



# NOAA HURRICANE FORECAST IMPROVEMENT PROGRAM (HFIP)



*Protecting life and property*

## Improving the accuracy and reliability of hurricane forecasts



HFIP Science Manager Dr. Frank Marks (right) with Jun Zhang, both from NOAA's Atlantic Oceanographic and Meteorological Laboratory, aboard one of NOAA's P-3 hurricane hunter aircraft. (Photo credit: NOAA)

Hurricanes are a major concern of the people who live, work and visit coastal communities. More than 50 percent of the U.S. population lives within 50 miles of the coast, and roughly 180 million people visit the coast every year. Hurricane forecasts have improved dramatically in the last 10 years. Today's 5-day track forecast is as good as the 3-day track forecast of a decade ago. Yet, forecasting rapid changes in hurricane intensity needs further improvement.

The **Hurricane Forecast Improvement Program (HFIP)** is a 10-year program formed in 2007 to improve guidance for hurricane track, intensity, and storm surge forecasts. NOAA's Office of Oceanic and Atmospheric Research (OAR) and National Weather Service (NWS) manage the HFIP program.

### The **goals of HFIP** are:

- To improve the accuracy and reliability of hurricane track and intensity forecasts,
- To extend lead times for hurricane forecasts with increased certainty, and
- To increase confidence in hurricane forecasts.

## Economic Impacts

On average, hurricanes account for \$5.1 billion in damages and 20 deaths per year.

For example, in September 2008, large and powerful **Hurricane Ike** made landfall in Texas, claiming 82 lives and resulting in an estimated \$27 billion in damages across 9 states.

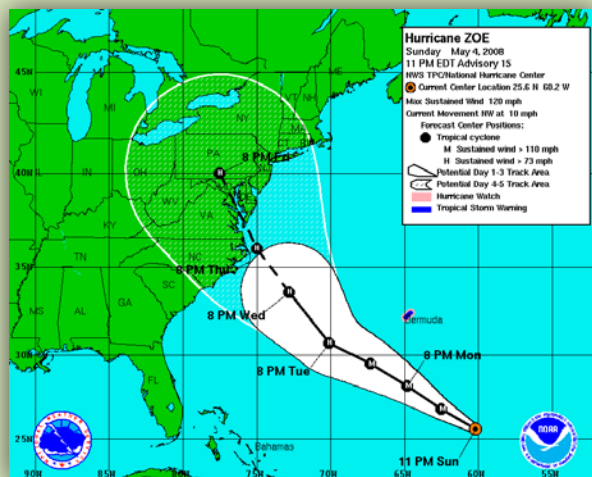


Bolivar Peninsula before and after Hurricane Ike. Yellow arrows indicate identical locations. (Photo credit: U.S. Geological Survey)

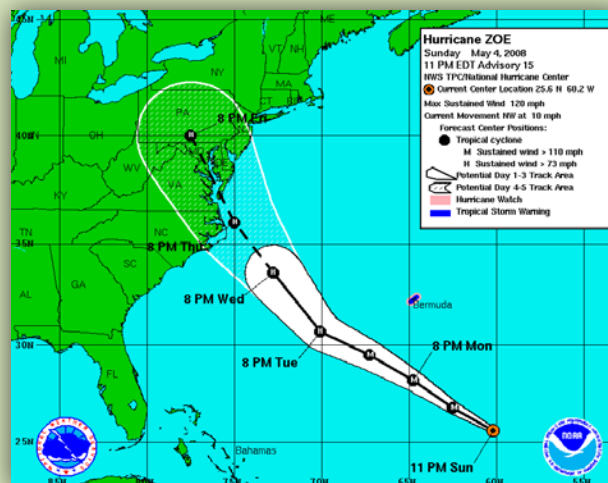
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## Today's Cone of Uncertainty



## Smaller Cone of Uncertainty with HFIP Goals realized



HFIP provides the basis for NOAA and other agencies to coordinate hurricane research needed to significantly improve guidance for hurricane track, intensity, and storm surge forecasts. Rapid intensification remains the number one challenge of hurricane forecasting.

### “Rapid intensification

is an increase in strength of at least 30 miles per hour in a 24 hour period. In 2004, Hurricane Charlie went from a Category 2 to a Category 4 in about 5 hours, right before landfall. When that happens, people can't prepare. HFIP tries to answer the intensity of the forecast problem – the **#1 issue** for the National Hurricane Center. ”

Frank Marks, Ph.D.  
HFIP Science Manager  
NOAA Hurricane Research Division  
Atlantic Oceanographic and Meteorological Lab

## Partnerships

- U.S. Department of the Navy
- National Science Foundation
- National Aeronautic and Space Administration
- U.S. Department of Interior
- National Center for Atmospheric Research
- Office of Naval Research
- Colorado State University
- Monash University (Australia)
- Pennsylvania State University
- State University of New York Albany
- University of Arizona
- University of Miami
- University of Rhode Island
- University of Wisconsin