WEATHER PROGRAM OFFICE
National Oceanic and Atmospheric Administration

FY21 Observations Projects

The Weather Act[1] mandates: NOAA to advance observations needed for substantial improvement in forecasting and prediction of high impact weather events.
The WPO Observations Program delivers: the FY21 Observations competition projects that will develop and demonstrate innovative weather observing technologies that have high potential for advancing an observation systems portfolio that is mission-effective, integrated, adaptable, and affordable.

The scope includes weather and water related observations from the surface through the planetary boundary layer including in-situ surface, profiling, balloon-borne, radar, and airborne and/or uncrewed systems (UxS) based technologies for use in detecting high impact weather phenomena including severe thunderstorms and tornadoes, extreme precipitation, extreme temperatures, winter storms, flash floods, and tropical cyclones.

1 Priority - The Weather Act
18 funded projects
21 extramural investigators
66 NOAA collaborators
$10M funding over **2** years

Competition topics were informed by the NWS (Office of Observations, Analyze Forecast and Support Office, Office of Water Prediction), OAR UxS Program Office, Office of Marine and Aviation Operations, the NOAA Water Initiative Observations Objective Team, the 2020 NOAA Snow Workshop, and the NOAA science and technology (S&T) focus areas. Funded projects were selected following a rigorous competitive merit review process, and:

- include substantial collaboration with operational weather stakeholders
- clearly document linkage to operational weather needs, and
- demonstrate potential to transition to operations, applications, or commercialization

[1] The Weather Research and Forecasting Innovation Act of 2017 (Public Law 115-25) (https://www.congress.gov/bill/115th-congress/house-bill/353) mandate is "**to improve the National Oceanic and Atmospheric Administration's weather research through a focused program of investment on affordable and attainable advances in observational**, computing, and modeling capabilities to support substantial improvement in weather forecasting and prediction of high impact weather events, to expand commercial opportunities for the provision of weather data, and for other purposes."

Photo credits : Dyer (Miss. State University), Sushko (Windborne Associates); McPartland (MIT Lincoln Lab), Zhang (PMEL)

NOAA OAR WPO - Observations Program - FY21 Funded Projects

Project Title (*alphabetical order*)	Principal Investigator(s)	Principal Investigator(s) Affiliation(s)
A New Global 4-km Multi-Decadal Snow Cover Extent/Snow Water Equivalent/Snow Depth Dataset from Blended In-situ and Satellite Observations	Peter Romanov, Cezar Kongoli	City College of New York (NOAA-CESSRT), ESSIC (University of Maryland)
Analysis and OSEs of UAS observations for improved high impact weather forecasts	Nusrat Yussouf	CIMMS (University of Oklahoma)
Anonymization, Bias Correction, and Assimilation of Smartphone Pressure Observations for Use in Numerical Weather Prediction in NOAA	Clifford Mass	University of Washington
Autonomous Measurements of Air-Sea Interaction from Saildrones for Improved Hurricane Intensity Prediction	Dongxiao Zhang, Jun Zhang	CICOES (University of Washington), CIMAS (University of Miami)
Development and Demonstration of a Low-Cost, Standalone Mode S EHS Aircraft Derived Atmospheric Observation System for Enhanced Weather Forecasting	Michael McPartland, Jason English	MIT Lincoln Laboratory, CIRES (University of Colorado)
Development and Deployment of a Sea Clutter Class within the Operational WSR-88D Hydrometeor Classification Algorithm	James Kurdzo Michael Istok	MIT Lincoln Laboratory
Employing a combined observation and simulation- based framework to investigate spatiotemporal variability in urban heat and associated heat advection	Sandip Pal	Texas Tech University
Employing Small Unmanned Aircraft Systems to Improve Situational Awareness and Operational Physics Routines Used to Predict Tropical Cyclone Structure and Intensity	Jun Zhang	CIMAS (University of Miami)
Evaluating Impact of In-situ Observations from Dynamically Targeted Long-Range Long-Duration Balloons	Andrey Sushko	Windborne Systems Inc.
High-impact Observations for Enhancing Great Lakes Snowfall Forecasting	Claire Pettersen	University of Wisconsin-Madison
Improvement in NOAA Winter Weather Operations using In Situ Mesonet Observations	Jerald Brotzge	University at Albany - SUNY
Improving Analysis and Communication of Extreme Temperatures Across the New York City Metropolis Using a Dense Network of In Situ Observations	Nick Bassill	University at Albany - SUNY
Improving Flood Inundation Mapping Using UAS-Based Optical Imagery	Jamie Dyer	Mississippi State University
Improving Quality Control of Multi-Radar Multi-Sensor Products from Non-Meteorological Radar Data Artifacts	Jeff Brogden	CIMMS (University of Oklahoma)
Observation of Sea Level Air Pressure and Directional Wave Spectra from Innovative Expendable Drifting Buoys	Luca Centurioni	University of California - San Diego
Particle Imaging and Ceilometer Observations for Snowfall Properties and Blizzard Parameters	Norman Wood Aaron Kennedy,	University of Wisconsin-Madison, University of North Dakota
Rapid Floodwater Extent and Depth Measurements Using Optical UAV and SAR	Leila Hashemi-Beni	NC Agricultural & Technical State University
Uncrewed aircraft observations to characterize the land surface and its interaction with the lower atmosphere in areas of complex terrain for improved prediction of water and weather	Gijs de Boer	CIRES (University of Colorado)

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https://wpo.noaa.gov/Programs/Weather-Observations-Research