Federal Funding Opportunities for Observations-based research in NOAA's Weather Program Office

Sandy LaCorte
NOAA’s Weather Program Office (WPO)
Observations Program Coordinator

NOAA WEATHER PROGRAM OFFICE

NOAA/OAR
WEATHER PROGRAM OFFICE (WPO)

– Funding research to improve forecasts –

The Weather Program Office is within the Office of Oceanic and Atmospheric Research (OAR).

Our aim is to integrate world class weather research into operational forecasts for the public, support new weather applications across the Weather Enterprise, and continually improve our understanding of weather phenomena.

WPO Programs
Air Quality & Fire Weather
Testbeds
Observations
Social Science (SSP)
Joint Technology Transfer Initiative (JTTI)
Subseasonal to Seasonal Research (S2S)
Earth Prediction Innovation Center (EPIC)
Supplemental Appropriations

NOAA WEATHER PROGRAM OFFICE

NOAA/OAR
WEATHER PROGRAM OFFICE (WPO)

– Funding research to improve forecasts –

The Weather Program Office is within the Office of Oceanic and Atmospheric Research (OAR).

Our aim is to integrate world class weather research into operational forecasts for the public, support new weather applications across the Weather Enterprise, and continually improve our understanding of weather phenomena.

WPO Programs

- Air Quality & Fire Weather
- Testbeds
- **Observations**
- Social Science (SSP)
- Joint Technology Transfer Initiative (JTTI)
- Subseasonal to Seasonal Research (S2S)
- Earth Prediction Innovation Center (EPIC)
- Supplemental Appropriations

NOAA WEATHER PROGRAM OFFICE

OBSERVATIONS PROGRAM

OUR MISSION:

To **advance observation capabilities** to improve weather forecasts and decision support

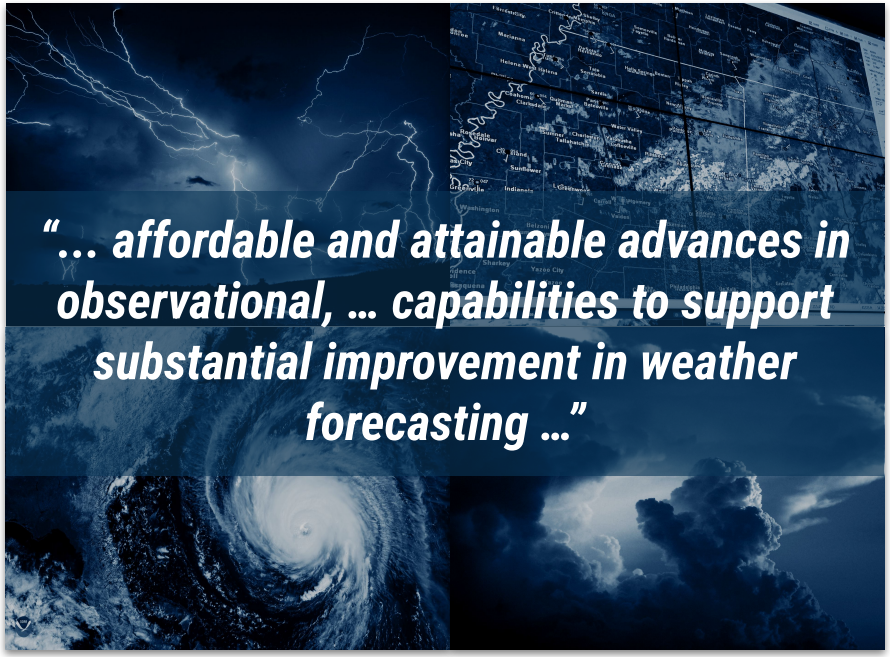
Focus Areas

- **Find & Fund** observation capabilities
- **Coordinate Transitions**
- **Manage Major Programs**

Funding the coolest projects in NOAA!

NOAA WEATHER PROGRAM OFFICE

OBSERVATIONS PROGRAM:
The Weather Research and Forecasting Innovation Act of 2017



Funding research that develops and demonstrates innovative sensor and observing technologies that have a high potential for advancing an observation systems portfolio that is mission-effective, integrated, adaptable, and affordable.

Our #1 priority!

NOAA WEATHER PROGRAM OFFICE

OBSERVATIONS PROGRAM

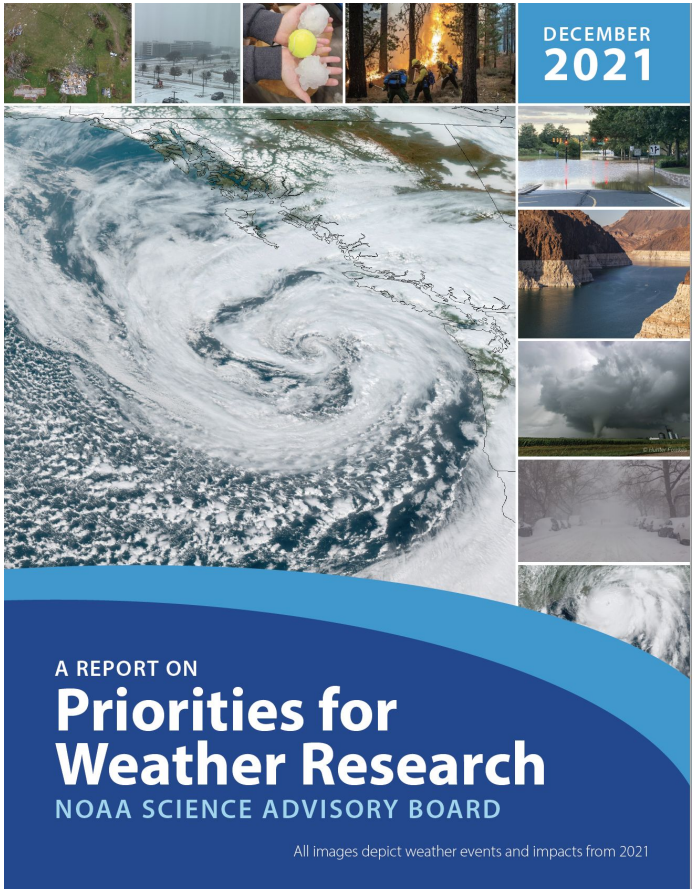
Aligned with SAB PWR report

"Observations are the foundation that supports the NOAA mission."

●●●●

"Ten Immediate First Steps

"Fill gaps in existing Earth system observing networks with existing, proven or augmenting technologies"



*NOAA Science Advisory Board (SAB), 2021:
A Report on Priorities for Weather Research (PWR)

NOAA WEATHER PROGRAM OFFICE

Observations Program

Status: The Current State of OBS R&D Funding

- **Resources:** Stabilizing R&D Budget $4-5M/year (+ TBD Earmarks and Supplementals).
  - To date, >90% of funding is extramural
- **Cadence:** Notice of Funding Opportunity (NOFOs) → 2 year cycle
  - Readiness Level: 5-7
- **Strong Relationships with Customers (Operations and R&D)**
  - **Requirements:**
    - NWS Office of Observations
    - NOAA Hurricane Forecast Community
    - National Integrated Drought Information System
    - NWS Analyze Forecast & Support
    - Technology Planning & Integration for Observation

Opportunities: Engagement with R&D community to identify emerging technologies (AMS National Networks of Networks, NOAA Emerging Technology Workshop, etc.)

NOAA WEATHER PROGRAM OFFICE

OBSERVATIONS PROGRAM: FY21 Funding Competition

1 Priority - The Weather Act

91 Letters of Intent

18 Funded Projects

66 NOAA Collaborators

$9.6M Funding over **2** years

NOAA WEATHER PROGRAM OFFICE

OBSERVATIONS PROGRAM: FY23 Funding Competition

1 Priority - The Weather Act

76 Letters of Intent

11 Funded Projects

16 NOAA Collaborators

$5.5M Funding over **2** years

NOAA WEATHER PROGRAM OFFICE

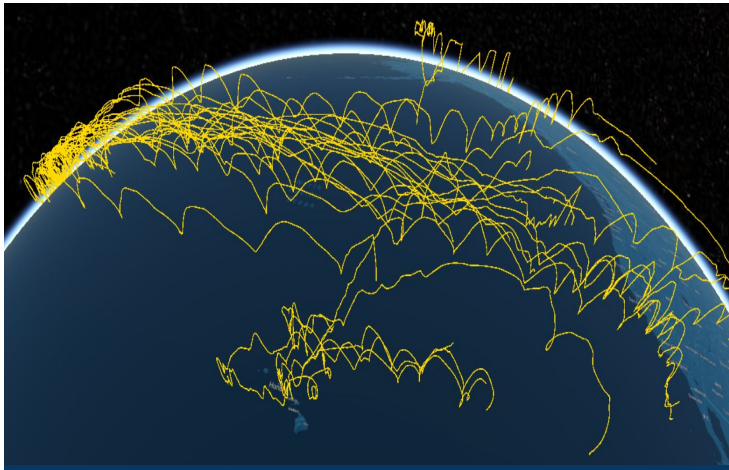
FY21

Project Highlight: Dynamically Targeted Long-Range Long-Duration Balloons

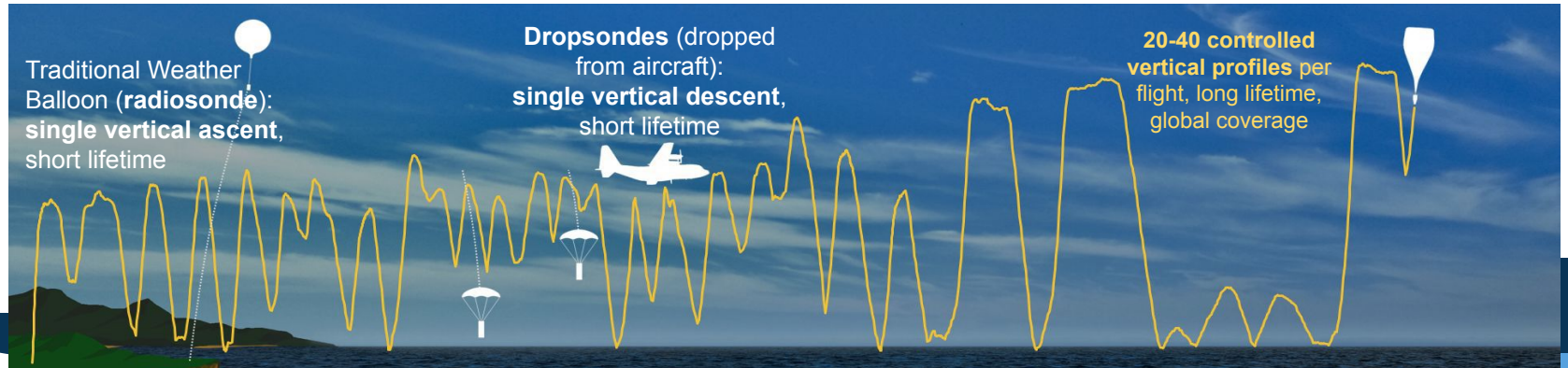
Evaluating Impact of In-situ Observations from Dynamically Targeted Long-Range Long-Duration Balloons

PI: Andrey Sushko, WindBorne Systems

- Example flight profile (below)
- **20-40 vertical profiles, up to 16 days of flight**
- **Real-time controllable altitude**
- **Pressure, temp, relative humidity, wind speed & direction**
- Ability to sample the planetary boundary layer
- Altitude ceiling is configurable (11 - 19 km)



WindBorne 3-D Representation of Flight Profiles.
**Visually amplified for clarity.*



NOAA WEATHER PROGRAM OFFICE

FY21

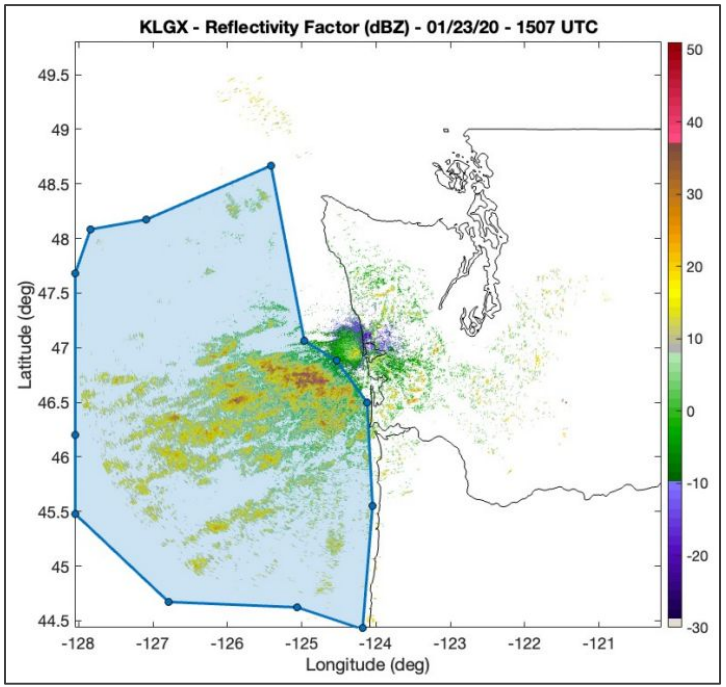
SEPARATING THE WEATHER FROM THE CHAFF

NOAA WEATHER PROGRAM OFFICE

Development and Deployment of a Sea Clutter Class within the Operational WSR-88D Hydrometeor Classification Algorithm

PI: Dr. James Kurdzo, MIT Lincoln Laboratory
NOAA Collaborators: Michael Istok, NOAA/NWS ROC

New algorithm distinguishes military chaff and sea clutter from weather



- Developed for NWS WSR-88D [*Weather Surveillance 1988 Doppler*] Radar
- Expected to transition to NWS Radar Operations Center (ROC)
- Improvement to NWS, FAA, and DoD operations

UNLOCKING A TREASURE TROVE OF AIRCRAFT DATA

FY21

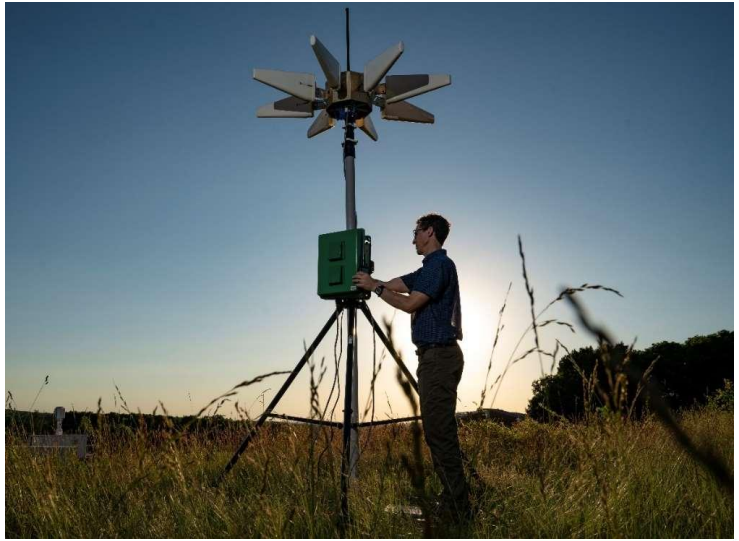
Development and Demonstration of a Low-Cost Standalone Mode S EHS Aircraft Derived Atmospheric Observation System for Enhanced Weather Forecasting

PI: Dr. Michael McPartland, MIT Lincoln Laboratory

NOAA WEATHER PROGRAM OFFICE

> *"Aircraft Derived Observations (ADO) winds and temperatures provide the highest value inputs to NWP models."*
>
> ***James & Benjamin, 2017***

	Current ADO (MDCRS)	Proposed ADO (PADWOS Mode S EHS)
% of Commercial Aircraft	20%	75% ↑
Latency	17 minutes	1 minute ↓
Domain	Major Airports	CONUS ♻



FY21

NEW HURRICANE HUNTERS JOIN THE FLEET: DRONES!

NOAA WEATHER PROGRAM OFFICE

Employing Small Unmanned Aircraft Systems to Improve Situational Awareness and Operational Physical Routines Used to Predict Tropical Cyclone Structure and Intensity

PI: Dr. Jun Zhang, CIMAS/University of Miami
co-PI: Dr. Joe Cione, NOAA/AOML/HRD

On September 28, 2022, the Area-I Altius 600 completed a successful mission into Hurricane Ian, measuring 216 mph winds at an altitude of 2,150ft!

- Deploy small uncrewed aircraft systems (sUAS) into dangerous, low altitude regions within tropical cyclones
- Data assimilation development work will be conducted using this data to improve model physics
- This work holds the potential to improve situational awareness and forecasts

FY21

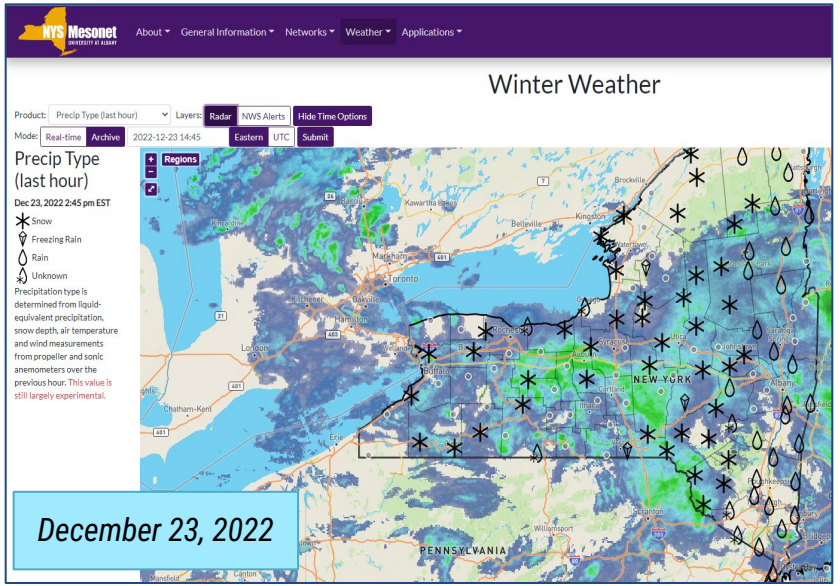
EITHER TOO HOT OR TOO COLD!

Improvement in Winter Weather & Extreme Heat Operations using In Situ Mesonet Observations

PI: Dr. Junhong Wang, University at Albany, NYSM
PI: Dr. Nick Bassill, University of Albany, NYSM

NOAA WEATHER PROGRAM OFFICE

New York State Mesonet data from 126 stations improves NOAA, state and local operations



- **NY Winter Weather Project:**

  Provides real-time snow depth, snowfall rates, snowfall accumulation, snow water equivalent, and precipitation type

- **NYC Urban Heat Project:**

  Provides real-time analysis and communication of extreme temperatures across New York City using a dense network of observations

"... the NYS Mesonet data are routinely interrogated during excessive heat to monitor and refine messaging associated with these impactful events."

Science and Operations Officer (SOO)
NOAA's National Weather Service, New York, NY

FY23 PROJECTS - JUST TO NAME A FEW!

Supporting NWS Post-Fire Flash-Flood Warnings with Multi-Sensor Burn Scar Mapping
Dr. Sam Batzli, University of Wisconsin-Madison

Development of Real-Time Multistatic Passive Radar Networks for Severe Weather Prediction
Dr. Patrick Skinner, CIWRO/OU

Assessment of the impact of New York State Mesonet profiler network and new profiling instruments on the skill of high impact weather predictions in New York State
Dr. Tammy Weckwerth, UCAR

Evaluating and Integrating Black Globe Temperature Observations into Operational WBGT Forecasts
Dr. Tim Glotfelty, NC State University

Adjusting Aircraft Wind Observations to 1-minute Sustained Winds for Improved Analysis of TC Intensity and Structure
Dr. Heather Holbach, Florida State University

NOAA WEATHER PROGRAM OFFICE

WPO OBSERVATIONS: PAST FUNDING TRENDS

Funding

- 2 Year Awards
- ~10-15 projects
- Readiness Level 5-7
- ~$600K total per project

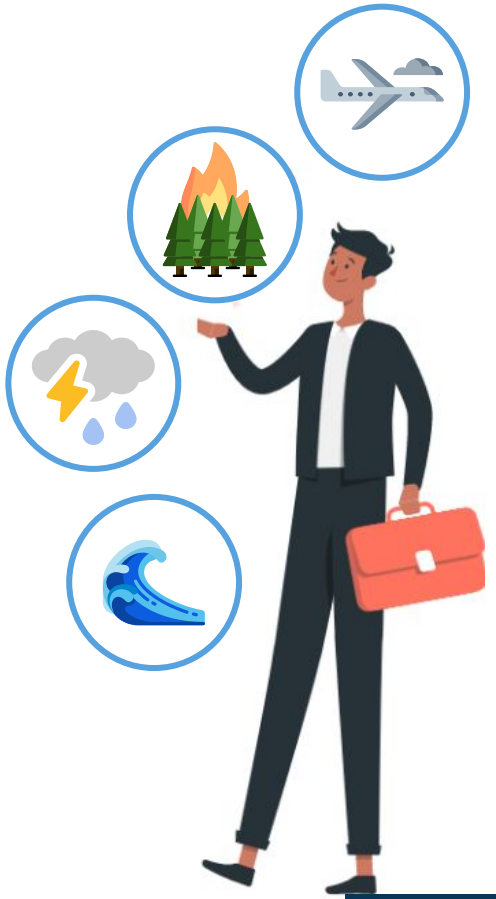
NOAA WEATHER PROGRAM OFFICE

Observations Competition: Strongest Proposals

1. include **substantial collaboration with one or more operational weather stakeholder(s)**

2. clearly **document linkage to operational weather needs** and demonstrate or allocate effort to understand how new observations may be used in the operational weather enterprise, e.g. NOAA National Weather Service, National MesoNet Program, State Climatologist Programs

3. demonstrate **potential to transition to operations, applications, commercialization, or a final product**



NOAA WEATHER PROGRAM OFFICE

EXAMPLE: WPO COMPETITIVE FUNDING OPPORTUNITY TIMELINE*

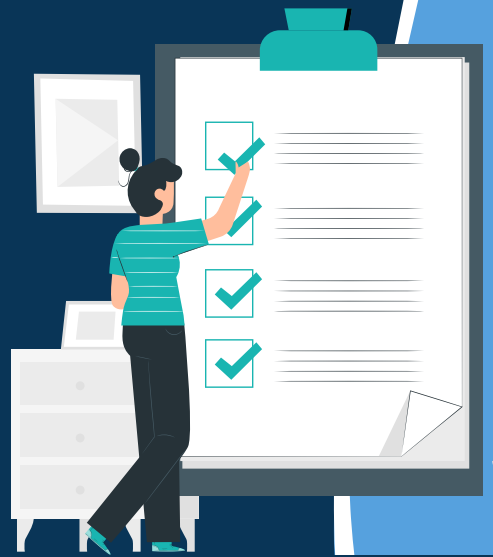
1	2	3	4	5	6
Submit Letters of Intent (LOIs)	Submit proposals to Grants.gov	Proposals Minimum Requirements	Reviewer Process	Awards Processed	Projects Begin
Fall	Fall	Winter	Winter/ Spring	Summer	Fall

Based on previous NOFOs

NOAA WEATHER PROGRAM OFFICE

IMPORTANT NOTES FOR FUTURE WPO FUNDING OPPORTUNITIES

- Future Notice of Funding Opportunities (NOFOs)
  - Grants.gov + NOAA WPO website and social media
- Letters of Intent (LOIs) are not required, but are encouraged!
- Refer to WPO website for additional information
  - FAQs
  - Templates
- Contact Program Managers if you have further questions



NOAA WEATHER PROGRAM OFFICE

Visit the NOAA WPO website!

NOAA WEATHER PROGRAM OFFICE

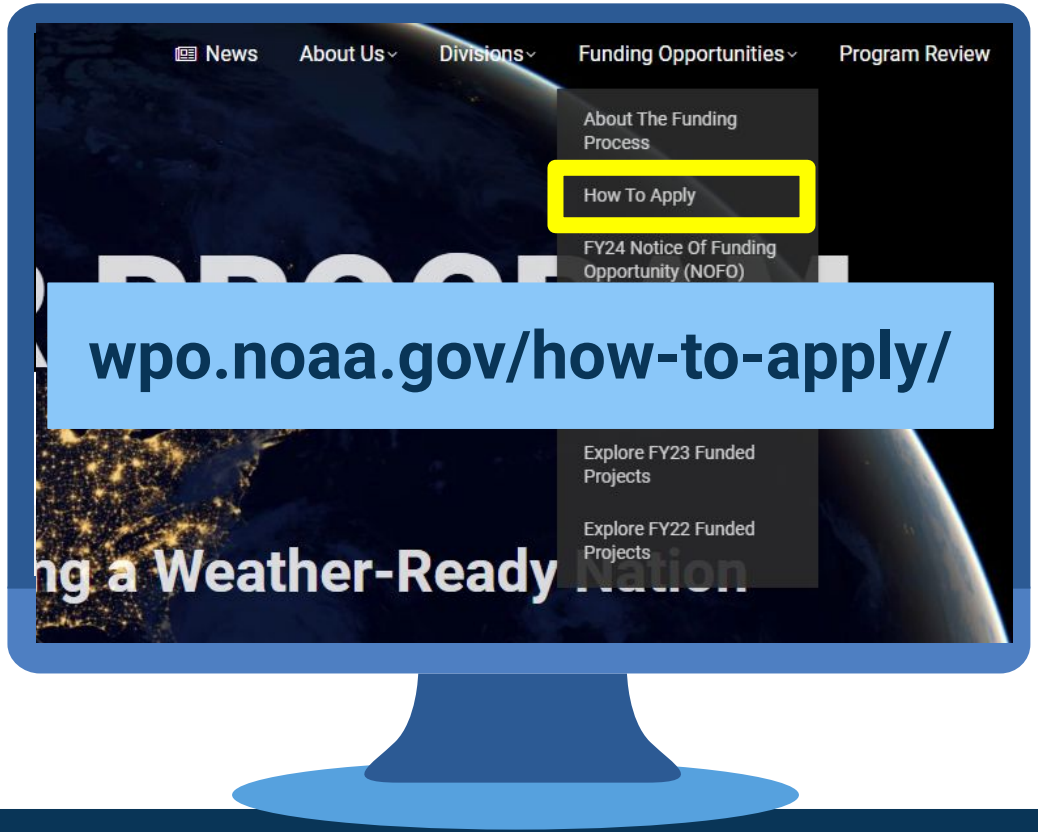
Visit the NOAA WPO website!

NOAA WEATHER PROGRAM OFFICE

Visit the NOAA WPO website!

NOAA WEATHER PROGRAM OFFICE

Visit the NOAA WPO website!



NOAA WEATHER PROGRAM OFFICE

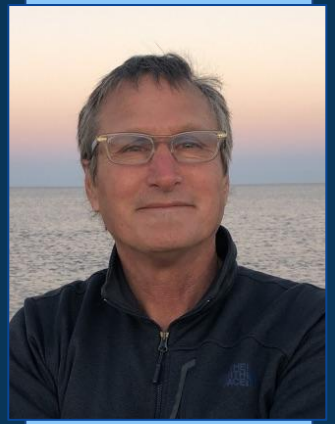
Thank You!
Questions?

Observations Program:
observations.wpo@noaa.gov

Email: sandra.lacorte@noaa.gov

WPO - Observations Program
https://wpo.noaa.gov/observations

OBSERVATIONS PROGRAM: OUR TEAM



Dr. Mark Vincent
Program Manager

Renee (Richardson) **Keller**
Deputy Program Manager

Sandy LaCorte
Program Coordinator

NOAA WEATHER PROGRAM OFFICE