



FY 2003 President's Request

U.S. Weather Research Program



Tropical Storm Allison caused billions in dollars of damages and claimed 35 lives as it swept through the United States.



Flooding from severe precipitation, not the wind, is the greatest contributing factor to the devastation caused by hurricanes.

What is requested?

NOAA's Office of Oceanic and Atmospheric Research requests an increase of \$1,000,000 to support research and development toward the USWRP's initial goals of improving inland heavy precipitation forecasts associated with landfalling hurricanes. The program is a cooperative effort among OAR, NWS, NESDIS, and the other USWRP agencies (National Science Foundation, National Aeronautics and Space Administration, Federal Highway Administration, Federal Aviation Administration, Navy, Air Force, Department of Agriculture, and Department of Energy). The program will work towards improving forecasts of the location and intensity of heavy precipitation, including predictions of where inland flooding will occur during and following extreme weather. Advanced warning of such events will give residents more time to prepare, such as sandbagging, boarding up, and evacuating. Such measures can help minimize and reduce the risk of the tremendous damage such storms have caused in the past. Greater forecast accuracy will also generate savings by narrowing the length of coastline along which mitigation efforts need to be undertaken. The line item is contained under the Weather and Air Quality subactivity of the OAR budget.

Why do we need it?

As millions of Americans move to coastal areas and build in low-lying flood plains, the U.S. population becomes increasingly vulnerable to the potentially devastating effects of a major hurricane landfall along the East or Gulf Coasts of the United States. Most of the destruction caused by severe storms does not occur from the wind but rather from the rainfall and flooding that follow the storm. As a result, it is just as important to be able not only to predict where a hurricane or other severe precipitation event will move, but also to understand where and how much inland flooding will also occur from the storm. This information can be critical. ABC News reported that in June 2001, Tropical Storm Allison caused \$1 billion in damage to Houston alone and led to at least 17 deaths just in Texas. The state and other surrounding areas were largely unprepared for the flooding from the storm, highlighting the need for such information.

The increased funding represents NOAA's commitment to meet the goals of the USWRP as part of a multi-agency partnership and help move applied research into actual operations. The fundamental USWRP goals are improving hurricane-at-landfall and precipitation forecasts and determining the quality and cost-effectiveness of different observations applied to models used for medium-range forecasts. These goals address the Nation's highest priorities to improve forecasting of high-impact severe weather events.



NOAA uses a variety of aircraft, such as the P3 and Gulfstream IV, to study and forecast hurricanes and heavy precipitation.



Better precipitation forecasts can help electricity generators prepare for heavy storms and hydropower plants prepare for more efficient production.



For more information:

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What will we do?

The proposed infrastructure will include the establishment of a National Test Bed (NTB) to ensure the timely and successful transition of our research investments into operations. The NTB will provide a cost-effective scientific strategy to mitigate the Nation's economic losses and reduce the loss of lives by strategic forecast improvements of severe weather events. Much of the NOAA USWRP base resources are applied to infrastructure development aimed at the successful transition of research and development into operations.

The requested increase will be used to address forecast improvements of heavy and, often, flood-producing rains associated with hurricanes and tropical storms as they move inland. Initial investments will be made in improving atmospheric boundary layer observations along the coast and inland, regional and fine-scale modeling, and model testing and evaluation. An investment will be made in the Joint Hurricane Test-bed (JHT), a component of the NTB, for forecast model testing and evaluation for eventual operational application. JHT staff and its numerical weather prediction extension at the National Centers for Environmental Prediction/Environmental Modeling Center in Suitland, MD, will facilitate improved forecaster aids and products. This initiative is closely coordinated with the National Weather Service Advanced Hydrological Prediction Service (AHPS) that links precipitation forecasts with hydrology to quantify flooding potential. Products in development include improved forecast models that will show, at finer scales, when and where heavy precipitation can be expected. Forecast decision aids will also be developed that will help local analyses in real-time.

What are the benefits?

Since about 1990, most of the deaths caused by hurricanes and tropical storms have been caused by fresh water flooding. In 1998, Hurricane Floyd swept up the East Coast. The devastation caused in South Carolina, North Carolina, and Virginia was not from winds and storm surge, but from stream and river flooding. Several lives were lost, much livestock was lost, and billions of dollars of damage were done, all due to flooding. In 2001, Tropical Storm Allison flooded central Texas and moved east and north causing floods in several states. Several people died and property damage totaled in the billions of dollars.

Improved lead time and precision of inland flood prediction will provide the capability to prepare for floods by moving people, livestock, and portable assets out of harm's way. It will provide the time and spatial location information to close flood gates, draw down small reservoirs, and put up flood walls and sandbags. In addition, reducing the length of coastline under hurricane warnings saves at least \$1 million per coastal mile in costs of evacuations and other preparedness actions. With about 75% of the insured losses in this country directly caused by weather and 95% of the Presidentially declared disasters over the last decade weather-related, even small forecast improvements can lead to significant benefits.

NOAA Budget

	FY03 Change \$ millions
Weather and Air Quality Research	
U.S. Weather Research Program	
U.S. Weather Research Program Base	\$1