



EMERGENCY SERVICES
Ocean City
COMMUNITY PREPAREDNESS
for the
2017 HURRICANE SEASON

May 24, 2017

Joseph J. Theobald, Director
Emergency Management

NATURAL AND MAN-MADE HAZARDS

Hurricanes – Nature's Most Deadly Storm

Ocean City Emergency Services:

- Public Awareness and Education
- Lessons Learned
- Daily monitoring of all storms
- Hurricane Tracking Tools and Resources
- Emergency Operations Plan
- Continuity of Operations Plan (COOP)
- Emergency Operations Center

The Public's Emergency Plan forms the partnership!

- WHAT ARE YOUR EXPECTATIONS?
- WHAT ARE THE REALITIES?
- WHAT CAN YOU DO FOR YOURSELVES?
- WHAT IF AN EVACUATION ORDER IS ISSUED?

Perception of Risk

Over the past several years, hurricane warning systems have provided adequate time for people living on barrier islands and the immediate coastline to move inland when hurricanes threaten.

However, it is becoming more difficult to evacuate people from these locations because road improvements have not kept pace with the rapid population growth.

The problem is further compounded because a large percentage of the population now living in hurricane-prone areas have never experienced the core of a "major" hurricane. Many of these people have been through weaker storms or only outer rain bands of the hurricanes.

The result is a false impression of a hurricane's damage potential. This can lead to complacency and delayed actions resulting in injuries and loss of lives.

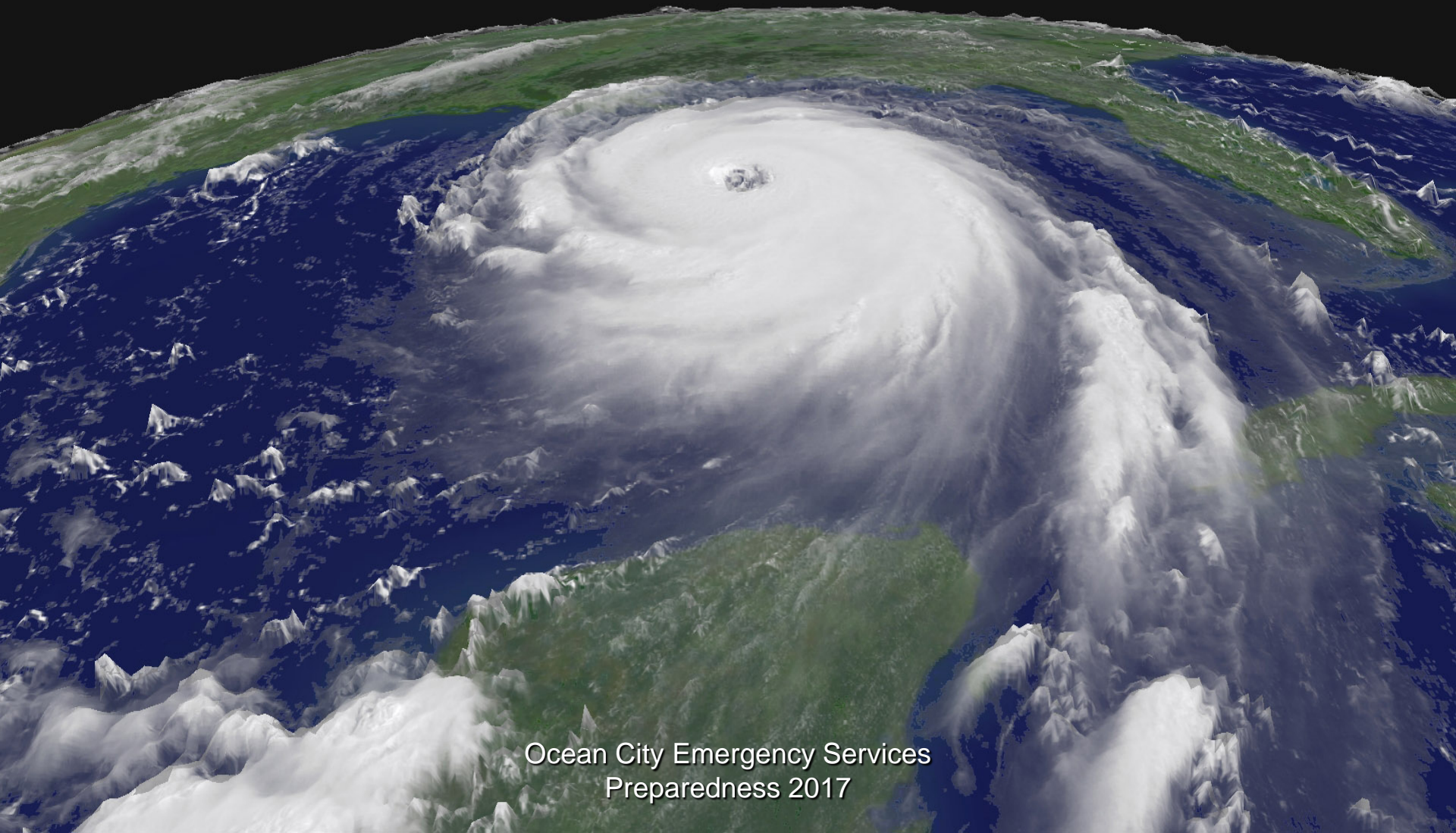
Awareness

- Lack a thorough knowledge of hurricanes.
- Perceive a low level of hurricane risk.
- Believe you are well prepared (the reality is you are not!).
- Believe protective actions too expensive.
- No actions taken to protect family and property.

Pre-Season

- Effective decision making depends on *pre-season preparedness and coordination with the public*.
- Comprehensive Public Education and Awareness Program improves government response and public survival.

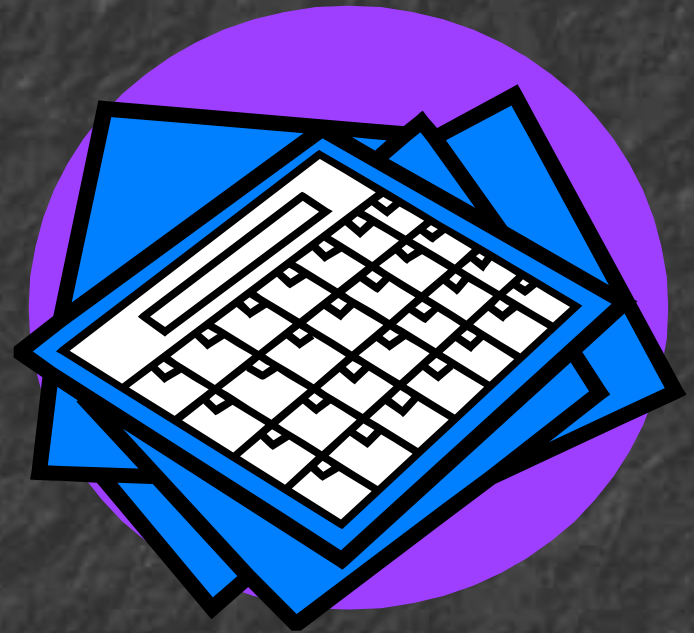
In the final analysis, the only real defense against hurricanes is the informed readiness of our community, your family and YOU.



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When is Hurricane Season?

*June 1st
through
November
30th*

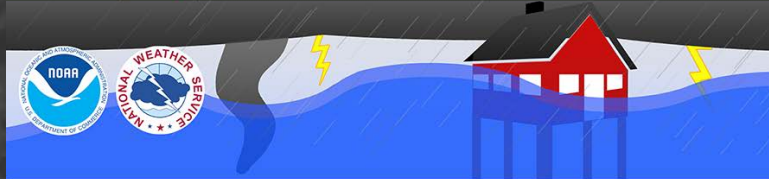




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THINGS TO KNOW ABOUT HURRICANE HAZARD RISKS



1

Storm surge is water pushed ashore by the winds of a tropical cyclone. It has caused more fatalities than any other hurricane hazard.



2

Winds from a hurricane are 74 mph or greater and can cause massive damage to buildings and structures in its path.



3

Inland flooding is the most frequent cause of tropical cyclone fatalities. It can occur far from the coast and long after landfall.



4

Tornadoes are commonly spawned by a hurricane and can cause damage far away from the center of the hurricane.



5

Rip currents and waves along and near the coast can be deadly even if the center of the storm passes well offshore.



For more Hurricane Safety Information, visit
weather.gov/hurricanesafety



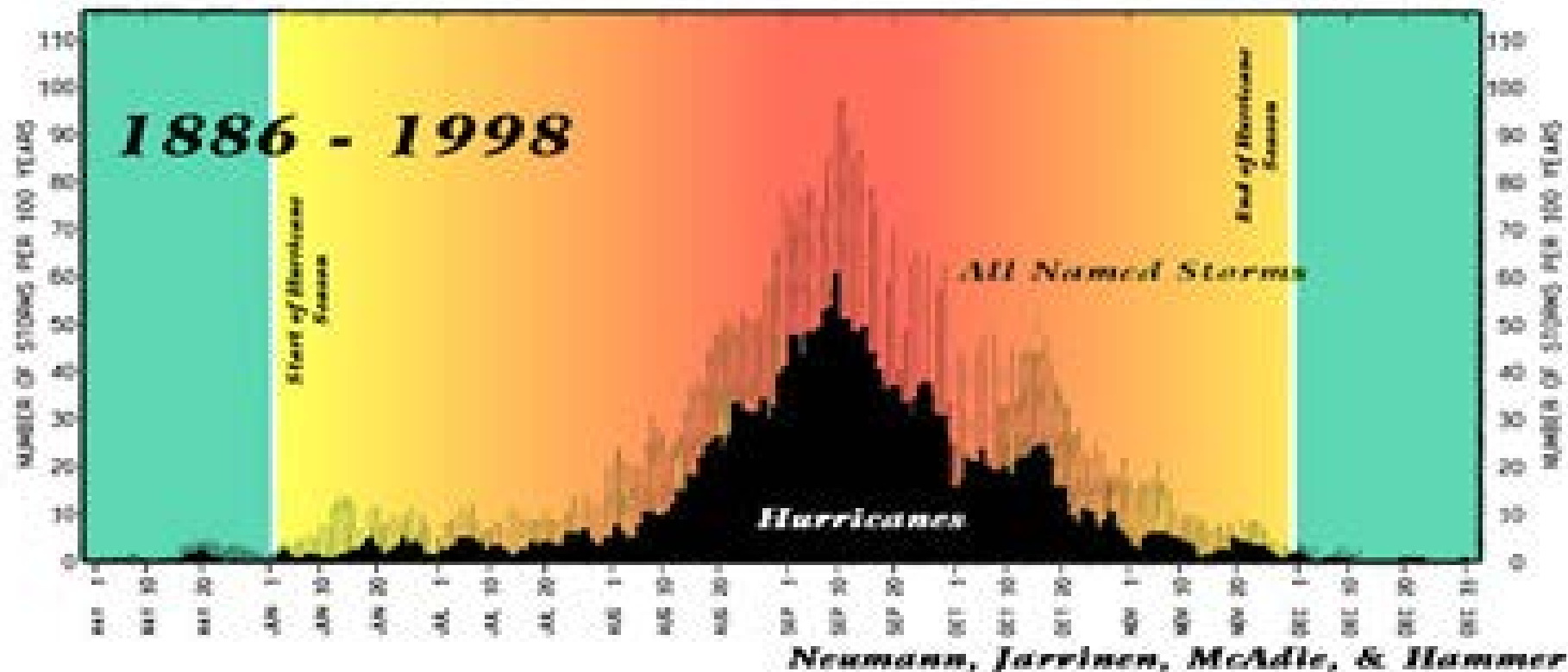
CONTINENTAL UNITED STATES HURRICANE STRIKES 1950 - 2005



NOAA'S NATIONAL CLIMATIC DATA CENTER, ASHEVILLE, NORTH CAROLINA

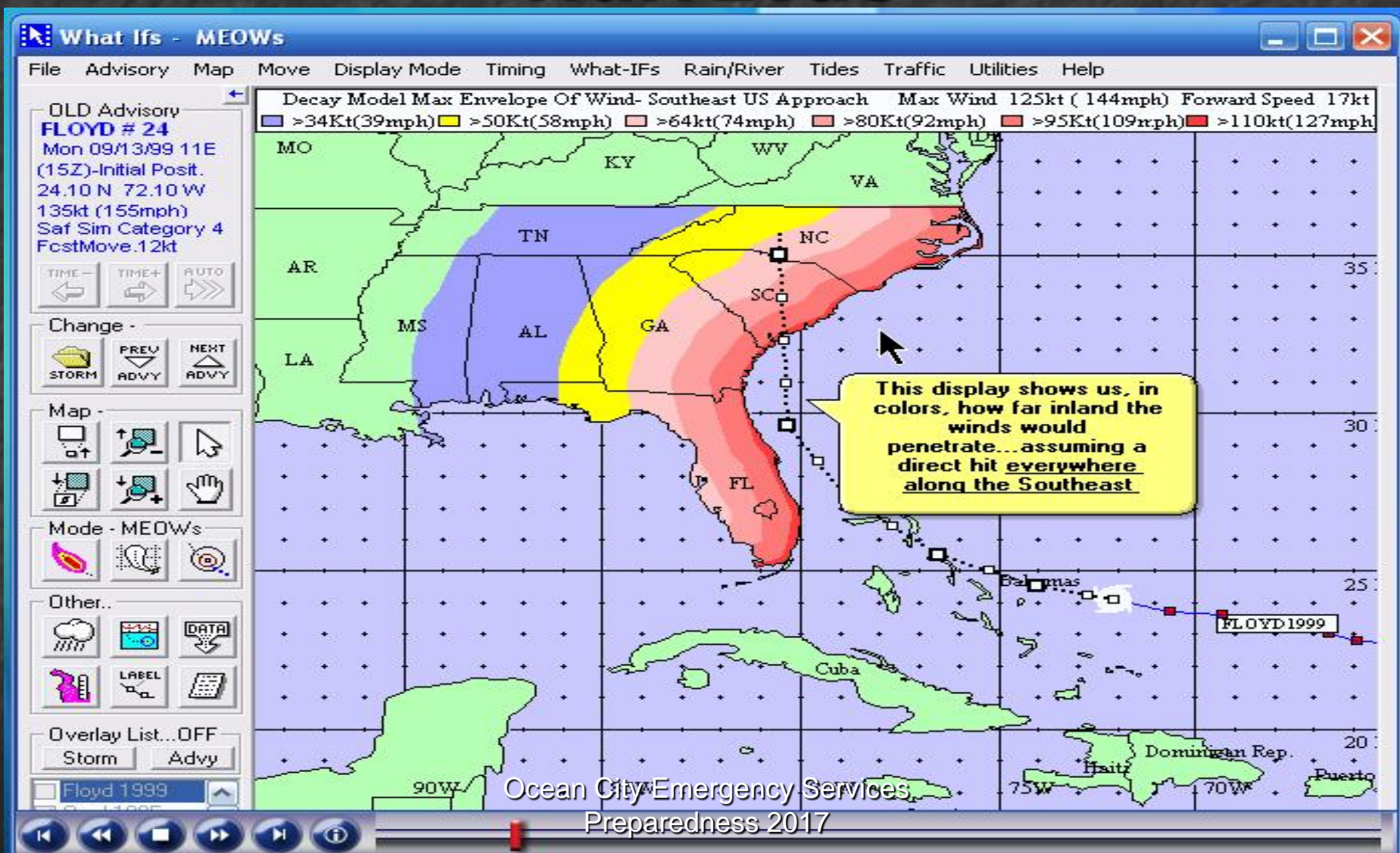
Protect Ocean City Emergency Services' future

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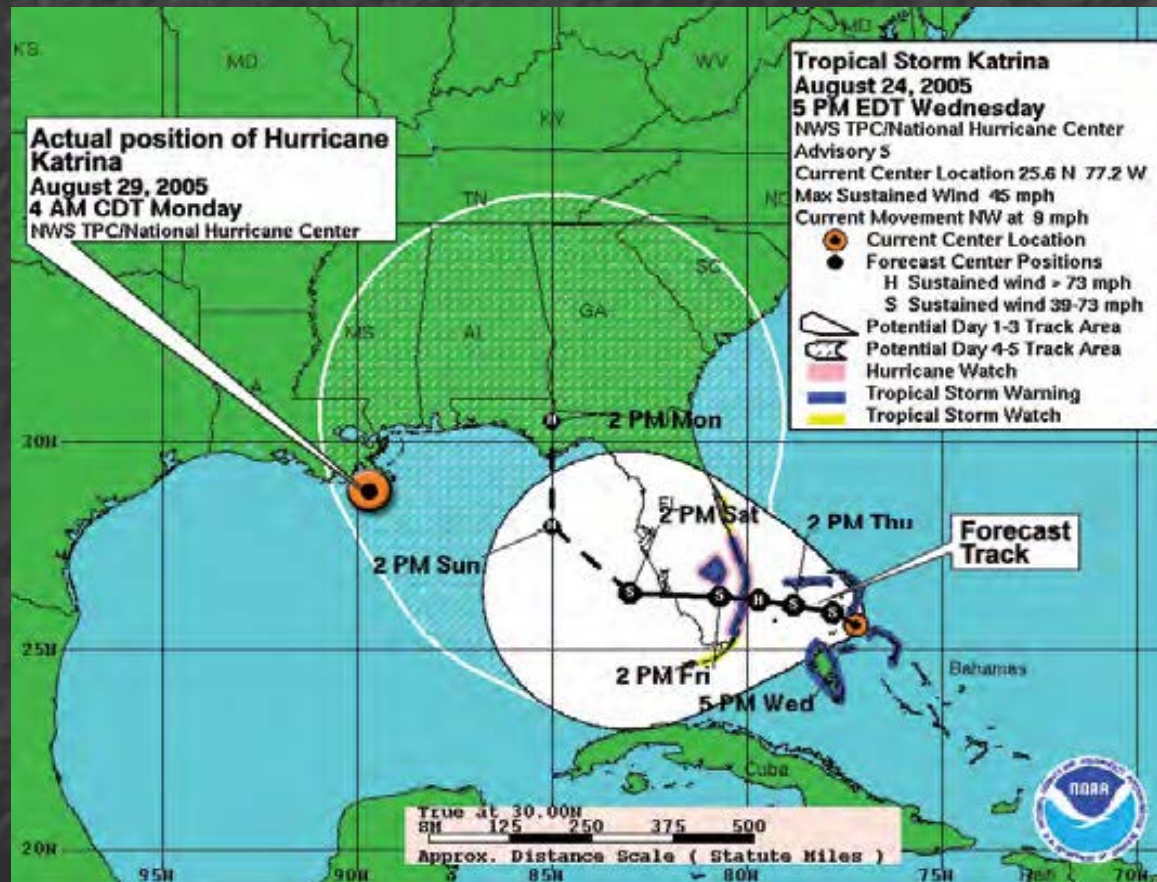


The "hurricane season" is just a name for the time period when we expect to see tropical systems develop. September 12th has been recorded as the "peak" date for Hurricane development.

Hurricane Tracking Software: HurrEvac



Don't Focus on the Skinny Black Line!



The forecast track today remains within the cone for the entire five days about two-thirds of the time.

Ocean City Emergency Services

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Emergency Operations Center Staffing

- Ocean City Mayor and City Council
- Ocean City, City Manager
- Ocean City Emergency Services Director
- Ocean City Departmental Representatives
- Federal, State and County Allied Agencies
- Support Organizations (Delmarva Power-HMRA-Verizon-Eastern Shore Gas- DCMA-Montego Bay Assoc., Media)

Emergency Operations Center Capabilities

- Full City Radio System capability
- Computer Aided Dispatch
- Internet Access and Government Web Site
- Hurricane tracking software (HurrEvac-Hurrtrak-WebEOC-Emnet, IPAWS and EAS System)
- Government Access Channel and Comcast Cable System override
- Ocean City Radio Stations WPSB 99.5 and WWOP 100.3
- Additional phone lines

OCEAN CITY COMPREHENSIVE EMERGENCY OPERATIONS PLAN (EOP)



Advisory Radio Station



- WPSB 99.5 FM is broadcast from the 65th Street Public Safety Radio Tower and can be received in the greater Ocean City area. WWOP 100.3 FM.

Other Methods of Alerting the Public

- Emergency Alert Systems (EAS)
- Integrated Public Alert Systems (IPAWS)
- Ocean City Cable TV System
- Ocean City FM Radio
- Ocean City Govt delivery
- Ocean City Hotline



OCEAN CITY EVACUATION PHASES

PHASE ONE

- 1.) All persons desiring to travel to Ocean City, Maryland, are asked to postpone their visits until the existing situation improves.
- 2.) Mobile home residents in Ocean City and those living in known flood prone areas should secure their homes and prepare for possible evacuation.
- 3.) Persons should secure or move all watercraft.

OCEAN CITY EVACUATION PHASES

PHASE ONE...continued

- 4.) All persons are asked to tune into Ocean City Government Access Channel (Channel 4) for detailed information or advisories.
- 5.) Initiate evacuation of all International workforce students.
 - a.) All International workforce students will report to assigned transportation pick-up location.
 - b.) All International workforce students will be transported to pre-determined staging locations.
 - c.) The International workforce students will then be under the jurisdiction, and become the responsibility of, the State of Maryland, by prior agreement, for further transportation and relocation.

OCEAN CITY EVACUATION PHASES

PHASE TWO

- 1.) All non-resident property owners, vacationers and visitors are requested to evacuate the island.
- 2.) All mobile home residents and occupants of known low lying areas are requested to evacuate.
- 3.) The Mayor will issue and enforce an order to close the Beach to all persons.
- 4.) Ocean City will utilize the municipal transportation system for relocation of people with special needs.

OCEAN CITY EVACUATION PHASES

PHASE TWO...continued

- 5.) Ocean City has opened the Convention Center and the North Side Recreation Park as pre-designated pick-up locations to relocate people to mainland safe havens.
- 6.) The Worcester County Department of Emergency Services has opened or is requested to open shelters.
- 7.) The draw span on U.S. Route 50 Bridge will be closed to all boat traffic and will remain closed.
- 8.) All persons should stay tuned to the Ocean City Government Access Channel (Channel 4), Ocean City FM 99.5 or 100.3, and local radio and television stations for additional information.

OCEAN CITY EVACUATION PHASES

PHASE THREE

- 1.) The Mayor of Ocean City, Maryland, has signed a proclamation declaring a local State of Emergency.
- 2.) All persons other than identified Emergency Personnel are ordered to evacuate.
- 3.) Utilizing the authority under a local State of Emergency, the Mayor will ban the sale of alcohol in Ocean City and request that all businesses close immediately.
- 4.) Worcester County has opened shelters.

OCEAN CITY EVACUATION PHASES

PHASE THREE....continued

- 4.) All incoming traffic to Ocean City, Maryland, will be limited to emergency personnel. No other vehicles will be permitted entry to the Island, except by approved authority (Mayor, City Manager, or Emergency Services Director).
- 5.) Ocean City Municipal Transportation System is providing transportation for special needs individuals.
International student workforce evacuation has been completed.
- 6.) The Ocean City Government Cable Access Channel will remain operational for further advisories.

OCEAN CITY EVACUATION PHASES

PHASE FOUR

- 1.) The Mayor has ORDERED a complete evacuation of Ocean City, Maryland. All remaining persons are to evacuate at this time.
- 2.) No incoming traffic will be allowed in Ocean City, Maryland until further notice.
- 3.) All public transportation is being shut down until further notice.
- 4.) The Mayor has ordered all City personnel to seek shelter and safe haven until further notice.
- 5.) Please stay tuned to NOAA weather radio, Ocean City FM 99.5 or 100.3, and local radio and television stations for further information or advisories.

Evacuation Routes

- All traffic from 62nd Street south will be routed south on Philadelphia Avenue and over the U.S. Route 50 Bridge via the westbound lanes.
- All evacuation traffic from the Delaware State Line south to 62nd Street will be routed south on Coastal Highway via the southbound lanes and over the Maryland Route 90 Bridge via both lanes.
- Baltimore Avenue, from the Inlet to 15th Street, will be north bound only. St Louis Avenue from 17th Street to Somerset Street will be used for emergency traffic only (unless flooded), and Coastal Highway, from 19th Street to the Delaware State line north bound lanes will be reserved for two way emergency traffic only.
- U.S. Route 50 east bound lanes will be reserved for two-way emergency traffic only.
- No eastbound traffic except emergency vehicles will be allowed on Maryland Route 90.

TSUNAMIS



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T s u n a m i s

pronounced soo-ná-meess, also known as seismic sea waves (mistakenly called “tidal waves”), are a series of enormous waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more.

From the area where the tsunami originates, waves travel outward in all directions. Once the wave approaches the shore, it builds in height. The topography of the coastline and the ocean floor will influence the size of the wave. There may be more than one wave and the succeeding one may be larger than the one before. That is why a small tsunami at one beach can be a giant wave a few miles away.

All tsunamis are potentially dangerous, even though they may not damage every coastline they strike. A tsunami can strike anywhere along most of the U.S. coastline.

TSUNAMI WARNING

When information is received from the National Weather Service that our area is under a Tsunami Warning the general population should be aware and react to the following:

:

- Differentiate between a Tsunami Siren Alert and other siren alert.
- Proceed to at least the 2nd floor level of a structurally sound high rise building near-by. Remain in the building until conditions are safe to leave.
- Stay away from the beach. If you can see the wave you are too close to escape it.
- Tune into the Town of Ocean City's AM Radio Station at 1670AM, for emergency information.
- Turn on your Television to any COMCAST Channel in Ocean City. Our Town's Division of Emergency Management will make voice override announcements ,during the emergency over this system.

CAUTION - If there is noticeable recession in water away from the shoreline, and NO WARNING IS HEARD, this is nature's tsunami warning and it should be heeded. You should move away immediately. The following are guidelines for the period following a tsunami:

- Stay away from flooded and damaged areas until officials say it is safe to return.
- Stay away from debris in the water; it may pose a safety hazard to boats and people.

Save Yourself not your possessions!

Comparison of Terms

- **Tropical Disturbance**

group of thunderstorms in the tropics that are present for at least 24 hours

- **Tropical Wave**

lack of circulation, winds <25 mph and every direction

- **Tropical Depression**

closed circulation but disorganized, winds > 25 mph

- **Tropical Storm**

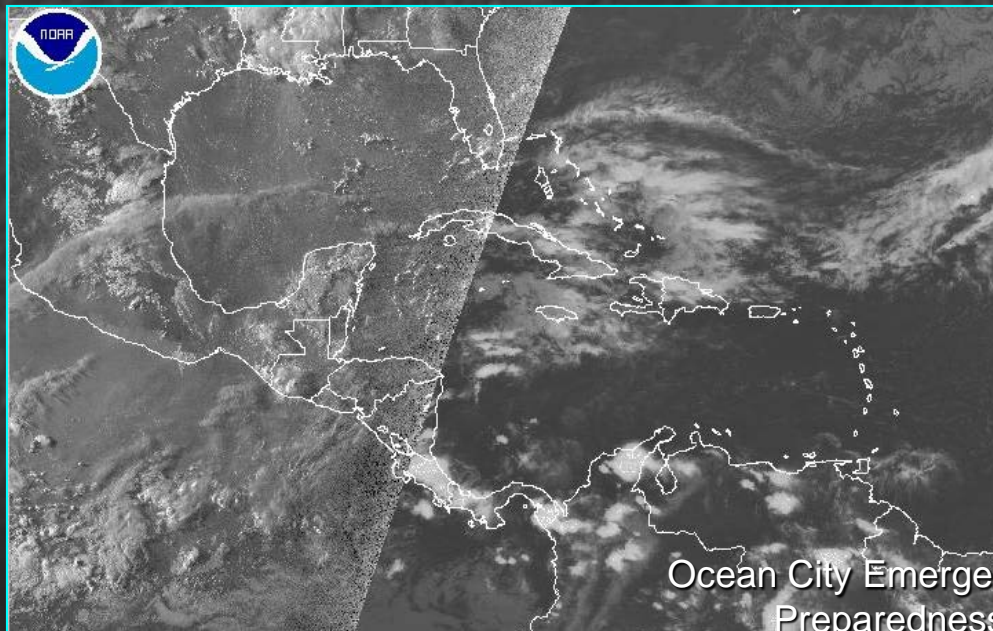
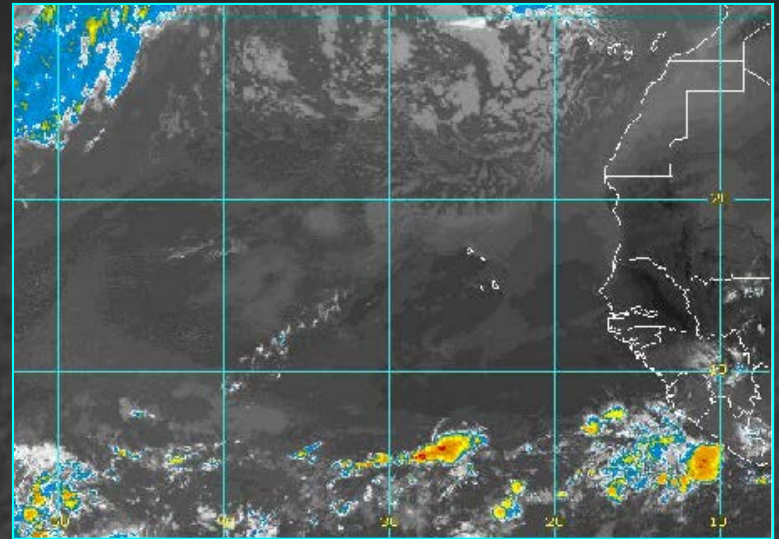
showers and thunderstorms move over closed circulation, winds > 39 mph

- **Hurricane**

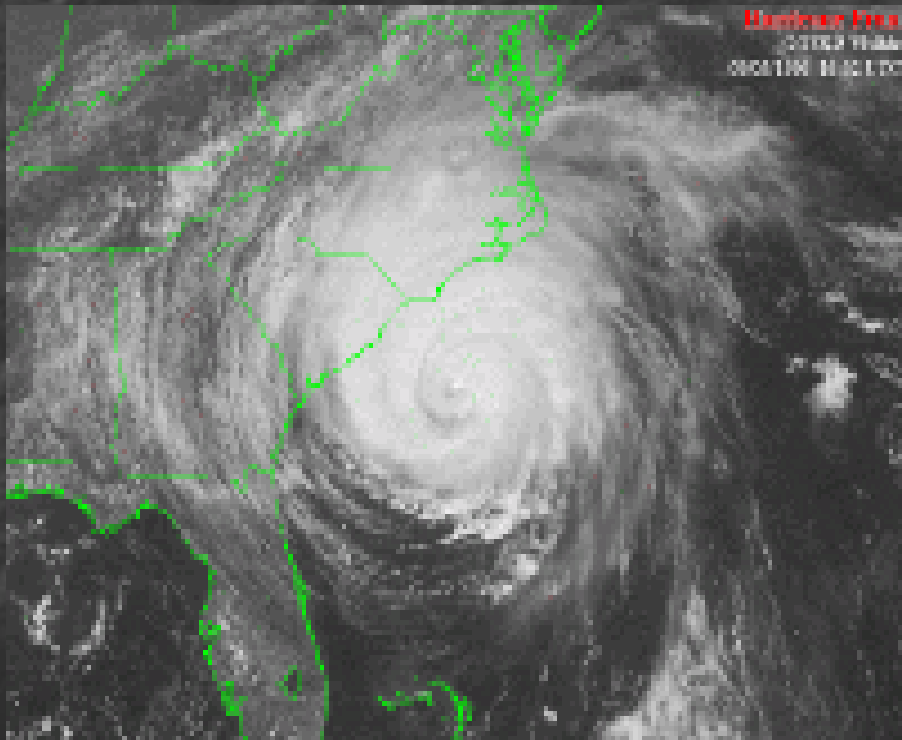
Eye is developed, winds > 74 mph

Storms of the Atlantic basin will begin forming in one of three places:

- Off the coast of Africa
- In the Caribbean Sea
- In the Gulf of Mexico

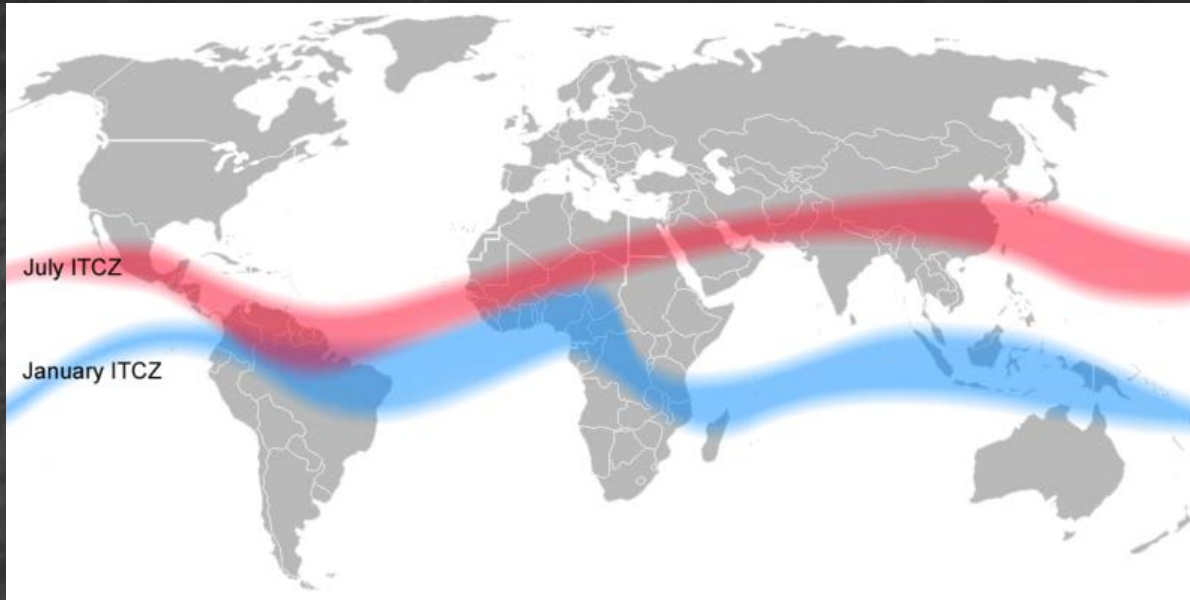


What conditions must be present for a hurricane to develop?



- Warm ocean temperatures ($>80^{\circ}$ F) up to 60m deep
- Little to no wind shear
- Low pressure system at least 5° North or South of Equator
- Rotation caused by winds

Inter-Tropical Convergence Zone

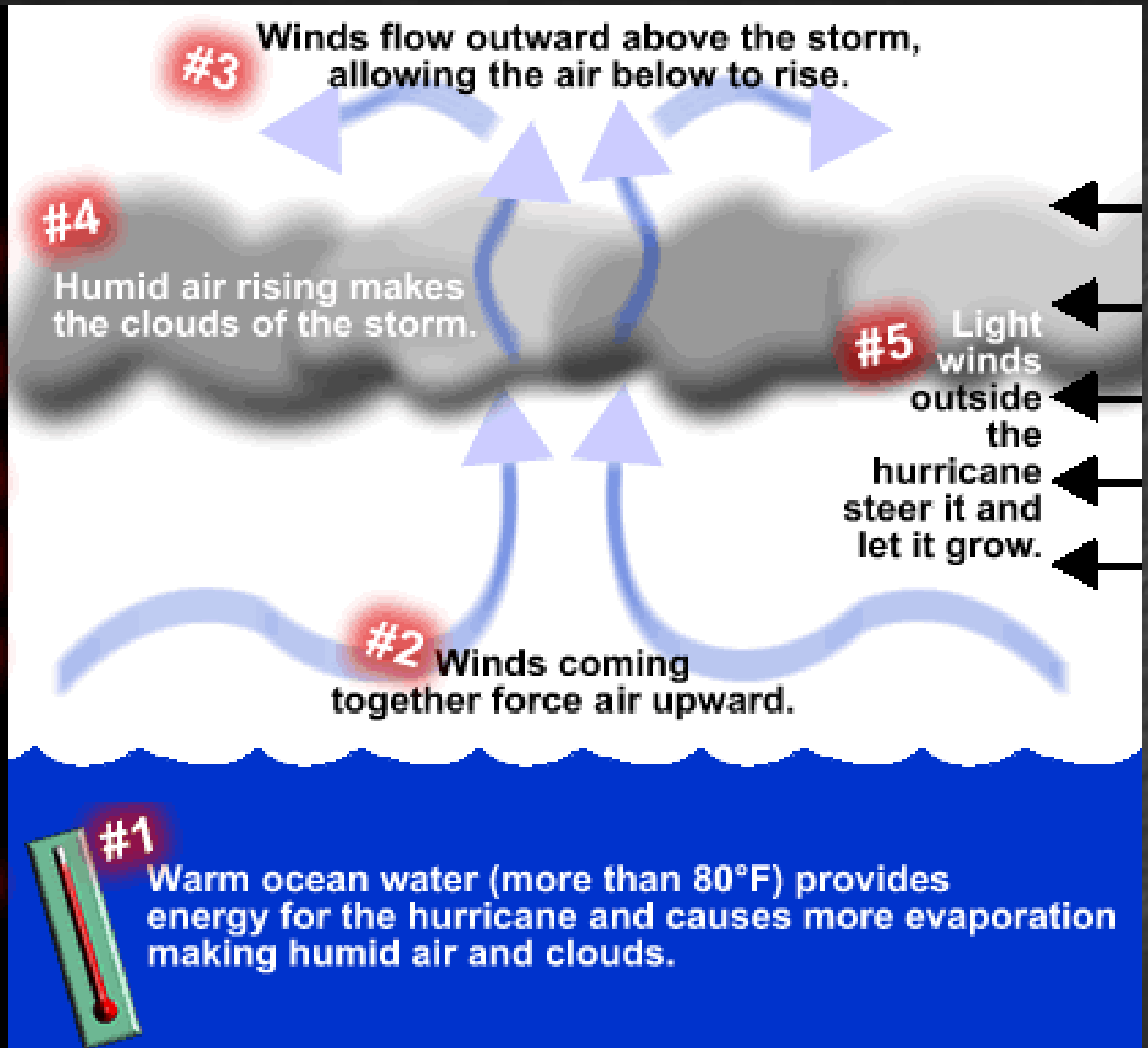
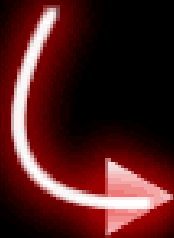


The ITCZ is an area of low pressure located roughly 5 degrees North and South of the Equator. It is a place where air converges, rises, and condenses (forming clouds).

Intertropical convergence zone

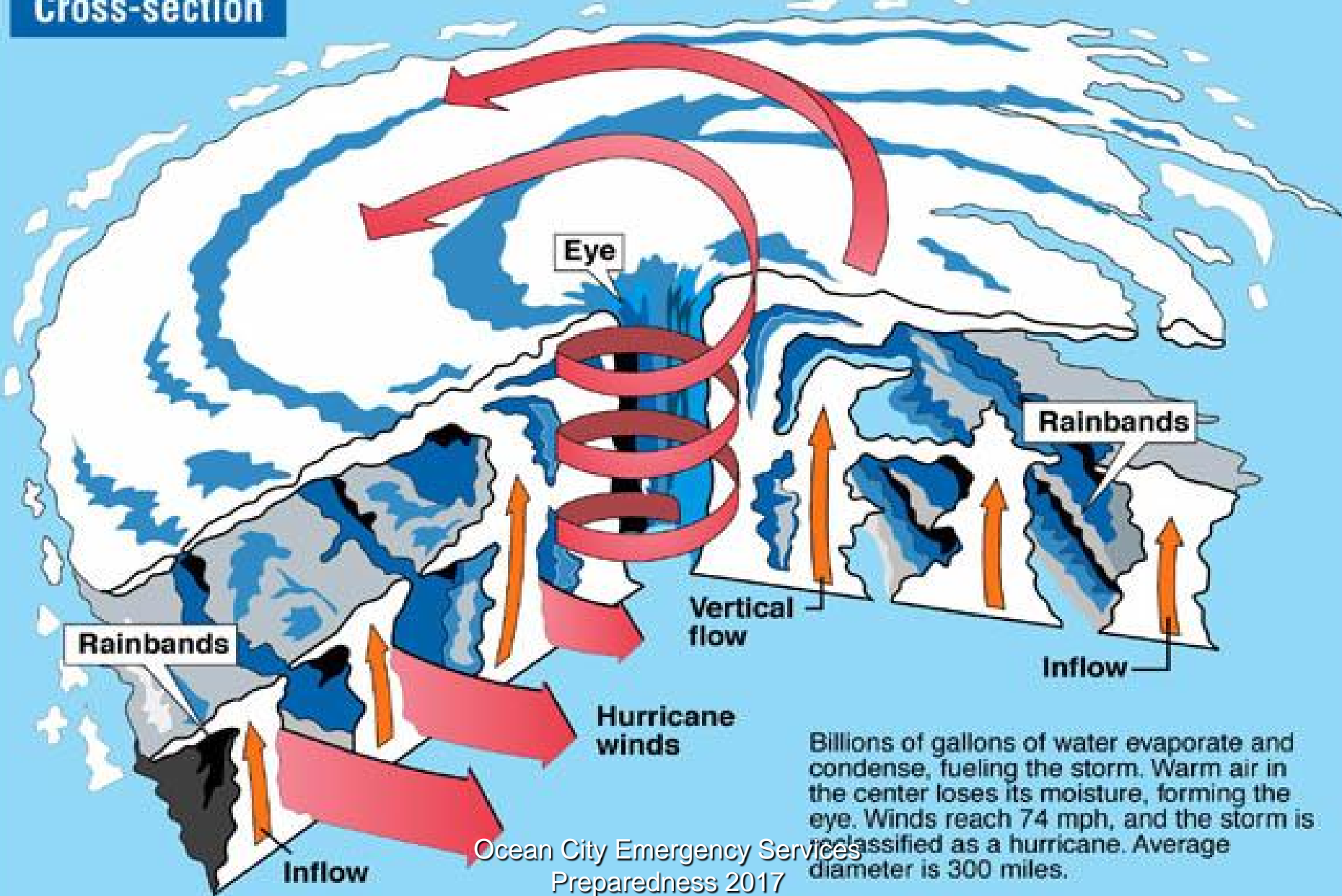


WHAT DOES A HURRICANE NEED?



Anatomy of a hurricane

Cross-section

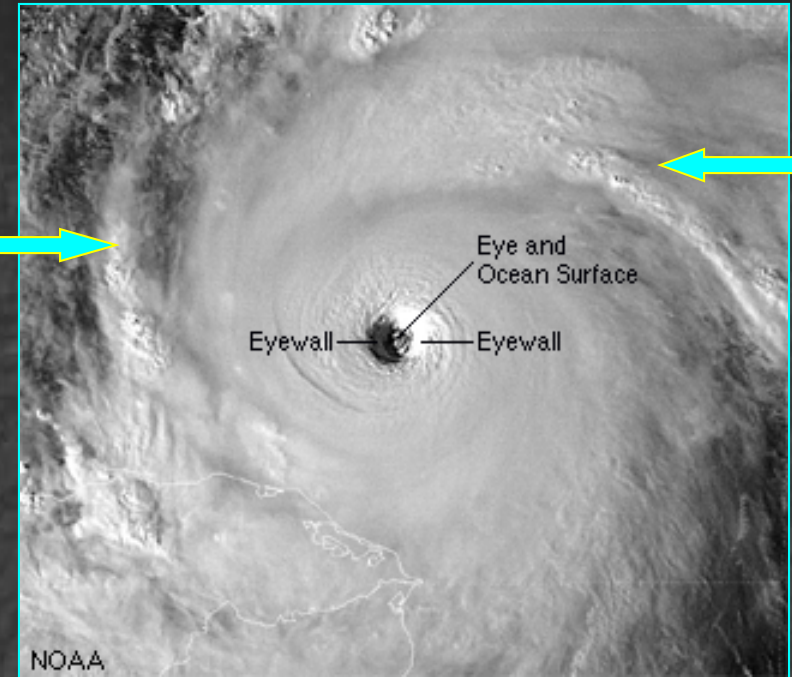


Hurricane Anatomy

A hurricane can best be described as a huge tropical storm (can be up to 600 miles in diameter and winds can be up to 200 mph)!

The winds are the strongest around the eye wall , a doughnut-shaped area of intense cumulonimbus development and very strong winds surrounding the eye of a hurricane.

Arrows indicate
"feeder bands"
or "rain bands"



The eye of the storm is usually about 20 miles in diameter at the center. Within the eye, winds are calm and the weather is great. Strongest winds are on the right side, heaviest rain is usually on the left side.

Saffir-Simpson Scale is used to categorize Hurricanes

Category	Max Wind Speed (mph)	Min. Surface Pressure (mb)	Storm Surge (ft)
1	74-96	> 980	3-5
2	97-111	979-965	6-8
3	112-131	964-945	9-12
4	132-155	944-920	13-18
5	> 155	< 920	>19

Hurricane Damage

CAT 1 - Minimal: *Damage primarily to shrubbery, trees, foliage and unanchored mobile homes.*

CAT 2 - Moderate: *Some trees blown down. Major damage to exposed mobile homes. Some damage to roofing materials, windows and doors.*

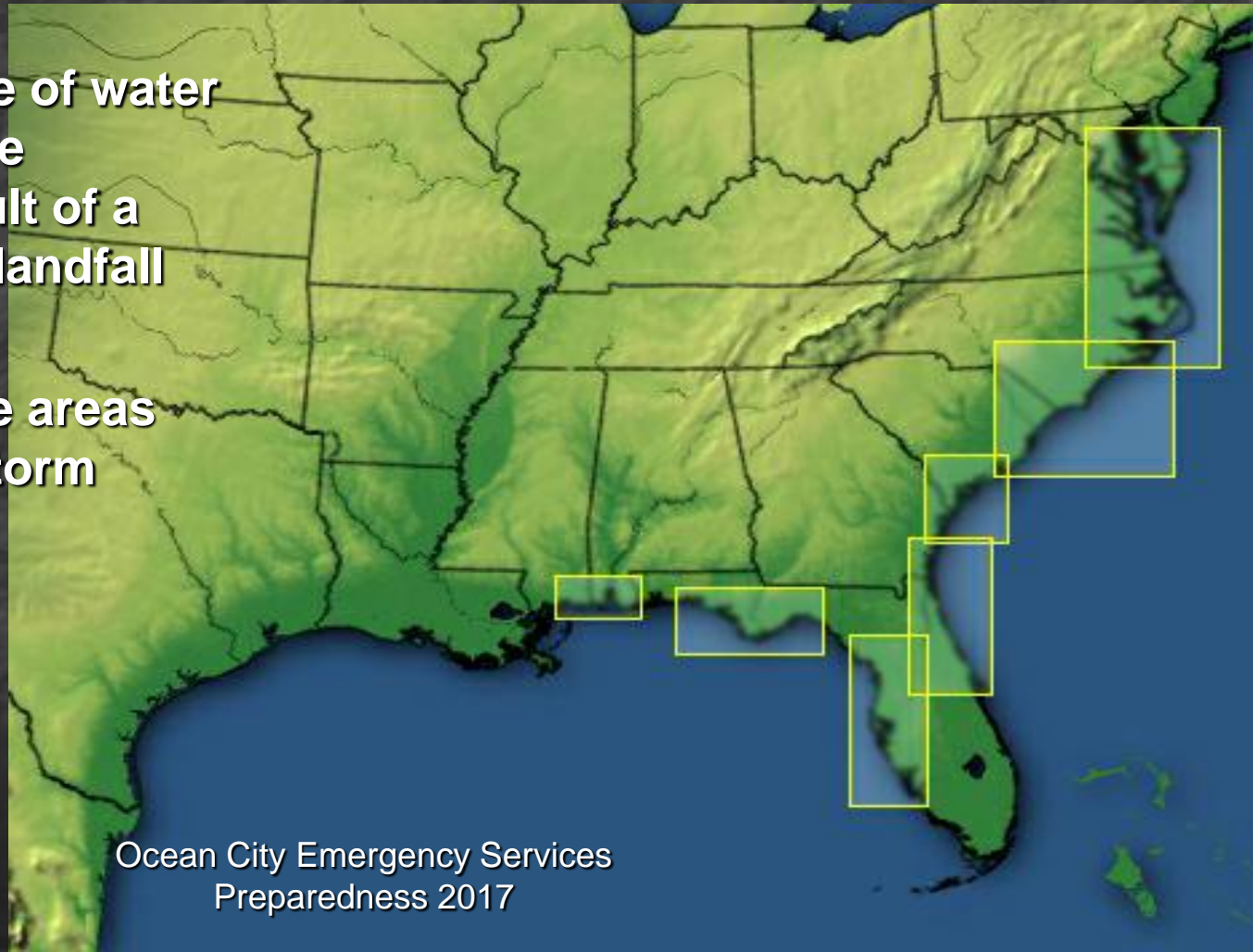
CAT 3 - Extensive: *Large trees blown down. Mobile homes destroyed. Some structural damage to roofing materials of buildings. Some structural damage to small buildings.*

CAT 4 - Extreme: *Trees blown down. Complete destruction of mobile homes. Extensive damage to roofing materials, windows and doors. Complete failure of roofs on many small residences.*

CAT 5 - Catastrophic: *Complete failure of roofs on many residences and industrial buildings. Extensive damage to windows and doors. Some complete building failures.*

What is a storm surge?

- Large wall or dome of water that rushes into the coastline as a result of a hurricane making landfall
- To the right are the areas affected by high storm surges



Storm Tide



Storm Tide

The storm tide is the combination of the storm surge and the astronomical tide. If the storm surge arrives at high tide, the water height will be even greater. For example, as a hurricane moves ashore, a 15-foot surge added to the 2-foot high tide creates a storm tide of 17 feet. This mass of water, topped by battering waves, moves ashore along an area of the coastline as much as 100 miles wide. The combination of the storm surge, battering waves and high winds can be deadly and can cause great property damage.

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CATEGORY 3 STORM SURGE

Bay St. Louis, Mississippi



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Hurricane Sandy October 2012 33rd Street Ocean City



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Watch vs. Warning

What is the difference between a Hurricane Watch and a Hurricane Warning?

- **Watch** – Hurricane poses a threat to coastal areas with 48 hours
- **Warning** - Hurricane conditions are expected in a coastal area within 36 hours

Hurricane Watch

- Frequently listen to radio, TV or NOAA Weather Radio for official bulletins of the storm's progress.
- Fuel and service family vehicles.
- Inspect and secure mobile home tie downs.
- Have extra cash on hand.
- Prepare to cover all windows and doors with shutters or other shielding materials.
- Check batteries and stock up on canned food, first-aid supplies, drinking water and medications.
- Bring in light-weight objects such as garbage cans, garden tools, toys and lawn furniture.

Hurricane Warning

- Closely monitor radio, TV or NOAA Weather Radio for official bulletins.
- Follow instructions issued by local officials. *When ordered to evacuate, leave as soon as possible.*
- Notify neighbors and a family member outside of the warning area of your evacuation plans.
- Turn off utilities if told to do so by local officials.
- Turn off propane tanks.
- Unplug small appliances.

Prior to Hurricane Season

- Determine safe evacuation routes inland.
- Learn location of official shelters.
- Make emergency plans for pets.
- Check emergency equipment, such as flashlights, generators and battery-powered NOAA Weather Radio and cell phones.
- Buy food that will keep and store drinking water.
- Store plywood or other materials to protect your home.
- Clear loose and clogged rain gutters and downspouts.
- Trim trees and shrubbery.
- Decide where to move your boat in an emergency.
- Review your insurance policy.

BEFORE THE DECISION: KNOW YOUR ZONE & DIVISION

In times of an emergency, specifically a hurricane or natural disaster, the Town of Ocean City wants residents, property owners and visitors to **KNOW YOUR ZONE & DIVISION** where you live and visit! Your zone and division are determined by two variables: Property location and vulnerability to flood inundation.

OCEAN CITY DIVISIONS			OCEAN CITY FLOOD INUNDATION ZONE	
1	RED	Inlet to 33 rd Street	A	4' FLOOD INUNDATION ZONE
2	YELLOW	33 rd Street to 62 nd Street	B	5' FLOOD INUNDATION ZONE
3	BLUE	62 nd Street to 100 th Street	C	6' FLOOD INUNDATION ZONE
4	ORANGE	100 th Street to DE Line		

The zone colors, which are broken down by divisions, are determined by the Town of Ocean City's Comprehensive Emergency Operations Plan, which divides the Town into four "divisions." The zone letters (A, B & C), however, are determined by the possible flood inundation levels where you live. In other words, our "Low Lying Area" (or areas with a 4 foot flood inundation) can be found in Zone A.

Because the term "Low Lying Area" can be vague, the new zones help residents and property owners have a clear understanding of their flood vulnerability. It's important to remember that just because you haven't experienced a flood in the past, doesn't mean you won't in the future. Flood risk isn't just based on history; it's based on a number of factors: rainfall, river-flow and tidal-surge data, topography, flood-control measures, and changes due to building and development.

Is a Flood Inundation Zone the Same as an Evacuation Zone?

No! Flood zones are areas established by the National Weather Service using historical and statistical data of flooding and/or tidal surge potential to OC, which provide residents and property owners their degree of flood risk. Emergency Managers use flood inundation, tidal surge, and winds to determine potential risk to the various communities throughout the Town, specifically in a storm or emergency. It is important for our residents, property owners and visitors to know which zone and division they reside, in case an evacuation is required.

What is Our Community's Evacuation Plan?

If a hurricane (or natural disaster) threatens the area, an evacuation order may be issued. Because of life safety concerns and property damage caused during a disaster or other unusual occurrence, specific properties, multiple locations or the entire city may require evacuation. Both actual damage and potential hazards must be considered. The lack of sanitary facilities, utilities services, or other hazards may necessitate such

actions. The Town of OC uses the concept of phased decision points based primarily on the National Weather Service (NWS) storm classifications (advisory, watch, warning, etc.). These decision points will be used as an overall philosophy in hurricane planning, response, and recovery, and facilitates the actions necessary to give an evacuation order. Evacuation phases are built into these classifications.

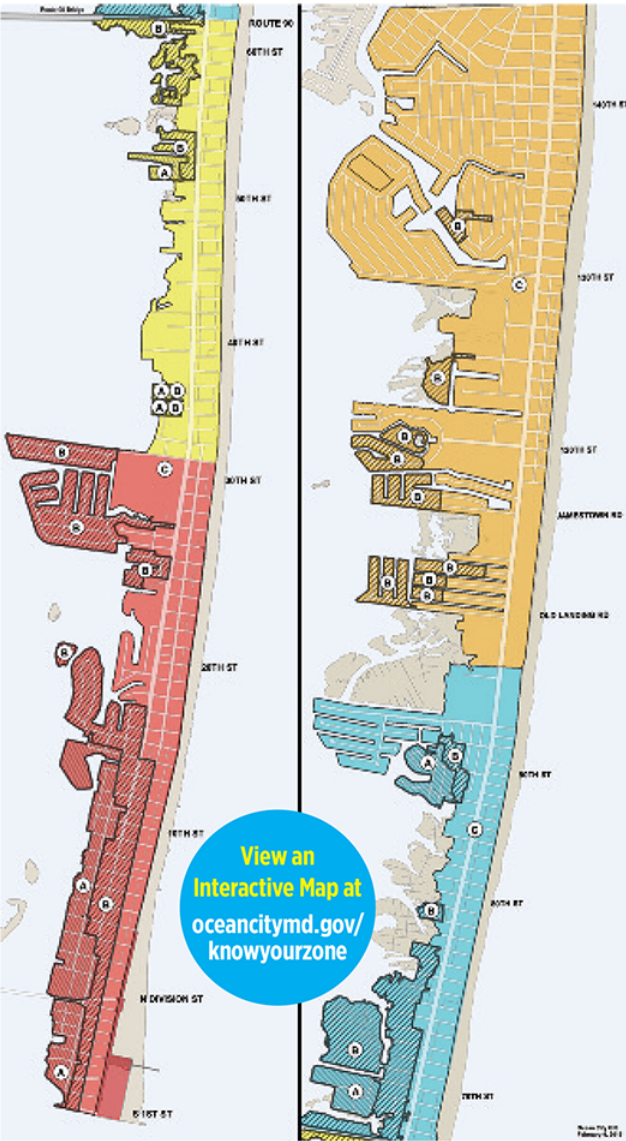
It is incredibly important that you **KNOW YOUR ZONE & DIVISION** and, if you are asked to go, move quickly but safely outside of the evacuation area.

How Can I Be Prepared?

Two keys to weather safety are to prepare for the risks and to act on those preparations when alerted by emergency officials. Some highlights on how to prepare and take action are found in three easy steps: (1) **Be Informed**, (2) **Make a Plan**, and (3) **Build a Kit**.

REMEMBER: Emergency Managers are counting on you to be prepared & do the right thing to keep yourself & your family out of dangerous situations. **KNOW YOUR ZONE & DIVISION** & have a plan for where you will go should something happen this hurricane season. For an interactive map of Ocean City, please visit ocean-city-md.gov/knowyourzone.

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OCEAN CITY FLOOD INUNDATION ZONES

- Division 1 (Inlet to 32nd Street)
- Division 2 (32nd to 62nd Street)
- Division 3 (62nd to 100th Street)
- Division 4 (100th Street to DE Line)
- Zone A
- Zone B
- Zone C - All Island

DEVELOP A FAMILY EMERGENCY PLAN

- Home Escape Routes (conduct an escape drill).
- Family Communications (how will YOU stay in contact?).
- Family Meeting Place (near-by and an alternate location).
- Know the location of your Utility shut-off's and how to safely turn them off.
- Do you have or need Flood Insurance?
- Where are your family's vital records, are they in a water and fire proof container?
- Special Needs Concerns (family member or neighbor).
- Caring for animals (most shelters do not allow pets).
- Preparedness Information, Internet, or contact Ocean City Emergency Management Office (410-723-6650 or 6646).
- Pre-recorded Information Line (410-723-6666).

Disaster Supplies Kit

- 3-day supply of water (one gallon per person, per day)
- Non-perishable food
- One change of clothing and shoes per person
- Prescription & non-prescription medicines
- One blanket or sleeping bag per person
- First-aid kit
- Battery-powered NOAA Weather Radio and a portable radio
- Emergency tools
- Flashlight, extra batteries
- Extra set of car keys and a credit card and cash
- Special items for infant, elderly or disabled family members

After the Storm

- Keep listening to radio, TV or NOAA Weather Radio, and monitor the Ocean City government site: ocmdemergency.gov for further information.
- Wait until advised the community is declared safe before returning.
- Watch for closed roads. If you come upon a barricade or a flooded road, turn around.
- Stay on firm ground. Moving water only 6 inches deep can sweep you off your feet. Standing water may be electrically charged from power lines.
- Once home, check gas, water and electrical lines and appliances for damage.
- Use a flashlight to inspect for damage. Never use candles or other open flames indoors.
- Do not drink or prepare food with tap water until officials say it is safe.
- If using a generator, avoid carbon monoxide poisoning by following manufacturer's instructions.
- Avoid electrocution by not walking in flooded areas.

Hurricane Ike - Galveston, Texas



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Hurricane Ike - Galveston, Texas



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Hurricane Sandy – Ocean City October 2012



Ocean City Emergency Services
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Hurricane Sandy – Ocean City October 2012



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Ocean City – Downtown 3rd Street March 1962 Storm



Ocean City Emergency Services
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Hurricane Irene – August 2011

Ocean Fishing Pier



Ocean City Emergency Services
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Ocean City Beach South of 22nd Street Nor-Easter November '09



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EMERGENCY MANAGEMENT WEB SITES

- www.ocmdemergency.com
- www.mema.state.md.us/mema
- www.co.worcester.md.us/emergencyservices
- www.dema.delaware.gov
- www.vdestate.va.us
- www.nhc.noaa.gov
- www.fema.gov
- www.ready.gov

Questions?

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