APPENDIX 1
SAFFIR SIMPSON HURRICANE WIND SCALE

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time. The scale provides examples of the type of damages and impacts in the United States associated with winds of the indicated intensity. In general, damages rise by about a factor of four for every category increase. The maximum sustained surface wind speed (peak 1-minute wind at 10 m [33 ft]) is the determining factor in the scale. The historical examples (one for the U.S. Gulf Coast and one for the U.S. Atlantic Coast) provided in each of the categories correspond with the intensity of the hurricane at the time of landfall in the location experiencing the strongest winds, which does not necessarily correspond with the peak intensity reached by the system during its lifetime. The scale does not address the potential for such other hurricane-related impacts, as storm surge, rainfall-induced floods, and tornadoes. These wind-caused impacts are to apply to the worst winds reaching the coast and the damage would be less elsewhere. It should also be noted that the general wind-caused damage descriptions are to some degree dependent upon the local building codes in effect and how well and how long they have been enforced. For example, recently enacted building codes in Florida, North Carolina and South Carolina are likely to somewhat reduce the damage to newer structures from that described below. However, for a long time to come, the majority of the building stock in existence on the coast will not have been built to higher code. Hurricane wind damage is also dependent upon such other factors as duration of high winds, change of wind direction, amount of accompanying rainfall, and age of structures.

Earlier versions of this scale - known as the Saffir-Simpson Hurricane Scale - incorporated central pressure and storm surge as components of the categories. The central pressure was utilized during the 1970s and 1980s as a proxy for the winds as accurate wind speed intensity measurements from aircraft reconnaissance were not routinely available for hurricanes until 1990. Storm surge was also quantified by category in the earliest published versions of the scale dating back to 1972. However, hurricane size (extent of hurricane force winds), local bathymetry (depth of near-shore waters), and topographic forcing can also be important in forecasting storm surge. Moreover, other aspects of hurricanes - such as the system's forward speed and angle to the coast - also impact the storm surge that is produced. For example, the very large Hurricane Ike (with hurricane force winds extending as much as 125 mi from the center) in 2008 made landfall in Texas as a Category 2 hurricane and had peak storm surge values of 15-20 ft. In contrast, tiny Hurricane Charley (with hurricane force winds extending at most 25 mi from the center) struck Florida in 2004 as a Category 4 hurricane and produced a peak storm surge of only 6-7 ft. These storm surge values were substantially outside of the ranges suggested in the original scale. Thus to help reduce public confusion about the impacts associated with the various hurricane categories as well as to provide a more scientifically defensible scale, the storm surge ranges, flooding impact and central pressure statements are being removed from the scale and only peak winds are employed in this revised version - the Saffir-Simpson Hurricane Wind Scale.

CATEGORY ONE HURRICANE (CAT 1)

Sustained winds 74-95 mph (64-82 kt or 119-153 km/hr). *Damaging winds are expected.* Some damage to building structures could occur, primarily to unanchored mobile homes (mainly pre-1994 construction). Some damage is likely to poorly constructed signs. Loose outdoor items will become projectiles, causing additional damage. Persons struck by windborne debris risk injury and possible death. Numerous large branches of healthy trees will snap. Some trees will be uprooted, especially where the ground is saturated. Many areas will experience power outages with some downed power poles. Hurricane Cindy (2005, 75 mph winds at landfall in Louisiana) and Hurricane Gaston (2004, 75 mph winds at landfall in South Carolina) are examples of Category One hurricanes at landfall.

CATEGORY TWO HURRICANE (CAT 2)

Sustained winds 96-110 mph (83-95 kt or 154-177 km/hr). *Very strong winds will produce widespread damage.* Some roofing material, door, and window damage of buildings will occur. Considerable damage to mobile homes (mainly pre-1994 construction) and poorly constructed signs is likely. A number of glass windows in high rise buildings will be dislodged and become airborne. Loose outdoor items will become projectiles, causing additional damage. Persons struck by windborne debris risk injury and possible death.. Numerous large branches will break. Many trees will be uprooted or snapped. Extensive damage to power lines and poles will likely result in widespread power outages that could last a few to several days. Hurricane Erin (1995, 100 mph at landfall in northwest Florida) and Hurricane Isabel (2003, 105 mph at landfall in North Carolina) are examples of Category Two hurricanes at landfall.

CATEGORY THREE HURRICANE (CAT 3)

Sustained winds 111-130 mph (96-113 kt or 178-209 km/hr). *Dangerous winds will cause extensive damage.* Some structural damage to houses and buildings will occur with a minor amount of wall failures. Mobile homes (mainly pre-1994 construction) and poorly constructed signs are destroyed. Many windows in high rise buildings will be dislodged and become airborne. Persons struck by windborne debris risk injury and possible death. Many trees will be snapped or uprooted and block numerous roads. Near total power loss is expected with outages that could last from several days to weeks. Hurricane Rita (2005, 115 mph landfall in east Texas/Louisiana) and Hurricane Jeanne (2004, 120 mph landfall in southeast Florida) are examples of Category Three hurricanes at landfall.

CATEGORY FOUR HURRICANE (CAT 4)

Sustained winds 131-155 mph (114-135 kt or 210-249 km/hr). *Extremely dangerous winds causing devastating damage are expected.* Some wall failures with some complete roof structure failures on houses will occur. All signs are blown down. Complete destruction of mobile homes (primarily pre-1994 construction). Extensive damage to doors and windows is likely. Numerous windows in high rise buildings will be dislodged and become airborne. Windborne debris will cause extensive damage and persons struck by the wind-blown debris will be injured or killed. Most trees will be snapped or uprooted. Fallen trees could cut off residential areas for days to weeks. Electricity will be unavailable for weeks after the hurricane passes. Hurricane Charley (2004, 145 mph at landfall in southwest Florida) and Hurricane Hugo (1989, 140 mph at landfall in South Carolina) are examples of Category Four hurricanes at landfall.

CATEGORY FIVE HURRICANE (CAT 5)

Sustained winds greater than 155 mph (135 kt or 249 km/hr). *Catastrophic damage is expected.* Complete roof failure on many residences and industrial buildings will occur. Some complete building failures with small buildings blown over or away are likely. All signs blown down. Complete destruction of mobile homes (built in any year). Severe and extensive window and door damage will occur. Nearly all windows in high rise buildings will be dislodged and become airborne. Severe injury or death is likely for persons struck by wind-blown debris. Nearly all trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Hurricane Camille (1969, 190 mph at landfall in Mississippi) and Hurricane Andrew (1992, 165 mph at landfall in Southeast Florida) are examples of Category Five hurricanes at landfall.

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