Introduction to Drought and the National Integrated Drought Information System (NIDIS)

Moving the Nation from Reactive to Proactive Drought Risk Management

Doug Kluck & Britt Parker
NOAA Regional Climate Services

Northern Great Plains Climate Workshop
Sioux Falls, SD
October 9-11, 2018
Drought: A Wicked Problem

- Multiple definitions
- When does it start? When does it end?
- Interconnected impacts on different sectors
- Large scale
- Challenging to manage
DROUGHT: How does it impact us?

- **Economic loss:** Dairy and beef production; crop production; impaired productivity of forest land; recreational industry
- **Threatens:** Municipal and industrial water supplies
- **Environmental damage:** Animals and plant species, key habitats, and ecosystems/natural capital
- **Health impacts:** Water quality, air quality, mental health
- **Cultural impacts:** Tribal customs/traditional practices, recreational activities
- **Ripple/Cascade effects:** Consumer price increases
# DROUGHT: How does it impact us?

Billion-dollar events to affect the U.S. from 1980 to 2018* (CPI-Adjusted)

<table>
<thead>
<tr>
<th>DISASTER TYPE</th>
<th>NUMBER OF EVENTS</th>
<th>PERCENT FREQUENCY</th>
<th>CPI-ADJUSTED LOSSES (BILLIONS OF DOLLARS)</th>
<th>PERCENT OF TOTAL LOSSES</th>
<th>AVERAGE EVENT COST (BILLIONS OF DOLLARS)</th>
<th>DEATHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td>25</td>
<td>10.9%</td>
<td>$239.1</td>
<td>15.3%</td>
<td>$9.6</td>
<td>2,993†</td>
</tr>
<tr>
<td>Flooding</td>
<td>29</td>
<td>12.6%</td>
<td>$122.5</td>
<td>7.8%</td>
<td>$4.2</td>
<td>543</td>
</tr>
<tr>
<td>Freeze</td>
<td>9</td>
<td>3.9%</td>
<td>$29.3</td>
<td>1.9%</td>
<td>$3.3</td>
<td>162</td>
</tr>
<tr>
<td>Severe Storm†</td>
<td>96</td>
<td>41.7%</td>
<td>$213.2‡</td>
<td>13.6%‡</td>
<td>$2.2‡</td>
<td>1,610</td>
</tr>
<tr>
<td>Tropical Cyclone</td>
<td>40</td>
<td>17.4%</td>
<td>$862.0</td>
<td>55.0%</td>
<td>$21.6</td>
<td>3,469</td>
</tr>
<tr>
<td>Wildfire</td>
<td>15</td>
<td>6.5%</td>
<td>$54.3</td>
<td>3.5%</td>
<td>$3.6</td>
<td>238</td>
</tr>
<tr>
<td>Winter Storm</td>
<td>16</td>
<td>7.0%</td>
<td>$46.4</td>
<td>3.0%</td>
<td>$2.9</td>
<td>1,044</td>
</tr>
<tr>
<td>All Disasters</td>
<td>230</td>
<td>100.0%</td>
<td>$1,566.8</td>
<td>100.0%</td>
<td>$6.8</td>
<td>10,059</td>
</tr>
</tbody>
</table>

†Deaths associated with drought are the result of heat waves. (Not all droughts are accompanied by extreme heat waves.)

https://www.ncdc.noaa.gov/billions
The National Integrated Drought Information System (NIDIS)

Act of 2006 (P.L. 109-430) prescribed a comprehensive, interagency approach for drought monitoring, forecasting, and early warning planning and preparedness to help states and local communities cope with the impacts of drought.

NIDIS realizes its mission of establishing a national drought early warning system through the following activities:

- Regional Drought Early Warning Information Systems
- Prediction and Forecasting
- Integrated Research and Monitoring
- Drought Planning and Preparedness
- Collaboration with Existing Programs and Partners
- The U.S. Drought Portal (www.drought.gov)
NIDIS Vision

The NIDIS vision is a dynamic and accessible drought information system that provides users with the ability to determine the potential impacts of drought and its associated risks, and the decision support tools needed to better prepare for and mitigate the effects of drought.
Amanda Sheffield
Elizabeth Weight
Molly Woloszyn
Elizabeth Ossowski
Britt Parker
Amanda Sheffield
Veva Deheza
Elizabeth Weight

NIDIS DEWS
Drought Early Warning System

NIDIS Support

- Decision-support climate and drought science
- Support evaluations to improve DEW
- Federal agency coordination
- Transferability and scalability

Observations and Monitoring
Interdisciplinary Research and Applications
Predictions and Forecasting
Planning and Preparedness
Communication and Outreach
Update to the MRB DEWS Strategic Plan

- Build on outcomes of the 1st Strategic Plan
- Informed by findings of the 2017 Northern Plains Drought Assessment
- Input from Missouri River Basin stakeholders
- 2018 Release
Drought Status Updates

Midwest & Missouri River Basin

**Significant Drought Impacts Reported in Kansas, Missouri, Southeast Iowa**

- A combination of hot temperatures and below normal precipitation has led to significant crop and urban drought impacts in KS, MO, and southeast IA.

- Drought conditions developed rapidly in KS, resulting in the destruction of corn, soybeans, and some specialty crops. KS and MO are also reporting crops and cattle conditions negatively impacting grazing.

- The cold front will bring lower temperatures and some precipitation to portions of the state of KS. But existing drought impacts are severe enough that MO, IA, IL, and NE are not expected to see improvements for the immediate future.

- The state and federal governments are responding with expedited actions to address the situation.

**Current Conditions**

- While high temperatures and dry conditions have not been as extensive as they were last month, persistent above normal temperatures and dryness continue to impact crop production for a broad area of the central U.S., including Iowa, Illinois, and Indiana.

- In particular, nighttime temperatures have been above normal across a majority of the region, causing additional stress on crops. Higher heat has persisted throughout the summer in Illinois, increasing stress on corn and soybeans.

- While temperatures have been above normal in Illinois, Illinois has seen the most severe crop stress of the three states. Illinois has reported 30% crop death, while Iowa and Nebraska have reported 20% and 15% crop death respectively. (Iowa is not repeatable) (Iowa drought: received only 25% of normal precipitation in June, July, and August.)

**Drought Conditions**

- Crop conditions have started to improve, with corn and soybean stocks rising in IA, KS, and southeast IA. Conditions continue to improve in Illinois and Missouri.

- The latest Drought Monitor report indicates that most of the area is in D2 (moderate drought) or D1 (drought stress), with pockets in D3 (severe drought) and D4 (exceptional drought).

**Impacts**

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**Pacific Northwest**

**Significant Drought and Related Fire Impacts Reported in Oregon, Washington, and Idaho**

- A combination of high temperatures, low rainfall, and dry to record dry conditions has increased fire danger.

- Wildfires continue to burn in Idaho, Washington, and parts of Oregon (Jul 5).

- Drought conditions and lower moisture are expected to continue across much of the region, which will fuel back the fire danger.

**Current Conditions**

- Off and on have been experiencing rough conditions. Combined with high temperatures, this is the designation of moderate to extreme drought in the Pacific Northwest. Wherever high fire danger prevails, the forecast shows it will last for at least the next two weeks. Low pressure 10 and the associated air are abnormally dry with some areas of moderate drought (B11).

- According to the National Interagency Fire Center, burning has increased by 50% from July 1 to July 10, similar to last year." (July 11) (30% of the area seen in moderate drought B11 will be exposed to extreme fire danger. The B11 drier than B10, and the longest they’ve been in at least 10 years (Aug 1).)

- Ash, dust, and smoke: As winds and dry, the drought, with recent warm and dry conditions, has caused dead fuel moisture to decline to record low levels, increasing the potential for extremely hazardous fire conditions.

**Impacts**

- In July, there are already larger, uncontrollable wildfires in Idaho, currently burning over 17,000 acres, including the Bear Ridge fire (22,202 acres), and Cottonwood

- In OR, there are 14 large, uncontrolled wildfires in 11 counties currently burning over 26,200 acres, including Tamarack Road fire (26,200 acres), 26% contained.

- In WA, there are six large, uncontrolled wildfires currently burning over 12,100 acres, including the Lake Chelan fire (11,900 acres), 31% contained.

- Approximately 12,000 firefighters and support personnel are deployed in OR, WA, and ID, boarding additional person and aircraft in the region.
2017 Northern Plains Drought

Impact Assessment
• Understand impacts
• Actions Taken
• Lessons Learned & Best Practices

Attribution Study
• Examine Causes
• Predictability
• Historical Context

www.drought.gov
NC Monthly Drought and Climate Webinars

North Central
"From the Rockies to the Great Lakes"

Climate & Drought Outlook Webinar

Thursday, June 21, 2018 from 1 pm - 2 pm CDT

Aaron Wilson, Atmospheric Scientist at Ohio State University, will discuss the latest climate and drought information and impacts for the Midwest and Great Plains regions, and outlook information for the next few months.
Cross-Regional Issue: Wildland Fire & Drought
Cross-Regional Issue: Public Health & Drought

- Supporting research linking physical mechanisms of U.S. drought & public health impacts
- 2019 Public Health Summit & Potential Regional Workshops
- 2020: Develop joint multiyear activities as part of a Drought & Public Health Initiative
U.S. Drought Portal

Incremental improvements now:
- New Homepage
- Updated State Pages ~Nov 2018
- Newly released products (ongoing)

NEWLY Designed Drought Portal Release
Late Spring/early Summer 2019

www.drought.gov
Improvements to U.S. Drought Portal

- Updates to the State & Regional Pages – including federal and extension resources
- Resources organized by sector to include Agriculture
Thank you

Britt Parker – NIDIS Missouri River Basin DEWS – britt.parker@noaa.gov
Molly Wolozyn – NIDIS Midwest DEWS – molly.wolozyn@noaa.gov
Doug Kluck – Central Regional Climate Services – doug.kluck@noaa.gov

Credit: Laura Edwards