



INTERDEPARTMENTAL MEMORANDUM

TO: Butte County Drought Task Force

FROM: Christina Buck, Water Resources Scientist
Water and Resource Conservation

SUBJECT: Hydrologic Conditions Update - Water Year 2012

DATE: November 8, 2012

Introduction and Statewide Overview

The water year begins October 1 each year. This update covers hydrologic conditions for the 2012 hydrologic year beginning October 1, 2011 thru September 30, 2012.

From the Department of Water Resources (DWR) Hydrologic Conditions Update as of September 30, 2012, *statewide* conditions were as follows, % of average for the date:

- Precipitation, 75% of average
- Runoff, 60% of average
- Reservoir Storage, 95% of average

Table 1 Shows the Water Year Type Index for the Sacramento Valley and San Joaquin Valley which are designated as Below Normal and Dry, respectively.

Table 1. From Executive Update Hydrologic Conditions in California, 10/01/2012

Forecast of Regional Water Supply Indices (5)		
Index	Value	Year Type
8 River Index for September (in 1000 AF)	332	n/a
Sacramento Valley Water Year Type Index (40-30-30) @ 50%	6.9	Below Normal
Sacramento Valley Water Year Type Index (40-30-30) @ 90%	6.6	Below Normal
San Joaquin Valley Water Year Type Index (60-20-20) @ 50%	2.3	Dry
San Joaquin Valley Water Year Type Index (60-20-20) @ 75%	2.2	Dry

The DWR produces Bulletin 120 four times a year (February, March, April and May), providing forecasts of the volume of seasonal runoff from the state's major watersheds, and summaries of precipitation, snowpack, reservoir storage, and runoff in various regions of the state. Statewide conditions as of May 1, 2012 indicated below normal or dry conditions with very low snowpack (40% of average for May 1) and low precipitation and runoff (Figure 1). The outlook would have been much worse had it not been for a wet March and April that improved the forecasts considerably. Reservoir storage was above average for May 1 thanks to carryover storage from a very wet 2011.

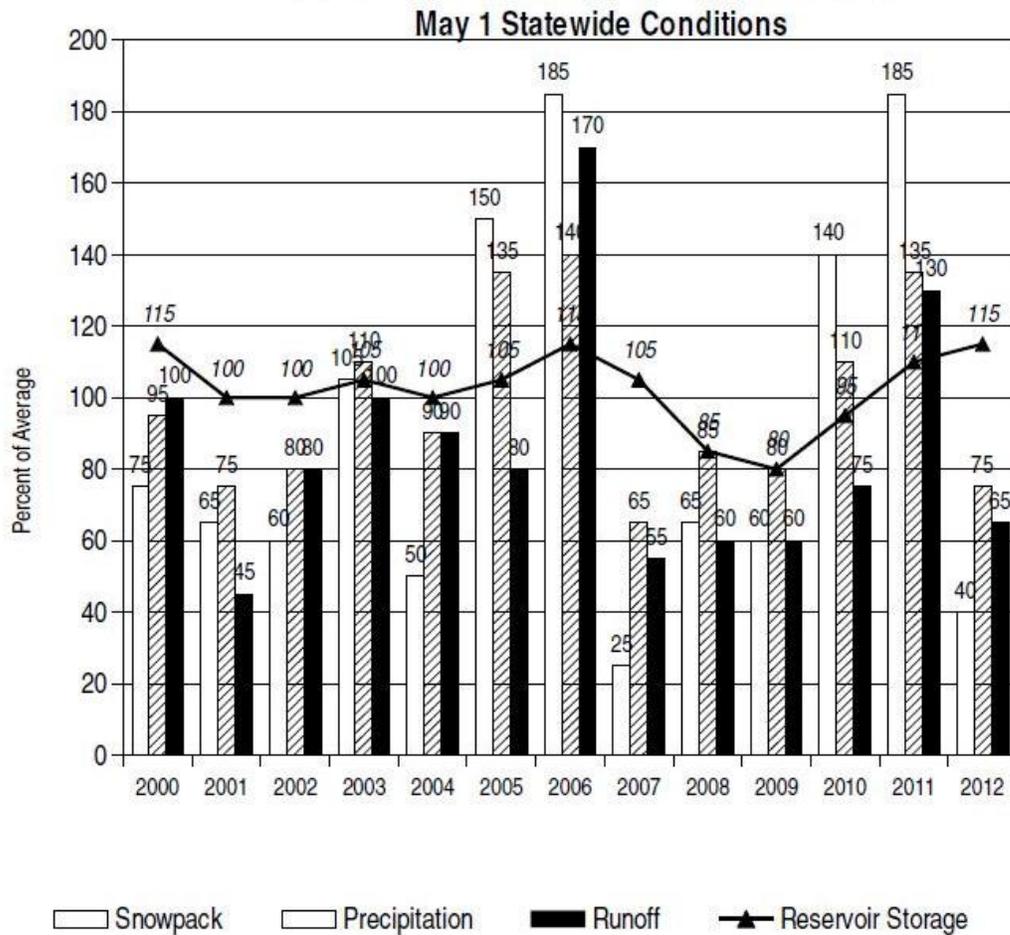
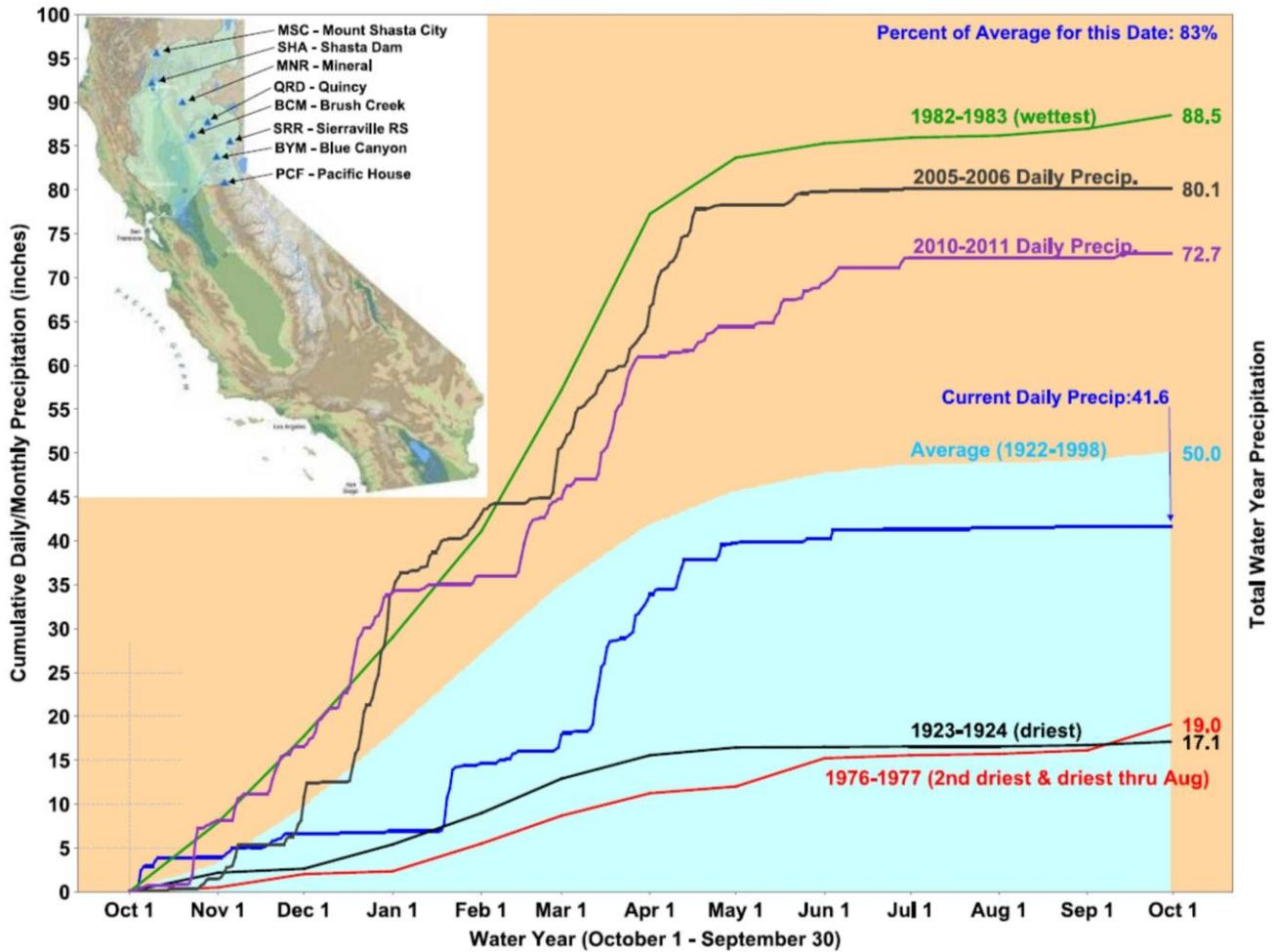


Figure 1. DWR CA Cooperative Snow Surveys, May 1 Statewide Conditions: Snowpack, Precipitation, Runoff, Reservoir Storage (Source: Bulletin 120 Water Supply Conditions may 1 2012 edition)

The dry start to the water year did however lead to a US Department of Agriculture Disaster Designation for a number of counties in California including Butte County for an incident period of February 21-May 14 (attached). This was approved for counties with drought intensity levels of D2 (for 8 consecutive weeks), D3, and D4 as reported on the US Drought monitor. This made farmers and ranchers who conduct family-sized farming operations eligible for disaster assistance.

Snow-pack/Precipitation

The Northern Sierra Precipitation Accumulation ended the 2012 water year with 41.6 inches which is about 83% of average. This 8-Station index provides a representative sample of the region’s major watersheds including the upper Sacramento, Feather, Yuba, and American Rivers. Figure 2 shows the distribution of the precipitation revealing the dry start to the water year persisting through the middle of January. Storms in mid-March and into April significantly improved the forecasts and led to a below normal water year in the Sacramento Valley instead of much drier conditions.



Northern Sierra Precipitation Accumulation (1)

Rainfall & Snow Water Content (in inches)

Water Year Amount to Date (since Oct. 1, 2011):	41.60
Average to Date:	50.00
Percent of Average to Date:	83 %

Figure 2. Northern Sierra Precipitation: 8-Station Index, September 30, 2012 (Source: <http://cdec.water.ca.gov/cdecapp/precipapp/get8SIPrecipIndex.action>)

Snow survey results from the May 1 DWR Bulletin 120 indicated below average precipitation in the Sacramento River watershed (80% of average) which was better than the San Joaquin and Tulare Basin snow surveys: 65% and 75% of average, respectively (Figure 3). Statewide, snow surveys indicated precipitation was at 75% of average for the May 1st date.

CALIFORNIA COOPERATIVE SNOW SURVEYS
SEASONAL PRECIPITATION
 IN PERCENT OF AVERAGE TO DATE
 October 1, 2011 through April 30, 2012

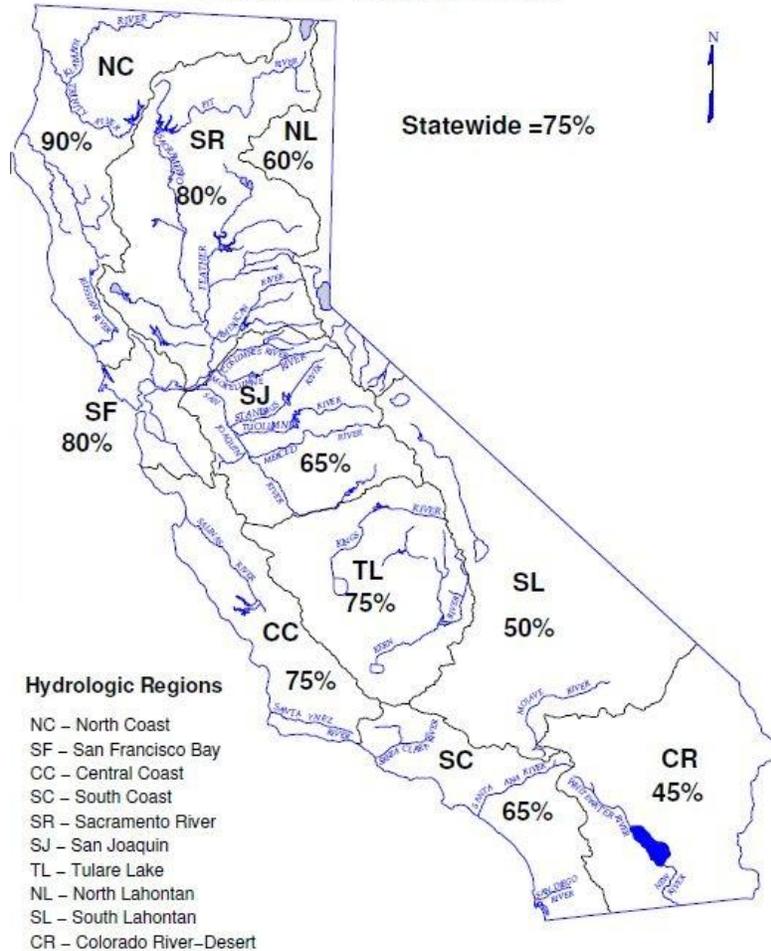


Figure 3. Snow Survey results, May 1 2012 (Source DWR Bulletin 120 Water Supply Conditions)

Runoff and Reservoir Levels

The Sacramento River Region Unimpaired runoff observed through Sept. 30, 2012 was about 11.8 million acre-feet (MAF), which is about 65% of average. Compare that to 25.2 MAF (138% of average) for the 2011 Water Year.

Most major reservoirs in California stand below the historical average for the end of the water year, September 30, 2012. Although Millerton Lake, for example, is substantially above the historical average level (157% of average). See Figure 4 for an overview of levels for the major reservoirs. Figure 5 shows storage conditions of Lake Oroville over the 2012 water year (green line) compared to WY 2011, and the driest year on record, WY 1977. It also includes storage for the beginning of the current water year, 2013. For the 2012 water year, Lake Oroville began the water year with storage well above average due to wet conditions in 2011, was at or near capacity in May, then ended the water year at 88% of average for the date.

Data as of Midnight: 30-Sep-2012

Change Date: 30-Sep-2012

Refresh Data

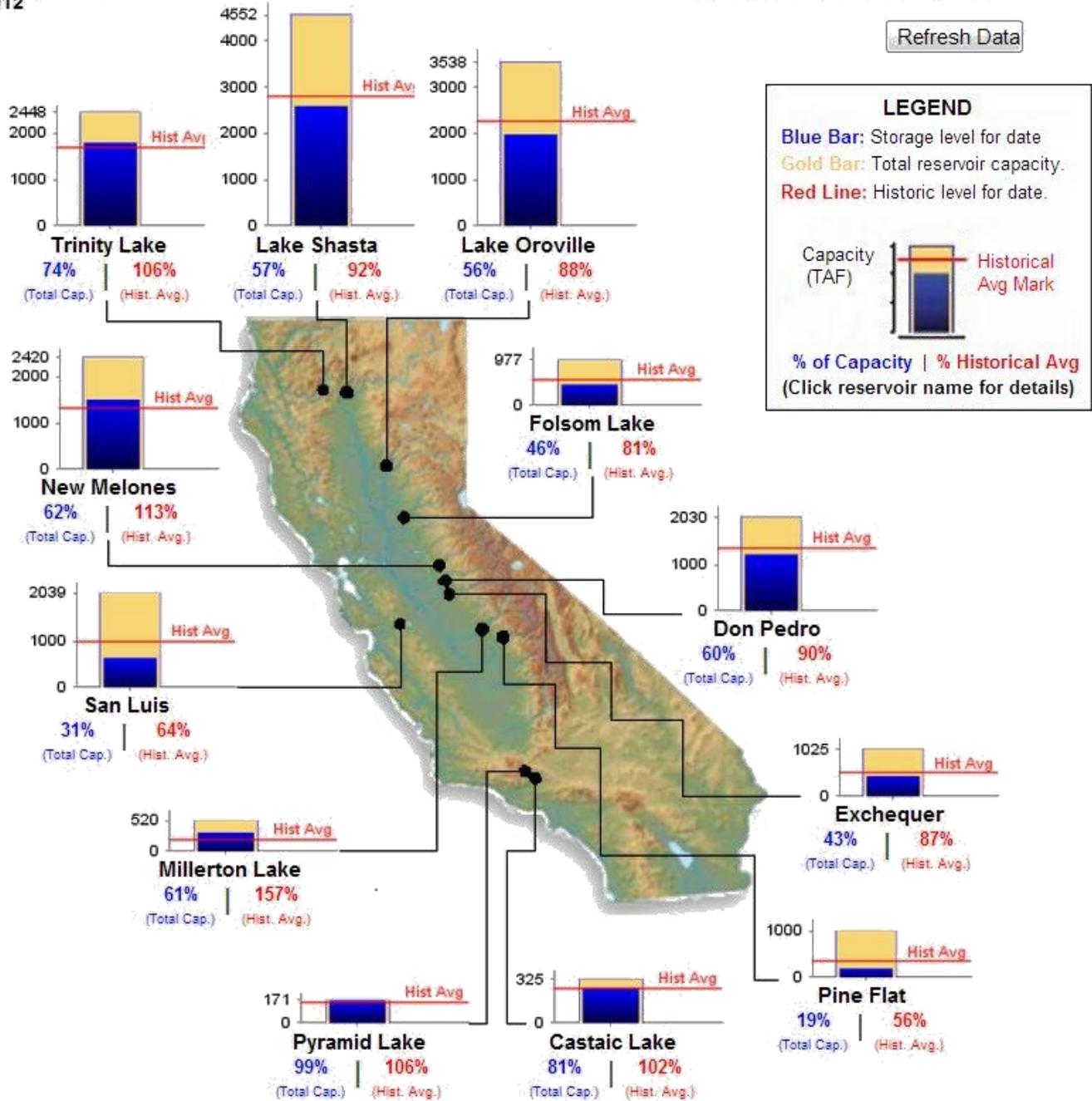


Figure 4. Conditions for Major Reservoirs as of September 30, 2012 (Source DWR: <http://cdec.water.ca.gov/cdecapp/resapp/getResGraphsMain.action>)

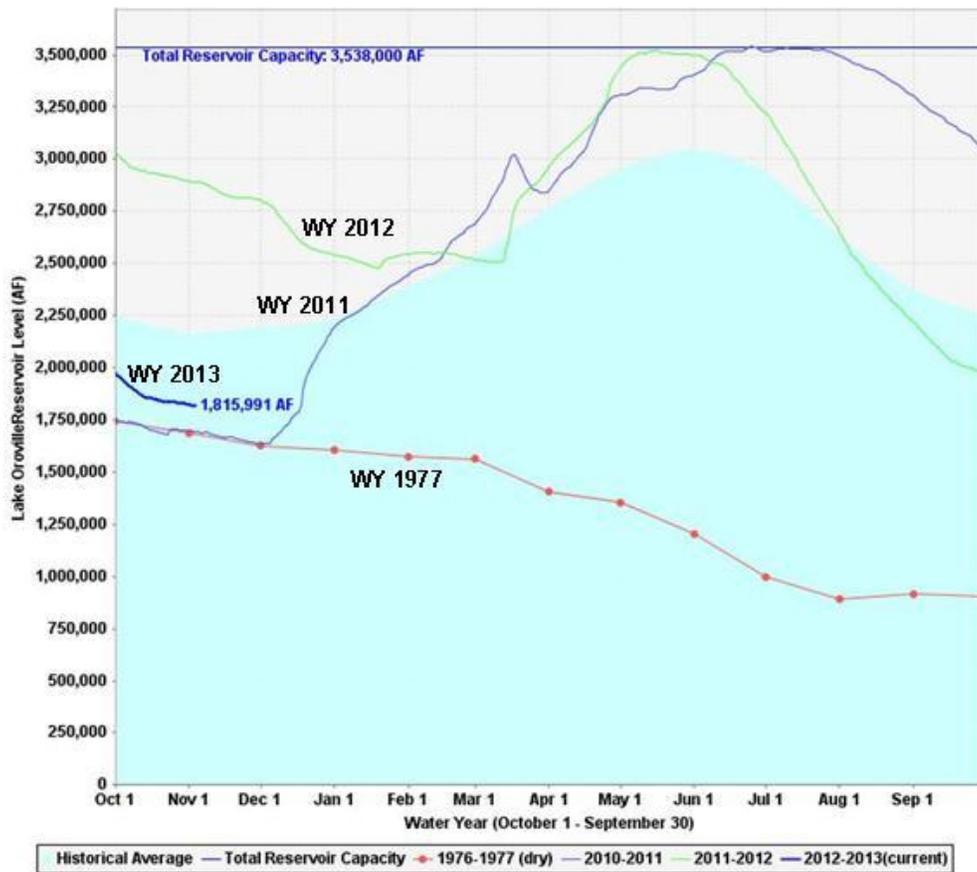


Figure 5. Lake Oroville Current (as of November 5, 2012) Reservoir Conditions- storage level in acre-feet (<http://cdec.water.ca.gov/cdecapp/resapp/resDetailOrig.action?resid=ORO>)

Groundwater Levels

Groundwater elevations in Butte County were measured by DWR Northern District the last week in March 2012 and the third week in October for Spring and Fall monitoring, respectively. A BMO Data Summary for historical spring groundwater elevations (2008-2012) is available on the Department’s website under BMO. With below average precipitation in the 2012 water year (October 2011-September 2012), water levels decreased in some areas and increased in others compared to 2011 spring levels. Groundwater levels reflect dry conditions with a number of Stage 1 Alerts occurring this spring and during the past five years (Table 2). The following sub-basins have wells that reached alert levels for spring 2012: Butte Sink, Cherokee, Esquon, North Yuba, Chico Urban Area, Durham/Dayton, Llano Seco, M&T, and Vina. Many of the wells at Alert Stage 1 have been there since at least spring 2008.

Table 2. Number of Spring Level Measurements at Alert Stage 1 and 2 for 2008-2012 Using Current BMOs

	2008	2009	2010	2011	2012
Alert 1	28	32	26	25	26
Alert 2	0	6	2	0	3

2012 Fall measurements also have a number of wells at alert stage 1 (23 wells) and 5 wells in alert stage 2 (Table 3). Like spring alerts, most of the wells in alert have been at an alert stage, perhaps on and off, since at least 2008. A number of wells have a higher fall groundwater level in 2012 than in 2011 but most had a lower groundwater level.

Subareas with generally lower groundwater levels include Esquon, Pentz, Chico Urban Area, Durham Dayton, M&T, and mostly Vina and Llano Seco. The 2012 levels are less than a foot to 16 feet lower than 2011 levels. Groundwater level data will be reviewed by the Technical Advisory Committee at their upcoming meeting November 29, 2012.

Table 3. Number of FALL Level Measurements at Alert Stage 1 and 2 for 2008-2012

	2008	2009	2010	2011	2012
Alert 1	29	31	23	10	23
Alert 2	2	1	1	2	5

National Drought Conditions

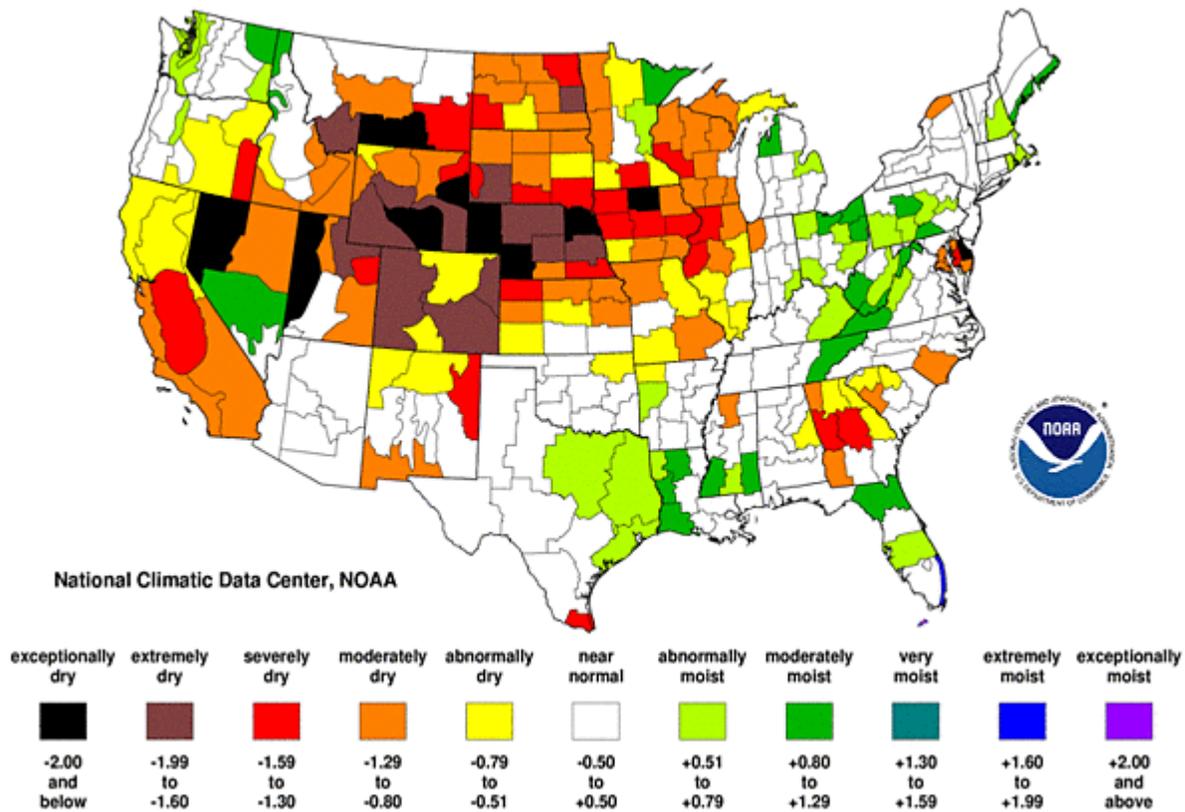


Figure 6. Standardized Precipitation Index for Twelve months, 2012 Water Year (Oct. 2011-Sept. 2012)