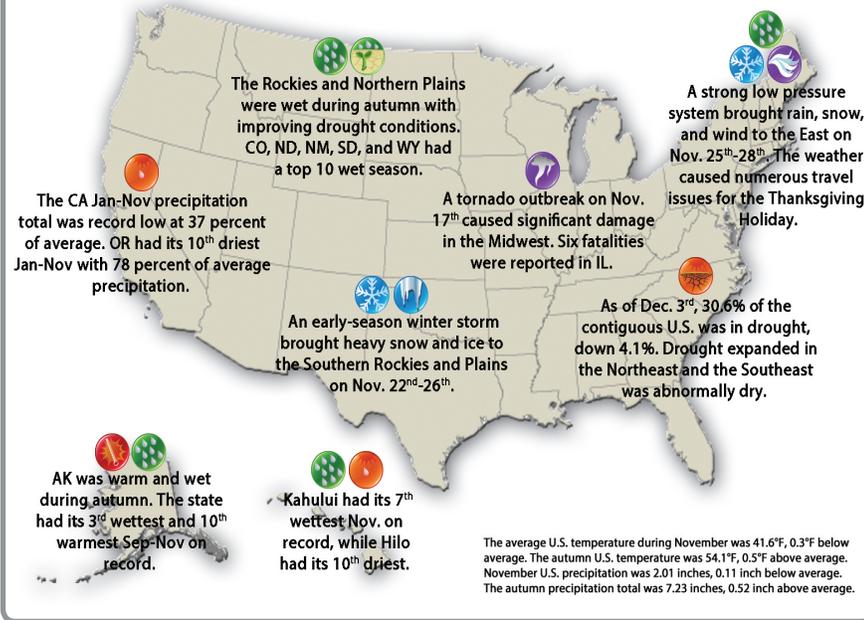


## National - Significant Events for September 2013–November 2013

### Significant Events for November and Autumn 2013



### Highlights for the Central Region

Much of the Colorado Front Range received a year's worth of rain in one week in September. For the period September 9–14, many locations received more than 10 inches of rain and as much as 20 inches. The torrential rain caused extensive flooding.

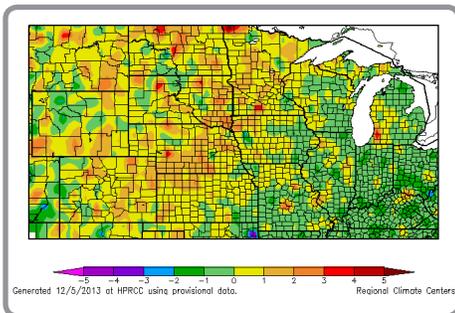
An early October blizzard in the Northern Plains dumped one to three feet of snow on the Black Hills in South Dakota. The snow was accompanied by winds gusting from 50 to 70 miles per hour. Lead, South Dakota, set a new record one-day snowfall for October of 42.0 inches, with a storm total of 55.0 inches of snow. This same storm produced two to six inches of rain across southeast Minnesota and northeastern Iowa.

On November 17, the fourth largest November tornado outbreak on record for the United States occurred with 72 tornadoes in seven states in the Midwest. Illinois and Indiana were the hardest hit states. The outbreak resulted in two EF-4 tornadoes, both in Illinois, and seven EF-3 tornadoes.

## Regional - Climate Overview for September 2013–November 2013

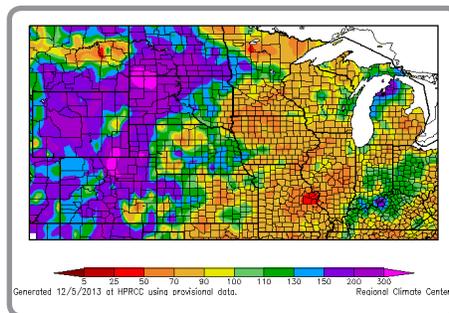
### Temperature and Precipitation Anomalies

Departure from Normal Temperature (° F)  
9/1/2013–11/30/2013



Temperatures were generally near normal in the eastern two-thirds of the region and from 1°F to 2°F below normal in the eastern third. However, the month to month variability was significant this season. Temperatures during September were above normal across the entire region, as much as 6°F above normal in the northern Plains. October was 2°F to 4°F below normal in the west and near normal in the east, while November was near normal in the west and much cooler than normal in the east.

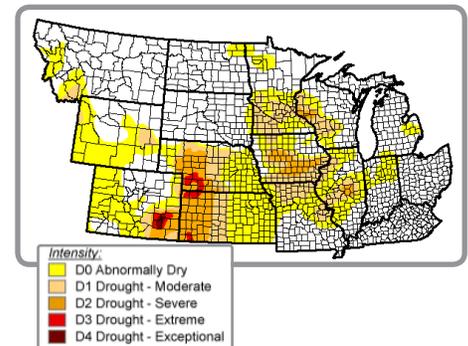
Percent of Normal Precipitation (%)  
9/1/2013–11/30/2013



Precipitation was much above normal in the western third of the region, particularly from Colorado and Wyoming north through the Dakotas. This was largely the result of a very wet September in the central Rockies and a wet October in the Northern Plains. At the end of November a number of locations in South Dakota and North Dakota had already set new annual precipitation records by several inches. Precipitation was near to below normal in the eastern two-thirds of the region, although portions of the Great Lakes and Ohio Valley received above normal precipitation.

### Drought in Central Region

U.S. Drought Monitor  
12/17/2013



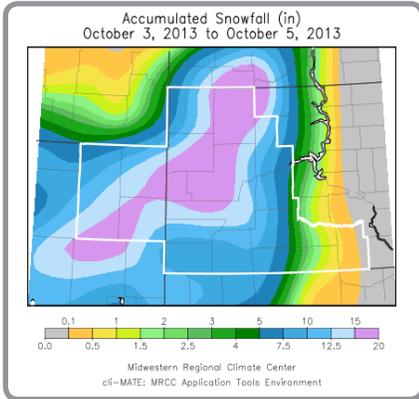
Moisture conditions gradually improved during the fall. The biggest improvements were in western Kansas and southwestern Colorado, although there are still a few pockets of Extreme to Exceptional drought.

# Regional Impacts for September 2013–November 2013

## Agriculture

At least 25,000 animals, including more than 21,000 cattle, perished in the October blizzard in South Dakota. The storm also caused sunflower seed loss ranging from 20 to 90 percent in southwestern North Dakota. Officials indicate a preliminary estimate of nearly \$38 million in damages to public infrastructure and property of private, non-profit entities.

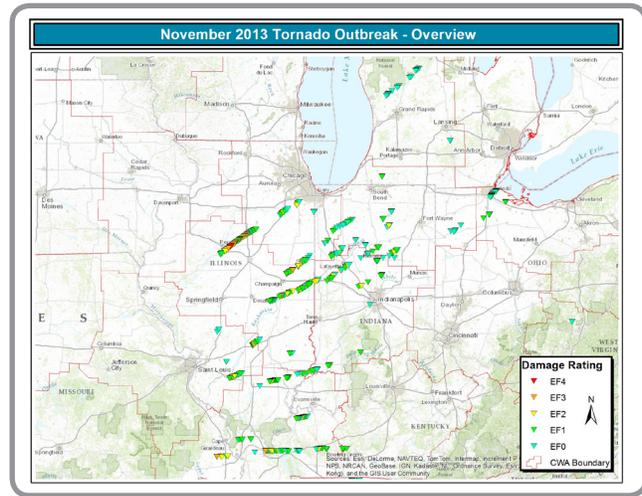
A wet October, particularly in the northern Midwest and Ohio Valley, slowed corn and soybean harvest, but a late first freeze in much of the region was favorable for late-maturing crops and the completion of most of the harvest in early November.



## Environment and Infrastructure

The September flooding in Colorado destroyed highways, damaged dams, isolated entire communities, and caused 8 fatalities. Preliminary estimates put property losses at \$2 billion.

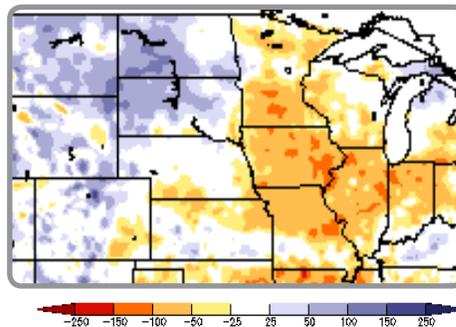
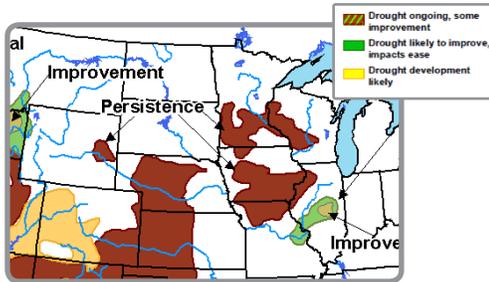
One risk management firm estimates that the November tornado outbreak could result in more than \$1 billion in losses, making it the costliest November disaster in 25 years. The tornadoes resulted in six fatalities, all in Illinois.



## Regional Outlook - for Winter 2013

### Little Change in Drought Conditions Expected Over Winter

U.S. Seasonal Drought Outlook  
Drought Tendency During the Period  
Valid for 12/19/2013–03/31/2014  
Released 12/19/2013



The latest Drought Outlook indicates that there is little change expected in drought status across the region during the winter months. Drought conditions are expected to develop in western Colorado, while winter precipitation is expected to eliminate drought from eastern Missouri through central Illinois. Winter is climatologically the driest season of the year in much of the central U.S., so without above-normal precipitation there is little likelihood of making up the current deficits. El Niño Southern Oscillation (ENSO) neutral conditions currently exist and are expected to persist through summer 2014. Typically, atmospheric patterns during ENSO neutral conditions are influenced by other shorter timescale climate patterns such as the North Atlantic Oscillation (NAO) and the Arctic Oscillation (AO).

Soil moisture deficits are highest in the central Midwest. Without normal to above normal winter precipitation, these deficits are likely to carry into the spring and will have impacts on agriculture. If this is the case, then adequate spring precipitation will be needed to provide enough moisture for spring planting and crop development. In the Dakotas, positive soil moisture anomalies raise concern for possible spring flooding in some river basins. High soil moisture levels in the southern Red River Valley raise concern for spring flooding of the Red River of the North. When fall is significantly wetter than normal it usually precedes major flooding in Fargo, and Fargo experienced its fourth wettest fall on record this year. At the end of November flow in the Red River at Fargo was well-above normal.

## Central Region Partners

- Climate Science Program, Iowa State University  
[climate.engineering.iastate.edu](http://climate.engineering.iastate.edu)
- High Plains Regional Climate Center  
[www.hprcc.unl.edu](http://www.hprcc.unl.edu)
- Midwestern Regional Climate Center  
[mrcc.isws.illinois.edu](http://mrcc.isws.illinois.edu)
- Missouri Basin River Forecast Center  
[www.crh.noaa.gov/mbrfc](http://www.crh.noaa.gov/mbrfc)
- National Climatic Data Center  
[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)
- National Drought Mitigation Center  
[drought.unl.edu](http://drought.unl.edu)
- National Integrated Drought Information System  
[www.drought.gov](http://www.drought.gov)
- National Weather Service Central Region  
[www.crh.noaa.gov/crh](http://www.crh.noaa.gov/crh)
- North Central River Forecast Center  
[www.crh.noaa.gov/nrcf](http://www.crh.noaa.gov/nrcf)
- NWS Climate Prediction Center  
[www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)
- South Dakota State University and SDSU Extension  
[www.igrow.org](http://www.igrow.org)
- State Climatologists  
[www.stateclimate.org](http://www.stateclimate.org)
- WaterSMART Clearinghouse, U.S. Dept. of Interior  
[www.doi.gov/watersmart/html/index.php](http://www.doi.gov/watersmart/html/index.php)
- Western Governors' Association  
[westgov.org](http://westgov.org)