The State of Climate Science and Insurance Modeling

Identifying Risk, Certainty and Insurance Implications
# Recent Losses

## United States

### May 2018

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Deaths</th>
<th>Structures/Claims</th>
<th>Economic Loss (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/30-05/03</td>
<td>Severe Weather</td>
<td>Plains, Midwest</td>
<td>0</td>
<td>100,000+</td>
<td>950+ million</td>
</tr>
<tr>
<td>05/03-06/07</td>
<td>Volcano</td>
<td>Hawaii</td>
<td>0</td>
<td>Hundreds+</td>
<td>Millions</td>
</tr>
<tr>
<td>05/12-05/16</td>
<td>Severe Weather</td>
<td>Rockies, Plains, Midwest, Northeast</td>
<td>5</td>
<td>115,000+</td>
<td>1.4+ billion</td>
</tr>
<tr>
<td>05/13-05/15</td>
<td>Flooding</td>
<td>Florida</td>
<td>0</td>
<td>Hundreds</td>
<td>Millions</td>
</tr>
<tr>
<td>05/19-05/20</td>
<td>Severe Weather</td>
<td>Plains, Midwest</td>
<td>0</td>
<td>Thousands</td>
<td>100+ million</td>
</tr>
<tr>
<td>05/26-06/01</td>
<td>Severe Weather</td>
<td>Rockies, Plains, Midwest, Mid-Atlantic</td>
<td>1</td>
<td>Thousands</td>
<td>100s of Millions</td>
</tr>
<tr>
<td>05/27-05/28</td>
<td>Flooding</td>
<td>Maryland</td>
<td>1</td>
<td>Thousands</td>
<td>10s of Millions+</td>
</tr>
<tr>
<td>05/27-05/30</td>
<td>STS Alberto</td>
<td>Southeast, Midwest</td>
<td>5</td>
<td>Thousands</td>
<td>Millions+</td>
</tr>
</tbody>
</table>

Source: Aon Impact Forecasting
Recent Losses

California

2018 Year to Date

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Deaths</th>
<th>Structures/Claims</th>
<th>Economic Loss (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/08-01/09</td>
<td>Flooding</td>
<td>California</td>
<td>21</td>
<td>6,500+</td>
<td>850+ million</td>
</tr>
<tr>
<td>03/21-03/22</td>
<td>Flooding</td>
<td>California</td>
<td>0</td>
<td>Hundreds</td>
<td>Millions</td>
</tr>
</tbody>
</table>

Source: Aon Impact Forecasting
Record Issuances of Cat Bonds

Catastrophe Bond Issuances by Quarter

Source: Aon Securities
Role of Risk Modeling in Risk Transfer Solutions

- Review / acquire historical data and client specific information
- Review existing models, if available
- Develop a solution designed for target risk and geography
- Fit probability distributions for underlying input variables
- Perform simulation based on probability distributions
- Explain the data sources and models used to the markets
Data Collection

- Claims vs losses
- Real time information
- New technologies
Data Quality

- Values
- Level of Detail
- Consistency of inputs
New Solutions

- More sophisticated approach to risk management
  - Criticality
  - Infrastructure Networks
  - Capital Expenditures
  - Policy Decisions