

NOAA Aviation Weather Testbed Charter Version 1.0 (24 June 2013)

1.0 Introduction

The National Oceanic and Atmospheric Administration (NOAA) Aviation Weather Testbed (hereafter, AWT) is a research-to-operations facility within the NOAA National Weather Service's (NWS) National Centers for Environmental Prediction (NCEP) Aviation Weather Center (AWC). As a standalone NOAA Testbed facility, the AWT was established in 2009. The AWT was established to facilitate the mission and realize the vision of NOAA AWC. The AWT achieves this through a physical and technical environment conducive to the efficient transfer of research into meteorological operations (or R2O).

The AWT performs mission-relevant applied research and development (R&D) including R2O, and supports relevant R2O efforts of external partners in government, industry, and academia. The goal of all AWT activities is state-of-the-art meteorology, technology, and professionalism in NOAA operations.

2.0 Mission and Vision

2.1 NOAA Aviation Weather Center (AWC)

Mission:

The AWC delivers consistent, timely and accurate weather information for the world airspace system. We are a team of highly skilled people dedicated to working with customers and partners to enhance safe and efficient flight.

Vision:

To be the trusted authority and leading innovator for aviation weather information.

2.2 NOAA Aviation Weather Testbed (AWT)

Mission:

To foster a science-based environment that assures an efficient transfer of innovative research and information technology advancements toward a continuous improvement of NOAA operations, products, and services.

Vision:

A destination facility recognized as the enterprise leader in realizing the best science, technology, and training for operational aviation meteorology.

3.0 Objectives

The AWT is a NOAA-based community resource designed to enhance the operational mission of NOAA. In doing so, the AWT also serves the entire aviation weather enterprise, including NOAA's government, academic, and private sector partners and stakeholders.

3.1 Strategic Objectives

The following are the Strategic Objectives of the AWT.

- Enhance the safety and efficiency of flight through meteorological observations, predictions, and warnings.
- Advance new techniques and tools for rapid, informed, and science-based meteorological decision support services.
- Improve the efficiency of operational meteorological analysis and forecasting.
- Employ the latest information technology to ensure state-of-the-art receipt, interrogation, and delivery of data, products, and services.
- Accelerate the realization of NextGen capabilities for NOAA aviation-weather operations.

3.2 Performance Objectives

The following AWT Performance Objectives are designed to meet the Strategic Objectives listed in section 3.1.

- Conduct focused or theme-based real-time forecasting and warning experiments in the AWT.
- Allow the AWT to serve as a crucible for the internal and external training and professional development of the aviation-weather enterprise.
- Evaluate and postprocess numerical weather prediction (NWP) models, particularly emerging high-resolution (convection allowing) models.
- Explore the postprocessing of ensemble prediction systems, particularly toward the realization of NextGen's goal of advanced probabilistic forecasting.
- Use data-mining, reforecasting, clustering, and related post-processing or downscaling techniques for innovative NWP and ensemble information extraction.
- Build and test meteorologist over the loop (MOTL) capabilities from ensembles and high-resolution NWP output to increase operational efficiency and realize decision support services.
- Receive and evaluate new or improved observations and analyses contributing to enhanced situational awareness (e.g., ASDI, EDR, etc.).
- Develop a robust and impact-based verification program to measure improvements to services, and ensure any product developed in the AWT is verified appropriately prior to real-time operational evaluation and industry sharing.
- Assume a leadership role in NextGen by (a) contributing to its scientific content and (b) building and populating the NOAA portions of its IT implementation (CSS-Wx).
- Fully support a NextGen meteorologist to accelerate the NextGen capability of NOAA.
- Fully support a GOES-R meteorologist to ensure full readiness and preparation for the next generation of GOES satellite data.

- Support and test the implementation and continued development of the AWIPS-2 system.
- Offer new and experimental versions of data and decision support services via web displays and other innovative methods of communication.
- Use the AWT as an R2O conduit for the FAA's Aviation Weather Research Program (AWRP).
- Open AWT experimental and training activities to the AWC's customers, partners, and stakeholders.
- Develop fair and equal collaborative partnerships with government and academic institutions, including but not limited to the FAA, MITRE, DOD, DHS, and U.S. universities.
- Develop fair and equal collaborative partnerships with private industry (e.g., through NOAA CRADA agreements with the private sector).
- Develop, test, and/or transfer gridded products for the World Area Forecast Center (WAFC-Washington), including ensemble output and "harmonized" grids.
- Encourage the participation of international activities and partnerships (e.g., Canada, Taiwan, China, etc.)
- Build and support a Visiting Scientist Program and a Student Research Program.

4.0 Location and Governance

The AWT is collocated with the AWC in Kansas City, MO. The authority to operate the AWC is provided by the AWC Director. The AWT is under the organizational structure of the AWC's Aviation Support Branch (ASB) and unless otherwise appointed, the ASB Branch Chief is the Director of the AWT. The management of the AWT is the responsibility of its Director and Management Board. The Management Board consists of the AWC Branch Chiefs and the AWC Deputy Director. The AWC Annual Operating Plans (AOP) provides annual guidance and Milestones to AWT operations.

AWT Authority to Operate: Director, Aviation Weather Center -- Robert W. Maxson

AWT Director: Chief, Aviation Support Branch -- David R. Bright

AWT Management Board: Deputy Director -- Clinton E. Wallace

Chief, Domestic Operations Branch -- Debra D. Blondin

Chief, International Operations Branch -- Matthew Strahan

The responsibilities of the AWT Director include the following.

- Provide scientific leadership and develop programs that facilitate the development and transition of research advances into improved aviation-weather products and services.

- Through the ASB, provide or assign effective leadership and oversight to all AWT activities and programs, including but not limited to experiments, training, model and ensemble post-processing and verification, and a visiting scientist program.
- Through the ASB, prepare or assign AWT related documentation, including reports and science-based strategic planning.
- Ensure AWT priorities are clearly aligned with the AWC Management Board and the AWC AOP.
- Inform and receive input from the AWC Management Team concerning AWT activities.
- Represent the AWT to the NOAA Testbed Coordinating Committee.
- Coordinate with the other NOAA Testbeds, particularly the Hazardous Weather Testbed (HWT) and the Hydrometeorological Testbed (HMT), and the NOAA Testbed Liaisons.
- Coordinate with the NOAA/NESDIS GOES-R Proving Ground (PG), and manage the activities of the GOES-R PG Specialist assigned to the AWC/AWT.
- Coordinate with the NOAA/NWS NextGen Program Office, and manage the activities of the NOAA NextGen Meteorologist assigned to the AWC/AWT.
- Coordinate with the FAA's Aviation Weather Research Program (AWRP), and manage the activities of the AWRP Meteorologist assigned to the AWC/AWT.
- Establish Associate support of AWT activities through the NOAA Cooperative Institute for Research of the Atmosphere (CIRA) at Colorado State University in Fort Collins, CO.

5.0 Research to Operations (R2O)Technology Transfer

Rapid science and technology infusion for the advancement of operational aviation weather services and NextGen requires direct, focused interactions between research scientists, numerical model and ensemble developers, post-processing and techniques development meteorologists, information technology specialists, operational forecasters, and specialists from government and industry.

The AWT provides an operational-like facility that allows participants with unique specialties and areas of interest to better understand the numerous and complex challenges associated with the prediction and detection of aviation meteorology and the upcoming development and implementation of NextGen. Complexities important to the AWC mission and NextGen include (but are not limited to) high-impact weather events such as convection, icing, ceiling/visibility, and turbulence, as well as decision support services associated with these hazards and the resulting national air traffic flow management.

Organizations cooperating with the AWT can refine and optimize emerging operational forecast and warning tools for rapid integration into NOAA and industry operations. In doing so, forecasters and scientists are educated on the scientifically correct use of emerging tools and techniques and the latest research related to aviation meteorology, national air traffic flow management, forecasting, and warning operations. Researchers,

educators, students, and industry specialists receive an education and feedback on the operational needs and constraints that must be met by any new tools. The synergy that develops between researchers, forecasters, and industry specialists serves as motivation for additional collaborative research projects that are directly relevant to NextGen, AWC operations, or industry requirements.

AWT activities are often based on real-time experiments. These experiments provide the ability to test new research, techniques, post-processed results, and decision support services for real-time aviation-weather operations. This is a critical evaluation component of the science and technology transition process in the AWT. Examples of such experiments include the AWT Winter Experiment and the AWT Summer Experiment. In addition to seasonal experiments, focusing on longer-term themes is another valid and acceptable approach for AWT R2O, such as “AWIPS-2 development and transition” or “ceiling and visibility improvements.”

New data, tools, and concepts examined in the AWT may be suitable for further testing in real-time operations (termed “real-time experimental”) or perhaps a complete and permanent transfer into operations. The transition of new data, products, or services to operations for ongoing real-time experimental evaluation is based on the recommendation of the AWT Director and Management Board. The transition to full operational status is based on the AWT Director and Management Board recommendation, along with specific inclusion as an AWC Milestone in the AWC AOP. Note that any product developed at the AWT must also include a robust set of verification metrics prior to its release outside the Center, as well as its full operational implementation. All publically available experimental and official operational products must follow NWS Policy as described in NWS 10-102.

6.0 Amendments

Amendments to this Charter may be made at any time with the signed approval of the AWC Director.

7.0 Signature and Approval

Director, NOAA Aviation Weather Center: /s/ Robert W. Maxson 24 June 2013