HURRICANE PLAN

LONG BEACH, NORTH CAROLINA

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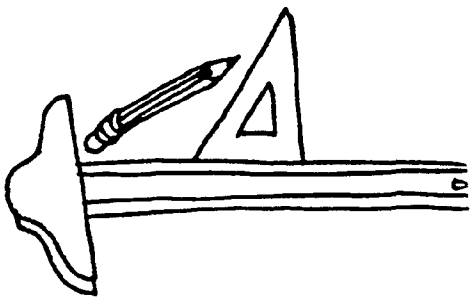
The preparation of this report was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

June 1984

BACKGROUND



Long Beach, with a 1982 population of about 2100 residents, occupies the southern portion of Oak Island in southernmost Brunswick County, North Carolina. Long Beach shares the island with the cities of Yaupon Beach (population: 1018) and Caswell Beach (population: 127). Long Beach is about 8 miles long and roughly 1/2 to 1/4 mile wide. Elevations range from 0' msl to 50' msl. A canal divides about 2/3 of the town into northern and southern portions. A two lane bridge connects the residents of Oak Island with the mainland. The bridge is located east of Long Beach and Yaupon Beach and west of Caswell Beach. Long Beach serves as a resort community with the population rising to as high as 30,000 on holiday weekends in the summer.

The town of Long Beach was built in the late 1940s as a residential community, after logging operations on the island ceased. In 1954, 352 of the town's 357 homes were lost as a result of Hurricane Hazel. Currently there are about 3000 housing units in Long Beach. Most of the homes are single story, predominately wood frame with some brick. There are approximately 500 mobile homes on the eastern boundary of the town.

Long Beach is well managed with a good fire and police protection. Disaster drills are held on a regular basis for possible radiation dangers in response to the Brunswick Nuclear Power Plant located nearby. The residents rely heavily on electricity and propane for fuel. There are no gas lines on the Island. Town water is available throughout Long Beach. Sewerage is by individual systems.

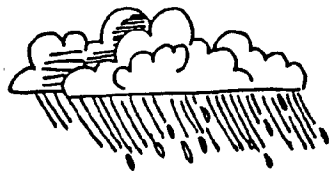
Long Beach has no local television or radio stations. The nearest emergency weather forecast broadcasting stations are:

WECT-TV	Channel 6	Wilmington
WWAY-TV	Channel 3	Wilmington
WHSL	1490	Wilmington
WMFD	630	Wilmington
WGNI	1340	Wilmington
WENC	1220	Whiteville
WMYB	1450	Myrtle Beach, S.C.
NOAA	VHF 24 hr weather	Wilmington

Emergency rescue protection in Long Beach is provided by the Long Beach Volunteer Rescue Squad. The rescue squad personnel consist of 40 EMT qualified volunteer members of which 9 are Public Safety Officers. The Rescue squad operates from the two City fire stations and includes the following equipment:

1979 Ford Ambulance
1973 Dodge Van Ambulance
1969 Chevrolet Ambulance
1981 Ford Ambulance
1963 4-Wheel Drive Jeep
16 foot McKee Boat

All equipment is in excellent shape.



HAZARD AND VULNERABILITY ANALYSIS

STORM FREQUENCY:

The Long Beach area is fortunate in that it has not experienced a major hurricane since the mid-1950s. Beach erosion has occurred as a result of occasional storm activity and hurricane landings nearby. In 1979 Hurricane David made landfall in South Carolina and caused a great amount of beach to be lost. While hurricane damage has been light in recent times, the southeastern edge of North Carolina has a 6 percent chance that a hurricane will strike in any given year. Hurricanes have averaged about 17 years between occurrences in Long Beach. All data seem to indicate that the Town is now due for a major storm.

COMPONENTS OF HURRICANE DAMAGE:

Storm surge is a critical factor in determining damage from a hurricane. It is the single most dangerous of all hurricane forces since most of the recorded storm damages result from the surge effects and 90% of hurricane deaths are by drowning. In the event of a Class 5 hurricane (worst case), Long Beach would be entirely flooded. Wind and rain are also components of a hurricane's destructive force. The storm category given a hurricane is based on its wind force (see Appendix). The speed at which a hurricane is moving determines how much rainfall is released on a given area. Wave action and erosion would change the island's shoreline.

HAZARD MAPPING:

One indicator of Long Beach's vulnerability to storm damage is through hazard mapping. Information for the hazard map found in the Appendix comes from two sources:

1. The Flood Hazard Boundary Map prepared by the Federal Insurance Administration of the Department of Housing and Urban Development.

2. Long Beach Land Use Plan map depicting Areas of Environmental Concern designated by the North Carolina Coastal Management Program through the Coastal Area Management Act of 1972 (CAMA).

The National Flood Insurance Program defines four levels of flood hazard within Long Beach and CAMA designates four sites of environmental concern (see Appendix).

When these factors are combined into a composite map, different levels of risk are displayed. The following table depicts the expected hazards mapped on the composite map found in the Appendix:

HURRICANE FORCES

Area	Erosion	Wave Action	Flooding	High Winds	Boundaries
1	X	X	X	X	AEC Areas
2	X	X	X	X	V Flood Zones
3			X	X	A Flood Zones
4				X	Remainder of Community

Source: McElyea, David, David Brower, and David Godschalk, 1982. Before the Storm. Chapel Hill, NC: UNC Center for Urban and Regional Studies.

While the above table describes an expected storm impact based on Flood Insurance Standards, it should be kept in mind that the impact of hurricane forces is highly variable and influenced by many factors which include but are not limited to the following:

- the slope of the ocean floor at Oak Island
- tidal pressures at the time of the hurricane
- the location and shape of bays and inlets
- the angle and force of the storm's approach

As previously mentioned, a Class 5 storm, and possibly a Class 4 storm, would inundate the island. Information based on local knowledge indicates that the backwash of a storm surge is likely to cut through the Town in the vicinity of West 39th Place, West 54th Place and East 69th Place, thereby temporarily or permanently dividing the Town.

Sophisticated computer models have been developed which can more accurately portray damages from a variety of storm levels and approaches. Consideration should be given to replacing the hazard map in the Appendix with a computer simulation model.

MAGNITUDE OF RISK:

The magnitude of the hurricane risk is a function of the size of the population and the value of property on the island.

1. Population Change:
   Population growth in Long Beach and Oak Island has been substantial. Since 1960, the island's (Caswell, Yaupon and Long Beach) population has grown by almost 2000%. The Long Beach growth can be tracked as follows:

1960	1970	1980	1984 est.
102	493	1795	2150

   In addition to the increase in year-round population, the Town of Long Beach enjoys great popularity as a second home community and vacation center. The six-month tourist season increases the population in the spring, summer and fall, particularly on holiday weekends when the population may rise to 20-30,000 people (staff estimate).

2. Valuation:
   Total assessed valuation for the Town of Long Beach has risen from $112 million in FY 1980-1981 to $130 million in FY 1983-1984. Values should increase significantly with upcoming reassessments.

Values can be distributed in the following broad categories:

Area	Approximate Assessed Value	Approximate % of Land Area
East Town	$15-25,000	6
Mid and West Town	$30-40,000	68
The Beach	$85-200,000	25
Commercial	$8-10,000/20' lot	1

IDENTIFICATION OF HAZARDS:

Recent development within the four subareas shown in the previous table is described in the 1984 Growth Management Plan:

a. East Town. This section of the community is bounded by the City Limits, E. Oak Island Drive and a line running between N.E. 64th and 65th Streets. Zoned to accommodate mobile homes and single-family dwellings, the area is approaching development saturation with approximately 85 percent lot coverage.

The dominant uses in the area are vacation/retirement-type mobile homes. Many are over ten years old and not built to state and Underwriter Laboratory Standards. Most would be unable to meet Town Building Code standards. All are served by the Town water system and septic tanks. Because of ground saturation problems, some sections of East Long Beach are experiencing high water tables, sewage smells and seepage in drainage ditches.

b. Mid and West Town. Ranging from the eastern town limit to the south of E. Oak Island Drive and East Town, and running the length and breadth of the community north of E. Pelican Drive and Davis Creek, this part of Long Beach is dominated by single-family dwellings built to N.C. Building Code Standards. Located on larger lots with larger minimum square footage requirements than East Long Beach, this section of the community generally houses more permanent residents.

c. The Beach. Much of the land on the east end of the beach from E. 58th Street to E. 74th Street is undeveloped because of the AEC designation for the fresh water lakes located here. To the west, however, from E. 58th Street, there is moderate to heavy development running for an equivalent of some 124 blocks. Most of the land in this section of Long Beach is used for vacation/resort-type homes for rent. Vacant land on the ocean front is fast being built upon.

To the far west towards Lockwood's Folley Inlet, homes are being built in precarious locations. Even while some newly built homes are being moved from the ocean front because of severe erosion, more are being built in the vicinity. The town has been unable to find ways to curtail this continuing development because it does not have the ability to compensate land owners for being prohibited to develop their properties.

d. Oak Island Drive Commercial Area. This section serves as the "central business district" for Long Beach. It generally is no more than one lot deep along E. Oak Island Drive except at 58th Street where an arm of the district extends toward the beach. Office uses can be found on both ends of this commercial strip which runs from E. 46th Street on the west to E. 64th Street on the east.

Many important government, institutional and utility structures are located in the A flood zone. These are:

Water line pump house
Southern Bell facility
CP&L power substation
Water towers
Fire Department and Rescue Squad stations
Recreation Center
Town Hall

In addition, the following streets are known to flood during severe thunderstorms and could be expected to be the first to flood with the heavy rains associated with a hurricane:

East 75th between Oak Island Drive and Oak
East 74th and Oak Island Drive
East 73rd and Oak Island Drive
East 72nd and Oak Island Drive
East 59th and Oak Island Drive
East 46th and Oak Island Drive
East 38th and Holly Drive
Pelican Drive between 40th SE and 58th SE
East 76th and East Beach Drive
East 46th and East Beach Drive
2200 block of East Beach Drive
1700 block of West Beach Drive
23rd Place West and West Beach Drive

It should be noted that much of the early flooding occurs on the main routes off the island and in the areas which are congested with traffic even in good weather.

VULNERABILITY AND MITIGATION POLICIES:

1. Long Beach should consider the establishment of a staff task force called the Hurricane Safety Committee. This committee would be assigned a variety of duties, among which are:
   - To conduct an annual review of the Emergency Plan Activities and Roles found later in this report
   - To inventory high risk individuals who may need assistance in evacuation
   - To review building codes of other states (especially Gulf States) to determine if other communities have devised new design techniques and safety requirements which may be useful to Long Beach. These standards can then be referred to the State Department of Insurance.

2. The Town should prepare publications for general distribution which give safety advice in the event of a hurricane. Later a survey should be conducted downtown or at a similar high-traffic area to test the effectiveness of the brochure and other informational programs.

3. Strict enforcement of the building codes and CAMA regulations should be continued for the future safety of the Town, its residents and their property.

4. City sewer service may one day be available. In that event, it may be used as a tool to guide growth into appropriate locations. It is important that a sewage treatment facility, if constructed, be carefully sited to avoid a secondary disaster if the Town is flooded.

5. A second bridge should be constructed between Oak Island and the mainland to provide adequate evacuation routes from the island.

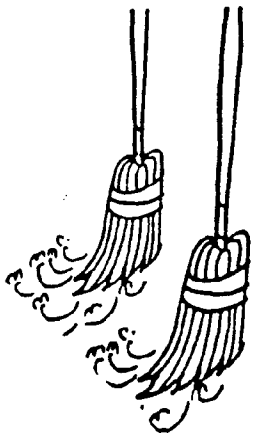
6. Inter-local agreements should be developed with inland towns, so that additional staff and equipment will be available in times of emergency.

7. Computer simulation models (SPLASH, etc.) should be made available by CAMA to determine a hurricane's impact on the Town under various

circumstances. The model may also be used to determine the vulnerability of buildings and utility structures before a storm and for reconstruction purposes after a storm. New or reconstructed public facilities should be located in those areas defined as least flood prone.

8. A system of greenways and drainage easements should be considered to aid drainage in flood prone areas and to provide open space/jogging trails.

CLEAN-UP



OVERVIEW:

Following a hurricane-related disaster, the Town of Long Beach would be faced with the difficult task of returning the area to a livable condition. Forces wishing a speedy return to normal often conflict with forces seeking to avoid another disaster. Reconstruction offers opportunities to make improvements but if plans are overly ambitious or require too much study, they may fail as a result of uncertainties and delays. After the storm there will be a great deal of confusion and fear. The most important service that the Town Government can provide to citizens at this point is to remove feelings of uncertainty and to instill confidence. This can best be accomplished by having a skilled reconstruction staff that is prepared for post-disaster activities. After a storm, decisions should be made in a timely manner. Information should be dispensed quickly. Rules should not be changed. A feeling of confidence in Town Government will speed recovery and will assure compliance with emergency regulations. Frequent changes in instructions will magnify the pre-existing confusion and slow the recovery process.

DAMAGE ASSESSMENT:

Damage assessment requires a staff team composed of members of the Long Beach Engineering, Inspections, and Public Works Departments as well as staff from the County Tax Office, and Health Department. Private assessors and real estate agents are also helpful. The assessment teams support damage claims and seek federal assistance. (See Emergency Plan Activities and Roles Chapter.)

Procedures:

- The task force team should meet immediately and fly over the Town and prepare a survey report of the disaster to request immediate assistance.

- Field assessment teams should be assembled to enter Long Beach to conduct a detailed survey of damages. For smooth operation of the recovery process, the detailed survey should be completed within the first week after the storm.

- Field assessment teams should be equipped with forms that set up the following four-level assessment scale:

  1. Demolished
  2. Require inspection before reconstruction
  3. Can be repaired with a permit
  4. Can be repaired without a permit.

- Teams should have paint and use a four color code to indicate the survey team's property designation. The color would be sprayed or painted on a corner of the structure.

LAND USE:

Development trends in effect before the storm are greatly accelerated after the storm. Examples can be seen in the changes in the development patterns of the Gulf Coast after Hurricane Frederick. Since Long Beach is an expanding community, it can be assumed that it will grow at an even more rapid rate following a major storm.

Often land requirements for emergency housing and debris collection are grossly underestimated. Often more than twice the amount of the damaged area is needed for temporary housing, commercial uses and debris clearance.

Procedures:

- The Town Board of Commissioners should establish an Emergency Land Zoning Overlay before reconstruction begins. The classification system could be gradually phased into the normal zoning standards as the emergency subsides.

- The following Overlay Zones are proposed:

Class 1 - Heavily damaged areas requiring complete redevelopment - a 45 day moritorium on new construction.

Class 2 - Impacted areas that may be restored - repairs should be made as quickly as possible.

Class 3 - Undamaged areas which may be rehabited immediately - density standards lifted to allow temporary housing for those needing shelter as a result of the storm. Temporary housing limited to an 18 month maximum.

- Notices of the need to obtain building permits for construction should be distributed to homeowners returning to the Town. Contractors should register for a privilege license.

- Citizen appeals of damage assessments and emergency zoning designations should be heard by an Emergency Board of Adjustment composed of members of the Long Beach Planning Board. The Mayor may make appointments to the Board to fill any vacancies. Operating rules shall be the same as the normal Board of Adjustments but decisions should be made as rapidly as possible.

- Additional temporary housing may be located at the Oak Island Golf Course if prior agreements are recorded with the Course Directors.

- Debris should be deposited on land that the Town owns north of the Intercoastal Waterway. The land should be kept cleared in preparation for this use. Alternate sites are CP&L property or the abandoned county landfill.

ASSISTANCE PROGRAMS:

Families are disrupted by deaths, injuries and the loss of a home, employment and personal possessions. These problems require many community policy decisions which must be made before major reconstruction begins.

Assistance will come from a wide variety of public and private sources and must be coordinated into an effective assistance effort.

Procedures:

- A Disaster Aid Coordinator should be appointed. This individual should be familiar with potential sources of family assistance.

- The Disaster Aid Coordinator should work with the Damage Assessment Team to itemize Town needs.

- Stations should be established (preferably in the Recreation Building) for dispensation of food, clothing and financial and housing assistance.

- Volunteers should be assembled at one site and then directed to various work stations.

- Recovered personal belongings should be catalogued and returned to the owner when possible.

FINANCIAL AID:

Those individuals having the easiest access to funds in the predisaster situation will recover most quickly from a storm. Some with good financial backing may be able to profit from the disaster. Those with limited capital will be slow to rebuild.

Financing is a major issue following a disaster. Aid to victims may be tied to requirements that new land use and construction policies be implemented to reduce the risk of future disasters.

Procedures:

- All Town buildings should be insured by available forms of insurance so that aid can be used in the commercial sectors rather than on government infrastructure.

- Federal and State aid program assistance applications should be filed as soon as damage assessments can be completed.

- A disaster contingency fund should be established in conjunction with other towns to cover large public expenditures that must be made when property tax revenue will be greatly reduced.

- Prefab emergency housing should be purchased by CAMA and stored inland for emergency use.

CAMA PERMITS:

CAMA regulations have been put into effect to protect the State's coastal property. After a hurricane, Long Beach must implement the CAMA minor permits program which will involve the siting of residential structures in relation to the CAMA required oceanfront setbacks.

Procedures:

- CAMA regulations should apply for any new construction.

- Structures which are damaged over 50% of their structural value and are located below the Mean High Water mark (MHW) or those between the MHW and the appropriate setback line should not be given CAMA permits for reconstruction.

- The administration of CAMA regulations following a storm is an issue that should be addressed by the Coastal Resources Commission and clear administrative guidelines should be forwarded to the Long Beach staff.

FINANCIAL ASSISTANCE

OVERVIEW:

A major hurricane will cause extensive property damage. The programs listed here and the forms that follow are designed to provide a handy reference for the type of disaster aid which may be available after a hurricane related disaster. It should be kept in mind that Federal programs are subject to change. An update of Federal assistance programs and application forms should be conducted annually.

Many assistance programs require a Presidential declaration of a "major disaster" or emergency. The Governor may ask the President for this declaration. If the President agrees that there is damage of significant scope that it is beyond the capabilities of local efforts, an emergency declaration may be made. Other assistance programs are available without the declaration.

Assistance programs suggested for use by the Town of Long Beach in the event of a hurricane are the following:

A. Emergency Loans
   Agency: Farmers Home Administration, U.S. Dept. of Agriculture
   Type of Assistance: Guaranteed/insured loans to repair, restore or replace damaged farm property.

B. Aid to Major Sources of Employment
   Agency: Small Business Administration and Farmers Home Administration
   Type of Assistance: After a Presidential declaration of a disaster, loans are made to any industrial or commercial enterprise which has constituted a major source of employment in the area and which is no longer in substantial operation.

C. Economic Injury Disaster Loans

Agency: Small Business Administration

Type of Assistance: After a Presidential declaration of emergency disaster loans may be made to pay current liabilities which could have been paid if the disaster had not occurred.

D. Debris Removal

Agency: Federal Emergency Management Agency

Type of Assistance: After a Presidential declaration of emergency, grants may be made to State or local governments for the removal of debris and wreckage. Federal agencies may be requested to arrange for the debris removal.

E. Emergency Protective Measures

Agency: Federal Emergency Management Agency

Type of Assistance: Emergency assistance to provide protective measures to save lives, remove health and safety hazards and to protect property.

F. Emergency Relief for Federal Aid Roads

Agency: Federal Highway Administration, Dept. of Transportation

Type of Assistance: After a declaration of emergency by the Governor, funds may be provided through the State highway agencies for the repair of damaged elements of Federal-aid highways.

G. Food, Water and Shelter

Agency: Federal Emergency Management Agency

Type of Assistance: After a Presidential declaration of emergency, specialists may be sent to survey the availability of food and shelter and to supervise the distribution of these items.

H. Public Transportation

Agency: Federal Emergency Management Agency

Type of Assistance: After a Presidential declaration of emergency, transportation can be provided to governmental offices, supply centers and other necessary locations.

I. Flood Fighting and Rescue Operations
Agency: U.S. Army Corps of Engineers
Type of Assistance: Specialized emergency assistance in all phases of flood fighting and rescue operations to supplement local efforts.

J. Protection of Essential Highways, Bridge Approaches and Public Works
Agency: U.S. Army Corps of Engineers
Type of Assistance: Specialized services for designing and constructing bank protection of highways and bridges endangered by floods and erosion.

K. Crisis Counseling Assistance
Agency: Federal Emergency Management Agency with the Public Health Service
Type of Assistance: After a Presidential declaration of emergency, professional counseling services will be made available to disaster victims.

L. Adjustments to Federal Loans - HUD
Agency: Department of Housing and Urban Development
Types of Assistance: After a Presidential declaration of emergency, HUD may authorize the refinancing of any note or obligation which is held by that agency in connection with any HUD loan.

M. Adjustments to Federal Loans - VA
Agency: Veterans Administration
Types of Assistance: After a Presidential declaration of an emergency, counseling and other services are available to property owners holding VA loans who suffered property damage as a result of the storm.

N. Manufactured Home Loans (Mobile Homes)
Agency: Department of Housing and Urban Development
Types of Assistance: After a Presidential Declaration of emergency, a family displaced by a disaster may receive an insured loan to purchase a mobile home as a principal place of residence.

O. Mortgage Insurance
Agency: Office of Housing, Dept. of Housing and Urban Development
Types of Assistance: After a Presidential declaration of an emergency, victims of the storm may receive insured loans to purchase single-family housing.

P. Temporary Housing
Agency: Federal Emergency Management Agency
Type of Assistance: After a Presidential declaration of an emergency, individuals may receive temporary housing in the form of government, private and commercial resources or grants for repairs to damaged structures.

Q. Very Low-Income Housing Repair Loans and Grants
Agency: Farmers Home Administration
Type of Assistance: Direct loans and payments for repairs to damaged homes.

R. Food Distribution Program - Emergency Assistance
Agency: Food and Nutrition Service, U.S. Department of Agriculture
Type of Assistance: Victims of the disaster may receive food commodities for mass feeding programs.

S. Food Stamp Program - Emergency Issue
Agency: Food and Nutrition Service, U.S. Department of Agriculture
Type of Assistance: Victims are eligible for emergency food stamps.

T. Individual and Family Grants
Agency: The State of North Carolina funded by Federal Emergency Management Agency after a request from the Governor
Type of Assistance: Individuals or families may receive grants of up to $5,000 to meet disaster-related expenses.

U. Legal Services
Agency: State Bar Association
Type of Assistance: After a Presidential declaration of emergency, low income residents may receive legal services if needed.

V. Physical Disaster Loans

Agency: Small Business Administration

Type of Assistance: After a Presidential declaration of emergency, direct loans are available to repair property damaged in the storm. Loans can be made to homeowners, renters, businesses, and churches.

NOTICE OF INTEREST

Form Approved
OMB No. 026-R0036

FEDERAL EMERGENCY MANAGEMENT AGENCY
DISASTER RESPONSE AND RECOVERY

NOTICE OF INTEREST

IN APPLYING FOR FEDERAL DISASTER ASSISTANCE

FEMA DECLARATION NUMBER

DATE

FIPS NUMBER

The purpose of this form is to list the damages to property and facilities so that inspectors may be appropriately assigned for a formal survey.

REQUIREMENTS FOR FEDERAL DAMAGE SURVEYS

A. DEBRIS CLEARANCE

- ☐ On Public Roads & Streets including ROW
- ☐ Other Public Property
- ☐ Private Property *(When undertaken by local Government forces)*
- ☐ Structure Demolition

B. PROTECTIVE MEASURES

- ☐ Life and Safety ☐ Health
- ☐ Property ☐ Stream/Drainage Channels

C. ROAD SYSTEMS

- ☐ Roads ☐ Streets
- ☐ Bridges ☐ Culverts
- ☐ Traffic Control ☐ Other*

D. WATER CONTROL FACILITIES

- ☐ Dikes ☐ Levees ☐ Dams
- ☐ Drainage Channels ☐ Irrigation Works

E. PUBLIC BUILDINGS AND EQUIPMENT

- ☐ Public Buildings
- ☐ Supplies or inventory
- ☐ Vehicles or other equipment
- ☐ Transportation Systems
- ☐ Higher Education Facilities

F. PUBLIC UTILITY SYSTEMS

- ☐ Water ☐ Storm Drainage
- ☐ Sanitary Sewerage ☐ Light/Power
- ☐ Other*

G. FACILITIES UNDER CONSTRUCTION

- ☐ Public Facilities*
- ☐ Private Non-Profit Facilities**

H. PRIVATE NON-PROFIT FACILITIES**

- ☐ Educational ☐ Medical
- ☐ Emergency ☐ Custodial Care
- ☐ Utility

I. OTHER *(Not in above categories)*

- ☐ Park Facilities
- ☐ Recreational Facilities

8

* *Indicate type of facility;*
** *Provide name of the facility and of private non-profit owner.*

NAME AND TITLE OF REPRESENTATIVE WHO WILL ACCOMPANY THE SURVEY TEAM.

NAME OF POLITICAL SUBDIVISION OR ELIGIBLE APPLICANT 1

COUNTY 2

BUSINESS ADDRESS

ZIP CODE

BUSINESS TELEPHONE *(Area Code/Number)* 3

HOME TELEPHONE *(Area Code/Number)*

APPLICANT'S AUTHORIZED REPRESENTATIVE 4

BUSINESS TELEPHONE *(Area Code/Number)*

FEMA FORM 90-49 (3/80)

DAMAGE SURVEY REPORT

Form Approved
OMB No. 3067-0027

FEDERAL EMERGENCY MANAGEMENT AGENCY
DAMAGE SURVEY REPORT 5
DISASTER RESPONSE AND RECOVERY
(See instructions on reverse)

3. DECLARATION NO. FEMA

4. INSPECTION DATE

1. TO ➡ REGION _____ FEDERAL EMERGENCY MANAGEMENT AGENCY

5. WORK ACCOMPLISHED BY
☐ CONTRACT
☐ FORCE ACCOUNT

2. APPLICANT *(State Agency, County, City, etc.)* | PA NO.

7. WORK CATEGORY *("X" Applicable Box)*
☐ EMERGENCY ☐ A ☐ B
☐ PERMANENT ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H ☐ I

DSR NO. 100001

6. PERCENTAGE OF WORK COMPLETED TO DATE
%

8. DAMAGED FACILITIES *(Location, identification and description)*

8A. FACILITY IN OR AFFECTS FLOOD PLAIN OR WET LANDS
☐ YES ☐ NO

9. DESCRIPTION OF DAMAGE

10. SCOPE OF PROPOSED WORK

11. ESTIMATED COST OF PROPOSED WORK

QUANTITY (a)	UNIT (b)	MATERIAL AND/OR DESCRIPTION (c)	UNIT PRICE (d)	COST *(dollars)* (e)

12. EXISTING INSURANCE *(Type)* | AMOUNT $ | TOTAL ➡ $

13. RECOMMENDATION BY FEDERAL INSPECTOR *(Signature, Agency, date)* | ELIGIBLE ☐ YES ☐ NO | ATTACHMENTS

14. CONCURRENCE IN REPORT BY STATE INSPECTOR *(Signature, Agency, date)* | CONCUR ☐ YES ☐ NO | ATTACHMENTS

15. CONCURRENCE IN REPORT BY LOCAL REPRESENTATIVE *(Signature, Agency, date)* | CONCUR ☐ YES ☐ NO | ATTACHMENTS

16. FEDERAL REVIEW *(Signature, Agency, date)* | FEMA REVIEW *(Initials and date)*

FEMA Form 90-52, JAN 81 (Formerly HUD Form 484)

COPY 1 - FEMA REGION

INSTRUCTIONS

1. The Damage Survey Report (DSR) is not a Federal approval of this proposed project and does not obligate Federal funds. DSR's are field recommendations which are attached as supporting justification to the applicant's project application, which must be approved by the Governor's Authorized Representative and the FEMA Regional Director. The applicant can be given no assurance of Federal reimbursement for any of the proposed work prior to approval of the project application by the Regional Director.

2. Use this form for the Federal Inspector's Damage Survey Report when required for emergency assistance, debris removal, temporary housing, or permanent repairs, replacement, or other restorative work. Separate DSR's will be prepared for emergency and for permanent work.

3. The Federal Inspector will attach properly captioned and cross referenced maps, sketches, or photos, as necessary to locate or describe the damages and the proposed scope of work. Additional sheets reporting comments by the DSR team members or any other pertinent information may be attached by the Federal Inspector to the original DSR.

4. Description of damages and "Scope of Proposed Work" should be stated in quantitative terms. For example, provide estimated quantities of debris removal or earth movement in cubic yards or tons; provide paving estimates in square feet or square yards; and provide principal dimensions of bridges, retaining walls or other structures as appropriate.

5. The Federal Inspector will attach his comments on each question of eligibility that arises. He should contact the Regional Director for guidance when necessary.

6. Cost estimates must be realistic; based on local conditions for the eligible scope of work without any contingency allowances. Cost breakdown should be sufficiently detailed for professional review including deductions such as salvage or insurance when appropriate. Under DSR Item 12 record the type of insurance coverage in force such as flood or casualty.

7. Under DSR Item 16, the "Federal Review" will be accomplished normally at the FEMA field office by a Federal engineer designated by the Regional Director. The FEMA review will be accomplished prior to distribution of the completed DSR's as indicated below. Based on these DSR reviews, a Federal Inspector may be required to correct errors in the DSR or to repeat field inspections when necessary.

8. Three copies of the DSR will be completed and signed at the time of the inspection. The applicant's representative will retain copy 3. The Federal Inspector will submit copy 1 to the Regional Director for review and copy 2 for automated data entry. The Regional Director will distribute two reproduced copies of the reviewed DSR to the Governor's Authorized Representative and two reproduced copies to the Federal agency which provided the inspector. The original (copy 1) will be retained for FEMA record file.

9. Force Account in Item 5 means work performed by Applicant's own forces.

SAMPLE RESOLUTION

WHEREAS, on the _____ day of _____, 19 __, the President declared a "major disaster" in the State of _____ under the provisions of Public Law 288, 93rd Congress, and

WHEREAS, _____, is a public entity within said State;

NOW THEREFORE, Be it Resolved, by _____
(Governing Body)
of _____ that the Federal Emergency Management
(Public Entity)
Agency hereby is requested to arrange to have the appropriate Federal Agency perform the following work:

(Describe the work or other assistance requested)

This body certifies that: (1) _____ lacks resources and is unable to perform the requested work with its own forces, or by contract, for reasons shown in the attached statement; and (2) to the best of its knowledge and belief, the requested work is eligible under Public Law 288, 93rd Congress.

This body agrees to: (1) provide without cost to the United States all lands, easements, and rights-of-way necessary to accomplishment of the approved work; (2) hold and save the United States free from damages due to the approved work or Federal funding.

This body assures its compliance with Title VI of the Civil Rights Act of 1964, Pub. L. 88-352, 78 Stat. 241 [42 U.S.C. 2000d-2000d-4], and Section 311, Pub. L. 93-288.

Passed and approved this _____ day of _____, 19 ___.

_____
Name and Title

_____
Name and Title

_____
Name and Title

SAMPLE CERTIFICATION

Resolution

_____
(Public Entity)

_____
(Date of Resolution)

I, _____, duly appointed and _____ (Title) of _____, do hereby certify that the above is a true and correct copy of a resolution passed and approved by the _____ (Governing Body) of _____ (Public Entity) on the _____ day of _____, 19 ___.

Date: _____

_____ (Official Position)

_____ (Signature)

CONCURRENCE BY STATE:

I concur in the request of _____, a public entity under the laws of the State of _____. The Governing body has the authority to issue this Resolution.

I certify that the State of _____ lacks resources and is (is not) able to perform the requested work with its own forces, or by contract, for reasons shown in the attached statement.

_____
Governor's Authorized Representative

_____
Date

EVACUATION

Determining evacuation times is one of the major objectives of any planning effort. By definition, evacuation time represents the minimum amount of time before projected land fall that local decision-makers must allow for safely completing the evacuation under storm conditions. An evacuation plan is especially important for Long Beach because the population has increased at a rapid rate but evacuation routes are relatively unchanged.

Sophisticated computer models have been used to develop emergency scenarios for metropolitan coastal areas. Simplified methods are used here since extensive data and transportation codings are not available.

Storm surge is a critical factor in evacuation planning. The term storm surge refers to a dome of water, driven by the wind that is 50 to 100 miles wide and moves across the coastline. The National Weather Service Saffir/Simpson Scale projects a 15 foot storm surge for a Class 5 (worst case) hurricane. However, surge heights can be amplified to higher levels if there is a gradual sloping of the ocean floor, tidal pressures or bays and inlets. Surge can flood low points in highways and cut-off evacuation routes. When Hurricane Hazel (Class 4) hit the North Carolina coast, a surge of 16 feet was recorded at Holden Beach.

In the event of a Class 5 Hurricane, Long Beach would be entirely flooded. Only one bridge is available to evacuate Oak Island. Once off the Island, traffic would be directed to Routes 87, 211 or 130. Evacuee would have to clear the bridge and a major intersection at NC 133 and 211. The recurrent flooding of NC 133 will be increased by the torrential rains associated with a hurricane. Low-lying escape routes may be cut by flooding three to five hours ahead of the hurricane arrival.

Wind and rain are also components of a hurricane's destructive force. The storm category given a hurricane is based on the intensity of its winds. The speed at which a hurricane is moving determines how much rainfall is released on a given area. Evacuation from Long Beach requires travel over a bridge that is 65 ft above the water. Hurricane force winds and blinding rain can combine to make it impossible to drive across the Inland Waterway from Long Beach. Studies in Florida indicate that gale force winds may precede landfall by six hours.

The Long Beach street network lends itself to many bottlenecks in an evacuation situation. Traffic must flow onto Oak Island Drive from dozens of cross streets. On peak vacation weekends, each intersection has the potential of being a trouble spot.

Evacuation travel is based on the length of the evacuation route and the assumed uninterrupted speed of the evacuation vehicles. Assuming an evacuee lives at the western end of Oak Island Drive, he or she must travel 8 miles to reach the bridge. It is another 16 miles to Bolivia, giving a total evacuation distance of 24 miles. Assuming a 35 mph speed with storm conditions and evacuation traffic, the uninterrupted travel time would be: 24 miles x 35 mph = 36 minutes.

Florida studies have shown that about 20% of the population leave before there is a notice to evacuate. Studies also show that evacuees in coastal areas average about 2.5 people per car. If Long Beach has about 10,000 people on a fall weekend, the following bridge delay could be expected:

10,000	people
2,000	leave early (20%)
8,000	people = 3,200 cars (2.5/car)

Studies show that 2 land bridge capacity is approximately 400 cars per hour. (Lane reserved for emergency use, travel slowed due to wind, rain and blowing debris.) In this scenario it would take traffic 8 hours to clear the bridge.

People usually leave within 3.5 hours after an evacuation notice has been given. Using this estimate, the delay time at the bridge can be calculated:

Assuming 3200 cars over 3.5 hours = 900 cars/hour

$$\text{Delay time} = 3.5 \text{ hours} \times 1 - \frac{\text{bridge capacity}}{\text{cars/hour}}$$

$$1.96 \text{ hours} = 3.5 \times (1 - 400/900)$$

Approximately a 2 hour delay

Since flooding of evacuation roads can occur 5 hours before a hurricane, notice to evacuate must be made at least 13 hours before the storm arrives (if 10,000 people are on the Island).

EVACUATION STEPS:

1. City Manager and Police Chief maintain close contact.
2. Monitor weather and estimate island population.
3. Put communication network in place and establish an EOC if conditions are threatening.
4. Place all emergency teams in a Preparedness situation.
5. Insure that police are in position at major traffic intersections and bridge.
6. Give notice to evacuate.

BRUNSWICK COUNTY SHELTER AREAS

	Capacity
North Brunswick High School	1320
South Brunswick High School	1320
West Brunswick High School	1320
South Middle School	1018
Leland Middle School	1018
Shallotte Middle School	1018
Waccamaw Elementary	1000
Union Primary	1018
Lincoln Primary	489
Bolivia Elementary	100
(Southport Primary)	(539)

Staff - Social Services Staffer
Parks and Recreation Staffer
Law Officer
Health Officer
Amateur Radio Operator

Water, Food and Power are unreliable at all shelters.

EVACUATION POLICIES:

1. Long Beach is in dire need of a second bridge to serve the western end of the Island. The safe evacuation of residents and visitors is dependent on it. Long Beach's population grew at a rate of 36% per year between 1970 and 1980. Growth in the 1980s will place the community in a particularly vulnerable situation because evacuation rates are little changed despite population growth. Only one exit is available. The almost certain flooding of the entire island in a hurricane situation similar to Hazel could expose a large number of people to the threat of drowning.

2. Access on Route 133 will be hampered by flooding. A chronic flooding problem exists on this road with even small storms. Repairs to the road to improve drainage should be made by the Highway Department well in advance of the next hurricane season.

3. A complete analysis of the storm surge effects (both incoming and returning to the ocean), wind hazards over time and flooding potentials would require computer models. A dynamic computer model called SPLASH (Special Program to List Amplitudes of Surges from Hurricanes) has been developed by NOAA. The CAMA office should consider implementing this model on the North Carolina coast and share the results with coastal communities.

4. Traffic patterns and signage planning for an evacuation should be developed. By directing certain portions of town onto different east-west thoroughfares, in-town bottlenecks could be reduced. Police officers could then control traffic at special merger points.

EMERGENCY ROLES

PURPOSE

This section is designed to be used as a pull out pamphlet for disaster preparation and drills in conjunction with the Hurricane Preparedness Committee proposed on page . Duties within this section are divided into four distinct stages or time frames. These are:

Stage I	Mitigation	Before a hurricane threat
Stage II	Preparedness	When a hurricane approaches
Stage III	Response	During a hurricane emergency
Stage IV	Post Disaster	After a hurricane emergency

Within each of the four stages, roles are defined for the following work groups:

Communications
Fire Department
Law Enforcement
Public Works
Search and Rescue
Damage Assessment

All activities for each of the work groups will be under the supervision of the Emergency Operations Center (EOC). While the EOC will be directed by Brunswick County staff, it would be appropriate to locate administrative officers from the Town of Long Beach at EOC so that there will be a direct link between the command center and emergency staff at work on Oak Island.

WORK GROUP DESCRIPTIONS

A. Emergency Operations Center

In the event of a hurricane-related emergency situation, all emergency operations will be coordinated from an Emergency Operations Center. The Brunswick County Courthouse in Bolivia has been designated as the EOC for Long Beach if Oak Island must be evacuated. During an emergency, the EOC will become the center for local government control. It is assumed that the ultimate resonsibility for providing decisions and response in times of emergency rests with the local government. Essential staff at the EOC shall consist of the Long Beach Mayor, City Manager, Communications Coordinator, Law Enforcement representative, Fire Department representative, Operations/Public Works coordinator and any support staff designated by the Mayor or City Manager. The Long Beach EOC Team will work in cooperation with the Brunswick County Emergency Center in determining staff assignments, shift changes and shelter needs. The Emergency Center will also provide information to commercial radio and TV stations on damage assessments and casualties.

B. Communications

The responsibility for developing and maintaining an emergency communications and warning system lies with local government. Emergency operations usually require communications capabilities beyond the capacity of normal local government operations. HAM radio operators, radio clubs and private organizations (RACES) with radio equipment are willing to assist communities in times of emergency. During an emergency, all Town departments must use the communications network to maintain close contact with the Emergency Operations Center (EOC) to keep them informed of their operational duties. The warning system must be available to warn citizens of an approaching storm. Activities at shelter areas, evacuation routes and the Town of Long Beach must be coordinated. A line of succession for communications duties must be established to assure proper response in an emergency. Written agreements must

be established between Long Beach and private organizations for communications services. Telephone circuits may be jammed during an emergency, therefore only direct lines that can withstand high winds and flooding should be considered as a part of any emergency plan.

C. Fire Department

In the event of a hurricane-related emergency, the Long Beach Fire Department will serve the important role of providing emergency medical care and assistance, transporting the sick and injured, freeing trapped individuals, operating a morgue and assisting in search and rescue operations. The Fire Chief will coordinate all Department activities. The Fire Department will also be important in arranging for the evacuation of citizens and critical equipment. After the hurricane, the Fire Department will help oversee the safe return of property owners to Long Beach. Fire Department personnel are also an important link in maintaining communications. They must keep careful records of all actions taken in the emergency conditions.

D. Law Enforcement

Law Enforcement personnel are key resources in a hurricane emergency. Their service is essential in traffic control, crowd control, security and communications. A Law Enforcement Officer should also be on the EOC staff. In the event of an emergency, Law Enforcement personnel may be delegated emergency authority beyond the normal operational responsibilities of day to day activities. Emergency capabilities may also require additional staff. Support may be available from County, State and military law enforcement agencies and by private individuals. However,

outside assistance should only be requested when all local resources have been deployed. After the emergency, Law Enforcement Officers will determine who is allowed to return to the Town. They will be responsible for issuing passes and badges to official personnel. They are a vital link in the communications network. They must also assist in Search and Rescue operations as directed.

E. Public Works

There is a tremendous need for public works services during an emergency. Public Works is responsible for construction, water service, building inspection, street repair, vehicle maintenance and sanitation. Public Works staff are also instrumental in evacuation and shelter operations. The Public Works personnel must determine the availability of resources and the effectiveness of proposed activities. The Public Works team will also direct the work of military forces deployed in the area in times of emergency. A Public Works Coordinator should be appointed to direct activities and a representative should be included in the EOC. In the event of a hurricane, there may be more need than local resources can handle. Local contractors and Public Works Departments from other jurisdictions and the State are often available to provide assistance. Agreements should be made in advance of a hurricane emergency to assure proper responses. Provisions should be made by Public Works to remove City resources to a safe location during a storm. After the disaster, Public Works restores access to the Town and reestablishes Town services.

F. Search and Rescue (SAR)

Search and rescue operations must be coordinated during most hurricanes. Special personnel, equipment and skills are required for search and rescue operations. Lines of command should be established well in advance of a hurricane so that leadership questions do not arise in an emergency. Coordination with State and Federal agencies (eg: Coast Guard) is also important because search and rescue operations may involve a large number of people. Search and rescue operations should also be available in a non-disaster situation to respond to limited emergencies such as missing children, drownings, plane crashes, etc. Good communications are necessary for successful search and rescue operations, therefore a common radio frequency that will not be oversaturated should be agreed upon. (One frequency often used for SAR is 155.6 MHz). Search and rescue operations will require the participation of personnel from Law Enforcement, Fire, Public Works and other Town Departments.

G. Damage Assessment

Damage Assessment focuses on the Town's responsibility to determine the impacts of a hurricane and then to rank needs in order of importance to return the community to a livable condition. It also functions as a means to support damage claims and to seek federal assistance. Extensive damage assessment is a necessary part of most state and federal recovery programs. Damage assessment will require staff from the Long Beach Engineering/Public Works Office, Building Inspection, County Tax Office, County Health Department and, if possible, the Governor's Office. Personnel from operating

departments will remain under the control of their own departments but will function under the immediate direction of the Damage Assessment Coordinator in disaster conditions. The Damage Assessment Coordinator will be appointed by the Town Manager. Provisions should be made for a line of succession so that damage assessment can continue should some personnel not be readily available. Agreements and understandings should be developed in writing between Long Beach and private organizations to assure that damage assessment takes place. Assignments should be made well in advance because in the event of a hurricane, confusion about specific assignments could have serious consequences. Insurance agents and realtors may be called in from the private sector if the workload exceeds available staff.

COMMUNICATIONS - STAGE I

1. Appoint a communications coordinator.

2. Analyze communications and warning resource requirements. Determine needed equipment.

3. Identify and designate private and public service agencies, personnel and equipment and facilities that can augment the Long Beach communications system.

4. Survey communications and warning equipment sites for power sources and locations.

5. Plan and train personnel for maximum use of available communications and warning resources.

6. Designate staff for radio operation and message handling.

7. Analyze equipment locations in relationship to potential flooding in hurricane conditions, protection from lightening and antenna damage in winds.

8. Identify repair capabilities for communications equipment under emergency conditions.

9. Coordinate communications and warning capabilities with neighboring jurisdictions. Coordinate frequencies and procedures.

10. Develop a communications organization chart with phone numbers and back up personnel.

11. Develop procedures with RACES for emergency augmentation of communication capabilities

12. Develop procedures for special warnings for the deaf, elderly and handicapped. Convey these procedures to those special populations.

13. Each Town Department should designate a messenger that will keep the communication network informed of that department's activities.

14. Determine staff roles. Suggested roles are: a) a communications coordinator to be at headquarters; b) radio operators; c) monitors to check commercial radio and TV; d) messengers to route messages to the proper person.

FIRE DEPARTMENT - STAGE I

1. Develop a listing of essential personnel.

2. Provide first aid training for members and general public.

3. Assemble records of radio frequencies and call signs of EMS agencies and units in other jurisdictions and at military installations.

4. Ensure that local ordinances and resolutions are in place authorizing the coordination and support of medical service in other jurisdictions in an emergency.

5. Secure authorization to purchase adequate medical supplies.

6. Develop a transportation plan to evacuate fire service equipment to a safe area.

7. Develop a transport plan to evacuate handicapped and injured citizens.

8. Prepare a list of back up personnel with nursing and paramedic skills that can assist in an emergency.

LAW ENFORCEMENT - STAGE I

1. Identify potential evacuation areas

2. Identify agencies, organizations and local citizens capable of providing support services.

3. Identify key and critical facilities requiring special security during an emergency.

4. Coordinate law enforcement capabilities with neighboring jurisdictions. Develop agreements of understanding.

5. Develop plans for traffic control in an emergency evacuation.

6. Prepare plans for the issuance of badges and security passes. (See attached sample.)

7. Inventory police vehicles and equipment. Prepare for its safe evacuation.

PUBLIC WORKS - STAGE I

1. Designate an emergency Public Works Coordinator

2. Assemble a team for providing Public Works services.

3. Train personnel in emergency procedures.

4. Identify vulnerabilities in Public Works systems.

5. Initiate mutual aid agreements with neighboring jurisdictions.

6. Work with local codes to insure ordinances which protect public works systems.

7. Review construction activities to assure that new buildings do not increase hazards in emergency conditions.

8. Identify local contractors whose equipment will not be damaged and who can provide back up support.

9. Keep all roads and bridges in good repair to handle an evacuation.

10. Maintain all emergency equipment and materials needed for an emergency in good repair.

11. Identify personnel, equipment and materials needed for an emergency. Equipment should include but not be limited to:

Tow trucks	Bull Dozers
Fuel delivery trucks	Backhoes
Fuel storage tanks	Generators
Floodlights, light units	Sand/graevel
Sand bags	Portable water suppliers
Drag lines	Cranes
Chain saws	Water pumps
Cutting torches	Rescue equipment
Circular saws	Boats

12. Identify personnel and resources available from military and other jurisdictions.

13. Identify dump sites for debris.

14. Plan for evacuation of equipment to save it from damage.

SEARCH AND RESUCE (SAR) - STAGE I

1. Appoint a search and rescue coordinator who will direct all volunteer and mutual aid forces.

2. Assemble a team of key SAR leadership personnel who can work with volunteers from all organizations to be involved in a hurricane emergency.

3. Identify equipment needed for SAR activities in the event of a hurricane. Suggested equipment: boats, portable communications equipment, diving gear, 4-wheel drive vehicles.

4. Contract with neighboring jurisdictions and develop mutual aid agreements. Include provisions for reimbursement of expenses and insurance payments.

5. Contact neighboring Coast Guard and military units to determine what assistance could be provided.

6. Work with the State to specify what agencies take command in case of a hurricane emergency involving a large percentage of the coast.

7. Identify volunteer organizations that could provide assistance and conduct volunteer training programs. Possible organizations include: 4-wheel drive clubs, scuba clubs, Coast Guard Auxilary, flying clubs.

8. Identify communications needs.

9. Develop public information programs about surviving a hurricane.

DAMAGE ASSESSMENT - STAGE I

1. Enforce adequate building codes.

2. Develop adequate land use regulations: dunes protection, flood plain protection, etc.

3. Develop survey teams. City staff should include engineering, public works, County Assessor, Health Inspector. When necessary recruit members of the private sector such as people from the fields of engineering building trades, property appraiser, insurance adjustors, Red Cross, Salvation Army, etc.

4. Designate a Damage Assessment Coordinator

5. Develop a damage assessment training program.

6. Develop an information program to warn citizens about possible damages.

7. Establish a damage assessment reporting system. (See appendix) Develop agreement forms for use if non-governmental personnel complete any damage assessments.

8. Make a list of critical facilities (streets, roads, and bridges, etc.) requiring priority repairs if damaged.

9. Estimate where washouts are likely to occur as the storm surge receeds across the island. Consider what measures for repair may be required.

10. Discuss with CAMA how emergency repairs will be made, since CAMA permits may be too time-consuming in a disaster situation.

11. Obtain maps with information about the locations of power lines and telephone lines.

COMMUNICATIONS- STAGE II

1. Test, repair and maintain communications equipment.
2. Arrange training programs for staff.
3. Stockpile supplies and repair equipment
4. Identify sources of additional equipment.
5. Develop special warning systems for deaf, elderly and handicapped.
6. Develop a contingency plan to provide warnings should existing equipment become disabled.
7. Develop plans to warn the Town to evacuate.
8. Develop accurate listings of phone numbers and radio frequencies of people to be contacted in an emergency: support personnel, neighboring jurisdictions, higher levels of government.
9. Arrange for central communications equipment to be transported to a safe location.
10. Prepare to protect or repair equipment in the event of wind or lightening damage.

FIRE SERVICE - STAGE II

1. Establish inventory, control and delivery systems for emergency equipment.
2. Collect medical supplies and equipment and load into EMS vehicles.
3. Notify hospitals and EMS personnel in other jurisdictions that an emergency situation may develop.
4. Insure that all equipment is in good working order and that repair parts are available.
5. Designate a siet for a temporary morgue
6. Assist in the evacuation procedures as directed by EOC.
7. Coordinate resources with other agencies and volunteer groups in order to provide assistance on a 24 hour basis.
8. Locate buses for transportation of large groups of people.
9. Ensure that EOC radios can communicate with EMC personnel.
10. Develop casualty tags, reports and notify next of kin procedures.
11. Prepare emergency water supplies.
12. Contact the Red Cross for possible assistance.
13. Locate first aid stations for emergency operations.
14. Prepare ambulance teams.

LAW ENFORCEMENT - STAGE II

1. Inventory available personnel
2. Place support personnel on notice that emergency may occur.
3. Designate a law enforcement corrdinator to serve at EOC.
4. Position law enforcement personnel at critical interchanges to control traffic.
5. Begin warning and evacuation procedures.
6. Maintain law and order and patrol evacuated areas.

PUBLIC WORKS - STAGE II

1. Establish inventory, control and delivery systems for emergency resources.

2. Set priorities on available resources.

3. Coordinate resources with other agencies and volunteer groups in order to maintain reserves.

4. Notify other jurisdictions and private organinzations about a possible need for assistance.

5. Ensure that debris removal equipment is in good repair and safe from the storm.

6. Ensure that adequate barrier and road block materials are available to the Police Department.

7. Secure all emergency equipment against damage.

8. Coordinate communications procedures.

9. Place standby equipment in operational readiness.

10. Assist in evacuation of City records and non-emergency equipment.

11. Assist in other evacuation procedures.

DAMAGE ASSESSMENT - STAGE II

1. Train personnel in damage assessment techniques.
2. Maintain predisaster maps, photos, surveys and other documents for damage assessment purposes.
3. Photo inventory structures in hazardous areas.
4. List critical facilities requiring priority repairs if damaged.
5. Conduct a damage assessment exercise.
6. Determine available assistance and alert people that they may be asked to assist.
7. Maintain accurate listings of all property owners.

COMMUNICATIONS - STAGE III

1. Assign staff to operate communications equipment on a 24 hour basis.

2. Make arrangements to ensure repair capabilities on a 24 hour basis.

3. Initiate warning procedures after directions from EOC.

4. Provide emergency communications during the storm.

5. Monitor commercial radio and TV broadcasts for accuracy and information.

6. Screen and route all incoming messages.

7. Maintain appropriate records and logs.

FIRE SERVICE - STAGE III

1. Initiate treatment and transportation activities
2. Provide security and law enforcement on the scene.
3. Activate a temporary morgue/
4. Free trapped individuals.
5. Provide communications network as required.
6. Consider that trained personnel may be required to perform as a triage team.
7. Conduct such activities as blood runs, physician transports etc.
8. Participate in search and rescue operations as required.
9. Perform body identification and transport as required.
10. Provide public information activities through EOC.
11. Provide support systems for victims and families.
12. Keep EOC informed of the disaster status.

LAW ENFORCEMENT - STAGE III

1. Maintain law and order
2. Remove police equipment to a safe location when possible.
3. Coordinate with EOC to ensure traffic control on evacuation routes and emergency shelters.
4. Provide search and rescue as required.
5. Issue passes to personnel authorized to enter strategic areas.
6. Staff road blocks and barricades and seal off disaster area.
7. Provide a communications network as needed.
8. Position traffic control devices as requested.
9. Direct activities of supporting state and military personnel.
10. Assist in damage assessment as required.
11. Provide emergency medical services as needed.

PUBLIC WORKS - STAGE III

1. Maintain contact with EOC
2. Provide equipment as needed in response to EOC.
3. Survey Town and evaluate in terms of engineering estimates.
4. Provide engineering services and advice.
5. Develop and mke recommendations to alleviate problems.
6. Coordinate response with other jurisdictions, state agencies and military.
7. Clear roads, mend bridges, effect emergency repairs of the Town water system. Clear roads in the following order: a) east-west thoroughfares
   b) north-south streets
   c) other residential streets
8. Barricade damaged areas.
9. Call private contractors for assistance.
10. Assist in search and rescue operations as directed.
11. Coordinate resources for disaster victims.
12. Transport refuse to dump sites.

SEARCH AND RESCUE - STAGE III

1. Call up SAR personnel as required.
2. Designate a staging area for SAR operations.
3. Coordinate local, state and federal rescue efforts
4. Maintain radio contact with EOC.
5. Transport sick and injured to medical facilities.
6. Provide backup communications as required.

DAMAGE ASSESSMENT - STAGE III

1. Activate assessment teams after authorization from EOC.
2. Deploy assessment teams to disaster locations.
3. Collect damage information and make records.
4. Compile damage assessment reports for appropriate state and federal agencies.
5. Determine unsafe buildings.
6. Keep public informed about unsafe buildings, bridges, roads, drinking water, etc. Post signs.
7. Advise and assist in casualty information.
8. Provide information about damage to utilities and lines.
9. Provide EOC with damage information.

COMMUNICATIONS - STAGE IV

1. Phase down operations as appropriate

2. Clean and repair equipment. Return it to proper location.

3. Submit communications expenditures to proper authorities for repayment.

4. Review procedures and recommend improvements in case of future emergencies.

FIRE DEPARTMENT - STAGE IV

1. Assist with other recovery operations
2. Assist with damage assessments as required.
3. Compile reports for state and federal agencies.
4. Restock emergency medical supplies.
5. Recommend changes to organization plans as necessary.

LAW ENFORCEMENT - STAGE IV

1. Coordinate with Caswell, Yaupon and County Sheriff to maintain a road block at the Oak Island bridge. Allow only identifiable personnel to cross. Property owners may return when safe. Property owners may be identified by comparing a Driver's License or other form of I.D. with computer printout of tax rolls.

2. Allow return of residents when directed by EOC.

3. Assist in return of evacuees to homes.

4. Patrol coast and inland waterway to guard against unauthorized landings.

5. Resume patrols in Town as soon as possible.

6. Assist in damage repairs.

7. Make suggestions for improvements to the Disaster Plan.

PUBLIC WORKS - STAGE IV

1. Assess impact and cost of disaster in terms of resource needs.
2. Assess recovery needs.
3. Identify repair and replenishment needs.
4. Maintain appropriate records.
5. Desseminate information on available materials for recovery to EOC.
6. Repair Town buildings.
7. Provide water and portable sanitary facilities as needed.
8. Suggest changes and improvements to future disaster plans.
9. Recommend changes in planning, zoning and building codes to mitigate damages in future hurricanes.

SEARCH AND RESCUE (SAR) - STAGE IV

1. See that all staff are accounted for.
2. Complete records of activities.
3. Submit reports as required.
4. Inventory equipment and resupply, clean or repair as needed
5. Critique activities and suggest improvements for future actions.

DAMAGE ASSESSMENT - STAGE IV

1. Set up offices in Town to use as a base for federal assistance program applications.

2. Find accomodations for insurance adjustors.

3. Summarize damage assessment reports.

4. Monitor restoration activities.

5. Advise on establishing priorities for emergency repairs.

6. Prepare documents for submission to state and federal government.

7. Use damage information to revise property records and tax records.

8. Review building codes and land-use regulations for possible improvements.

DAMAGE ASSESSMENT REPORT

Date _____

_____
County, city, town or special district

1. Casualties: Dead _____ Injured _____ Missing _____
2. Damage to private property:

	Homes a	Mobile Homes a	Business a	Other a	Dollar Value b	Average Insurance Coverage/ Unit c
Destroyed						
Major damage						
Minor damage						

3. Agriculture damage:
   - A. Farm buildings — d. $ _____
   - B. Machinery and equipment — d. $ _____
   - C. Crop losses — d. $ _____
   - D. Livestock — e. $ _____
4. Public property damage:
   - A. Debris clearance — e. $ _____
   - B. Protective measures — e. $ _____
   - C. Road systems — e. $ _____
   - D. Water control facilities — e. $ _____
   - E. Public building and related equipment — e. $ _____
   - F. Public utilities — e. $ _____
   - G. Facilities under construction — e. $ _____
   - H. Private nonprofit facilities — e. $ _____
   - I. Other (not in above categories) — e. $ _____
5. Total damage — f. $ _____
6. Remarks:

   NOTE: Append maps, photographs, and any other supplemental material desired. See Appendix

INSTRUCTIONS FOR COMPLETING DAMAGE ASSESSMENT REPORT

CASUALTIES: Self-explanatory.

DAMAGE TO PRIVATE PROPERTY:

a. Report number of units in each category that are destroyed or damaged.

Destroyed: Self-explanatory.

Major damage: Extensive repairs required; structure cannot be used for its intended purpose.

Minor damage: Repairs required; structure can be used for its intended purpose.

b. Report the total dollar value of damage in each category.

c. Report the average percent of insurance coverage per unit.

AGRICULTURAL DAMAGE:

d. Agricultural damage assessment should be obtained from the county emergency board (USDA). Attach copy of natural disaster damage assessment report, if available.

DAMAGE TO PUBLIC PROPERTY:

e. Report dollar value of damage to public property in each category. Categories are explained below:

Debris clearance—Removal of trees, limbs, building rubble, etc., from roads and streets to permit orderly flow of traffic; from drainage ditches to allow adequate runoff or flow; from reservoirs to prevent clogging of intakes or damage to structures; from private property within 50 feet of a house; and from any area when considered in the public interest for health and safety.

Protective measures—Measures taken to protect public health and safety and to prevent damage to public or private property. Includes construction of emergency levees, pumping and sandbagging, warning signs and barricades, extra police for the emergency, overtime for regular employees.

Road systems—Damage includes but is not limited to bridges, drainage structures, travelled ways, shoulders and safety features (Non-FAP/FAS roads only. Damage to FAP/FAS roads should be included in the remarks).

Water control facilities—Damage to dikes, levees, drainage channels, irrigation channels, and debris catch basins.

Public buildings and related equipment—Damages to public buildings to the extent not covered by insurance, include the physical plant and equipment in hospitals, libraries, penal and welfare institutions, police and fire stations, public office buildings and recreational buildings. Includes vehicles damaged or destroyed by the disaster (not as a result of operations).

Public utilities—Damage to publicly owned facilities, including water, electric, gas, and sewerage facilities to the extent not covered by insurance.

Facilities under construction—Damage to facilities that were under construction at the time of the disaster to the extent not covered by insurance.

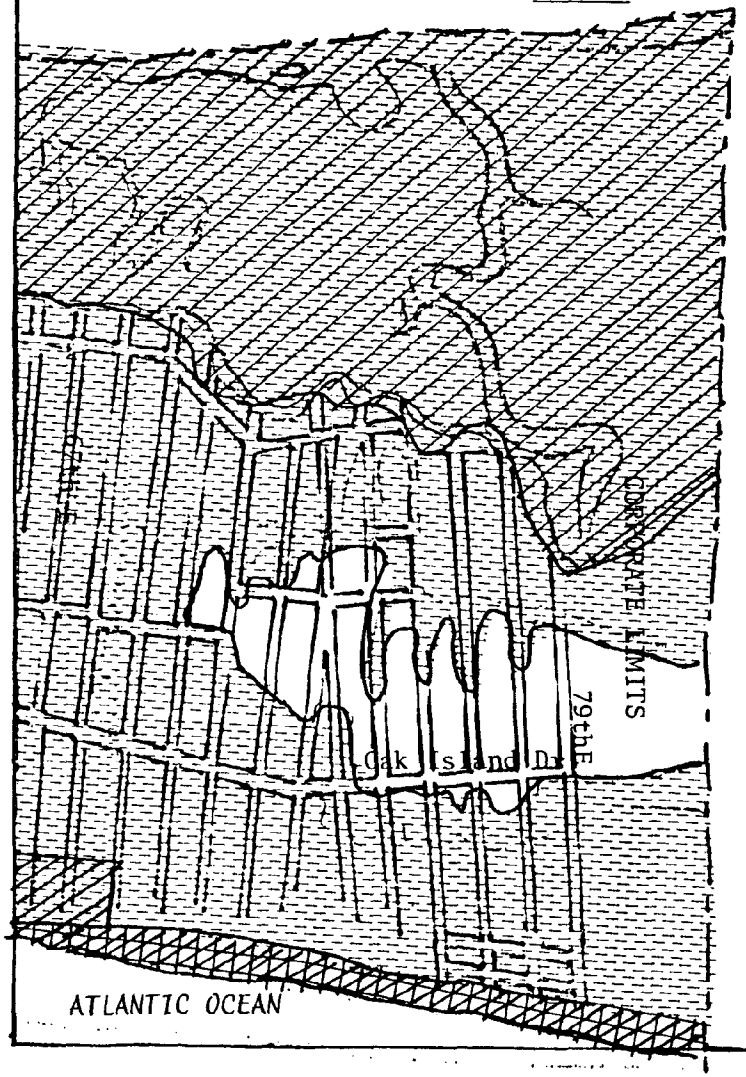
Private, nonprofit facilities—Damages to private, nonprofit educational, utility, emergency medical, and custodial care facilities.

Other—Includes damages to parks and recreational facilities.

APPENDIX

COMPOSITE HAZARD AREA MAP

MAP #1



LEGEND

A E C AREAS

V FLOOD ZONES

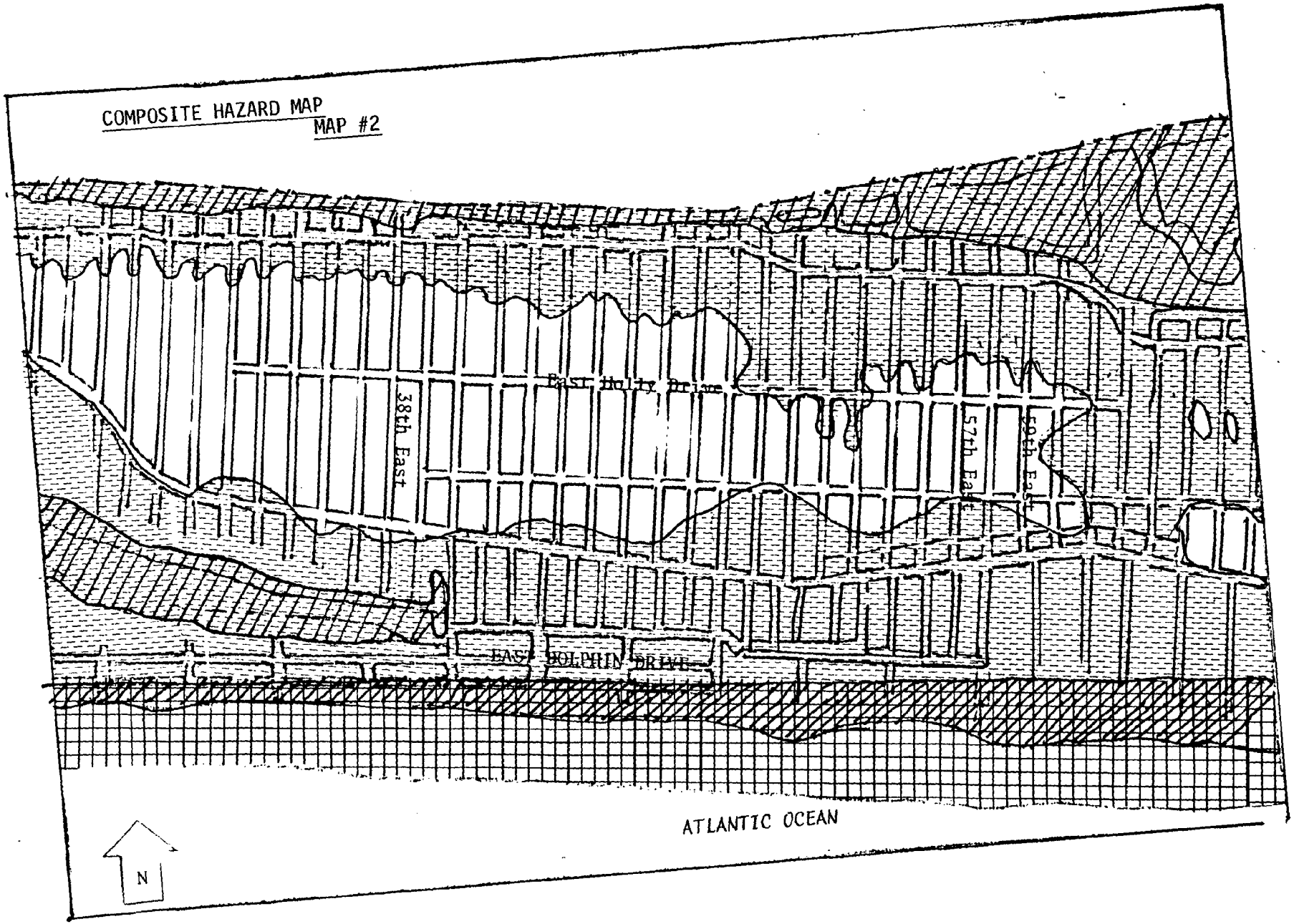
A FLOOD ZONES

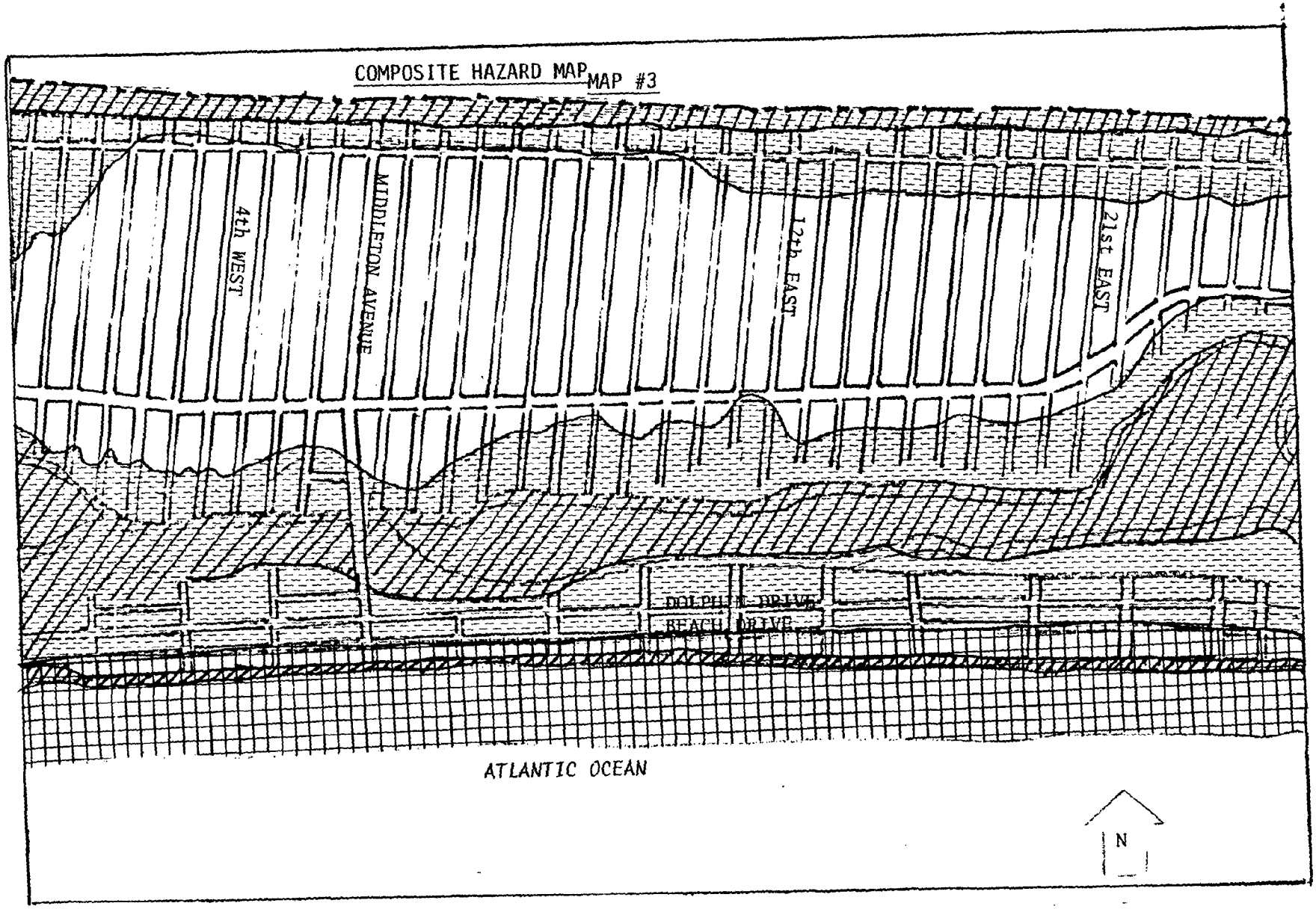
AEC Areas - Areas of Environmental Concern

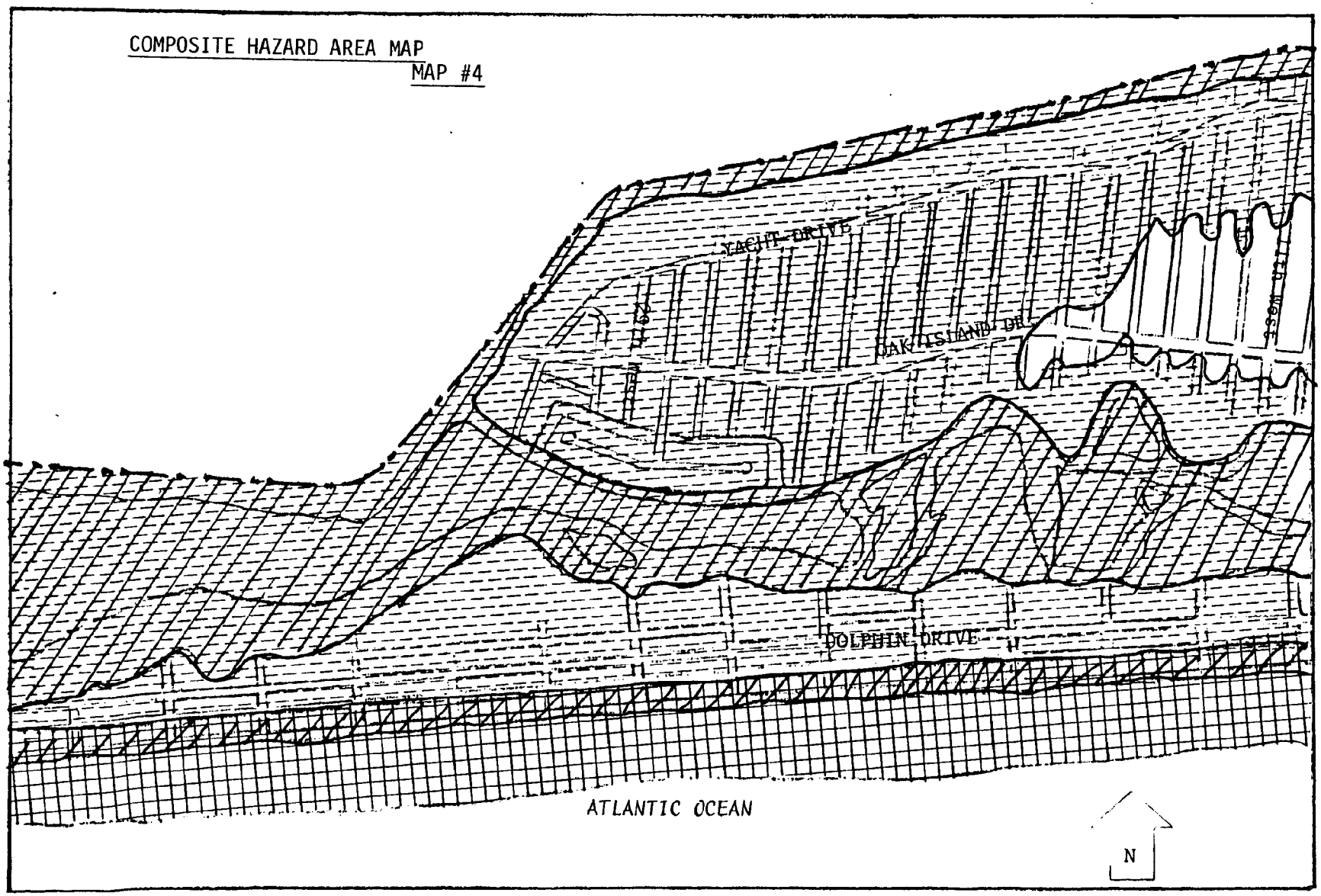
V Flood Zone - Area of special flood hazard with velocity that is inundated by tidal floods.

A Flood Zone - Area of special flood hazard

N

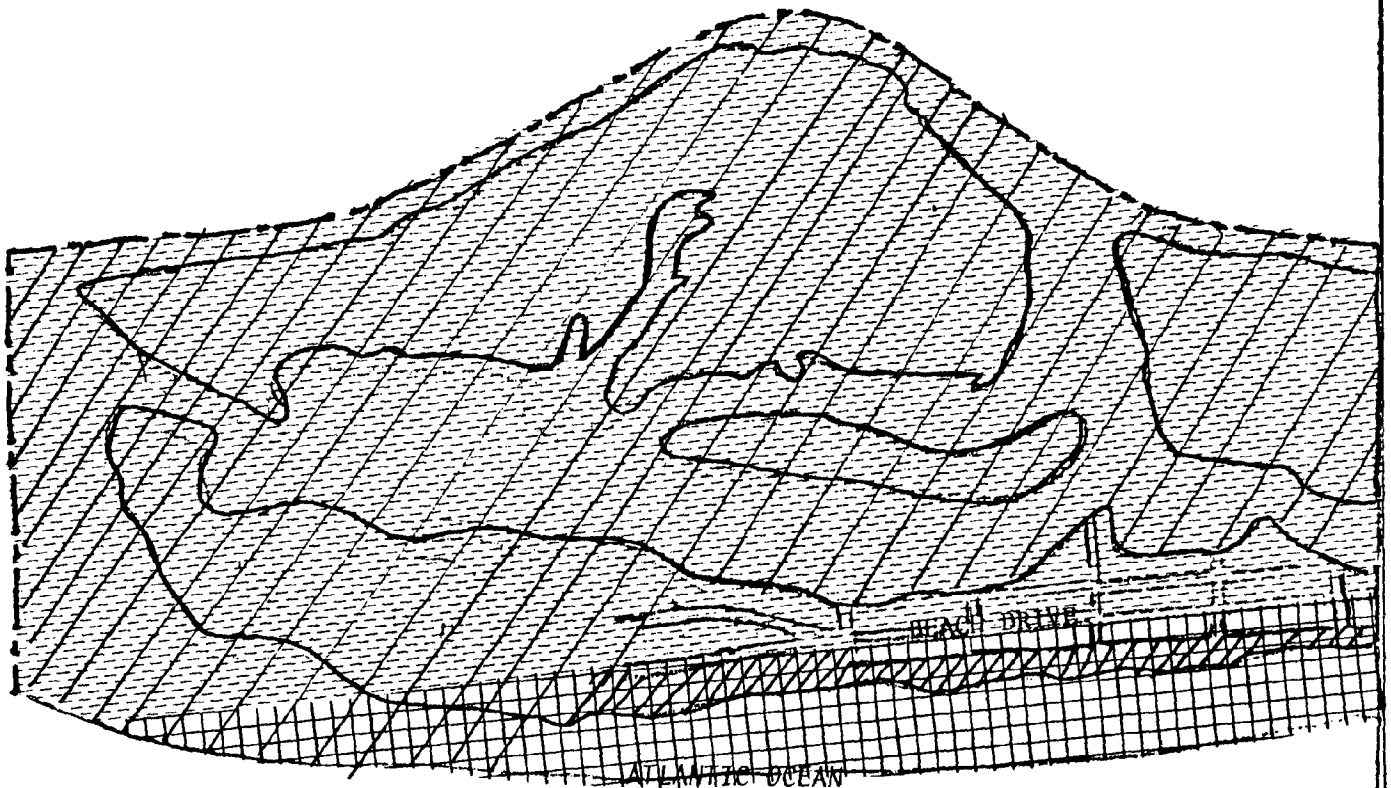

COMPOSITE HAZARD MAP
MAP #2
38th East
East Holly Drive
57th East
58th East
EAST DOLPHIN DRIVE
ATLANTIC OCEAN
N


COMPOSITE HAZARD MAP MAP #3
4th WEST
MIDDLETON AVENUE
12th EAST
21st EAST
DOLPHIN DRIVE
BEACH DRIVE
ATLANTIC OCEAN
N


COMPOSITE HAZARD AREA MAP
MAP #4
YACHT DRIVE
OAK ISLAND DR.
DOLPHIN DRIVE
ATLANTIC OCEAN
N

COMPOSITE HAZARD AREA MAP

MAP #5



OAK ISLAND

VEHICLE PASS

NAME:

AGENCY:

Issued by:

PUBLIC INFORMATION BROCHURE

The overall response to hurricane hazards and reconstruction after a hurricane requires that the public be informed annually of what they need to do prior to a storm. Public information brochures should be printed and distributed to residents and tourists to inform them of actions that should be taken in the event of a hurricane. The following format is suggested for a Town brochure:

* Front cover:
  Map of Long Beach with evacuation routes.

* Inside left:
  What to do when a hurricane approaches:
  - Keep your radio, television or NOAA Weather Radio on and listen for weather service advisories.
  - Plan your time before the storm arrives and avoid last-minute hurry.
  - Leave low-lying areas that may be swept by high tides and storm waves.
  - Leave mobile homes for more substantial shelter.
  - Moor your boat securely. When your boat is moored, leave it, and don't return once the waves are up.
  - Board up windows or protect them with shutters or tape.
  - Secure outdoor objects that might blow away.
  - Store drinking water in clean bathtubs and bottles.
  - Check your battery operated equipment.
  - Keep car fueled.

- Follow the instructions and advice of your local government.
- If an evacuation is ordered:
  Leave early
  Have enough gasoline
  Follow recommended routes
  Listen to the radio

* Inside right:
  After the hurricane:
  - Remain in the shelter until informed to leave.
  - Keep tuned to local radio stations for advice and instructions.
  - Stay out of disaster areas, since sightseeing may interfere with rescue efforts.
  - Drive carefully along debris filled streets. Roads may be undermined and collapse under the weight of your car.
  - Avoid loose or dangling wires and report them to the power company or police.
  - Report any broken water mains
  - Prevent fires since firefighters will be involved in recovery operations and water pressure may be down.
  - Check refrigerated food for spoilage if power is off during the storm.
  - Electrical equipment should be checked and dried before returning to service.
  - Do not use fresh food that has come in contact with flood waters.
  - Obtain a building permit before attempting reconstruction.

* Back page:
  List of shelter areas and location.

THE SAFFIR/SIMPSON HURRICANE SCALE

The Saffir/Simpson Hurricane Scale is used by the National Weather Service to give public safety officials a continuing assessment of the potential for wind and storm surge damage from a hurricane in progress. Scale numbers are made available to public safety officials when a hurricane is within 72 hours of landfall. Scale assessments are revised regularly as new observations are made, and public safety organizations are kept informed of new estimates of the hurricane's disaster potential.

Scale numbers range from 1 to 5. Scale No. 1 begins with hurricanes in which the maximum sustained winds are at least 74 mph, or which will produce a storm surge 4 to 5 feet above normal water level, while Scale No. 5 applies to those in which the maximum sustained winds are 155 mph or more, which have the potential of producing a storm surge more than 18 feet above normal.

The scale was developed by Herbert Saffir, Dade County, Florida, consulting engineer, and Dr. Robert H. Simpson, former National Hurricane Center director, and projects scale assessment categories as follows:

Category No. 1 - Winds of 74 to 95 mph. Damage primarily to shrubbery, trees, foliage, and unanchored mobile homes. No real damage to other structures. Some damage to poorly constructed signs. Storm surge 4 to 5 feet above normal. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

Category No. 2 - Winds of 96 to 110 mph. Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of buildings; some window and door damage. No major damage to buildings. Storm surge 6 to 8 feet above normal. Coastal roads and low-lying escape routes inland cut by rising water two to four hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying island areas required.

Category No. 3 - Winds of 111 to 130 mph. Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings; some window and door damage. Some structural damage to small buildings. Mobile homes destroyed. Storm surge 9 to 12 feet above normal. Serious flooding at coast and

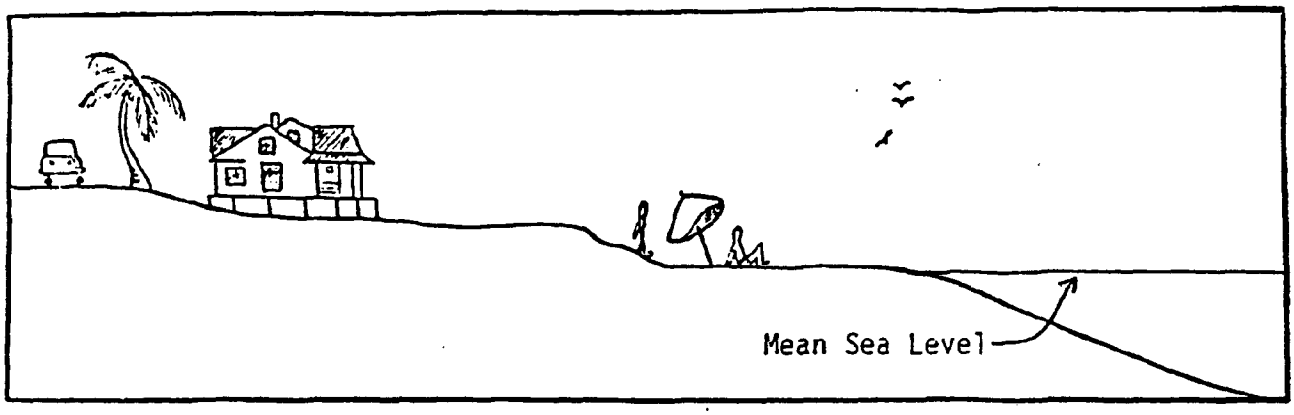
many smaller structures near coast destroyed; large structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Flat terrain 5 feet or less above sea level flooded inland 8 miles or more. Evacuation of low-lying residences within several blocks of shoreline possible required.

Category No. 4 - Winds of 131 to 155 mph. Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows, and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Storm surge 13 to 18 feet above normal. Flat terrain 10 feet or less above sea level flooded inland as far as six miles. Major damage to lower floors to structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within two miles of shore.

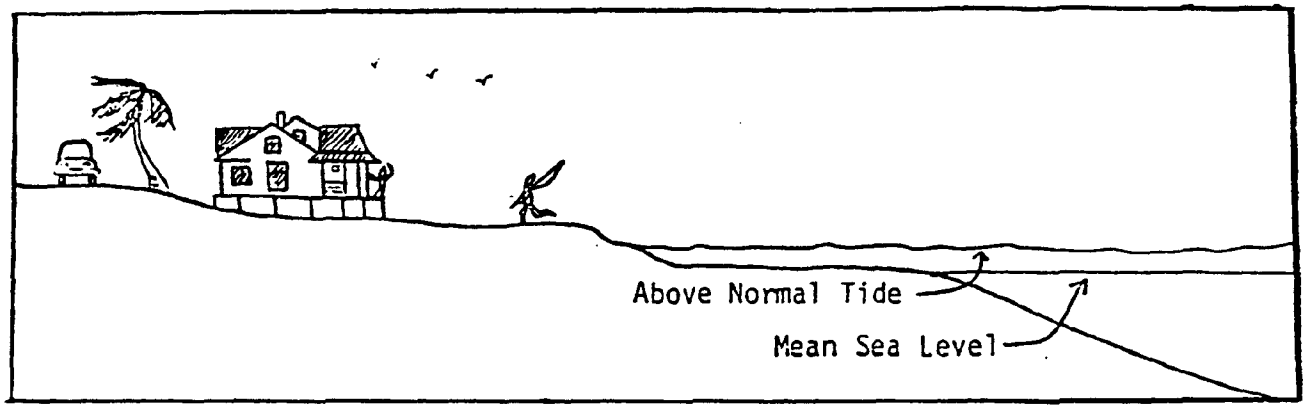
Category No. 5 - Winds greater than 155 mph. Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings over-turned or blown away. Complete destruction of mobile homes. Storm surge greater than 18 feet above normal. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Massive evacuation of residential areas on low ground within five to ten miles of shore possibly required.

Dr. Neil Frank, present National Hurricane Center director, has adapted atmospheric pressure ranges to the Saffir/Simpson Scale. These pressure ranges, along with a numerical break-down of wind and storm surge ranges are:

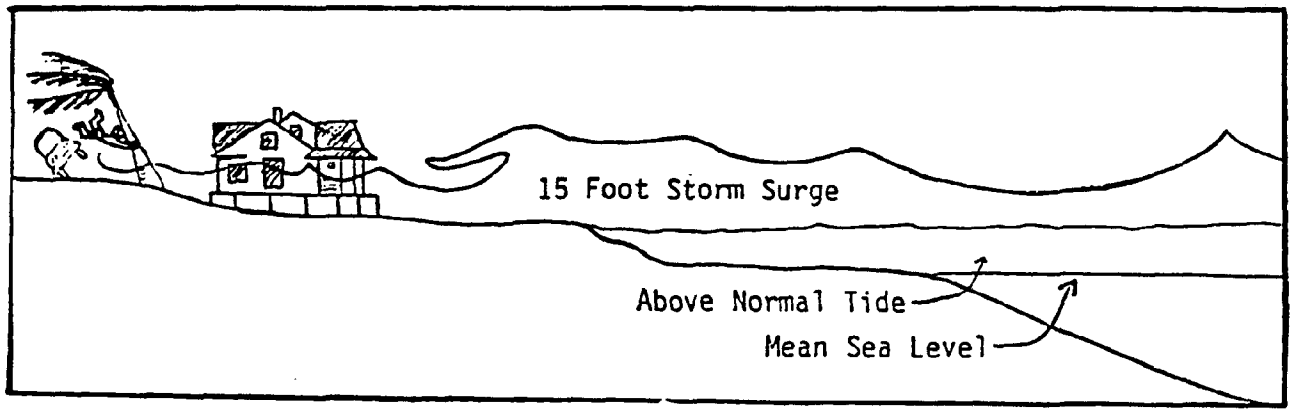
SCALE NUMBER	CENTRAL PRESSURES MILLIBARS	INCHES	WINDS (MPH)	SURGE (FT.)	DAMAGE
1	980	28.94	74- 95	4- 5	Minimal
2	965-979	28.5 -28.91	96-110	6- 8	Moderate
3	945-964	27.91-28.47	111-130	9-12	Extensive
4	920-944	27.17-27.88	131-155	13-18	Extreme
5	920	27.17	155+	18+	Catastrophic



Normal day. The sea rises and falls with astronomical tidal action. There are the usual small waves.



A hurricane is 12 hours away. The tide is a little above normal; the water moves further up the beach. Swells are beginning to move in from the deep ocean. Waves as high as 5 to 8 feet run up the beach.



Hurricane is moving close ashore. A 15-foot surge is added to the normal 2-foot tide creating a 17-foot storm tide. This mound of water is moving ashore along an area of coastline 50 to 100 miles wide.

Development of Storm Surge Along the Coastline*

* _____, "Storm Surge and Hurricane Safety," U.S. Department of Commerce, NOAA, U.S. GPO, 1979.