Why Should EMs and Planners Care About Climate Data?

RACHEL RILEY, SOUTHERN CLIMATE IMPACTS PLANNING PROGRAM
A reminder...

- Relationships between emergency managers and planners are typically underdeveloped (Kartez & Faupel 1994, Schwab 2010, Smith 2011)

- Complementary strengths and weaknesses (Schwab 2010)
  - EMs: Hazard knowledge but operational timescales
  - Planners: Comprehensive community thinking but little to no hazard knowledge
A reminder…

- Sometimes working toward similar goals:
  - Long-term risk reduction
  - Protect and enhance people, property, economy, natural resources

- Multi-hazard mitigation plans can be used to drive climate adaptation planning
  - or storm water, land use, comprehensive water, or comprehensive planning, etc.

SOURCE - Integrating Hazard Mitigation and Climate Adaptation Planning: Case Studies and Lessons Learned, ICLEI

Integrating Climate Adaptation into a Hazard Mitigation Plan
Flooding Impacts

- Loss of human life
- Damage to property
- Destruction of crops
- Loss of livestock
- Deterioration of health conditions as potential for waterborne diseases increase
- Erosion
- Decrease in water quality
- More pollution from runoff
Winter Weather

- Snowfall events of several inches are fairly common
  - 5 major snowfall events in last 15 years
- Ice has become (perhaps) more of a problem since 2000
  - Limited records prior to 1996
- Cold fronts often stall across region (roughly along I-44) creating a boundary for ice or snow to form
  - Very difficult to forecast precipitation type
Do a Couple of Degrees Really Matter?

A small shift affects the full range of climate.
Observed Change in Very Heavy Precipitation
1958-2012
Hazards are Costly

Oklahoma Disasters, 2000-2016: 41

FEMA Assistance, 2012-2016: $283 Million!

<table>
<thead>
<tr>
<th>Date of Event</th>
<th>Hazard(s)</th>
<th>Total FEMA Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/11-13/2016</td>
<td>Severe Storms &amp; Flooding</td>
<td>$348,747.74</td>
</tr>
<tr>
<td>12/26/15-1/5/16</td>
<td>Severe Winter Storms &amp; Flooding</td>
<td>$37,723,681.39</td>
</tr>
<tr>
<td>11/27-29/15</td>
<td>Severe Winter Storms &amp; Flooding</td>
<td>$23,599,970.49</td>
</tr>
<tr>
<td>5/5/15-6/22/15</td>
<td>Severe Storms, Tornadoes, Winds, Flooding</td>
<td>$85,064,443.04</td>
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<tr>
<td>12/5-6/13</td>
<td>Severe Winter Storm</td>
<td>$4,006,684.32</td>
</tr>
<tr>
<td>5/8/13-6/2/13</td>
<td>Severe Storms and Tornadoes</td>
<td>$64,420,692.22</td>
</tr>
<tr>
<td>2/24-26/13</td>
<td>Severe Winter Storm and Snowstorm</td>
<td>$58,277,965.45</td>
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<tr>
<td>8/3-14/2012</td>
<td>Wildfires</td>
<td>$7,153,276.60</td>
</tr>
<tr>
<td>4/28-5/1/2012</td>
<td>Severe Storms, Tornadoes, Winds, Flooding</td>
<td>$2,923,013.89</td>
</tr>
<tr>
<td><strong>Total, last 5 years (2012-2016)</strong></td>
<td></td>
<td><strong>$283,518,475.14</strong></td>
</tr>
</tbody>
</table>
Why view climate risks with a long term perspective?

- More accurate assessment
  - Recency bias
  - Organizational knowledge can disappear with a retirement or job change

- Data can help provide justification for a project

- Pre-disaster risk reduction pays off in the long term
  - $4 saved for every $1 FEMA spends on hazard mitigation (NIBS 2005)
  - Study is being updated
Hazard mitigation and climate adaptation planning can be supported by:

“Scale-relevant data that are responsive to local level needs and presented in a manner that informs local decision making.”

Walton et al. (2016)
U.S. Climate Extremes Index - Graph or Map

U.S. Climate Extremes Index (CEI)

The U.S. Climate Extremes Index documents the area of the contiguous United States (or a region therein) that experienced extreme conditions (as defined by the index) during various time periods.

U.S. Climate Atlas

U.S. Climate Atlas (nClimDiv)

Access maps of the contiguous United States showing minimum, maximum temperature, and precipitation.

Climate Statistics at Individual Stations

Comparative Climatic Data

This site provides data tables for comparing normals at major U.S. stations.

Evaporative Stress Index - Map

GOES Evapotranspiration and Drought (E Panes)

Images produced from satellite data showing areas that can be used to estimate current drought conditions.

Climate Layers

- 550 °C (1400 °F)
- 600 °C (1112 °F)
- 650 °C (1202 °F)
- 700 °C (1292 °F)

Seasonal

- Spring
- Summer
- Autumn
- Winter

Transparency

100%
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