Measuring the Social Media Response: An Actuarial Perspective on Catastrophe Loss Control and Prevention

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National Tornado Summit
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Evolution of social media in insurance loss prevention and loss control

• Social Media becoming an increasing part of the insurance industry communication message
  • Natural extension of messaging for policyholders & public affairs
  • Increasingly important in communication prior to, during and after catastrophes
Evolution of social media in insurance loss prevention and loss control

• Social Media evolution is dynamic... Where are your policyholders today? Where will they be tomorrow?
• Blurring of lines between “social interaction” and “information flow”
Data intensity

• Actuarial focus on data... plenty to be collected through catastrophic events

• Objective: Use social media as a source of data and information
  • Most common and available information source is Twitter
  • Hypothesis: Each unique cat event has its own distinct Catastrophe Communication Signature (CCS)
  • Evidence and Measurement
    • Early Warning System effectiveness
    • Information flow
    • Loss Control

• Society of Actuaries 2015 study
  • Tweets from 3 recent catastrophes
  • Observe changes in signatures & outcomes
## Tornados Studied

<table>
<thead>
<tr>
<th>Location</th>
<th>Joplin, MO</th>
<th>Washington, IL</th>
<th>Rochelle, IL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Sunday May 22 2011</td>
<td>Sunday November 17 2013</td>
<td>Thursday April 9 2015</td>
</tr>
<tr>
<td>Touchdown</td>
<td>5:34 PM</td>
<td>10:59 AM</td>
<td>6:40 PM</td>
</tr>
<tr>
<td>Severity</td>
<td>EF-5</td>
<td>EF-4</td>
<td>EF-4</td>
</tr>
<tr>
<td>Casualties</td>
<td>158 deaths 1000+ injuries</td>
<td>8 deaths 190 injuries</td>
<td>2 deaths 30 injuries</td>
</tr>
</tbody>
</table>
Methodology

• Data collected over a two-week period (3 days prior, 11 days after) each event

• Data sorted for catastrophe relevance
  • Example: “TORNADO” OR “EF” OR [contains “INJUR*”] OR [contains “INSUR*”] OR …. AND {Cat Location Identifier}

• Approximately 500,000 - 800,000 tweets and 70+ pieces of information for each tweet

• Foreign language filtering to get to final 100,000 – 200,000 tweets

• Groupings of tweets into 5-minute intervals;

• Main focus in visuals over a 24-hour period
  • 6 hours prior to touchdown
  • 4 hours “During Event”
  • 14 hours “After Event”

• Categorization of tweet volume for comparison
Joplin 2011 CCS

Tweet Volume in 5-Minute Intervals
Joplin, MO; May 22, 2011
Industry Examples

• Prior:
  • Loss Prevention

• During:
  • Insurance System Awareness

• After:
  • Loss Control & Communication
Tweet Volume in 5-Minute Intervals
Washington, IL; Nov 17, 2013
Industry Examples

• Prior:
  • Loss Prevention

• During:
  • Insurance System Awareness

• After:
  • Loss Control & Communication
Rochelle 2015 CCS

Tweet Volume in 5-Minute Intervals
Rochelle, IL; Apr 9, 2015
Industry Examples

• Prior:
  • Loss Prevention

• During:
  • Insurance System Awareness

• After:
  • Loss Control & Communication
Observations

• Growth of Social Media Communications

• Importance of Early Warning Systems
  • April 2012: Commercial Mobile Alert System (CMAS), interface to the Wireless Emergency Alerts (WEA) service goes live

• Time of Day / Day of Week Influence

• Location Influence
<table>
<thead>
<tr>
<th>Washington 2013: Location of Tweet by Illinois County for November 17, 2013</th>
<th>Latitude</th>
<th>Longitude</th>
<th># of Tweets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td><strong>Before</strong></td>
<td><strong>During</strong></td>
<td><strong>After</strong></td>
</tr>
<tr>
<td>Peoria-EF2</td>
<td>40.57</td>
<td>-89.63</td>
<td>7355</td>
</tr>
<tr>
<td>Woodford,LaSalle,Livingston,Tazewell (Washington City)-EF4</td>
<td>40.62</td>
<td>-89.55</td>
<td>26761</td>
</tr>
<tr>
<td>Macoupin,Montgomery-EF0</td>
<td>39.23</td>
<td>-89.72</td>
<td>454</td>
</tr>
<tr>
<td>Clinton-EF1</td>
<td>38.7</td>
<td>-89.51</td>
<td>235</td>
</tr>
<tr>
<td>Washington County-EF4</td>
<td>38.42</td>
<td>-89.45</td>
<td>405</td>
</tr>
<tr>
<td>Christian-EF1</td>
<td>39.39</td>
<td>-89.07</td>
<td>228</td>
</tr>
<tr>
<td>Fayette,Effingham-EF2</td>
<td>38.99</td>
<td>-88.92</td>
<td>413</td>
</tr>
<tr>
<td>Grundy-EF2</td>
<td>41.24</td>
<td>-88.3</td>
<td>351</td>
</tr>
<tr>
<td>Will-EF2</td>
<td>41.41</td>
<td>-87.93</td>
<td>2502</td>
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<tr>
<td>Jasper-EF1</td>
<td>38.85</td>
<td>-88.08</td>
<td>169</td>
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<tr>
<td>Moultrie-EF1</td>
<td>39.77</td>
<td>-88.56</td>
<td>11</td>
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<tr>
<td>Douglas-EF3</td>
<td>39.84</td>
<td>-88.28</td>
<td>96</td>
</tr>
<tr>
<td>Champaign,Vermillion,Iroquois-EF3</td>
<td>40.24</td>
<td>-88.06</td>
<td>725</td>
</tr>
<tr>
<td>Kankakee-EF1</td>
<td>41.3</td>
<td>-87.55</td>
<td>121</td>
</tr>
<tr>
<td>Jefferson-EF1</td>
<td>38.27</td>
<td>-88.78</td>
<td>172</td>
</tr>
<tr>
<td>Wayne,Edwards-EF2</td>
<td>38.45</td>
<td>-88.15</td>
<td>506</td>
</tr>
<tr>
<td>Wabash-EF2</td>
<td>38.38</td>
<td>-87.91</td>
<td>197</td>
</tr>
<tr>
<td>Massac,Pope-EF3</td>
<td>37.1</td>
<td>-88.74</td>
<td>311</td>
</tr>
</tbody>
</table>
Loss Prevention / Control / Recovery

• Comparison of Communication Efforts
• Pre/During/Post (6/4/14 hours) by Category

Insurance-Related Tweets by Year

- Year 2011
- Year 2013
- Year 2015
Other Uses for Study

• Tweet Sentiment

• Communication Effectiveness