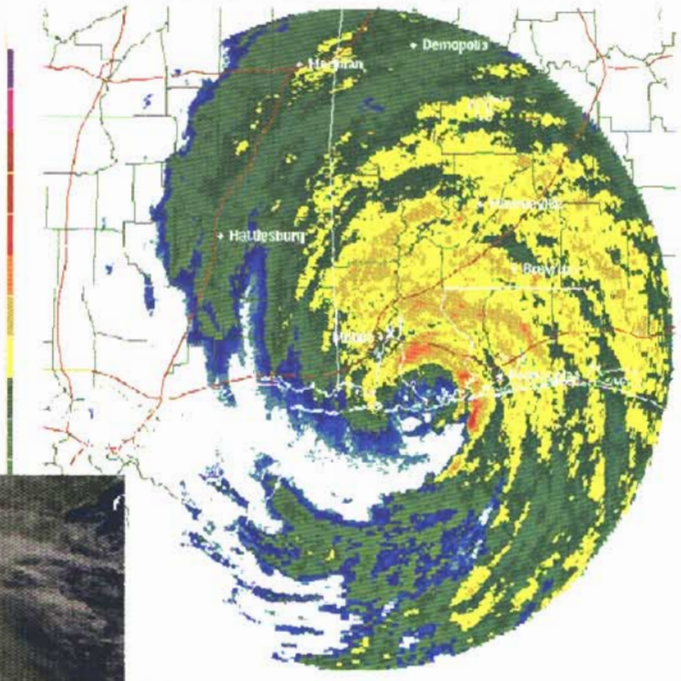
HURRICANE

PREPAREDNESS IN ALABAMA

RUN FROM THE WATER



HIDE FROM THE WIND

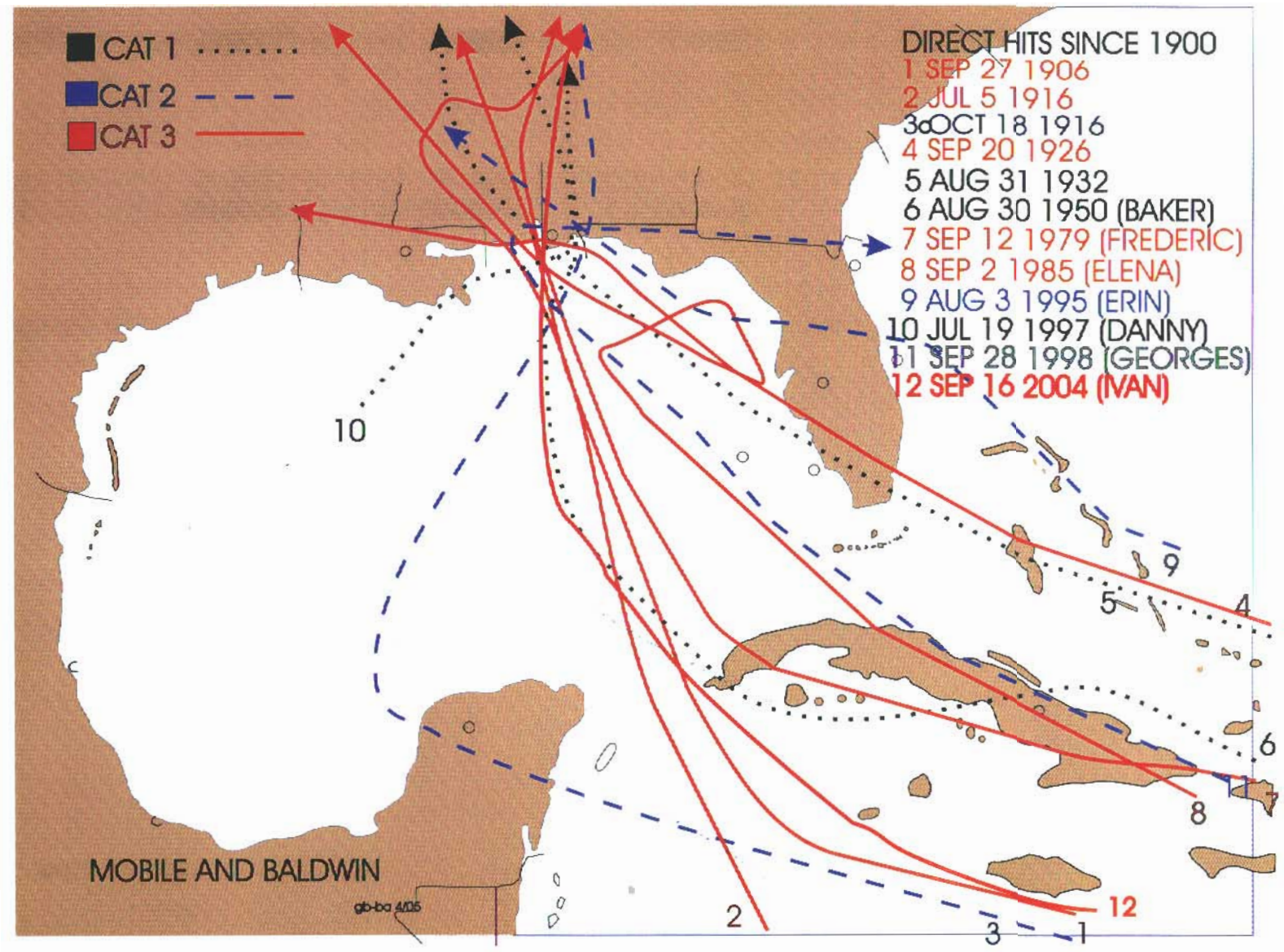
2005

An Educational Effort Sponsored by the National Weather Service and the Alabama Emergency Management agency

Alabama EMA
Emergency Management Agency

NATIONAL WEATHER SERVICE
MOBILE, ALABAMA

NATIONAL WEATHER SERVICE


CAT 1
CAT 2
CAT 3
DIRECT HITS SINCE 1900
1 SEP 27 1906
2 JUL 5 1916
3 OCT 18 1916
4 SEP 20 1926
5 AUG 31 1932
6 AUG 30 1950 (BAKER)
7 SEP 12 1979 (FREDERIC)
8 SEP 2 1985 (ELENA)
9 AUG 3 1995 (ERIN)
10 JUL 19 1997 (DANNY)
11 SEP 28 1998 (GEORGES)
12 SEP 16 2004 (IVAN)
MOBILE AND BALDWIN
gb-ba 4/05

HURRICANE PREPAREDNESS WEEK IN ALABAMA

Hurricane season officially runs from June 1st through the end of November. Governor Bob Riley has proclaimed the week of **May 15 - 21, 2005**, as Hurricane Preparedness Week in Alabama. The National Weather Service, in cooperation with the Alabama Emergency Management Agency, participates in this week to draw attention to the threat of hurricanes this summer and fall. The media in Alabama and Northwest Florida are encouraged to use information contained in this packet to increase hurricane awareness and readiness. Be prepared when a hurricane threatens! This pamphlet highlights the primary hazards associated with tropical storms and hurricanes, and is arranged so a different subject can be highlighted each day.

During Hurricane Awareness Week residents both near the coast, as well as those in interior locations, should review preparedness plans and be ready for the next Gulf coast hurricane. Because we took a direct hit from Ivan last year, many people may think that we will not be affected by another major hurricane this year. This mind-set places people at risk of being unprepared and can easily result in the loss of life. As we saw in Florida last year, tropical systems can affect the same area many times. (Lightning can strike the same area more than once, and the same is true for hurricanes). Everyone is urged to use Hurricane Awareness Week to formulate and review hurricane preparedness plans. Even inland communities need to make plans for eventualities to prepare for assisting coastal evacuees.

Personal hurricane plans should be designed so you can take quick action when a hurricane threatens. The **most** important thing you need to do is have a **plan**. Then decide if you will leave or stay. If you live near the coast in an evacuation zone or in a flood prone area, you need to evacuate. If you live inland away from the coast in a well built home, you would probably be better off **boarding up your home and staying put**. Remember **"Run from the water - Hide from the wind".** Whatever you decide, with a plan you should be able to make quick decisions regarding questions like: Where will I go when I evacuate? How will I get there? When will I leave? What do I need to take with me? How can I prepare my home for the storm? When should I pick up outside objects, which could become missiles during a storm? Remember, as we have seen six times since 1995, it can happen here.

During hurricane season in the Atlantic, Caribbean Sea and Gulf of Mexico, there is an average of four tropical storms and six hurricanes each year. Early predictions for the upcoming season have thirteen named storms with seven of these becoming hurricanes. It is difficult, if not impossible, to predict what the upcoming hurricane season will bring. Remember, only one major hurricane hitting the United States coast could cause billions of dollars in property damage and many fatalities. Let's prepare ... because it's not **if** but **when.**

COVER GRAPHICS:

Front cover: Radar and satellite pictures of hurricane Ivan. Inside front cover: Tracks of storms that have directly hit Mobile and Baldwin counties since 1900. The tracks are color coded with category 1 storms being black, 2 being blue and category 3 storms being red. A direct hit means the center of the maximum winds moved across the area. Inside back cover: Easy to read Saffir - Simpson Hurricane Scale designed by RL Shepherd. Back cover: Pictures of Hurricane Ivan damage.

A Message from the National Weather Service

Last year Hurricane Ivan reminded us of the importance of knowing what to do when a hurricane threatens. Do you live in an area where evacuation might be necessary due to a hurricane strike, or do you live in an area where you would be better off riding out the storm in your home? Do you know what items should be included in your hurricane survival kit? **Hurricane Preparedness Week** is conducted each year in Alabama, prior to hurricane season, to encourage coastal residents to ask themselves these questions, and to help them to come up with the right answers. The National Weather Service, along with partners such as the Alabama Emergency Management Agency, will work with you or your organization to make sure that you have the correct answers to questions like the ones above. The key is to make sure that you have your answers **BEFORE** a hurricane threatens...If you wait until the last minute to find your answers, it may be too late.

Randy McKee, Meteorologist-in-Charge
National Weather Service, Mobile

A Message from the Governor of Alabama

Time and again, Alabamians have weathered the damage brought by hurricanes. Recently, we saw an amazing show of courage as people pulled together to help each other recover from the devastation caused by Hurricane Ivan.

To ensure that all of our residents are prepared, I am pleased to join with the Federal Emergency Management Agency, the National Weather Service, and the Alabama Emergency Management Agency and all hurricane prone states in declaring May 15-21, 2005, as "Hurricane Preparedness Week."

Hurricanes can – and do – cause damage throughout Alabama. Hurricane Preparedness Week will place a focus on different hurricane-related subjects. This information provides a valuable tool in helping Alabamians and our state's visitors in preparing a family disaster plan. I encourage you to take advantage of the information provided to protect your families and property.

Bob Riley
Governor

Message from the Alabama Emergency Management Agency

Hurricane Ivan is still fresh on the minds of victims of a storm that made disaster history in Alabama. We are continuing to work disaster recovery programs to put communities back together. More than $735 million in federal and state disaster funds have been provided to victims and government entities as a result of Hurricane Ivan.

As we face hurricane season for 2005, I hope that this history making storm will remind you to prepare yourself and your family from the dangers of hurricanes. These dangers include storm surge, high winds, tornadoes and inland flooding.

The Alabama Emergency Management Agency is pleased to support Governor Bob Riley, the Federal Emergency Management Agency, and the National Weather Service for Hurricane Preparedness Week. The time to plan must come before a hurricane.

AEMA encourages you to prepare a family hurricane plan and exercise it. Planning ahead could save your life

Bruce Baughman
Director

TABLE OF CONTENTS

FOR YOUR INFORMATION

This booklet contains materials useful during the upcoming hurricane season. It is arranged so a different subject can be highlighted each day during the week. You are invited to contact your local National Weather service office or state and county emergency management agencies for answers to any questions you may have.

The following National Weather Service Offices cover most of Alabama.

For coastal and southwest Alabama, contact :
Gary A Beeler or Randy McKee **Mobile** **251-633-6443**

For southeast Alabama, contact:
Bob Goree or Paul Duval **Tallahassee, Fl** **850-942-8833**

For north Alabama, contact:
Tim Troutman or Mike Coyne **Huntsville** **256-890-8503**

For the rest of Alabama, contact:
Jason B. Wright or Jim Stefkovich **Birmingham** **205-664-3010**

For the Alabama Emergency Management Agency, contact:
Scott Adcock **Clanton** **205-280-2247**

Local Emergency Management directors are located in each of Alabama's 67 counties.

Internet Addresses: Mobile National Weather Service www.srh.noaa.gov/mob
Alabama Emergency Management Agency www.ema.alabama.gov

HURRICANE HISTORY

Since 1953 tropical storms and hurricanes in the Atlantic, Caribbean Sea, and Gulf of Mexico have been given names to reduce confusion when exchanging information about the storm, especially when two storms occur during the same time period. Initially, only female names were used, but male names were included in the list of storm names in 1979. If a hurricane becomes especially strong and/or causes significant damage, the name is retired from the list and will not be used again. Camille, Frederic, Opal, Charley, Frances and Ivan are examples of names that have been retired.

Hurricane return periods are the frequency at which a hurricane of certain intensity or category can be expected within 75 miles of a given location. For example, a return period of 20 years for a Category 3 hurricane at a certain location means that on average, during the previous 100 years, a Category 3 hurricane passed within 75 miles of that location about five times. The return periods for Baldwin and Mobile counties are listed below.

Category 1	10 years	Category 2	21 years	Category 3	33 years
Category 4	62 years	Category 5	140 years		

As can be seen on the inside front cover of this publication, the Alabama coastline has not had a direct hit by a Category 4 or 5 hurricane in more than 100 years of record keeping, and may have never been hit by such a storm. Ivan was a category 3 when it made landfall near Gulf Shores last year. Both Ivan and Frederic (1979) devastated the Alabama and western Florida panhandle areas with widespread wind damage and significant coastal flooding and storm surge damage as they moved ashore, both as strong Category 3 hurricanes. As indicated by the return period statistics listed above, one can clearly see that the Alabama coastline is very much overdue for an extreme Category 4 or 5 hurricane.

While Frederic and Ivan both caused major wind and storm surge damage along the Alabama and northwest Florida coasts, the storms produced little in the way of rainfall, as only eight to ten inches of rain fell across the area. By contrast, other tropical systems, often much weaker with regard to wind speeds, can and have produced copious amounts of rainfall. In 1997, Hurricane Danny, a Category 1 storm, produced widespread 48 hour rainfall totals ranging from 10 to 20 inches across most of Mobile and Baldwin counties of southwest Alabama, with maximum totals in excess of 30 inches over southeastern portions of Mobile County. The official 48 hour rainfall reported at the Dauphin Island Sea Lab was 36.71 inches. Several rivers in both Mobile and Baldwin counties experienced record flooding. Heavy rainfall can also occur well removed from the center of a tropical system. In 1998, Category 2 Hurricane Georges made landfall along the Mississippi Gulf Coast, but produced significant flooding rainfall over parts of southern Alabama and portions of the western Florida panhandle. As one can easily see, there are many hazardous that can accompany a tropical storm or hurricane, and every storm is different.

On the next two pages are the storms that have impacted our area since 1559. Clearly, tropical storms and hurricanes are frequent visitors to the Alabama Gulf Coast. With each storm, lessons are learned that have a positive influence in the preparation for the next big hurricane that will inevitably hit the region. History can be a great teacher, but those who do not heed the lessons learned from past hurricanes are doomed to suffer the same disastrous consequences as those of the past.

TROPICAL SYSTEMS THAT HAVE AFFECTED THE AREA

Year	Date	Class.	Remarks
1559	Sept. 19	---	Coast near present-day Mobile and Pensacola. Damaged de Luna's fleet.
1732	----	---	Mobile.
1736	----	---	Pensacola. Village destroyed.
1740	Sept. 12	---	SE Mississippi to NW Florida.
1766	Oct. 22	---	Pensacola.
1772	Sept. 4	---	SE Louisiana to SW Alabama.
1813	Aug. 19	—	Gulf coast.
1819	Aug. 27-28	---	Mississippi and Alabama.
1822	July 11	---	Mobile.
1852	Aug. 23	—	"Great Mobile Hurricane".
1856	Aug. 30	—	Mobile.
1860	Aug. 11	—	Landfall W of Mobile.
1860	Sept. 15	---	Landfall W of Mobile.
1870	July 30	---	Mobile.
1880	Aug. 31	—	SW Alabama, NW Florida.
1882	Sept. 9	---	SW Alabama, NW Florida.
1885	Sept. 27-28	---	Alabama, NW Florida coasts.
1889	Sept. 23	H	SE Mississippi to NW Florida.
1893	Oct. 2	H	Mississippi and Alabama coasts. Extensive damage. Close to 2,000 people killed from SE Louisiana to S Alabama.
1894	Aug. 7	TS	Pensacola, NW Florida.
1895	Aug. 16	TS	SE Mississippi and SW Alabama.
1898	Aug. 2-3	H	NW Florida, SW Alabama.
1900	Sept. 13	TS	Weak tropical storm SE Mississippi.
1901	June 14	TS	Mobile.
1901	Aug. 15	H	SE Mississippi.
1901	Sept. 17	TS	E of Pensacola.
1902	Oct. 10	TS	Mobile.
1906	Sept. 27	H	Major hurricane. Pensacola, Mobile. Strongest hurricane to strike Pensacola since 1736 storm.
1911	Aug. 11	H	Alabama, NW Florida coasts. Major damage.
1912	Sept. 14	H	Landfall just W of Mobile.
1916	July 5	H	Extensive damage from SE Mississippi to NW Florida. Landfall just W of Mobile. Pressure at Ft. Morgan, AL fell to 28.38 in.
1916	Oct. 18	H	Eye passed over Pensacola with winds of 114 mph.

1917	Sept. 28	H	Landfall E of Pensacola with winds 103 mph.
1919	July 4	TS	Tropical Storm, landfall E of Pensacola.
1922	Oct. 17	TS	Weak tropical storm, landfall between Mobile and Pensacola.
1926	Sept. 20	H	Major hurricane. Extensive damage along coast. Pressure at Perdido Beach, Baldwin County, AL fell to 28.20"
1932	Aug. 31	H	Mobile.
1934	Oct. 5	TS	Weak tropical storm, SW Alabama.
1936	July 31	H	Landfall at Choctawhatchee Bay, FL.
1939	June 16	TS	Mobile Bay.
1944	Sept. 10	TS	SE Mississippi and SW Alabama.
1947	Sept. 8	TS	Weak tropical storm W of Mobile.
1950	Aug. 30	H	Hurricane Baker made landfall between Mobile and Pensacola.
1956	Sept. 24	H	Hurricane Flossy, NW Florida.
1959	Oct. 8	TS	Tropical Storm Irene, Pensacola.
1960	Sept. 15	H	Hurricane Ethel, SE Mississippi.
1960	Sept. 26	TS	Tropical Storm Florence, NW Florida. Weakened to tropical depression before landfall.
1969	Aug. 17	H	Camille (Cat 5 storm) moved inland near Bay St. Louis, causing Moderate damage across southwest Alabama
1975	Sept. 23	H	Hurricane Eloise, NW Florida.
1979	Sept. 12	H	Hurricane Frederic, NW Florida, SW Alabama, and SE Mississippi. Incredible damage to Mobile.
1985	Sept. 2	H	Hurricane Elena, SE Mississippi.
1985	Oct. 31	H	Hurricane Juan, SW Alabama and NW Florida. Weakened before making landfall.
1994	July 3	TS	Tropical Storm Alberto, NW Florida and S Alabama.
1995	Aug. 3	H	Hurricane Erin. NW Florida.
1995	Oct. 4	H	Hurricane Opal. NW Florida.
1997	Jul. 19	H	Hurricane Danny. SW Alabama.
1998	Sep 28	H	Hurricane Georges. SW Alabama, NW Florida and SE Mississippi
2002	Sep 14	TS	Hanna, SW Alabama
2002	Sep 26	TS	Isidore, SW Alabama and NW Florida
2004	Sep 16	H	Ivan, SW Alabama and NW Florida Strongest hurricane from Baldwin to Santa Rosa counties in more than 100 years

(H is a Hurricane and TS is a Tropical Storm)

STORM SURGE AND MARINE SAFETY

The greatest threat to life and property related to a hurricane is from the **Storm Surge**, which historically claims nine out of ten victims. This country's greatest natural disaster occurred during a hurricane in 1900, when a storm surge killed almost 8,000 people in Galveston, Texas.

Storm Surge is simply a dome of water, 50 to 100 miles wide, that is pushed toward the shore by the force of the winds swirling around the storm. This dome of water is also enhanced slightly by contributions associated with the extreme low pressure within the storm itself. The advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level 15 feet or more. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding along our coastline and bays, particularly when the storm tide coincides with normal high tides. Because much of our low lying coastline has become densely populated, the danger from storm tides is tremendous. During hurricane Georges in 1998, Water Street in downtown Mobile was covered with bay water when the storm tide reached almost 9 feet. Two years ago, Tropical Storm Isidore brought very high tides to the area with Water Street and the Causeway being flooded. Last year, Hurricane Ivan brought a 10-15 foot surge that caused extensive damage along coastal Alabama and northwest Florida. The surge also damaged the I-10 bridge across Escambia Bay.

One tool used to evaluate the threat of storm surge is the SLOSH model. Emergency managers use data from SLOSH to determine which areas must be evacuated due to potential storm surge inundation. Storm surge can also affect some of our coastal rivers, potentially increasing the area that must be evacuated.

For Mariners, there is no single rule of thumb that can be used to ensure safety from a hurricane. Instead, constant monitoring of hurricane potential, and continual risk analysis when used with some fundamental guidelines, become the basic tools to minimize a hurricanes's impact to vessels at sea, or in port. Today, even as our understanding of hurricanes increases, there is still much inherent error in forecasting the movement and intensity of these systems.

Through the use of recurring risk analysis including but not limited to a review of regional tropical cyclone climatology; obtaining the latest Tropical Prediction Center analysis and forecast charts; and the plotting of tropical waves, disturbances, and cyclones; mariners can make plans that will minimize the potential impacts of a hurricane encounter.

Contrary to their appearance on weather maps, hurricanes are much larger than the point source often depicted on those maps. Similarly, their path is more than a line and should be looked at as a swath across which the system and its associated impacts are felt. This tropical cyclone swath requires the mariner to take precautions far from where the center is currently located and forecast to move.

Local boat owners should make all arrangements for moving and securing their vessels prior to hurricane season. Remember, Ivan caused major damage to almost all of the marinas in the area last year. There may be insufficient safe havens for all vessels, so those who act early, fare best. Most importantly, do not ride out the storm on your vessel.

Rip currents are always present in the high winds and seas that accompany a tropical storm or hurricane, so people should stay out of the water as the storm approaches.

Tropical Storm Allison in June of 2001 showed that a tropical system does not have to be directly affecting the area to present dangerous rip current conditions. Five people drowned in a two day period in rip currents along the northwest Florida coast while Allison was over Texas.

HIGH WINDS AND TORNADOES

Hurricane winds are a force to be reckoned with by communities along and near the coast, especially when deciding how strong their homes and businesses should be built. As winds increase against an object, pressure increases at a disproportionate rate. Pressure against a wall mounts with the square of the wind speed so that a threefold increase in wind speed results in a ninefold increase in pressure. Therefore, a 25 mph wind causes about 1.6 pounds of pressure per square foot. A four by eight sheet of plywood will be pushed by a force of 50 pounds. In 75 mph winds, the speed associated with a minimal Category 1 hurricane, that force becomes 450 pounds, and in 125 mph winds, a mid Category 3 hurricane, the force becomes 1250 pounds. For many structures, this force is enough to cause failure or significant damage. Hurricane-force winds, 74 mph or more, can destroy poorly constructed buildings and mobile homes and down trees and power lines. Debris, such as signs, roofing material, siding, and small items left outside, become flying missiles in hurricanes.

Hurricanes are large storm systems that can measure as much as 300 to 500 miles across. In a hurricane, the winds rapidly increase in strength from the weakest on the outer fringes of the storm to the strongest near the eye. Hurricane winds are most intense around the perimeter of the eye, or within the area of the storm called the **eye wall**. This area is generally from 15 to 20 miles wide and also contains the most intense rainfall. As a hurricane moves inland, away from the coastline, winds begin to rapidly decrease, but may remain above hurricane strength well inland. *A general rule-of-thumb is wind speeds will decrease by 50% within the first twelve hours of landfall.* Therefore, the faster the storm is moving, the further inland the hurricane force winds will be experienced.

Wind damage patterns are often very different from storm to storm. Last year, Ivan, a strong Category 3 at landfall, moved into interior sections of northwest Florida and southwest Alabama, cutting a path of destruction well inland. Tree and power line damage alone had a cost estimate of nearly 1 Billion dollars. In 1992, Hurricane Andrew became the costliest hurricane in United States history when it slammed into south Florida with sustained winds estimated at more than 155 mph with higher gusts. This compact, intense Category 5 hurricane caused major wind damage over a small, but highly populated and developed area. Damage was estimated at $25 billion with reportedly 25,524 homes destroyed and 101,241 others damaged. It is also important to note that at least 95% of all mobile homes in or near the path of Andrew were totally destroyed.

Hurricanes also produce tornadoes, which can add to the hurricane's destructive power. These tornadoes most often occur in thunderstorms embedded in rain bands well away from the center of the hurricane. However, they can also occur near the eyewall. During Opal, in 1995, the area experienced eight tornadoes, primarily in the outer rain bands. One of these tornadoes killed a person near Crestview, Florida several hours before the center of the hurricane moved ashore. Last year, we had six weak tornadoes as the outer rain bands from Ivan moved across the area, but a stronger tornado occurred near Panama City, Florida, killing two people.

Hurricanes versus Tornadoes

The Saffir-Simpson Hurricane Scale

Tropical Storm
Winds 39-73 mph

Category 1 Hurricane
Winds 74-95 mph
No real damage to buildings.
Damage to unanchored Mobile homes.
Some damage to poorly constructed signs.

Category 2 Hurricane
Winds 96-110 mph
Some damage to roofs, doors and windows. Mobile homes demolished. Some trees blown down.

Category 3 Hurricane
Winds 111-130 mph
Some structural damage to small residences and utility buildings. Large trees blown down Mobile homes and poorly built signs destroyed

Category 4 Hurricane
Winds 131—155 mph
Wall failures in homes and complete roof structure failure on small homes. Total destruction of mobile homes. Trees, shrubs and signs all blown down.

Category 5 Hurricane
Winds 156 mph and higher
Complete roof failure on homes and industrial buildings. Some complete building failures. Severe and extensive window and door damage.

The Fujita Tornado Scale

F0 Gale Tornado
Winds 40-72 mph
Some damage to chimneys. Tree branches broken off. Shallow rooted trees uprooted.

F1 Moderate Tornado
Winds 73-112 mph
Peels surface off roofs. Mobile homes overturned. Moving autos pushed off roads.

F2 Significant Tornado
Winds 113-157 mph
Considerable damage. Roofs torn off frame houses. Large trees snapped or uprooted. Light-object missiles generated.

F3 Severe Tornado
Winds 158-206 mph
Severe damage. Roofs and some walls torn off well constructed homes. Trains overturned. Most trees in forests uprooted. Heavy cars lifted off ground and thrown.

F4 Devastating Tornado
Winds 207-260 mph
Well-constructed houses leveled. Structures with weak foundations blown off some distance. Cars thrown and large missiles generated.

F5 Incredible Tornado
Winds 261-318 mph
Strong frame houses lifted off foundations and disintegrated. Automobile-sized missiles fly through the air in excess of 100 mph. Trees debarked.

Relationships in Wind Speed and Effects on Structures

Tropical Storm = F0 Tornado
Category 1 & 2 Hurricane = F1 Tornado
Category 3 & 4 Hurricane = F2 Tornado
Category 5 Hurricane = F3 Tornado
F4 and F5 Tornadoes have no corresponding hurricane relationships

INLAND FLOODING

When it comes to hurricanes, wind speeds do not tell the whole story. Hurricanes produce storm surges, tornadoes, and often the most deadly of all, **inland flooding**.

Alabama is affected by a large number of tropical weather systems. Although storm surge has the greatest potential for loss of life, recent research indicates that inland flooding is responsible for the greatest number of fatalities over the last 30 years. Studies show that 59 percent of the tropical cyclone deaths in the United States resulted from freshwater flooding. Intense rainfall is not related to the wind speed of tropical cyclones. In fact, some of the greatest rainfall amounts occur from weaker storms that drift slowly or stall over an area.

In July 1994, Tropical Storm Alberto slowly dissipated over southeast Alabama and southwest Georgia. Heavy rains caused record flooding in the area and 32 people died from the high water, with many deaths being vehicle-related. In 2002, heavy rains from Allison caused major flooding in Houston (Rain of Terror). Allison caused the most extensive flooding ever recorded from a tropical storm and killed 22 people in the Houston area.

Statistics clearly point out the high risk of driving in and around flooded roads and low spots. Often, individuals will attempt to drive through flooded roads only to be whisked away by rushing waters. Though the water may not look very deep, it may hide severe road damage. Unsuspecting drivers have entered what they thought was a minor overflow of the road, only to find themselves sinking rapidly into a collapsed roadbed. The rule is simple: if you cannot see the road or its line markings, do not drive through the water.

Moving water exerts a pressure on an object such as a car or person. As water depth increases or a greater area is exposed to moving water, a greater force will be exerted. Also, as a surface becomes slippery, friction is reduced. Water, sand, or mud tends to replace the frictional forces that hold a car in place.

Even though the weight of Sport Utility Vehicles (SUVs) may appear to offer a greater protection in crossing flooded roads, their size and larger tires can make them more buoyant and more prone to being swept away. Bottom Line: It is just as dangerous to drive a SUV through flooded waters as a regular vehicle.

Some statistics to remember if you are ever faced with the decision of crossing a flooded roadway.

- *As little as one foot of water can move most cars off the road.*
- *Just six inches of fast-moving flood water can sweep a person off his or her feet.*
- *Most flood-related deaths occur at night and are vehicular.*
- *Tropical cyclones pose significant risk well inland due to fresh water flooding.*

When rivers rise, water tends to spread out far from riverbanks. In the case of Hurricanes Danny in 1997 and Georges in 1998, rising rivers and repeated periods of heavy rainfall combined to pool water over inland areas miles away from rivers. In fact, normally small rivers turned into vast lakes.

Though not swift moving, pooling water also poses a significant risk, mainly due to the inability to judge water depth. Relatively "safe" water only inches deep can be next to more dangerous water that is several feet deep. So, the next time you hear hurricane, think **inland freshwater flooding**. Drive Smart - **TURN AROUND DON'T DROWN!**

THE FORECAST PROCESS

Part of the mission of the National Weather Service (NWS) and the Tropical Prediction Center (TPC) is to save lives and protect property by issuing watches, warnings, forecasts, and statements which inform the public of hazardous weather conditions. This section provides information about the roles of those responsible for providing hurricane and tropical storm information to emergency managers and local decision makers, as well as to the general public.

The Tropical Prediction Center (TPC) is comprised of the National Hurricane Center (NHC), the Tropical Analysis and Forecast Branch (TAFB), and the Technical Support Branch (TSB). During hurricane season (June 1st-Nov 30th), the latter two provide support to NHC. NHC is responsible for forecasting the movements and intensities of tropical disturbances in the Atlantic, Carribean and the Gulf of Mexico. Again this year the hurricane forecast from the hurricane center will provide a five day forecast. This should give decision makers a little more time to make a decision on when and if to evacuate or shut down a business

NHC uses a wide variety of tools and techniques to monitor the tropical Atlantic and to forecast the development and movement of any tropical weather systems. These include the use of weather satellite imagery, ship reports, marine buoy data, high detailed computer forecast models, and once a storm develops, hurricane reconnaissance aircraft.

NHC closely coordinates with the local NWS Weather Forecast Offices (WFO's) in hurricane-prone areas. As a tropical storm or hurricane approaches the coast, NHC coordinates with local WFO's with regard to the appropriate tropical storm or hurricane watch/warning information. The Storm Prediction Center (SPC) provides guidance and watch information to the WFO with regard to the severe thunderstorm and tornado potential that is often associated with land falling hurricanes.

The role of the WFO in the forecast process is to provide warnings for their local area as it is affected by a land falling tropical system. These include, but are not limited to, severe thunderstorm, tornado, flash flood, and inland wind warnings. Statements and forecasts of expected conditions with regard to the hurricane are also provided by the WFO. The forecast process of the local WFO uses a wide variety of observations, analysis tools and techniques in conjunction with guidance and information supplied by the NHC. This includes a network of surface weather observing systems, upper air observations, Doppler radar analysis, and information provided by local officials and storm spotters. In addition, computer model guidance and satellite imagery is also used at the local level.

While the broadcast media does a great job of relaying National Weather Service products to the public, the **National Oceanic and Atmospheric Administration (NOAA) Weather Radio**, the official "voice of the National Weather Service", is the NWS's most direct link to the public. Getting reliable, up-to-date weather information during threatening, critical situations is essential to any hurricane preparedness plan. The **NOAA Weather Radio (NWR)** system in place across the country provides the public with a convenient and rapid means of receiving weather forecasts, weather warnings, and other weather information. This information is broadcast on NWR 24 hours a day, seven days a week. Along the immediate Gulf Coast area of Alabama and the western Florida Panhandle, weather radio transmitters are located in Gulfport, MS, Mobile, AL, and Milton, FL. Other transmitting locations can be found throughout Alabama, Florida, Georgia and Mississippi.

Weather radios can be purchased at many stores at affordable prices, and some AM/FM radios have "weather bands" to receive NWR broadcasts. Look for a radio with an alert mode, one that has backup battery power, and one that has the capability of receiving all seven NWR broadcast frequencies. Most weather radios sold today have al feature known as Specific Area Message Encoder (SAME). The SAME feature will allow you to have the radio alarm warnings for only those counties in your area that you specify. NWR broadcasts will include the latest information prepared on tropical storms and hurricanes by the NHC. NWS offices will also broadcast local information on the weather, it's impact on the local area, and any information from local emergency management officials.

Some of the terms and definitions to listen for during hurricane season (June 1st to Nov 30th), as well as information for local decision makers follows...

Tropical Storm Watch... Tropical Storm conditions (winds 39 to 73 mph) are **possible** in the specified area of the Watch, usually within 36 hours.

Tropical Storm Warning...
Tropical Storm conditions are **expected** in the specified area of the Warning, usually within 24 hours.

Hurricane Watch... Hurricane conditions (winds 74 mph or higher) are **possible** in the specified area of the Watch, usually within 36 hours. During a Hurricane Watch, prepare to take immediate action to protect your family and property in case a Hurricane Warning is issued.

Hurricane Warning... Hurricane conditions are **expected** in the specified area of the Warning within 24 hours or less. Complete all storm preparations and evacuate if directed by local officials.

Short Term Watches and Warnings... These provide detailed information on specific hurricane threats, such as tornadoes, floods, and high winds.

Public Advisory... Issued by the National Hurricane Center. Provides critical hurricane warning and forecast information out through five days.

Marine Advisory... Issued by the National Hurricane Center. Provides detailed hurricane track and wind field information.

Tropical Cyclone Update... Issued by the National Hurricane Center. Highlights significant changes in a hurricane that occur between advisories.

Probabilities of Hurricane/ Tropical Storm Conditions... Provides a measure of the forecast track accuracy. The probabilities have no relation to tropical storm intensity.

Hurricane Local Statements... Issued by your local National Weather Service office and gives greater detail on how the storm will impact the local area.

Inland Tropical Storm/Hurricane Wind Watch/Warning... Issued by you local National Weather Service office when tropical storm or hurricane force winds are expected to occur beyond coastal areas and outside of the traditional hurricane warning area.

BE PREPARED

If you were suddenly faced with a powerful land falling hurricane, would you know what to do? For residents along the central Gulf coast, the key to protecting yourself and your family is preparation. Main preparations before hurricane season include ensuring that your house (and boat) are in good condition, your insurance is up to date, and that you have adequate emergency supplies on hand. You should also determine the main threat you face from a hurricane and whether you need to evacuate. Basically, if you live in or near the coast or in a flood prone area, you need to evacuate.

However, if you live away from the coast in a well-built home, you would probably be better off boarding up your home and staying put. Remember, **"Run from the water - Hide from the wind"**. Whether you decide to evacuate or not, from June through November, you should be ready to enact a family disaster plan in case a hurricane threatens. The plan should cover actions such as boarding up the house and securing the boat. In addition, special considerations should be taken for young children, the elderly, the disabled, and pets.

Building a Safe Room Inside Your Home

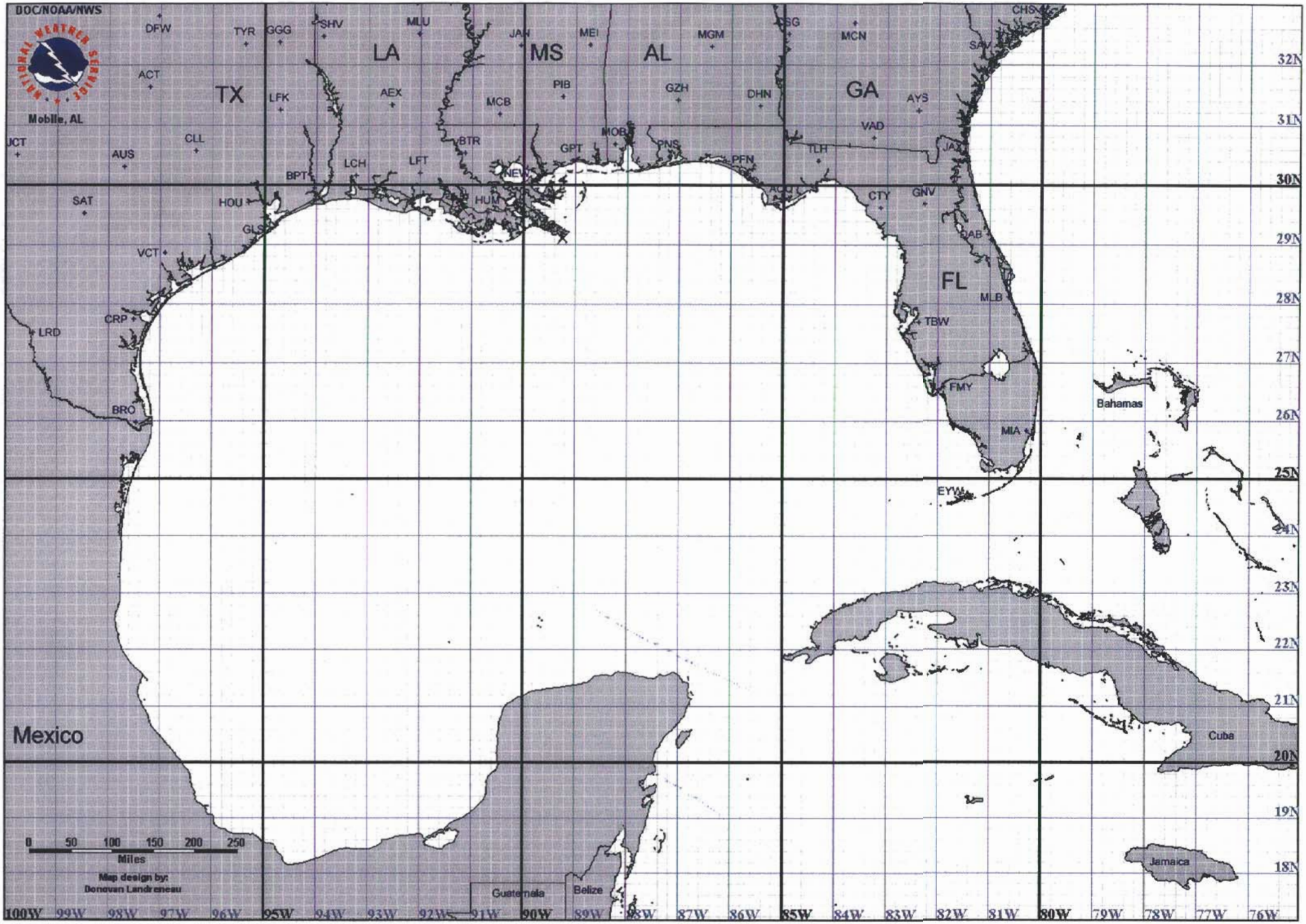
Extreme winds can create stresses on houses that frequently cause connections between building components to fail. For example, the roof or siding material can be pulled off or the windows can be blown out. Once this type of wind damage occurs, additional and often more significant damage can follow. In addition, during extreme winds, damage can also be caused by flying debris. If winds become strong enough, flying debris can be thrown at a building with enough force to penetrate windows, walls, or the roof. In fact, most of the common materials used in building today can be penetrated by flying debris if winds become strong enough. For this reason, persons living in areas where extreme winds associated with hurricanes or tornadoes could occur, should consider having a shelter, or safe room, built into their home to provide a place to seek safe shelter and protect themselves and their families from injury or death caused by the dangerous forces of extreme winds. It can also relieve some of the anxiety created by the threat of an oncoming hurricane or tornado.

Over the past several years, extensive testing and design by several universities and wind engineering research facilities have resulted in the development of shelters constructed of building materials and combinations of building materials that will withstand the forces imposed on it by extreme winds without failing, and will also resist penetration by wind blown flying debris. These safe rooms are most easily built into new homes, but some shelter designs can be added to existing homes. For more detailed information about building a shelter, or safe room, inside your house, contact the Federal Emergency Management Agency.

EMERGENCY SUPPLY KIT

- Flashlight(s) with extra batteries
- Portable radio with extra batteries
- Matches
- Sanitary Supplies
  - Toothbrush/toothpaste
  - Soap
  - Shampoo
  - Sponge
  - Cleanser
  - Bleach
  - Paper towels/towelettes
  - Plastic trash bags
  - Tissues
- Pencils
- Food (three day supply)
  - Canned and dried foods
  - Canned/boxed drinks
- Bottled water (1 gal per person per day)
- Cooking Utensils
  - Cooking pot
  - Camping stove and fuel
- Plastic dishes/eating utensils
  - Aluminum foil
  - Manual can opener
- Baby Supplies
  - Formula
  - Bottles
  - Powered milk
  - Diapers
  - Medications/lotions
  - Blankets/extra clothes
- Pet Supplies
  - Food
  - Leash and/or carrier
  - Vaccination records
  - Food and water containers
- Mosquito Repellant
- Documents
  - Important telephone numbers,
  - Record of bank account numbers
  - Records (birth, marriage, wills)
  - Insurance policies
  - Contracts, deeds, titles
  - Credit card account numbers/companies
  - Passports, social security cards
  - Vaccination records
  - Family Pictures
- Tools and repair supplies
  - Tarps (for temporary roof repair)
  - Hammer and nails
  - Ax
  - Pliers
  - Handsaw
  - Screwdrivers
  - Work gloves
  - Knife
- Extra clothes
- Foul weather gear
- Blankets and towels
- Sunglasses
- Sun screen
- Cash or traveler's checks
- First aid kit
  - Bandages
  - Gauze
  - Scissors
  - Petroleum Jelly
  - Antiseptic spray
  - Hydrogen Peroxide
  - Antacids
  - Aspirin
  - Thermometer
  - Rubbing Alcohol
  - Anti-diarrhea medication
  - First Aid Handbook
- Emergency Generator

NOTE: This list is not intended to be all-inclusive. You must decide what supplies are best suited for you and your family's survival. This list contains suggestions for your consideration.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TAKE ACTION

TERMS AND DEFINITIONS TO IMPROVE THE UNDERSTANDING OF HURRICANES AND RELATED HAZARDS

HURRICANE... An intense tropical weather system with a well defined circulation and maximum sustained winds of 74 mph or higher.

TROPICAL STORM... An organized system of strong thunderstorms with a well defined circulation and maximum sustained winds of 39 to 73 mph.

TROPICAL DEPRESSION... An organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 38 mph or less.

STORM SURGE... This large dome of water, often 50 to 100 miles wide, sweeps ashore near where a hurricane strikes land and typically accounts for nine of ten hurricane fatalities. The greatest natural disaster in the United States occurred when a hurricane generated storm surge swept across Galveston Island, Texas, in 1900, killing approximately 8000 people. A buildup of the water level up to 15 feet or more can cause severe flooding, particularly when the storm surge coincides with normal high tides. Storm surges of 10 to 15 feet, from hurricane Opal in 1995, devastated the coastal areas from Pensacola Beach to Panama City Beach. In 1998, hurricane Georges brought surges of 8 to 12 feet to Mobile and Baldwin counties. In 2002, Tropical Storm Isidore brought storm tides of 5 to 6 feet, so it does not have to be a major hurricane to bring high storm tides to the coast. Last year Ivan brought surges of 10 to 15 feet from Fort Morgan to Navarre Beach. This surge devastated the area. Many buildings withstood hurricane winds until their foundations, undermined by erosion from the storm surge, were weakened and failed. Storm tides, waves, and currents in confined harbors can severely damage ships, marinas, and pleasure boats as Ivan showed. Also, currents set up along the coast by the gradient in storm surge heights and wind combine with waves to severely erode beaches and coastal highways.

RIP CURRENTS...Nice weather along the coastal areas well in advance of an approaching hurricane or tropical storm can be deceiving. While the storm is still distant, large swells can propagate away from the storm and impact local beaches in the form of very rough surf. This can result in the development of dangerous rip currents along local beaches. As winds and tides increase as the storm draws nearer, rip currents can become even more dangerous. Swimmers at local beaches should be aware of these dangers if a hurricane or tropical storm is present, even if it is hundreds of miles away.

TORNADOES... Even though a hurricane or tropical storm weakens as it moves inland, it can produce deadly and damaging tornadoes. During Opal, eight tornadoes were confirmed across south Alabama and northwest Florida. During Georges, nine tornadoes were reported across the area. We recorded six weak tornadoes with Ivan

FLOODING... Typically, hurricanes bring heavy rains which can compound drainage problems in areas experiencing storm surge flooding. Rainfall totals of 10 inches are not uncommon when a tropical storm or hurricane moves across a coastal location. Over land, torrential rain may continue even after the wind has diminished. Rainfall totals of this magnitude could easily result in destructive flash flooding and river flooding. In the past few hurricane seasons, more people have died from fresh water flooding than from storm surge. Flooding also causes extensive property and agricultural losses. During Danny almost thirty-nine inches of rain was measured on Dauphin Island with several locations across south Baldwin and south Mobile counties estimating thirty-five to forty inches of rain.

WHEN IN A WATCH AREA

- Frequently monitor radio, TV (local and cable), NOAA Weather Radio, and/or the Internet (www.srh.noaa.gov/mob) for official bulletins of the storm's progress.
- Fuel and service family vehicles.
- Inspect and secure mobile home tie downs.
- Prepare to cover all window and door openings with shutters or other shielding materials.
- Check batteries and stock up on canned food, first aid supplies, drinking water, and medications.
- Prepare to secure or store lawn furniture and other loose, light-weight objects, such as garbage cans, garden tools, etc.
- Have on hand an extra supply of cash.

WHEN IN A WARNING AREA

- Closely monitor radio, TV (local and cable), NOAA Weather Radio, and/or the Internet (www.srh.noaa.gov/mob) for official bulletins.
- Complete preparation activities, such as putting up storm shutters, storing or securing loose objects, etc.
- Follow instructions issued by local officials. Leave immediately if told to do so!
- If evacuating, leave early (if possible, in daylight). Stay with friends or relatives, at a low-rise inland hotel/motel, or (as a last resort) go to a predesignated public shelter outside a flood zone.
- Leave mobile homes in any case.
- Notify neighbors and a family member outside of the warned area of your evacuation plans.
- Put food and water out for a pet if you cannot take it with you. Most public health regulations do not allow pets in public shelters, nor do most hotels/motels allow them.

IF STAYING AT HOME

Only stay in a home if you have **NOT** been ordered to leave. Stay inside a well constructed building. In structures, such as a home, examine the building and plan in advance what you will do if winds become strong. Strong winds can produce deadly missiles and structural failure.

- Turn refrigerator to maximum cold and open only when necessary.
- Turn off propane tanks.
- Board up windows.
- Stock up on canned goods, flashlights, battery operated radio and plenty of extra batteries.
- Fill bathtub and large containers with water for sanitary purposes.
- Know how to turn off utilities if told to do so by authorities.
- Remove objects from around your home that could become dangerous wind-driven projectiles.

IF WINDS BECOME STRONG

- Stay away from windows and doors even if they are covered. Take refuge in a small interior room, closet, or hallway.
- Close all interior doors. Secure and brace external doors.
- If you are in a two-story house, go to an interior first-floor room, such as bathroom or closet.
- If you are in a multiple-story building and away from the water, go to the first or second floors and take refuge in the halls or other interior rooms away from windows.
- Lie on the floor under a table or another sturdy object.

PLAN TO EVACUATE IF YOU

- Live in a mobile home. They are unsafe in high winds, no matter how well fastened to the ground.
- Live on the coastline, an offshore island, or near a river or a flood plain.
- Live in a high-rise near the beach. Hurricane winds are stronger at higher elevations.

AFTER THE STORM

- Keep monitoring radio, TV (local or cable), NOAA Weather Radio, and/or the Internet.
- Roads may be closed for your protection. If you come upon a barricade or a flooded road, turn around and go another way!
- Avoid weakened bridges and washed out roads. Do not drive into flooded areas.
- Stay on firm ground. Moving water only 6 inches deep can sweep you off your feet. Standing water may be electricity charged from underground or downed power lines.
- Check gas, water, and electrical lines and appliances for damage.
- Do not drink or prepare food with tap water until you are certain it is not contaminated.
- Avoid using candles and other open flames indoors. Use a flashlight to inspect for damage.
- Be especially cautious if using a chainsaw to cut fallen trees.
- Use the telephone to report life-threatening emergencies only.
- Wait until an area is declared safe before entering.
- If you are using an emergency generator, make sure the exhaust is vented to the outside.
- Most important, be a GOOD neighbor.

ATLANTIC TROPICAL STORM AND HURRICANE NAMES FOR 2005

Arlene

Bret

Cindy

Dennis

Emily

Franklin

Gert

Harvey

Irene

Jose (ho-ZAY)

Katrina (ka-TREE-na)

Lee

Maria (ma-REE-ah)

Nate

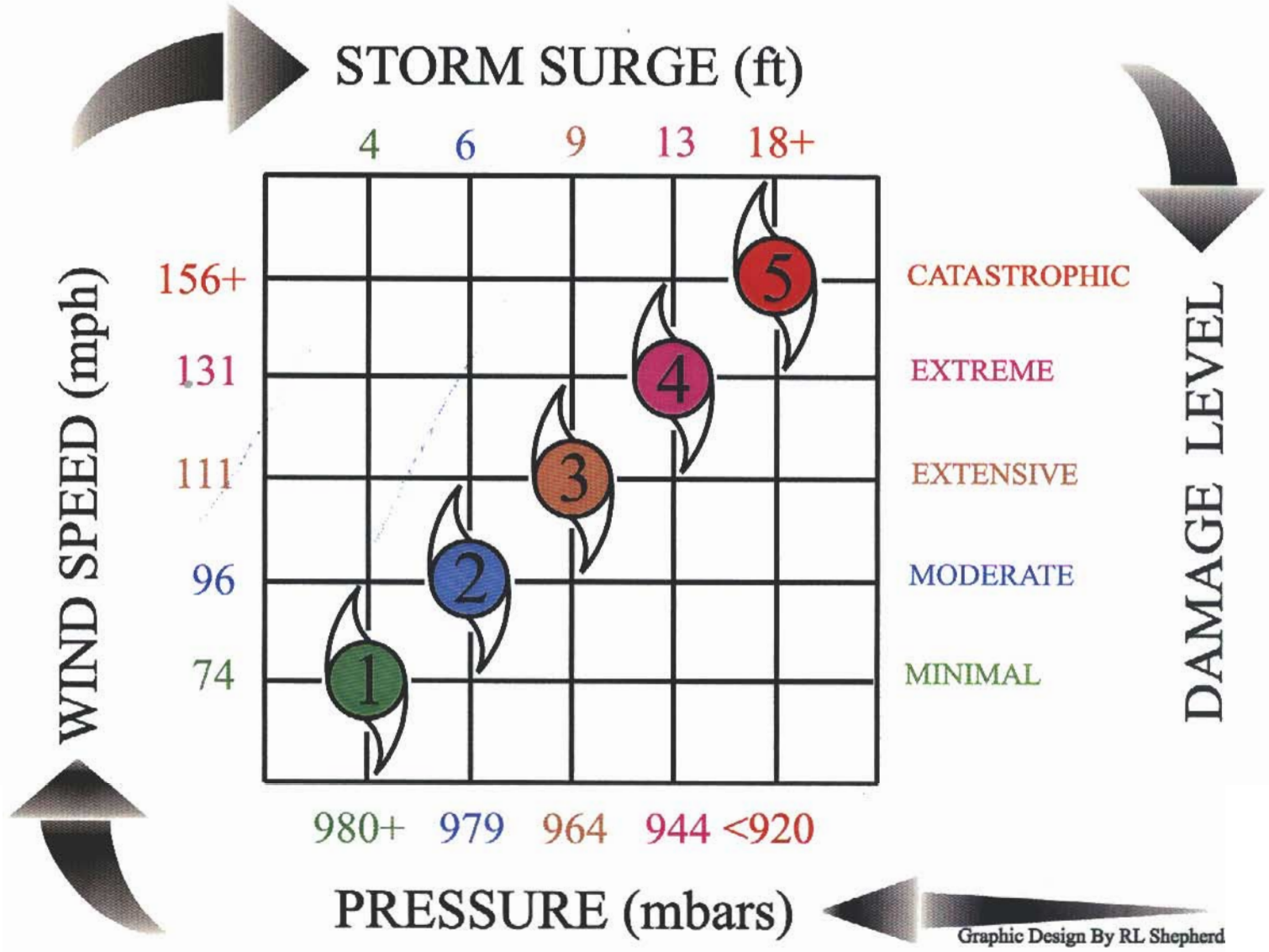
Ophelia (o-FEEL-ya)

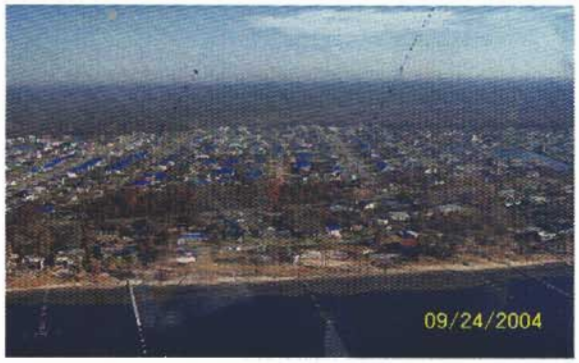
Philippe (fe-leep)

Rita

Stan

SAFFIR-SIMPSON HURRICANE SCALE





Alabama EMA
Emergency Management Agency

NATIONAL WEATHER SERVICE
MOBILE, ALABAMA

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