

Another Crazy year in Colorado – Where does 2012 Fit in the Bigger “Climate” Picture?

An aerial photograph showing a massive plume of dark smoke billowing from a wildfire in a mountainous, forested area. The smoke is thick and extends across a significant portion of the frame, obscuring parts of the surrounding hills and valleys. In the background, snow-capped mountain peaks are visible under a clear blue sky.

Nolan Doesken

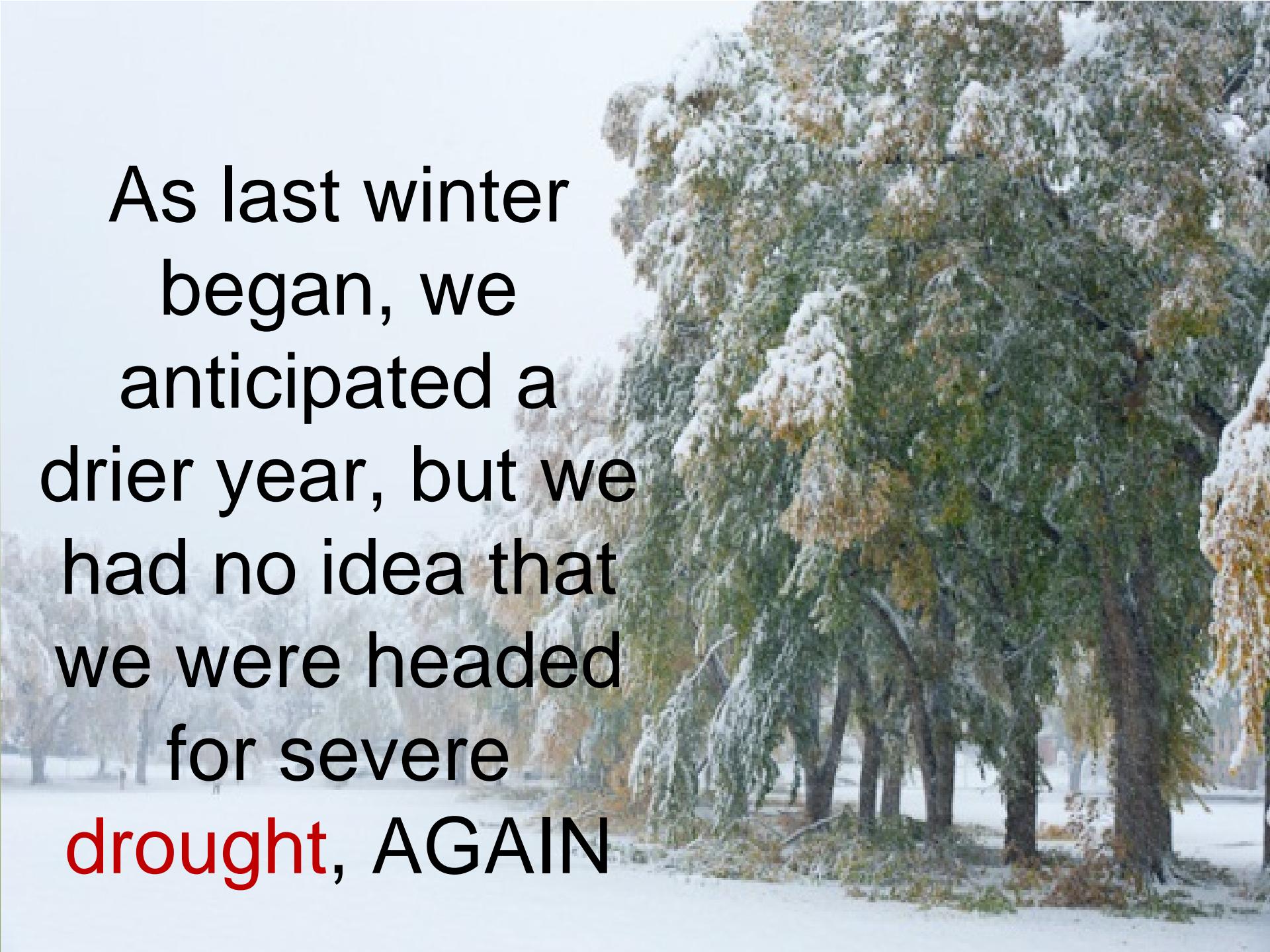
Colorado State Climatologist

Presented at the 2012 South Platte Forum

Longmont, Colorado

October 25, 2012

As last winter
began, we
anticipated a
drier year, but we
had no idea that
we were headed
for severe
drought, AGAIN

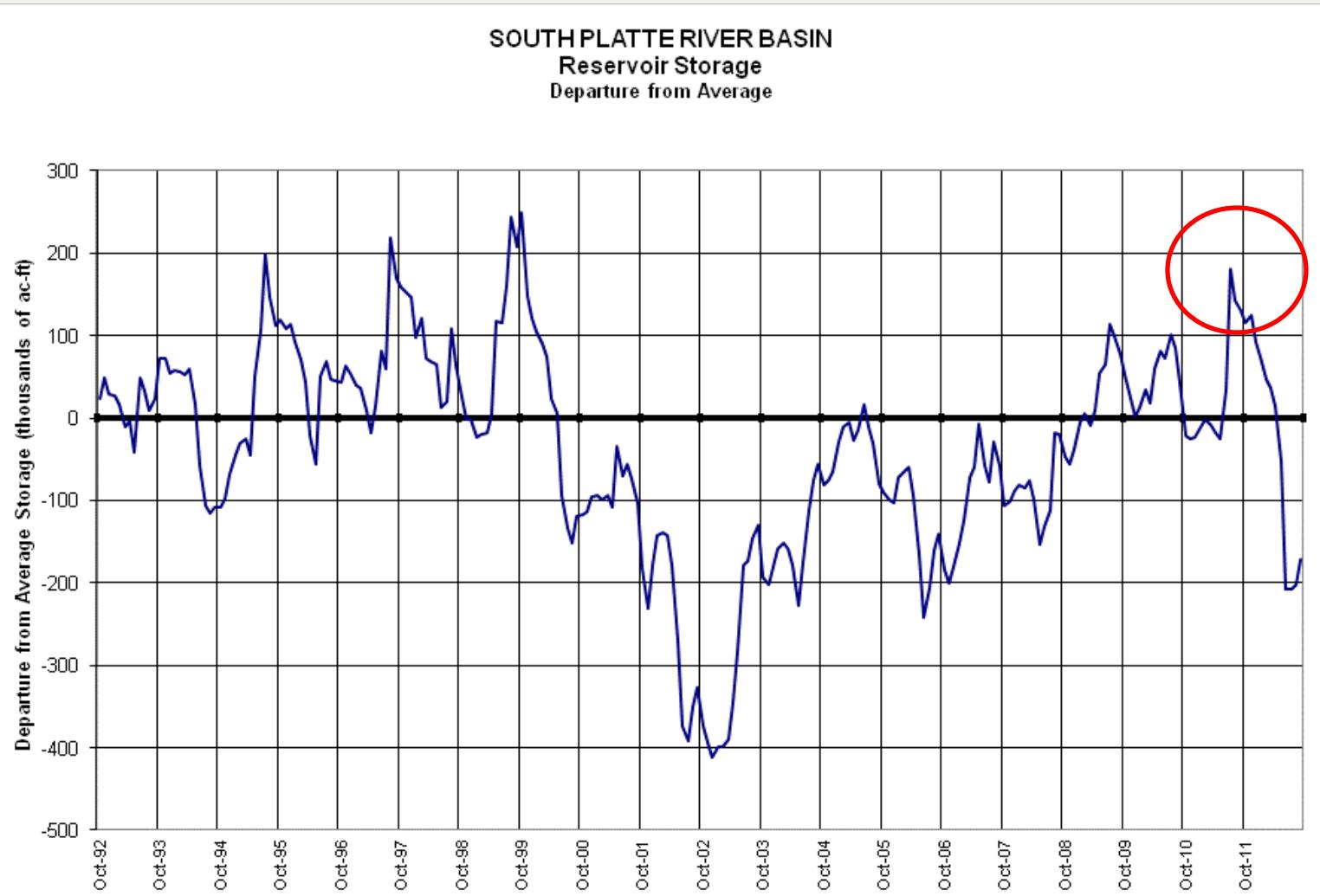


We had just “enjoyed” a year
(2011) with incredible snowpack
and generous streamflow

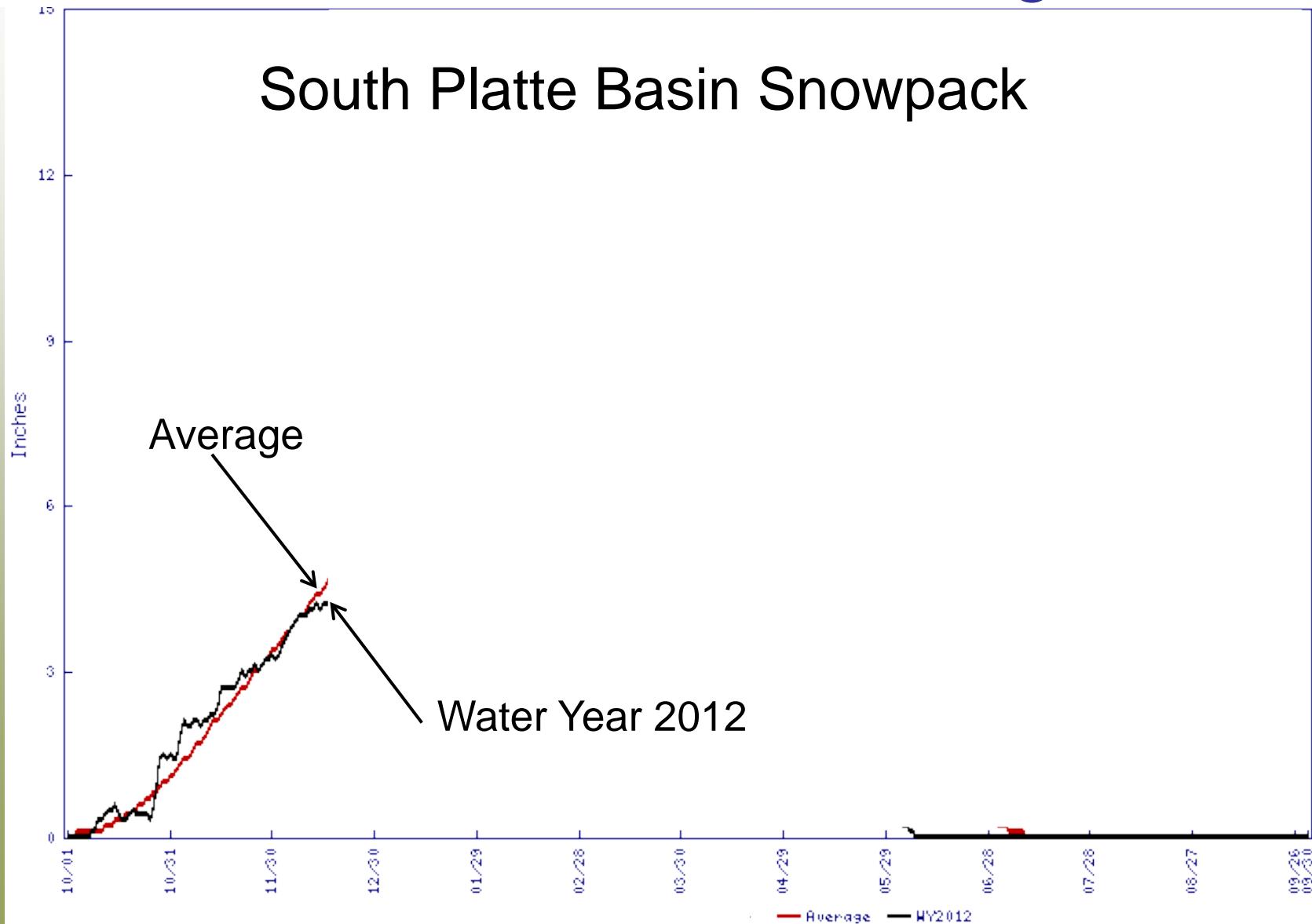


Cache La Poudre near Greeley, June 2011

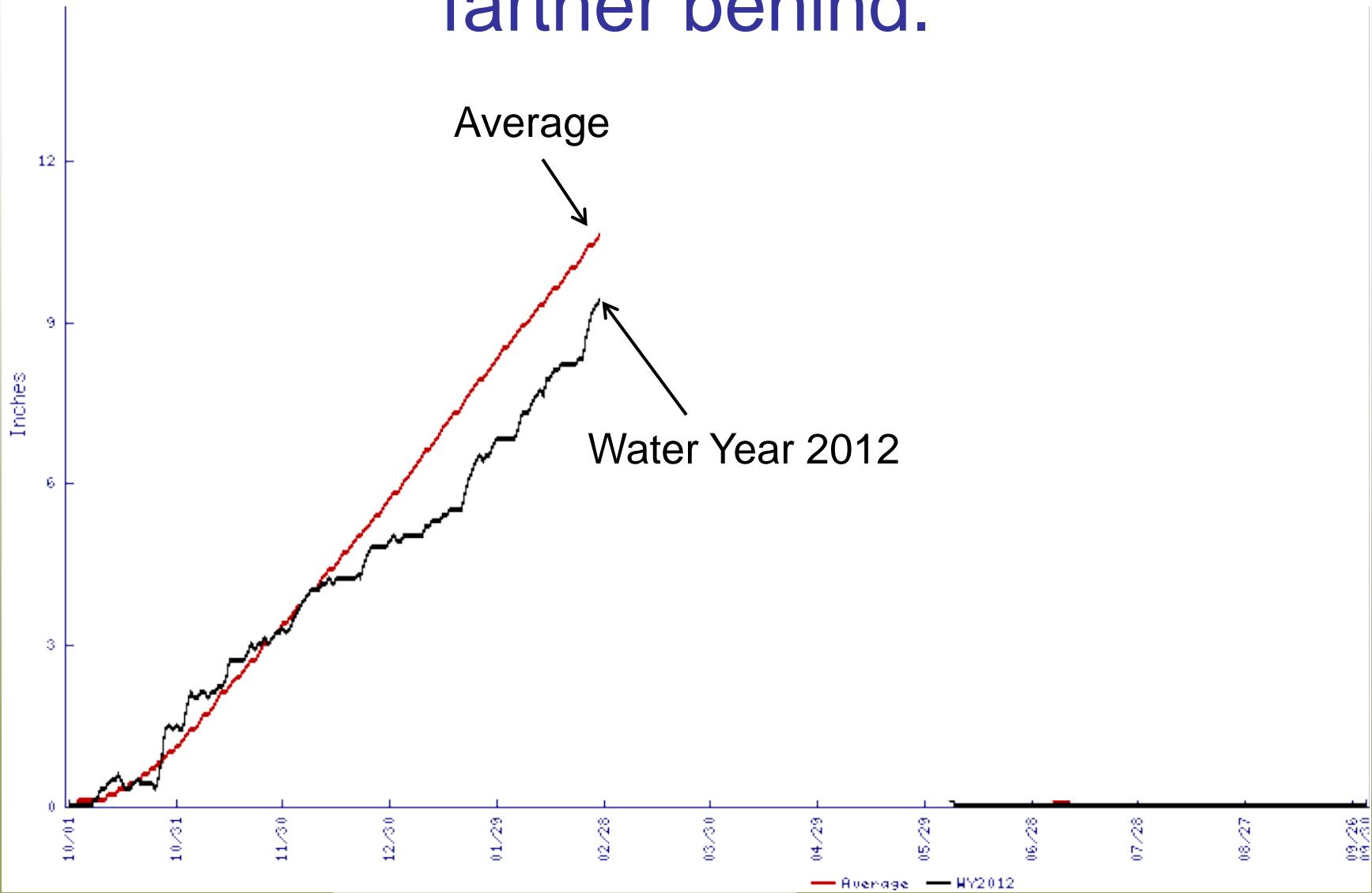
Despite a hot late summer in 2011,
we still ended the year with
abundant water supplies



This past winter snowpack got off to a “normal” start. Life looked good!

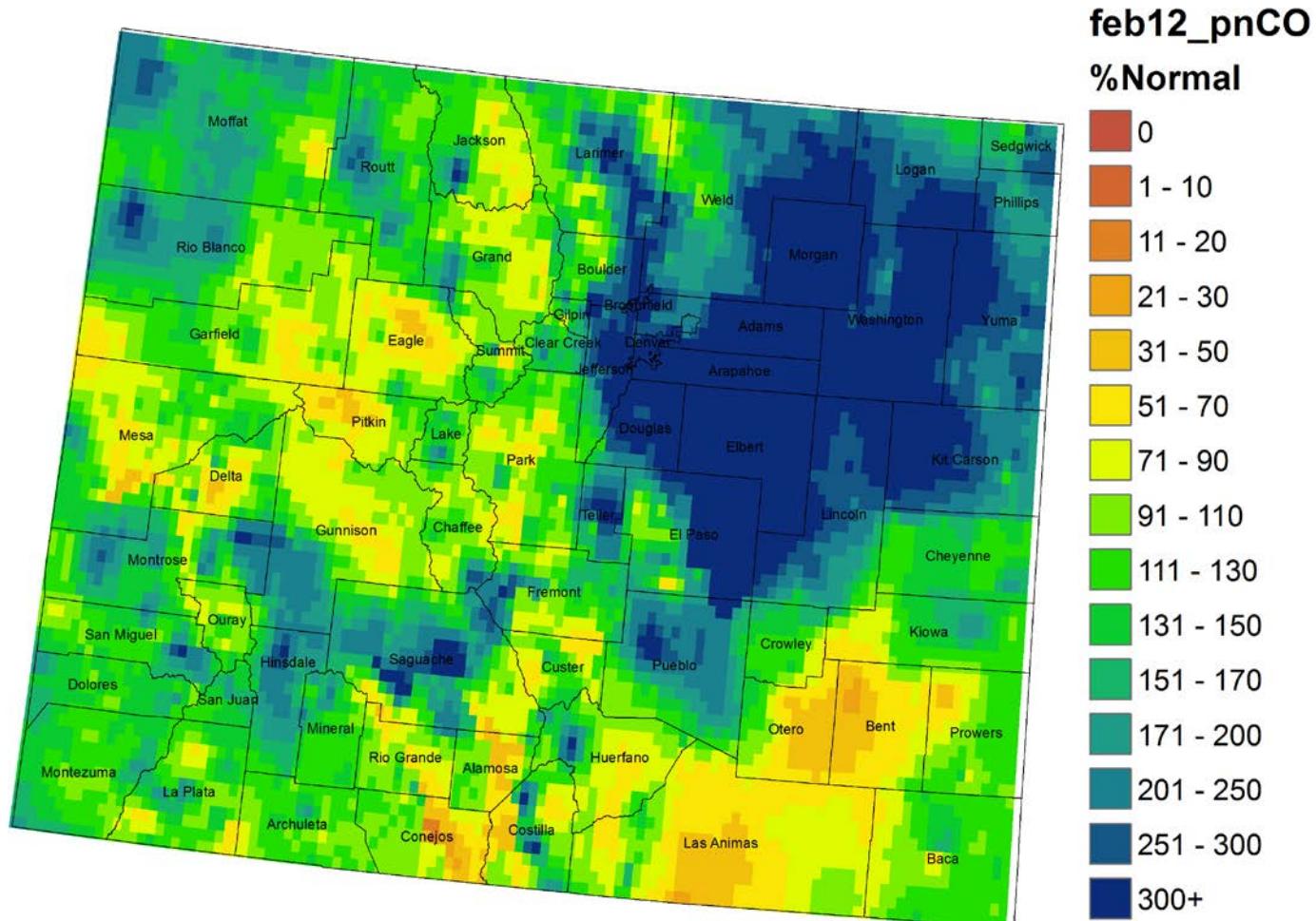


The high mountain snows then became fewer and lighter, and we gradually fell farther behind.



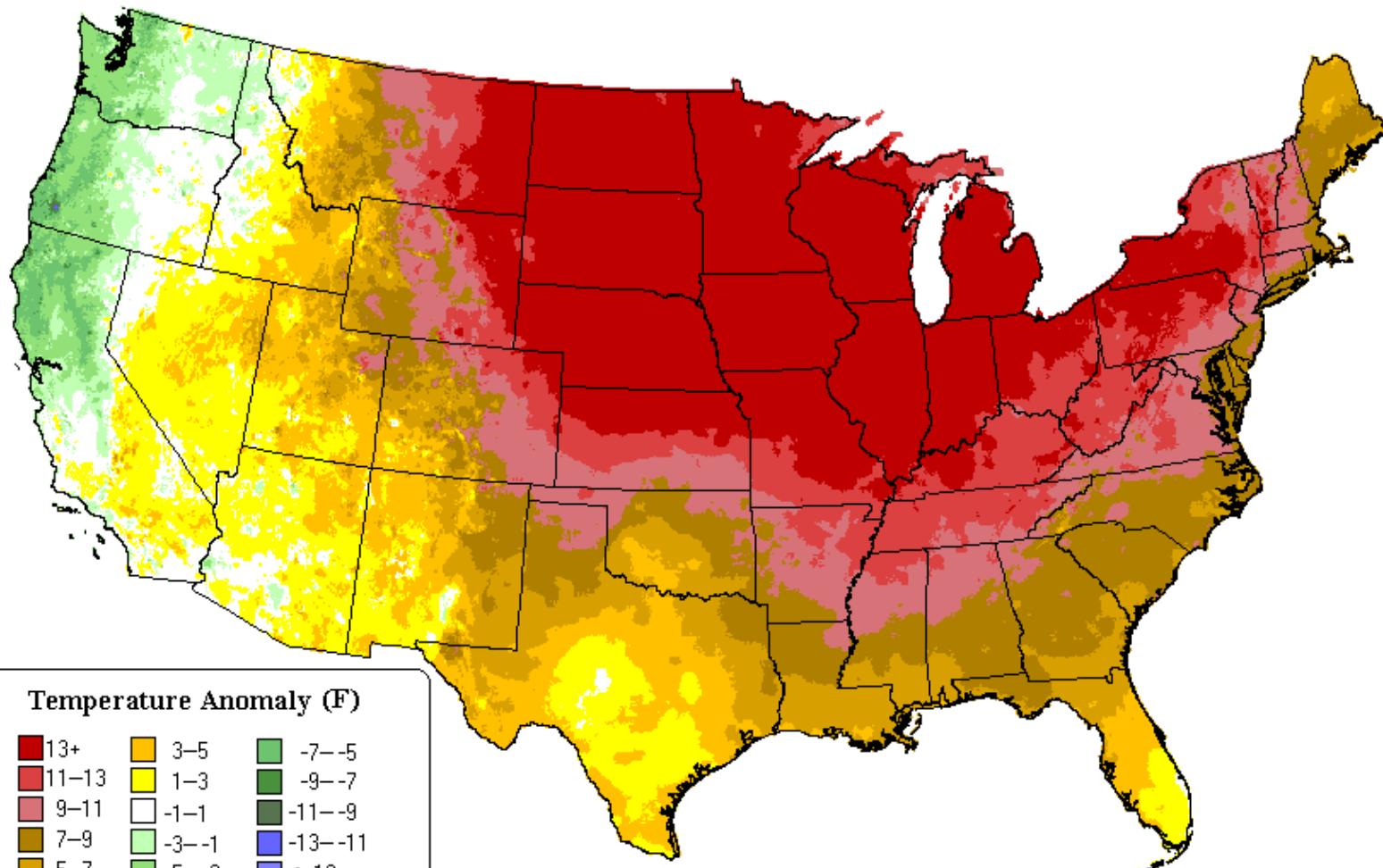
With generous February snowfall along the Front Range, drought still seemed very distant.

Colorado February 2012 Precipitation as Percentage of Normal



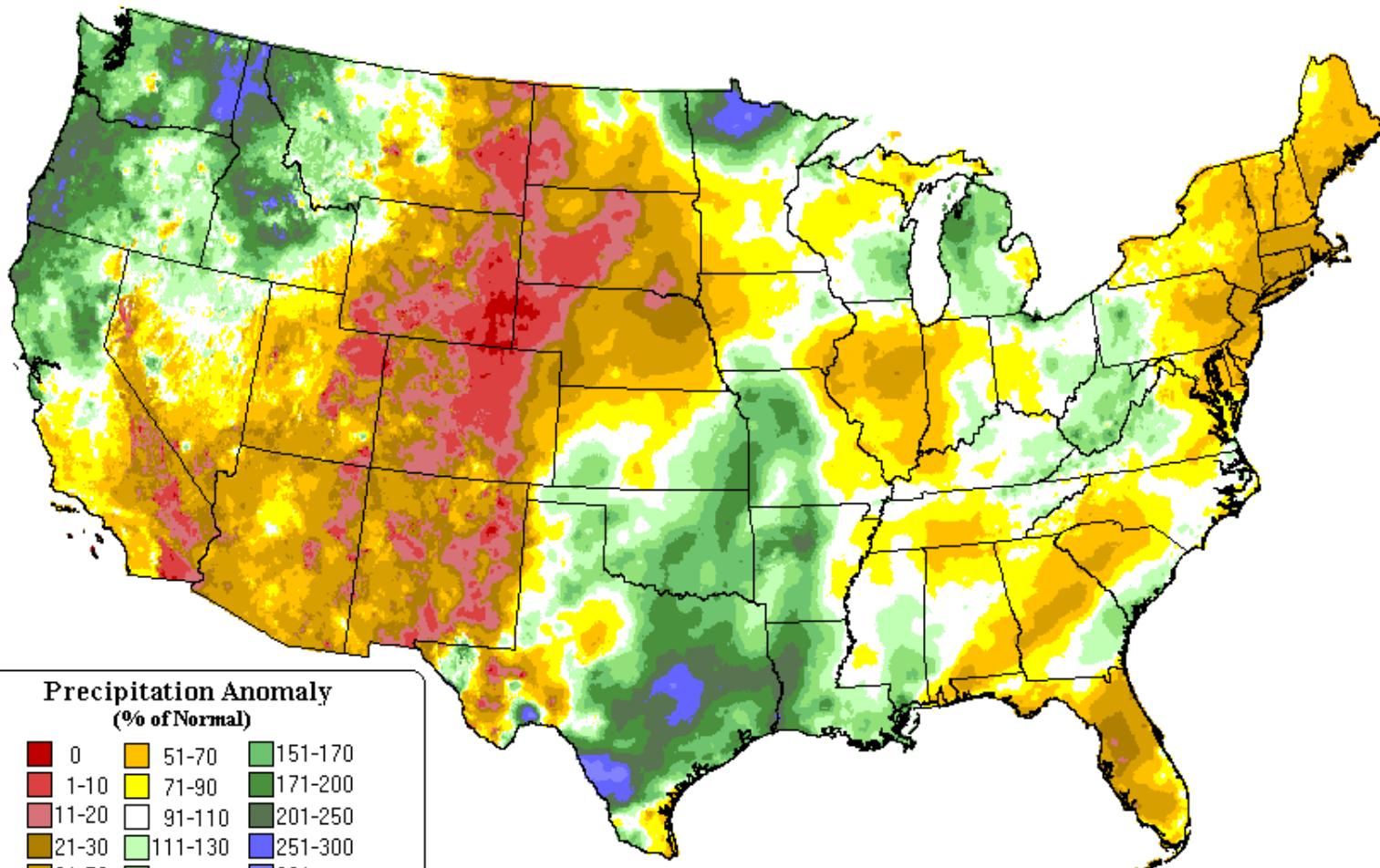
Then came March 2012 – the game changer

Maximum Temperature Anomaly: Mar 2012
Final Data



March 2012 Precipitation as percent of Average – DRY!

Precipitation Anomaly: Mar 2012
Final Data



Copyright (c) 2012, PRISM Climate Group, Oregon State University
<http://prism.oregonstate.edu> - Map created Sep 07 2012

With bare ground showing way too early...

Looking NW from Copper
Mountain

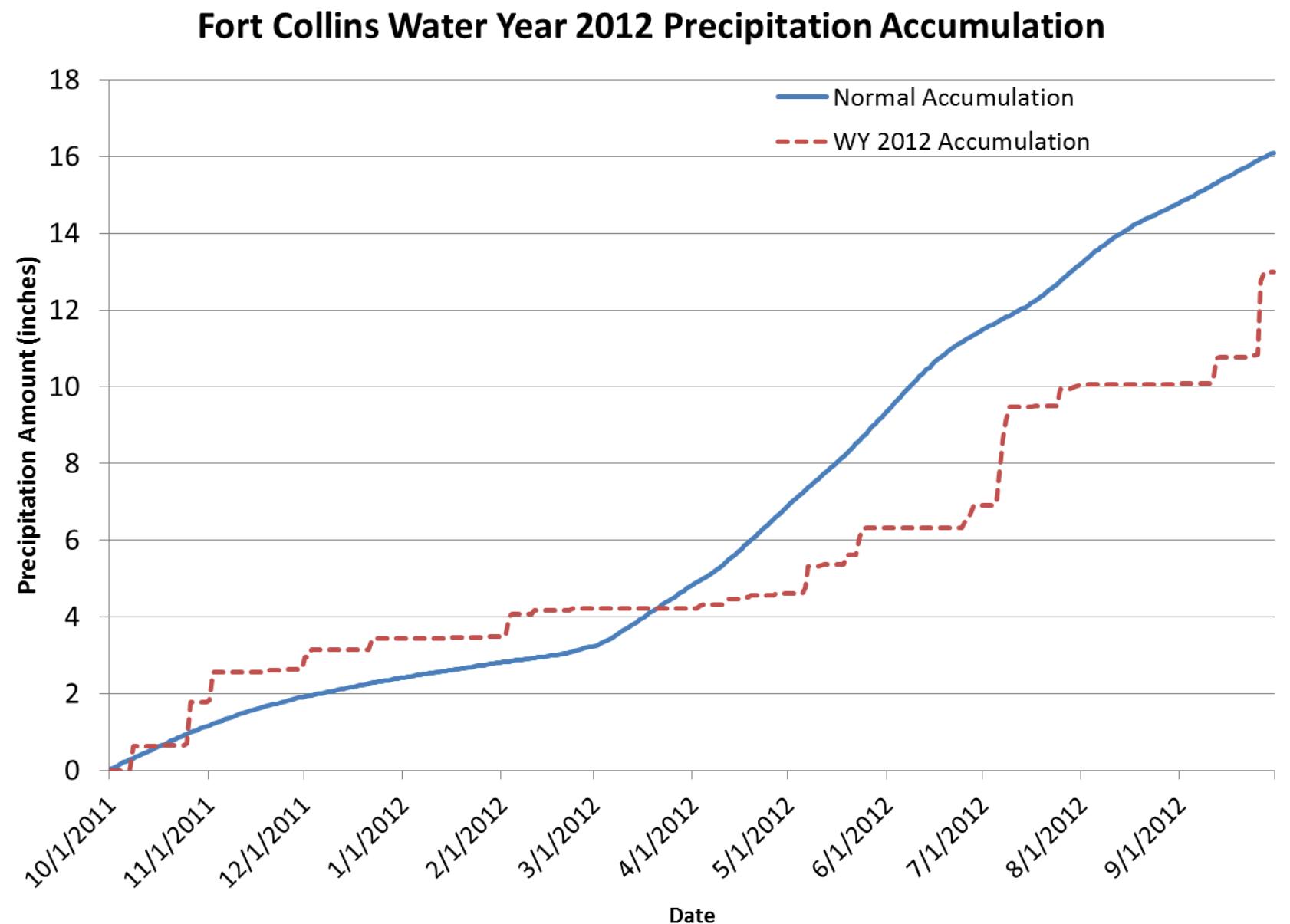
March 24, 2012

A lot of bare ground showing
-- trouble brewing --

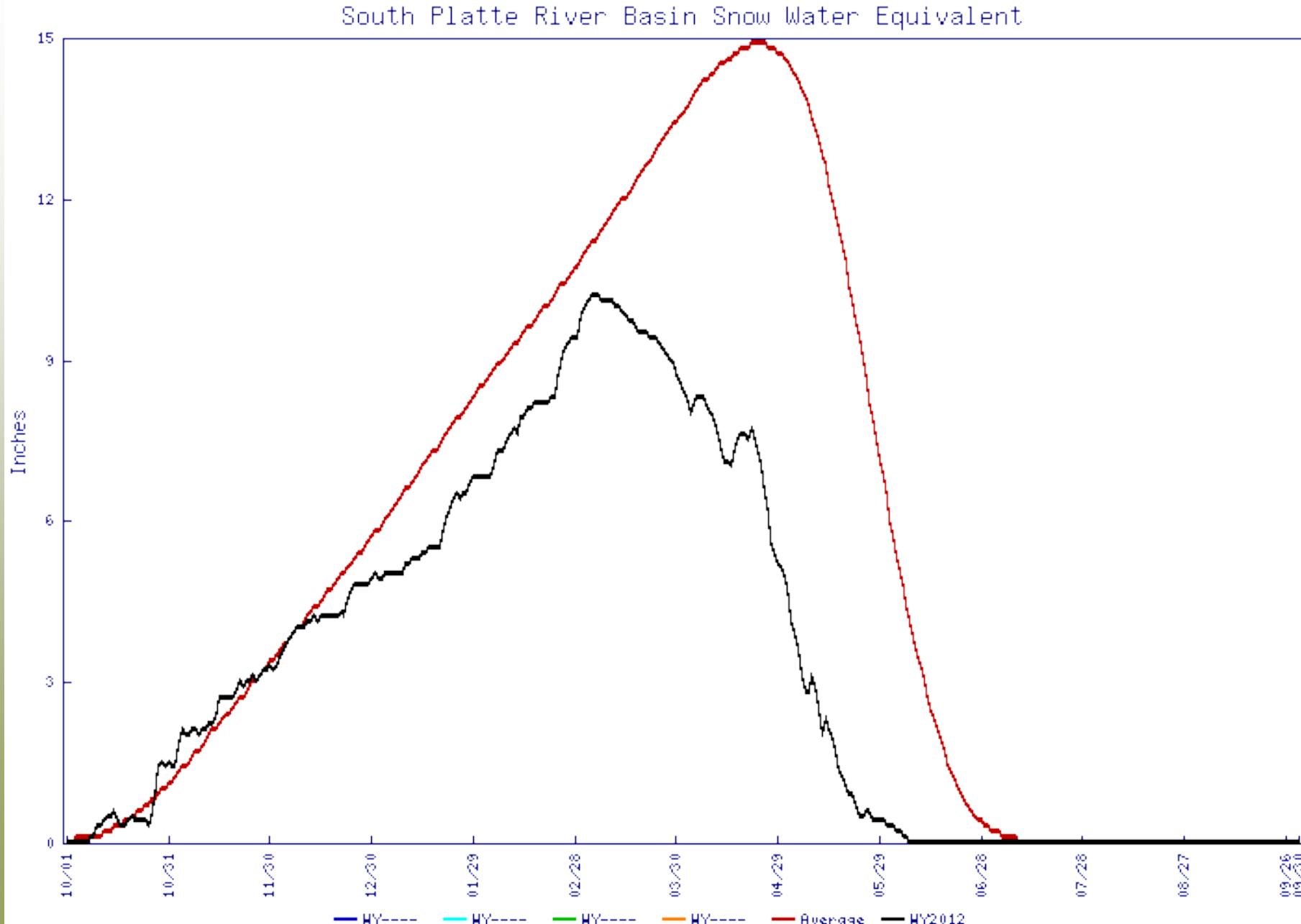


We were playing catch up

Our spring storms were fewer and weaker

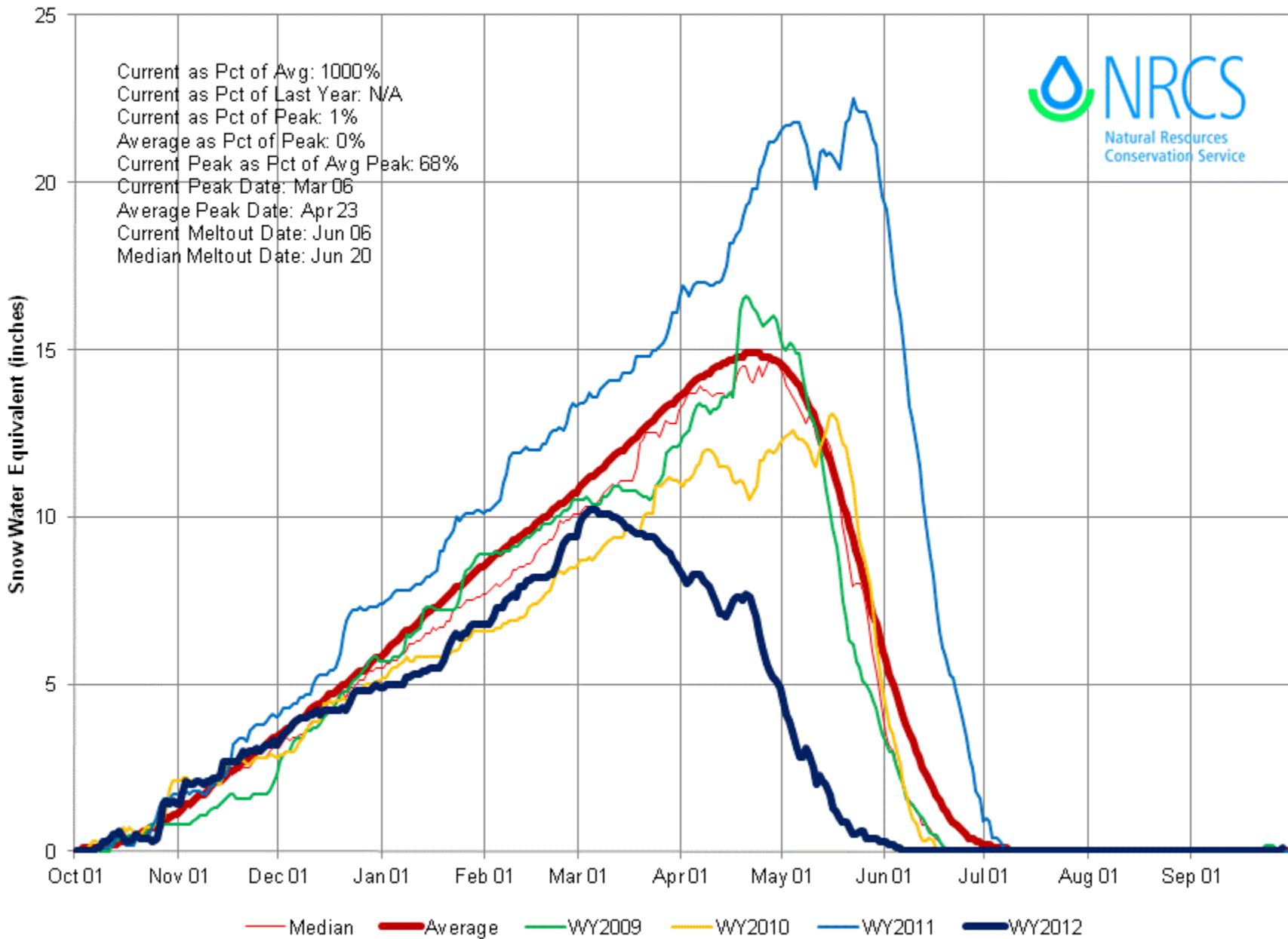


Snow melted fast and early

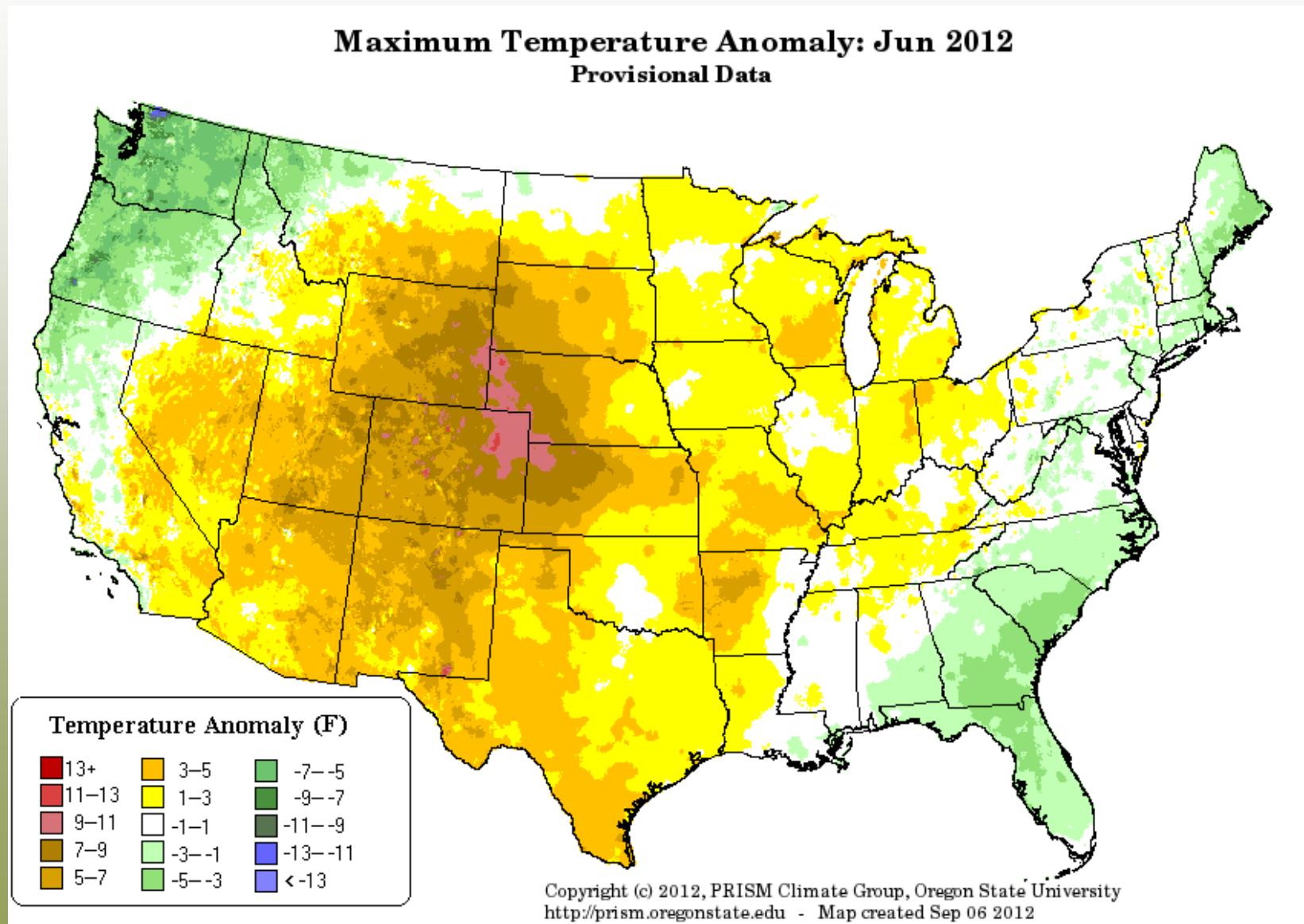


South Platte River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Sep 28, 2012



Then came June, and we were immediately engulfed by midsummer heat.



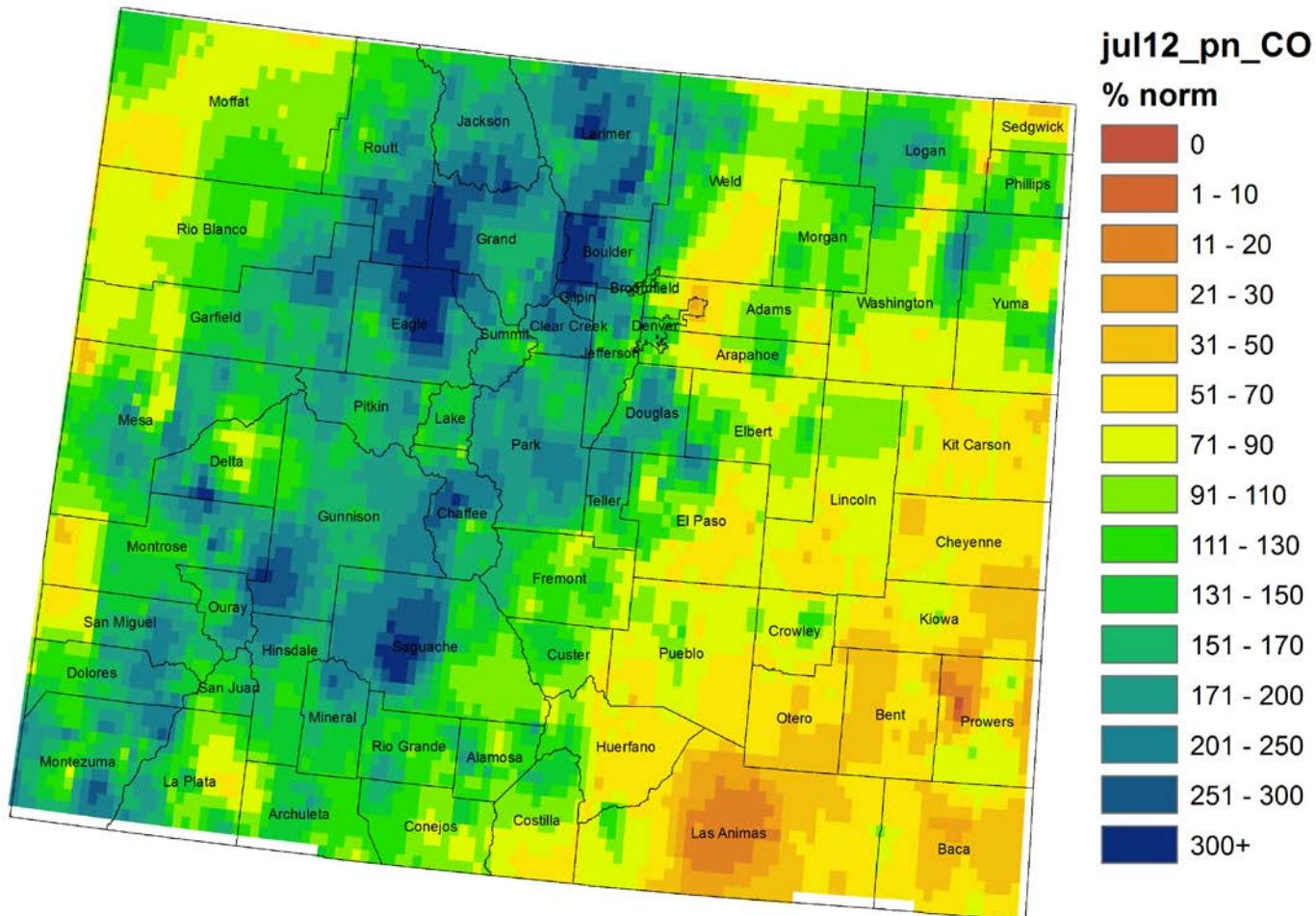


You'll recall the
impacts!



July rains were beneficial in the South Platte Basin and parts of W Colorado

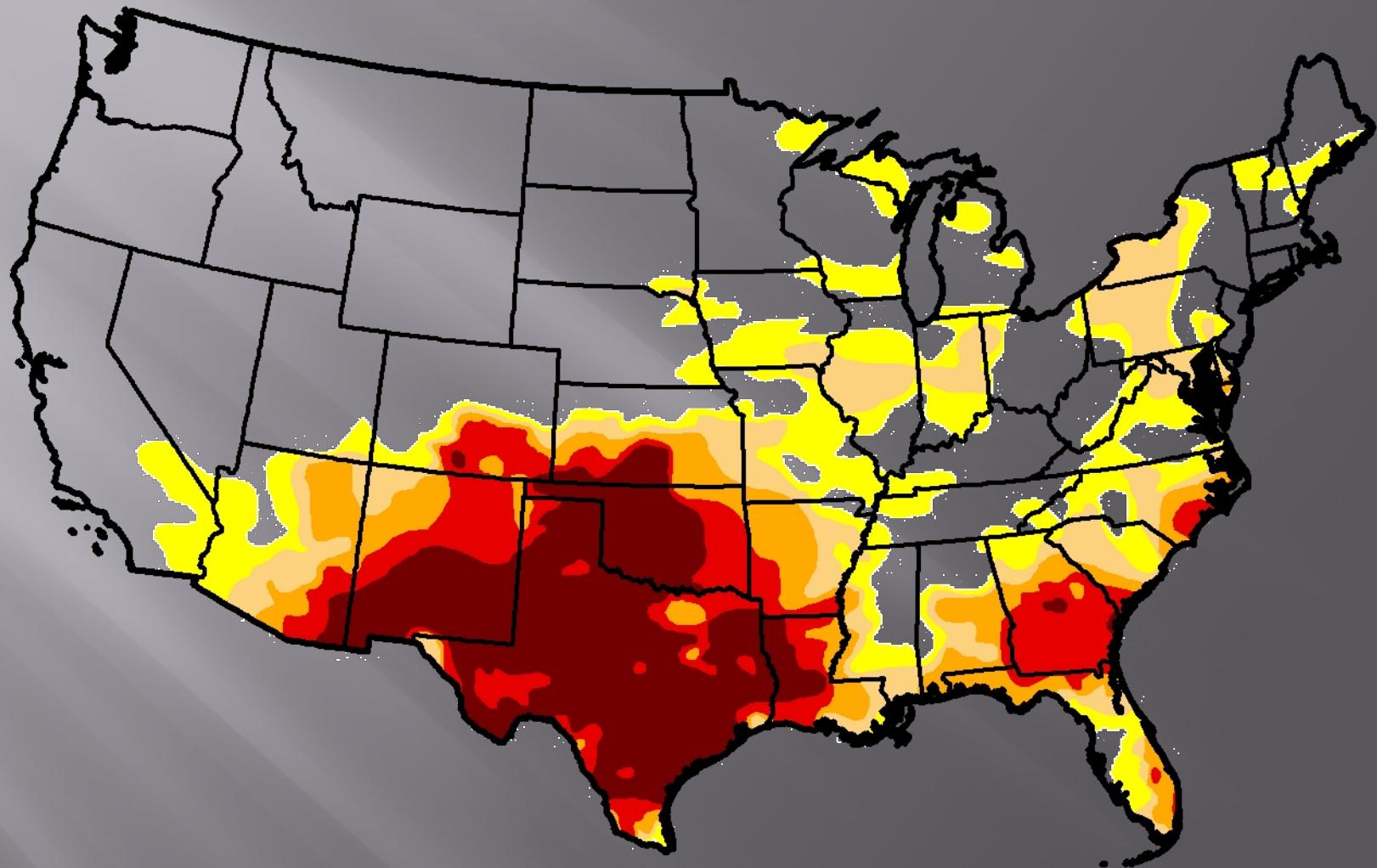
Colorado July 2012 Precipitation
as Percentage of Normal



A wide-angle photograph of a vast, dry, cracked landscape under a clear blue sky. The foreground is filled with a dense network of deep, brownish cracks in the earth, indicating severe drought. Sparse, small green shrubs are scattered across the horizon. The horizon line is flat and stretches far into the distance.

But summer heat persisted
and the U.S. drought spread

USDM: August 2011



Drought Severity



D0 - Abnormally Dry



D1 Drought - Moderate



D2 Drought - Severe



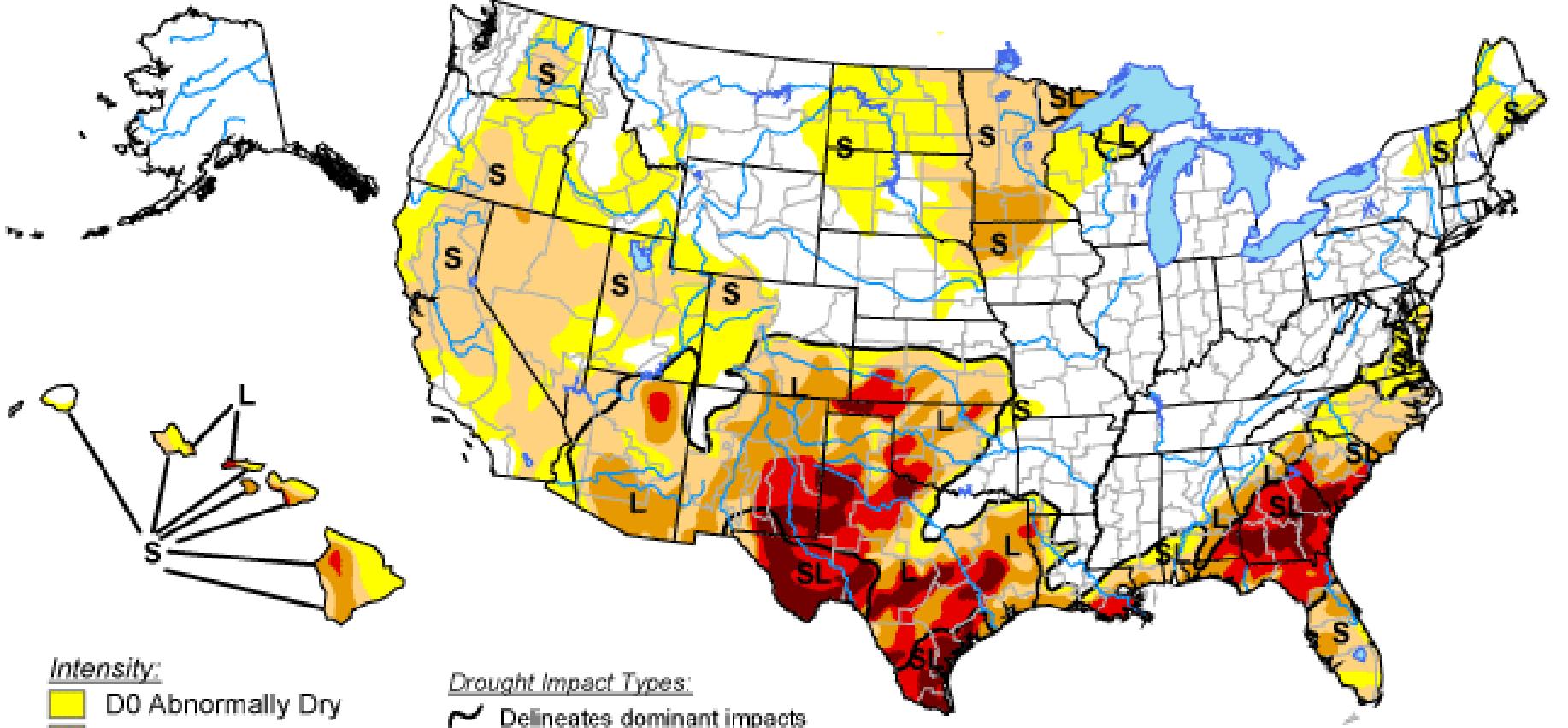
D3 Drought - Extreme



D4 Drought - Exceptional

U.S. Drought Monitor

February 7, 2012
Valid 7 a.m. EST



Intensity:

- [Yellow] D0 Abnormally Dry
- [Light Orange] D1 Drought - Moderate
- [Orange] D2 Drought - Severe
- [Red] D3 Drought - Extreme
- [Dark Red] D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

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

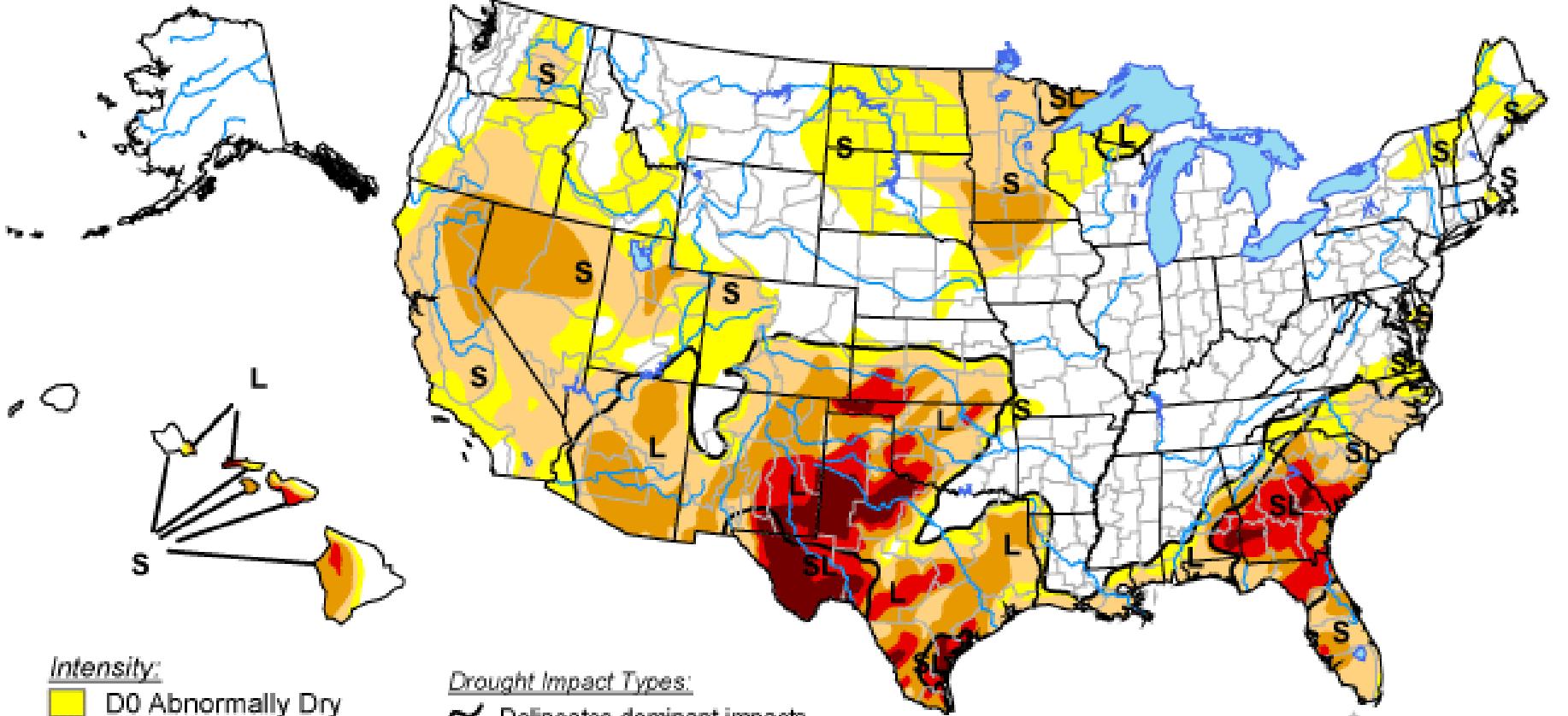
<http://droughtmonitor.unl.edu/>



Released Thursday, February 9, 2012
Author: Rich Tinker, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

March 6, 2012
Valid 7 a.m. EST



Intensity:

- [Yellow] D0 Abnormally Dry
- [Orange] D1 Drought - Moderate
- [Dark Orange] D2 Drought - Severe
- [Red] D3 Drought - Extreme
- [Dark Red] D4 Drought - Exceptional

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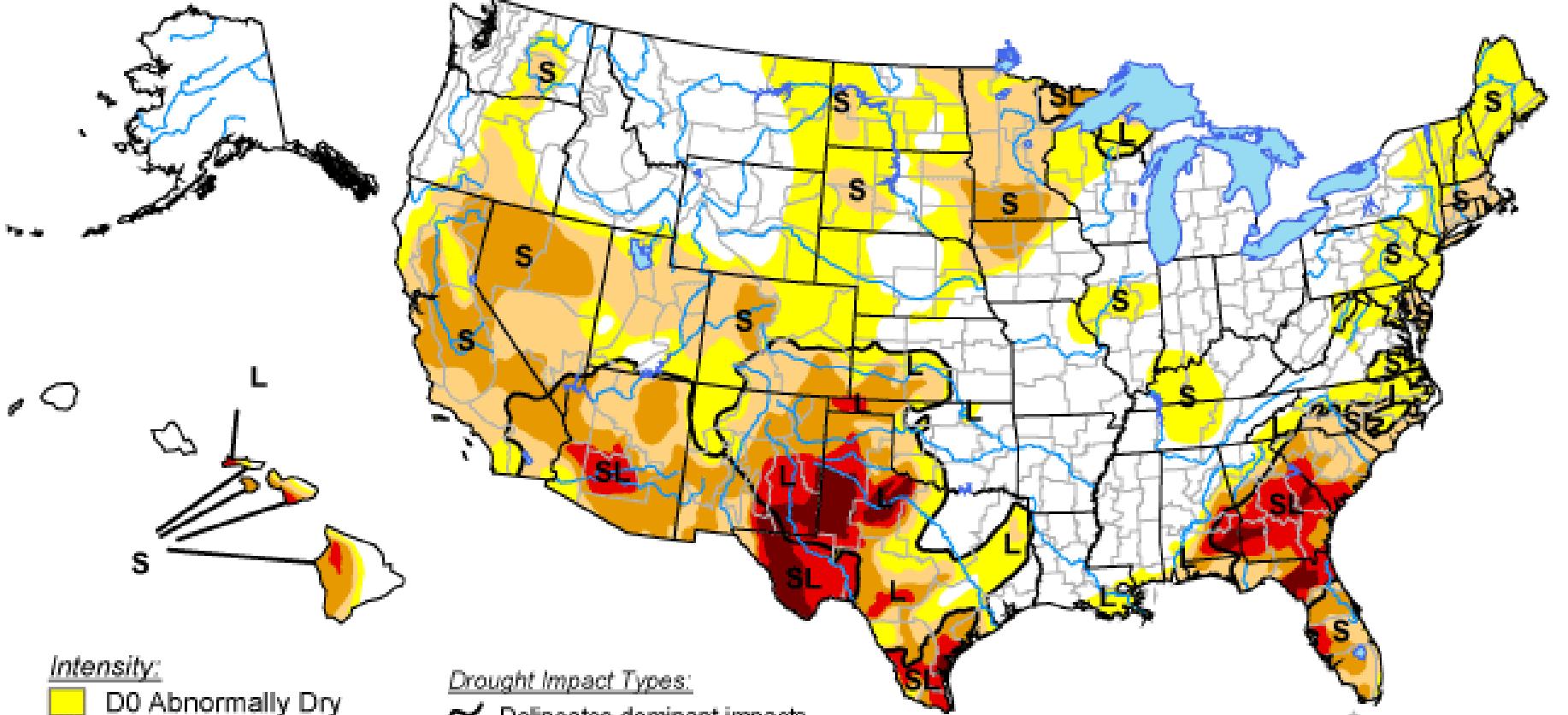
Author: Michael Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC



Released Thursday, March 8, 2012

U.S. Drought Monitor

April 3, 2012
Valid 7 a.m. EDT



Intensity:

- [Yellow square] D0 Abnormally Dry
- [Orange square] D1 Drought - Moderate
- [Dark Orange square] D2 Drought - Severe
- [Red square] D3 Drought - Extreme
- [Dark Red square] D4 Drought - Exceptional

Drought Impact Types:

- [Wavy line symbol] Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

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

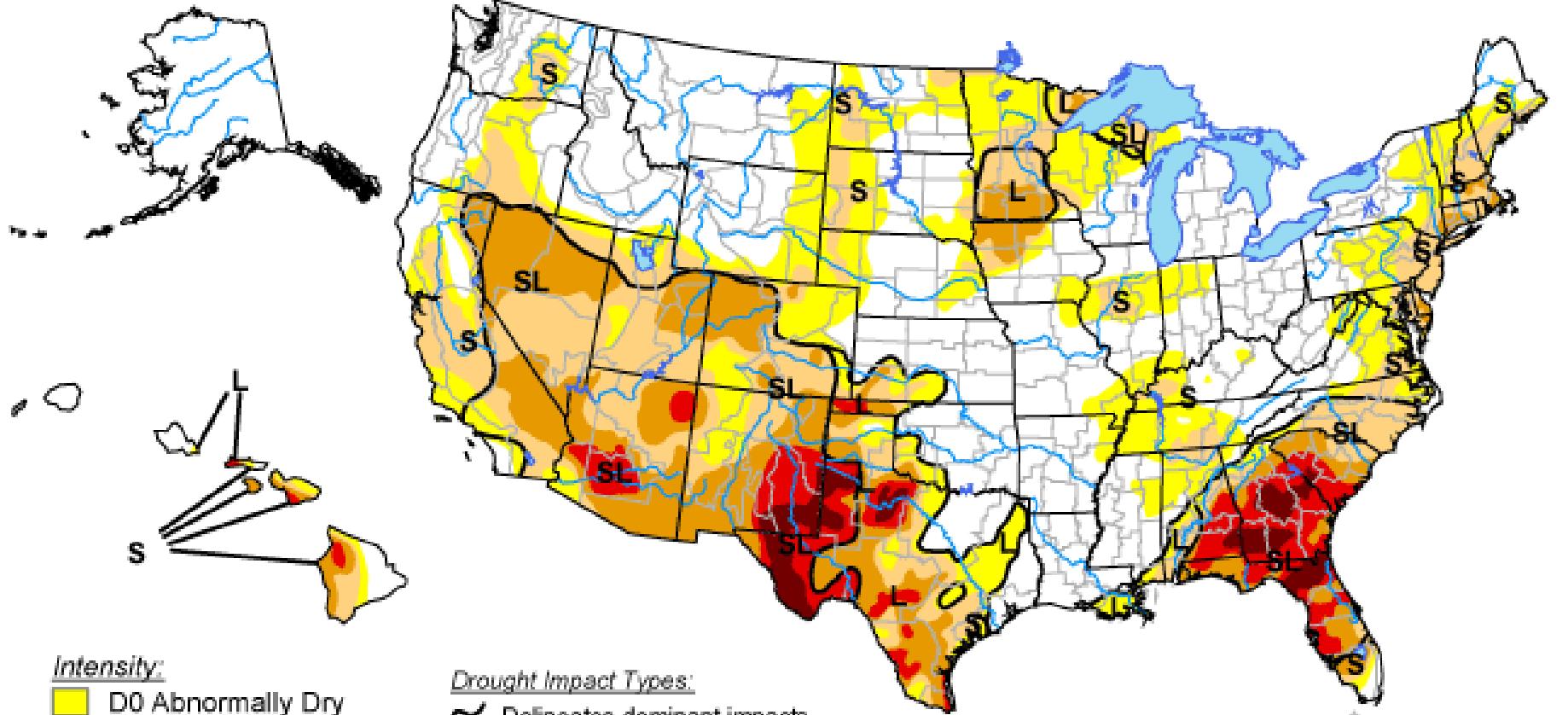


Released Thursday, April 5, 2012

Author: Brian Fuchs, National Drought Mitigation Center

U.S. Drought Monitor

May 1, 2012
Valid 7 a.m. EDT



Intensity:

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

Drought Impact Types:

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- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
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<http://droughtmonitor.unl.edu/>

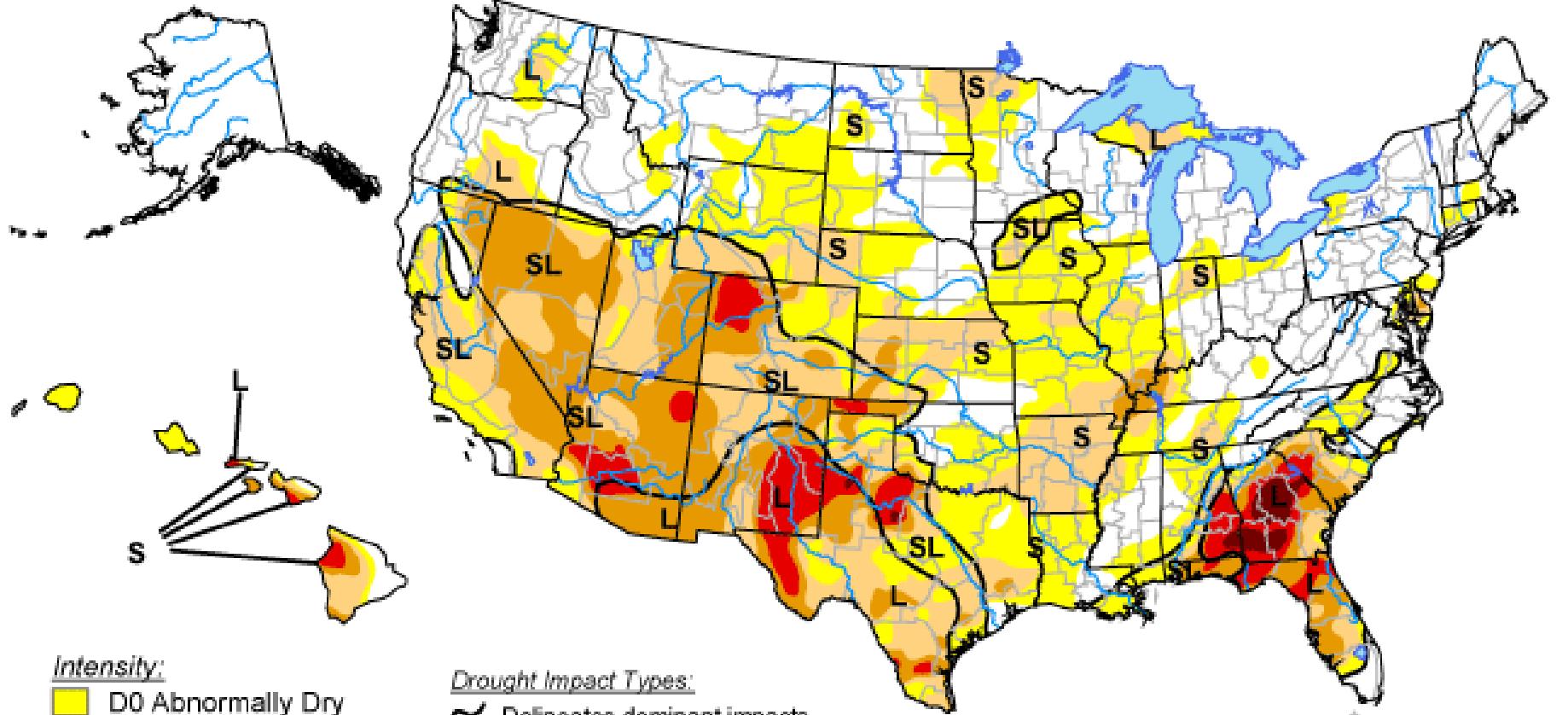


Released Thursday, May 3, 2012

Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

June 5, 2012
Valid 7 a.m. EDT



Intensity:

- [Yellow] D0 Abnormally Dry
- [Light Orange] D1 Drought - Moderate
- [Medium Orange] D2 Drought - Severe
- [Dark Red] D3 Drought - Extreme
- [Maroon] D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

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

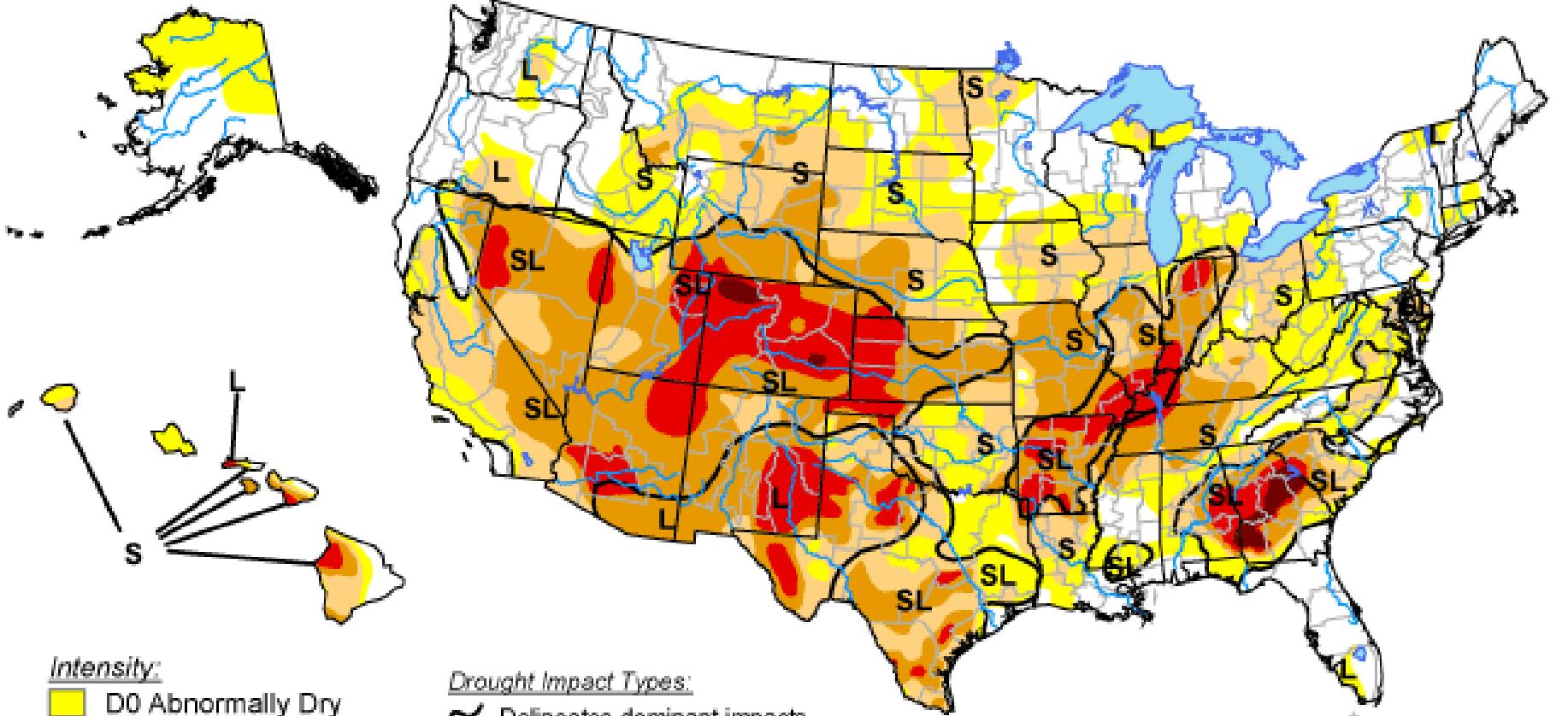
<http://droughtmonitor.unl.edu/>



Released Thursday, June 7, 2012
Author: David Miskus, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

July 3, 2012
Valid 7 a.m. EDT



Intensity:

- [Yellow square] D0 Abnormally Dry
- [Light Orange square] D1 Drought - Moderate
- [Medium Orange square] D2 Drought - Severe
- [Red square] D3 Drought - Extreme
- [Dark Red square] D4 Drought - Exceptional

Drought Impact Types:

- [Wavy line symbol] Delineates dominant impacts
- [S symbol] S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- [L symbol] L = Long-Term, typically >6 months (e.g. hydrology, ecology)

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

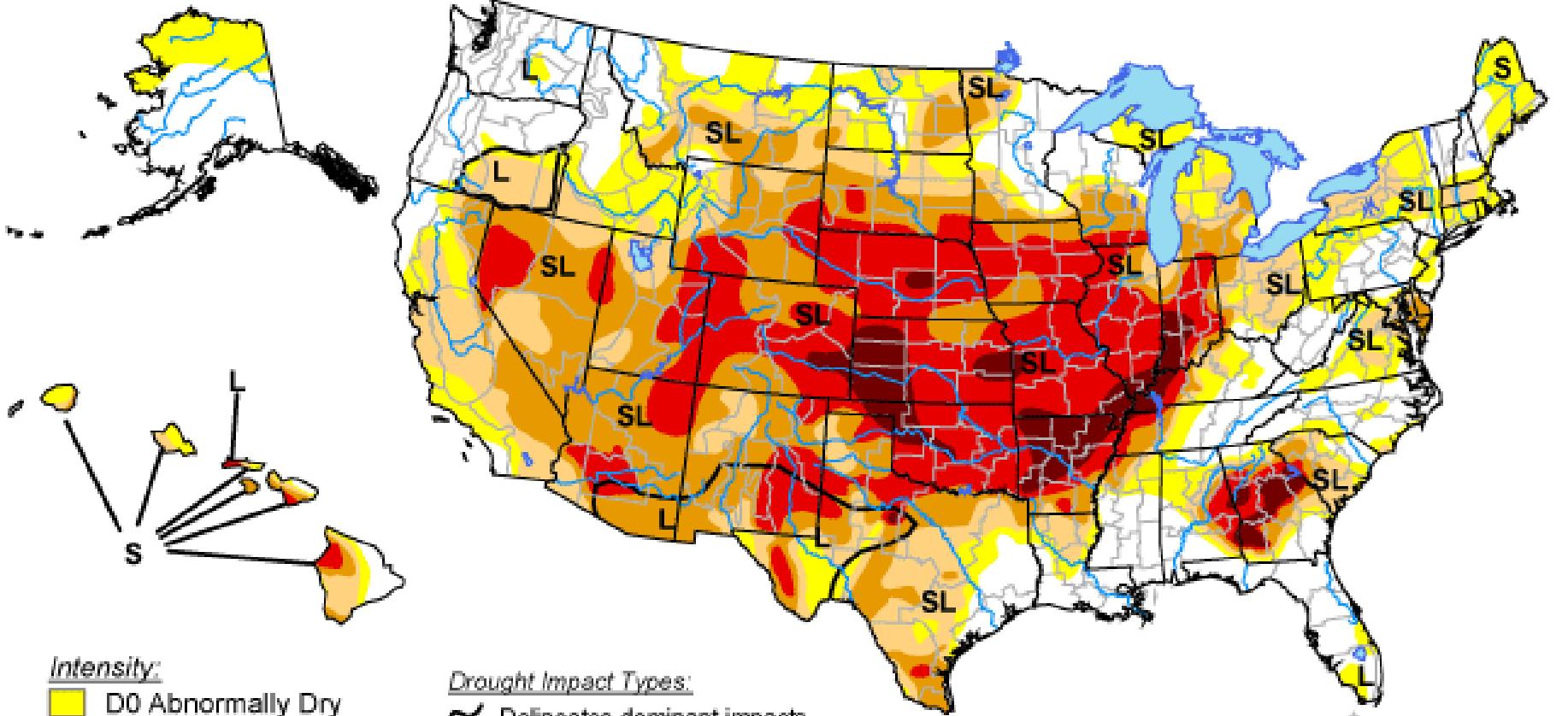
<http://droughtmonitor.unl.edu/>



Released Thursday, July 5, 2012
Author: Rich Tinker, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

August 7, 2012
Valid 7 a.m. EDT



Intensity:

- Yellow = D0 Abnormally Dry
- Light Orange = D1 Drought - Moderate
- Orange = D2 Drought - Severe
- Red = D3 Drought - Extreme
- Dark Red = D4 Drought - Exceptional

Drought Impact Types:

- A dashed line delineates dominant impacts.
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

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for forecast statements.

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

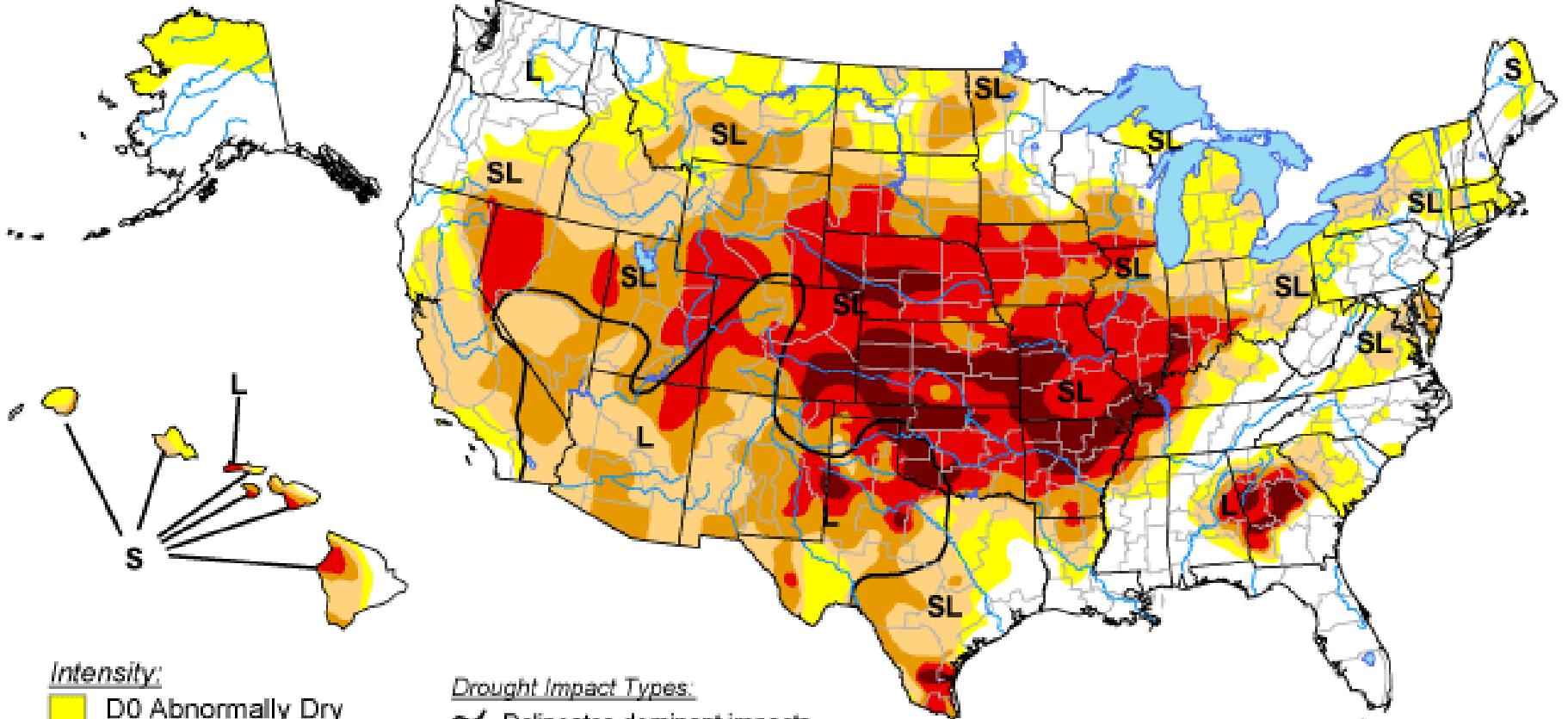


Released Thursday, August 9, 2012

Author: Mark Svoboda, National Drought Mitigation Center

U.S. Drought Monitor

August 28, 2012
Valid 7 a.m. EDT



Intensity:

- [Yellow] D0 Abnormally Dry
- [Orange] D1 Drought - Moderate
- [Dark Orange] D2 Drought - Severe
- [Red] D3 Drought - Extreme
- [Dark Red] D4 Drought - Exceptional

Drought Impact Types:

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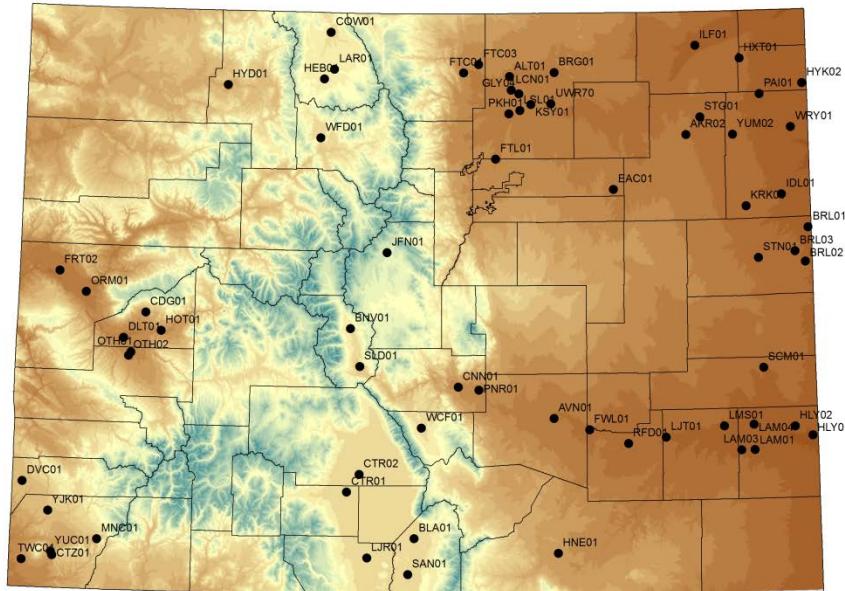


Released Thursday, August 30, 2012

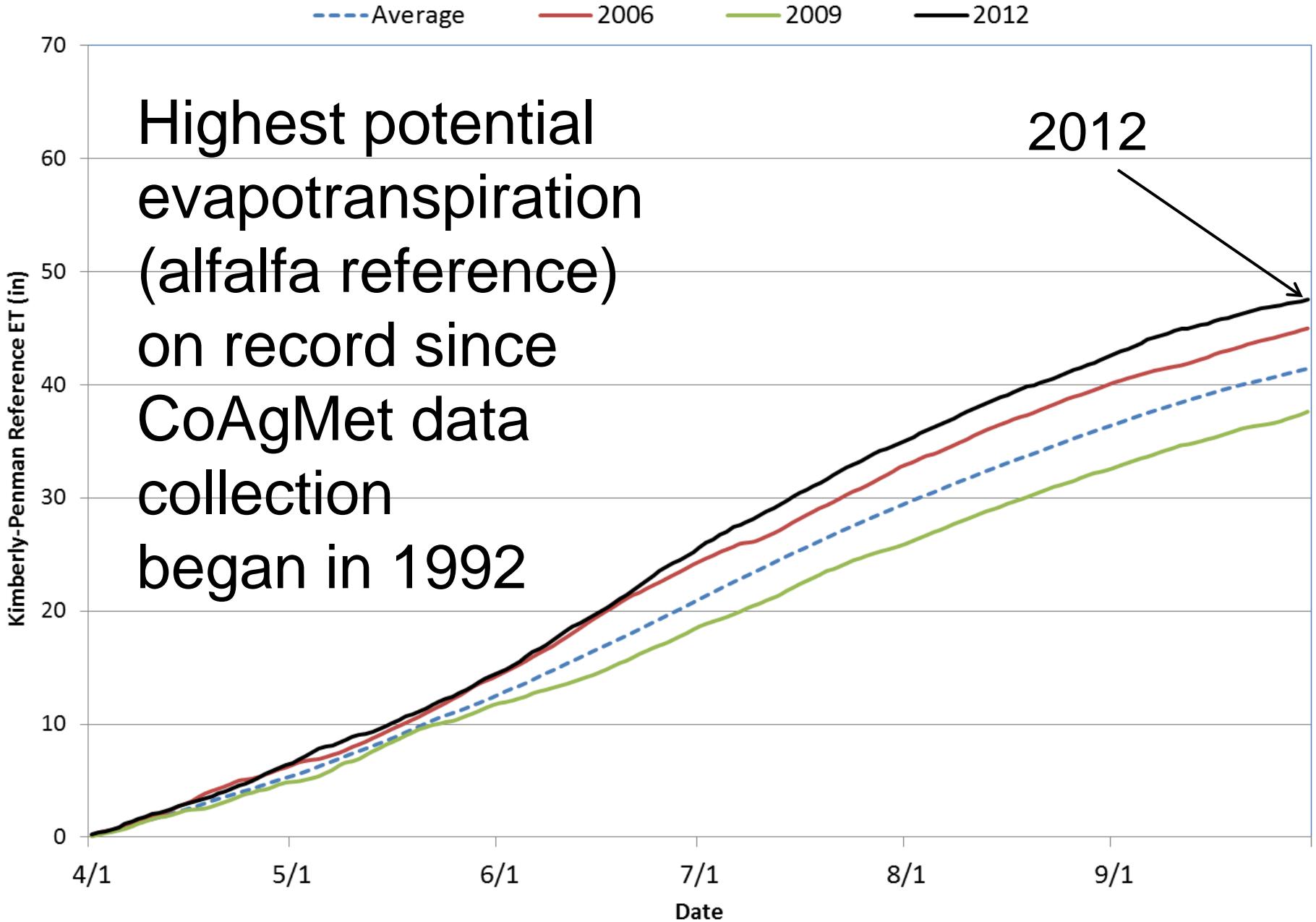
Author: Brian Fuchs, National Drought Mitigation Center

Based on 20 years of data from CoAgMet – our agricultural weather monitoring network -- 2012 was an **extreme** year for evapotranspiration

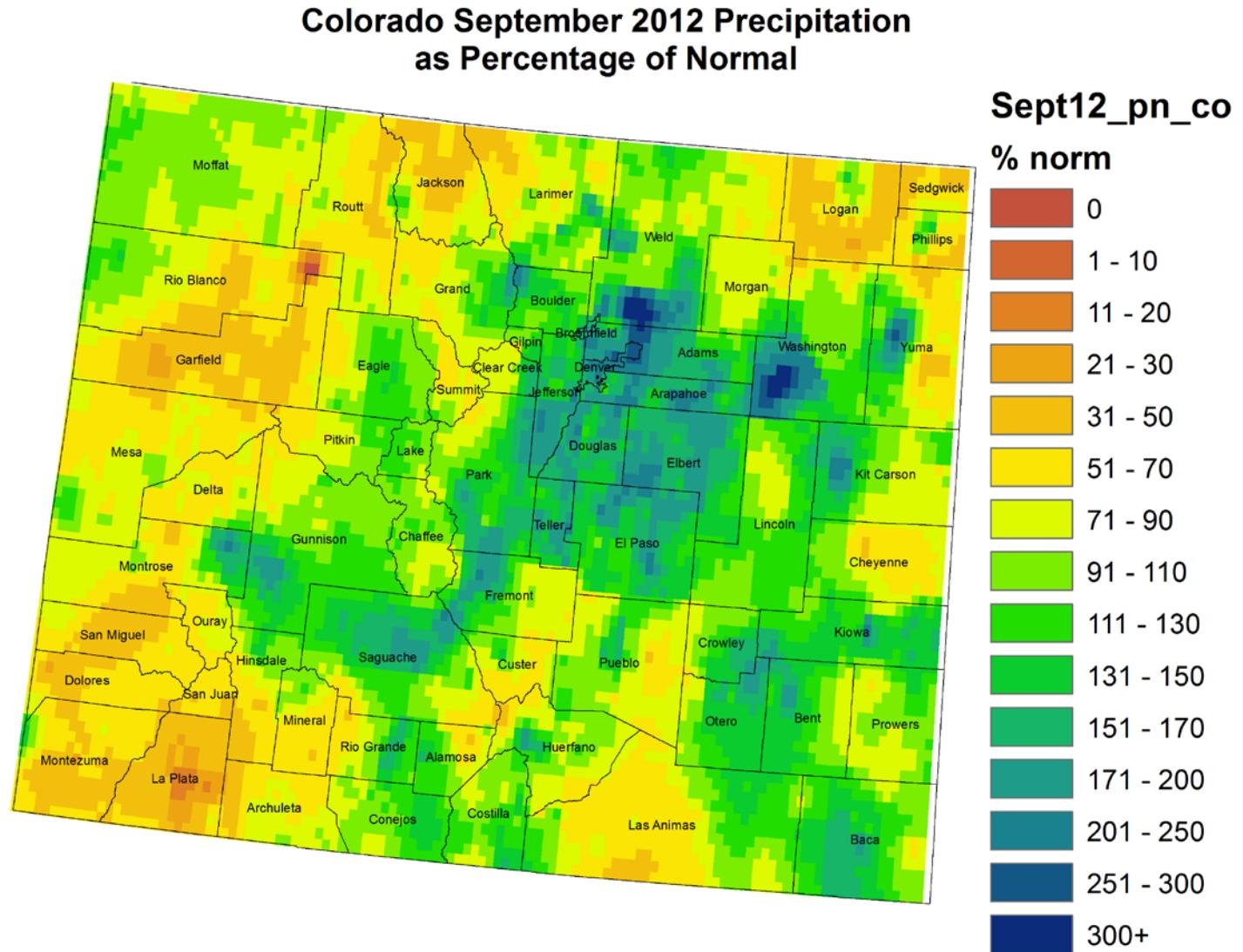
Current CoAgMet Station Locations - July 2012



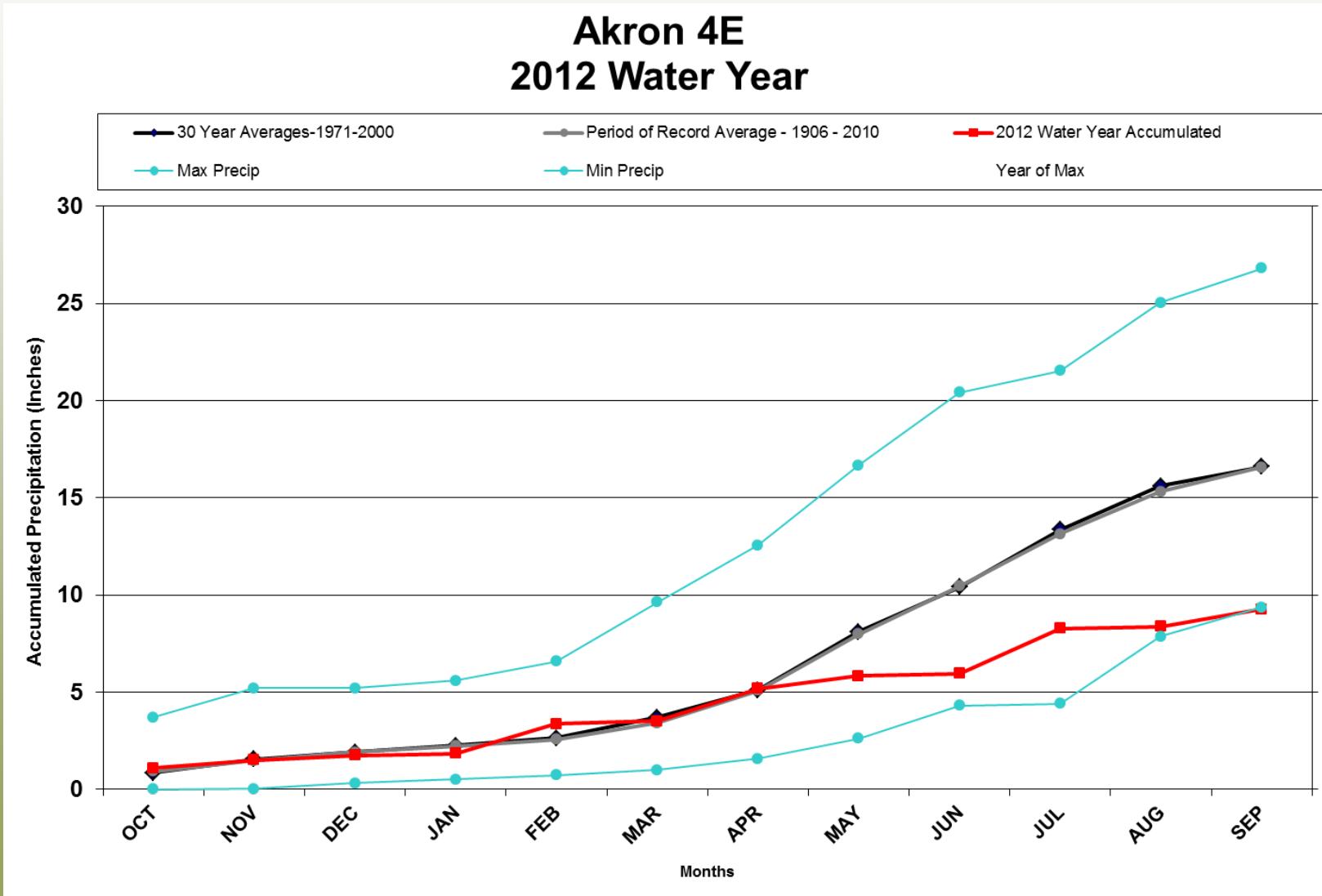
Lucerne Kimberly-Penman Reference ET (1992 - 2012)



Another round of beneficial moisture in parts of the basin in September

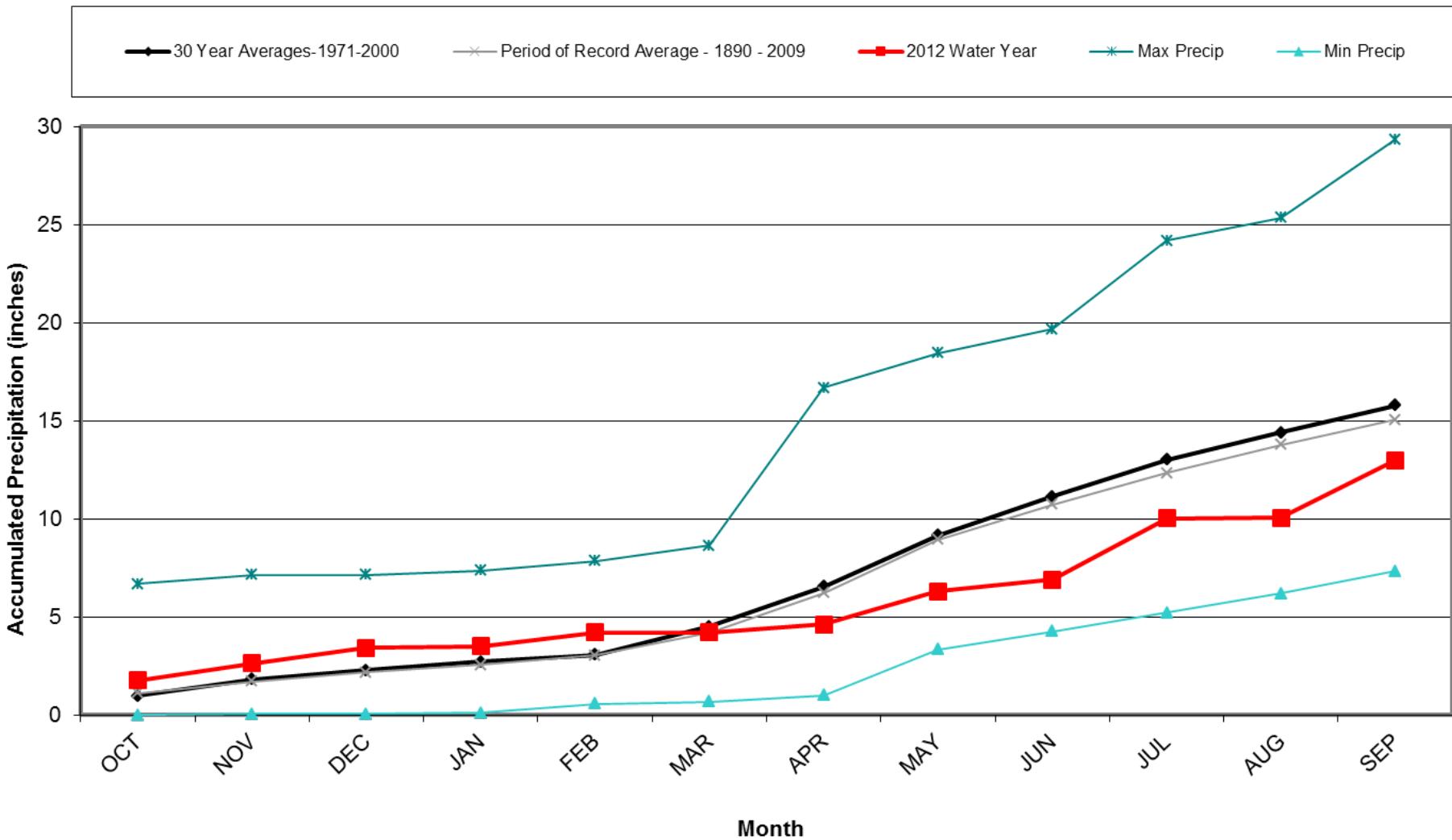


Precipitation was too little and too late for most agricultural needs



So let's put the year in perspective

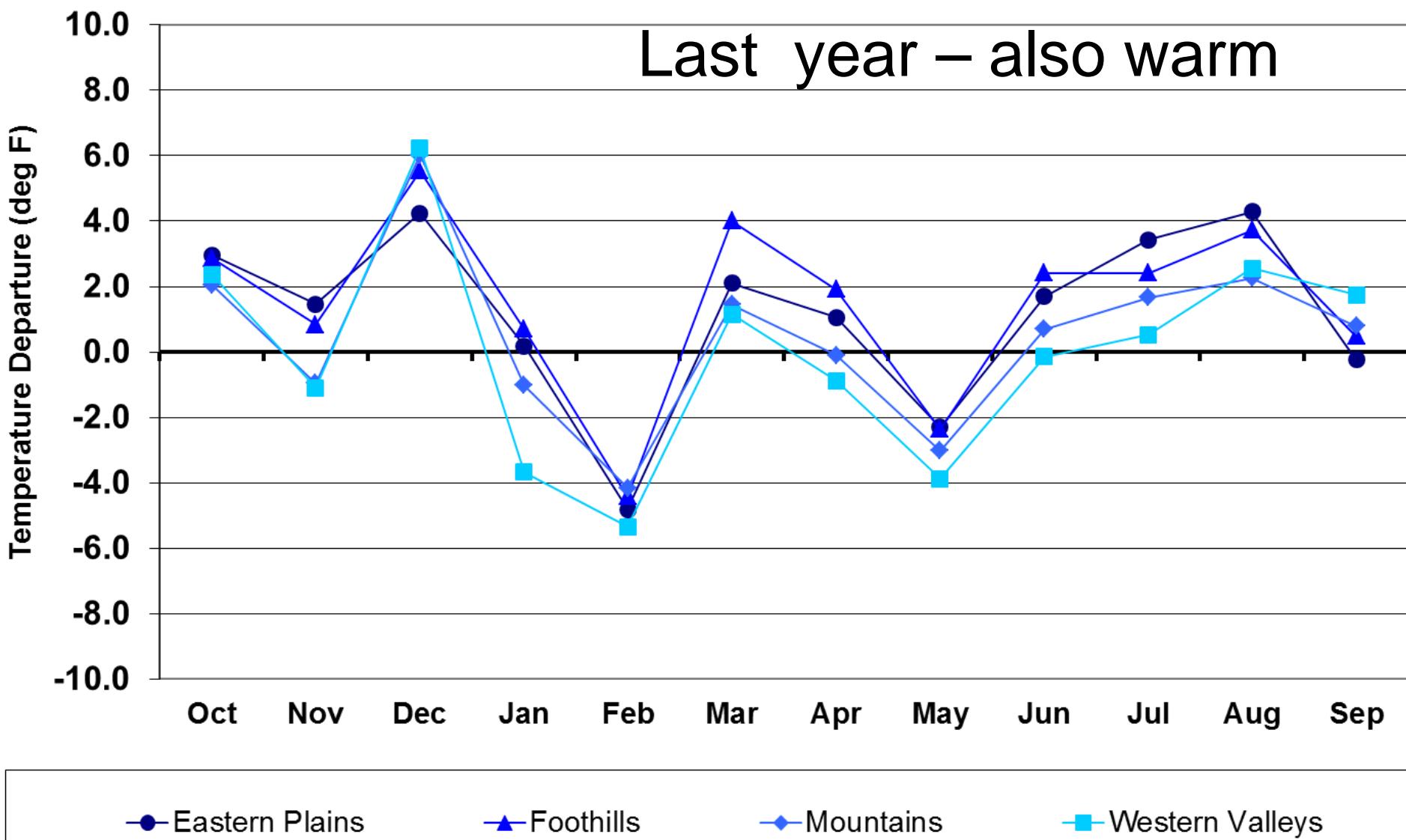
Fort Collins 2012 Water Year



Water Year Temperature Departure

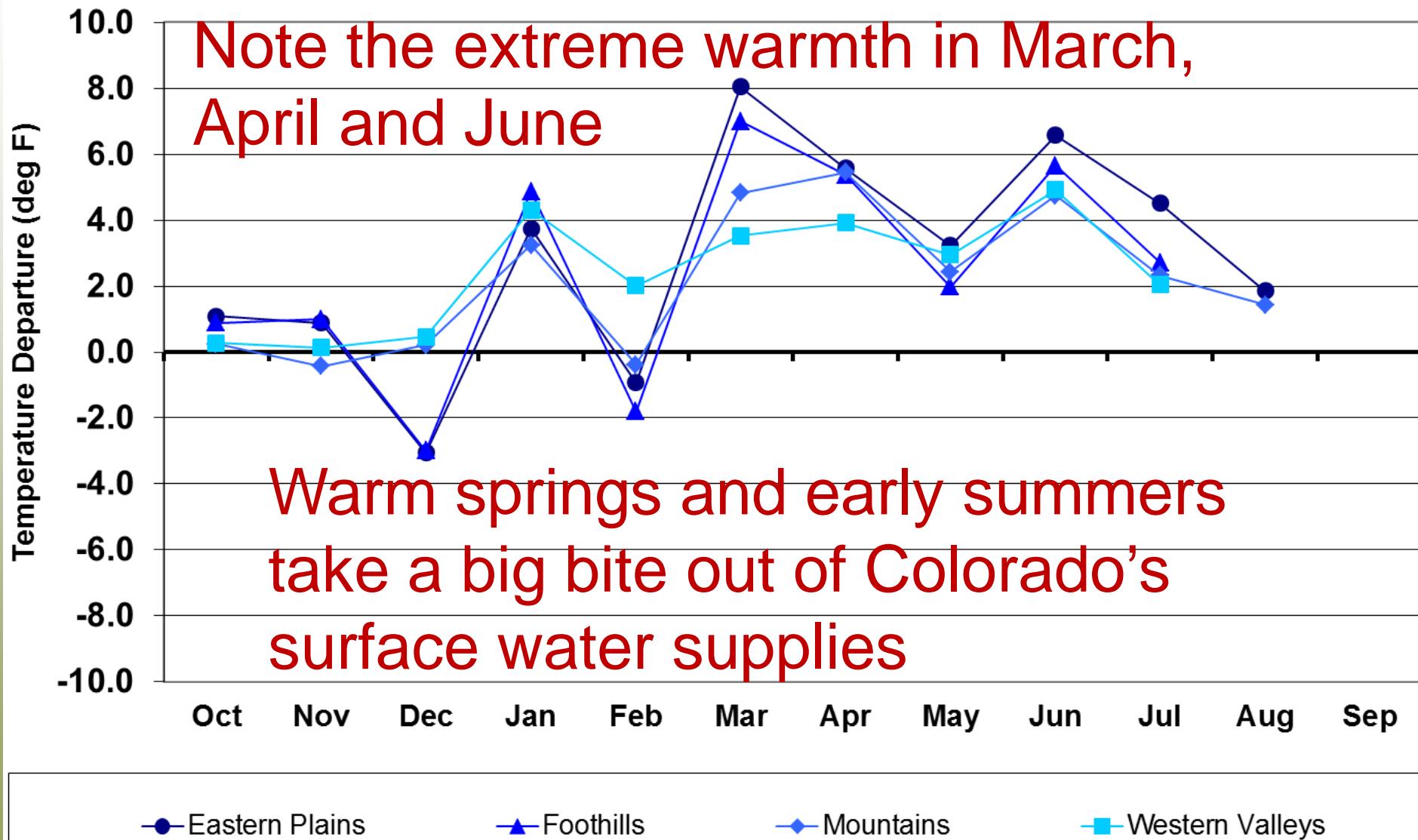
Water Year 2011

Last year – also warm

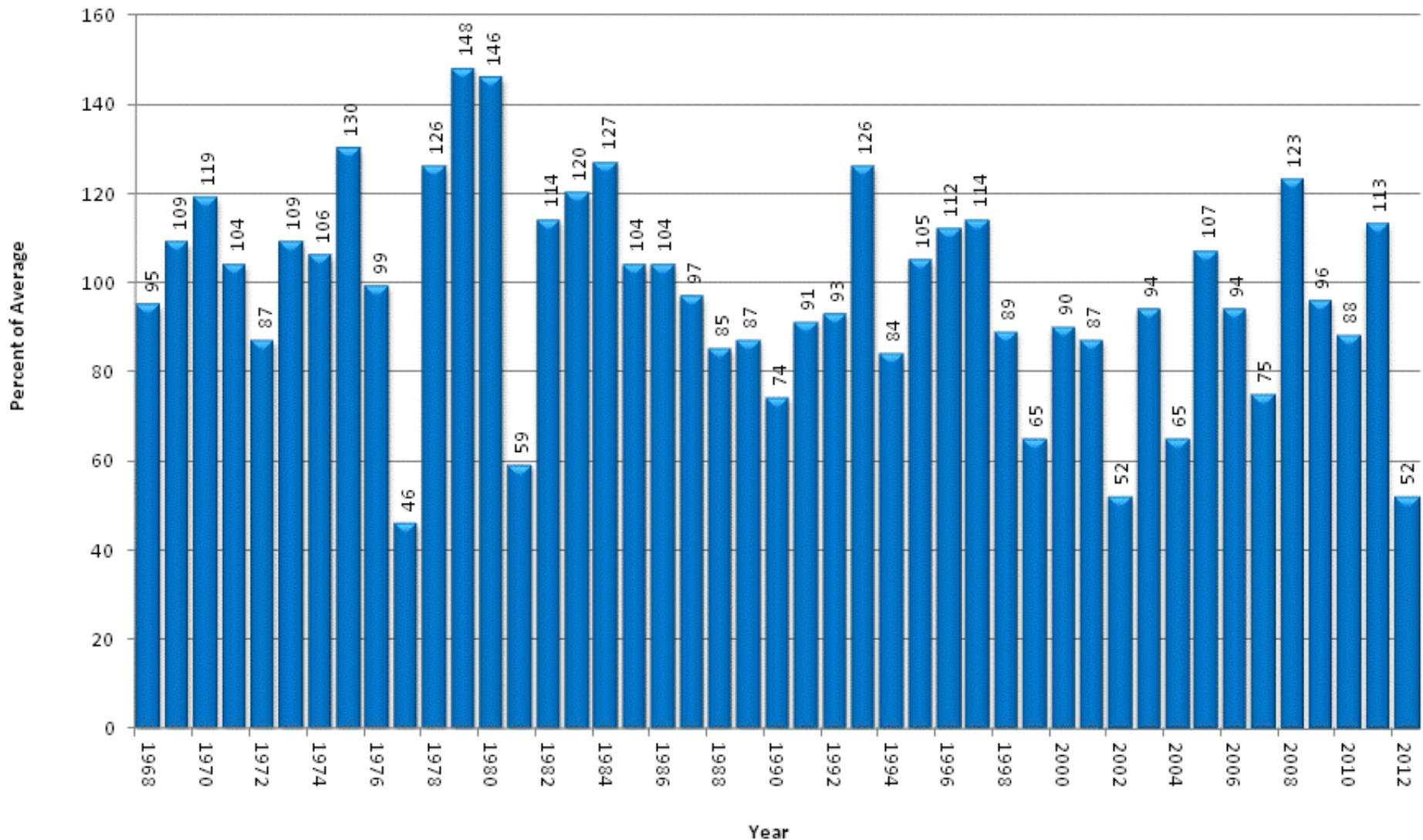


Water Year Temperature Departure

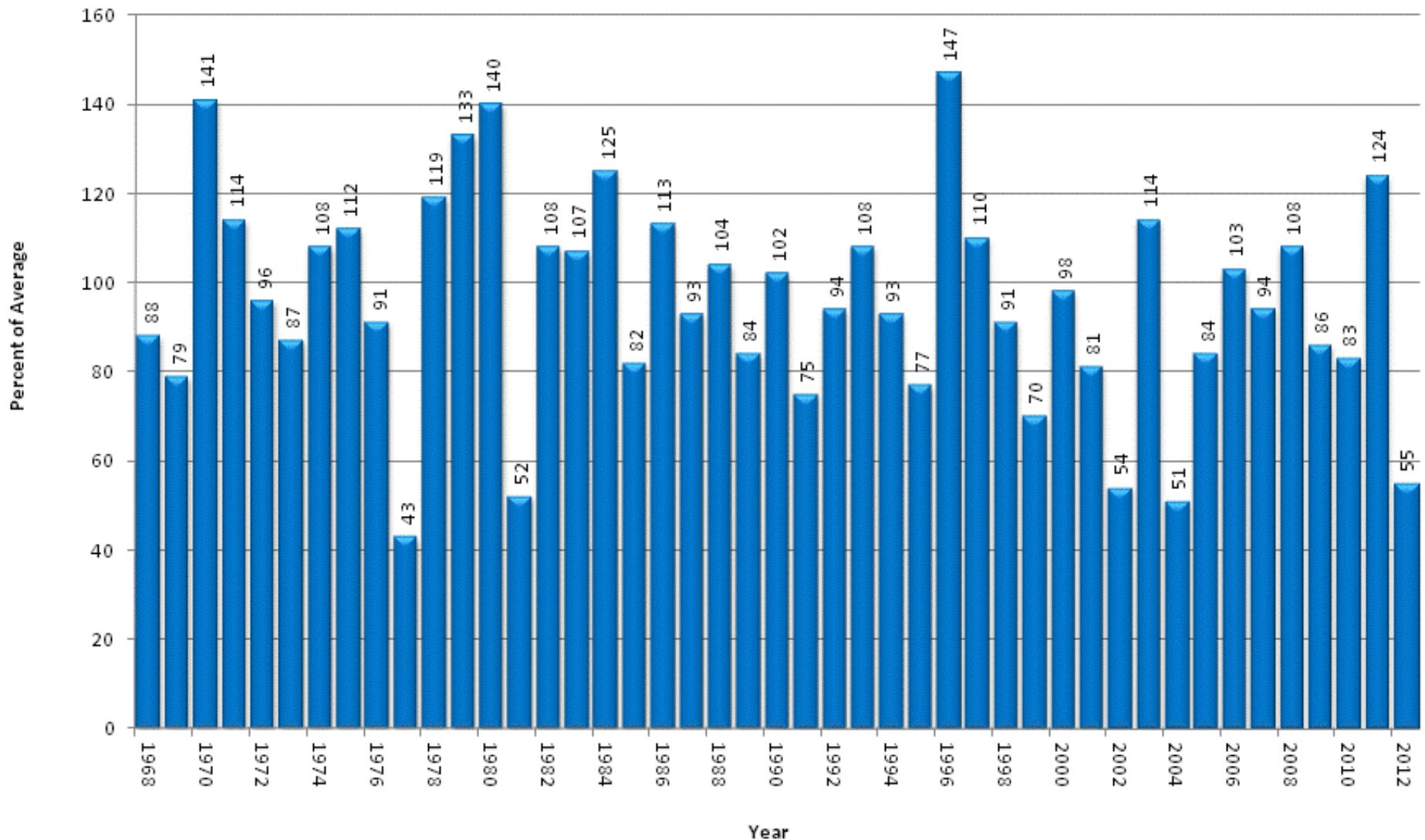
Water Year 2012



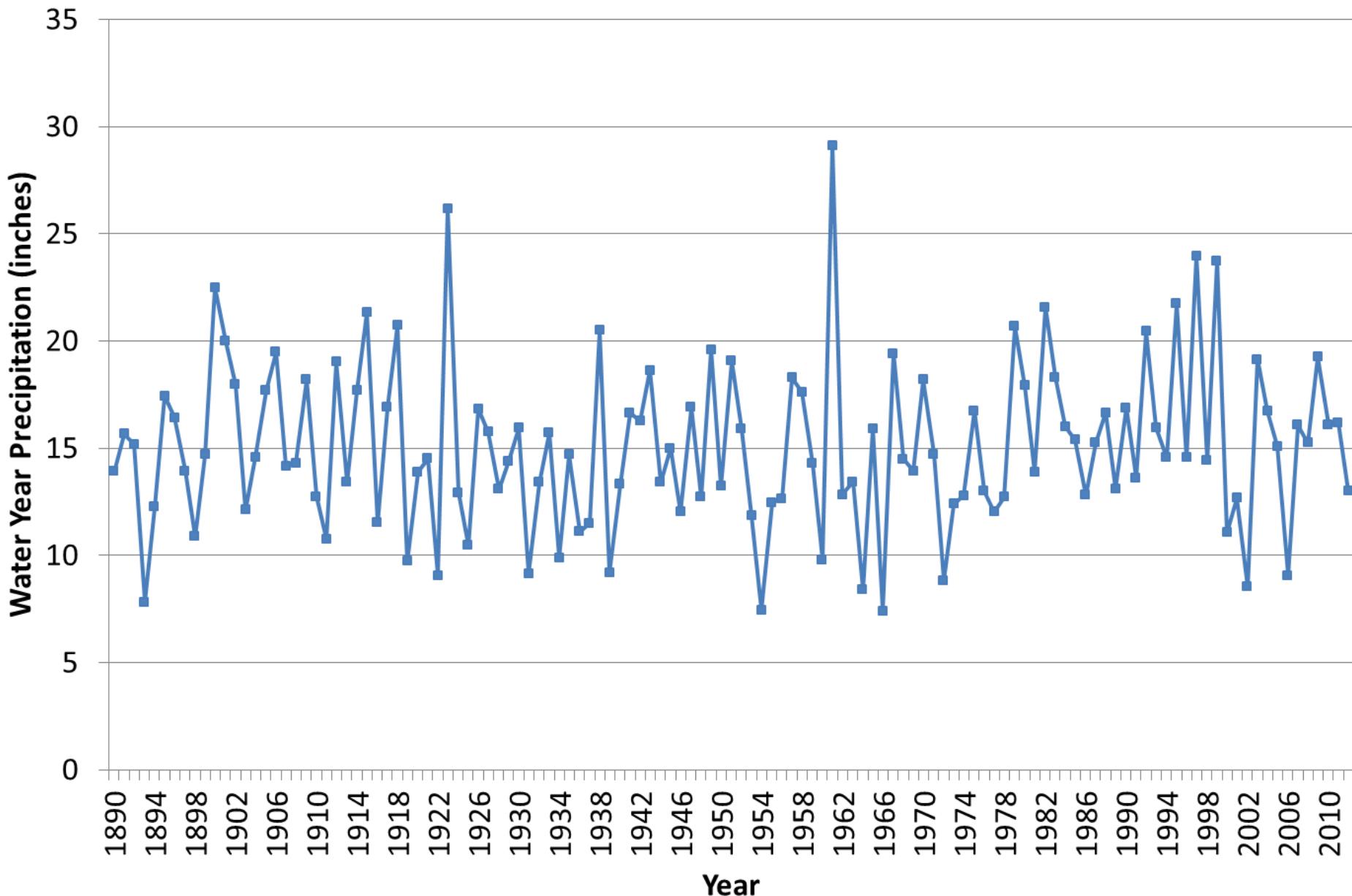
April 1 Colorado Statewide Snowpack



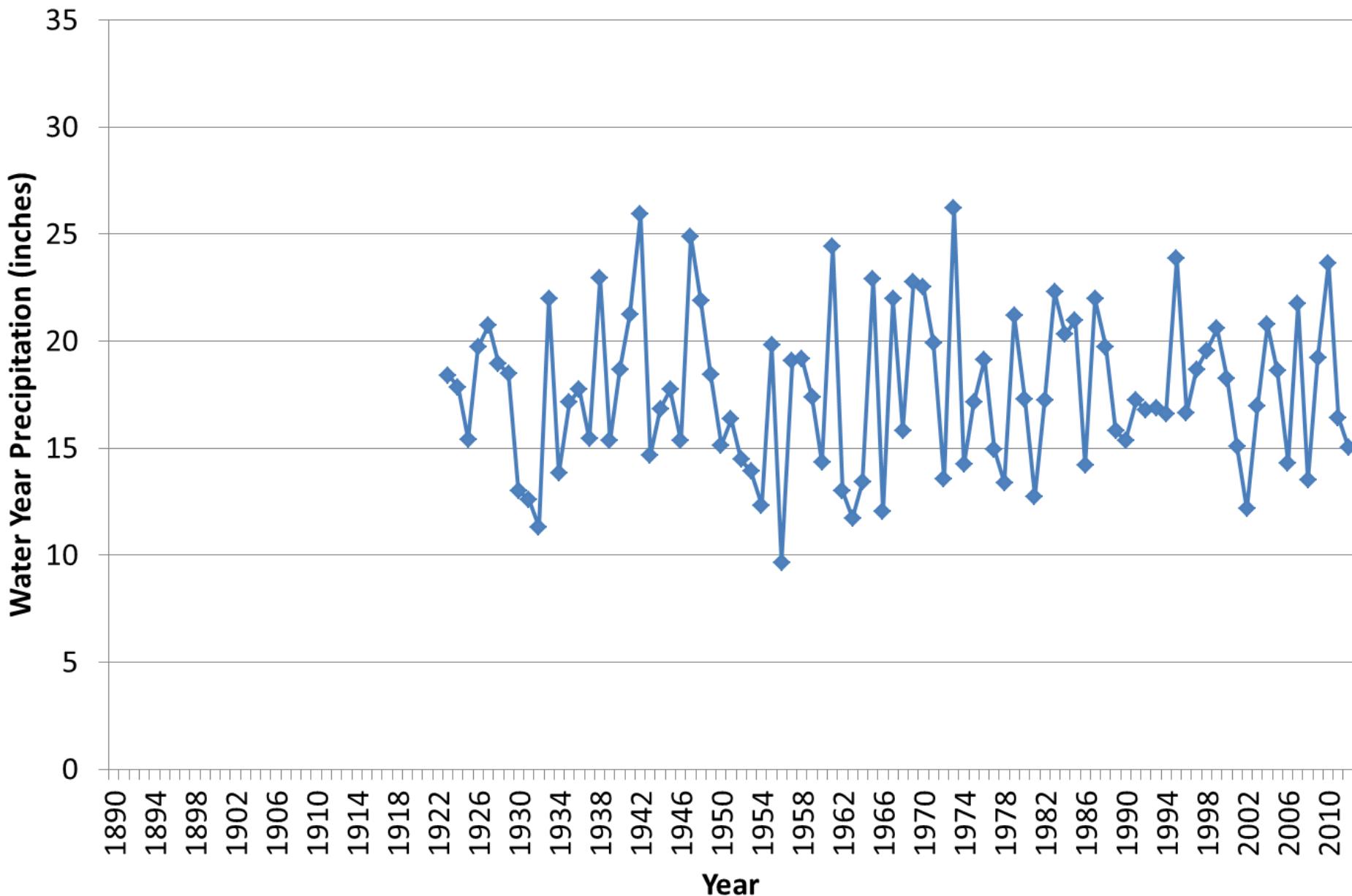
April 1 South Platte River Basin Snowpack



Fort Collins Water Year (Oct - Sep) Precipitation

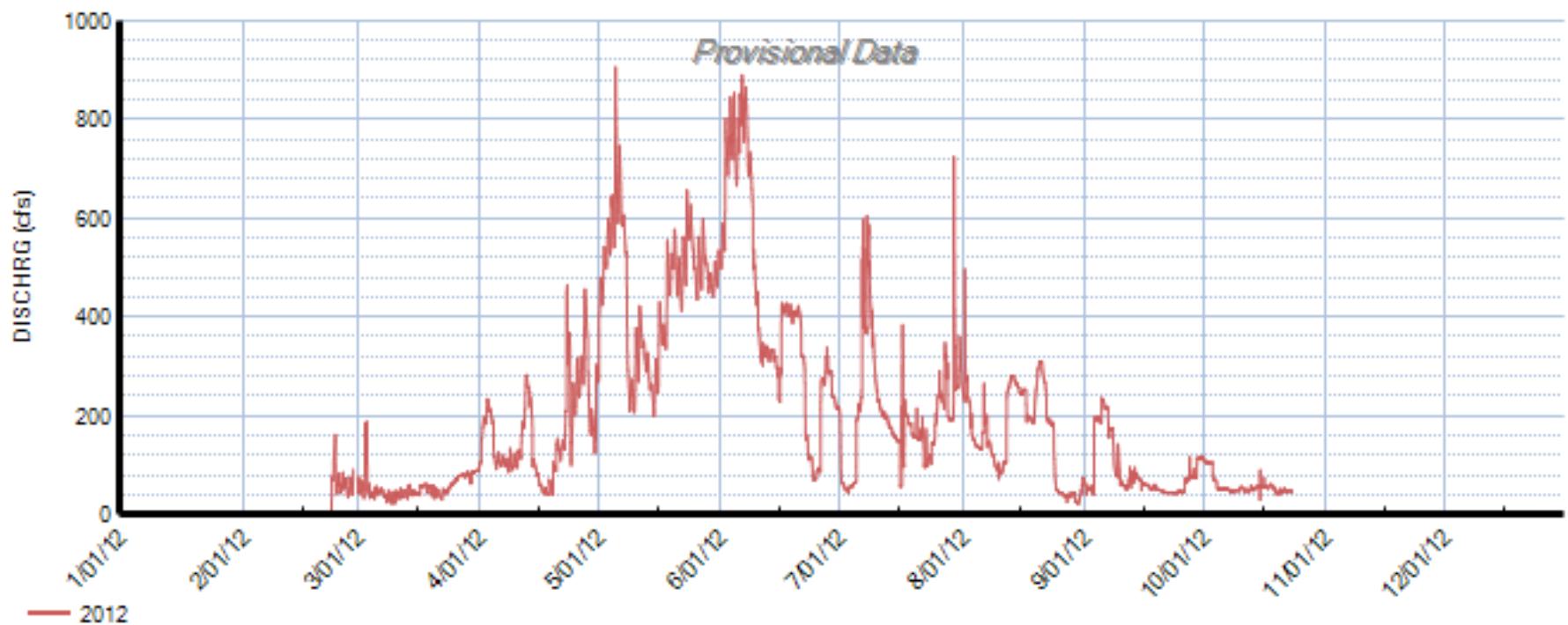


Kassler, CO Water Year (Oct - Sep) Precipitation

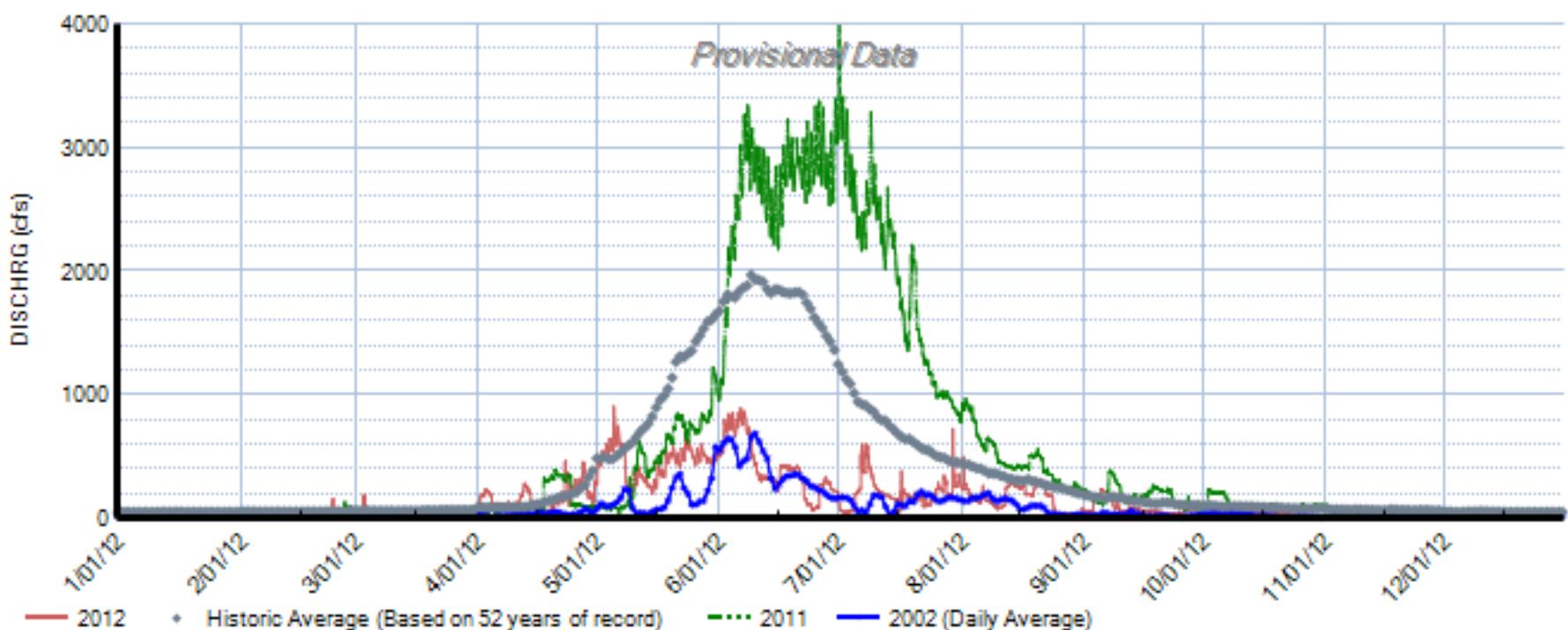


Cache La Poudre at Canyon Mouth near Fort Collins Streamflow

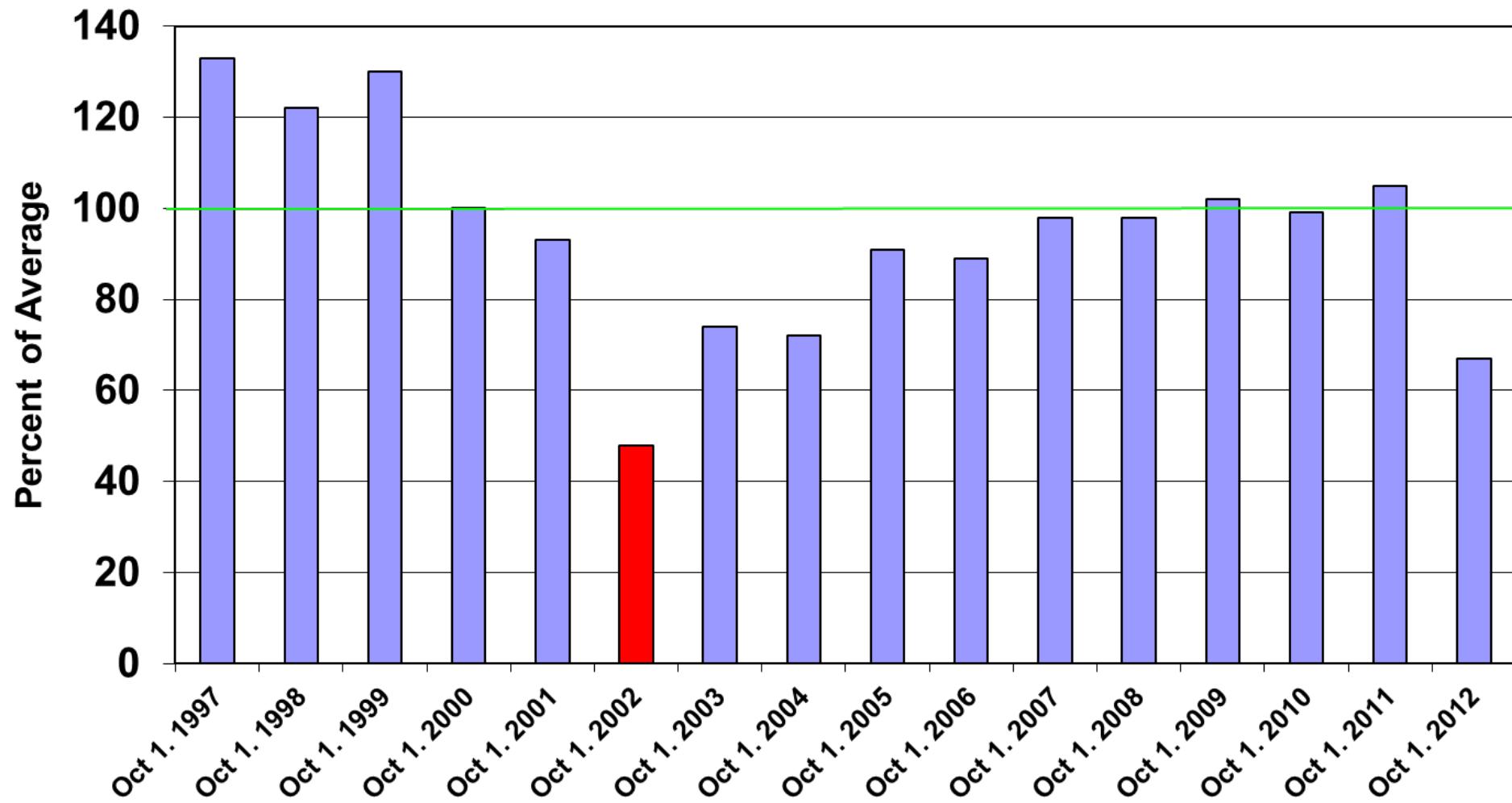
CACHE LA POUDRE AT CANYON MOUTH NEAR FORT COLLINS (CLAFTCCO)
Data Source: Co. Division of Water Resources



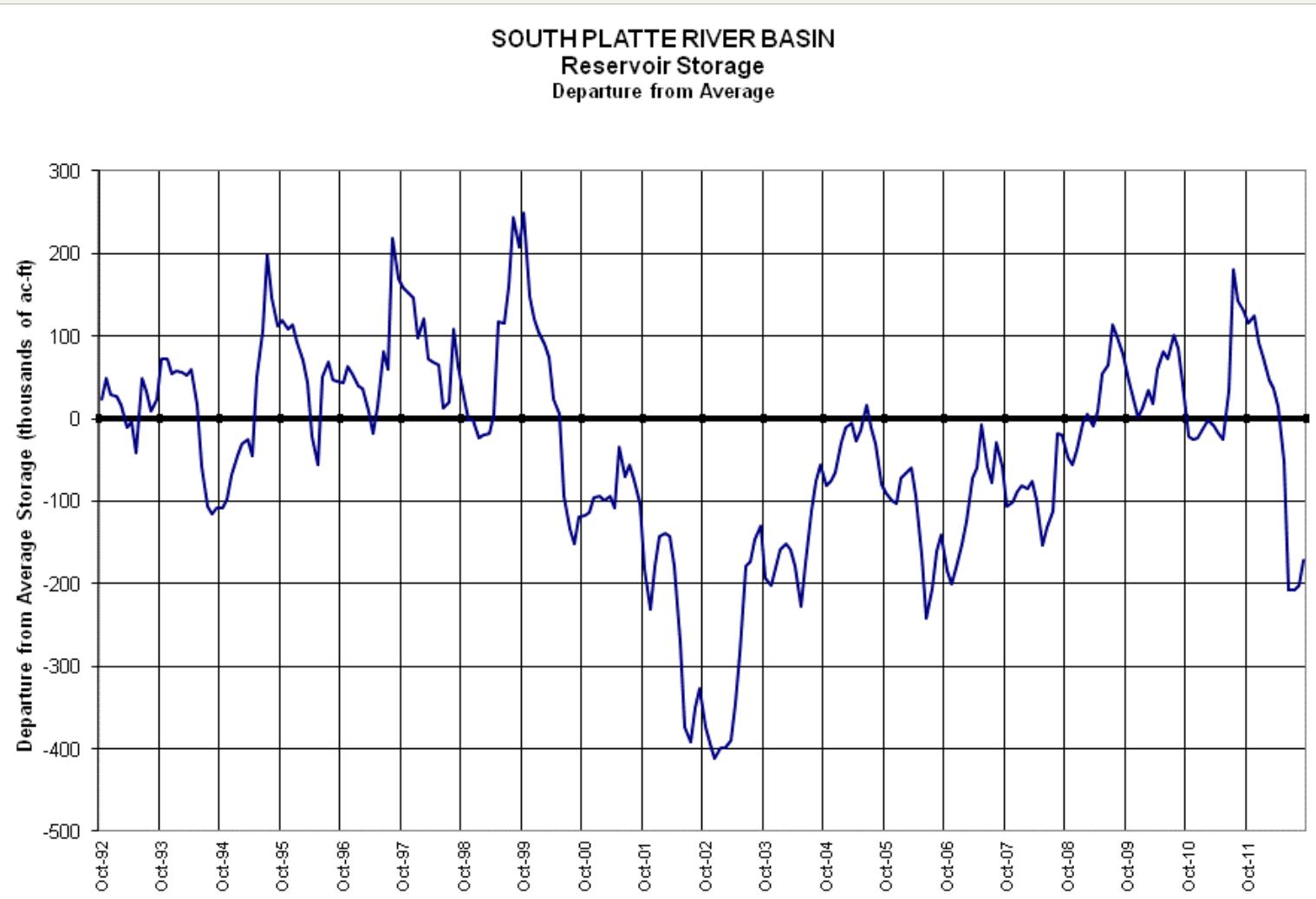
CACHE LA POUDRE AT CANYON MOUTH NEAR FORT COLLINS (CLAFTCO)
Data Source: Co. Division of Water Resources



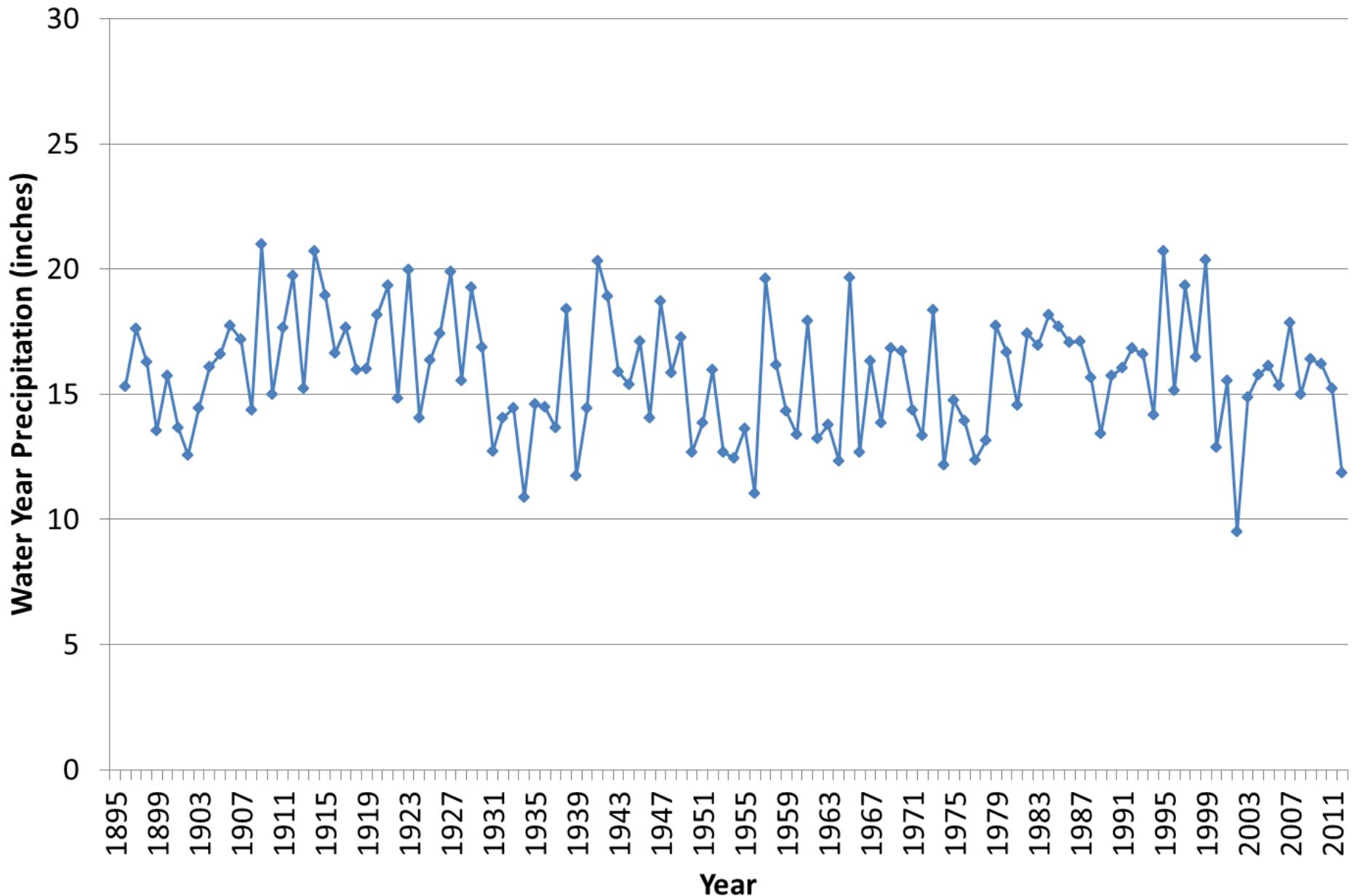
Colorado Statewide Reservoir Levels on October 1st for Years 1997- 2012



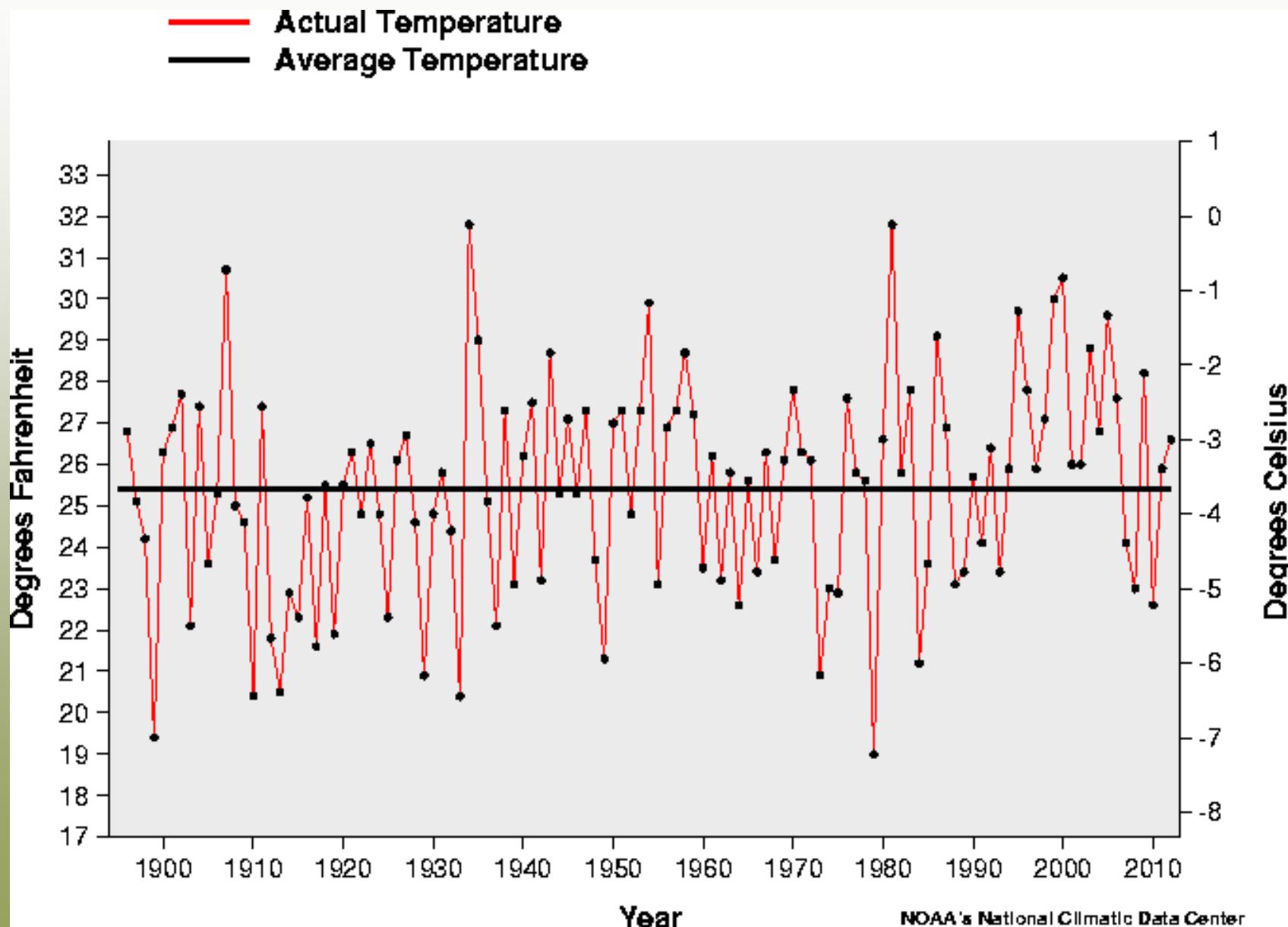
Imagine 2012 without reservoirs



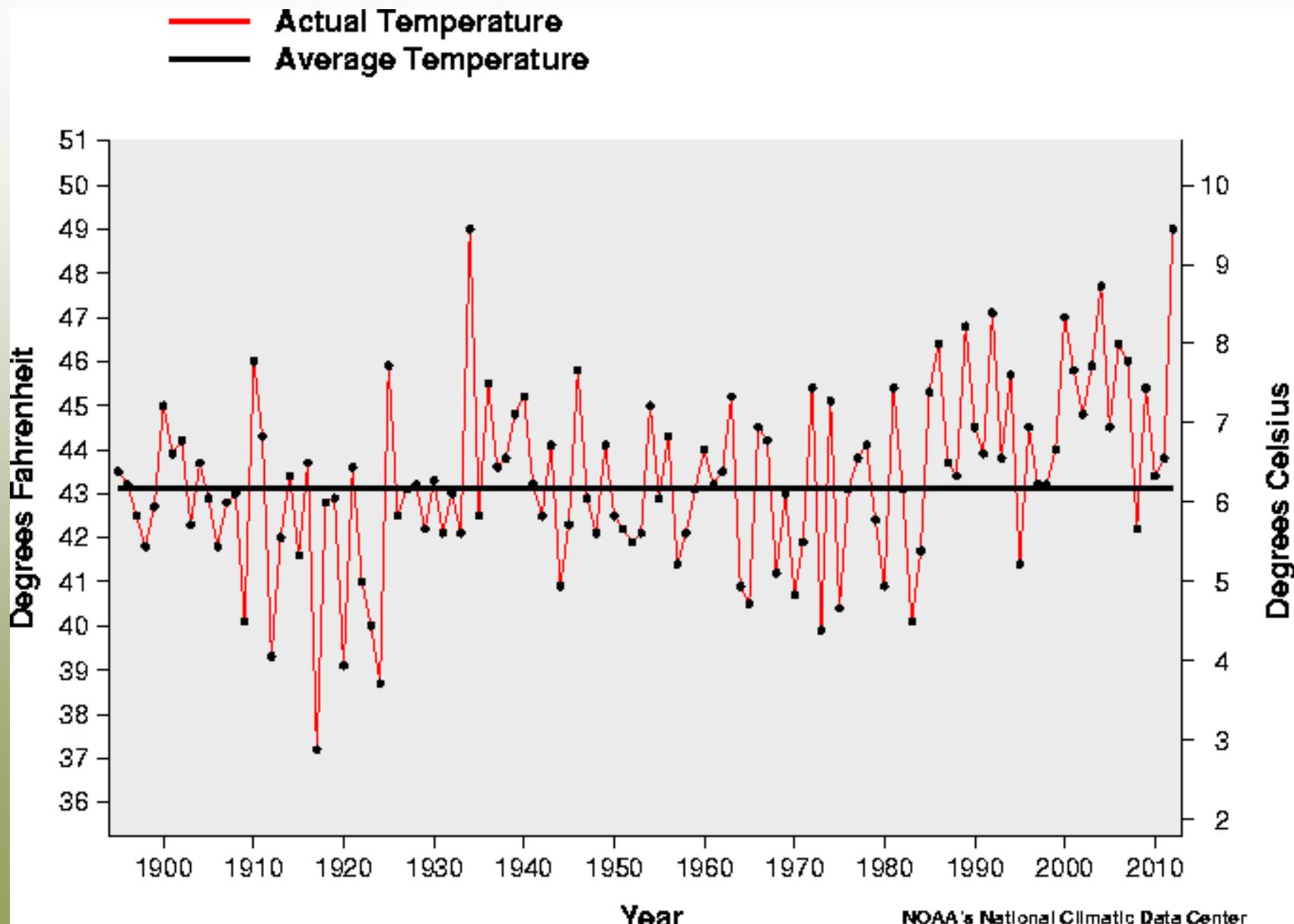
Colorado Statewide Water Year (Oct - Sep) Precipitation



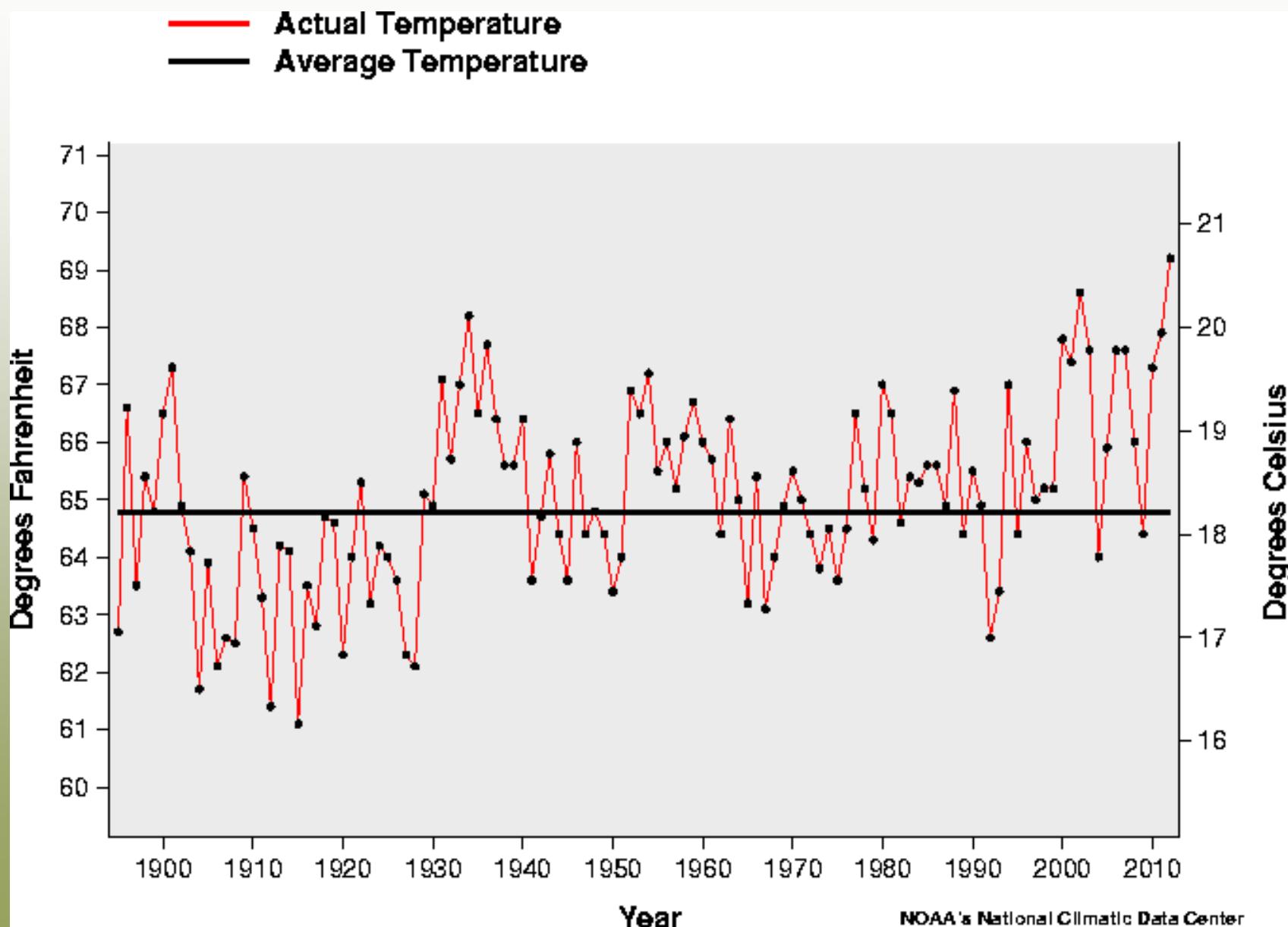
Colorado Statewide Mean Winter Temperature (Dec – Feb)



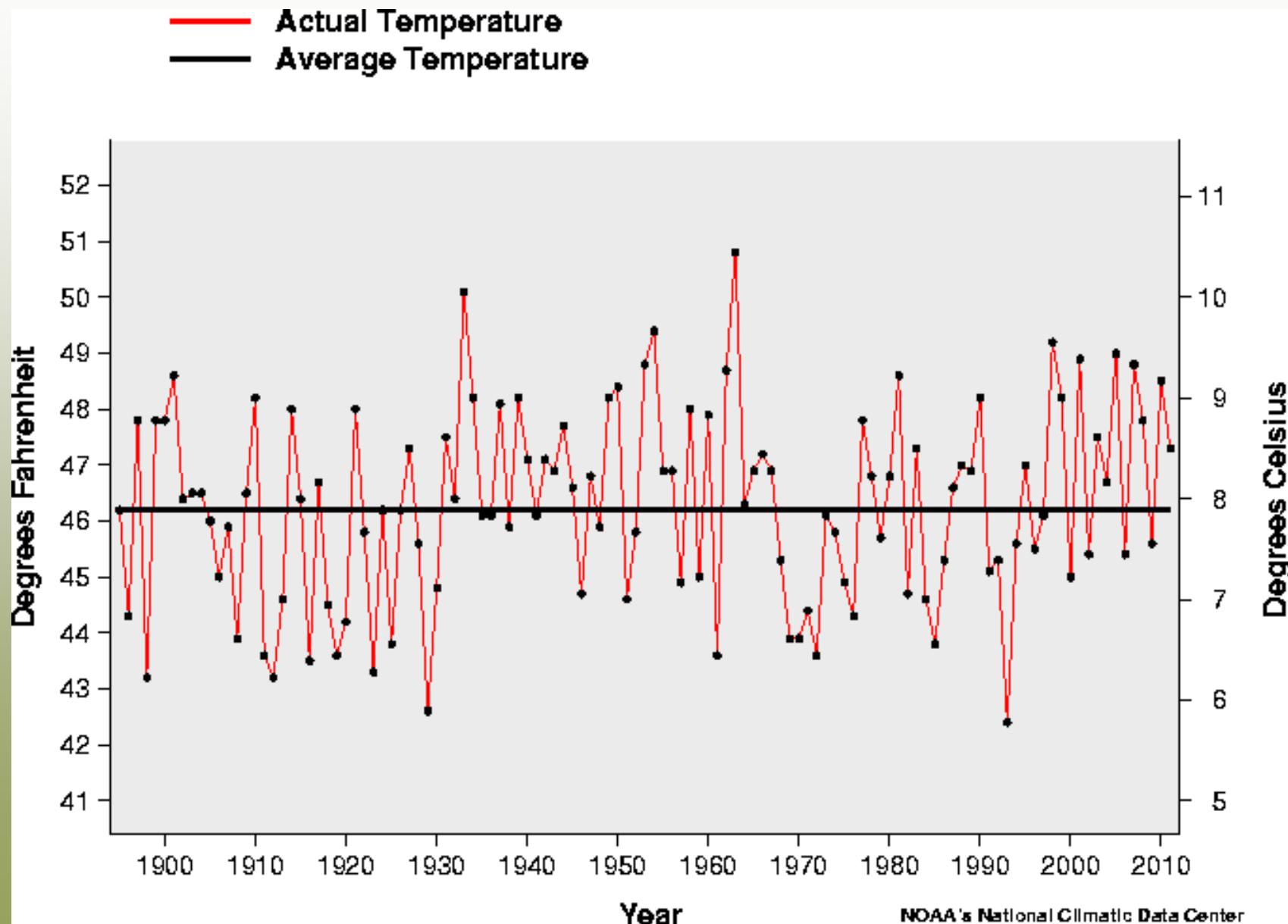
Colorado Statewide Mean Spring Temperature (Mar - May)



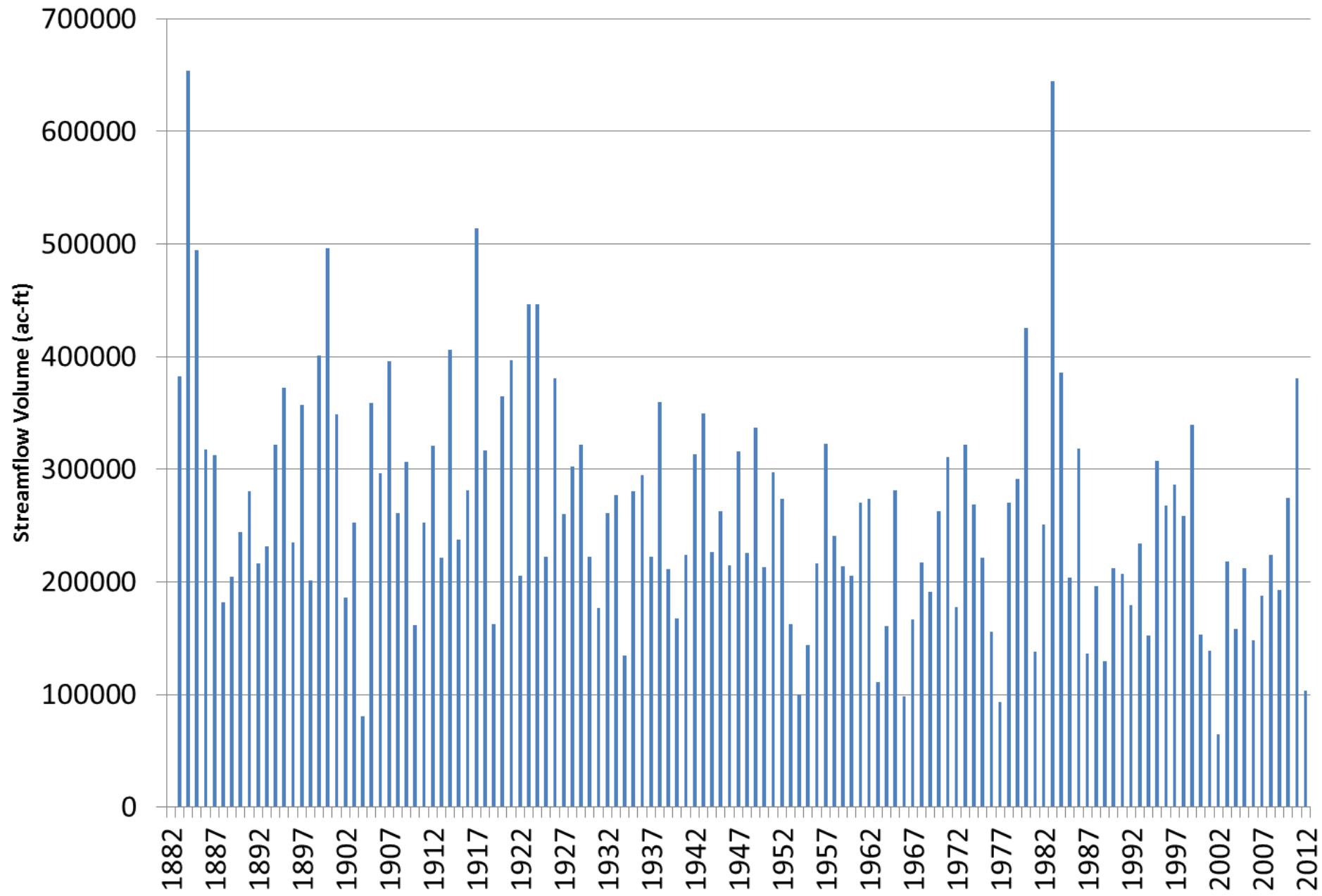
Colorado Statewide Mean Summer Temperature (Jun - Aug)



Colorado Statewide Mean Fall Temperature through 2011 (Sep – Nov)



Poudre River at Canyon Mouth Water Year Streamflow

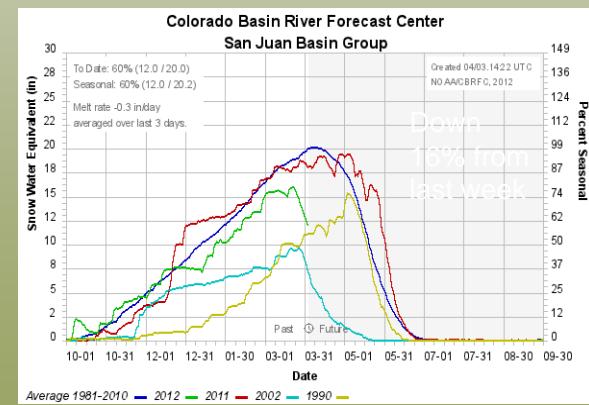
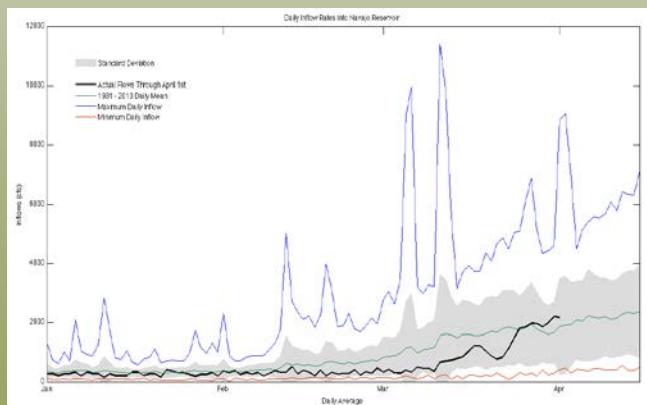
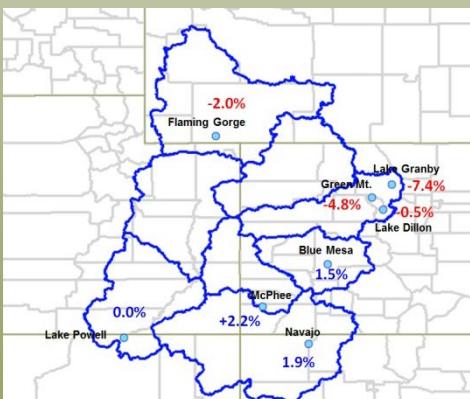
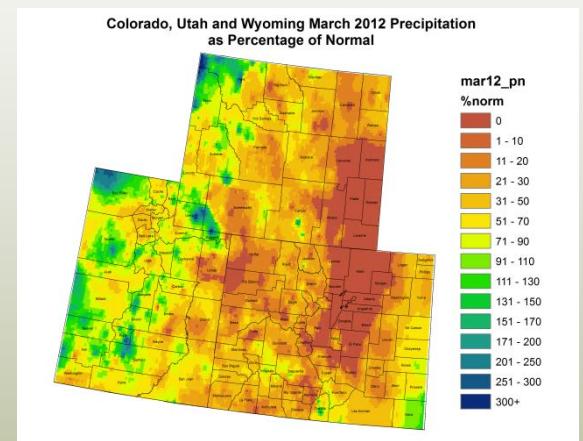
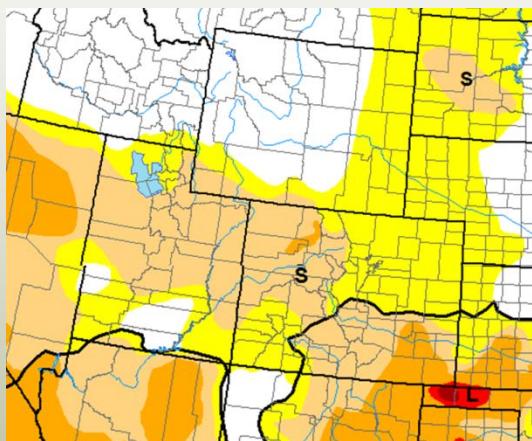
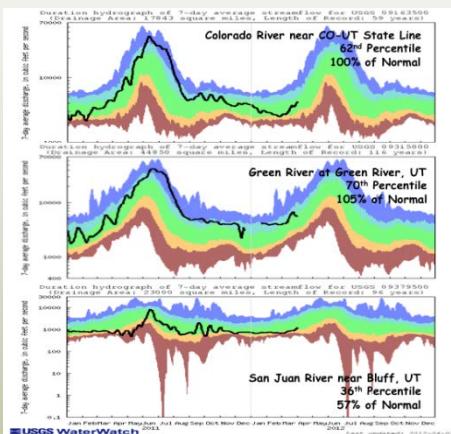


So now what??



Enhanced Drought Early Warning -- weekly updates

National Integrated Drought Information System (NIDIS)



Give me your business card today
and we'll get you on this
Drought Monitoring
e-mail list

You will never again go all week
without getting e-mail ☺



www.water2012.org

CoCoRaHS and Colorado Water 2012

- CoCoRaHS offered free rain gauges to ALL schools in Colorado (1,800+)
- Local communities/organizations donated the gauges
- Over 100 schools signed up and received training
- Ongoing efforts to train, provide lesson plans and recruit

How Can you Help Beyond 2012?



www.cocorahs.org

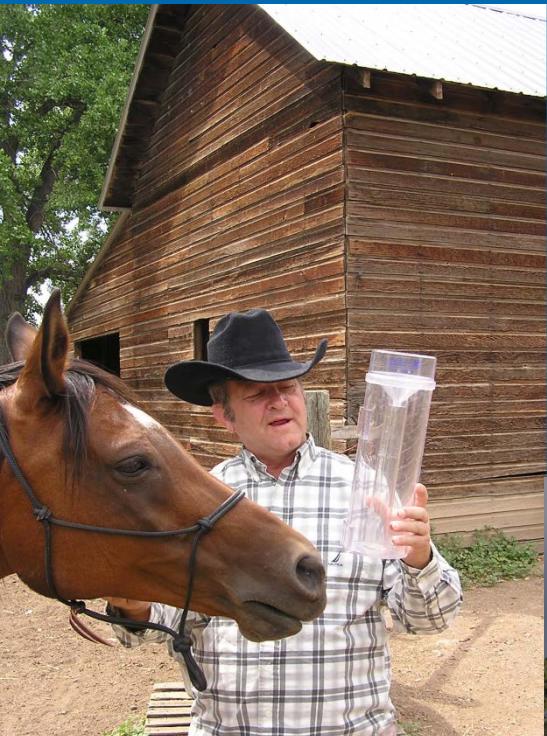


Contact:
education@cocorahs.org

Sponsor a gauge!

Mentor a School!

Also, Please Help Us Monitor Colorado's Climate!

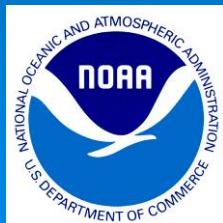
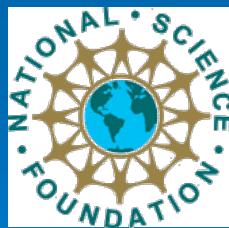


Photos by H. Reges

For information and to volunteer, visit the CoCoRaHS Web Site

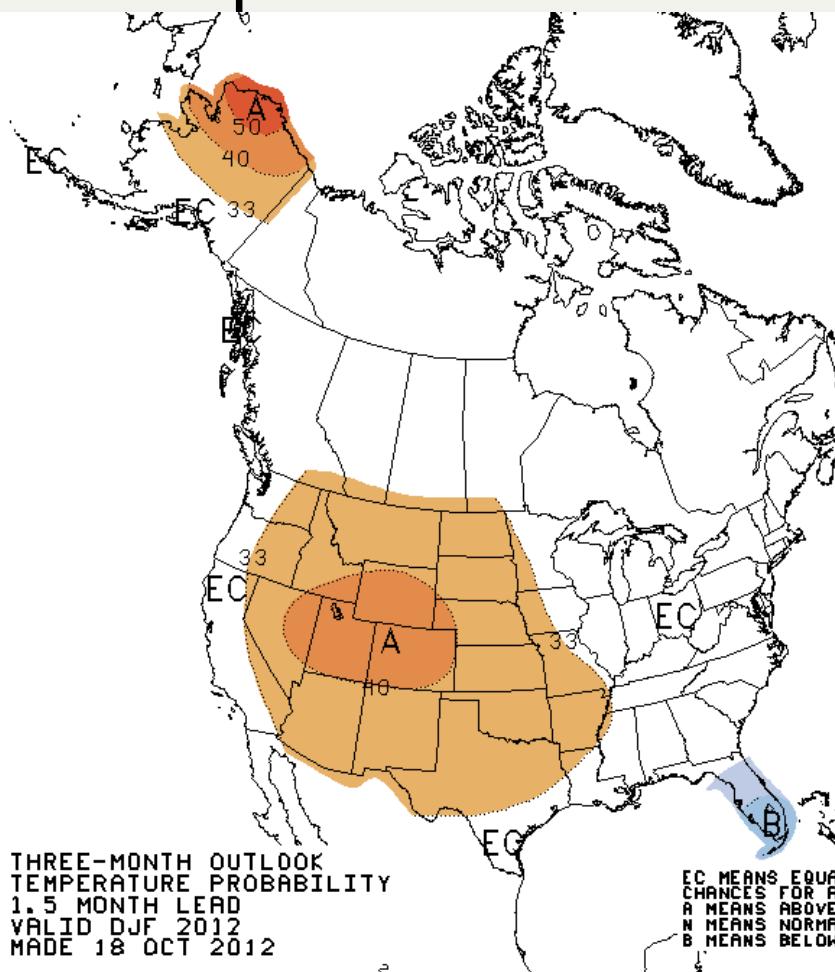


<http://www.cocorahs.org>

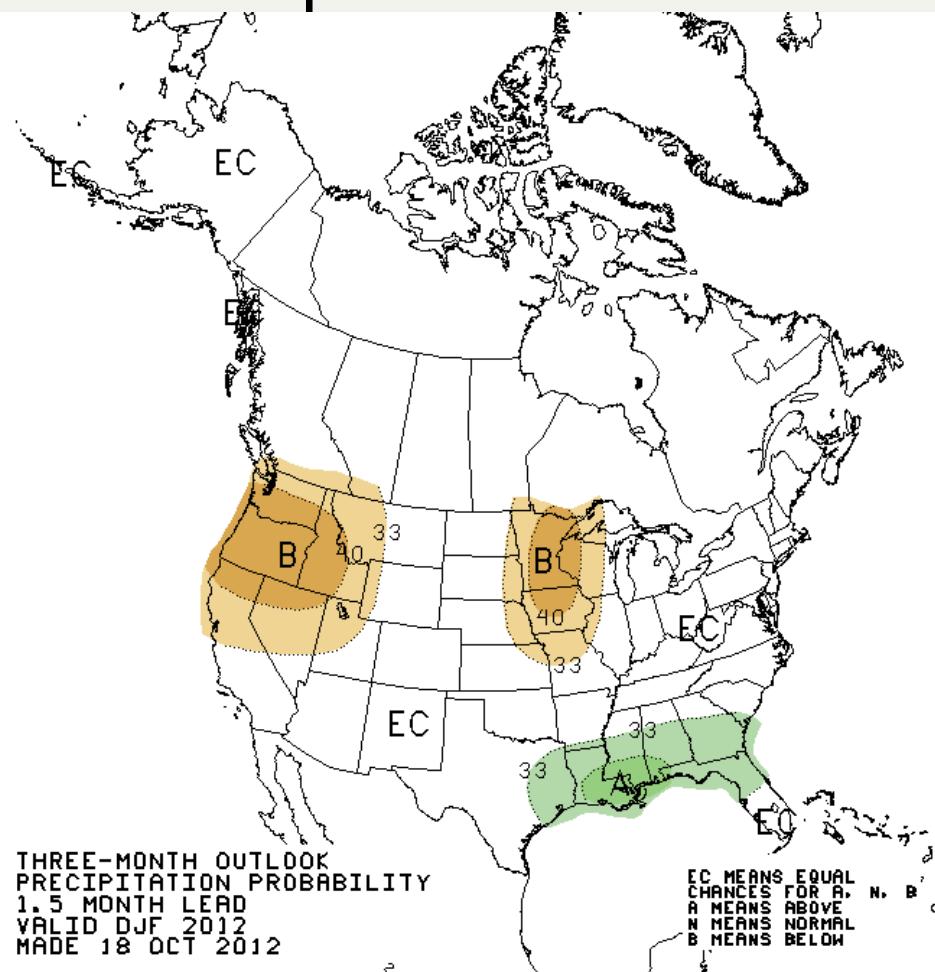


Support for this project provided by
NSF Informal Science Education Program,
NOAA Environmental Literacy Program
and
many local charter sponsors.

CPC December, January, February Temperature Outlook



CPC December, January, February Precipitation Outlook



Colorado Climate Center

Data and Power Point Presentations available for
downloading

<http://ccc.atmos.colostate.edu>

Nolan.Doesken@Colostate.edu



Knowledge to Go Places



COLORADO
CLIMATE
CENTER