

# Weather Shelter Assessment, FEMA and National Weather Service Standards



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# Today's Agenda

Review FEMA Weather Shelter Regulations

Review NWS Weather Shelter Best Practices

Q&A

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# Why is This Important?

1	Date	Time Estimate	State	School	Damages	Injuries	Deaths	Notes
2	1/11/2020	Evening	SC	North Central HS				High School is a total loss from EF3 tornado with 130mph winds
3	1/11/2020		KY	Christian County HS				Roof damage to HS from high winds
4	1/11/2020		MS	RH Bearden Elementary				Roof severely damaged by winds. 370+ students, teachers and staff displaced for 12 days
5	1/11/2020		MS	Pleasant Hill Elementary				Desoto County SD had five schools sustain damage. Significant damage occurred at Lewisburg HS and Olive Branch Elementary
6	1/11/2020		MS	Center Hill Elementary				
7	1/11/2020		MS	Lewisburg Elementary				
8	1/11/2020		MS	Lewisburg HS				
9	1/11/2020		MS	Olive Branch Elementary				
10	1/11/2020		LA	Benton MS				Roof severely damaged
11	1/12/2020	Evening	AL	Brindlee Mountain Primary				Cafeteria, office and several class rooms severely damaged. School closed
12	1/12/2020	Evening	AL	Holly Pond HS				Damage to awning, greenhouse and four buses
13	1/13/2020	1pm	SC	Loris HS				10 cars damaged by EF1 w/ 90mph winds passing through parking lot
14	1/13/2020	2pm	NC	Union Intermediate School			3	Gym wall destroyed and roof significantly damaged
15	2/6/2020	Afternoon	NC	Bunn HS				Extensive damage to football and baseball fields
16	3/3/2020	Evening	TN	West Wilson MS				Wilson County SD lost two schools for the remainder of the year, displacing 1700+ students, teachers and staff.
17	3/3/2020	Evening	TN	Stoner Creek Elementary				
18	3/3/2020	Evening	TN	Robert Churchwell Museum Elementary				
19	3/3/2020	Evening	TN	Meigs Academic Magnet				
20	3/3/2020	Evening	TN	Mount Juliet Christian Academy				
21	3/3/2020	Evening	TN	Lockeland Design Center Elementary				
22	4/8/2020	Evening	IN	Vincennes Rivet School				Roof partially torn off the school
23	4/8/2020	Evening	IN	Vincennes Univeristy				Dorm building destroyed by straight line winds. Building condemned
24	4/8/2020		IL	Bement Elementary				Damage to chimney and roof from 80mph winds
25	4/8/2020		PA	Meyersdale Area Elementary				Roof torn off. Extensive damage to HS athletic fields
26	4/12/2020	9:25pm	MS	Parks Elementary				Roof torn off building and wall collapse.
27	4/12/2020	Around Noon	LA	Sterlington HS				Significant damage to athletic facilities with additional damage to school
28	4/12/2020	10:50p	GA	Northwest Elementary				Murray County Schools with 3 schools damaged. NW Elementary with

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				Roof severely damaged
				Cafeteria, office and several class rooms severely damaged. School closed
				Damage to awning, greenhouse and four buses
				10 cars damaged by EF1 w/ 90mph winds passing through parking lot
		3		Gym wall destroyed and roof significantly damaged
				Extensive damage to football and baseball fields
				Wilson County SD lost two schools for the remainder of the year, displacing
				1700+ students, teachers and staff

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# Why is This Important?

1	Date	Time Estimate	State	School	Damages	Injuries	Deaths	Notes
2	1/6/2021	6-7pm	TX	Calvin Vincent Early Childhood				EF1 tornado (86 to 110mph) forced both schools to close to make repairs, clean up and restore power
3	1/6/2021	6-7pm	TX	Kohfeldt Elementary				
4	1/6/2021	6-7pm	TX	Blocker MS				Minor damage but school delayed to open until 9am to clean up properties, make repairs and restore power
5	1/6/2021	6-7pm	TX	Texas City HS				
6	1/6/2021	6-7pm	TX	Industrial Trade Center				
7	1/26/2021	10:30pm	AL	Fultondale HS				School severely damaged by tornado and unlikely to re-open this year
8	2/22/2021		TX	Harpool MS				Water Damage due to extreme cold busting pipes. Will not reopen this year. Denton ISD 7 schools damaged by water pipes bursting. Some may not reopen this year
9	2/22/2021		TX	Arlington ISD				
10	2/22/2021		TX	Audie Murphy MS				Killeen ISD still assessing damage at multiple schools
11	2/22/2021		TX	Kocurek Elementary				Austin ISD - Extensive water damage due to burst pipes. 90 schools damaged
12	2/22/2021		TX	Bertha Sadler Means Young Womens Academy				
13	2/22/2021		TX	Gus Garcia Young Men's Leadership Academy				
14	2/22/2021		TX	Bowie HS				
15	2/22/2021		TX	Mason Elementary				Leander ISD with 17 damaged schools. 5 extensively
16	2/22/2021		TX	Stiener Ranch Elementary				
17	2/22/2021		TX	Running Brushy MS				
18	2/22/2021		TX	Giddens Elementary				
19	2/22/2021		TX	Block House Creek Elementary				More than 140 Dallas ISD schools damaged by water and frozen pipes
20	2/22/2021		TX	Dallas ISD				
21								
22	February, 2021 the state of Texas sustained a long period of temperatures below freezing, even record cold, along with snow and ice. These conditions led to power loss and burst pipes as temperatures in unheated buildings dropped below freezing. The initial number of damaged schools is in the hundreds. An exact number may be tough to find.							
23								
24	3/25/2021	1:15pm	GA	Cedartown HS				Roof damage from strong winds and water damage forced school to send kids home
25	3/26/2021	12:10am	GA	Newnan HS				EF4 tornado destroyed several walls and roof of 133 year old HS. Likely total loss. All 30 Coweta County schools sustained damage. Most sustained significant damage.
26								
27								
28	3/31/2021	Morning	MS	Vardaman School				Significant damage to roof and exterior walls from strong winds

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Young Womens Academy Leadership Academy				Austin ISD - Extensive water damage due to burst pipes. 90 schools damaged
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# FEMA Regulations



Siting Considerations



Occupancy



Distance



Signage

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# FEMA Regulations



Siting Considerations

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# FEMA Regulations

Below ground  
provides greatest  
protection

Interior rooms on  
ground level



Siting Considerations

# FEMA Regulations

Future Designs

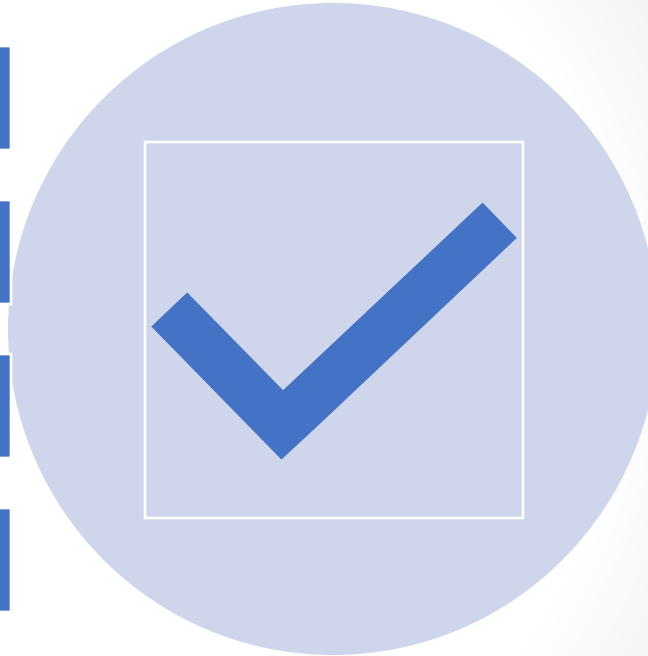
Consider shelters

Know daily occupancy

Build basements

Use materials that protect from missiles and falling debris

Wide stairwells and hallways



Siting Considerations

# FEMA Regulations



Siting Considerations



Occupancy



Distance



Signage

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# FEMA Regulations



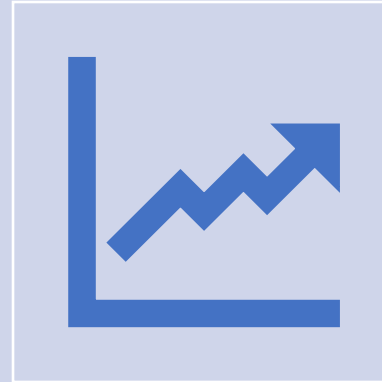
Occupancy

# FEMA Regulations

Plan for 2 hours in shelter

5 sq. ft/person

Can exceed normal maximum occupancy



Occupancy

# FEMA Regulations



Siting Considerations



Occupancy



Distance



Signage

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# FEMA Regulations



Distance

# FEMA Regulations

Shelter within 5 minutes

Do not block access to shelters

Do not use shelters as storage

Hindering access creates chaos & panic



Distance

# FEMA Regulations



Siting Considerations



Occupancy



Distance



Signage

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# FEMA Regulations



Signage

# FEMA Regulations

Obvious & luminescent

Signage outside of entrance to shelter

Once identified, there is an expectation of access to shelter



Signage

# FEMA Regulations



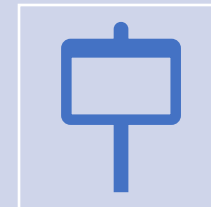
Siting Considerations



Occupancy



Distance



Signage

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**HEROIC TEACHER PROTECTS CHILDREN**

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# FEMA Review

Are you using the best locations to shelter?

Do you know how many people you can shelter?

Can you move people to shelter quickly without obstruction?

Can people that missed the drill quickly find shelter?





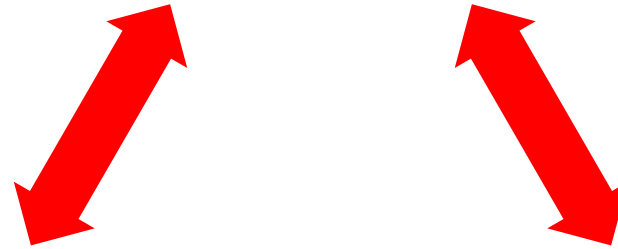
MOORE

# THE OKLAHOMAN

THE STATE'S MOST TRUSTED NEWS

# NWS Best Practices

Shelter  
Assessments



Drills

Communication

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# NWS Best Practices

## Shelter Assessments

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# NWS Best Practices

## Shelter Assessments

Are you using best locations

- When was the last time you assessed

Have you assessed capacity

- Is there access

# NWS Best Practices

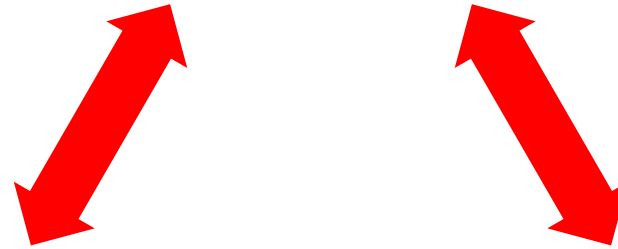
## Shelter Assessments

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# NWS Best Practices

Shelter  
Assessments



Drills



Communication

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# NWS Best Practices

## Communication

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# NWS Best Practices

## Communication

Multiple ways to receive and emit weather alerts

- Can all staff/coaches receive alerts

Internal and external communications

- Filter out non-essential alerts



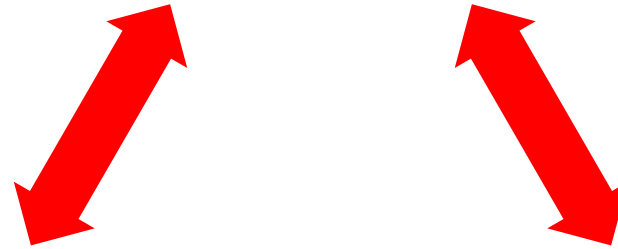
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# NWS Best Practices

Shelter  
Assessments



Drills



Communication

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# NWS Best Practices

## Drills

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# NWS Best Practices

## Drills

Can you get to shelter in 3 minutes

- Drill for after hours/weekends

Is there is signage and directional signage

- Are 3<sup>rd</sup> parties aware

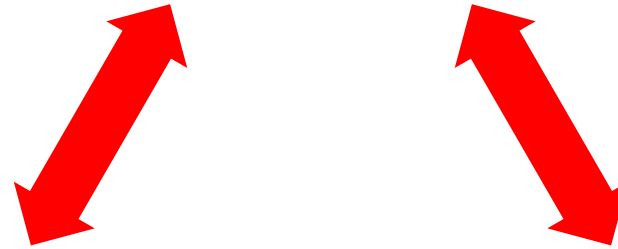
# NWS Best Practices

## Drills

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# NWS Best Practices

Shelter  
Assessments



Drills



Communication

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# NWS Review

Multiple platforms to receive and alert for severe weather

Only have alerts for severe thunderstorm and tornado

Are shelters in the best location and what is their capacity

Are shelters pre-assigned and does staff know their shelter

Drill twice a year and have drills for after hours/ weekends

Can everyone shelter within 3 minutes – capacity, signage, access

