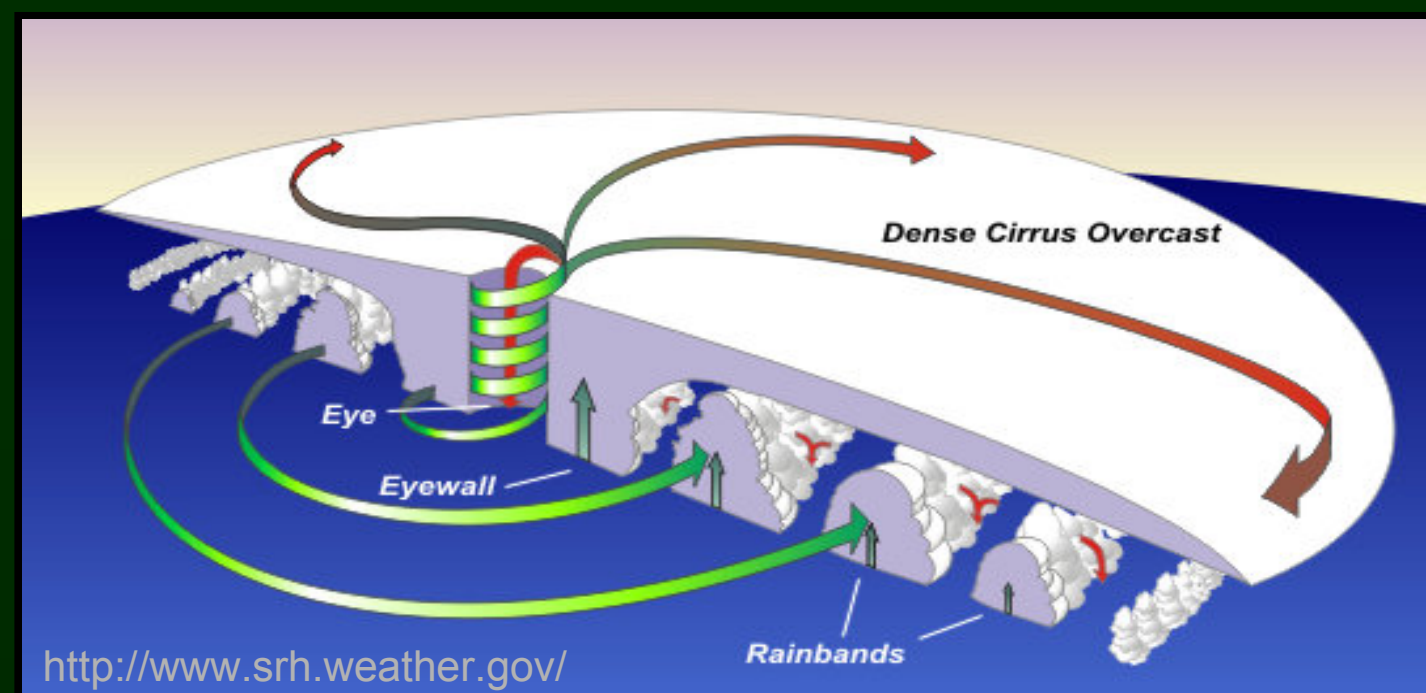


FORMING HURRICANES

What is a Hurricane ?

A hurricane is the most intense form of a tropical cyclone with sustained winds exceeding 120 kilometers per hour (74 mph) that rotate around a strong atmospheric low-pressure system. Hurricanes are accompanied by several hazards (below). North of the equator, hurricanes spin counterclockwise; south of the equator, clockwise. The word comes from the Carib for strong wind, *Huracan*.

Anatomy of a Hurricane



Eye: The hurricane's center can be amazingly clear and calm enough for people to see blue skies above. It can be as large as 65 kilometers (40 miles) across.

Eyewall (also called the Wall Cloud): The dense wall of thunderclouds that define the eye holds the highest wind speeds and controls the size of the eye.

Rainbands: The outer and less severe bands of thunderstorms can range in size from 80 to 500 kilometers (50-300 miles).

Hazards of a Hurricane

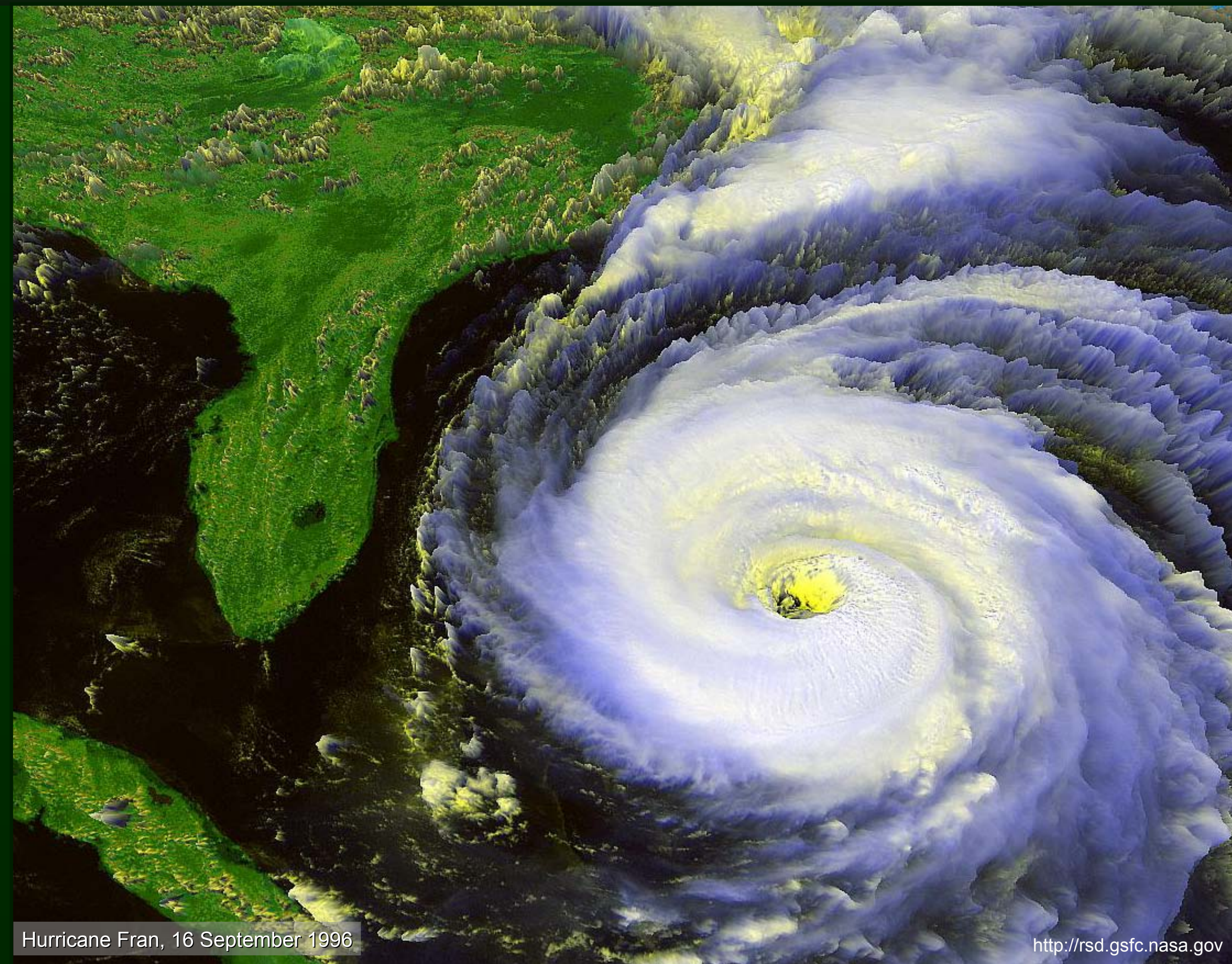
High Winds: The hazard most associated with hurricanes are defined under the **Saffir-Simpson** scale (to the far right). Hurricane-force winds can easily destroy poorly constructed buildings.

Storm Surge: A rapid rise in sea level forced on land by high winds that cause flooding. Storm surges are the worst of hurricane hazards, claiming the most fatalities.

Heavy Rains: Rainfall levels of 15-30 centimeters (6-12 inches) are common, but can reach 115 centimeters (45 inches). Heavy rainfall can lead to significant flooding in low-lying areas.

Tornadoes: Over half of the hurricanes that reach land produce at least one tornado. These tornadoes tend to be less intense than those occurring in the Great Plains.

For Hurricane Safety and Preparedness Guides, please visit
<http://www.nws.noaa.gov/om/brochures/hurr.pdf> and
<http://www.fema.gov/areyouready/>



Hurricane Fran, 16 September 1996

<http://rsd.gsfc.nasa.gov>

What causes Hurricanes ?

Atlantic hurricanes form from atmospheric disturbances, usually off the west coast of Africa but also in the Caribbean Sea and Gulf of Mexico. Hurricanes also form in the tropical Pacific, where they are called typhoons. Hurricanes are fueled by water vapor rising from warm ocean water (27°C, 80°F). These vapors form clouds and rain that warm the surrounding air. If upper level winds are light and unchanging, the system intensifies causing warm wind to move toward the low-pressure center. The air spins under the action of the rotating Earth (Coriolis) causing the storm to grow. The energy organizes into bands of thunderstorms that expand upward and outward of the low-pressure center encircling the eye. Hurricanes can last two weeks over warm ocean waters, but will subside over cooler waters or land. Ocean observing systems provide vital data to scientists indicating when and where hurricanes form, intensify, and move. This information is used for hurricane preparedness (evacuations) and research.

The Saffir/Simpson Hurricane Scale

This scale rates hurricane's intensity based on sustained wind speed, and provides an estimate of potential property damage and flooding.

Hurricane Category	Wind Speed km/h (mi/h)	Storm Surge * m (ft)
Tropical Depression	< 61 (38)	< 1.5 (< 5)
Tropical Storm	62-118 (39-73)	< 1.5 (< 5)
minor 1	119-153 (74-95)	1.5 (5)
2	154-177 (96-110)	2.5 (8)
major 3	178-209 (111-130)	3.7 (12)
4	210-249 (131-155)	5.5 (18)
5	> 249 (> 155)	> 5.5 (> 18)

* Could be less or significantly larger depending on direction and speed of approach, point of landfall and storm radius.

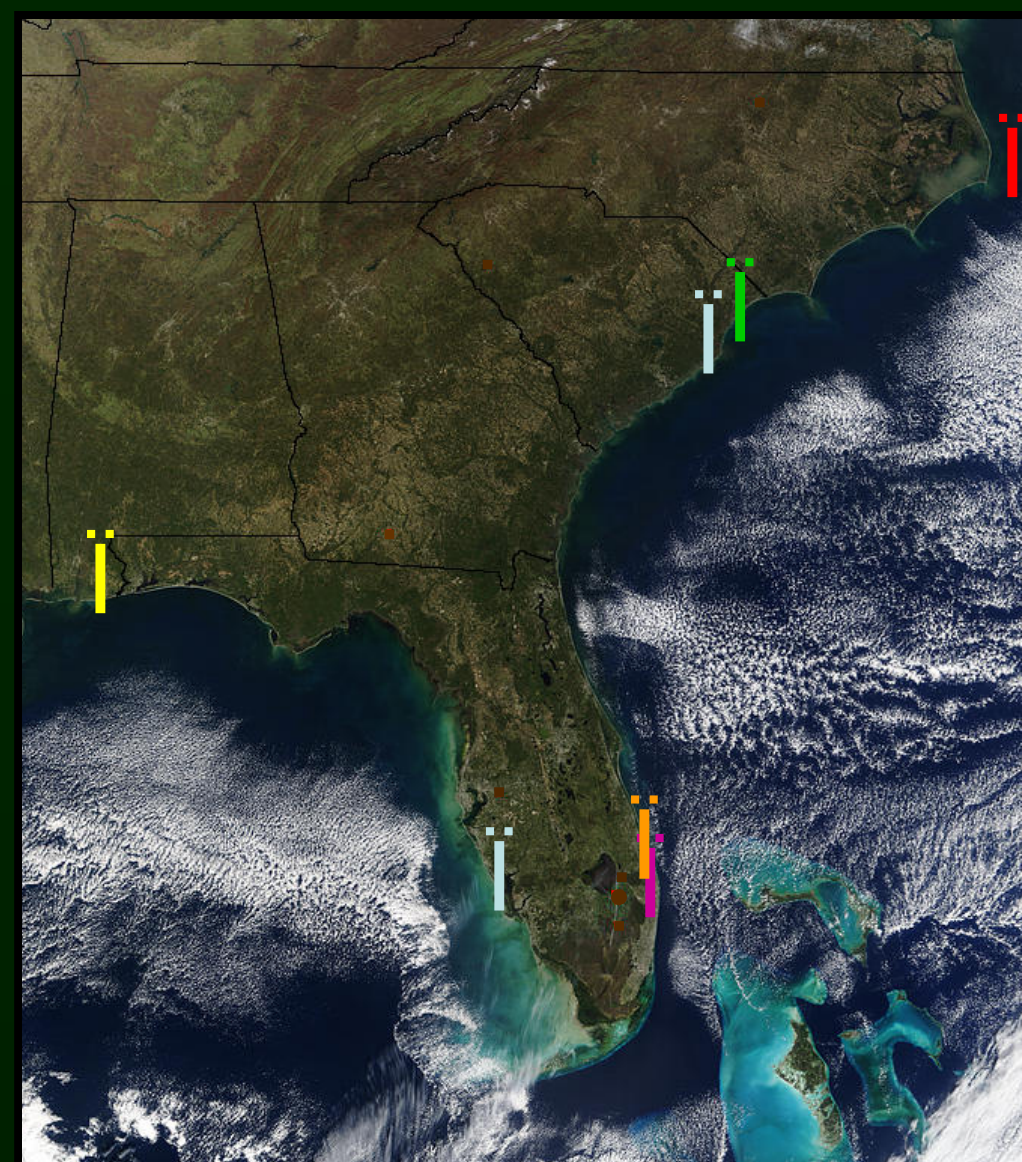
SouthEast Atlantic Hurricane Facts

• The official Atlantic hurricane season begins on June 1 and ends November 30, but peak season is from mid-August until October.

• The naming of hurricanes using alternating male and female names and moving through the alphabet began in 1979. There are 6 lists of names (reused every 6 years) that are used by the National Hurricane Center. These have been endorsed by the World Meteorological Organization.

• On average, 5 hurricanes make landfall from Maine to Texas every 3 years. However in 2004, 6 hurricanes came onshore from North Carolina to Florida alone (to the left). A record level of activity has been noted during the first two months of the 2005 Atlantic hurricane season.

• Since 1950, 48 hurricanes have made landfall from North Carolina to Florida. Of those, 16 were major (Categories 3-5). Hurricanes in 2004 caused 117 deaths and \$42 billion in damage in the U.S. alone.



Storms bringing hurricane conditions onshore from North Carolina to Florida. Symbols (I) define areas where hurricanes were over land and water. The Hurricanes were: **Alex**, **Charley**, **Frances**, **Gaston**, **Ivan** and **Jeanne**.



The images to the left show Villa Sabine, Florida (located west of Pensacola) before and after Hurricane Ivan made landfall near there on September 16, 2004. The red arrows mark the same locations on both images. Notice the severe structural damage and over-washed road.

