Willis

STRATEGIC OUTCOMES PRACTICE

TECHNICAL ADVISORY BULLETIN

April 2011

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2011 ATLANTIC BASIN SEASONAL HURRICANE FORECAST

WORSE THAN AVERAGE BETTER THAN PREDICTED

Information obtained through March 2011 by Dr. William Gray and his team at Colorado State University indicates that the 2011 Atlantic hurricane season will have significantly more activity than the average 1950-2000 season.

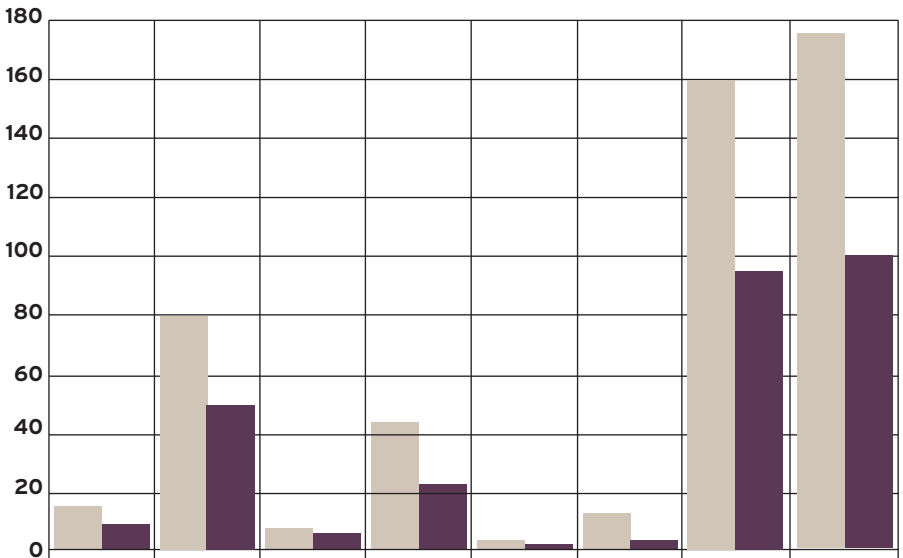
The forecast has been slightly decreased from their early December 2010 forecast because of an anomalous warming in the eastern and central tropical Pacific and cooling in the tropical Atlantic.

TROPICAL CYCLONE SEASONAL FORECAST FOR 2011

	Prediction for 2011	Average
Named Storms (NS)	16	9.6
Named Storm Days (NSD)	80	49.1
Hurricanes (H)	9	5.9
Hurricane Days (HD)	35	24.5
Major Hurricanes (MH) (Category 3-4-5)	5	2.3
Major Hurricane Days (MHD)	10	5.0
Accumulated Cyclone Energy (ACE)	160	96.1
Net Tropical Cyclone Activity (NTC)	175	100%

Seasonal updates of their 2011 Atlantic basin hurricane forecasts will be issued on Wednesday, June 1 and Wednesday, August 3. They will also be issuing two-week forecasts for Atlantic tropical cyclone activity during the climatological peak of the season, from August-October. A verification and discussion of all 2011 forecasts will be issued in late November 2011. All of their forecasts will be available on the web at: **http://hurricane.atmos.colostate.edu/Forecasts**.

YEAR 2011 HURRICANE PREDICTION (FORECAST VS. CLIMATOLOGY)



	Named Storms	Named Storm Days	Hurricanes	Hurricane Days	Major Hurricanes	Major Hurricane Days	ACE	Net Activity (%)
Forecast	16	80	9	35	5	10	160	175
Climatology	9.6	49.1	5.9	24.5	2.3	5	96.1	100

LANDFALL PREDICTIONS

PROBABILITIES FOR AT LEAST ONE MAJOR (CATEGORY 3-4-5) HURRICANE LANDFALL ON EACH OF THE FOLLOWING COASTAL AREAS:

1. Entire U.S. coastline – 72% (average for last century is 52%)
2. U.S. East Coast including Florida peninsula – 48% (average for last century is 31%)
3. Gulf Coast from the Florida Panhandle westward to Brownsville - 47% (average for last century is 30%)

PROBABILITY FOR AT LEAST ONE MAJOR (CATEGORY 3-4-5) HURRICANE TRACKING INTO THE CARIBBEAN (10°- 20° N, 60° - 88° W)

1. 61% (average for last century is 42%)

BEFORE THE STORM

- Review/update business continuity/disaster recovery plan.
- Review procedures with emergency organization or emergency response team to ensure all positions are filled and all members are properly trained.
- Check general condition of the building, specifically the roof covering, roof flashing and roof drains. Make all necessary repairs.
- Order emergency supplies such as plywood for windows, mops, brooms, tarpaulins for key equipment, sandbags, etc.
- Identify key equipment, stock and supplies, and vital records that will need to be relocated or moved.
- Have materials available to secure outside and/or roof-mounted equipment such as cranes, signs, trailers and HVAC equipment.
- Monitor commercial TV, radio and/or internet websites to keep abreast of weather conditions and issuance of watches and/or warnings.
- Test all generators, emergency lighting, UPS equipment and sump pumps to ensure proper operation.

IMPENDING STORM

- Implement business continuity/disaster recovery plan.
- Shut down operations in an orderly manner and in accordance with emergency shutdown procedures.
- Check all fire protection equipment such as sprinkler control valves and fire pumps.
- Fuel all fire pumps, generators, company vehicles, power equipment such as saws, etc.
- Install hurricane shutters or plywood over windows and doors.
- Cover computers, machinery and stock and supplies with tarpaulins.
- If possible, raise any equipment, finished goods or items off the floor.
- Secure outside and/or roof-mounted equipment such as cranes, signs, trailers and HVAC equipment.
- If necessary, turn off utilities to reduce the probability of a fire/explosion.
- Conduct final inspection of building and make emergency repairs.

AFTER THE STORM

- Secure the facility.
- Survey for damage – take pictures of any damage to both the building(s) and its contents.
- Avoid loose or dangling power lines and report them to utility company, police or fire department.
- Before utilities are returned to service, check for gas leaks, look for electrical system damage, and check for sewage and water line damage.
- Begin salvage operations as soon as possible.
- Clean debris from roofs and property if safe to do so.
- Use telephone only for emergency calls.
- Use pre-established property conservation programs such as sprinkler impairment procedures and cutting and welding permits when repairs commence.
- Stay tuned to local radio for information.
- Critique pre- and post-storm actions to identify strengths and weaknesses and make necessary modifications to prepare for the next emergency.

THE SAFFIR-SIMPSON HURRICANE WIND SCALE

The **Saffir-Simpson Hurricane Wind Scale** was updated in early 2010. The scale keeps the same wind speed ranges as the original Saffir-Simpson Scale for each of the five hurricane categories, but no longer ties specific storm surge and flooding effects to each category.

CATEGORY ONE HURRICANE

VERY DANGEROUS WINDS WILL PRODUCE SOME DAMAGE Sustained winds 74-95 mph (119-153 km/hr). People, livestock and pets struck by flying or falling debris could be injured or killed. Older (mainly pre-1994 construction) mobile homes could be destroyed, especially if they are not anchored properly as they tend to shift or roll off their foundations. Newer mobile homes that are anchored properly can sustain damage involving the removal of shingle or metal roof coverings, and loss of vinyl siding, as well as damage to carports, sunrooms or lanais. Some poorly constructed frame homes can experience major damage, involving loss of the roof covering and damage to gable ends as well as the removal of porch coverings and awnings. Unprotected windows may break if struck by flying debris. Masonry chimneys can be toppled. Well-constructed frame homes could have damage to roof shingles, vinyl siding, soffit panels and gutters. Failure of aluminum, screened-in swimming pool enclosures are possible. Some apartment building and shopping center roof coverings could be partially removed. Industrial buildings can lose roofing and siding especially from windward corners, rakes and eaves. Failures to overhead doors and unprotected windows will be common. Windows in high-rise buildings can be broken by flying debris. Falling and broken glass will pose a significant danger even after the storm. There will be occasional damage to commercial signage, fences and canopies. Large tree branches will snap and shallow rooted trees can be toppled. Extensive damage to power lines and poles will likely result in power outages that could last a few to several days. Hurricane Dolly (2008) is an example of a hurricane that brought Category 1 winds and impacts to South Padre Island, Texas.

CATEGORY TWO HURRICANE

EXTREMELY DANGEROUS WINDS WILL CAUSE EXTENSIVE DAMAGE Sustained winds 96-110 mph (154-177 km/hr).There is a substantial risk of injury or death to people, livestock and pets due to flying and falling debris. Older (mainly pre-1994 construction) mobile homes have a very high chance of being destroyed, and the flying debris generated can shred nearby mobile homes. Newer mobile homes can also be destroyed. Poorly constructed frame homes have a high chance of having their roof structures removed especially if they are not anchored properly. Unprotected windows will have a high probability of being broken by flying debris. Well-constructed frame homes could sustain major roof and siding damage. Failure of aluminum, screened-in swimming pool enclosures will be common. There will be a substantial percentage of roof and siding damage to apartment buildings and industrial buildings. Unreinforced masonry walls can collapse. Windows in high-rise buildings can be broken by flying debris. Falling and broken glass will pose a significant danger even after the storm. Commercial signage, fences and canopies will be damaged and often destroyed. Many shallow rooted trees will be snapped or uprooted, blocking numerous roads. Near-total power loss is expected with outages that could last from several days to weeks. Potable water could become scarce as filtration systems begin to fail. Hurricane Frances (2004) is an example of a hurricane that brought Category 2 winds and impacts to coastal portions of Port St. Lucie, Florida with Category 1 conditions experienced elsewhere in the city.

CATEGORY THREE HURRICANE

DEVASTATING DAMAGE WILL OCCUR Sustained winds 111-130 mph (178-209 km/hr). There is a high risk of injury or death to people, livestock and pets due to flying and falling 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 constructed frame homes can be destroyed by the removal of the roof and exterior walls. Unprotected windows will be broken by flying debris. Well built frame homes can sustain major damage involving the removal of roof decking and gable ends. There will be a high percentage of roof covering and siding damage to apartment buildings and industrial buildings. 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. Numerous windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm. Most commercial signage, fences and canopies will be destroyed. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to a few weeks after the storm passes. Hurricane Ivan (2004) is an example of a hurricane that brought Category 3 winds and impacts to coastal portions of Gulf Shores, Alabama with Category 2 conditions experienced elsewhere in this city.

CATEGORY FOUR HURRICANE

CATASTROPHIC DAMAGE WILL OCCUR Sustained winds 131-155 mph (210-249 km/hr).There is a very high risk of injury or death to people, livestock and pets due to flying and falling debris. Nearly all older (pre-1994) mobile homes will be destroyed. A high percentage of newer mobile homes also will be destroyed. Poorly constructed homes can sustain complete collapse of all walls as well as the loss of the roof structure. Well-built homes also 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. Large amounts of windborne debris will be lofted into the air. Windborne debris damage will break most unprotected windows and penetrate some protected windows. There will be a high percentage of structural damage to the top floors of apartment buildings. Steel frames in older industrial buildings can collapse. There will be a high percentage of collapse to older unreinforced masonry buildings. Most windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm. 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 residential areas. Power outages will last for weeks to possibly months. Long-term water shortages will increase human suffering. Most of the area will be uninhabitable for weeks or months. Hurricane Charley (2004) is an example of a hurricane that brought Category 4 winds and impacts to coastal portions of Punta Gorda, Florida with Category 3 conditions experienced elsewhere in the city.

CATEGORY FIVE HURRICANE

CATASTROPHIC DAMAGE WILL OCCUR Sustained winds greater than 155 mph (249 km/hr). People, livestock and pets are at very high risk of injury or death from flying or falling debris, even if indoors in mobile homes or framed homes. Almost complete destruction of all mobile homes will occur, regardless of age or construction. A high percentage of frame homes will be destroyed, with total roof failure and wall collapse. Extensive damage to roof covers, windows and doors will occur. Large amounts of windborne debris will be lofted into the air. Windborne debris damage will occur to nearly all unprotected windows and many protected windows. Significant damage to wood roof commercial buildings will occur due to loss of roof sheathing. Complete collapse of many older metal buildings can occur. Most unreinforced masonry walls will fail, which can lead to collapse of the buildings. A high percentage of industrial buildings and low-rise apartment buildings will be destroyed. Nearly all windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm. 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 residential areas. Power outages will last for weeks to possibly months. Long-term water shortages will increase human and animal suffering. Most of the area will be uninhabitable for weeks or months. Hurricane Andrew (1992) is an example of a hurricane that brought Category 5 winds and impacts to coastal portions of Cutler Ridge, Florida with Category 4 conditions experienced elsewhere in south Miami-Dade County.

CONTACTS

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Advice given in this bulletin is general in nature and covers basic procedures applicable to most, if not all, properties susceptible to cold weather, snow and ice. It does not purport to cover all possible conditions, perils or hazards which may be found at a given location or facility, nor to provide complete and all-encompassing loss prevention advice. Other factors could contribute to a loss, or prevent or mitigate a loss.