Monitoring Drought in Kentucky
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Kentucky Division of Water

PRESENTED TO THE USDM FORUM
APRIL 4, 2017
KEYSTONE, SD
Diversity of the Commonwealth
## Agricultural Production

<table>
<thead>
<tr>
<th>Product</th>
<th>US Rank</th>
<th>Production</th>
<th>Cash Receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cattle</td>
<td>8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>1 million head</td>
<td>$3 Billion</td>
</tr>
<tr>
<td>Broilers</td>
<td>7&lt;sup&gt;th&lt;/sup&gt;</td>
<td>307 million head</td>
<td>$960 million</td>
</tr>
<tr>
<td>Soybeans</td>
<td>15&lt;sup&gt;th&lt;/sup&gt;</td>
<td>88 million head</td>
<td>$788 million</td>
</tr>
<tr>
<td>Corn, for grain</td>
<td>14&lt;sup&gt;th&lt;/sup&gt;</td>
<td>225 million bu</td>
<td>$782 million</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>149 million lbs</td>
<td>$371 million</td>
</tr>
<tr>
<td>Hay</td>
<td>8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>5.6 million tons</td>
<td>$215 million</td>
</tr>
<tr>
<td>Horses</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>242,000</td>
<td>$523 million&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bourbon</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>4.7 million barrels</td>
<td>95% world production</td>
</tr>
</tbody>
</table>

- Stats from Kentucky Agricultural Statistics 2016 Annual Bulletin produced by USDA NASS

<sup>1</sup> 2016 Keeneland Thoroughbred Sales
Source: USDA NASS 2012 Census of Agriculture
Emergence of Center Pivot Irrigation

- Estimated Year of Installation
  - 2004 or earlier: 162
  - 2005-2010: 113
  - 2011-2016: 434
Kentucky Drought Mitigation and Response Plan completed on December 31, 2008

Established the Kentucky Drought Mitigation Team, designated membership, and drought assessment teams.

Drought indicators: Precipitation, streamflows, USDM, Reservoir Storage and Soil Moisture (CMI).

Three Drought Declaration Levels

Input to USDM began in 2011

State Water Management Working Group and State Water Management Board
State Drought Plan

Drought Management Organizational Structure

Governor

Kentucky Drought Mitigation Team

Climate and Water Resources Data
  Monitor and evaluate climate, weather, and water data; identify drought potential and drought development.

Drinking Water and Public Health
  Monitor and evaluate water supplies, water utility operation and public health impacts of drought.

Agriculture and Natural Resources
  Identify potential impacts of drought conditions to agriculture and track their occurrence and intensity.

Drought and Water Emergencies
  Identify water suppliers and communities that have an elevated risk of emergency water shortage; oversee on the ground drought response in the event of an emergency.
State Drought Plan

Kentucky Drought Mitigation Team (KDMT) (Emergency Management, Public Health, Gov Office of Ag Policy, KY Farm Bureau)

USDM Task Force (NWS, UK AG Weather, USDA, State Climatologist)

Climate and Water Resources Data Team (CWRD) (USGS, USACE, State Agencies)

USDM INPUT

Yearly Meeting, communication during severe drought conditions.

Teleconference every other week during drought, weekly during severe drought.

Weekly emails during drought
State Drought Declarations

Drought Level I
- “Official” recognition of drought
- Streamflows below a normal range
- Drought Monitor: D1 to D2
- Precipitation indicators: 60 to 75% of normal
- Drought Impact(s) reported (Agriculture, fire)

Drought Level II
- Streamflows well below normal: 6:10% duration
- Soil moisture deficits
- Drought Monitor: D2 to D3
- Observed drought impacts to some water supplies
- Local PWS water shortage advisors

Drought Level III
- Streamflows less than a 5% duration
- Drought Monitor: D3 to D4
- Severe Drought Impacts and water shortages
Future of Kentucky Drought Monitoring

- Midwest DEWS

- Websites
  - Kentucky Drought Viewer
    - http://watermaps.ky.gov/drought

- Water Shortage Response Plan program

- Updating the Drought Plan

- Drought Impact Collector Ap
Fall of 2016 Drought
Summer-Fall Climate Comparison
Kentucky, Statewide

Kentucky Temperature Summer-Fall Scatter Plot

Kentucky Precipitation Summer-Fall Scatter Plot

Projection as of Nov 21, 2016
Wildfires

- In November there were 331 fires in Kentucky that burned a total of 54,790 acres. The largest being 7,400 acres.
- National Guard was deployed to fight fires with helicopters.
Agriculture

- Agriculture impacts were seen state wide.
- Drought conditions developed late enough that impacts to row crops were minimal.
- Livestock producers were forced to feed hay early sparking concerns of shortages later in the winter.
  - These concerns were not realized in part due to an unseasonably warm winter
- Low to dry stock ponds forced some farmers to purchase or haul water, though this seemed to be fairly limited.
- Winter wheat planting and germination concerns.
Streamflows and Water Shortage Issues
Questions?

- For more information contact:
  Chip Zimmer: Edward.zimmer@ky.gov

- Special Thanks to:
  Stu Foster- Kentucky State Climatologist
  Steve Kull- Kentucky Division of Forestry
  Bill Caldwell- Kentucky Division of Water