The Latest on ENSO, Recent Weather and Drought Conditions, And the July-August-September Climate and Drought Outlooks For Colorado

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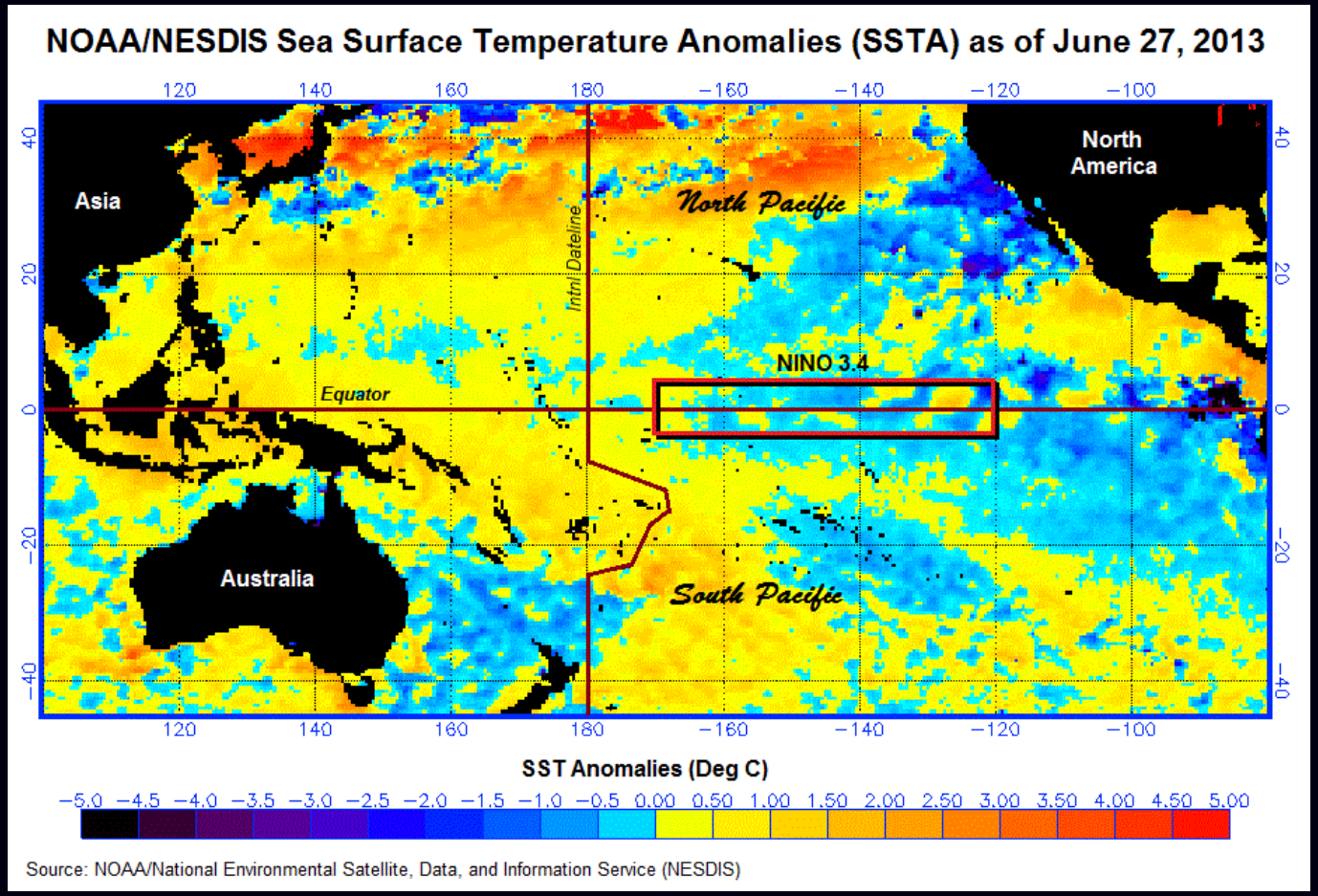
June 27, 2013

The El Niño/Southern Oscillation in the Pacific



Sea surface temperatures (SSTs) across the eastern equatorial Pacific Ocean, including the region known as Niño 3.4, remain slightly below average (blue shading) during the second half of June.

Niño 3.4 (indicated by the red box) is the principal region in the eastern equatorial Pacific Ocean used by NOAA's Climate Prediction Center (CPC) for monitoring, assessing and predicting the interseasonal climate phenomena commonly referred to as the El Niño/Southern Oscillation (ENSO).

The Oceanic Niño Index (ONI) for Niño 3.4

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2001	-0.7	-0.6	-0.5	-0.4	-0.2	-0.1	0.0	0.0	-0.1	-0.2	-0.3	-0.3
2002	-0.2	0.0	0.1	0.3	0.5	0.7	0.8	0.8	0.9	1.2	1.3	1.3
2003	1.1	0.8	0.4	0.0	-0.2	-0.1	0.2	0.4	0.4	0.4	0.4	0.3
2004	0.3	0.2	0.1	0.1	0.2	0.3	0.5	0.7	0.8	0.7	0.7	0.7
2005	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.0	-0.2	-0.5	-0.8
2006	-0.9	-0.7	-0.5	-0.3	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.0
2007	0.7	0.3	-0.1	-0.2	-0.3	-0.3	-0.4	-0.6	-0.8	-1.1	-1.2	-1.4
2008	-1.5	-1.5	-1.2	-0.9	-0.7	-0.5	-0.3	-0.2	-0.1	-0.2	-0.5	-0.7
2009	-0.8	-0.7	-0.5	-0.2	0.2	0.4	0.5	0.6	0.8	1.1	1.4	1.6
2010	1.6	1.3	1.0	0.6	0.1	-0.4	-0.9	-1.2	-1.4	-1.5	-1.5	-1.5
2011	-1.4	-1.2	-0.9	-0.6	-0.3	-0.2	-0.2	-0.4	-0.6	-0.8	-1.0	-1.0
2012	-0.9	-0.6	-0.5	-0.3	-0.2	0.0	0.1	0.4	0.5	0.6	0.2	-0.3
2013	-0.6	-0.7	-0.4	**-0.2**								

NOAA/CPC Last Update 06-04-13

The ONI for the latest complete three month climate season (March, April, May) was -0.2.

El Niño : ONI higher than +0.45
Neutral ENSO : ONI of -0.45 to +0.45
La Niña: ONI lower than -0.45

The ONI is based on sea surface temperature (SST) departures from average in the Niño 3.4 region of the eastern tropical Pacific Ocean. It is the principal measure used by NOAA's Climate Prediction Center (CPC) for monitoring, assessing and predicting El Niño/Southern Oscillation (ENSO.)

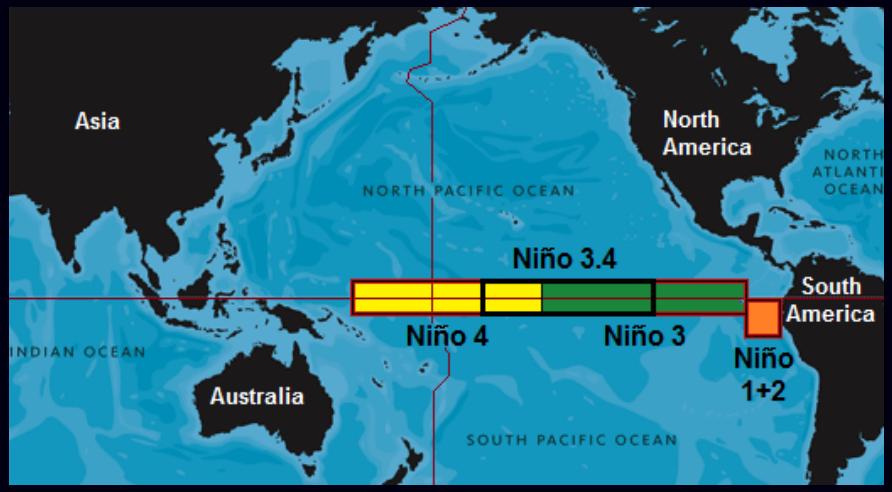
ONI is defined as the three-month running mean SST departures in the Niño 3.4 region of the Pacific.

ONI is used to place current ENSO and non-ENSO events into a historical perspective.

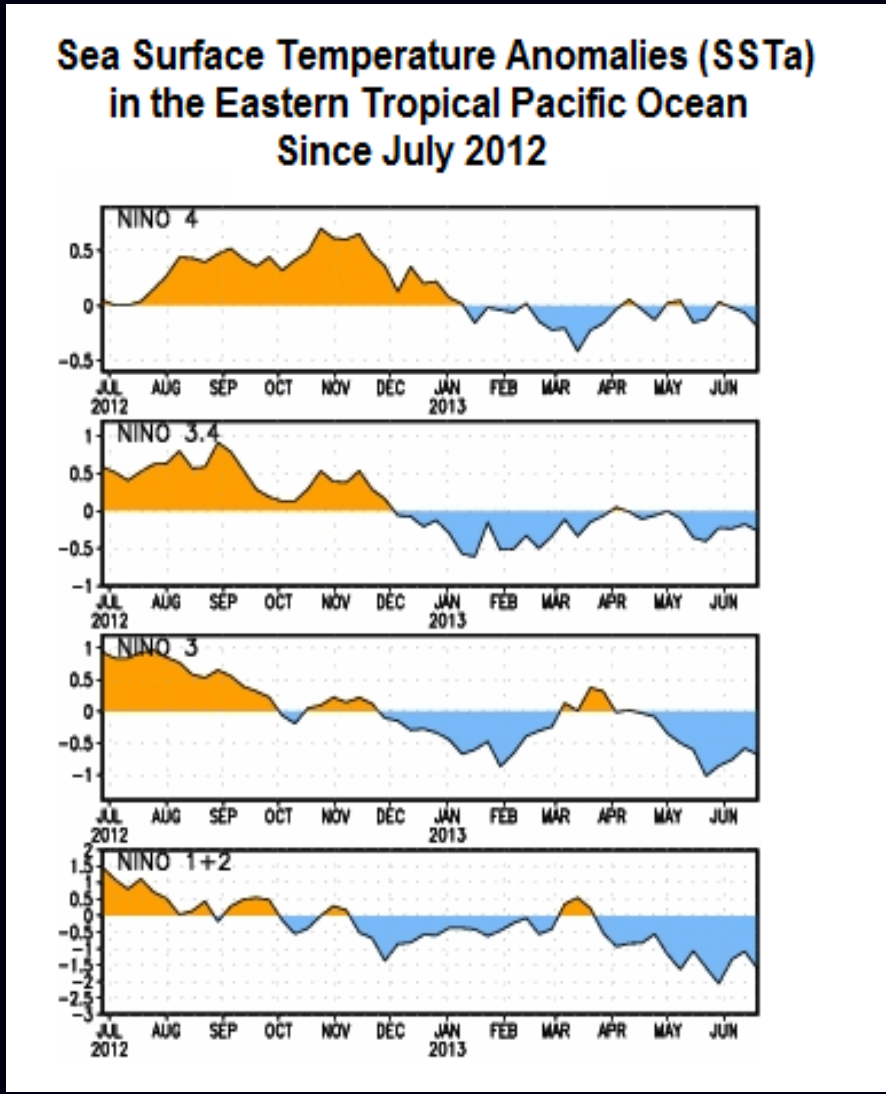
CPC's operational definitions of El Niño and La Niña are keyed to the ONI index.

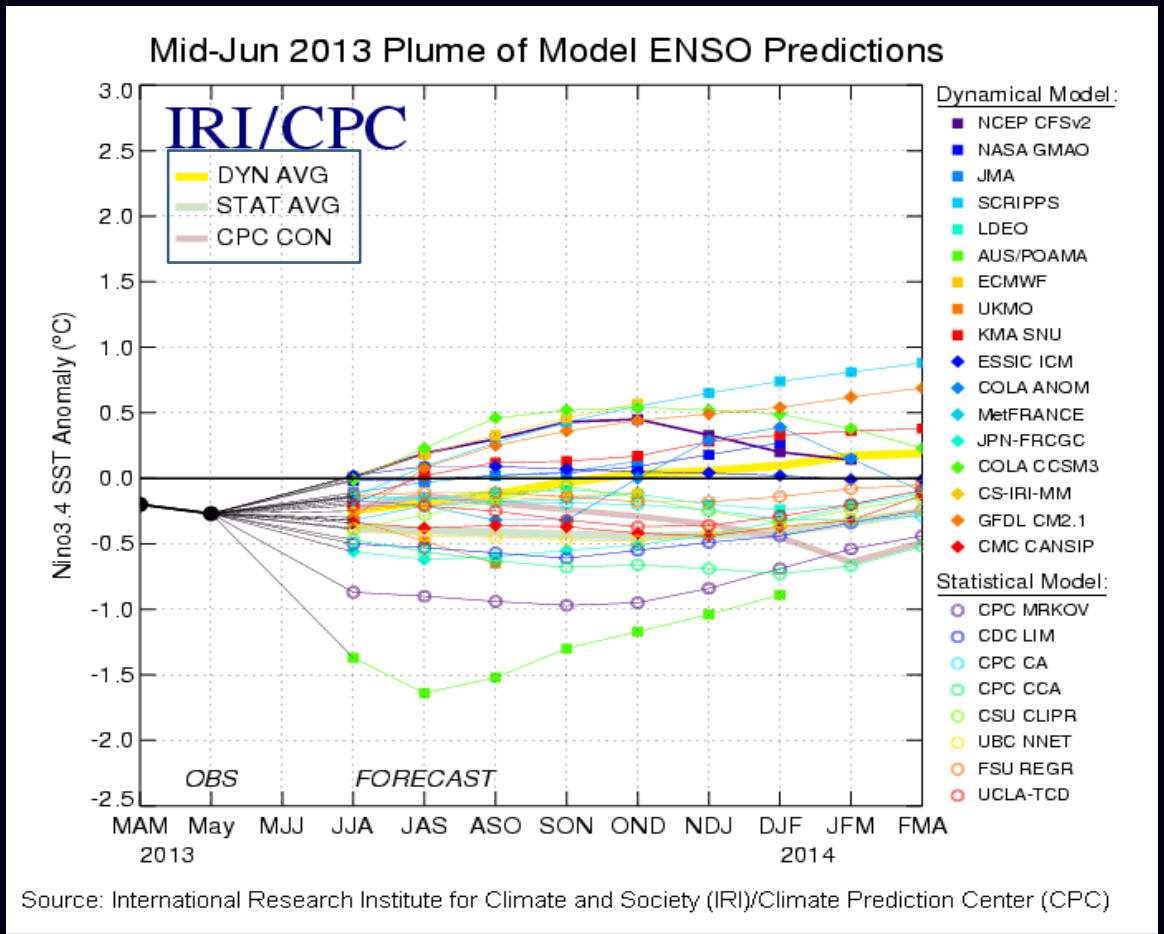
For historical purposes, warm and cold phases of ENSO (the red and blue colored numbers) are defined when the threshold is met for a minimum of 5 consecutive over-lapping 3-month seasons.

Baker - National Weather Service Boulder, Colorado



Niño 3.4 is part of a much larger region of the central and eastern tropical Pacific Ocean where climate scientists from around the world monitor, assess and predict ENSO. For a few weeks in early spring of this year SSTs were slightly above average (a 30-year average) across this entire region of the Pacific. Otherwise, negative SST anomalies have dominated all four Niño regions (see chart at right) since the start of 2013.





Source: International Research Institute for Climate and Society (IRI)/Climate Prediction Center (CPC)

IRI/CPC ENSO Forecast

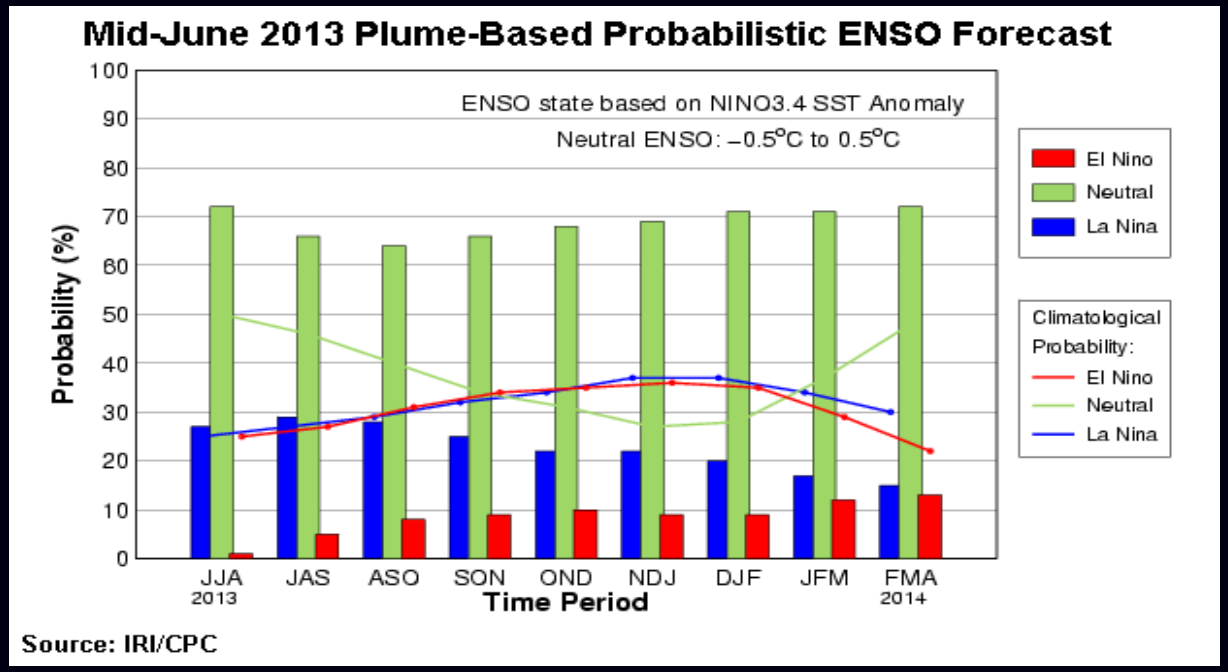
A majority of the 17 dynamical models (at upper left) continue to predict neutral ENSO conditions through the summer of 2013. Beyond that, these same models split between weak El Nino, neutral and weak La Nina conditions, centering on neutral conditions through the autumn of 2013. By comparison, the 8 statistical models (at lower left) favor either neutral or weak La Niña (with a couple bordering on moderate La Nina) conditions during the same time period.

The lower table contains the cumulative average of sea surface temperature anomalies (SSTa) from all 25 models through the February-March-April (FMA) 2014 climate season. The table indicates near average sea surface temperatures for Niño 3.4 during the next 11 months.

Seasons 2013-2014

Models	JJA	JAS	ASO	SON	OND	NDJ	DJF	JFM	FMA
Average, dynamical models	***-0.2***	***-0.2***	***-0.1***	***0***	***0***	***0.1***	***0.1***	***0.2***	***0.2***
Average, statistical models	***-0.4***	***-0.4***	***-0.4***	***-0.4***	***-0.4***	***-0.4***	***-0.4***	***-0.3***	***-0.3***
Average, all models	**-0.3**	**-0.2**	**-0.2**	**-0.2**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**0**

Probabilistic ENSO Forecast Through February-April 2014



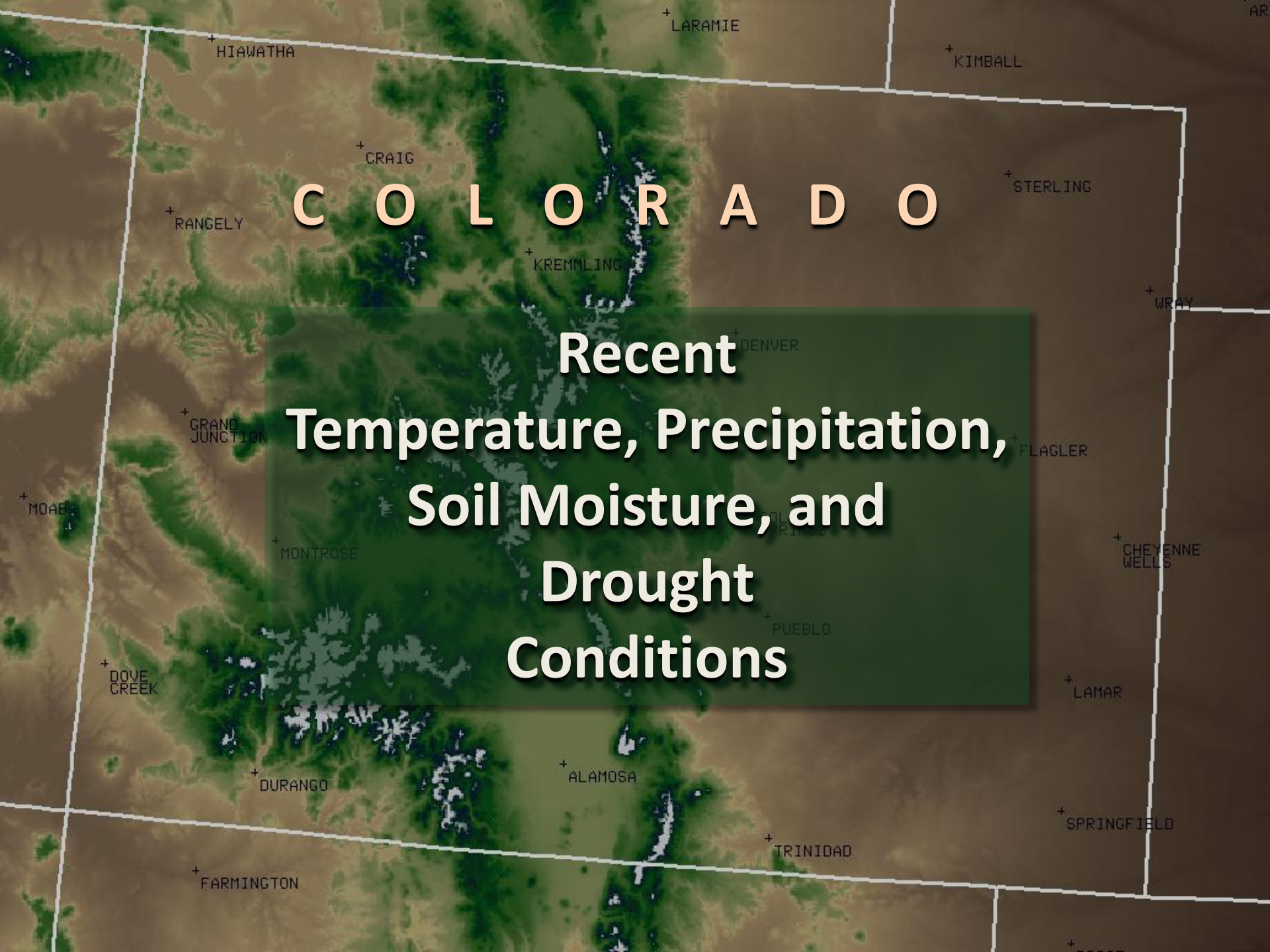
IRI Probabilistic ENSO Prediction for NINO3.4 Region

Season	La Niña	Neutral	El Niño
JJA 2013	27%	72%	1%
JAS 2013	29%	66%	5%
ASO 2013	28%	64%	8%
SON 2013	25%	66%	9%
OND 2013	22%	68%	10%
NDJ 2014	22%	69%	9%
DJF 2014	20%	71%	9%
JFM 2014	17%	71%	12%
FMA 2014	15%	72%	13%

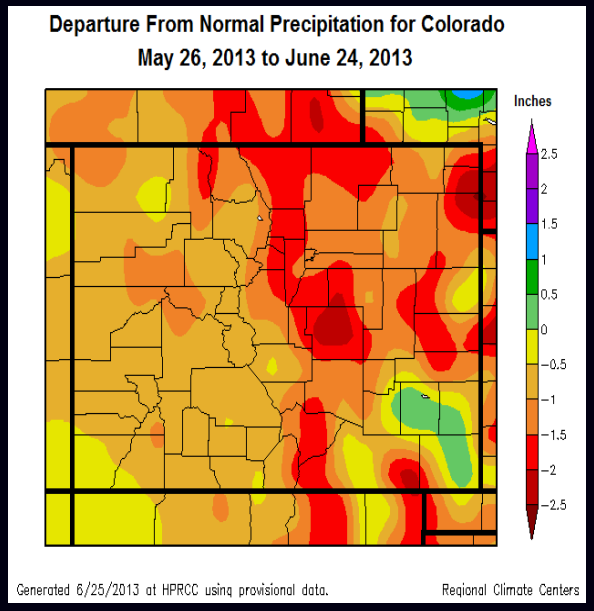
Source: International Research Institute for Climate and Society (IRI) – June 20 2013

The bar chart (at left) indicates the probabilities of El Niño, neutral ENSO conditions and La Niña starting with the June-July-August (JJA) climate season and ending with the February-March-April (FMA) 2014 climate season.

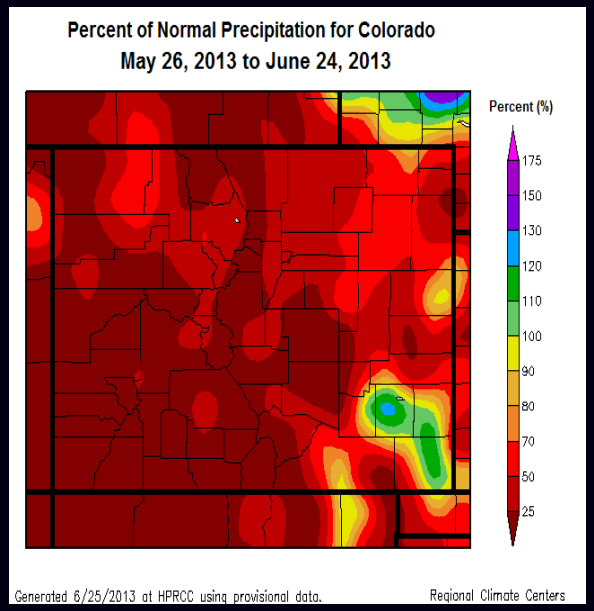
The probabilities derived from the 24 dynamical and statistical models, on average, maintain neutral ENSO conditions through the ASO 2013 climate season. Beyond that, there is less certainty in the latest the forecast because of the known biases and recent changes to the models .


LARAMIE
HIAWATHA
KIMBALL
CRAIG
STERLING
C O L O R A D O
RANGELY
KREMMLING
WRAY
DENVER
GRAND JUNCTION
FLAGLER
MOAB
MONTROSE
CHEYENNE WELLS
PUEBLO
DOVE CREEK
LAMAR
DURANGO
ALAMOSA
SPRINGFIELD
TRINIDAD
FARMINGTON
Recent Temperature, Precipitation, Soil Moisture, and Drought Conditions

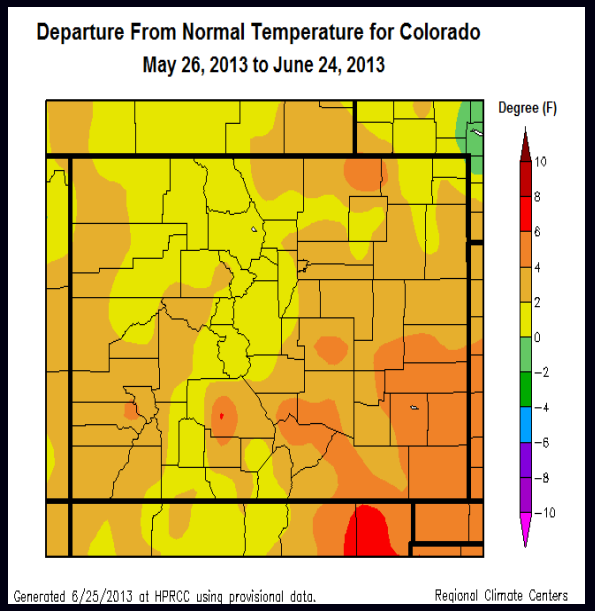
Recent Precipitation and Temperature In Colorado



Precipitation



Precipitation

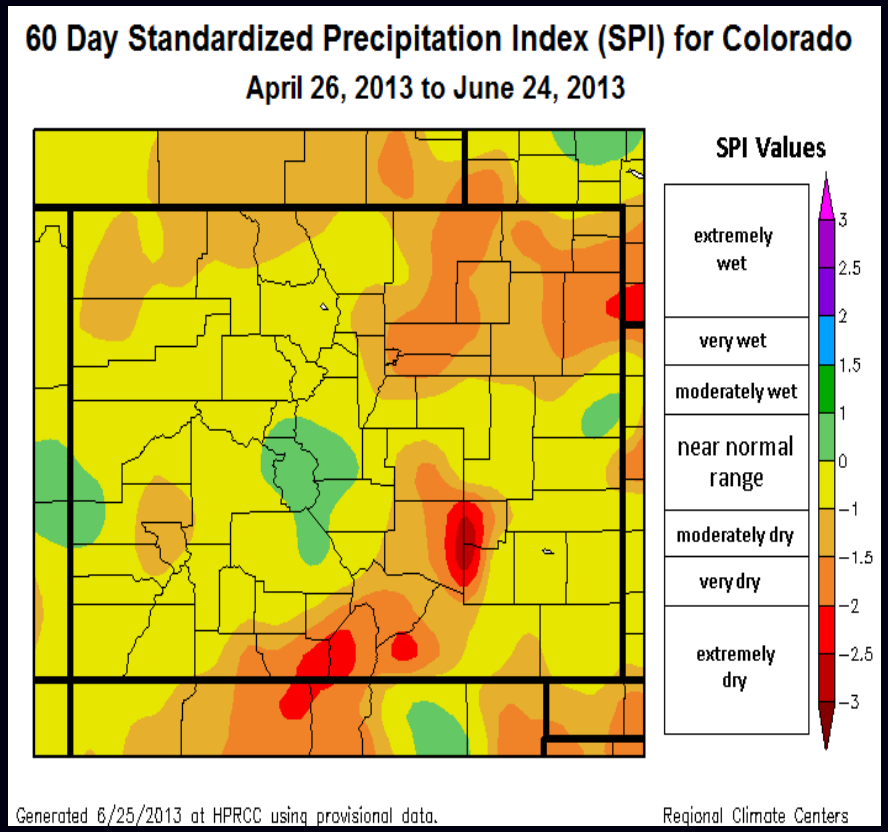


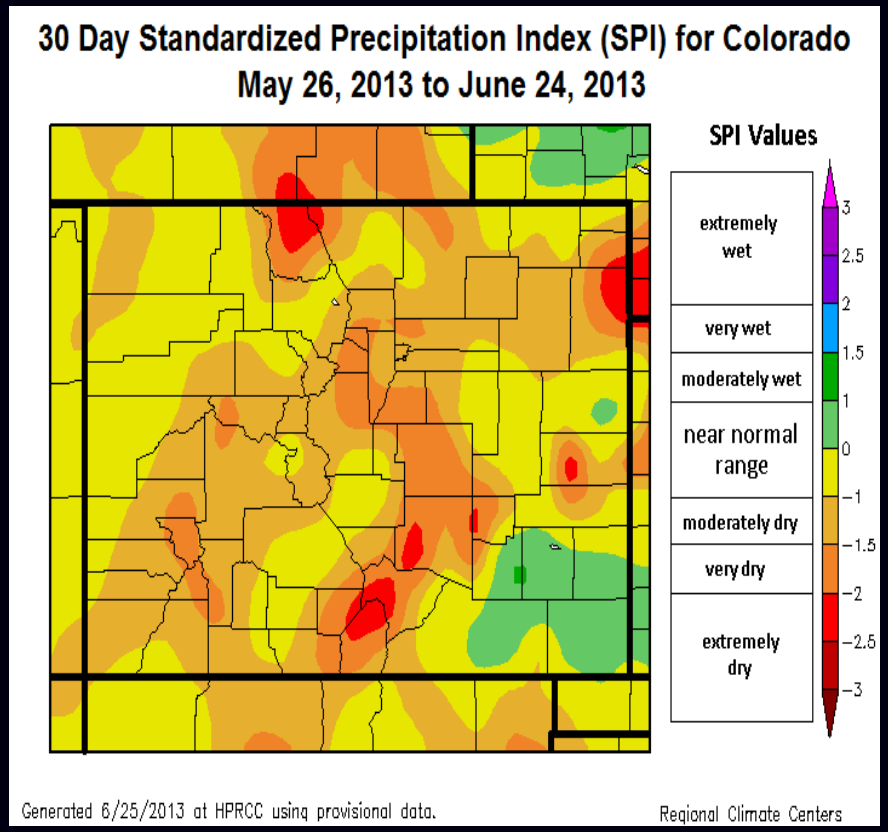
Temperature

After an abnormally wet (snowy) start to spring for much of north central and northeast Colorado, conditions have turned significantly drier, not just here, but across all of Colorado. Precipitation was acutely absent across southwest and south central Colorado during this 30-day. The very small negative precipitation departures observed across this region can be deceiving as this is normally a very dry time of year. However, when compared to climatological normals for this period, precipitation across this region and other parts of Colorado was less than 25 percent of normal. Portions of eastern Colorado, fortunately, were not as dry, such as the southeast corner of the state.

During the same 30 day period, temperatures across Colorado ranged from near to above average, with the largest positive departures from normal observed in southeast Colorado.

Soil Moisture Conditions
Across Colorado Since April 26, 2013

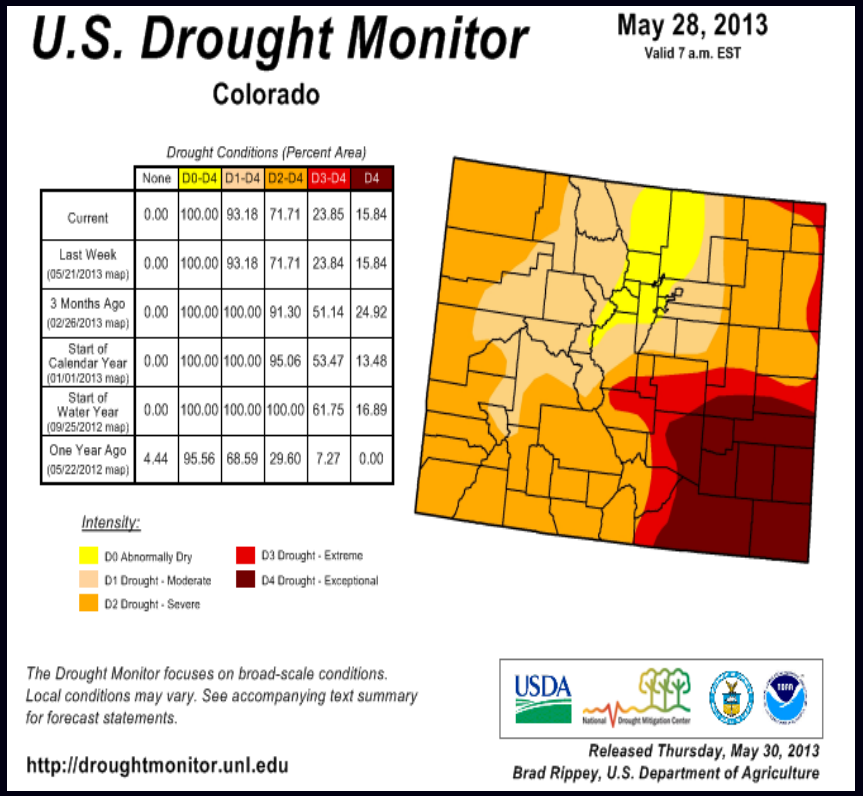




Since late April, soil moistures have trended downward across most of Colorado, particularly along the east face of the Front Range mountains, over the higher elevations of southwest Colorado, and across the northeast plains. By comparison, soil moistures showed improvement in parts of southeast Colorado.

The SPI was developed to monitor potential short term agricultural and long-term hydrological drought conditions. The SPI is a probability index that considers only precipitation.

Current Drought Conditions In Colorado



U.S. Drought Monitor

May 28, 2013
Valid 7 a.m. EST

Colorado

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	93.18	71.71	23.85	15.84
Last Week (05/21/2013 map)	0.00	100.00	93.18	71.71	23.84	15.84
3 Months Ago (02/26/2013 map)	0.00	100.00	100.00	91.30	51.14	24.92
Start of Calendar Year (01/01/2013 map)	0.00	100.00	100.00	95.06	53.47	13.48
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	100.00	61.75	16.89
One Year Ago (05/22/2012 map)	4.44	95.56	68.59	29.60	7.27	0.00

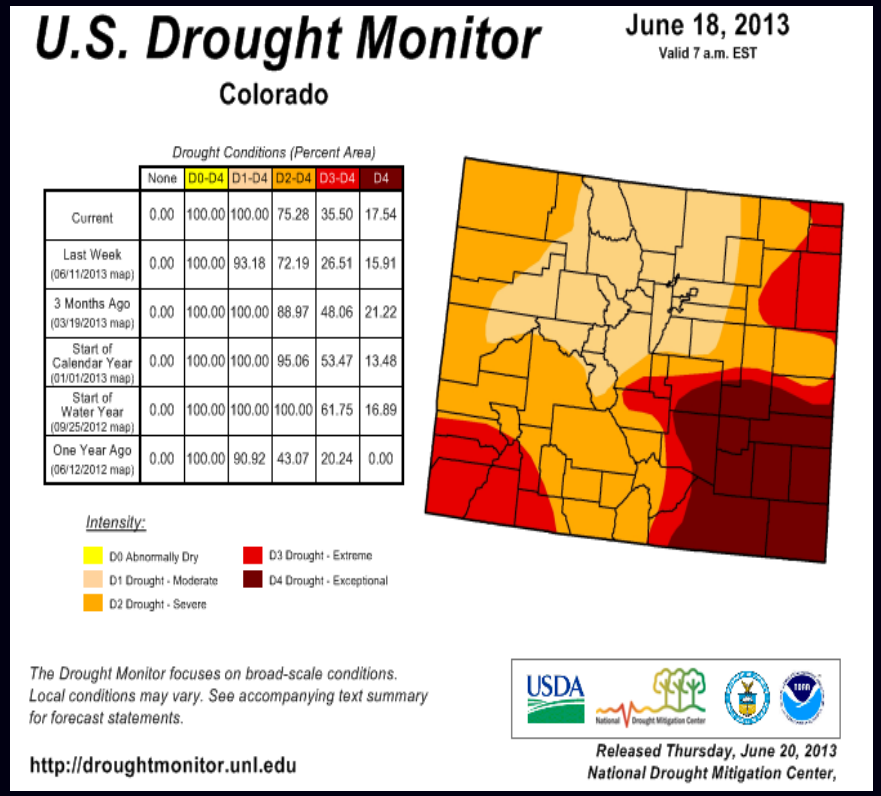
Intensity:

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

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

http://droughtmonitor.unl.edu

Released Thursday, May 30, 2013
Brad Rippey, U.S. Department of Agriculture



U.S. Drought Monitor

June 18, 2013
Valid 7 a.m. EST

Colorado

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	75.28	35.50	17.54
Last Week (06/11/2013 map)	0.00	100.00	93.18	72.19	26.51	15.91
3 Months Ago (03/19/2013 map)	0.00	100.00	100.00	88.97	48.06	21.22
Start of Calendar Year (01/01/2013 map)	0.00	100.00	100.00	95.06	53.47	13.48
Start of Water Year (09/25/2012 map)	0.00	100.00	100.00	100.00	61.75	16.89
One Year Ago (06/12/2012 map)	0.00	100.00	90.92	43.07	20.24	0.00

Intensity:

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

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

http://droughtmonitor.unl.edu

Released Thursday, June 20, 2013
National Drought Mitigation Center,

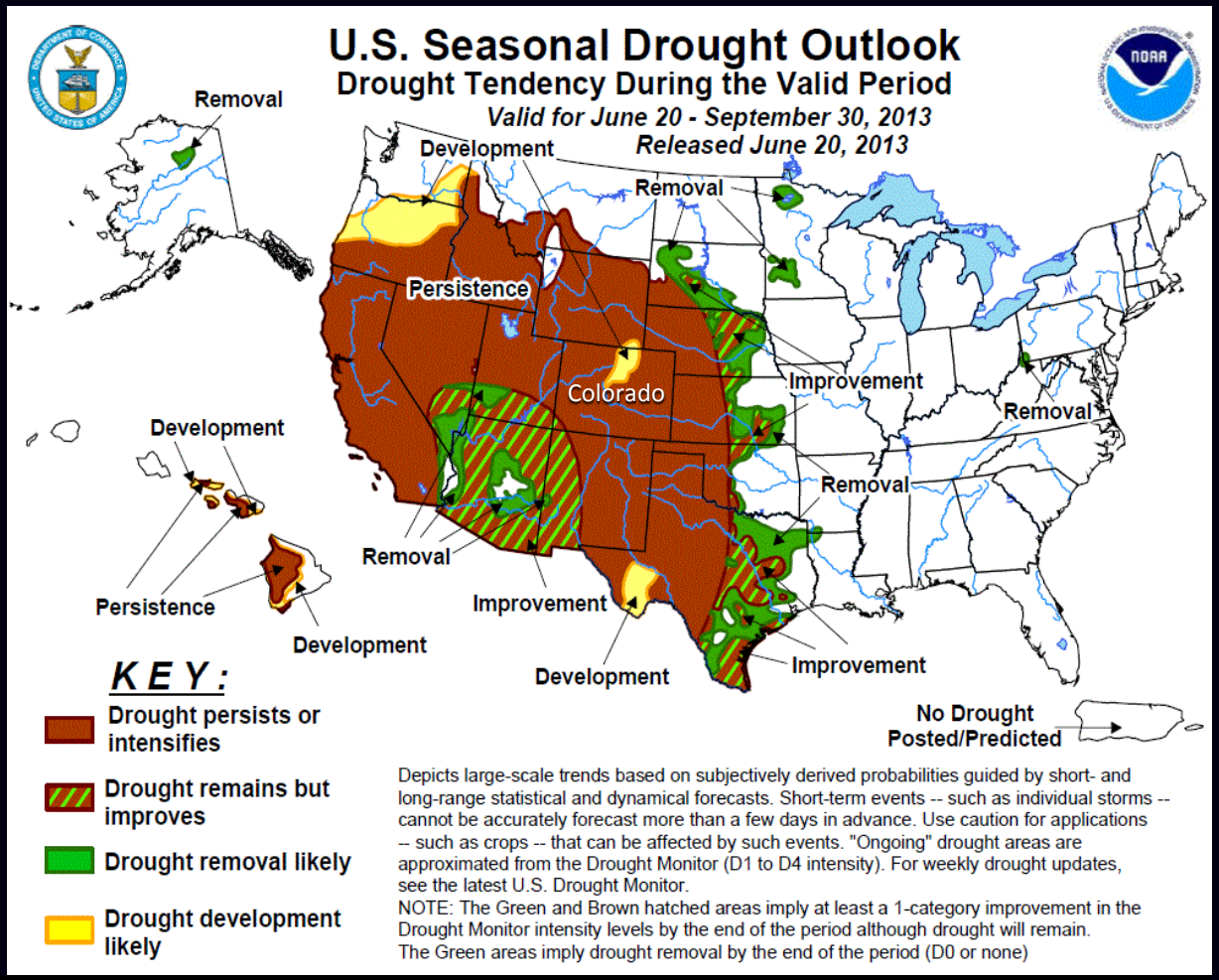
As of May 28 ,2013

As of June 18 ,2013

Even with the recent precipitation, exceptional drought conditions (D4) continue to grip southeast Colorado. In recent days, extreme drought conditions (D3) have developed across portions of southwest and northeast Colorado. Moderate drought conditions (D2) have also returned to the Colorado Front Range, which includes Denver, Boulder, Longmont, Loveland, Fort Collins and Greeley.

Baker - National Weather Service Boulder, Colorado

The Latest 3-Month Drought Outlook



www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif.

NOAA's Climate Prediction Center Seasonal Drought Outlook calls for drought conditions to develop across north central Colorado, and persist across the remainder of the state during the next three months. Some improvement in drought conditions is predicted for the southwest corner of the state in response to the summer monsoon rainy season that often appears during July and early August. The duration and strength of this year's monsoon remains uncertain.

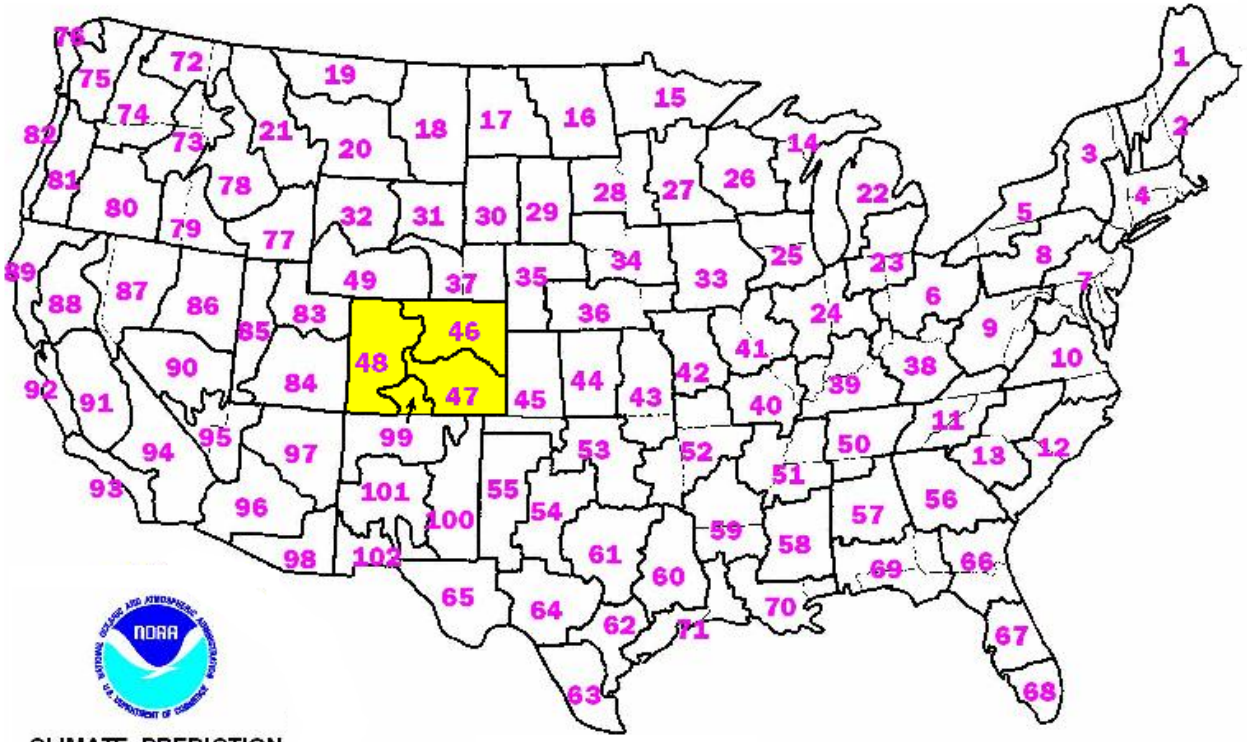
July-August-September 2013 Temperature and Precipitation Outlooks for Colorado Issued by the Climate Prediction Center

Climate Prediction Center Seasonal Outlooks

The National Weather Service Seasonal Climate Outlooks predict the probability of conditions being among the warmest/coldest or wettest/driest terciles of years compared to the period of record 1981-2010.

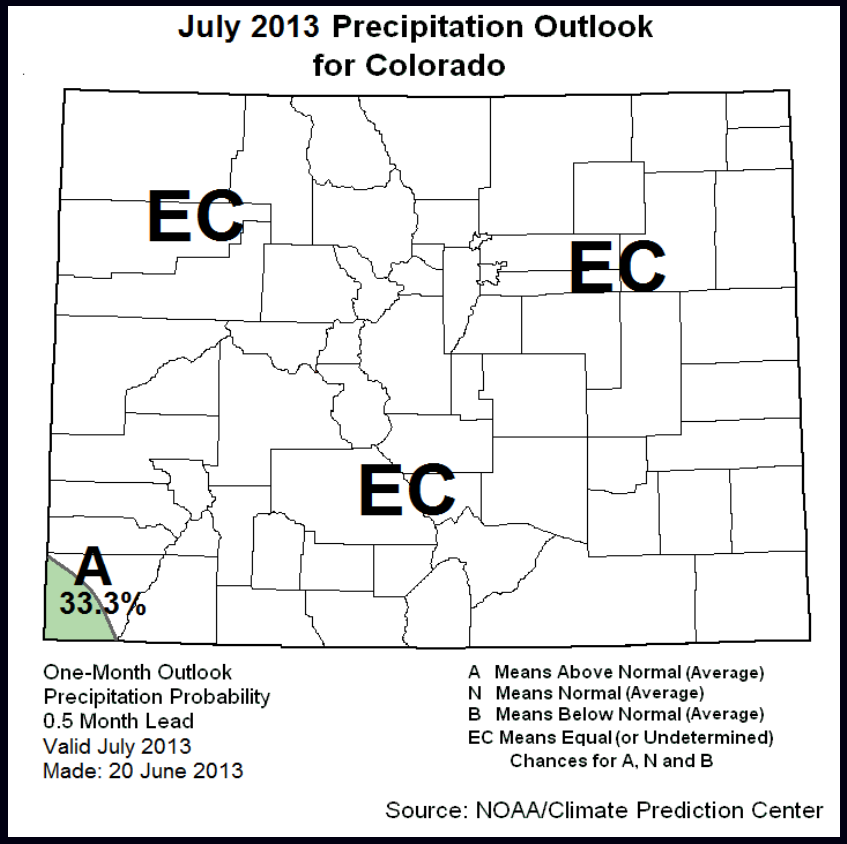
The outlooks indicate probability of being in three specific categories in reference to the 30-year climatology from 1981-2010. They are above, below and average.

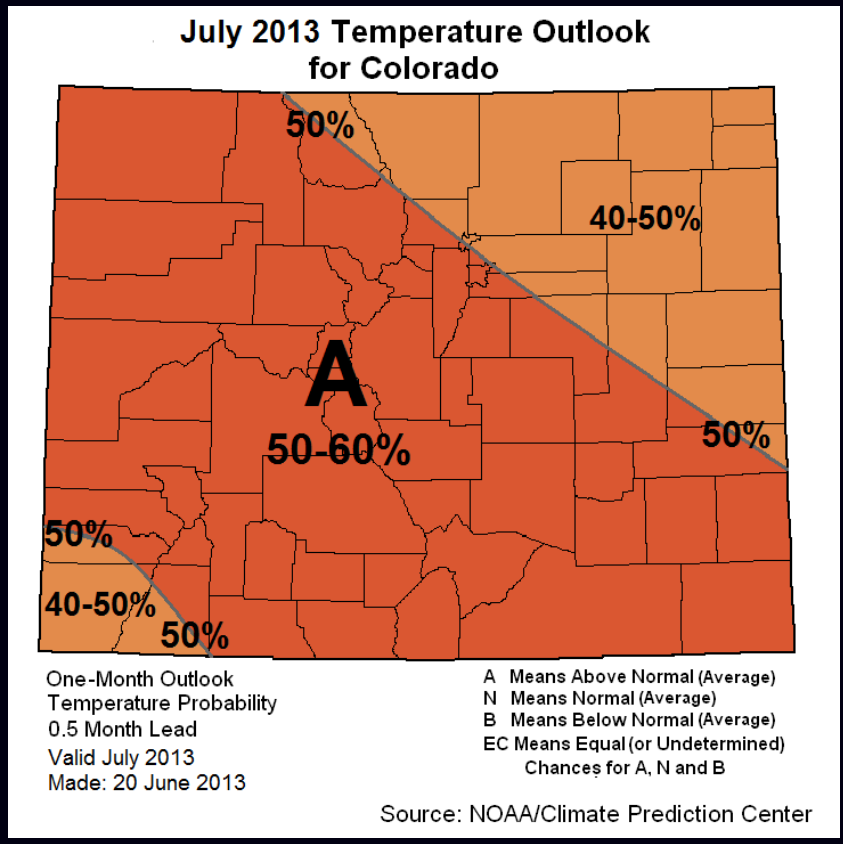
Remember, Climate Predicition Center (CPC) outlooks are made at the scale of the climate megadividions (see the map below).



CLIMATE PREDICTION CENTER

30 Day Precipitation and Temperature Outlooks For Colorado

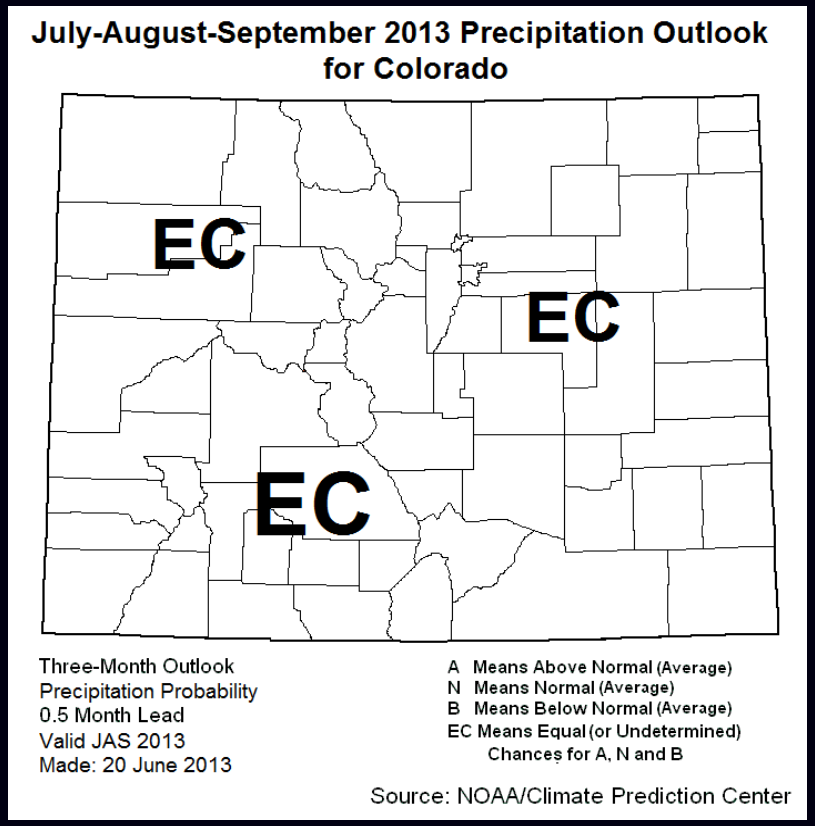


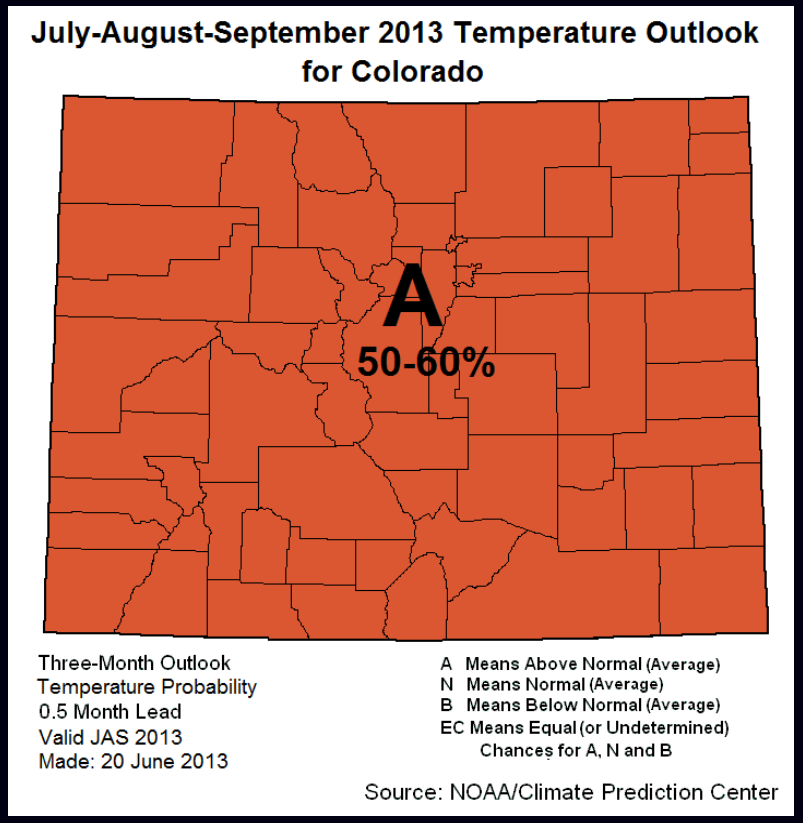


The outlook for July calls for an equal (or undeterminable) chance for above, near and below average precipitation for nearly all of Colorado. One exception is in the far southwest corner of the state, where CPC believes there is at least a 33.3 percent chance for above average precipitation during July.

For the same month, CPC predicts a 50 to 60 percent chance for above average temperatures across central portions of Colorado, and a slightly lower (40-50 percent) chance for warmer than average temperatures for the southwest and northeast corners of the state.

90 Day Precipitation and Temperature Outlooks for Colorado





For the 3-month period July-September, CPC is calling for an equal (or undeterminable) chance for above, near and below precipitation for all of Colorado.

Finally, the temperature outlook for the same 3-month period is for a 50-60 percent chance of above average temperatures across Colorado.