TABLE OF CONTENT

FIGURES

Storm Surge…. *A concern to coastal residents*

One major cause of hurricane damage is storm surge. Storm surge is the rising of the sea level due to the low pressure, high winds, and high waves associated with a hurricane as it makes landfall. The storm surge can cause significant flooding and cost people their lives if they're caught unexpected. This was the number one killer during "Katrina" , which historically has claimed **nine of ten victims**.

The Power & Damage of Storm Surge

Wave and current action associated with the tide also causes extensive damage. Water weighs approximately 1,700 pounds per cubic yard; extended pounding by frequent waves can demolish any structure not specifically designed to withstand such forces. The currents created by the tide combine with the action of the waves to severely erode beaches and coastal highways. Many buildings withstand hurricane force winds until their foundations, undermined by erosion, are weakened and fail.

In general, the more intense the storm, and the closer a community is to the right-front quadrant, the larger the area must be evacuated.

The problem is always the uncertainty about how intense the storm will be when it finally makes landfall.

Storm Surge….How?

Storm surge can best be understood by :
The strong winds blowing towards the shore help push water towards shore on the right side of the hurricane's direction of motion. This piling up contributes to most of the coastal flooding. Also, the central pressure of a hurricane is so low that the relative lack of atmospheric weight above the eye and eye wall causes a bulge in the ocean surface level. This effect is similar to using a straw. When you use a straw, you decrease the air pressure in the straw, and the high pressure pushing down on the rest of the drink pushes the drink up the straw. Here it is the relative higher pressure on the ocean around the outside the hurricane that lifts the ocean surface in the center. *Figure 1* on page 4 shows a graphic of this event.

Typical storm surge heights vary with the hurricane's intensity, but they can range from only 1 to more than 5 meters (3 to 25+ feet). The inland penetration of the storm surge's damage can vary depending on the topography. In some locations, like Florida, the landscape is quite flat and if the ocean is raised a couple of meters, the intrusion of the storm surge can be as far as a mile or two or more. Storm surge creates steady flooding, and can wreck homes and pull boats and cars inland or out to sea. *Figures 2 & 3* on page 4, graphically demonstrate these effects.

Waters that flow into low-lying areas can remain for weeks.

Storm Surge….Other Factors

Surge and wave heights on shore are affected by the shelf, or, configuration and bathymetry of the ocean bottom. A narrow one that drops steeply from the shoreline and subsequently produces deep water in close proximity to the shoreline tends to produce a lower surge, yet a higher and more powerful wave. This situation is seen along the southeast coast of Florida. The edge of the Floridan Plateau, where the water depths equal 91 meters (300 feet), lies just 3 km off shore of Palm Beach, Florida; just 7 km off shore, the depth plunges to over 180 meters. The 180 meter (600-foot) depth contour followed southward from Palm Beach County lies more than 30 km to the east of the upper Keys.

Conversely, coastlines such as those along the Gulf of Mexico coast from Texas to Florida, have long, gently sloping shelves and shallow water depths. On the Gulf side of Florida, the edge of the Floridian Plateau (91 meter depth) lies more than 160 km offshore of Marco Island in Collier County. Florida Bay, lying between the Florida Keys and the mainland, is also very shallow; depths typically vary between 0.3 and 2 meters. These areas are subject to higher storm surge, but smaller waves. This difference is because in deeper water, a surge can be dispersed down and away from the hurricane. However, upon entering a shallow, gently sloping shelf, the surge can not be dispersed away, but is driven ashore by the wind stresses of the hurricane. Again, *Figures 2 & 3* show these effects.

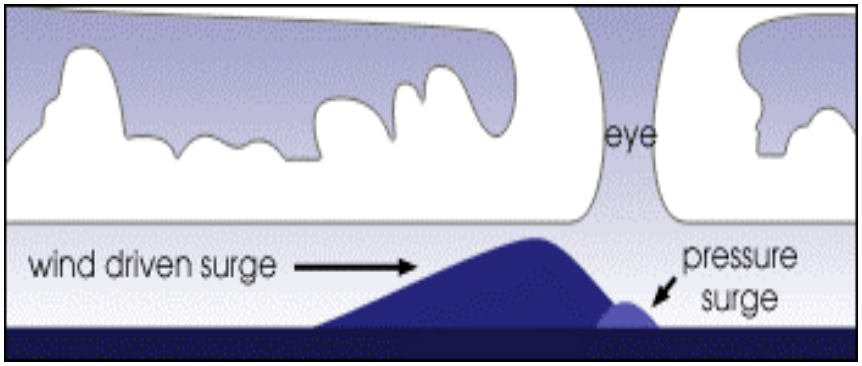

FIGURE 1
EYE SURGE AND WIND SURGE

FIGURE 2
SHALLOW DROPOFF (Western Florida)

FIGURE 3
STEEP DROPOFF (Eastern Florida)

SAFFIR-SIMPSON HURRICANE SCALE			
SCALE NUMBER (CATEGORY)	**SUSTAINED WINDS (MPH)**	**DAMAGE**	**STORM SURGE**
1	74-95	*Minimal:* Unanchored Mobile Homes, vegetation & signs	4-5 feet
2	96-110	*Moderate:* All Mobile Homes, Roofs, small crafts, flooding	6-8 feet
3	111-130	*Extensive:* Small buildings, low-lying roads cutoff	9-12 feet
4	131-155	*Extreme:* Roofs destroyed, trees down, roads cutoff, Mobile Homes destroyed, Beach homes flooded	13-18 feet
5	More Than 155	*Catastrophic:* Most buildings destroyed, vegetation destroyed, Major roads cutoff, homes flooded	Greater Than 18 feet

It should be noted that other factors contribute to Storm Surge such as Tides. When Katrina hit New Orleans as a Category 3, it was at high Tide and the Storm Surge was 23 feet.

FIGURE 4