Midwest and Great Plains Climate-Drought Outlook
21 August 2014

Dr. Jeff Andresen
State Climatologist
Michigan State University
andresen@msu.edu
517-432-4756

Flooding along I-696 in Warren, MI
11 AUG 2014
Photo courtesy of NBC News
General Information

* Providing climate services to the Central Region
  * Collaboration Activity Between:
    * State Climatologists
    * Doug Kluck & John Eise (NOAA/NWS)
    * American Association of State Climatologists
    * Midwest and High Plains Regional Climate Centers
    * National Drought Mitigation Center/USDA

* Access to Future Climate Webinars and Information
  * http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars
  * http://mrcc.isws.illinois.edu/webinars.htm
  * http://www.hprcc.unl.edu/webinars.php
  * Operator Assistance for questions at the end
Agenda

- Current Conditions
- Impacts
  - Flooding
  - Agriculture
- Outlooks
  - El Niño
Review/Current Conditions
July Temperatures

Much cooler than normal regionwide
July Temperatures

Statewide Average Temperature Ranks
July 2014
Period: 1895–2014

[Map showing average temperature ranks across the United States]
Temperature anomalies were strongly linked with the mean upper air pattern.
November – July Temperatures
1895-2014

Michigan, Average Temperature, November-July

- 1896-2014 Trend
  +0.3°F/Decade
- 1901-2000
  Avg: 39.0°F
- Avg Temperature

°F

- 34
- 36
- 38
- 40
- 42
- 44

- 1900
- 1910
- 1920
- 1930
- 1940
- 1950
- 1960
- 1970
- 1980
- 1990
- 2000
- 2010
Most of Midwest turned drier
Total Growing Season Precipitation

Precipitation (in)  
4/1/2014 – 8/20/2014

Departure from Normal Precipitation (in)  
4/1/2014 – 8/20/2014

Seasonal surpluses N, NE, deficits SW
Impacts
Total Growing Season GDDs

Surpluses west, east, deficits north, south
Cooling Degree Day Accumulations

Cooling Degree Days (base 65)
5/1/2014 - 7/31/2014

Departure from Normal CDD (base 65)
5/1/2014 - 7/31/2014

Deficits most areas, lower electricity bills
Deficits have developed in recent weeks across central and other parts of the region.
Soil Moisture status

U.S. Drought Monitor

August 19, 2014
(Released Thursday, Aug. 21, 2014)
Valid 8 a.m. EDT

Drought Impact Types:
- D = Short Term, typically less than 6 months (e.g., agriculture, grasslands)
- L = Long Term, typically greater than 6 months (e.g., hydrology, ecology)

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

The Drought Monitor focuses on broad-scale conditions; local conditions may vary. See accompanying text summary for financial assistance.

http://droughtmonitor.unl.edu/

U.S. Drought Monitor Class Change
1 Month

August 19, 2014 compared to July 22, 2014

http://droughtmonitor.unl.edu
Impacts

Agriculture
Crop Progress and Condition: Corn
Crop Progress and Condition: Soybean
High corn and soybean yields in the Midwest are strongly linked with cooler and wetter than normal growing seasons.
Crop conditions across much of the region are good to excellent with high potential yields.

Crops progressed through sensitive reproductive stages with adequate soil moisture.

Crops generally progressing at or near normal rates of development except northern sections where they lag behind normal.

Growing concern about late planted crops reaching maturity prior to first killing freeze across northern sections.
Impacts

Regional Flooding
A slow-moving frontal boundary led to heavy rainfall and flooding across sections of Missouri during the first week of August, leading to several days of flash flooding. Near 15 inches of rain was recorded in Waynesville, MO in a two-day period, with one-day totals of 6 inches or more were common across the width of the southern part of Missouri. The communities of Branson and Hoillister, MO were especially hard hit, necessitating waterborne rescues.

A series of training thunderstorms brought 3-6 inches in less than 12 hours resulting in widespread flooding across SE Lower Michigan on the 11th. Preliminary damage estimates are in excess of $500M.
Flood Event of August 11th, 2014

Michigan: 8/12/2014 1-Day Observed Precipitation
Valid at 8/12/2014 1200 UTC - Created 8/14/14 23:32 UTC

Image courtesy of Iowa Environmental Mesonet (IEM)
Outlooks
Forecast Upper Air Flow
Temperature and Precipitation Probabilities for 26-30 August 2014

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/predictions/610day/index.php
Latest forecast guidance suggests an increase in tropical cyclone activity in the vicinity of the southern USA, including the NW Atlantic Basin.
September Temperature and Precipitation Probabilities

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/30day/
El Nino Development?

Week centered on 28 May 2014
SST (°C)
While it has decreased relative to previous outlooks, the forecast chance of El Niño remains at about 65% during the No. Hemisphere fall and early winter.
3 Month Temperature and Precipitation Probabilities
(September - November)

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1
U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for August 21 - November 30, 2014
Released August 21, 2014

KEY:
- **Dark Brown**: Drought persists or intensifies
- **Light Brown**: Drought remains but improves
- **Tan**: Drought removal likely
- **Light Yellow**: Drought development likely

Author: David Miskus, Climate Prediction Center, NOAA

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.

NOTE: The tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain.
The Green areas imply drought removal by the end of the period (D0 or none)

Crop Maturity Before First Frost?

Corn Growing Degree Day Tool

- 2014 GDD
- 2014 GDD Projection
- GDD Comparison (1992)
- Last Freeze (Spring)
- First Freeze (Fall)
- Silk
- Black Layer

Location: 43.34, -83.74 in Saginaw Co., MI, Start Date: May 15, Maturity Days: 95, Freeze Temp: 28°F, Variation: All Years

Source: GDD.AgClimate4U.org
Summary - Conditions

* Generally cooler than average across much of the region, although hot weather has developed recently across sections of the region

* Overall, seasonal precipitation surpluses continue across most of the region, but some areas have become dry in recent weeks

* Crops generally in good to excellent condition
Summary - Outlooks

* Warmer next several days, then average to cooler more likely by first week of September.
* Wetter than normal conditions likely regionwide through early September
* Increasing concern for late planted crops reaching maturity prior to first freeze across northern sections
* Cooler and wetter than normal across central Great Plains during the fall
* El Nino still likely – warmer and drier than normal conditions possible across much of the region during the upcoming winter
Further Information - Partners

* Today’s and Past Recorded Presentations and:
  * http://mrcc.isws.illinois.edu/webinars.htm
  * http://www.hprcc.unl.edu
* NOAA’s National Climatic Data Center: www.ncdc.noaa.gov
  - Monthly climate reports (U.S. & Global):
    * www.ncdc.noaa.gov/sotc/
* NOAA’s Climate Prediction Center: www.cpc.ncep.noaa.gov
* Climate Portal: www.climate.gov
* National Drought Mitigation Center: http://drought.unl.edu/
* State climatologists
  * http://www.stateclimate.org
* Regional climate centers
  * http://mrcc.isws.illinois.edu
  * http://www.hprcc.unl.edu
Thank You and Questions?

* Questions:
  * **Climate:**
    * Jeff Andresen: andresen@msu.edu, 517-432-4756
    * Dennis Todey: dennis.todey@sdsstate.edu, 605-688-5141
    * Doug Kluck: doug.kluck@noaa.gov, 816-994-3008
    * John Eise: john.eise@noaa.gov, 816-268-3144
    * Mike Timlin: mtimlin@illinois.edu; 217-333-8506
    * Natalie Umphlett: numphlett2@unl.edu; 402 472-6764
    * Brian Fuchs: bfuchs2@unl.edu 402 472-6775

  * **Weather:**
    * crhroc@noaa.gov

Winnipeg, MB
2013/2014 Snow Removal Pile,
15 AUG 2014