



NOAA Hazardous Weather Testbed

Linking research and operations

NOAA's Hazardous Weather Testbed (HWT) develops, tests and evaluates severe weather forecast and warning techniques for the entire United States. The HWT is a joint facility managed by the National Severe Storms Laboratory (NSSL), the Storm Prediction Center (SPC), and the National Weather Service Oklahoma City/Norman Weather Forecast Office (OUN) located at the National Weather Center in Norman, Oklahoma.

HWT facilities

The HWT provides a unique setting that encourages interaction between researchers and the people who most benefit from research – forecasters. The HWT facilities include a combined forecast and research area placed between the operations areas of the SPC and OUN, and the NSSL Development Lab located nearby. The development lab includes four wall-mounted plasma screen displays and enough space for at least 10 workstations. Researchers, forecasters and developers use the lab to evaluate new platforms and techniques in real-time as a team. Collaboration among these diverse groups provides valuable feedback that can immediately be applied to the research and development process, streamlining technology transfer.

Meeting NOAA and NWS strategic goals

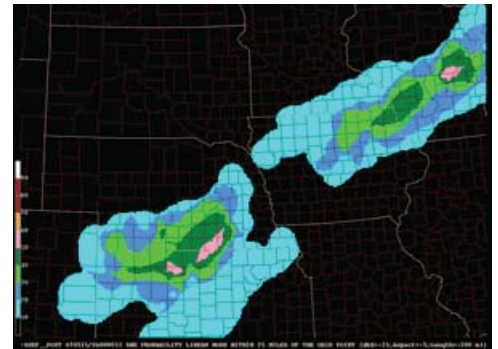
NOAA's mission is to serve society's needs for weather and water information. NWS strategic goals aim to reduce the loss of life, injury, and damage to the U.S. economy. The NOAA HWT supports both by increasing the development, application, and transition of advanced science and technology to operations and services, and looking for ways to increase the lead-time and accuracy for weather and water warnings and forecasts. The HWT has two separate components: the Experimental Forecast Program (EFP) and the Experimental Warning Program (EWP). These two programs conduct independent but interrelated activities.

HWT Experimental Forecast Program

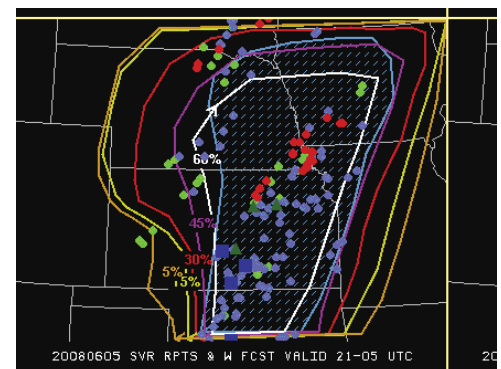
The HWT Experimental Forecast Program (EFP) is focused on the use of computer models of the atmosphere to improve predictions of hazardous and convective weather events from a few hours to a week in advance, and over several counties to the continental U.S. The EFP supports the NWS goal to *increase lead-time and accuracy for weather and water warnings and forecasts.*



HWT facilities in the National Weather Center



Example of new guidance products derived from the high resolution ensemble showing the probability of a squall line of thunderstorms.



Experimental forecast of areas of severe weather. Lines show areas and dots indicate where the severe weather actually occurred.

HWT Experimental Warning Program

The HWT Experimental Warning Program (EWP) is concerned with detecting and predicting weather hazards on a smaller scale: from a few minutes to a few hours, and over several counties to fractions of counties. The EWP is geared to severe weather warning operations in the forecast office and includes the evaluation of phased array radar technology in real-time. The EWP supports the *NWS goal to improve the predictability of the onset, duration, and impact of hazardous severe weather and water events.*

The annual Spring Experiment

The cornerstone of the HWT is the SPC/NSSL Spring Experiment held for 6-8 weeks each year during the active spring severe weather season. As many as 60 researchers and forecasters are drawn to Norman annually to evaluate emerging scientific concepts and tools in a simulated operational forecasting environment. They also work together to answer the basic question, “What do forecasters need?” The exchange provides forecasters with a first-hand look at the latest research concepts and products, while research scientists gain valuable understanding of the challenges, needs, and constraints of front-line forecasters. The end result meets another *NWS goal to increase the development, application, and transition of advanced science and technology to operations and services.*

Shadow forecasting

NSSL scientists shadow NOAA Storm Prediction Center operational forecasters to observe and interact during a variety of operational forecasting scenarios. These range from quieter convective days when more in-depth discussion is possible, to more active severe weather days when valuable insights can be gained through observing the operational decision-making processes. This program helps NSSL scientists enhance the operational relevance of their research efforts.

History

The HWT in Norman rose up from a grassroots level after the Storm Prediction Center moved its operations to the National Severe Storms Laboratory facility in 1997. The mutual interests of forecasters from the SPC, researchers from NSSL, and collocated joint research partners from the Cooperative Institute for Mesoscale Meteorological Studies (CIMMS) inspired the formation of the HWT.

Hazardous weather research payoff: An effective NWS severe weather forecast and warning program must provide the public with critical weather information including sufficient advance notice of impending hazardous weather.



Researchers in the Hazardous Weather Testbed track storms with experimental tools during the annual Spring Experiment.

For more information, contact: Keli Tarp, keli.tarp@noaa.gov

On the web: <http://www.nssl.noaa.gov/hwt/>

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