The Drought Story and El Nino Outlook

Record warmth has occurred from January to December 2014 (4.1 F for California), and October 2014 to September 2015 received much below average precipitation (4th year in a row). The prior year, 2013-14, was the second driest in California since 1976-77. This continued into 2015 with the winter months being the warmest on record for California (4.7 F above normal past 12 months) and receiving only 40 to 80 percent of average precipitation statewide. The past 48 months or 4 consecutive seasons were the driest period on record for California (deficit of 26 inches of precipitation statewide). December and February precipitation allowed for the most significant green up across the state since 2011, but these grasses combined with the ongoing historic drought created above normal fire danger across most of California. To make the situation worse, the state snowpack was measured at an all-time record low of 5 percent on April 1, 2015 which led to further significant decreases in water supply. The past 4 years are the warmest consecutive 48 hours in California on record (2.8 F above normal). Along the Pacific coast sea surface temperature continue to run 2 to 5 degrees above normal and are contributing to the warm land temperatures. Across the equatorial Pacific Ocean average sea surface temperatures warmed into the expected moderate El Nino conditions during this summer. The resultant weather pattern brought an increased southern storm track to southern California and northern Texas in May 2015. Historically, several El Nino winters have brought normal and below normal precipitation. It is important to note, only ***the strong phase of the El Nino has been the most consistent with above normal precipitation for southern California***.

Currently, state water supply is 54 percent of historical average capacity (37% capacity) and snow melt runoff and recharge was very little spring 2014 due to historical low snowpack. Water supply is nearing all-time lows but remains higher than 1976-77. The combination of below normal precipitation this past year, and the past 4 years combined being the driest on record, have all led to the extreme drought conditions.

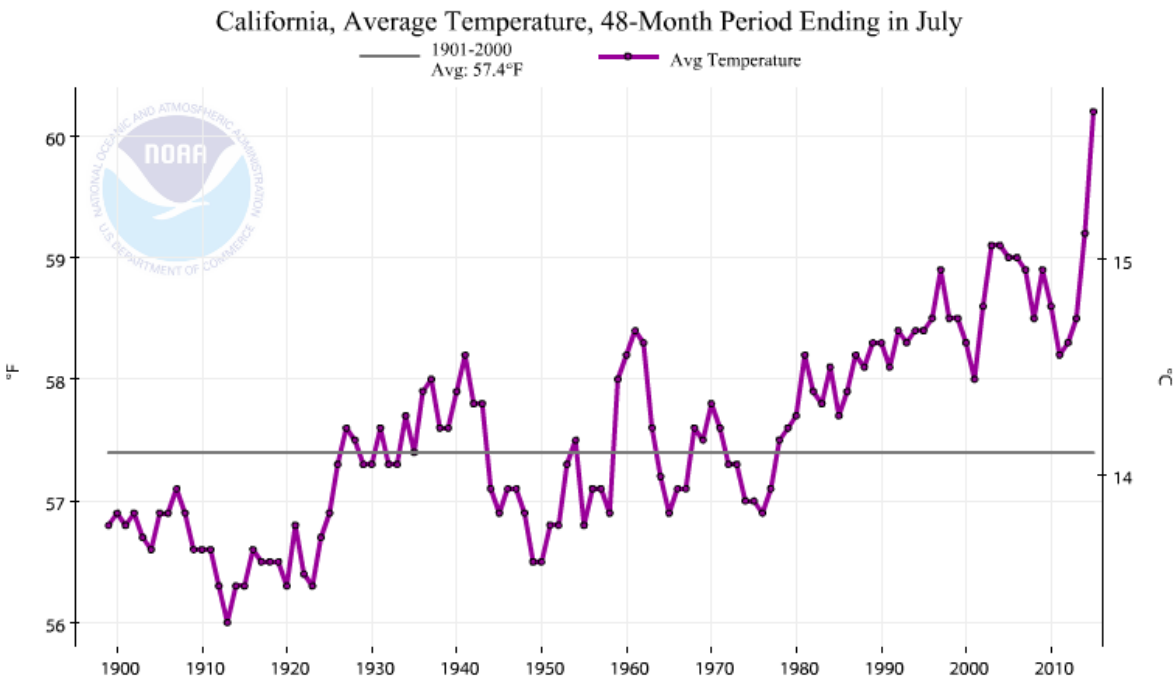
FACTS on Drought and El Nino:

- 2014 warmest year on record for California (4.1 F degrees above normal)
- 2014-2015 warmest 12-month period on record for California (4.7 F degrees above), the south coast and San Diego
- Through July 2015, warmest 48-month period for California at 2.8 F degrees above
- Sierra Nevada California snowpack on April 1 was 5 percent of average (next closet was 25 percent 2014)
- Current California water supply is 14.0 million acre feet or 54 percent of average storage
- 2014-15 precipitation in California was 40 to 80 percent of average (most in December and February)
- January 2011 to July 2015 is the driest period on record for California (-26 inches)
- 1923-24 and 1976-77 years were drier than 2013-2015
- Historically tree rings records indication a similar drought 1653-55
- Southern California is missing 1.5 to 2.5 seasons of precipitation since January 2011
- Weak El Nino conditions were observed during the start of the 1976-77 and 2006-07 droughts
- El Nino years (weak to moderate) have produced a range of 4 to 22 inches at San Diego
- Strong El Nino years have a good correlation to above normal precipitation for Southern California
- Last wet year for California was 2010-11 which was during La Nina conditions
- Southern California would need 24 to 45 inches to be "normal" by September 30, 2016
- Drought conditions may prevail even if deficits are received due to insufficient snowpack and water storage
- 1982-83 and 1997-98 strong El Nino years were above normal state wide but not all strong El Nino are the same
- El Nino tends to alter the Jet Stream to bring more frequent storms but not necessarily stronger storms systems
- **Other years with a STRONG El Nino: 1957/58, 65/66, 72/73, 82/83, 91/92 and 97/98**

Past Weather and Climate

June 2014 to July 2015 the warmest period on record for all of California.

Move mouse towards an axis until highlighted. Left-click mouse to pan. *Shift key + left-click to* zoom.

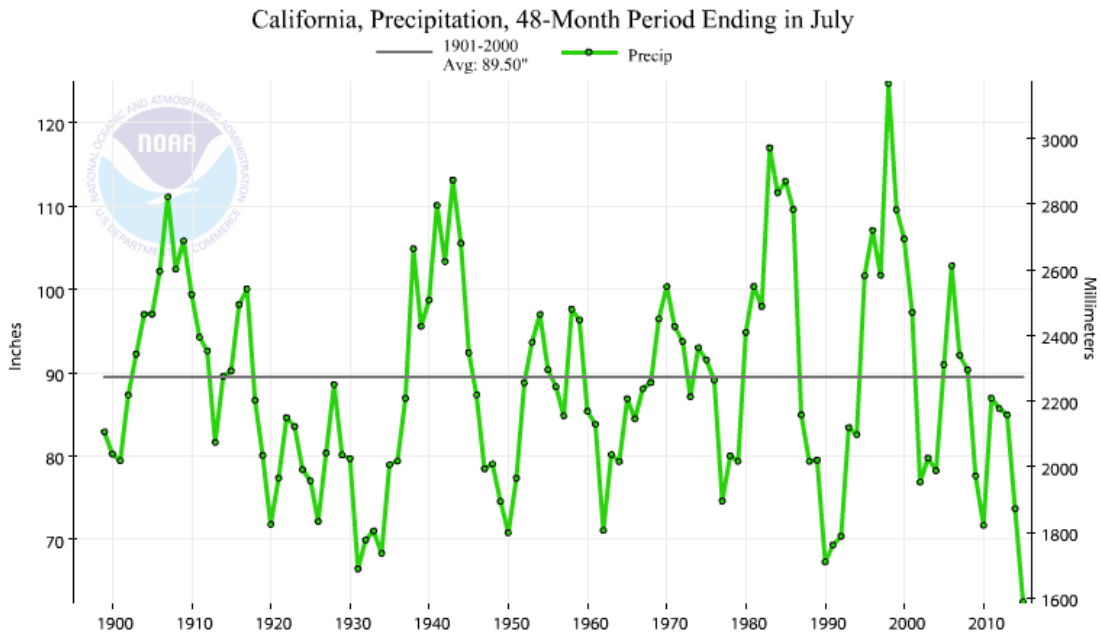


Download: XML

DATES	VALUE	RANK	ANOMALY (57.4°F) 1901-2000 BASE PERIOD
201108 - 201507	60.2°F	117	2.8°F
201008 - 201407	59.2°F	116	1.8°F
199908 - 200307	59.1°F	115	1.7°F
200008 - 200407	59.1°F	115	1.7°F
200108 - 200507	59.0°F	113	1.6°F

The past 48 consecutive months through July 2015 are the warmest on record for California (+2.8 F).

Move mouse towards an axis until highlighted. Left-click mouse to pan. *Shift key + left-click to* zoom.



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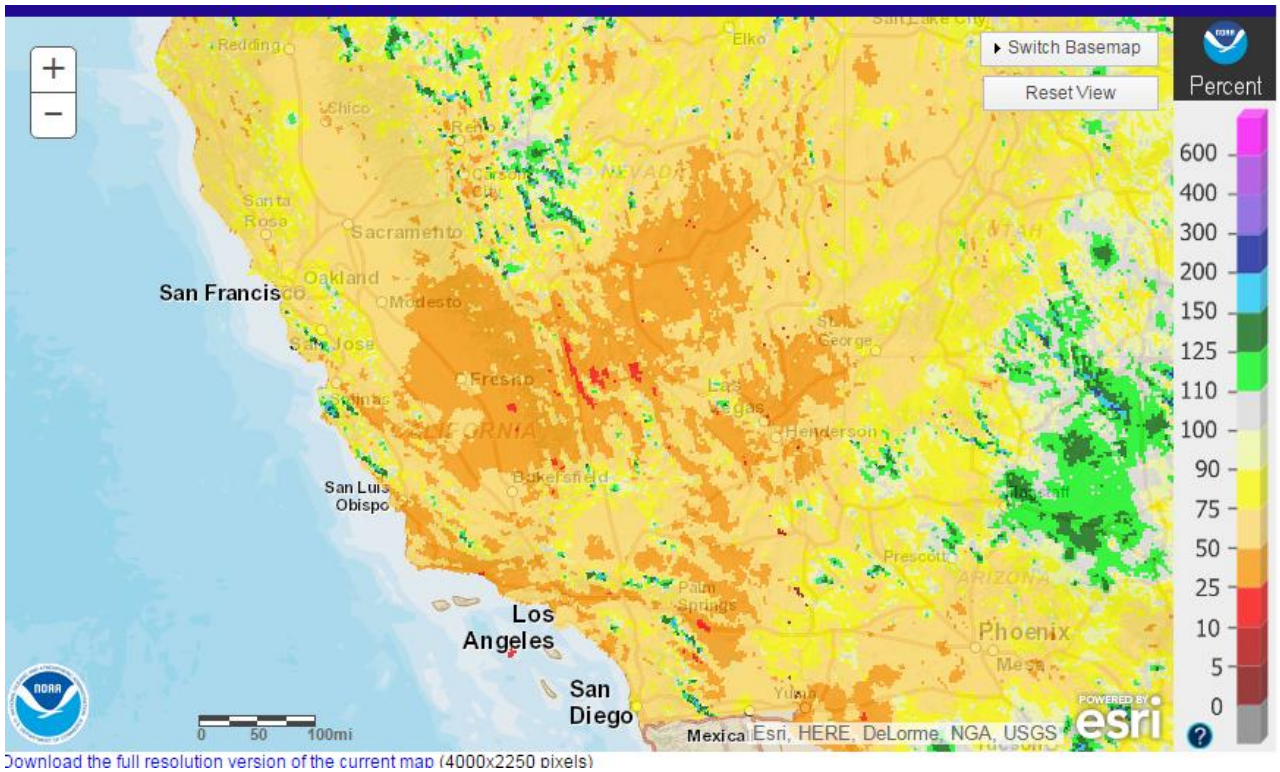
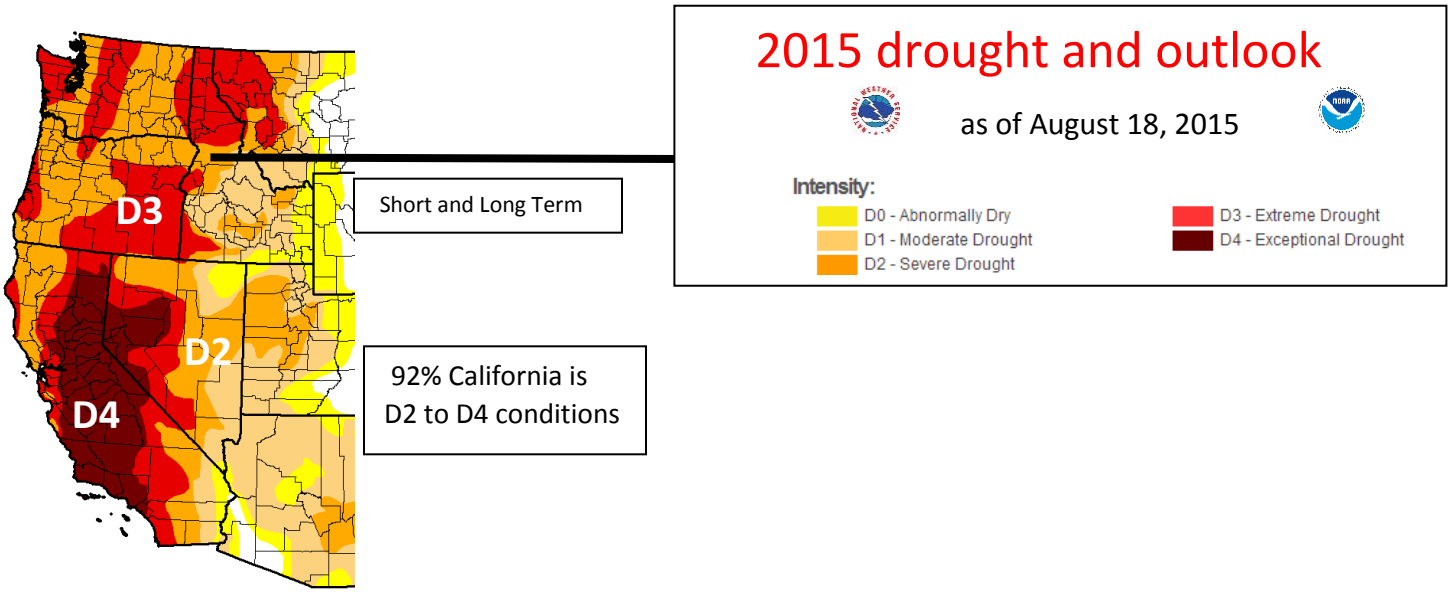
DATES	VALUE	RANK	ANOMALY (89.50") 1901-2000 BASE PERIOD
201108 - 201507	62.52"	1	-26.98"
192708 - 193107	66.47"	2	-23.03"
198608 - 199007	67.31"	3	-22.19"
193008 - 193407	68.32"	4	-21.18"
198708 - 199107	69.32"	5	-20.18"
192808 - 193207	69.95"	6	-19.55"

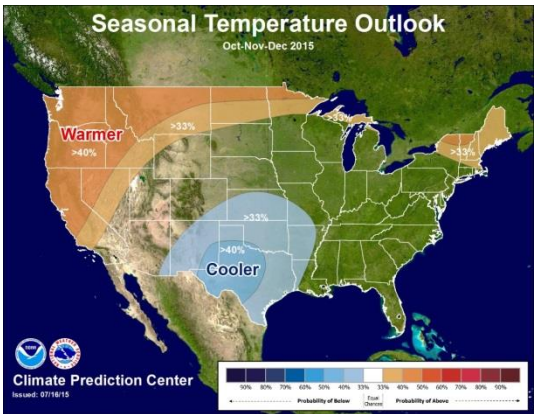
The past 48 consecutive months in California were the driest on record with a deficit of 26 inches. Note: Most of southern California is missing 1 to 2 seasons of precipitations in the past 4 years.



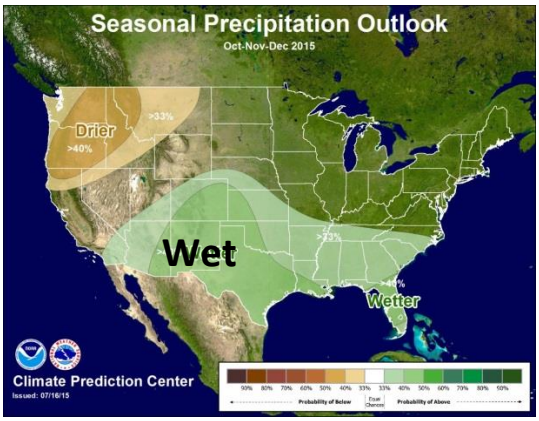
Download the full resolution version of the current map (4000x2250 pixels)

Percent of normal precipitation since **October 1, 2014** (40 to 80 percent)

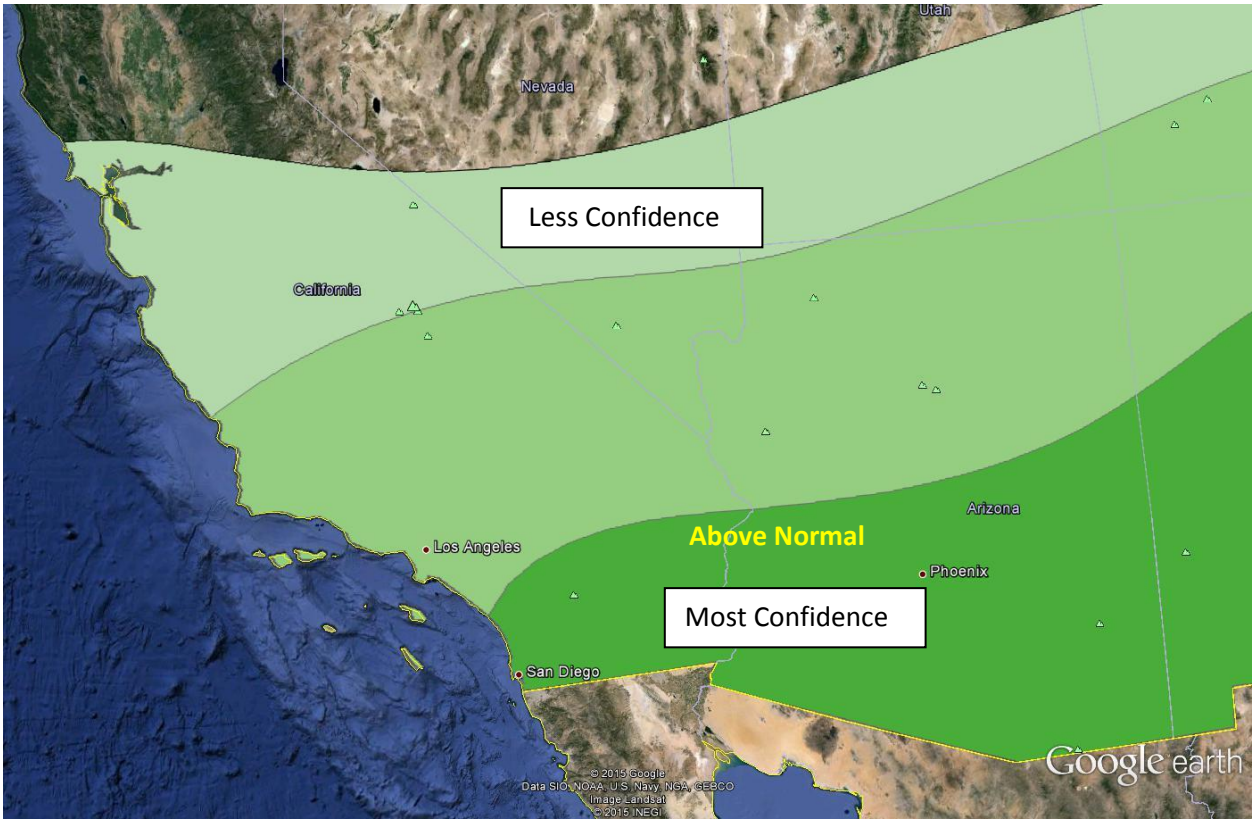




Oct to Dec 2015 Outlook



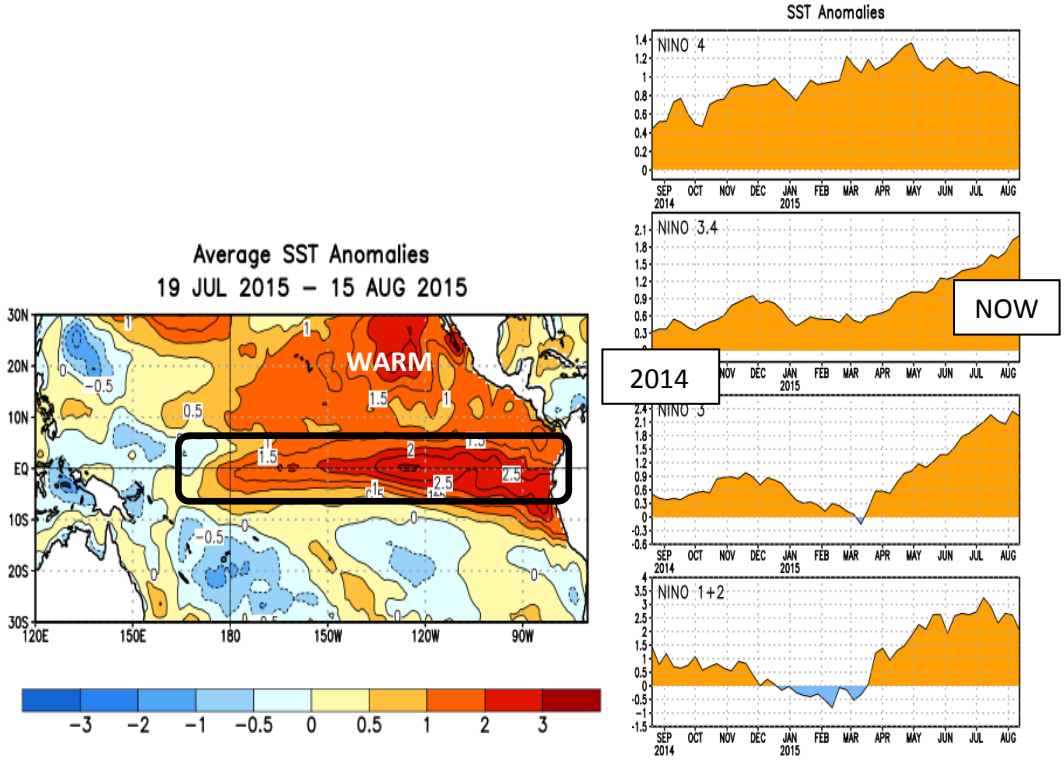
Temperature (left) and precipitation (right) outlook for the period October to December 2015.
Green is 33 to 40 percent chance of "above normal" precipitation. Source: Climate Prediction Center.



The precipitation outlook for December to February 2016. Best chance of above normal in far southern California.

ENSO El Nino Current Conditions

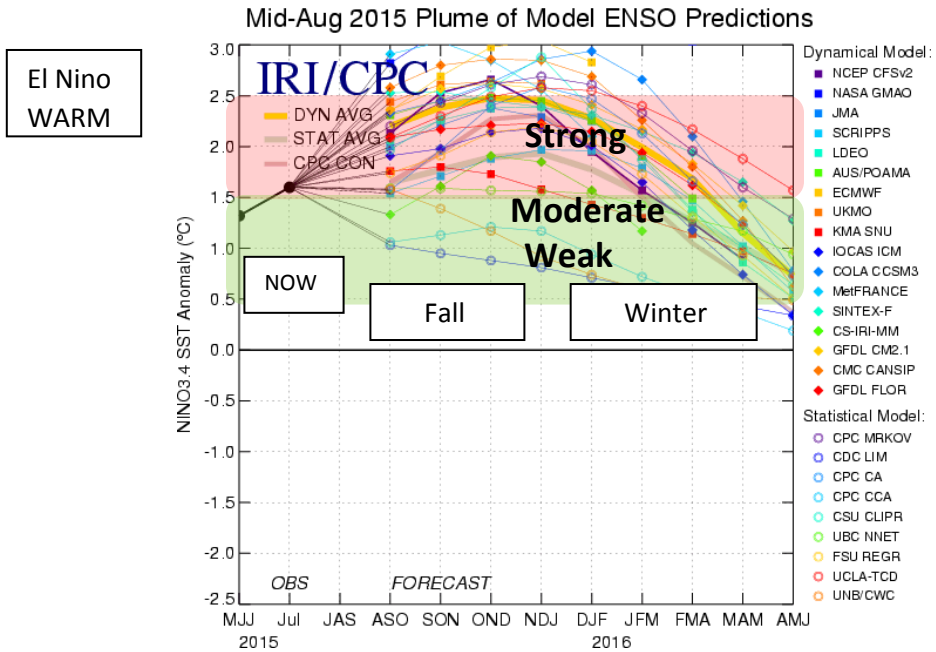
<u>Moderate El Nino conditions are observed</u> in the equatorial Pacific as seen in sea surface temperatures.



Rectangle area is monitoring zone for ENSO and image is departure from normal (orange and red is warm).

ENSO El Nino *predictions* as of August

ENSO forecast for 2015. Consensus (yellow line).



Compiled by Alex Tardy, NOAA National Weather Service, alexander.tardy@noaa.gov