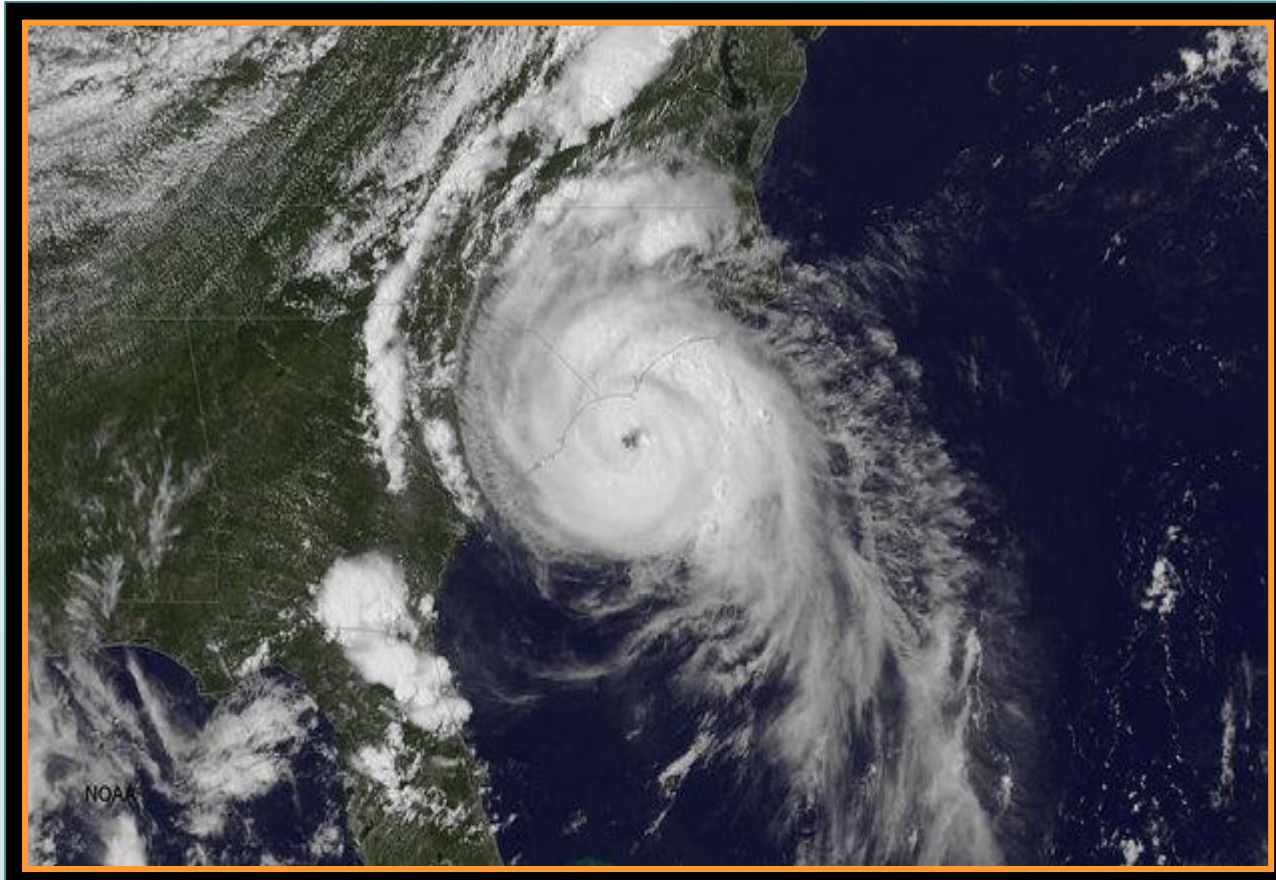




NASA Shared Services Center



2015 Hurricane Preparedness

RELEASED - Printed documents may be obsolete; validate prior to use.



Discussion Topics



- **Introduction**

- **Storm Surge Warnings - New with 2015 Season**

- **Hurricane Terminology and Facts**

- **NSSC/SSC Levels of Preparation**

- **Organization/Company Hurricane Plans**

- **Personal Hurricane Plans**

- **Frequently Asked Questions**

- **Summary**



New in 2015



Beginning with the 2015 hurricane season, NOAA's National Weather Service (NWS) will offer a prototype **storm surge watch and warning** graphic to highlight those areas along the Gulf and Atlantic coasts of the United States that have a significant risk of life-threatening inundation by storm surge from a tropical cyclone.

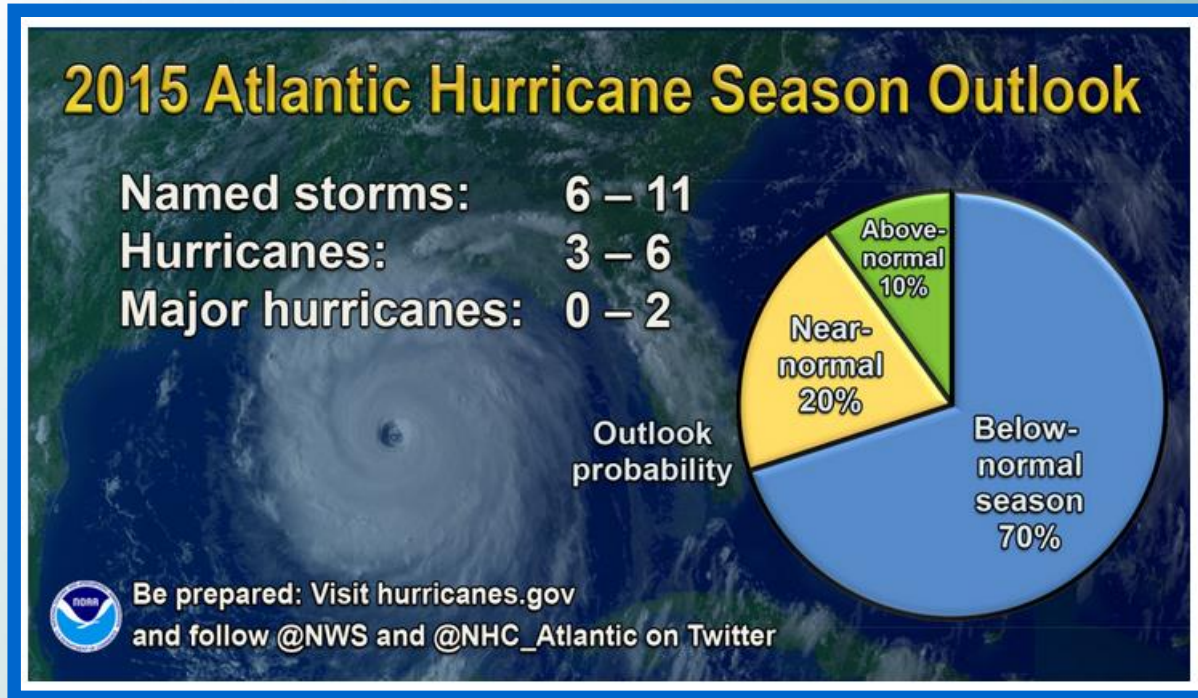
For more information, copy-and-paste the following into your web browser:

www.nhc.noa.gov/surge/resources.php

<http://www.nhc.noaa.gov/surge/StormSurgeWatchWarningMediaTips.pdf>



2015 Outlook



(Revised June 1, 2015)



Names for 2015 - 2020



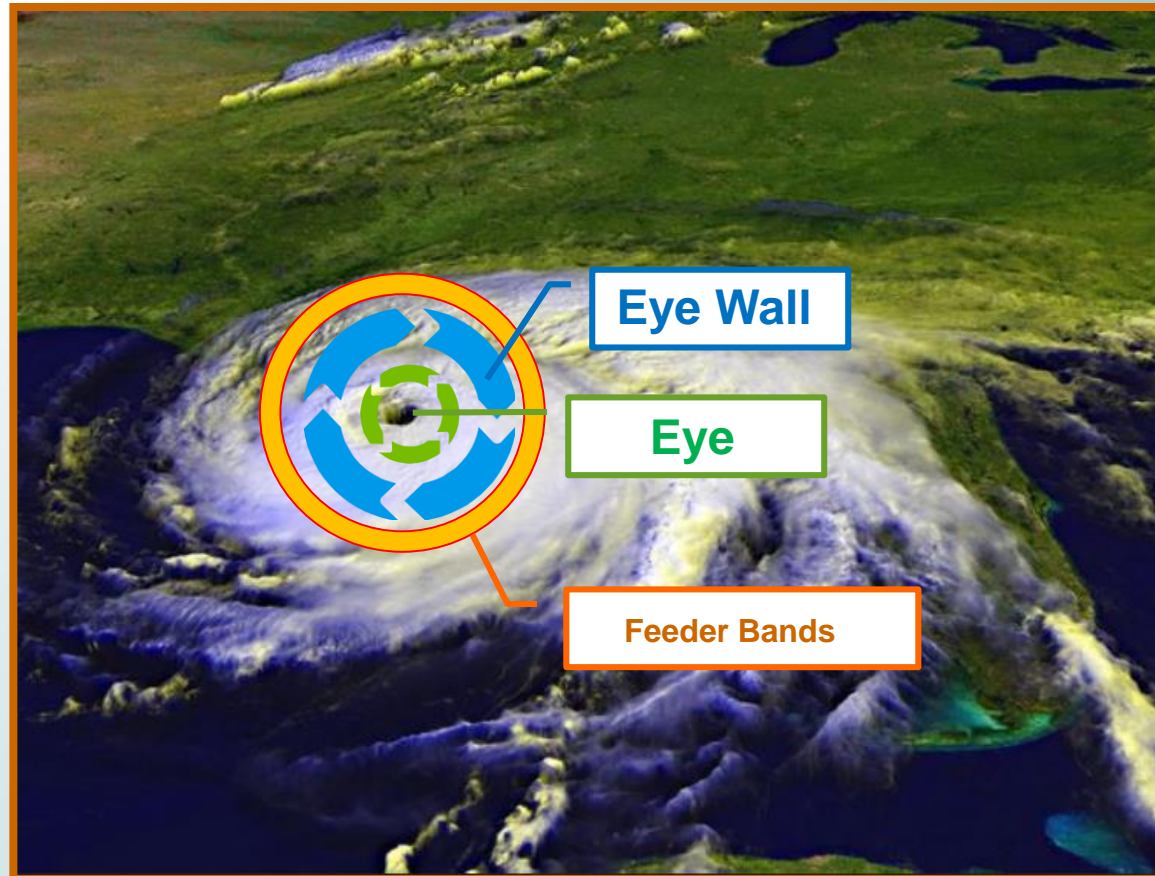
Atlantic Names

[Atlantic Pronunciation Guide \(PDF\)](#)

2015	2016	2017	2018	2019	2020
Ana	Alex	Arlene	Alberto	Andrea	Arthur
Bill	Bonnie	Bret	Beryl	Barry	Bertha
Claudette	Colin	Cindy	Chris	Chantal	Cristobal
Danny	Danielle	Don	Debby	Dorian	Dolly
Erika	Earl	Emily	Ernesto	Erin	Edouard
Fred	Fiona	Franklin	Florence	Fernand	Fay
Grace	Gaston	Gert	Gordon	Gabrielle	Gonzalo
Henri	Hermine	Harvey	Helene	Humberto	Hanna
Ida	Ian	Irma	Isaac	Imelda	Isaias
Joaquin	Julia	Jose	Joyce	Jerry	Josephine
Kate	Karl	Katia	Kirk	Karen	Kyle
Larry	Lisa	Lee	Leslie	Lorenzo	Laura
Mindy	Matthew	Maria	Michael	Melissa	Marco
Nicholas	Nicole	Nate	Nadine	Nestor	Nana
Odette	Otto	Ophelia	Oscar	Olga	Omar
Peter	Paula	Philippe	Patty	Pablo	Paulette
Rose	Richard	Rina	Rafael	Rebekah	Rene
Sam	Shary	Sean	Sara	Sebastien	Sally
Teresa	Tobias	Tammy	Tony	Tanya	Teddy
Victor	Virginie	Vince	Valerie	Van	Vicky
Wanda	Walter	Whitney	William	Wendy	Wilfred



Air Movement and Rotation



**Low pressure at the surface pulls air in counter-clockwise.
High pressure aloft expels the air in a clockwise direction.**

Winds are breezy at the edge of the storm and increase to a maximum in the eye wall. Winds are relatively light in the 'eye' itself.



What is a....



- **Tropical Depression**
- **Tropical Storm**
- **Hurricane**



Tropical Depression



An organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds of 38 mph.



Tropical Storm



An organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39-73 mph.



Hurricane



A hurricane is an intense, rotating oceanic weather system that possesses maximum sustained winds exceeding 119 km/hr (74 mph). It forms and intensifies over tropical oceanic regions.



The Hurricane Scale



Saffir-Simpson Hurricane Scale (CAT 3-5 Speeds Revised May 2012)

Scale Number (Category)	Sustained Winds (MPH)	Damage	Examples (States Affected)
1	74 - 95	Minimal	Florence 1988 (LA) Charley 1988 (NC)
2	96 - 110	Moderate	Erin 1995 (NW FL) Isabel 2003 (NC)
3	111 - 129	Extensive	Sandy 2012 (NJ) Irene 2011 (VA/NJ)
4	130 – 156	Extreme	Hugo 1989 (SC) Katrina 2005 (LA, MS, AL)
5	>157	Catastrophic	Andrew 1992 (SE FL) Camille 1969 (LA/MS)



The Hurricane Scale (cont.)



Category	Wind Speed	Damage
1	74 - 95	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some coastal road flooding and minor pier damage.
2	96 - 110	Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of center. Small craft in unprotected anchorages break moorings.
3	111 - 129	Some structural damage to small residences and utility buildings with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near coast destroys smaller structures with larger structures damaged by floating debris. Terrain continuously lower than 5 feet ASL may be flooded inland 8 miles or more.
4	130 - 156	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach. Major damage to lower floors of structures near the shore. Terrain continuously lower than 10 feet ASL may be flooded requiring massive evacuation of residential areas inland as far as 6 miles.
5	> 157	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located less than 15 feet ASL and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5 to 10 miles of the shoreline may be required.



Hurricane Facts



Tropical storms need warm water (at least 80 degrees F.) to grow

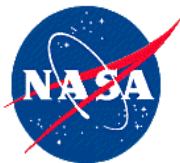
The warm water evaporates into the storm, releasing the stored heat energy when it condenses

The average hurricane uses as much energy in a day as the entire U.S. in 6 months

Hurricanes help maintain the heat balance of the Earth

Hurricanes cannot be stopped with nuclear weapons or cloud seeding

Hurricanes move with large currents of air in the atmosphere. The direction of the storm is not altered by land masses.



Atlantic Seasonal Activity



NOAA's National Centers for Environmental Information



April 2015



Terminology



Hurricane Advisory/Bulletin

An official, numbered release issued at six-hour intervals by the National Hurricane Center containing specific information on a storm and projections of its future course and intensity.

Hurricane Watch

A statement issued 48 hours prior to anticipated landfall advising that there is a possibility of a storm coming ashore within a defined geographical area.

Hurricane Warning

A statement issued 24 hours prior to anticipated landfall advising that there is a high probability of a storm coming ashore within a defined geographical area. Flood, small craft, and gale warnings may be issued, and local officials may recommend evacuations.

NSSC Hurricane Emergency Support Specialist

JC Cogley (228-813-6304)



How Do Hurricanes Destroy?



- **Wind**
- **Heavy Rain & Flooding**
- **Storm Surge**



Wind





Wind



- **Long duration, shifting and gusting winds.**
- **Wind knocks down trees & power lines.**
- **Propels objects into windows and walls.**
- **Wind slowly dismantles homes/buildings.**

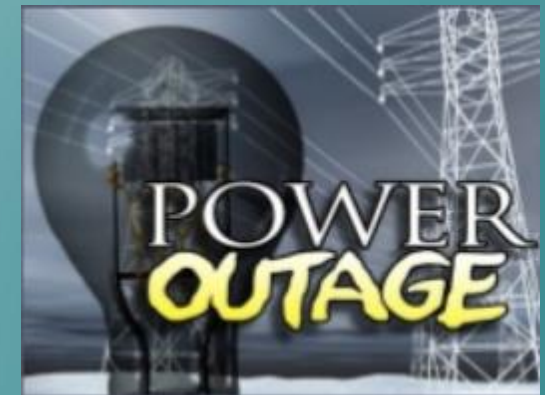


Electricity Interruption



NO POWER

Lights, air conditioning, refrigeration, cooking, fans, TELEVISION, stoplights, gasoline, computers, clocks, banks (ATMs), electric can openers, hairdryers, coffee makers, freezers, stereos, most stores, most businesses, garage door openers, bug zappers and so on....and so on....





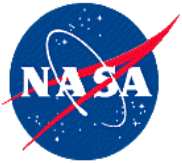
Heavy Rain and Flooding



ONE INCH PER HOUR!

- **Slow moving storms can easily dump 15-20 inches of rain over a wide area.**
- **Debris clogs sewers and drainage ways.**
- **Flood waters contaminate drinking water**
- **High water forces insects, snakes and other wild animals to higher ground (your home).**
- **Flood damage not covered by home owners insurance!!!**





Storm Surge



- **Low pressure and converging winds raise sea levels under the hurricane. When the hurricane makes landfall, so does the higher sea level.**
- **Powerful waves ride on top of the surge.**
- **Storm surge destroys coastal buildings and inundates barrier islands.**
- **Storm surge can travel well inland through harbors, rivers, creeks and canals.**
- **Storm surge is responsible for the greatest loss of life on Mississippi Gulf Coast (*Katrina 32 feet*)**



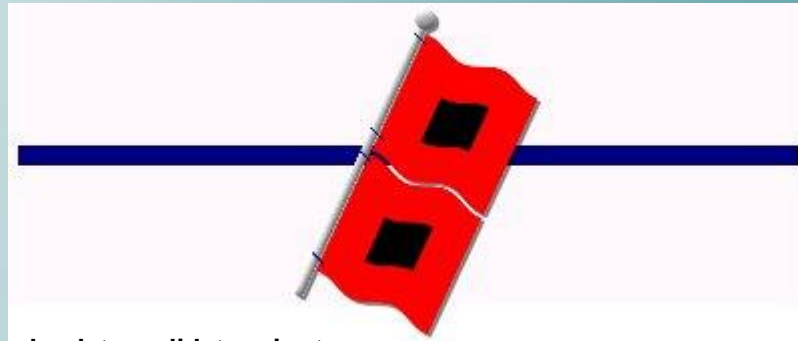
NSSC Preparation Levels



Routine-Normal Operations

A continuing activity throughout the year.

The Business Continuity Plan (BCP) is in place and tested to ensure critical functions can be relocated to an alternate work site.





NSSC Preparation Levels (cont.)



Routine-Normal Operations (cont'd)

Pre-Hurricane Season Activities

- * *Review Plan – Drill – Verify timelines*
- * *Inspect Equipment*
- * *Verify necessary supplies in place –
Recovery Cleanup Areas*
- * *Verify emergency phone numbers*
- * *Review post storm response*
- * *Store backup of critical records at secure offsite
facility*
- * *Verify employee Hurricane Checklist Kits*



SSC/NSSC Hurricane Conditions



Condition 4	Concern	96-72 hours
Condition 3	Watch	72-48 hours
Condition 2	Warning	48-24 hours
Condition 1	Imminent Landfall	



SSC/NSSC Conditions



Condition 4 – Concern

Initiated when a storm poses a threat to SSC/NSSC within 96-72 hours or a storm enters the Gulf of Mexico.

Employees assigned responsibilities for hurricane/severe weather planning and implementation review and initiate preparedness plans to assure a state of readiness and remain prepared to initiate Condition 3 activities.

Managers review project priorities and assignments to assure operations can be reduced or terminated if necessary.



SSC/NSSC Conditions



Condition 4 – Concern (cont.)

- **Activities**
 - Deliver Hurricane Supplies to designated locations
 - Review post storm response
 - Review Personal Hurricane Plan



SSC/NSSC Conditions



Condition 3 - Preparation (Hurricane Watch)

The SSC Emergency Director activates the SSC Emergency Operations Center (EOC) in Bldg 8000 when there is a high probability that severe weather conditions will pose a significant threat to SSC/NSSC employees and facilities, generally within 72-48 hours.

- SSC EOC activated.
 - Phone number: 228-688-3777
- Management initiates liberal leave policy
- Management review of possible site closure





SSC/NSSC Conditions



Condition 3 - Preparation (Hurricane Watch)

(cont'd)

NSSC B&I Team notifies employees to perform housekeeping before leaving:

- Unplug all electrical appliances (i.e., coffee pots, heaters, etc.) and clocks; move them away from outside windows
- Move valuable files and paper away from outside windows to provide protection from blowing rain; protect equipment with plastic
- Secure all classified/sensitive material; lock in file cabinets and safes
- Remove all items from bottom drawers and shelves and place them in a higher location (desk or table top) to protect from water
- Raise Venetian blinds to their maximum height
- Close all doors
- Inform immediate supervision of evacuation plans (route, location, telephone)



SSC/NSSC Conditions



Condition 2 - Response (Hurricane Warning)

SSC Closure is authorized by the SSC Center Director, generally when a high probability of threat exists within 24 hours. Implementation of this condition consists of completing all protection measures that place the facilities in a final state of readiness. The NSSC Executive Director in concert with the SSC Director may release all NSSC employees.

NOTE: All employees must leave when the Center is closed unless they have been designated as necessary in hurricane plans to secure facilities before leaving.

- Employees released at designated time or immediately
- Majority of employees should be evacuated from the NSSC at this time.
- Security & Facilities Personnel check facility before lock-down
- Center status will be available by a recorded message (228-688-3777) or on the web site (www.ssc.nasa.gov/)



SSC/NSSC Conditions



Condition 1

Begins 12 hours before storm landfall and continues after the severe weather/hurricane has passed. Implementation of this level consists of damage assessment and facility recovery phase.

- Recorded status message on **228-688-3777**, or Website. **www.ssc.nasa.gov**)
- Monitor information on local radio and/or television.
- After "All Clear" is declared. SSC Facilities and Safety personnel survey damaged areas.
- Return to Work authorized only after area is approved.





Organization/Company Hurricane Plans



NSSC Hurricane, Damage Assessment and Recovery Plans:

Recovery Levels:

- ▶ **Level R1, Assessment**
 - ▶ **Level R2, Short-Term Recovery**
 - ▶ **Level R3, Long-Term Recovery**
 - ▶ **Level R4, Return to Normal Operations**
-
- **Damage assessments initiated after the storm when it is safe**
 - **Recovery and return to work decisions will be announced on TV, Radio, phone and web.**
 - **NSSC Organization contingency plans include:**
 - **Telephone rosters for all personnel**
 - **Internal assessment of damage impacting return to normal operations**
 - **Procedures to notify employees if return to work is delayed in their work area**



Your Disaster Plan





What should you do ***BEFORE*** the Storm?



Family Disaster Plan



- **Discuss the hazards that may affect your family and your home**
- **Learn about basic terminology and notification systems**



Prepare a Disaster Supply Kit



- **Pack everything in air tight containers.**
- **Keep supplies all together in a backpack, duffel bag, or other easy-to-carry receptacle.**
- **Plan on supplies to last 3-14 days.**
- **Date everything so that you know when items must be replaced.**



Family Disaster Plan: Assemble an Emergency Supply Kit



- **Water, at least one gallon per person per day**
- **Non-perishable food (and manual can opener!)**
- **First Aid Kit**
- **Battery Powered Flashlight**
- **Battery Powered Radio**
- **Extra Batteries**
- **Cash**
- **Important Documents (in water tight container or bag)**
- **Medications and Eye Glasses or Contact Lenses**



Family Disaster Plan: Emergency Supply Kit (cont.)



- **Extra clothing, rain gear, and sturdy shoes**
- **Change of bed linens**
- **Specialty items for babies, children, people with special needs, and senior citizens**
- **Personal hygiene items**
- **Entertainment items (books, games, toys)**
- **Tools**
- **Extra Keys**



Family Disaster Plan: Evacuation versus Shelter-in-Place



- **Evacuation**

- Learn if you live in an evacuation zone
- Look at a map and identify two different routes to evacuate your neighborhood
- Learn two different ways to evacuate your home. Teach and practice with all members of your household.
- Identify NOW where you will go if you need to evacuate.
- Identify NOW where you will take your pets.



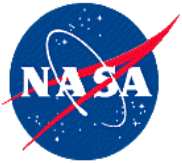


Family Disaster Plan: Evacuation versus Shelter-in-Place

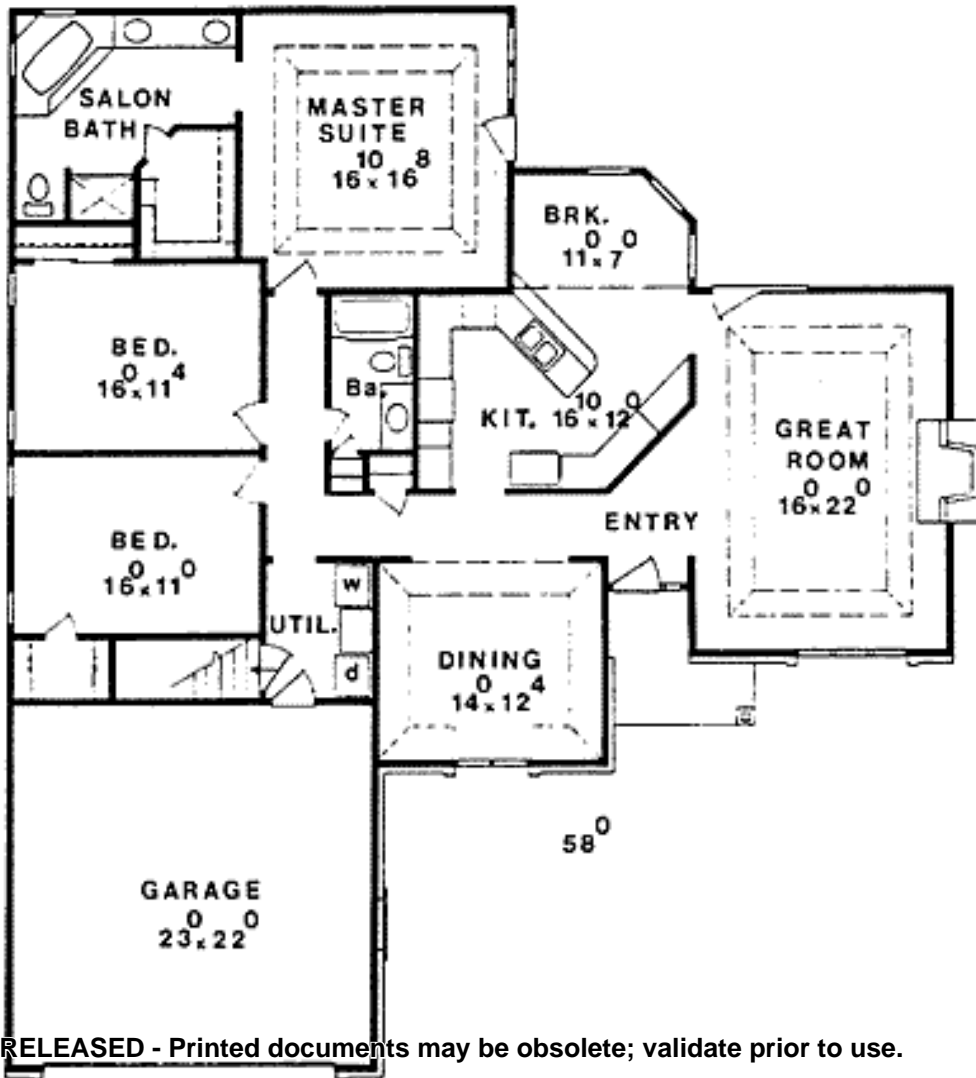


- **Shelter-in-Place**

- If you do not live in an evacuation zone or unsafe structure, it is safer to shelter-in-place.
- Find an interior room with the fewest doors and windows, on the first floor if possible.
- Close and lock all doors and windows.
- Take your emergency supply kit and your pets with you.
- Monitor local media for specific instructions and an all-clear.



Shelter-In-Place



- Identify a 1st floor interior room with no windows like a bathroom or closet OR a 1st floor exterior room with load-bearing walls and the fewest windows.
- Make sure to bring your Disaster Supply Kit!!





Communications Plan



- **Make sure all members of your family know each others' phone numbers.**
- **Post emergency numbers in a common area such as the refrigerator.**
- **Identify two meeting places for your family in case you cannot return home: one should be near your house (a tree or mailbox) and one should be in your neighborhood (a school or place of worship).**
- **Identify an out of state contact who will let your friends and family know that you are all right.**



Additional Considerations



- Understand your insurance coverage! Flood insurance is often **not covered** by homeowners insurance
- Make a plan now for your boat. Do NOT ride out a storm in your boat. Make sure your boat AND neighboring boats are tied up properly.
- Make sure everyone in your home knows how to use 911.
- Take first aid, CPR, and disaster preparedness courses.
- Pool-owners — Add extra chlorine and turn off the electricity.



What should I do when a hurricane is approaching?



- **Fill up the gas tank in your car.**
- **Bring in all loose items outside of your home, including bicycles, patio furniture, children's toys, and even satellite dishes.**
- **Turn refrigerator and freezer to coldest settings. Only open when absolutely necessary and close quickly.**
- **Prepare your windows.**
- **Store water for toilet flushing. Fill bath tubs.**



What should I do when a hurricane is approaching?



- **Moor boat securely or move it to a designated safe place. Use rope or chain to secure the trailer. Use tie downs to anchor trailer to the ground or house.**
- **Monitor local media for evacuation and shelter-in-place orders from emergency officials.**
- **If power is lost, turn off major appliances to reduce power “surge” when electricity is restored.**
- **Avoid open flames, candles, and kerosene lamps as a source of light. Use a flashlight.**



Hurricane Evacuations



- If you live in a mobile home, you must always evacuate during a hurricane.
- If you live in an evacuation zone and there is an evacuation order of that zone, you must evacuate.
- If you feel your structure is unsafe in hurricane winds, you should consider **evacuating**.





Why Evacuate?

You May Be Cut Off !



- **Prolonged interruption of power, water, and sewer systems**
- **Interruption of communications**
- **Interruption of public services including police, fire, and EMS responders stop responding**
- **Debris blocked streets:**
 - delayed delivery of food, water, supplies
 - employees unable to report to work
 - isolation
- **Damage to property and assets**
- **Injury from hazards:**
 - live downed power lines
 - contaminated water/environment





Hurricane Evacuation



- **Once an evacuation order is given, do not wait. Evacuate immediately.**
- **Try to stay with friends or family outside of the evacuation zones. Hotels will fill up quickly and Hurricane Evacuation Centers (HECs) are a last resort. If you must go to a HEC, take all of your disaster supplies because it is likely that nothing will be provided.**



Hurricane Evacuations

...run from the water, hide from the wind



- Remember the objective of a hurricane evacuation is to locate a building strong enough to withstand hurricane force winds and to escape storm surge.
- The objective of a hurricane **IS NOT** to escape the storm. You do not have to travel many miles; this often adds danger to your evacuation.





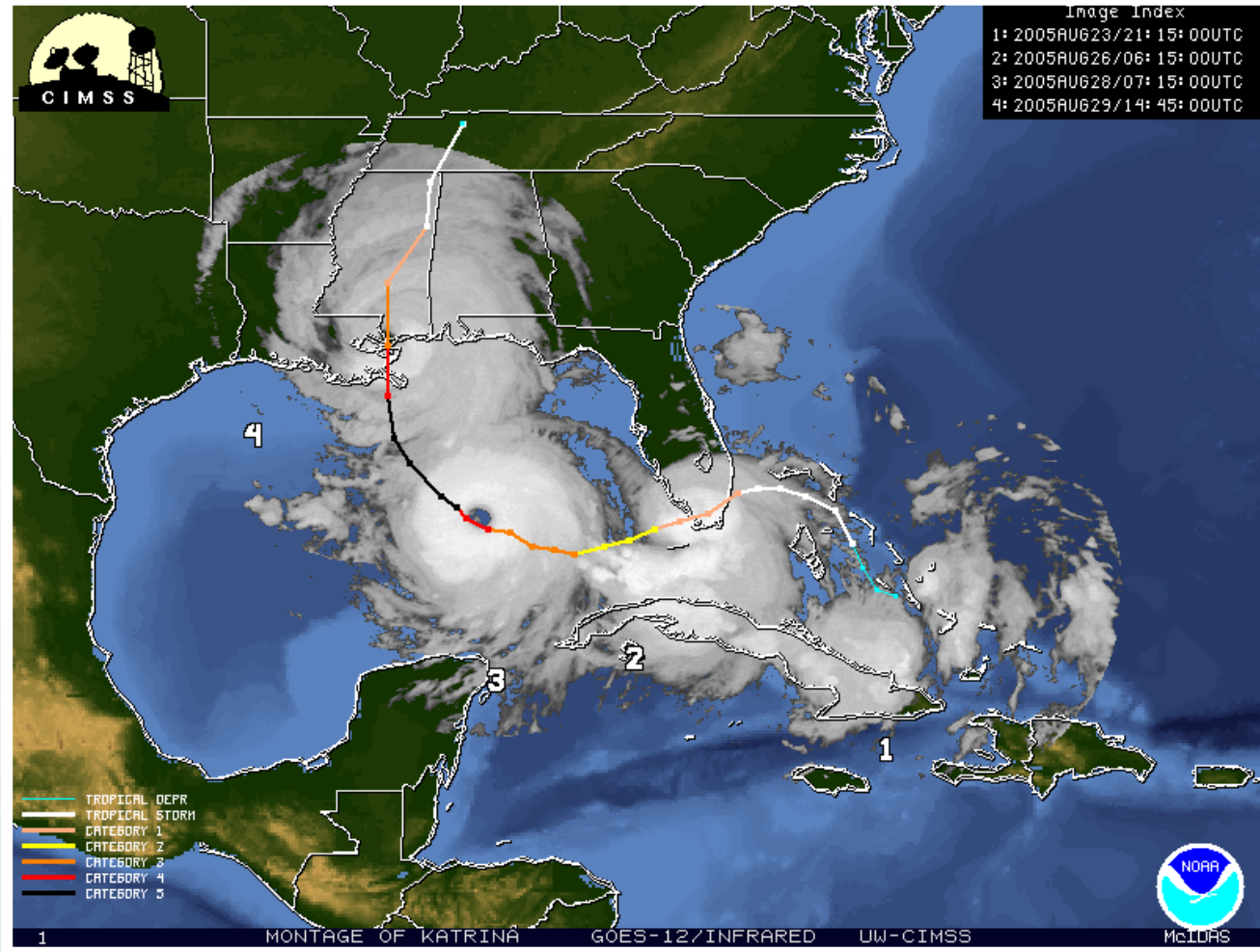
Summary



- ☐ Have a written plan. Know what you will do and when.***
- ☐ Know the special needs of your office/employees.***
- ☐ Educate employees and coworkers.***
- ☐ Be prepared to act when directed.***
- ☐ Communicate!! Inform employees, coworkers and family members of what you intend to do and where you will be. Maintain a contact list of phone numbers for after the storm.***
- ☐ Prepare and maintain a personal emergency supply kit for evacuation and sheltering in place – and for your car!***



Who Needs a Hurricane Plan?



YOU DO!

RELEASED - Printed documents may be obsolete; validate prior to use.



QUESTIONS??

