Developments in Drought Planning and Policy

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National Drought Mitigation Center

Mission: To lessen societal vulnerability to drought by promoting planning and the adoption of appropriate risk management techniques.
NDMC Program Objectives

- Improve the science of drought monitoring, planning, and mitigation
- Build awareness of drought and its impacts on society and the environment
- Build awareness of how human actions affect our vulnerability to drought
- Focus the attention of policy makers on the importance of drought policy and planning in the wise stewardship of natural resources

RESEARCH, OUTREACH, AND TRAINING
The Cycle of Disaster Management

- Planning
- Monitoring and Prediction
- Impact Assessment
- Recovery
- Mitigation
- Protection
- Disaster
- Reconstruction
- Response
- Crisis management
- Risk management
Drought Management in the U.S.

• 1850s – 1970s
  – Relief based policy with increasing federal involvement over time
  – Little to no “planning”, mostly ad hoc response
  – Costly!!

### Table 1. President Roosevelt's Drought Relief Program
Proposed June 9, 1934.

<table>
<thead>
<tr>
<th>Program</th>
<th>Amount (million $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special work program and human relief</td>
<td>125</td>
</tr>
<tr>
<td>Livestock purchase in addition to the funds already available under the Jones–Connally Act</td>
<td>75</td>
</tr>
<tr>
<td>Shipping, processing and relief distribution of purchased cattle</td>
<td>100</td>
</tr>
<tr>
<td>Loans to farmers to finance emergency feed purchases and shipments</td>
<td>100</td>
</tr>
<tr>
<td>Emergency acquisition of submarginal farms and assistance in relocating destitute farm families</td>
<td>50</td>
</tr>
<tr>
<td>Work camps to afford employment in the drought area for young men principally from cities and towns</td>
<td>50</td>
</tr>
<tr>
<td>Purchase of seed for 1935 plantings, and for loans to get seeds into farmer's hands</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>525</strong></td>
</tr>
</tbody>
</table>

### Table 2. President Eisenhower's Drought Relief Program, 1953–1956.

<table>
<thead>
<tr>
<th>Program</th>
<th>Amount (million $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed government-owned surplus foods free through state welfare offices to needy people in cities, towns and rural areas</td>
<td>100</td>
</tr>
<tr>
<td>Distributed government-owned surplus feed grains to help farm and ranch families maintain foundation livestock</td>
<td>140</td>
</tr>
<tr>
<td>To help purchase hay and other roughage to maintain foundation livestock, including dairy cattle</td>
<td>26</td>
</tr>
<tr>
<td>To help implement wind erosion control measures</td>
<td>18</td>
</tr>
<tr>
<td>Emergency credit and livestock loans</td>
<td>260</td>
</tr>
<tr>
<td>Purchased beef and pork products to strengthen distressed livestock prices. Frozen hamburger was purchased to help stabilize prices of certain grades of cattle</td>
<td>184</td>
</tr>
<tr>
<td>Long-term, favorable-rate loans for small businesses in drought-stricken communities</td>
<td>1</td>
</tr>
<tr>
<td>Free grain furnished to small farm families through state welfare offices to maintain subsistence livestock</td>
<td></td>
</tr>
<tr>
<td>Special permission in 562 counties in 12 states to graze soil bank reserved acres</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>729</strong></td>
</tr>
</tbody>
</table>
Total federal drought assistance estimated at $7-8 Billion for 1976-77.

- About 40 separate programs
- Administration by 16 federal agencies

<table>
<thead>
<tr>
<th>Title</th>
<th>Purpose/Description</th>
<th>Amount (million $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Loans Program (FmHA)</td>
<td>5% loans to cover prospective losses to farmers and ranchers</td>
<td>100</td>
</tr>
<tr>
<td>Community Program Loans (FmHA)</td>
<td>$150 million in 5% loans and $75 million in grants to communities less than 10,000 population for emergency water supplies</td>
<td>225</td>
</tr>
<tr>
<td>Emergency Conservation Measures Program (ASCS)</td>
<td>Soil Conservation cost sharing grants</td>
<td>100</td>
</tr>
<tr>
<td>FCIC Insurance</td>
<td>Increases FCIC capital stock</td>
<td>100</td>
</tr>
<tr>
<td>Drought Emergency Program (Bur. Reclamation)</td>
<td>Creation of water bank, protection of fish &amp; wildlife, grants to states, 5% for water supply and conservation measures</td>
<td>100</td>
</tr>
<tr>
<td>Emergency Fund (Bur. Reclamation)</td>
<td>Emergency irrigation loans</td>
<td>30</td>
</tr>
<tr>
<td>Emergency Power (SWPA)</td>
<td>Purchase of emergency power supply</td>
<td>13</td>
</tr>
<tr>
<td>Community Emergency Drought Relief Program (EDA)</td>
<td>$150 million in 5% loans and $75 million in grants to communities over 10,000 for emergency water supply</td>
<td>225*</td>
</tr>
<tr>
<td>Physical Loss and Economic Injury Loans (SBA)</td>
<td>Low interest loans for small businessmen (including farmers)</td>
<td>50**</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>844</strong></td>
</tr>
</tbody>
</table>
Recommendations

• Need timely and reliable drought information
  – Conditions and impacts
• Improve impact assessment
• Consistent eligibility for assistance
• Proactive development of response efforts
• Development of a National Drought Plan
• More active role in planning at the state-level

## State Drought Plan Database

<table>
<thead>
<tr>
<th>Database Table</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Information</td>
<td>Tracks basic information such as the classification of the plan, the year of implementation, the agency responsible for the plan, etc.</td>
</tr>
<tr>
<td>Communication and Coordination</td>
<td>Information on how the official at the state level communicate with other levels of government</td>
</tr>
<tr>
<td>Drought Declaration and Response</td>
<td>Information about how drought is declared at the state level and how it is responded to</td>
</tr>
<tr>
<td>Diversity of Water Users</td>
<td>Tracks how the plans account for water users</td>
</tr>
<tr>
<td>Impact and Risk Assessment</td>
<td>Information on whether or not the plan takes drought impacts into account</td>
</tr>
<tr>
<td>Triggers</td>
<td>Information on how triggers and indicators are used in each plan</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Information about how the plan takes uncertainty such as climate change into account</td>
</tr>
</tbody>
</table>
National Efforts

• National Drought Policy Act 1998 (P.L. 105-199)
• National Drought Policy Commission 2000 Report
  – Preparing for Drought in the 21st Century
• National Drought Preparedness Act
  – Never passed
• Western Governors Association 2004 Report
  – Envisioned the National Integrated Drought Information System (NIDIS)
• NIDIS Act of 2006
  – PASSED!
NIDIS – P.L. 109-430

Calls for an interagency, multi-partner approach to drought monitoring, forecasting, and early warning
Governance Structure for NIDIS Implementation

NIDIS Executive Council
Co-chairs: Director, NOAA Climate Program Office (or designee)
Director, National Drought Mitigation Center (or designee)

NIDIS Program Office
NPO Director
- Coordinate NIDIS-relevant cross-NOAA, and interagency drought related activities
- Develop a national presence for NIDIS (e.g., formal links to National Governors Association)
- Participate in GEOSS/IEOS

NIDIS Program Implementation Team
NPIT
- Working-Level Partner Representatives
- Coordinate and develop evaluation criteria for all NIDIS activities including pilot project selection
Chair: NPO Director

NIDIS Technical Working Groups
- Federal, Regional, State, Tribal and Local Partner Leads
- Embedded in national, regional, and local NIDIS activities
- Develop pilot implementation and transferability criteria
CO-chair selected by NPIT

Public Awareness and Education

Engaging Preparedness Communities

Integrated Monitoring and Forecasting

Interdisciplinary Research and Applications

U.S. Drought Portal

National Integrated Drought Information System
Early Warning System Design, Pilots and Implementation
NIDIS Pilot Areas
Percent Area of the United States in Severe and Extreme Drought

January 1895 – January 2011

Based on data from National Climatic Data Center/NOAA
From State Plan Database:
- 74 total plans/updates (71 w/ known start dates)
- 46 implemented w/in 2 years of a drought
- 52 implemented w/in 3 years of a drought
- 57 implemented w/in 5 years of a drought
Components of Drought Risk Management

$$\text{Risk} = \text{Hazard} \times \text{Vulnerability}$$

(natural event) (social factors)
Percent Change in Resident Population for the 48 States and the District of Columbia: 1990 to 2000

Percent Change
Three Times U.S. Rate
Two Times U.S. Rate
U.S. Rate (13.2)
No Change
Less than 0

CA 13.8
NV 66.3
AZ 40.0
UT 29.6
CO 30.6
WA 21.1
OR 20.4
ID 28.5
MT 12.9
ND 0.5
MN 12.4
NE 8.4
SD 8.5
IA 5.4
IL 8.6
IN 9.7
OH 4.7
KY 9.7
WV 0.8
VA 14.4
NC 21.4
SC 15.1
GA 26.4
AL 10.1
MS 10.5
LA 5.9
TX 22.8
OK 9.7
AR 13.7
TN 16.7
VT 8.2
NH 11.4
VT 8.2
ME 3.8
RI 4.5
CT 3.6
MA 5.5
NH 11.4
ME 3.8
VT 8.2
RI 4.5
CT 3.6
MA 5.5
NJ 8.9
DE 17.6
MD 10.8
DC -5.7
Under “normal” climate conditions
Norman, OK

Under drought conditions

Norman Water Usage 2006 (April - October)

Source: Drought Ready Community: Norman, OK Case Study lead by Renee McPherson
<table>
<thead>
<tr>
<th>DISASTER TYPE</th>
<th>NUMBER OF EVENTS</th>
<th>PERCENT FREQUENCY</th>
<th>NORMALIZED DAMAGES (Billions of Dollars)</th>
<th>PERCENT DAMAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical Storms/Hurricanes</td>
<td>27</td>
<td>27.2%</td>
<td>367.3</td>
<td>50.6%</td>
</tr>
<tr>
<td>Severe Weather</td>
<td>21</td>
<td>21.2%</td>
<td>41.4</td>
<td>5.7%</td>
</tr>
<tr>
<td>Heatwaves/Droughts</td>
<td>15</td>
<td>15.2%</td>
<td>185.2</td>
<td>25.6%</td>
</tr>
<tr>
<td>Non-Tropical Floods</td>
<td>15</td>
<td>15.2%</td>
<td>74.3</td>
<td>10.2%</td>
</tr>
<tr>
<td>Fires</td>
<td>10</td>
<td>10.1%</td>
<td>19.2</td>
<td>2.6%</td>
</tr>
<tr>
<td>Freezes</td>
<td>6</td>
<td>6.1%</td>
<td>18.6</td>
<td>2.6%</td>
</tr>
<tr>
<td>Blizzards</td>
<td>2</td>
<td>2.0%</td>
<td>11.9</td>
<td>1.6%</td>
</tr>
<tr>
<td>Ice Storms</td>
<td>2</td>
<td>2.0%</td>
<td>5.9</td>
<td>~0.8%</td>
</tr>
<tr>
<td>Nor'easter</td>
<td>1</td>
<td>1.0%</td>
<td>2.2</td>
<td>~0.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>99</strong></td>
<td></td>
<td><strong>726.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: NCDC Billion Dollar Weather Disasters 1980-2010
Components of Drought Risk Management

Risk = Hazard × Vulnerability

(natural event) (social factors)
Positive Influences

• Significant advances in drought monitoring
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

Released Thursday, February 17, 2011
Author: Matthew Rosencrans, NOAA/NWS/NCEP/CPC
Positive Influences

- Significant advances in drought monitoring
- Increasing body of drought planning and policy literature
  - Nationally and globally
- Organizations making drought a priority
  - Western Governors’ Association
  - NDMC
  - NOAA/RISA
  - WMO
Where are we going from here?

- NIDIS just getting started, continued national interest and growth
- Water and food security world-wide
- Monitoring – remote sensing!
- Increased mitigation planning at state level
- Greater focus on local level
  - Support from NIDIS
  - Research focal point
  - Interest from new groups
    - FEMA, CDC, APA, etc.
Thank you!

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http://drought.unl.edu