NOAA-CIRES Climate Diagnostics Center

CO WATF
20 April '10
Denver

Western Water Assessment

Seasonal Outlook through September 2010

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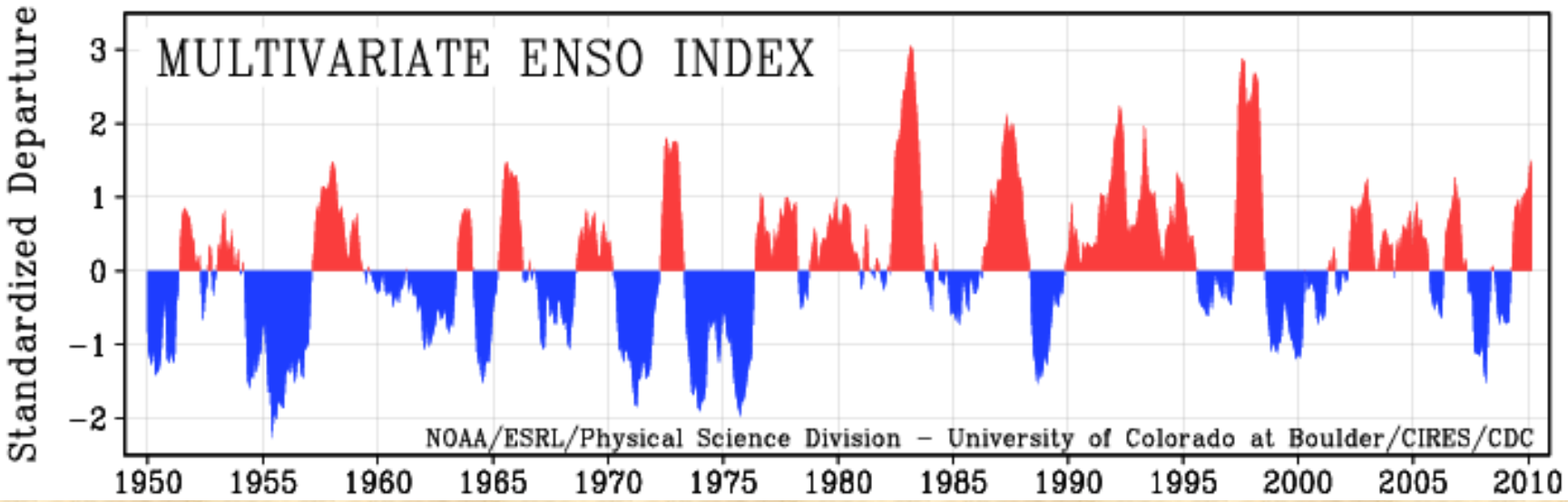
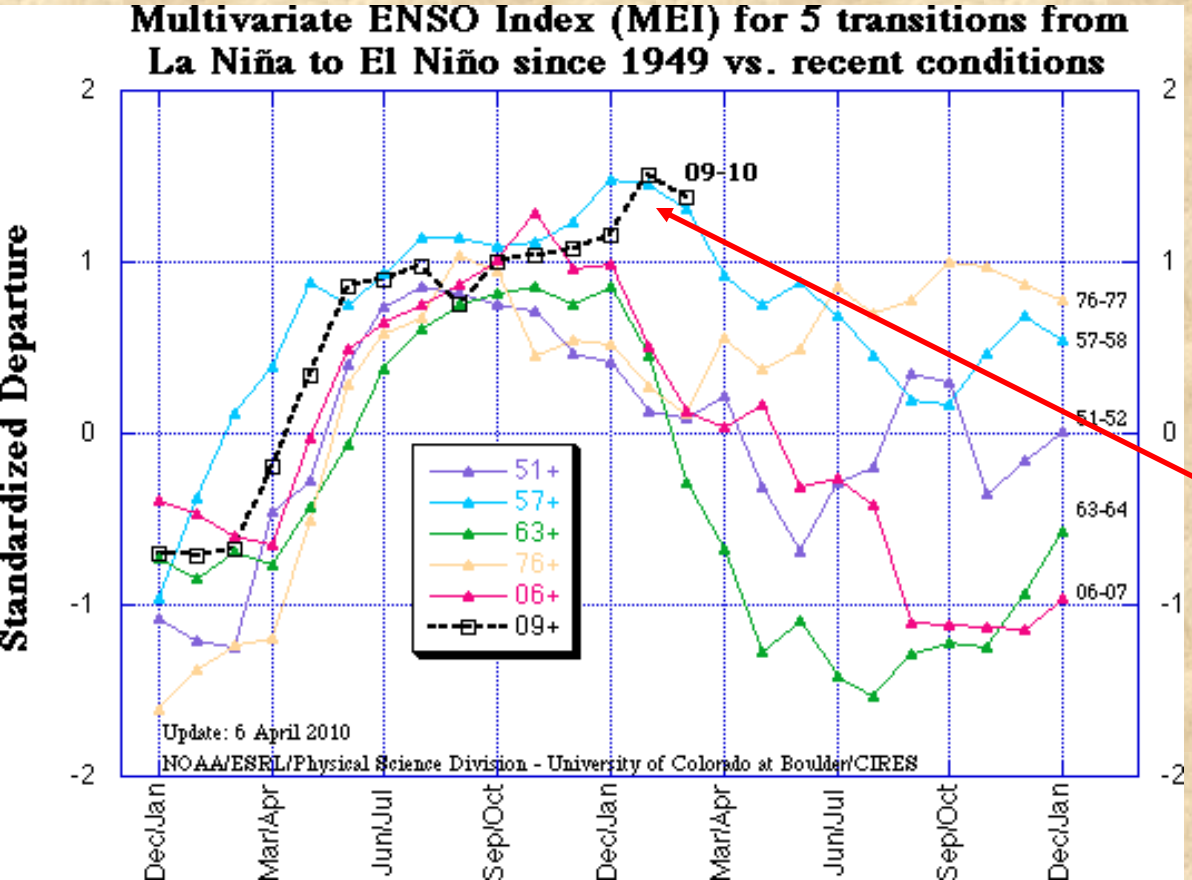
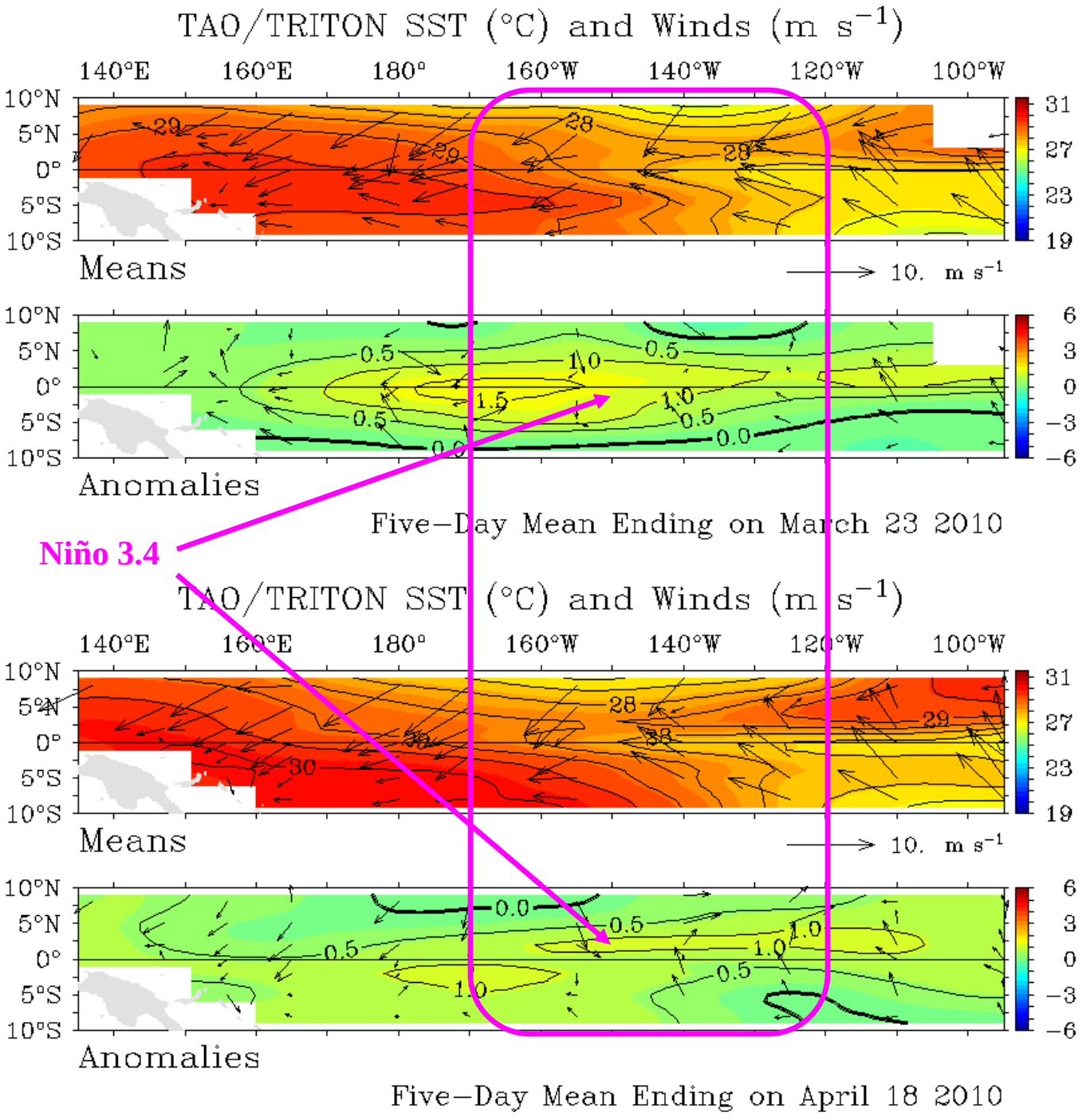
- **El Niño starting to fade?!**
- **Recent weather & comparison with forecasts**
- **Expectations for next few weeks**
- **Experimental Seasonal Forecast Guidance**
- **CPC forecasts for May-July through July-September**
- **Executive Summary**

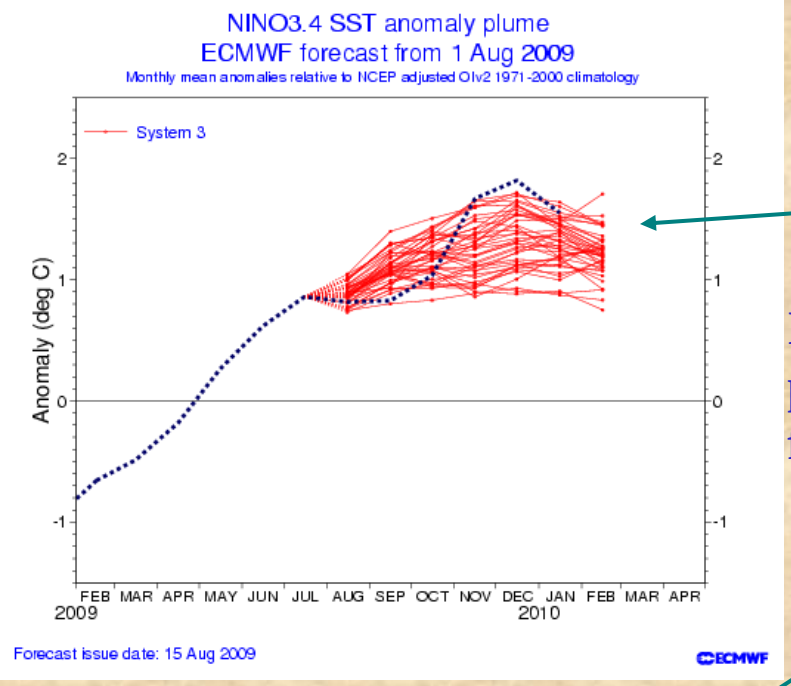




El Niño probably peaked in January-February - its strength was highest since 1997-98

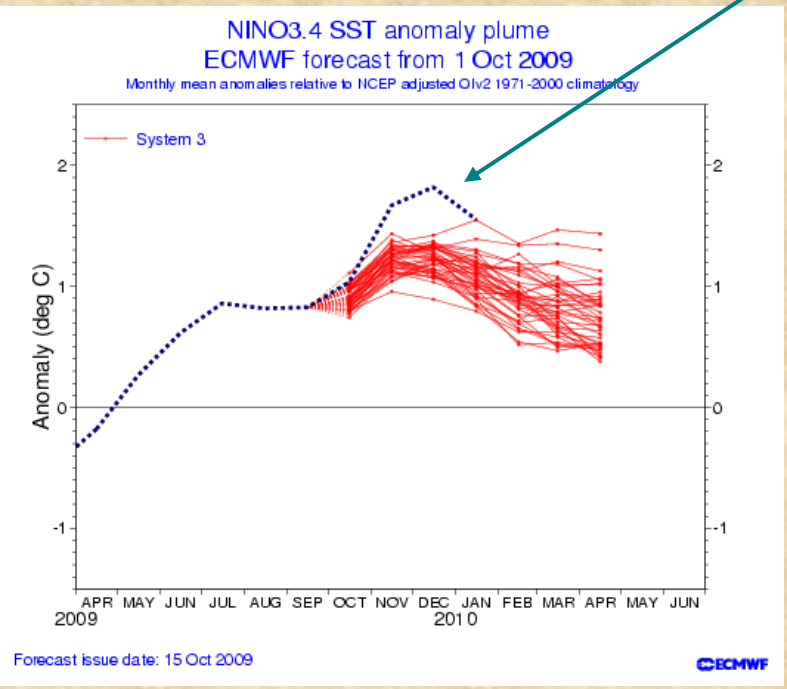
Current state of ENSO (bottom) compared to last month (top): warm event has weakened, still near +1°C; wind anomalies are mostly weak, and not conducive to renewed growth.



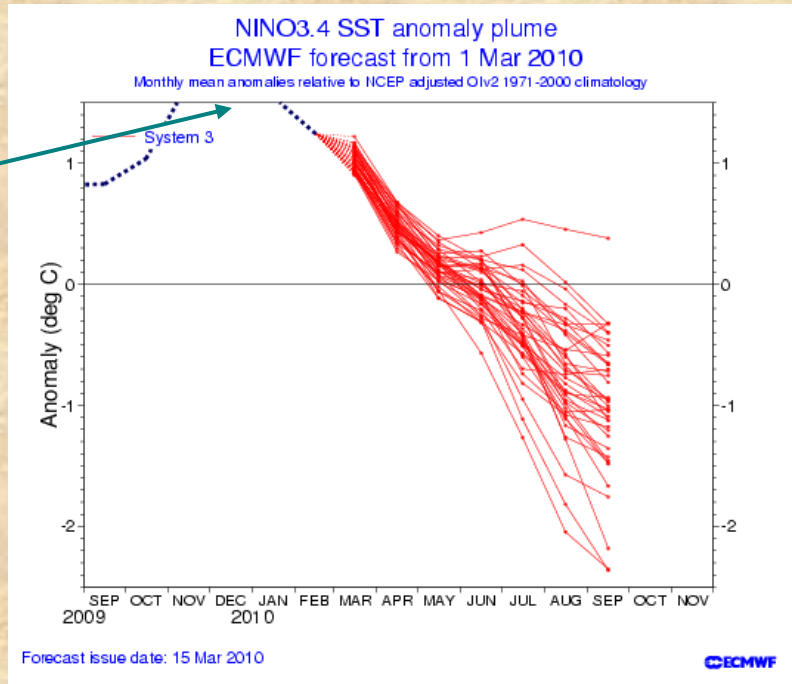


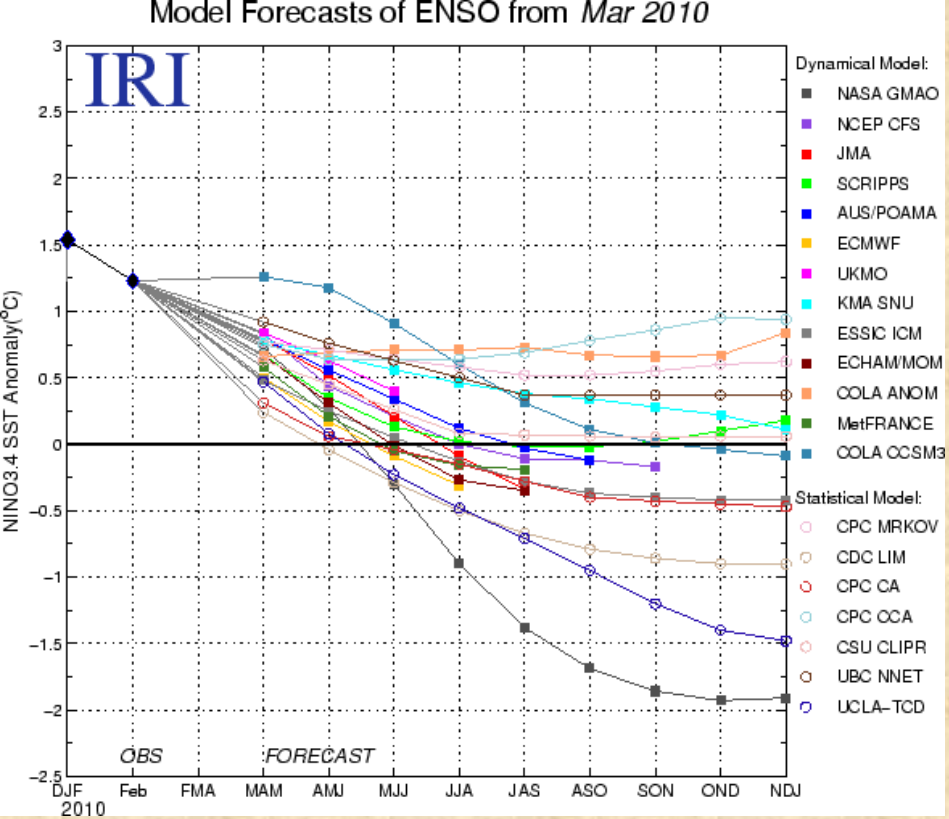
The European model's August '09 forecast (left) had the right idea about a moderate-sized El Niño event;

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

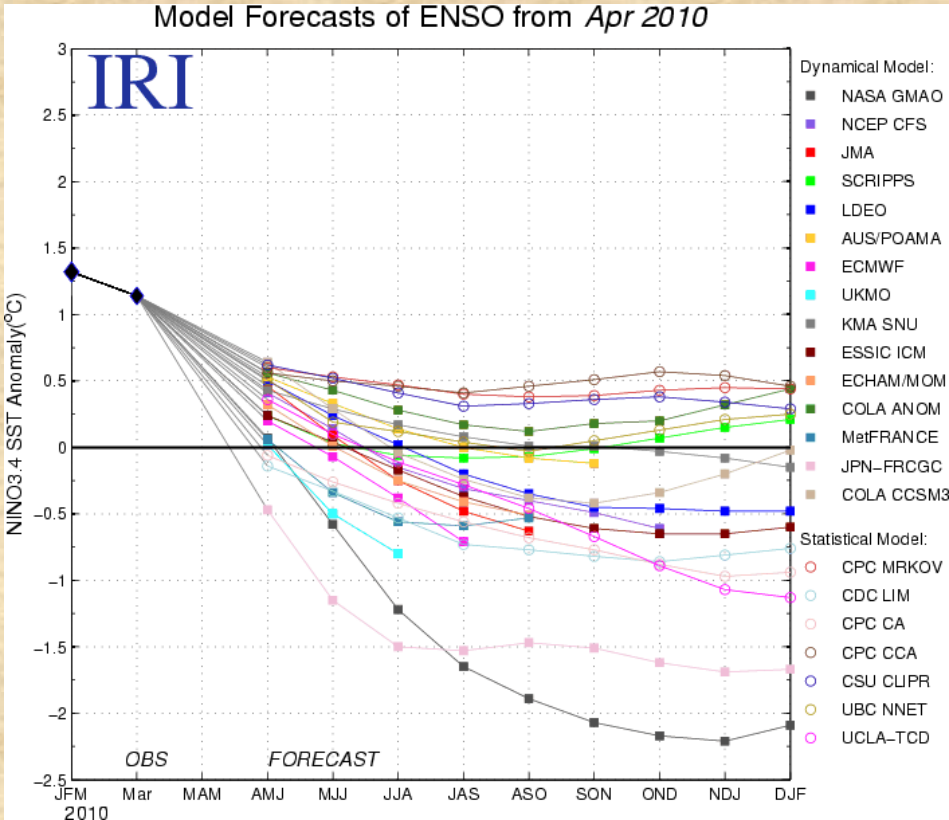


After January's peak, this model goes for a rapid transition into La Niña by the summer.

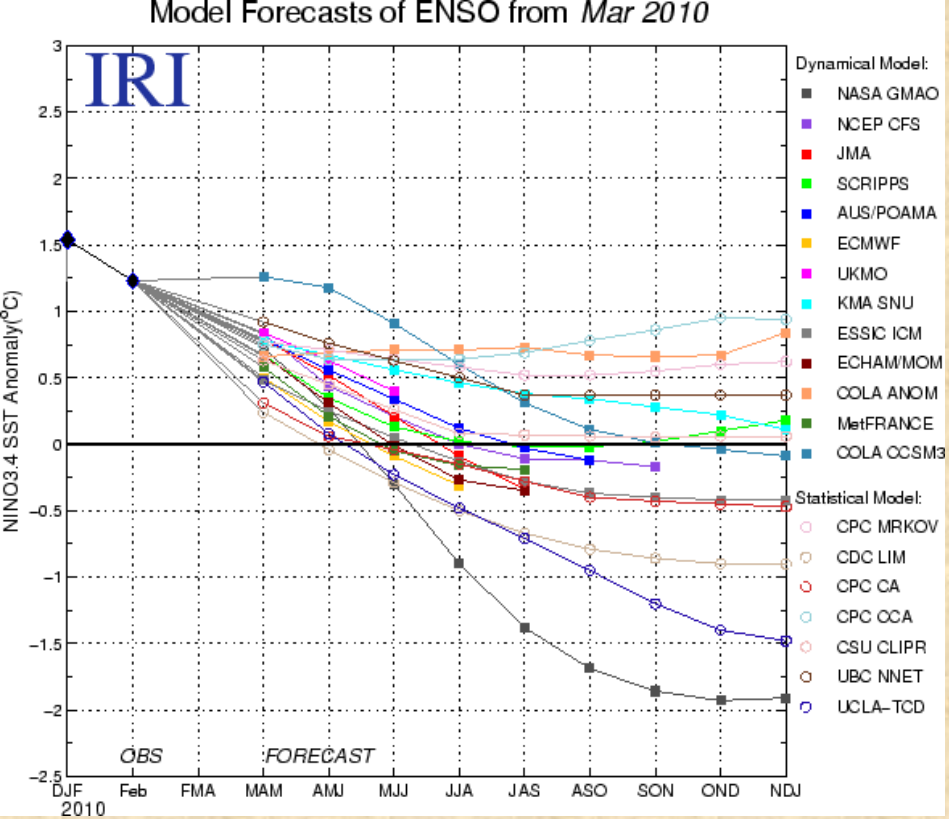




ENSO forecasts from almost two dozen dynamical & statistical forecast models (below) vs. last month's (left). Declining values have been predicted unanimously for several months now, but there are still a couple of statistical 'minority-opinions' that try to hang on to at least weak El Niño conditions for the next 6-9 months, while a few models each 'run away' with La Niña earlier or later this year.



This El Niño will remain a factor at least through May, with neutral conditions most likely this summer, most likely switching to La Niña by the fall. After reverting back to negative values in November, the PDO rose above +0.8 in both January and February, followed by a drop to +0.4 in March – will it stay above 0? Two-year El Niño events are more likely with positive PDO values.



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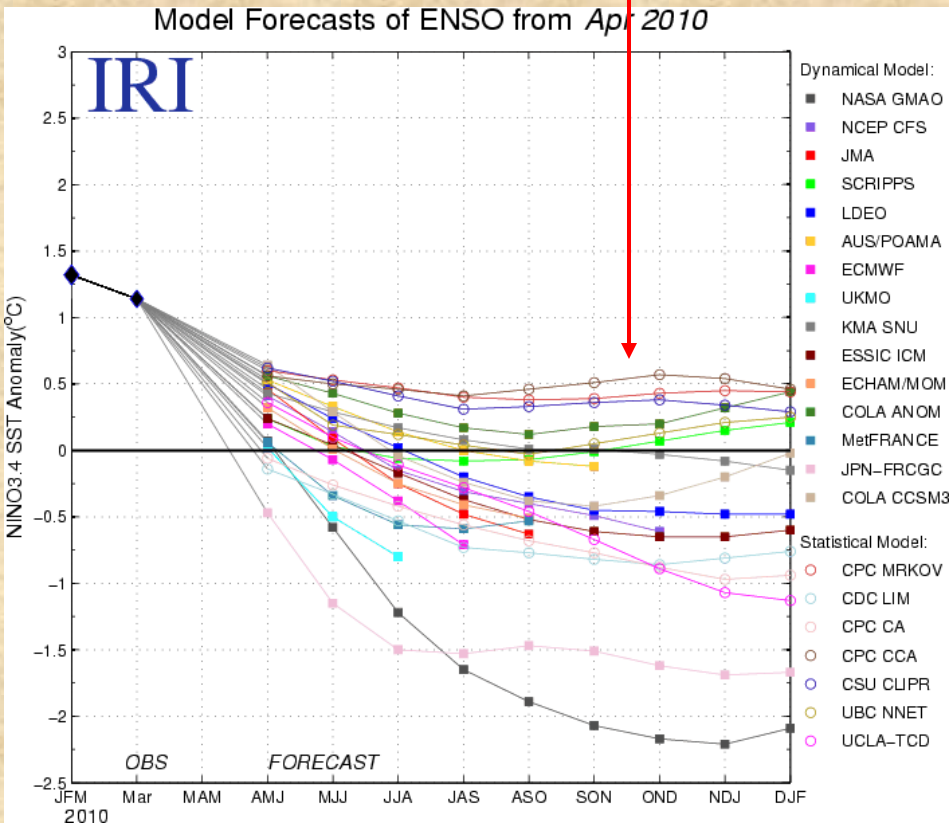

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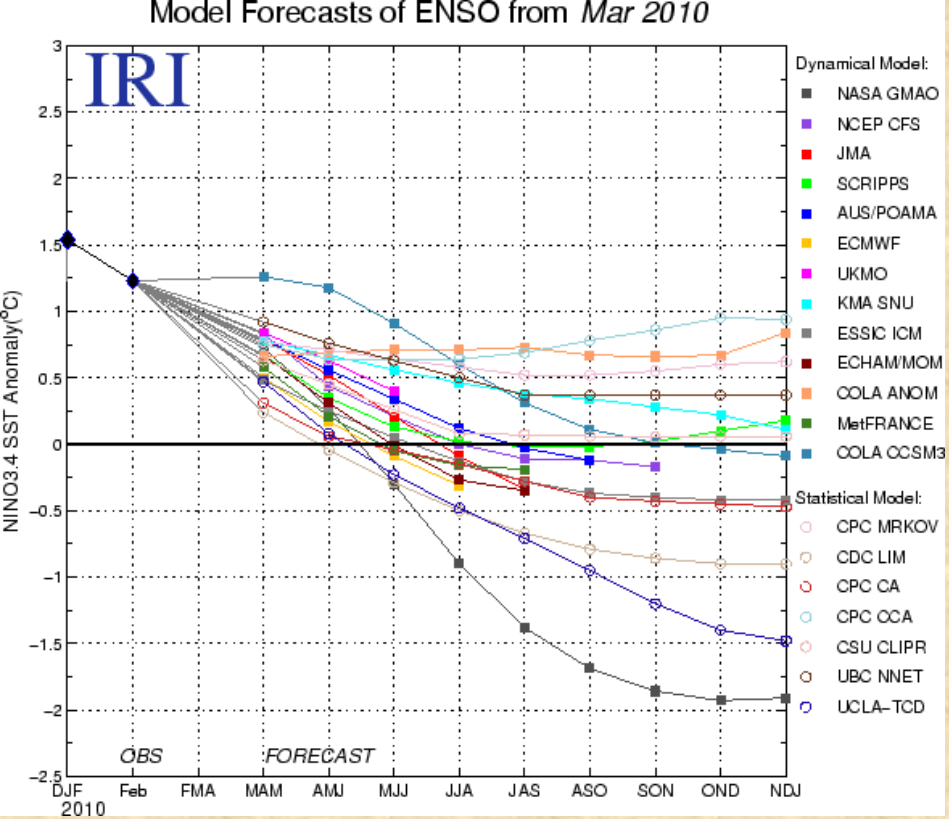

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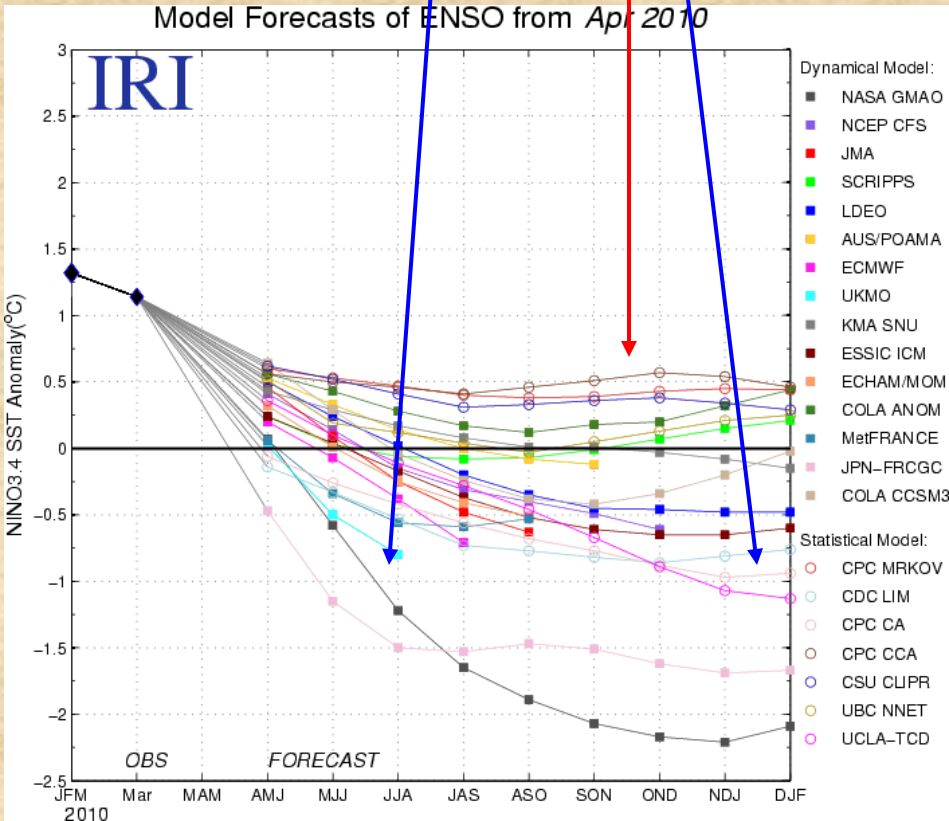

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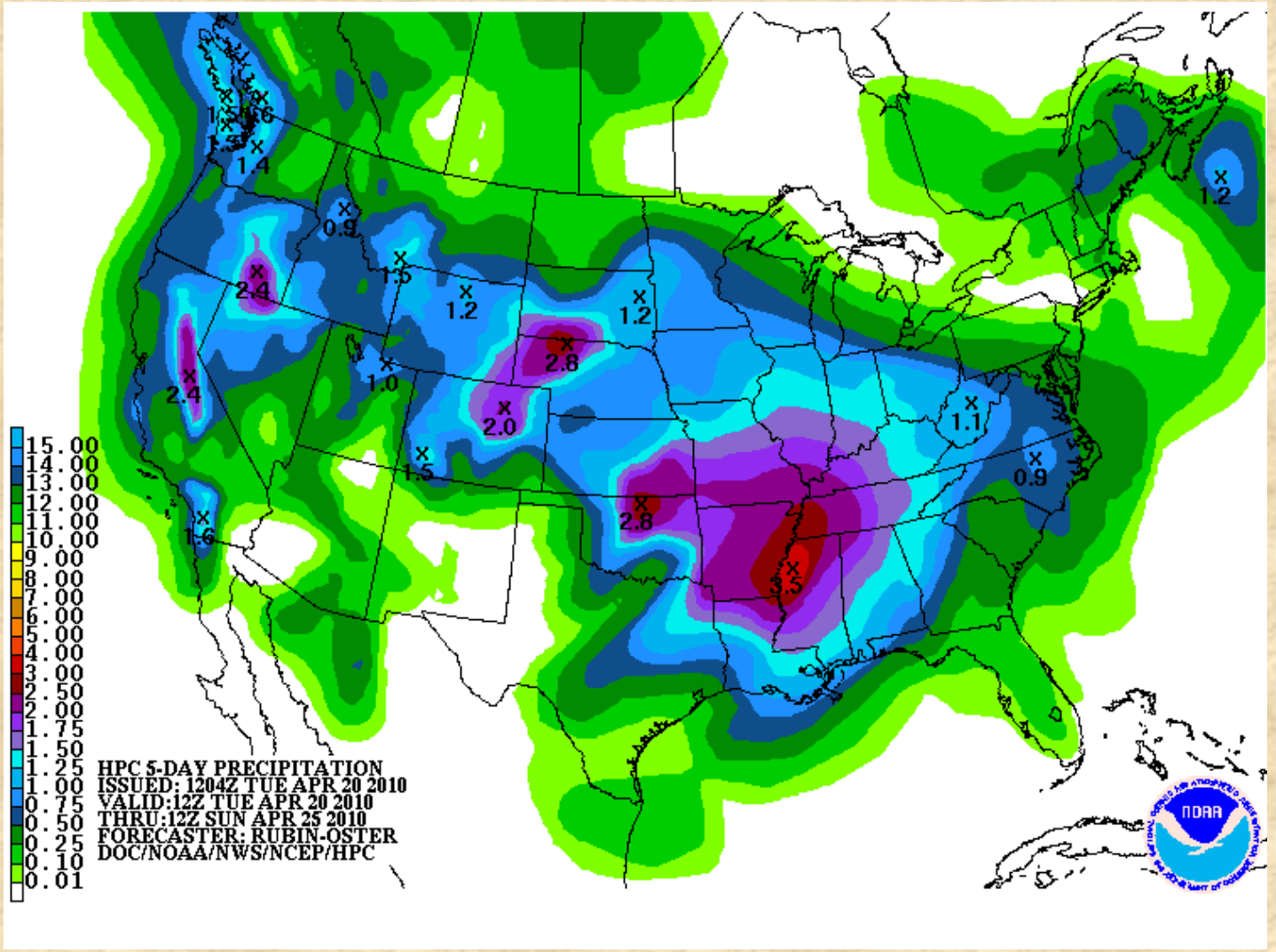
What can we expect in the next two weeks?



Expected total precipitation thru Sunday morning, according to the Hydrological Prediction Center (HPC): except for SE Colorado, most of our state can expect a wet week – with 1-2” of moisture, in particular over the northern half of the state – good news!

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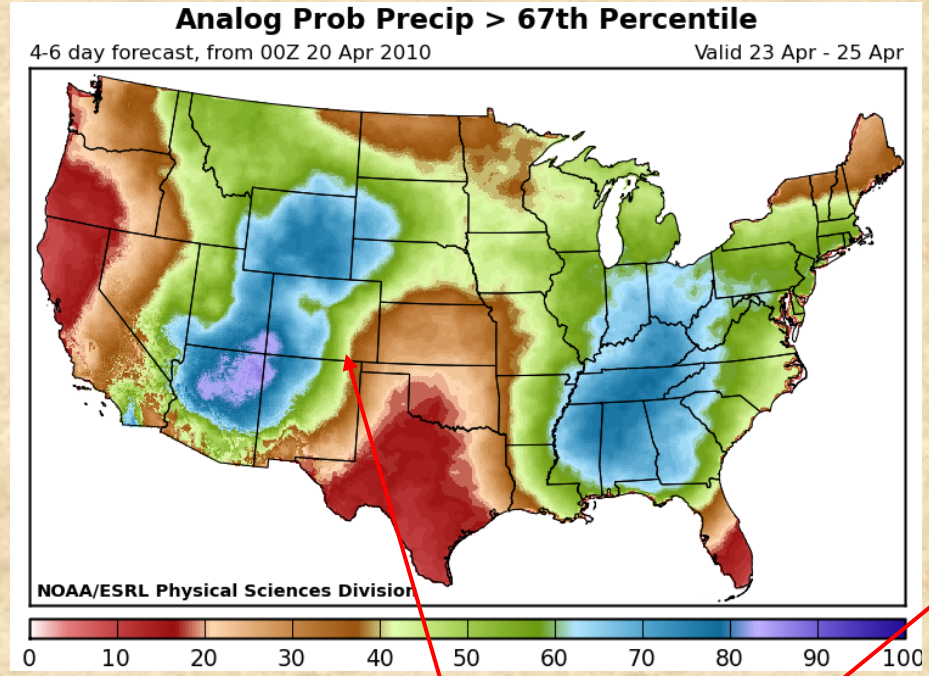

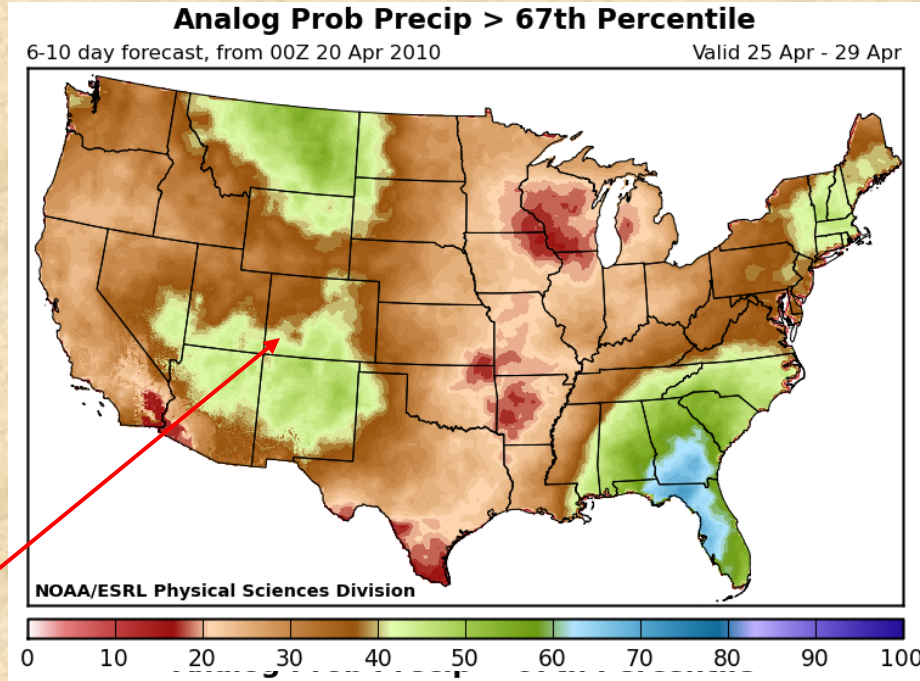

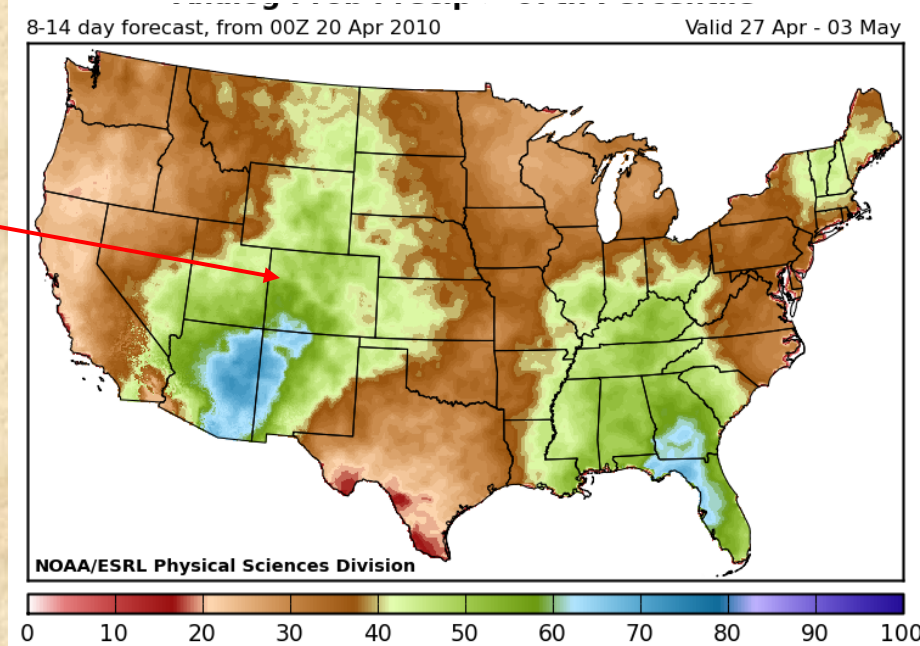

Precipitation chances for 4-6, 6-10, and 8-14 days from Tuesday start out with lingering wetness from this week's departing storm (Friday through Sunday, top left); after that, still better than normal chances of moisture early next week (top right), and during Week 2 (right). During this time of year, this translates into 1"+ per week in the northern mountains. At the same time, temperatures are expected to hover at or below normal.

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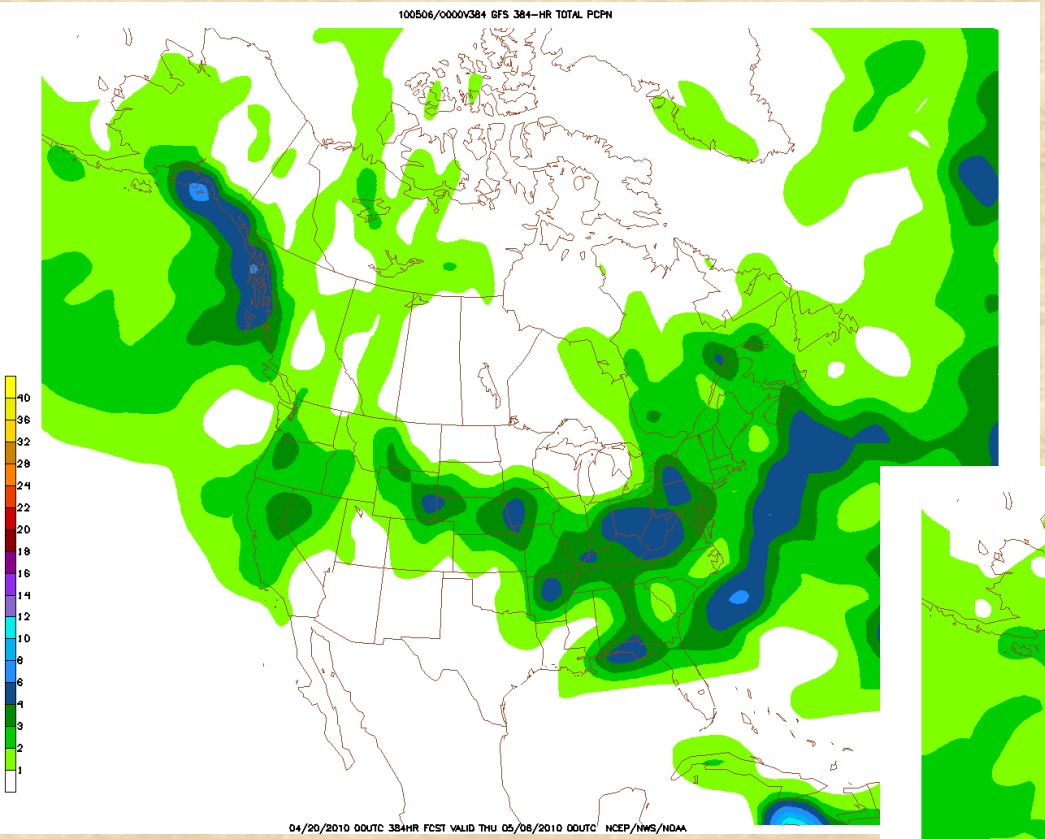
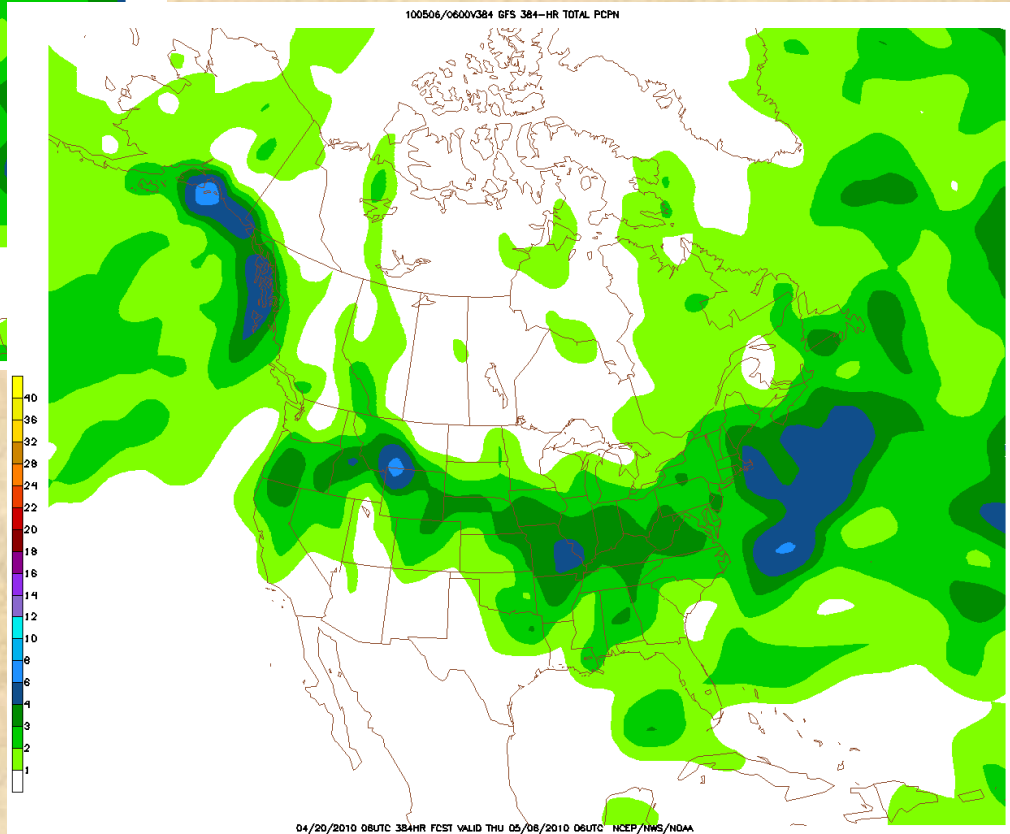


GFS Control runs from last night (left) and this morning (bottom)

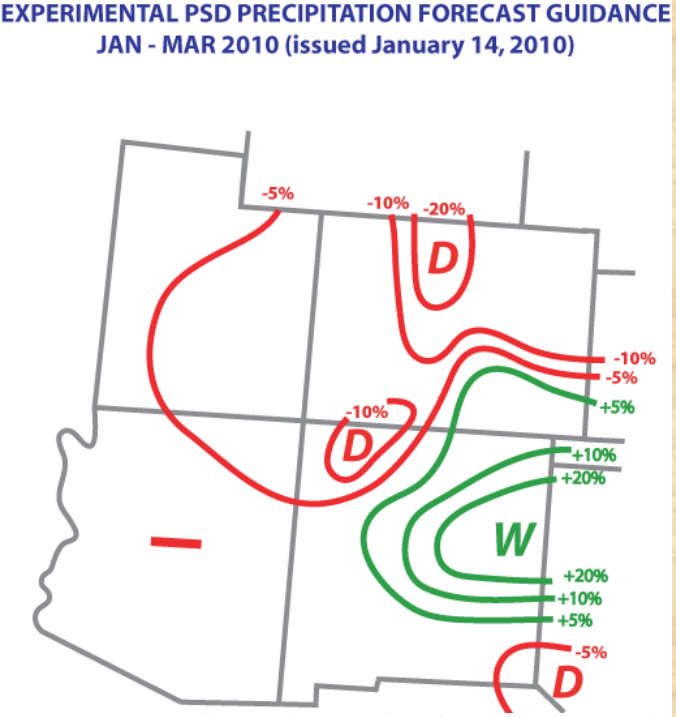


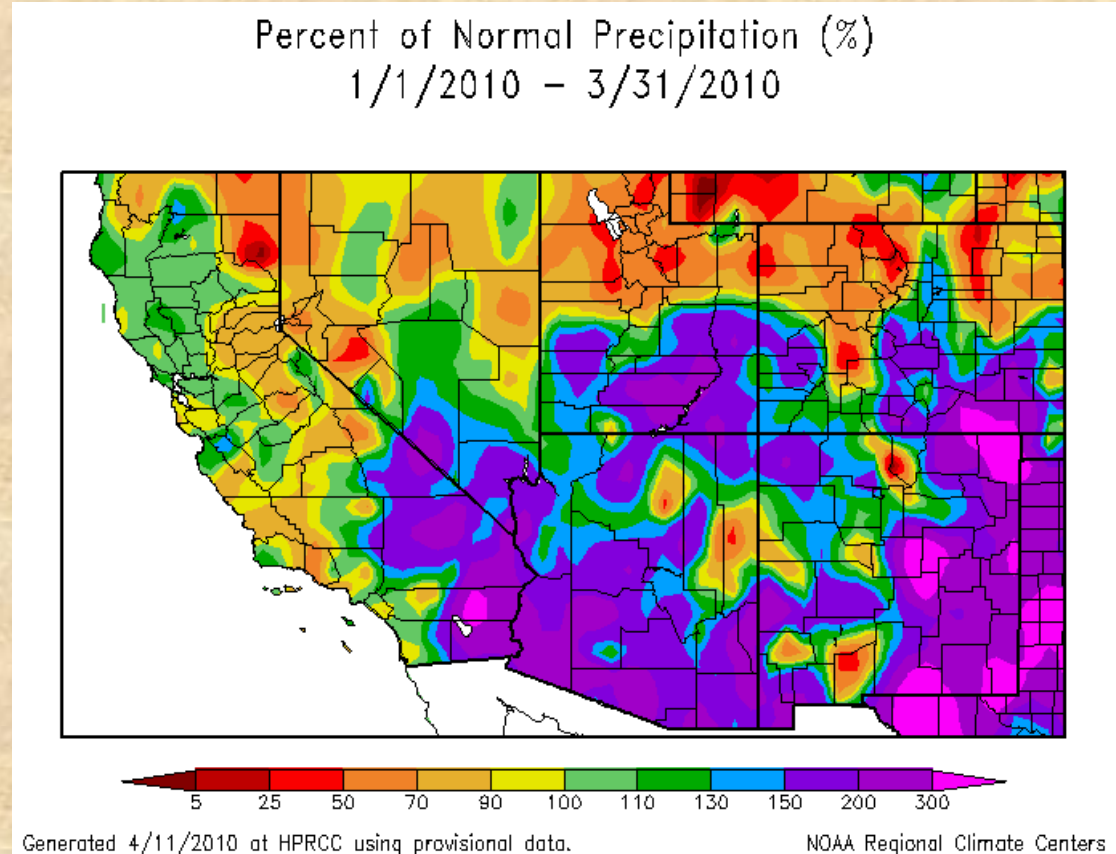
<u>Bottomline</u>: the GFS gives our state 1-2"+ of moisture over the next two weeks, near-normal at best. This model has shown a lot of run-to-run variability in the last few weeks.

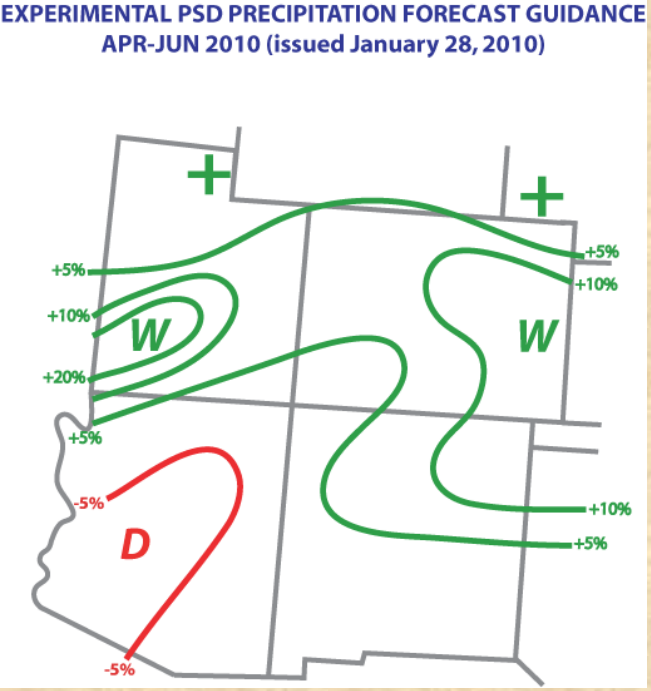
Yesterday's 18z run gave us 3"+!

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 for January-March 2010).



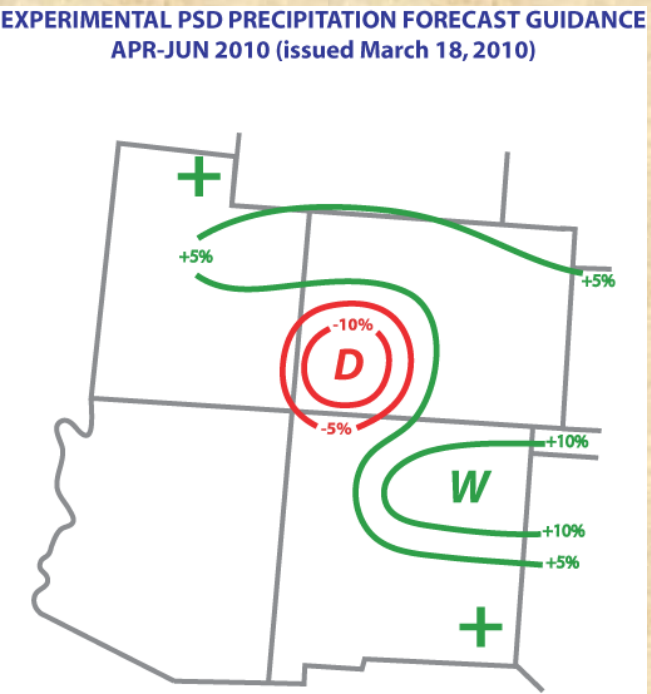


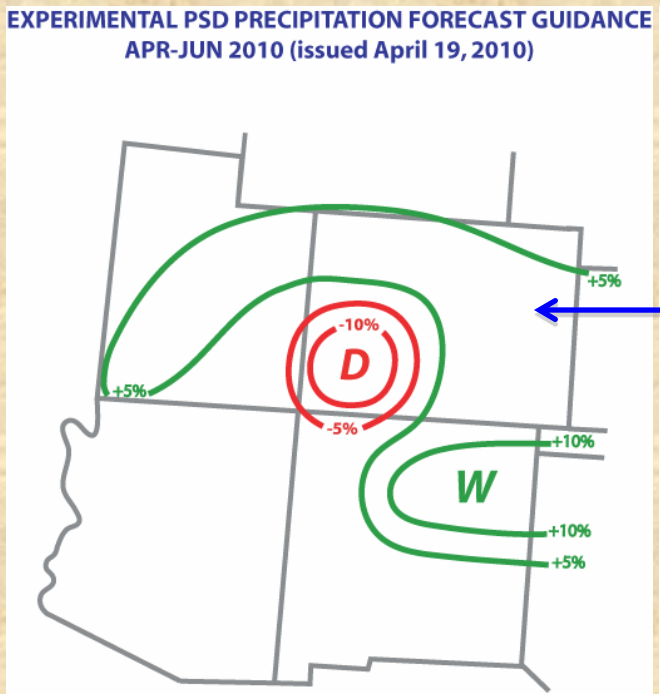


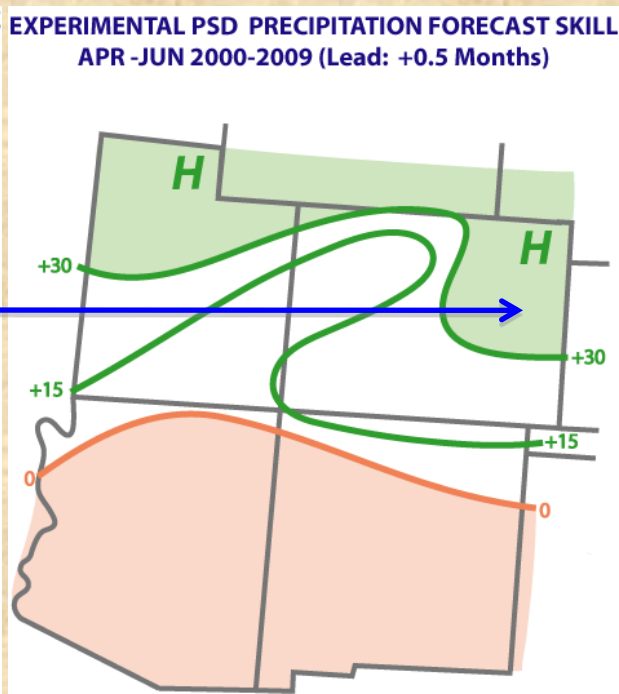
Experimental Forecast Guidance

Forecasts for April-June 2010 from January (left), March (bottom left), and this month (bottom middle) show increased chances of above-average moisture for most of Colorado – *this is also the best season for verified forecast skill in our state since 2000!*

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







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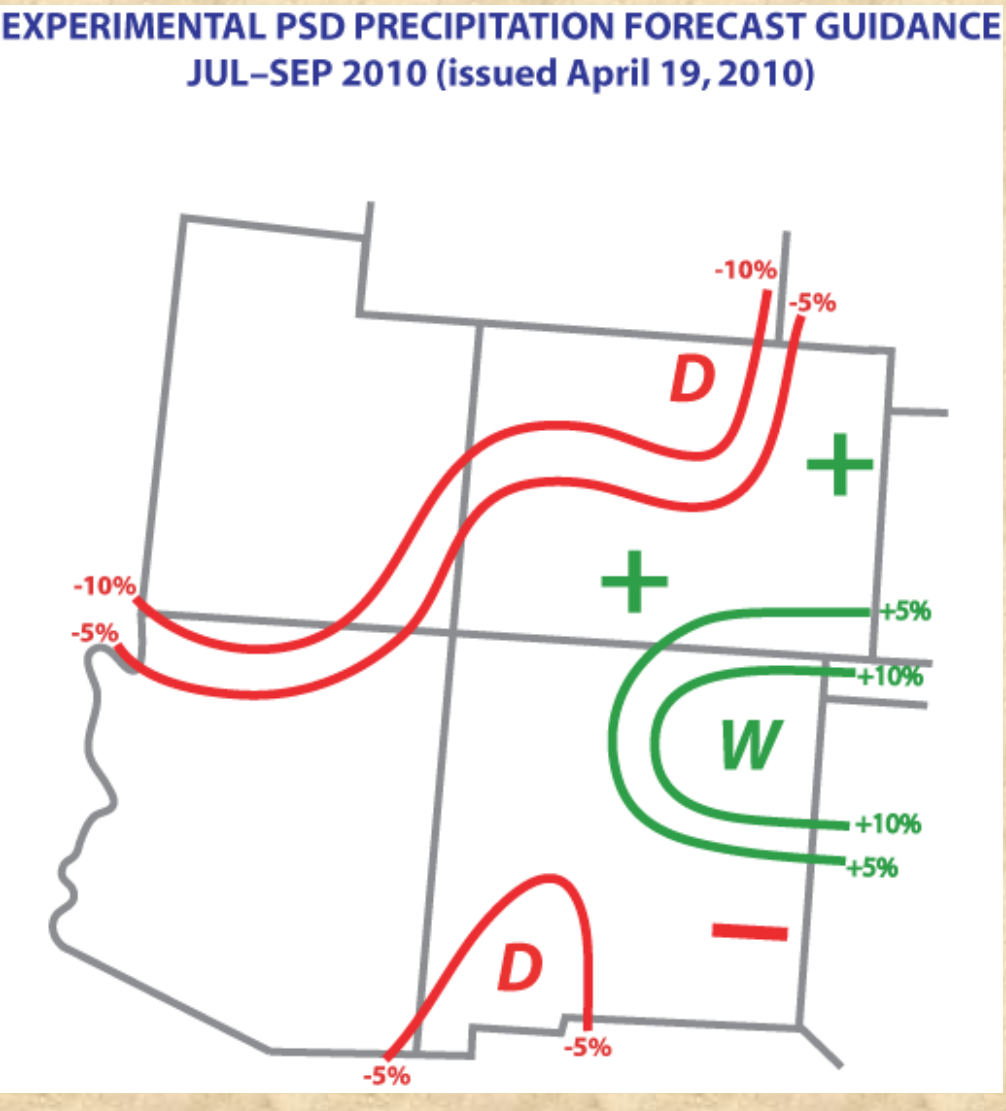
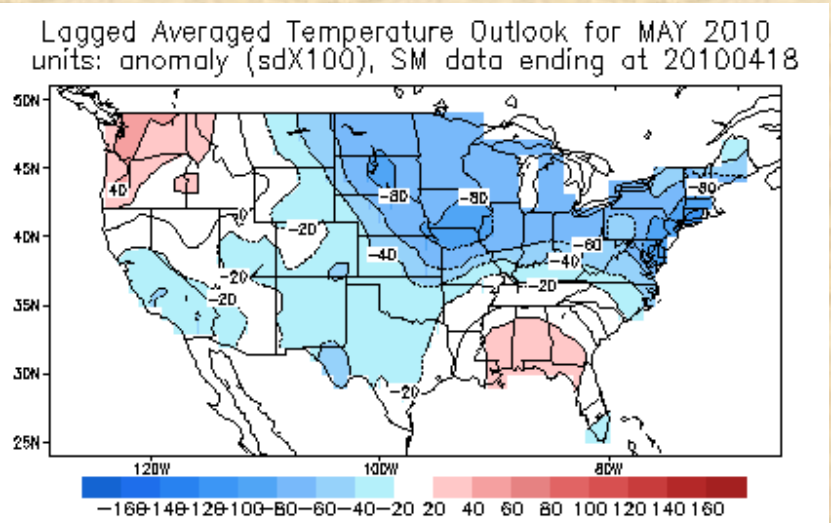
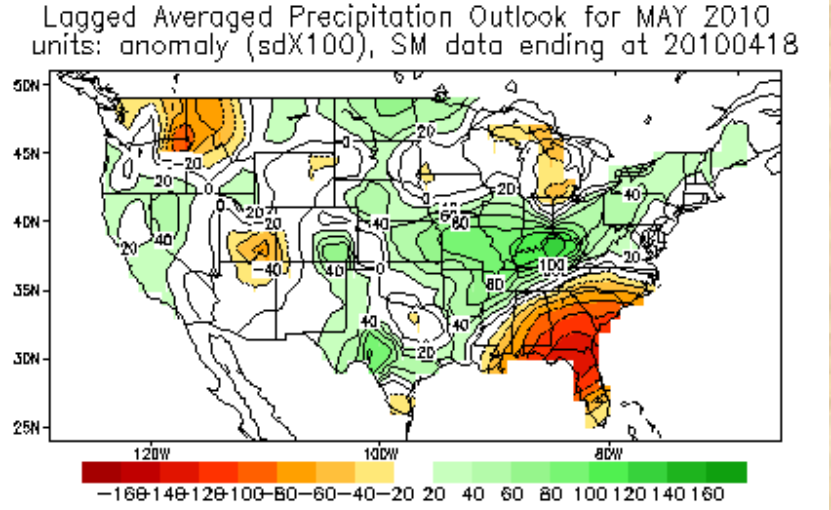
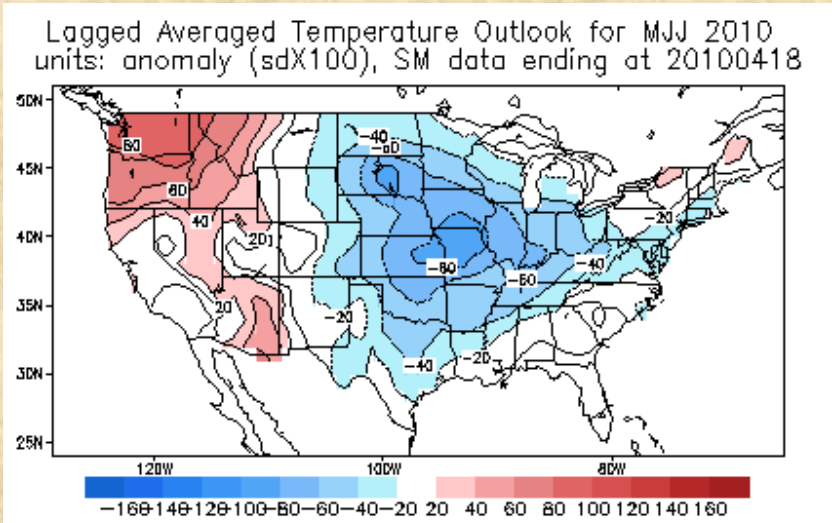


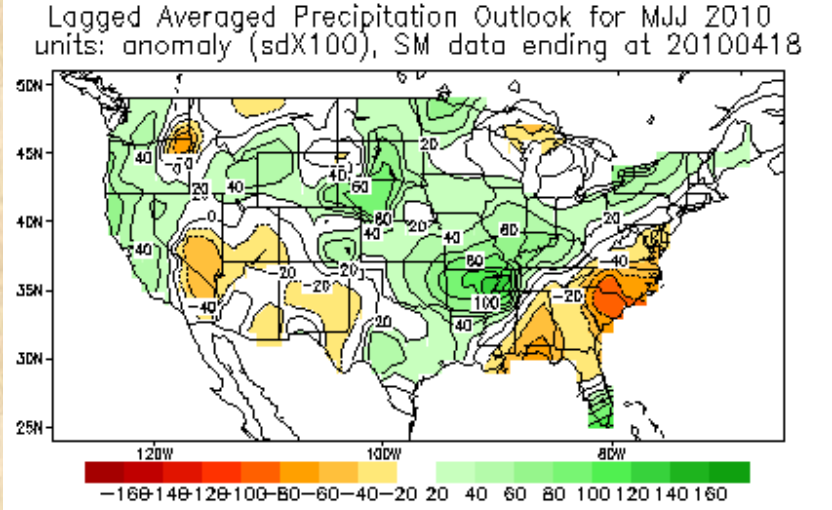
Forecast for July-September 2010 from this month (left) shows increased chances of above-average moisture over southeastern Colorado, juxtaposed with a good chance for below-normal moisture over northwestern Colorado. This looks like an exaggerated version of the average moisture distribution during the summer monsoon (dry northwest/moist southeast Colorado). Skill this far out is marginal, but should improve over the next few months.

CPC Analog Forecasts



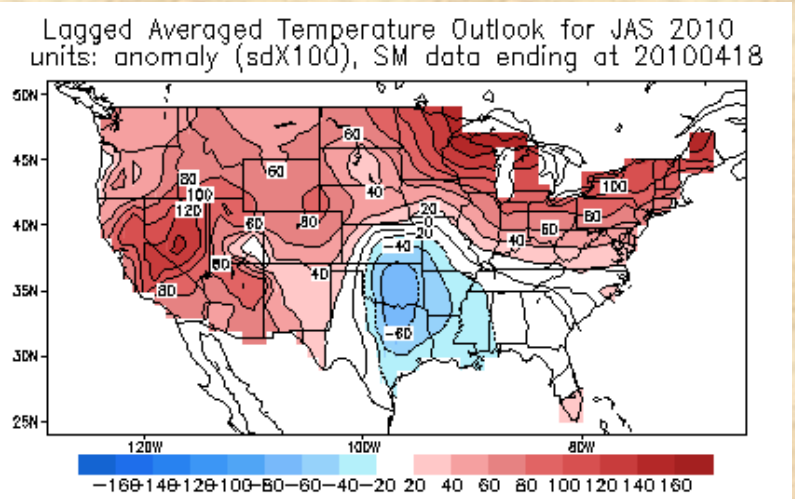


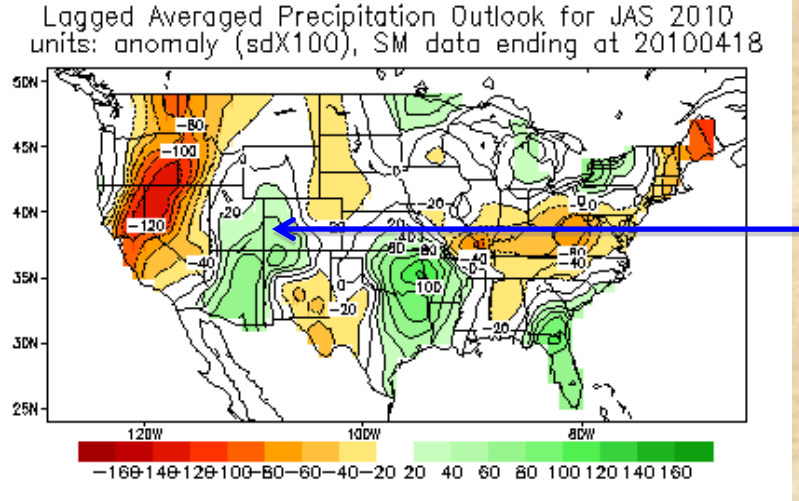


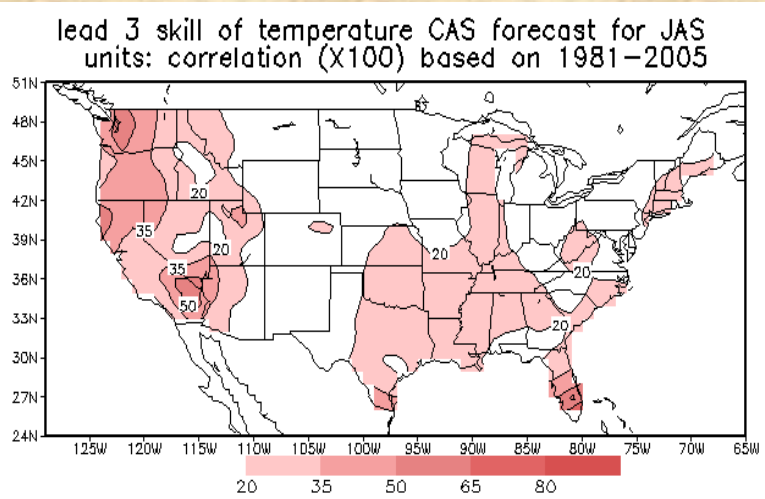


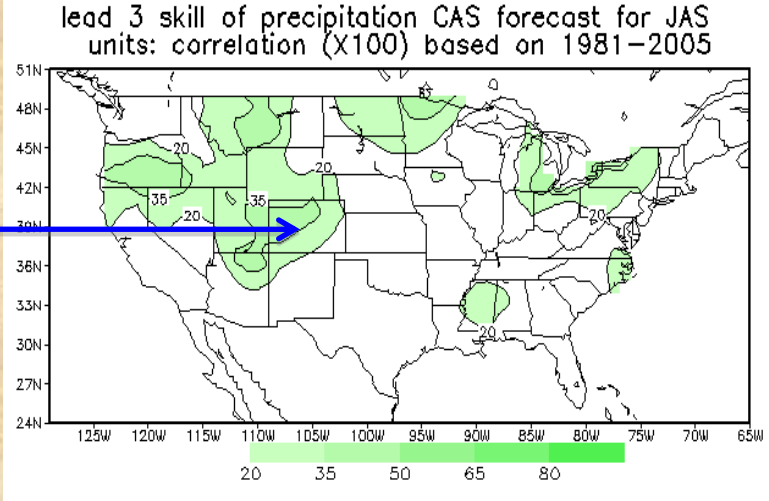
According to CPC's latest soil-moisture analog forecast, May (left) and May-July(right) look somewhat cool and wet for Colorado, consistent with many El Niño 'analogs'! **Source**: ***http://www.cpc.noaa.gov/soilmst/cas.shtml***

CPC Analog Forecasts



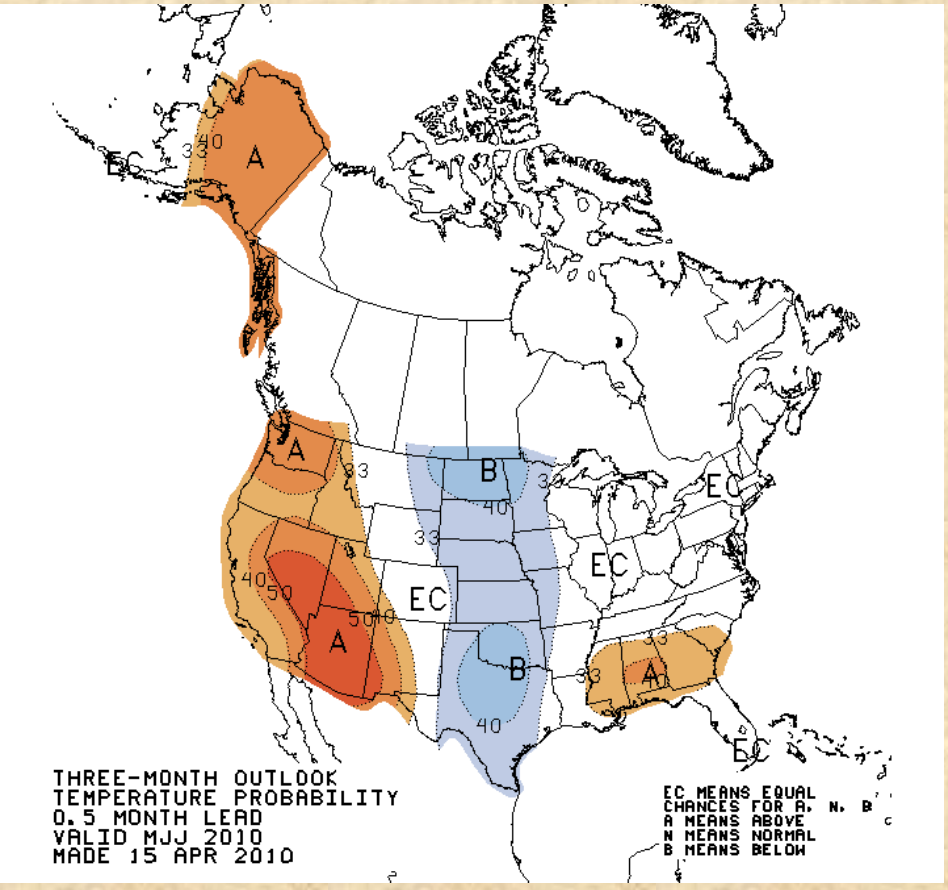


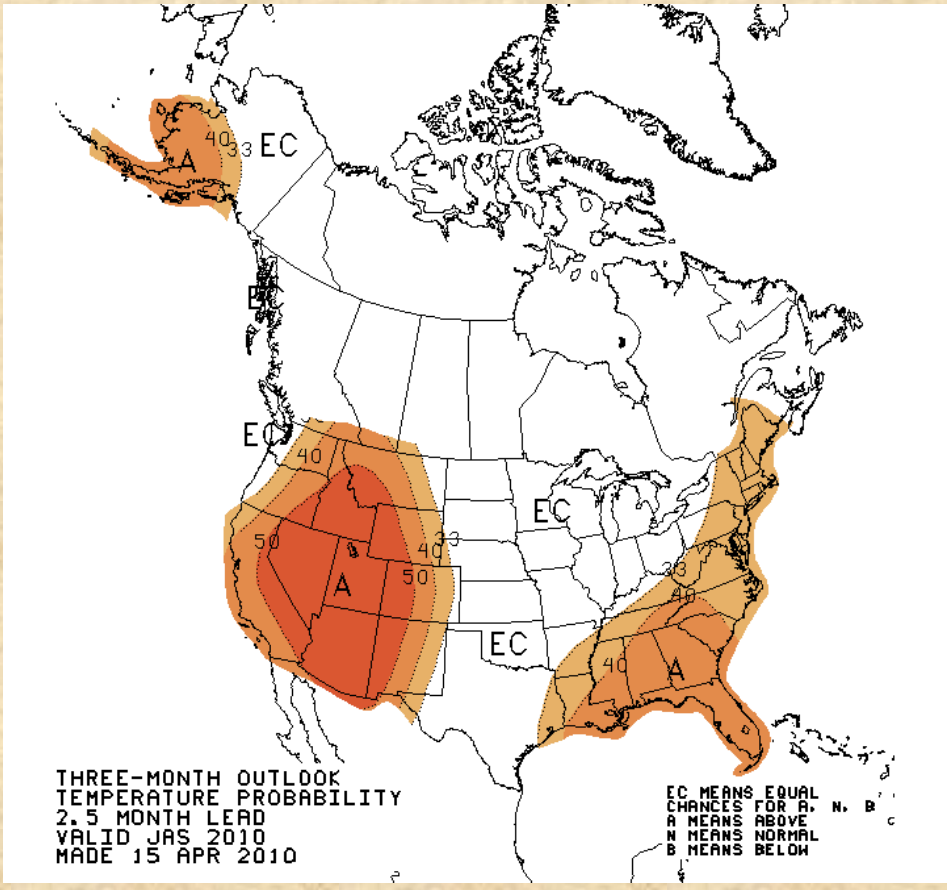




According to CPC's latest soil-moisture analog forecast, July-September (left) looks warm and mixed moisture-wise for CO (not well matched with experimental forecasts), along with fairly high skill for precipitation forecasts (and none for temperatures). **Source**: ***http://www.cpc.noaa.gov/soilmst/cas.shtml***

CPC Temperature Forecasts

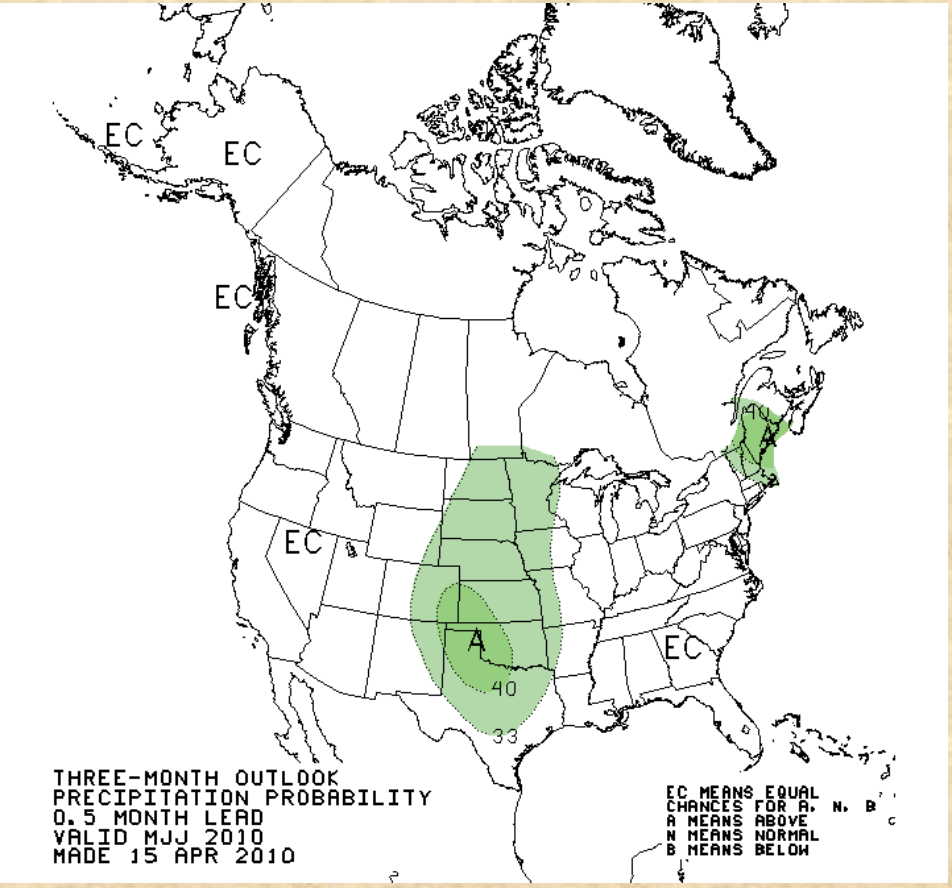


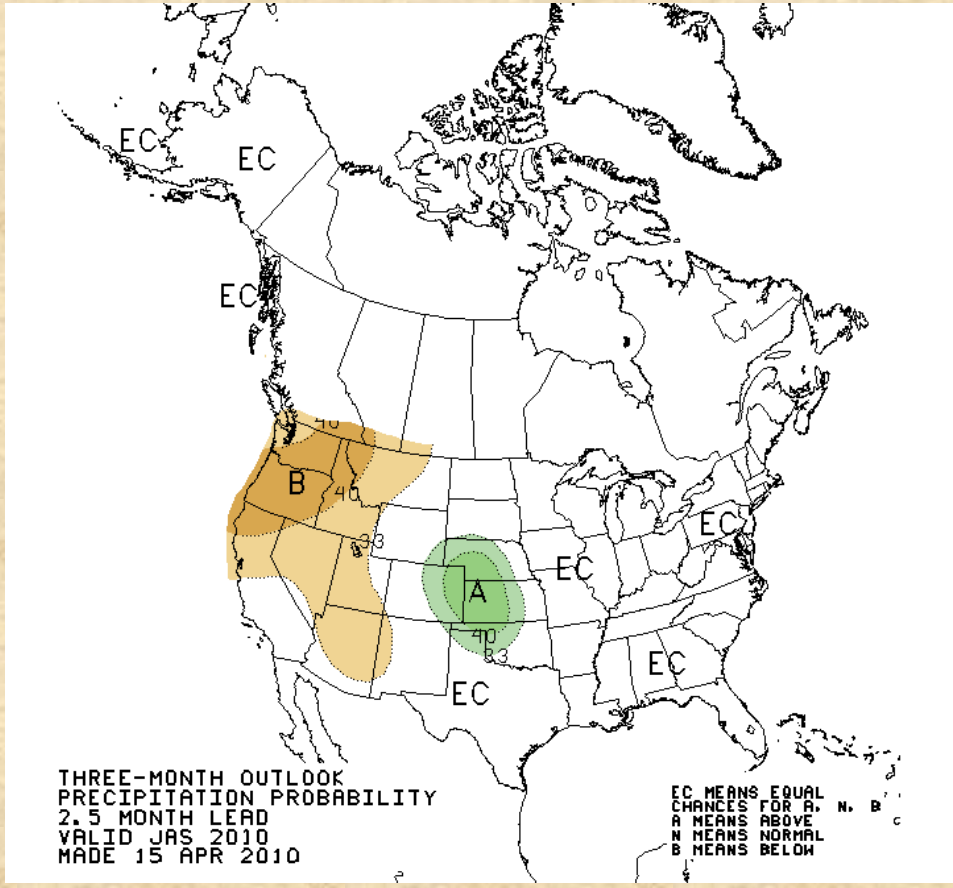


According to CPC's latest forecast, May-July (left) and July-September (right) temperature forecasts reflect long-term warming trends, as well as recent high soil moisture east of here. ENSO was not a factor in this forecast round.

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

CPC Precipitation Forecasts





According to CPC's latest forecast, May-July (left) and July-September (right) precipitation forecasts cover the eastern plains of Colorado with above-normal moisture chances, while the rest of the state is 'EC' – this is thought to come about from 'recycled moisture' and long-term trends in this region.

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

Draft Executive Summary (20 April 2010)

1. **The El Niño event of 2009-10 appears to have peaked recently, but should still affect our spring season.**
2. **The last week has seen fairly dry and mild weather, facilitating an 'orderly' meltout, with only minor flooding in Southern Colorado where it has been a bit accelerated due to a few 'dust on snow' events(?). The next two weeks should have above-average moisture in much of the state, along with near-normal to below-normal temperatures, slowing down the snowmelt season.**
3. **My experimental forecast guidance for the late spring season (April-June) is favorable for a wet spring from northern UT across northwestern CO into the high plains of eastern CO and NM, 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, suppressing snowfall amounts over northern CO and northern UT, while dropping above-average moisture over much of AZ and NM. During spring, this stormtrack should move northwards to benefit the dry holdouts of this winter. While this may 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.**

Source: ***http://www.esrl.noaa.gov/people/klaus.wolter/SWcasts/***