New plane awaits '97 hurricanes

Forecasters predict 'Gonzo' will improve storm tracking

Associated Press

MIAMI — When Hurricane Andrew left much of south Dade County resembling the aftermath of a B-51 bombing raid, forecasters fretted about where the massive storm would strike next.

Warnings flashed along the Gulf Coast from the Florida Panhandle to Louisiana. Projections put a bulls-eye on flood-prone New Orleans, where residents boarded up their homes and fled north. But Andrew blew ashore in an unpopulated marshland more than 100 miles west of the city.

New Orleans was spared major damage in August 1992. But the city and its residents still paid a hefty price to prepare for the storm — estimated at more than $50 million.

The inexact science of plotting hurricanes frustrates the most seasoned experts.Hurricane season began June 1, and a new piece of forecasting technology will greatly improve the odds of predicting a storm's landfall.

The first time a storm approaches U.S. territory or the Caribbean this year, a Gulfstream IV jet will depart from Tampa and fly over and around the system, gathering data that will reveal more precise coordinates and gauge its power.

The tracking jet will fly much faster and higher — up to 500 mph and 45,000 feet — than the Hercules WC-130 four-engine turboprop that the Air Force uses to head directly into the eye of a hurricane at 1,500 to 10,000 feet. Its top speed is about 370 mph.

"It will have a substantial impact on forecasts in the future," said Bob Sheets, who headed the National Hurricane Center when Andrew hit and is now a consultant. "What we've lacked all these years is the data from around the hurricane. It's going to improve the 24-, 36- and 48-hour forecasts substantially."

The new jet, dubbed "Gonzo" after the Sesame Street character, cost $23 million and took 19 years to research and design especially for forecasters. It will cost $22,500 every time the aircraft takes a 9-hour hurricane flight with a crew of as many as a dozen people.

Sheets fears congressional budget cuts may force the plane to spend more time in its hangar at Tampa's MacDill Air Force Base than chasing hurricanes.

The Department of Commerce recently threatened to cut funding to the hurricane center and other National Weather Service facilities, but restored the money after receiving protests from hurricane-prone states. The cuts would have eliminated key positions in Miami, where a skeleton crew works round-the-clock when storms threaten.

"The critical problem now is whether we will have enough money to fly it," Sheets said. "It would be upsetting to see that resource sitting there and not be able to use it."

But Jim McFadden, the Commerce Department's hurricane manager charged with overseeing the Gulfstream jet, said money questions won't ground the plane.

"If the flight is needed, it will be flown," he said.

Its mission is to measure variables in the atmosphere high above and around a storm. That data is then transmitted to the National Weather Service in Washington, where it is fed into computer tracking models.

"For the first time, we're going to have information that defines the river of air that steers the hurricane," said Max Mayfield, a hurricane forecaster in Miami.

If this high-altitude jet had been available in 1992, New Orleans may not have been included in the warning area, Sheets said.

Anyone who's had to wait outside a building materials store at 4 a.m. to buy plywood to cover windows when a hurricane is predicted knows the feeling when a storm veers away. The time and money were spent for nothing.

"The economic benefit is one of the real keys," said McFadden. "When forecasters issue a public warning, they may have to issue that warning over a 300-mile strip. If it costs about $200,000 per mile of coast line to prepare for a hurricane warning, that's a significant amount of money."

Narrowing the scope of evacuations not only saves money. It will boost the confidence of coastal residents and the decision makers who order evacuations.

"We've been lucky most of this century and that makes it difficult because people become complacent," said Robert Smith, the emergency management director in Savannah/Chatham County, Ga.

Two times last year Smith asked Savannah residents to pack up and leave town. Both times, the frustrations grew as the storms — first Hurricane Bertha, then a few weeks later Hurricane Fran — swerved north and struck North Carolina.

While residents and some local politicians grumbled about being forced to evacuate, Smith and forecasters like Mayfield support the decisions.

"The truth is it doesn't matter if you have the best satellites, the best radar, the best computers, and it really doesn't even matter if you make the perfect forecast," Mayfield said. "If you can't communicate that information to the decision makers, you haven't done your job."

Hurricane names

Associated Press

Names for the 1997 Atlantic hurricane season (The National Weather Service skips the letters Q, U, X, Y and Z because they have too few names to be regularly rotated.): Ana, Bill, Claudette, Danny, Erika, Fabian, Grace, Henri, Isabel, Juan, Kate, Larry, Mindy, Nicholas, Odette, Peter, Rose, Sam, , Teresa, Victor, Wanda.

Mark Inabinett photo

Market Street, between Sixth and Seventh streets, shows the effects of Fran's flooding the morning after the hurricane's visit to Washington in September.

Heat engines spin from tropics

Ocean, atmosphere combine to create hurricanes during summer

The term hurricane probably derived from the Carib Indians of the West Indies who called them huracan after the Mayan storm god, Hunraken. The Spanish later modified it to hurricane.

A hurricane is a type of tropical cyclone — the general term for all circulating weather systems over tropical waters. Hurricanes are products of the tropical ocean and atmosphere. Developing hurricanes gather heat and energy through contact with warm ocean waters. The addition of moisture by evaporation from the sea surface powers them like giant heat engines.

The diameter of a hurricane, referred to as the core or eye, ranges up to 25 miles. The wall cloud around the eye extends up to 10 miles high. The eye of a hurricane is relatively calm. The most violent activity takes place in the area immediately around the eye, called the eyewall. At the top of the eyewall (about 50,000 feet), most of the air is propelled outward, increasing the air's upward motion. Some of the air, however, moves inward and sinks into the eye, creating a cloud free area.

Hurricanes may die out over the water or head inland leaving a patch of destruction in their wake. They can produce torrential rains, floods, thunder and lightning, and spawn tornadoes which can do even more devastation than the hurricanes. Hurricane winds average 74 to 150 miles per hour.

Hurricanes occur only in the hot season probably because in the winter the jet stream transfers temperatures and energy throughout the globe. But in the summer, the jet is so weak that another method is needed to keep Earth's "energy budget" in balance.

In the eastern Pacific, hurricanes begin forming in mid-May, while in the Atlantic, Caribbean and Gulf of Mexico, hurricanes development starts in June. For the United States, the peak hurricane threat exists from mid-August to late October, although officially the hurricane season extends through November. Over other parts of the world, such as the western Pacific, hurricanes can occur year-round.

Early in the Atlantic Tropical Cyclone season, the Caribbean Sea and Gulf of Mexico are the general formation zones. By July and August, the center of creation shifts eastward to the west coast of Africa, and then drifts slowly westward again. By September the breeding ground extends from the Bahamas to the Lesser Antilles. From there if shifts further westward and back to the original formation zones: the Caribbean and Gulf of Mexico.

A slight rotary circulation with no strong winds is called a tropical disturbance. A tropical depression is a rotary counterclockwise circulation with sustained winds of 38 miles per hour. A tropical storm is a distinct rotary counterclockwise circulation with sustained winds of 39 to 73 miles per hour. The eye becomes visible, and the Hurricane Center in Miami gives it a name, such as Hugo. A tropical storm becomes a hurricane when winds reach 74 miles per hour. The eye of a hurricane is very pronounced.

Hurricanes are categorized by severity on the Saffir-Simpson Hurricane Scale. A Category 1 hurricane usually causes little property damage. With a Category 2 hurricane, evacuation of coastal residents is required. With Category 3, evacuation of residents within several blocks of the shoreline is required. With Category 4, residents within two miles of the coast should be evacuated; and with a Category 5 hurricane, residents who live up to 10 miles from the shore could be evacuated.

Each year on average, 10 tropical storms (of which six become hurricanes) develop over the Atlantic Ocean, Caribbean Sea or Gulf of Mexico. Many of these remain over the ocean. However, about five hurricanes strike the U.S. coastline every three years. Of these five, two will be major (Category 3 or greater) hurricanes.

It's important to know the difference between a severe weather watch and a warning during a storm.

A watch is issued when weather conditions are favorable for creating a tropical storm, tornado or hurricane.

When a warning is issued, a tropical storm, tornado or hurricane has been spotted on the weather service's radar or sighted in a nearby area. Short-term watches and warning provide detailed information on specific hurricane threats, such as floods and high winds.

Hurricane Preparedness

How you fare during a hurricane can depend on how prepared you are for it. The key to survival is preparation.

When the storm is forecast:

— Learn the evacuation route. If you live in a mobile home, plan to evacuate.

— Check with your insurance company to see what will be covered. Separate policies are needed for wind and flood damage.

— Take a full inventory of your personal property to help in filling out claims. List descriptions and take pictures.

When the storm threatens:

— Check supplies and make sure you have on hand portable radio with fresh batteries, flashlight, candles or lamps, matches, first-aid kit, canned or packaged food that can be prepared without cooking or refrigeration, several days' supply of drinking water (one quart per person per day) and a full tank of gas in your car.

— Watch television and listen to the radio for hurricane position, intensity and expected landfall.

— Prepare for high winds by boarding up or taping windows and other glass, anchoring objects outside, bracing garage doors and lowering antennas.

— Move boats and trailers close to the house and check mooring lines of boats in the water.

— Put important papers in waterproof containers (take them along if you evacuate) and move all valuables to higher levels in your home.

When a storm hits:

— Stay indoors in an inside room away from doors and windows. Don't go out in the brief calm during the eye of the storm.

— Keep television and radio tuned for information from official sources.

— If you evacuate, take blankets, first aid supplies and other essential items to the nearest shelter. Don't travel farther than necessary. Before you leave, turn off gas, water and electricity.

After the storm has passed:

— Beware of loose or dangling power lines and report them immediately.

— Walk or drive cautiously. Watch out for debris filled streets and weakened bridges. Snakes and insects may be a problem.

— Guard against spoiled food.

— Use your emergency water supply or boil water before drinking until local officials say the water supply is safe. Report broken sewer or water mains.

— Make temporary repairs to protect property from further damage or looting. Beware of unscrupulous characters who may show up.

— Notify your insurance agent or broker of any losses.

Mark Inabinett photo

A tree lies toppled off Harvey Street in Washington following Hurricanee Fran in September.