



NOAA *Backgrounder*

Hurricane Tracking Models: Helping to Forecast Severe Storms

The National Hurricane Center (NHC) in Miami, Florida, is a component of the National Centers for Environmental Prediction and the National Weather Service. NHC's mission is to track tropical cyclones and predict their future position and intensity over the north Atlantic Ocean, Caribbean Sea, Gulf of Mexico and eastern North Pacific Ocean. This monitoring begins in a tropical cyclone's infancy as "tropical depression" through its maturity as a "hurricane."

A WORD ABOUT NOAA. . .

The National Oceanic and Atmospheric Administration (NOAA) conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and service that touch the lives of all Americans.

NOAA warns of dangerous weather, charts our seas and skies, guides our use and protection of ocean and coastal resources, and conducts research to improve our understanding and stewardship of the environment which sustains us all.

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For further information: NOAA Office of Public Affairs, 14th Street and Constitution Avenue NW, Room 6013, Washington, D.C. 20230. Phone: (202) 482-6090.

To forecast the track and intensity of tropical cyclones, NHC uses mathematical models run on the Cray C-90 super computer. These models represent the future motion and intensity of a tropical cyclone and its environment in a simplified manner. Hurricane forecasters then interpret model results to arrive at a final track and intensity forecast, distributing it to the public in the form of advisories.

Model Types

NHC uses three types of mathematical models: Statistical, Dynamical or a combination (Statistical-Dynamical). Statistical Models forecast the future by using current information about a tropical cyclone and comparing it to the historical behavior of similar storms. The historical record for storms in the north Atlantic begins in 1871, while the record for storms for the east Pacific extends back to 1945.

Dynamical Models use the results of global atmospheric data to forecast tropical cyclone motion and intensity. Global models take current wind, temperature, pressure and humidity observations and make forecasts of the actual atmosphere in which the cyclone exists.

Statistical Models are defined by their simplicity; while Dynamical Models are hampered by incomplete data sets and lack of computer "horse power." Predictions from both computer models are only approximate. Statistical Models don't directly include current atmospheric conditions, and Dynamical Models omit the historical behavior of storms.

Because of their simplicity, Statistical Models were designed first in the late 1960s for tropical cyclone

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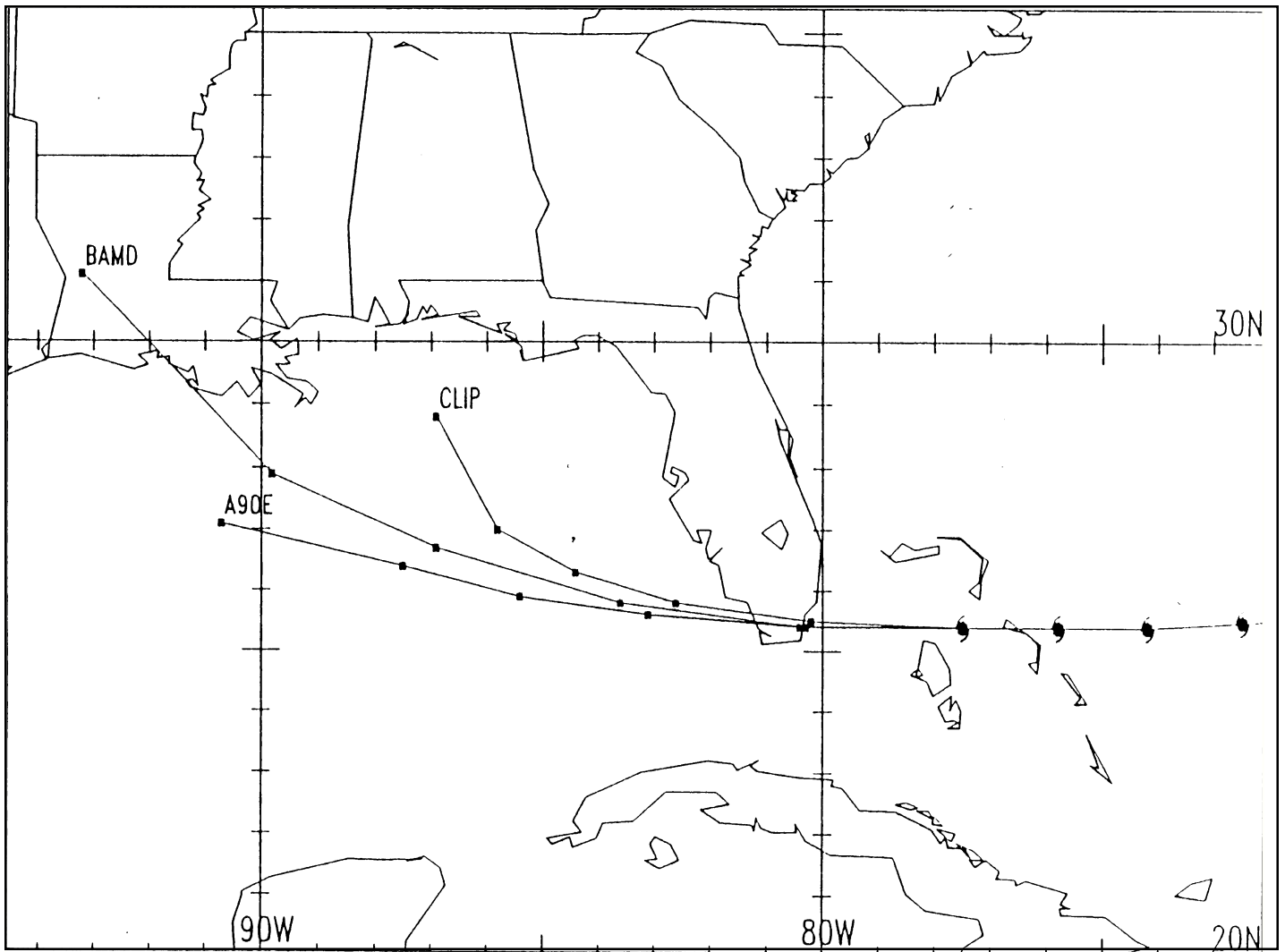
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forecasting. In the early 1970s, Combination Models were developed as global models began making forecasts in tropical regions. As computers became more powerful, pure Dynamic Models began dominating the accuracy race. This is particularly true when tropical cyclones approach data-rich regions close to the continents, where the state of the atmospheric environ-

ment is adequately observed and well known.

What Hurricane Forecasters Look At When Some Models Are Run

The illustration below demonstrates only three models used to forecast the track of 1992's Hurricane Andrew. The CLIP is a statistical model; the BAMD is a dynamic model; and the A90E is a combination model. ☺



For more information contact NOAA's National Hurricane Center Public Affairs at (305) 229-4404 or visit the Web site at www.nhc.noaa.gov.