Midwest and Great Plains Climate & Drought Outlook
19 October 2017

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DuPage River flooding in Naperville, IL (courtesy of Matt Piechota)
General Information

• Providing climate services to the Central Region
  – Collaboration Activity Between:
    • State Climatologists/American Association of State Climatologists
    • NOAA NCEI/NWS/OAR/NIDIS/
    • USDA Climate Hubs
    • Midwest and High Plains Regional Climate Centers
    • National Drought Mitigation Center/USDA

• Next Regular Climate/Drought Outlook Webinar
  – November 16, 2017 (1 PM CDT), presenter TBD

• 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

• Open for questions at the end
Agenda

- Recent Conditions
- Impacts
- Outlooks
  - La Niña Watch
  - Winter season

Soybean harvest near Baltic, SD. Photo: Sara Berg
Recent Conditions

A LOOK BACK
September Temperature Ranks

Statewide Average Temperature Ranks
September 2017
Period: 1895–2017

Growing Season Temperature Ranks

Statewide Average Temperature Ranks
April–September 2017
Period: 1895–2017

Map of the United States showing temperature ranks for each state. The map is color-coded to indicate different temperature categories. The website link is also provided:

September Precipitation Ranks

Statewide Precipitation Ranks
September 2017
Period: 1895–2017

Last 30 Days

Departure from Normal Temperature (F)

9/17/2017 – 10/16/2017

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps
Last 30 Days
Percent of Normal Precipitation (%)
9/17/2017 – 10/16/2017

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps
Modeled Soil Moisture

http://www.emc.ncep.noaa.gov/mmb/nldas/drought/
28-Day Average Streamflow

Tuesday, October 17, 2017

Impacts

WARMTH AND WATER
Date of First 32°F Freeze since 8/1
As of 10/18/2017

MRCC Experimental Freeze Guidance:
These experimental maps may be utilized as a guide to local and regional freeze conditions but should NOT be used by themselves for decision processes.
Record Warmth in Midwest

Daily High Temperature Records broken or tied During the Month of September 2017

- Both High Maximum and Minimum
- High Maximum
- High Minimum

Minimum 30 years of data
All Reports Are Considered Preliminary
Record Warmth in Midwest

Daily Low Temperature Records broken or tied
During the Month of September 2017

- ▲: Both Low Minimum and Maximum
- △: Low Minimum
- ▽: Low Maximum

Minimum 30 years of data
All Reports Are Considered Preliminary
Chicago and Cedar Rapids

• Chicago:
  – Sep 20-26, 7 consecutive days 92-95F high temps.
  – Latest string of 92+ days on record, previous was Sep 16-19, 1955.
  – 2\textsuperscript{nd} time on record (July 27-Aug 4, 1988).

• Cedar Rapids
  – Latest occurrence of the year’s warmest 5-day stretch on record
  – Highs in the 90s for much of this period
October 14-15 Extreme Rainfall

http://www.weather.gov/lot/14Oct2017_rainfall
Missouri River

Missouri Mainstem Reservoir Status (as of 10/10/17):

- System storage is 59.1 million acre-feet (MAF), 3.0 MAF above the base of the Annual Flood Control and Multiple Use Zone.
- Gavins Point and Fort Randall releases were reduced to lessen downstream flooding. Releases will be increased to previous levels as downstream flows recede.

La Niña Winter?

- 55-65% likely development between November – February
- Has often meant colder in the northern states, and wetter in the Ohio River basin
- Recent La Niña events have shown a lot of variability
La Niña Probabilities

Early-Oct CPC/IRI Official Probabilistic ENSO Forecast

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5°C to 0.5°C

Climatological Probability:
- Red: El Nino
- Green: Neutral
- Blue: La Nina

Time Period
SON 2017
OND
NDJ
DJF
JFM
FMA
MAM
AMJ
MJJ 2018

Probabilty (%)
Temperature anomalies during La Niña Episodes
21 Events, 1949-2012
Temperature anomalies during La Niña Episodes

Episodes prior to 1985

Episodes after 1985
Precipitation anomalies during La Niña Episodes
21 Events, 1949-2012
Precipitation anomalies during La Niña Episodes

Episodes prior to 1985
Episodes after 1985
Winter (December-February) precipitation during strong, moderate, and weak La Niñas since 1950.
Looking Ahead

OUTLOOKS
Climate Outlooks

- 7-day precipitation forecast
- 8-14 day outlook
- November temperature and precipitation
- Winter season temperature and precipitation
7-day Quantitative Precipitation Forecast
Valid: Thu 19 Oct – Thu 26 Oct

http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml
Temperature and Precipitation Probabilities for 26 Oct-1 Nov 2017

http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php
November Temperature and Precipitation Outlooks

Temperature

Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/predictions/30day/
3 Month Temperature and Precipitation Outlooks, Nov-Jan

[Map showing temperature and precipitation outlooks for Nov-Jan with color coding for probability and areas predicted as Above Normal (A), Normal (N), Below Normal (B), and Equal (EC)].

3 Month Temperature and Precipitation Outlooks, Dec-Feb

Summary - Conditions

- Cool in the west, warm in the east
- Dry in west and south, very wet through center of the region
- Frost (32F minimum temperature) is later than average.
- Rivers were dry in late September, but recent rains have increased flows for barge traffic
- Water supply in Missouri River is near normal.
La Niña Watch –

Historically this has often meant colder in the north and wetter in the Gt Lakes/Ohio basin. But recent events have not shown this consistently.

November:

- Wetter conditions favored in Montana
- Warmer conditions favored in southwest

Winter:

- Transition towards colder in northern states and wetter over Great Lakes and Ohio basin
Further Information - Partners

• **Today’s and Past Recorded Presentations:**
  - [http://mrcc.isws.illinois.edu/webinars.htm](http://mrcc.isws.illinois.edu/webinars.htm)
  - [http://www.hprcc.unl.edu](http://www.hprcc.unl.edu)

• NOAA’s National Climatic Data Center: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

• NOAA’s Climate Prediction Center: [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)

• Climate Portal: [www.climate.gov](http://www.climate.gov)

• U.S. Drought Portal: [www.drought.gov](http://www.drought.gov)

• National Drought Mitigation Center: [http://drought.unl.edu/](http://drought.unl.edu/)

• State climatologists
  - [http://www.stateclimate.org](http://www.stateclimate.org)

• Regional climate centers
  - [http://mrcc.isws.illinois.edu](http://mrcc.isws.illinois.edu)
  - [http://www.hprcc.unl.edu](http://www.hprcc.unl.edu)
Thank You and Questions?

- **Questions:**
  - **Climate:**
    - Laura Edwards: laura.edwards@sdstate.edu, 605-626-2870
    - Dennis Todey: dennis.todey@ars.usda.gov, 515-294-2013
    - Doug Kluck: doug.kluck@noaa.gov, 816-994-3008
    - 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
North-Central U.S. Agricultural Update, Oct. 19, 2017

Winter Wheat in St. Joseph Co., IN, June 27, 2016. Photo by B. Rippey, USDA.
United States: Corn

- Major areas combined account for 75% of the total national production.
- Major and minor areas combined account for 99% of the total national production.
- Major and minor areas and state production percentages are derived from NASS survey data from 2010 to 2014.

XXX = percent each state contributed, on average, to national production. States not numbered contributed < 1%.

Corn crop calendar for most of the United States

The crop calendar was developed using NASS crop progress data from 2010-2014. This calendar illustrates, on average, the dates when national progress advanced from 10 to 90 percent.
U.S. Corn Areas Experiencing Drought

Reflects October 10, 2017
U.S. Drought Monitor data

Approximately 9% of corn production is within an area experiencing drought.

Major and minor agricultural areas are derived from NASS county-level crop production data from 2006 to 2010. Additional information on these agricultural data can be found at: http://www.nass.usda.gov/.

Mapped drought areas are derived from the U.S. Drought Monitor product and do not depict the intensity of drought in any particular location. More information on the Drought Monitor can be found at: http://droughtmonitor.unl.edu/.

- Major agricultural areas combined account for 75% of the total national production.
- Major and minor agricultural areas combined account for 99% of the total national production.
Agricultural Weather Assessments
World Agricultural Outlook Board
U.S. CORN Condition Index

Index Weighting: Excellent = 4; Good = 3; Fair = 2; Poor = 1; Very Poor = 0

Based on NASS crop progress data.
U.S. Corn Conditions
Percent Good to Excellent
October 15, 2017

National Condition
Good to Excellent 65
Change from Last Year -9

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

TOP ## - Percent Good to Excellent
[BOTTOM ##] - Change from Last Year
U.S. Corn Progress
Percent Mature
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress
Mature 90
Change from 5-year Average -4
It was an imperfect year for corn, especially in the upper Midwest (drought) and the eastern Corn Belt (late planting, erratic rainfall).

October 1 estimates, if realized, indicate record-high corn production in Kentucky and Michigan.

If October 1 estimates are realized, 2017 will feature the second-highest U.S. corn yield (171.8 bushels/acre) and production (14.3 billion bushels) on record.

Drought affected 0 to 16% of the U.S. corn production area during the 2017 growing season.

Currently, 65% of the U.S. corn crop is rated good to excellent.
United States: Soybeans

Major Crop Area
Minor Crop Area

- Major areas combined account for 75% of the total national production.
- Major and minor areas combined account for 99% of the total national production.
- Major and minor areas and state production percentages are derived from NASS survey data from 2010 to 2014.

XXX = percent each state contributed, on average, to national production. States not numbered contributed < 1%.

Soybean crop calendar for most of the United States

The crop calendar was developed using NASS crop progress data from 2010-2014. This calendar illustrates, on average, the dates when national progress advanced from 10 to 90 percent.
U.S. Soybean Areas Experiencing Drought

Reflects October 10, 2017
U.S. Drought Monitor data

Approximately 9% of soybean production is within an area experiencing drought.

Major and minor agricultural areas are derived from NASS county-level crop production data from 2006 to 2010. Additional information on these agricultural data can be found at: http://www.nass.usda.gov/.

Mapped drought areas are derived from the U.S. Drought Monitor product and do not depict the intensity of drought in any particular location. More information on the Drought Monitor can be found at: http://droughtmonitor.unl.edu/.

- Major agricultural areas combined account for 75% of the total national production.
- Major and minor agricultural areas combined account for 99% of the total national production.
United States Soybean Areas Located in Drought

Moderate or more intense drought (D1+)
Severe or more intense drought (D2+)
Extreme or more intense drought (D3+)
Exceptional drought (D4)
U.S. SOYBEAN Condition Index

Index Weighting: Excellent = 4; Good = 3; Fair = 2; Poor = 1; Very Poor = 0

Based on NASS crop progress data.
U.S. Soybean Conditions
Percent Good to Excellent
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Condition
Good to Excellent 61
Change from Last Year -13

TOP ## - Percent Good to Excellent
[BOTTOM ##] - Change from Last Year

USDA Agricultural Weather Assessments
World Agricultural Outlook Board
- It was also an imperfect year for soybeans, but better in states bordering the MS River.
- October 1 estimates, if realized, indicate record-high soybean production in two Central Region States (KY and MO).
- If October 1 estimates are realized, 2017 will feature record-high U.S. soybean production (4.43 billion bushels).
- Drought affected 0 to 16% of the U.S. soybean production area during the 2017 growing season.
- Currently, 61% of the U.S. soybean crop is rated good to excellent.
Other Current Agricultural Highlights

- **Spring wheat** harvest wrapped up early, following the growing region’s worst drought since 1988. Production is down 25% from last year; harvested area is down 7%.

- **Sunflower** production is down 32% from last year; early harvest activities have been delayed. Harvested area is down 12%.

- **Winter wheat** is emerging across the Plains and lower Midwest. Emergence in Kansas, in particular, has been delayed by rain-induced planting disruptions.

- The **sugarbeet** harvest is well underway. The production estimate is down more than 3% from last year.

- **Sorghum** production is down 24% from last year, with harvested acres down 18% and yield down 7%.

- **Rangeland and pastures** across the northern High Plains were severely stressed by drought. Some recovery has begun with autumn rainfall, but significant new grass growth may not be fully realized until spring 2018 or beyond.
United States: Spring Wheat

- Major areas combined account for 75% of the total national production.
- Major and minor areas combined account for 99% of the total national production.
- Major and minor areas and state production percentages are derived from NASS survey data from 2010 to 2014.

XXX = percent each state contributed, on average, to national production. States not numbered contributed < 1%.

Spring wheat crop calendar for most of the United States:

The crop calendar was developed using NASS crop progress data from 2010-2014. This calendar illustrates, on average, the dates when national progress advanced from 10 to 90 percent.
Based on NASS crop progress data.

Index Weighting: Excellent = 4; Good = 3; Fair = 2; Poor = 1; Very Poor = 0
Approximately 51% of spring wheat production is within an area experiencing drought.
United States Spring Wheat Areas Located in Drought

- Moderate or more intense drought (D1+)
- Severe or more intense drought (D2+)
- Extreme or more intense drought (D3+)
- Exceptional drought (D4)

Agricultural Weather Assessments
World Agricultural Outlook Board
United States: Winter Wheat

- Major crop areas combined account for 75% of the total national production.
- Major and minor areas combined account for 99% of the total national production.
- Major and minor areas and state production percentages are derived from NASS survey data from 2010 to 2014.

XXX = percent each state contributed, on average, to national production. States not numbered contributed < 1%.

Winter wheat crop calendar for most of the United States:

- The crop calendar was developed using NASS crop progress data from 2010-2014. This calendar illustrates, on average, the dates when national progress advanced from 10 to 90 percent.
U.S. Winter Wheat Progress

Percent Emerged
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress
- Emerged: 37
- Change from 5-year Average: -6

TOP ## - Percent Emerged
[BOTTOM ##] - Change from 5-year Average

USDA Agricultural Weather Assessments
World Agricultural Outlook Board
United States: Sugarbeets

Major Crop Area
Minor Crop Area

- Major areas combined account for 75% of the total national production.
- Major and minor areas combined account for 99% of the total national production.
- Major and minor areas and state production percentages are derived from NASS survey data from 2010 to 2014.

XXX = percent each state contributed, on average, to national production. States not numbered contributed < 1%.

Sugarbeet crop calendar for most of the United States

The crop calendar was developed using NASS crop progress data from 2010-2014. This calendar illustrates, on average, the dates when national progress advanced from 10 to 90 percent.
U.S. Sugarbeets Progress

Percent Harvested
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Harvested</td>
<td>65</td>
</tr>
<tr>
<td>Change from 5-year Average</td>
<td>0</td>
</tr>
</tbody>
</table>

TOP ## - Percent Harvested
[BOTTOM ##] - Change from 5-year Average

USDA Agricultural Weather Assessments
World Agricultural Outlook Board
United States: Sorghum

- Major areas combined account for 75% of the total national production.
- Major and minor areas combined account for 99% of the total national production.
- Major and minor areas and state production percentages are derived from NASS survey data from 2010 to 2014.

Sorghum crop calendar for most of the United States:

<table>
<thead>
<tr>
<th>Month</th>
<th>Plant</th>
<th>Head</th>
<th>Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td></td>
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<tr>
<td>Feb</td>
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<td>Mar</td>
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<td>Apr</td>
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<td>May</td>
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<td>Jun</td>
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<td>Aug</td>
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<td>Oct</td>
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<td>Nov</td>
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<tr>
<td>Dec</td>
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</tr>
</tbody>
</table>

XXX = percent each state contributed, on average, to national production. States not numbered contributed < 1%.

The crop calendar was developed using NASS crop progress data from 2010-2014. This calendar illustrates, on average, the dates when national progress advanced from 10 to 90 percent.
U.S. Sorghum Conditions
Percent Good to Excellent
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Condition
Good to Excellent 65
Change from Last Week +1

TOP ## - Percent Good to Excellent
[BOTTOM ##] - Change from Last Week
U.S. Sorghum Progress

Percent Mature
October 15, 2017

National Progress

Mature 81
Change from 5-year Average -1

TOP ## - Percent Mature
[BOTTOM ##] - Change from 5-year Average

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables.
U.S. Sorghum Progress
Percent Harvested
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress
Harvested 40
Change from 5-year Average -10

TOP ## - Percent Harvested
BOTTOM ## - Change from 5-year Average

USDA Agricultural Weather Assessments
World Agricultural Outlook Board
U.S. Pasture and Range Conditions
Percent Good to Excellent
October 15, 2017

Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables.

National Condition
Good to Excellent: 40
Change from Last Year: -6

TOP ##: Percent Good to Excellent
(BOTTOM ##): Change from Last Year
Cherry Production

Released June 9, 2017, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA).

Tart Cherry Production Down 23 Percent

United States tart cherry production is forecast at 238 million pounds, down 23 percent from the 2016 production.

In Michigan, the largest producing State, growers are still assessing damage from an early May freeze event but expect an average crop.

Utah growers reported a less than average crop this year. Some growers reporting low production cited freeze and frost at bloom. In Wisconsin, the season has been wet and cool, which may have hurt pollination. There was a frost in early May but it appears to have only caused modest damage.

<table>
<thead>
<tr>
<th>State</th>
<th>Total production (million pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>Michigan</td>
<td>158.0</td>
</tr>
<tr>
<td>New York</td>
<td>10.5</td>
</tr>
<tr>
<td>Oregon ^1</td>
<td>1.5</td>
</tr>
<tr>
<td>Pennsylvania ^1</td>
<td>7.5</td>
</tr>
<tr>
<td>Utah</td>
<td>40.7</td>
</tr>
<tr>
<td>Washington</td>
<td>25.0</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>9.3</td>
</tr>
<tr>
<td>United States</td>
<td>252.5</td>
</tr>
</tbody>
</table>

(NA) Not available.

^1 Estimates discontinued in 2018.