STATE OF CALIFORNIA -- CALIFORNIA NATURAL RESOURCES AGENCY **EDMUND G. BROWN JR.**, *Governor*

DEPARTMENT OF WATER RESOURCES
DIVISION OF FLOOD MANAGEMENT
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June 10, 2013

TO: Long Range Weather Forecasting Committee Members

SUBJECT: Summer 2013 Forecasts

The updated Climate Prediction Center (CPC) forecast for June is now available. I do not expect anything new within the next few weeks, so I am sending out the quarterly summer forecasts now. The winter started quite wet in November and December, but then switched to the driest January through May period in a record of 90 years. The Northern Sierra 8 station 5-month total was 9.4 inches; well under the previous record low of 11.1 inches in 1924. The San Joaquin 5 station index was equally dismal at 6.8 inches, compared to 8.7 inches in 1966. (The average amount for the 5-month period is about 30 and 26 inches, respectively.) There is little reason to expect any change now until the new water year next fall. Water year runoff is expected to be around 11.5 million AF for the Sacramento 4 river system and 3.0 million AF on the San Joaquin four rivers, which would be 63 and 50 percent of average respectively and roughly in the 24 and 18 percentile range. Without the two big late fall and early winter storm events, water year runoff would have been quite grim.

Enclosed are the new sets of experimental long-range forecasts for the summer and next fall provided by the National Weather Service (NWS) CPC, which were produced on May 16 or 31. For the 3-month summer period, the CPC is forecasting a brown dry area over the Pacific Northwest and the Southwest four corners region (a poor summer monsoon) with wetness in the central Gulf of Mexico region. The big story is the warmer than normal forecast for both seasons across most of the west, except the coastal fringe. Although, even this is projected to be warm in June, continuing a warm pattern reported by meteorologist Jan Null for April and May. The charts do not show a precipitation slant for summer or fall in California, but summers are generally dry anyway, leaving some hope for more normal fall rains next season.

The weak La Nina of last winter in the eastern tropical Pacific faded to the near neutral range last spring, which the CPC thinks will continue this summer. (However, the Nino region chart does show cooling near South America, leaving me to wonder if we might, in fact, see another La Nina this fall.) The IRI/CPC projections are shown in a later chart. The Pacific Decadal Oscillation (PDO) was slightly negative at -0.16 in April, much relaxed from negative values last year. It has been trending toward neutral this year. (May values are not yet posted by the University of Washington.)

Art Douglas, former head of the Meteorology Department of Creighton University in Omaha, and now retired in southeastern Arizona, occasionally sends copies of his outlooks to me. He just sent me the next set of 6 maps with his temperature and precipitation outlooks for summer, fall and next winter. His temperature outlooks for summer and fall are not that different from the CPC. However, the wet fall will be most welcome. He then seems to ease back on precipitation in the winter. One of his indicators, east Pacific temperatures off Baja, California, which were cold this past winter, seems to have warmed to more normal patterns. This may give hope for more normal rainfall next winter—but we can't be sure.

The next set of maps for winter and spring are from the International Research Institute of Columbia University at Palisades, New York. It is similar to the CPC for the USA (based on the same methodology) but shows other countries in North America. Perhaps the most striking feature is the warmness projected for much of North America this summer and fall.

The drought monitor map is attached near the end of the package. Apart from the northern tier of states, most of the western half of the country is quite dry, especially the southern high plains.

Also attached for your information is an interesting chart I came across in the May Nature Climate Change journal. The article is entitled "Projections of Declining Surface-Water Availability for the Southwestern United States" by Richard Seager and others from Lamont Doherty Earth Observatory of Columbia University. The chart, which is an extended long-range forecast for 2021-2040, details the projected precipitation patterns by season. The data was pulled from a portion of the climate modeling for the Intergovernmental Panel on Climate Change (IPCC) in their forthcoming Assessment Report Five. The left figure shows seasonal average precipitation change, and the right is calculated precipitation minus evapotranspiration as a proxy for stream runoff. If they are accurate, we can expect wetter winters in northern and central California, but less rain in fall and spring.

If you have questions or comments, please feel free to call me at (916) 574-2625 or email at Maury.Roos@water.ca.gov.

Sincerely,

Maurice Roos

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Jon Ericson
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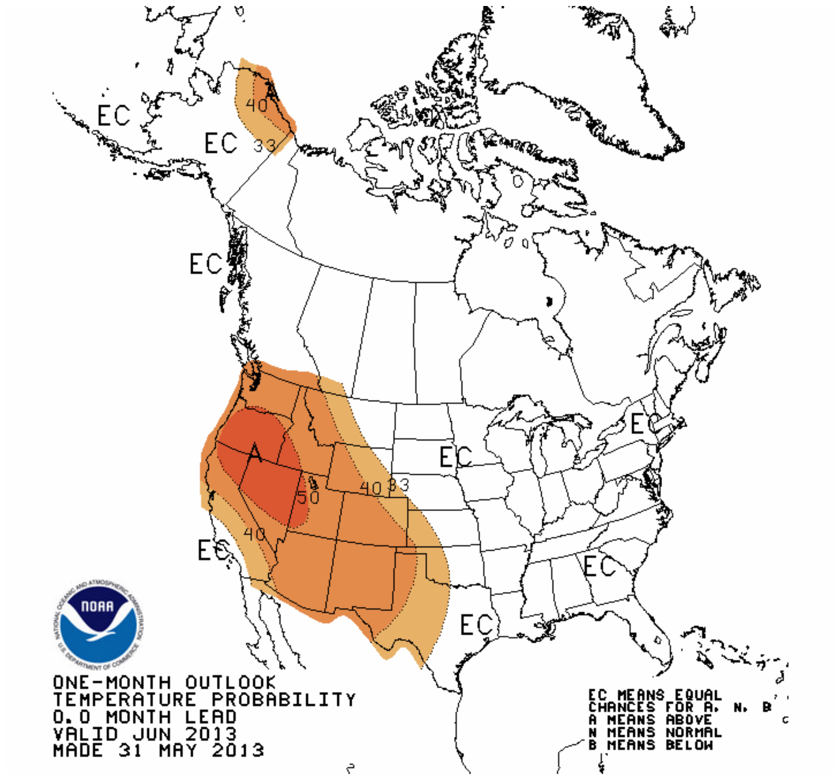
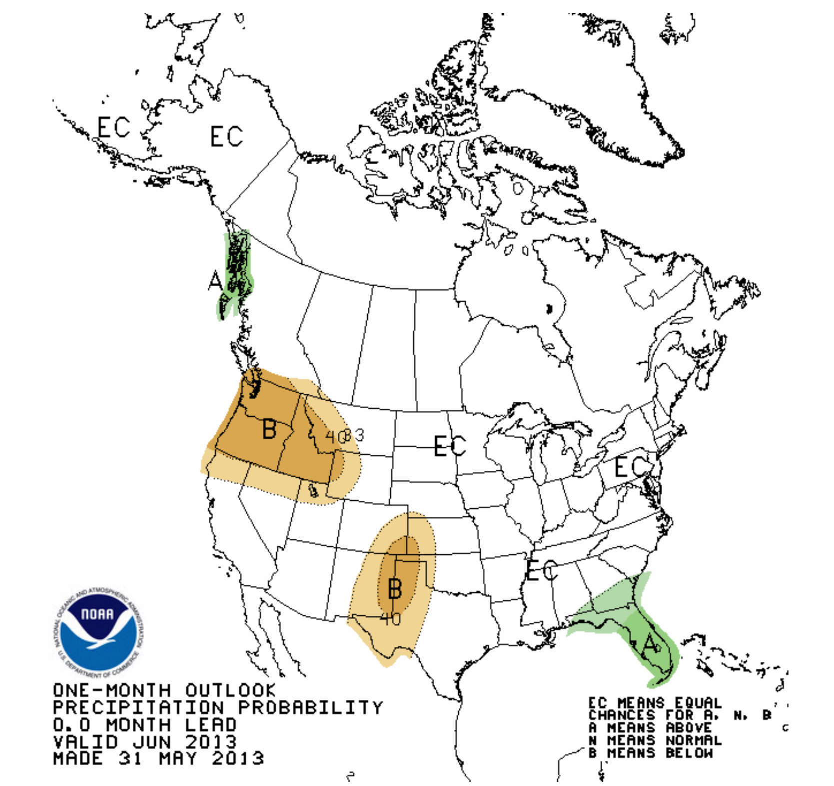
Matt Winston
Steven Nemeth
Michael Anderson
Wendy Halverson-Martin
Jeanine Jones
Steve Johnson

One-Month Outlook

Revised OFFICIAL Forecasts

June 2013

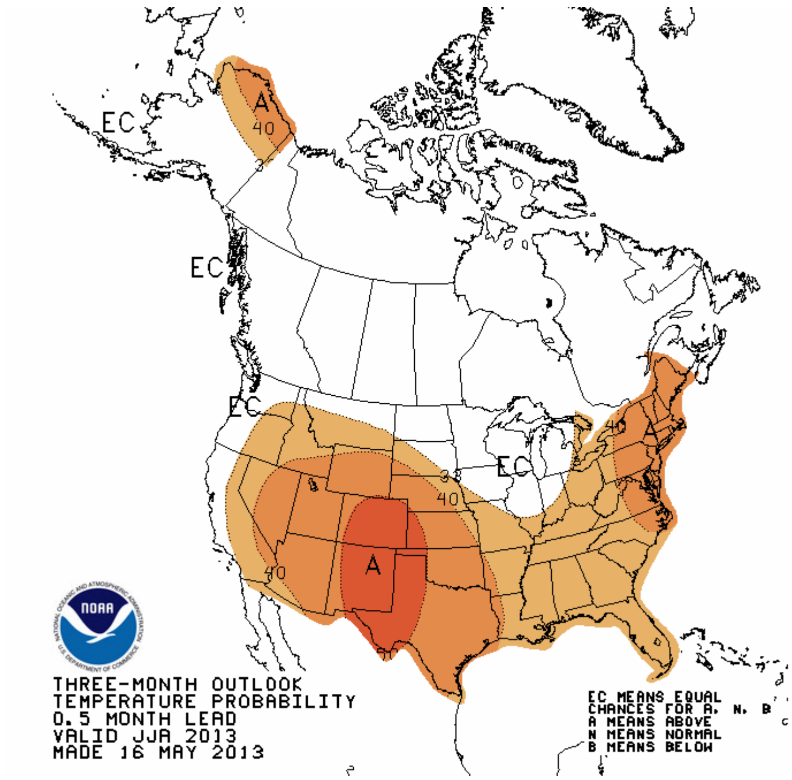


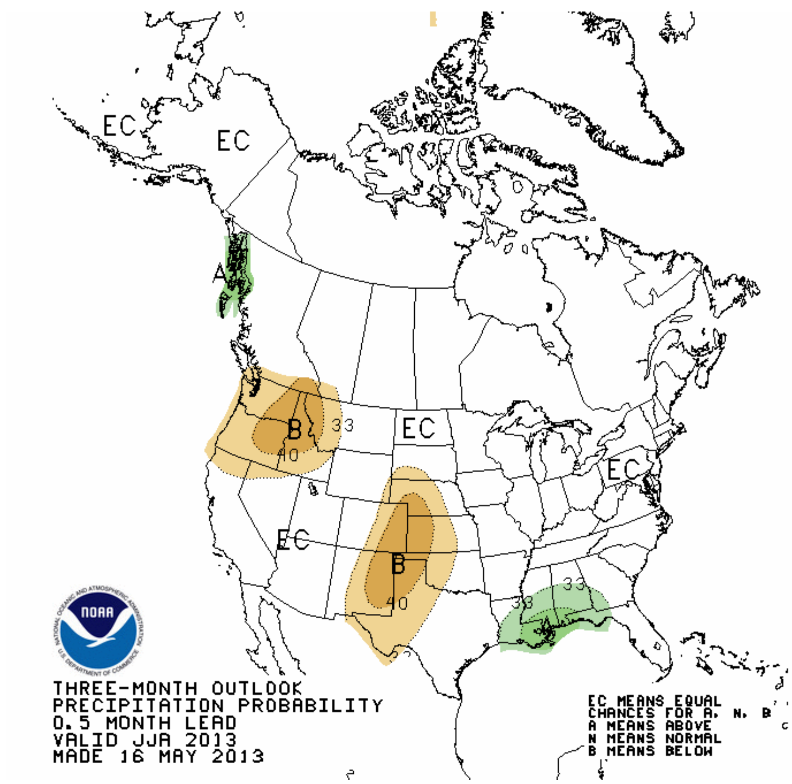


Three-Month Outlooks

OFFICIAL Forecasts

Jun-Jul-Aug 2013

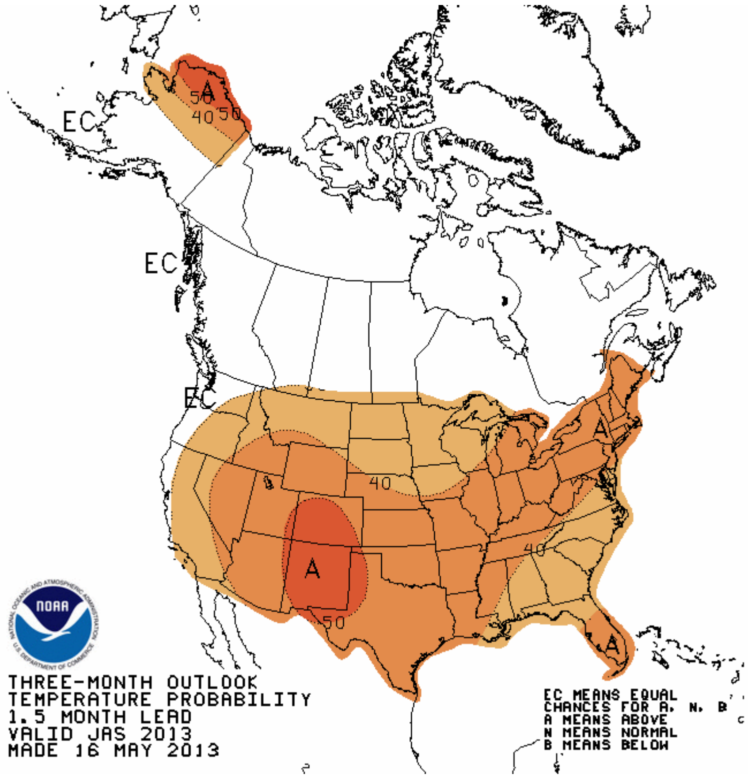


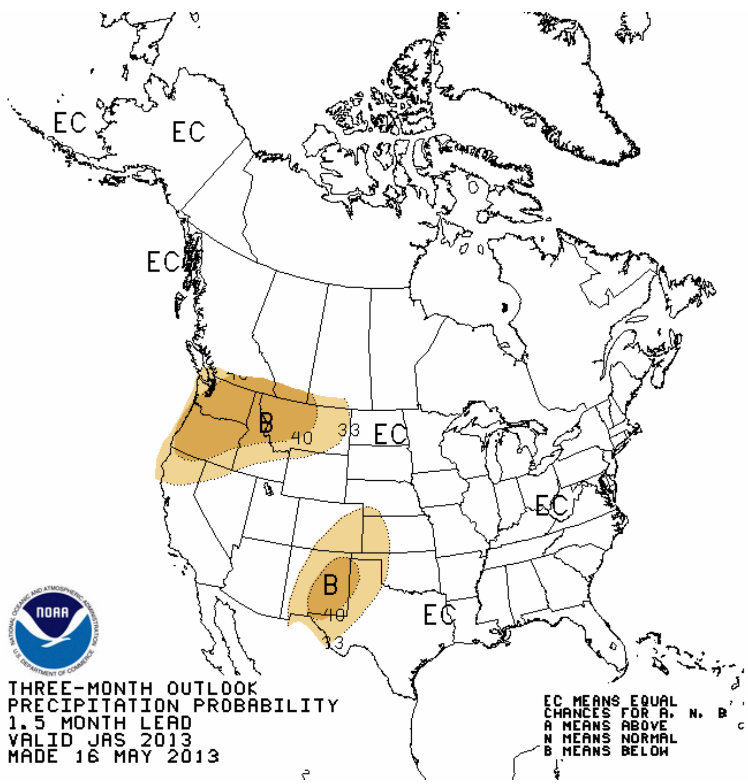


Three-Month Outlooks

OFFICIAL Forecasts

Jul-Aug-Sep 2013

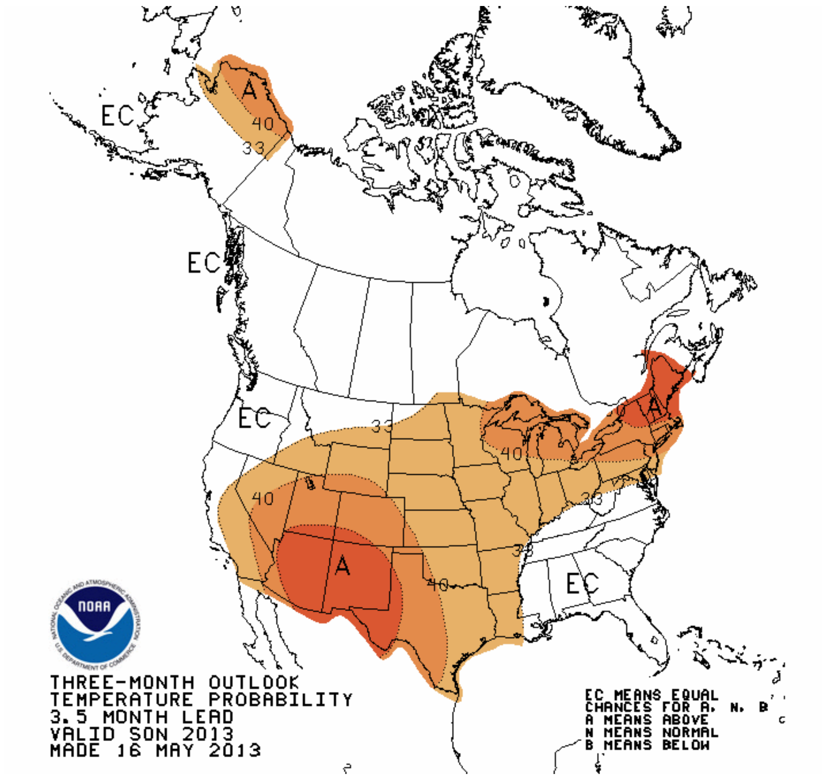


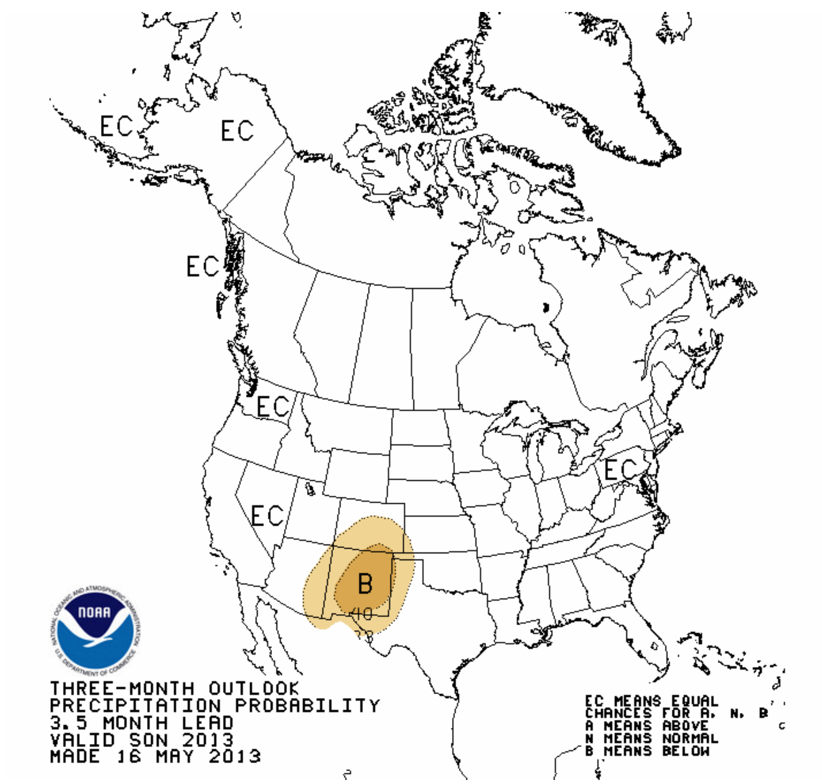


Three-Month Outlooks

OFFICIAL Forecasts

Sep-Oct-Nov 2013

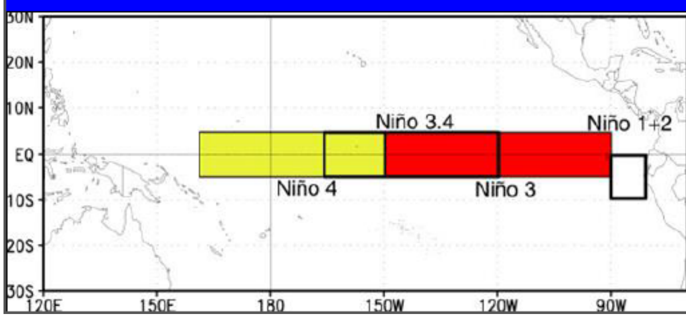


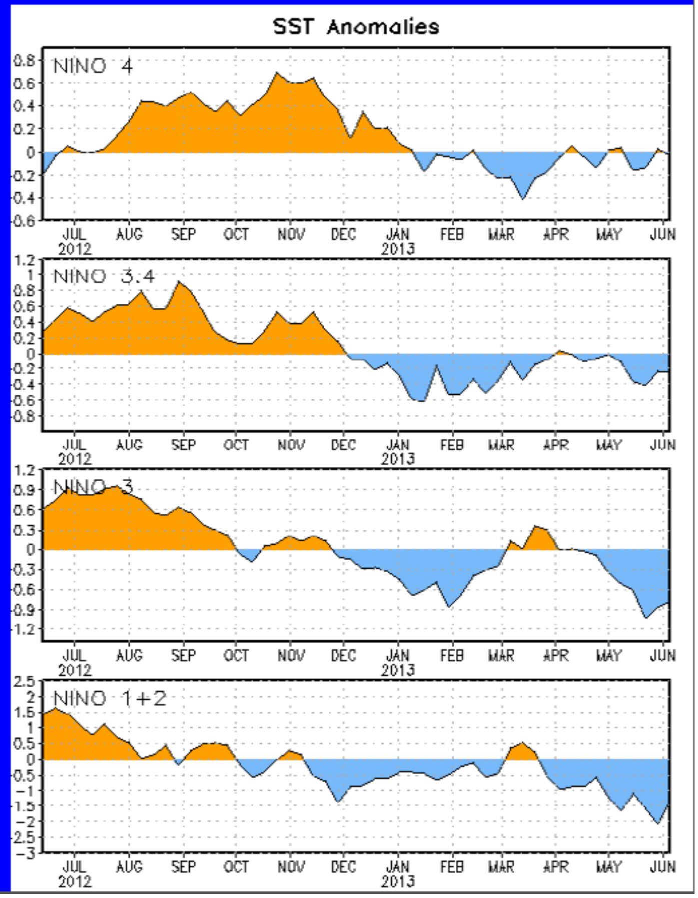


Niño Region SST Departures (ºC)
Recent Evolution

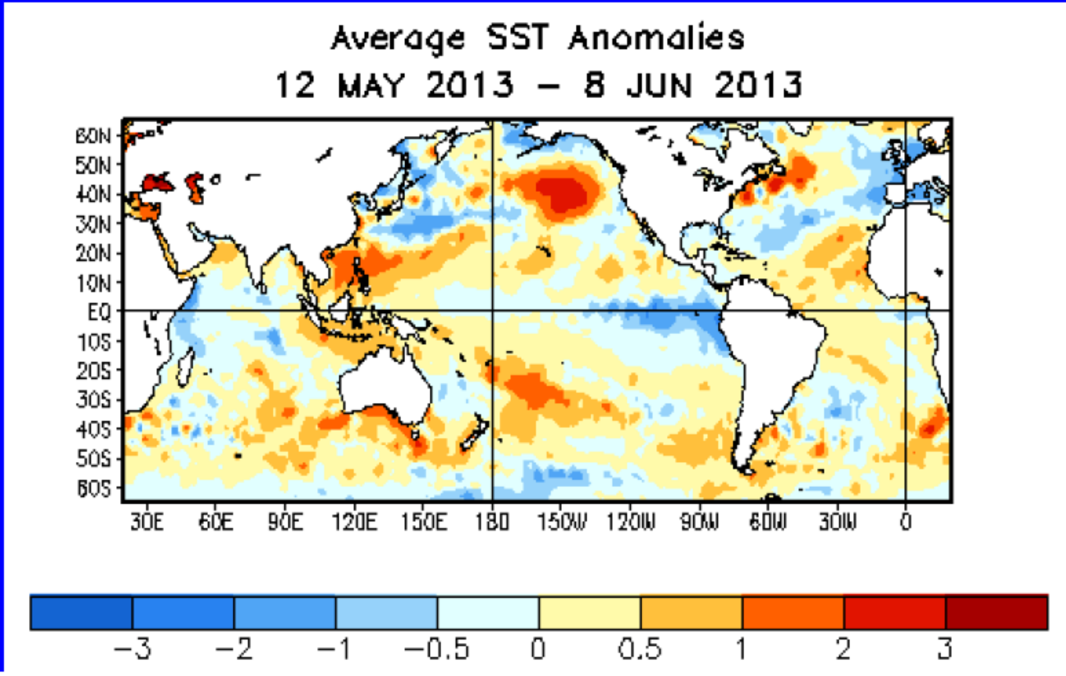
The latest weekly SST departures are:

Niño 4	**0.0ºC**
Niño 3.4	**-0.2ºC**
Niño 3	**-0.8ºC**
Niño 1+2	**-1.3ºC**





Global SST Departures (°C)



During the last four weeks, equatorial SSTs were below average in the eastern Pacific Ocean and the western Indian Ocean, and above average near the Maritime Continent (north of Australia).

Pacific Niño 3.4 SST Outlook

- Most models predict ENSO-neutral (-0.5°C to +0.5°C) continuing through 2013.

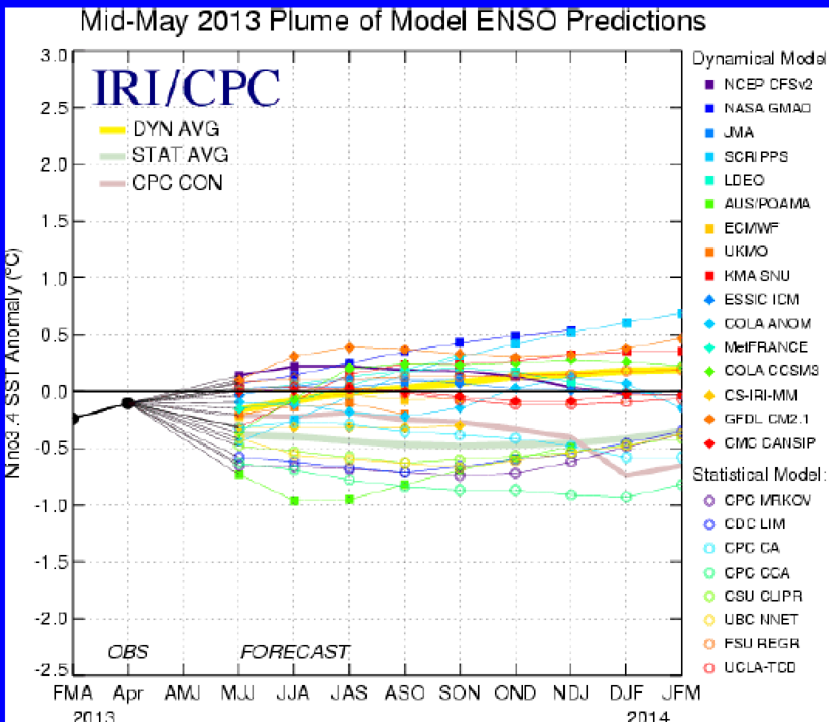
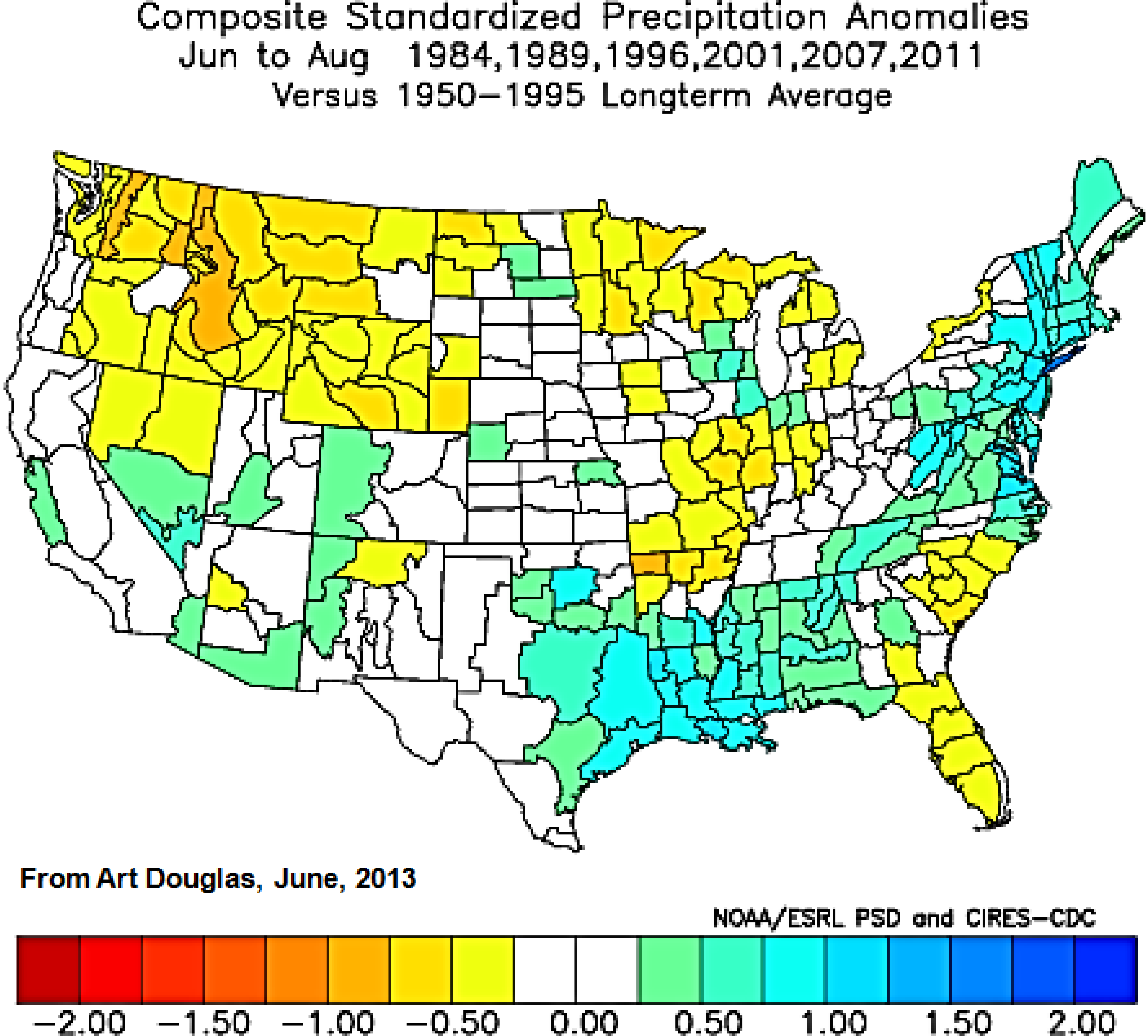
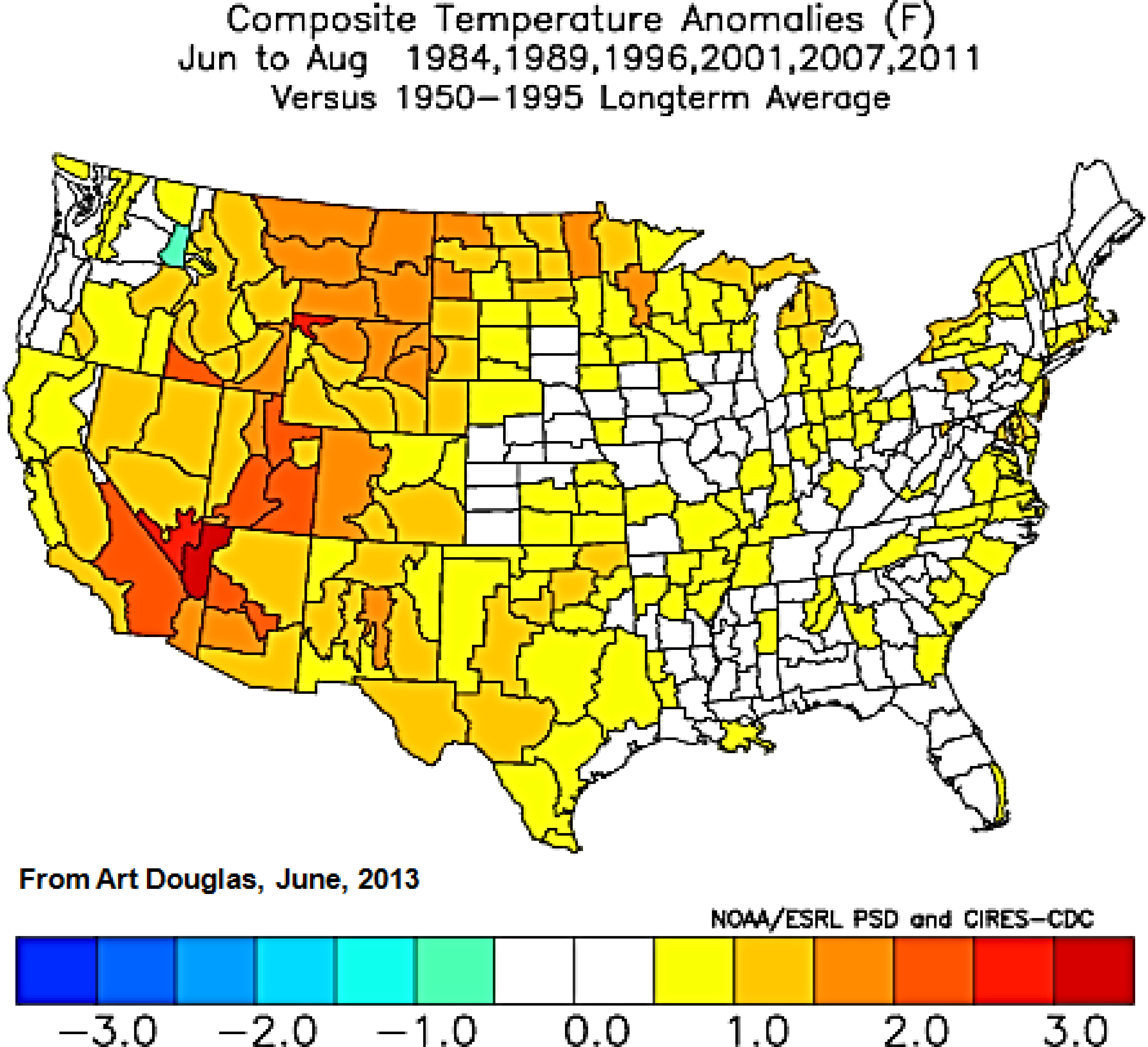
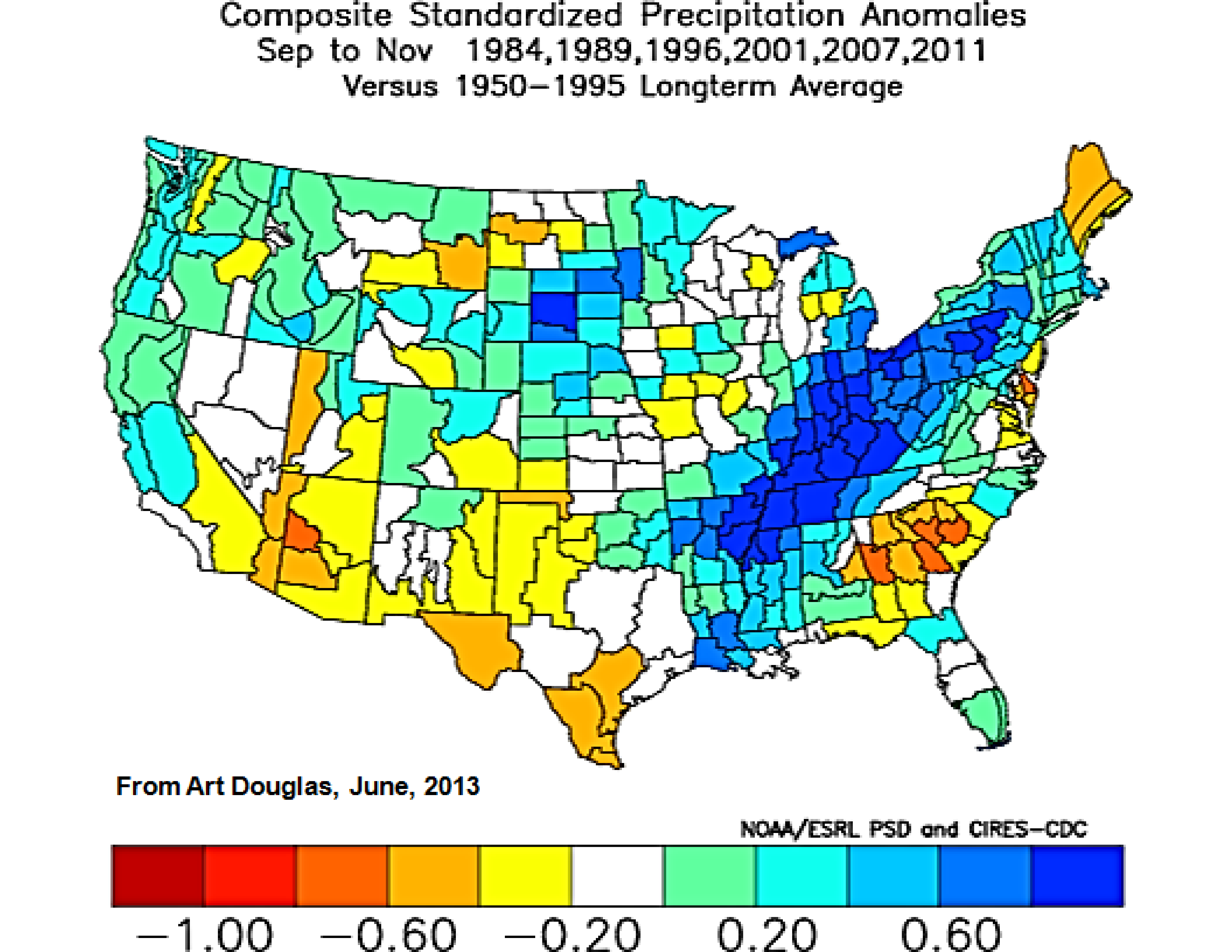


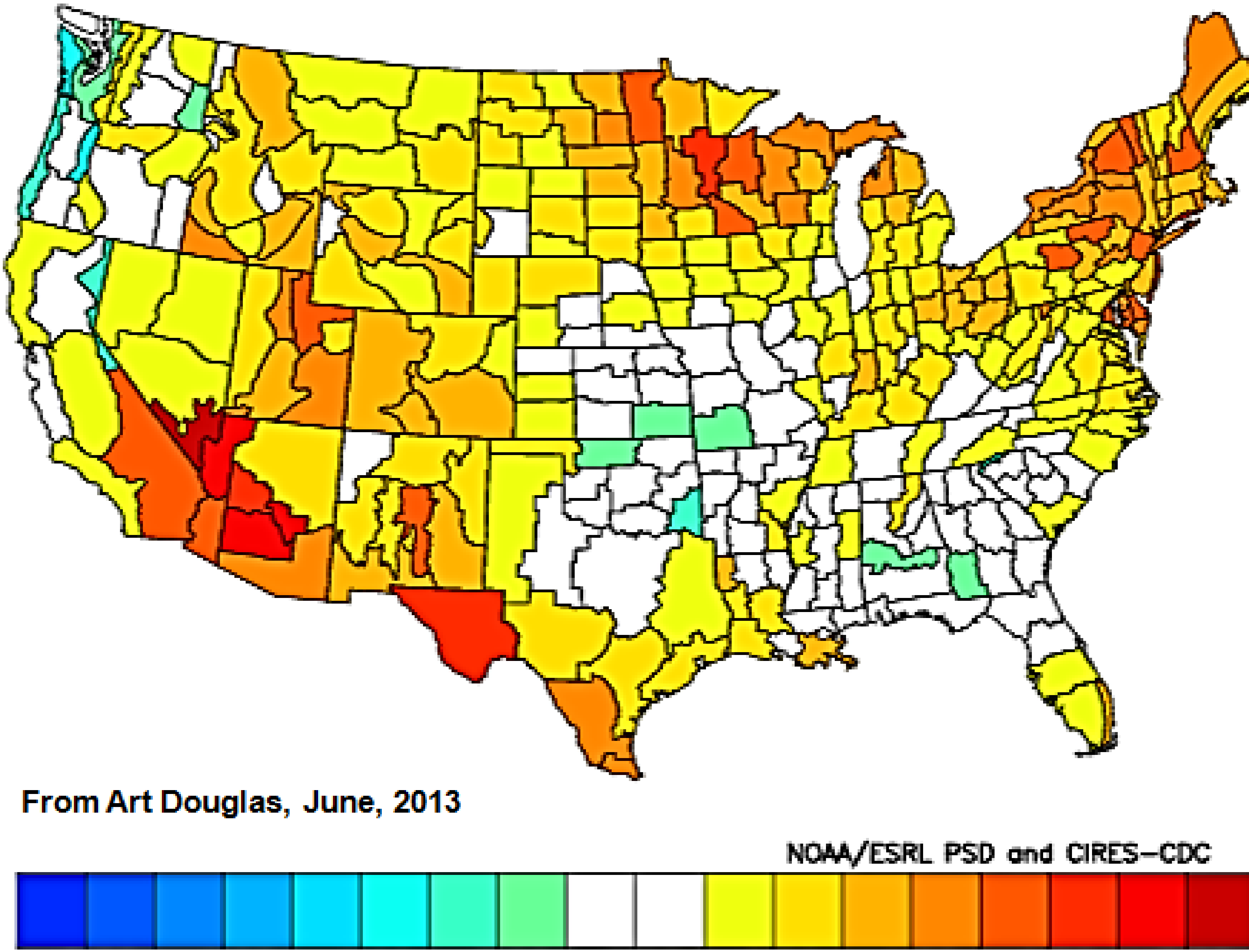
Figure provided by the International Research Institute (IRI) for Climate and Society (updated 14 May 2013).


Composite Standardized Precipitation Anomalies
Jun to Aug 1984,1989,1996,2001,2007,2011
Versus 1950–1995 Longterm Average
From Art Douglas, June, 2013
NOAA/ESRL PSD and CIRES–CDC
–2.00
–1.50
–1.00
–0.50
0.00
0.50
1.00
1.50
2.00


Composite Temperature Anomalies (F)
Jun to Aug 1984,1989,1996,2001,2007,2011
Versus 1950–1995 Longterm Average
From Art Douglas, June, 2013
NOAA/ESRL PSD and CIRES–CDC
–3.0
–2.0
–1.0
0.0
1.0
2.0
3.0


Composite Standardized Precipitation Anomalies
Sep to Nov 1984,1989,1996,2001,2007,2011
Versus 1950–1995 Longterm Average
From Art Douglas, June, 2013
NOAA/ESRL PSD and CIRES–CDC
–1.00
–0.60
–0.20
0.20
0.60

Composite Temperature Anomalies (F)
Sep to Nov 1984,1989,1996,2001,2007,2011
Versus 1950-1995 Longterm Average

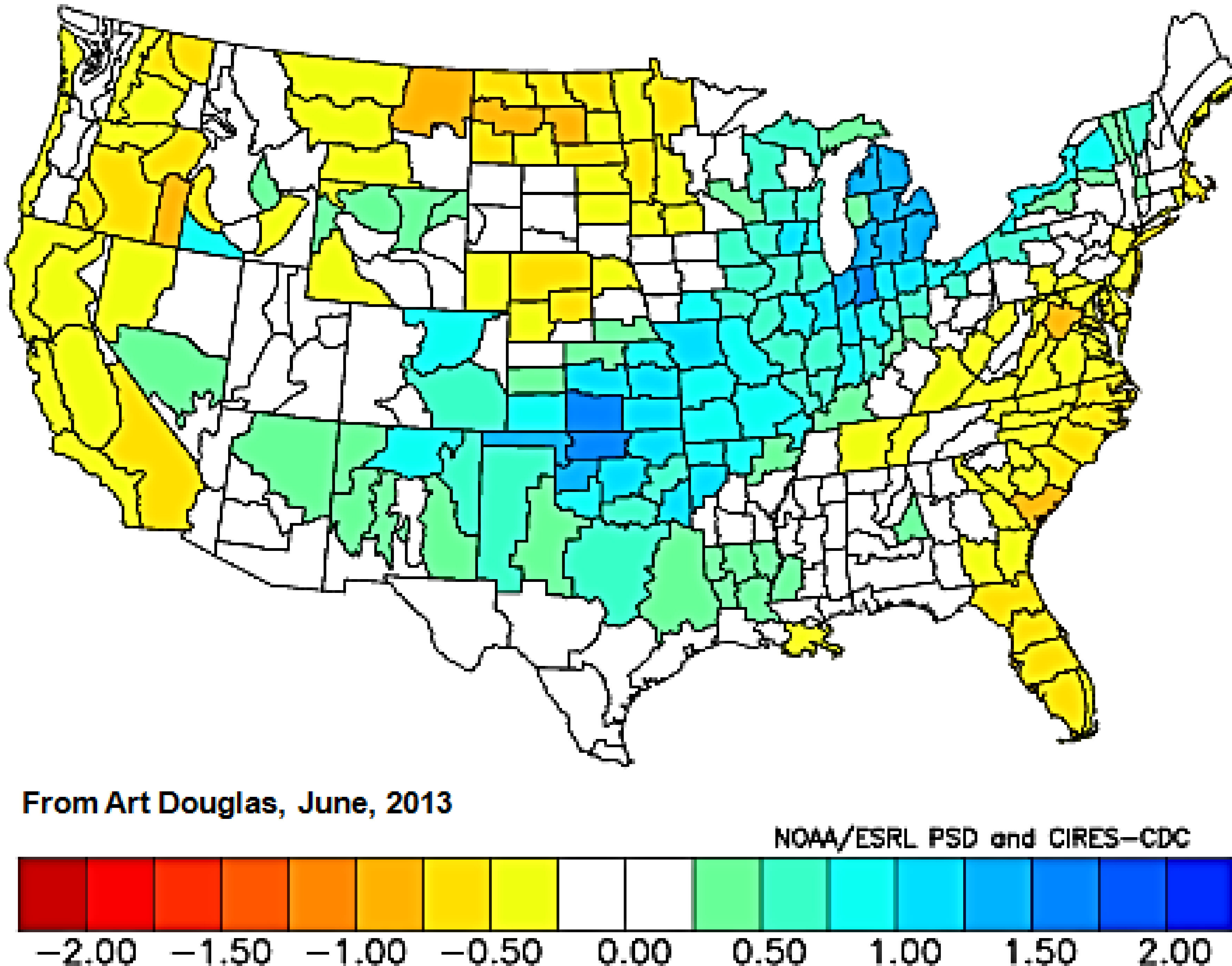


From Art Douglas, June, 2013

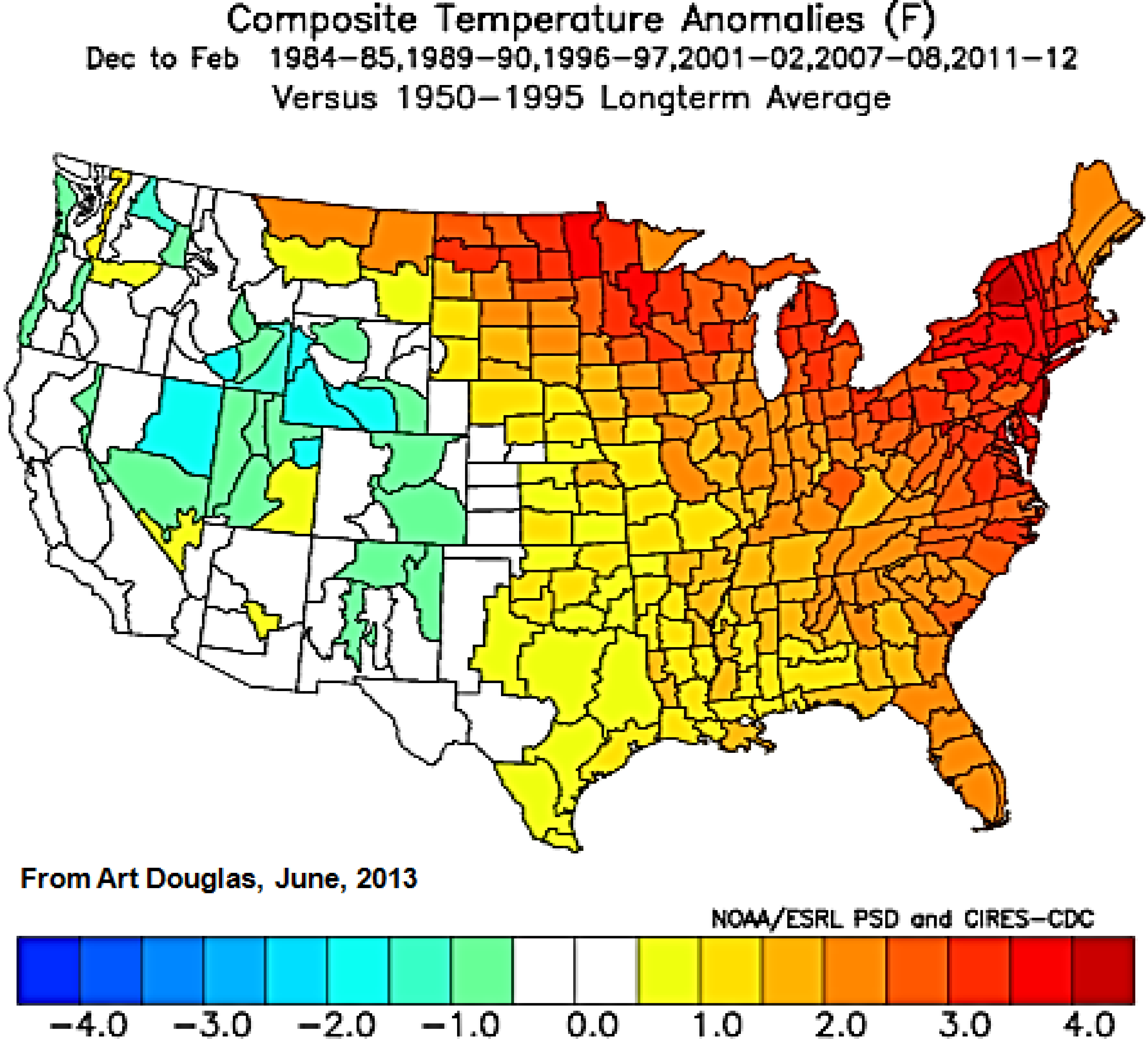
Composite Standardized Precipitation Anomalies

Dec to Feb 1984–85,1989–90,1996–97,2001–02,2007–08,2011–12

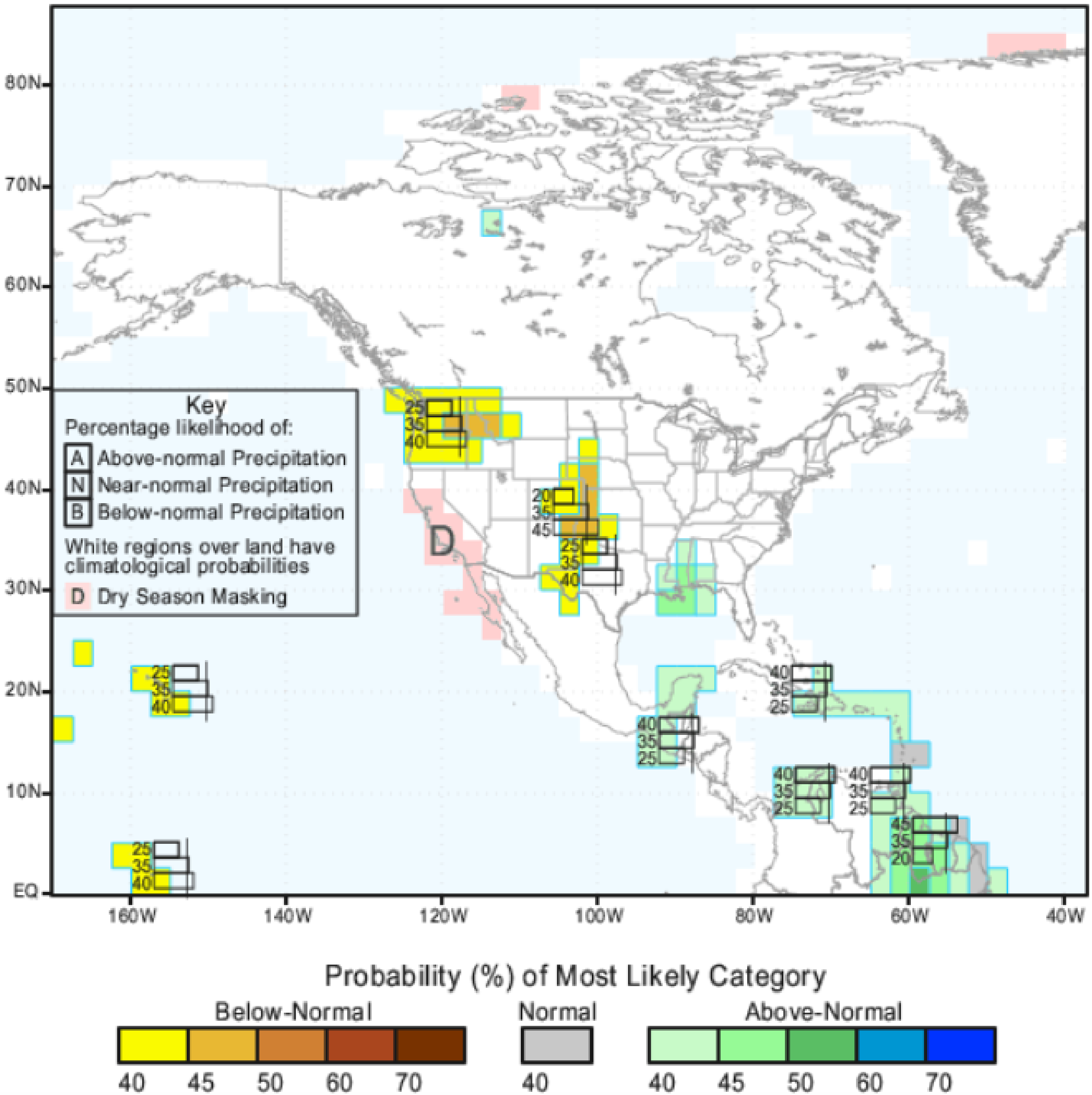
Versus 1950–1995 Longterm Average



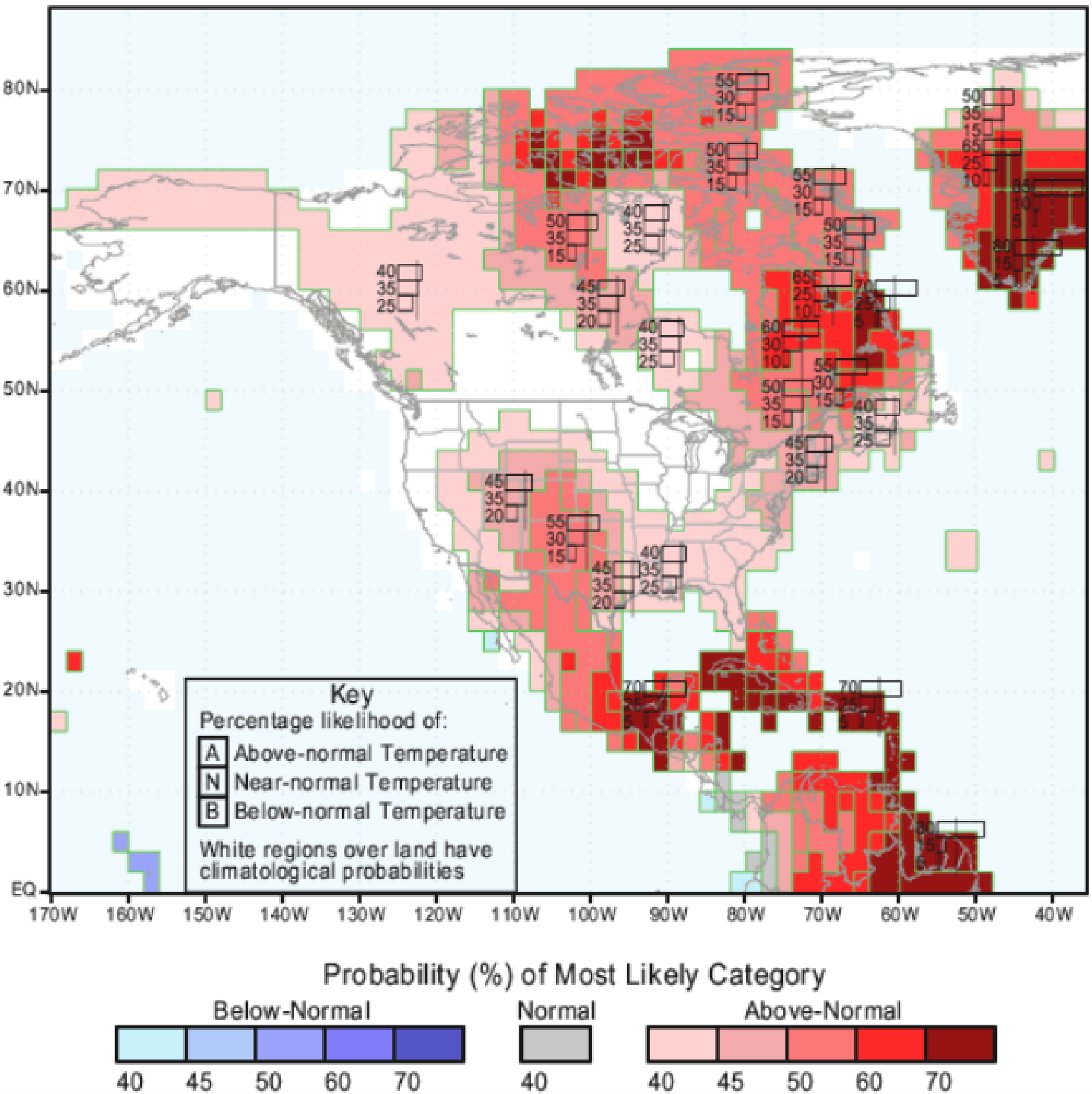
From Art Douglas, June, 2013


Composite Temperature Anomalies (F)
Dec to Feb 1984-85,1989-90,1996-97,2001-02,2007-08,2011-12
Versus 1950-1995 Longterm Average
From Art Douglas, June, 2013
NOAA/ESRL PSD and CIRES-CDC
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0

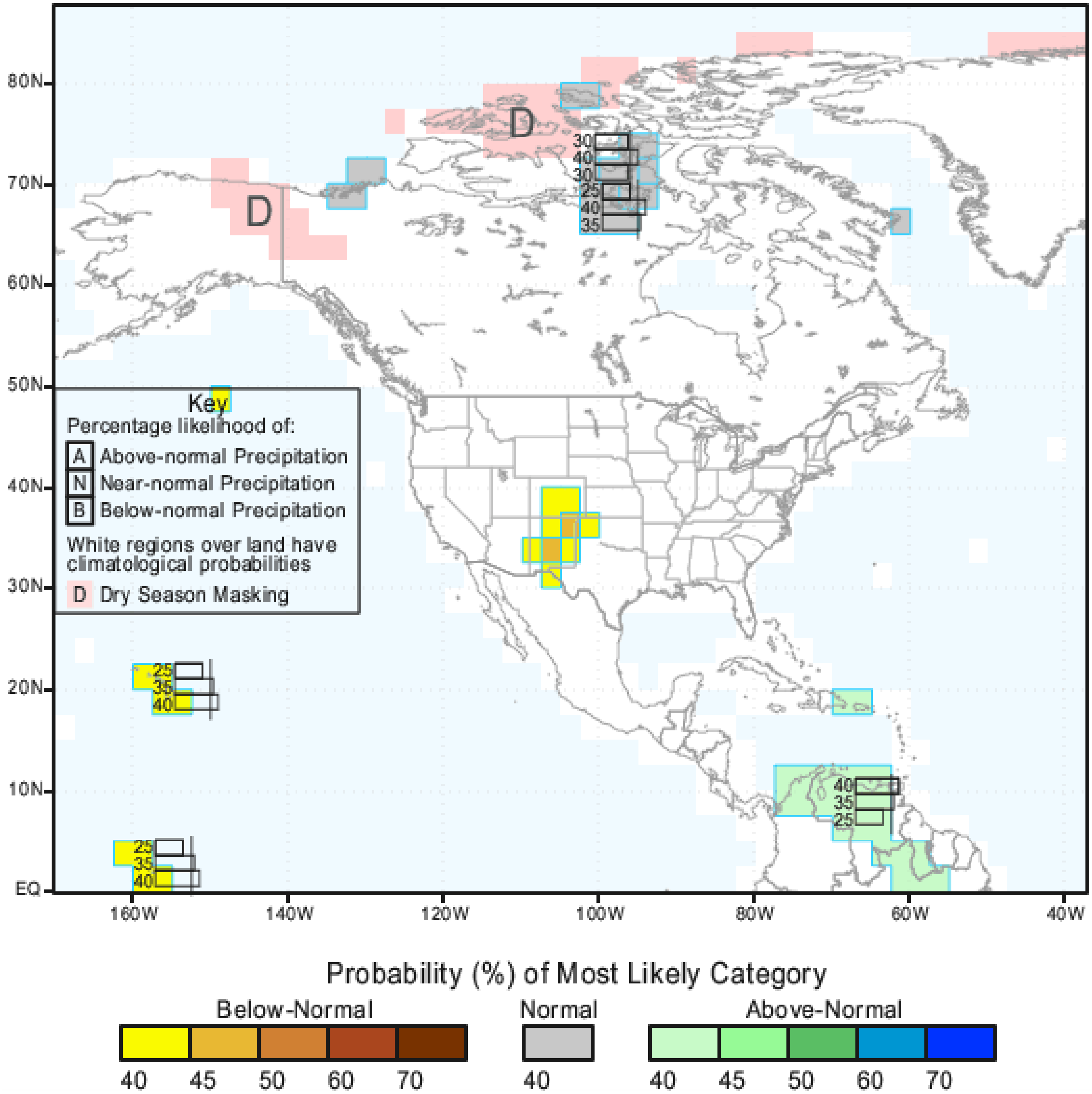
IRI Multi-Model Probability Forecast for Precipitation for June-July-August 2013, Issued May 2013



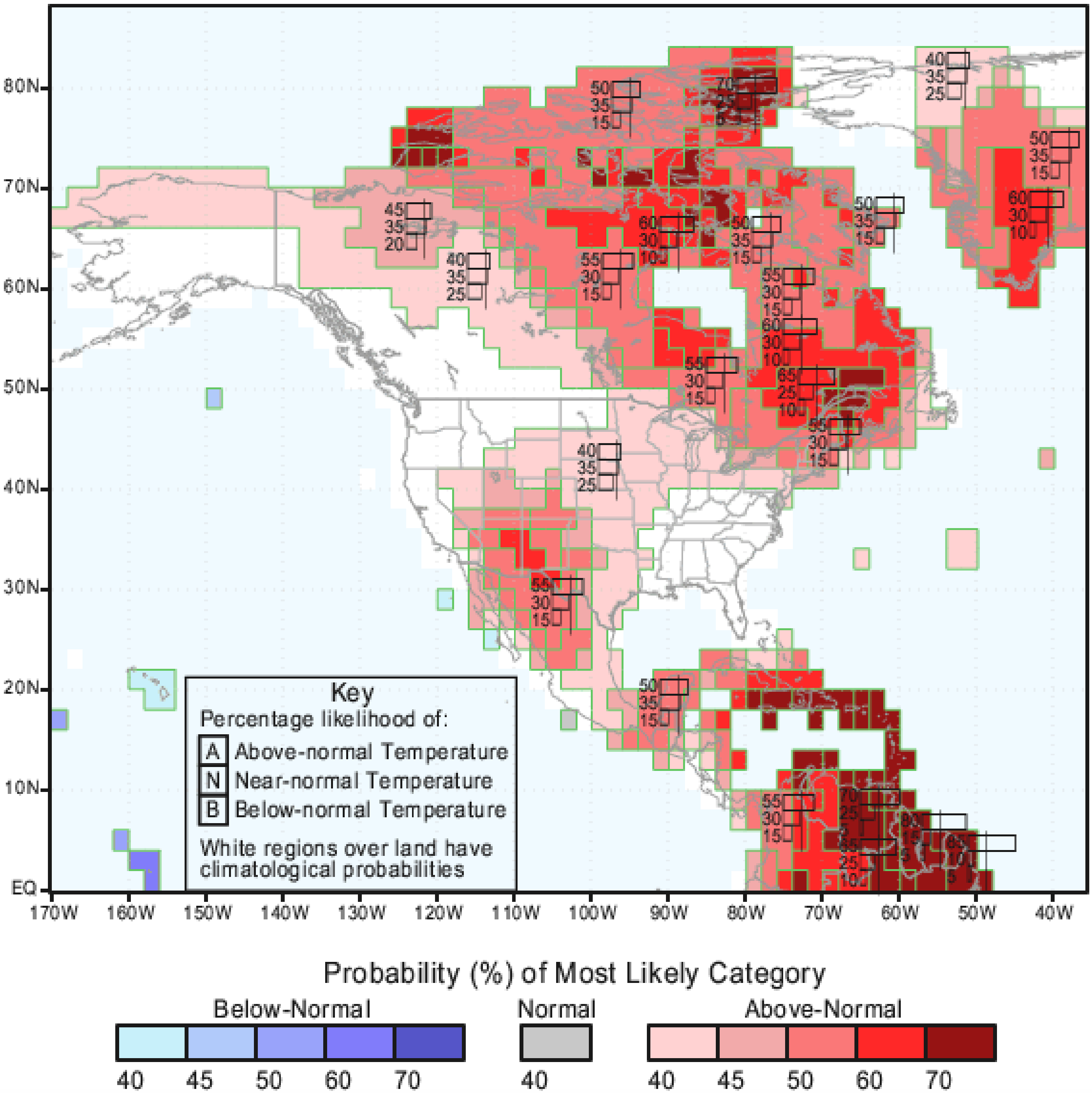
IRI Multi-Model Probability Forecast for Temperature for June-July-August 2013, Issued May 2013



IRI Multi-Model Probability Forecast for Precipitation for September-October-November 2013, Issued May 2013



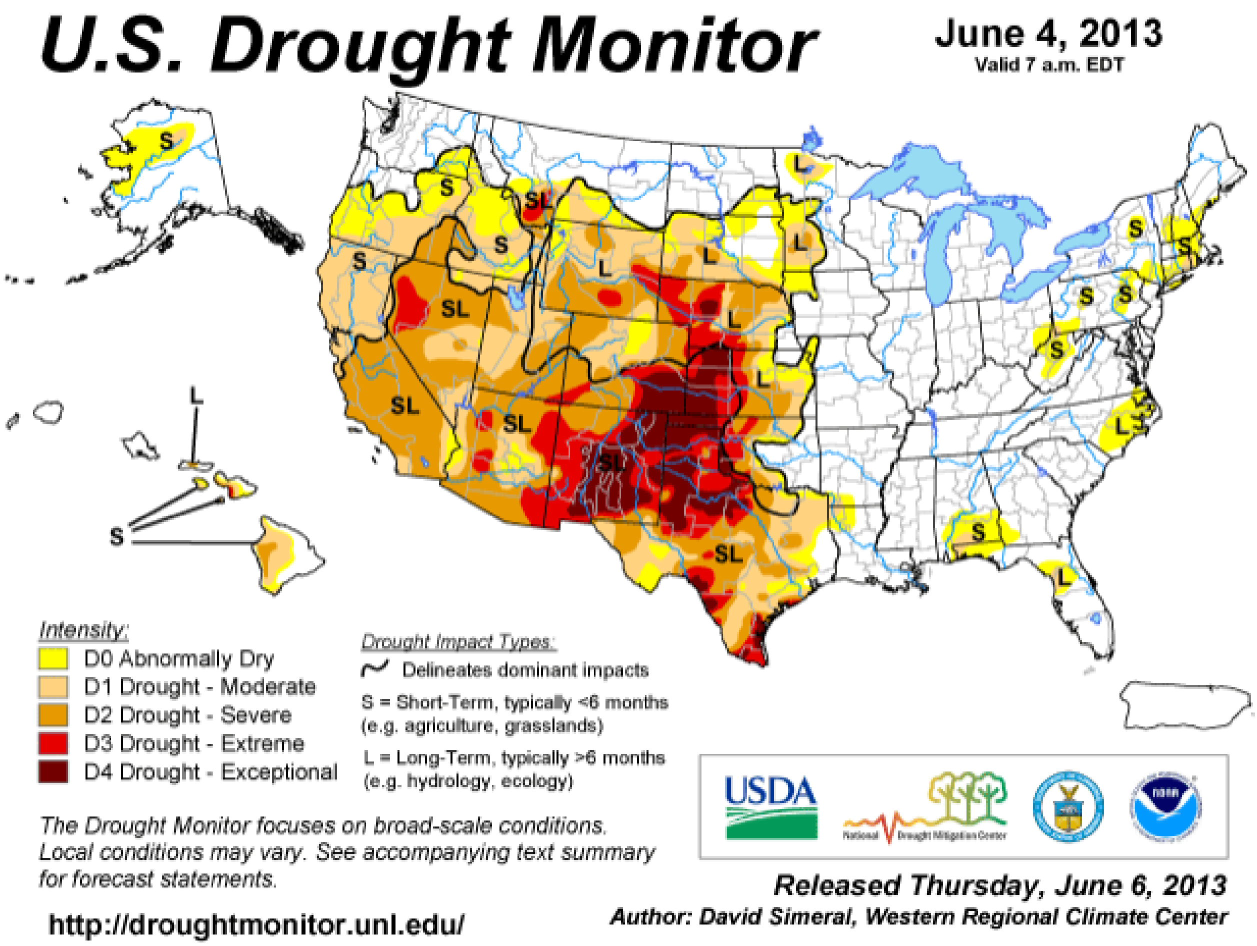
IRI Multi-Model Probability Forecast for Temperature for September-October-November 2013, Issued May 2013



Current U.S. Drought Monitor

The data cutoff for Drought Monitor maps is Tuesday at 7 a.m. Eastern Standard Time. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

NOTE: To view regional drought conditions, click on map below. State maps can be accessed from regional maps.



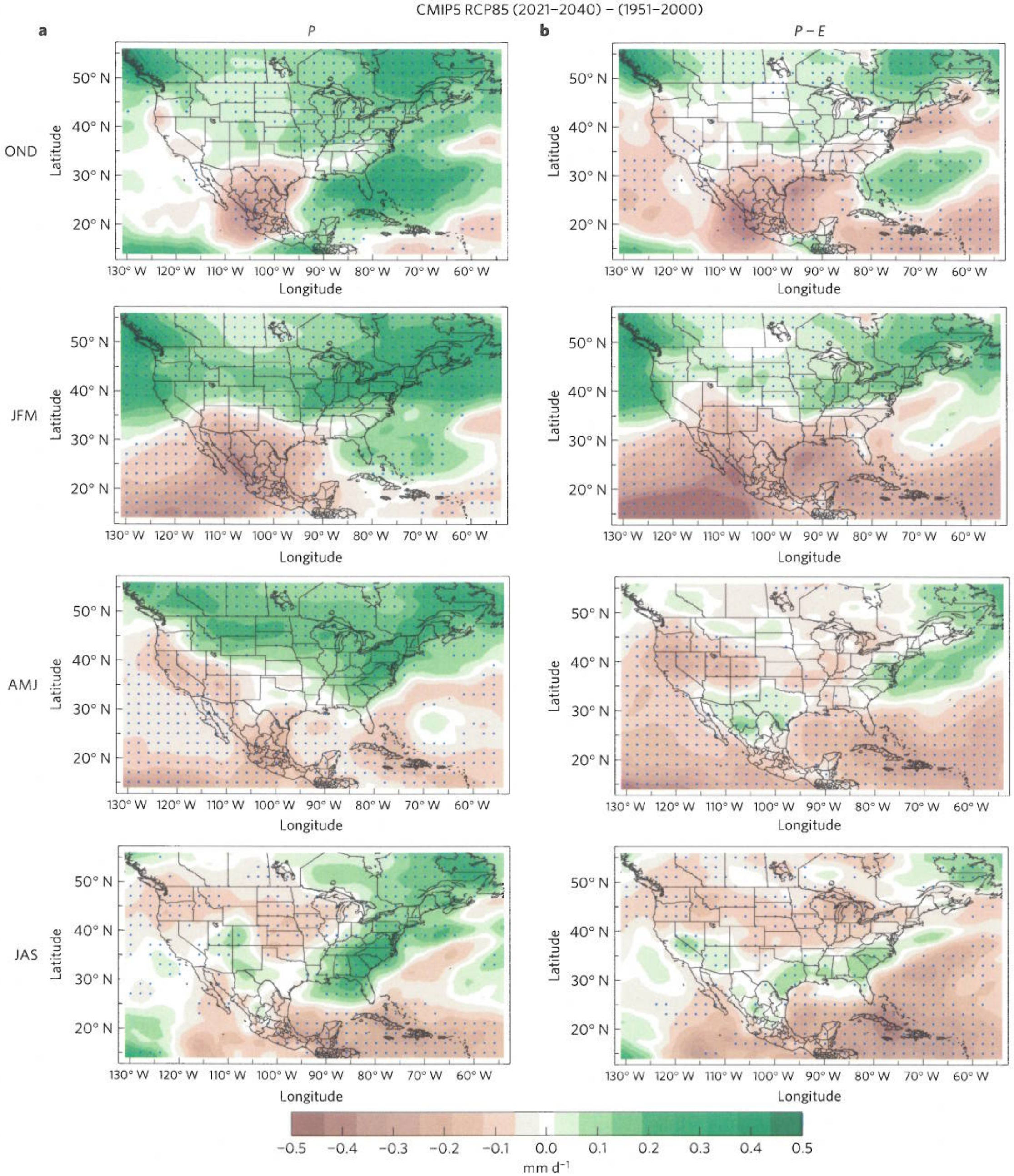


Figure 1 | The average across the 16 CMIP5 models of the change in *P* and *P* − *E* for 2021–2040 minus 1951–2000, using the RCP85 emissions scenario for the future and the simulations with historical forcing for the past. All simulations of each model that were continuous were used in the analysis with averaging across each model ensemble performed first before creating the multimodel ensemble. Dots indicate that three-quarters of the models and the all-model mean agree on the sign of the projected change. Results are shown for, from top to bottom, autumn (OND), winter (JFM), spring (AMJ) and summer (JAS) with seasons chosen so that autumn begins with the beginning of the hydrological year.