

El Niño and Seasonal Forecast Outlooks

Mike Hardiman
National Weather Service
El Paso, TX / Santa Teresa, NM

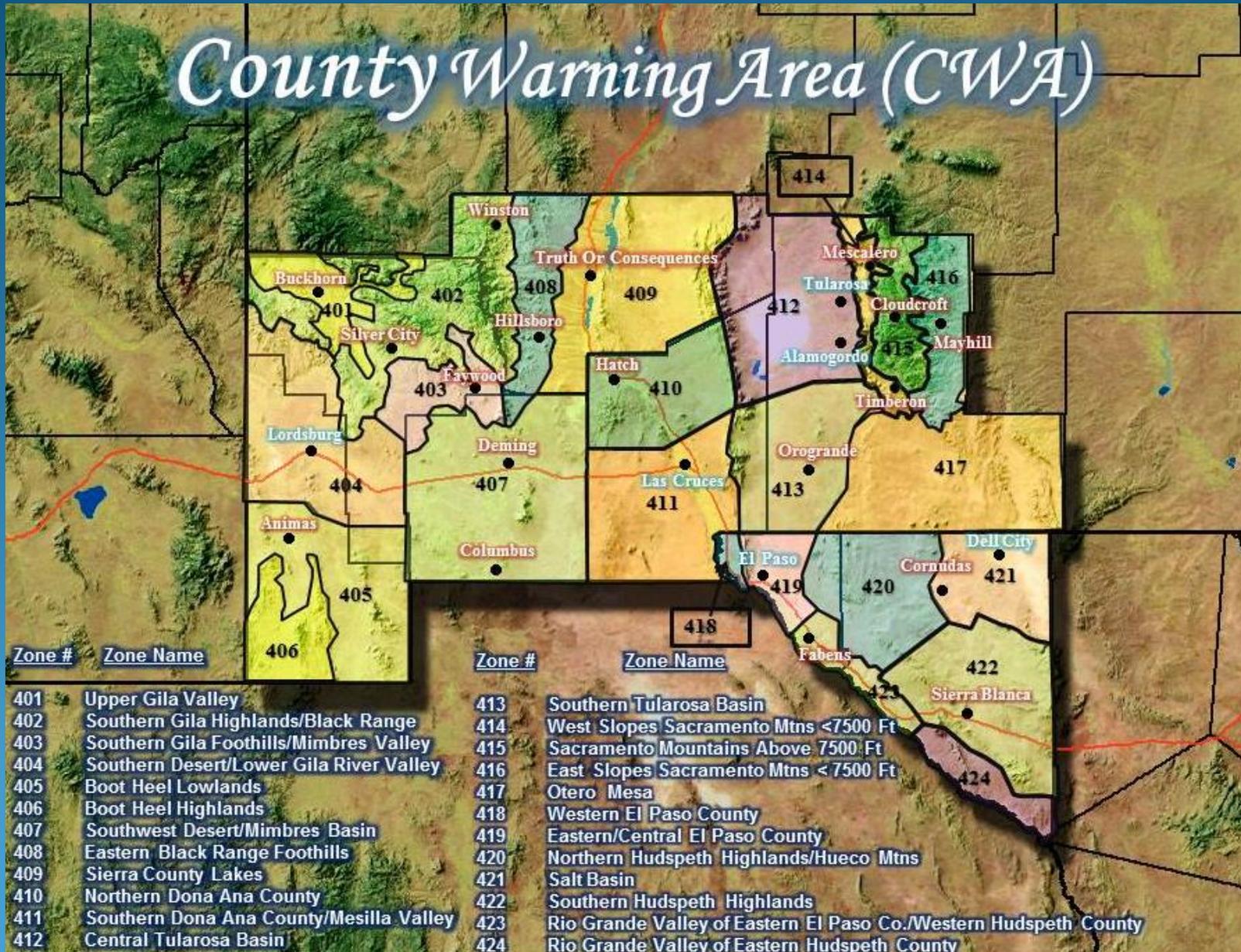
Your National Weather Service Office



**“El Paso Area Forecast Office”
Santa Teresa, New Mexico**

Your National Weather Service Office

County Warning Area (CWA)



Precipitation Recap

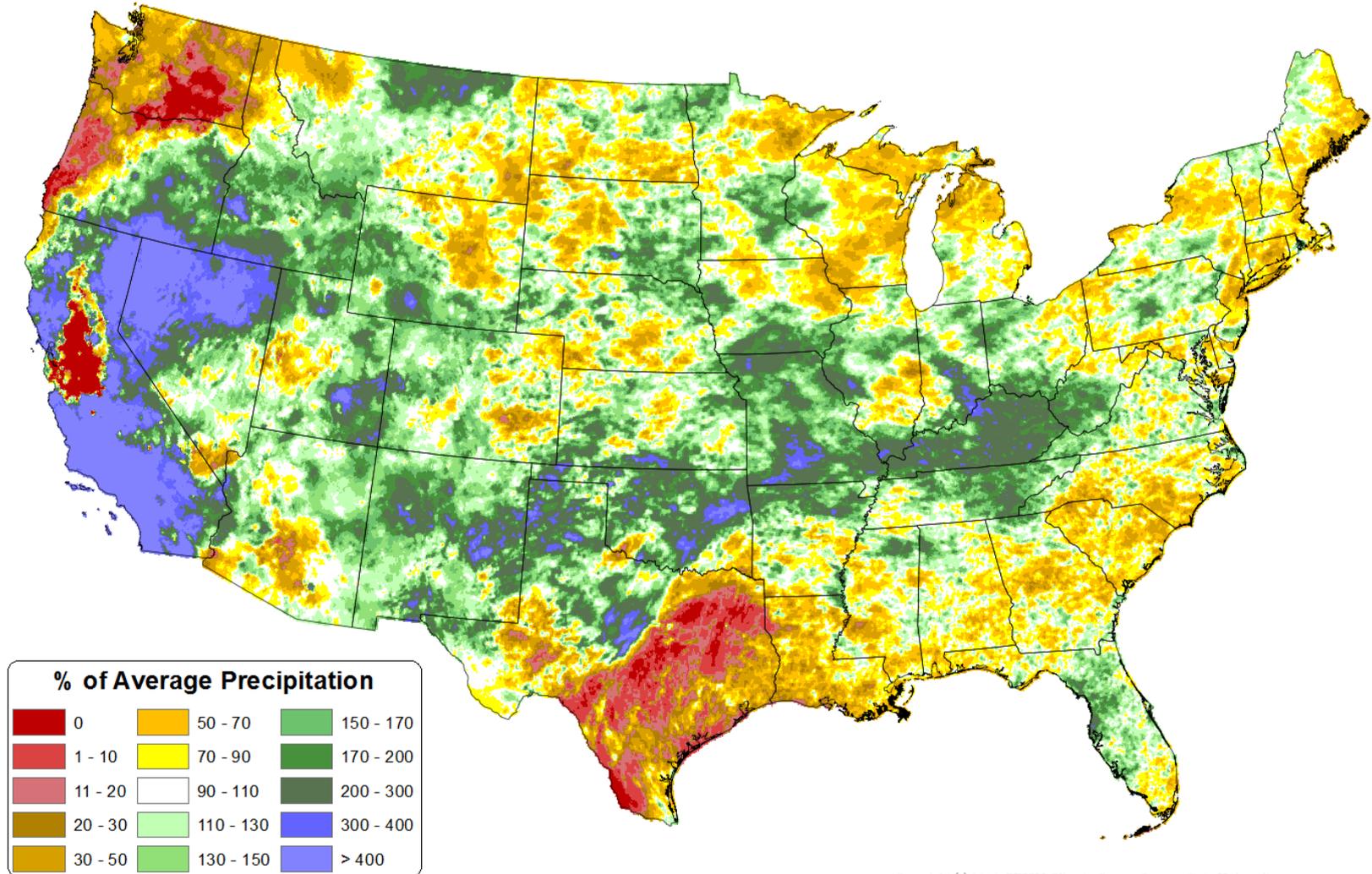
Precipitation Recap: July 2015

Total Precipitation Anomaly: July 2015

Period ending 31 Jul 2015

Base period: 1981-2010

(Map created 15 Jan 2016)



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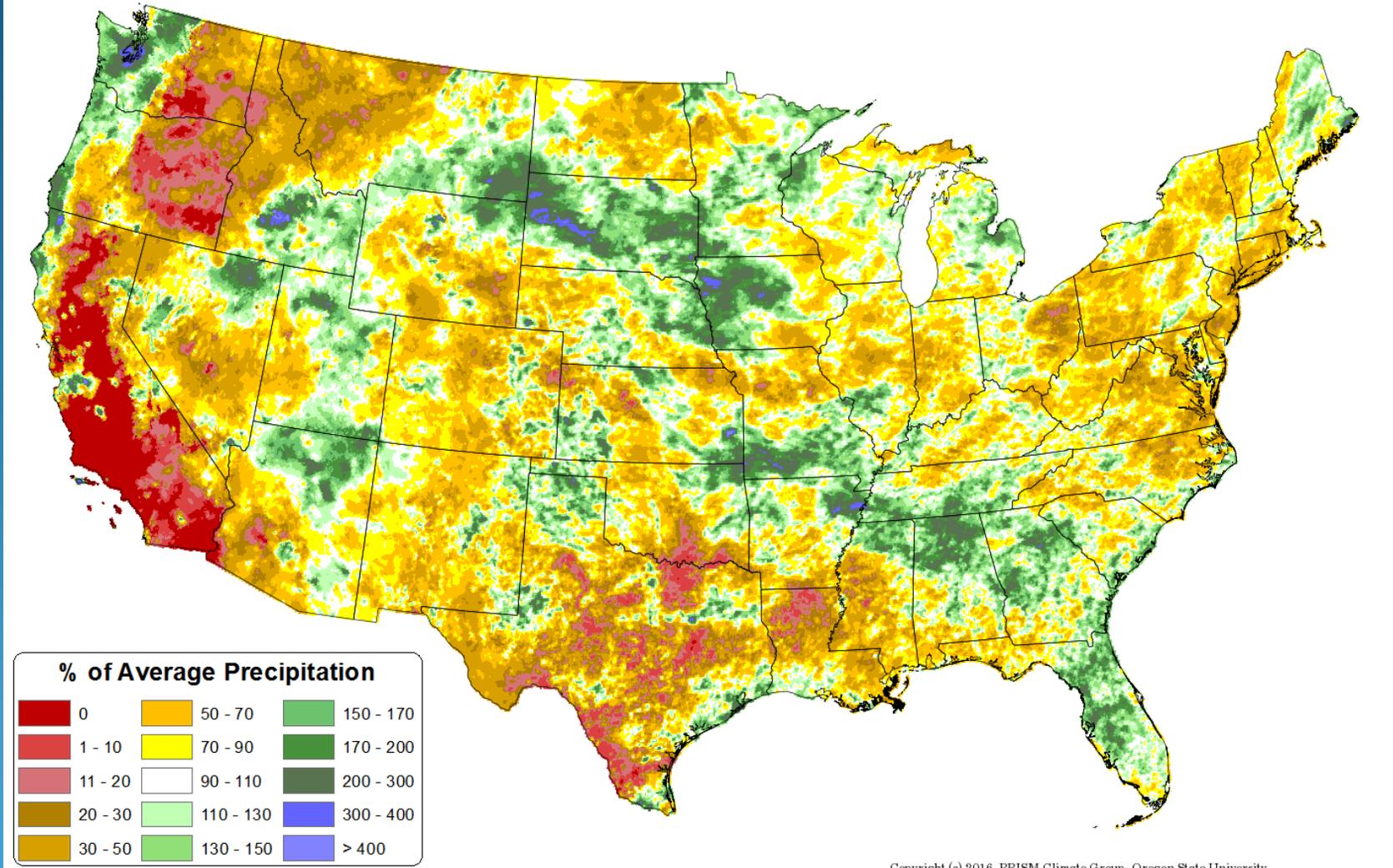
Precipitation Recap: August 2015

Total Precipitation Anomaly: August 2015

Period ending 31 Aug 2015

Base period: 1981-2010

(Map created 15 Jan 2016)



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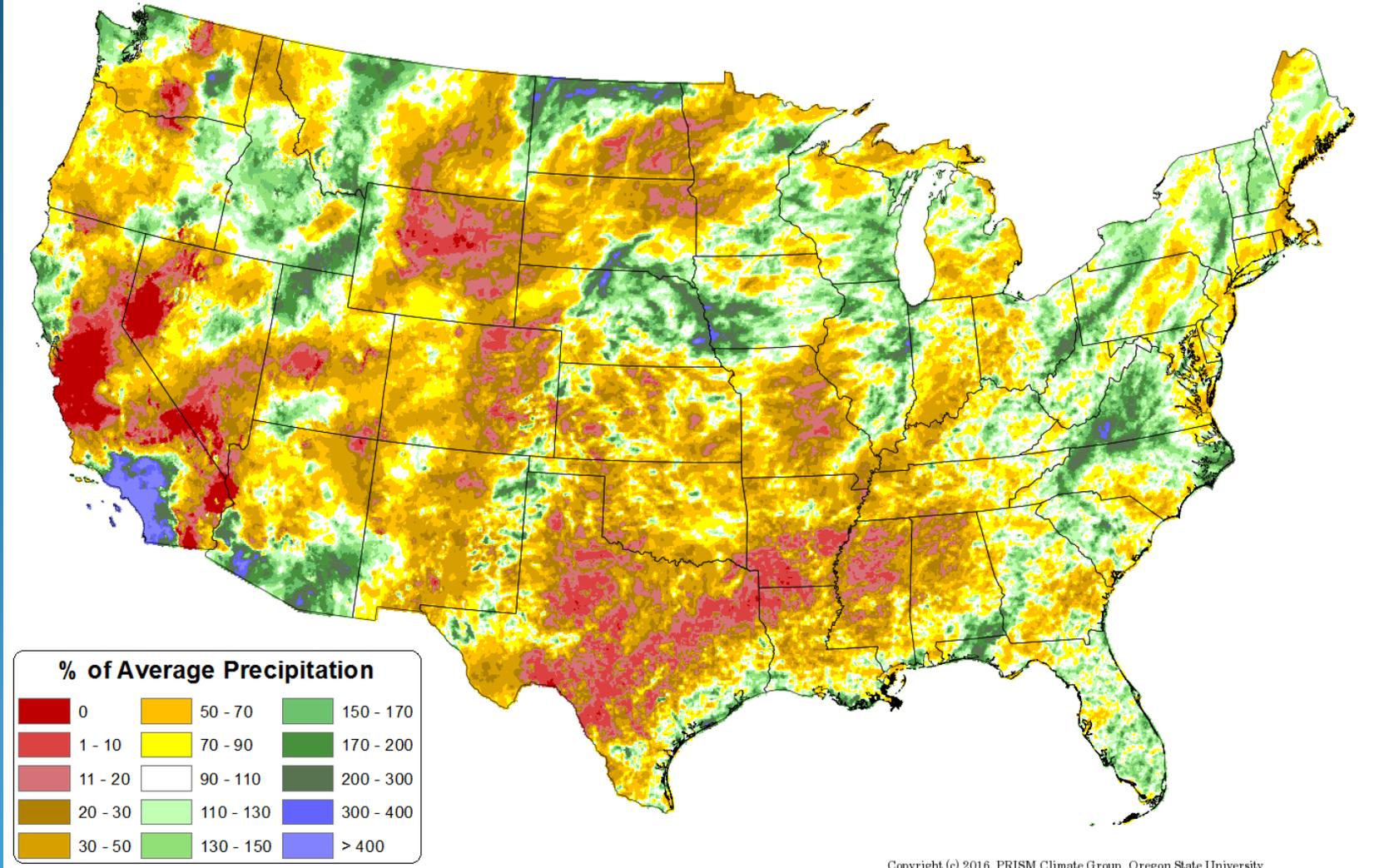
Precipitation Recap: September 2015

Total Precipitation Anomaly: September 2015

Period ending 30 Sep 2015

Base period: 1981-2010

(Map created 15 Jan 2016)



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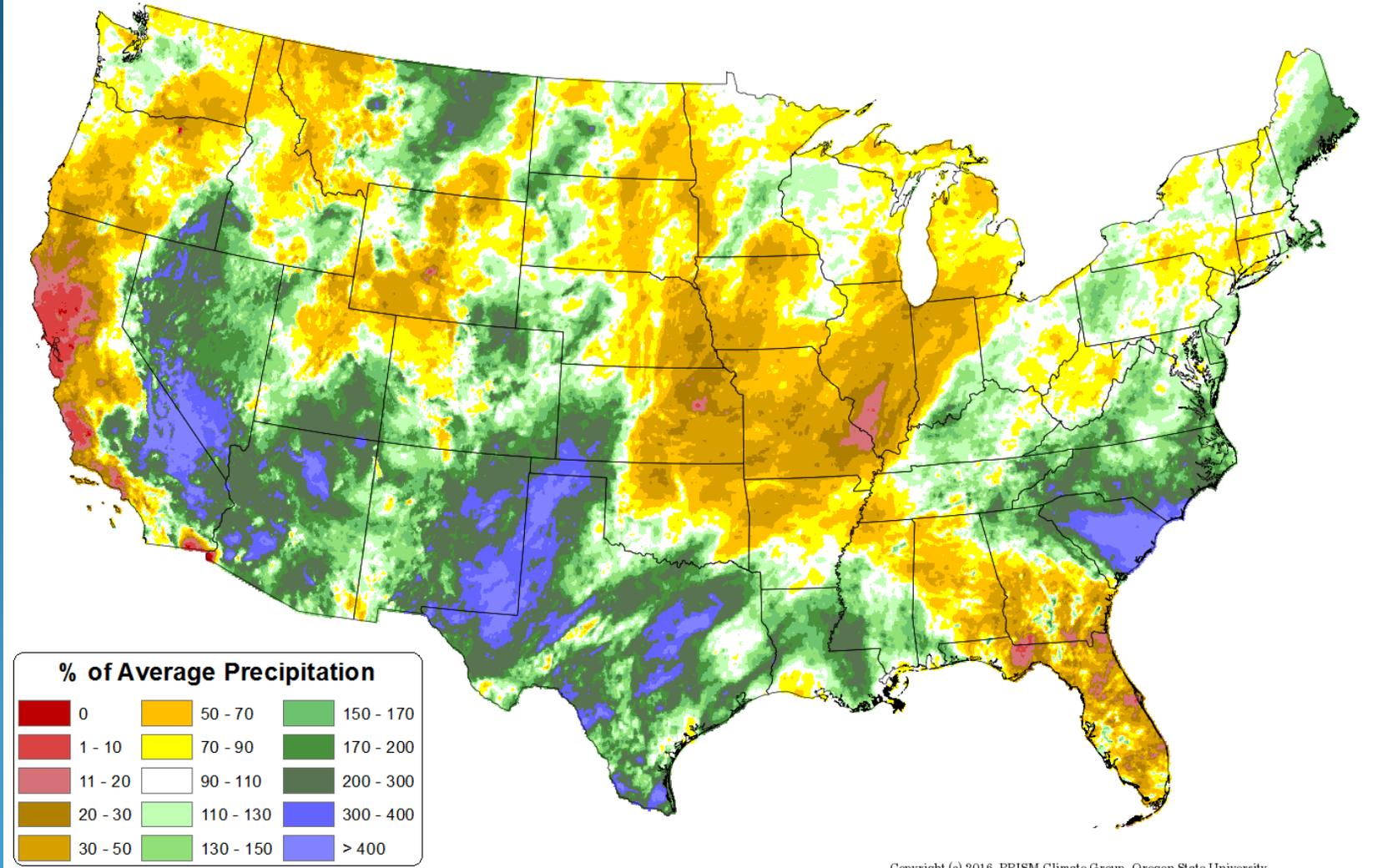
Precipitation Recap: October 2015

Total Precipitation Anomaly: October 2015

Period ending 31 Oct 2015

Base period: 1981-2010

(Map created 15 Jan 2016)



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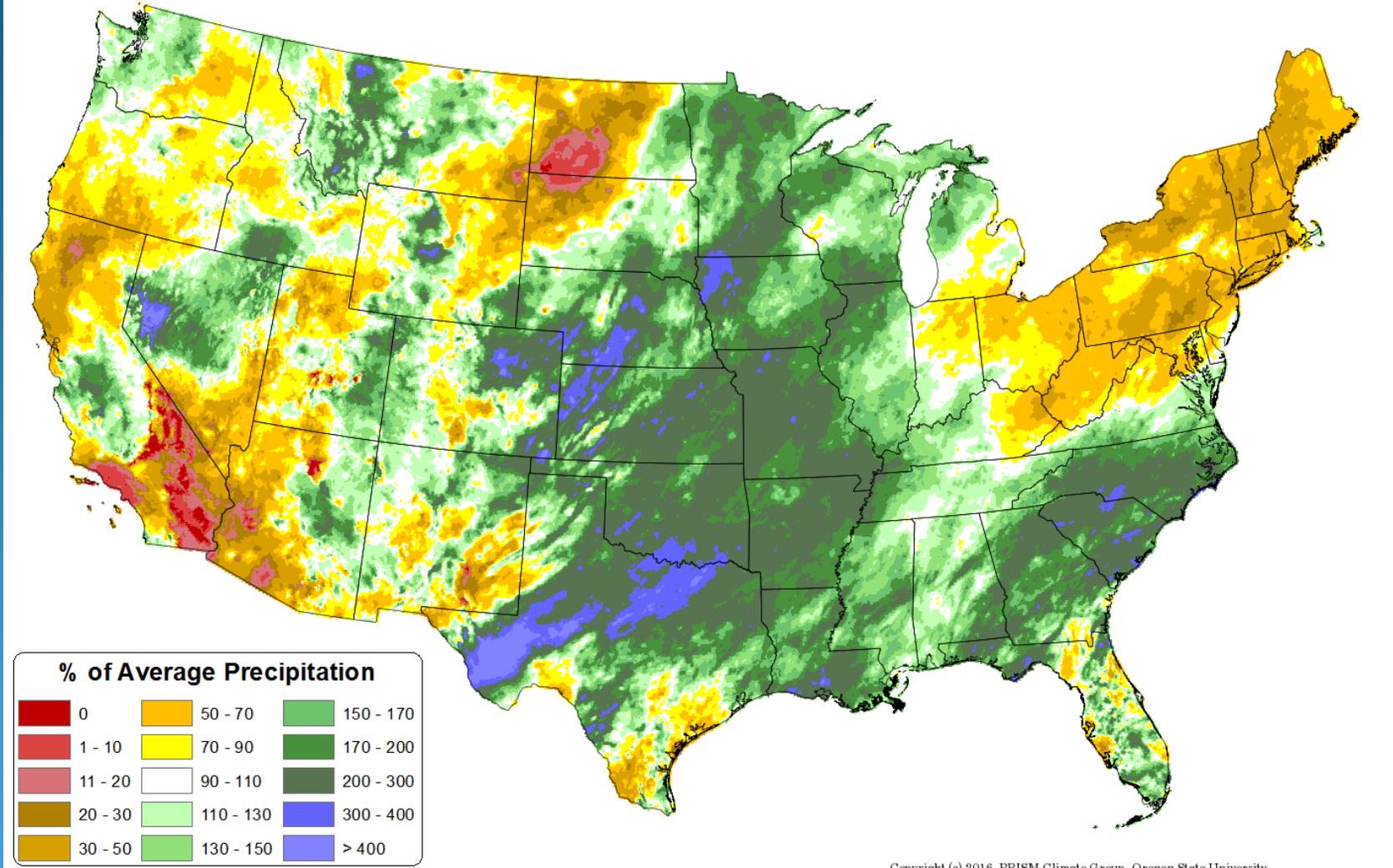
Precipitation Recap: November 2015

Total Precipitation Anomaly: November 2015

Period ending 30 Nov 2015

Base period: 1981-2010

(Map created 15 Jan 2016)



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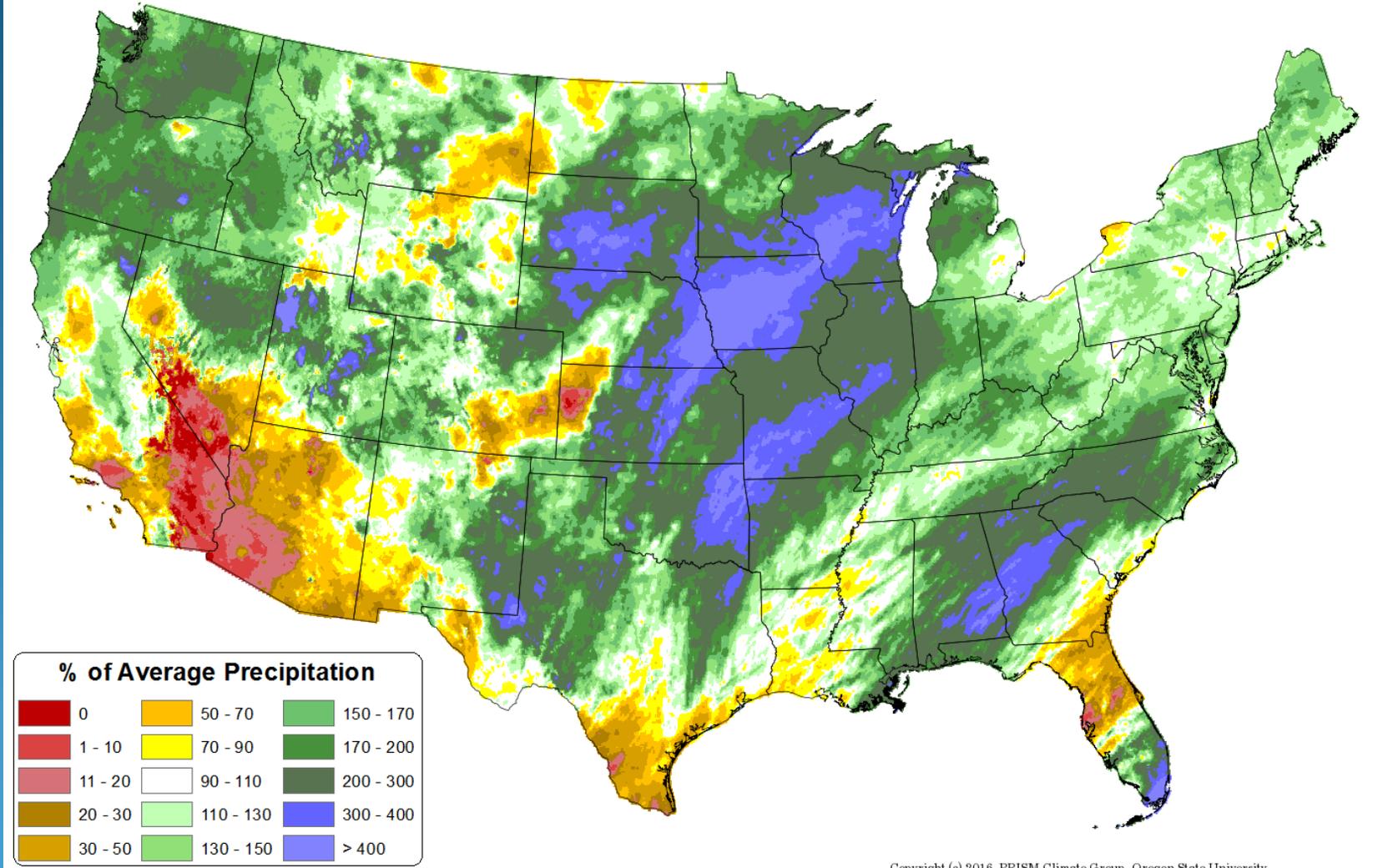
Precipitation Recap: December 2015

Total Precipitation Anomaly: December 2015

Period ending 31 Dec 2015

Base period: 1981-2010

(Map created 15 Jan 2016)



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Precipitation Recap: Whole Year 2015

West Gulf River Forecast Center: 2015 Annual Percent of Normal
Precipitation

Valid on: January 01, 2016 12:00 UTC



Print this map

Permalink

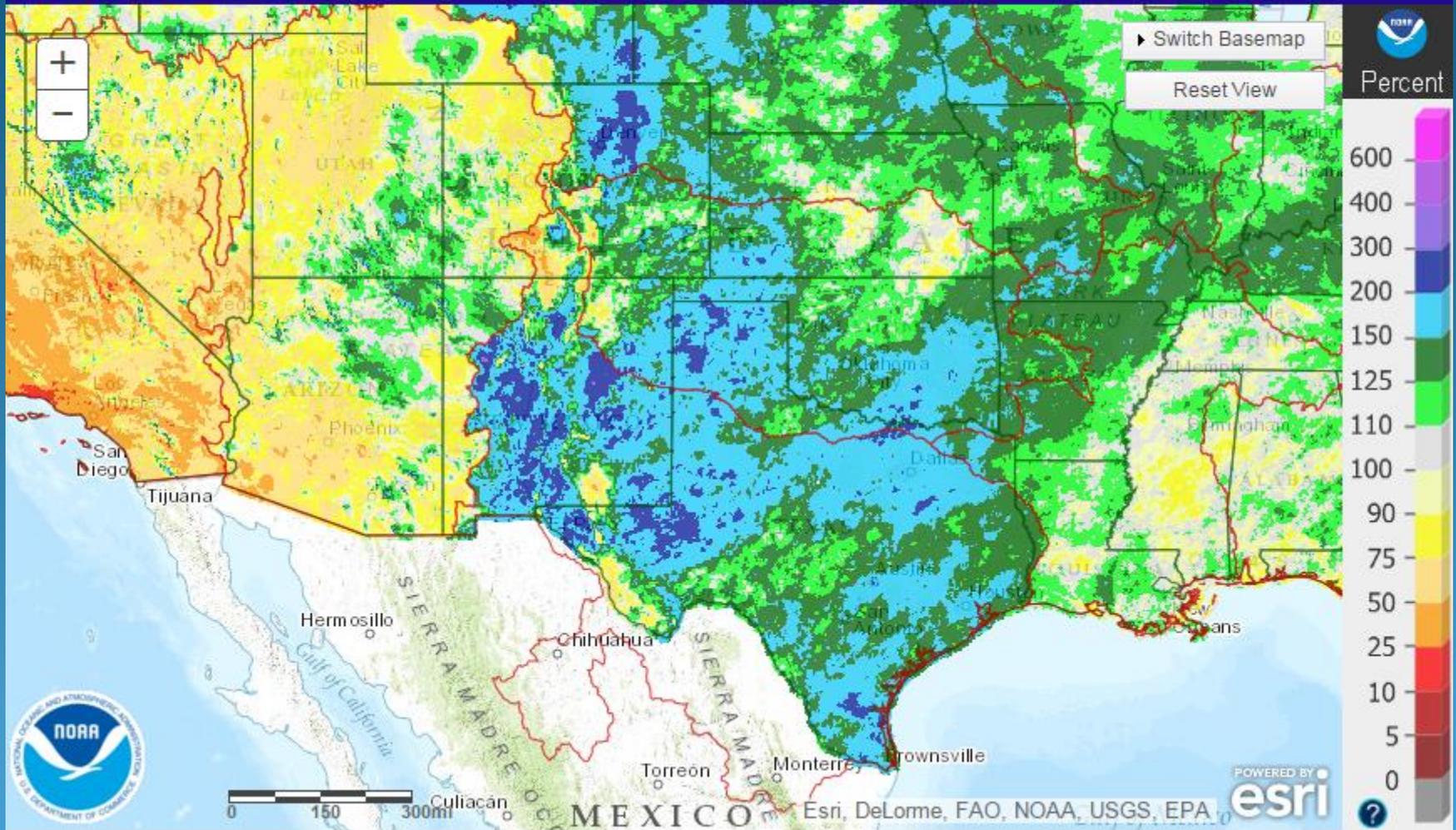
BOOKMARK



What is UTC time?

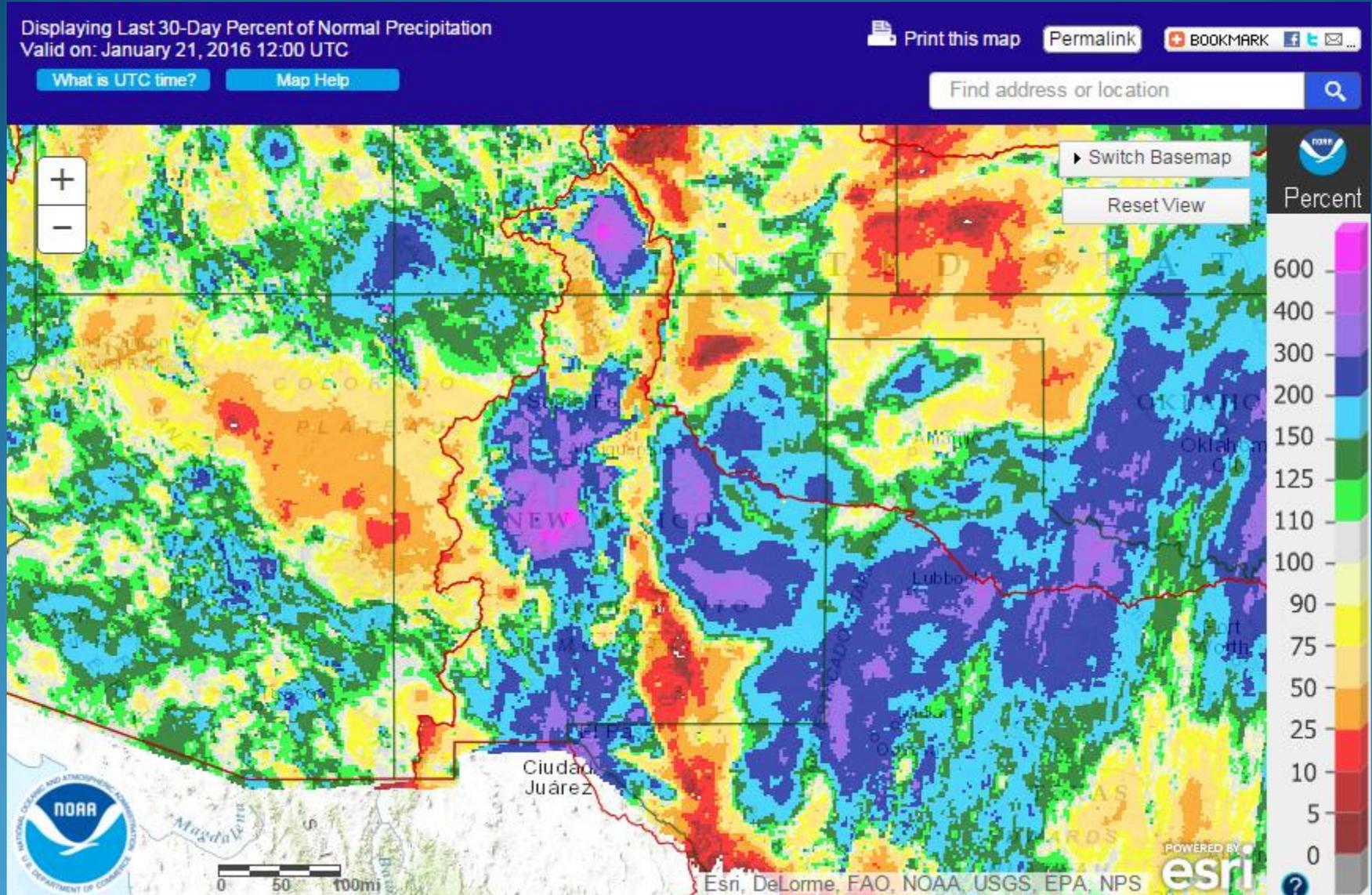
Map Help

Find address or location



Source: NWS AHPS ~ <http://water.weather.gov/precip/>

Precipitation: Last 30 Days



Source: NWS AHPS ~ <http://water.weather.gov/precip/>

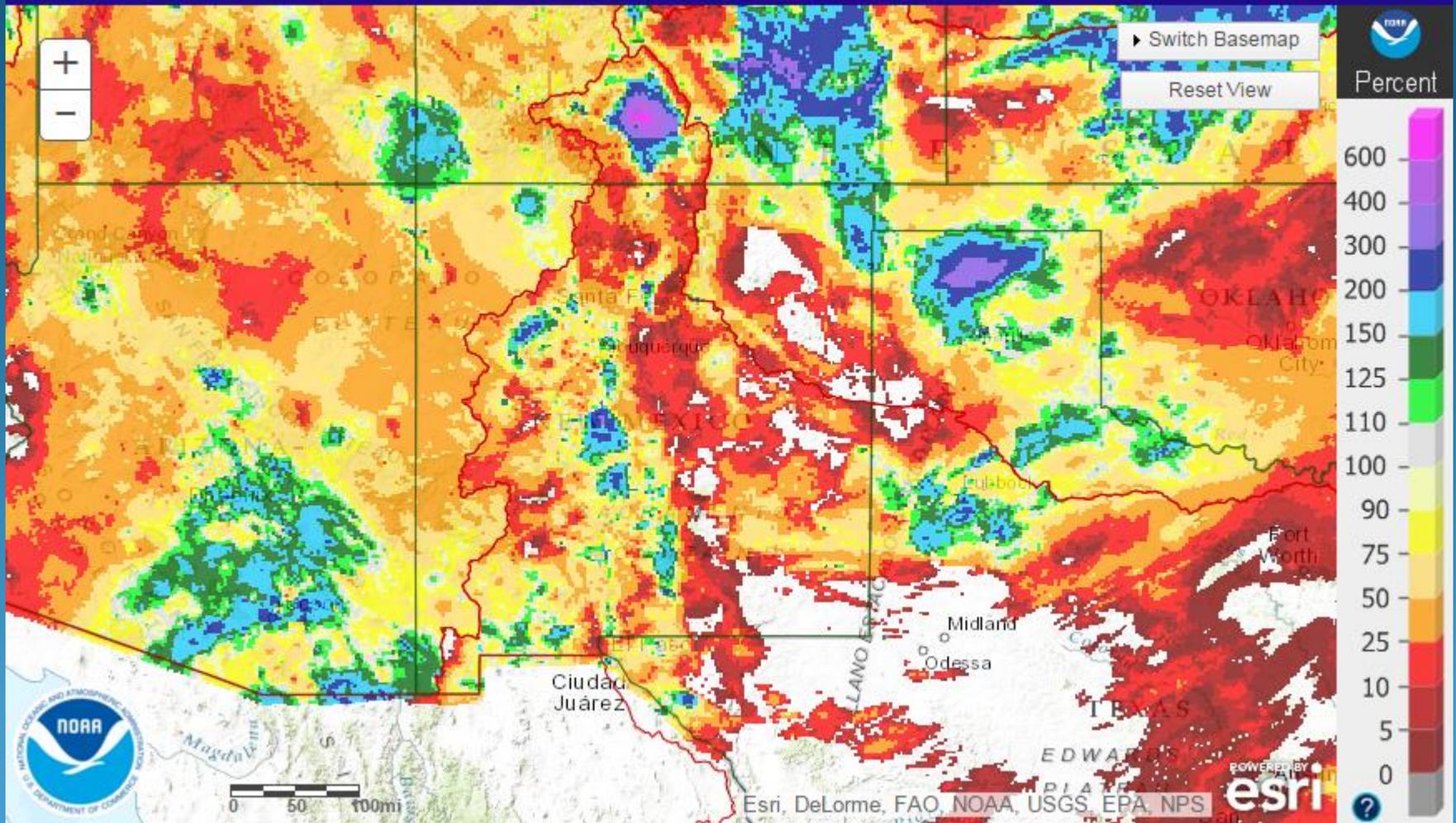
Precipitation: Last 14 Days

Displaying Last 14-Day Percent of Normal Precipitation
Valid on: January 21, 2016 12:00 UTC

Print this map Permalink BOOKMARK

What is UTC time? Map Help

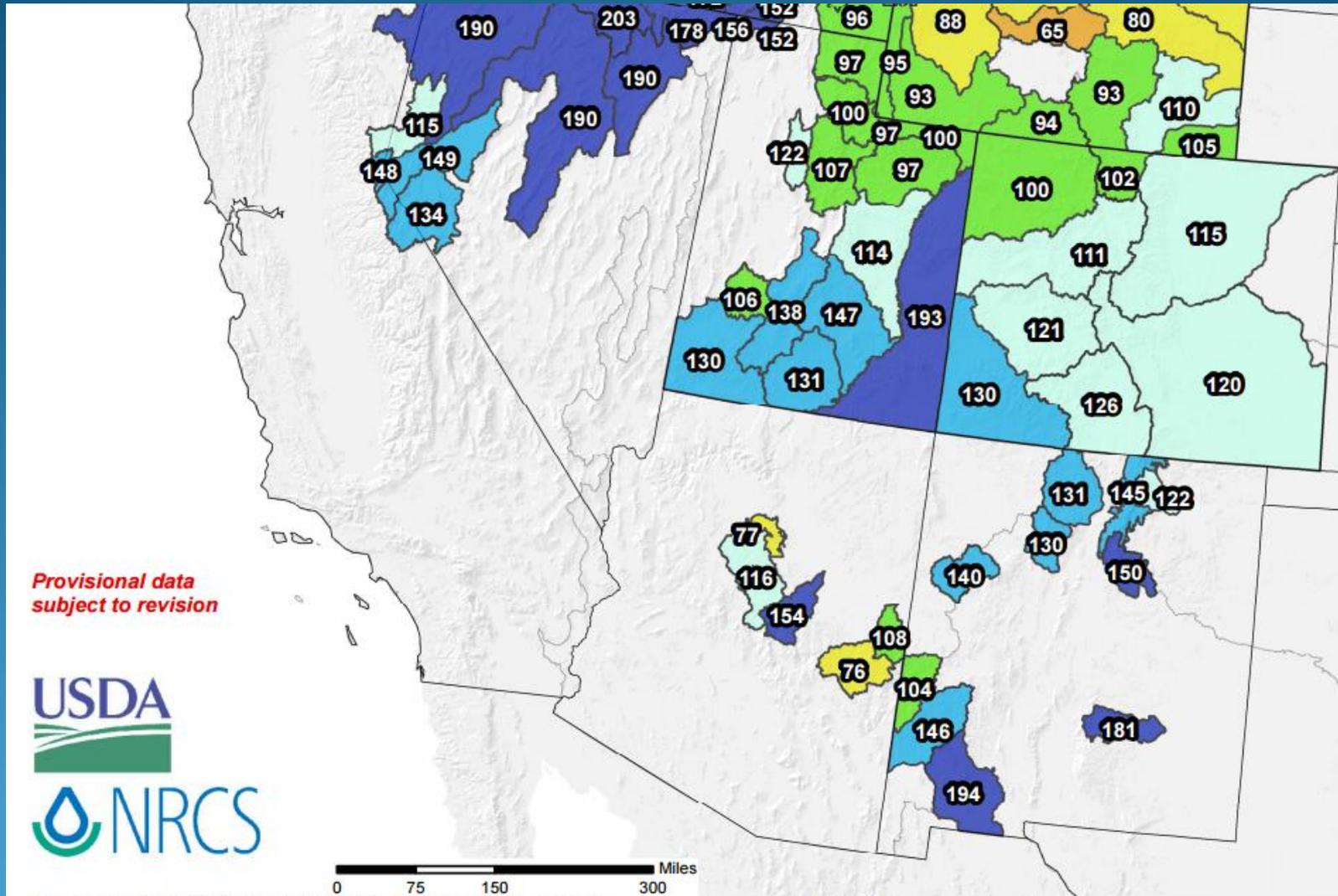
Find address or location



Source: NWS AHPS ~ <http://water.weather.gov/precip/>

Upper Rio Grande Snow Pack

Snow Water Equivalent: January 1st



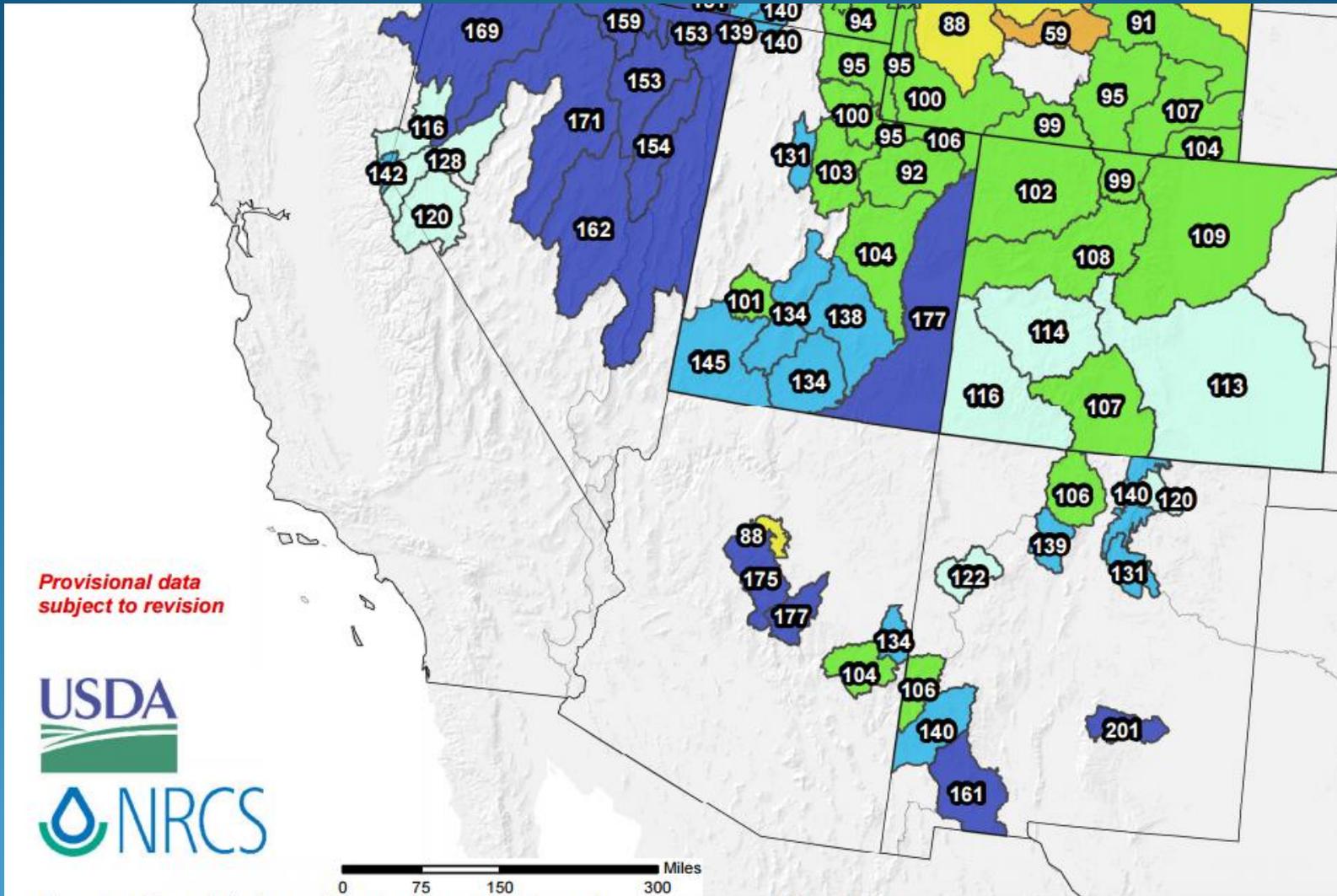
*Provisional data
subject to revision*



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

Snow Water Equivalent: January 21st



*Provisional data
subject to revision*

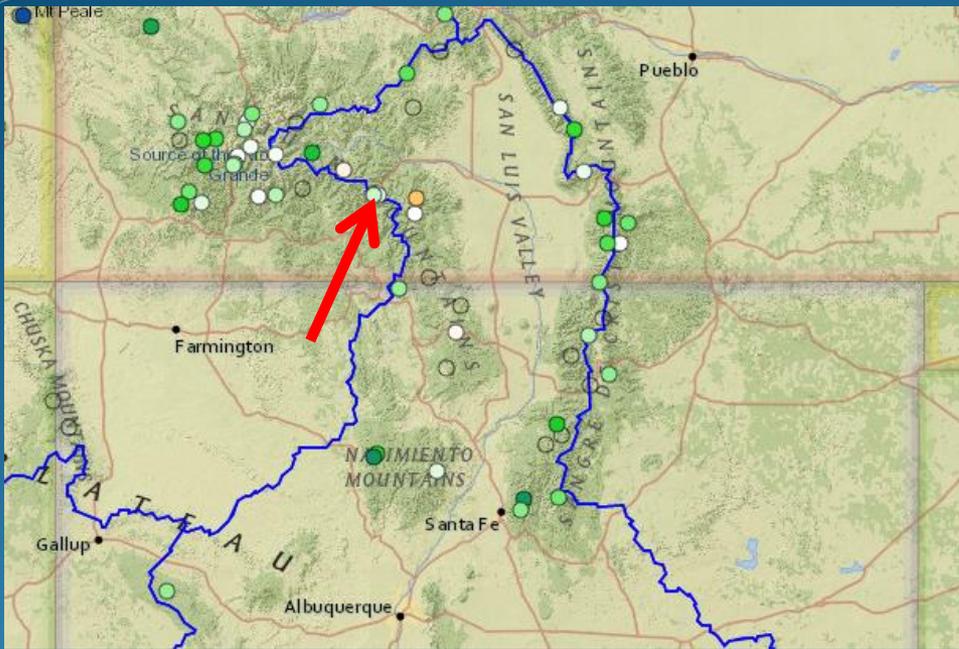


0 75 150 300 Miles

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

Snow Pack: Wolf Creek Summit, CO



Wolf Creek Summit

Station ID: 874
State: Colorado
Network: SNOTEL
County: Mineral
Elevation: 11000 ft.
Latitude: 37.48
Longitude: -106.8
HUC: 140801010203

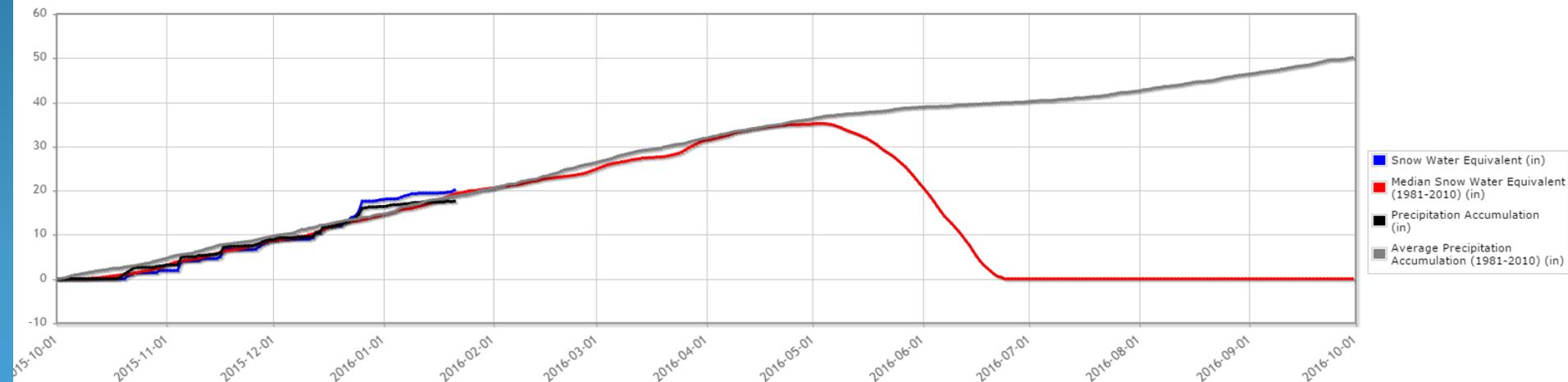


Snow Water Equivalent (inches) on January 20, 2016, end of day

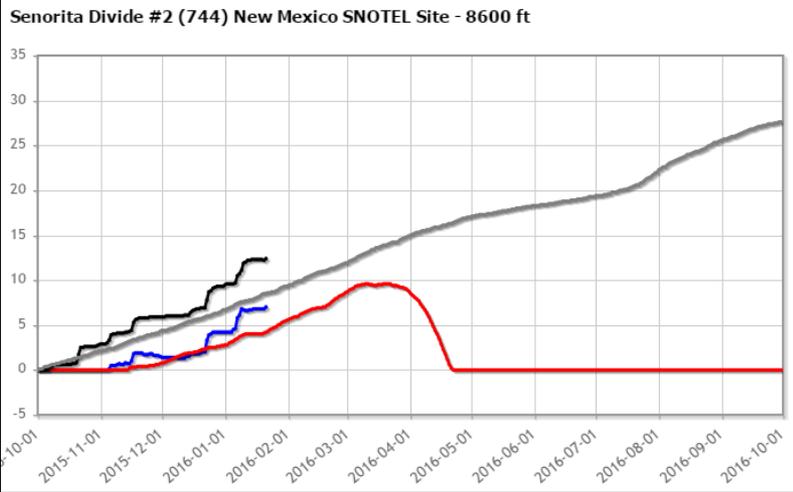
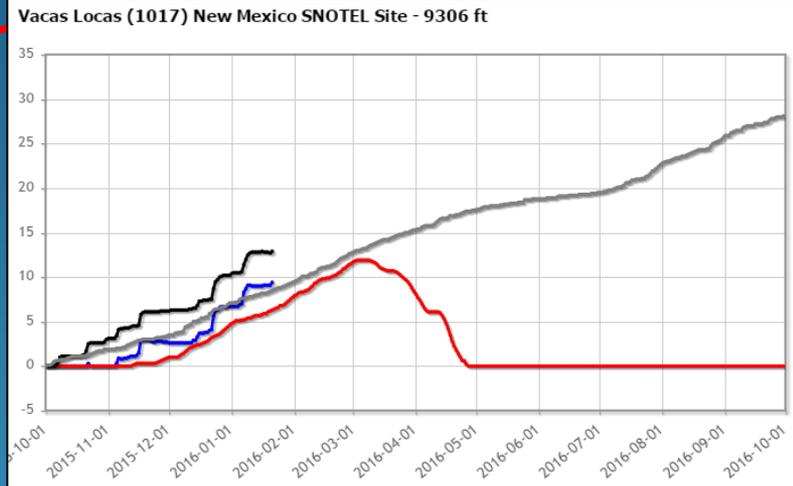
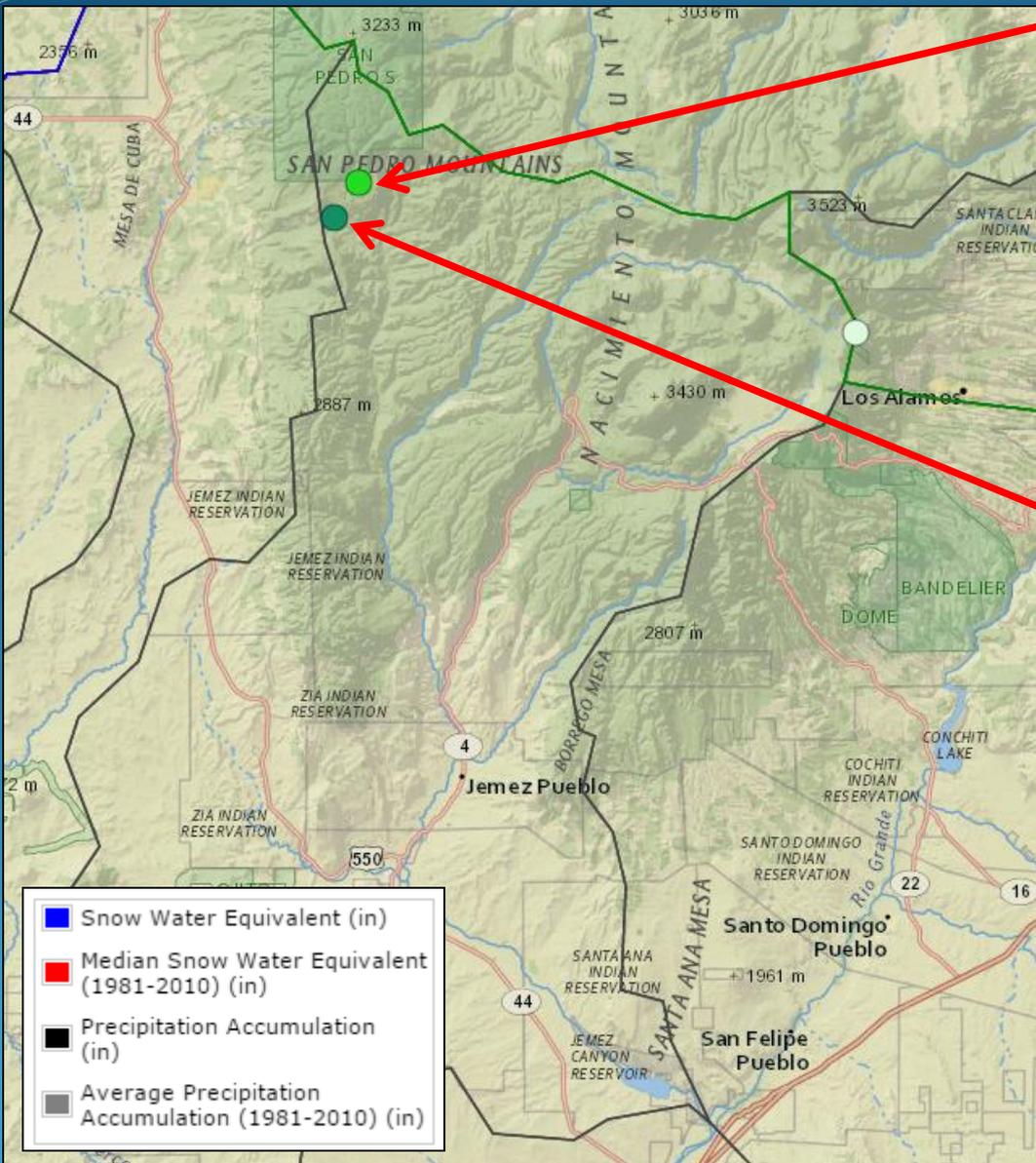
Value:	20.1	Anomaly:	1.95
POR Median:	18.15	Official Median:	19.2
% of POR Median:	111%	% of Official Median:	105%
POR Average:	16.78	Official Average:	17.1
% of POR Average:	120%	% of Official Average:	118%
Percentile:	66	# of Observations:	30
POR Max (year):	30.8 (2005)	Max Rank:	11
POR Min (year):	2.5 (2000)	Min Rank:	20

Wolf Creek Summit (874) Colorado SNOTEL Site - 11000 ft

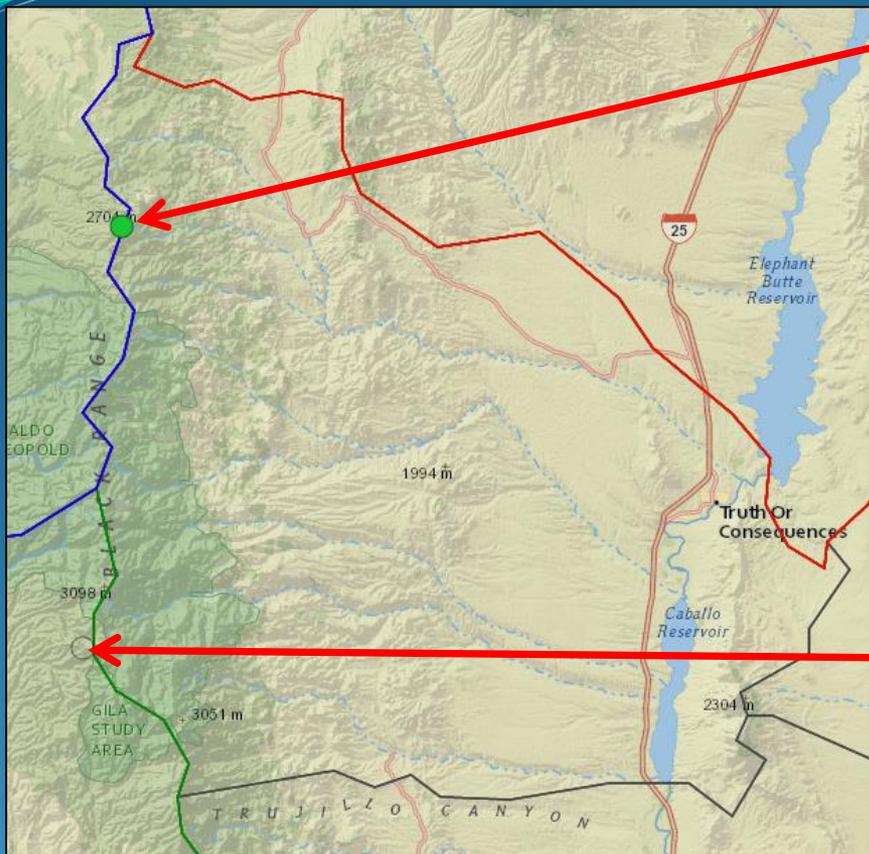
Chart Help



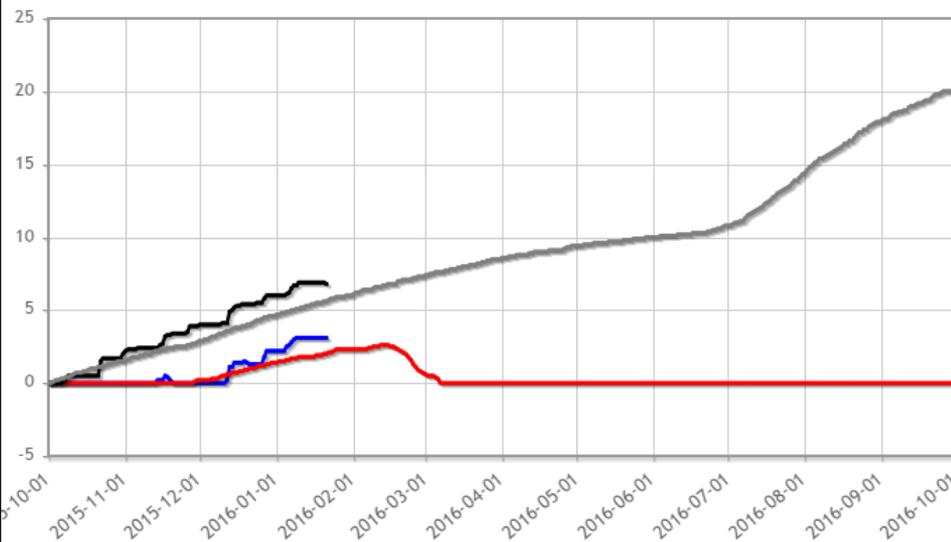
Snow Pack: Above Jemez Canyon (NM)



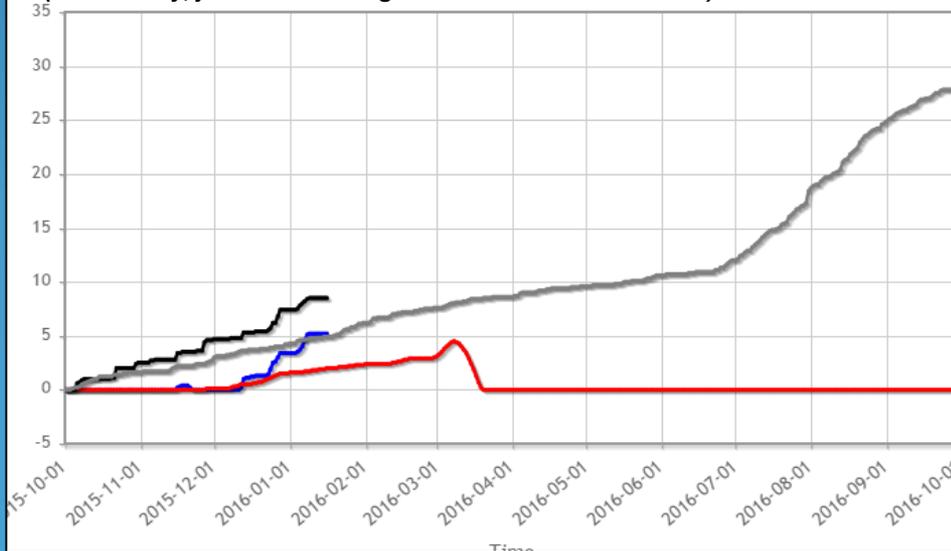
Snow Pack: Black Range (NM)



Lookout Mountain (595) New Mexico SNOTEL Site - 8500 ft



Mcknight Cabin (1048) New Mexico SNOTEL Site - 9240 ft
(Technically, just over the ridge and in the Mimbres Basin)



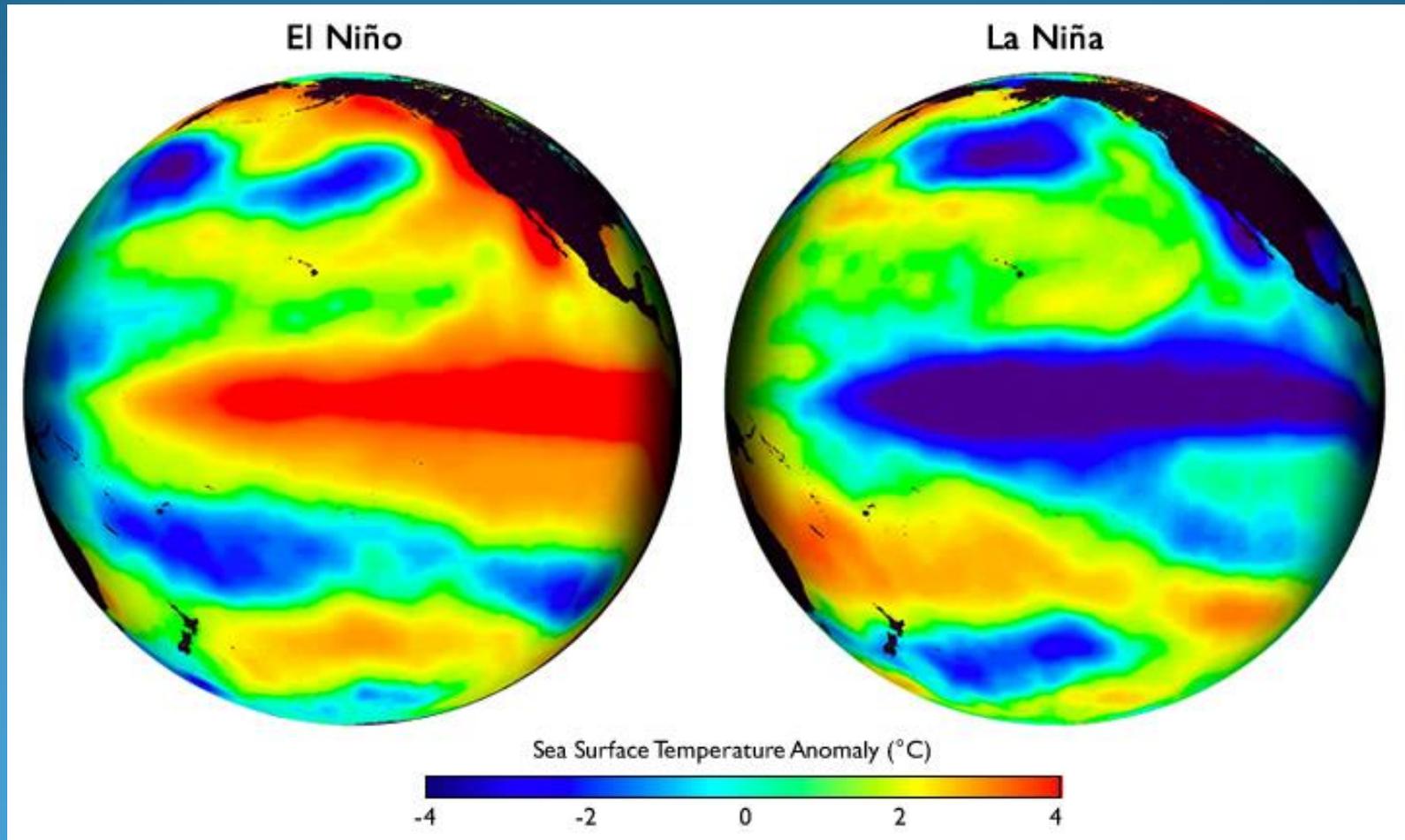
- Snow Water Equivalent (in)
- Median Snow Water Equivalent (1981-2010) (in)
- Precipitation Accumulation (in)
- Average Precipitation Accumulation (1981-2010) (in)

El Nino vs La Nina

ENSO – El Nino Southern Oscillation

Warm Phase

Cool Phase



What is El Niño?



El Nino vs La Nina

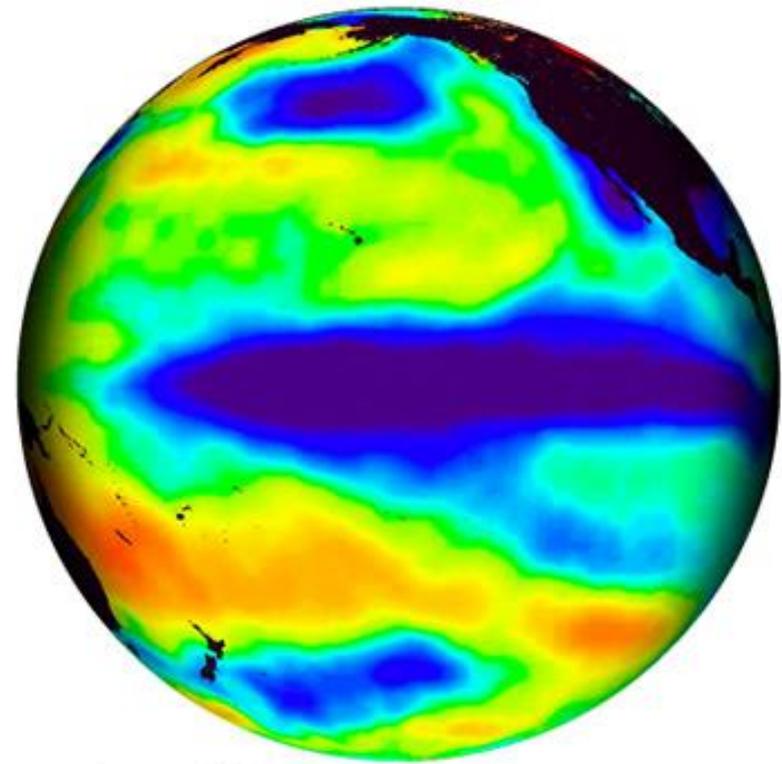
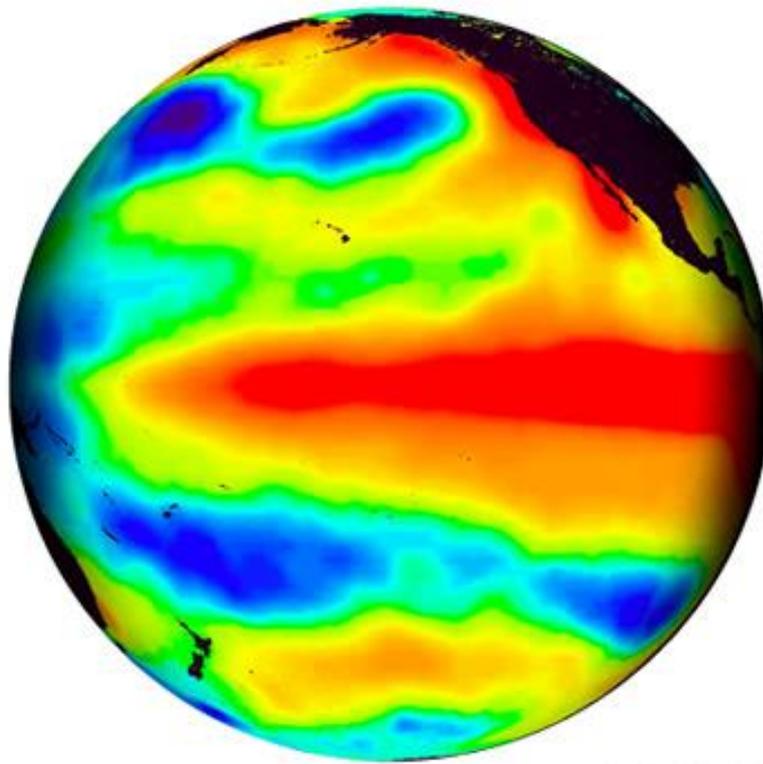
El Nino Southern Oscillation (ENSO)

Warm Phase

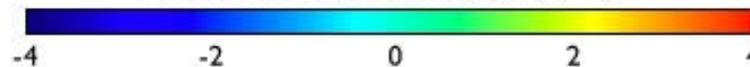
Cool Phase

El Niño

La Niña



Sea Surface Temperature Anomaly (°C)

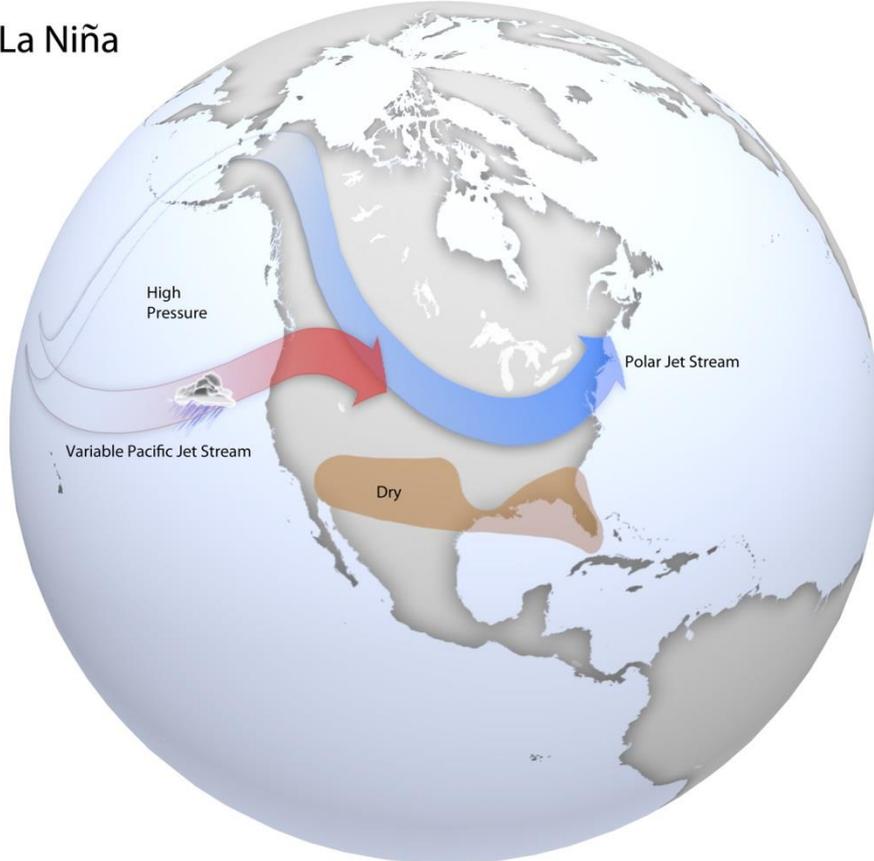


El Nino vs La Nina

El Nino Southern Oscillation (ENSO)

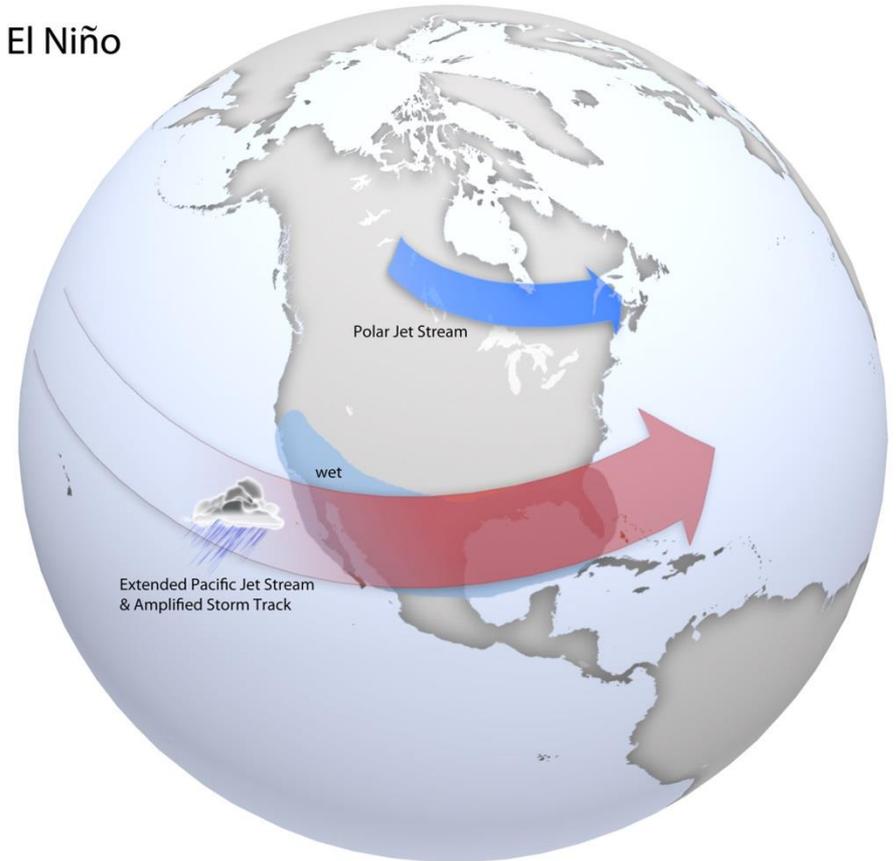
Cool Phase

La Niña

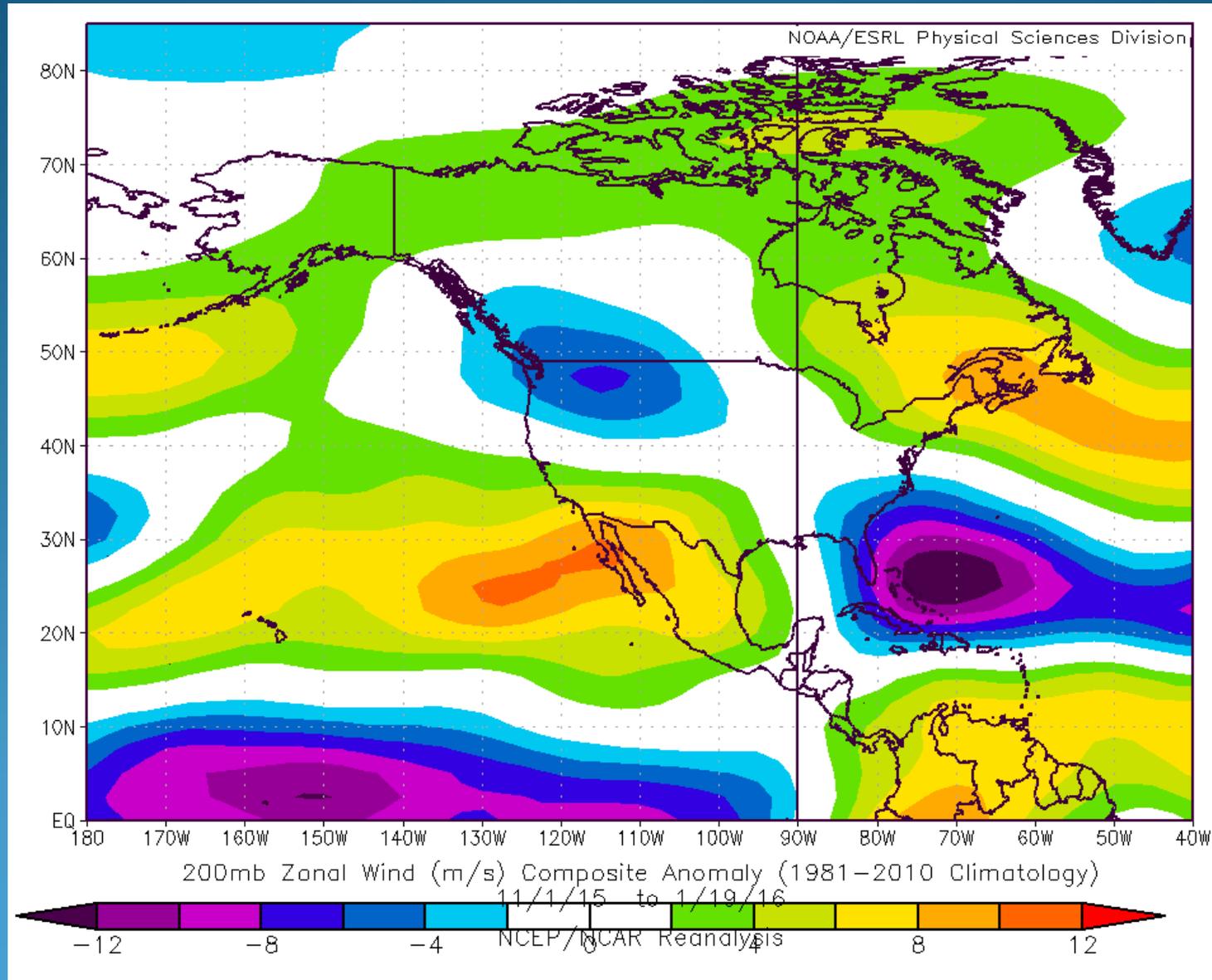


Warm Phase

El Niño



Jet Stream – Anomaly (Nov 2015-Jan 2016)



~ Strong El Niño Event ~

El Paso Precipitation History

These are the **6 Strong & Very Strong El Niños** on record

Season (Nov-Apr)	EP Precipitation	EP Snowfall
30 yr Climate Norm.	2.6"	3.6"
1957-58	4.9"	13.4"
1965-66	2.5"	0.4"
1972-73	4.1"	9.9"
1982-83	5.8"	35.2"
1991-92	5.9"	7.4"
1997-98	2.6"	1.0"
El Niño Averages	4.3"	11.21" (7.9")
El Niño Differences	+1.7" pcpn.	+4.3" snow

(Strong & Very Strong Events)

All-time Heavy Snow Events for El Paso

Top 22 Events

- 22.4 inches December 13-14, 1987
- 16.5 inches April 4-7, 1983
- 8.6 inches December 8-10, 1960
- 8.4 inches November 18-19, 1906
- 8.1 inches February 2, 1956
- 7.8 inches November 13-14, 1961
- 7.7 inches November 24-25, 2007
- 7.3 inches March 11-12, 1958
- 7.1 inches December 7-8, 1951
- 7.0 inches December 30-31, 1982
- 7.0 inches November 26-27, 1968
- 6.7 inches November 27-28, 1976
- 6.1 inches March 5, 1984
- 6.0 inches December 25-26, 1982
- 6.0 inches November 12-13, 1976
- 6.0 inches November 27-28, 1969
- 6.0 inches December 8-9, 1960
- 5.5 inches January 7-8, 1906
- 5.4 inches November 5, 1889
- 5.3 inches February 5, 1988
- 5.3 inches December 14-16, 1967
- 5.3 inches February 12-13, 1963

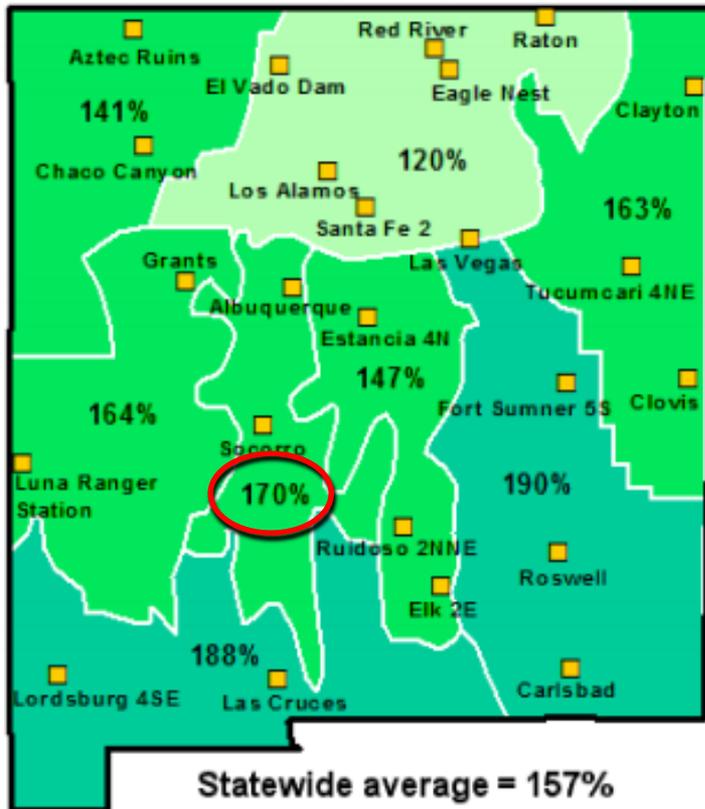
El Niño			
Weak	Mod	Strong	Very Strong
✓ 1951-52*	✓ 1963-64	1957-58	✓ 1982-83 ✓
1952-53	✓ 1986-87	1965-66	1997-98
1953-54	✓ 1987-88*	1972-73	
✓ 1958-59	1991-92		
✓ 1968-69*	2002-03		
1969-70	2009-10		
✓ 1976-77			
1977-78			
1979-80*			
1994-95*			
2004-05			
✓ 2006-07			

13 of 22 top El Paso snow events occurred during an El Niño year

El Nino Winter & Spring Percent of Normal Precipitation

Winter

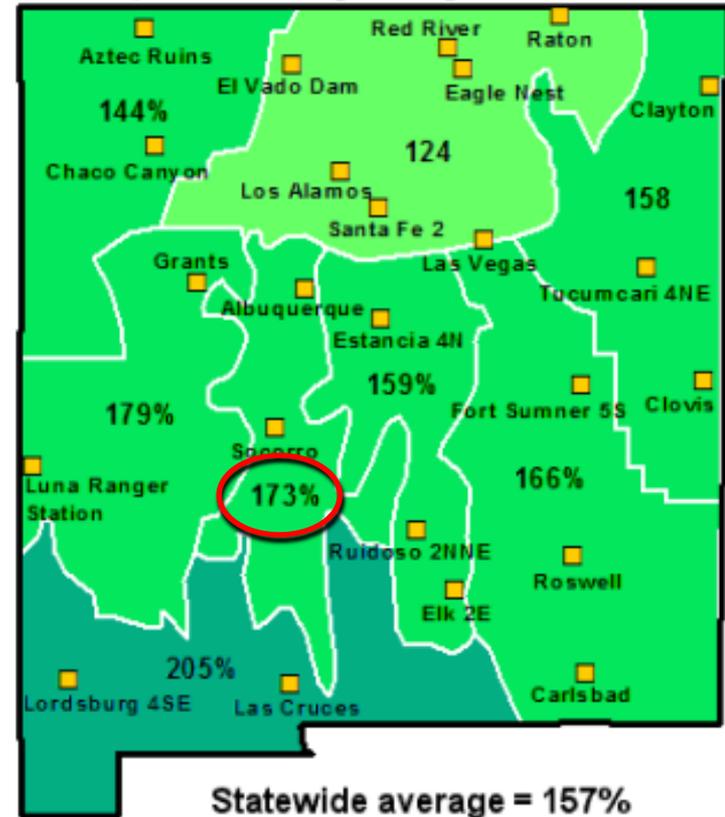
Percent of Normal Dec-Jan-Feb
Precipitation during Strong El Niño Events



1914-15, 1940-41, 1957-58, 1965-66, 1972-73, 1982-83, 1991-92,
1997-98, 2009-10

Spring

Percent of Normal Mar-Apr-May
Precipitation during Strong El Niño Events

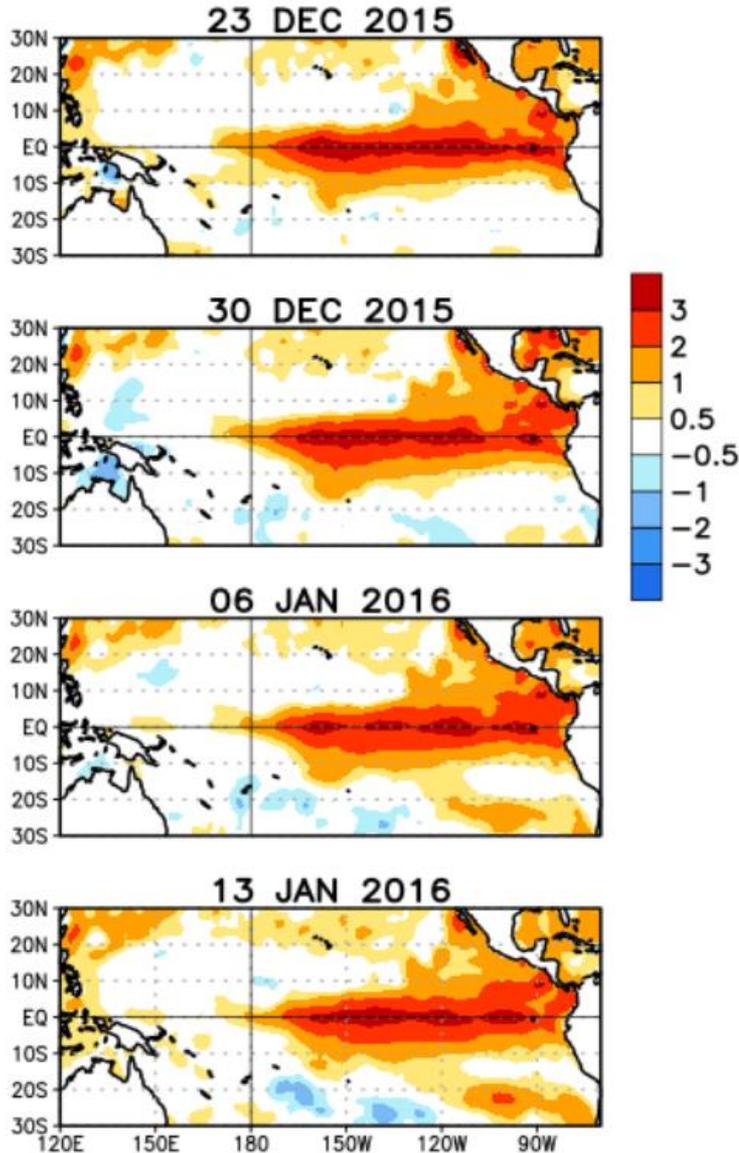


1915, 1941, 1958, 1966, 1973, 1983, 1992, 1998, 2010

Current El Niño Conditions And Forecast

Current El Nino Facts and Forecast

Weekly SST Anomalies (DEG C)

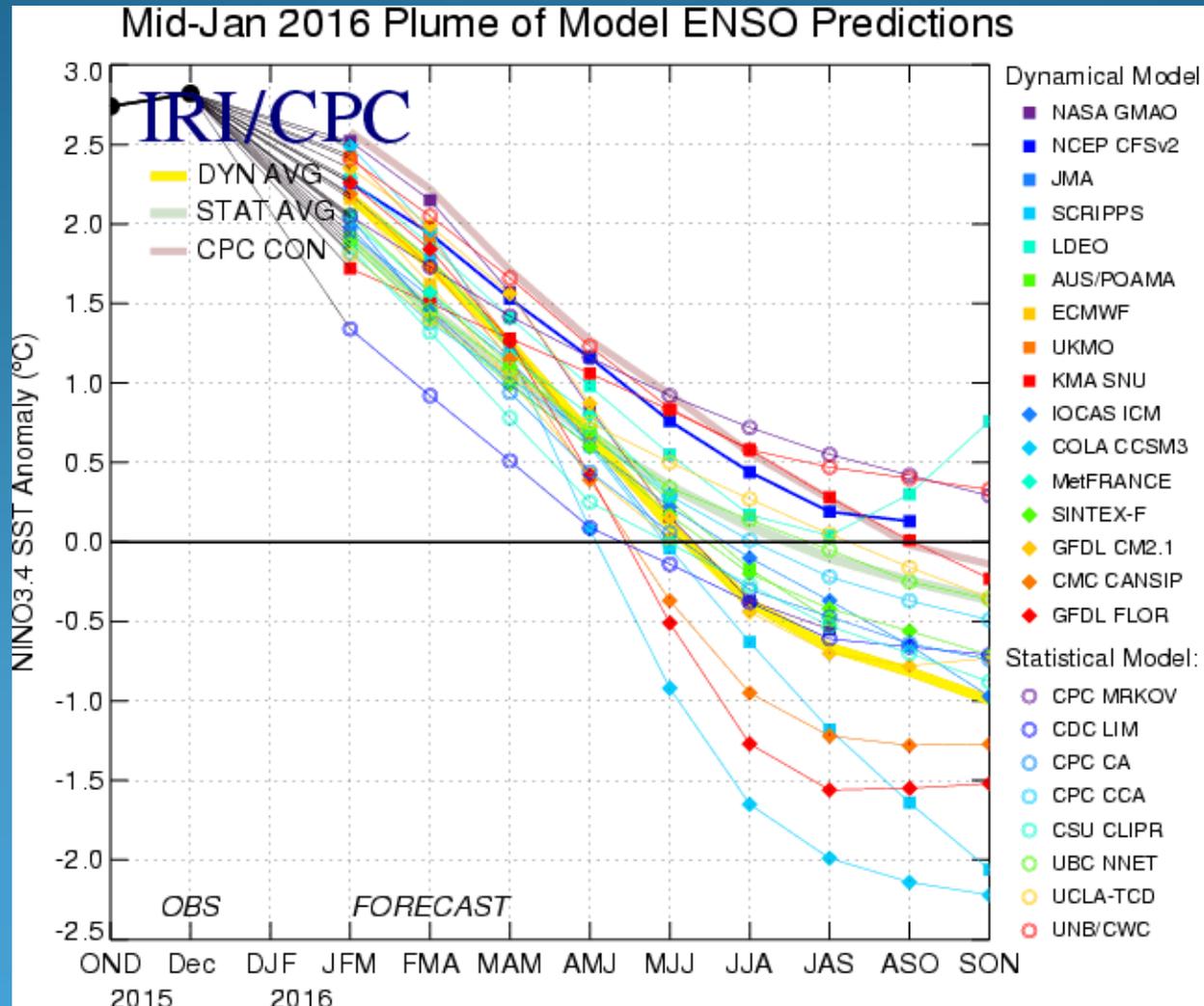


- Tied for Strongest El Nino (Based on Sea Surface Temperatures), (Equaling 1997-98, exceding 1982-83).
- Eastern Tropical Pacific SSTs Anomalies much cooler than in 1997-98. (+2.0C vs +3.8C)
- This may account for the “sputtering” of effects over Desert SW in recent week or two.
- Inter-seasonal variability also a likely player.

El Niño Status and Forecast

“A strong El Niño is expected to gradually weaken through spring 2016, and to transition to ENSO-neutral during late spring or early summer.”

- NOAA/Climate Prediction Center 1/14/16



Impacts: Seasonal Outlooks

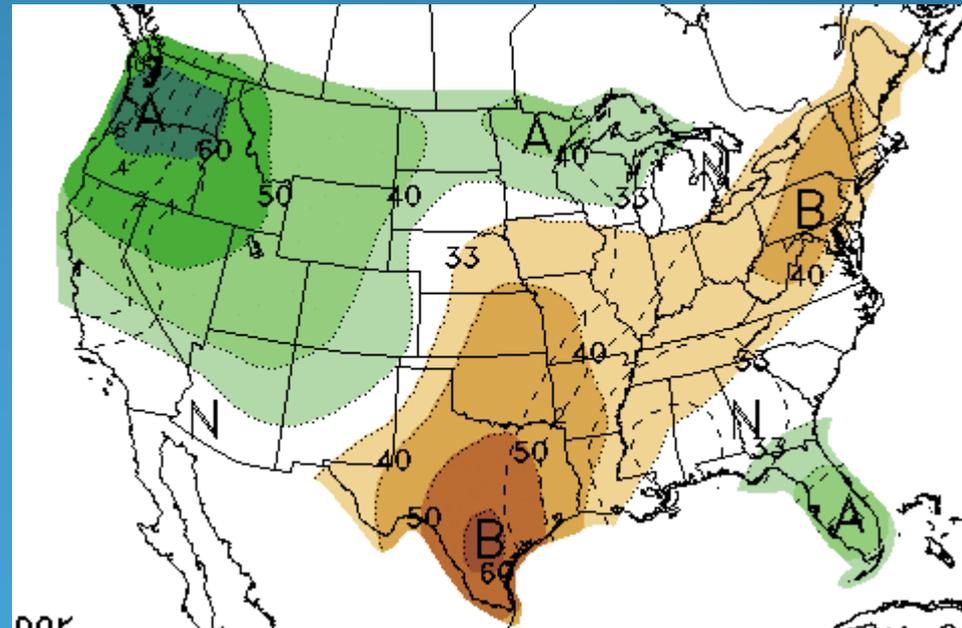
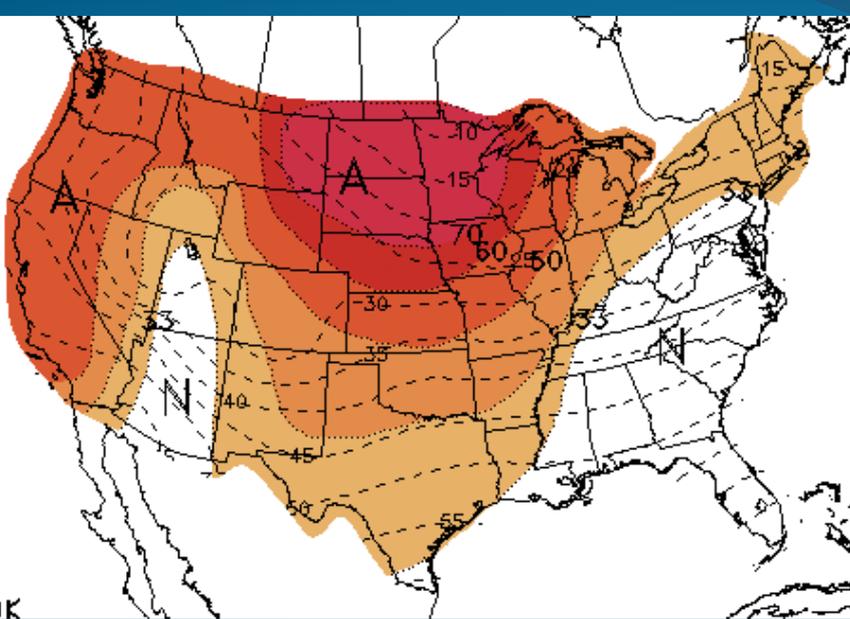
Temperatures

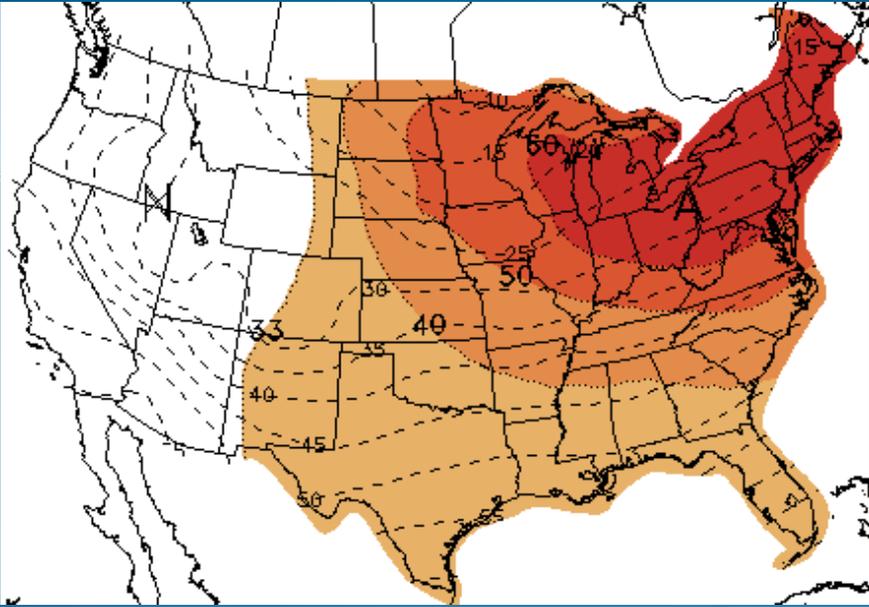
Probability that average temperature will be Above/Below Normal

6-10 Day Outlook (27-31 January)

Precipitation

Probability that average precipitation will be Above/Below Normal





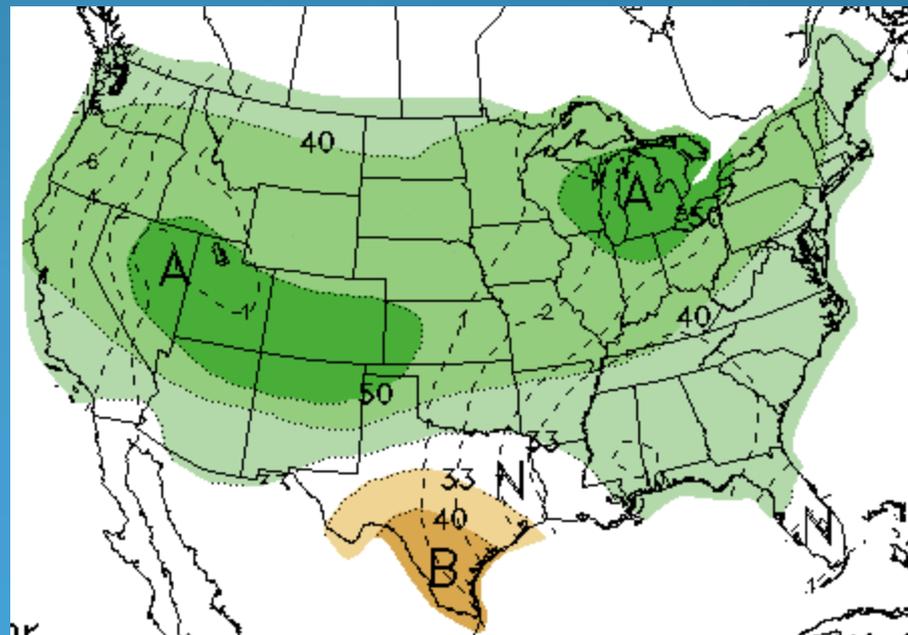
Temperatures

Probability that average temperature will be Above/Below Normal

8-14 Day Outlook (29 Jan – 04 Feb)

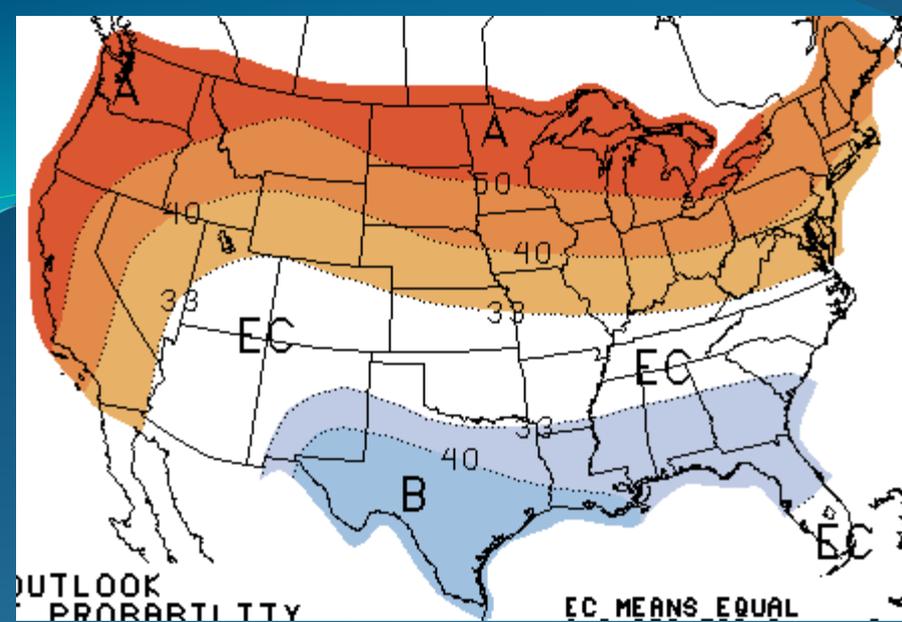
Precipitation

Probability that average precipitation will be Above/Below Normal



Temperatures

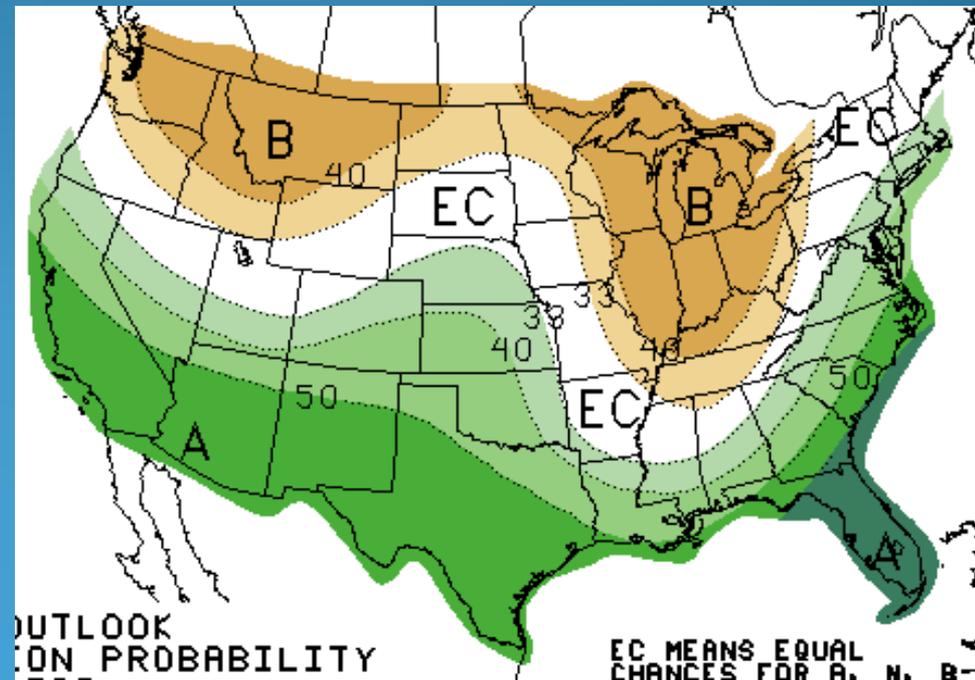
Probability that average temperature will be Above/Below Normal



One Month (February 2016)

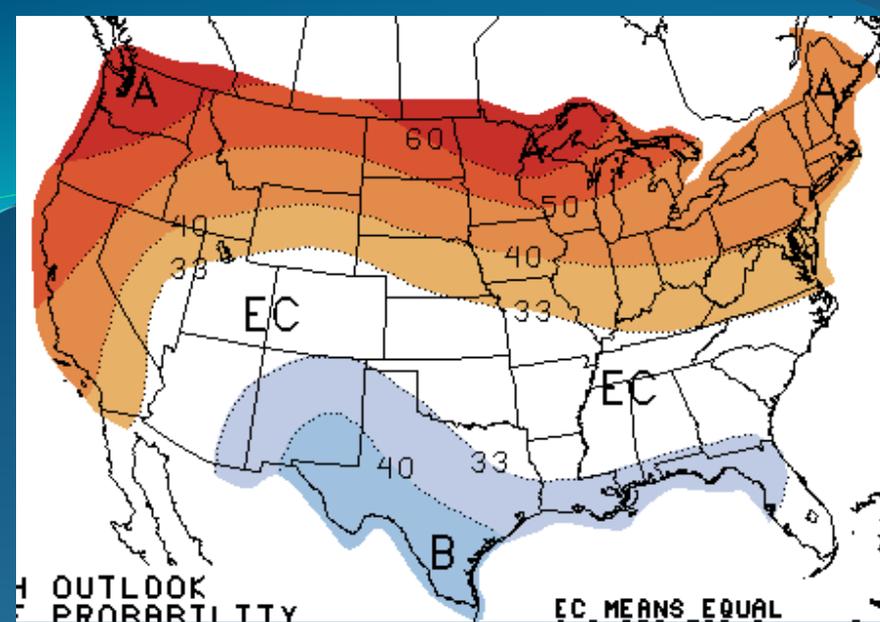
Precipitation

Probability that average precipitation will be Above/Below Normal



Temperatures

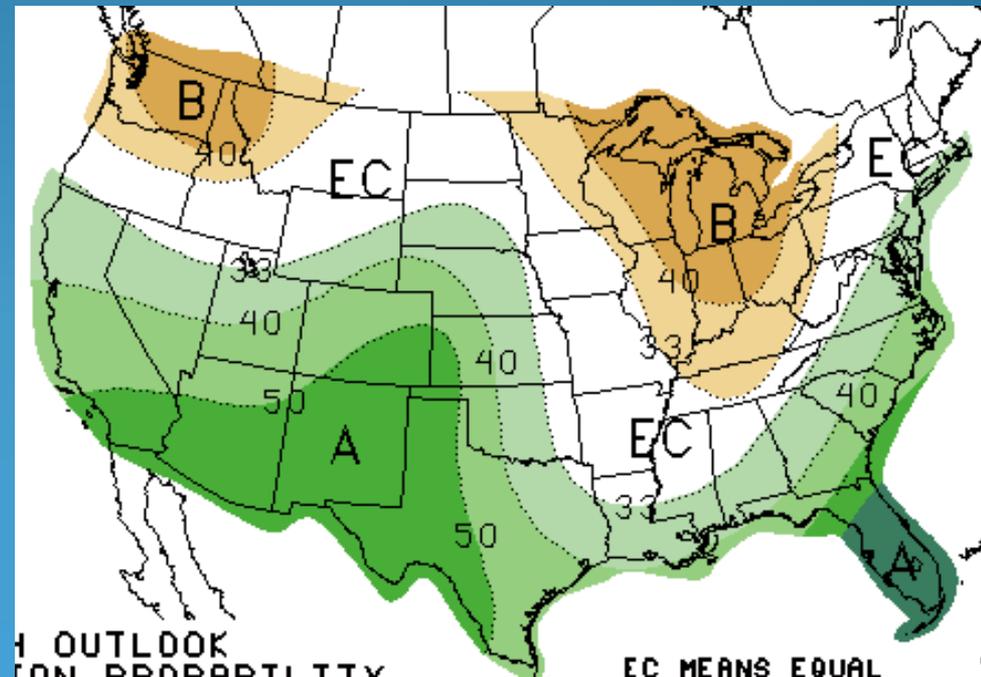
Probability that average temperature will be Above/Below Normal



Three Month (Feb-Mar-Apr 2016)

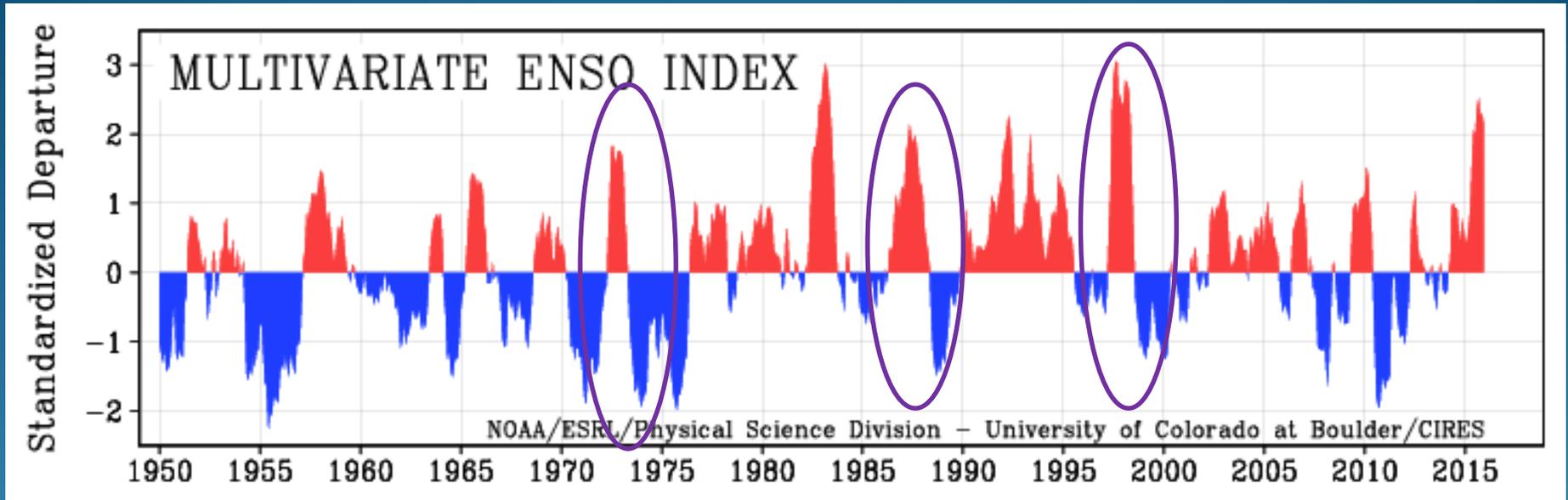
Precipitation

Probability that average precipitation will be Above/Below Normal



Looking Ahead

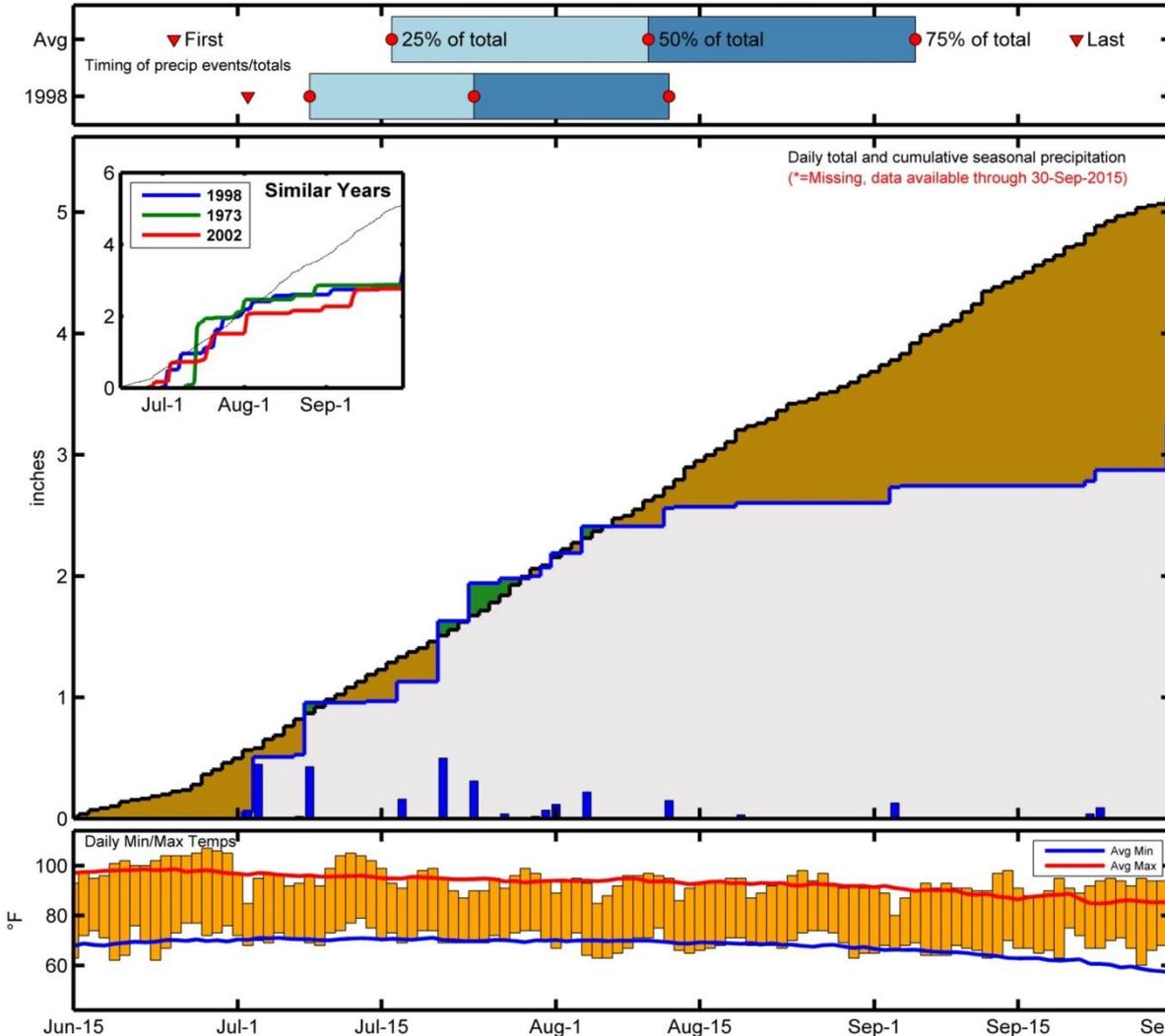
What's Next?



Not unusual for Strong El Nino episodes to be quickly followed by La Nina conditions.

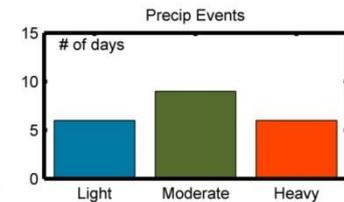
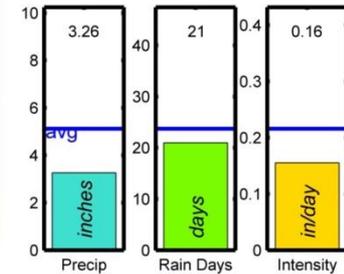
Monsoon 1998 – El Paso, TX

1998 Monsoon Summary



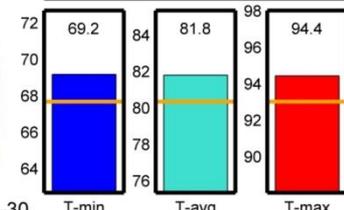
EL PASO INTL AP

Elevation: 1194m
 Period of record: 1947-2015
 Years in record: 69
 Precip rank: 50 (1, wettest)
 Temp rank: 14 (1, warmest)
 Missing in 1998: 0 days



Dry Spells

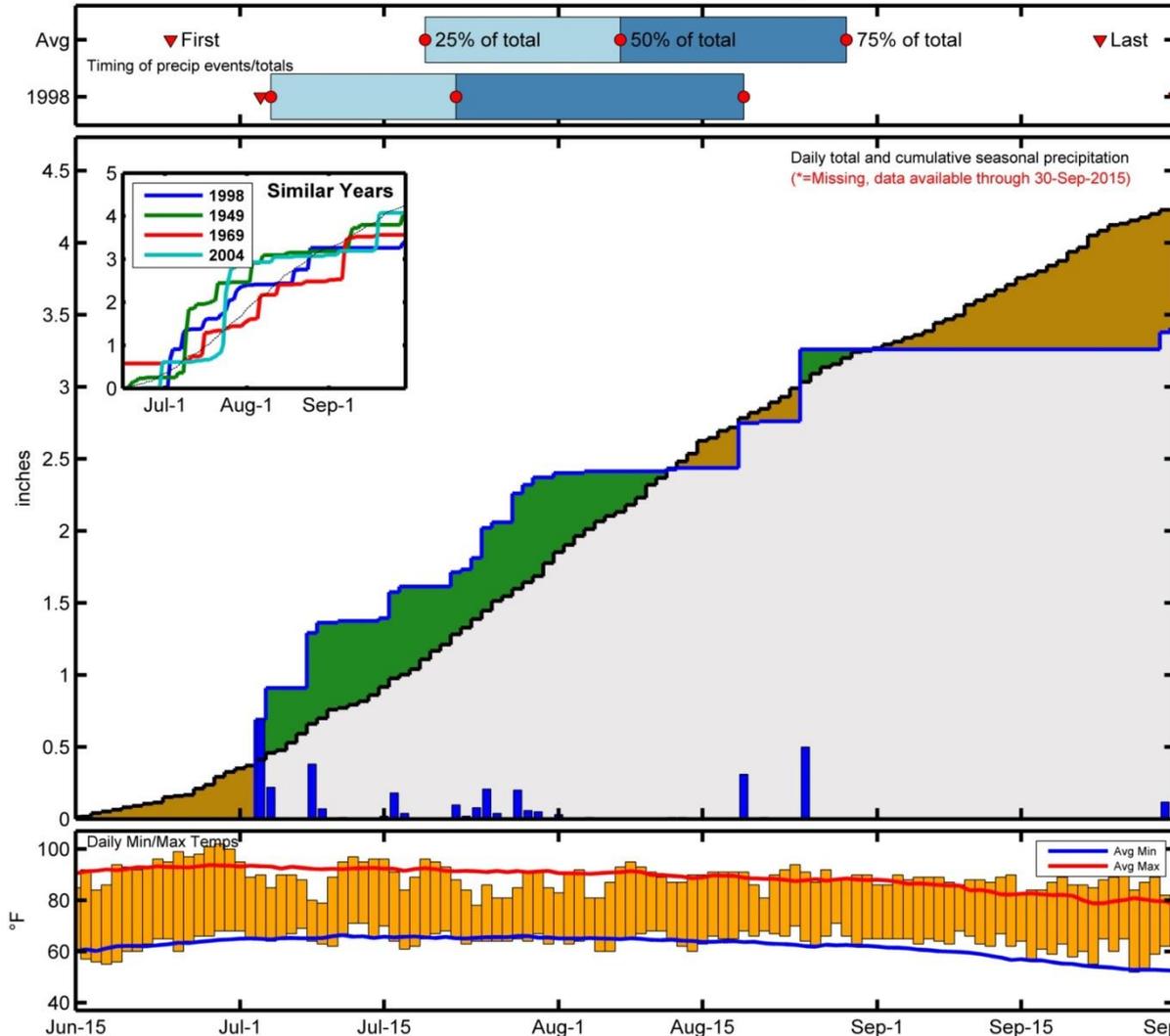
Avg length: 6 days (avg: 6)
 Max length: 17 days (avg: 17)



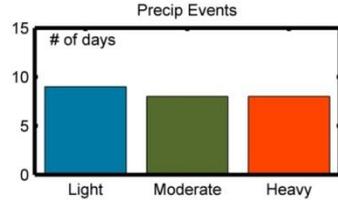
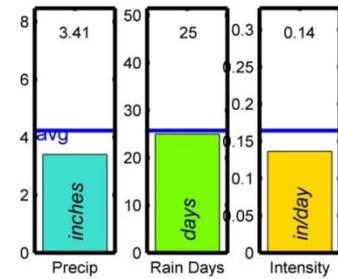
Strong El Nino to Moderate La Nina

Monsoon 1998 – Albuquerque, NM

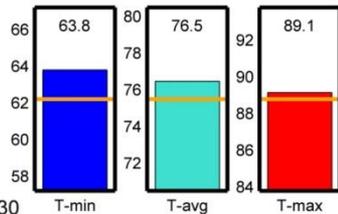
1998 Monsoon Summary



ALBUQUERQUE INTL AP
 Elevation: 1619m
 Period of record: 1946-2015
 Years in record: 70
 Precip rank: 50 (1, wettest)
 Temp rank: 20 (1, warmest)
 Missing in 1998: 0 days



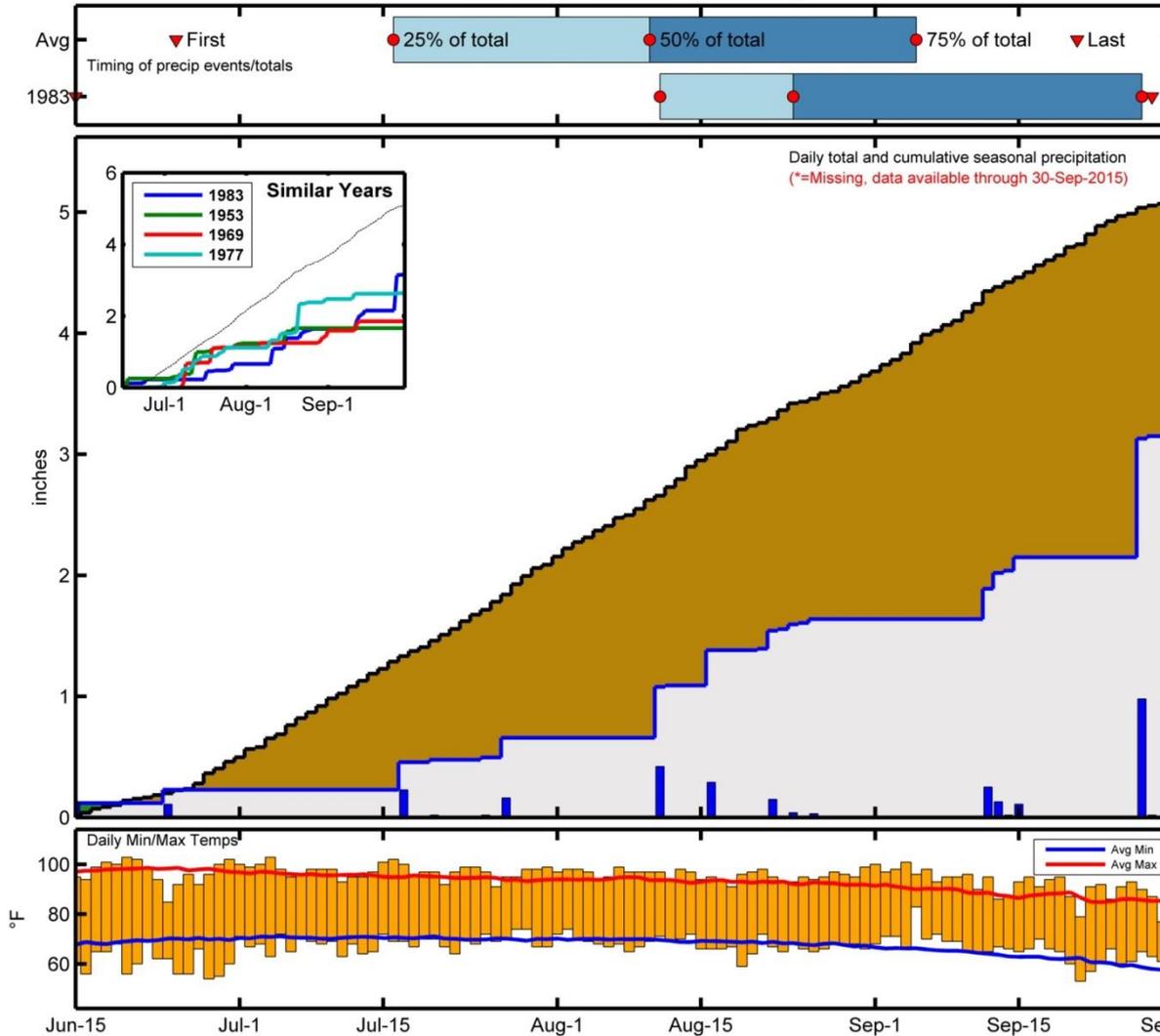
Dry Spells
 Avg length: 6 days (avg: 5)
 Max length: 34 days (avg: 16)



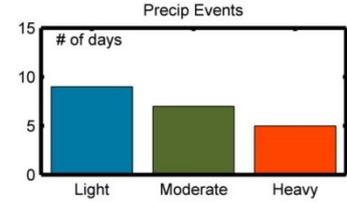
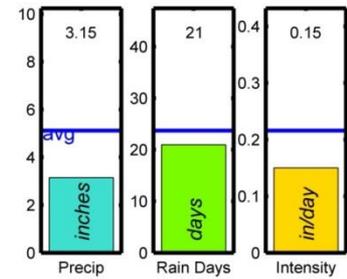
Strong El Nino to Moderate La Nina

Monsoon 1983 – El Paso, TX

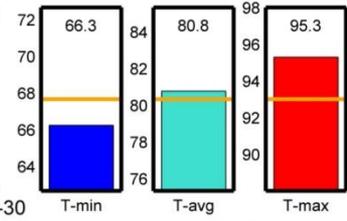
1983 Monsoon Summary



EL PASO INTL AP
 Elevation: 1194m
 Period of record: 1947-2015
 Years in record: 69
 Precip rank: **53** (1, wettest)
 Temp rank: **32** (1, warmest)
 Missing in 1983: 0 days



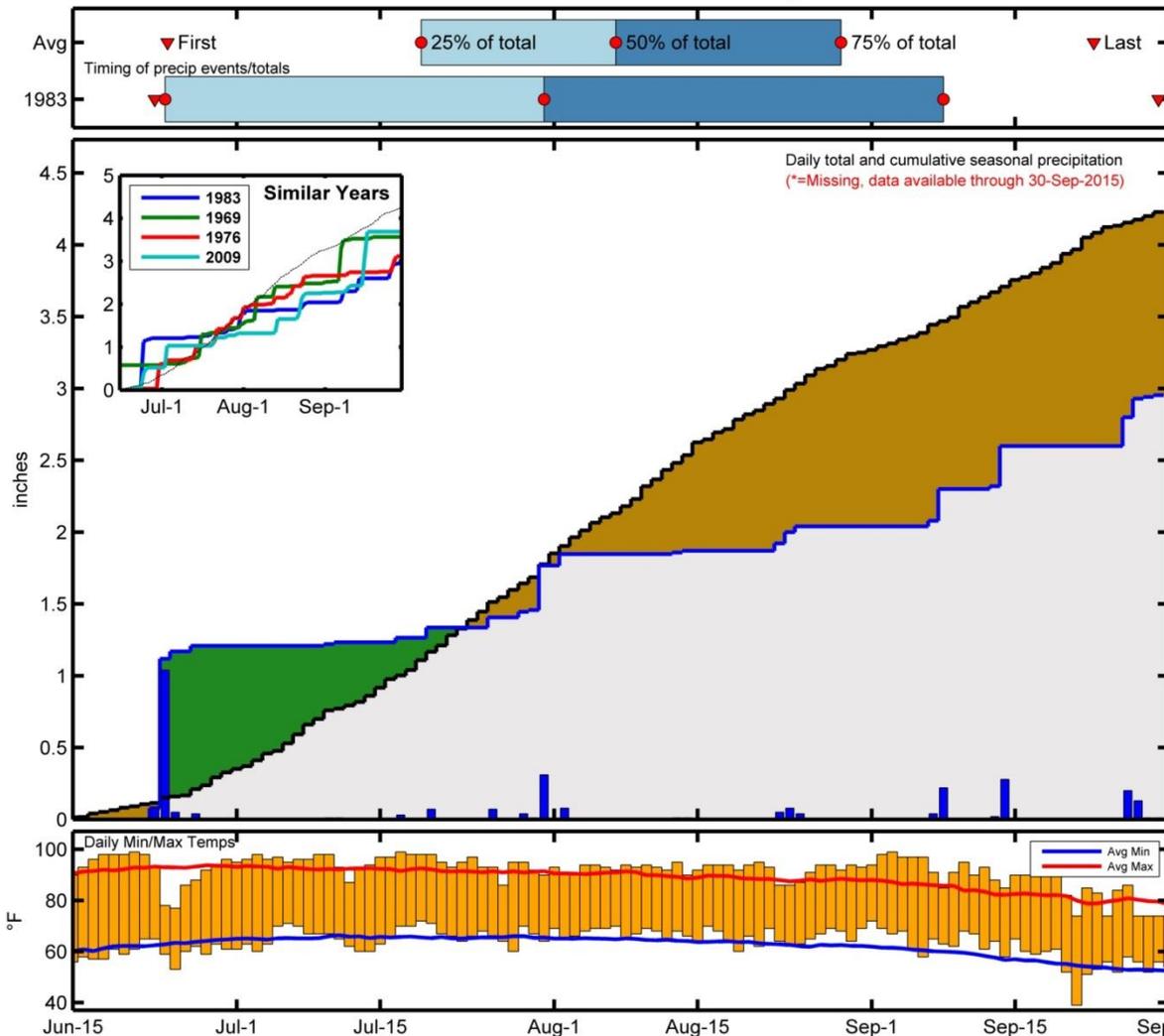
Dry Spells
 Avg length: 9 days (avg: 6)
 Max length: 22 days (avg: 17)



Strong El Nino to Weak La Nina

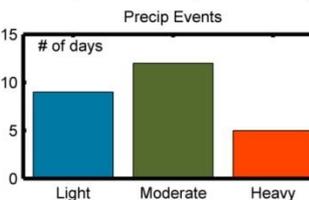
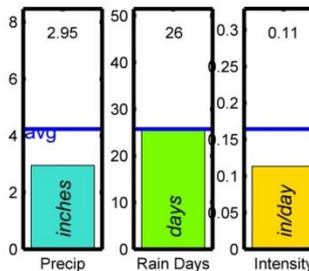
Monsoon 1983 – Albuquerque, NM

1983 Monsoon Summary

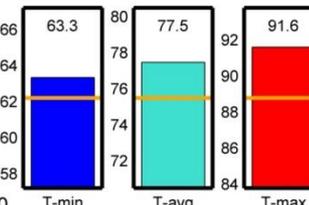


ALBUQUERQUE INTL AP

Elevation: 1619m
 Period of record: 1946-2015
 Years in record: 70
 Precip rank: 58 (1, wettest)
 Temp rank: 5 (1, warmest)
 Missing in 1983: 0 days



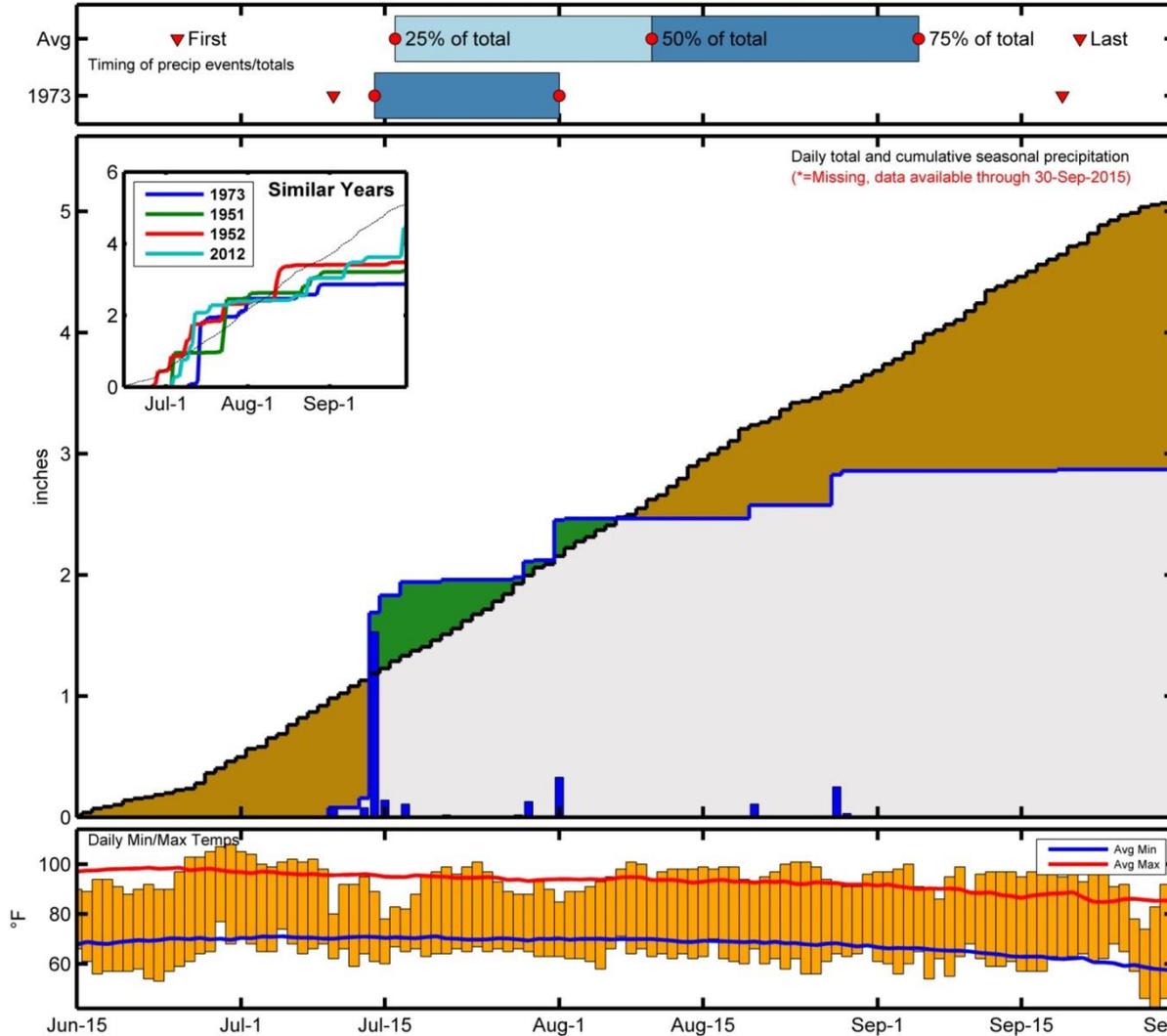
Dry Spells
 Avg length: 6 days (avg: 5)
 Max length: 12 days (avg: 16)



Strong El Nino to Weak La Nina

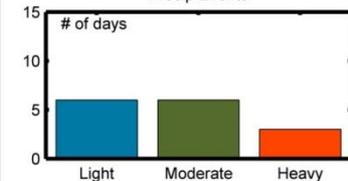
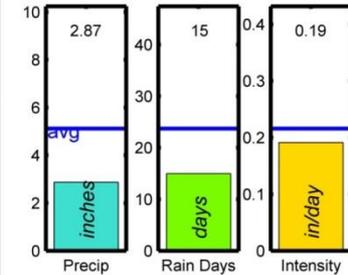
Monsoon 1973 – El Paso, TX

1973 Monsoon Summary



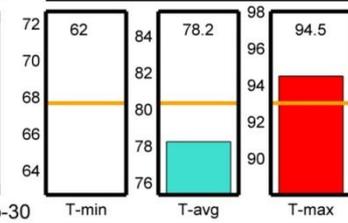
EL PASO INTL AP

Elevation: 1194m
 Period of record: 1947-2015
 Years in record: 69
 Precip rank: 59 (1, wettest)
 Temp rank: 61 (1, warmest)
 Missing in 1973: 0 days



Dry Spells

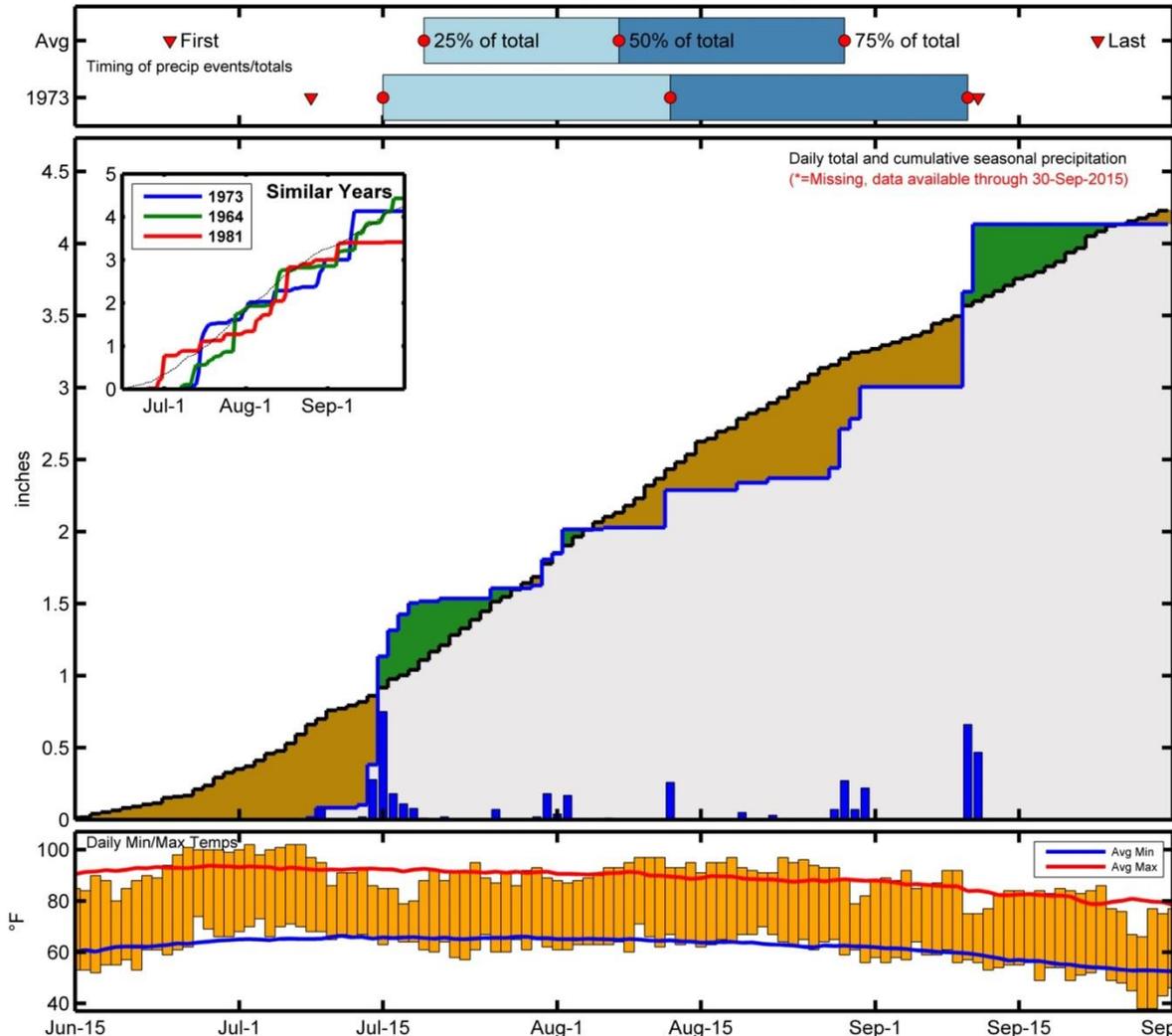
Avg length: 9 days (avg: 6)
 Max length: 20 days (avg: 17)



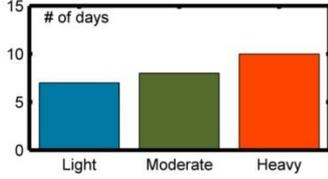
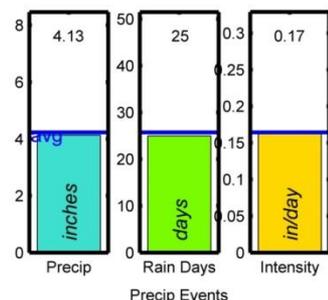
Moderate El Nino to Strong La Nina

Monsoon 1973 – Albuquerque, NM

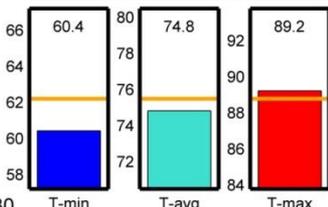
1973 Monsoon Summary



ALBUQUERQUE INTL AP
 Elevation: 1619m
 Period of record: 1946-2015
 Years in record: 70
 Precip rank: 34.5 (1, wettest)
 Temp rank: 47 (1, warmest)
 Missing in 1973: 0 days



Dry Spells
 Avg length: 6 days (avg: 5)
 Max length: 9 days (avg: 16)



Moderate El Nino to Strong La Nina

El Paso Weather Forecast Office - Social Media Streams -



Facebook: ***NWSEIPaso***



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