

Superstorm Sandy – What Risk Managers and Underwriters Learned

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Superstorm Sandy

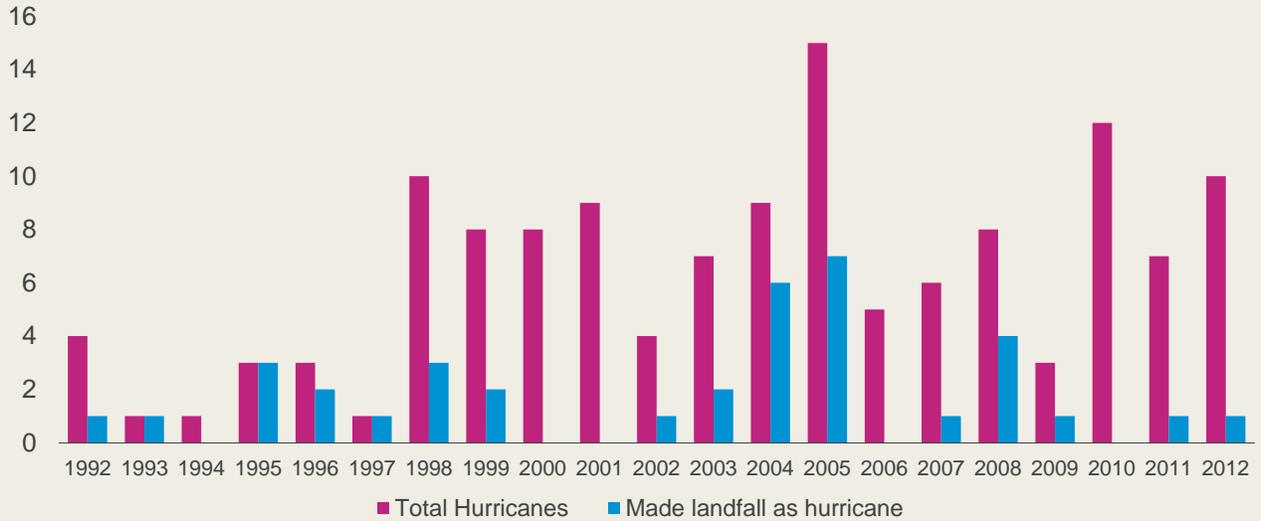
Change in the Weather

- Recent years appears to indicate increase in frequency and severity of weather events
- Sandy, Irene, tornadoes in Midwest
- Predictions that this trend will continue to escalate
 - Temperatures have risen 1.5° F in past century
 - Sea levels have risen
- How does this impact the utility industry?
- How will this impact property insurance for utilities?

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Hurricanes in the US



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Largest Population Change In Coastal Counties

(1960 – 2008)



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Superstorm Sandy and Tornadoes

- Named windstorms (NWS) occur June through October
- No NWS ever made landfall before June or after November
- September is most common month for hurricanes making landfall in the US
- Tornadoes occur year round
- April through June are the most common months
- Often are part of a major NWS event

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Most Costly US Catastrophes Involving Windstorms



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Most Costly US Catastrophes Involving Tornadoes

(\$ Millions when Occurred)

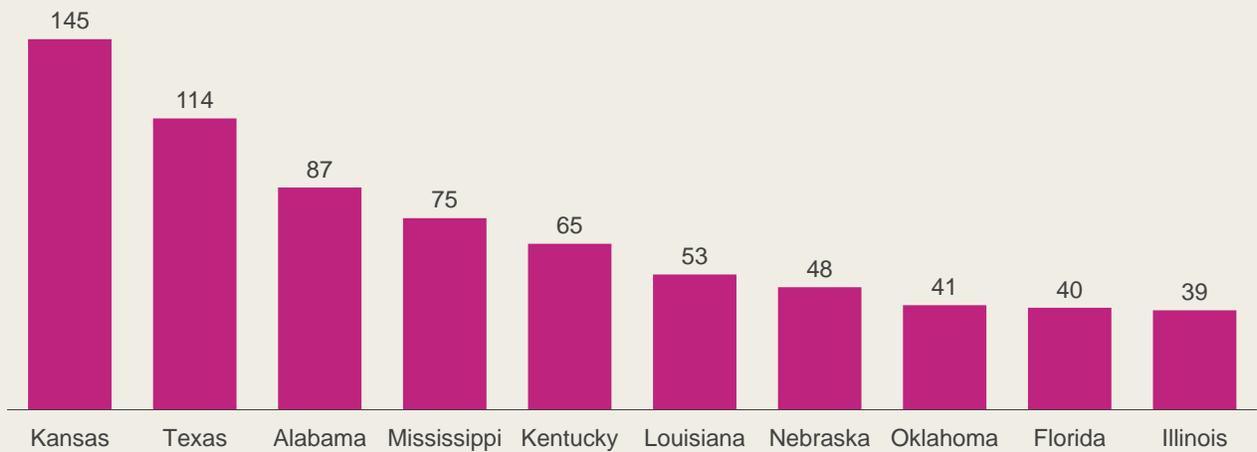


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Top Ten States, by number of Tornadoes

(2012)



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What Underwriters Learned

- CAT modeling tools not reliable for flood and storm surge
- Underwriters need much more information to underwrite flood exposures
- Insured provide detailed information
 - Loss control to determine flood zones and secondary modifiers
 - Locations and values actually exposed

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What Underwriters Learned

- Underwriters need to remain diligent in evaluating information and addressing exposures

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FirstEnergy: Superstorm Sandy

Thomas McDonnell

Manager, Insurance & Operational Risk
FirstEnergy Corp.

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Pre Storm Preparation

Proactive Preparation is Vital to Restoration

- FirstEnergy meteorologists monitor and forecast storms and areas of impact
- Local and Mutual Assistance crews are strategically positioned to respond
- Communications are established with responders, state officials, and media
- Staging areas and command centers are established to coordinate the response
- Crews inspect "at risk" locations and take preventative measures

More than 8,000 workers were staged in 14 areas helping to restore service to 90% of affected customers within 7 days

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Casino Pier

Seaside Heights, NJ



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Funtown Pier

Seaside Heights, NJ



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Casino & Funtown Piers

Seaside Heights, NJ



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Superstorm Sandy



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Hurricane Sandy

By the Numbers

- 2.47 million: FirstEnergy customers who lost power in New Jersey, Pennsylvania, Ohio, West Virginia and Maryland
- 1.5 million: customer outage calls received at our three contact centers
- 20,000: line workers, hazard responders, forestry workers, contact center representatives, management and support personnel involved in storm response
- 30,000: cross arms damaged by storm
- 10,000: utility poles replaced
- 6,400: transformers replaced
- 930: miles of wire replaced

\$850 million: total cost of the storm

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Storm Preparation Going Forward

Always Room to Improve

- Strengthening of infrastructure
 - Over \$500 million in system reliability improvement projects
- Enhanced communications
 - Advanced outage management system more accurately and quickly pinpoints outages
 - Improved online customer outage maps provide more accurate updates and restoration estimates
 - Text messages, phone apps, and social media accelerate the communication process and provide localized info
- Vegetation management
 - Over 3,500 circuit miles will be trimmed in JCP&L alone by the end of 2013
- Crew mobilization
 - Enhanced outage management systems allow for better prioritization and more rapid and accurate crew deployment

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Superstorm Sandy – What Risk Managers and Underwriters Learned

David Layne

Senior Treasury and Risk Manager
The Empire District

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Joplin Tornado – May 22, 2011

EF-5 Tornado Strikes Joplin on Sunday Evening at 5:41 pm

- Storm path is 13 miles long and more than $\frac{3}{4}$ mile wide
- Wind speeds in excess of 200 mph
- 20,000 customers without power
- St. Johns Hospital destroyed
- 6 of 17 Joplin schools damaged / destroyed
- 7,500 homes damaged / destroyed
- 557 businesses damaged / destroyed
- 162 lives lost and more than 1,500 injured

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Path East to West



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St. Johns Hospital



Joplin High School



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Residential Structures



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Business Structures



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EDE Facility Damage

- Transmission
 - Ten transmission lines out of service
 - 135 structures affected
- Substations
 - Six initially impacted
 - Sub 59 destroyed
 - 422 and 430 damaged



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EDE Facility Damage

- Distribution
 - 100 miles of line down
 - Approx. 3,900 poles damaged
 - 31 of 60 circuits off
 - 1,450 transformers recovered
- Fiber
 - 30 cuts repaired / replaced
- \$30 million – total cost of storm



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Immediate Response

- Immediate mobilization
- Communication issues
- Employees responded, even those personally affected
- Assess damage
- De-energize lines
- Make safe for public, emergency and Empire personnel
- Make safe for roads to be cleared
- Debris removal

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Critical Infrastructure Assessment and Restoration

Freeman Hospital

- Primary substation – de-energized but minimal damage
 - Transmission down over a half mile in both directions
- Primary circuit
 - Distribution down from substation to hospital
- Alternate substation – destroyed
- Alternate circuit – damaged and no connection to energized substation
- Engineered and constructed alternate circuit before sunrise
- Water & sewer services restored within 72 hours

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Mutual Aid and Restoration Results

- 247 lineman from 6 companies
- 144 tree trimmers and debris removal personnel from 4 companies
- Established 12 pole and material yards throughout town
- Poles dropped, materials filled and kitted overnight
- Within 1 week – St. John’s temporary hospital
- Within 10 days – service restored to all who could receive service
- Within 1 month – 600 FEMA units, 5 new subdivision extensions, temporary school sites
- Worked hand in hand with City, State, FEMA and USACE

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Lessons Learned

- Improve system reliability – increase sectionalization to reduce customers affected during outages
- Mobilize storeroom operations around the clock
- Book hotel rooms, provide box lunches and laundry services for crews
- Communication difficulties overcome
- Underground not necessarily better
- OMS ineffective due to damage; relied solely on field verification
- Storm material kitting – plan revision
- Retrain construction designers to assess damage and write jobs

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