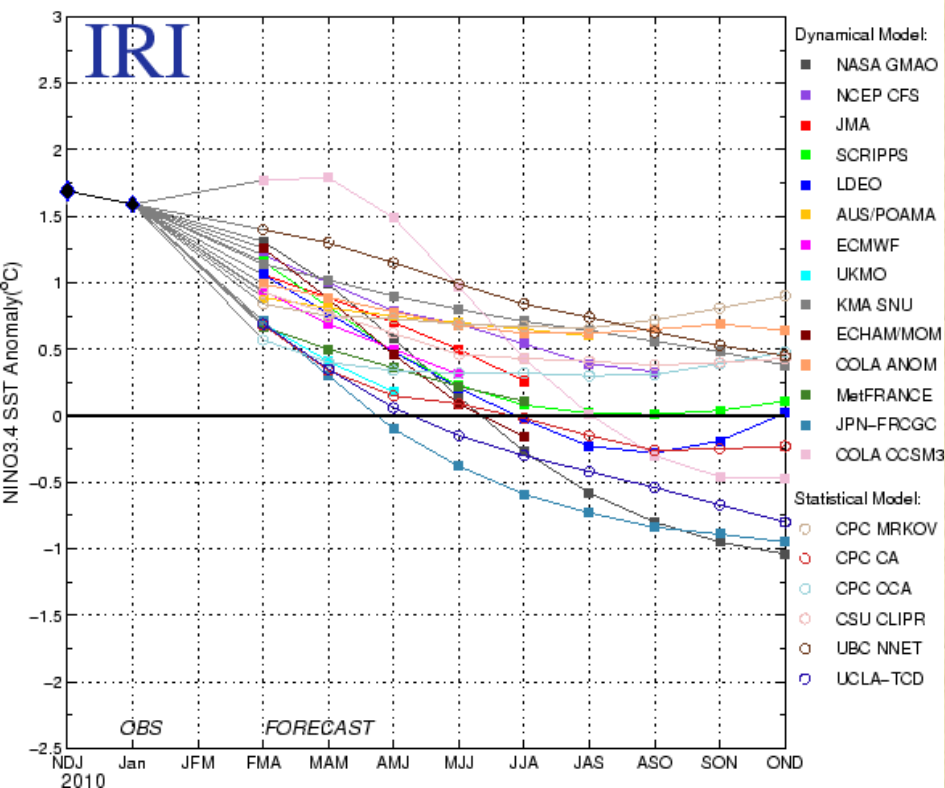
ECMWF forecast from 1 Mar 2010

Monthly mean anomalies relative to NCEP adjusted Olv2 1971-2000 climatology



Forecast issue date: 15 Mar 2010

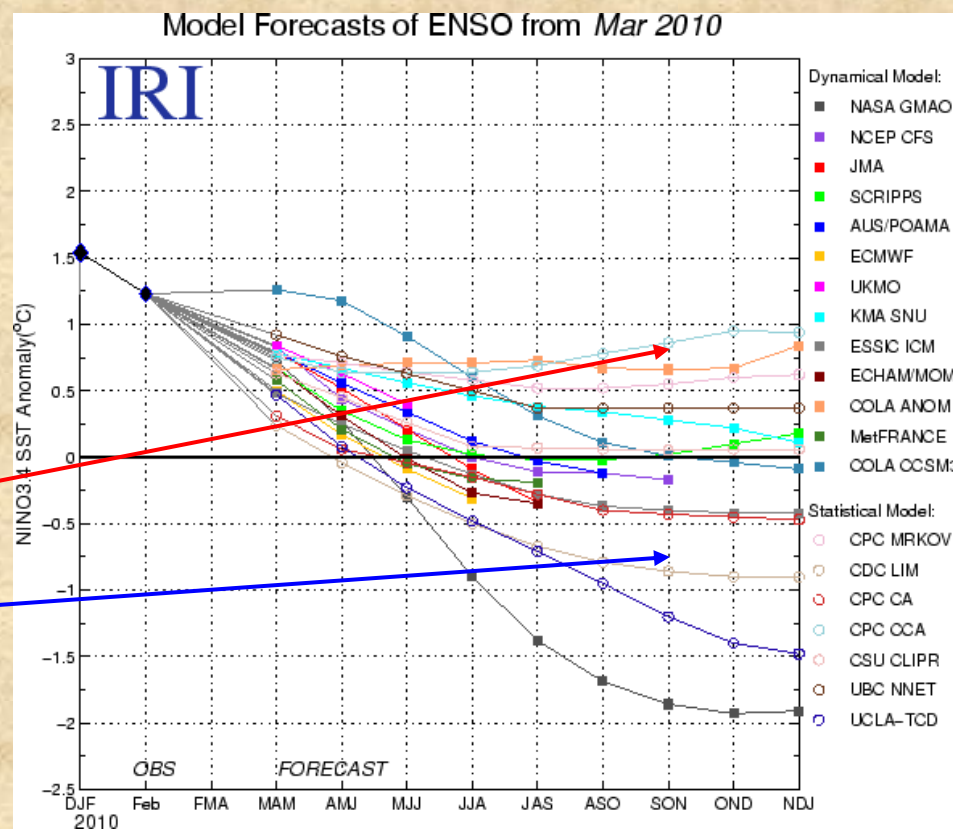
ECMWF



ENSO forecasts from almost two dozen dynamical & statistical forecast models (below) vs. last month's (left). Declining values have been predicted almost unanimously for several months now, but there is little agreement on the forecast for this fall and winter (spread has increased since last month).

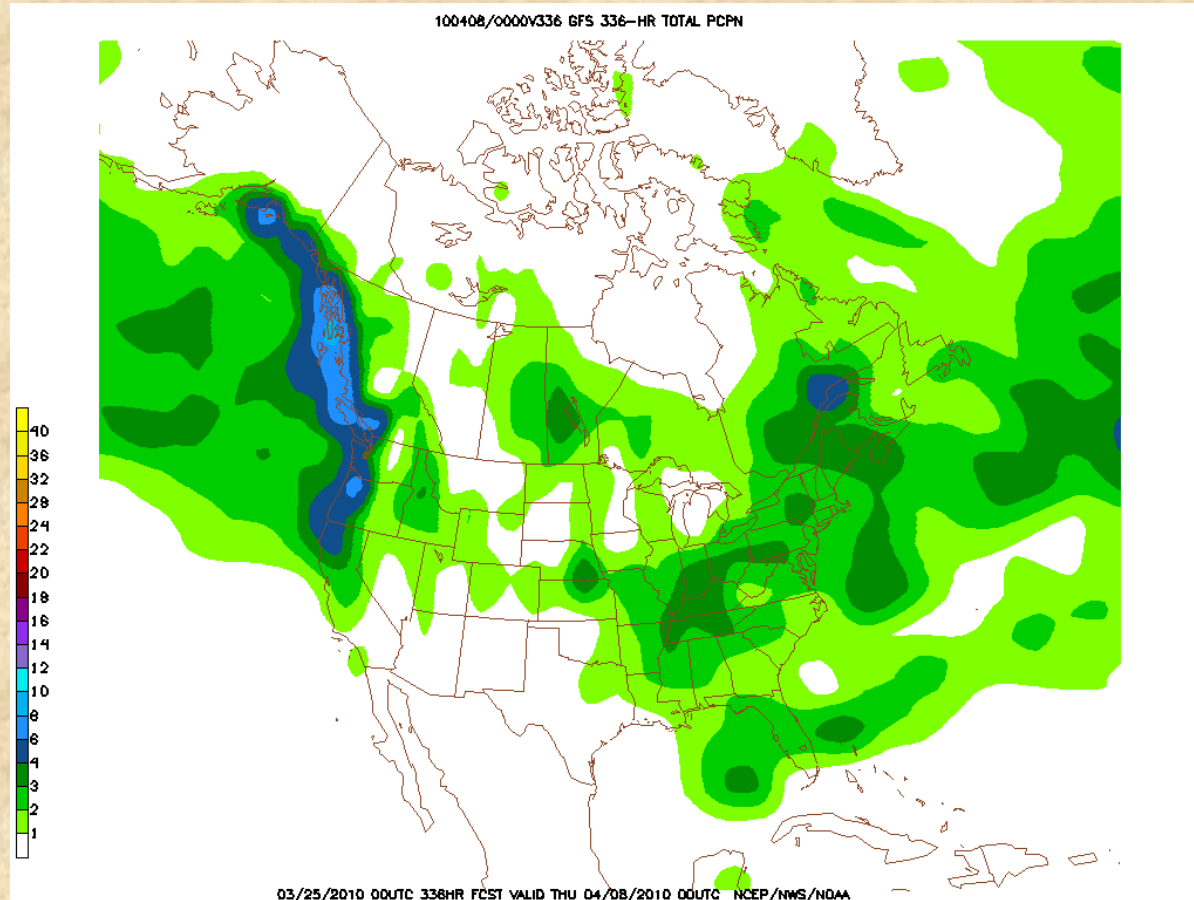
This El Niño will be a factor at least through May, with neutral conditions most likely this summer.

About an equal chance of El Niño continuing or switching to La Nina by the fall.



What can we expect in the next two weeks?

Two week precipitation from Global Forecast System (GFS) --- yesterday's run from 6pm.



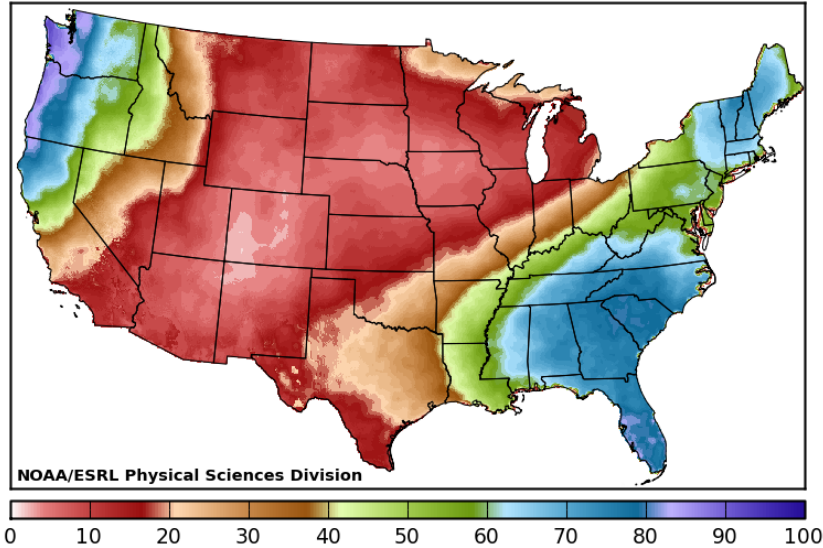
BOTTOM LINE: the GFS gives most of our state 1+” of moisture over the next two weeks, nothing extraordinary. This model has shown a lot of run-to-run variability in the last few weeks.

What can we expect in the next two weeks?

Analog Prob Precip > 67th Percentile

4-6 day forecast, from 00Z 25 Mar 2010

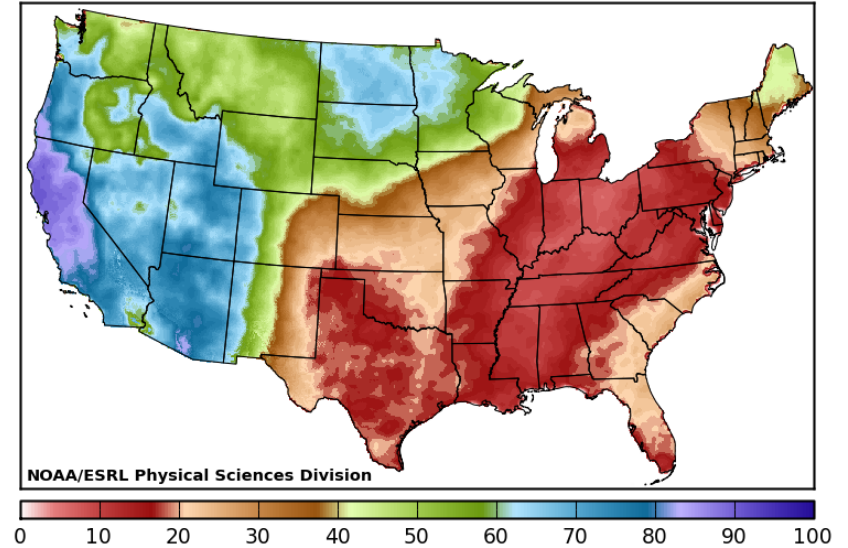
Valid 28 Mar - 30 Mar



Analog Prob Precip > 67th Percentile

6-10 day forecast, from 00Z 25 Mar 2010

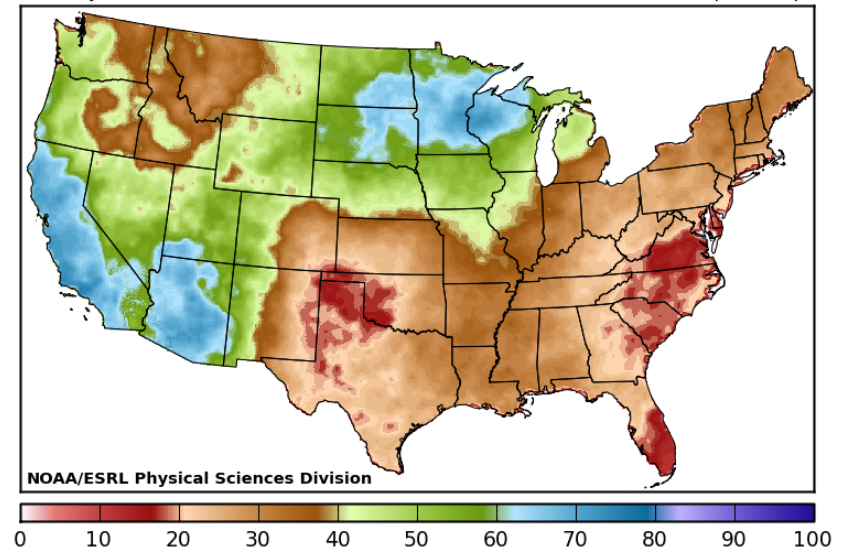
Valid 30 Mar - 03 Apr



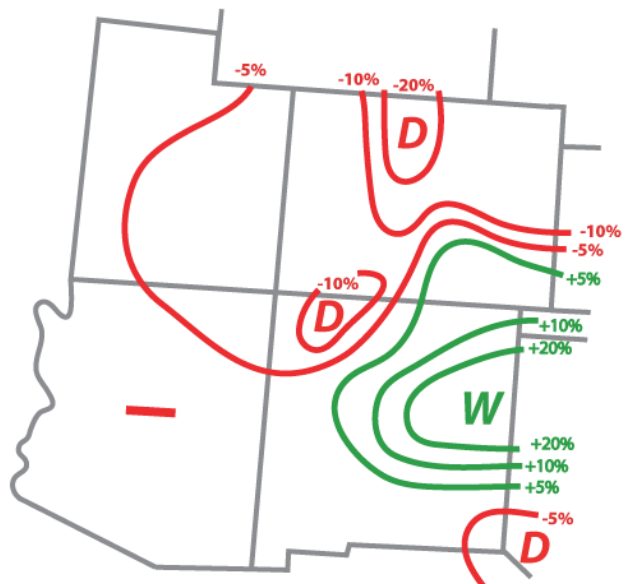
Analog Prob Precip > 67th Percentile

8-14 day forecast, from 00Z 25 Mar 2010

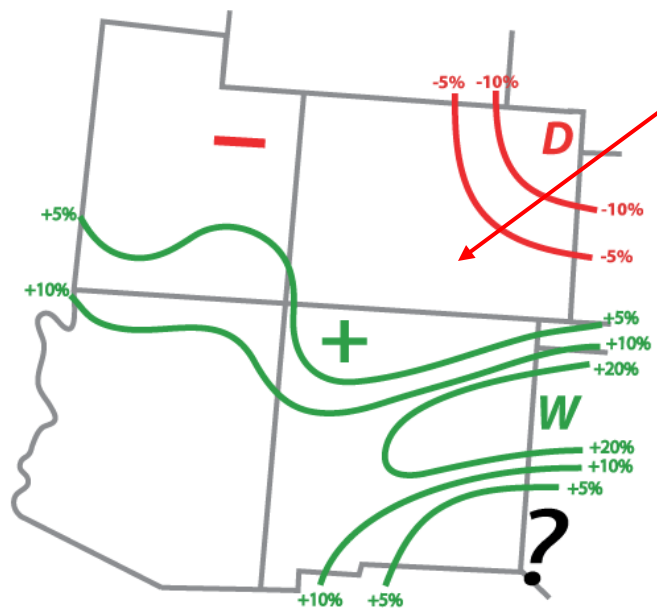
Valid 01 Apr - 07 Apr



Precipitation chances for 4-6, 6-10, and 8-14 days from last night's runs start out with a short warm, dry spell over Colorado (Sun thru Tues, top left); after that, a classic extended Pacific jet stream appears to benefit the western states WEST of Colorado (top right), with some of it 'trickling through' to our state by the 1st week of April (8-14 day fcst, right).



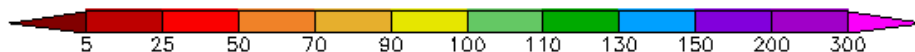
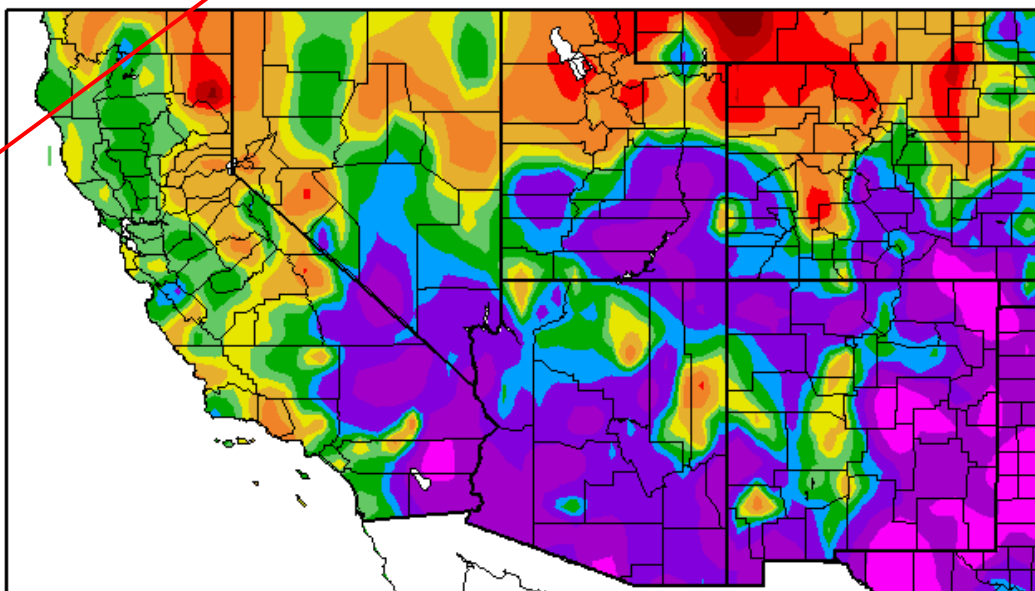
EXPERIMENTAL PSD PRECIPITATION FORECAST GUIDANCE
JAN - MAR 2010 (issued September 29, 2009)



Experimental Forecast Guidance

Forecasts for January-March 2010 from early January (left) and September (bottom left) appear to confirm a peculiar trait of my winter forecasts: longer-lead forecasts have been consistently *better* over the last 10 years than shorter-lead ones (bottom right shows precipitation anomalies so far this year).

Percent of Normal Precipitation (%)
1/1/2010 - 3/22/2010

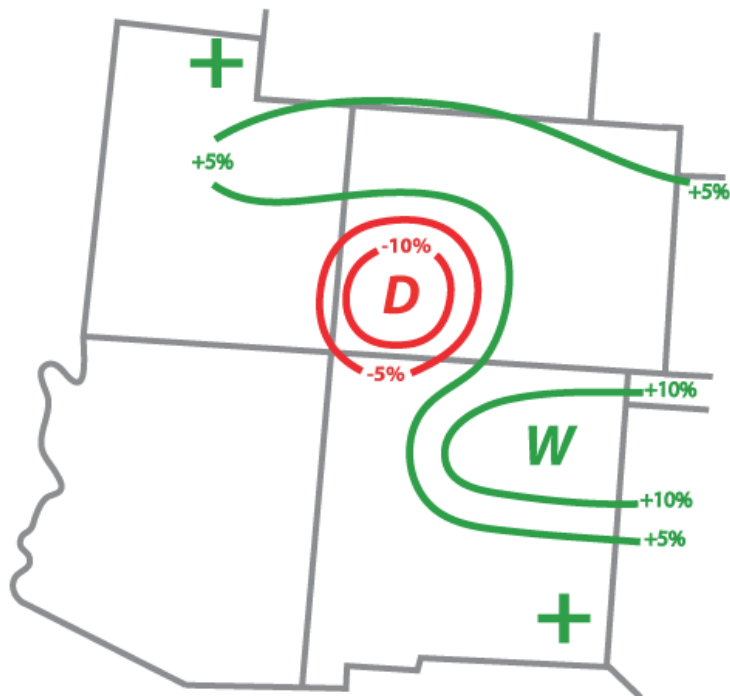


Experimental Forecast Guidance

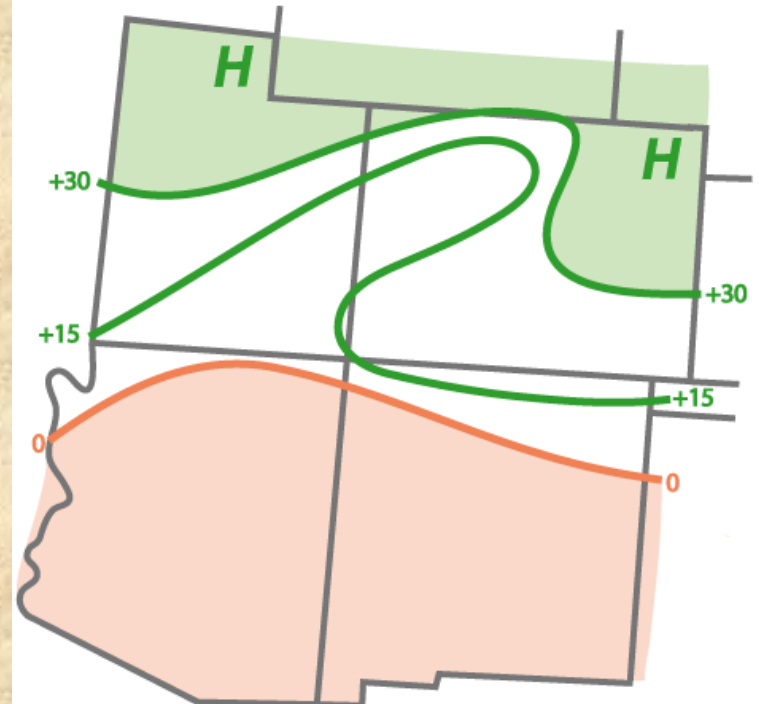
Most recent forecast for April-June 2010 precipitation (bottom left) shows slightly increased chances of above-average moisture for most of Colorado – *this is also the best season for verified forecast skill in our state over the 2000-2009 period (bottom right)!*

Area of concern: Southwestern Colorado, but their snowpack is good, and they don't depend as much on the spring season as the Front Range!

EXPERIMENTAL PSD PRECIPITATION FORECAST GUIDANCE
APR-JUN 2010 (issued March 18, 2010)

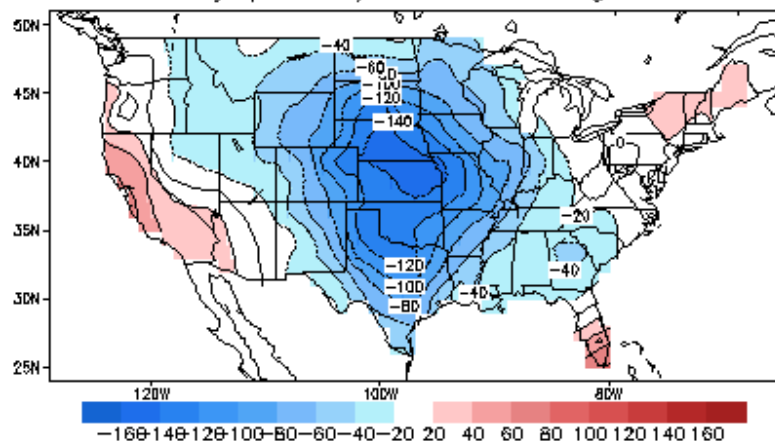


EXPERIMENTAL PSD PRECIPITATION FORECAST SKILL
APR-JUN 2000-2009 (Lead: +0.5 Months)

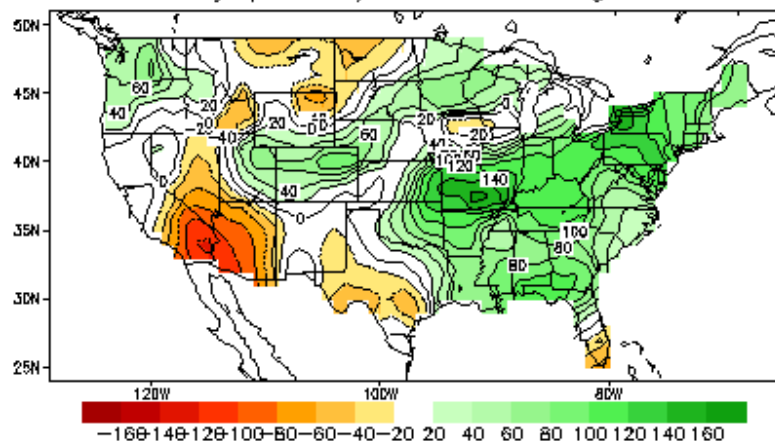


CPC Analog Forecasts

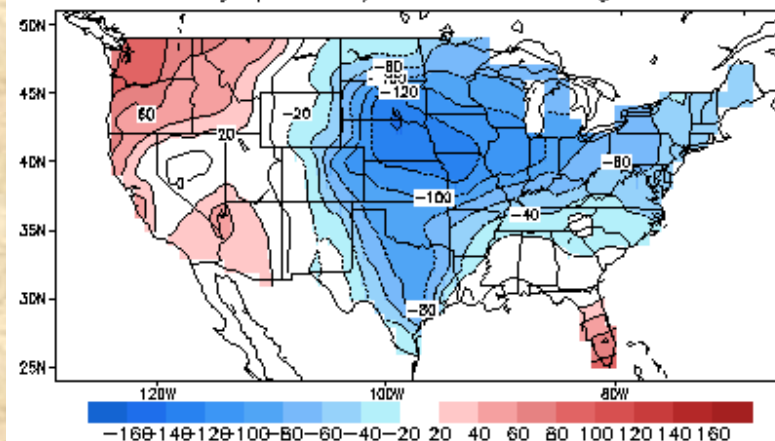
Lagged Averaged Temperature Outlook for APR 2010
units: anomaly (sdX100), SM data ending at 20100323



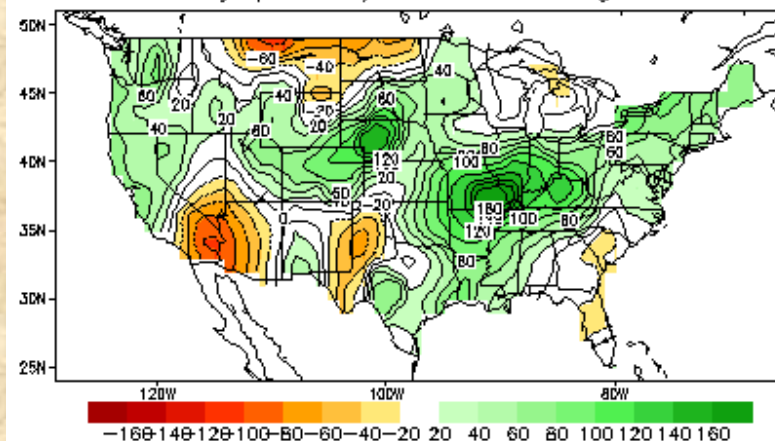
Lagged Averaged Precipitation Outlook for APR 2010
units: anomaly (sdX100), SM data ending at 20100323



Lagged Averaged Temperature Outlook for AMJ 2010
units: anomaly (sdX100), SM data ending at 20100323

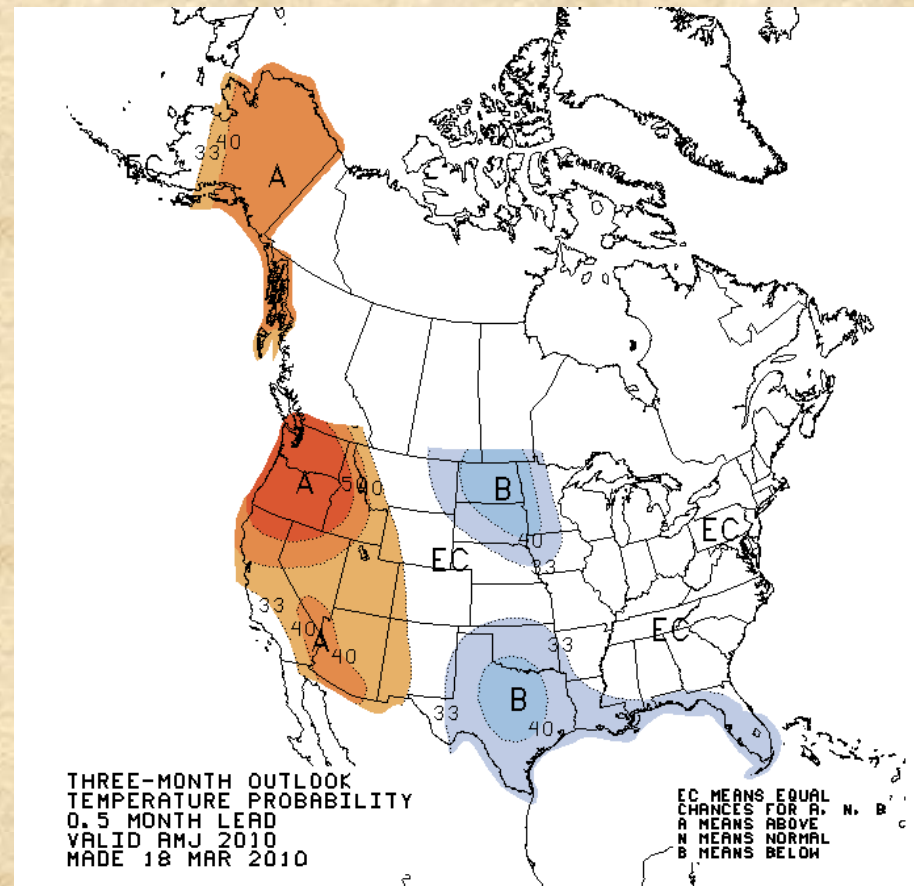
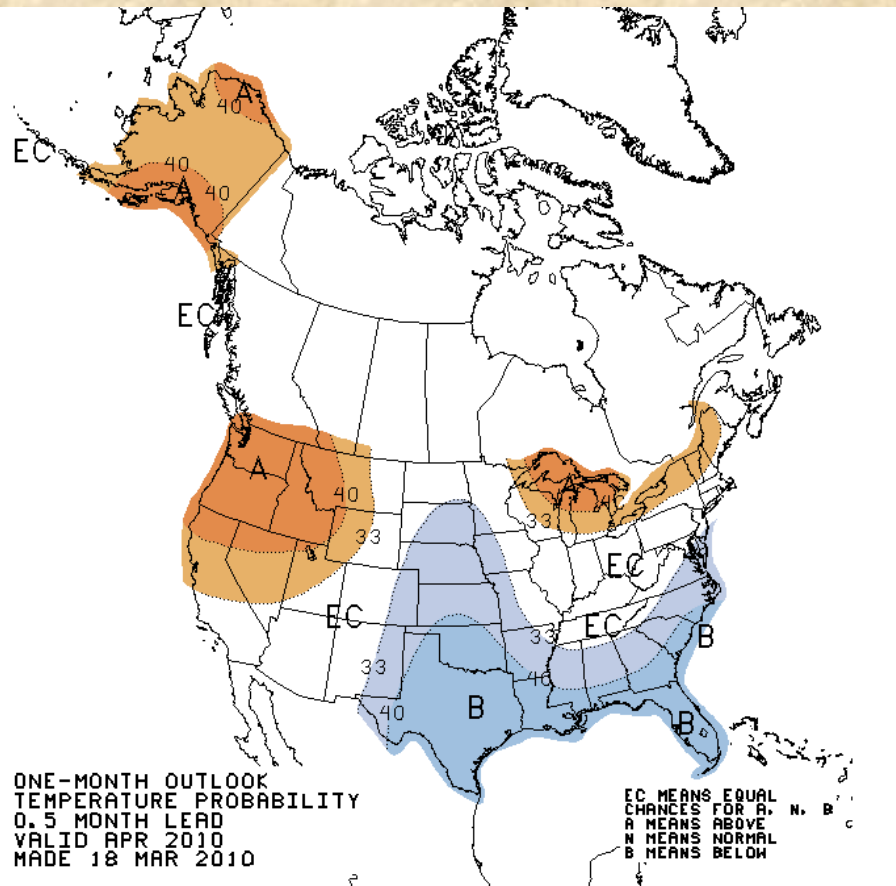


Lagged Averaged Precipitation Outlook for AMJ 2010
units: anomaly (sdX100), SM data ending at 20100323



According to CPC's latest soil-moisture analog forecast, April (left) and April-June (right) look cool and wet for Colorado, consistent with many El Niño 'analog'!
Source: <http://www.cpc.noaa.gov/soilmst/cas.shtml>

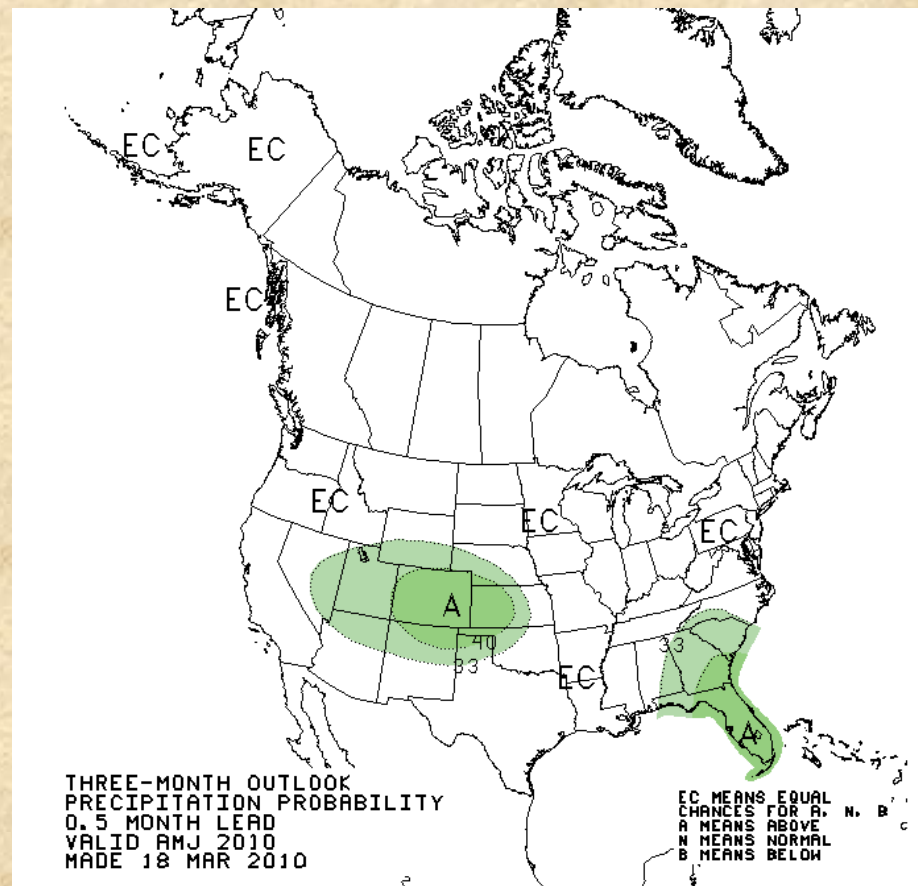
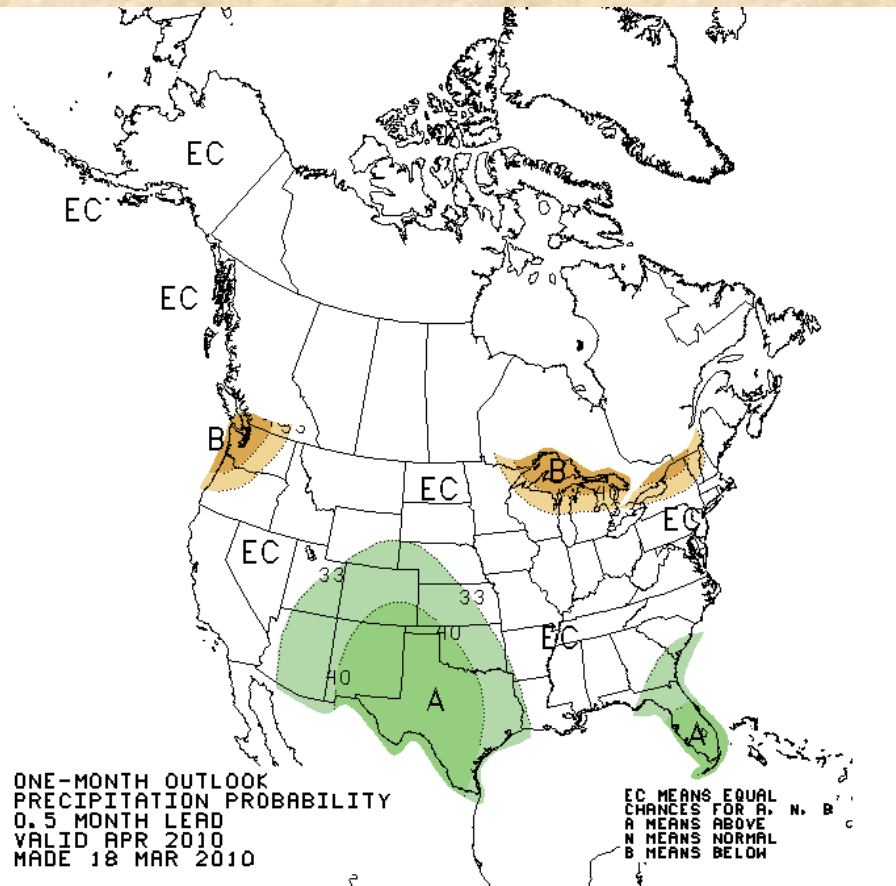
CPC Temperature Forecasts



According to CPC's latest forecast, April (left) and April-June (right) temperature forecasts start out with typical El Niño coolness in the southeastern half of the country, including SE Colorado, but evolve towards warmer temperatures in much of the Southwest, the signal from long-term trends, after the assumed demise of El Niño.

Source: <http://www.cpc.ncep.noaa.gov/products/predictions/>

CPC Precipitation Forecasts



According to CPC's latest forecast, April (left) and April-June (right) precipitation forecasts start out with a moderate El Niño-related tilt of above-normal precipitation in Colorado, apparently supported by the Coupled Model Forecast System (CFS).

Source: <http://www.cpc.ncep.noaa.gov/products/predictions/>

Updated Executive Summary (24 March 2010)

- 1. The El Niño event of 2009-10 appears to have peaked recently, but its effects should linger well into our spring season.**
- 2. The last four weeks have brought above-average moisture to much of CO, but northwestern CO has remained drier-than-average. Below-normal temperatures have delayed the snowmelt. The next two weeks will see an initial dry-out and warm-up, followed by a renewed active stormtrack into the Western U.S.**
- 3. Experimental forecast guidance for the late spring season (April-June) is favorable for a wet spring across northern and eastern CO, much of this consistent with lingering El Niño effects. A dry forecast for southwestern CO contradicts typical El Niño outcomes, but follows on the heels of a wet winter.**
- 4. Bottomline: The moderate El Niño of 2009-10 shifted the main stormtrack southwards as expected, dropping above-average moisture over much of AZ and NM. During spring, this stormtrack should move northward to benefit areas of northern CO which have been dry this winter. While this likely will not be sufficient to make up for all of the 'lost ground' in northern UT and CO, the water supply outlook should improve by early May compared to recent forecasts.**

Klaus' forecasts: <http://www.esrl.noaa.gov/people/klaus.wolter/SWcasts/>