



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

National Severe Storms Laboratory
120 David L. Boren Blvd.
Norman, OK 73072

January 8, 2020

Hazardous Weather Testbed Activities

The NOAA Hazardous Weather Testbed (HWT) at the National Weather Center (NWC) in Norman, Oklahoma, is seeking participants for several experiments in 2020. The testbed is a joint project of the National Weather Service Storm Prediction Center and the National Severe Storms Laboratory that provides a conceptual framework and physical space to foster collaboration between research and operations to test and evaluate emerging technologies and science. This year, we will be conducting the 2020 HWT activities for **27 weeks** in total.

There will be **nine** primary projects in the HWT during 2020. The details of the Radar Convective Applications, Satellite Convective Applications, Probabilistic Hazard Information Prototype, and Spring Forecasting Experiment projects are listed in the attachments.

Hazard Services - Probabilistic Hazard Information Interoffice Collaboration	February 10-14, February 24-28 <i>Application Closed</i>
Severe Weather & Society Dashboard	Mar 16-20, Mar 23-27, Mar 30-Apr 3 <i>Application Closed</i>
Radar Convective Applications	Apr 13-17, Apr 27-May 1, May 11-15, Jun 1-5 Application Deadline: Feb 28
Satellite Convective Applications	May 11-15, June 1-5, Jun 8-12 Application Deadline: Feb 28
Probabilistic Hazard Information Prototype	Apr 20-24, May 4-8, May 18-22 Application Deadline: Feb 28
Spring Forecasting Experiment	Apr 27-May 1, May 4-8, May 11-15, May 18-22, May 26-29 Application Deadline: Feb 28
Warn-on-Forecast*	Jul 13-17, Jul 20-24, Aug 3-7, Aug 10-14
Brief Vulnerability Overview Tool*	Aug 17-21, Aug 31-Sep 4

Hazard Services – Probabilistic Hazard Information (HS-PHI)*	Summer/Fall 2020
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*Application Deadline: Will be announced in Spring 2020

Details about HWT 2020 will become available over the next several weeks at: <http://hwt.nssl.noaa.gov/>

Travel stipends are being awarded to pay for all of the travel costs of the participants (airfare, lodging, MIE per diem, local transportation). As a condition of receiving the travel stipend, those who are selected to participate in the HWT in 2020 are also agreeing to allow the principal investigators to use the data they provide for research purposes. (More details about the research participation will be sent to those who are selected in March.) Each project-specific application form (found in the project details selection below) will require from each candidate:

- a. Name and organization (WFO, region HQ, etc.)
- b. Forecaster position
- c. Prior HWT experience
- d. Interest statement (one paragraph, 200 words max)
- e. Weeks available

The interest statements should include your motivation for evaluating future warning and/or forecast systems in the HWT and demonstrate why you would be a good fit for a particular experiment. Participants may include WFO, CWSU, or Region HQ staff, and participants are not required to have had prior HWT experience. We are seeking diversity among regions, warning experience, and HWT experience.

Note that the HWT organizational structure has two primary programs: the Experimental Warning Program (EWP) and the Experimental Forecast Program (EFP). Those interested in participating in the EFP's Spring Forecasting Experiment should contact their Regional SSD Chief and EFP coordinator **Israel Jirak** (Israel.Jirak@noaa.gov).

The deadline for the second round of applications is February 28, 2020. Candidates will be selected shortly thereafter so that we can begin the necessary travel arrangements. Any questions or concerns regarding work and travel time, and travel funds should be directed to **Alan Gerard** (alan.e.gerard@noaa.gov).

We desire enthusiastic people who are interested in improving NWS warning and/or forecast decision-making technology, products, and services. We would be happy to provide more information about the HWT activities if requested.

Sincerely,
Alan Gerard
Hazardous Weather Testbed, National Severe Storms Laboratory

Radar Convective Applications Experiment Project Descriptions & Details

<https://forms.gle/zppsun4PZPYFvZP6A>

The deadline for applications is February 28, 2020. Candidates will be selected shortly thereafter so that we can begin the necessary travel arrangements.

WHEN – April 13-17, April 27-May 1, May 11-15, June 1-5

- Travel periods: Sunday, Friday evening

WHAT – Participants working in pairs will issue experimental short-term forecast discussions and convective warnings for a given County Warning Area using AWIPS-II during live weather cases. Participants will also work select archived cases in displaced real-time using WES-2 Bridge. Experimental single-radar products being evaluated by the participants include, but are not limited to:

- New Tornado Detection Algorithm (NTDA). A single-radar based product that displays icons on automated high-rotation detections with a probability of a tornado being present.
- New Mesocyclone Detection Algorithm (NMDA). A single-radar based product that displays icons on mesocyclones that it detects and tracks.

In addition to these experimental products, standard observational and forecast products, including the currently operational TDA and MDA will also be available to participants. The NTDA will be the main focus of evaluation during this experiment, with the NMDA only being evaluated over weeks 1 and 2. In addition, this experiment will combine efforts with the Satellite Convective Applications experiment for weeks 3 and 4. During the evaluation, forecasters will compose blog posts regarding their use of the operational and experimental radar products in the warning decision-making process, along with any other thoughts and feedback.

WHY – This HWT experiment provides an avenue to obtain forecaster feedback for new applications developed for the WSR-88D network. This evaluation will focus on two single-radar products, NTDA and NMDA. These products will be examined to gauge their effectiveness in detecting mesocyclones and tornadoes during the warning-decision making process. Feedback will be used to drive algorithm improvements and assess their operational feasibility in replacing the engines of the current TDA and MDA.

WHO – All forecasters are welcome to apply for this experiment. We would like geographic, experiential, and gender diversity in our forecaster pool. Completion of the Warning Decision Training Division's Radar Applications Course and some operational severe weather warning experience is required.

WHO - All forecasters are welcome to apply for this experiment. We would like geographic, experiential, and gender diversity in our forecaster pool. Completion of the Warning Decision Training Division's Radar Applications Course and some operational severe weather warning experience is desired.

Satellite Convective Applications Experiment

<https://forms.gle/ppZYmSBLavvUfdOm7>

The deadline for applications is February 28, 2020. Candidates will be selected shortly thereafter so that we can begin the necessary travel arrangements.

WHEN – May 11-15, June 1-5, June 8-12

- Travel periods: Sunday, Friday afternoon

WHAT – Participants working in pairs will issue experimental short-term forecast discussions and convective warnings for a given County Warning Area using AWIPS-II during live weather cases. Forecasters will compose blog posts during realtime operations regarding their use of the operational and experimental satellite products in the warning decision-making process, along with any other thoughts and feedback. Experimental and operational satellite products most likely to be available include, but are not limited to:

- Geostationary Lightning Mapper (GLM) total lightning data.
- ProbSevere Hazard Model: Fuses GOES cloud products, multi-radar/multi-sensor (MRMS) data, lightning data, and RAP-derived environmental fields through object-based tracking on both GOES and radar imagery to produce a probability of specific hazards (e.g., hail, wind, tornado) for individual storms.
- Legacy Atmospheric Profile (LAP) thermodynamic fields using ABI data: Fields include CAPE, LI, TPW, LPW, possibly more. Fusion of ABI clear-sky LAP algorithm, cloudy-sky algorithm, and NWP allows for one, blended all-sky product.
- NUCAPS Temperature and Moisture Profiles, gridded plan views and cross sections, and experimental boundary layer modified profiles: Profiles are generated using data collected from polar-orbiting satellites, including Suomi NPP and possibly newly launched NOAA-20.
- Blended Total Precipitable Water Product. This product fuses multiple satellite observations and model input for a global total precipitable water product.

WHY – This HWT experiment provides an operational demonstration of products and capabilities associated with the recently-launched GOES-16 and NOAA-20 satellites. The additional demonstration of JPSS products introduces and familiarizes users with newly developed products associated with the next generation polar-orbiting satellite system. This evaluation will focus on gauging the effectiveness of the GOES-R training, test forecaster understanding of GOES-R and JPSS data, understand the usability and effectiveness of the visualizations in AWIPS, and identify best practices for integrating the new data into operations. Feedback received during GOES-R and JPSS product demonstrations will be integrated into training initiatives in coordination with the Warning Decision Training Division and with the GOES-R and JPSS programs and researchers for future product development and visualizations.

WHO – All forecasters are welcome to apply for this experiment. We would like geographic, experiential, and gender diversity in our forecaster pool. Training with IDSS concepts is preferred.

Probabilistic Hazard Information Prototype Experiment

<https://forms.gle/HJEkkgWeKGHUa4Ey6>

The deadline for applications is February 28, 2020. Candidates will be selected shortly thereafter so that we can begin the necessary travel arrangements.

WHEN – April 20-24, May 4-8, May 18-22

- Travel periods: Sunday, Friday afternoon

WHAT – Participants will issue Probabilistic Hazard Information (PHI) in lieu of warnings using a web-based platform. The focus for the 2020 spring experiment will be integrating the tornado probabilities from the New Tornado Detection Algorithm (NTDA) and evaluation of the automated tornado objects. In addition to tornado probabilities, we will be exploring different workload approaches to handling PHI for severe and lightning simultaneously. Forecasters may also be able to test the manipulation speed and motion uncertainty relative to each PHI threat-in-motion. In addition to automated guidance available within the PHI-prototype system, forecasters will have access to real-time and archived data within the AWIPS-II platform for storm interrogation and analysis.

WHY – This HWT experiment provides a pre-operational evaluation of PHI-design and workload. Feedback from this evaluation will be used for configuration of PHI within Hazard Services and provide guidance for an operational implementation of PHI at NWS offices nationwide.

WHO – All forecasters are welcome to apply for this experiment. We would like geographic, experiential, and gender diversity in our forecaster pool. Completion of the Warning Decision Training Division's Radar Applications Course and some operational severe weather warning experience is desired.



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We are pleased to announce the 2020 **Spring Forecasting Experiment (SFE)**, part of the Experimental Forecast Program (EFP) of the NOAA Hazardous Weather Testbed (HWT), hosted by the Storm Prediction Center (SPC) and the National Severe Storms Laboratory (NSSL). We invite you to participate in the experimental activities that are planned for this spring during the five-week period of **April 27-May 29**. Information about the overall goals of the HWT can be found here: <https://hwt.nssl.noaa.gov/>.

NWS forecaster participation in the HWT SFE is essential to facilitate meaningful interactions between the development and operational communities that will accelerate research-to-operations transitions. In particular, this provides opportunities for forecasters to provide feedback to ensure that new guidance products and visualization approaches meet their needs. This is a unique opportunity to see and influence the future of NWS forecasting tools for high-impact weather. Here is more information about the 2020 SFE:

- The focus of the experiment is directly aligned with NWS FACETs and Warn-on-Forecast (WoF) programs, including examination of real-time forecasts from a prototype WoF ensemble system.
- Activities are formulated to provide evidence-based information on how best to design convection-allowing models and ensemble systems, including the HREF and HRRRE, and to explore innovative ways to extract relevant information and create calibrated probabilistic hazard guidance for high-impact weather events.
- These efforts also directly support the evolution toward a probabilistic NBM to better represent and account for forecast uncertainty.
- To accomplish these goals, the SFE brings together major model development organizations in the US (EMC, GSD, NSSL, GFDL, and NCAR) to work collaboratively to improve community modeling for future implementation into NWS operations.
- The SFE efforts support NOAA plans to develop a simplified, unified forecast system (UFS) centered on the FV3 dynamic core. Multiple versions of the FV3 run at 3-km CAM scales will be tested to assess the ability of the FV3 provide storm-scale guidance.

For those who want to be on the cutting-edge of NWS science developments, please consider participating in the innovative, exciting SFE activities for one week during the April 27-May 29 period by filling out the [2020 HWT SFE Google Form](#) by **February 28**.

Sincerely,
Israel Jirak (SPC) and Adam Clark (NSSL)

