Section 9: Storm

Sectors: 1,2,3,4,5,6

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Why are Storms a Threat to the City of Nacogdoches?

Severe weather occurs frequently in the City of Nacogdoches due to the convergence of warm, moist air from the Gulf of Mexico with cool, dry air from the Rocky Mountains. Although severe thunderstorms, lightning, hail, tornadoes, and high winds can occur at any time throughout the year, they are most prevalent in the springtime.

History

The following Chart 9-1 reflects the history of storms in the City of Nacogdoches. No significant storms were reported in the City of Nacogdoches in 2003.

Chart 9-1: History and Hazard Frequency of Storms

Storm Type	Total Number of Events	Years in Record	Recurrence Interval	Hazard Frequency
Hail	65	42	0.6	1.55
Ice	10	20	2	0.5
Wind	112	42	0.4	2.67
Lightning	2	9	4.5	0.022

Source: City of Nacogdoches Archival Data

Risk Factors for Storms

Property damage is of major concern during all types of storms. Hail can damage roofs, cars, windows, vegetation and much more. Debris removal, building damages and power outages oftentimes occur in the aftermath of an ice storm. The high number of trees creates a hazardous situation when ice is accumulated, when lightning strikes or when high winds blow through.

Another facet of the population at risk during storm events are those living in manufactured housing. A manufactured housing survey was conducted by the City of Nacogdoches in which an estimated 690 number of manufactured homes were identified and valued at approximately $13,386,680.

Storm Terminology

Doppler Radar is a weather instrument used to pinpoint and track severe weather.

Manufactured Home is a home that is built in the controlled environment of a manufacturing plant and is transported in one or more sections on a permanent chassis.

Storm Acronyms

FEMA – Federal Emergency Management Agency

NHMPC – Nacogdoches Hazard Mitigation Planning Committee

EAS - Emergency Alert System

NOAA - National Oceanic and Atmospheric Administration

NWS - National Weather Service

LWP - Local Warning Point

DPS – Department of Public Safety

DEM – Division of Emergency Management

Hazard Assessment

The greatest monetary impact of storms for the City of Nacogdoches is the expense associated with clean-up. Debris removal is imperative to re-open city streets. The use of overtime labor, city equipment and the additional burden to the City's landfill can become quite expensive. In the wake of Tropical storm Allison (June 2001), the City of Nacogdoches submitted over $30,000 in expenses for debris removal to be reimbursed by FEMA.

Risk Analysis

Chart 9-1: History of Storms includes the hazard frequency and recurrence intervals for storms in the City of Nacogdoches. The NHMPC utilized the frequency of events to identify storms as a significant threat for the citizens of the City of Nacogdoches.

Community Storm Issues

Storm Mitigation Activities

Outdoor Warning System

Timely storm warnings to the public may save lives, decrease injuries, and reduce some types of property damage. The City of Nacogdoches has an outdoor warning system consisting of 10 sirens that cover approximately 85% of the City's geographic area and approximately 95% of its population. Please see *Map 9-1: Outdoor Warning System* at the end of this section for a graphic of the coverage area. Testing procedures are slated regularly to ensure the system is in good working order at all times.

Although effective at alerting the citizens of Nacogdoches, the sirens cannot provide instructions or other commentary. Local radio and television stations will broadcast Emergency Alert System (EAS) messages when requested by local government officials. These messages indicate the impending weather event along with the necessary safety precautions that should be taken. In addition, the local National Oceanic and Atmospheric Administration (NOAA) Weather Radio station will broadcast weather watches and warnings issued by the National Weather Service (NWS). Weather radios are activated when such messages are broadcast.

The primary objective of a warning system is to notify key officials of emergency situations and disseminate timely and accurate warnings and instructions to the population at risk from the threat or occurrence of emergency situations. Rapid dissemination and delivery of warning information and instructions may provide time for citizens to take action to protect themselves and property.

The focal point of the warning function is the Local Warning Point (LWP), which operates around the clock and is located in the City's Police Department/Emergency Communications Center. Detailed information regarding the procedures to operate the City's outdoor warning system are contained in Annex A of the City of Nacogdoches Emergency Management Plan (Appendix IV).

Emergency Phone Bank

The City of Nacogdoches has also developed, equipped and staffed an Emergency Phone Bank to be activated during emergency events. The phone bank is designed to divert non-emergency calls for help in the event of a disaster or other emergency. Staff directs callers to emergency shelters, provides the latest incident information, directs pertinent calls to the City's Information Officer and most importantly relieves the call volume on the City's dispatch and

emergency personnel. Equipped with 8 telephones, cable television, a facsimile machine, Internet access, maps and a resource manual, the City of Nacogdoches Emergency Phone Bank has become an integral key to emergency response.

Computer Weather Tools

The City of Nacogdoches subscribes to several internet-based weather radar systems. These resources allow Emergency Management staff the ability to track major weather events threatening the community and thereby, place on stand-by key personnel. It also allows City staff opportunity to ready appropriate resources (sanding equipment for icy conditions, barricades for potential flooding, etc.).

City of Nacogdoches Building Code

Section 1609 of the 2000 International Building Code adopted by the City of Nacogdoches provides consideration for wind loads up 90 miles per hour. The code stipulates that all buildings and structures constructed in the City of Nacogdoches be designed to withstand 90 mile an hour winds coming from any horizontal direction.

City of Nacogdoches Zoning Ordinance

Section 118-317 of the City of Nacogdoches Code of Ordinances stipulates that manufactured homes used for residential purposes adhere to the following:

- Manufactured homes shall be secured to the ground through the appropriate use of tie downs as required in the standard Building Code Section 14-31.

- Manufactured homes shall be skirted with suitable, weatherized material similar in type of material and color to the sided of the manufactured home.

These requirements may reduce the risk for damage to the property by increasing wind resistance.

KTRE-TV Live Doppler Radar

KTRE-TV, the local news station has become the first in Deep East Texas to have Live Doppler Radar. The benefit to the citizens of Nacogdoches is earlier storm detection and warning. Utilizing the Doppler Radar called Live Doppler 9, KTRE-TV meteorologists are now able to detect storm's patterns as well as rotation to track the formation of tornadoes. This information is immediately

passed along to the viewers of KTRE-TV, helping to ensure the safety of the citizens of the City of Nacogdoches.

Volunteer Sky Warn Coalition

The Nacogdoches Community has an extremely active Sky Warn Group. Comprised of volunteers – including HAM radio operators, these individuals alert Emergency Management officials to storm strengths, characteristics, etc. This group is also a critical component in the reporting of storm damages.

Storm Mitigation Action Items

ST-SM#1: Compile a list of wind-resistant products and building techniques and distribute it to citizens obtaining building permits.

Implementation:

- Coordinate with local hardware stores to develop a list of wind-resistant products and techniques locally available.
- Develop and distribute comprehensive brochures regarding wind-resistant products and techniques.
- Make information available to the public via City's website and local media.
- Coordinate with local builders to gain further knowledge of current wind-resistant construction techniques being implemented.
- Educate property owners of construction alternatives that will reduce the risk of property damage during high winds and other storms.

Coordinating Authority:	City of Nacogdoches Local Media Builders Associations Local Hardware Stores
Timeline:	Short Term 1-2 Years
MAP Goals Addressed:	Protection of Life and Property Public Awareness
City Sectors Affected:	1,2,3,4,5,6
Cost:	$5,000-$10,000
Potential Funding Source:	OB, EMPG, Grants

ST-SM#2: Promote safety campaigns to educate the public on what to do during storms.

Implementation:

- Utilize City's website to inform and direct citizens on what to do when a storm warning is issued.
- Coordinate with local schools to ensure all safety precautions are being exercised.

Coordinating Authority:	City of Nacogdoches Local Media Nacogdoches Independent School District
Timeline:	Short Term 1-2 Years
MAP Goals Addressed:	Protection of Life and Property Public Awareness Emergency Services
City Sectors Affected:	1,2,3,4,5,6
Cost:	$1,000-$5,000
Potential Funding Source:	OB, EMPG, Grants

ST-SM#3: Improve early warning system.

Implementation:

- Seek funding to purchase additional sirens to complete the coverage area.

- Maintain Annex A – Warning to City of Nacogdoches Emergency Management Plan.

Coordinating Authority:	City of Nacogdoches Texas DPS-DEM
Timeline:	Short Term 1-2 Years
MAP Goals Addressed:	Protection of Life and Property Public Awareness
City Sectors Affected:	1,2,3,4,5,6
Cost:	$65,000-$120,000
Potential Funding Source:	OB, CIP, EMPG, Grants

Map 9-1: Outdoor Warning System Coverage Area