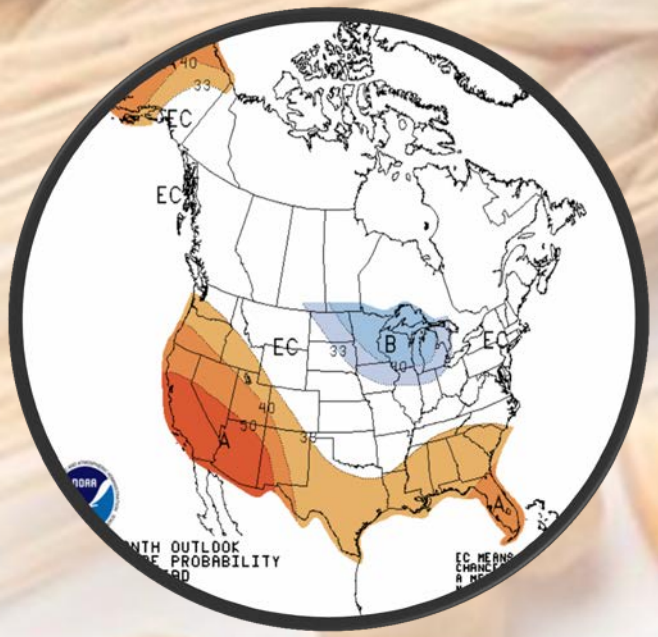
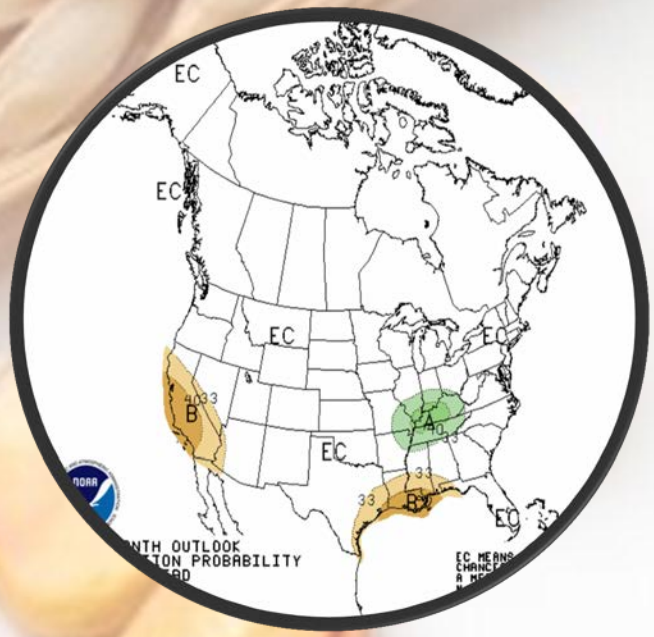
CPC Climate Outlooks For Spring & Summer 2014





Anthony Artusa
Climate Prediction Center
College Park, MD

USDA Agricultural Outlook Forum, Crystal City, VA
2/21/2014

"FLASH DROUGHT" OF 2013

Frozen soils (Upper Midwest) into April

Very wet Spring

Plants developed shallow root systems in response to wetness

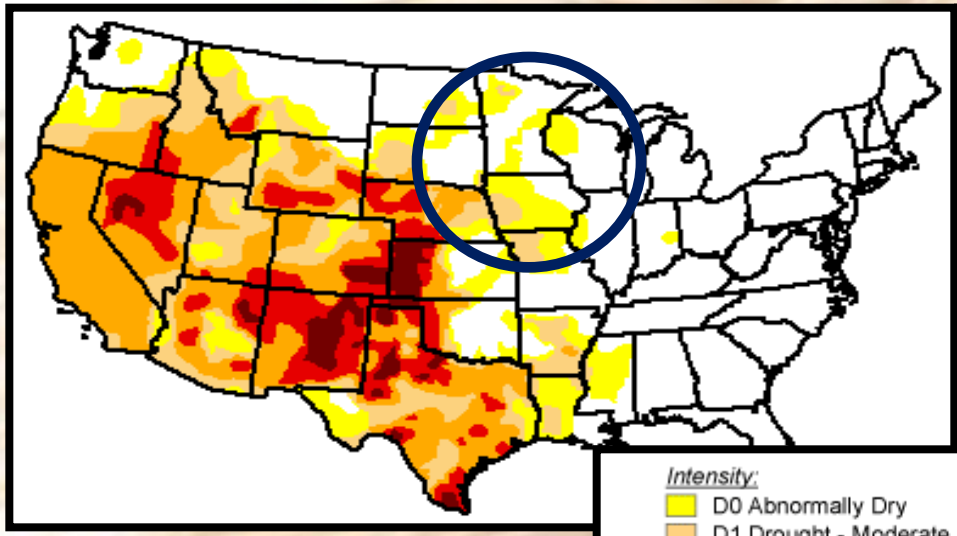
When wetness abruptly stopped in early summer, roots unable to access deeper moisture.

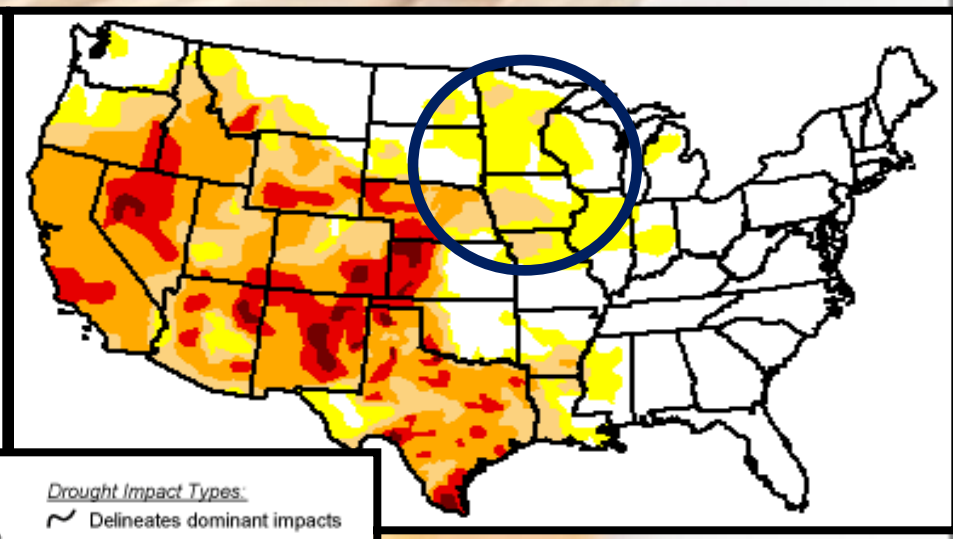
Drought rapidly expands & intensifies

(U.S. Drought Monitor 2013)

August 6

August 20





Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

~ Delineates dominant impacts

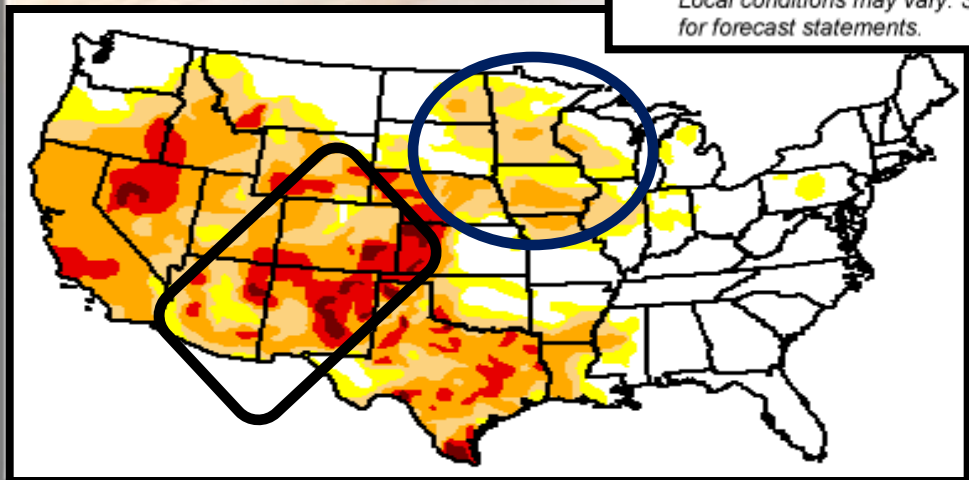
S = Short-Term, typically <6 months (e.g. agriculture, grasslands)

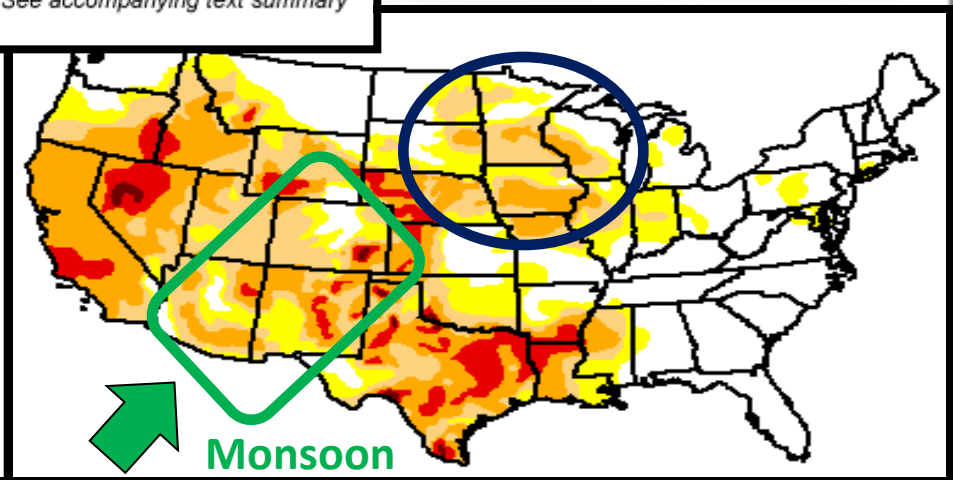
L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

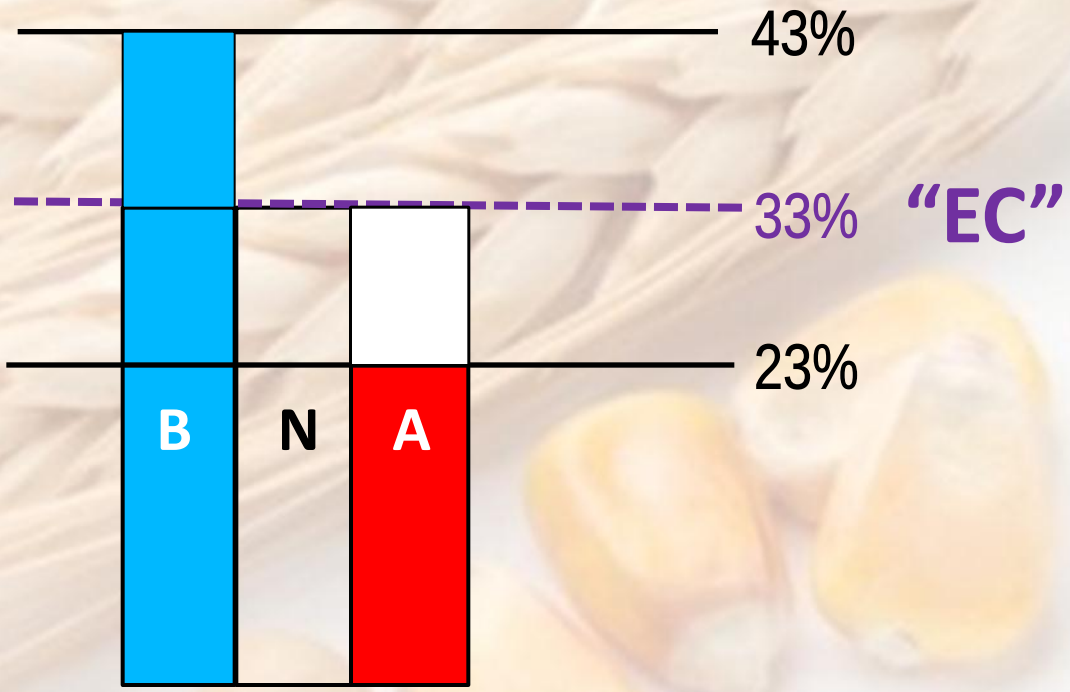
Sept 3

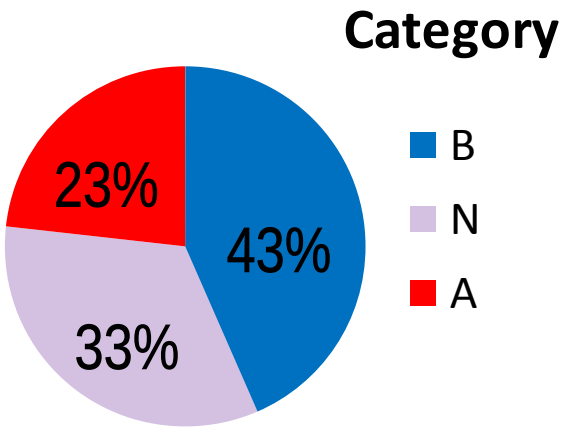
Sept 17





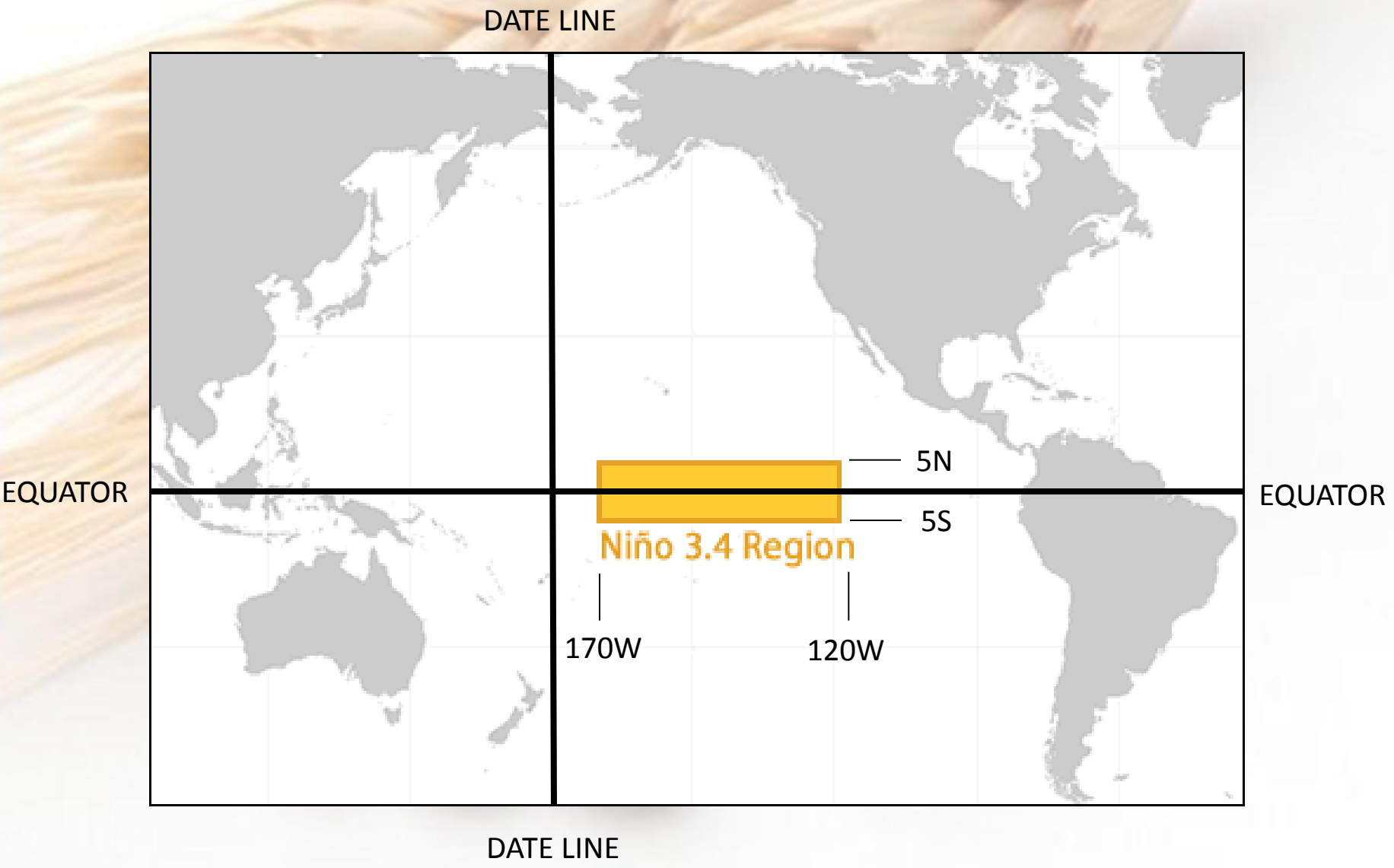
TERCILE ADJUSTMENTS





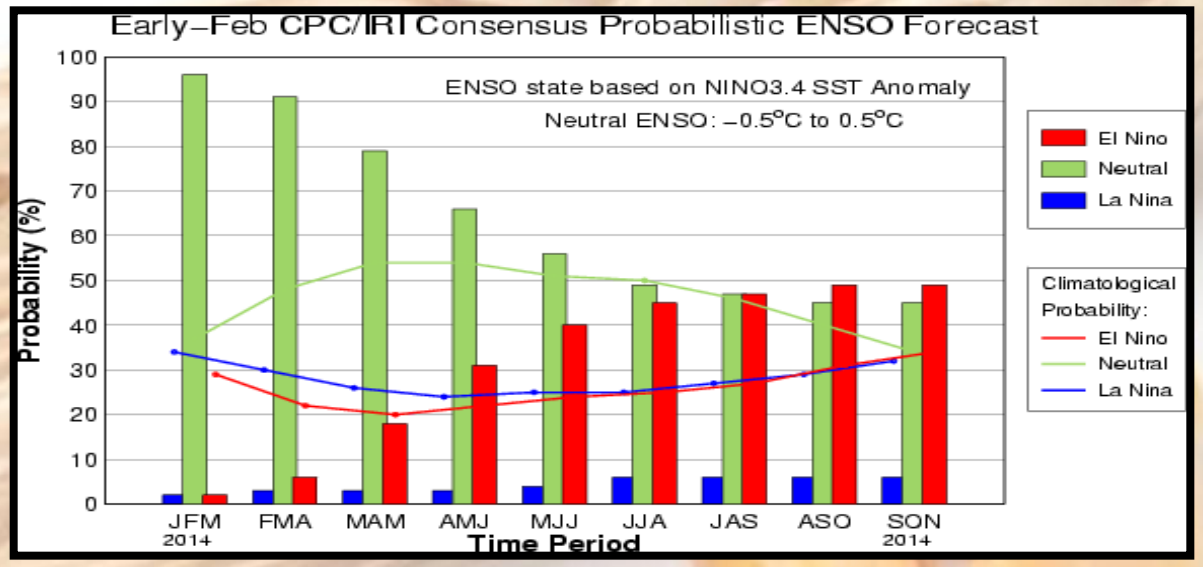
MOST LIKELY CATEGORY: BELOW NORMAL

NINO 3.4 REGION



Spring & Summer 2014 Climate Outlooks

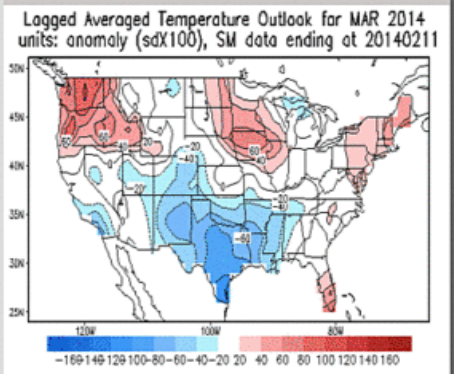
ENSO-NEUTRAL FAVORED (SPRING)
BORDERLINE NEUTRAL / EL NINO (SUMMER)



Season	La Niña	Neutral	El Niño
JFM 2014	2%	96%	2%
FMA 2014	3%	91%	6%
MAM 2014	3%	79%	18%
AMJ 2014	3%	66%	31%
MJJ 2014	4%	56%	40%
JJA 2014	6%	49%	45%
JAS 2014	6%	47%	47%
ASO 2014	6%	45%	49%
SON 2014	6%	45%	49%

MAR 2014 [Temperature]

CAS



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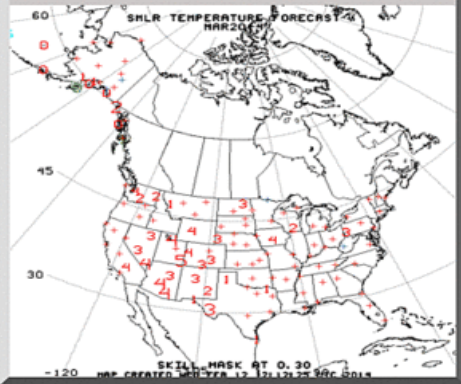

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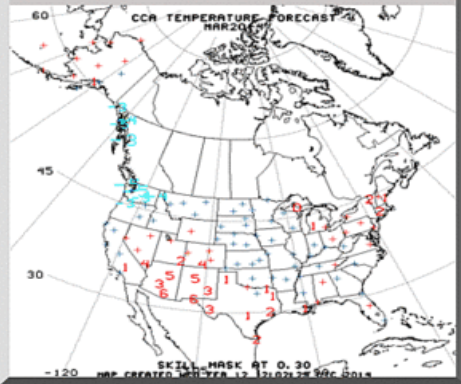

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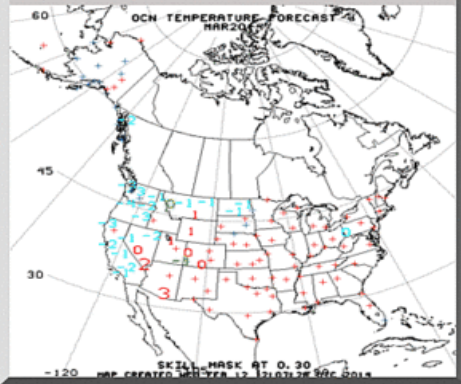
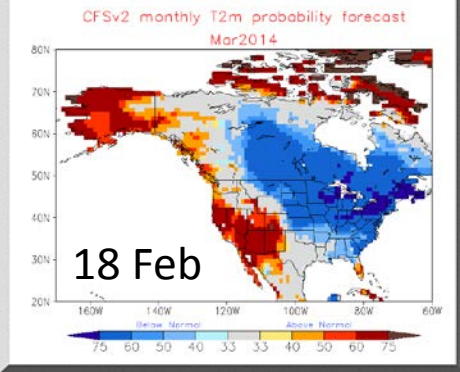


CFSv2 (Probability)



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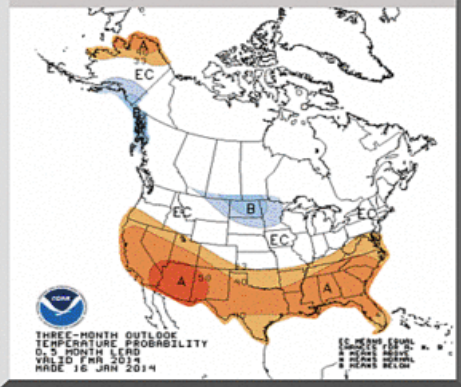

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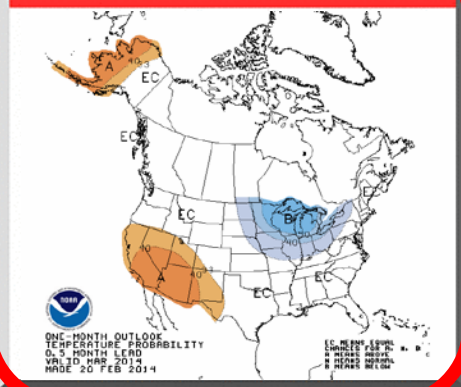

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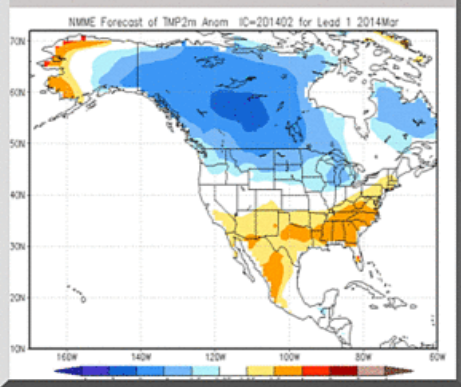
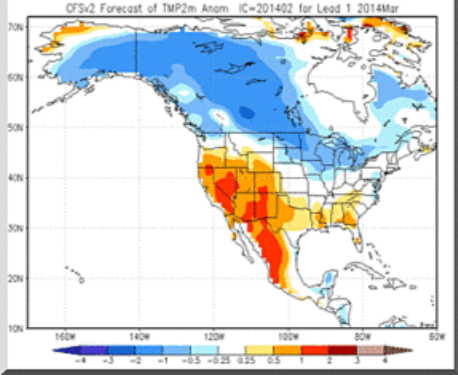
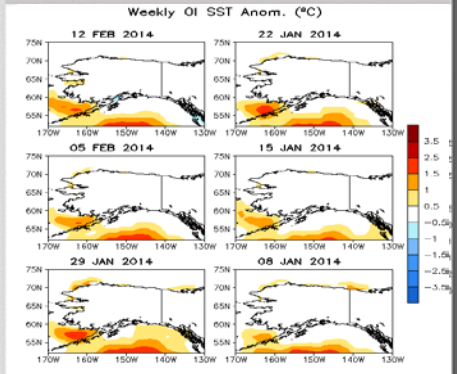


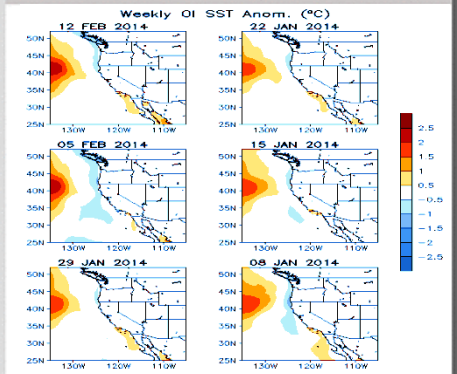
CFSv2 (NMME version)



WEEKLY SSTs



WEEKLY SSTs



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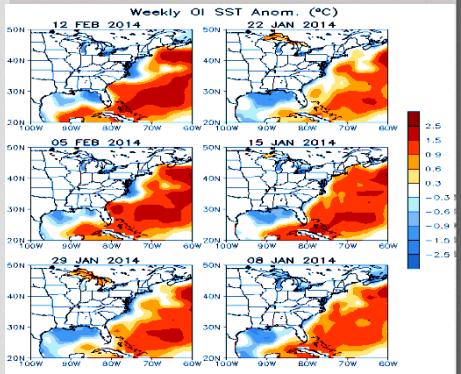
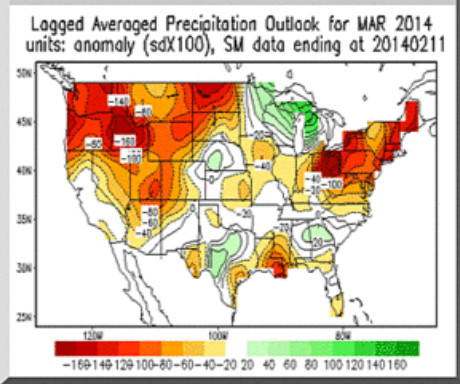


MAR 2014 [Precipitation]

CAS



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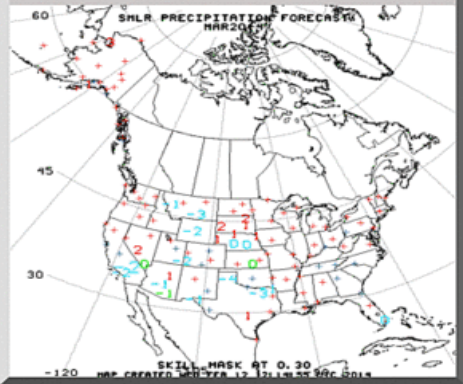

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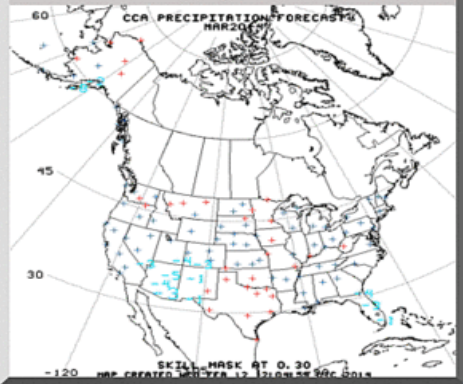

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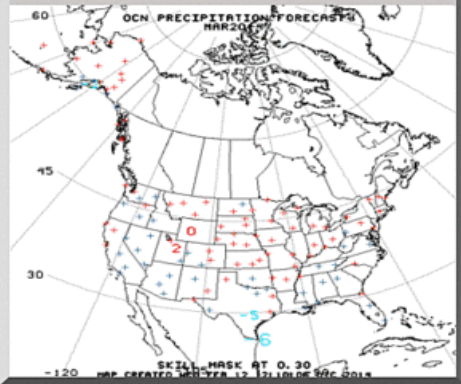
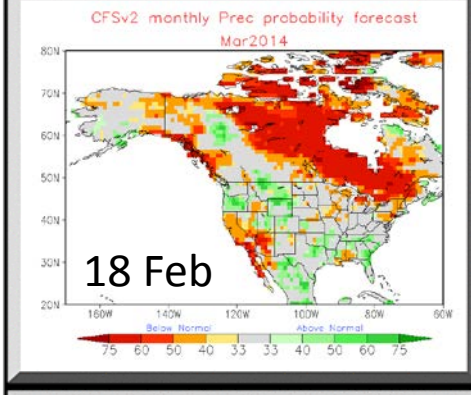


CFSv2 (Probability)



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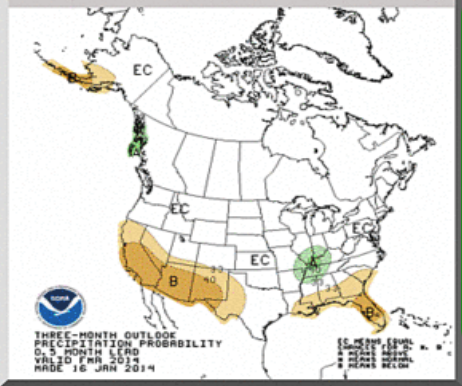

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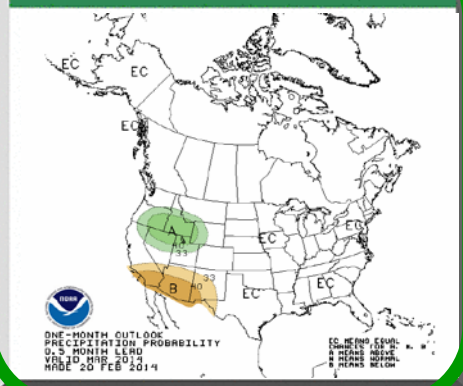

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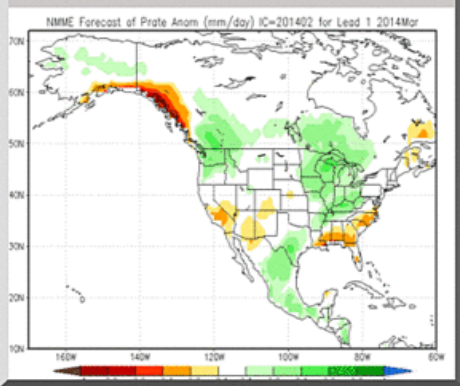
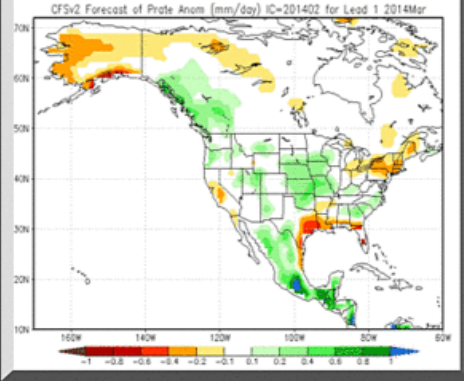
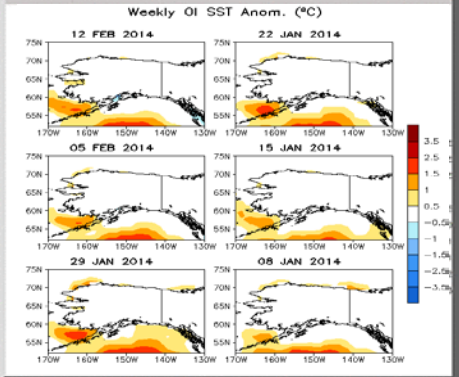


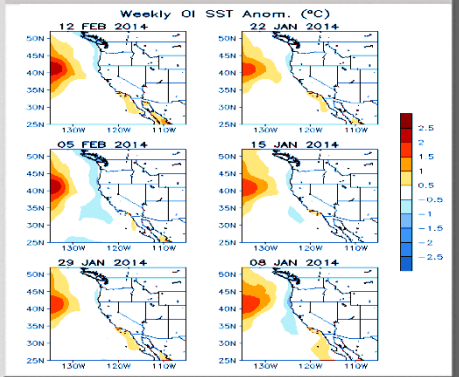
CFSv2 (NMME version)



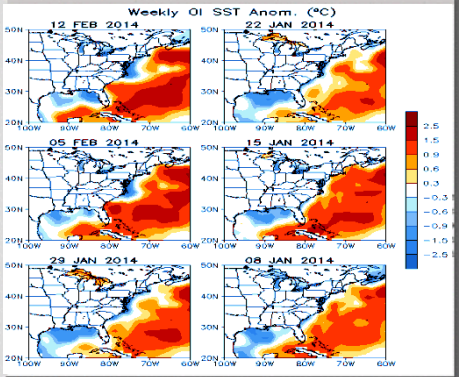
WEEKLY SSTs



WEEKLY SSTs

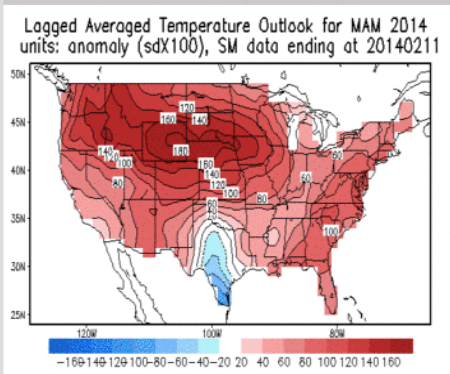


WEEKLY SSTs



MAM Season [Temperature]

CAS



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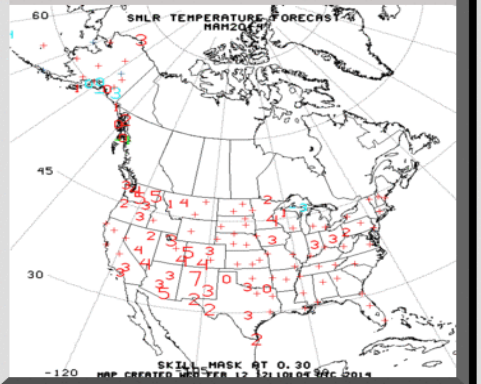

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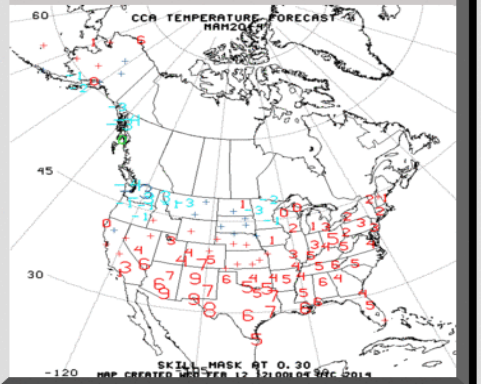

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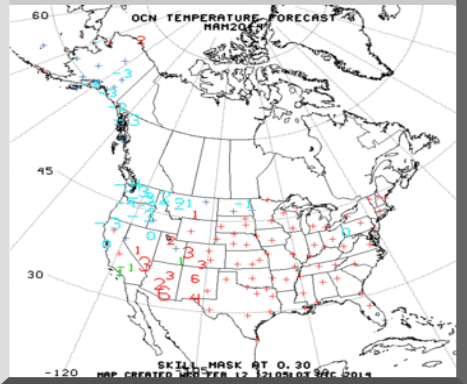
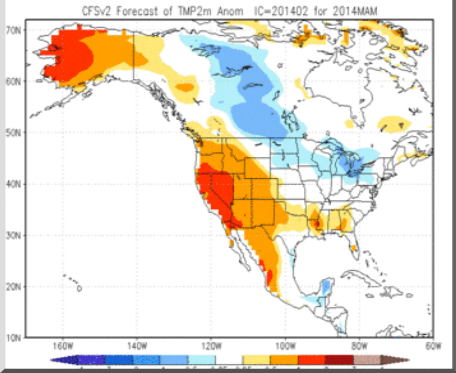


CFSv2



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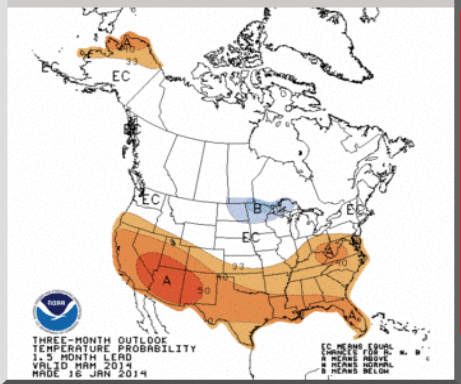
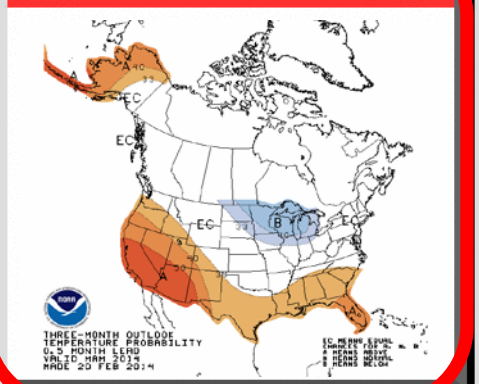
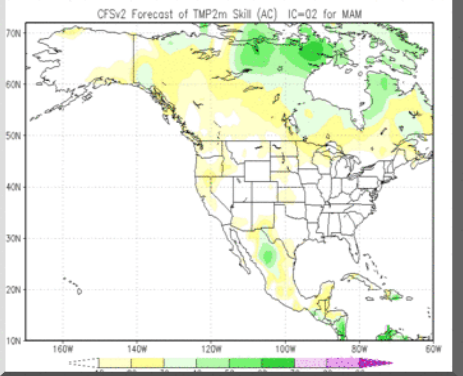


** NEW OUTLOOK **



CFSv2 (skill)



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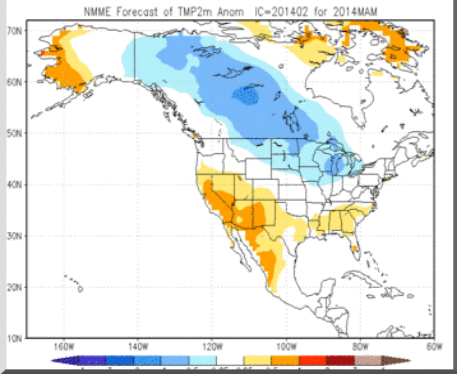

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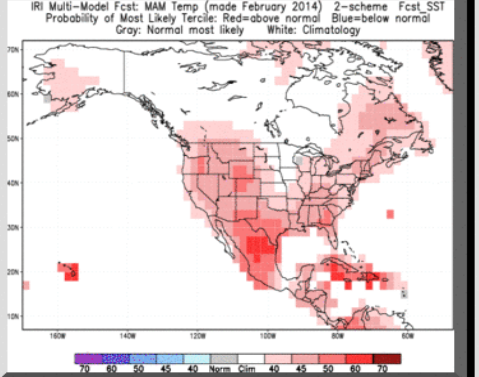
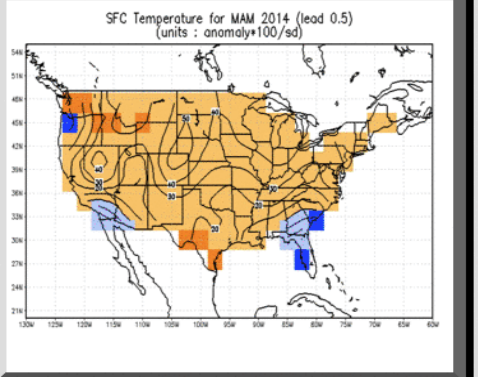
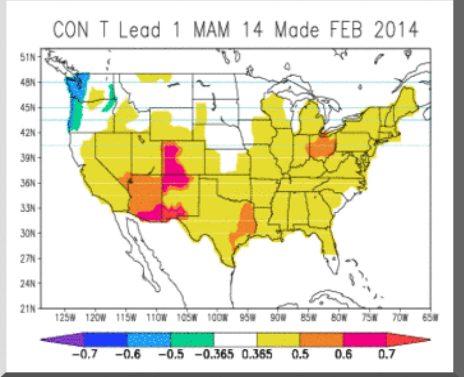


ENSEMBLE CCA (ECCA)

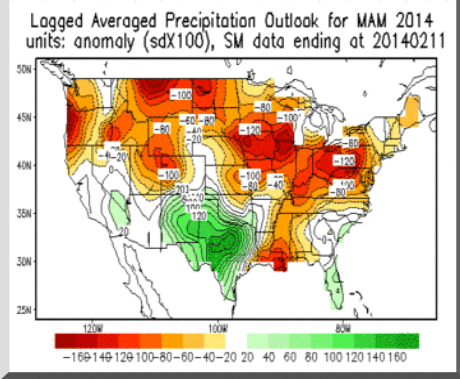


CONSOLIDATION



MAM Season [Precipitation]

CAS



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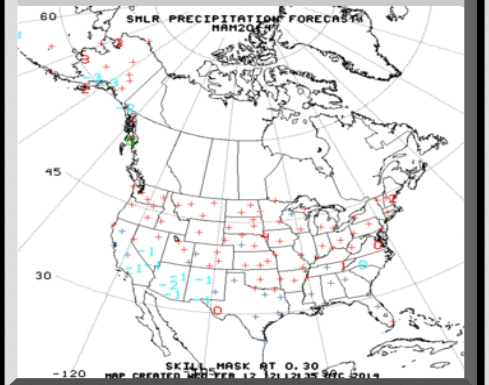

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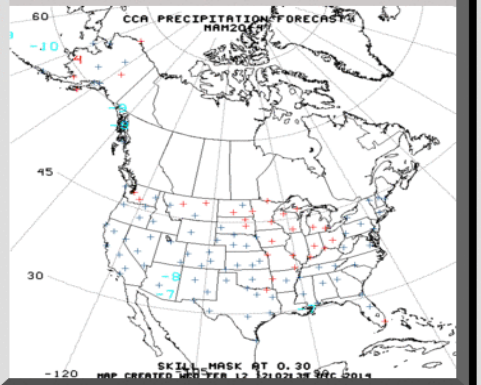

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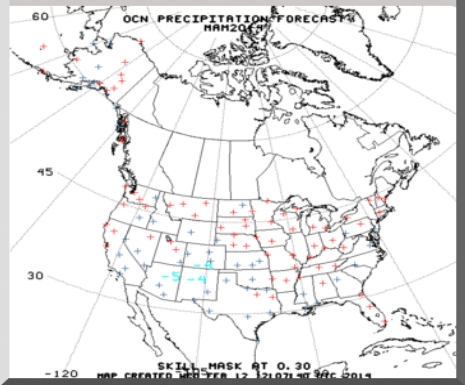
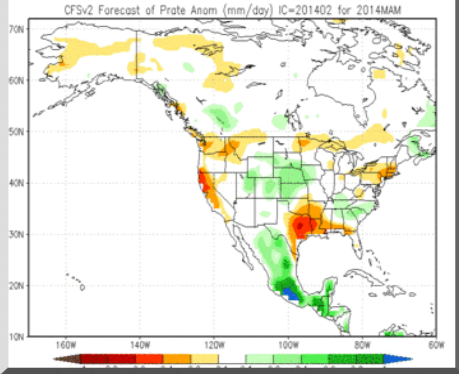
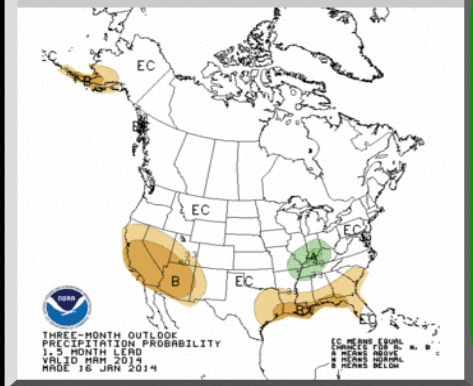


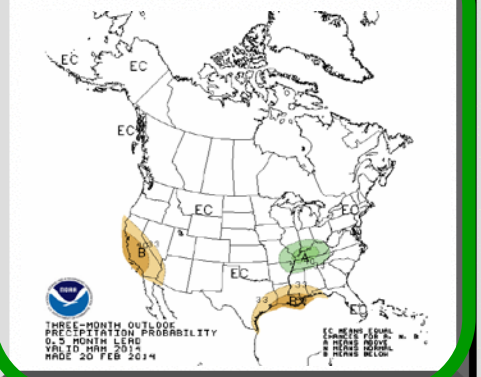
CFSv2



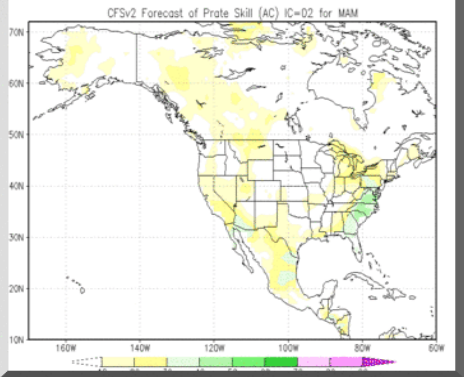
OLD OUTLOOK



** NEW OUTLOOK **



CFSv2 (skill)



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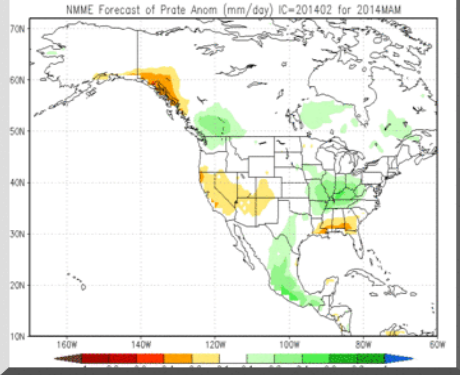

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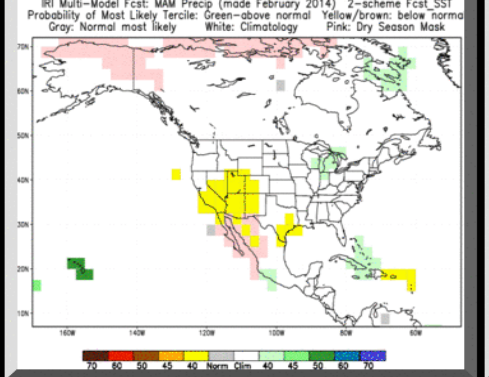
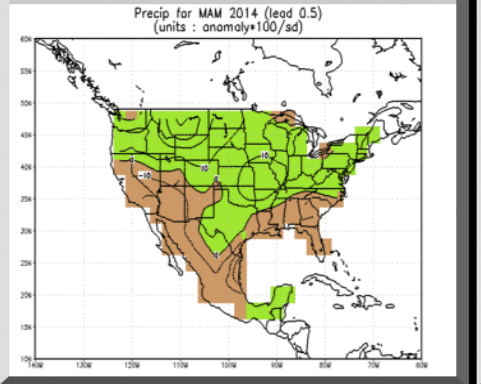
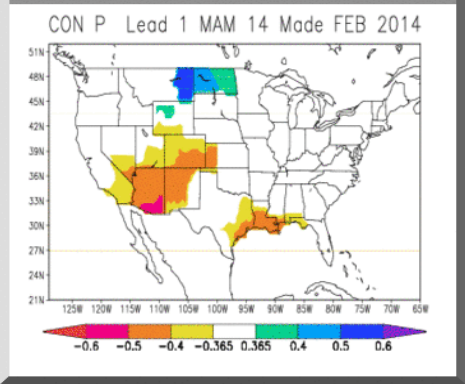


ENSEMBLE CCA (ECCA)

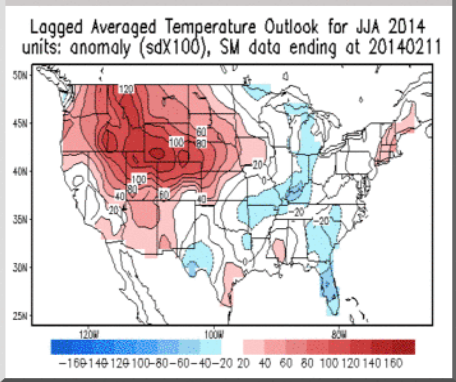


CONSOLIDATION



JJA Season [Temperature]

CAS



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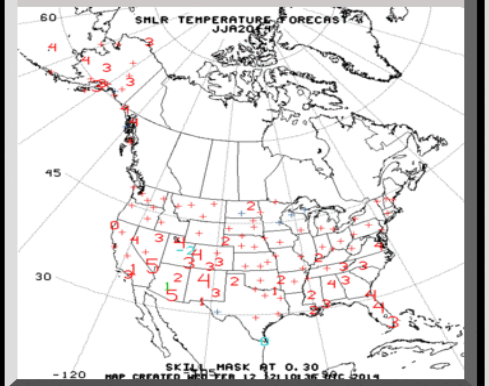

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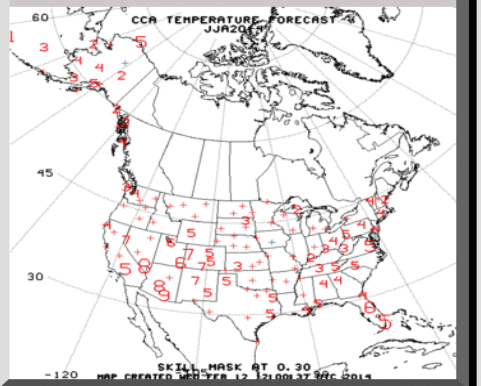

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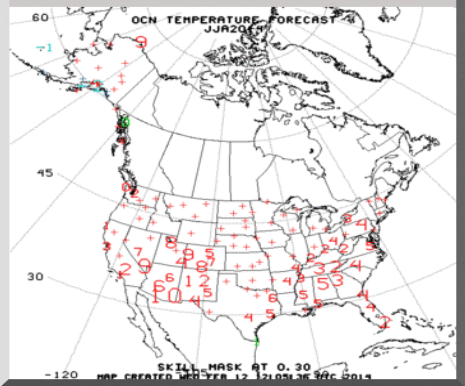
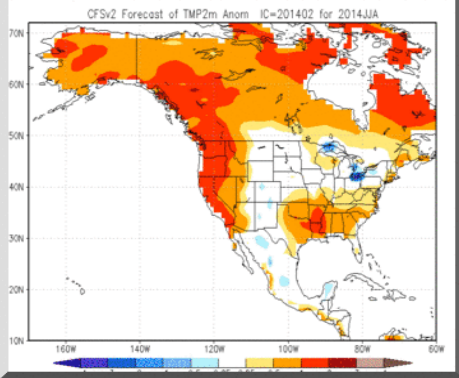


CFSv2



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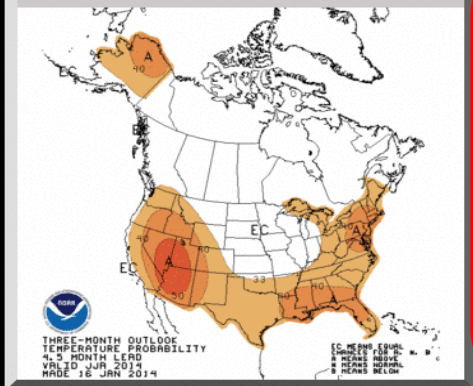
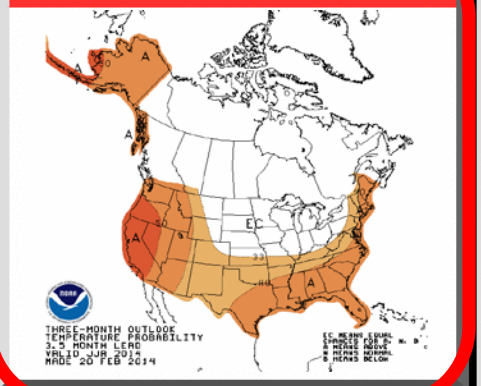


** NEW OUTLOOK **



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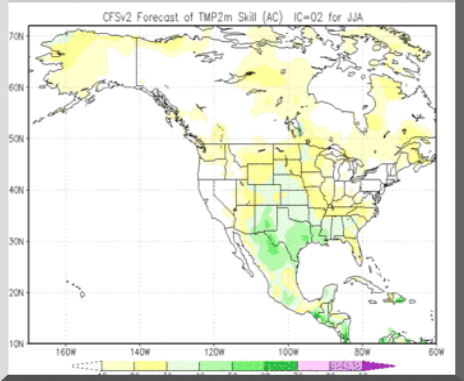

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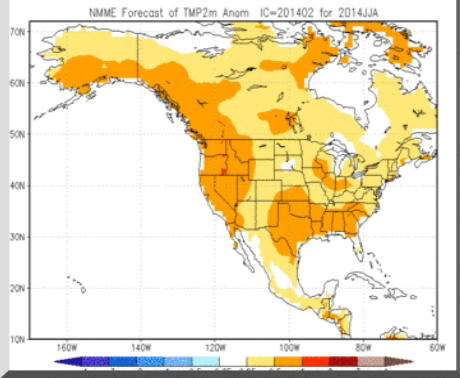
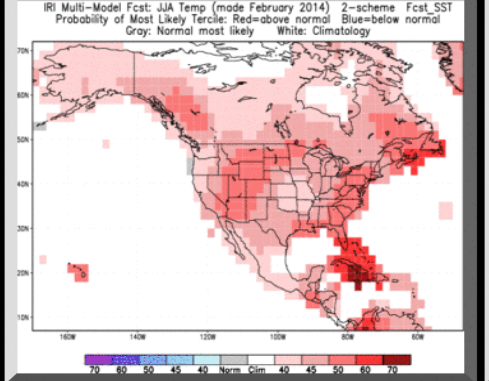


IRI



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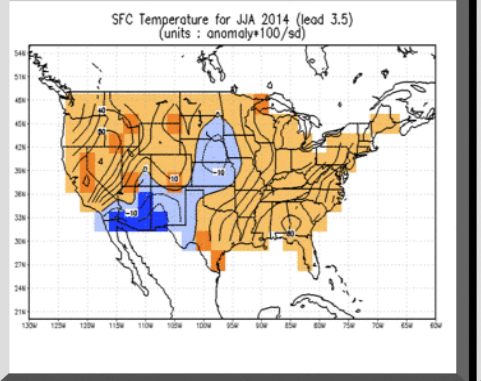

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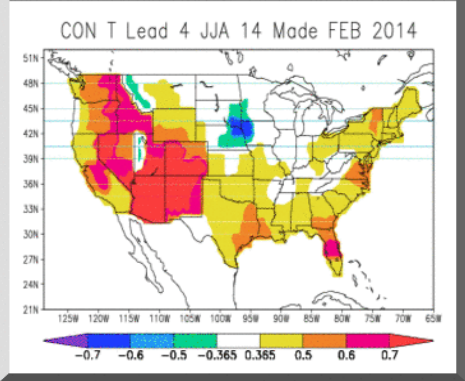
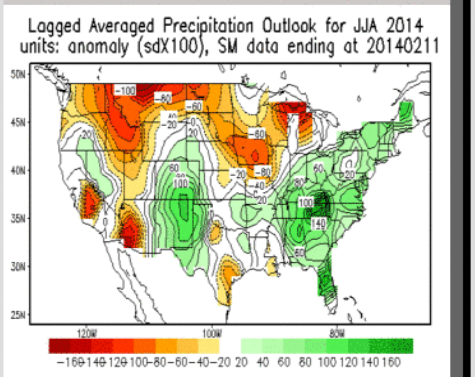


JJA Season [Precipitation]

CAS



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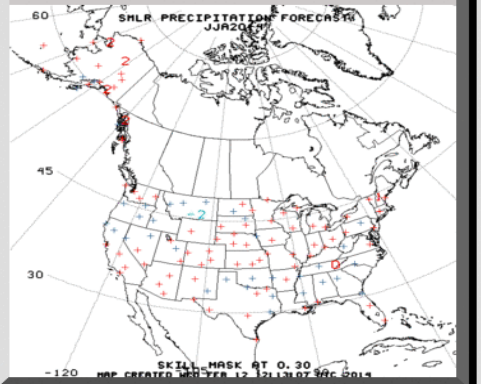

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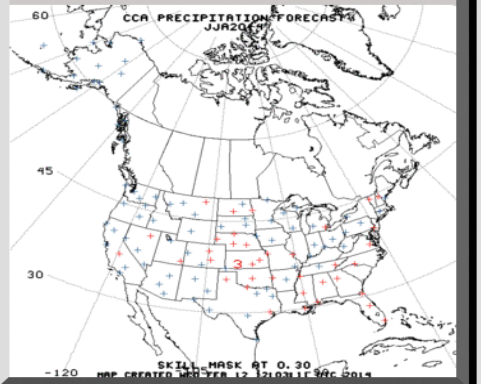

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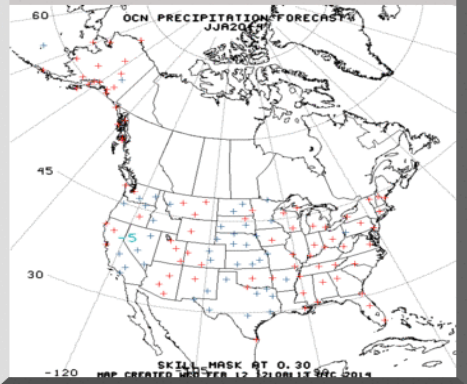
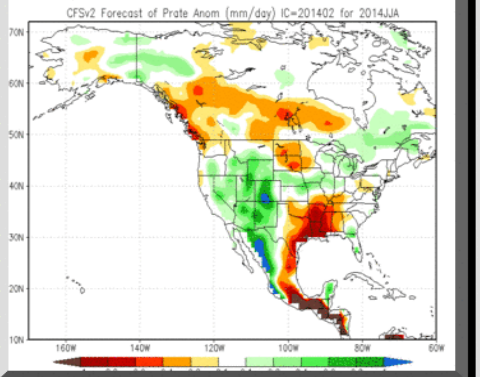
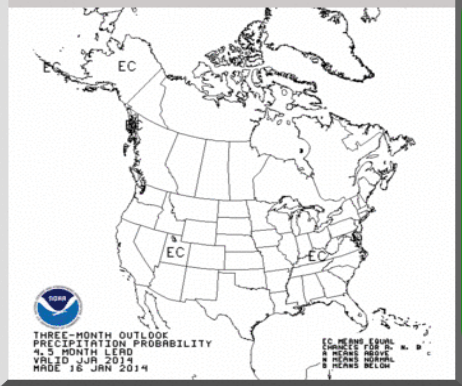


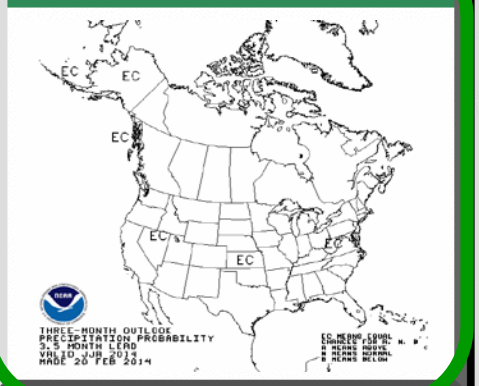
CFSv2



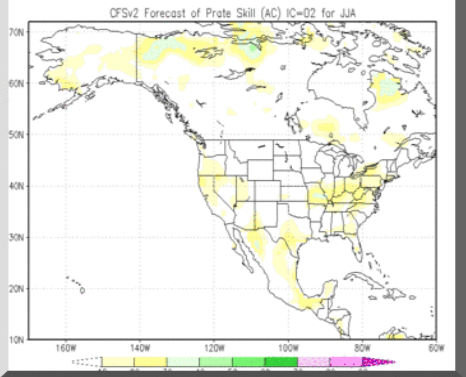
OLD OUTLOOK



** NEW OUTLOOK **



CFSv2 (skill)



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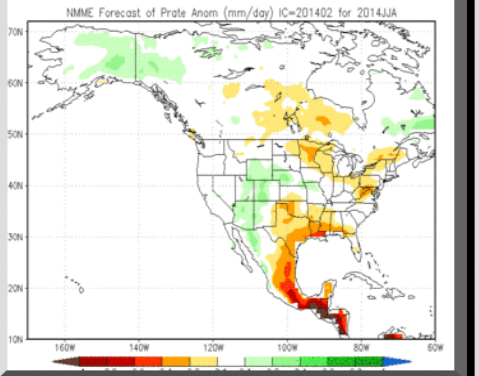

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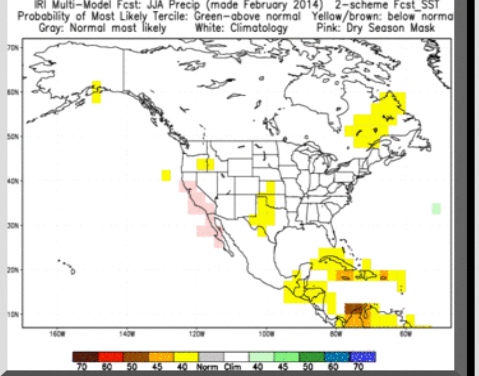
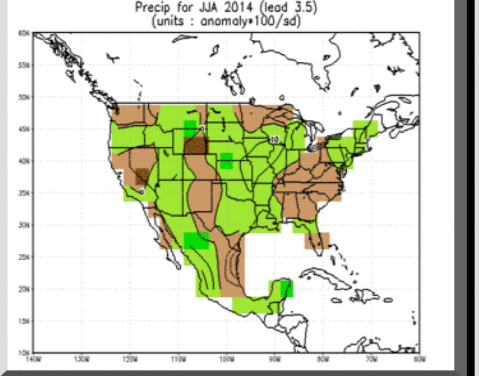
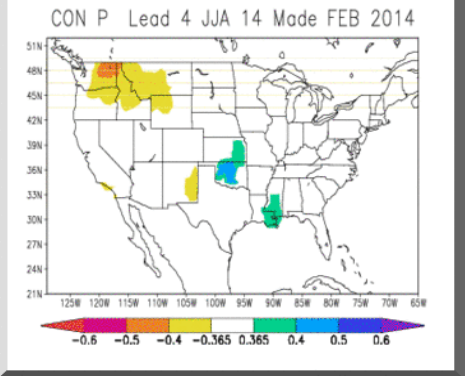


ENSEMBLE CCA (ECCA)

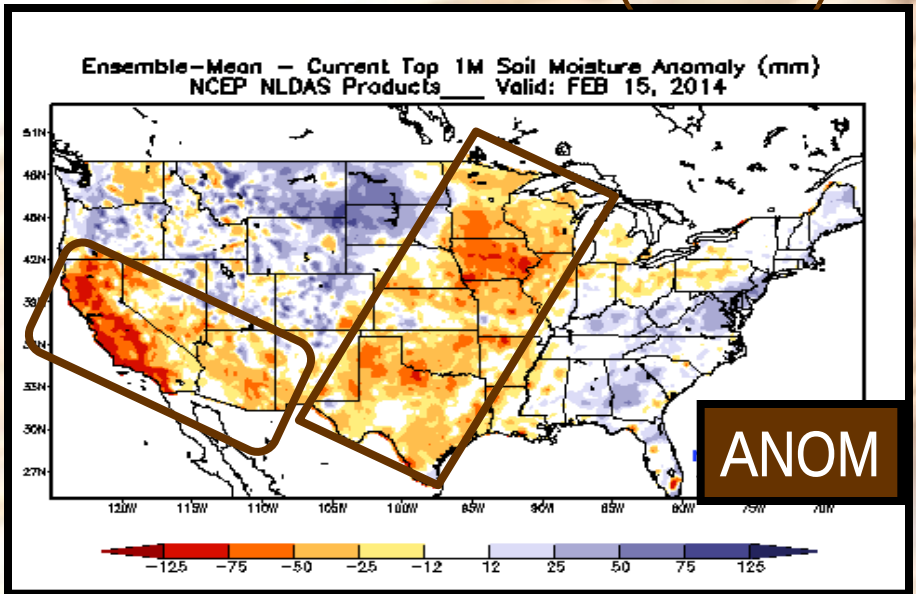


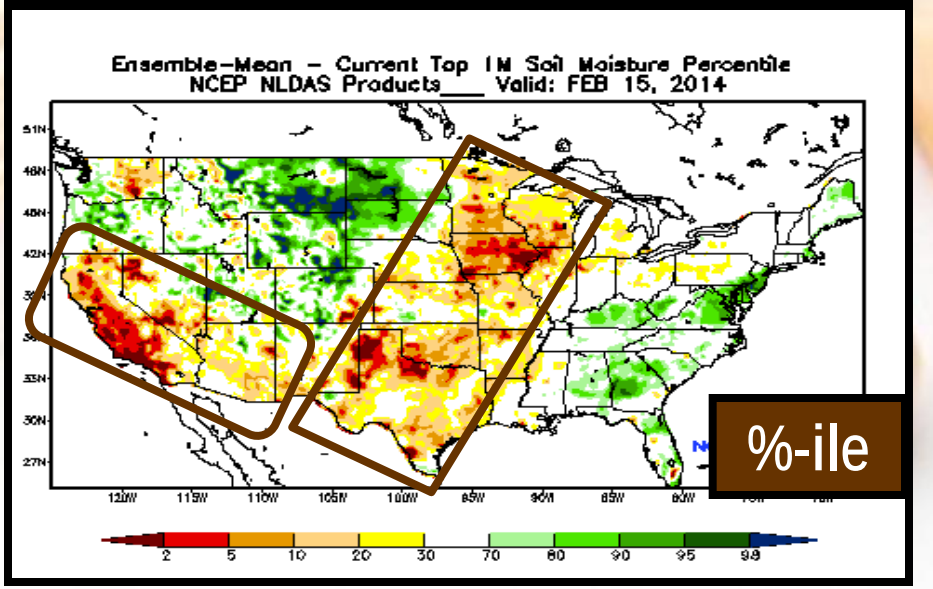
CONSOLIDATION



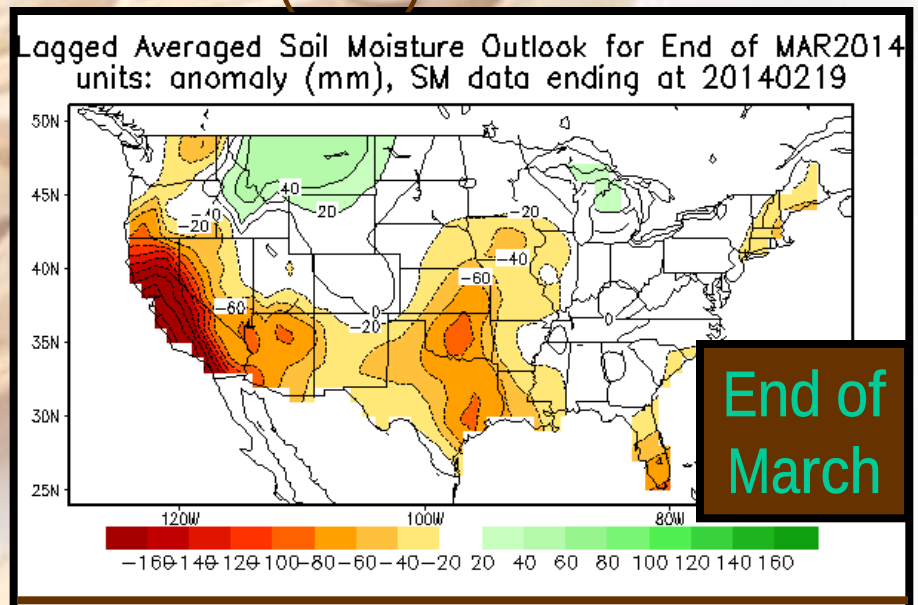
Soil Moisture

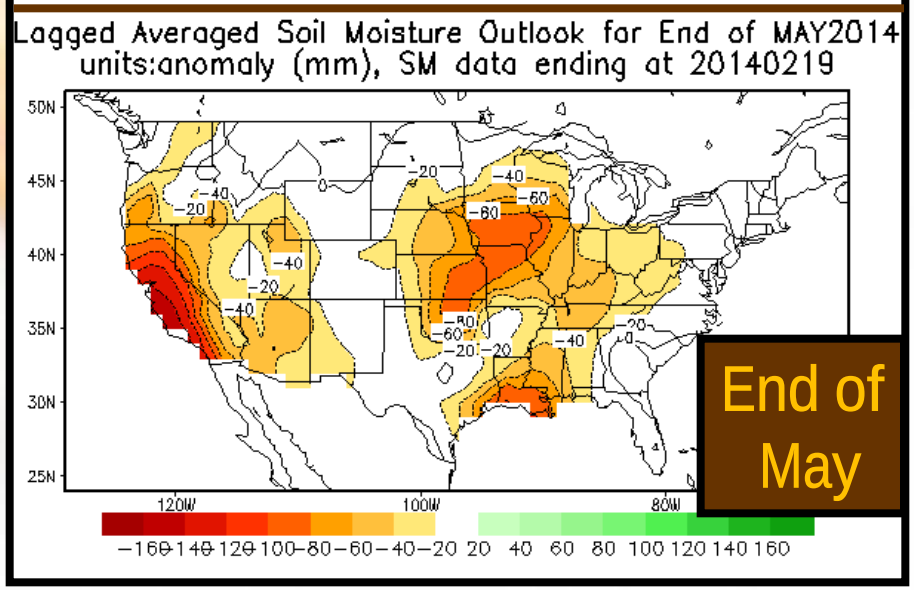
"Current" Conditions (NLDAS)



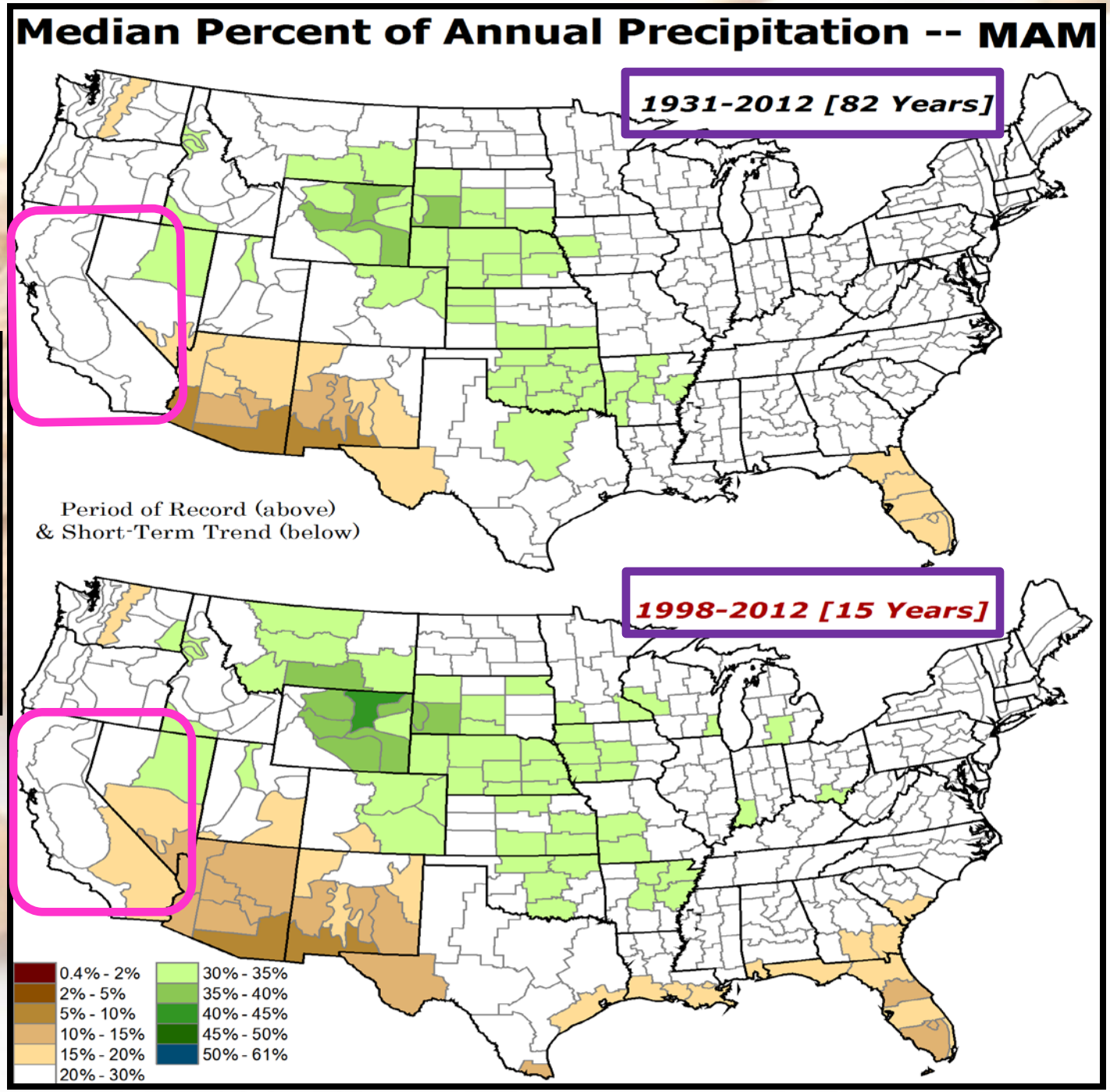


(CAS) Outlooks



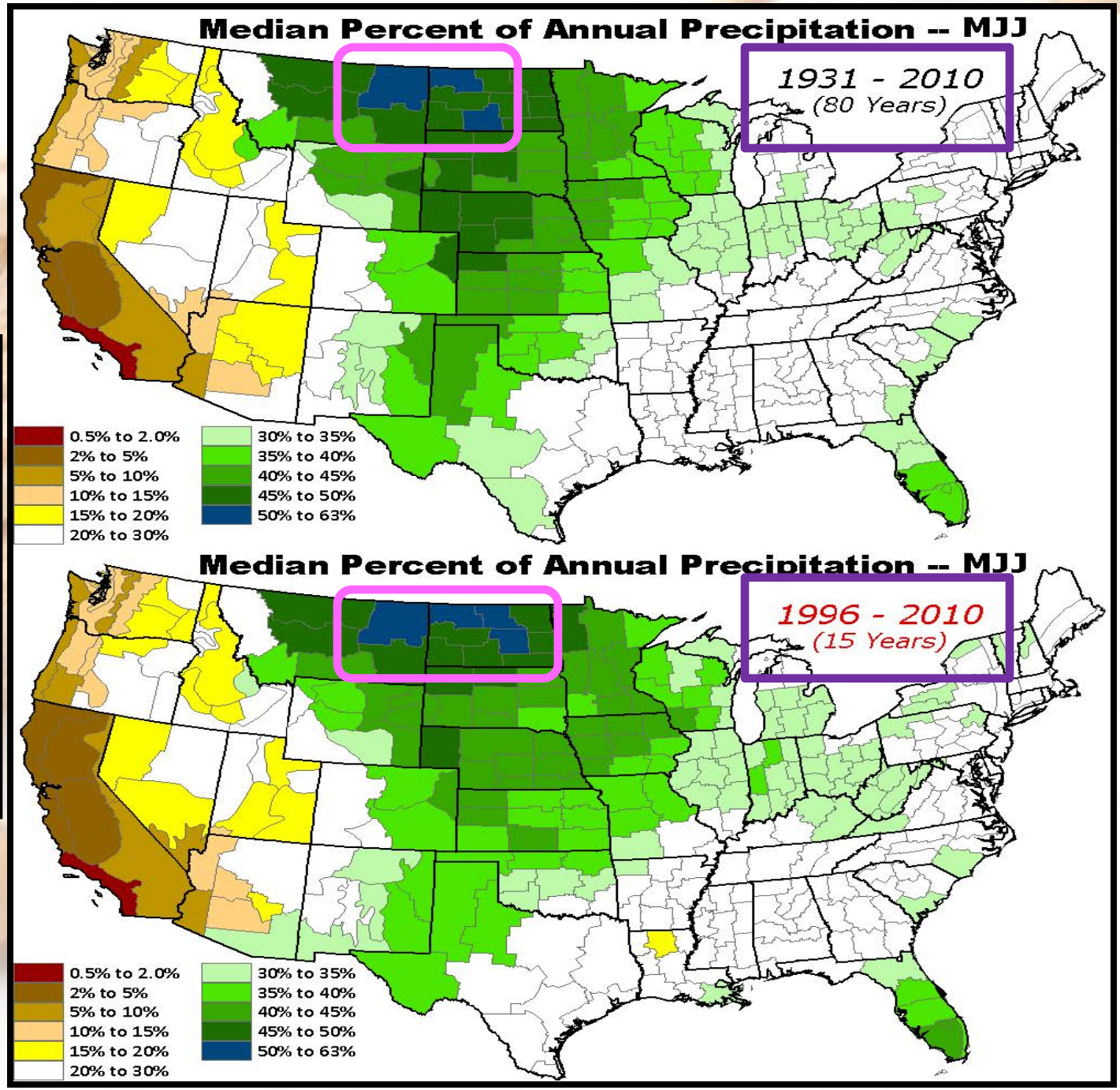


From 15%-30% of California's annual precipitation comes in Mar-Apr-May



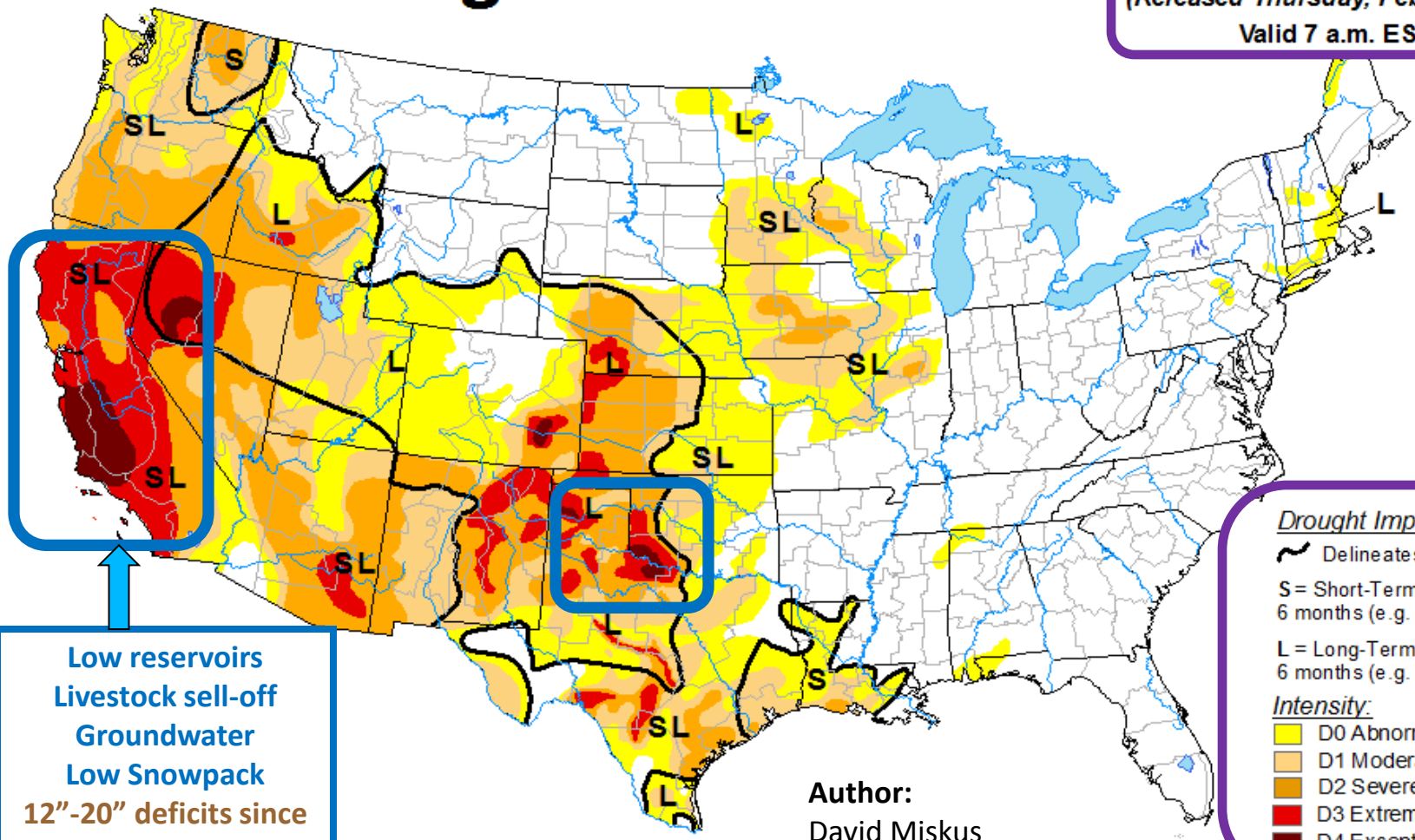
From 35%-60% of Central U.S.'s annual precipitation comes in May-June-July.

(MCS's/Fronts)



U.S. Drought Monitor

February 18, 2014
(Released Thursday, Feb. 20, 2014)
Valid 7 a.m. EST



Low reservoirs
Livestock sell-off
Groundwater
Low Snowpack
12”-20” deficits since start of WY

Author:
David Miskus
NOAA/NWS/NCEP/CPC

Drought Impact Types:

Delineates dominant impacts

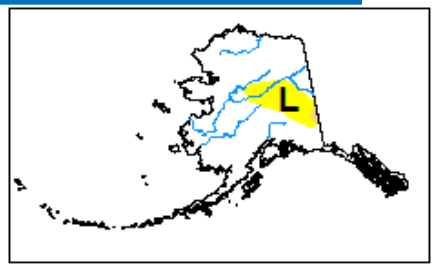
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

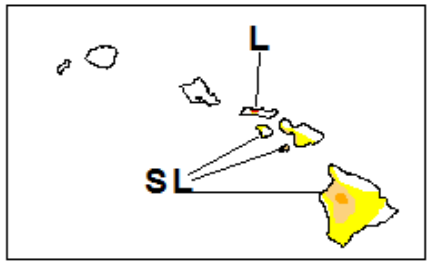
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

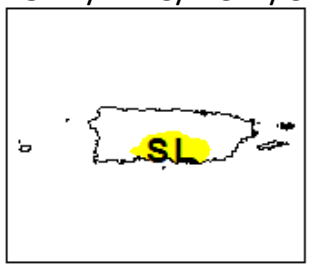
Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.







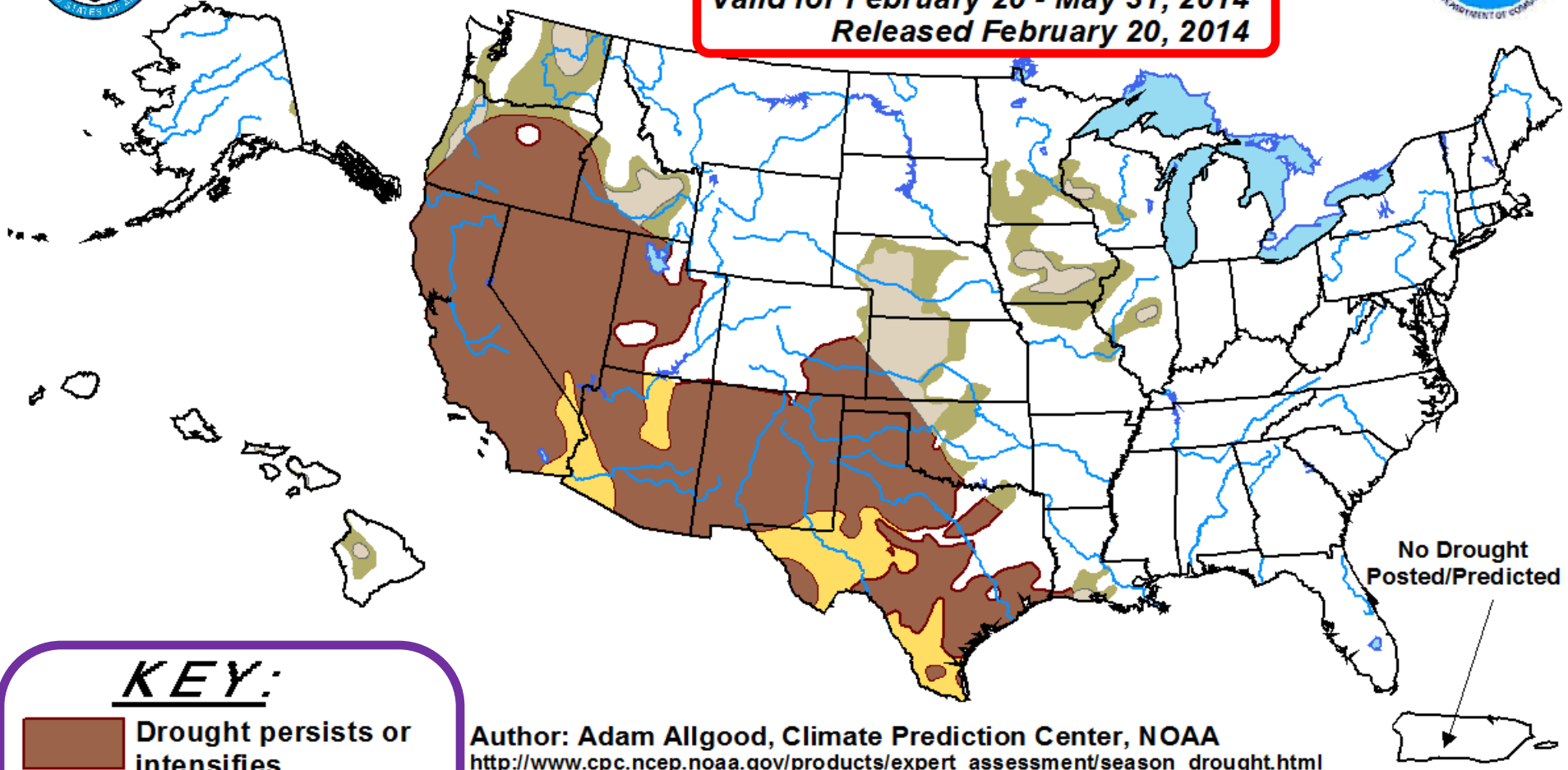
USDA | National Drought Mitigation Center

http://droughtmonitor.unl.edu/

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for February 20 - May 31, 2014
Released February 20, 2014



KEY:

- Drought persists or intensifies
- Drought remains but improves
- Drought removal likely
- Drought development likely

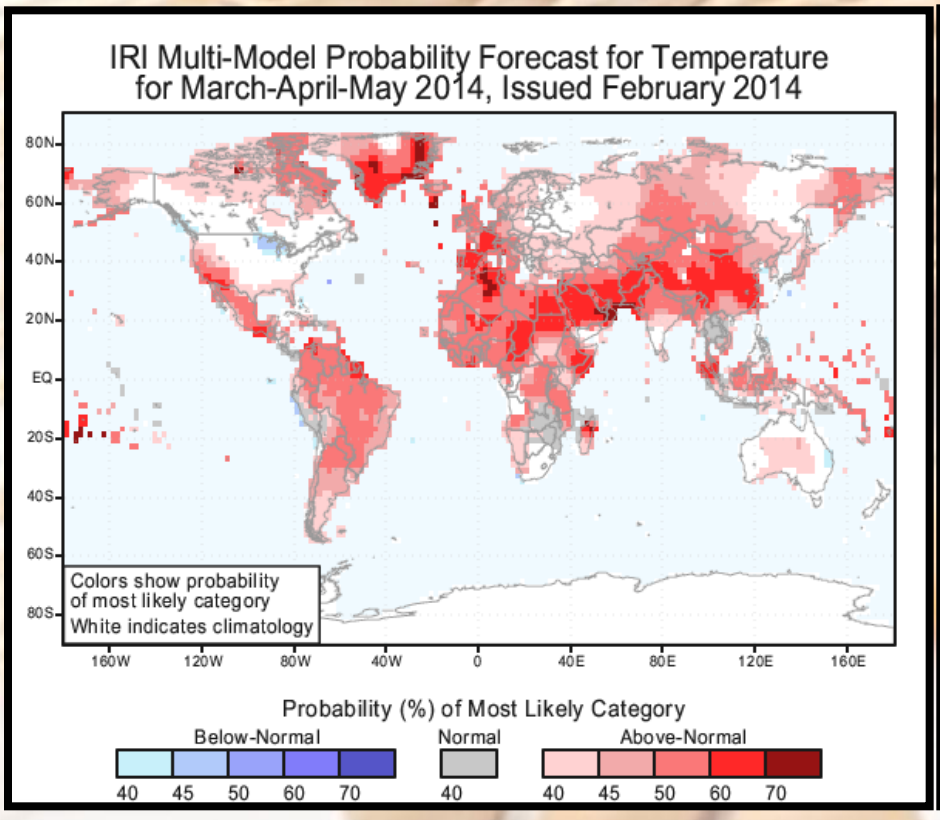
Author: Adam Allgood, Climate Prediction Center, NOAA
http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity).
For weekly drought updates, see the latest U.S. Drought Monitor.
NOTE: The tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain.
The Green areas imply drought removal by the end of the period (D0 or none)

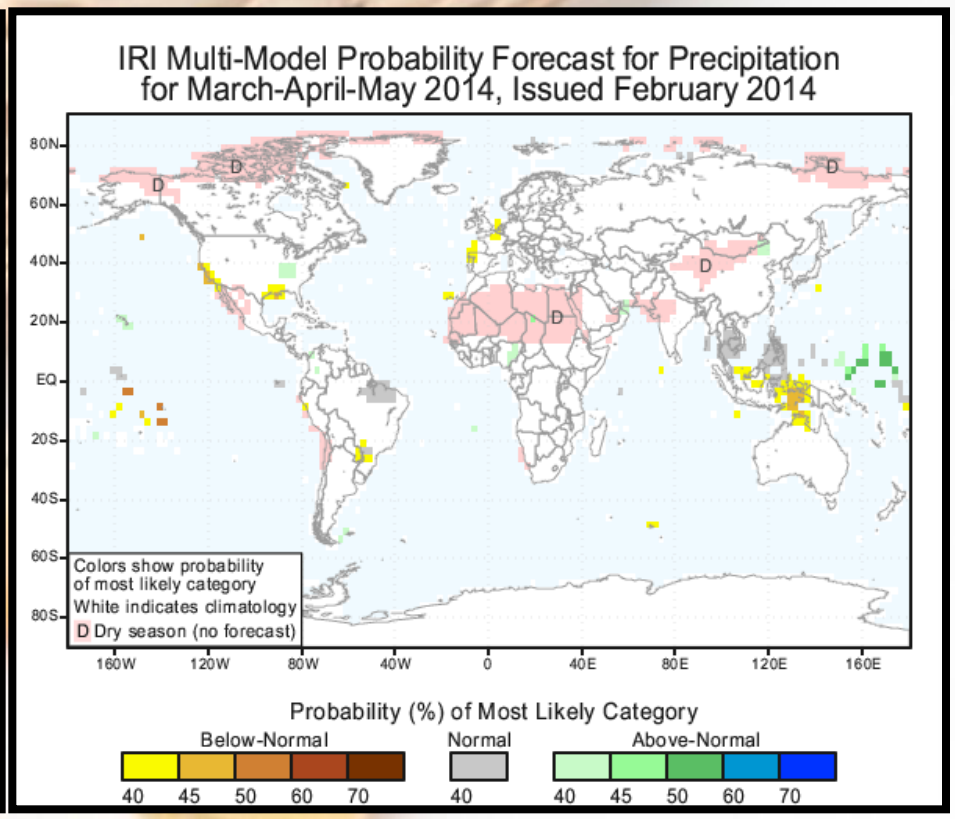
IRI* Multi-Model Forecast

SPRING

TEMPERATURE



PRECIPITATION



* International Research Institute for Climate and Society
(Lamont Campus, Columbia University, Palisades, NY)

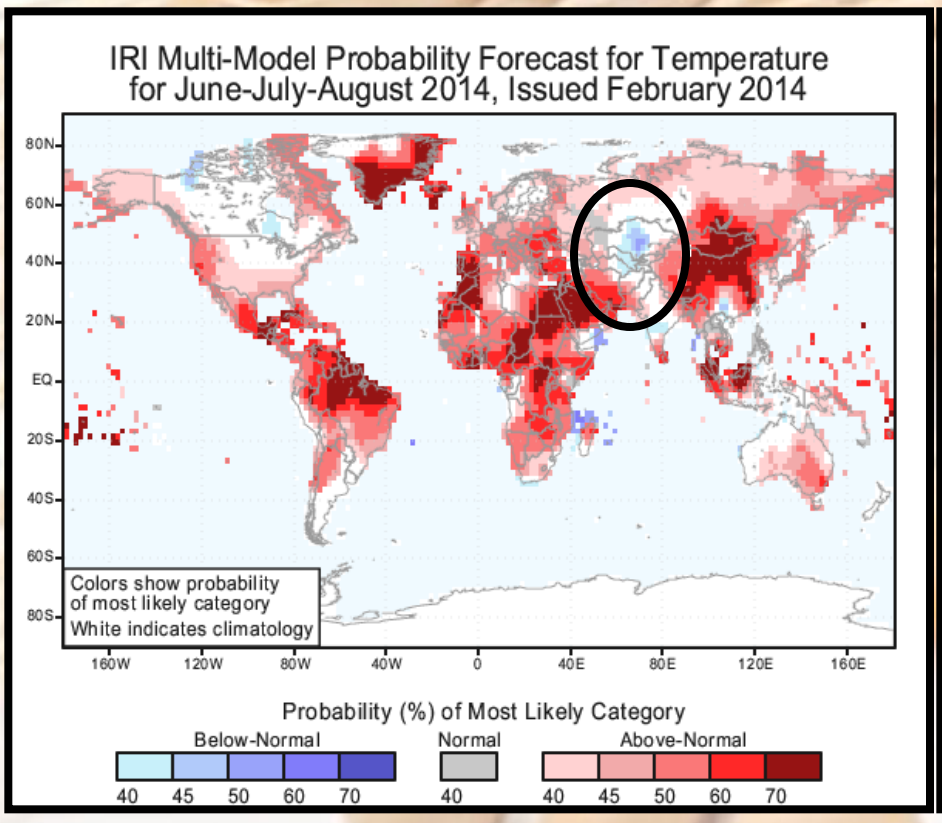
http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/MAM14_World_temp.gif

http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/MAM14_World_pcp.gif

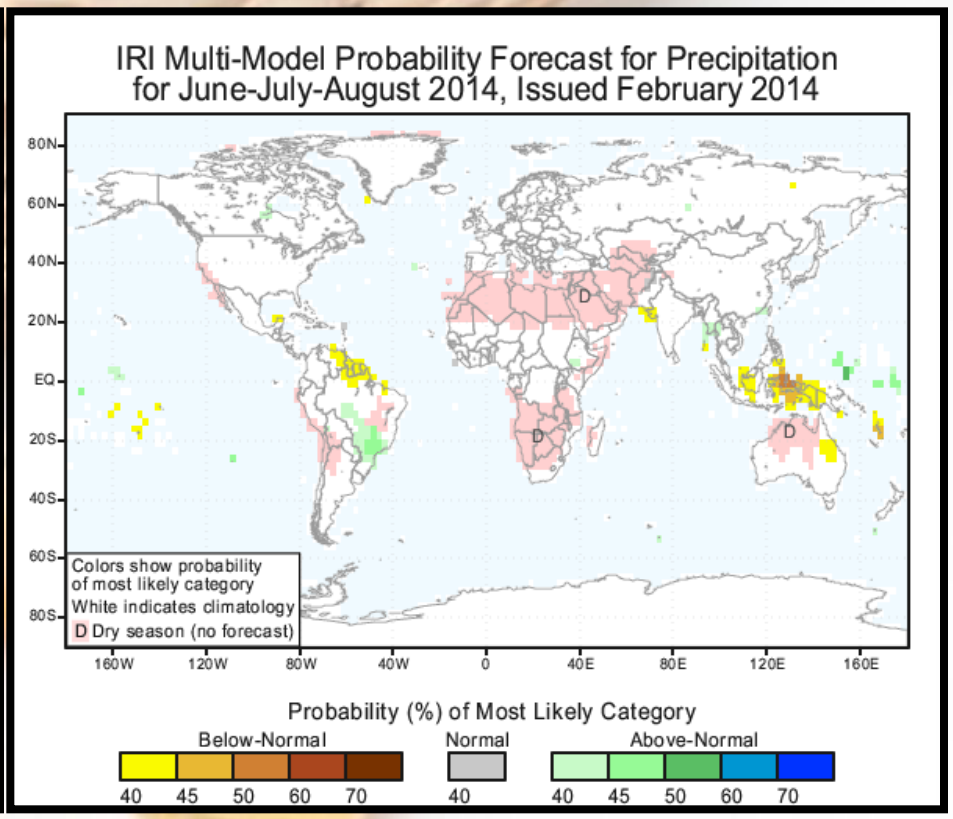
IRI* Multi-Model Forecast

SUMMER

TEMPERATURE



PRECIPITATION



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http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/JJA14_World_temp.gif

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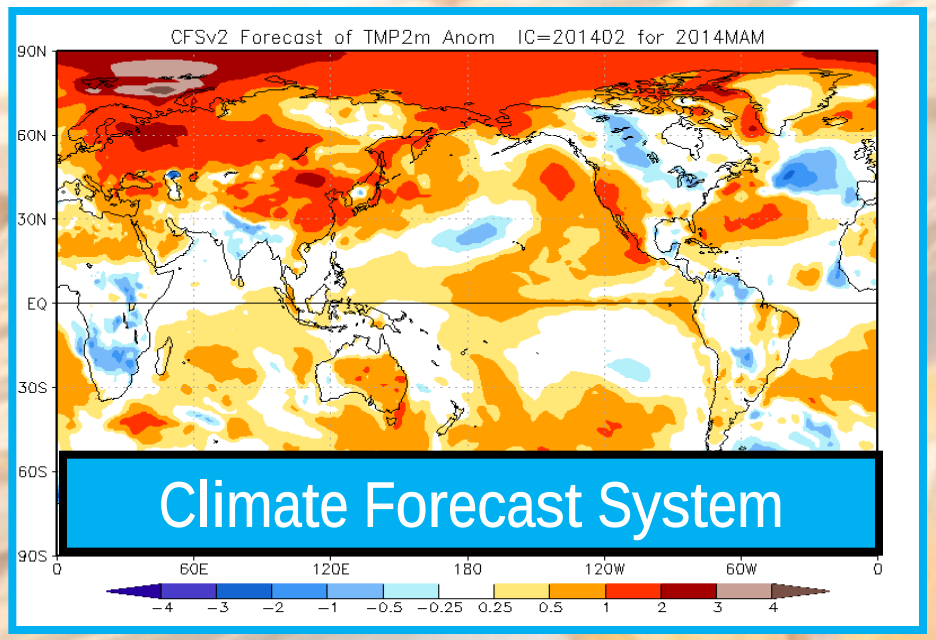
International Temperature Outlooks for MAM 2014

SPRING



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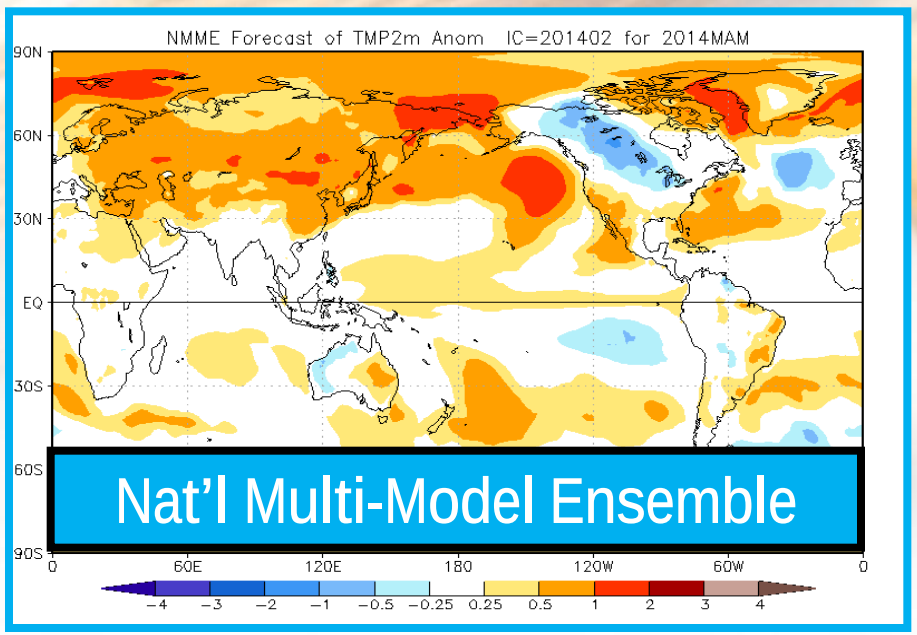
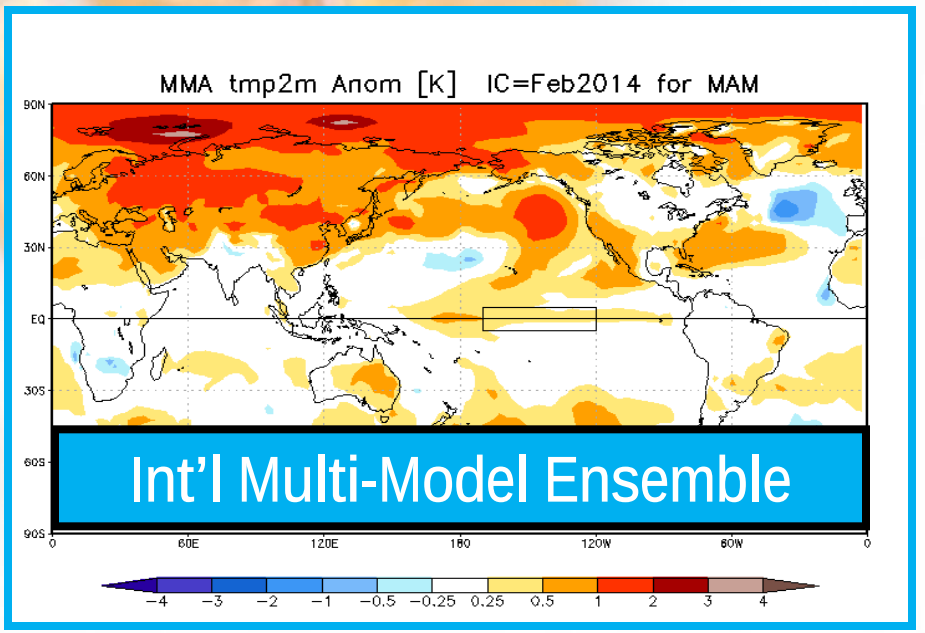
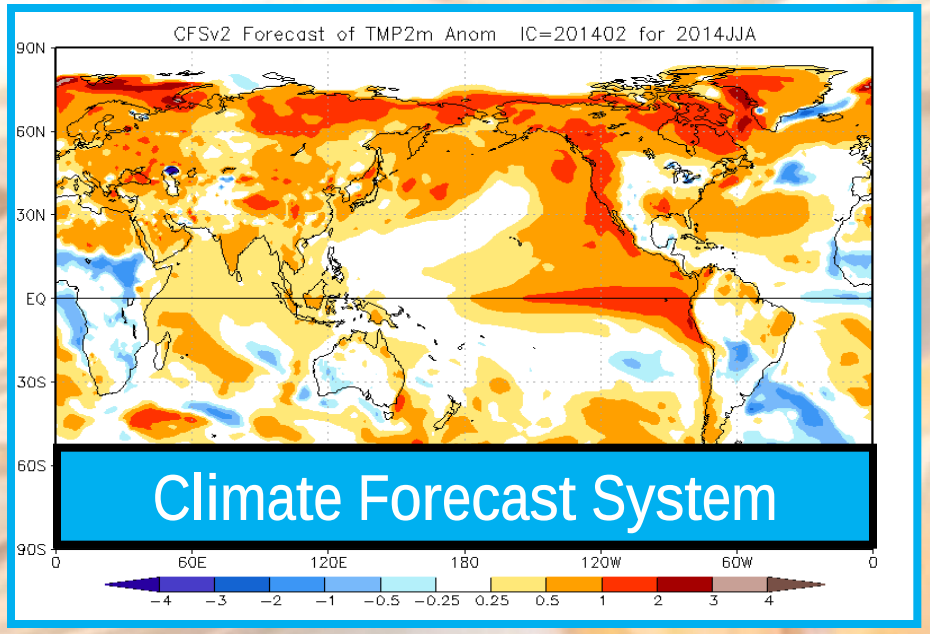


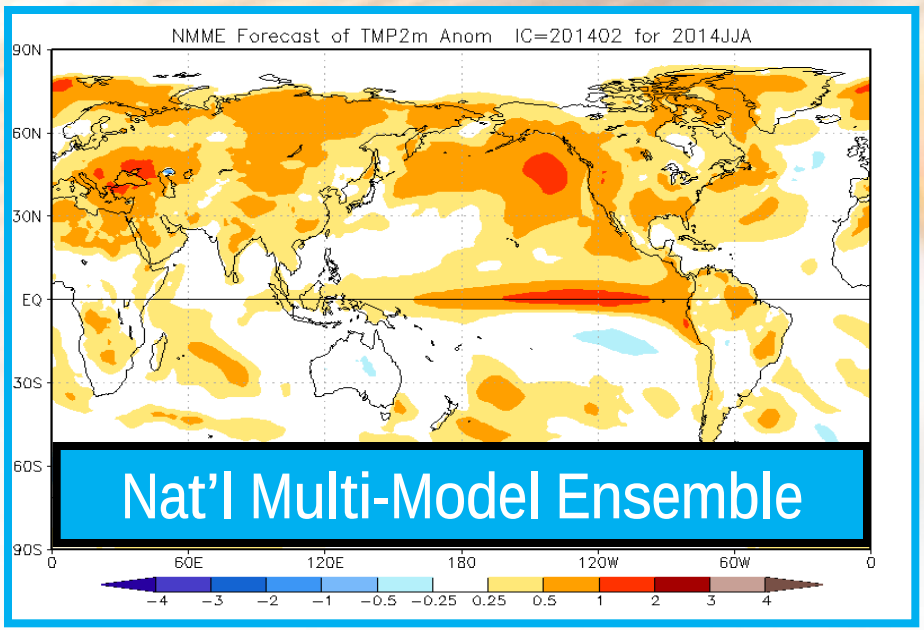


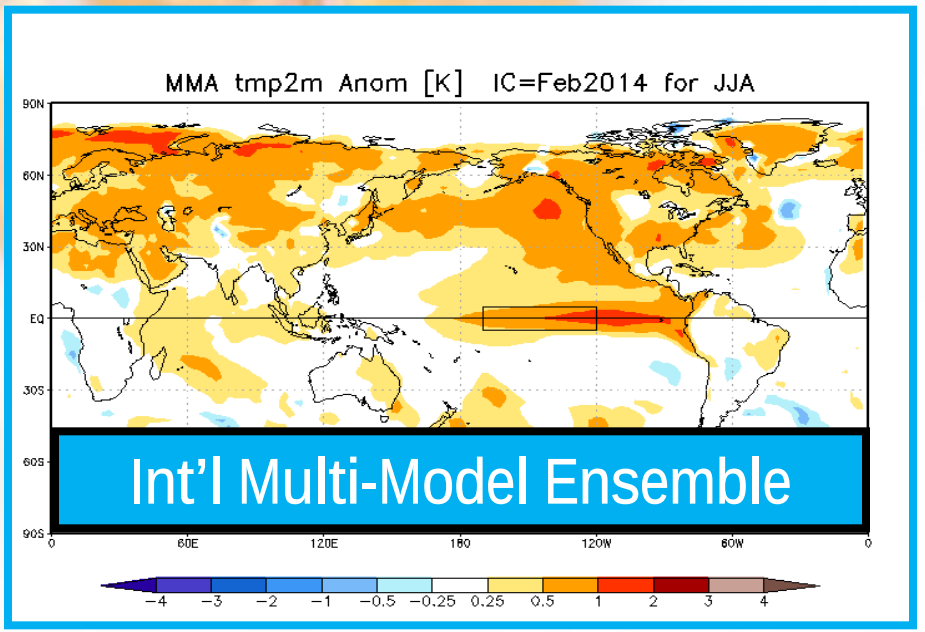
International Temperature Outlooks for JJA 2014

SUMMER



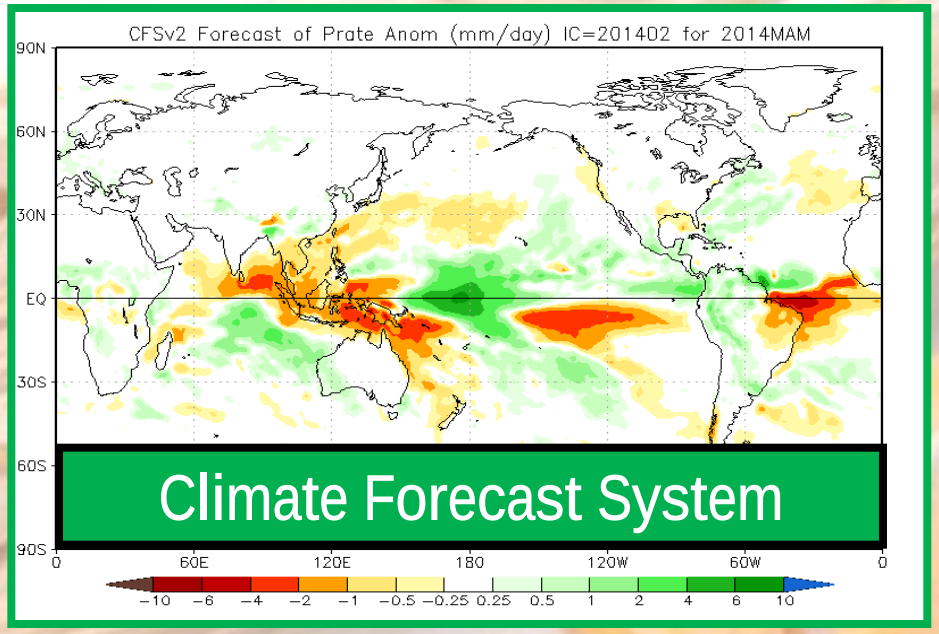
SUMMER





International Precipitation Outlooks for MAM 2014

SPRING



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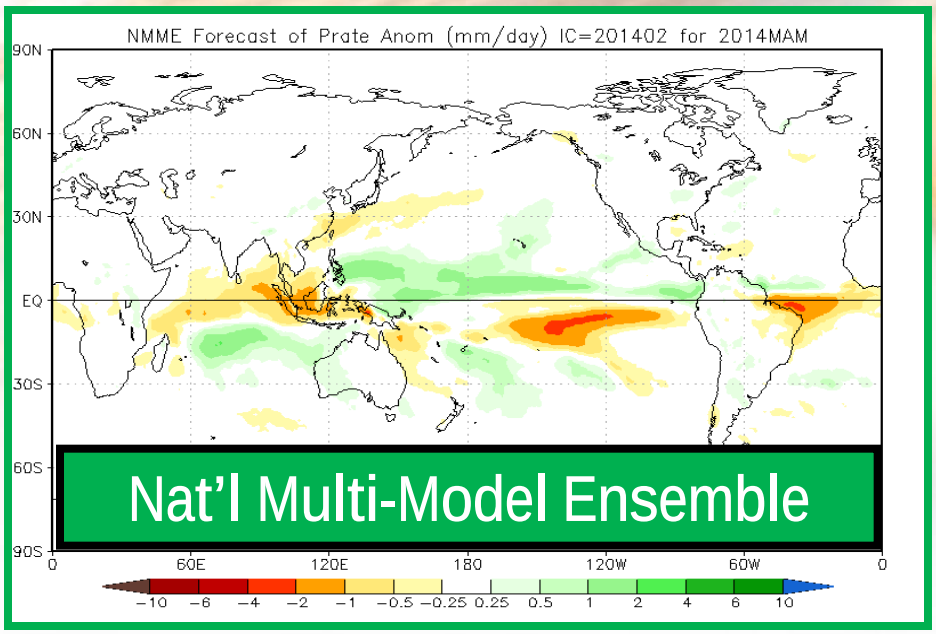
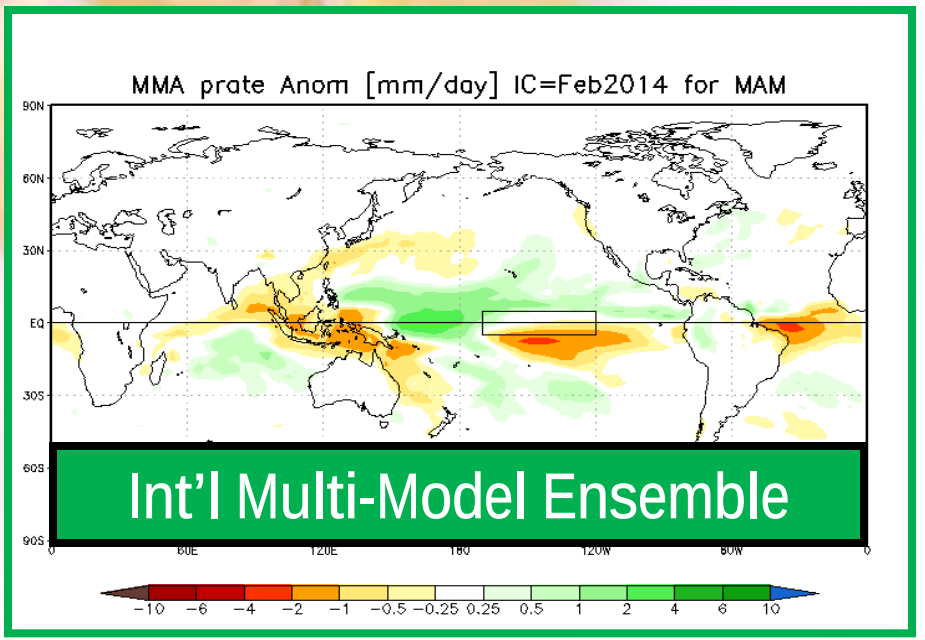
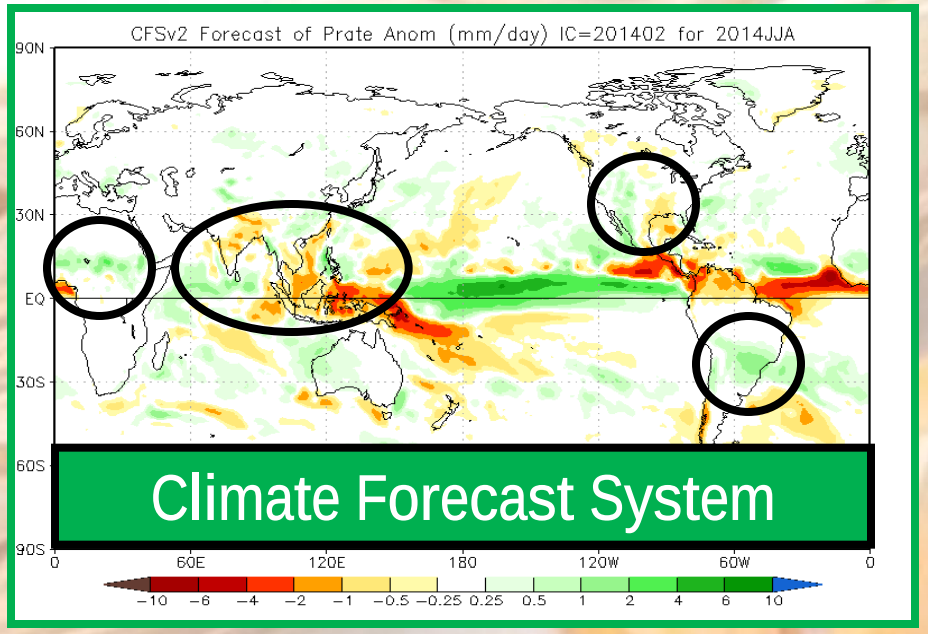




International Precipitation Outlooks for JJA 2014

SUMMER



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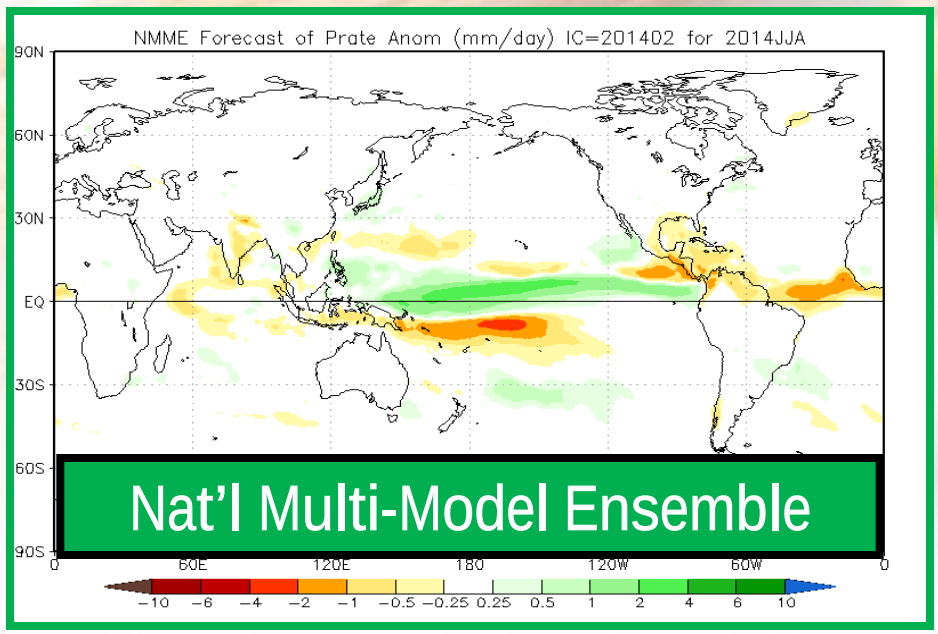
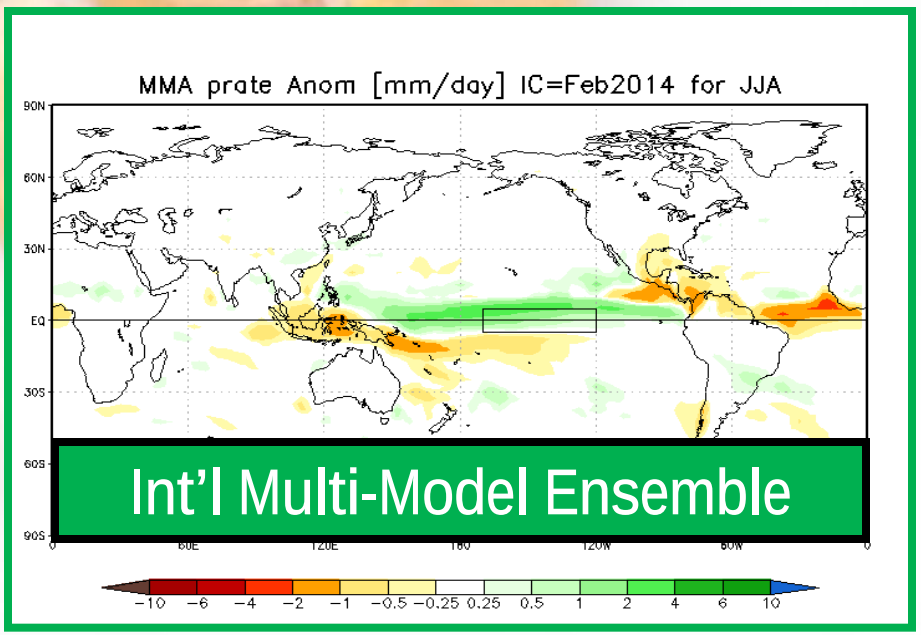
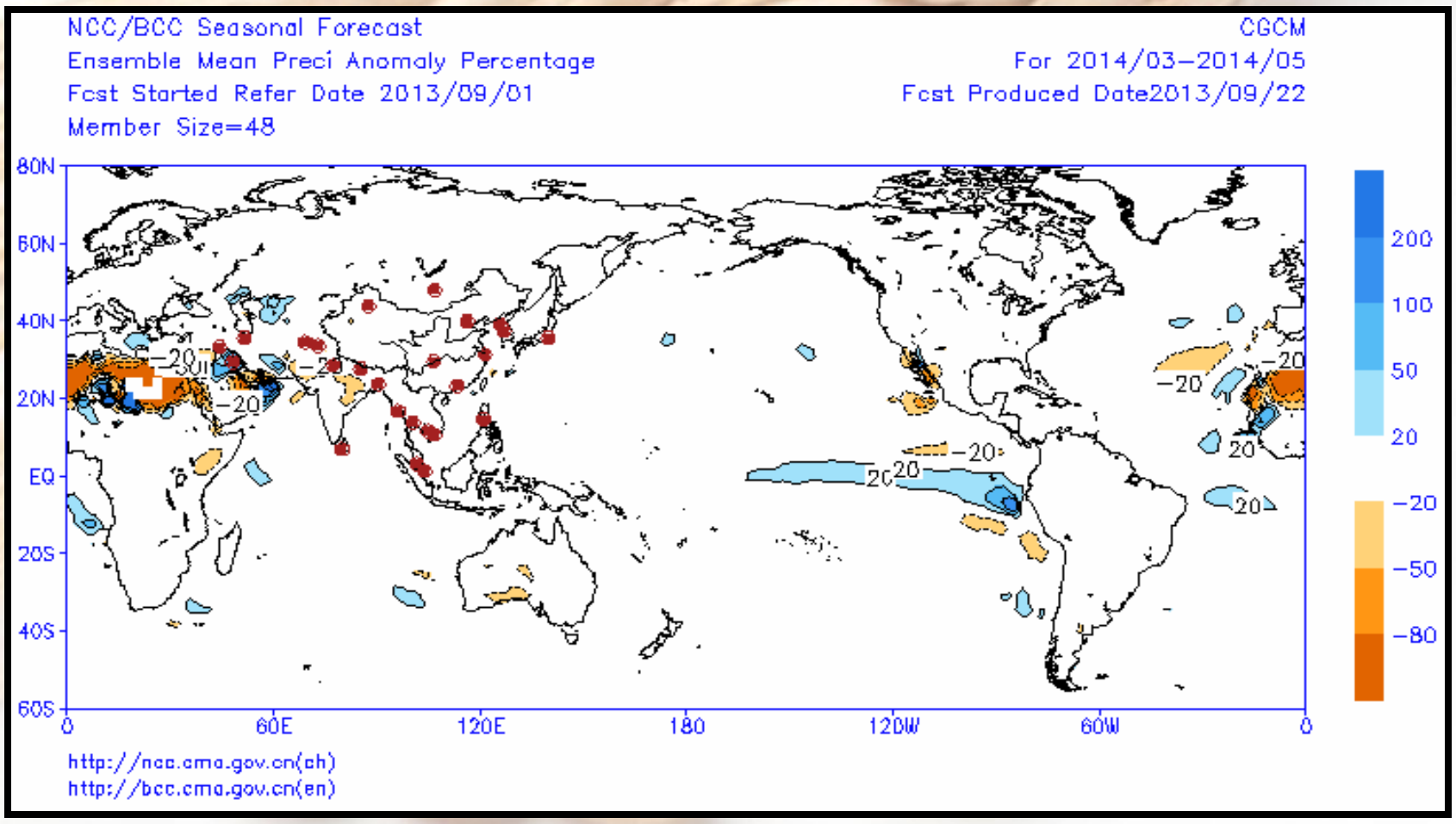


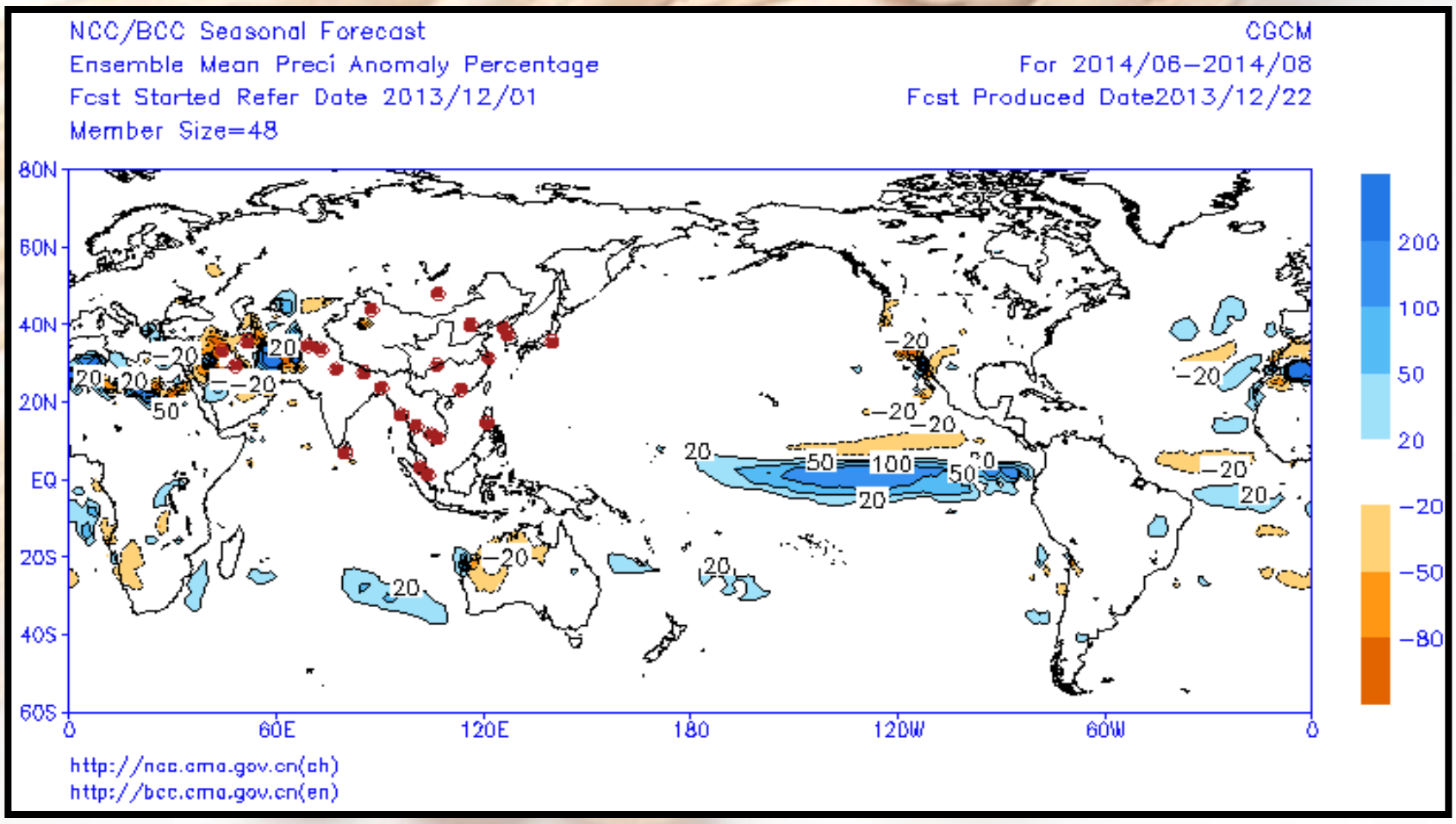


Beijing Climate Center
(March-May 2014 Precipitation)



http://cmdp.ncc.cma.gov.cn/pred/cs/CS2014/CS201403_201405GLRAINL6.GIF

Beijing Climate Center
(June-August 2014 Precipitation)

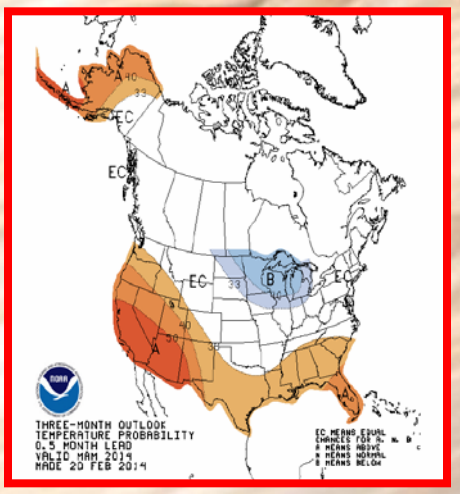


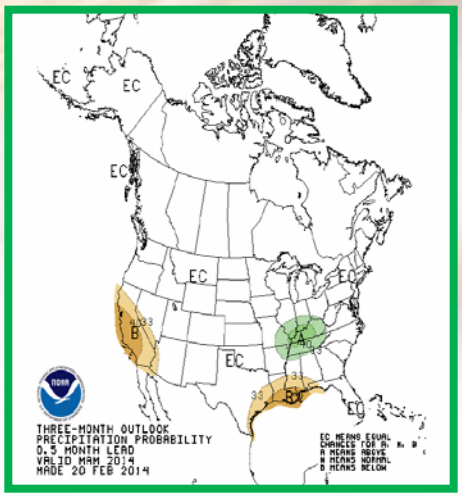
http://cmdp.ncc.cma.gov.cn/pred/cs/CS2014/CS201406_201408GLRAINL6.GIF

SUMMARY:

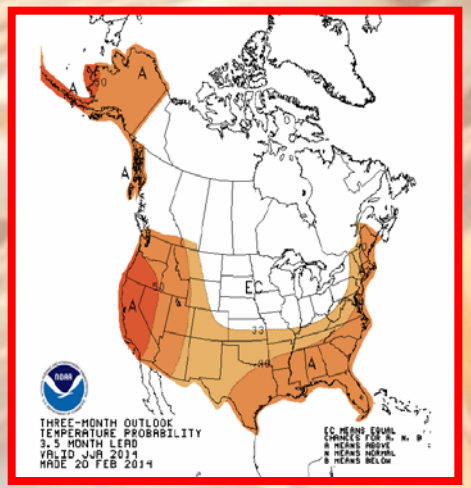
ENSO-NEUTRAL (Spring) | NEUTRAL/WARM (Summer)

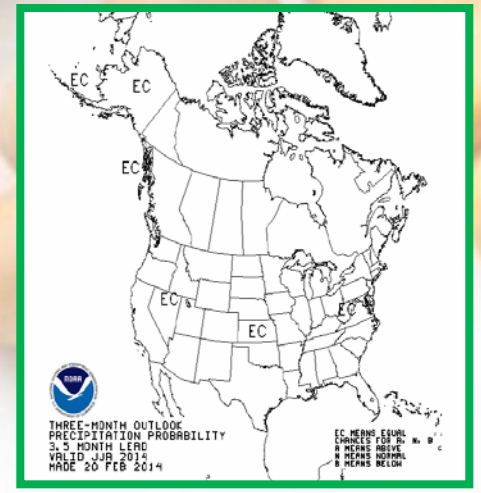
SPRING

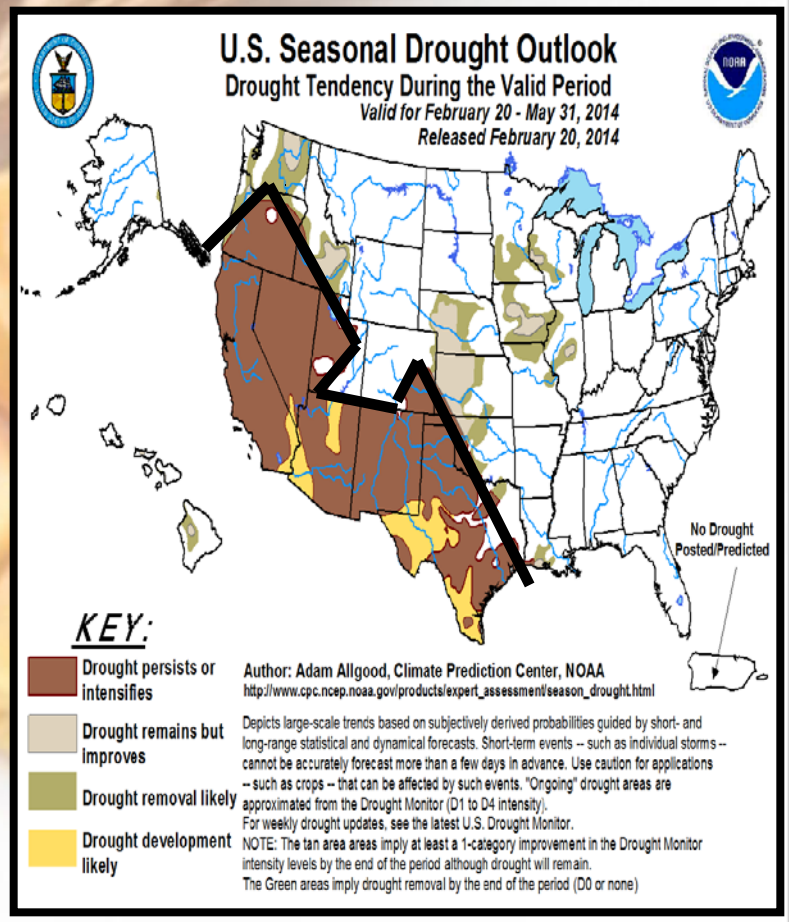




SUMMER







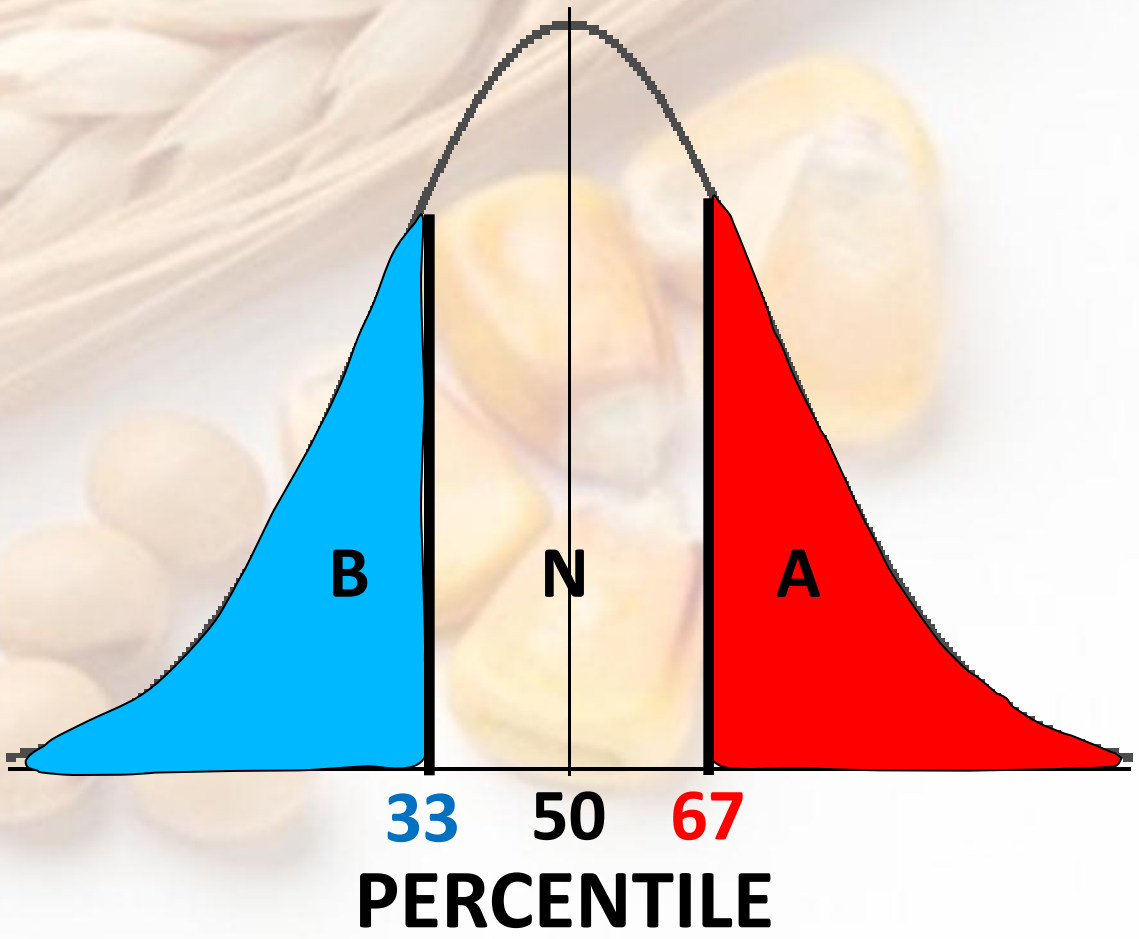
Pictures:

http://www.cameronhanover.com/wp-content/uploads/corn__wheat___soybeans1.jpg

http://nixahardware.com/images/alfalfa_hay_round_bales.jpg

http://www.cottonman.com/images/cotton%20pictures/cotton%20field.jpghttp://www.technikboerse.com/pictures/49007145/5983b7c4-2de5-41bc-9d78-fc2e0b42c8c8.jpg (axial flow combine)

CLIMATOLOGICAL CATEGORIES/TERCILES
(1981-2010 Temp / Prcp Historical Observations)



Verification of several Climate Outlooks (2014)

Heidke Skill Score (HSS):

$$HSS = \frac{C - E}{T - E} \times (100)$$

C: number of stations Correctly forecast
E: number of stations Expected Correct by random chance (=1/3)
T: Total number of stations

“FLASH DROUGHT” OF 2012

Antecedent winter/spring soils insufficiently recharged

Very mild winter left little snowpack to help keep soils moist in spring

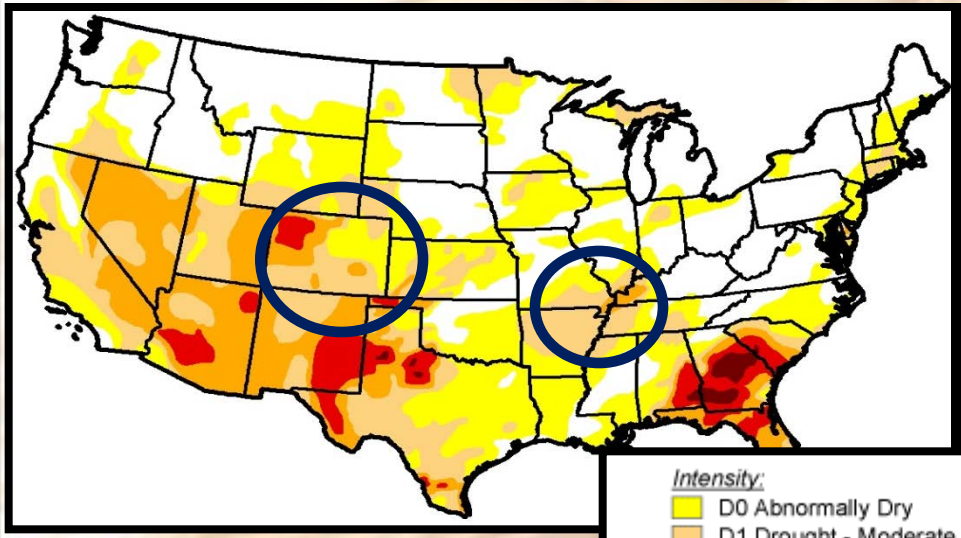
Record Heat in March coming out of a La Nina winter

Rapid Onset of Heat in early June 2012 (bad timing)

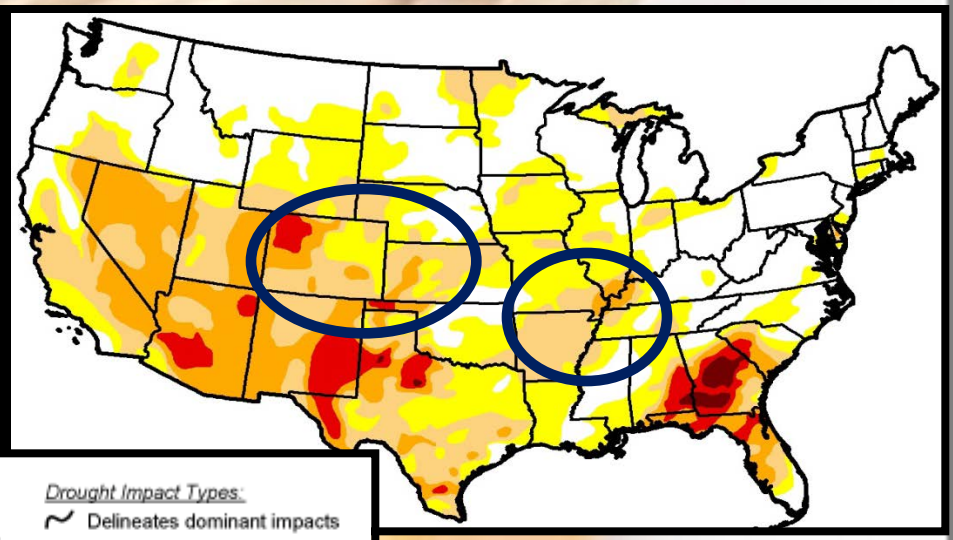
Pre-existing Drought rapidly intensifies & expands

(U.S. Drought Monitor 2012)

May 29



June 5

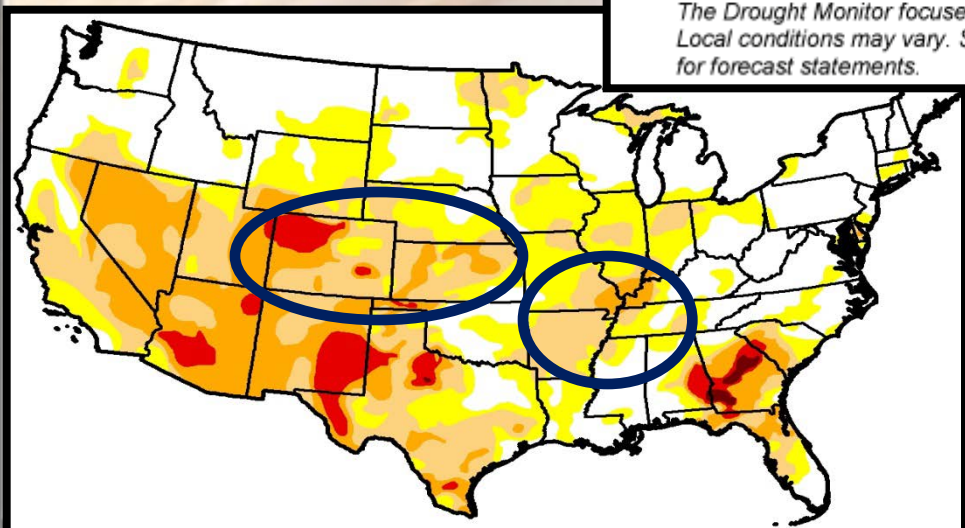
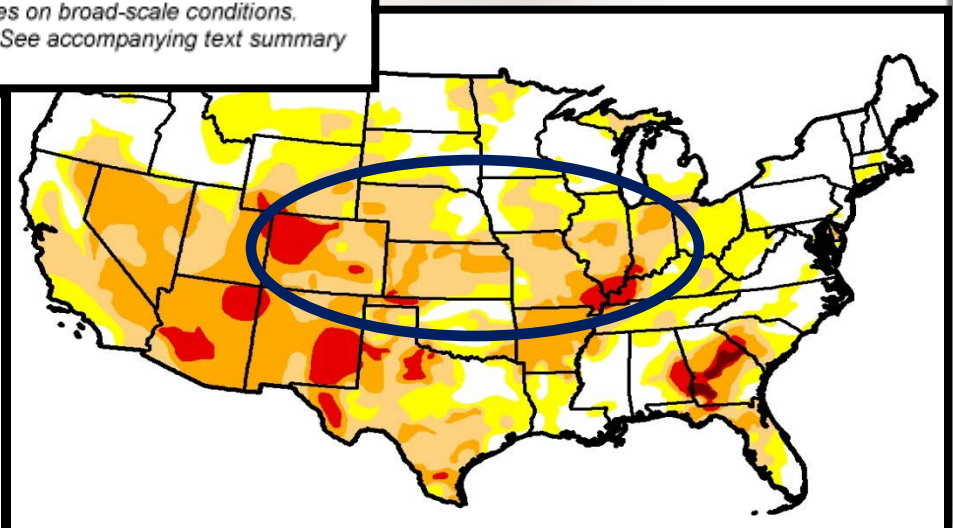


Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:
- Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

June 12



June 19