

Preparing for Hurricanes: An Evaluation of Disaster Preparedness in East Coast Schools

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Section 1.1 Introduction: Hurricane Katrina

In 2005, Hurricane Katrina made landfall in New Orleans. With winds gusting over 125 miles per hour, it was one of the most devastating hurricanes in US history. The flood protection, telecommunications, and surface transportation systems were completely destroyed, and the levees, floodwalls and natural ridges designed to keep out flood water ironically ended up trapping it inside the city for 53 days.¹ Three weeks later, Hurricane Rita struck New Orleans a second time, and the combined damage from both storms led to over 1,800 deaths and \$200 billion in property damage.²

Despite all of the destruction and tragedy that the region underwent, there is still hope in this story: people volunteered to come in and clean up parks, streets, and roads under grass-roots organizations such as The Katrina Krewe; the Musicians Village worked to provide permanent housing for musicians; Federal Emergency Management Agency (FEMA) offered temporary housing to 64,150 households through their “Katrina Cottages;” and the Regional Transit Authority utilized the remaining streetcars and buses to facilitate city mobilization.³

Katrina is a story about people coming together to build themselves up.⁴ We can learn from this both in terms of how to prepare for a disaster and the resilience needed to respond.

Section 1.2 Why We Need Disaster Preparedness in United States East Coast Schools

We can’t ignore it anymore: climate change is worsening each year, increasing the number of natural disasters. According to The Washington Post, “Nearly 1 in 3 Americans live in a county hit by a weather disaster in the past three months.”⁵ In fact, the National Oceanic and Atmospheric Administration reported that this year (2022) marks the 7th consecutive above-normal hurricane season.⁶

Christina Caron of The New York Times notes that these disasters often cause incredible damage: at least 10 one billion-dollar disasters occurred every year from 2015-2020.⁷ A look at the most destructive hurricanes in the United State’s recent past will only reinforce this sentiment. The five most costly hurricanes in descending order of expensiveness were Hurricane Katrina (2005 - \$186.3 billion), Hurricane Harvey (2017 - \$148.8 billion), Hurricane Maria (2017 - \$107.1 billion), Hurricane Sandy (2012 - \$81.9 billion), and Hurricane Ida (2021 -

¹“Urban Resilience in Post-Katrina/Rita New Orleans - LSU,” accessed July 29, 2022, <http://evaccenter.lsu.edu/pub/amdphk.pdf>.

²“Louisiana Recovery Authority,” Louisiana Recovery Authority, accessed July 28, 2022, <http://www.louisianarecoveryauthority.org/>.

³“Hurricane Katrina,” Urban Planning of New Orleans, accessed July 28, 2022,

<https://neworleansusp100.weebly.com/hurricane-katrina.html>.

⁴ LSU. “Urban Resilience in Post-Katrina/Rita New Orleans - LSU”

⁵ Kaplan, Sarah, and Andrew Ba Tran. “Nearly 1 in 3 Americans Experienced a Weather Disaster This Summer.” The Washington Post, WP Company, 4 Sept. 2021, www.washingtonpost.com/climate-environment/2021/09/04/climate-disaster-hurricane-ida/.

⁶“Forecasters Predict 7th Straight above-Normal Hurricane Season,” Business Insurance, accessed July 28, 2022,

<https://www.businessinsurance.com/article/20220524/NEWS06/912350110/Forecasters-predict-7th-straight-above-normal-hurricane-season>.

⁷ Caron, Christina. “How Families Can Prepare for a Disaster.” The New York Times, The New York Times, 19 Apr. 2020, www.nytimes.com/2020/04/19/parenting/prepare-for-natural-disaster.html.

\$78.7 billion).⁸ Though many of these hurricanes haven't matched the terror Katrina instilled, they have been starting to appear more frequently (Harvey, Maria, and Ida all occurred in the past 5 years).⁹

Unfortunately, many of the districts most affected by these disasters, particularly those along the East Coast, also contain the most students. According to ABC News, "more than half of the nation's public school districts are located in counties that were subject to major disasters from 2017-2019 and comprise more than two-thirds of the nation's students."¹⁰ What's more, the Atlantic Hurricane Season runs from June 1 to November 30 and peaks in early fall, so many schools may be impacted just as they are reacclimating to the school environment.¹¹

Children in schools are a particularly susceptible group to natural disasters because they are separated from their parents and are not yet ready to take care of themselves. Children with disabilities, medical needs, or limited English proficiency can add to the challenges of responding in critical situations. With climate change rising, severe disasters already striking the US in increasing frequency, and a lack of physical infrastructure or preparedness, the situation looks bleak. In fact, a National Report Card discovered that only 29 states were adequately prepared for meeting the standards of safety in the event of a natural disaster.¹² Nevertheless, with proper resource investment and allocation, East Coast schools can turn the tide and make a stand to protect the future of tomorrow.

Section 2 Federal Government

The two primary disaster preparedness federal agencies, FEMA and the Department of Education (DOE), each have their own guides on emergency preparedness.¹³ Both guides tackle the issue in general terms, highlighting the basic steps that schools can take but not offering much specificity beyond that.¹⁴ As such, analyzing contributions on the state and district level will be more useful.

It is worth noting that the DOE runs the Disaster Recovery Unit, a committee that financially supports school communities and helps coordinate agencies. However, as this group focuses on the response effort in particular, it fails to address the core issue behind the lack of school safety: inadequate preparation.¹⁵

⁸ NCEI.Monitoring.Info@noaa.gov, "Billion-Dollar Weather and Climate Disasters," Billion-Dollar Weather and Climate Disasters | National Centers for Environmental Information (NCEI), accessed July 28, 2022, <https://www.ncei.noaa.gov/access/billions/>.

⁹ "The Complete Hurricane Season Toolkit for Schools," Inside RM, accessed July 28, 2022,

<https://www.tasbrmf.org/learning-news/insiderm/home/safety-security/the-complete-hurricane-season-toolkit-for-schools.aspx>.

¹⁰ Tatum, Sophie. "Low-Income Schools Facing String of Challenges After Natural Disasters: Report." ABC News, ABC News Network, 18 Jan. 2022,

<https://abcnews.go.com/Politics/low-income-schools-facing-string-challenges-natural-disasters/story?id=82250527>.

¹¹ Daisy Kincaid, "Preparing Schools for Hurricane Season," HES Facilities Management, July 20, 2021,

<https://hesfacilities.com/hurricane-season/>.

¹² Silverman, Brenda, Chen Brenda, Nancy Brener, Judy Kruger, Nevin Krishna, Paul Renard, Sandra Romero-Steiner, and Rachel Nonkin Avchen. "School District Crisis Preparedness, Response, and Recovery Plans — United States, 2012." *Morbidity and Mortality Weekly Report* 65, no. 36 (2016): 949–53. <https://www.jstor.org/stable/24858966>.

¹³ "Guide for Developing High-Quality School Emergency Operations Plans - FEMA," accessed July 29, 2022, <https://www.fema.gov/sites/default/files/2020-07/guide-developing-school-emergency-operations-plans.pdf>.

¹⁴ "National Preparedness Goal," FEMA.gov, accessed July 28, 2022, <https://www.fema.gov/emergency-managers/national-preparedness/goal>.

¹⁵ "Disaster Recovery Unit," Office of Elementary and Secondary Education, September 9, 2021, <https://oese.ed.gov/offices/disaster-recovery-unit/>.

Section 3.1 A Table Evaluating States' Preparedness Levels

	Disaster Preparedness Guide	Drills	Additional Features	Areas to Improve	Overall Grade
Louisiana	Not Available	Not Available	<p>Issued The Protect Louisiana Schools: Hurricane Preparedness Commission</p> <p>Mandates an Emergency Preparedness and Recovery Point of Contact</p> <p>Coordinates partnerships with school buses to facilitate emergency evacuations</p>	Guide is not directly accessible online and only available in physical copies at Red Cross	Prepared
Florida	Very Prepared	Hurricanes, tornadoes, and severe storms	<p>Includes specialized state plans that tailors the federal government's plans to the state specifically</p> <p>Wrote The State of Florida 2020 Comprehensive Emergency Management Plan</p>	Clarify what each drill includes	Very Prepared
North Carolina	Prepared	Guide has advice on how to respond to tornadoes and thunderstorms	<p>Places a special emphasis on providing access to free meals during disasters</p> <p>Works closely with Emergency Alert Stations</p>	N/A	Prepared
Virginia	Very Prepared	Tornado Drill and Earthquake Drill	<p>Administers a climate survey for public schools in Virginia</p> <p>Created the School Crisis, Emergency Management and Medical Emergency Response Plan that helps schools prepare for earthquakes, dam failure, floods, lightning, and tornados.</p> <p>Wrote The Virginia Educator's Guide for Planning and Conducting School Emergency Drills</p>	N/A	Very Prepared
Texas	Prepared	Shelter for Severe Weather Drill	<p>Coordinates with NOAA Weather Radio</p> <p>Created the Texas School Safety Center, an official university-level research center at Texas State University that places a primary emphasis on</p>	N/A	Prepared

			Mandatory Drills for Schools, Guidelines, and an Operations Plan. ¹⁶ Created a Hurricane Quick Reference Guide by the Texas School Safety Center and Texas Education Agency. ¹⁷		
New York	Not Available	Not Available	N/A	Create a guide and emergency preparedness drills	Unprepared
Maryland	Unprepared	Shelter for Severe Weather Drill	N/A	Develop better guide to tailor to Maryland	Unprepared

Section 3.2 Prepared State Governments

For the most part, many states have sufficient emergency preparedness guides that outline important steps school districts need to take and consider nearby geography. The information below includes other ways that state governments are taking initiative and promoting preparedness.

Louisiana

Louisiana requires schools to practice crisis management and have a response plan ready in the event of a disaster. The state helps schools create their own Emergency Operations Plans through development workshops, and provides expert review and technical assistance workshops for those that already have. “The review process will identify strengths and recommend areas of improvement in the EOP,” says the Louisiana DOE.¹⁸

Louisiana also encourages schools to put out an Emergency Preparedness and Recovery Point of Contact who will update the school’s emergency preparedness information and be the reference point in case of a natural disaster. Furthermore, Louisiana has a guide called the 2020 Louisiana Student Transportation Operational Procedures that coordinates partnerships with school buses to facilitate emergency evacuations.

Recently, the state launched The Protect Louisiana Schools: Hurricane Preparedness Commission to help fortify school infrastructure and respond to hurricanes in the Baton Rouge area. “Many coastal public schools have been devastated from the repeated barrage of high winds, torrential rain, and flash floods, resulting in billions of dollars in damages – roofs torn off,

¹⁶“TXSSC,” Home | Texas School Safety Center, accessed July 28, 2022, <https://txssc.txstate.edu/>.

¹⁷“Hurricane Quick Reference Guide for School Administrators August 2020,” accessed July 29, 2022, <https://tea.texas.gov/sites/default/files/EOP-Hurricane-Quick-Reference.pdf>.

¹⁸“Dot Emergency Preparedness, Response, and Recovery Information,” U.S. Department of Transportation, accessed July 28, 2022, <https://www.transportation.gov/emergency>.

hallways flooded, and walls collapsed,” said State Superintendent of Education Dr. Cade Brumley.¹⁹

Florida

Florida contains many foundational pieces to a good school preparedness guide. The State of Florida 2020 Comprehensive Emergency Management Plan describes how Florida is susceptible to many hazards such as floods, tropical cyclones, tornados, and wildfires, information that can prove very useful when preparing for the future.²⁰ The guide notes that Florida’s shipping and tourism industries are crucial, and that most people live along the coast and speak a variety of languages.

North Carolina

North Carolina prioritizes the importance of food security in the event of disasters. During Hurricane Irma, when many families evacuated to North Carolina, the state government tried to provide free meals to displaced individuals by working with the State’s Homeless Liaisons and Coordinators.²¹ The state particularly made an effort to connect with students in need by working with school principals to identify homeless students and make the process as non stressful as possible.

Virginia

Virginia offers a climate survey that contains data from across the nearly 2,000 public schools in the state with 100% participation. The survey offers Virginia’s planners more information about how to better equip its schools and make safety improvements, specifically targeting the schools that need drastic improvements.²²

The Virginia Educator’s Guide for Planning and Conducting School Emergency Drills lists various weather-related exercises that schools must practice.²³ One of these is the Tornado drill, under which schools must call emergency contacts, spread word to those outside school buildings, move students to designated areas (the guide recommends interior, underground areas on the north east side if possible), and telling all students to “duck and cover,” a formation attained by crouching down and covering one’s head with their arms. Another drill they mandate is the Earthquake drill, which includes important procedures such as utilizing the public announcement system to announce when shaking has begun and stopped, practicing similar actions to the Tornado drill by covering one’s body, and moving students into the middle of an open field where there is nothing that could fall on top of them.

¹⁹“Louisiana DOE Launches Hurricane Preparedness Commission,” Louisiana Believes - Louisiana DOE, accessed July 28, 2022, <https://www.louisianabelieves.com/newsroom/news-releases/release/2022/02/01/louisiana-department-of-education-launches-hurricane-preparedness-commission>.

²⁰Solodev, “Critical Incident/Emergency Planning for Schools,” Florida DOE, accessed July 28, 2022, <https://www.fldoe.org/finance/emergency-management/critical-incident-emergency-planning-f.stml>.

²¹“To: School Nutrition Administrators - Dpi.nc.gov,” accessed July 29, 2022, <https://www.dpi.nc.gov/media/12843/download?attachment>.

²²“Model Crisis, Emergency Management and Medical Response Plan ... - Virginia,” accessed July 29, 2022, https://www.dcjs.virginia.gov/sites/dcjs.virginia.gov/files/publications/law-enforcement/school-crisis-emergency-management-and-medical-emergency-response-plan-quick-guide_0.pdf.

²³“Virginia Department of Criminal Justice Services Improving and Promoting Public Safety in the Commonwealth,” Virginia Department of Criminal Justice Services | Improving and promoting public safety in the Commonwealth, accessed July 28, 2022, <http://dcjs.virginia.gov/>.

Texas

Texas practices a Shelter for Severe Weather Drill, an exercise that involves quickly moving students and staff indoors into more secure locations, oftentimes “to rooms without windows on the lowest floor possible or to a weather shelter.”²⁴ Moreover, Texas has implemented specific stations in the NOAA Weather Radio informing residents about “warnings, watches, forecasts, and other hazard information 24 hours a day.”²⁵

Section 3.3 Unprepared State Governments

New York

New York State contains no comprehensive disaster preparedness plan for weather related incidents.

Maryland

Maryland practices a Shelter for Severe weather drill similar to Texas, a vital exercise that can help with school procedures in the event of an actual disaster.²⁶

Section 4.1 Prepared Districts

Broward County, Florida

Broward stands out as a county that is doing everything right to prepare its schools for a potential disaster. Though just a district, they have a holistic guide that hones in on storms specifically, describing pre-storm procedures (transportation, physical plant operations, information and technology, facilities and construction management, innovative learning for media centers), during storm procedures, and post-storm procedures. It contains emergency contacts, important protocols, and more information about Broward’s topography.²⁷

Miami Dade, Florida

Miami Dade’s guide includes a portion on natural disasters, which specifically analyzes the effects of hurricanes, earthquakes, tornados, and floods. The guide investigates how to help students readjust after coping with a natural disaster from both the teachers’ perspective and the parents’ perspective.²⁸

²⁴“TXSSC,” Training, Drilling, and Exercising Toolkit | Texas School Safety Center, accessed July 28, 2022, <https://txssc.txstate.edu/tools/tde-toolkit/drill-requirements>.

²⁵“Legal Services,” Texas Association of School Boards, accessed July 28, 2022, <https://www.tasb.org/services/legal-services.aspx/>.

²⁶“Emergency Planning Guidelines for Local School Systems and Schools,” accessed July 29, 2022, <https://www.marylandpublicschools.org/about/Documents/DSFSS/SSSP/EPSS/EmergencyPlanningGuidelines2017.pdf>.

²⁷“Browardschools.com,” accessed July 29, 2022, https://www.browardschools.com/cms/lib/FL01803656/Centricity/domain/23291/pdf/Emergency_Preparedness_Manual.pdf.

²⁸“Miami-Dade County Public Schools Crisis Management Resource Manual,” accessed July 29, 2022, [https://api.dadeschools.net/WMSFiles/94/pdfs/Crisis_Manual0726126\(Final\).pdf](https://api.dadeschools.net/WMSFiles/94/pdfs/Crisis_Manual0726126(Final).pdf).

Section 4.2 Unprepared Districts

Houston, Texas

Houston does not have a school guide. It contains tips for families to endure natural disasters, whether through making a plan, building a kit, staying informed, or knowing the neighbors well, but it still lacks something for school administrators to use.²⁹

Section 5 Evaluation

Section 5.1 The Guide - What School Administrators Should Do

Pre-Storm Protocol

The first component of pre-storm protocol is for staff to be well-educated. It's important to know terms like "Watch," which signifies that hurricanes are possible in an area, and "Warning," which indicates that hurricanes are expected in the area. Moreover, it's crucial to constantly check in on forecasts such as the Hazardous Weather Outlooks, which projects the weather for the next seven days, or to alternatively use an NOAA Weather Radio that gives even more advanced notice of any possible weather conditions.³⁰

School bus drivers should also be well informed about what to do in the event of severe weather while transporting students. Drivers should participate in practice sessions and know of shelters along school routes in case they're caught in a storm. They're also encouraged to take Skywarn severe weather spotter training classes to detect warning signals.³¹

Another important element is having a plan ready for when a disaster does strike. The plan should include the physical layout of schools and designate shelter areas under the guidance of school officials or building engineers, preferably in jagged hallways or small rooms such as bathrooms or offices on the interior on the lowest floor.³² Shelters should be readily accessible (under 3 minutes travel time) and accommodate all students regardless of the time of day. Some helpful planning questions include how to protect expensive systems such as heating, ventilation, and air conditioning systems, and how to transmit information among administrators and facilities teams.

It's also important to develop a method that notifies everyone about an impending natural disaster. A school speaker system is one effective way to transfer this information, though it's important to have a backup resource such as an air horn or megaphone in case electricity is lost.

During Storm Protocol

During the storm, it is important to use radios for staff to communicate and to have storm spotters monitor weather information. Staying away from windows and removing possible moving objects can also help with safety. For students actively on a bus, they should go into a ditch, and the bus should be moved far away so that it doesn't get fall on top of them.

²⁹"Make a Plan Build a Kit Stay Informed Know Your Neighbors," accessed July 29, 2022, <https://www.readyhouston.tx.gov/wp-content/uploads/COH-trifold-broch-English.pdf>.

³⁰NOAA US Department of Commerce, "NOAA Weather Radio," National Weather Service (NOAA's National Weather Service, June 2, 2016), <https://www.weather.gov/grb/nwr>.

³¹NOAA US Department of Commerce. "NWS Green Bay Skywarn Spotter Home." National Weather Service (NOAA's National Weather Service, April 4, 2022), <https://www.weather.gov/grb/skywarn>.

³² Daisy Kincaid. "Preparing Schools for Hurricane Season."

Post-Storm Protocol

After the storm has hit, the building should be assessed for damage. Once clear, students can leave the shelters or evacuate to safer areas. Similar to the signal that alerts students of a natural disaster, there should be an “all clear” message at the end that signals that everyone can return to their original rooms. In the aftermath, conducting a survey can help improve the current school preparedness plan.

Section 5.2 National and Local Inventory and Physical Infrastructure Investment

It’s important to keep track of data across all levels. An important first step is a census funded at the national level: government representatives visiting every school in the country can create a comprehensive inventory. Checking vehicles, machinery, heating and cooling equipment, lighting, and security systems will help assess what kinds of support schools need. Using this information, we should then invest the necessary resources into renovating and maintaining schools. Doing so has an added benefit: discussing these renovations with students can serve as an opportunity to teach them about the consequences of climate change, which may inspire them to work toward protecting the environment. Keeping track of inventory can also speed up the process for repairs and replacements after a hurricane, whether it be losses, insurance claims, or disaster aid.

Section 5.3 Student Education

Another vital aspect of school preparedness is to make sure that the students themselves are well-informed. This can be accomplished through school drills, interactive guides, or school assembly meetings. Owlle Skywarn’s Weather Book is a children’s guide created by the American Red Cross, US Department of Commerce, US Department of Homeland Security, and NOAA. The brief and to the point guide picks interesting information about hurricanes, such as how the air around the Earth weighs over five quadrillion tons, but also critical information about listening to instructions when told to do so and going inland. The guide has information about pre-storm and during storm operations and a quiz for kids to test themselves at the end.³³ Similarly, the Community Education Services of the Children’s Television Workshop produced a national public education program on natural disasters. Recently, they released a fire program to help educate preschoolers through songs, skits, and other teaching techniques.

Section 5.4 Crisis Leadership

Crisis leadership is another vital part of school preparedness. Though school leaders, primarily school principals, may not be able to prevent natural disasters, they can help keep everyone calm by demonstrating leadership qualities and effectively communicating. This task can be quite daunting as leaders have to think on the spot and make timely decisions, but they can have a huge impact on the school community.

To be an effective crisis leader, one needs to be dispositional, relational, and situational. Dispositional consists of having a strong background with many experiences, values, and leadership skills. Relational includes being able to unify and galvanize the troops to one holistic body. Situational involves properly assessing certain situations and responding to them.³⁴

³³“National Weather Service,” accessed July 29, 2022, <https://www.weather.gov/media/owlle/owlle-hurricane.pdf>.

³⁴ Grasser, Kara. 2022. Sensemaking and crisis communication: How school leaders communicate in times of crisis. Ph.D. diss., The George Washington University,

Section 5.5 Mental Health Program

When a natural disaster is declared, FEMA works with the National Institute for Mental Health (NIMH), an agency of the US Public Health Service, to provide valuable mental health support. This aid can consist of up to eleven months of crisis counseling for disaster victims. Due to the difficulty of providing one-on-one counseling, FEMA and the American Red Cross have been offering accessible mental health education guides for those who need them.

Having a good mental health program in advance is a very vital part of the recovery process. When dealing with victims of a natural disaster, it is important for disaster workers to provide outreach and avoid terms such as “mental illness.” Oftentimes, community mental health centers are the best sources for mental support as they are familiar with local community members and the different mental health resources available to them.

Section 6 Conclusion

To sum, we need to do more to increase school resiliency against hurricanes and other weather-related events. Preparations for natural disasters will obviously be costly, and some might argue that this focus on school preparedness should really be geared towards climate change. Nevertheless, it is inevitable that climate change will persist for the next few decades, and in that span of time, many students could be vulnerable to climate change’s side effects.

If we want schools to be ready for future disasters, it is imperative that we start now. The US has always committed to working on behalf of its students. What does this commitment mean if the US does not take the steps necessary to protect students within the walls of its schools?