Preparing for Floods at K-12 Schools and School Districts

Introduction

Source: https://www.fema.gov/media-library.

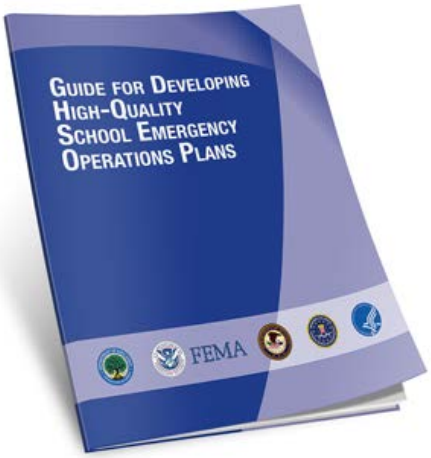
"Flooding is the most common natural hazard in the United States, affecting more than 21,000 local jurisdictions and representing more than 70 percent of Presidential disaster declarations."[i] In 2018, there were 19 major disaster declarations for flood-related emergencies in the United States. A total of 12 states in the South, Midwest, West, and East Coast and 2 tribal nations were affected. In 2016, there were $4 billion inland flood events and, in 2017, there were $2 billion inland flood events.[ii] According to the Federal Emergency Management Agency's (FEMA's) research on historical flood risk, 98 percent of U.S. counties have been impacted by a flooding event.[iii] Not only do flood events occur in and impact all regions of the United States, but they are also costly. Therefore, it is in the interest of communities for education agencies—public and nonpublic K-12 schools and school districts—to prepare for floods and participate in mitigation, protection, prevention, response, and recovery efforts.

Flooding can occur due to heavy rain and severe storms, including those in coastal areas that result in storm surges, rapid melting of heavy snow, tsunamis, hurricanes, tropical cyclones, and even dam failure. Flash floods are a specific type of flooding that are dangerous, sudden, and violent—developing in as little as a few minutes—and can even occur in areas where there is no rainfall. The National Weather Service (NWS) issues a variety of information statements related to flood events, including the following: Flash Flood Warnings, Flood Warnings, and Flood Advisories, which the public is encouraged to "take action" upon receipt; and Flash Flood Watches and Flood Watches, which the public is encouraged to "be prepared" upon receipt. Flash Flood Warnings are issued by NWS via the Wireless Emergency Alert system.

Be Aware[iv]	Be Prepared[v]	Take Action![vi]
Flood Advisory: Conditions could potentially cause a significant inconvenience and those in flood-prone areas should exercise caution. Issued when flooding warrants notification, albeit less urgent than a warning.	**Flash Flood Watch:** Current or developing conditions are favorable for flash flooding.	**Flash Flood Warning:** Flash flooding is occurring, imminent, or highly likely and those in flood-prone areas should move to higher ground immediately. Typically issued minutes to hours in advance of the onset of flooding.
	Flood Watch: Current or developing conditions are favorable for flooding.	**Flood Warning:** Flooding is occurring, imminent, or highly likely and those in flood-prone areas should move to higher ground immediately. Typically issued hours to days in advance of the onset of flooding.

Flood water can have lasting effects on buildings, such as saturation damage, mold growth, wood decay, metal corrosion, moisture issues, erosion, wall destabilization, and warped floors. Items and contents can also be damaged by flood water, such as furniture, cabinetry, computers, files, books, food items, and equipment. Additionally, floating debris, such as trees, trash containers, outdoor furniture, and remnants of manmade structures can also contribute to the damage of buildings, and debris and sediment can accumulate on sites. Flood water can also damage utility systems, such as the electrical system, water system, sewer system, and HVAC system. Several hazards can occur because of flooding: food can become contaminated from the flood water, hazardous materials (e.g., gas) can leak, power outages can occur, mold and other contaminants can grow in buildings and its contents, infectious disease outbreaks can occur, toxic materials present in laboratories can leak, and water failure can result from a contaminated water supply.

Incorporating Flooding in Emergency Operations Plans (EOPs)



Years of work in school emergency management planning culminated in the development of the Guide for Developing High-Quality School Emergency Operations Plans *(School Guide)*. Released jointly by six Federal agencies, including the U.S. Department of Education (ED), U.S. Department of Justice, Federal Bureau of Investigation, U.S. Department of Homeland Security, FEMA, and U.S. Department of Health and Human Services, this guidance contains best practices in school preparedness, and its six-step planning process can be

used by public and nonpublic schools and school districts as they plan for before, during, and after flood events.

Step 1: Form a Collaborative Planning Team

Members of the core planning team should include a variety of personnel at the education agency, student and/or parent representatives, representatives of individuals with disabilities and/or access and functional needs, and community partners. In relation to flood planning, it is integral that the following representatives are members of or coordinate with and contribute to the core planning team:

Planning Team Members From K-12 School Districts	Planning Team Members From K-12 Schools	Planning Team Members From Community Partners
• Superintendents • Emergency Managers • Transportation Managers • Facility Managers	• Principals • Incident Commanders • School Bus Drivers • Facility/Custodial Staff	• Emergency Managers • Floodplain Administrators

Step 2: Understand the Situation

The planning team develops a comprehensive list of possible threats and hazards by consulting a variety of data sources. These sources include assessments, such as site assessments, culture and climate assessments, behavioral threat assessments, and capacity assessments, as well as information from local, state, and Federal partners and the school community. State education agencies (SEAs) or other state-designated agencies may provide schools and school districts with a list of statewide hazards and threats.

Information on the hazard of floods in your community will most likely come from local agencies such as your city or county emergency management office. You may also find information from historical flood databases and other GIS/mapping platforms from state or Federal agencies (listed in Resources on Preparing for Floods at Education Agencies). Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt a flood hazard map. These maps, which are updated as new data and studies become available, are excellent sources of information for planning teams and can be accessed by contacting the local emergency manager or floodplain administrator. Additionally, NFIP participating communities will have a local hazard mitigation plan, which will contain the geographic areas affected by floods, their strength or magnitude and duration, a history of previous occurrences, and the possibility of future events. The planning team will also evaluate the risk of each threat and vulnerabilities of each hazard, such as floods, using a risk assessment matrix. Your education agency will then be able to prioritize hazards and threats accordingly.

Step 3: Determine Goals and Objectives

Using the comprehensive and prioritized list of threats and hazards, planning teams will develop goals and objectives to be addressed in the EOP. SEAs and/or other state-designated agencies may provide statewide goals and objectives for statewide threats and hazards to schools and school districts using the EOP ASSIST software application (app), EOP ASSIST Interactive Workbook, or another plan generator tool or technical assistance resource.

Similarly, K-12 school districts should develop districtwide goals and objectives for districtwide hazards and threats using the same free resources from the REMS TA Center. Of course, school planning teams can always develop their own goals and objectives for hazards and threats in their school EOPs. Below are a list of sample goals and objectives:

- **Ensure that the school can receive notification of local weather conditions and alerts, including flood watches and flood warnings.** (Goal 1: Before)
- **Protect and keep students, educators, staff, families, and visitors safe during a flood.** (Goal 2: During)
    - Keep all students away from fast-moving or swift water, including creeks, streams, rivers, or flood channels. (Objective 2.1)
    - Cancel any field trips, after-school events, or extracurricular activities. (Objective 2.2)
    - Move or secure any outdoor equipment or items that could float away. (Objective 2.3)
    - Relocate the student loading or drop-off location(s) of school buses if there are any road closures or flooding in such areas. (Objective 2.4)
    - If it is no longer safe for students, educators, staff, families, and visitors to remain in the building, evacuate to an off-campus location. See Evacuation Annex. (Objective 2.5)
- **Restore the physical conditions of the buildings and grounds and remediate any damage caused by the flooding**. (Goal 3: After)

Step 4: Plan Development

Planning teams will develop courses of action for accomplishing the goals and objectives identified in the previous step. These courses of action are the specific procedures used to accomplish goals and objectives and address the what, who, when, where, why, and how for each hazard. Using scenario-based planning can help planning teams imagine the different ways that flooding may unfold and the steps your education agency and community partners should take. Possible considerations for flood planning include:

- How will the school or school district be notified of Flood Warnings and Flood Watches?
- How will weather conditions be monitored?

- How will students, staff, and/or parents/guardians be notified?
- How will the school or school district decide when to close?
- How will students and staff be accounted for before, during, and after a flood?
- How will continuity of learning, continuity of business services, etc., be ensured if the school or school district is closed?
- How will food and medical supplies on campus be protected in the event of a power outage that results from the flood?

Source: https://www.ready.gov/.

You will most likely need to add references to any functional annexes that are applicable to a flood emergency. For example, you could add a note for when the education agency has received notice of a flood warning: "If NWS issues a flood warning, see the Alerts, Communications, and Warning Annex on how to notify students, staff, and parents." Other functional annexes that relate to flooding include the Accounting for All Persons Annex; Continuity of Operations Annex; Evacuation Annex; Family Reunification Annex; Public Health, Medical, and Mental Health Annex; and Recovery Annex.

Furthermore, you may need to add references to other threat- or hazard-specific annexes that may result from flooding. For example, hazardous materials may accidentally be released within a school due to flood water. In this case, a team would note procedures for after a flood emergency in the Flood Annex: "Conduct a site assessment of the building and grounds. If spilled chemicals, mold, or other hazardous materials are found, activate the Hazardous Materials Annex." Other threat- or hazard-specific annexes that relate to flooding include the Contaminated Food Outbreak Annex, Infectious Disease Annex, Power Failure Annex, Toxic Materials Present in School Laboratories Annex, and Water Failure Annex.

Step 5: Plan Preparation, Review, and Approval

The planning team now formats the material of the plan into a draft EOP. Using the traditional EOP format, a Flood Annex will be in the Threat- or Hazard-Specific Annexes section of the EOP. The team will also draft the Basic Plan section and format the Functional Annexes section. You may need to update any threat- or hazard-specific annexes that could cause or result in flooding and add references to the Flood Annex. For example, if your education agency has a Winter Precipitation Annex, then you could add a note for after winter precipitation occurs: "If snow melts at a rate which causes flooding, see the Flood Annex." Other hazard-specific annexes that relate to flooding include the Hurricane Annex, Dam Failure Annex, and Tsunami Annex.

Once the draft EOP is prepared, the planning team reviews the EOP for both plan content and writing conventions, revises the plan accordingly, obtains official approval of the plan from leadership, and shares the plan with community partners. Consider sharing the Flood Annex with community partners who have a responsibility in flooding, such as first responders and local emergency management staff.

Step 6: Plan Implementation and Maintenance

Finally, stakeholders are trained on their roles and how to exercise the plan. Consider conducting drills and exercises that practice the Flood Annex, visiting on- and off-campus evacuation sites, and posting key information on floods throughout the building. Whenever possible, conduct a debriefing after the drill or exercise to identify gaps and address those areas of improvement during plan revisions.

Flood-Related Preparedness Activities

The following activities may be utilized by nonpublic and public K-12 schools, as well as school districts, where noted, before, during, and after flood events. This list is not comprehensive but offers schools and school districts ideas and suggestions. It is possible that regional education agencies (REAs) could adopt activities listed for school districts, as applicable.

Before

Conduct mitigation activities. Schools and school districts can take steps to eliminate or reduce the loss of life and property damage by lessening the impact of flooding on their school community. This may range from ensuring that valuable equipment and supplies are stored up high off the floors to relocating electrical lines and other fire-prone instructure so that they are adequately protected. FEMA's Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards contains actions that you may use. You may also view our archived Webinar Mitigation and Resiliency Strategies for Schools and Institutions of Higher Education. Other mitigation resources are listed in the Key Resources section of this document.

Document the condition of buildings and grounds. This information is imperative to capture before an emergency event, such as flooding, so that your school or school district may be reimbursed for any damages. The REMS TA Center's SITE ASSESS mobile app allows users to capture and upload images directly into the app and export those images in a Word document, in addition to collecting data on the status of the school's buildings and grounds. During this process, the local education agency (LEA) may also identify areas prone to flooding.

Develop a Flood Annex. School districts can develop districtwide goals and objectives for flooding that schools can address in their EOPs. Schools can identify courses of action for a flood using the goals and objectives that they develop themselves or that their school district develops. The REMS TA Center's EOP ASSIST software app allows users to develop a customized school EOP collaboratively with access to resources along the way and export the EOP as a Word document. Alternatively, the REMS TA Center's EOP ASSIST Interactive Workbook is a low-tech version of a plan generator and may be used to develop a customized school EOP with access to resources along the way offline using a PDF viewer and Word. School districts can upload any districtwide goals, objectives, hazards, threats, or functions directly into the software app or add them to the instructions of the interactive workbook.

Practice the Flood Annex. Practicing the plan allows stakeholders to act more effectively during a real emergency event, as well as the planning team to identify gaps and weaknesses in the plan and strengthen it accordingly. Schools can conduct tabletop exercises, drills, functional exercises, and full-scale exercises to practice the Flood Annex, and should consider the costs and benefits of each before selecting an exercise type. When practicing the Flood Annex, schools should include their community partners such as local emergency management staff and first responders who would play a role in a flood emergency. FEMA's Prepare Your Organization for a Flood Playbook contains a sample tabletop exercise with a flood scenario.

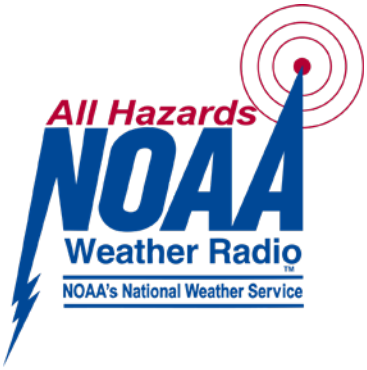
Source: https://www.weather.gov/StormReady.

Create a culture of flood preparedness at your school. Schools can become StormReady® or TsunamiReady® through NWS, which offers these voluntary programs to increase communities' preparedness for weather and flood emergencies and tsunamis, respectively, and create a Weather-Ready Nation. Schools and school districts can participate in statewide flood and severe weather awareness campaigns, such as an annual Flood Preparedness Week or Month, with targeted messaging on flood preparedness and flood safety. Check the NWS Awareness and Preparedness Calendar for any flood safety campaigns in your state.

Incorporate flood preparedness into the curriculum. Educators can integrate flood preparedness and flood science lesson plans into classroom curricula. The National Center for Atmospheric Research offers a Flash Floods Teaching Box. Other flood preparedness lesson plans and activities are listed in the Key Resources section of this document. School administrators, educators, and/or staff can join SKYWARN®, a voluntary program offered by NWS to train severe weather spotters. These materials and programs directly connect to science, technology, engineering, and math (STEM) and career and technical education (CTE) initiatives. Educators can even remind students to not walk through or play near rivers, creeks, and storm strains. Also, educators can use their substitute plans as a foundation for their

continuity of teaching and learning planning. By creating a unit plan with a few lesson plans that complement and supplement the existing curriculum, educators can be prepared for 5-10 school days.

Ensure that your communications/warnings systems are in place and working properly via regular testing. All schools and school districts should have at least two ways to receive weather information and warnings, as well as at least two ways to communicate/relay warnings. Schools and school districts can receive weather information directly from the nearest NWS office via a NOAA Weather Radio, as well as warning and post-event information for floods and other emergencies.



Source: https://www.nws.noaa.gov/nwr/.

Build community partnerships. These relationships can be established formally via agreements, such as memorandum of understanding (MOUs) or memorandum of agreement (MOAs), or informally. Schools and school districts should maintain a close relationship with the city/county emergency management office so that coordination and integration is possible before, during, and after an emergency. Schools and school districts should know whom to contact in their locality to access information about road closures due to flooding, including those that impact bus routes. Schools and school districts may even consider staffing some of their personnel at the city/county emergency operations center (EOC). For more information, read our publication Collaboration: Key to a Successful Partnership.

Prepare to shelter students if flooding occurs during school hours. It is possible that flooding will occur at the homes of students or in the areas surrounding their homes. In these cases, it may be safer for students to remain at the school than to be dismissed. Schools can keep emergency supplies, snacks, and activities at the school in case students do need to shelter at the school.

During

Maintain communication with the locality and other support agencies. This can be accomplished via citywide meetings. It is imperative to lead a coordinated effort with community partners before, during, and after flooding events.

Monitor the weather conditions in the surrounding community and adjust the school day accordingly. It is possible that some students' homes will be located in flooded areas or that they must travel through unsafe conditions, and so it may be safer for them to stay at the school and the schools to extend the school day or delay dismissal. Alternatively, some schools may choose to dismiss students earlier than normal to reunite them with their families.

Furthermore, LEAs may need to cancel field trips that are planned in outdoor locations or flood-prone areas during inclement weather.

After

Implement the recovery annex. Depending on the impact of the flood, LEAs may need to engage in various types of recovery: physical and academics recovery; structural recovery; business functions recovery; and social, emotional, and behavioral recovery. LEAs may need to contact their SEA, REA, or state or local EOC after a flood event to provide a status update of your site and receive the appropriate resources. It often takes LEAs months, if not years, to recover from emergency events such as floods. For more information, view our archived Webinar Planning to Recover From Emergencies at Districts and Schools.

Provide support services to displaced students and families. After a flood, education agencies may no longer be able to provide basic needs to displaced families, receive an influx of students from neighboring and nonlocal LEAs and systems, and see an increase in the need for support from local students and families. LEAs should foster community partnerships and create MOUs for sharing data, as needed, between school districts and other organizations. Every school district has a Local Homeless Education Liaison, who may play an important role in ensuring that school leadership understands McKinney-Vento. For more information, view our archived Webinar Supporting Displaced Students and Families During and After Emergency Events.

Manage donations and volunteers effectively. After a flood, the local community as well as individuals from across the nation may show up at your site to volunteer or send/drop off donations without any requests. To utilize these resources effectively, LEAs should designate key local points of contact, create MOUs and MOAs with key agencies and organizations, develop systems to support information management, and determine which school departments will be needed to support the process. It is important for LEAs to develop protocols for utilizing school district staff, resources, volunteers, and donations; set up systems to manage donations and volunteers for the long term; and confirm tracking/inventory requirements. Additionally, LEAs may need to manage event memorialization if there were any lives lost during the flood. For more information, view our archived Webinar Managing Donations and Volunteers Before, During, and After Major Emergency Events.

Assess the damage of and then repair and clean-up buildings and grounds. It is important to document all damage to buildings and grounds prior to commencing repair for reimbursement purposes. Documentation may be completed using the REMS TA Center's SITE ASSESS mobile app, which allows users to capture and upload photos directly within the app. Public and nonpublic K-12 schools may be eligible to receive funds from FEMA's Public Assistance Program to help repair, restore, and clean up education facilities that have been damaged during a

disaster, including a flood. For more information, view our archived Webinar How Schools and Higher Ed Institutions Can Access FEMA's Public Assistance Program.

Keep students, staff, and visitors safe from damaged and/or flooded areas of your campus. Schools may need to create a barrier around flooded areas using cones, tape, or other supplies. Schools may also need to relocate the student drop-off/loading areas if those areas are flooded.

Source: https://www.fema.gov/media-library.

Key Resources

Resources on Preparing for Floods at Education Agencies, REMS TA Center. This resource list contains planning resources on Flood Annex development; data sources for floods; flood mitigation; flood alerts, communications, and warnings/notifications; creating a culture of flood preparedness; physical and structural recovery from floods; and general flood safety.

Planning for Natural Hazards That May Impact Students, Staff, and Visitors, REMS TA Center. This topic-specific Web page contains resources from the REMS TA Center, ED, and other Federal agencies related to planning for natural hazards, which includes floods.

Recurring Flooding at Oak Grove Lutheran School in Fargo, North Dakota, REMS TA Center. This publication captures lessons learned from a private pre-K-12 school regarding structural preparedness, personnel preparedness, response efforts, structural recovery, and other flood preparedness efforts in the context of recurring flooding in the school community. Their experience can help inform other schools on how to prepare for, mitigate the effects of, and recover from flooding.

Mitigation and Resiliency Strategies for Schools and Institutions of Higher Education Webinar, REMS TA Center and ED with FEMA, Orange County Department of Education in California, and Georgetown University in the District of Columbia. This archived Webinar presents key considerations for mitigation, the process for including mitigation activities in planning efforts, how school mitigation and resiliency plans integrate with those at the local and state level, and practical examples of how schools have made their campuses more resilient to emergencies.

NOAA Weather Radio, NWS. This product offers the latest weather information via a nationwide network of radio stations and broadcasts 24 hours a day, 7 days a week. The REMS

TA Center publication All-Hazards NOAA Weather Radio Network Now Available describes this tool and its features, including how schools can use it.

How Schools and Higher Ed Institutions Can Access FEMA's Public Assistance Program Webinar, REMS TA Center and ED with FEMA. This archived Webinar shares information about grants available to educational facilities following a presidentially declared major disaster that involves a public assistance cause.

Planning to Recover From Emergencies at Districts and Schools Webinar, REMS TA Center and ED with Washington School Safety Center, Plaza Towers Elementary School in Oklahoma, and Norman Public Schools in Oklahoma. This archived Webinar describes key considerations for recovery, the process for including recovery activities in planning efforts, and lessons learned from emergency events.

Managing Donations and Volunteers Before, During, and After School and Campus Emergency Events Webinar, REMS TA Center and ED with FEMA and Joplin School District in Missouri. This archived Webinar describes operational considerations for managing donations and volunteers from the Federal and local perspective and shares lessons learned from Hurricanes Harvey and Irma and the 2011 tornado that impacted Joplin.

Supporting Displaced Students and Families During and After Emergency Events Webinar, REMS TA Center and ED with ED's National Center on Homeless Education. This archived Webinar provides a basic overview of why providing supports for homeless and displaced students and families during and after emergencies is important. It also provides insight that can help SEAs and LEAs, with their emergency management agency partners, understand how they can support students and families displaced from homes, communities, and school settings due to a natural disaster, such as a flood.

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[i] Federal Emergency Management Agency (FEMA) (2010, December). Chapter 5: Making schools safe from flooding. *Design guide for improving school safety in earthquakes, floods, and high winds.* Retrieved from https://www.fema.gov/media-library-data/20130726-1531-20490-0438/fema424_web.pdf.

[ii] Smith, A. B. (2018, January 8). 2017 U.S. billion-dollar weather and climate disasters: A historic year in context [Blog post]. Retrieved from https://www.climate.gov/news-features/blogs/beyond-data/2017-us-billion-dollar-weather-and-climate-disasters-historic-year.

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[iv] NWS (Unknown). Flood warning vs. watch. Retrieved from https://www.weather.gov/safety/flood-watch-warning.

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[vi] NWS (Unknown). Flood related products. Retrieved from https://www.weather.gov/safety/flood-products.