

Fiscal Year 2025 Competition Information Sheet
NOAA OAR Weather Program Office
Observations Program

This information summarizes key content for the Observations Competition from the FY25 NOAA OAR Weather Program Office (WPO) Notice of Funding Opportunity (NOFO).

Program Name

NOAA/OAR/WPO Observations Program

Observations Program: <https://wpo.noaa.gov/Programs/Observations>

Program Manager

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Funding for FY2025

Pending the availability of funds in FY2025, the Observations program anticipates a funding allocation of up to **\$2,100,000.00 per year** for this competition. Projects may be for up to two years, with up to **\$300,000/year**. A total of approximately **7 projects** may be funded.

Program Objectives for FY2025

The aim of this competition is to develop, demonstrate, and/or analyze innovative sensor and observing technologies and strategies that have high potential for advancing an observation systems portfolio that is mission-effective, integrated, adaptable, and affordable. Proposed projects should document clear relevance and support to the weather enterprise.

Observations from the surface through the troposphere serve as critical inputs for the analysis and forecasts of the operational weather enterprise for the protection of life and property and enhancement of the national economy. High resolution surface and planetary boundary layer/tropospheric observations in both the vertical and horizontal dimensions are limited, which impedes progress in skillful predictions of high-impact and disruptive weather. Proposals should focus on technologies and strategies with the

potential to improve the accuracy, reliability, spatial coverage, cost effectiveness, deployability, safety, and sustainability of observations for eventual use by the operational weather enterprise such as NOAA, including the National Mesonet Program, the private sector, and other government sectors.

The scope includes weather-related observations and observing strategies targeting the surface through the planetary boundary layer/troposphere. Satellite-based sensors are not included in this scope except to calibrate, validate, or integrate with in-situ observations as a secondary objective.

Engagement with, and participation by the operational weather commercial sector is also encouraged.

The strongest proposals should:

1. include **substantial collaboration with one or more operational weather stakeholder(s)** with the potential to benefit from the work
2. include **collaboration with other relevant R&D partners** to help accelerate results
3. clearly **document linkage to operational weather needs**
4. demonstrate **potential to transition to operations, applications, commercialization, or a final product**, and, if applicable (e.g., the path to operations is *not* commercialization), explain how **NOAA can sustain the observational capabilities** and outcomes of the proposed work in an operational capacity.

Projects appropriate for this competition range from Readiness Level (RL) 4 to RL 7 and have potential to transition to operations, application, commercialization, final product, or knowledge at either NOAA or the weather enterprise within the next 3 to 6 years. The NOAA Readiness Levels are defined in the WPO FY25 General Information Sheet.

For additional information on this WPO Observations Program funding opportunity, including complete, detailed descriptions for each priority, please review the FY24 Observations Program funding information sheet for the Observations competition in the grant package associated with this announcement at <https://www.grants.gov>.

Program Priorities for FY2025

The WPO Observations Program, in collaboration with the NWS and other NOAA stakeholders, developed the following four priorities.

OBS-1: Weather Buoy Mitigation Vehicle - Weather buoys provide observational data that are critical in the monitoring and the prediction of the weather across oceans and coastal areas. Outages in weather buoys cause observational data gaps that impact the monitoring and prediction of maritime weather. This priority seeks research that aims to develop and demonstrate a high endurance, modular construction and portable Uncrewed Surface Vehicle (USV) that is combined with an Artificial Intelligence (AI) User Interface (UI) and easy payload integration capability. The vehicle will be used to quickly mitigate weather buoy outages to reduce observational data gaps until a long-term moored buoy solution is available. Using AI, automated station keeping will provide more consistent maritime weather observations.

OBS-2: Rainfall Estimate Improvement - Specific Differential Phase (KDP) is a critical dual polarization weather radar parameter used to estimate rainfall rates in the presence of hail, identify regions of ice crystal growth within the Dendritic Growth Layer, and determine the location of thunderstorm downdrafts. This priority seeks research aiming to develop and demonstrate an improved derived KDP product by separating the contributions of propagation from backscattered components of the total differential phase, filtering measurement variance to rid of unwanted signals but retain resolution, and identifying return data corrupted by artifacts to ultimately improve rainfall, particularly heavy rainfall, estimates

OBS-3: SFMR Improvement - The Stepped Frequency Microwave Radiometer (SFMR) delivers surface wind speed and rain rate estimates along the track of the reconnaissance aircraft around and within a tropical cyclone. There is a critical need to further improve the understanding and processing of SFMR retrievals to ultimately provide trustworthy data to forecasters and decision makers. This priority targets activities aiming to develop and demonstrate software to process SFMR brightness temperature measurements and deliver more reliable rain rates and surface wind speeds from all SFMR instruments on reconnaissance aircraft. Additionally, projects may seek to leverage other in-situ and remotely sensed tropical cyclone observations for SFMR validation.

OBS-4 Tropical Cyclone Reconnaissance Data Advancements: Tropical cyclone aircraft reconnaissance missions investigate tropical cyclones and collect data that play a vital role in improving tropical cyclone forecasts. To continue advancing tropical cyclone reconnaissance efforts, this priority seeks the use of NOAA Unified Forecast Systems

(UFS), including the Global Forecast System (GFS) and Hurricane Analysis and Forecast System (HAFS) to develop and demonstrate:

- Improved use of airborne reconnaissance observations of tropical cyclones already in the operational data stream, through methods such as super-obbing of high-resolution reconnaissance data
- Assimilation of existing experimental tropical cyclone reconnaissance data that is not already in the operational data stream
- Assimilation of other new or experimental data, in-situ and remotely sensed, from poorly sampled regions that pertain to improving tropical cyclone forecasts; in particular, examine how new or experimental data can be coordinated with tropical cyclone airborne reconnaissance data
- Improved quality assurance/quality control (QA/QC) procedures for tropical cyclone airborne reconnaissance data