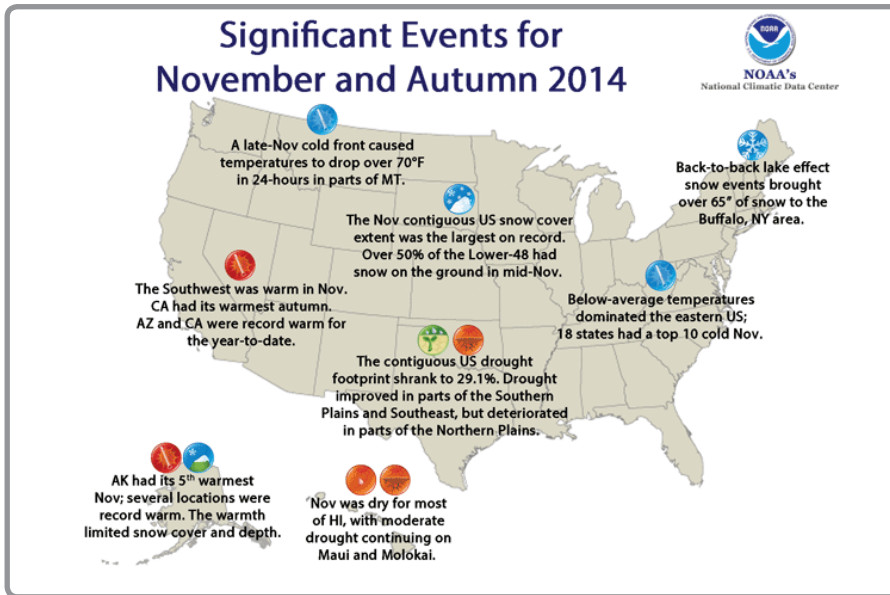


National - Significant Events for September - November 2014



Highlights for the Basin

October was the first month in over a year that the majority of the Basin experienced above normal temperatures. States ranking in the top 10 warmest Octobers since 1895 included Montana (3), Colorado (6), and Wyoming (9). November was cooler with Missouri (5), Iowa (9), and South Dakota (10) ranking in the top 10 coolest.

An early September winter storm brought the earliest one inch snowfall to parts of the Black Hills with snowfall totals up to 8 inches.

A 1 in 200 year rain event occurred in the Lincoln, NE area September 30 - October 1. Rainfall observations of up to about 9 inches were reported. Local flooding occurred as a result.

A mid-November Arctic blast brought extreme temperatures to the Basin. Average temperatures the week of the 11th-17th were over 25°F below normal across much of the Basin. Thousands of daily records were broken nationwide.

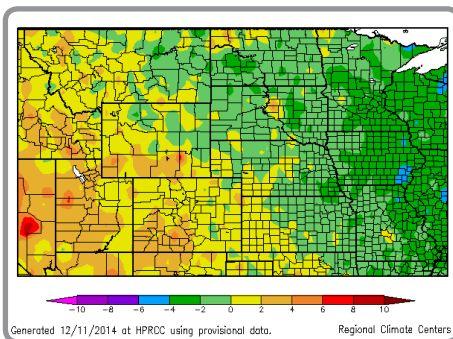
Although several smaller events have occurred, numerous locations in North Dakota have failed to reach their first one inch snowfall.

The average US temperature during November was 39.3°F, 2.4°F below average. The autumn US temperature was 54.1°F, 0.6°F above average. November US precipitation was 2.07", 0.16" below average. The autumn precipitation total was 7.12", 0.24" above average.

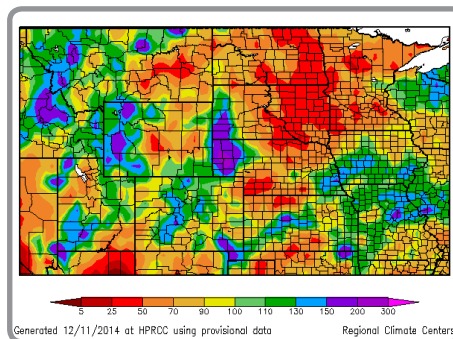
Regional - Climate Overview for September - November 2014

Temperature and Precipitation Anomalies

Departure from Normal Temperature (°F)
September 1 - November 30, 2014

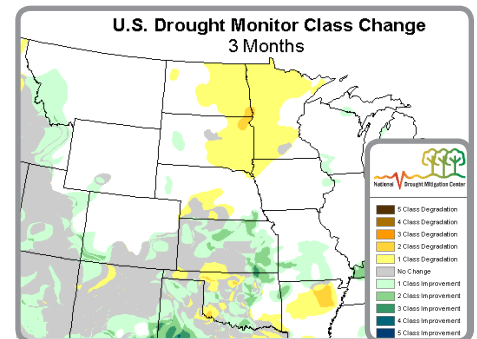


Percent of Normal Precipitation (%)
September 1 - November 30, 2014



Drought Conditions

3-Month Class Change
11/25/2014



It was a roller coaster of temperatures for the Missouri River Basin states this fall. After a fairly average September, October was quite warm. This warmth continued into November until an Arctic airmass moved into the region, bringing record-setting cold. The end result was a fall which averaged out to near normal for the majority of the Basin with slightly above normal temperatures to the west and slightly below normal temperatures to the east. Only isolated areas exceeded 2°F above or below normal.

Precipitation varied this fall. September was largely near normal, while upper portions of the Basin were dry in October and wet in November. Lower portions were wet in October and dry in November. Ultimately, the wet areas included the Black Hills, the Nebraska panhandle, and western Wyoming where over 150% of normal precipitation fell. However, eastern areas of the Dakotas received at most 50% of normal precipitation. By the end of November, snowpack in the Rockies was near normal.

According to the U.S. Drought Monitor, rainfall early in the season allowed for the improvement of drought conditions across Colorado and Kansas. However, low precipitation totals over the past three months led to an introduction of abnormally dry conditions (D0) across eastern parts of the Dakotas and south-central Nebraska. The map above shows the locations of these improvements and degradations to the U.S. Drought Monitor. Luckily, at this time of the year, impacts from dryness are minimal.

Regional - Impacts for September - November 2014

Agriculture

Fall brought near perfect harvest conditions to the Missouri River Basin states. These warm and dry conditions were needed due to late developing crops. Unfortunately, there could be problems for winter wheat throughout the plains due to the sharp transition from warm to extremely cold temperatures and the duration of that cold weather.

Record high cattle prices have led to thefts in Kansas. Farmers and ranchers have been advised to brand their cattle and install cameras to monitor their property. The high prices are a long term impact of drought, which has driven the nationwide cattle herd to low numbers. According to the Farmers & Ranchers Livestock Commission, steers were selling between \$1,300 and \$2,000.

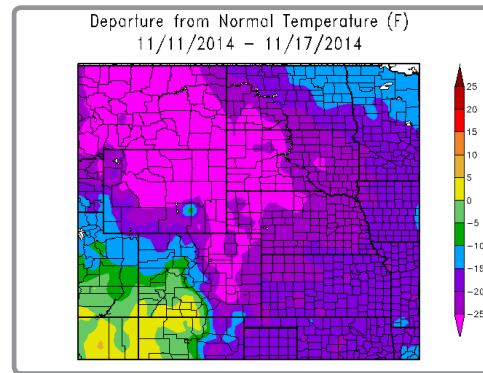
Horticulture

An early killing freeze in September occurred along parts of the Front Range in Colorado. The last frost in these areas occurred in mid-May, making this one of the shortest growing seasons in decades. After this early freeze, milder weather set in which was then followed by the Arctic blast of November. Impacts of this event are unknown at this time; however there is a possibility of considerable tree and shrub damage.

Recreation and Tourism

It was a slow start to the winter resort season in Colorado as temperatures were too warm to make snow in October and snowfall in the mountains was lacking in November. It was not until just before Thanksgiving that the snowpack came up to near normal in most areas.

Fewer deer hunting permits were issued in South Dakota this year as deer counts were down as a result of epizootic hemorrhagic disease. This disease was an issue during the 2012 drought.



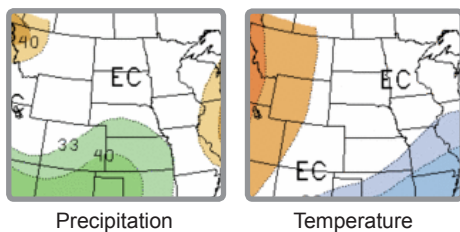
Top: Departure from normal temperature for November 11-17.

Bottom: Wheat damage in west-central Kansas following the November cold. Image courtesy of Mary Knapp.

Regional - Outlook for January - March 2015

3-Month Precipitation and Temperature Outlooks

Valid for January-March 2014



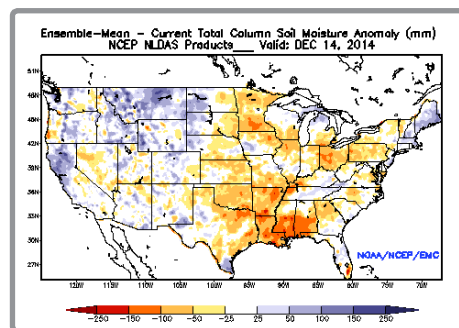
EC: Equal chances of above, near or below normal
A: Above normal, B: Below normal

ENSO (El Niño/Southern Oscillation) neutral conditions were ongoing this fall. The 3-month outlooks indicate increased chances for above normal temperatures in western portions of the Basin and below normal temperatures in the south. The precipitation outlook shows equal chances for above, below, or near normal precipitation for much of the Basin except for increased chances of dry conditions in western Montana and wetter conditions in the south.

While El Niño conditions are still likely to develop later this winter, these conditions should be weak. Thus, the impacts of this potential development are unclear at this time.

Soil Moisture Conditions

12/14/2014



Modeled soil moisture conditions at the end of fall generally indicated wetter soils to the north and west and drier soils to the east and south. Conditions at this time of year can provide some insight for the spring because once the soil freezes, changes in soil moisture are unlikely to occur. Thus, the drier soils in the eastern Dakotas may be beneficial going into spring as wet soils in recent years have been a limiting factor for planting. Drier soils in these areas will also reduce flood risk going into spring for the James and Red Rivers. This map shows the total column soil moisture anomaly in millimeters, from a NOAA model called NLDAS.

MO River Basin Partners

- High Plains Regional Climate Center
www.hprcc.unl.edu
- Kansas State, Department of Agronomy
www.agronomy.k-state.edu
- National Oceanic and Atmospheric Administration
www.noaa.gov
- National Weather Service - Central Region
www.crh.noaa.gov/crh
- National Climatic Data Center
www.ncdc.noaa.gov
- Missouri River Basin Forecast Center
www.crh.noaa.gov/mbrfc
- Climate Prediction Center
www.cpc.ncep.noaa.gov
- National Operational Hydrologic Remote Sensing Center
www.nohrsc.noaa.gov
- National Drought Mitigation Center
www.drought.unl.edu
- National Integrated Drought Information System (NIDIS)
www.drought.gov
- State Climatologists
www.stateclimate.org
- South Dakota State University Extension
<http://figrow.org>
- U.S. Army Corps of Engineers - Missouri River Basin Water Management Division
www.usace.army.mil
- U.S. Department of Agriculture
www.usda.gov
- NRCS National Water & Climate Center
www.wcc.nrcs.usda.gov
- Regional Climate Hubs
www.usda.gov/oce/climate_change/regional_hubs.htm
- U.S. Geological Survey, Water Mission Area
www.usgs.gov/water
- Western Governors' Association
www.westgov.org

