

Southwest Drought Webinar

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Colorado Climate Center
June 25, 2018



Colorado State University



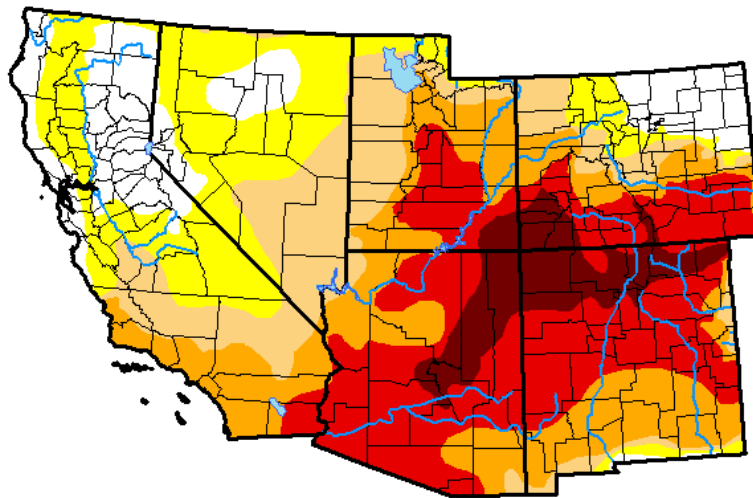
Current Drought

U.S. Drought Monitor
Drought evolution



U.S. Drought Monitor Southwest

June 19, 2018
(Released Thursday, Jun. 21, 2018)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	12.87	87.13	68.27	51.67	31.95	7.41
Last Week <i>06-12-2018</i>	12.51	87.49	68.77	51.95	32.47	7.43
3 Months Ago <i>03-20-2018</i>	3.99	96.01	69.32	47.11	16.26	0.00
Start of Calendar Year <i>01-02-2018</i>	26.99	73.01	40.50	9.04	0.00	0.00
Start of Water Year <i>09-26-2017</i>	72.18	27.82	5.15	0.00	0.00	0.00
One Year Ago <i>06-20-2017</i>	76.35	23.65	7.61	0.28	0.00	0.00

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.

Author:

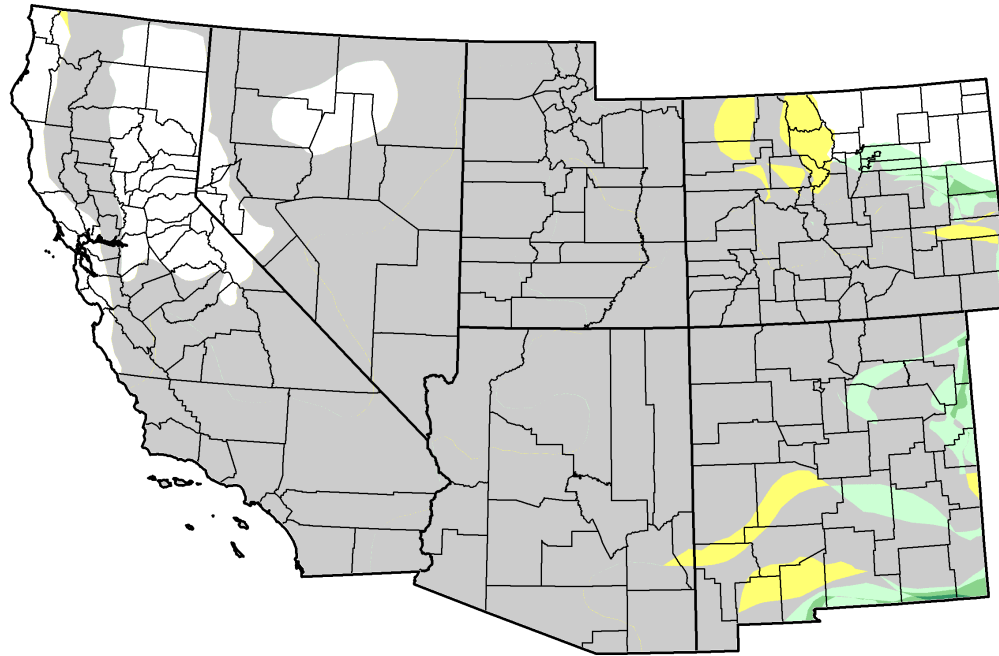
Brian Fuchs
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>



U.S. Drought Monitor Class Change - Southwest 1 Month



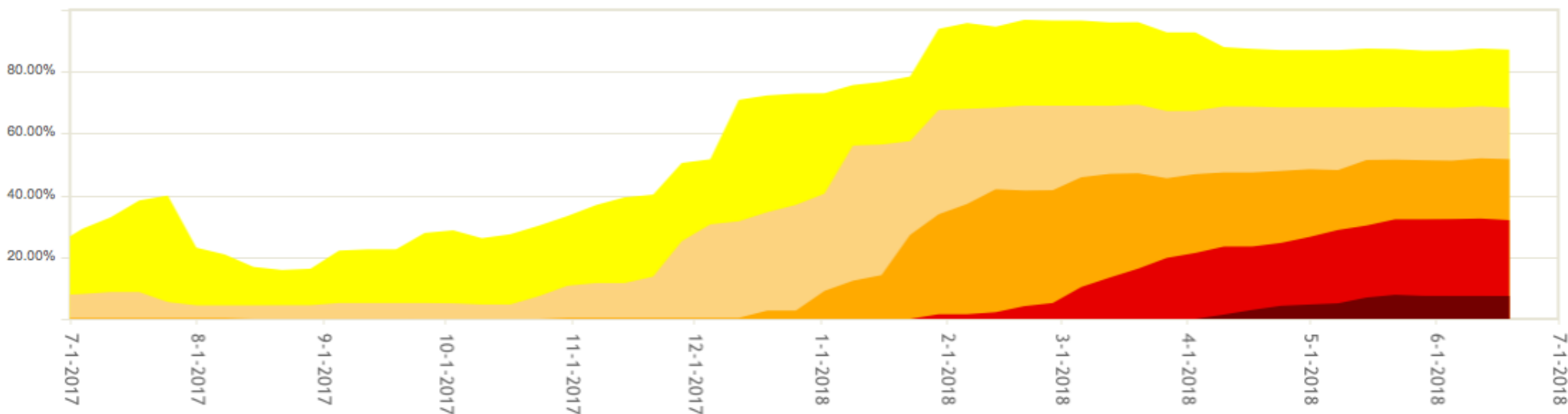
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

June 19, 2018
compared to
May 22, 2018

<http://droughtmonitor.unl.edu>



Southwest Percent Area



- Drought – Exceptional 0 to 2 (D4)
- Drought – Extreme 2 to 5 (D3)
- Drought – Severe 5 to 10 (D2)
- Drought – Moderate 10 to 20 (D1)
- Abnormally Dry 20 to 30 (D0)

U.S. Drought Monitor Time Series:
droughtmonitor.unl.edu/Data/Timeseries.aspx



Recent Climate

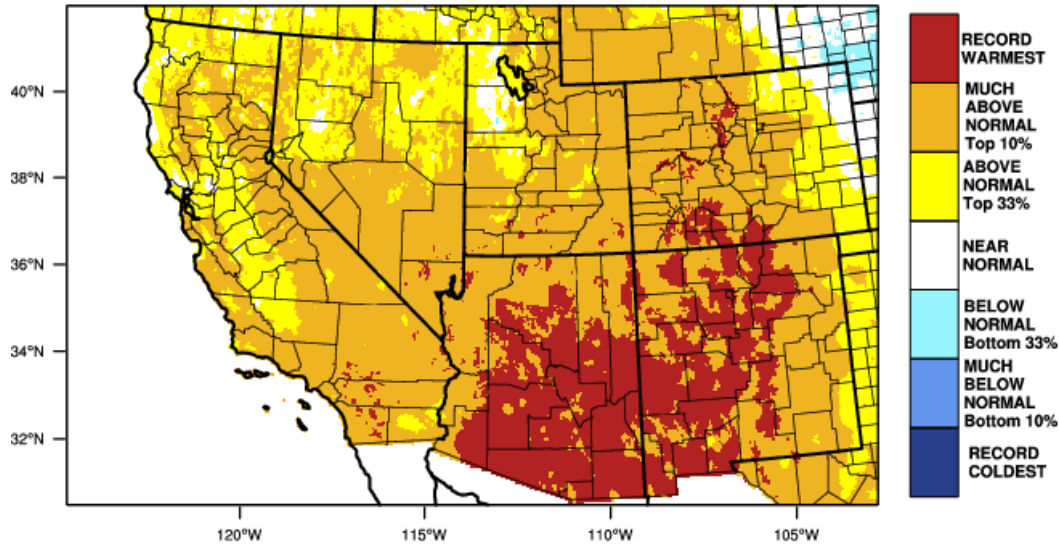
Precipitation
Temperature
Historical Ranks

Hydrology
Vegetation

from denverpost.com (June Record High Temperatures)



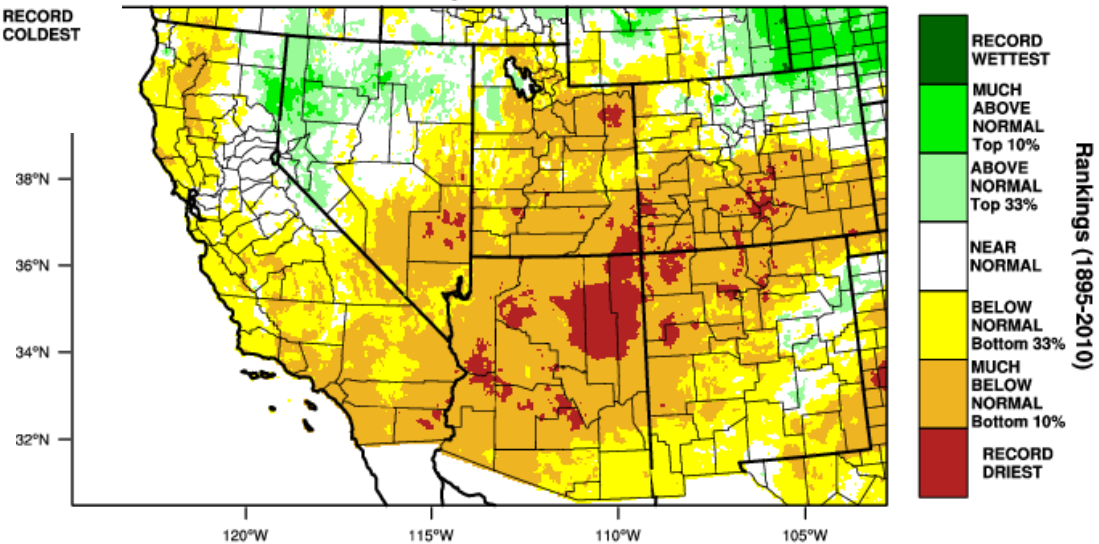
Southwest - Mean Temperature
October-May 2018 Percentile



WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 16 JUN 2018

What's been happening since the beginning of the water year?

Southwest - Precipitation
October-May 2018 Percentile

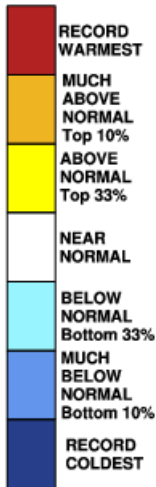
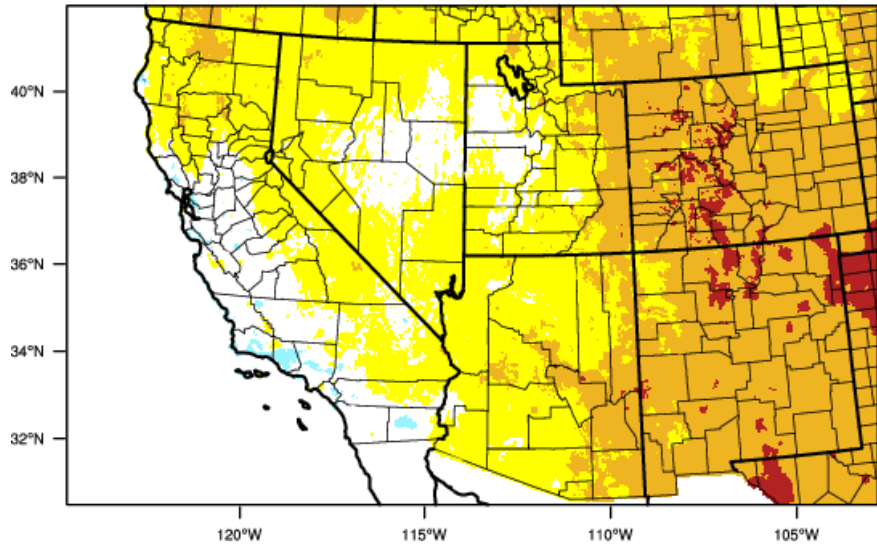


WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 16 JUN 2018

WestWide Drought Tracker:
<https://wrcc.dri.edu/wwdt/>



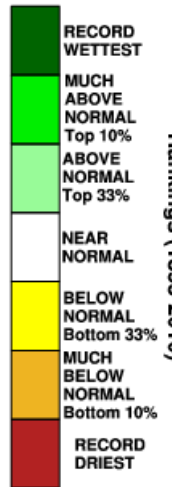
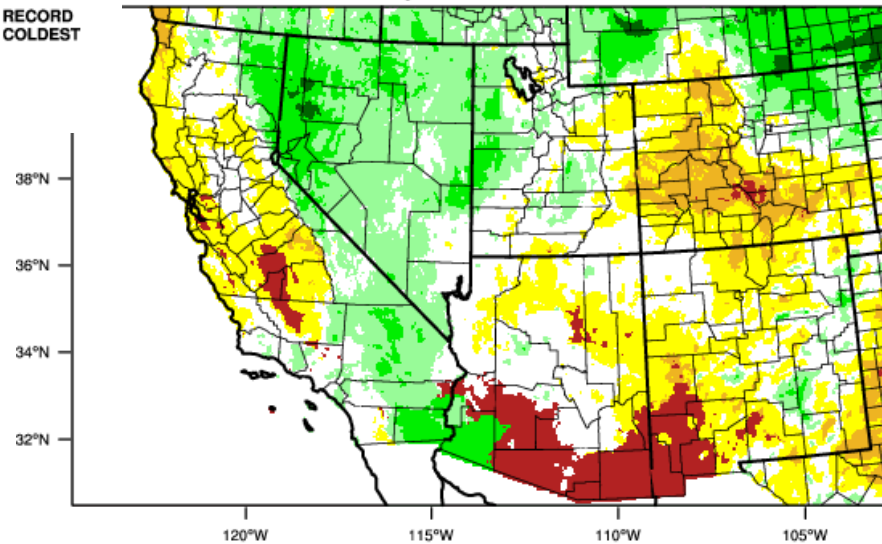
Southwest - Mean Temperature
May 2018 Percentile



WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 16 JUN 2018

What happened last month?

Southwest - Precipitation
May 2018 Percentile

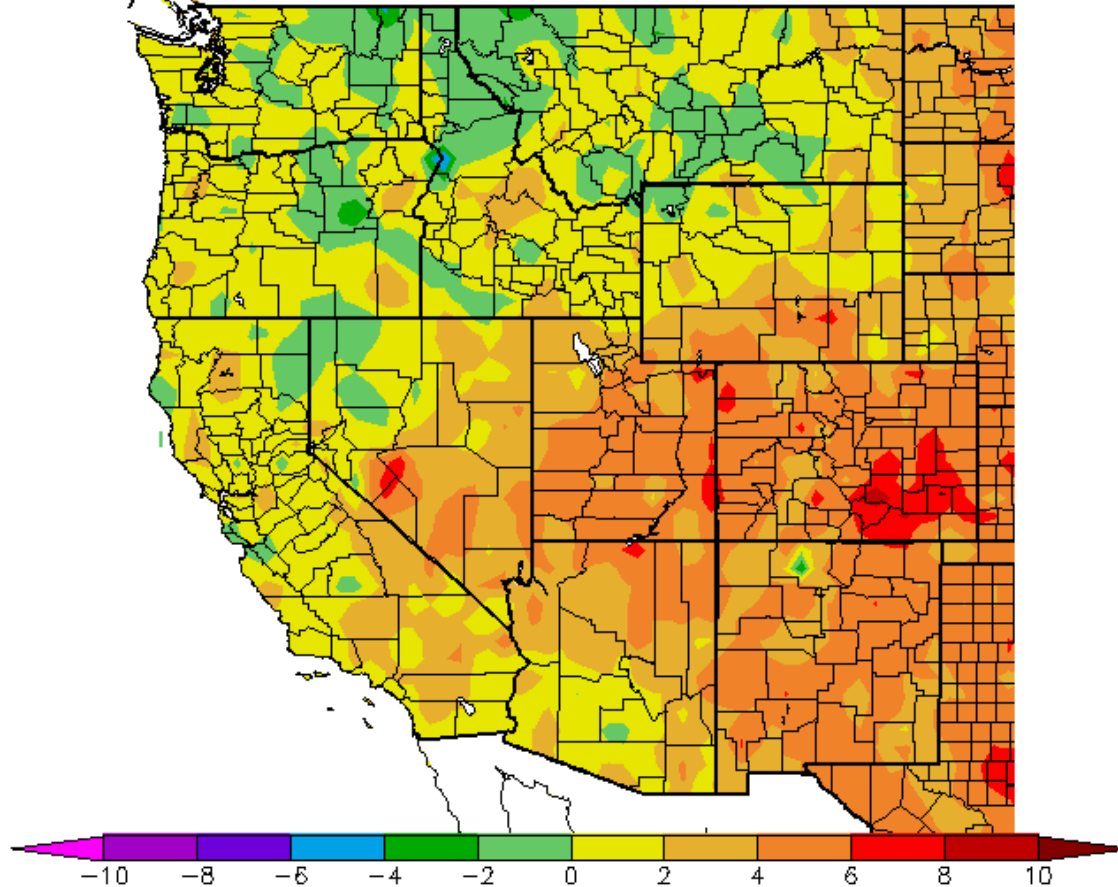


WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 16 JUN 2018

WestWide Drought Tracker:
<https://wrcc.dri.edu/wwdt/>



Ave. Temperature dep from Ave (deg F)
6/1/2018 - 6/23/2018



Generated 6/24/2018 at WRCC using provisional data.
NOAA Regional Climate Centers

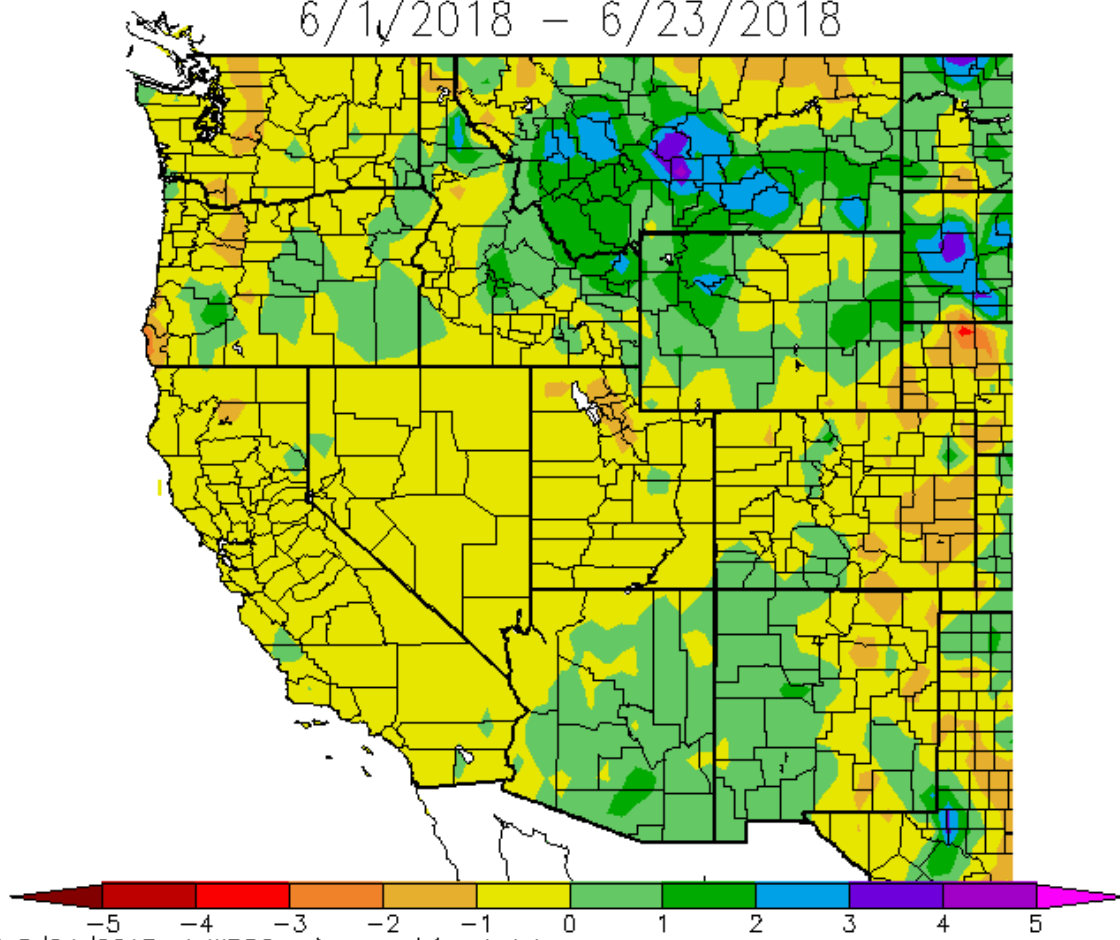
Western Climate Anomaly Maps:
<https://wrcc.dri.edu/anom/>



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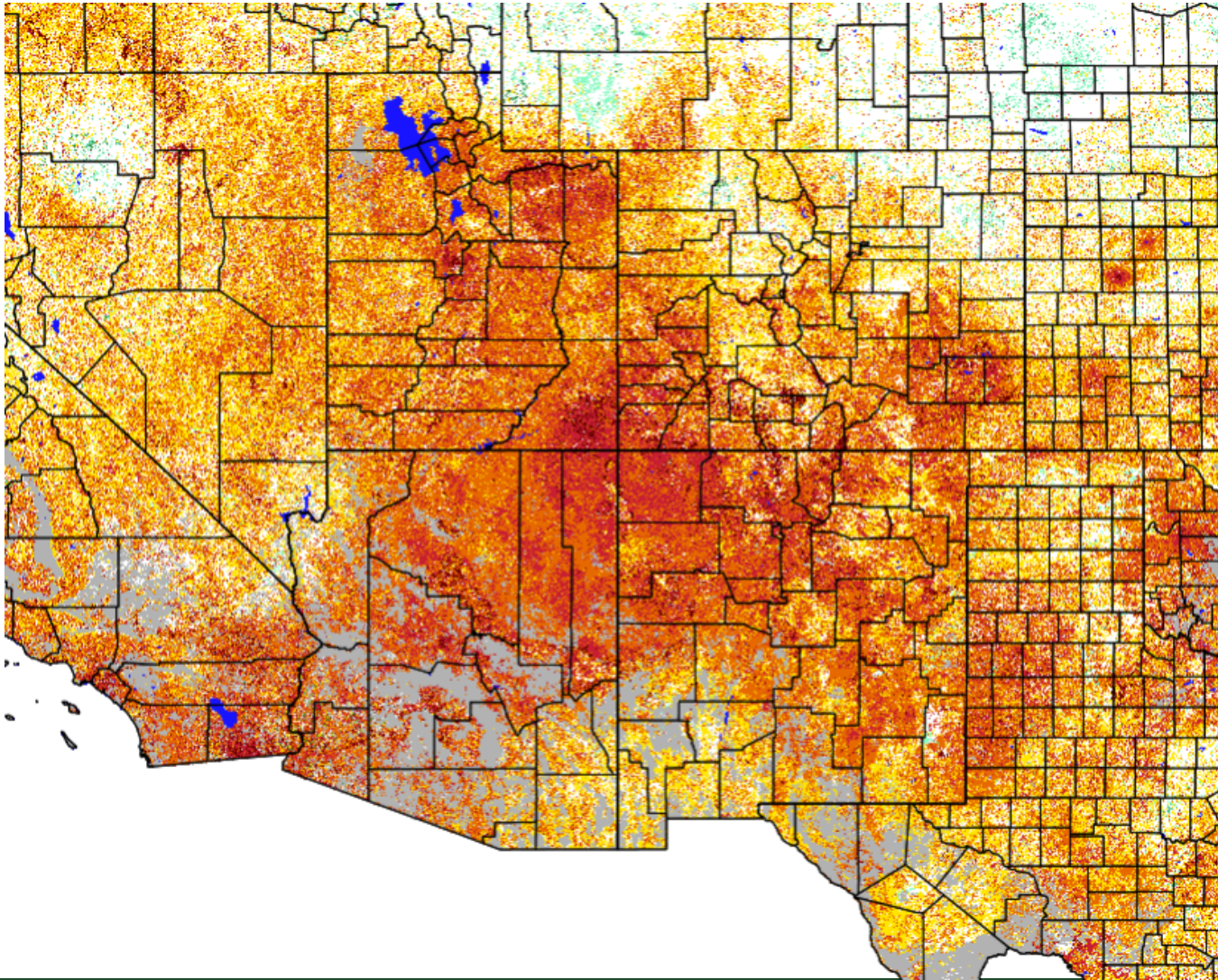
Precipitation Departure from Average (in.)
6/1/2018 - 6/23/2018



Generated 6/24/2018 at WRCC using provisional data.
NOAA Regional Climate Centers

Western Climate Anomaly Maps:
<https://wrcc.dri.edu/anom/>





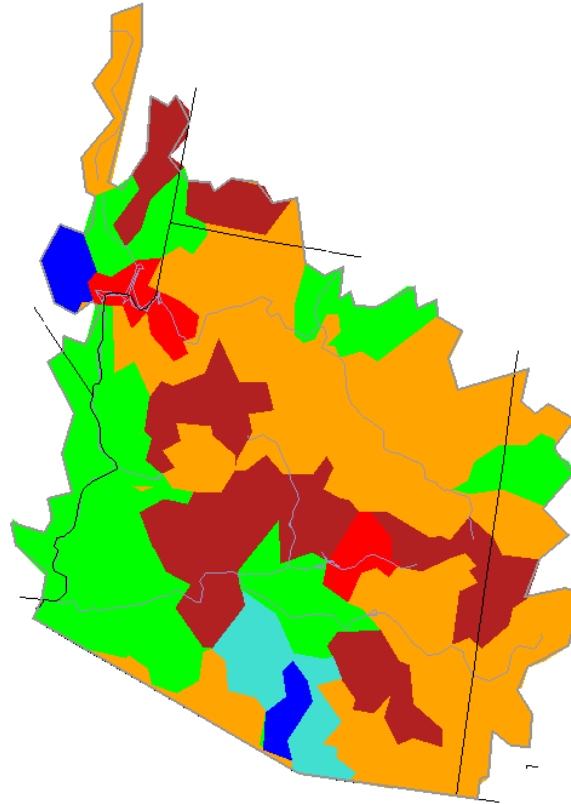
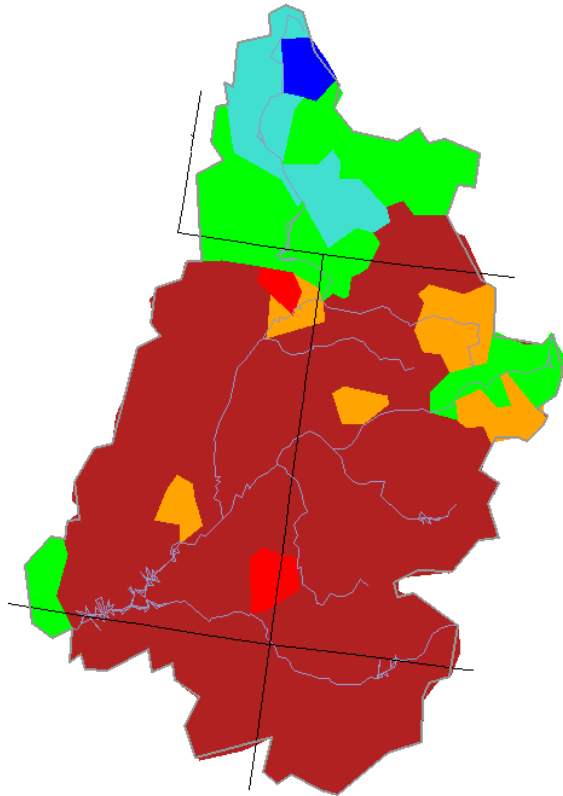
VegDRI – satellite derived
vegetation conditions on June 3

- Extreme Drought [less than 64]
- Severe Drought [65-80]
- Moderate Drought [81-96]
- Pre-Drought [97-112]
- Near Normal [113-160]
- Unusually Moist [161-177]
- Very Moist [177-192]
- Extremely Moist [193-252]
- Water
- Out of Season



Sunday, June 24, 2018

Sunday, June 24, 2018



28-day Averaged Streamflows for the Upper Colorado (left) and Lower Colorado (right)

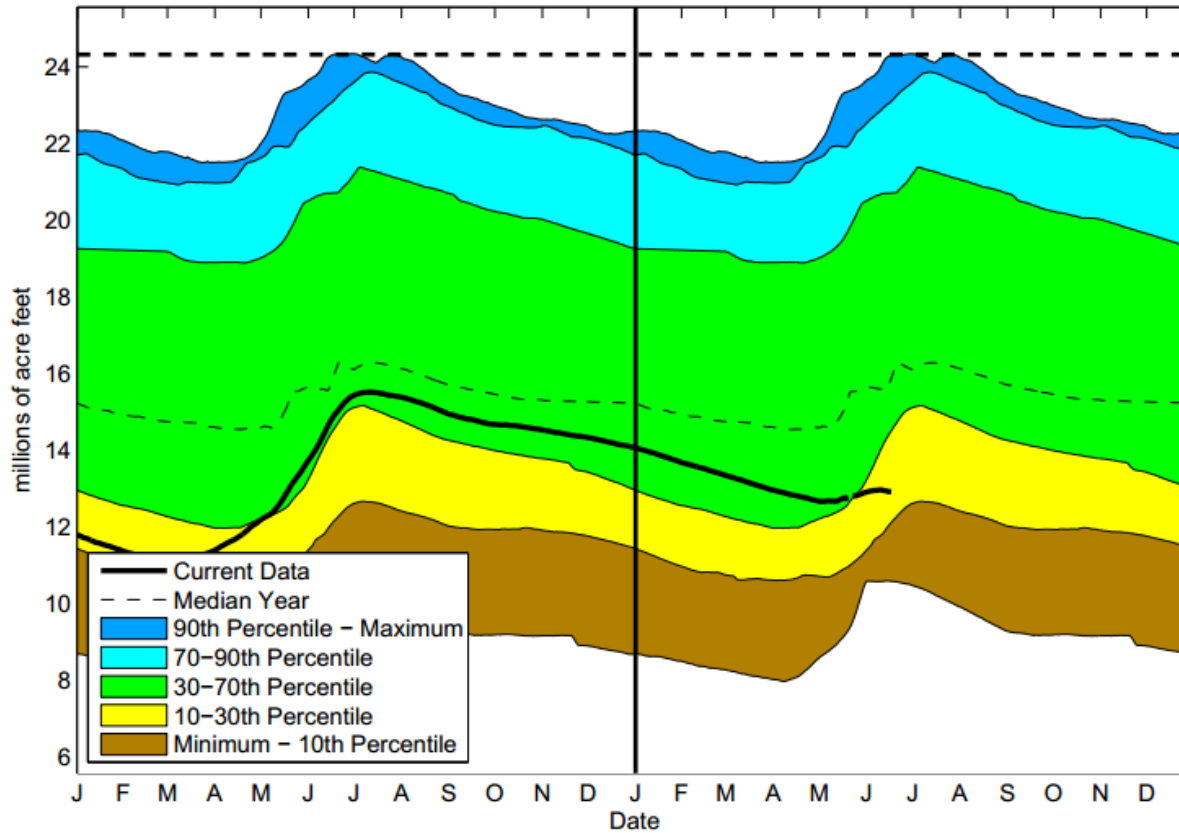


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

waterwatch.usgs.gov



Lake Powell Reservoir Level 06/17/2018
74 Percent of 1985-2016 Average



produced by Peter Goble at:
climate.colostate.edu/~drought





Wildfire Season

List of major fires
Impacts of fire

picture by Emile Elias (416 Fire)



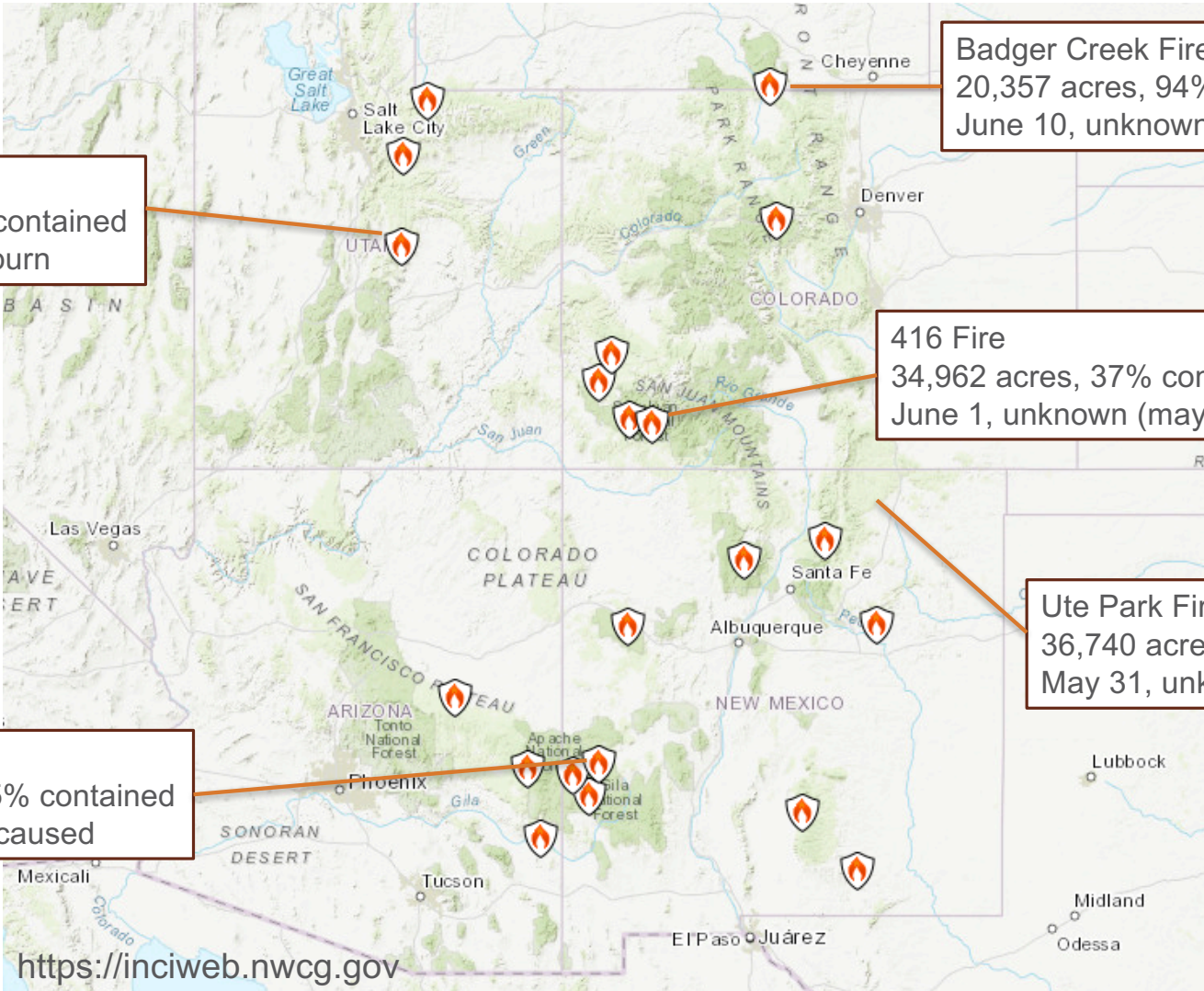
Trail Mountain Fire
17,697 acres, 79% contained
June 6, prescribed burn

Badger Creek Fire
20,357 acres, 94% contained
June 10, unknown

416 Fire
34,962 acres, 37% contained
June 1, unknown (maybe train?)

Ute Park Fire
36,740 acres, 85% contained
May 31, unknown

Buzzard Fire
50,296 acres, 85% contained
May 22, human caused



<https://inciweb.nwcg.gov>

Fire Statistics

- ✓ 28 active fires listed on Inciweb in the last 2 weeks
- ✓ Over 170,000 acres of new fire since mid-May
- ✓ Majority are human-caused with some lightning caused
- ✓ In Arizona, by the end of April, 604 of the 611 wildfires that occurred were human caused – only 7 due to lightning.

FLOOD AFTER FIRE

Did you know that wildfires dramatically alter the terrain and increase the risk of floods?

**Reduce your risk.
The time to buy flood insurance is now.**

Contact your local insurance agent for more information or visit the National Flood Insurance Program at www.fema.gov/national-flood-insurance-program



During normal conditions, vegetation helps absorb rainwater.



But after an intense wildfire, burned vegetation and charred soil form a water repellent layer, blocking water absorption.



During the next rainfall, water bounces off of the soil.



And as a result, properties located below or downstream of the burn areas are at an increased risk for flooding.



Heavy Rains
Excessive amounts of rainfall can happen throughout the year. Properties directly affected by fires and those located below or downstream of burn areas are most at risk for flooding.

Degree of Land Slope

Higher degrees of land slope speed up water flow and increase flood risk.



Flash Floods

Intense rainfall can flood low lying areas in less than six hours. Flash floods roll boulders, tear out trees and destroy buildings and bridges.



Mudflows

Rivers of liquid and flowing mud are caused by a combination of brush loss and subsequent heavy rains. Rapid snowmelt can also trigger mudflows.



<https://www.usfa.fema.gov>



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National Forest Closures:

- Apache
- Navajo
- Coconino
- Tonto
- Gila
- Sante Fe
- San Juan

Fire Restrictions

- Arizona: most of state under Stage II or Stage 1 Restrictions
- Utah: widespread active restrictions in southwest and southeast regions
- Colorado: 50 out of 64 counties reporting fire bans/restrictions
- New Mexico: widespread Stage II Restrictions



Impacts

Anecdotal stories
Pictures



photo provided by Chuck Hanagan (USDA – FSA)



Ranching Impact: With no precipitation for dryland fields and grasslands, there is no food for cattle. This results in ranchers having to haul in hay (and water) or liquidate the herd.

** (multiple reports from all Four Corners states)



photo courtesy Deseret News, Utah

One irrigation company's records show Sanpete County, UT hasn't been this dry in 41 years.



“The ecosystem has been starved for a long time with just the occasional \$1 menu cheeseburger thrown to it...”

Royce Fontenot, describing the New Mexico drought



photo courtesy of Royce Fontenot (National Weather Service) – northeast NM



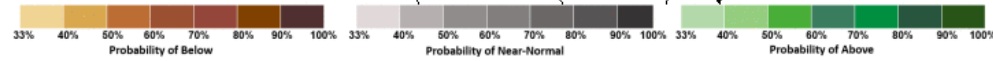
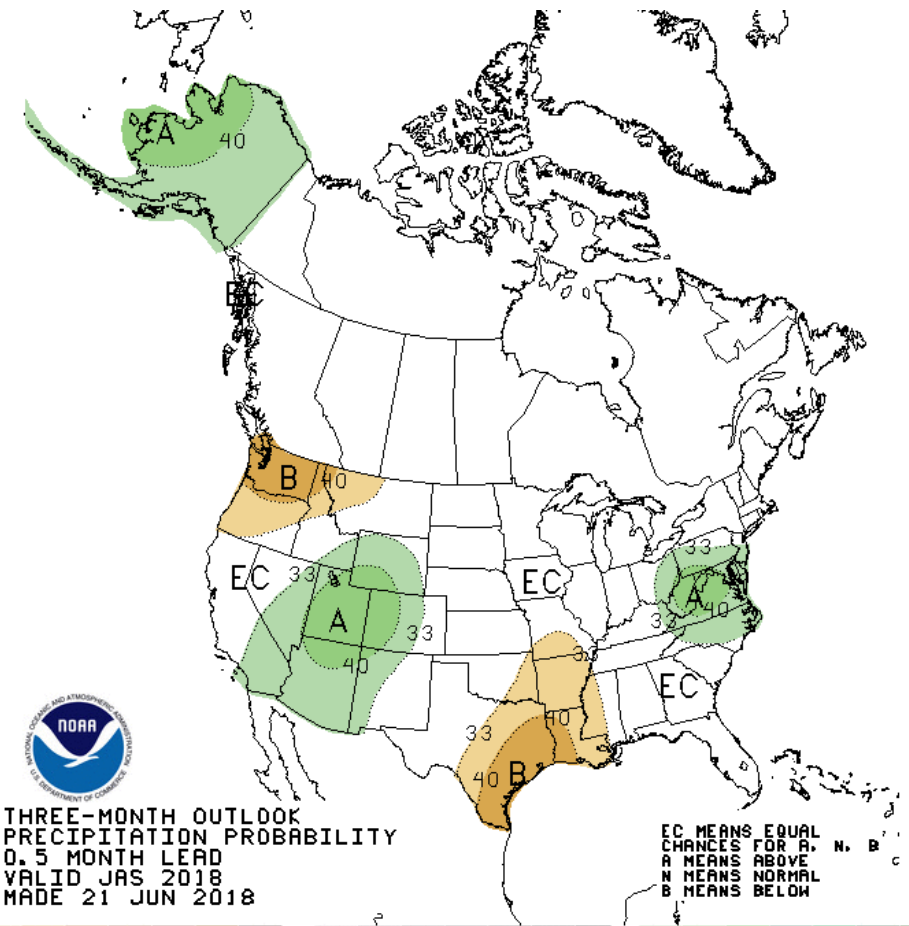
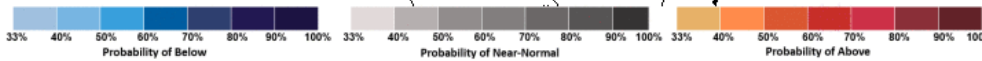
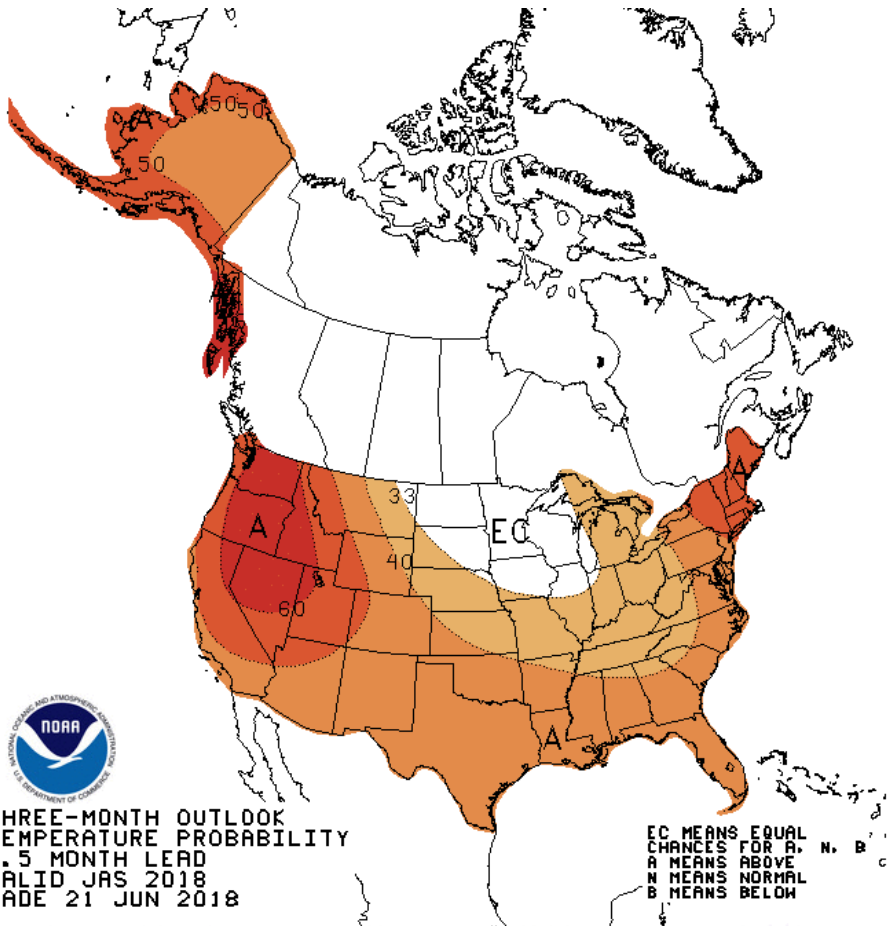


Outlook

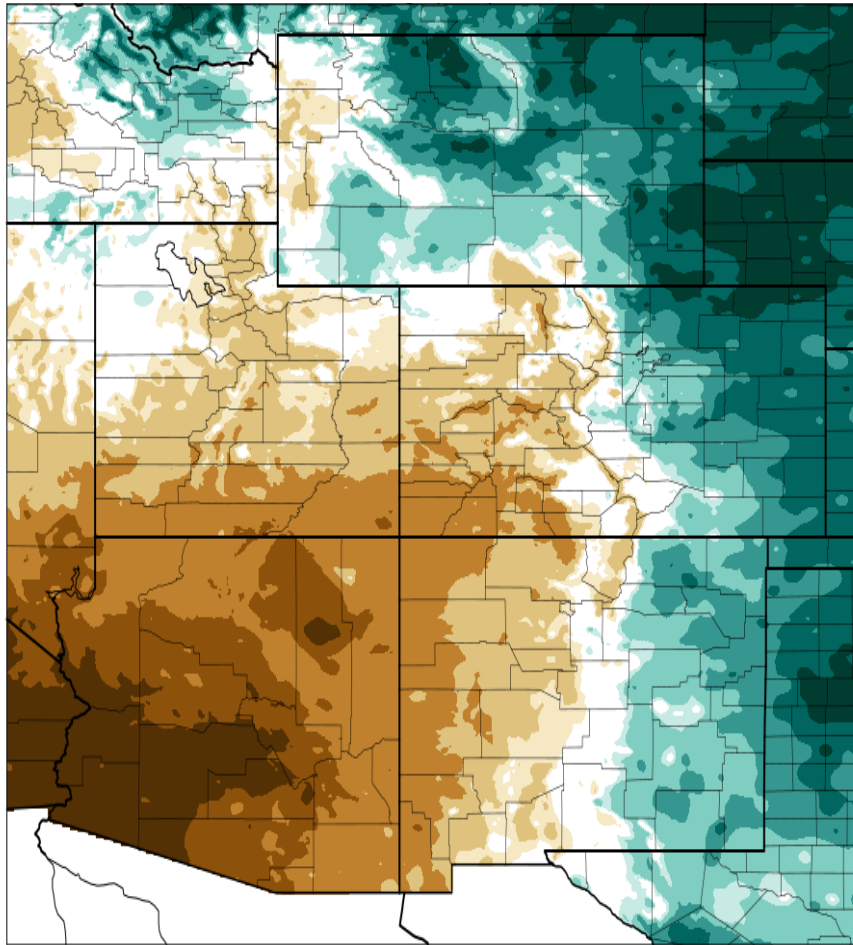
How do we get back to normal?

What's in store for us if El Niño arrives?





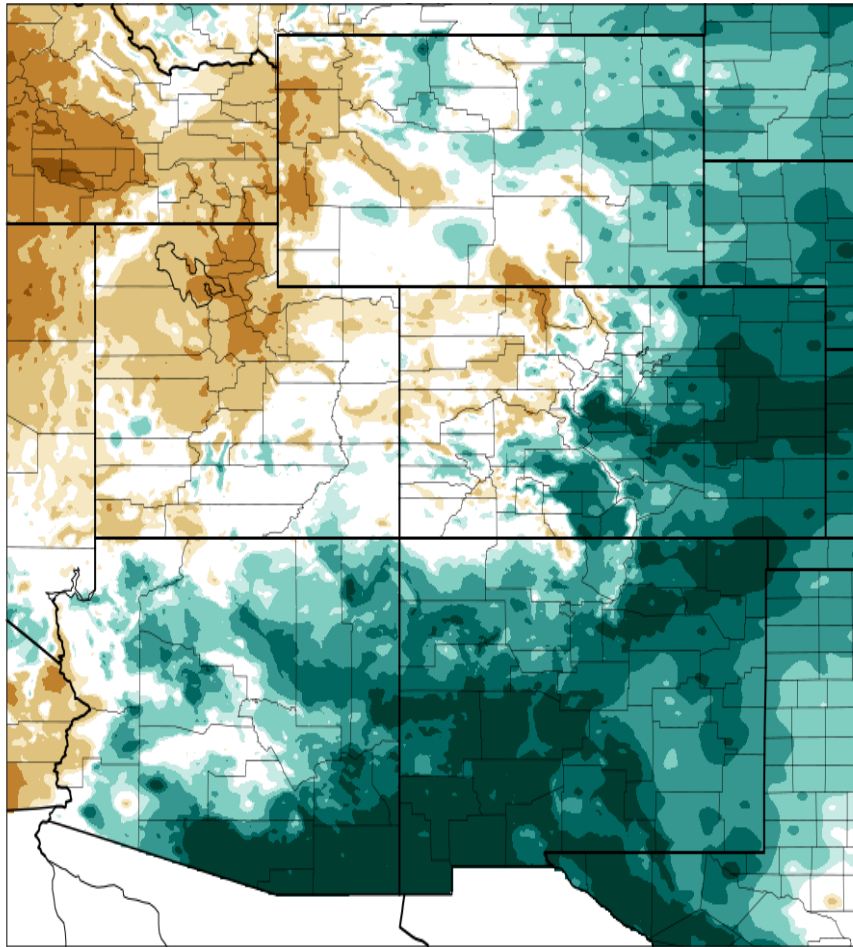
Seasonal Outlook from cpc.ncep.noaa.gov



June Precipitation Proportion

Russ Schumacher,
climate.colostate.edu

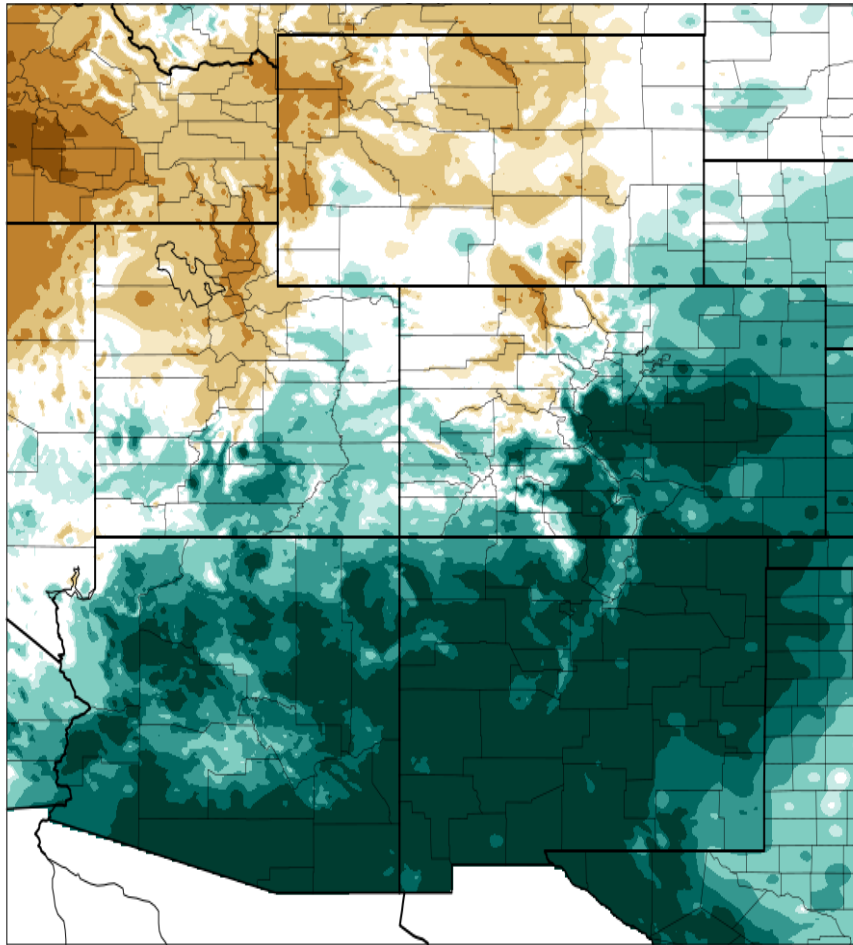




July Precipitation Proportion

Russ Schumacher,
climate.colostate.edu



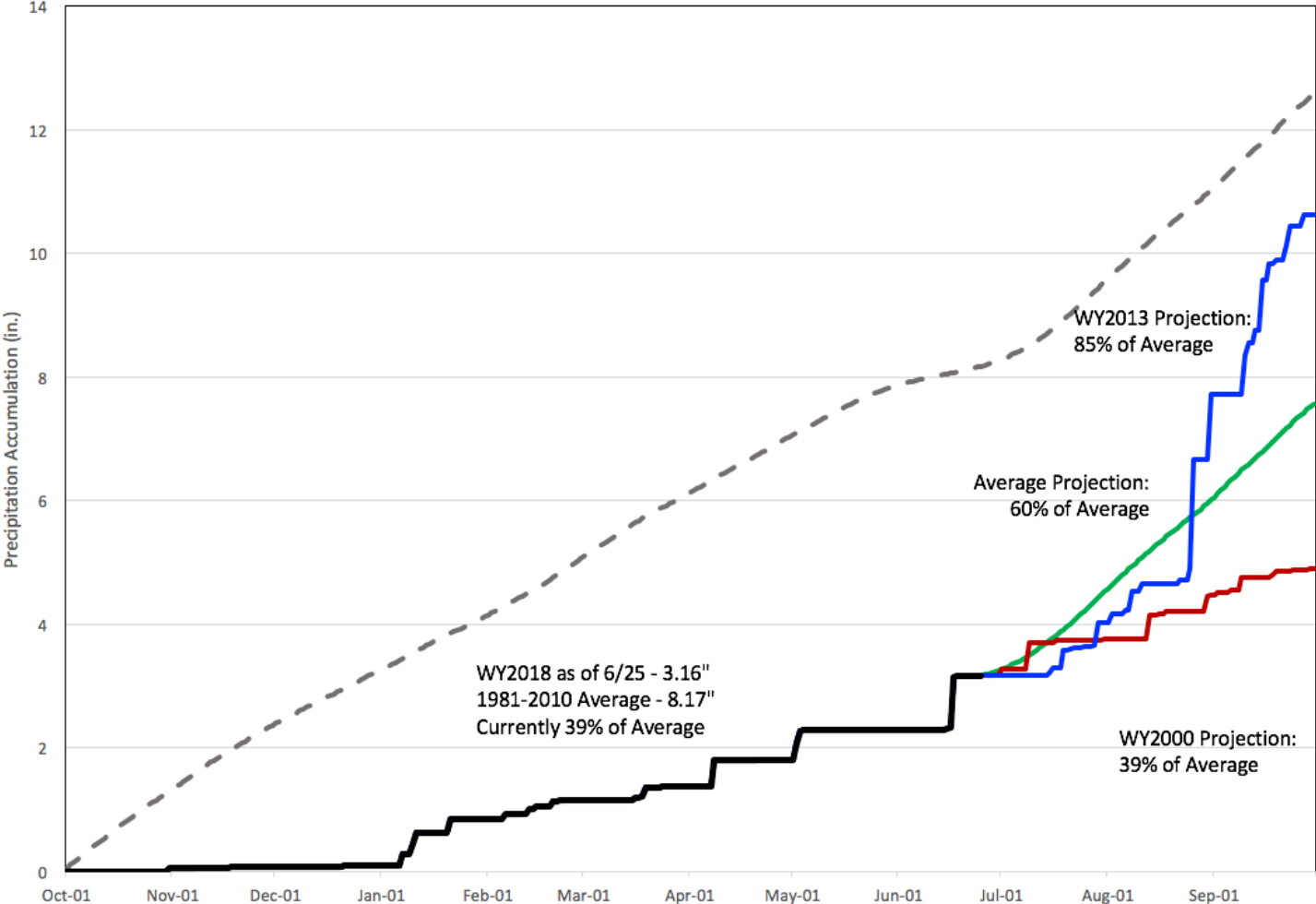


Aug. Precipitation Proportion

Russ Schumacher,
climate.colostate.edu



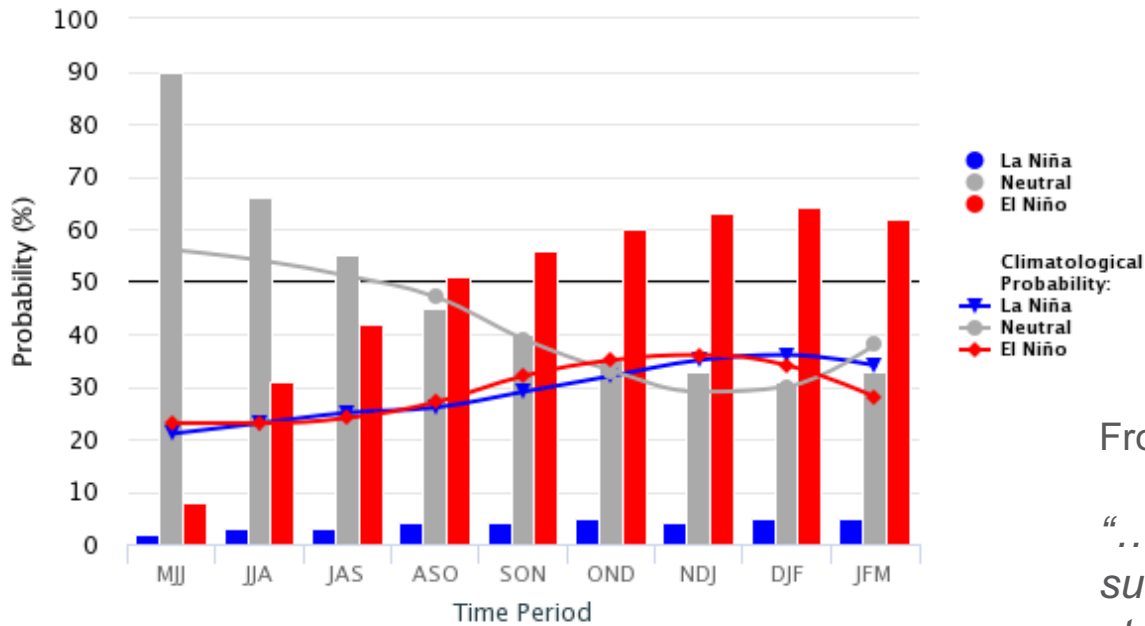
CORTEZ Precipitation Accumulation Projections



An El Niño Watch has been issued....

Early-Jun CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C



From the IRI ENSO Forecast:

“...weak El Niño development during late summer, growing to possibly moderate strength during fall and winter...”

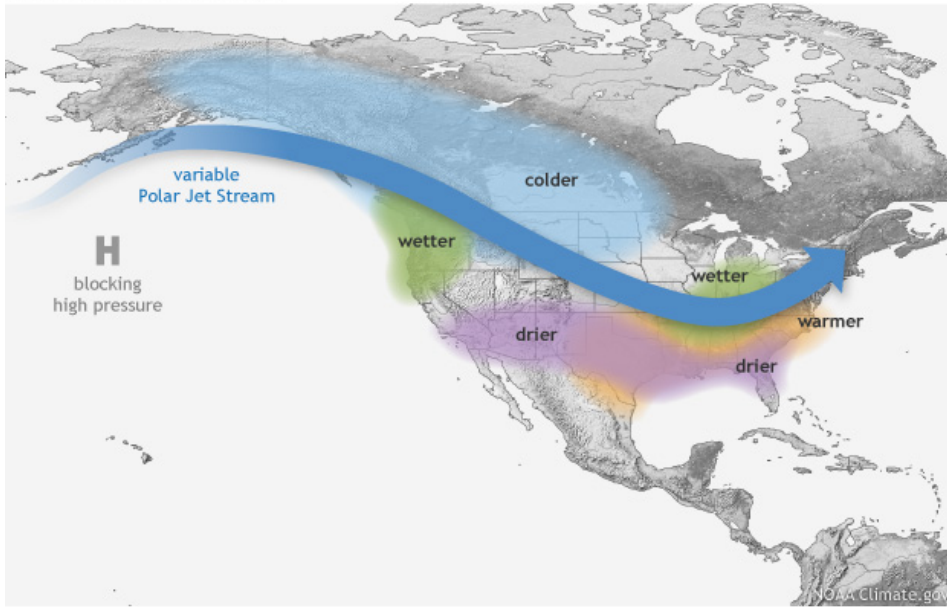
<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>



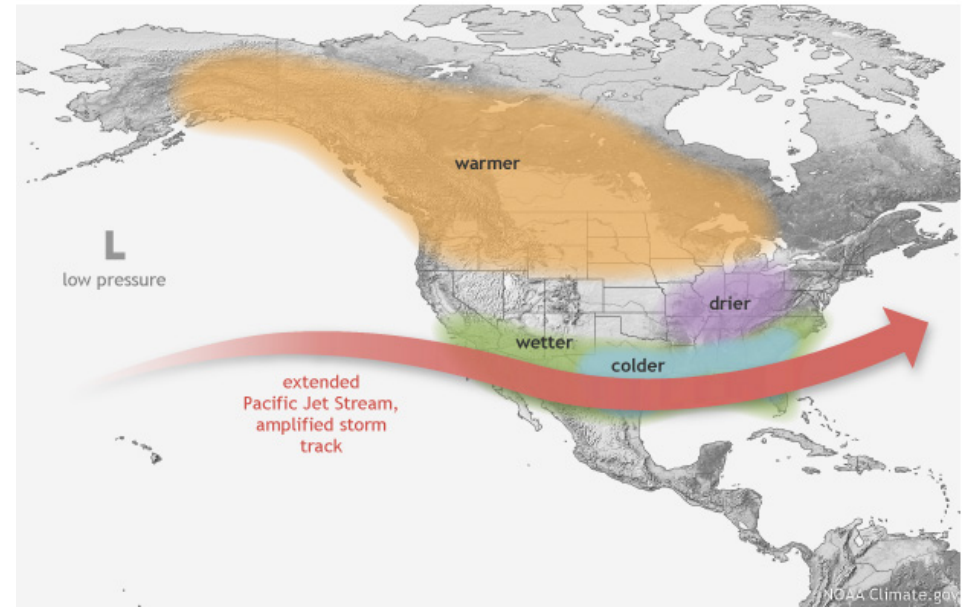
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WINTER LA NIÑA PATTERN



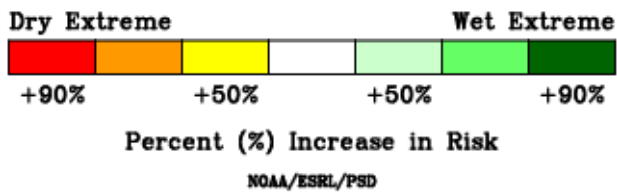
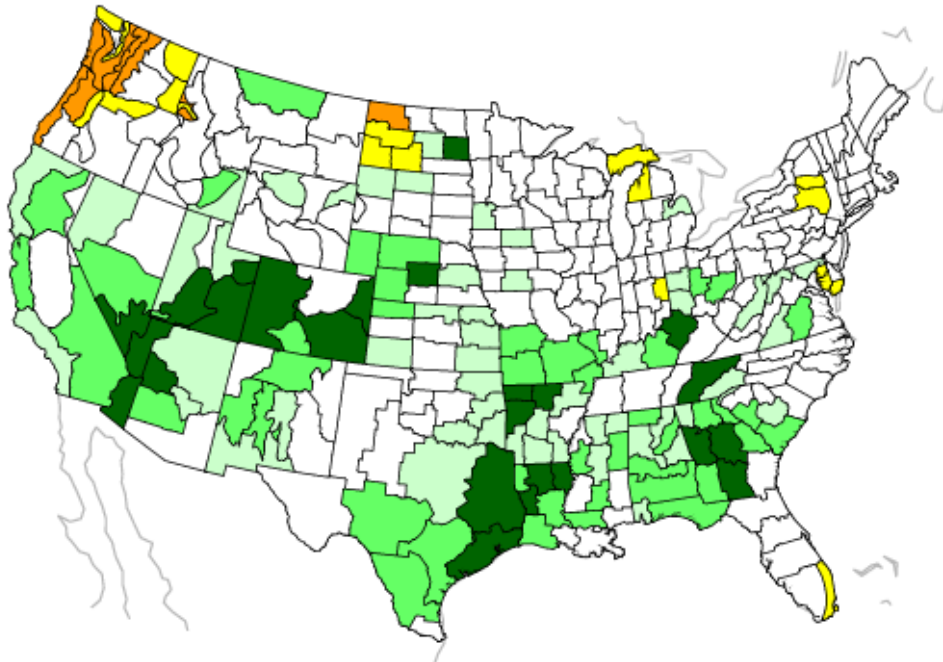
WINTER EL NIÑO PATTERN



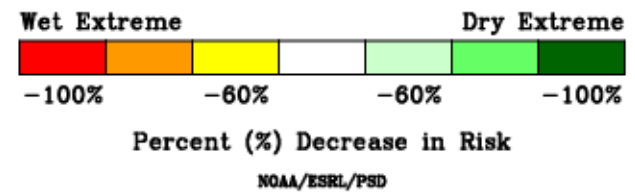
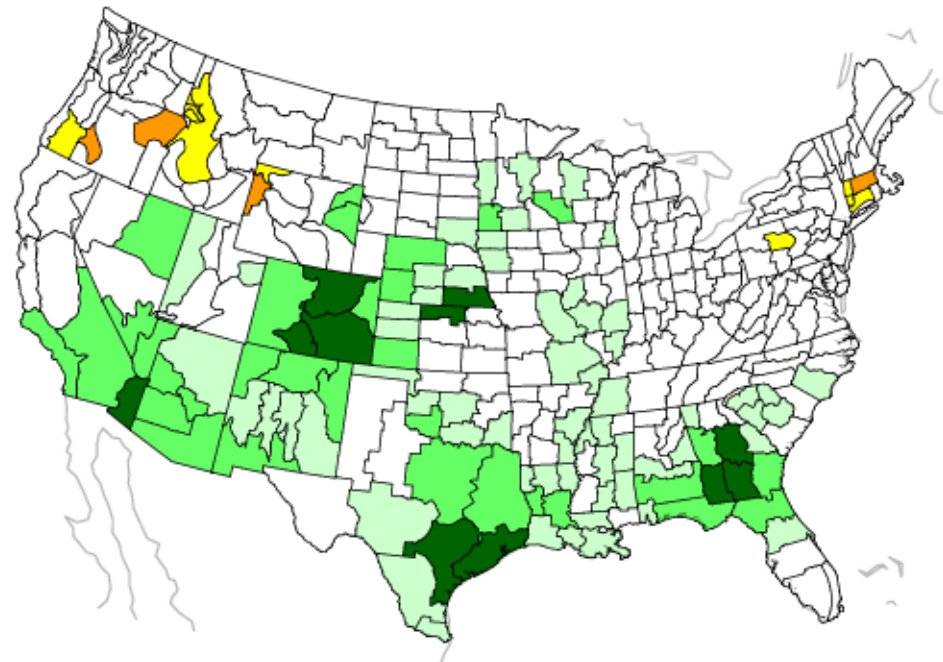
from climate.gov



SON Precipitation During El Nino
Increased Risk of Wet or Dry Extremes



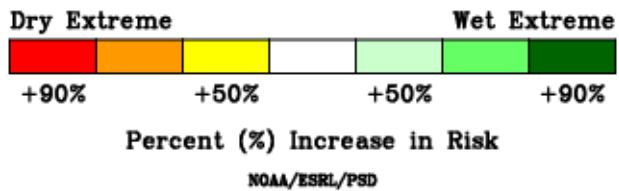
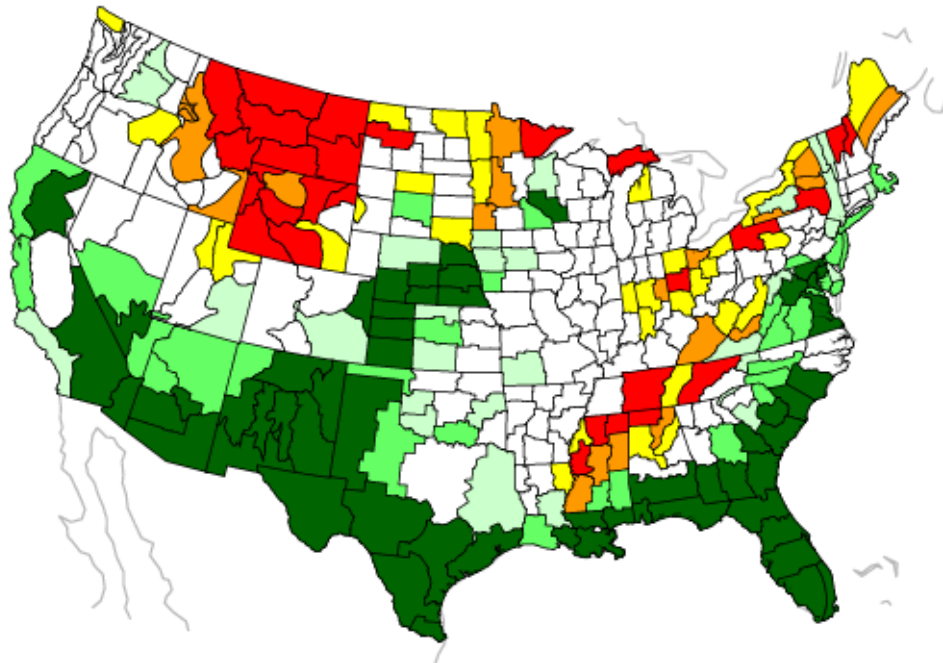
SON Precipitation During El Niño
Decreased Risk of Wet or Dry Extremes



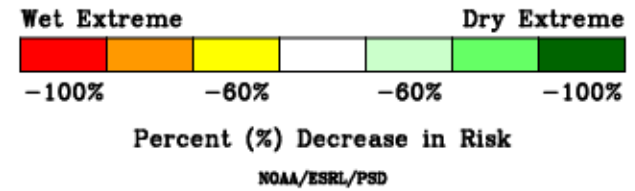
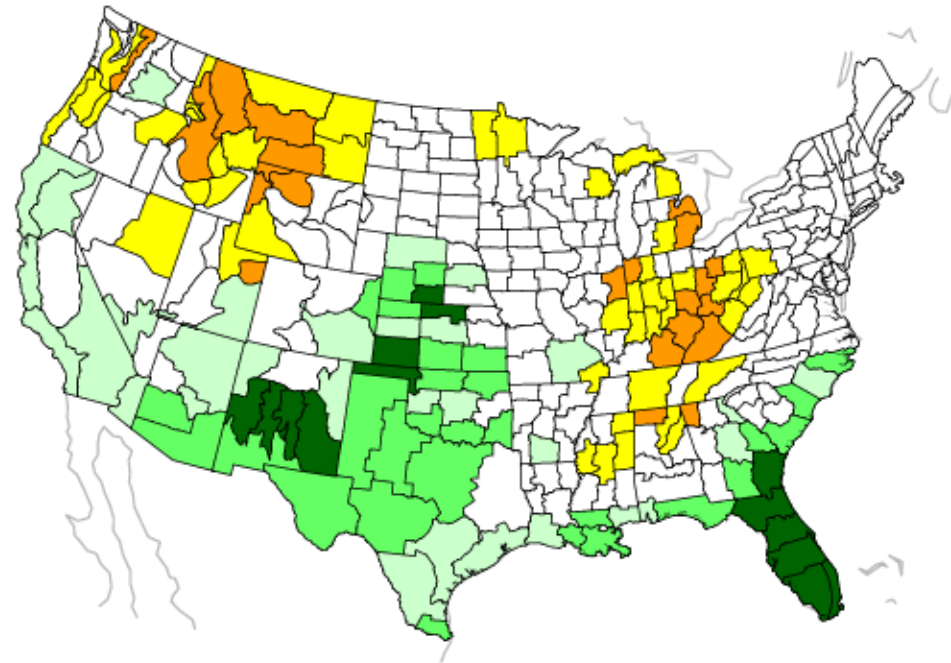
<https://www.esrl.noaa.gov/psd/enso/climaterisks/>



DJF Precipitation During El Nino
Increased Risk of Wet or Dry Extremes



DJF Precipitation During El Nino
Decreased Risk of Wet or Dry Extremes



<https://www.esrl.noaa.gov/psd/enso/climaterisks/>



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climate.colostate.edu/~drought

Thank you



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