

**Summer  
2011**

**August 30<sup>th</sup>, 2011**



**Weekly Colorado Drought Assessment**

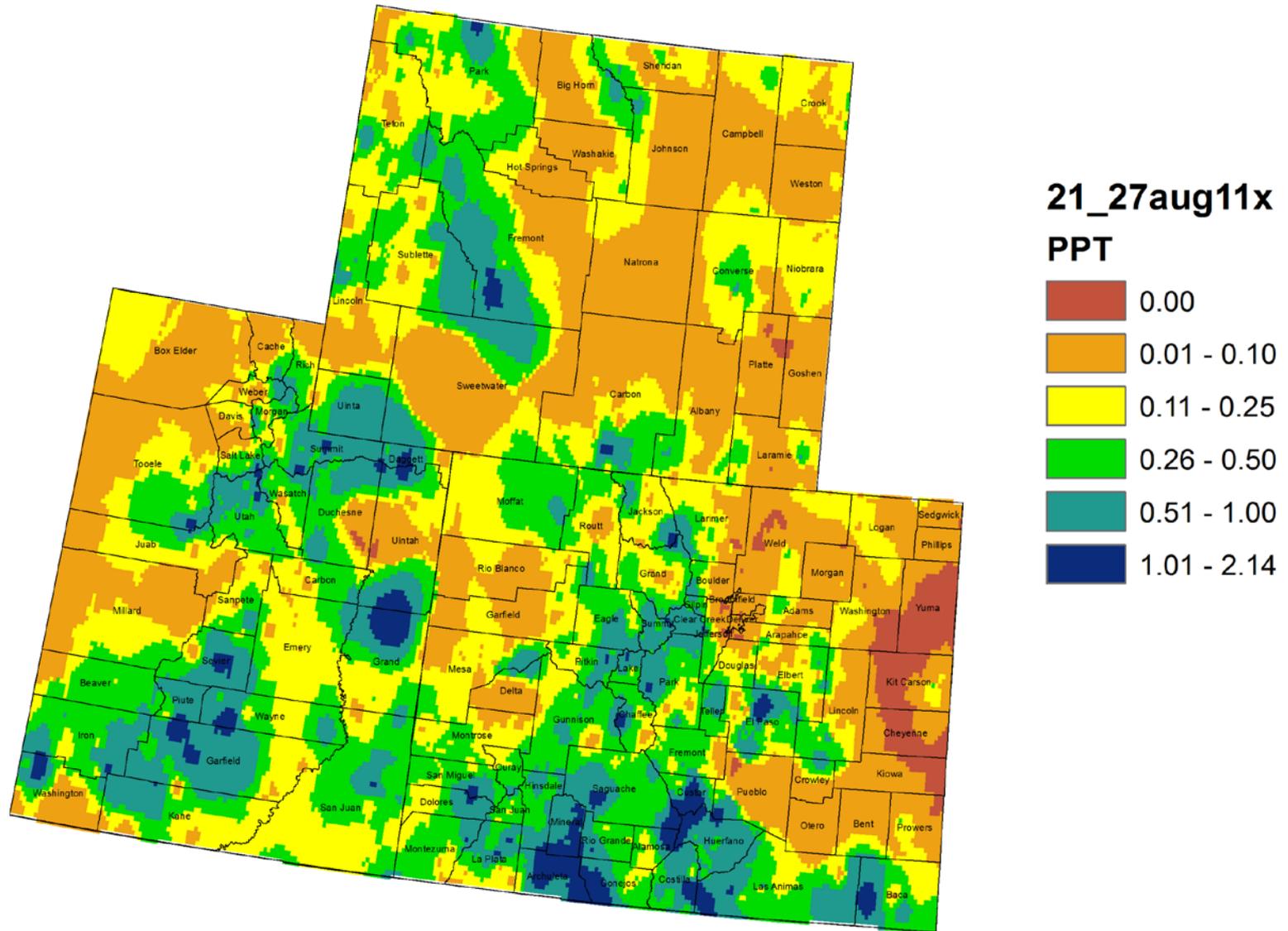
# Today's Agenda

- Assessment of current water conditions
- Precipitation Forecast
- Recommendations for Drought Monitor

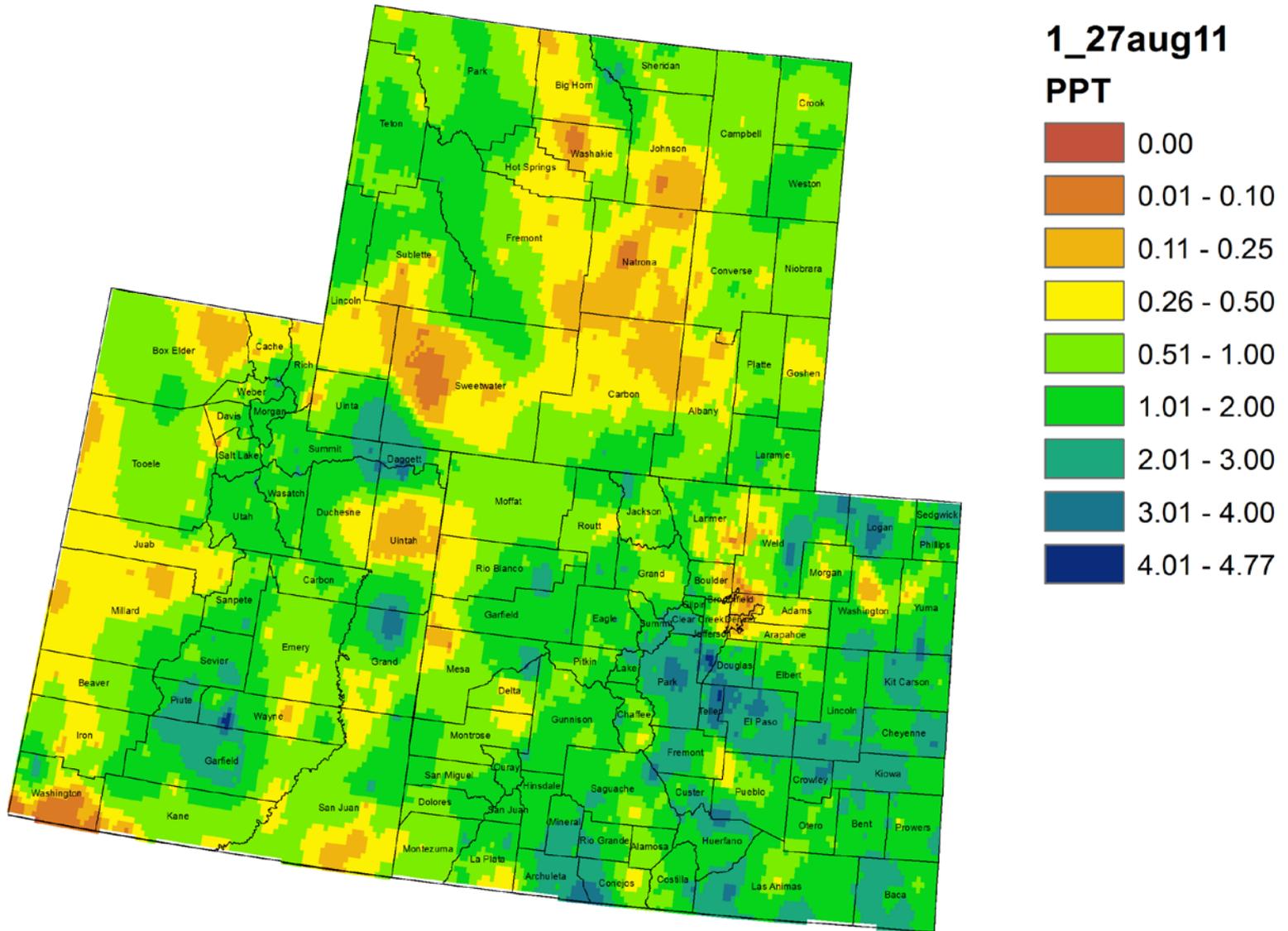
# Precipitation/Snowpack Update



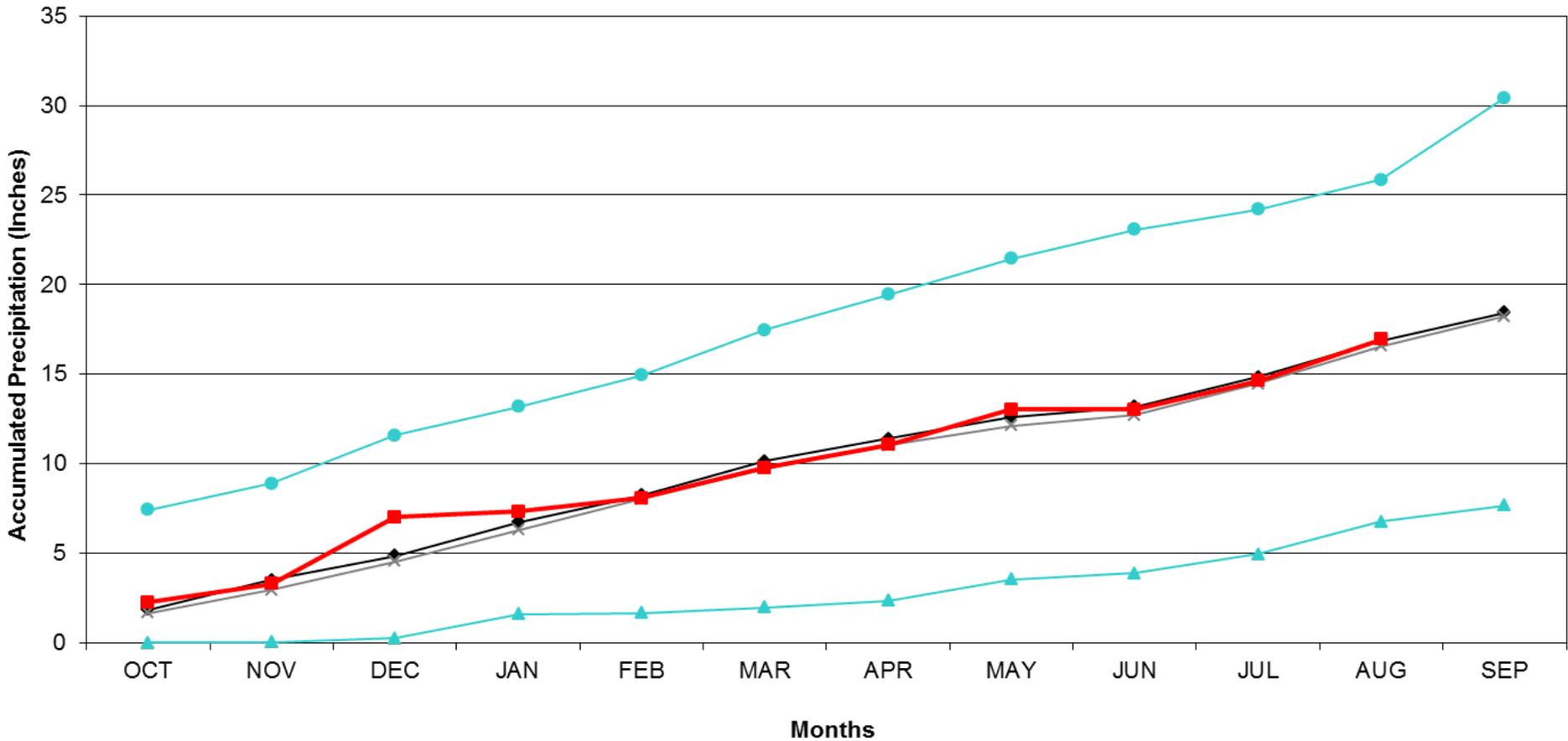
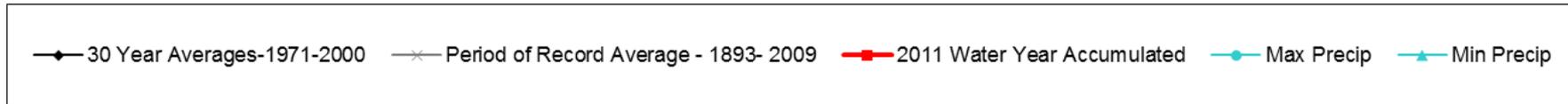
# Colorado, Utah and Wyoming 7 Day Precipitation (in) 21 - 27 August 2011



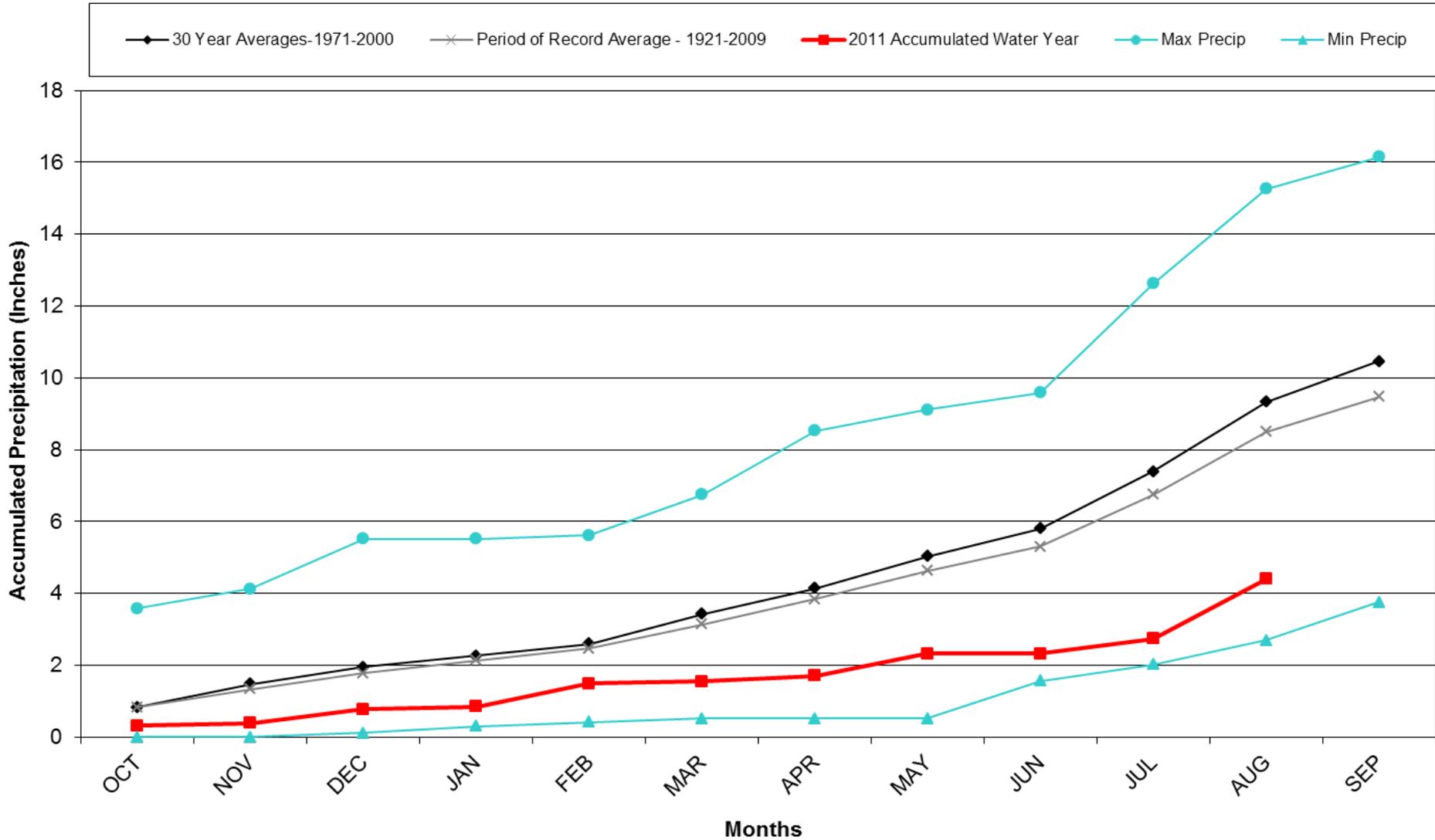
# Colorado, Utah and Wyoming Month to Date Precipitation (in) 1 - 27 August 2011



# Mesa Verde NP 2011 Water Year

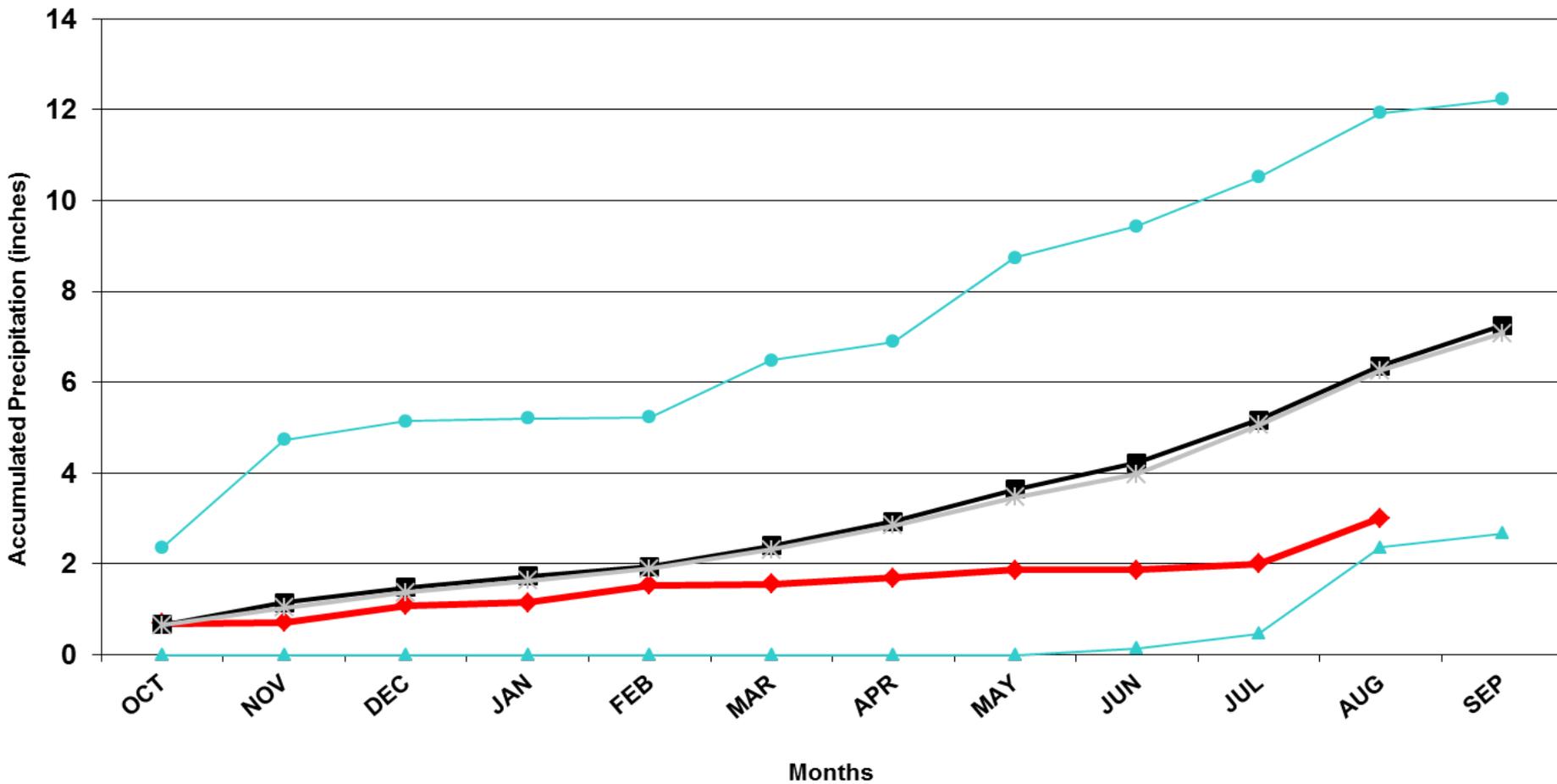


# Del Norte 2011 Water Year

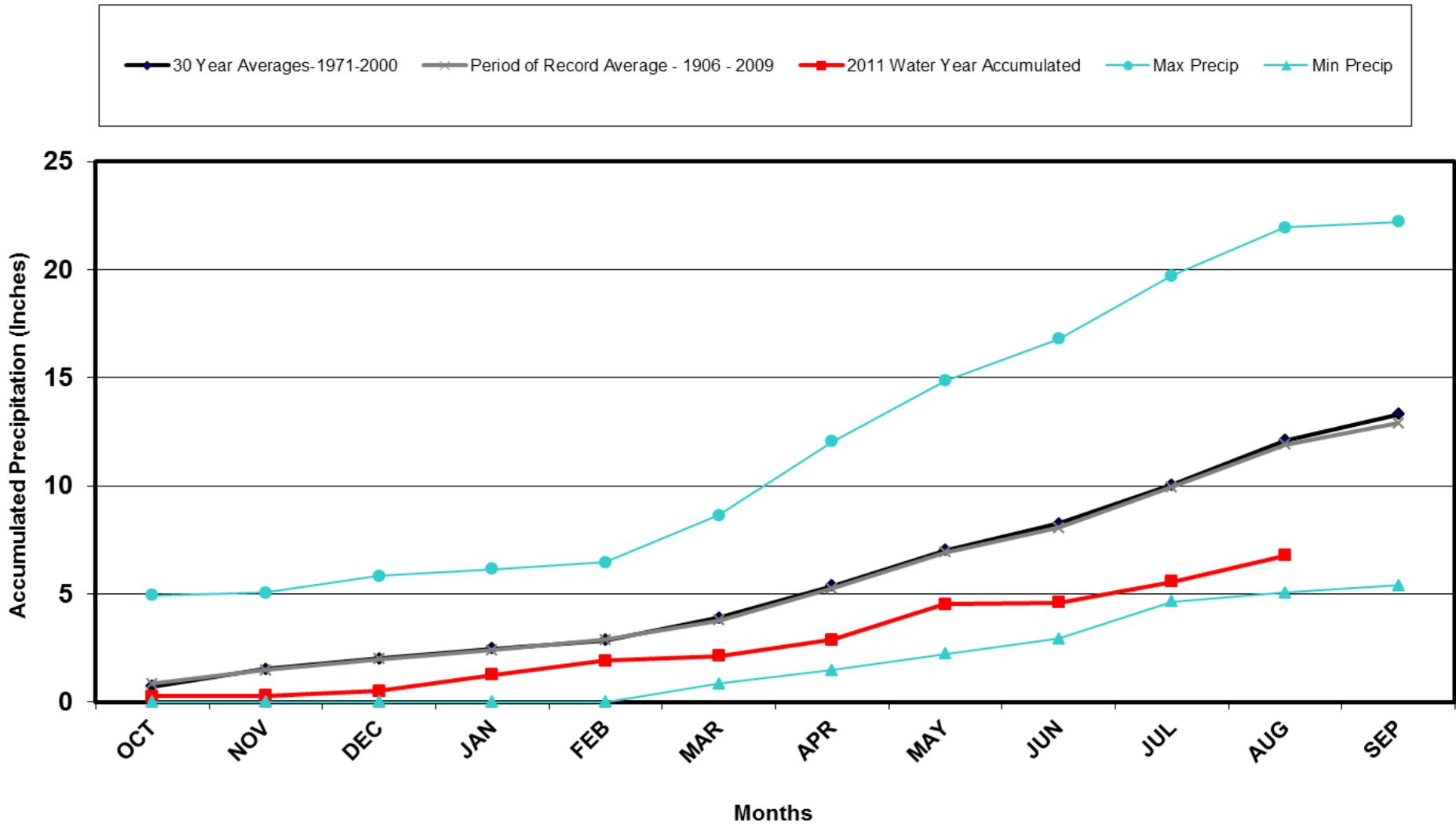


# Alamosa 2011 Water Year

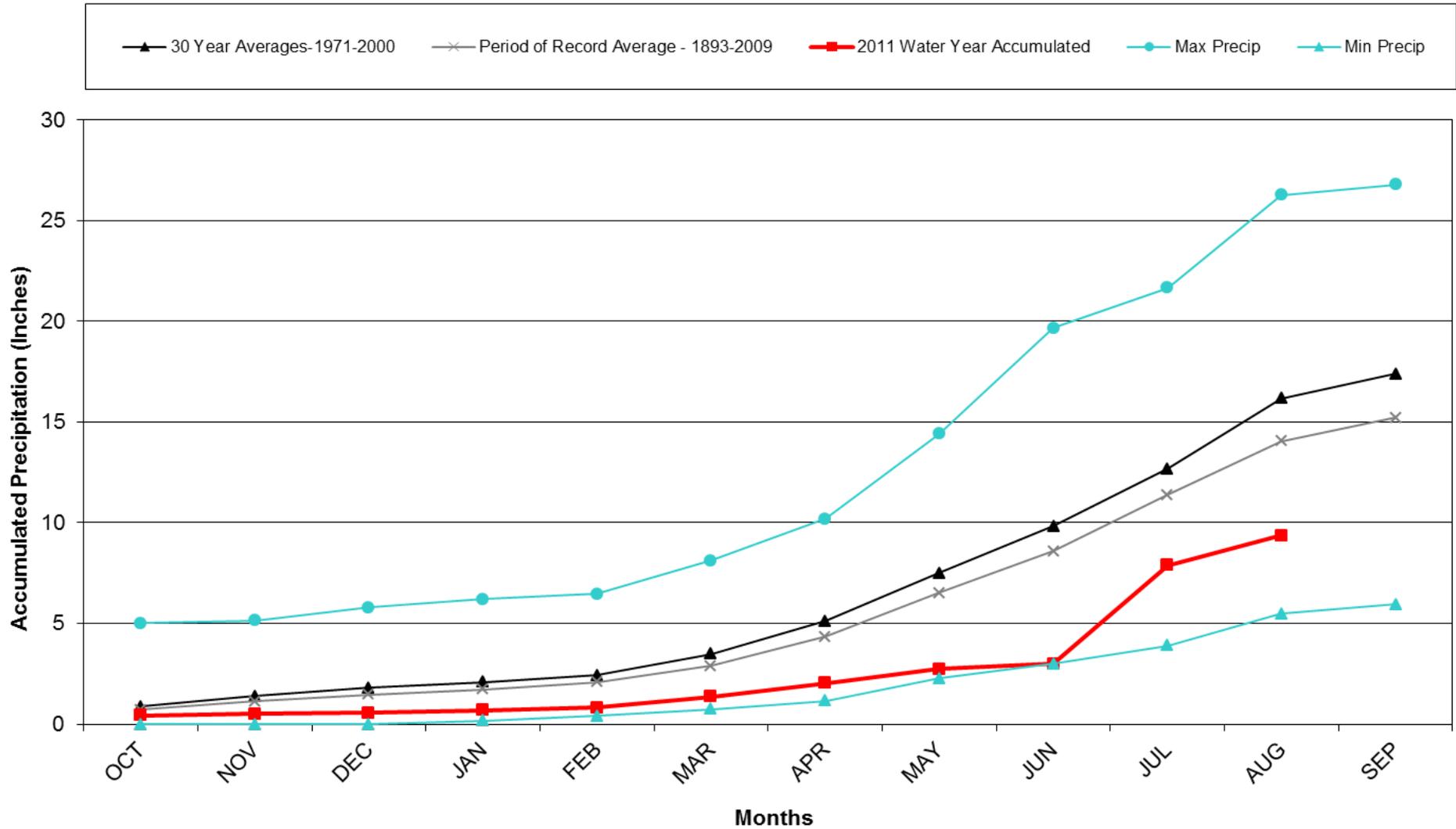
2011 Water Year    30 Year Averages-1971-2000    Period of Record Average - 1948-2010    Max Precip    Min Precip



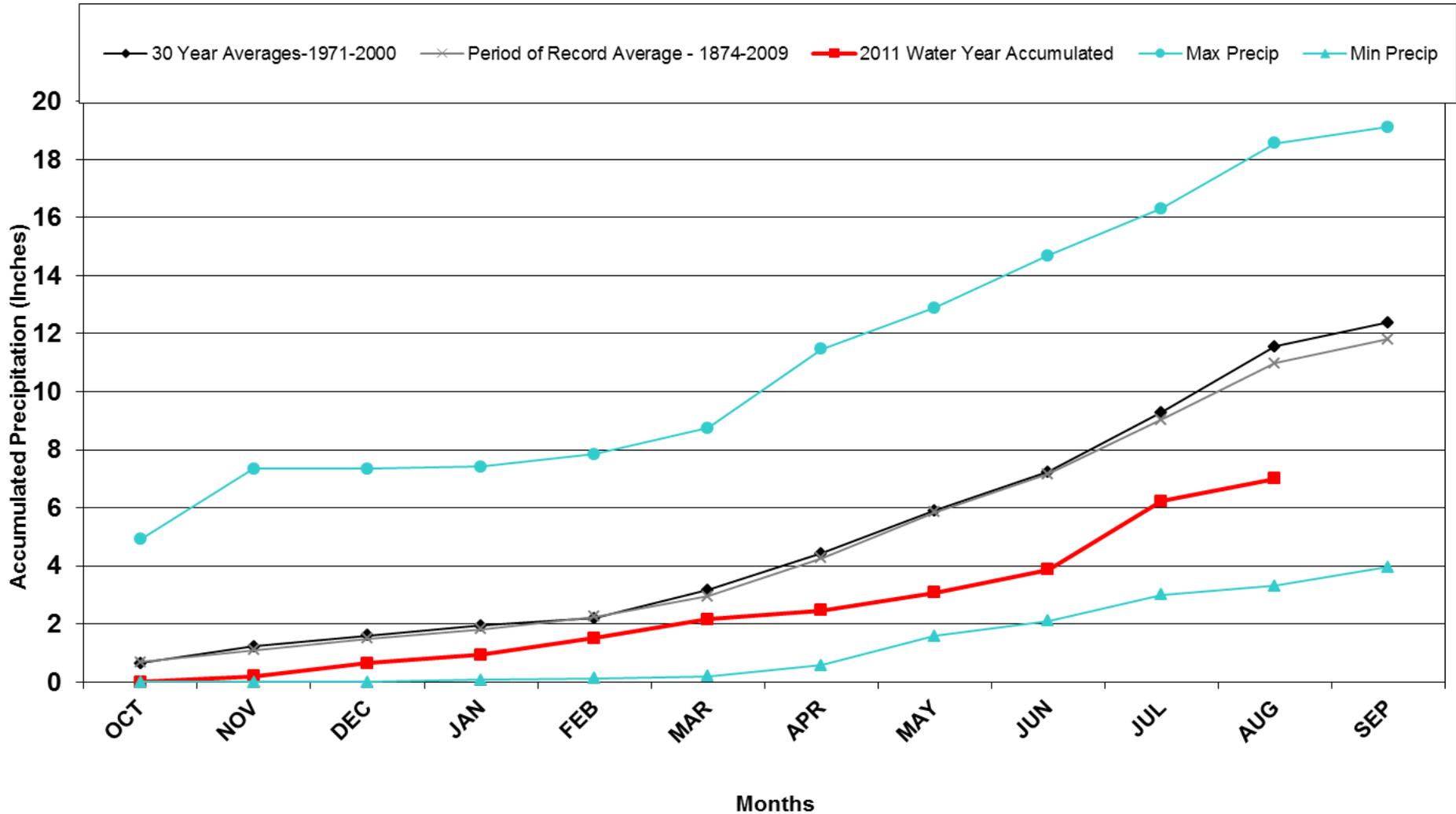
# Canon City 2011 Water Year



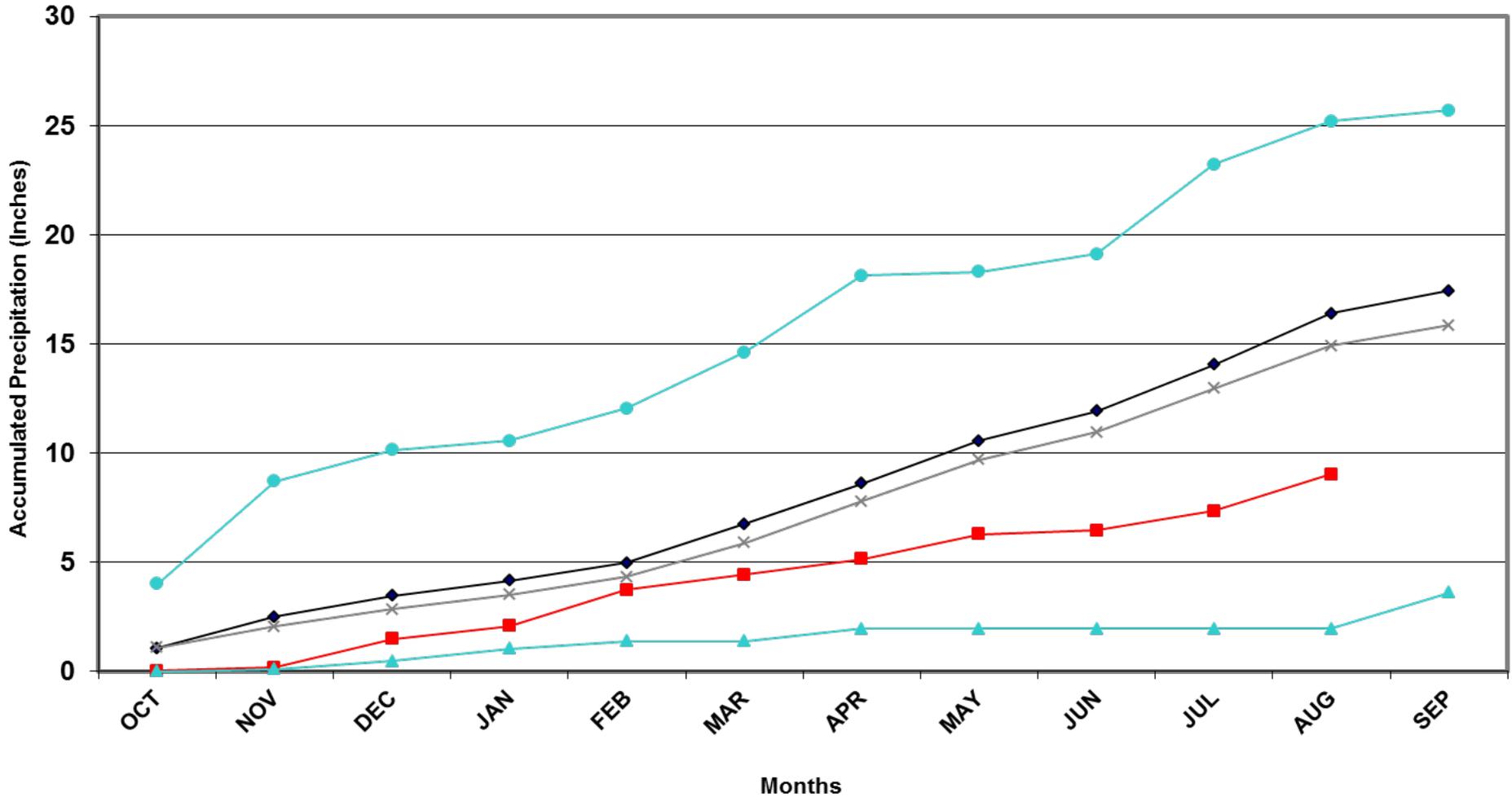
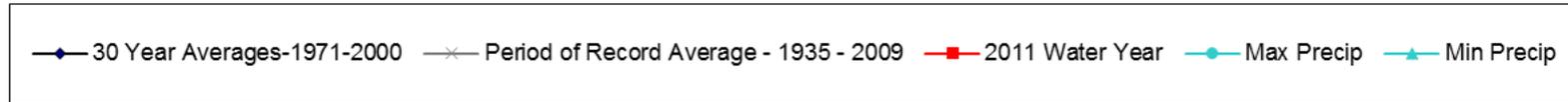
# Colorado Springs 2011 Water Year



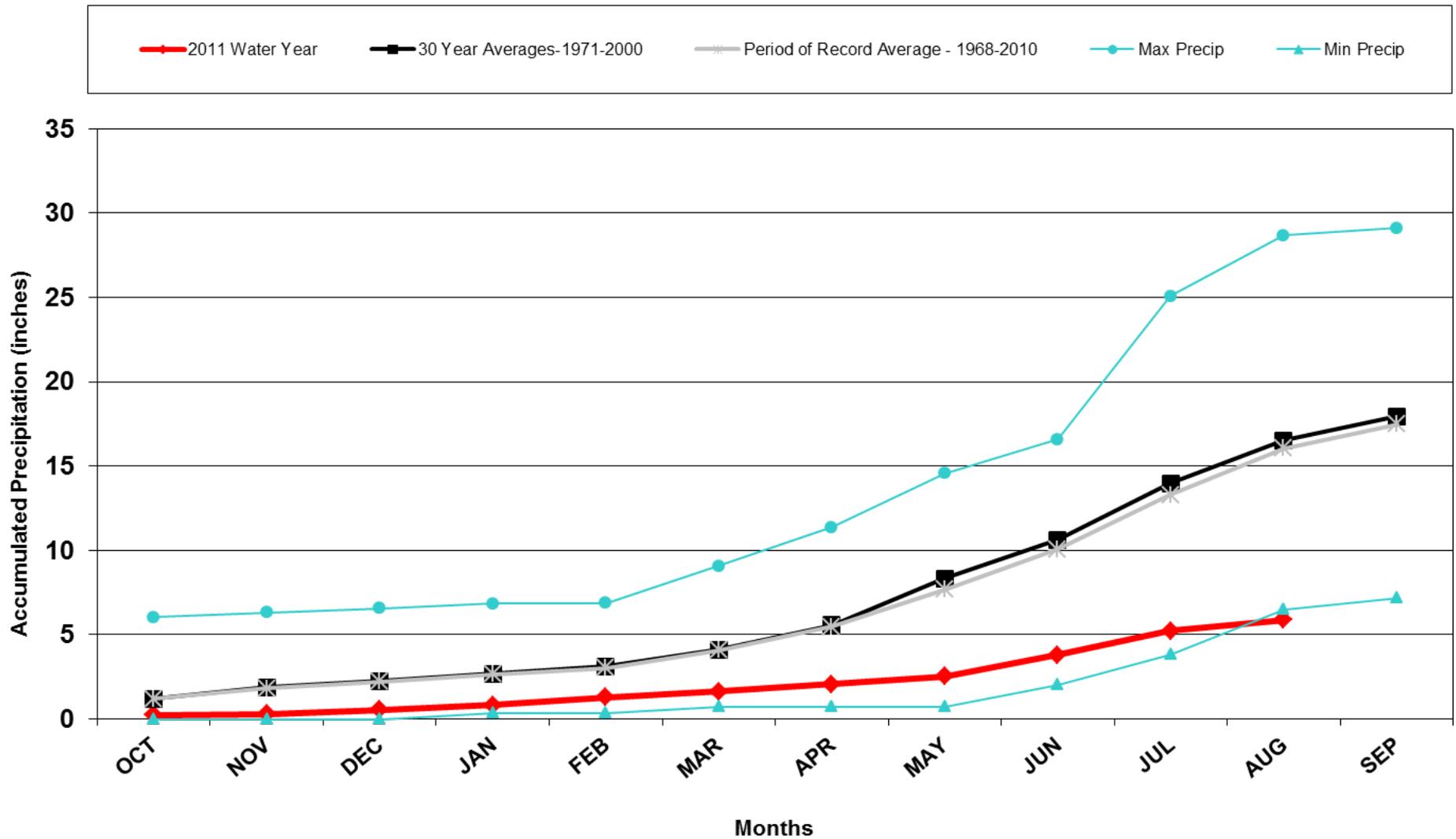
# Pueblo WSO 2011 Water Year



# Walsenburg 2011 Water Year

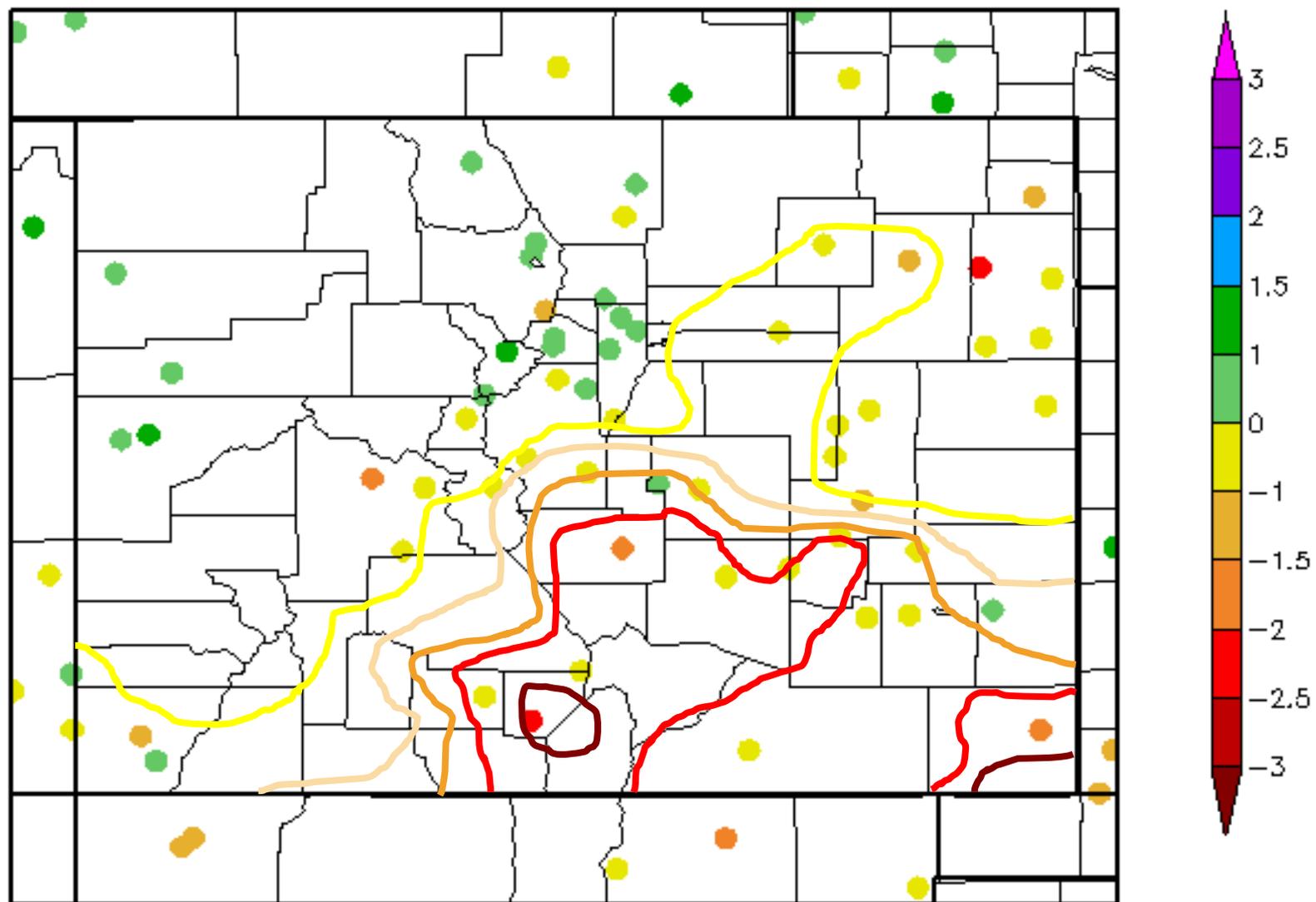


# Walsh 2011 Water Year



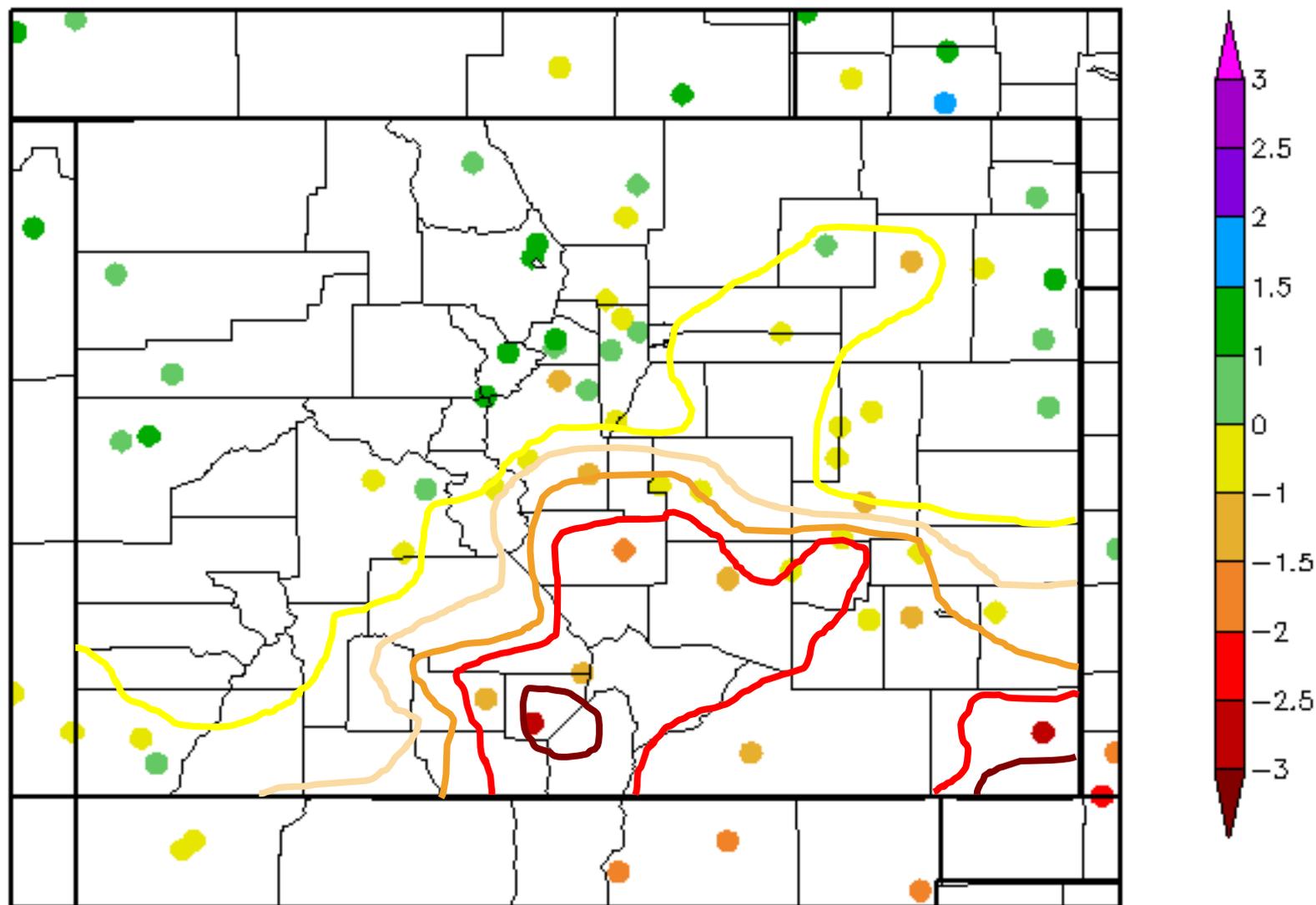
# 90 Day SPI

5/31/2011 - 8/28/2011



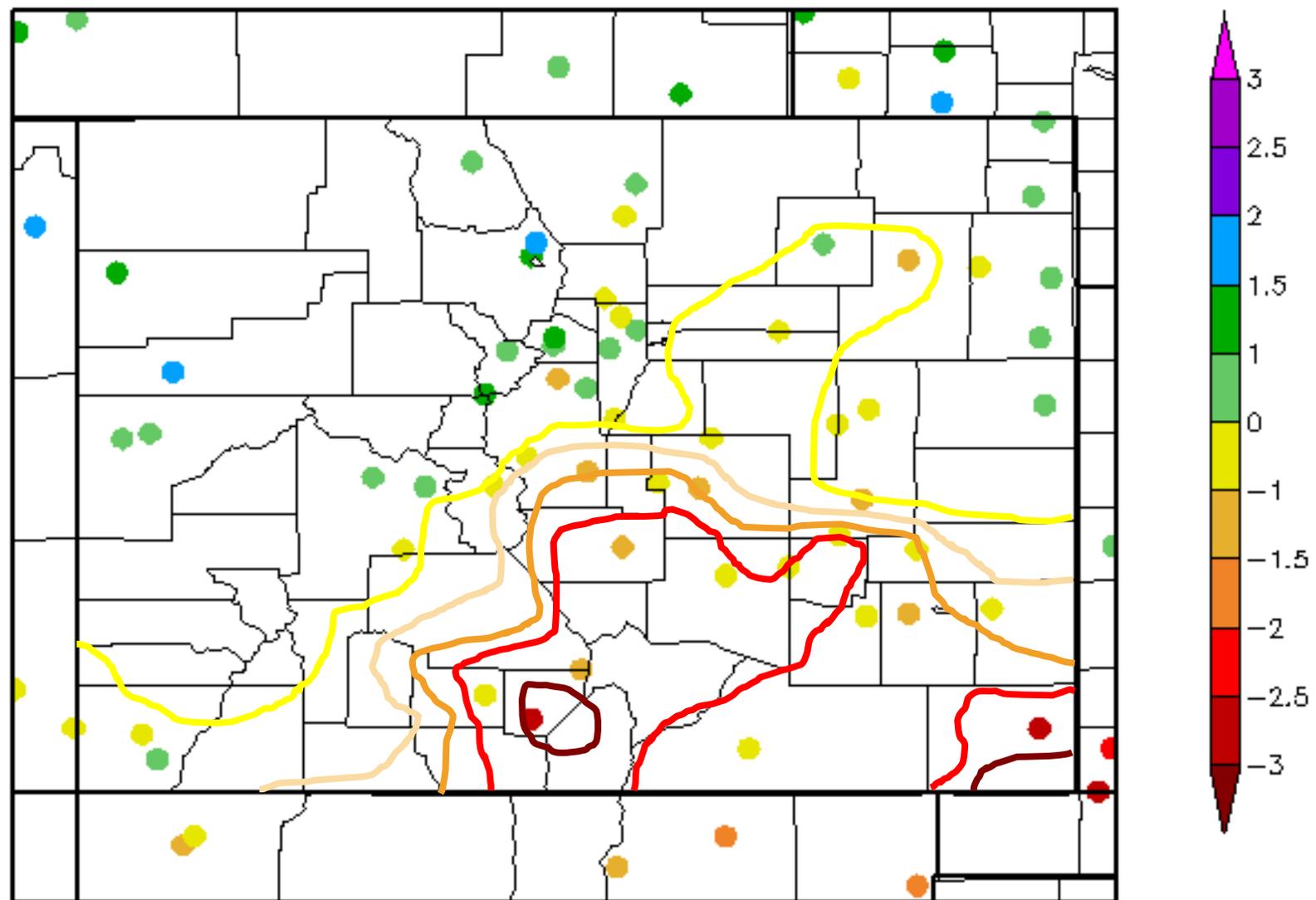
# 6 Month SPI

3/1/2011 - 8/28/2011



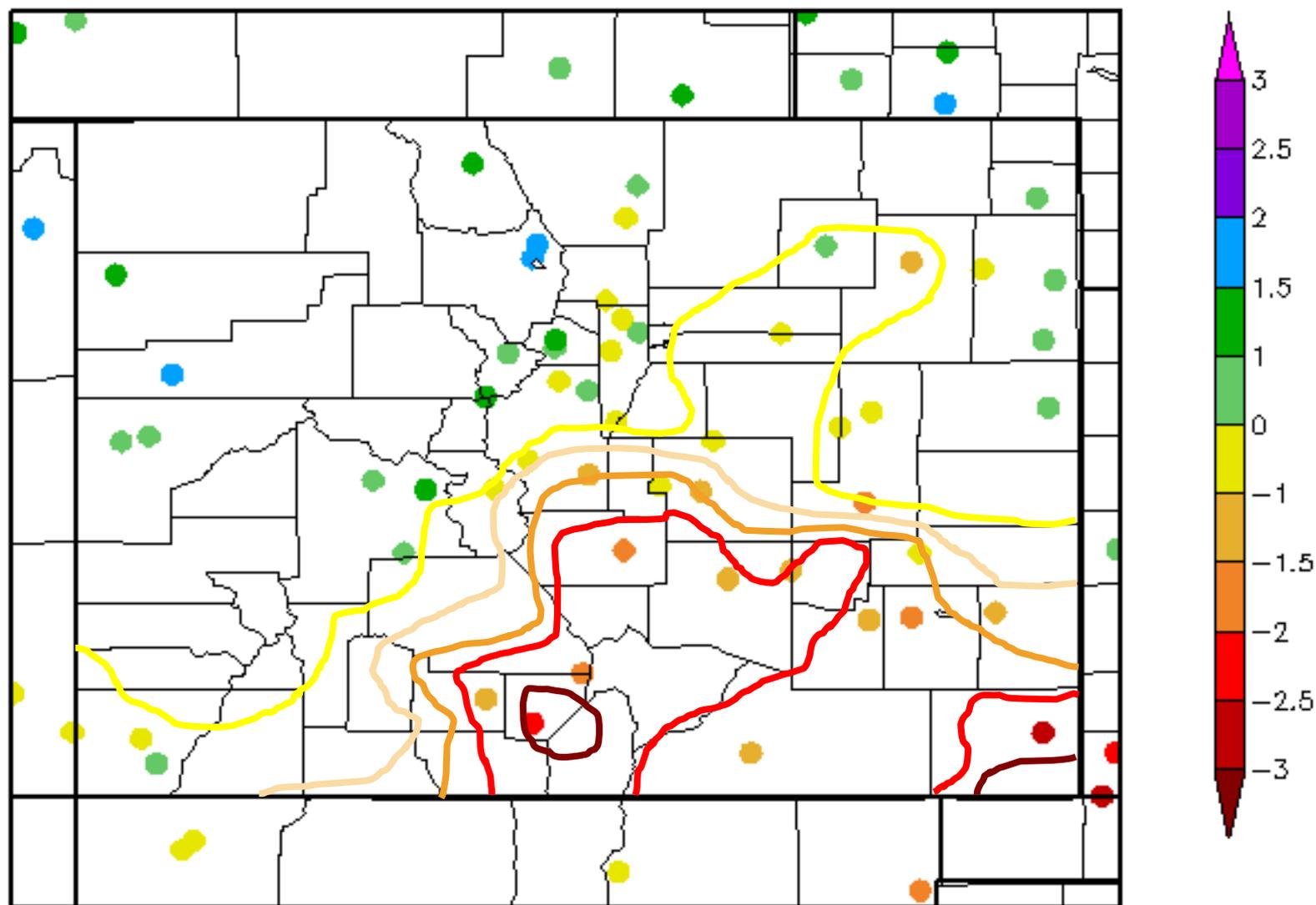
# 9 Month SPI

11/29/2010 - 8/28/2011

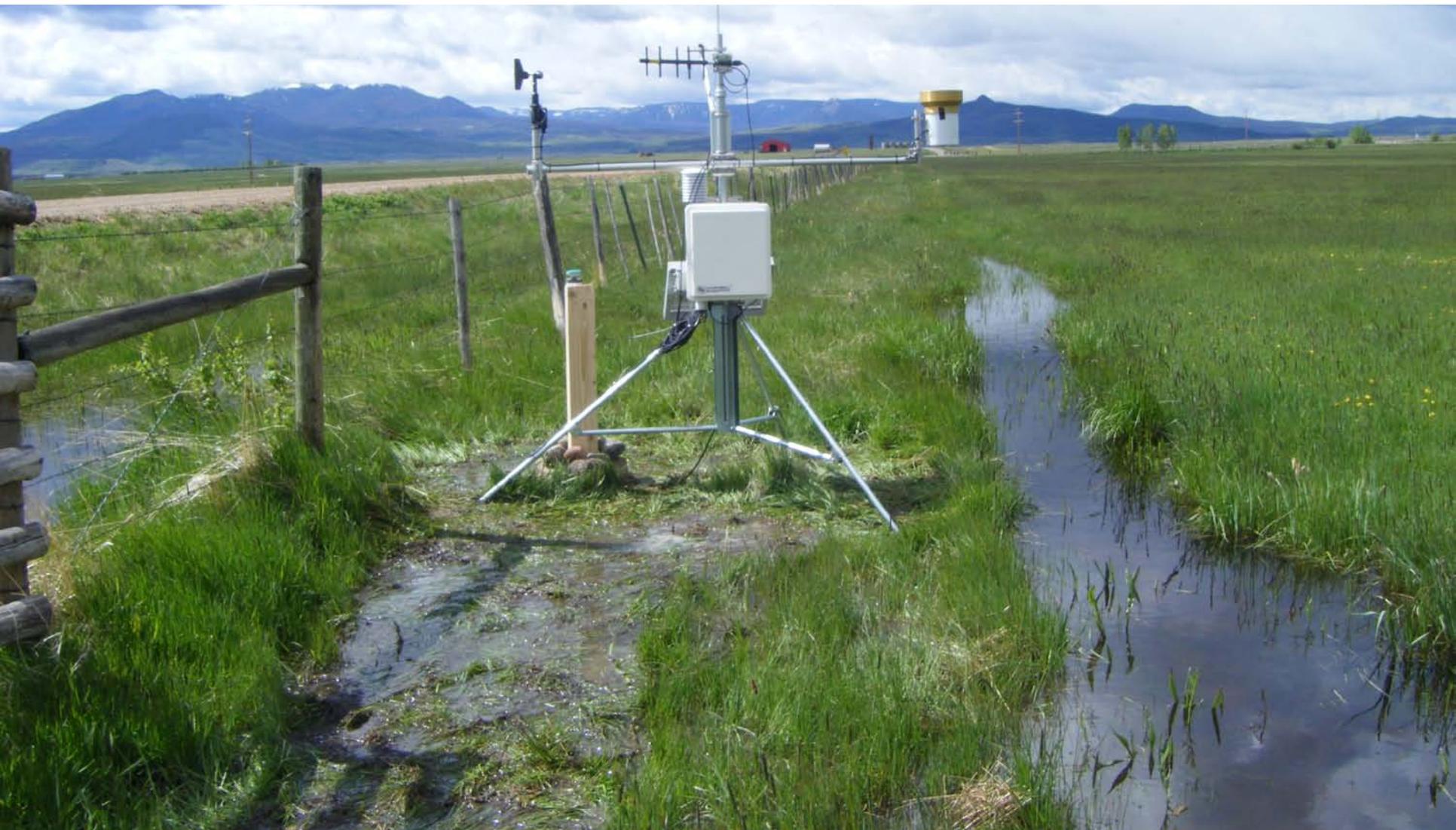


# Water Year SPI

10/1/2010 - 8/28/2011

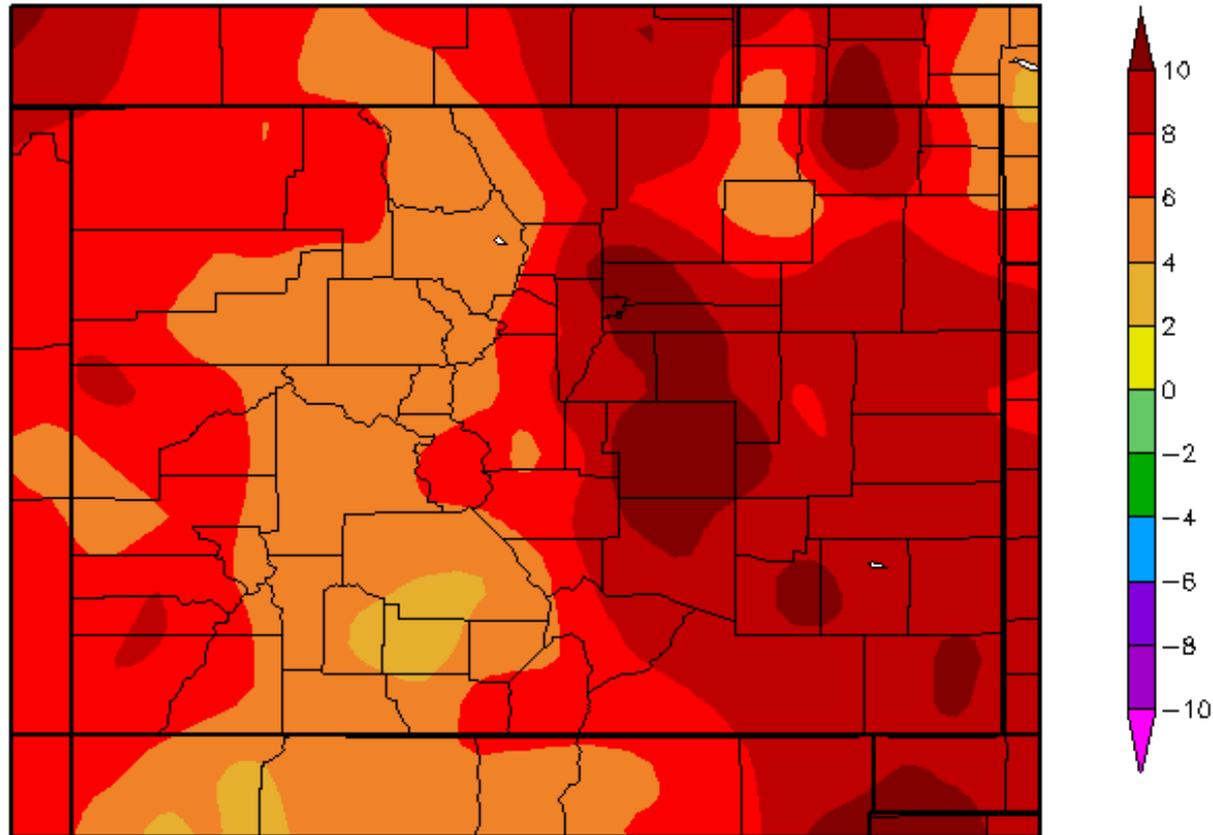


# Water Demand



# Temperature Departure from Normal 08/22/2011 – 08/28/2011

Departure from Normal Temperature (F)  
8/22/2011 – 8/28/2011

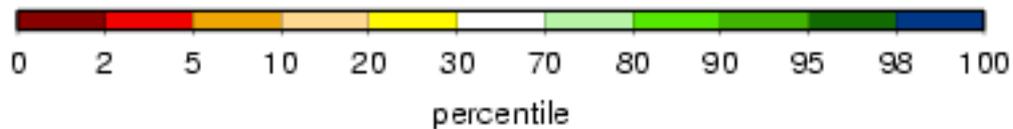
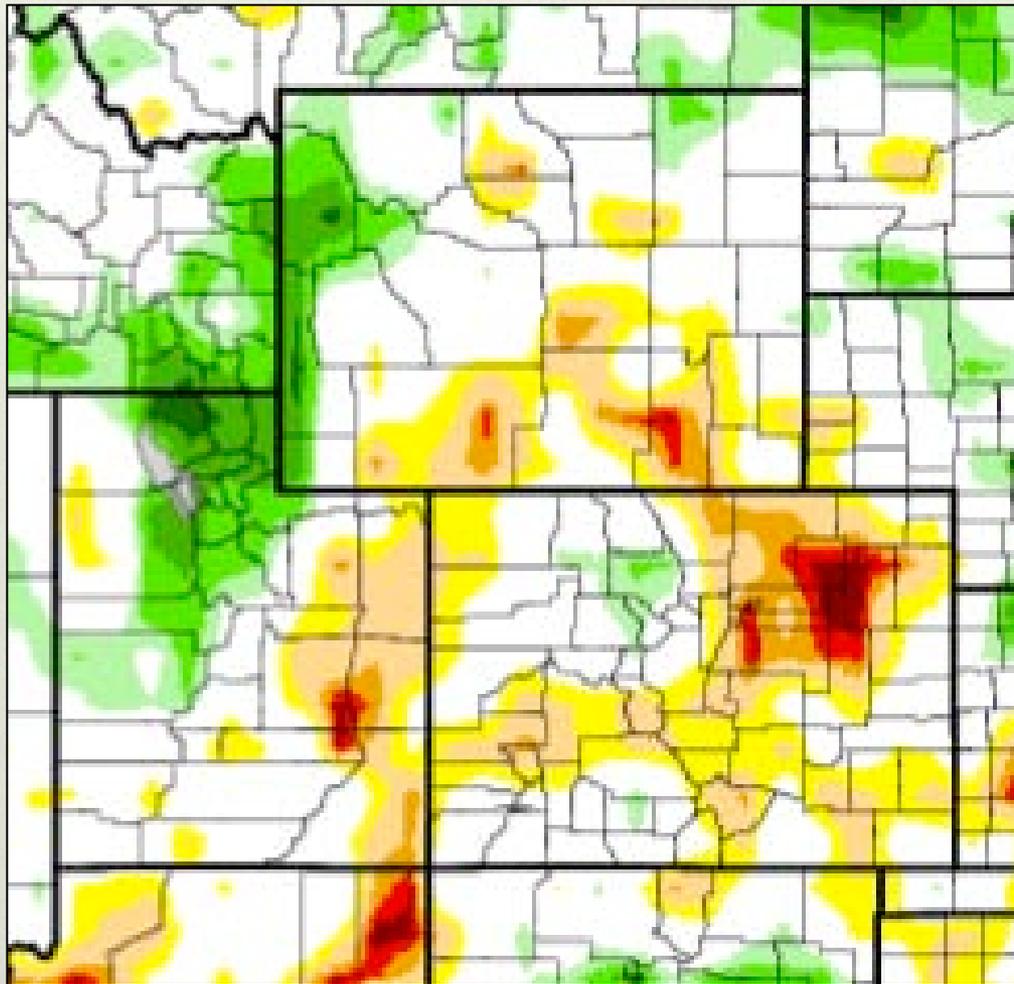


Generated 8/29/2011 at HPRCC using provisional data.

Regional Climate Centers

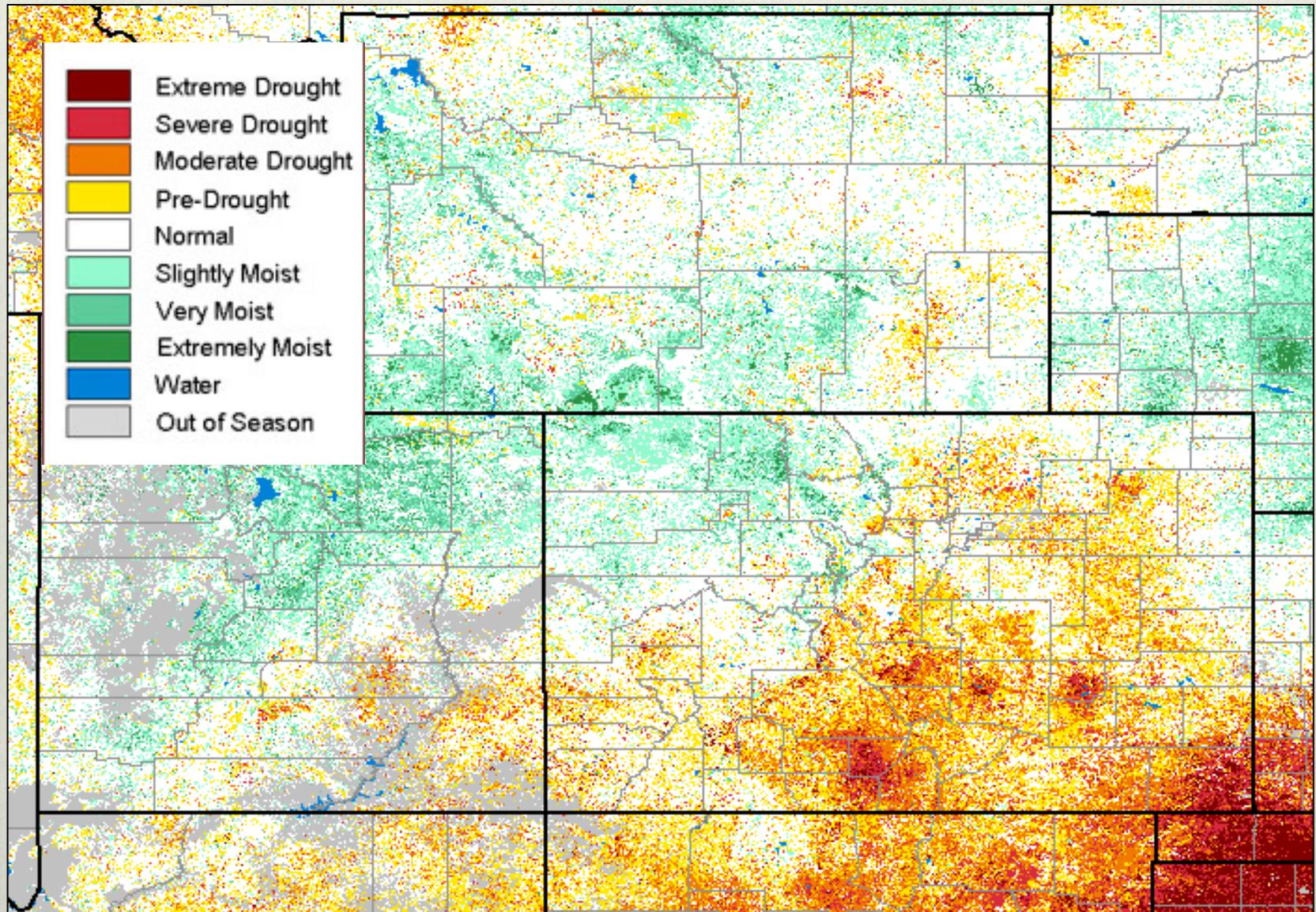
# VIC Soil Moisture Percentiles

## 28 August 2011



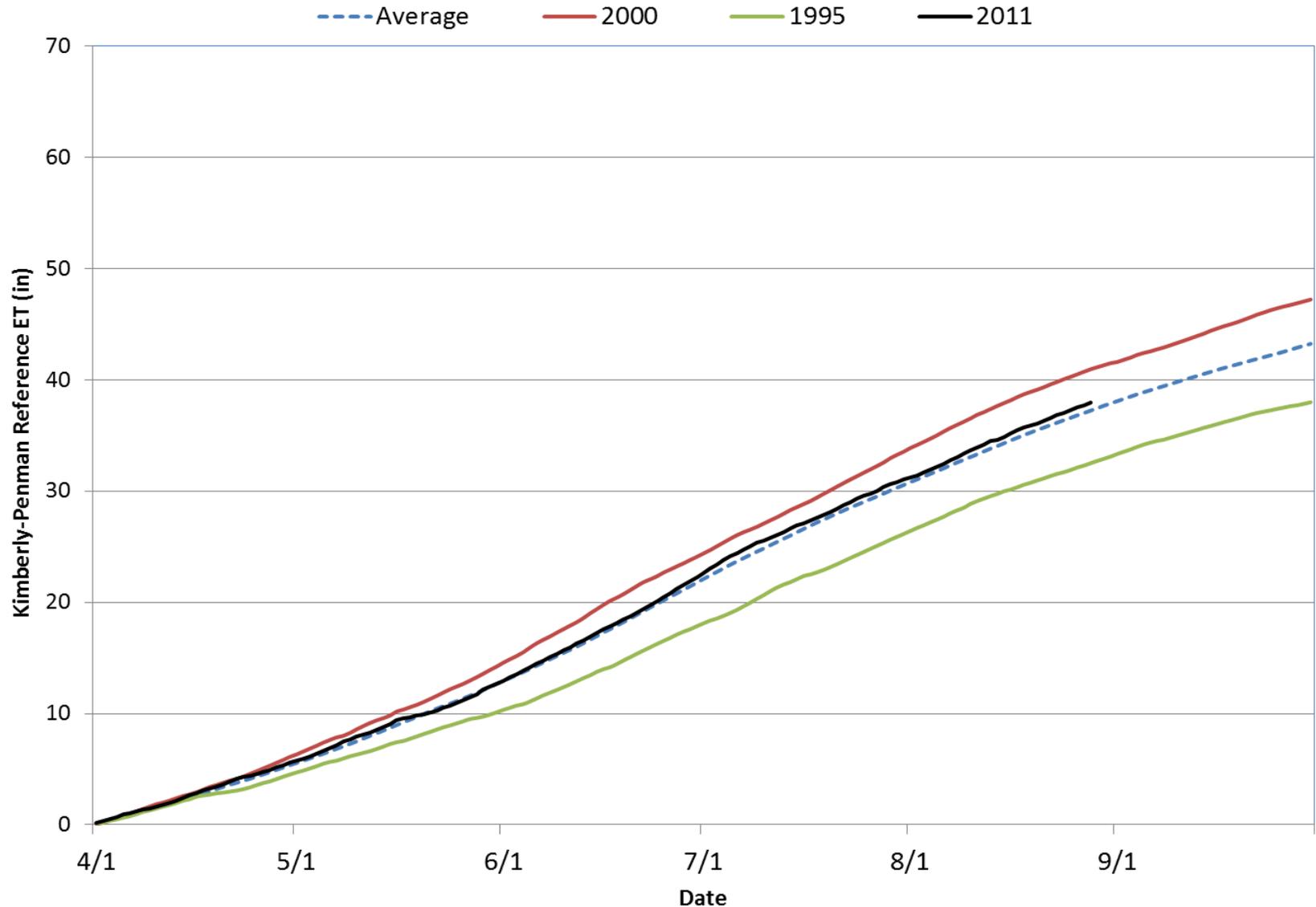
# eMODIS VegDRI

## 28 August 2011



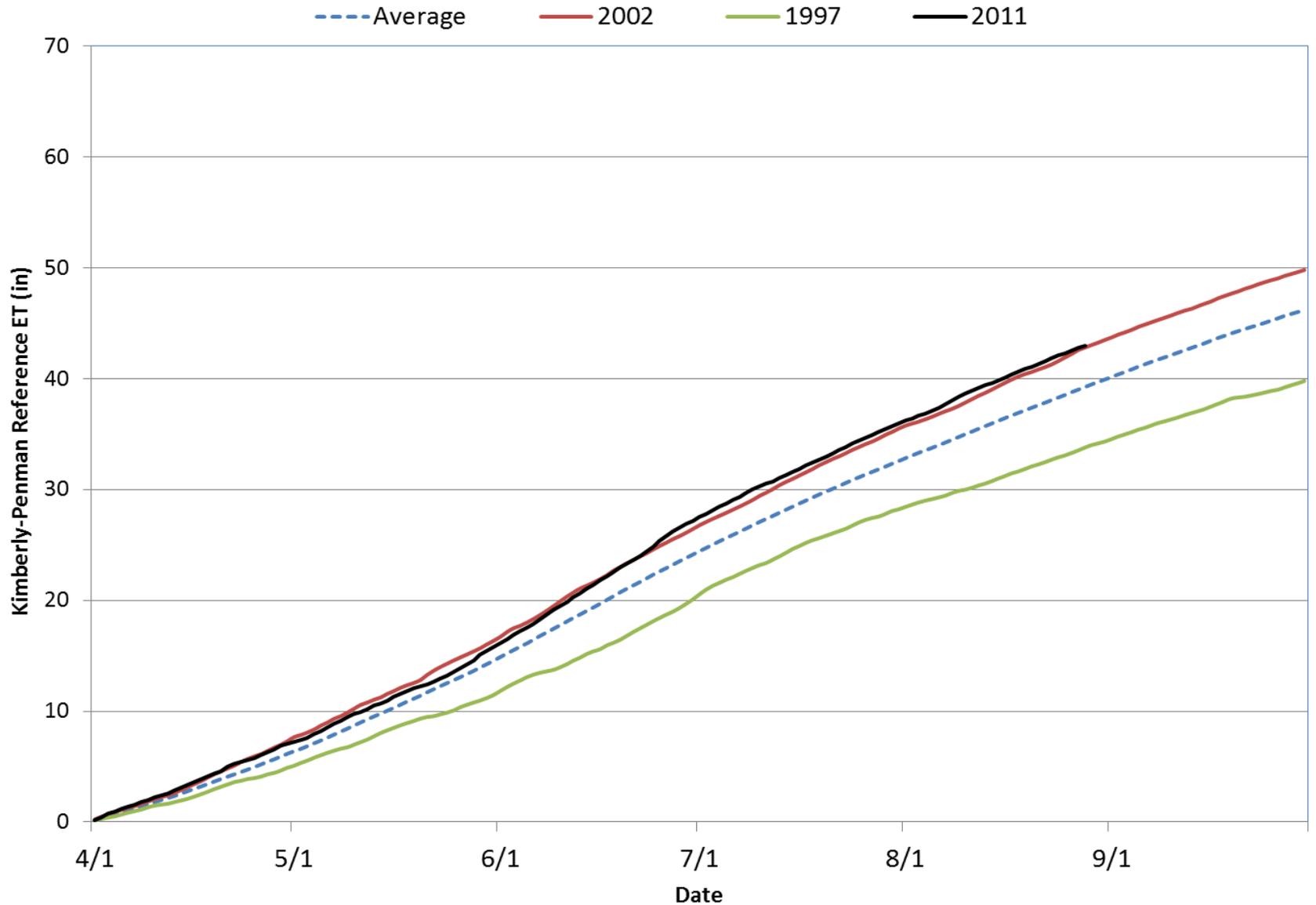
# Cortez Reference ET – SW CO

CTZ01 Kimberly-Penman Reference ET (1992 - 2011)



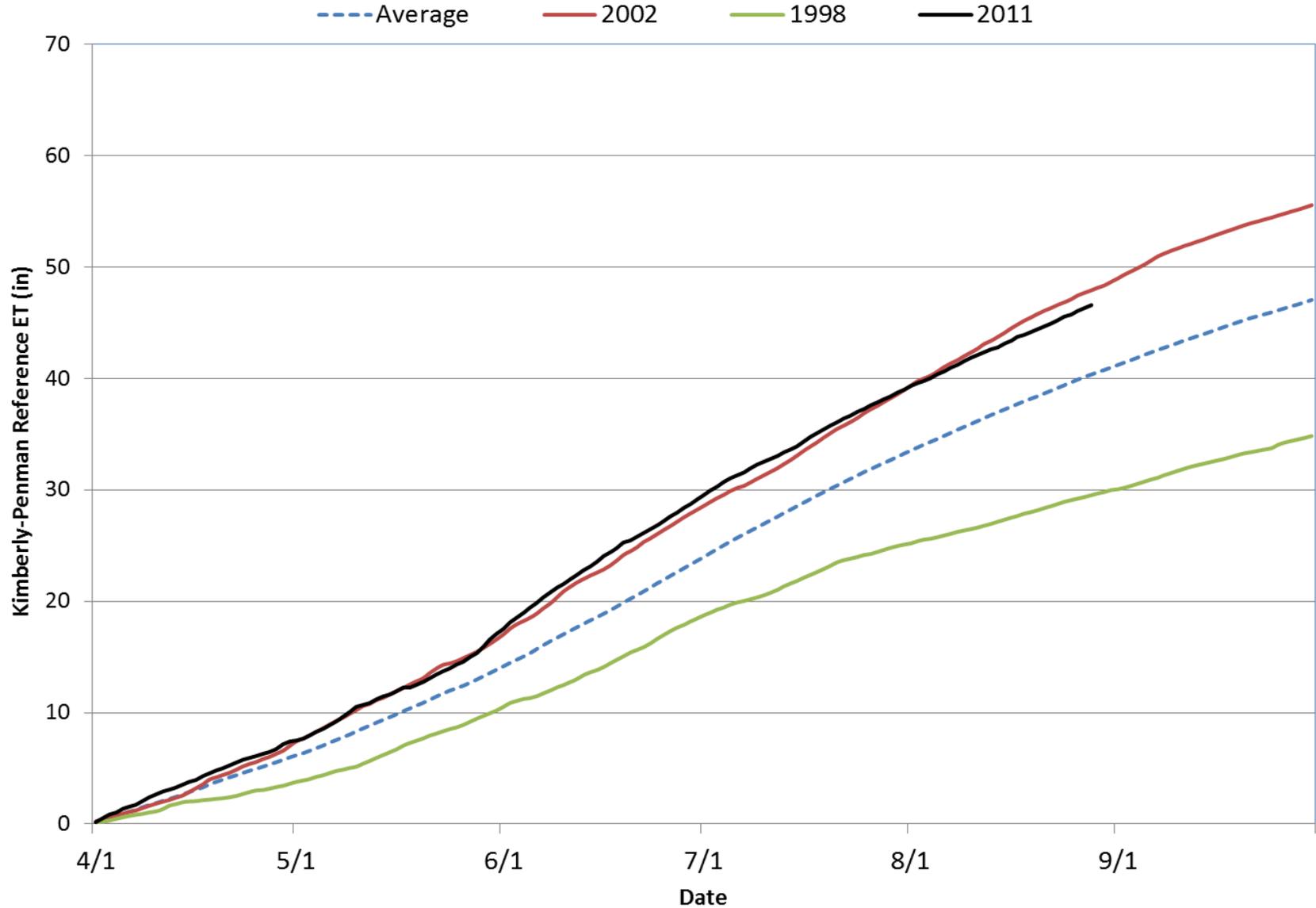
# Center Reference ET - SLV

CTR01 Kimberly-Penman Reference ET (1994 - 2011)



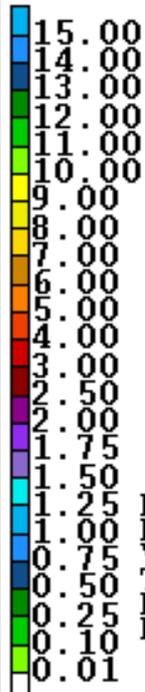
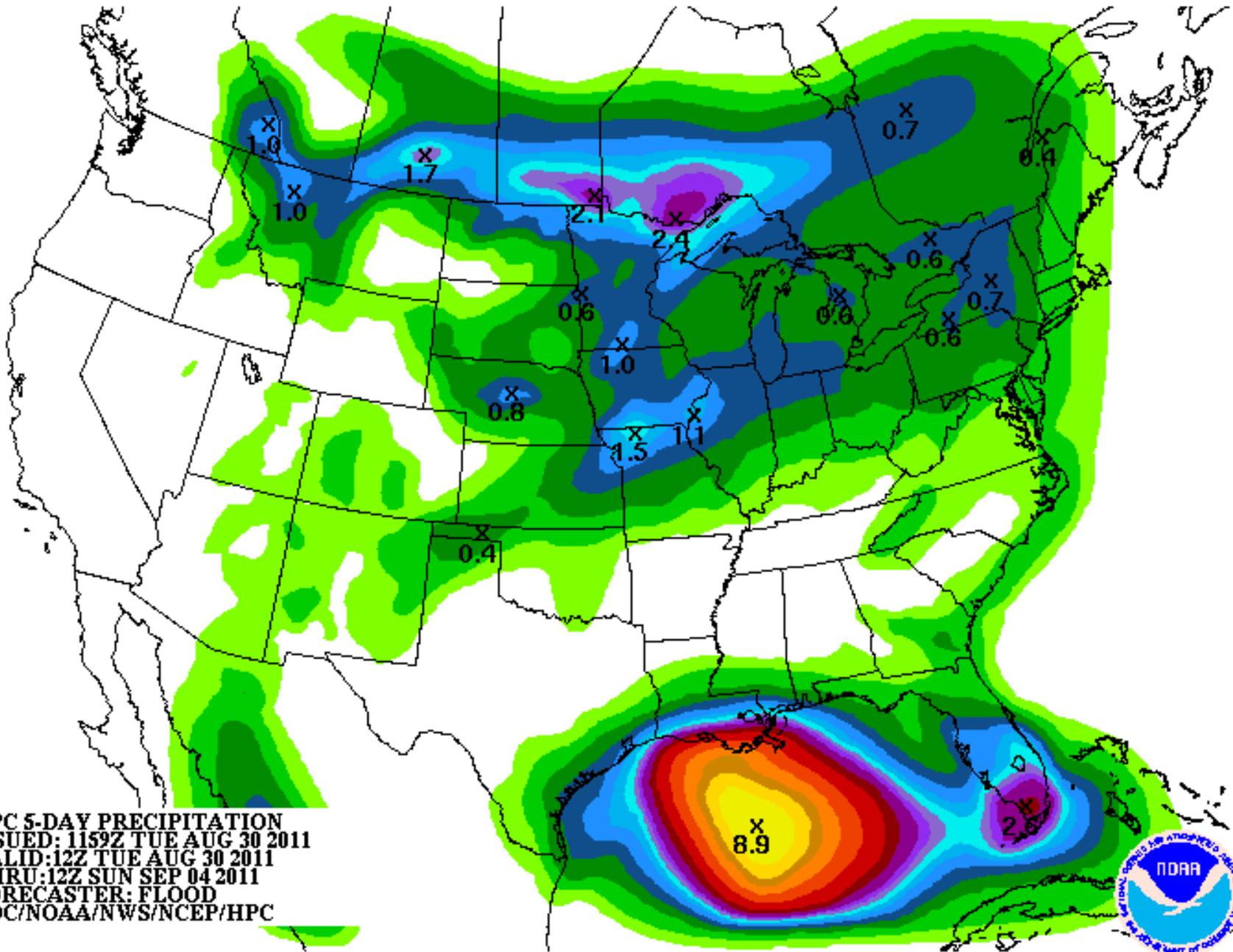
# Avondale Reference ET – AR Basin

AVN01 Kimberly-Penman Reference ET (1993 - 2011)



# Precipitation Forecast

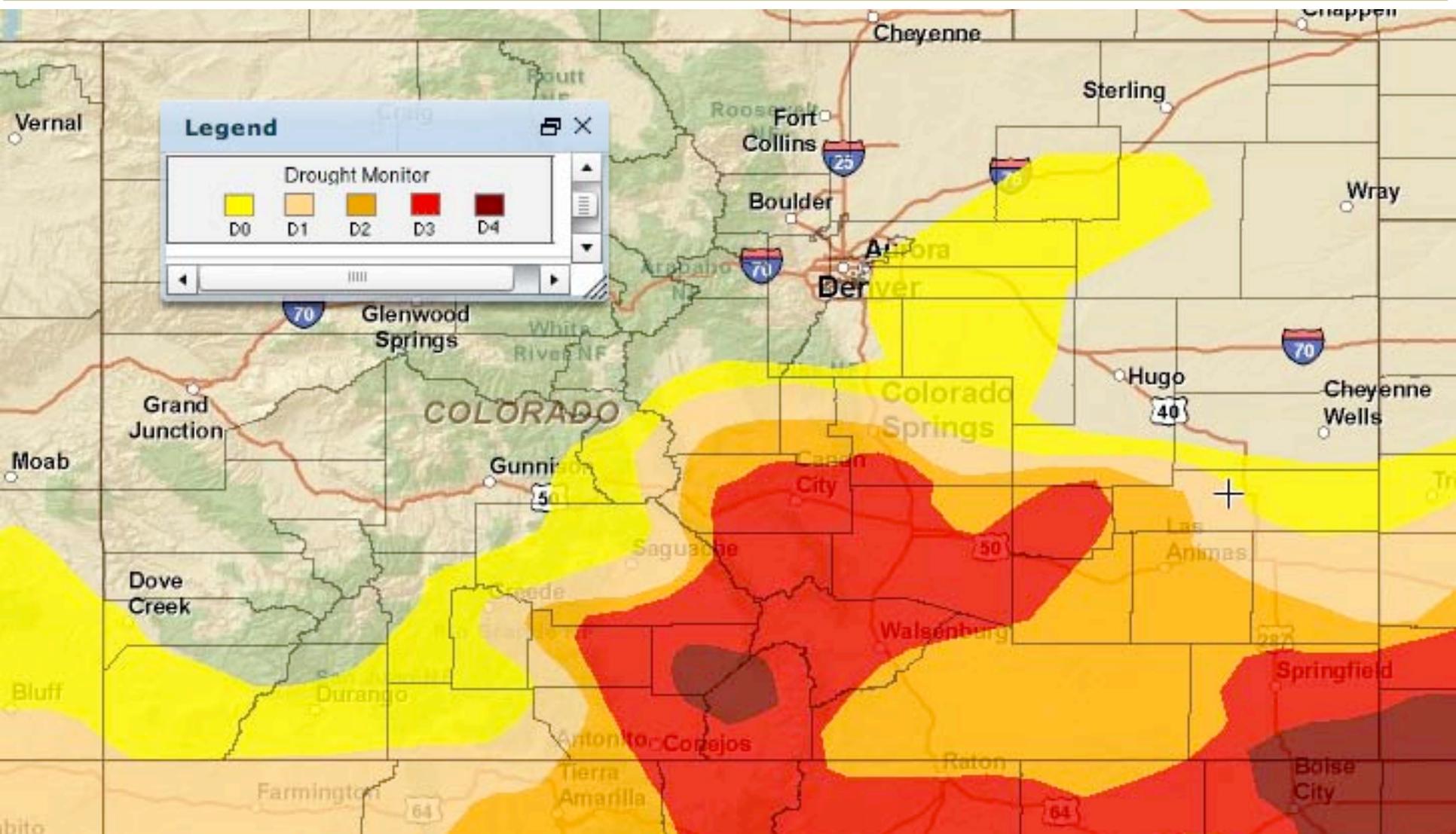




**HPC 5-DAY PRECIPITATION**  
 ISSUED: 1159Z TUE AUG 30 2011  
 VALID: 12Z TUE AUG 30 2011  
 THRU: 12Z SUN SEP 04 2011  
 FORECASTER: FLOOD  
 DOC/NOAA/NWS/NCEP/HPC



# Recommendations



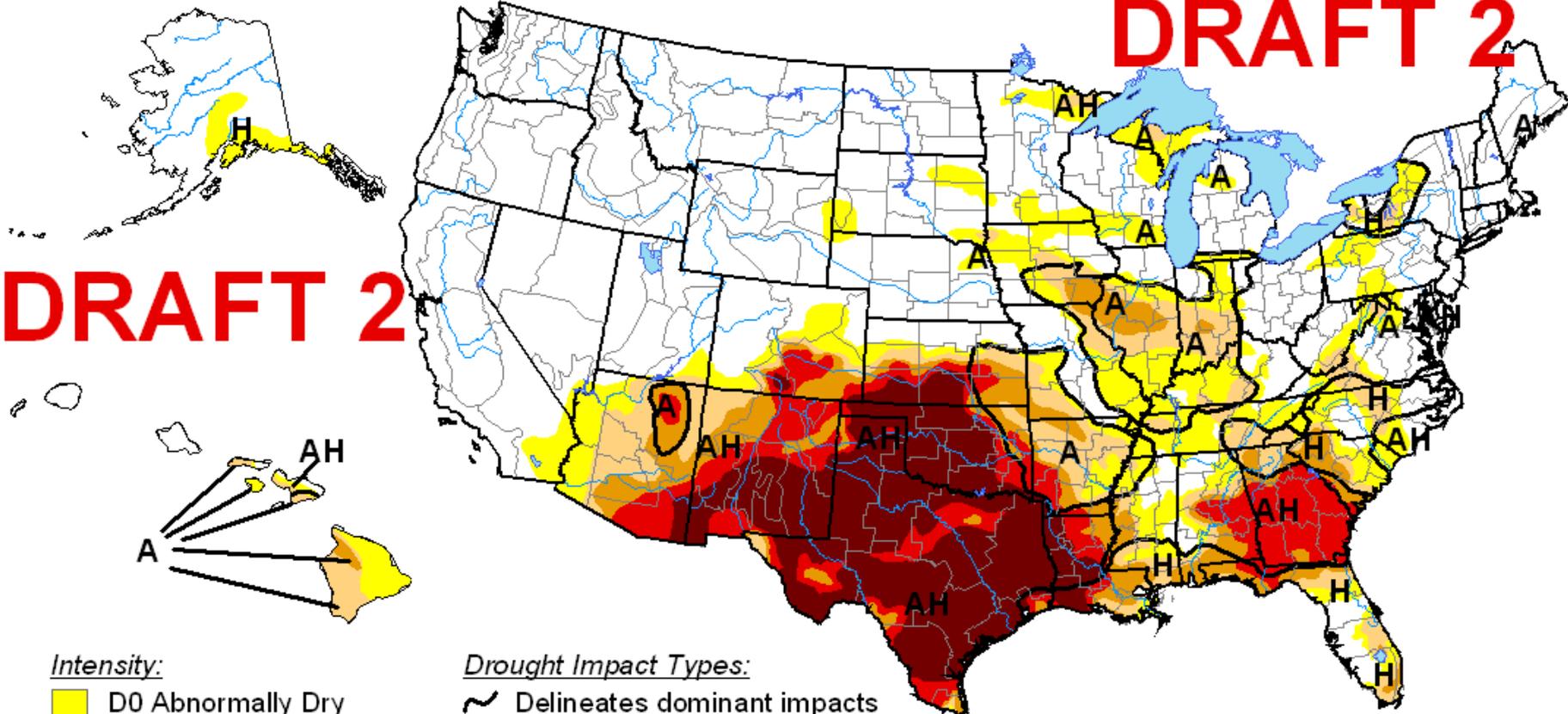
# U.S. Drought Monitor

August 30, 2011

Valid 7 a.m. EDT

## DRAFT 2

## DRAFT 2



### Intensity:

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

### Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

## DRAFT 2

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

<http://drought.unl.edu/dm>



Released Thursday, September 1, 2011

Author: Eric Luebehusen, U.S. Department of Agriculture

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**NIDIS - UPPER COLORADO BASIN PILOT PROJECT**

**F o r m o r e i n f o r m a t i o n**

# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

August 30, 2011

# Precipitation and Snowpack

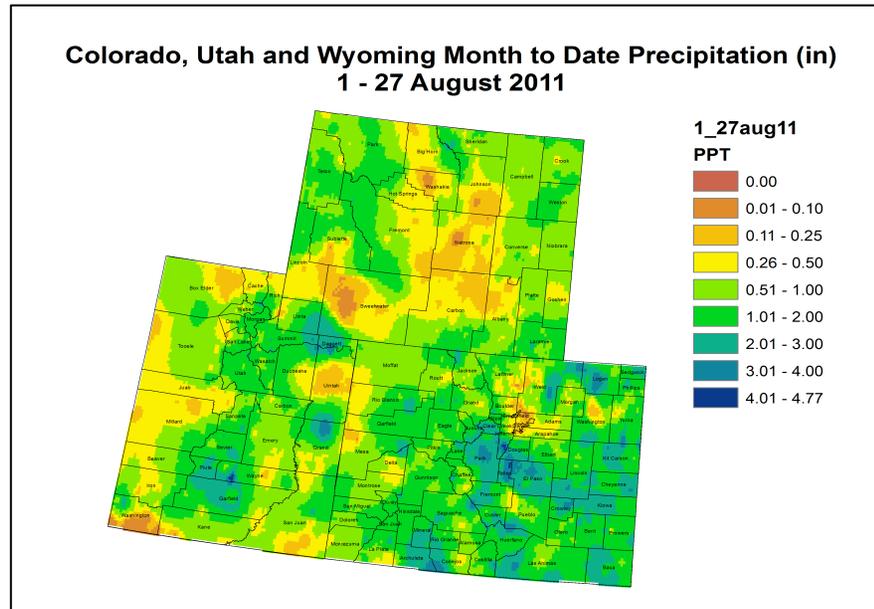


Fig. 1: August month-to-date precipitation in inches.

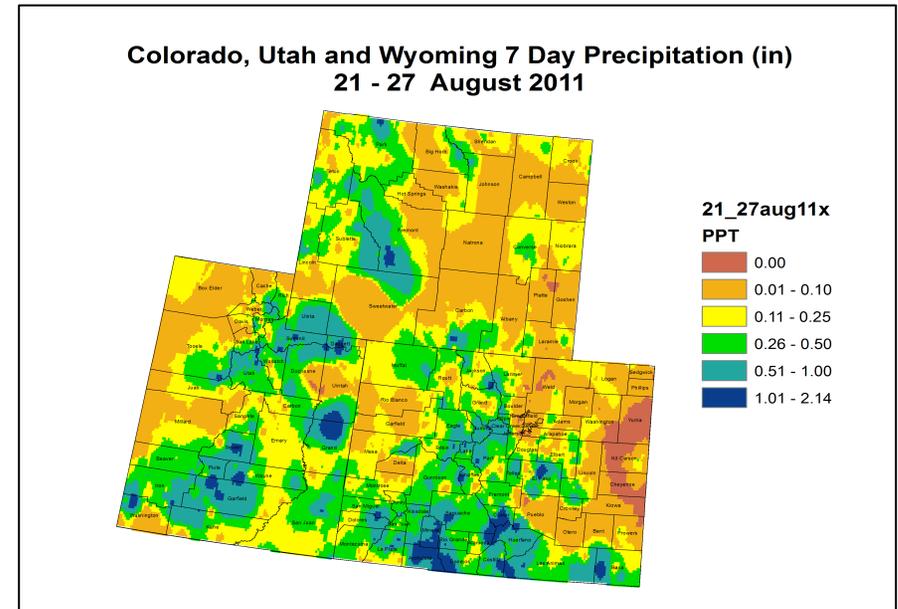


Fig. 2: August 21 – 27 precipitation in inches.

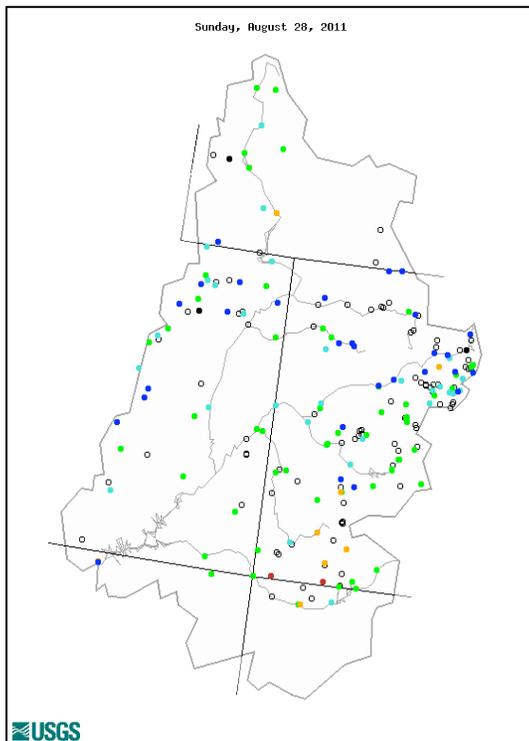
Water-year-to-date (WYTD), most of the Upper Colorado River Basin (UCRB) received near or above average precipitation. The Upper and Lower Green River basins have received over 200% of their average WYTD precipitation in many spots. The southern portion of the UCRB has been drier, seeing around 70 to 100% of average. For the month of August so far, precipitation has been widespread around the UCRB and eastern CO, with higher amounts ranging between half an inch to over 3 inches (Fig. 1). Some drier areas in southwest WY, eastern UT, and northeast CO have seen less than half an inch of moisture for the month so far.

Last week, the heaviest amounts of moisture fell in northeast UT and in the San Juan and Sangre de Cristo mountains in southern CO (Fig. 2), with amounts between half an inch to over 2 inches. Accumulations greater than a quarter inch also fell in the central and northern CO mountains, in southwest WY and in some isolated drier areas in southeast CO. Some areas of the central and northern UCRB and in northeast and eastern CO were drier, receiving less than a tenth of an inch for the week.

# Streamflow and Water Supply

As of August 28<sup>th</sup>, about 91% of the USGS streamgages in the UCRB recorded normal (25<sup>th</sup> – 75<sup>th</sup> percentile) or above normal 7-day average streamflows (Fig. 3), with 47% of the gages recording flows above the 75<sup>th</sup> percentile (down from 66% three weeks ago). Key gages on the Colorado River near the CO-UT state line and the Green River at Green River, UT have above normal 7-day average streamflow at the 78<sup>th</sup> and 89<sup>th</sup> percentiles, respectively (Fig. 4). Streamflow on the San Juan River near Bluff, UT is at the 28<sup>th</sup> percentile.

All the major reservoirs' storage volumes in the UCRB have been decreasing throughout August, with Green Mountain, Lake Granby, and Lake Dillon seeing only minor decreases. All of the major reservoirs above Lake Powell are currently near or above their average August levels. This April – July period was the 3<sup>rd</sup> wettest with regard to inflows into Lake Powell since operations at Glen Canyon Dam began in 1963. Lake Powell's volume is currently 88% of average and 74% of capacity.



Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">○</span>
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 3: 7-day average discharge compared to historical discharge for August 28<sup>th</sup>.

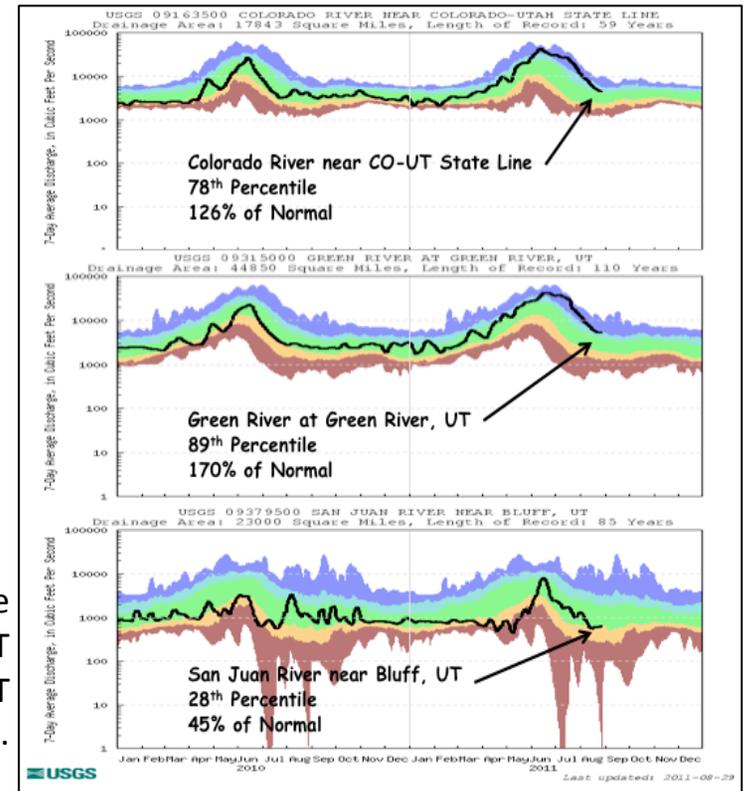


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

## Water Demand

Last week, warmer than average temperatures were observed over the UCRB, and also across the Front Range and eastern plains of CO. The warmer temperatures have contributed to higher reference evapotranspiration (refET) in drought stricken areas. In the Four Corners, refET is currently just above average, on track with the drier years. In the San Luis Valley refET is currently tracking near the highest refET year, during the drought of 2002—so precipitation falling there could be quickly lost to the atmosphere again. Very high refET rates are also seen in the Arkansas River basin, though improvements have been seen over the past few weeks (Fig. 5).

The VIC model shows improved soil moisture conditions for the San Luis Valley, though this is likely only from short-term precipitation input into the model. Poor soil moisture conditions are still seen in parts of southeast CO and in northeast CO and southern WY; deteriorating conditions are now being seen in eastern UT. Satellite imagery of vegetation conditions show very dry vegetation with little growth in the San Luis Valley and southeast CO (Fig. 6). Vegetation conditions are moist for the northern portion of the UCRB, slightly dry in the Four Corners area, and slightly drier than average for northeast CO.

## Precipitation Forecast

A hot and dry airmass will be over most of the UCRB today with the exception being a few lingering showers over the central CO mountains. The dry forecast will continue through Thursday as an approaching Pacific trough continues to push sub-tropical moisture south of the area. This trough is expected to move across WY late Thursday evening and bring an end to the recent string of unseasonably warm temperatures. While most of the energy with this system is expected to remain over WY, it will send a surface cold front southward into CO and trigger some scattered showers along the frontal boundary Thursday evening into early Friday. Drying trend will resume through the rest of the weekend before sub-tropical moisture again tries to work northward on Monday. As a result, expect to see a return of isolated to scattered thundershowers early next week, with activity favoring southern portions of the UCRB, in and around the Four Corners region.

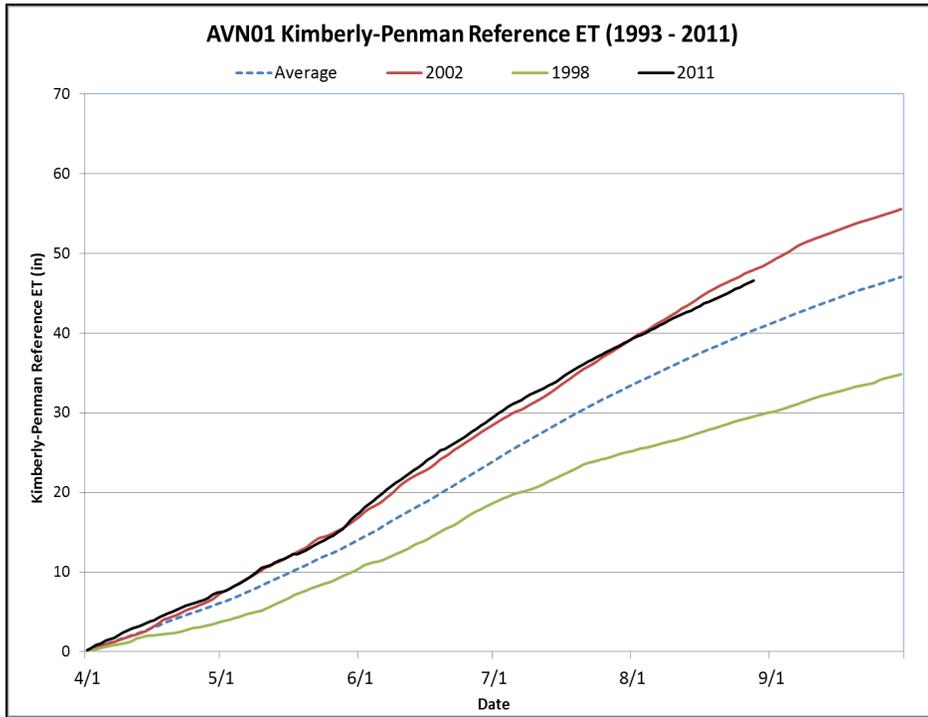


Fig. 5: Reference evapotranspiration since April 1<sup>st</sup> at Avondale, CO in the Arkansas River basin.

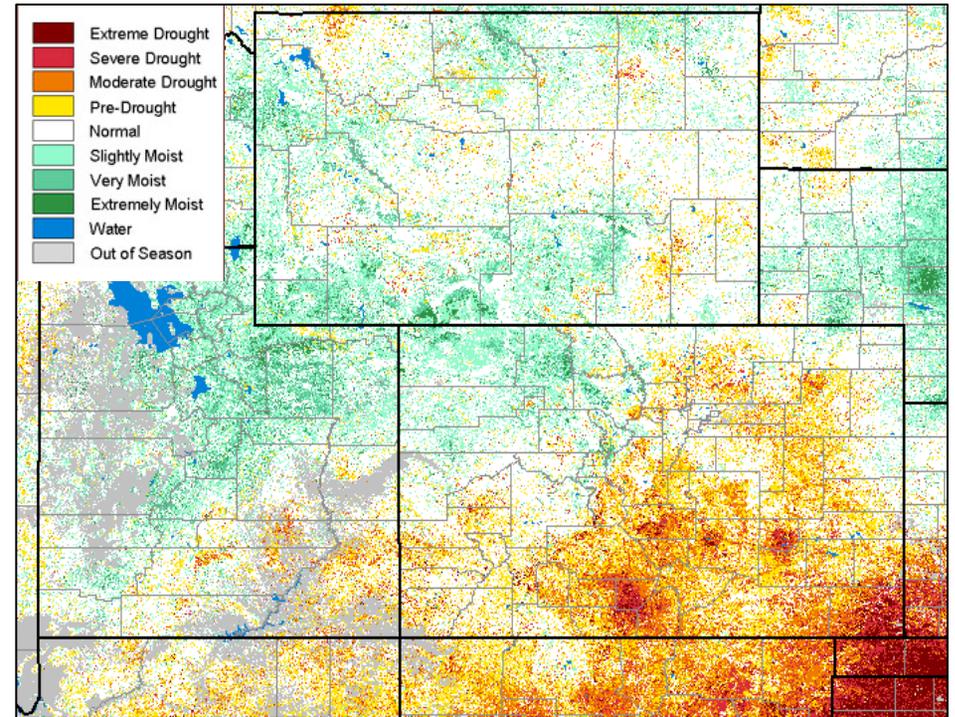


Fig. 6: August 28<sup>th</sup> VegDRI map, based on satellite-derived observations of vegetation.

# Drought and Water Discussion

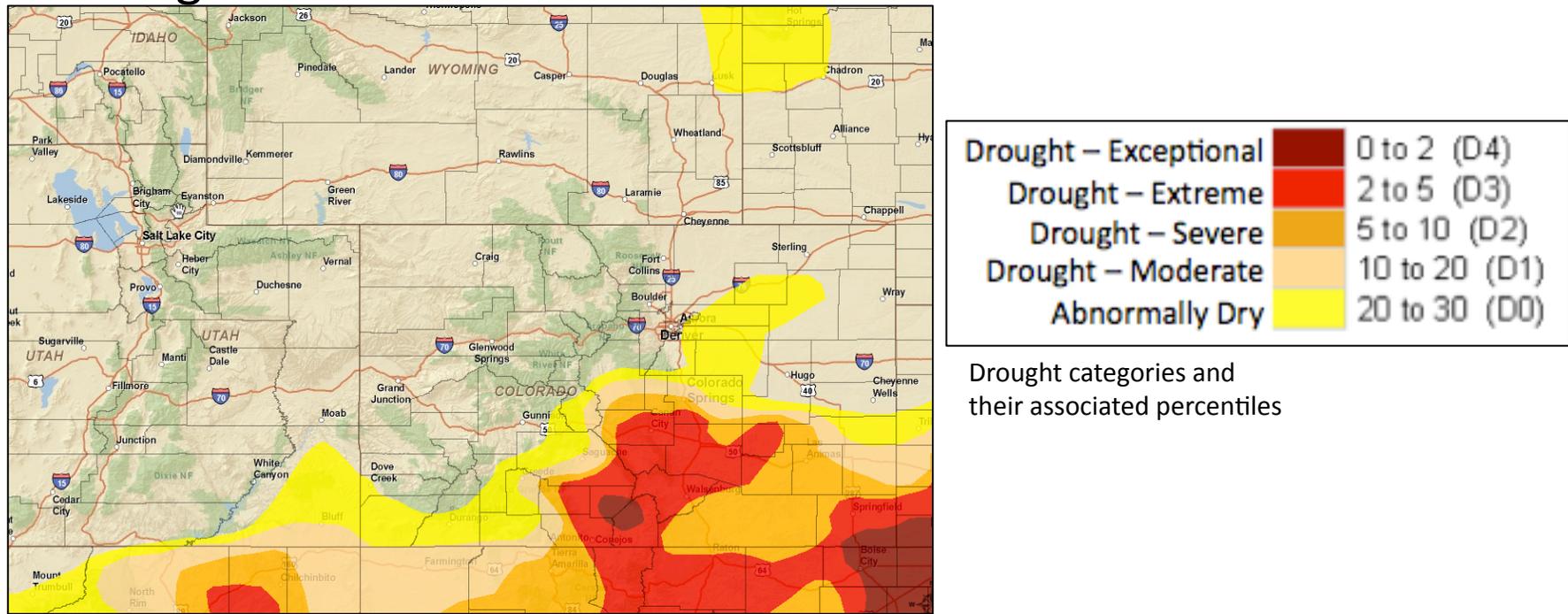
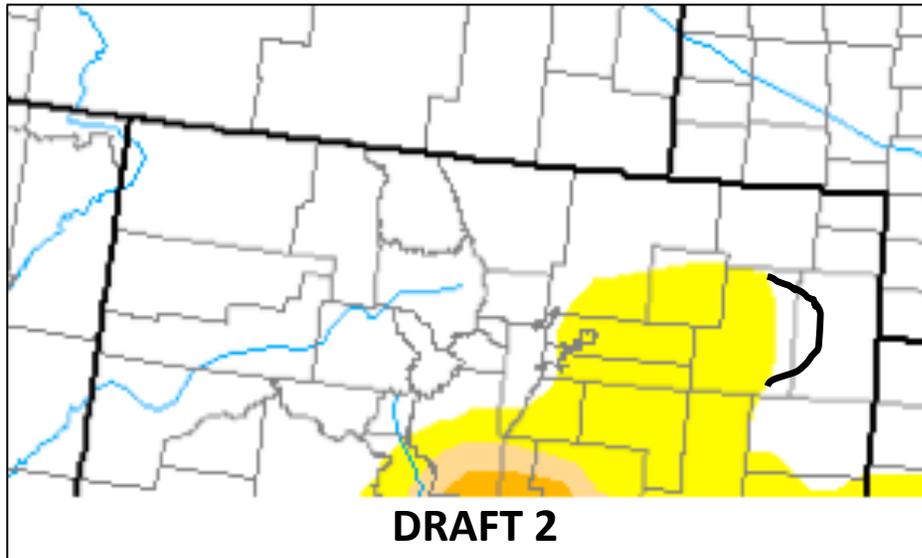


Fig. 7: August 23<sup>rd</sup> release of U.S. Drought Monitor for the UCRB

It has been recommended that improvements be made around the San Luis Valley to the current U.S. Drought Monitor map (USDMD, Fig. 7), with the elimination of the D4 there and a trimming of the D3 in eastern Saguache and Rio Grande counties and western Huerfano, southern Custer and extreme southwest Pueblo counties where the Wet Mountains reside.

Though recent beneficial rains have fallen in the area, it appears to have favored the surrounding mountains much more than the valley itself—this is supported by local experts who also observe little improvement as a result of recent moisture. Several longer SPI time scales still show a possible D4 around Alamosa as well. Trimming of the D3 could be made as suggested; the D4 could still be justified at this time, though a growing consensus is suggesting its removal. Therefore we defer to the current USDMD author on the final depiction in that area.

# Drought and Water Discussion



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)

Drought categories and their associated percentiles

Fig. 8: Draft 2 depiction of U.S. Drought Monitor for northeast CO.

In a recent draft, the current USDM author adjusted the D2 – D4 lines throughout southern CO to better match the current VegDRI depiction, though these changes were minimal. The author has also expanded the D0 in northeast CO to cover more of Washington, Lincoln, and Cheyenne counties to better represent the short-term dryness seen there (Fig. 8).

The 90-day standardized precipitation index (SPI) at the Yuma station (in western Yuma County) is less than negative 2, with negative SPIs also seen at longer time scales. Because of this, and deteriorating soil moisture conditions, it is recommended that the D0 also be expanded to cover western Yuma County (Fig. 8, black line).

No changes are recommended in the UCRB at this time. Very little changes have been seen around the Four Corners area, so the D0/D1 there is still justified.