

The Saffir-Simpson Hurricane Wind Scale

In 1971 civil engineer, Herbert Saffir and meteorologist Dr. Robert Simpson developed the Saffir-Simpson Hurricane Scale. The initial scale showed the expected damage to structures based upon wind speed and storm surge effects.

In 2010, the National Hurricane Center removed storm surge and barometric pressure from the Saffir-Simpson Scale, turning it into the Saffir-Simpson Hurricane Wind Scale. The scale provides examples of the type of damage and impacts in the United States associated with winds of the indicated intensity. The Saffir-Simpson Hurricane Wind Scale provides information on wind impacts only and does not provide commentary or information on the other impacts or characteristics associated with tropical cyclones.

Category One Hurricane:

Sustained winds of 74-95 mph, 64-82 kt, or 119153 km/hr. Very dangerous winds will produce some damage. People, pets, and livestock could be injured or killed by flying or falling debris.

Older (pre-1994 construction) mobile homes could be destroyed, especially if they are not anchored properly. Newer mobile homes that are anchored properly can sustain damage to shingles or metal roof coverings, loss of vinyl siding, as well as damage to carports, sunrooms, or lanais. Poorly built frame homes can experience major damage. Unprotected windows may break if struck by flying debris. Masonry chimneys can be toppled. Well-built frame homes can experience damage to roof shingles, vinyl siding, soffit panels, and gutters. Overhead doors may fail if not secured properly. Failure of aluminum, screened-in enclosures can occur. Roof coverings and siding may be partially removed. Broken glass will pose a threat, and there may be damage to commercial signage, fences, and canopies.

Large branches of trees will snap, and trees may topple. Extensive damage to power lines and poles will likely result in power outages.

Category Two Hurricane:

Sustained winds of 96-110 mph, 83-95 kt, or 154177 km/hr. Extremely dangerous winds will cause extensive damage. Substantial risk of injury or death to people, pets, and livestock due to flying and falling debris.

Older (pre-1994 construction) mobile homes have a very high chance of being destroyed. Newer mobile homes can also be destroyed. Poorly built frame homes have a high chance of having their roof structures removed, especially if not anchored properly. Unprotected windows will have a high chance of being broken by flying debris. Well-built frame homes could sustain major roof and siding damage. Failure of aluminum, screened-in enclosures will be common. Unreinforced masonry walls can collapse. High percentage of roof and siding damage to buildings. Windows in high-rise buildings can be broken. Broken glass will pose a significant danger, and commercial signage, fences, and canopies will be damaged or destroyed.

Many shallow rooted trees will be snapped or uprooted. Near-total power loss is expected; clean water could become scarce due to system failures.

Category Three Hurricane:

Sustained winds of 111-129 mph, 96-112 kt, or 178-208 km/hr. Devastating damage will occur. High risk of injury or death to people, pets, and livestock due to debris.

Nearly all older (pre-1994) mobile homes will be destroyed. Most newer mobile homes will sustain severe damage with potential for complete roof failure and wall collapse. Poorly built frame homes can be destroyed. Well-built frame homes can experience major damage. Unprotected windows will be broken by flying debris. Isolated structural damage to wood or steel framing can occur. Complete failure of older metal buildings is possible, and older unreinforced masonry buildings can collapse. High percentage of roof and siding damage to buildings. Numerous windows will be blown out of high-rise buildings, and most commercial signage, fences, and canopies will be destroyed.

Many trees will be snapped or uprooted. Electricity and water will be unavailable.

Category Four Hurricane:

Sustained winds of 130-156 mph, 113-136 kt, or 209-251 km/hr. Catastrophic damage will occur. Very high risk of injury or death to people, pets, and livestock due to debris.

Nearly all older (pre-1994) and a high percentage of newer mobile homes will be destroyed. Poorly built homes can sustain complete collapse of all walls as well as the loss of the roof structure. Well-built homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Extensive damage to roof coverings, windows, and doors will occur. Windborne debris will break most unprotected windows and penetrate some protected windows. High percentage of structural damage to the top floors of apartment buildings. High percentage of collapse in older unreinforced masonry buildings. Steel frame in older industrial buildings can collapse. Most windows will be blown out of high-rise buildings, and nearly all-commercial signage, fences, and canopies will be destroyed.

Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate areas. Power outages and long-term water shortages may last for many months; most of the area will be uninhabitable during that period.

Category Five Hurricane:

Sustained winds greater than 157mph, greater than 137 kt, or greater than 252 km/hr. Catastrophic damage will occur. Very high risk of injury or death to people, pets, and livestock from debris, even if indoors in mobile homes or framed homes.

Almost complete destruction of all mobile homes will occur, regardless of age or construction. High percentage of frame homes will be destroyed. Extensive damage to roof covers, windows, and doors will occur. Windborne debris damage will occur to nearly all unprotected windows and many protected

windows. Complete collapse of many older metal buildings can occur. Most unreinforced masonry walls will fail leading to the collapse of buildings. Significant damage to wood roofs will occur. High percentage of industrial and low-rise apartment buildings will be destroyed. Nearly all windows will be blown out of high-rise buildings, and nearly all-commercial signage, fences, and canopies will be destroyed.

Nearly all trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate areas. Power outages and long-term water shortages may last for many months; most of the area will be uninhabitable during that period.