The Evolution and Impacts of the 2018 Four Corners Drought in Southwest U.S.

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U.S. Drought Monitor Forum
Bowling Green, Kentucky
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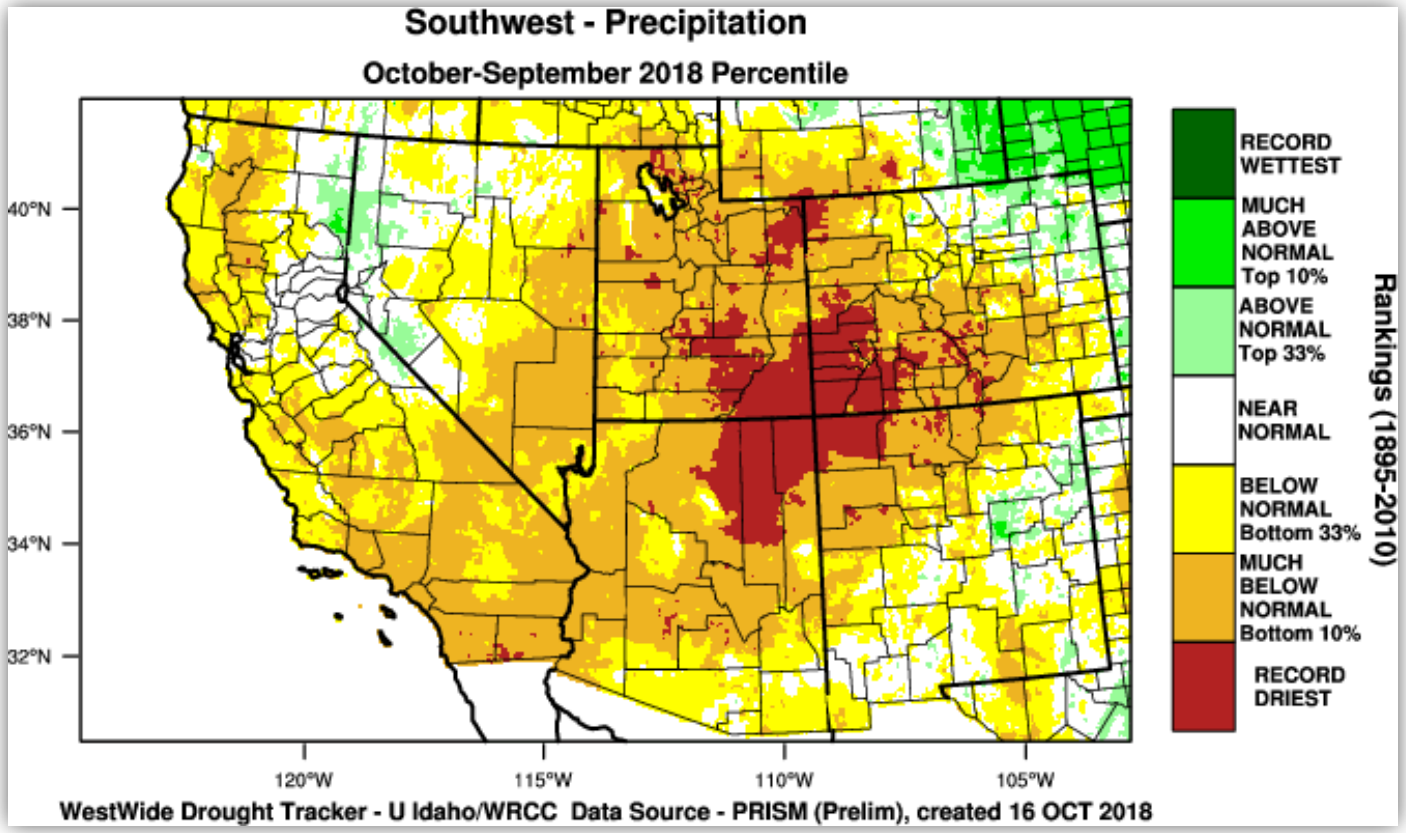
COLORADO CLIMATE CENTER

ATMOSPHERIC SCIENCE
COLORADO STATE UNIVERSITY

2018 Four Corners drought in 5 pictures



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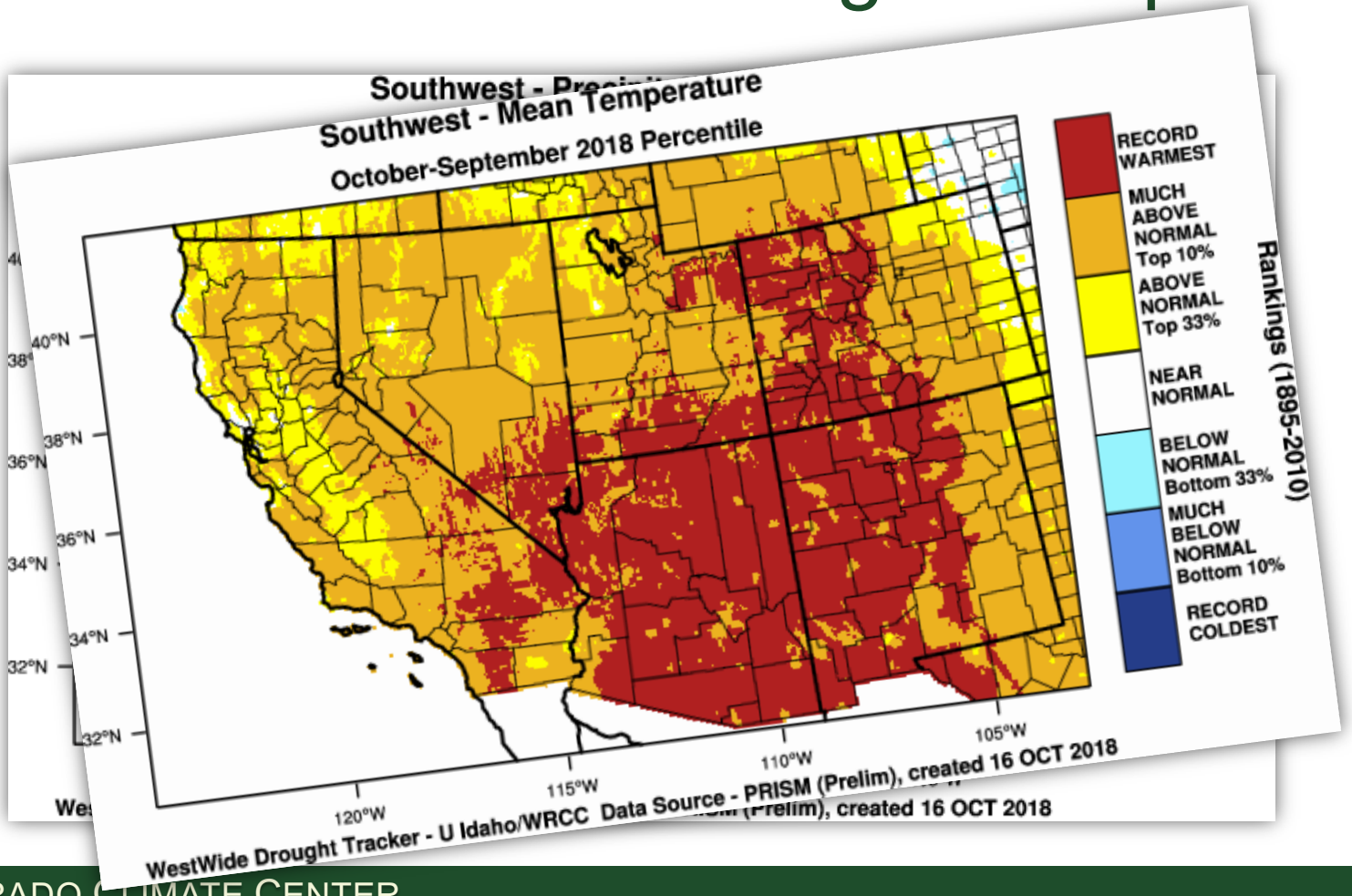
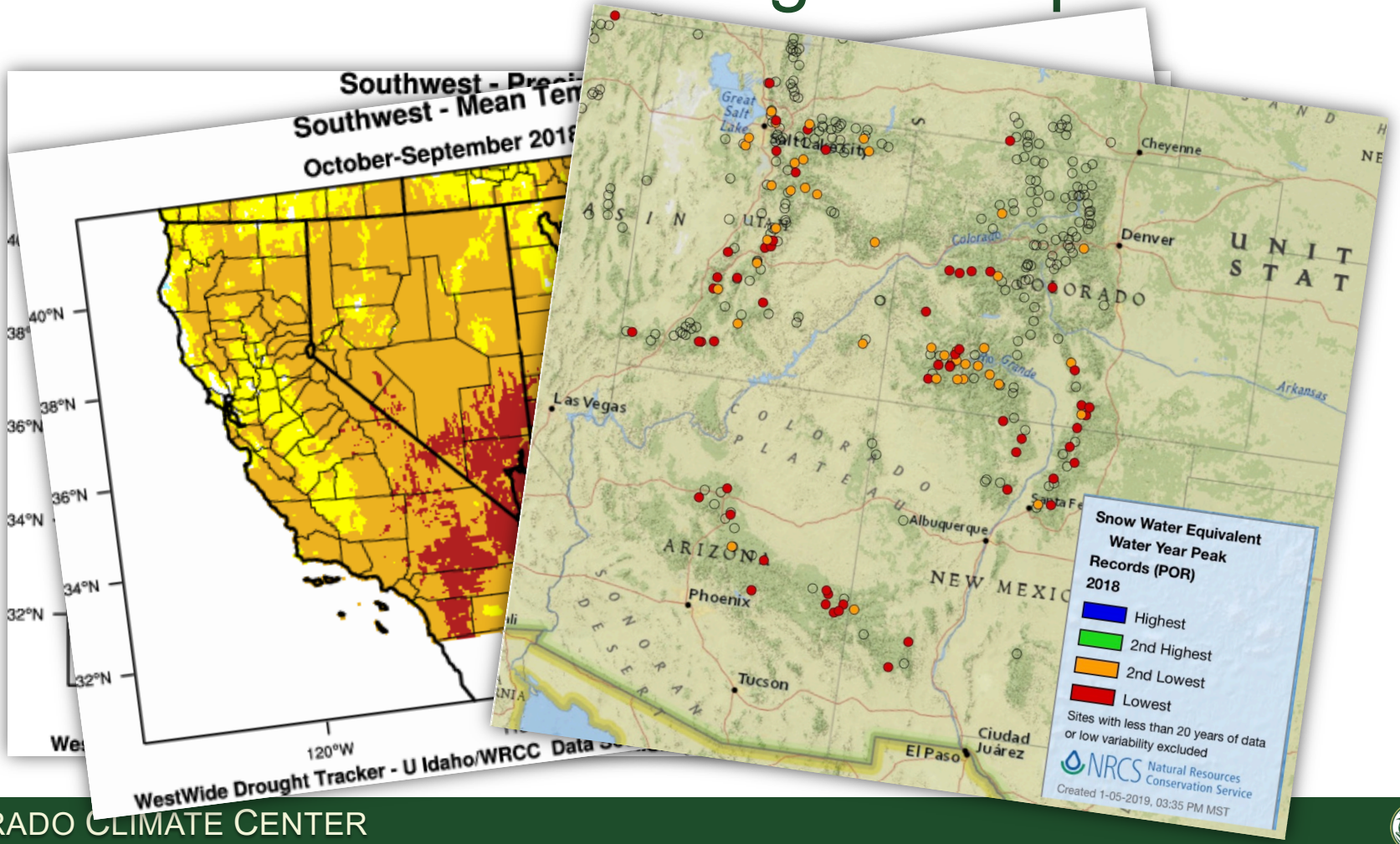


2018 Four Corners drought in 5 pictures



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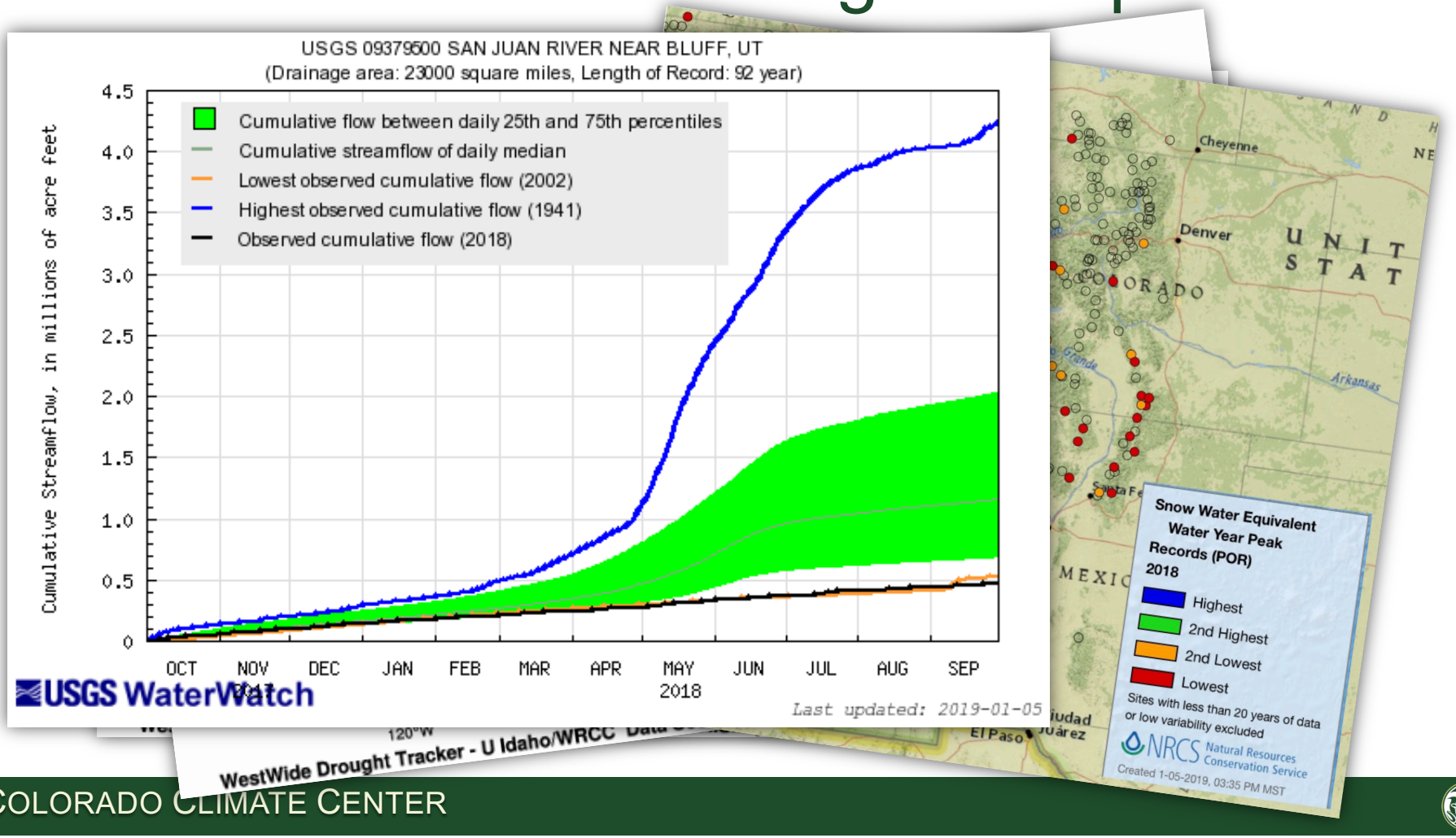

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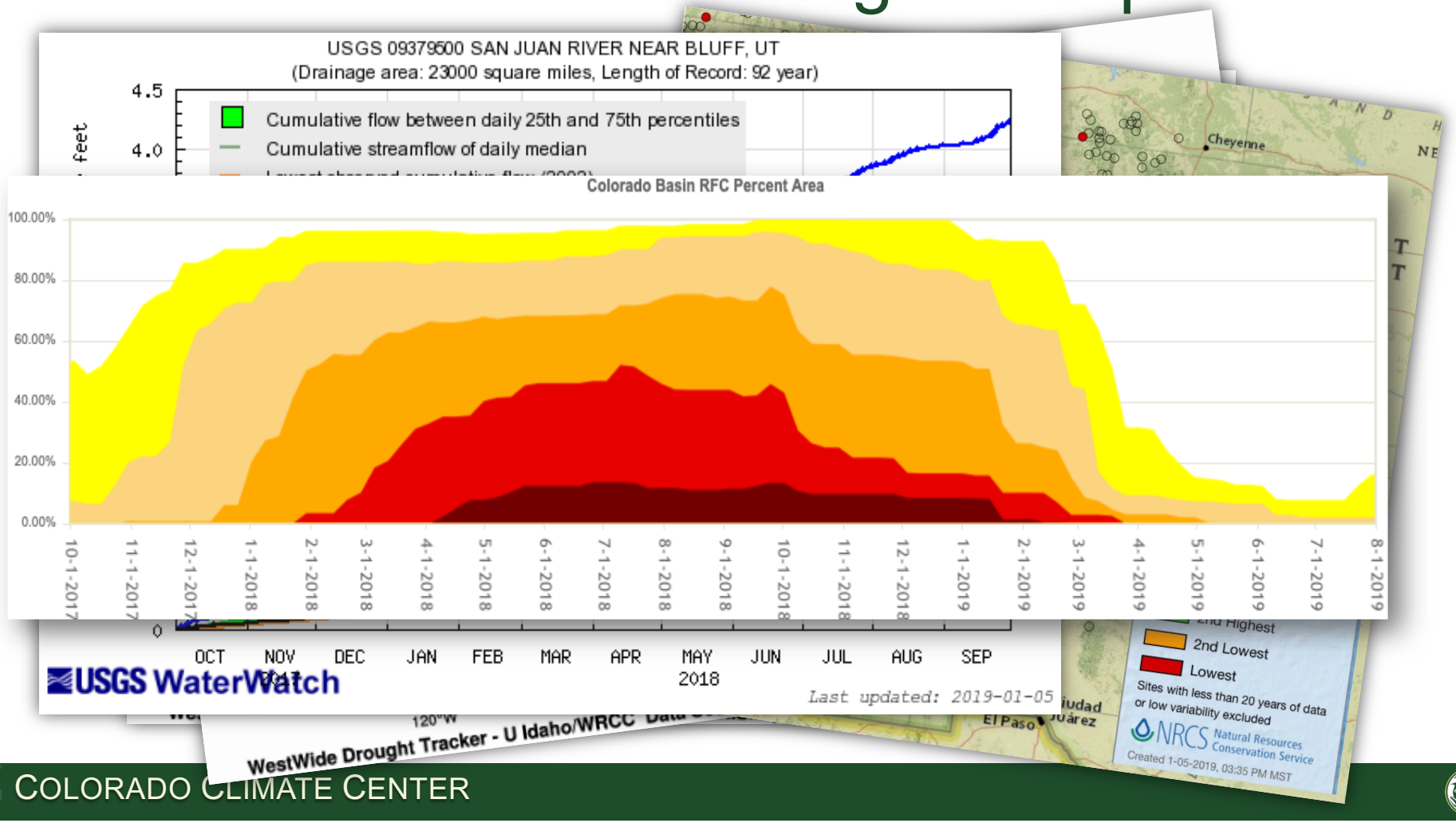

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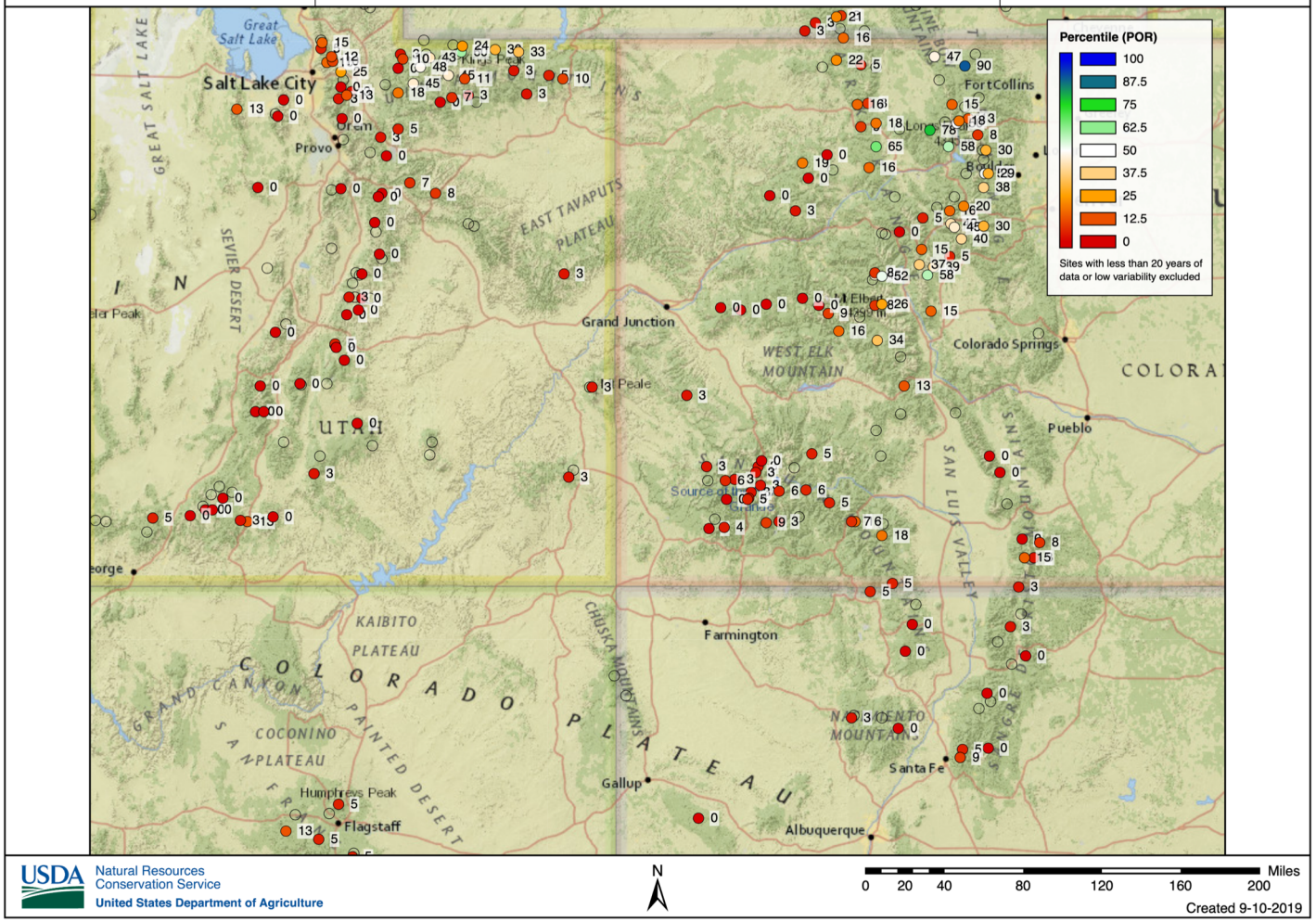
Evolution of Drought

Winter 2017-2018:

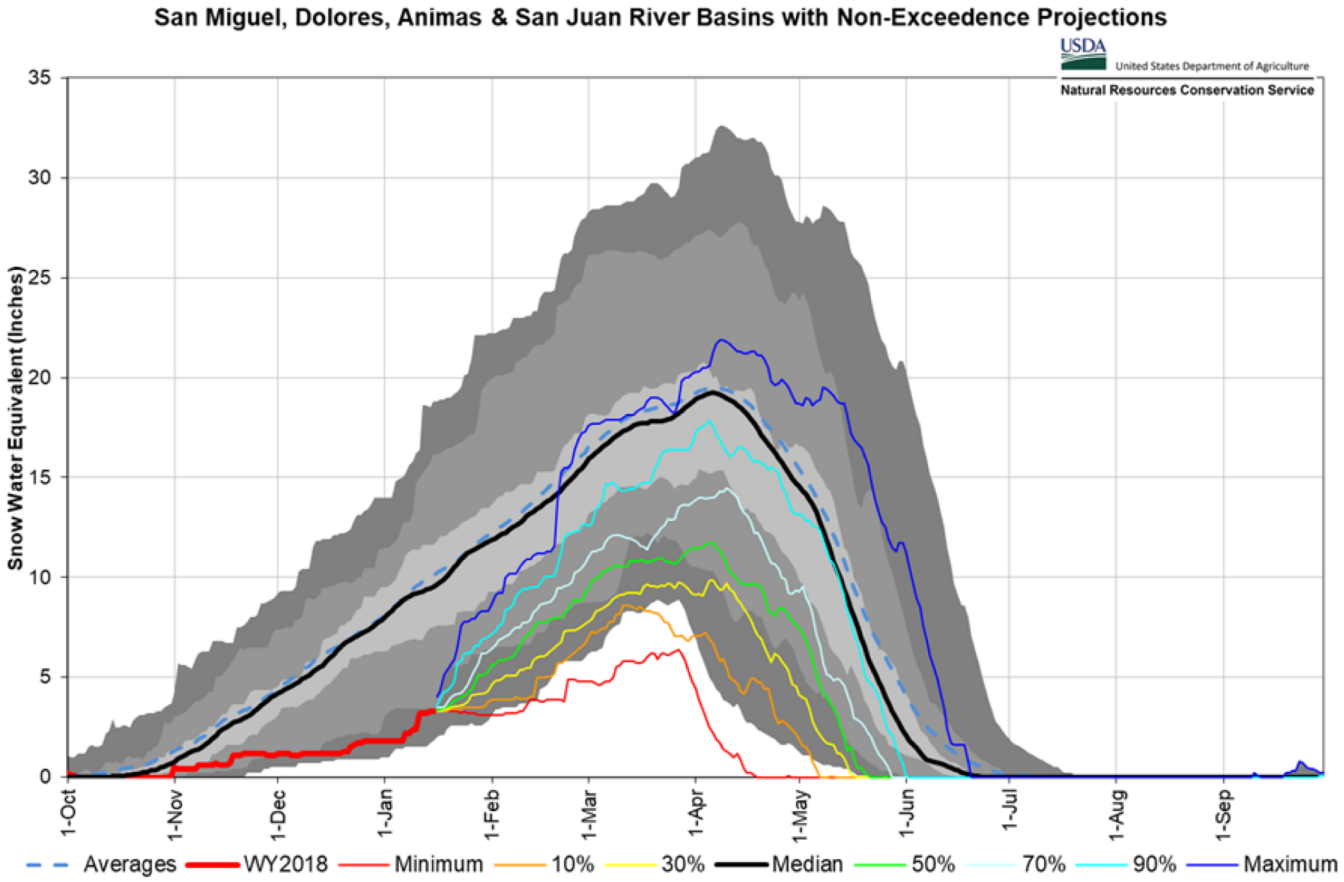
A snow drought

Snow Water Equivalent	Percentile (POR)	January 1, 2018, end of day



USDA Natural Resources Conservation Service
United States Department of Agriculture

Could we salvage the season?



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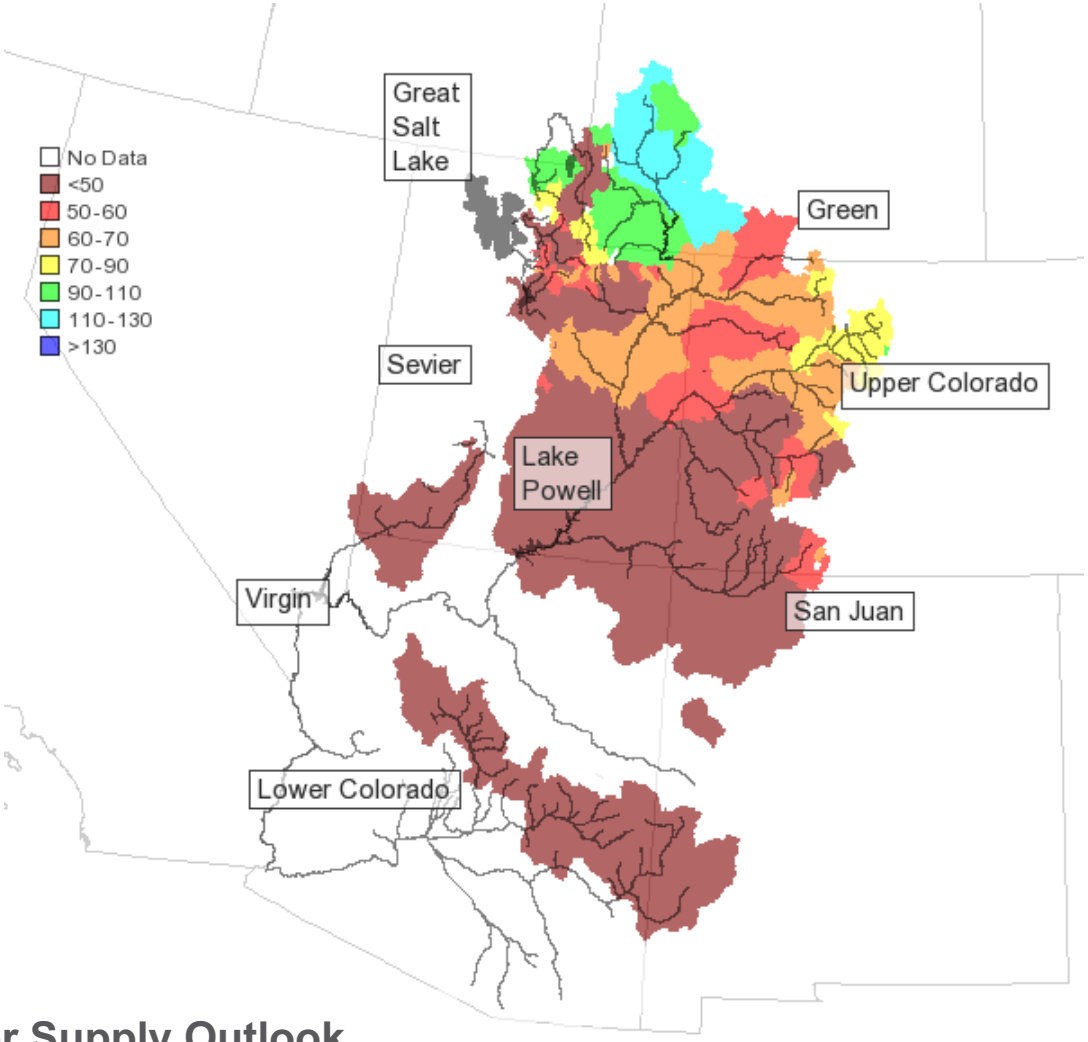
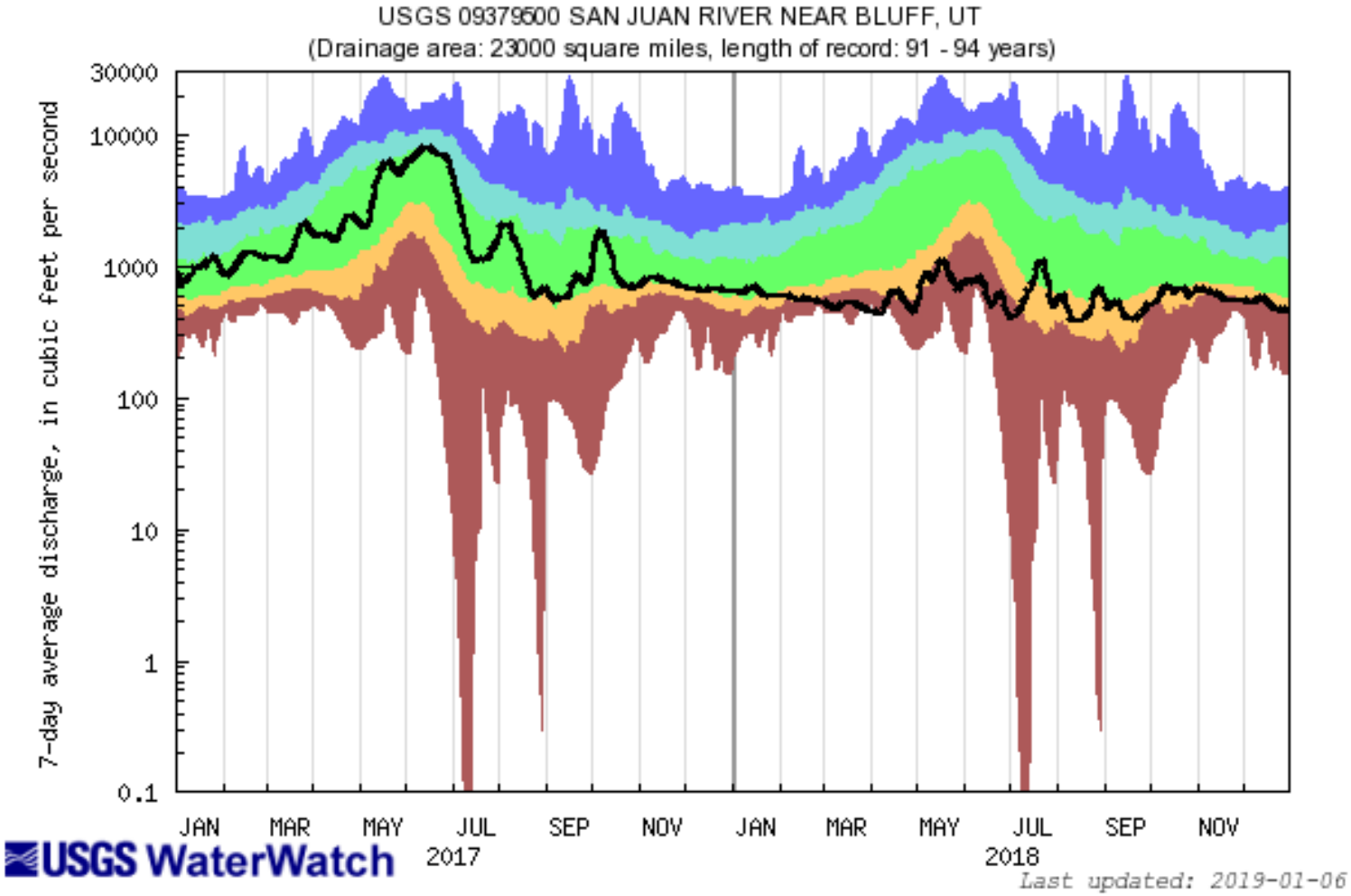
Evolution of Drought

Spring 2018:

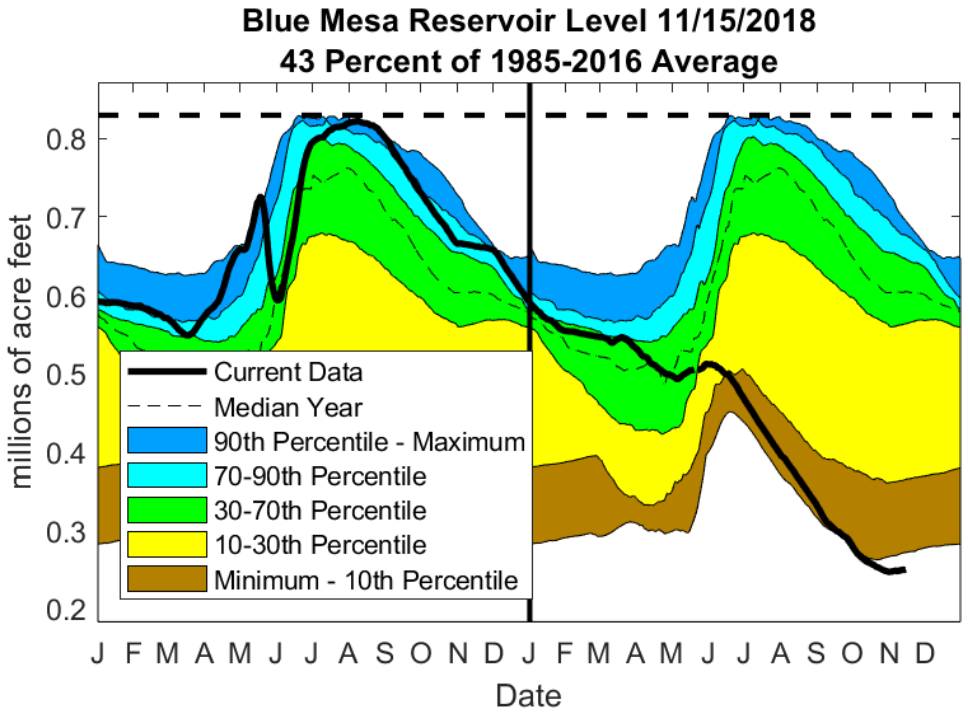
A hydrologic response

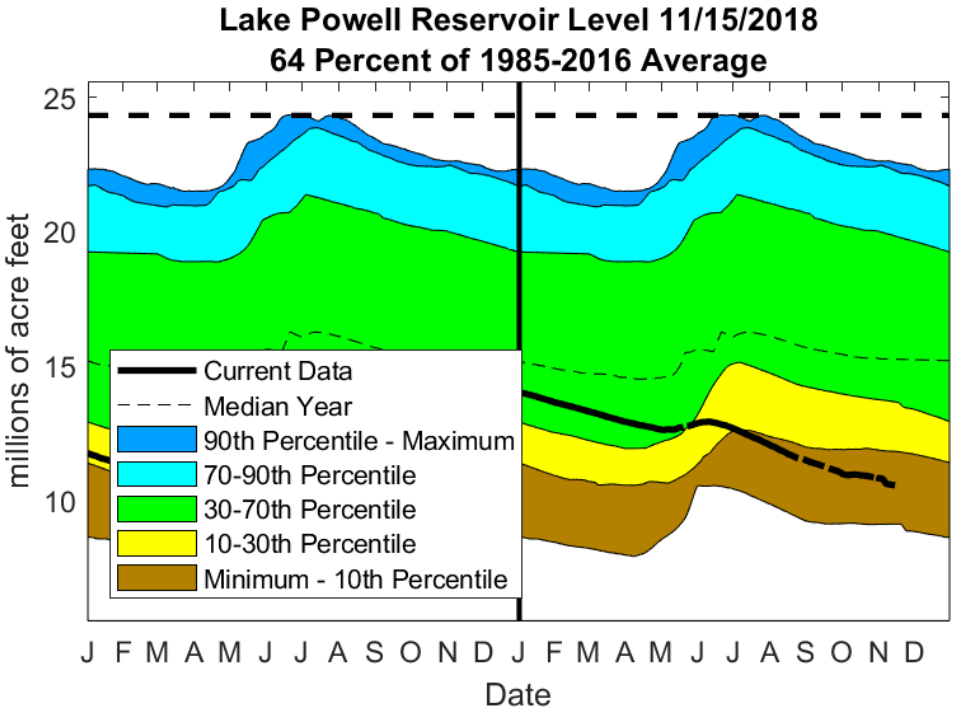


March 2018 Water Supply Outlook


USGS 09379500 SAN JUAN RIVER NEAR BLUFF, UT
(Drainage area: 23000 square miles, length of record: 91 - 94 years)
7-day average discharge, in cubic feet per second
30000
10000
1000
100
10
1
0.1
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2017
2018
USGS WaterWatch
Last updated: 2019-01-06

Colorado's largest reservoir





The Upper Basin states "bank account"

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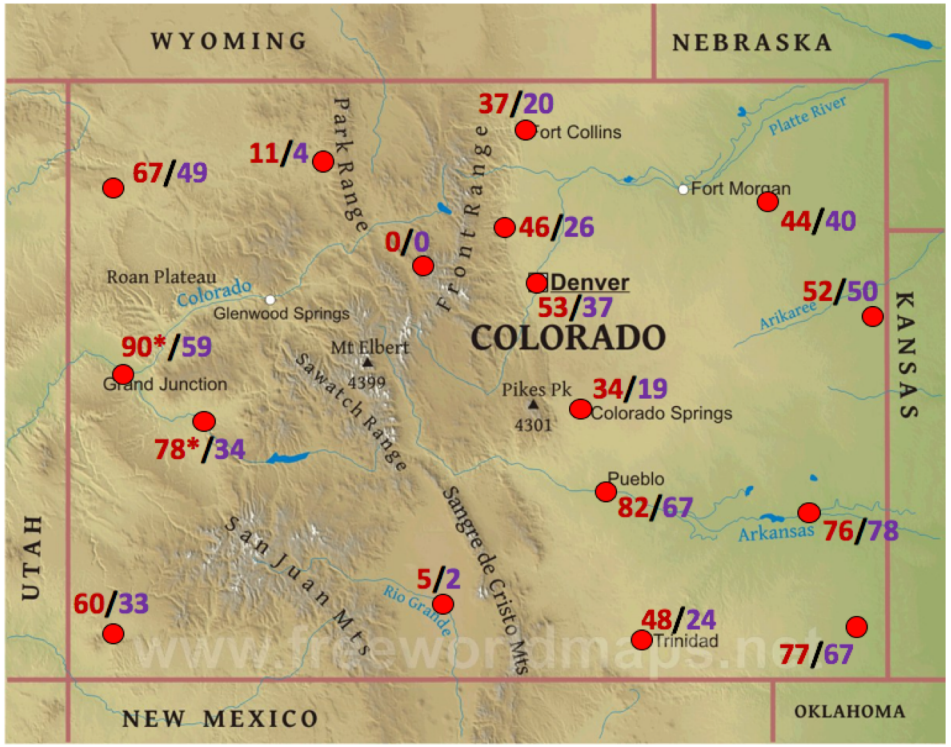
Exceptional Drought

Summer 2018:

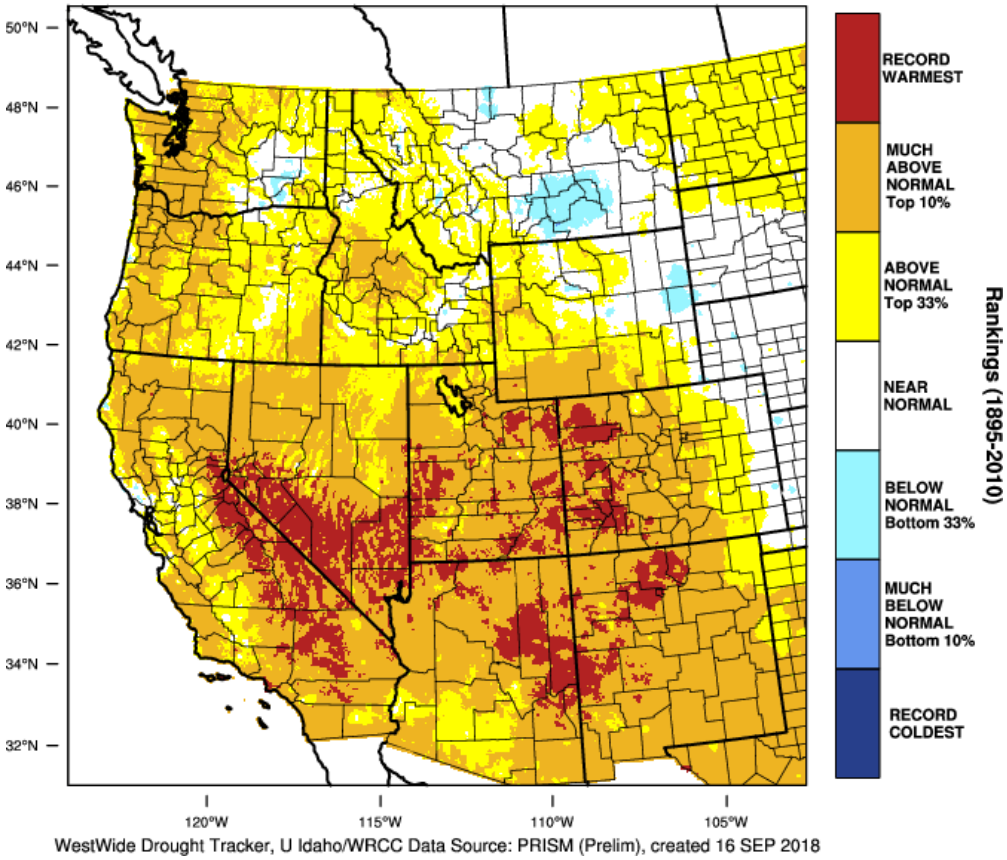
The heat is on

Number of 90 Degree Days



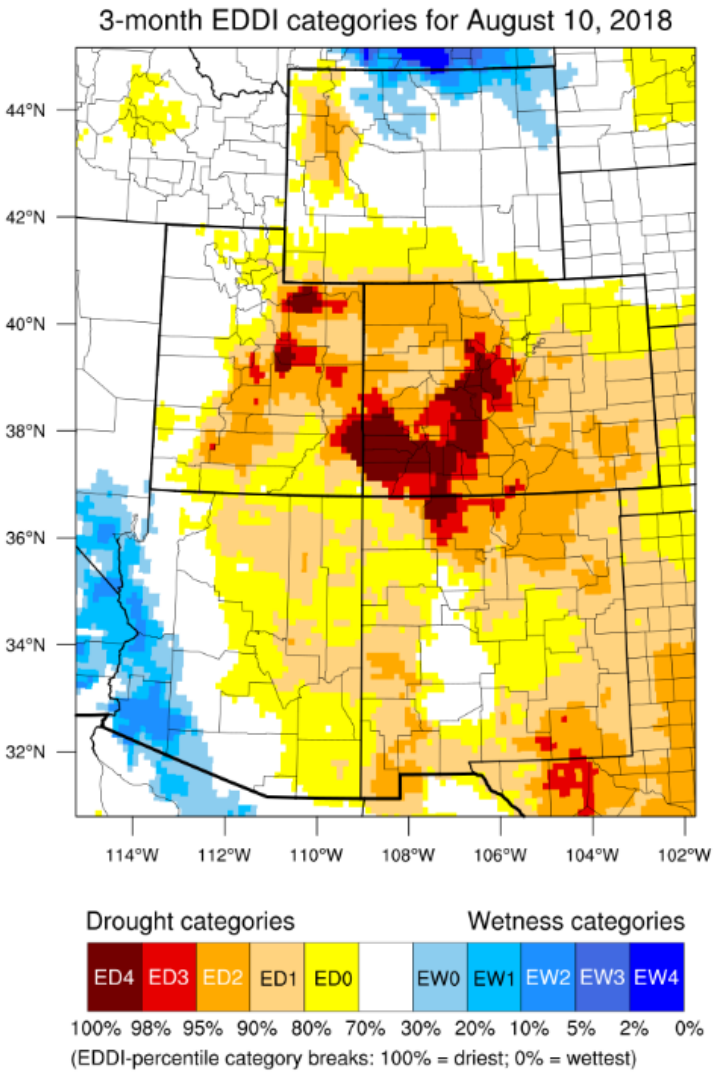
Western United States - Mean Temperature

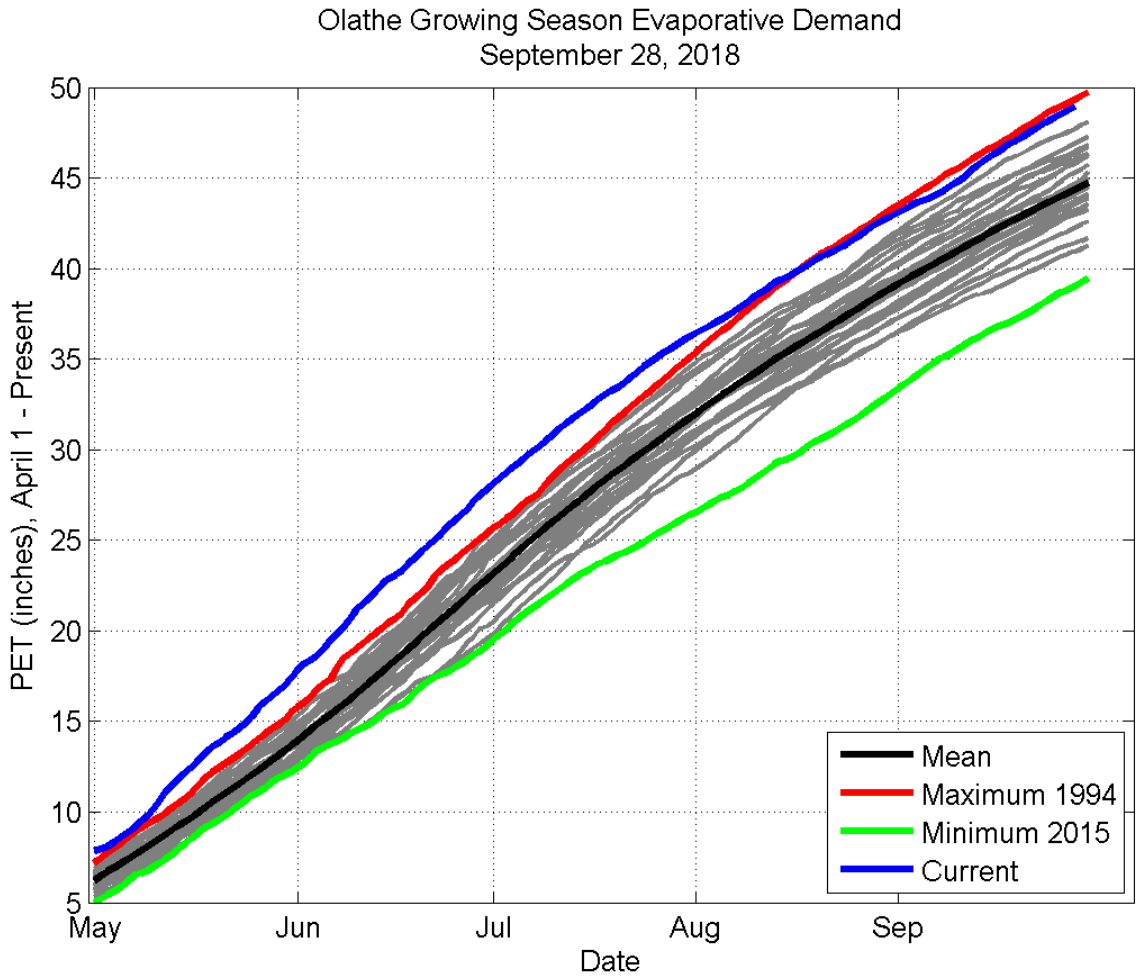
June-August 2018 Percentile



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

Evaporative Demand Drought Index (NOAA ESRL)





Colorado Agricultural Meteorological Network

CoAgMET

coagmet.colostate.edu

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Impacts & response

farming and ranching

forests and wildfire

recreation and economy

water supply

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Mountain Town News

A Colorado winter to remember so far, but for entirely the wrong reason

by Allen Best

THE Durango HERALD

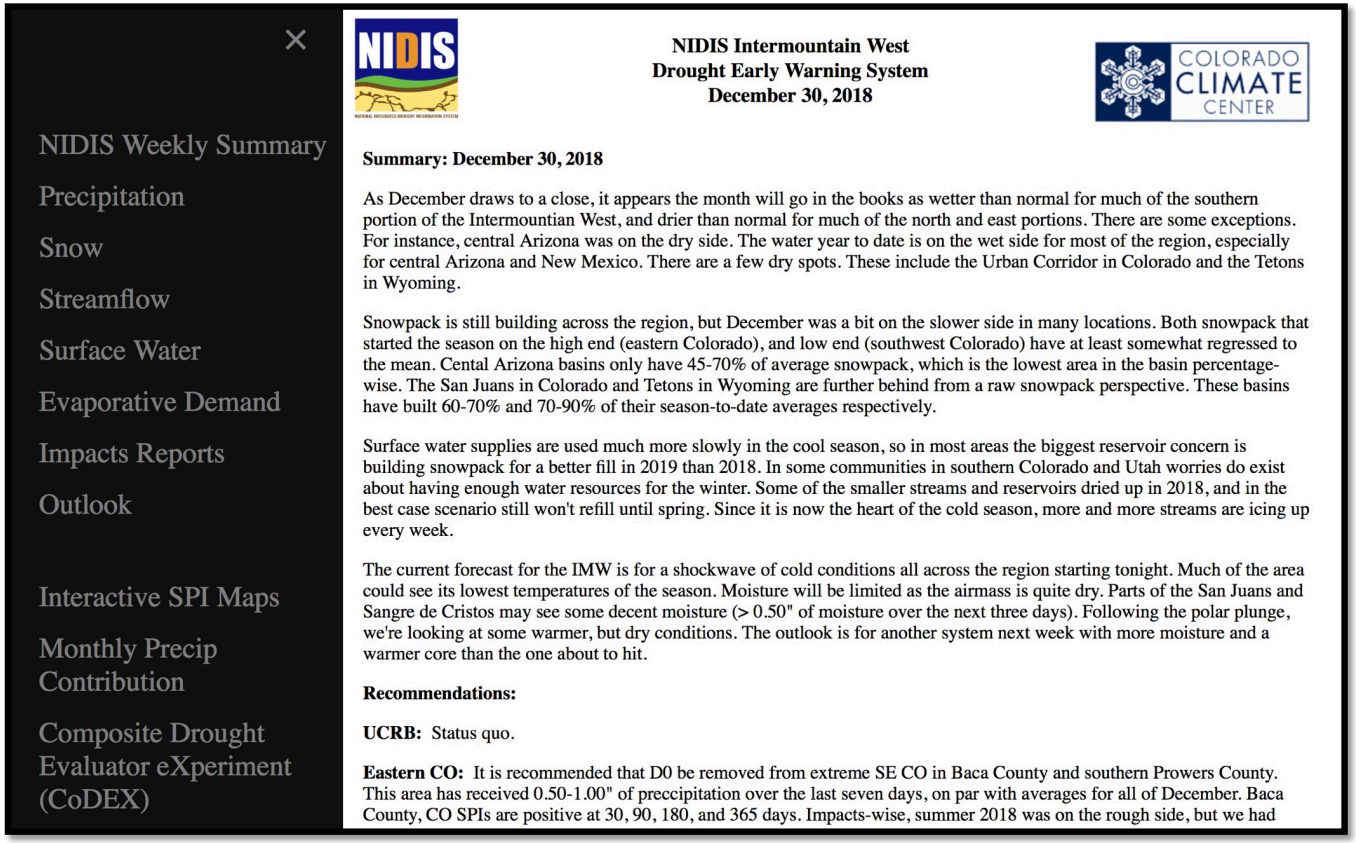
Durango train faces tough questions going forward

Large water cars such as this one are used for fighting fires along the Durango & Silverton Narrow Gauge Railroad tracks. D&SNG Owner Al Harper says the railroad will re-evaluate its firefighting measures in light of the 416 Fire. While no official cause of the fire has been determined, Harper said extreme drought conditions pose new risks along the 45-mile route.

Durango Herald file

Not since the Missionary Ridge Fire in 2002 has the Durango & Silverton Narrow Gauge Railroad been out of service for so long over the summer months.

“Drought Early Warning” starts with constant monitoring…



- NIDIS Weekly Summary
- Precipitation
- Snow
- Streamflow
- Surface Water
- Evaporative Demand
- Impacts Reports
- Outlook
- Interactive SPI Maps
- Monthly Precip Contribution
- Composite Drought Evaluator eXperiment (CoDEX)

NIDIS Intermountain West
Drought Early Warning System
December 30, 2018

Summary: December 30, 2018

As December draws to a close, it appears the month will go in the books as wetter than normal for much of the southern portion of the Intermountian West, and drier than normal for much of the north and east portions. There are some exceptions. For instance, central Arizona was on the dry side. The water year to date is on the wet side for most of the region, especially for central Arizona and New Mexico. There are a few dry spots. These include the Urban Corridor in Colorado and the Tetons in Wyoming.

Snowpack is still building across the region, but December was a bit on the slower side in many locations. Both snowpack that started the season on the high end (eastern Colorado), and low end (southwest Colorado) have at least somewhat regressed to the mean. Cental Arizona basins only have 45-70% of average snowpack, which is the lowest area in the basin percentage-wise. The San Juans in Colorado and Tetons in Wyoming are further behind from a raw snowpack perspective. These basins have built 60-70% and 70-90% of their season-to-date averages respectively.

Surface water supplies are used much more slowly in the cool season, so in most areas the biggest reservoir concern is building snowpack for a better fill in 2019 than 2018. In some communities in southern Colorado and Utah worries do exist about having enough water resources for the winter. Some of the smaller streams and reservoirs dried up in 2018, and in the best case scenario still won't refill until spring. Since it is now the heart of the cold season, more and more streams are icing up every week.

The current forecast for the IMW is for a shockwave of cold conditions all across the region starting tonight. Much of the area could see its lowest temperatures of the season. Moisture will be limited as the airmass is quite dry. Parts of the San Juans and Sangre de Cristos may see some decent moisture (> 0.50" of moisture over the next three days). Following the polar plunge, we're looking at some warmer, but dry conditions. The outlook is for another system next week with more moisture and a warmer core than the one about to hit.

Recommendations:

UCRB: Status quo.

Eastern CO: It is recommended that D0 be removed from extreme SE CO in Baca County and southern Prowers County. This area has received 0.50-1.00" of preccipitation over the last seven days, on par with averages for all of December. Baca County, CO SPIs are positive at 30, 90, 180, and 365 days. Impacts-wise, summer 2018 was on the rough side, but we had

http://climate.colostate.edu/~drought


Southwest
Drought Webinar Series
Monday, June 25, 2018
2:00 pm - 3:00 pm MDT
Due to the severity of drought conditions in the Southwest, a collaboration of experts are providing up-to-date information on drought in the region, including portions of Colorado, Arizona, New Mexico, and Utah. This webinar will also cover monsoon predictions for the Southwest.
Drought.gov
NDMC
AASC
AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS
USDA
COLORADO CLIMATE CENTER
NOAA
NIDIS

Data sources

- WestWide Drought Tracker: https://wrcc.dri.edu/wwdt/
- U.S. Drought Monitor: https://droughtmonitor.unl.edu
- NRCS SNOTEL Western Mapping: https://www.wcc.nrcs.usda.gov/webmap/
- NRCS Colorado Snow Survey: https://www.nrcs.usda.gov/wps/portal/nrcs/main/co/snow/
- Colorado Basin River Forecast Center: https://www.cbrfc.noaa.gov
- USGS Streamflow: https://waterwatch.usgs.gov
- Evaporative Demand Drought Index (EDDI): https://www.esrl.noaa.gov/psd/eddi/realtime_maps/
- National Integrated Drought Information System (NIDIS): https://drought.gov
- **Join our next Intermountain West Drought Webinar!**
  - **http://climate.colostate.edu/webinar_registration.html**

Thank you

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