

**Summer
2012**

September 18th, 2012

NIDIS - UPPER COLORADO BASIN PILOT PROJECT

Weekly Climate, Water & Drought Assessment

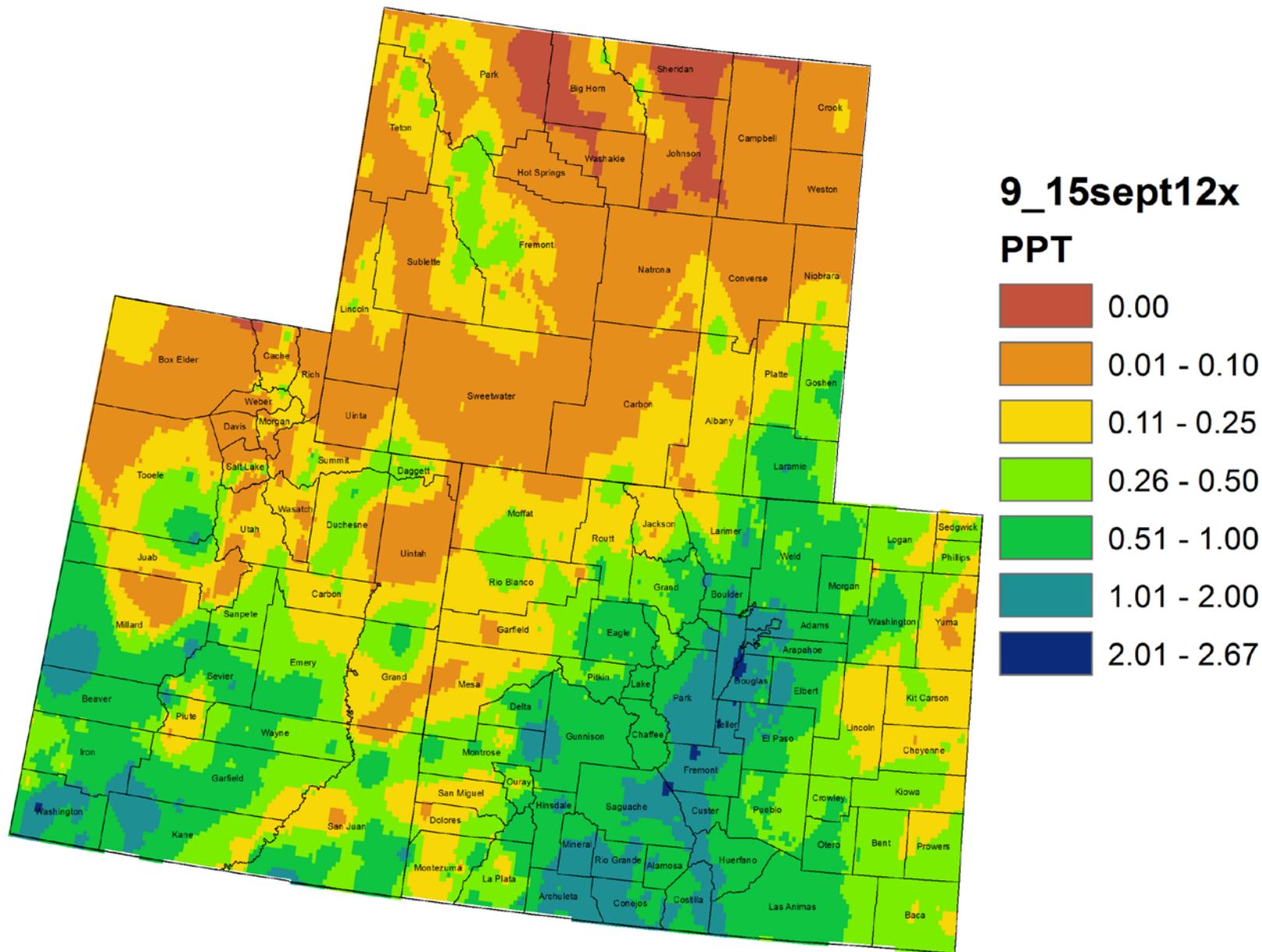
Today's Agenda

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

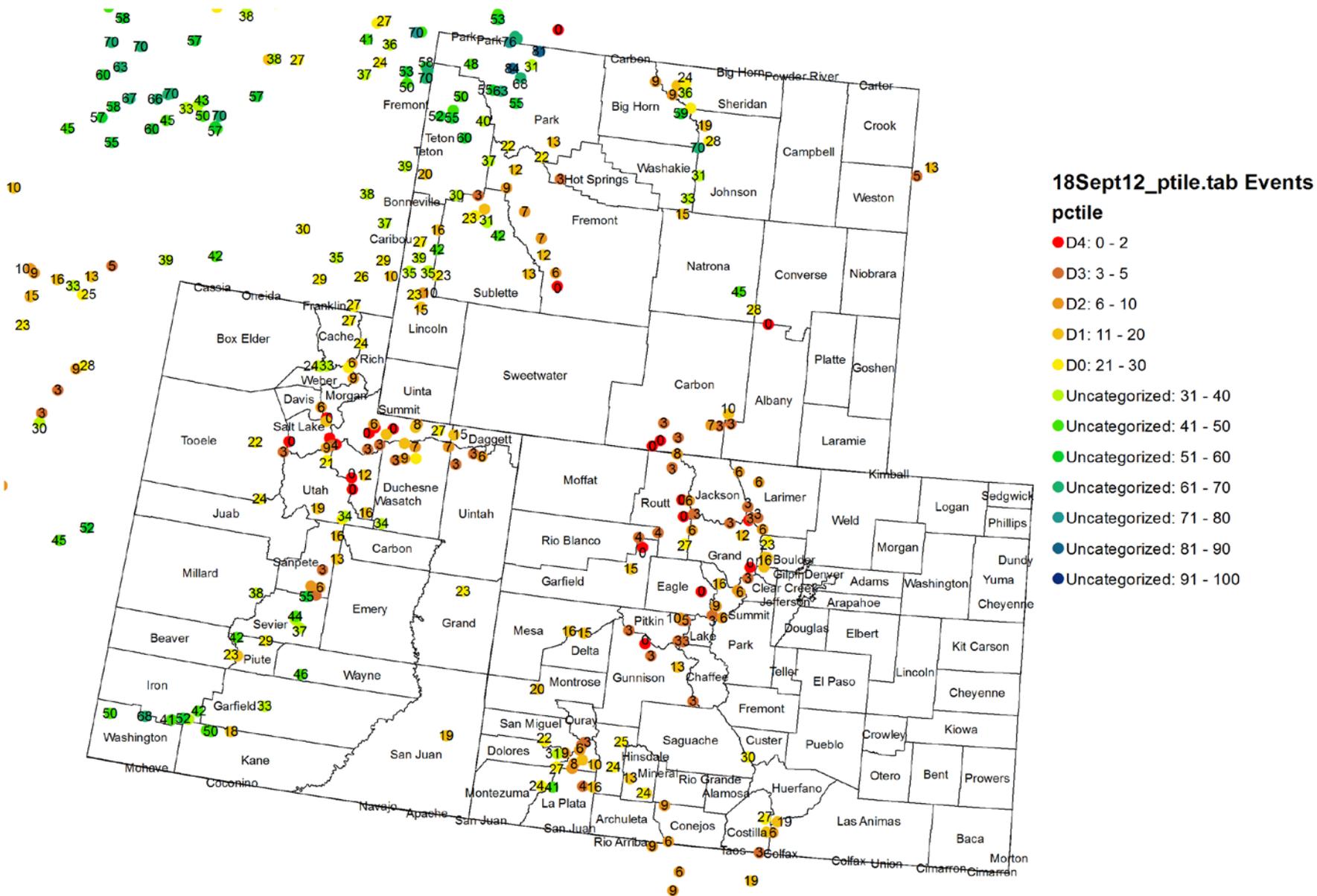
Precipitation/Snowpack Update



Colorado, Utah and Wyoming 7 Day Precipitation (in) 9 - 15 September 2012

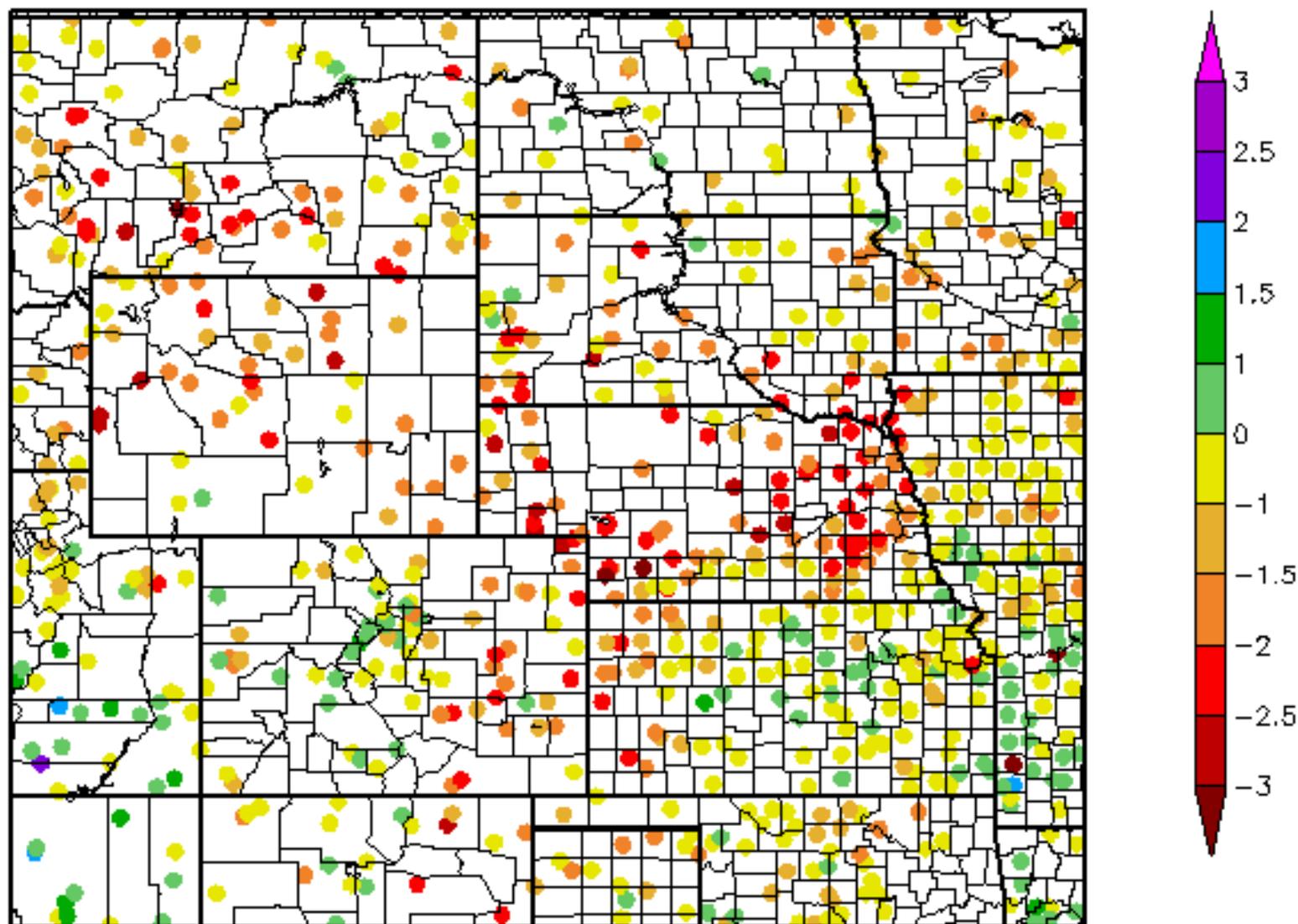


Snotel Water Year Precipitation Percentile Ranking for 18 September 2012 (Stations with 15+ years of data only)



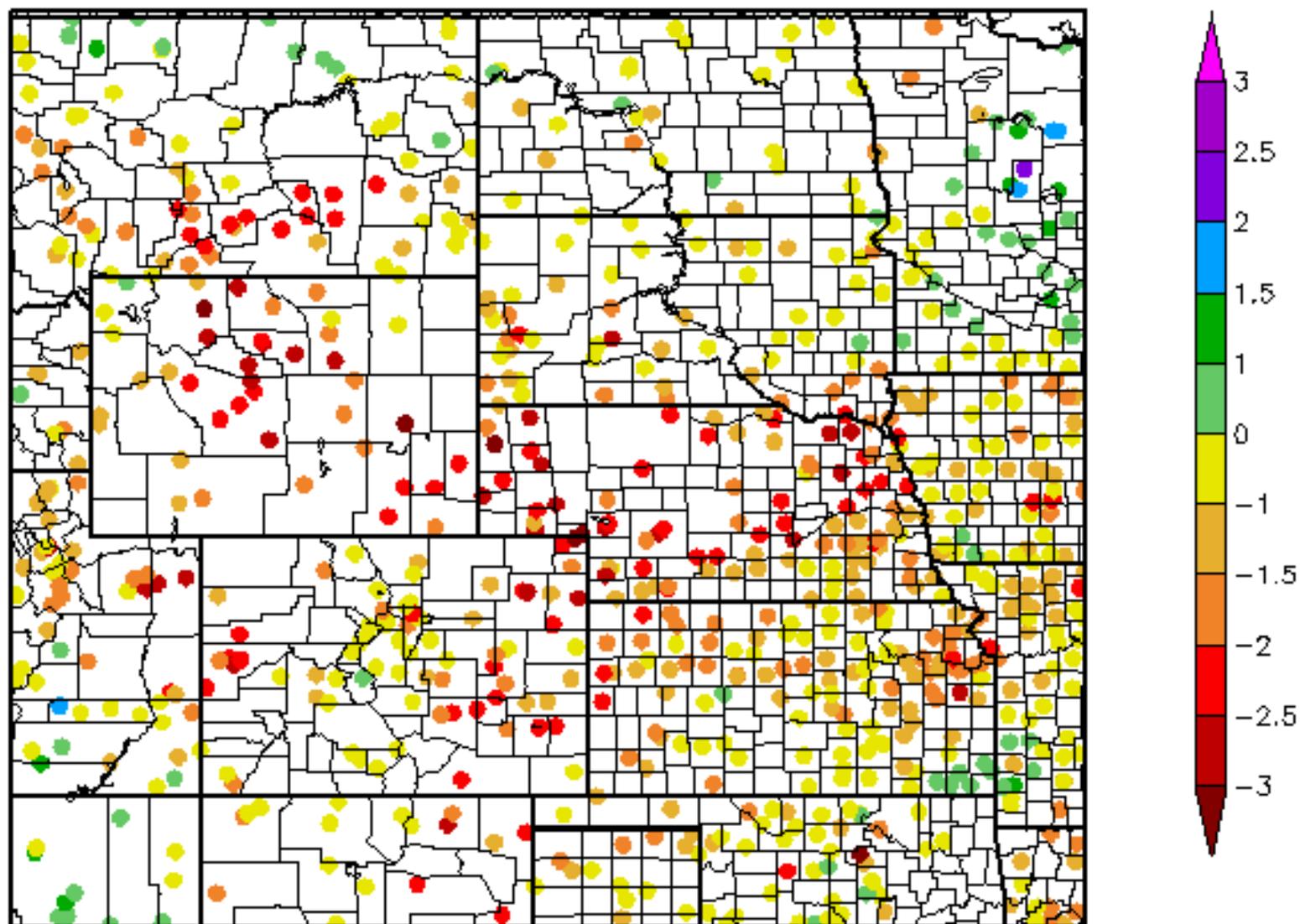
60 Day SPI

7/20/2012 - 9/17/2012



6 Month SPI

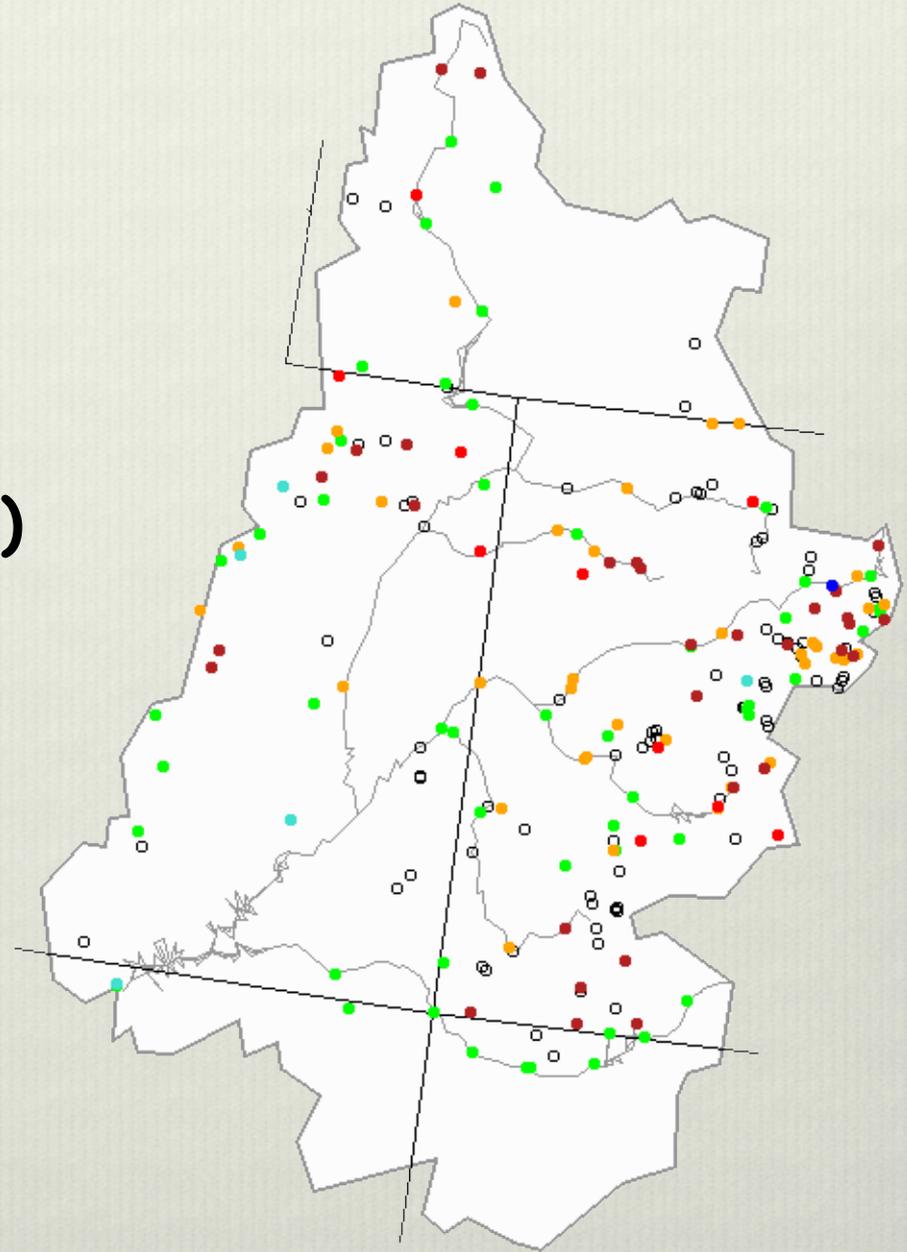
3/18/2012 - 9/17/2012



Streamflow Update



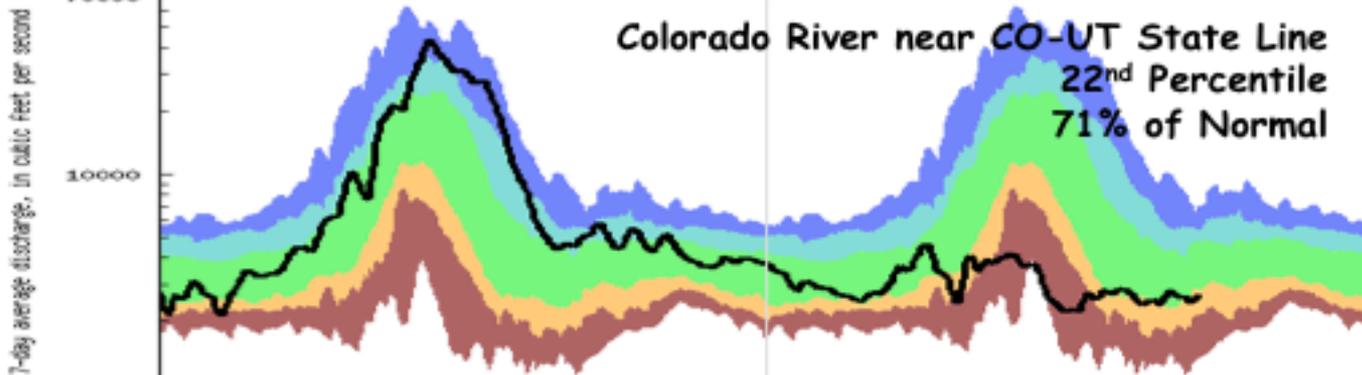
7-day average discharge compared to historical discharge for the day of the year (September 16th)



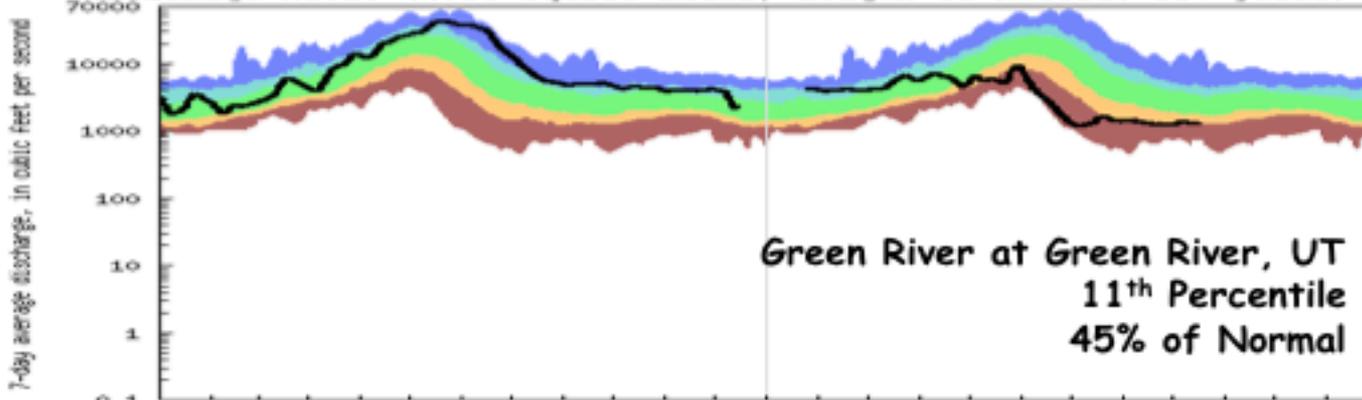
Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

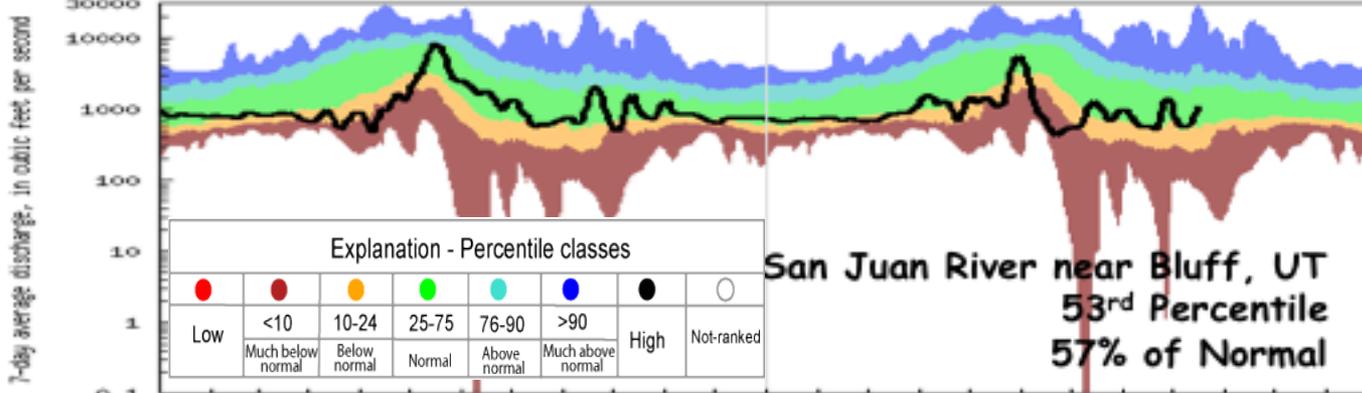
Duration hydrograph of 7-day average streamflow for USGS 09163500
(Drainage Area: 17843 square miles, Length of Record: 61 years)



Duration hydrograph of 7-day average streamflow for USGS 09315000
(Drainage Area: 44850 square miles, Length of Record: 117 years)



Duration hydrograph of 7-day average streamflow for USGS 09379500
(Drainage Area: 23000 square miles, Length of Record: 97 years)

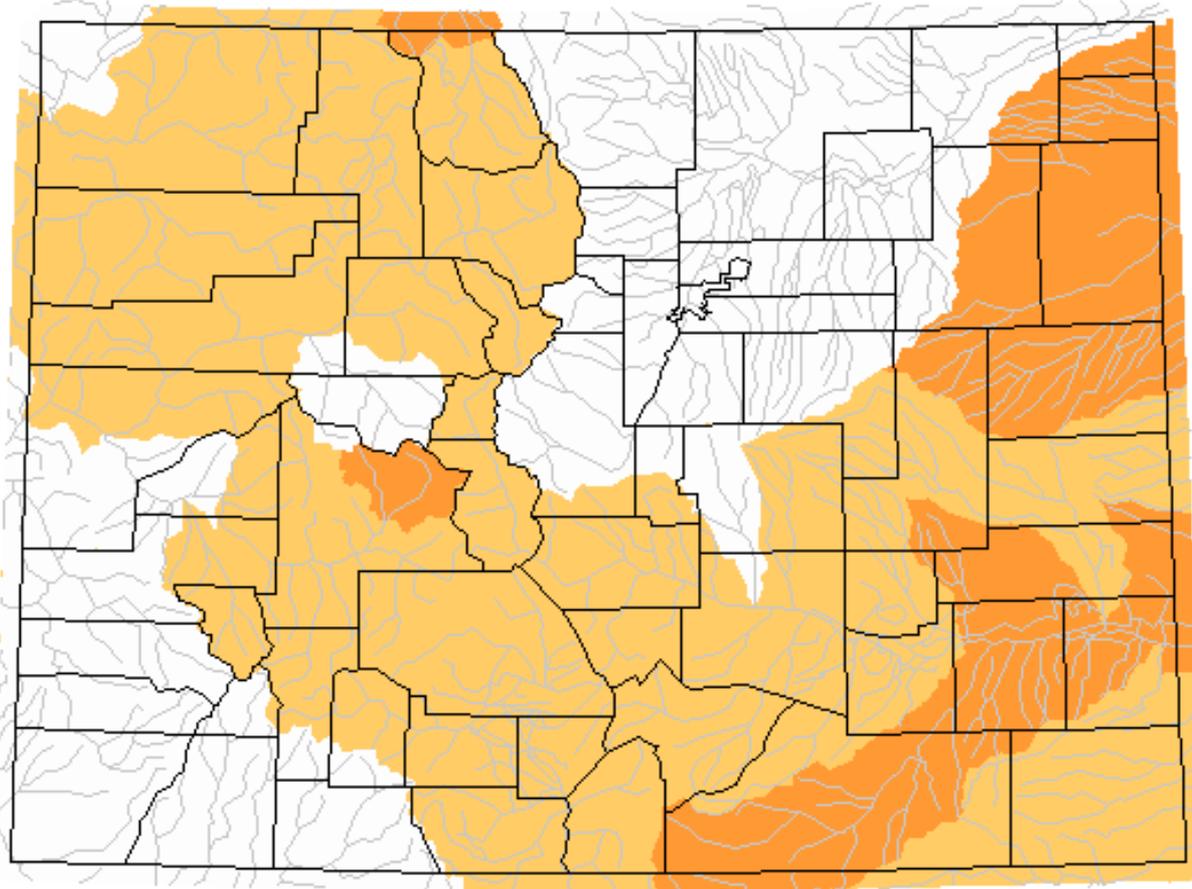


Explanation - Percentile classes

●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

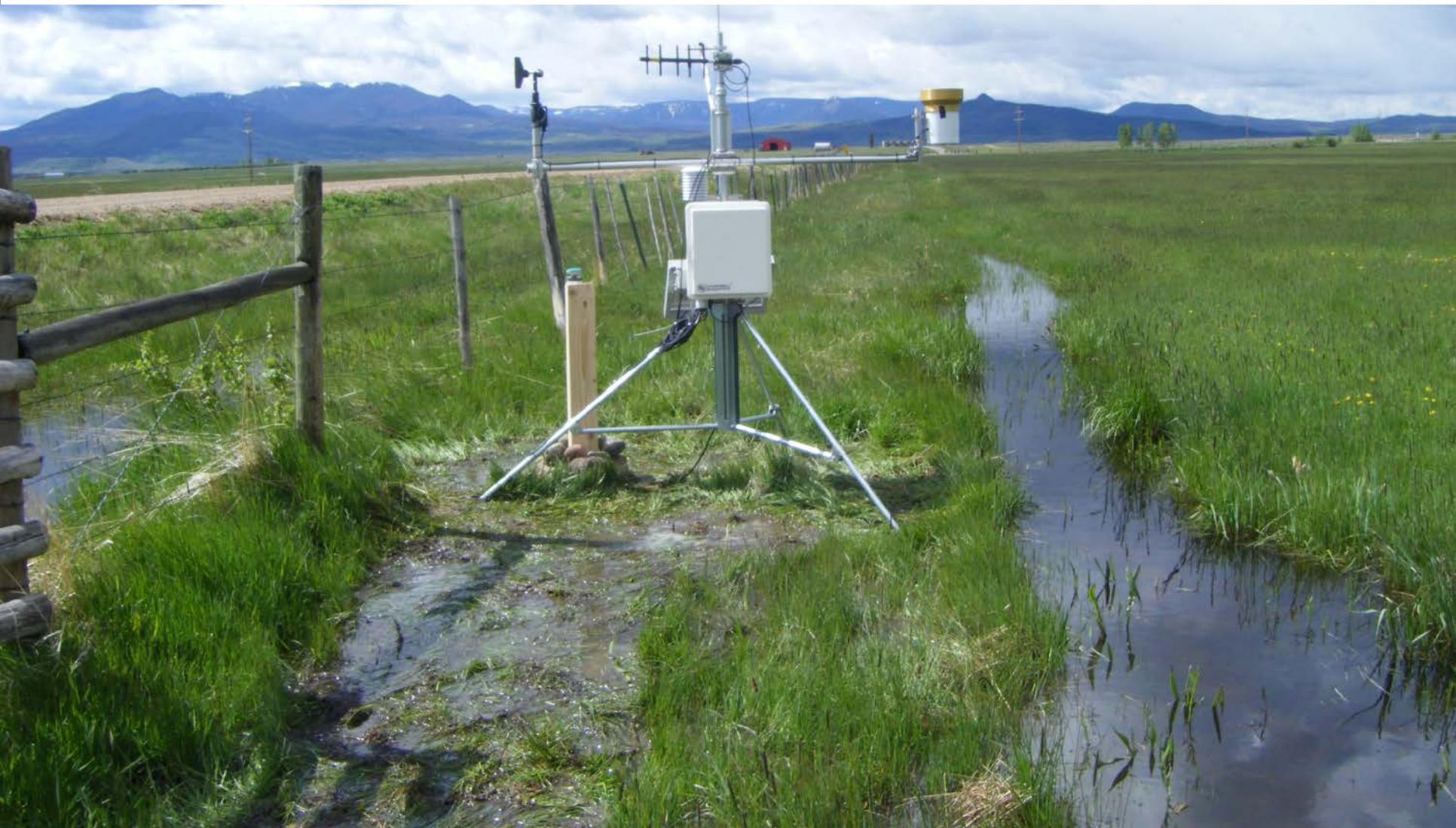
7-day average streamflow compared to historical streamflow

Sunday, September 16, 2012

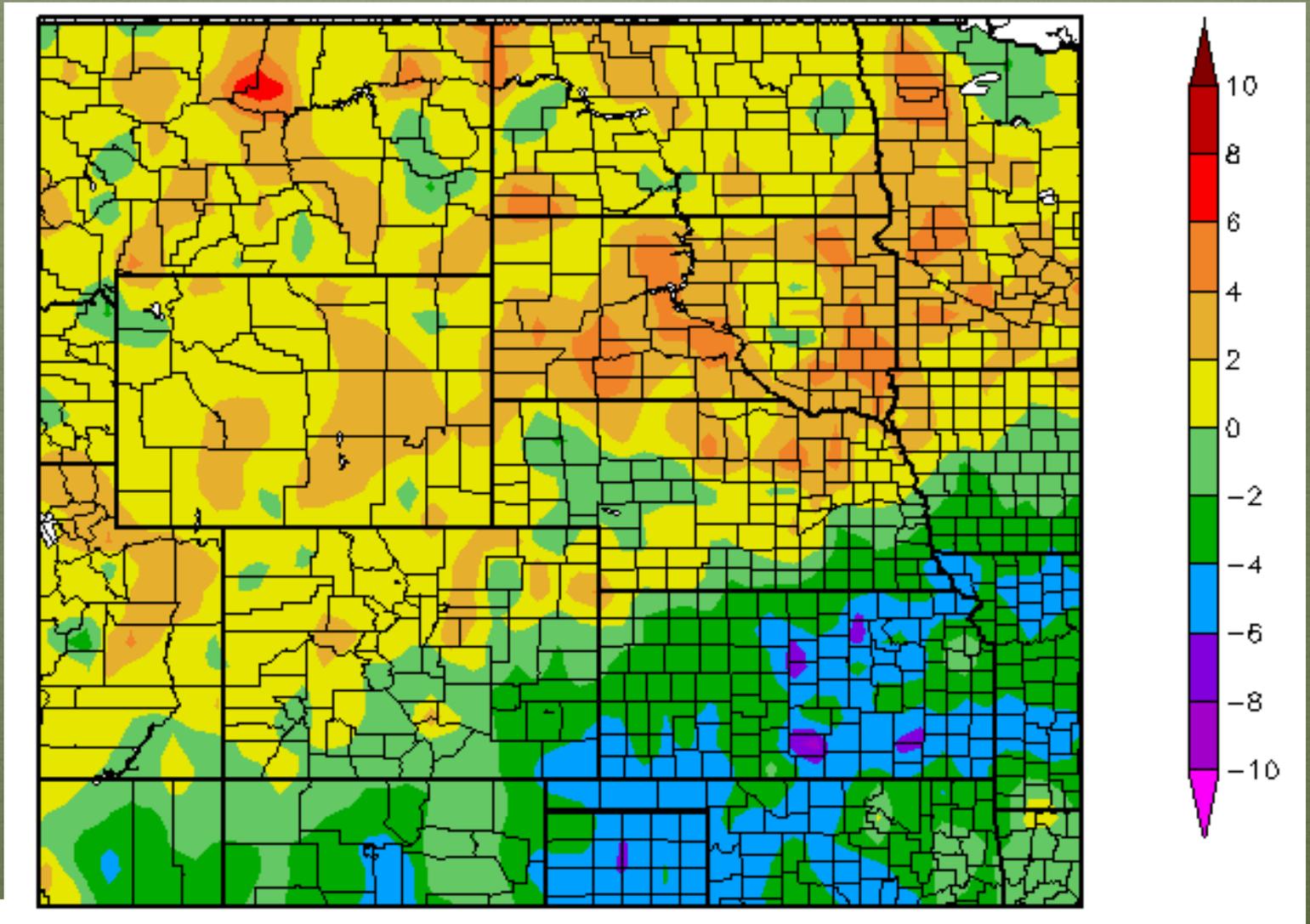


Explanation - Percentile classes			
			
Low	≤ 5	6-9	10-24
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal

Water Demand

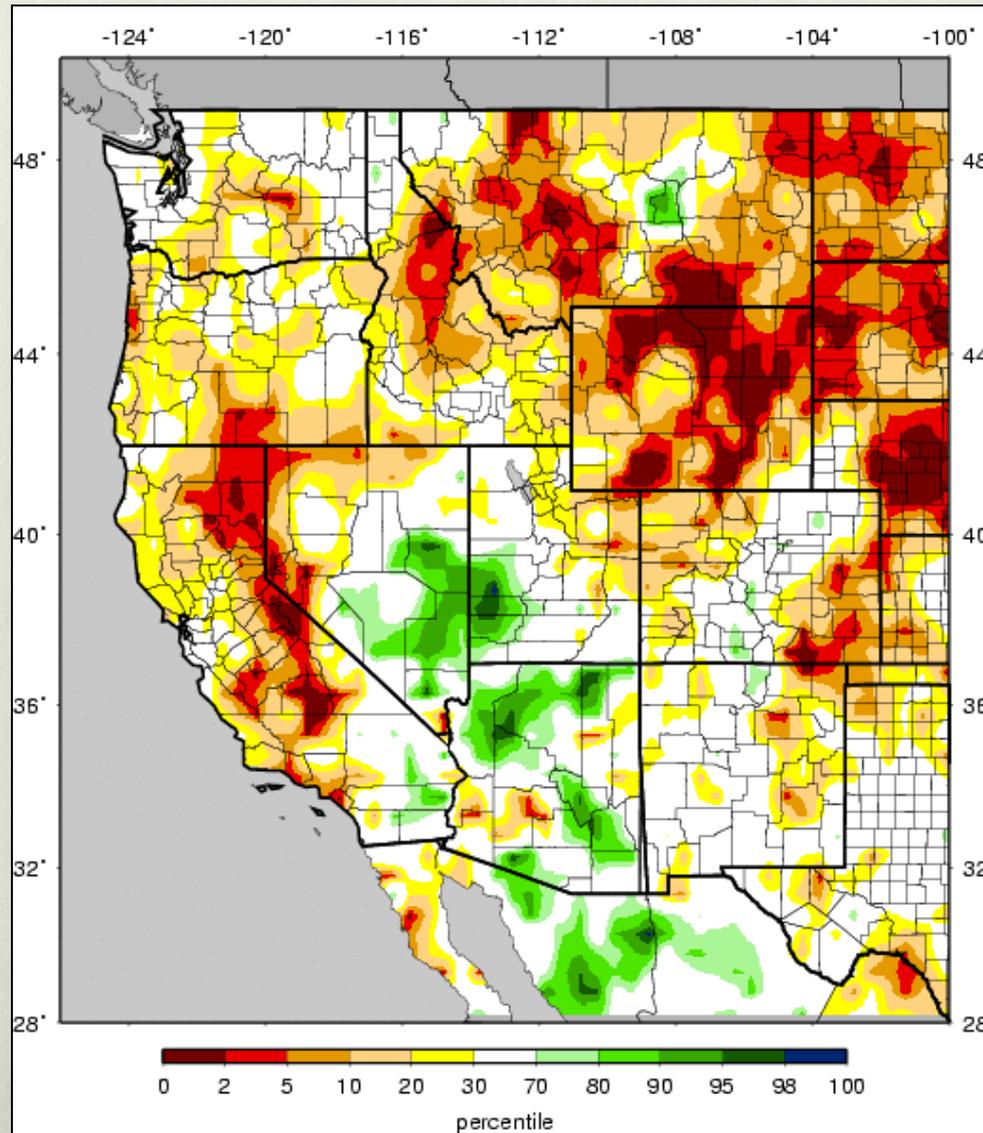


Temperature Departure from Normal 09/10/2012 – 09/16/2012



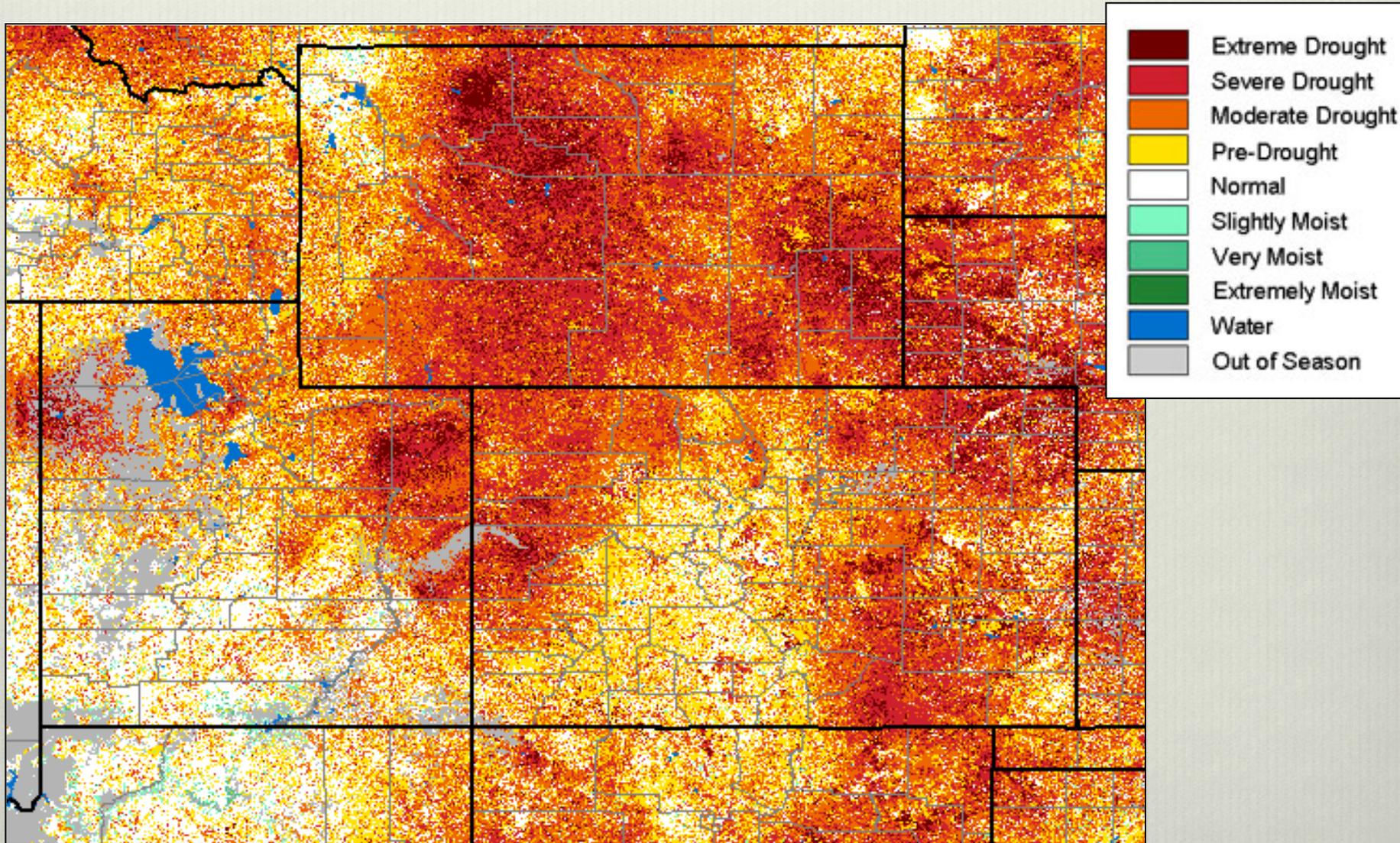
VIC Soil Moisture

15 September 2012

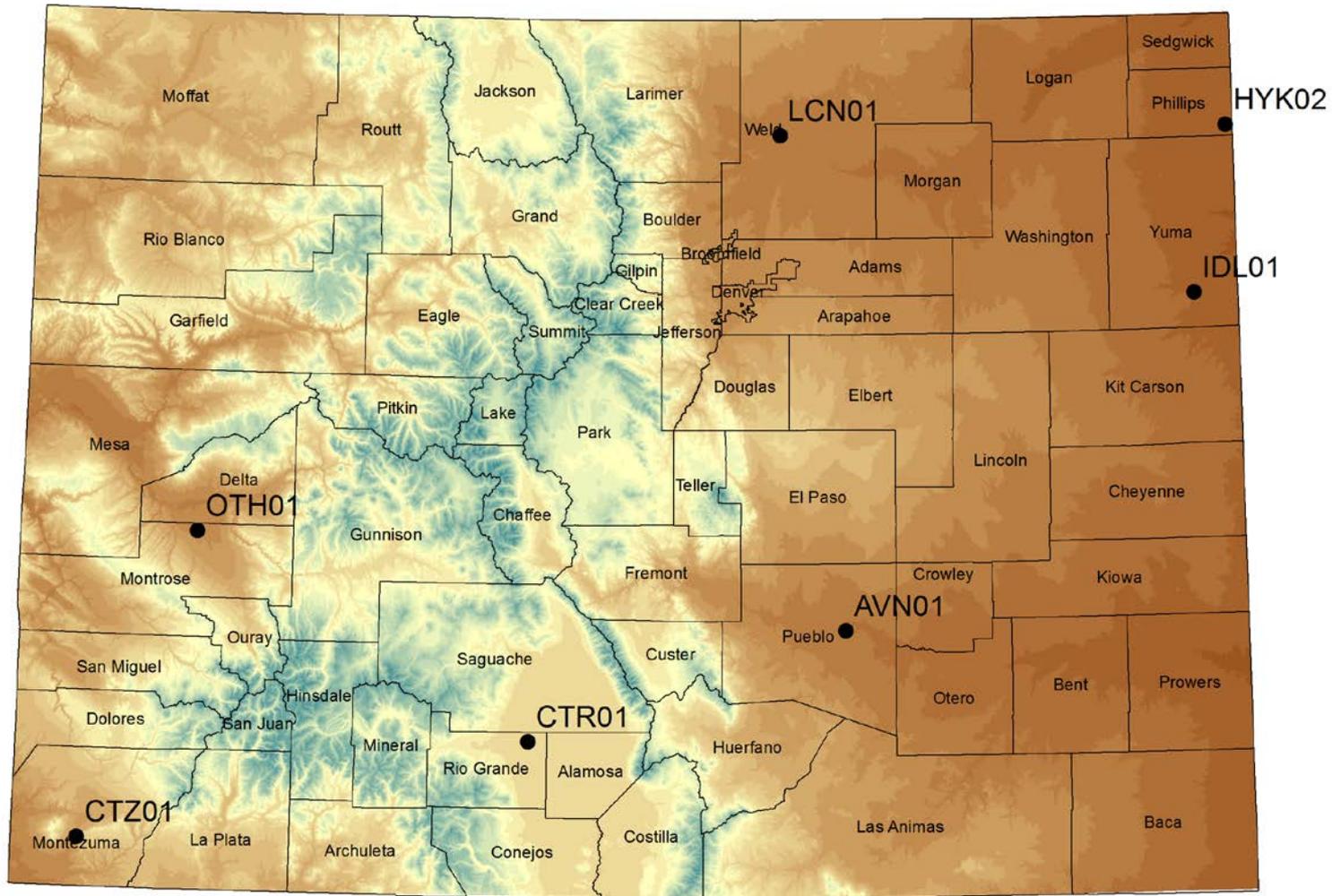


eMODIS VegDRI Vegetation

16 September 2012

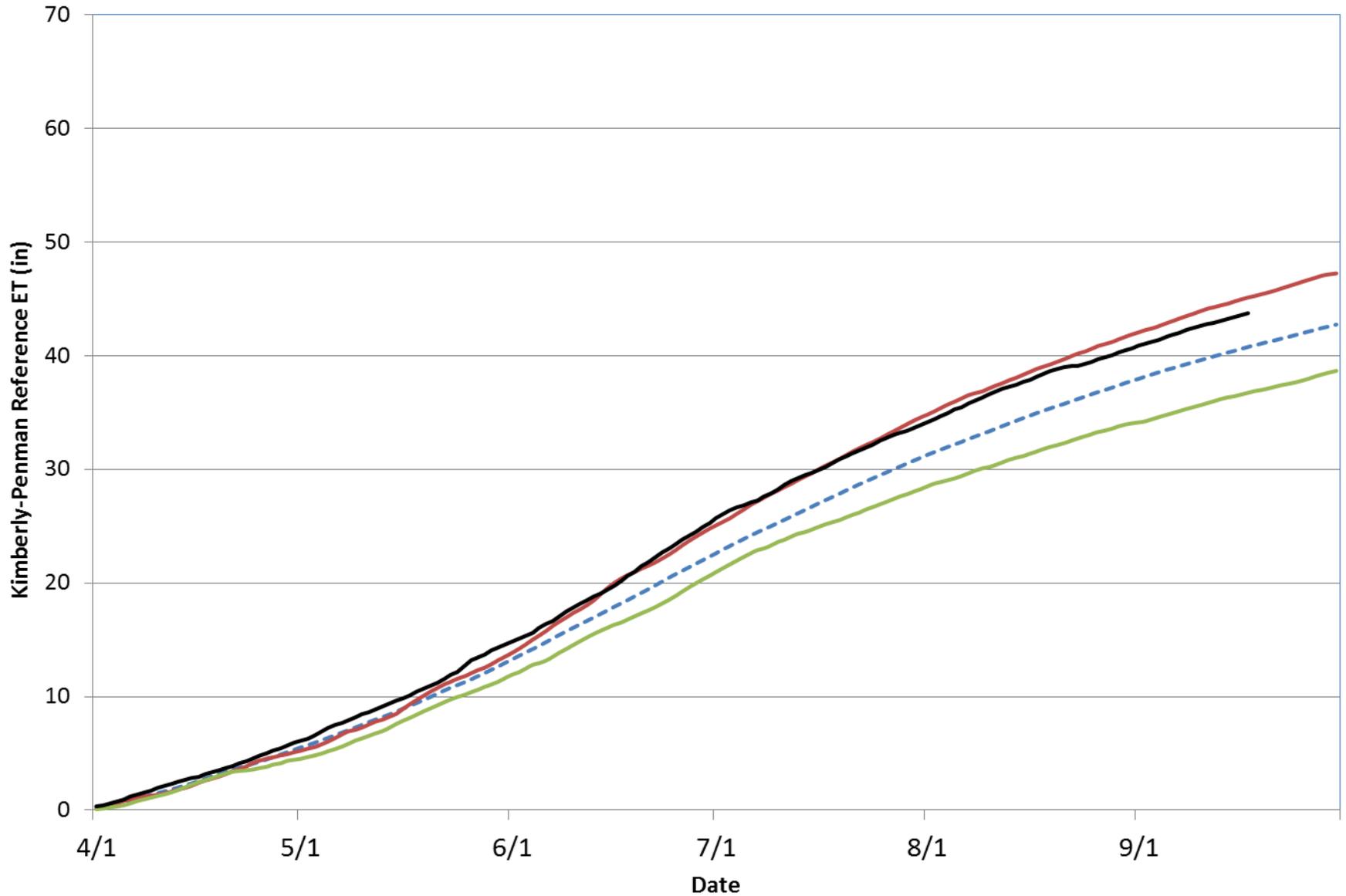


CoAgMet Reference Evapotranspiration Stations



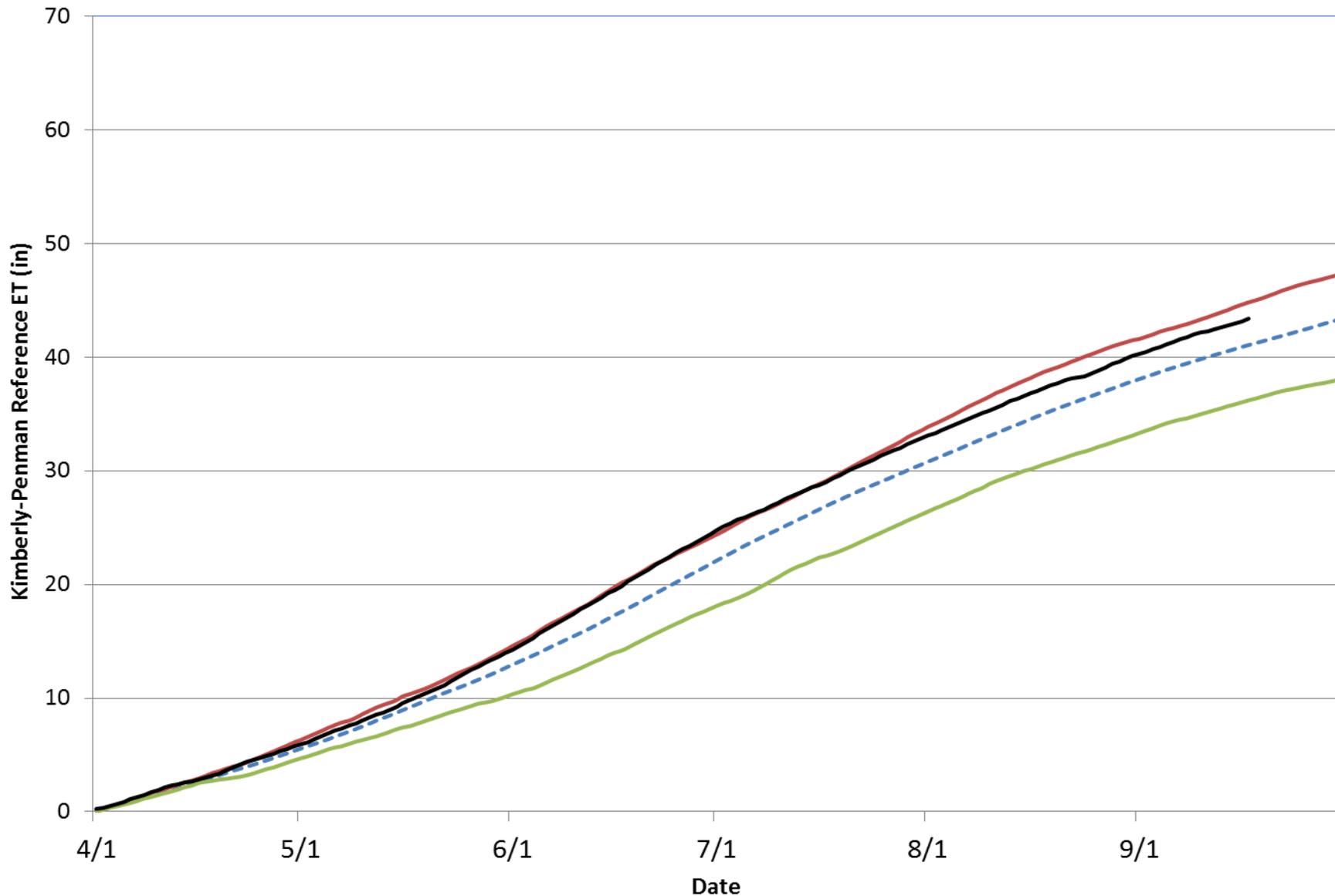
Olathe 1 & 2 Kimberly-Penman Reference ET (1993 - 2012)

--- Average — 1994 — 1999 — 2012



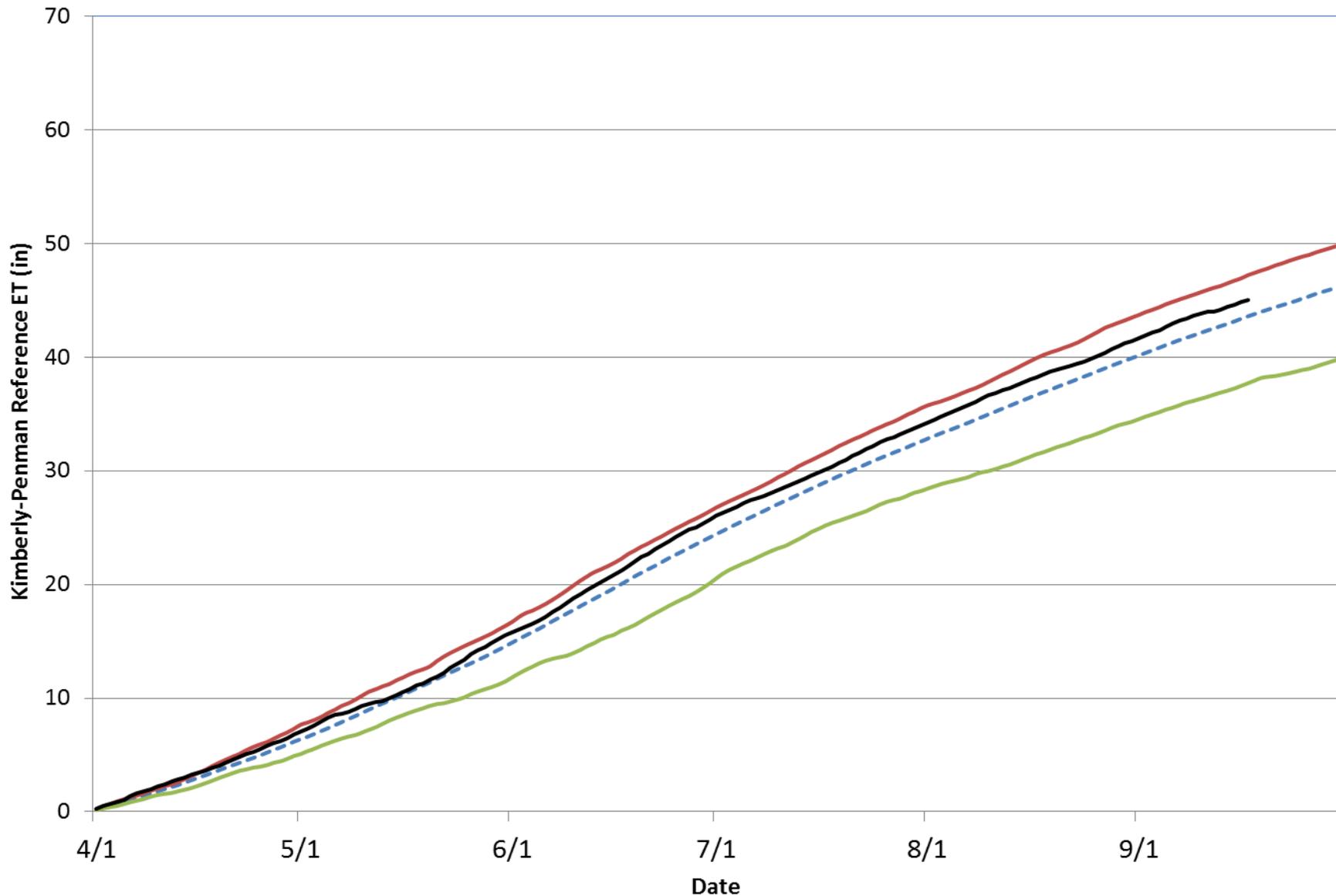
Cortez Kimberly-Penman Reference ET (1992 - 2012)

--- Average — 2000 — 1995 — 2012



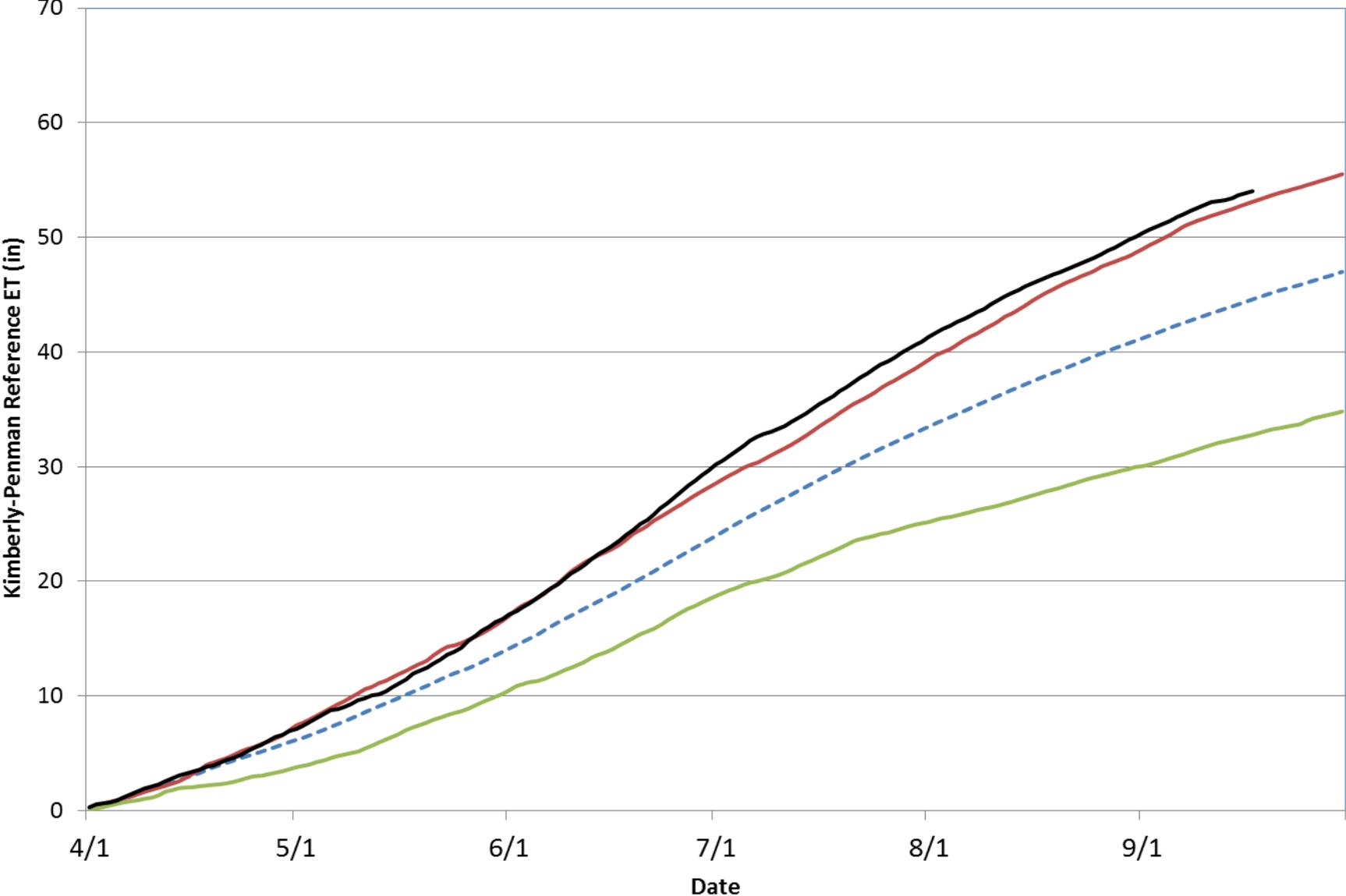
Center Kimberly-Penman Reference ET (1994 - 2012)

--- Average — 2002 — 1997 — 2012



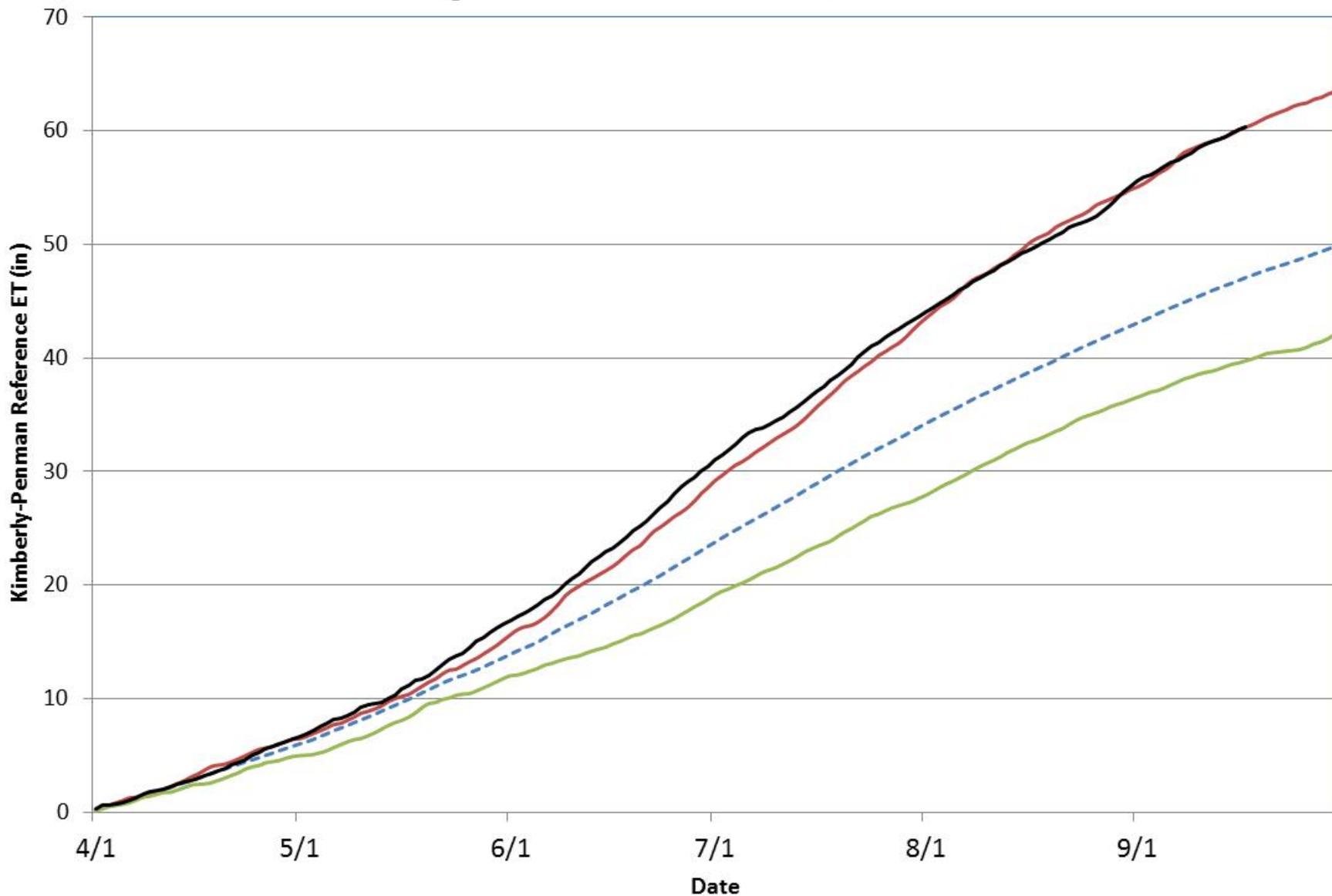
Avondale Kimberly-Penman Reference ET (1993 - 2012)

--- Average — 2002 — 1998 — 2012



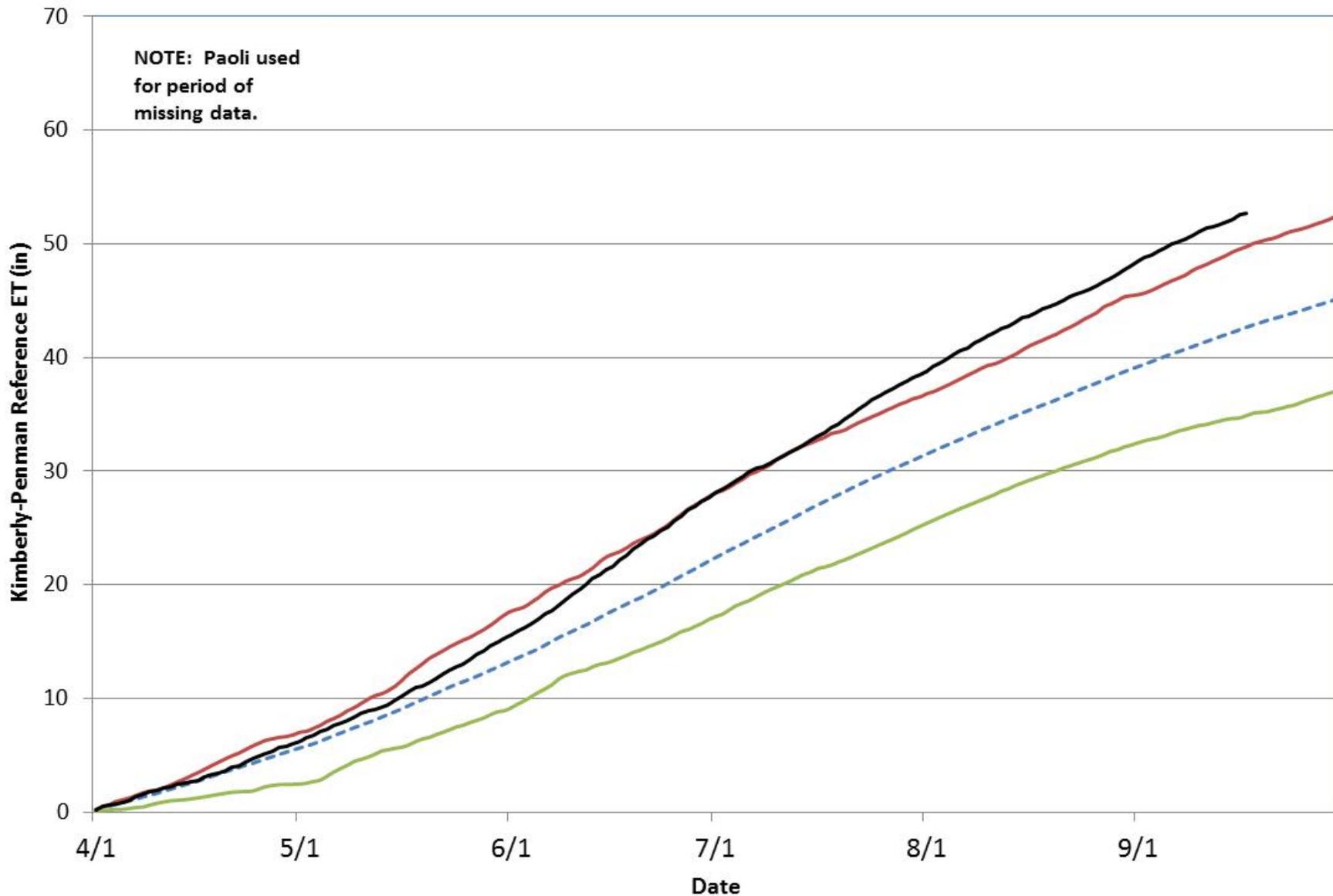
Idalia Kimberly-Penman Reference ET (1992 - 2012)

--- Average — 2002 — 2009 — 2012



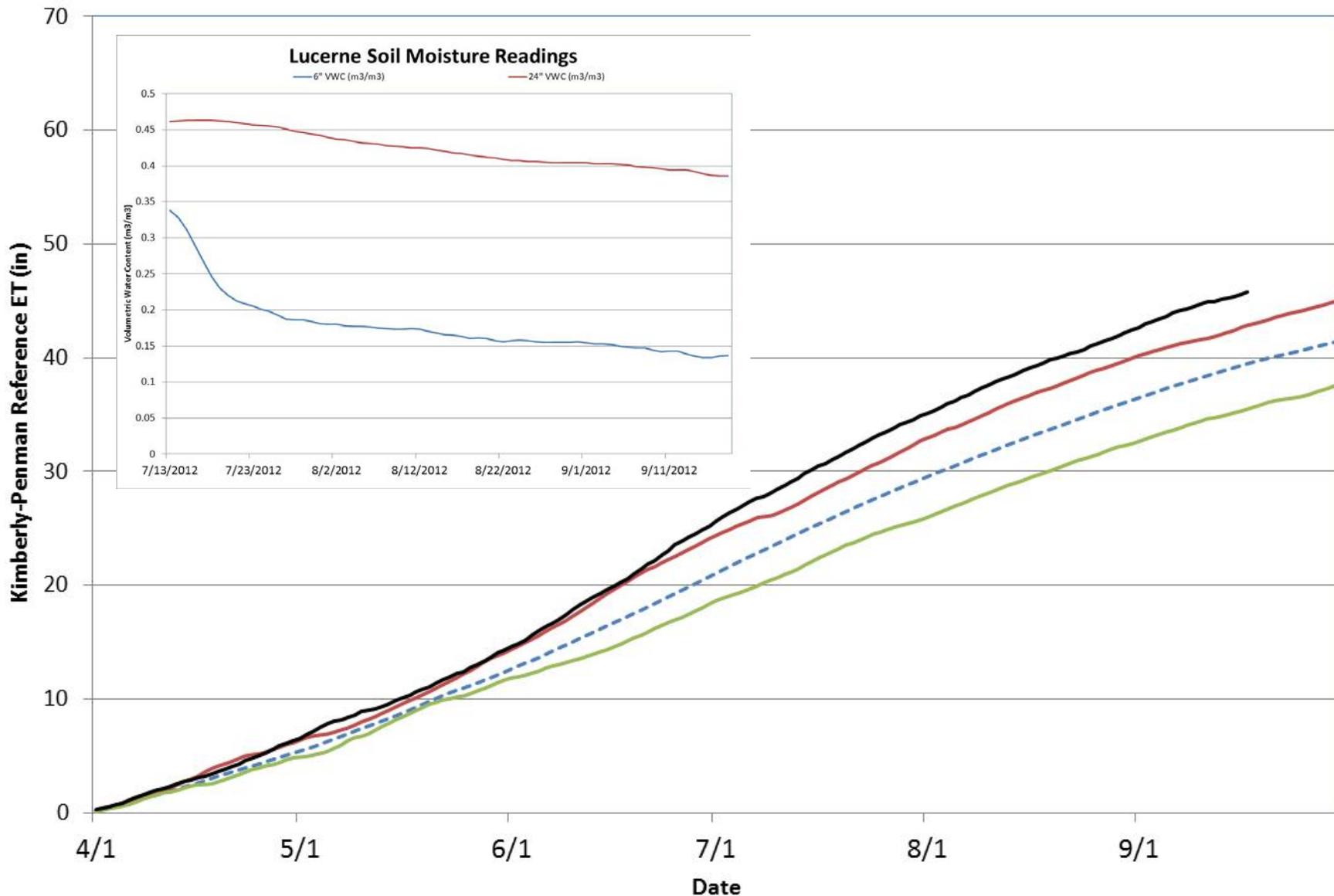
Holyoke Kimberly-Penman Reference ET (1992 - 2012)

--- Average — 1994 — 1999 — 2012



Lucerne Kimberly-Penman Reference ET (1992 - 2012)

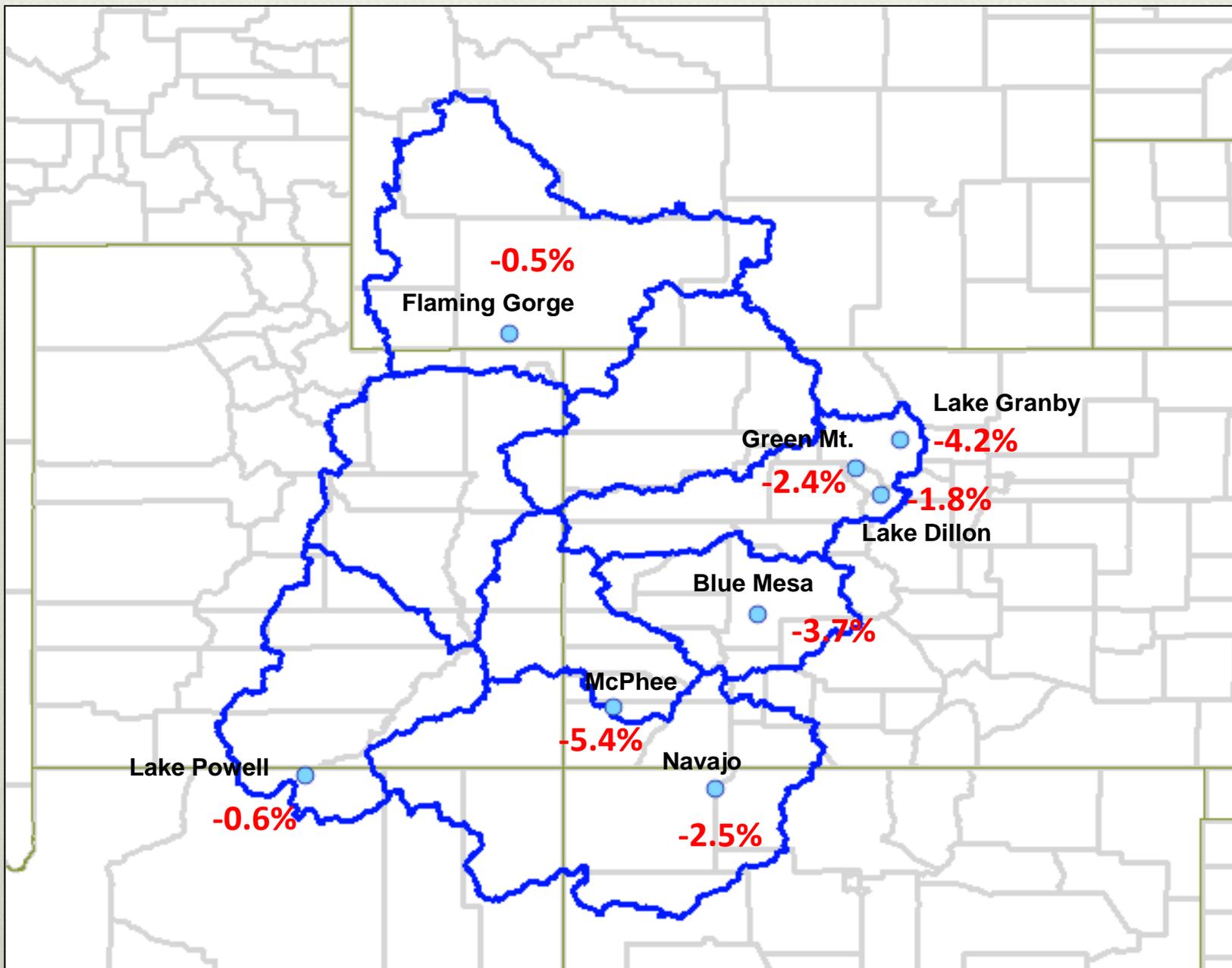
--- Average — 2006 — 2009 — 2012



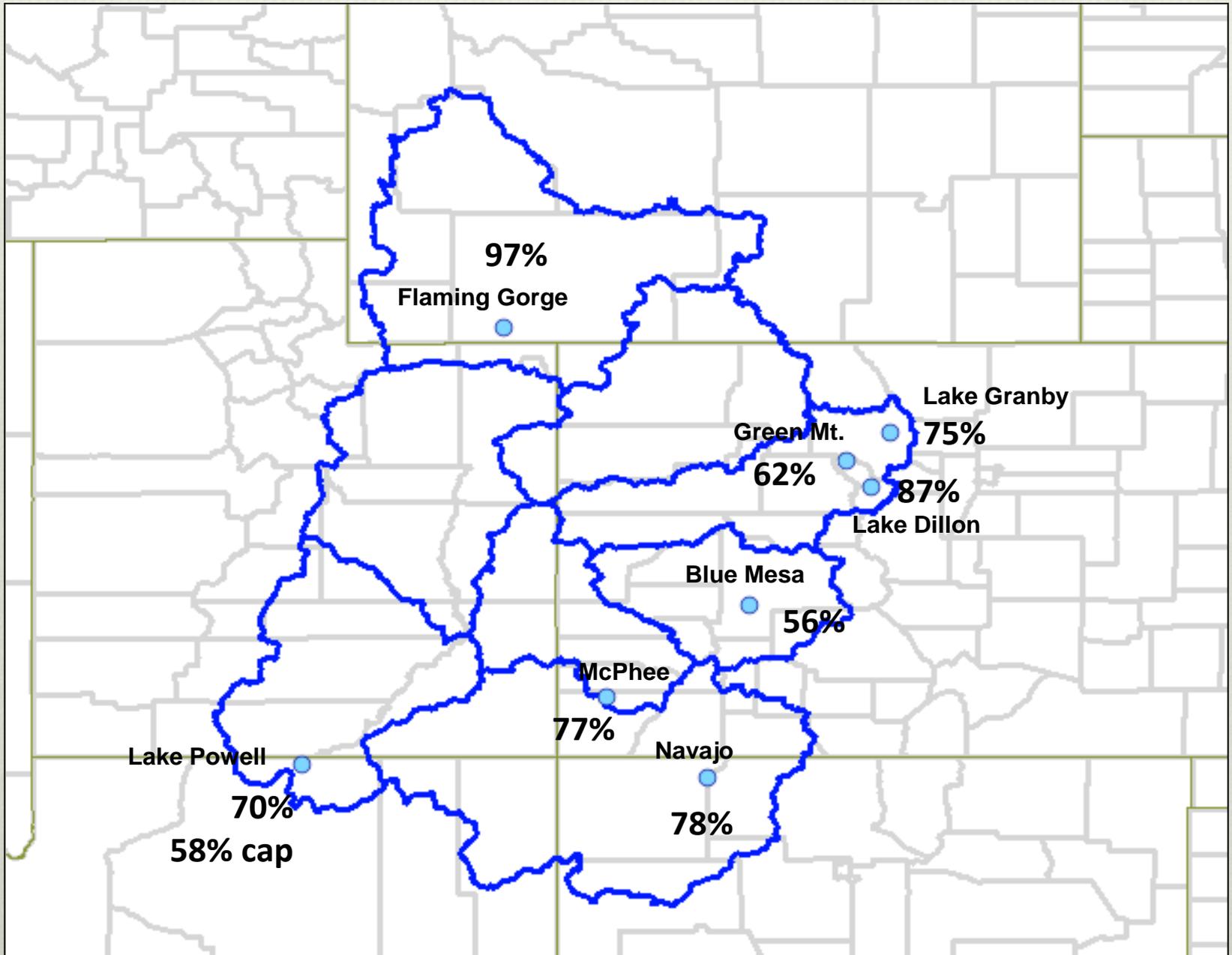
Reservoir Update



September Reservoir Storage Volume Change

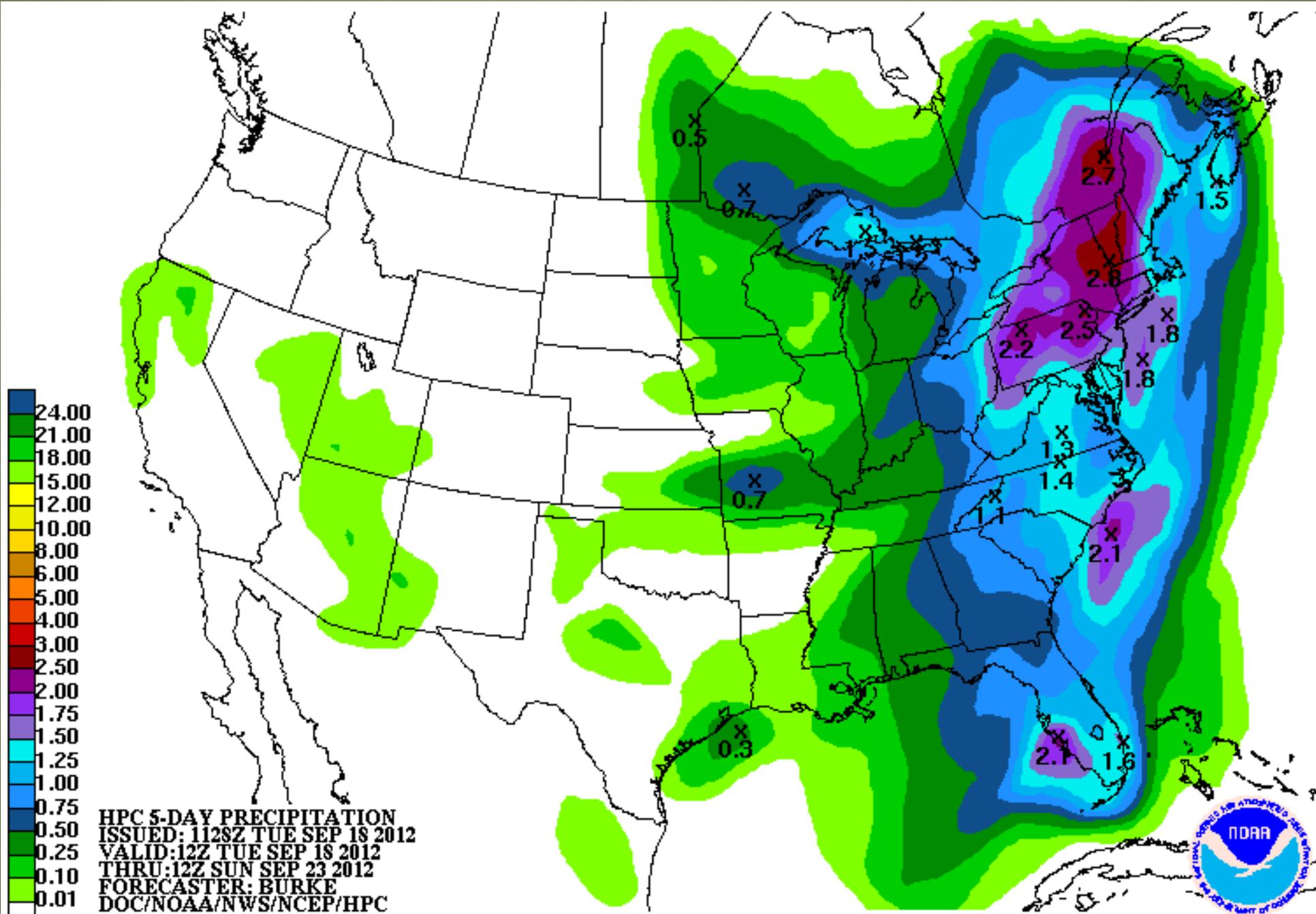


September Average Reservoir Storage Volume



Precipitation Forecast

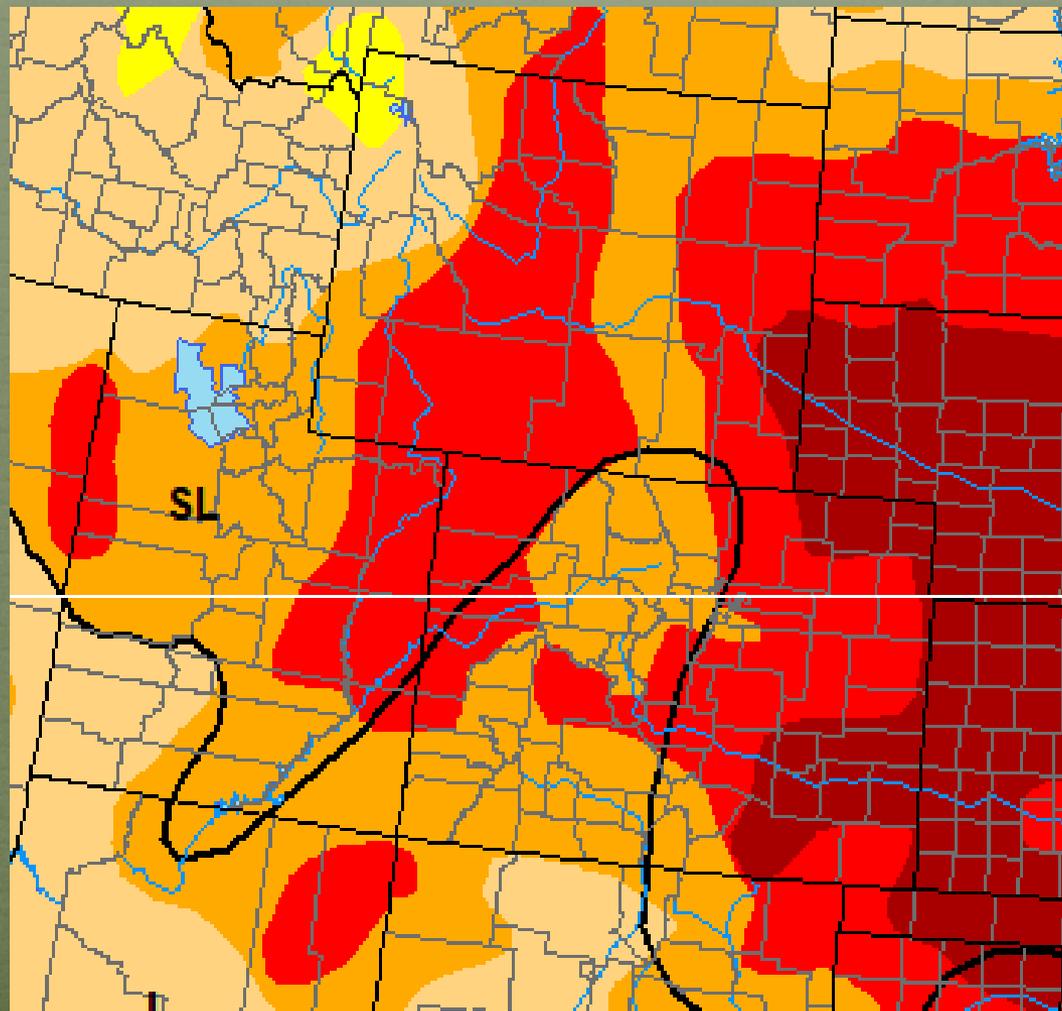




HPC 5-DAY PRECIPITATION
 ISSUED: 1128Z TUE SEP 18 2012
 VALID: 12Z TUE SEP 18 2012
 THRU: 12Z SUN SEP 23 2012
 FORECASTER: BURKE
 DOC/NOAA/NWS/NCEP/HPC



Recommendations



Intensity:

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

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NIDIS - UPPER COLORADO BASIN PILOT PROJECT

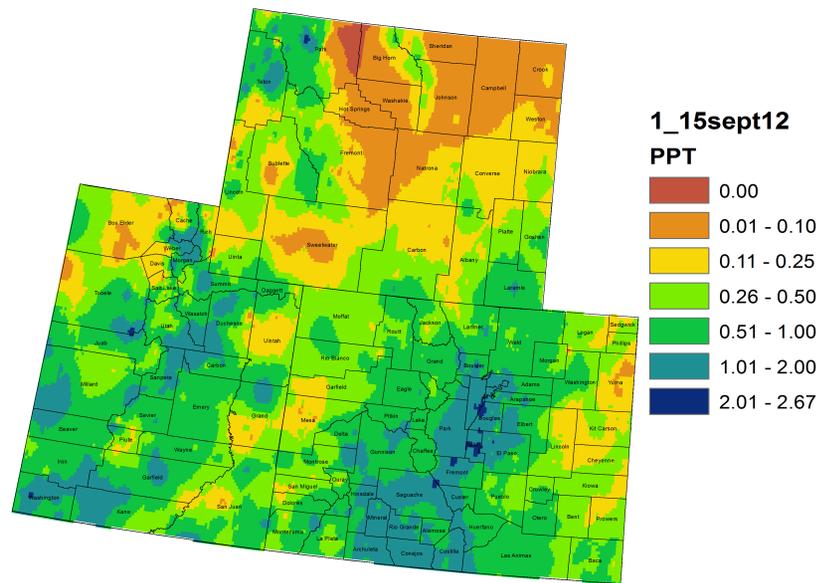
For more information

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

September 18, 2012

Colorado, Utah and Wyoming Month to Date Precipitation (in)
1 - 15 September 2012



Snotel Water Year Precipitation Percentile Ranking for
18 September 2012 (Stations with 15+ years of data only)

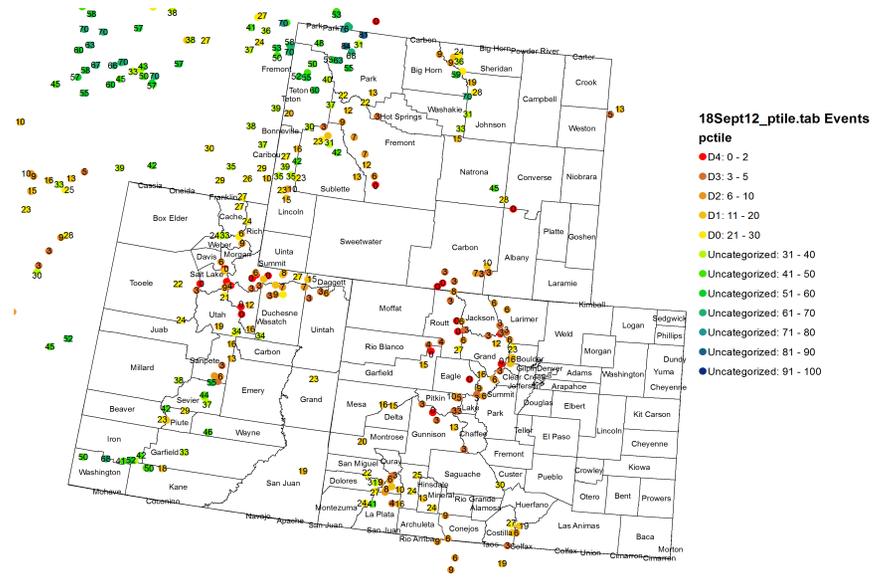


Fig. 1: September 1 – 15 precipitation in inches.

Fig. 2: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor D0 category).

Precipitation

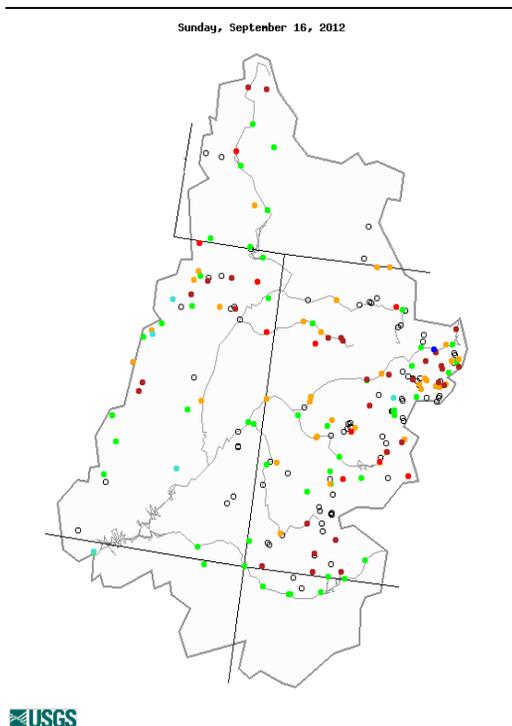
Since the beginning of the month, most of the Upper Colorado River Basin (UCRB) has received between .25 inches to 2 inches of precipitation (Fig. 1). Lower elevations in southwest Wyoming and some spotty locations in the middle part of the UCRB have been a little drier, receiving less than .25 inches. The Wasatch Range in Utah and the San Juans in Colorado fared the best, receiving between .5 and 2 inches. For the rest of CO, the Front Range and foothills received a good amount of moisture last week, but the far eastern plains have been a little drier with some areas receiving less than .25 inches since the beginning of the month.

Water-year-to-date (WYTD), SNOTEL precipitation percentiles are low for the Yampa and Gunnison basins in CO, and the Wasatch range in UT, with many sites reporting in the lowest (driest) 10th percentile or below (Fig. 2). The northern mountains of CO are also dry, with most sites reporting precipitation percentiles in the teens and single digits. SNOTEL percentiles in the Upper Green basin in WY are around the 20th to 30th percentiles, and percentiles in the San Juan basin are in the teens and 20s.

Streamflow

As of September 16th, about 43% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) or above normal 7-day average streamflows (Fig. 3). About 5% of the gages in the UCRB are recording above normal flows, while about 31% percent of the gages in the basin are recording much below normal or low (i.e. lowest on record) streamflows. As flows return to a normal baseflow, the rivers are expected to run lower, and small changes could mean larger changes in percentiles rankings. Accumulated volumes for this time of year is a better indicator of how runoff has been affected by dry conditions.

The three key gages around the basin have shown variable flows in the past week (Fig. 4). The Colorado River near the CO-UT state line dropped from the normal range to the below normal range with flows at the 22nd percentile. Flows on the Green River at Green River, UT stayed steady at the low end of the below normal range (the 11th percentile). Flows on the San Juan River near Bluff, UT saw an increase over the last week to the 53rd percentile (in the near normal range).



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
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 September 16th.

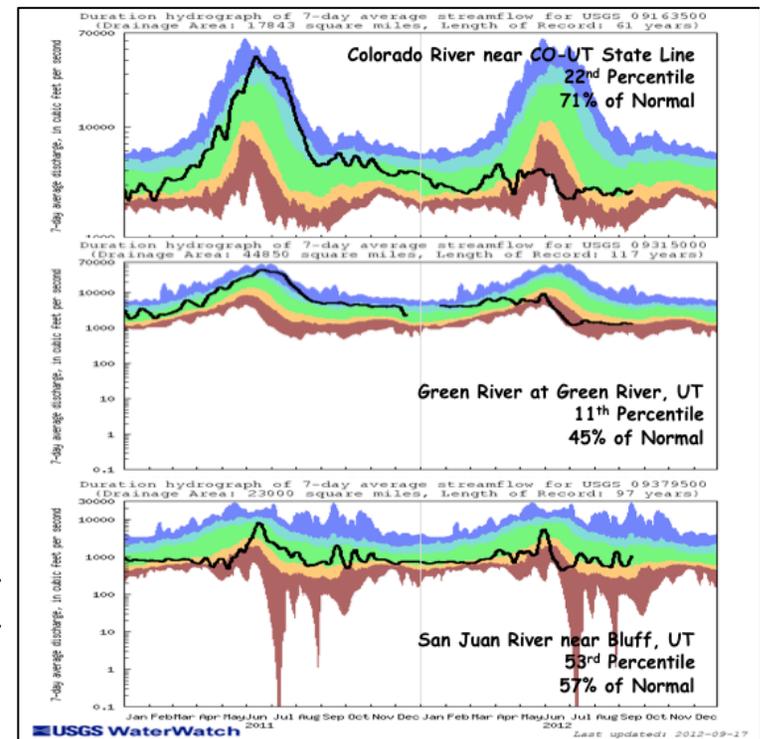


Fig. 4: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).

Water Supply and Demand

Most of the UCRB experienced close to average temperatures for the week with slightly warmer than average temperatures to the north and cooler than average temperatures around the Four Corners. Much of the rest of CO also experienced near average to cooler than average temperatures last week. Satellite vegetation conditions show very dry vegetation through much of the northern part of the UCRB and throughout eastern CO (Fig. 5). Improved vegetation conditions show up in the central and southern mountains of CO and also in southern UT. Reference ET rates are still higher than average across the basin though not above the record. East of the basin, most of the reference ET sites are recording a record high year, with daily ET rates between .20 to .30 inches (Fig. 6).

Last month, all the major reservoirs in the UCRB saw storage volume decreases, which is expected during the demand season, though most of the reservoirs experienced larger decreases than what is normal for this time of year. For the month of September so far, McPhee, Granby, and Blue Mesa have shown larger percentage decreases while Flaming Gorge and Powell have only decreased slightly. All of the reservoirs are below their September averages, with most between 70% and 90% of average.

Precipitation Forecast

A strong ridge of high pressure currently establishing itself over the western US will continue to strengthen over the next several days. This high pressure is expected to remain anchored over the area throughout the week, and will promote very dry conditions with almost no chance of precipitation in the forecast area through Friday. The dry airmass will allow for below normal overnight lows and slightly above average daily highs. The next change in the weather pattern will arrive late this weekend as the remnants of a Pacific low pressure system attempts to move inland over the Great Basin and dislodge the ridge. Moisture from this upper level low should begin to impinge on the far western sections of the UCRB by Monday, and gradually spread eastward moving into early next week. While most forecast models indicate that this feature will move over the area at some point in time, details on the system remain scarce this far out. Expect to see a chance of showers to return to the area sometime late this weekend, with the bulk of the activity tending to favor the northern half of the basin on Monday and Tuesday of next week.

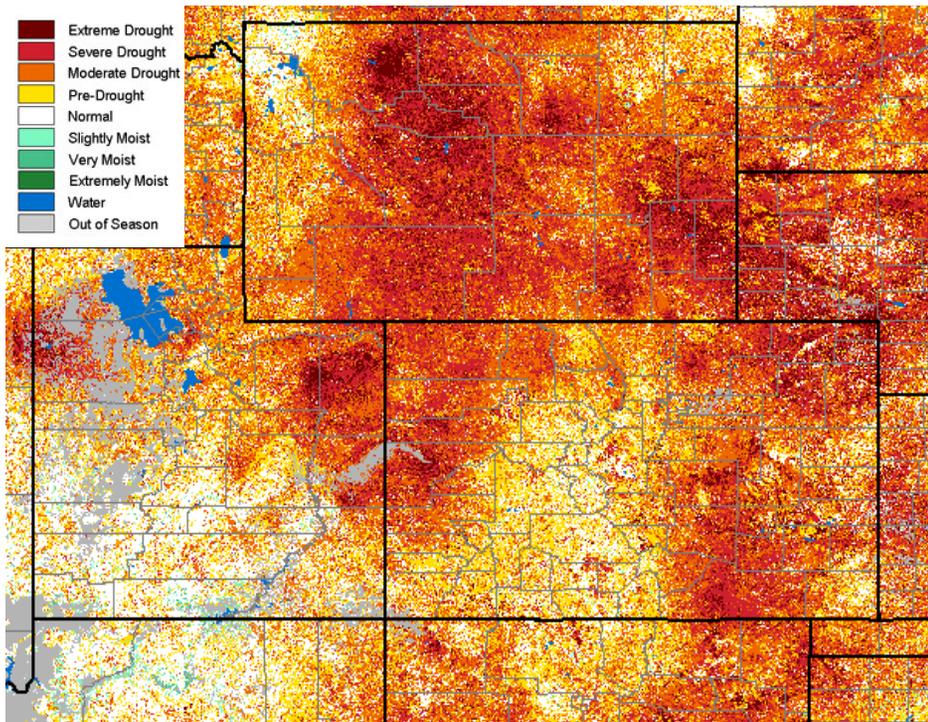


Fig. 5: eMODIS VegDRI showing satellite vegetation conditions as of September 16th.

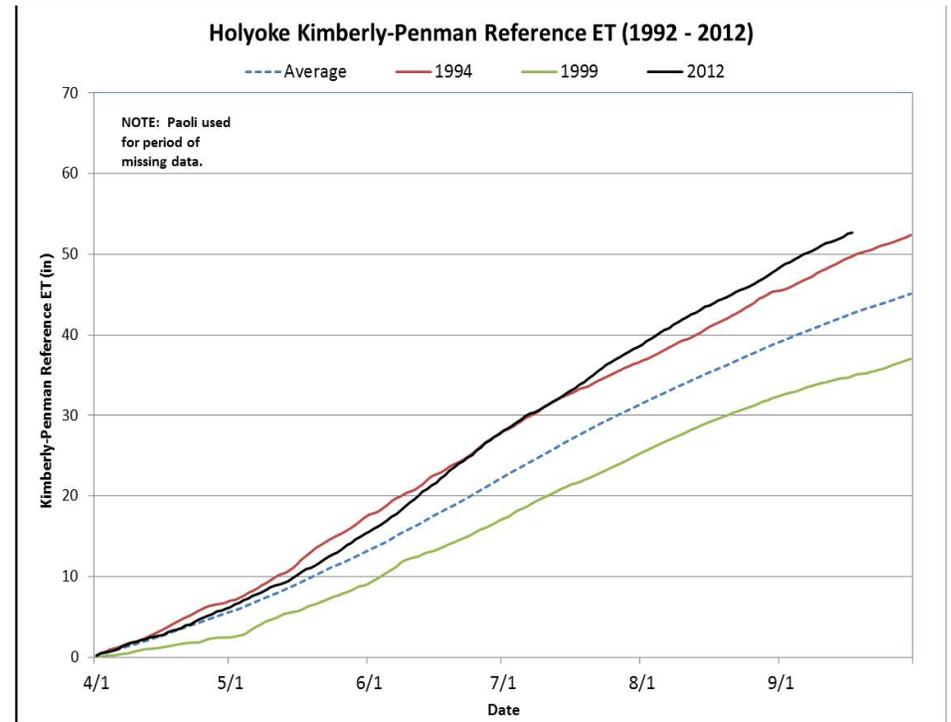


Fig. 6: Accumulated reference ET (black line) at Holyoke in northeast CO, compared to the max year (red), min year (green), and average (dashed line).

Drought and Water Discussion

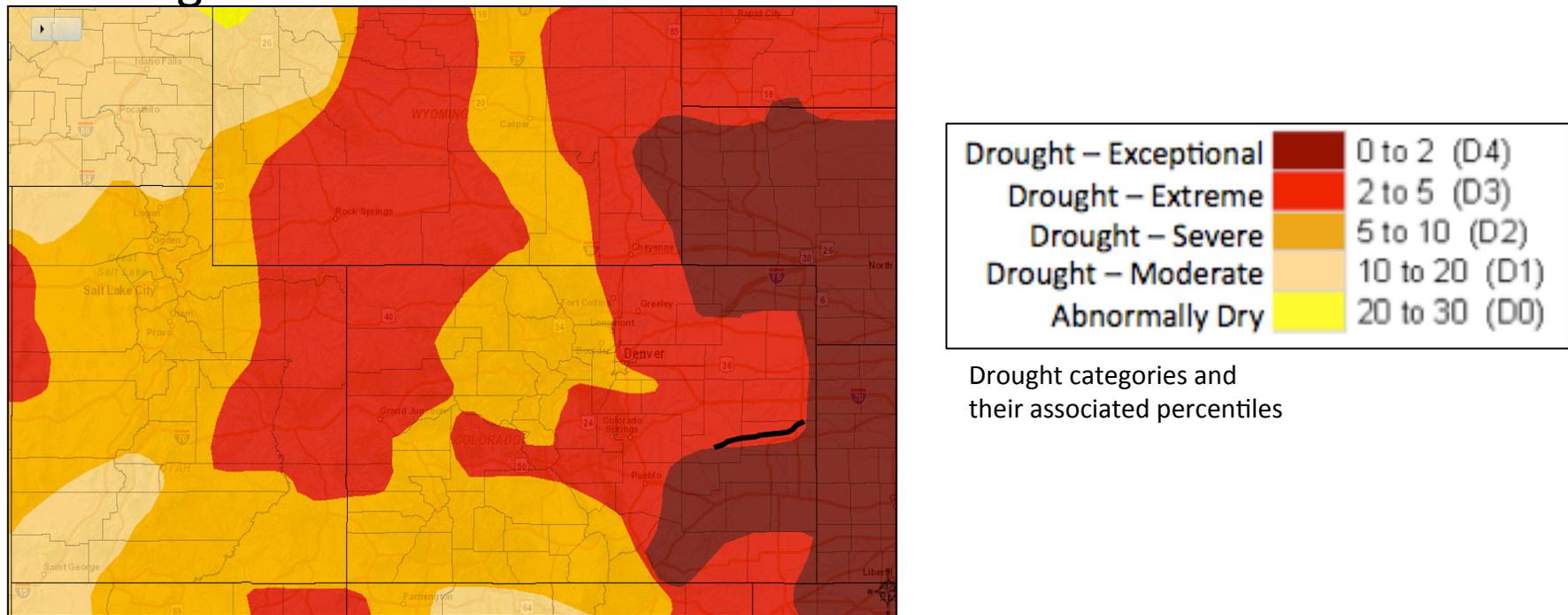


Fig. 7: September 11th release of U.S. Drought Monitor for the UCRB.

UCRB: Status quo is recommended for the UCRB in the current depiction of the U.S. Drought Monitor (USDM) map (Fig. 7). Some beneficial rains did fall in the region, but with limited response to the vegetation, soils and runoff. Would recommend to wait for additional precipitation before making any large scale improvements in the region.

Eastern CO: A slight northward expansion of the D4 in Lincoln and Cheyenne counties is recommended (Fig. 7, black line). Though this area has received a bit of precipitation in the past week, they missed out on the bulk of the major precipitation event. Standardized precipitation indices (SPIs) are below -2 on several different timescales and soil moisture and vegetation conditions in the area are very poor.