

### **Severe Weather Risk Assessment**

# **Understanding Potential Impacts of and Preparing for Extreme Weather Events**

Healthcare Facility Management Society of New Jersey May 20, 2021



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- Veteran of (3) major Hurricanes and numerous named storm recovery efforts
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- Pomarico Design Studio, Architecture PLLC 36 Years 100% Healthcare Architecture
- HealthRisk Technologies 16 Years Risk Assessment and EOC Software
- Center for Health Design Environmental Standards Council





## Introduction:

Severe weather has the capacity to profoundly impact a healthcare providers operational readiness and environment of care. These types of events span a broad range of severity, thunderstorms, tornadoes, tropical depressions and tropical storms ranging from Category 1 -5.

Additional impacts from other events can also compound post storm recovery efforts escalating the complexities of remediation and recovery.



## Introduction:

This presentation and discussion will showcase a healthcare systems preparation for, exposure to and ongoing recovery through an eight-month period of extreme weather.

Events that included (5) named storms, one Category 4 Hurricane, a Category 3 Hurricane, a Tropical Depression, two named winter storms, and this week, an extreme rain event that released 16" of rain in less than 24 hours.



## Introduction:

The presentation will overview key efforts of preparation, recovery, mitigation, and the necessity of healthcare providers to perform severe weather risk assessments to identify weaknesses, remediate potential risks and understand strategies to achieve stand-alone capabilities.



# **Learning Objectives:**

- Understand the potential outcome of a severe weather event.
- Evaluate event duration and what to anticipate.
- Be able to identify facility risks that may adversely impact operational readiness.
- Evaluate impacts to patient population that may result from severe weather.
- Understand shelter in place and evacuation scenarios.
- Evaluate critical systems connectivity needs for extended outages and implications on Emergency Power, Potable Water Sanitary Sewer and Communications.
- Building evaluation and triage processes, dewatering, temporary protection and asset protection.
- How to prepare for long term reconstruction efforts.



### Part 1 - A Severe Weather Event

Lake Charles Memorial Memorial Health System, is the largest medical complex, serving the healthcare needs of Southwest Louisiana.

The main campus consists of 314 acute care beds, providing the largest array of specialty, emergency, trauma and critical care services in the community. With the largest emergency department and the only trauma center in the region, Memorial provides much needed trauma services to the community. Memorial has the largest critical care capacity in southwest Louisiana with a total of 34 intensive care beds.

The health system which consists of 30 buildings, 3 of which are hospitals, the balance being outpatient and support services.



August 27, 2020 was the beginning of an unprecedented series of severe weather events, America's Most Weather-Battered City.

- Hurricane Laura (Cat 4) August 27, 2020
- Hurricane Delta (Cat 2) October 9, 2020
- Tropical Storm Beta October 29, 2020
- Winter Storm Uri February 13 17 2021
- Winter Storm Viola February 15 20 2021
- 40 Year Record Rain Event May 17 19, 2021

























Coast-to-coast crises waiting to happen



By Christopher Flavelle

When extreme weather knoc power and water in Texas las represented a profound warn the rest of the country: The n vital infrastructure remains fundamentally <u>unprepared for</u> <u>shocks of climate change</u>.

### Keturn, Many Texans Lack Drinking Water

- Hundreds of thousands of home and businesses dealt with burst pipes or were ordered to boil wa
- President Biden declared emergencies in Texas and Oklahoma as FEMA made generators and fuel available fo critical locations.
- Another storm was spreading across much of the country, with several inches of snow falling in

# Texas Blackouts Point to Coast-to-Coast Crises Waiting to Happen

Continent-spanning storms triggered blackouts in homa and Mississippi ed one-third of U.S. oil luction and disrupted inations in 20 states.

#### 'Such Dire Straits': Hobbled Texas Hospitals Are Filling Dialysis Needs

The state's power failure has plunged some hospitals into crisis, even as they are still reeling from the coronavirus pandemic.





- Impacts facilities
- Impacts community
- Disrupts supply chains
- Destroys or severely impacts infrastructure, energy and communication
- Stresses human resources at all levels



 Preparation - evacuate, shelter in place, mobilize support network, evaluate potential impacts.



"In two hours' time, we transferred 19 NICU babies from that facility to our main campus," said Matt Felder, director of communications for Lake Charles Memorial Health system.

"They did it in record time, 19 babies across the city in under two hours," he said. They had to do it before conditions became too dangerous.

Ambulances transported the babies to the bigger hospital -- one with 10 floors instead of the women's hospital that only houses patients on one floor, Alford said.

Doctors, residents, the sheriff's department and others helped transport the precious cargo and all of the equipment and supplies the staff needed to keep the babies safe. Respirators, incubators and all sorts of items were taken to Lake Charles Memorial Hospital.

# Louisiana hospital staff stayed behind to care for 19 babies as Hurricane Laura hit



By Christina Zdanowicz, CNN Updated 6:18 AM ET, Fri August 28, 2020



• Event duration, what to anticipate.









• Post-event response: Emergency Power, Potable Water, Sanitary Sewer, EOC and Asset Evaluation & Triage. First responder support (18 days).





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• Dewatering, temporary protection and asset preservation.





- Navigating Insurance, FEMA, and asset valuation. lacksquare
- Long term reconstruction efforts.

**FEMA** 

year 2021.

**Public Assistance** 

\$15.9

Public Assistance grants awarded (in

billions) so far in 2021.





### Part 3 - Lessons Learned

- Understand the potential for impact, preparation, plan for the absolute worst case scenario. When the event is unfolding, is not the time to start preparing.
- What to expect from a severe wind event, extended outages?
- Understand critical assets and business interruption impacts and how this will influence preparation. Operational continuity at all levels.
- Shelter in place, evacuation issues, horizontal evacuation, safe zones. Plan for the worst and hope for the best.
- Insurance coverage, property manifests, valuation of assets, support teams and resources for asset protection must be planned out in advance.



• Evaluate weaknesses, develop a risk assessment process, establish frequency. Coordinate assessment with potential exposures.





- Assess critical infrastructure needs for operational readiness. Utilities, Chilled Water, Communications.
  - ✓ 18 consecutive days running on emergency power, required generator service, equipment failures may and will happen. Intermittent power failures for over a month.
  - ✓ 20 days without potable water supply (no pressure and boil alert) required extensive temporary water supply system and supply chain. \$1.5M/Week.
  - ✓ Lack of water impacted cooling towers, necessitated portable air cooled chillers. \$19M.
  - ✓ Limited cell service, internet access or POTS for over a week with extended service interruptions for over a month. No internet for a month.



 Assess the physical plant and building envelope. Understand how buildings fail under severe conditions. Fatigued materials, fasteners, projectiles, freeze exposure. Collateral damage and chain event failures may occur.





 Management of potential risks that are enabled by ongoing operations. Structures of convenience represent substantial risk, value engineering, construction quality assurance must be closely monitored.

✓ Canopies, signs, site accessories and similar elements can become high velocity projectiles that will breach the building envelope allowing hurricane force winds and driving rain to enter the structure.

✓ Value engineering should not be performed on building envelope design.
Existing assemblies should be routinely inspected for vulnerabilities.

✓ Construction quality assurance, maintenance training, monitoring and rounding should be performed to mitigate risk. Engineer everything.



### Conclusion

A severe weather event in our region may be inevitable.

The NJ/NY area located within 100 nautical miles centered on Bergen County is within a 17 year window of opportunity for a 100 year wind event.







The **1938 New England Hurricane** (also referred to as the **Long Island Express Hurricane**) was one of the deadliest and most destructive tropical cyclones to strike Long Island, New York, and New England. The storm formed near the coast of Africa on September 9, becoming a Category 5 hurricane on the Saffir–Simpson hurricane scale, before making landfall as a Category 3 hurricane<sup>[3]</sup> on Long Island on September 21. It is estimated that the hurricane killed 682 people, damaged or destroyed more than 57,000 homes, and caused property losses estimated at \$306 million (\$4.7 billion in 2017). Damaged trees and buildings were still seen in the affected areas as late as 1951. It remains the most powerful and deadliest hurricane in recorded New England history.



## **Questions?**





# Who are HealthRisk Technologies?

HealthRisk Technologies is dedicated to providing a new generation of surveying, assessing and reporting. We create state of the art applications specific to the needs of healthcare providers.

Our software is in use in both major metropolitan healthcare systems and community hospitals, performing PCRA/ICRA and other safety assessments.

Recent applications of our software facilitated a rapid response facility evaluation team of engineers deployed to triage over 30 buildings immediately after a major Category 4 hurricane.

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