



WEATHER PROGRAM OFFICE

National Oceanic and Atmospheric Research

NOAA Weather Program Office's Presentations

@ American Meteorological Society (AMS) 101st Meeting [Virtual]

January 10 – 15, 2021

[Link to AMS meeting site](#)

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WEATHER PROGRAM OFFICE

National Oceanic and Atmospheric Research

About NOAA's Program Office

In pursuit of its vision and mission, WPO works closely with the [National Weather Service](#) (NWS) to help develop and transition weather research, including hurricanes, severe thunderstorms, heavy precipitation, and air pollution. Additionally, WPO utilizes [social science](#) to learn how to deal with the uncertainties weather presents and to inform its engagement and communication with researchers, funders, and the public.

Furthermore, WPO selects and funds research that supports and fosters collaborations — within NOAA's research [laboratories](#) and across the weather enterprise (i.e., NOAA, other Federal agencies and entities, state and local governments, academia, and the private sector).

This coordination will include:

- 1) developing engagement mechanisms with the U.S. private weather industry;
- 2) enhancing two-way collaboration, coordination, and feedback between operations and research to accelerate the pace of capability improvements;
- 3) supporting community modeling efforts beneficial to both operational support and research questions; and
- 4) guiding collaborative efforts to include both operational and research priorities in planning phases.

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January 12, 2021

Panel Discussion 4 Ninth Symposium on the Weather, Water, and Climate Enterprise - How We Decide: Tools and Approaches for Guiding Investments in Observations

Panelist: Mark Vincent

Time: 10:30 AM

Abstract

A variety of tools can be used to determine the potential impact of both real and simulated observing systems in numerical weather prediction forecasts, products, and services. Examples include Observing System Experiments (OSEs), Observing System Simulation Experiments (OSSEs), Forecast Sensitivity - Observation Impact (FSOI), value chains such as the NOAA Observing System Integrated Analysis (NOSIA-II), and the Advanced Systems Performance Evaluation tool for NESDIS (ASPEN).

These tools have been applied to individual systems as well as broader applications such as the National Plan for Civil Earth Observations. The primary objective is to improve quantitative and objective assessment capabilities to evaluate operational and future observation system impacts and trade-offs to assess and to prioritize observing system architecture. This session will compare the strengths, weaknesses, appropriate uses, and costs of these tools as well as specific portfolio decisions that have been made, and possible observing systems that could be evaluated in the future. The focus of this session is on the use of these tools for ground-based airborne, and satellite observing systems.

[Link to panel discussion](#)

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“Testbeds: A NOAA Research to Operations Transition Program for Extreme Precipitation, Severe Thunderstorms, and Hurricanes”

Presenter: Jordan Dale

Time: 10:40 AM

Abstract

NOAA’s Weather Program Office (WPO), in the Office of Oceanic and Atmospheric Research (OAR), supports world-class weather research to save lives, reduce property damage, and enhance the national economy. In support of WPO’s mission, the [Testbeds Program](#) works closely with the National Weather Service (NWS) and OAR Laboratories to help advance and transition weather research related to extreme precipitation, severe weather, and hurricanes into operations.

The Testbeds Program is currently supporting 11 ongoing two- and three-year projects funded through 14 cooperative agreements valued at \$6.0M with multiple universities and NOAA laboratories. The projects started in July 2019 and will test within three NOAA high impact weather testbeds across the U.S. These testbeds include the Hydrometeorology Testbed, focusing on heavy precipitation and hydrologic response; the Hazardous Weather Testbed, focusing on severe weather such as tornadoes, hail, and wind; and the Joint Hurricane Testbed, focusing on tropical cyclones and hurricanes.

These projects support the development of new weather and hydrologic analysis and forecasting techniques or numerical forecast models that are broadly applicable to the weather enterprise and can also be used by forecasters at NWS Weather Forecast Offices, River Forecast Centers, and national centers to improve their products and services over the next five years. The objective is to improve services to the public by closely linking university and other laboratory researchers doing highly applied research with operational forecasters so that emerging new technology can be tested and proven beneficial within a

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pseudo-operational environment at these offices and transitioned for their use more quickly within NOAA and to the broader weather science and forecasting communities.

This presentation will outline the program objectives, types of supported projects, processes, future funding competition schedules, as well as the latest status of the current projects and future plans. The Testbeds Program has resulted in improved opportunities for universities and other external researchers to work directly with NOAA scientists and forecasters to apply new technology for public benefit.

[Link to session and full abstract](#)

What Is Being Enhanced?: An Examination of the Storm Prediction Center's Risk Category System among Members of the Public

Presenter: Castle Williams

Time: 10:40 AM

Abstract

The National Weather Service Storm Prediction Center (SPC) develops and issues both the Convective Outlook and the Public Severe Weather Outlook (PWO) which graphically communicate an area's categorical risk for severe or convective weather using numbers (e.g., 4), risk language or risk words (e.g., Moderate), and colors (e.g., red). Although broadcast meteorologists and emergency managers have acknowledged that this product is effective for decision-making, these user groups have expressed concern that members of the public may not be able to adequately use the Convective Outlook graphic and/or understand its risk category system. The challenge, however, is that there are only a few empirical studies to-date that have evaluated the general public's understanding of the Convective Outlook graphic and its risk category system. As a first step toward addressing this operational need, we used both quantitative and qualitative methods to evaluate the public's ability to use and interpret the SPC's risk category system.

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Policy, Research and Practice - To Infinity and Beyond! Using the Social and Behavioral Science R2O Workshop to Launch WPO's Social Science Program into the Future

Panelists: Gina Eosco, Alice Grossman, Michele Olson, Castle Williams

Time: 4:00 PM

Abstract

Building upon the National Academy of Sciences report on Integrating Social and Behavioral Science within the Weather Enterprise, National Oceanic and Atmospheric Administration's (NOAA) Weather Program Office hosted the first Social and Behavioral Science (SBS) Research to Operations (R2O) Workshop September 4th–6th, 2019 in Silver Spring, MD. The initial workshop agenda focused on types of transitions, how to develop a transition plan, and defining social science readiness levels. However, after meeting with various stakeholders within NOAA and external SBS researchers, the WPO [Social Science Program](#) realized the previous workshop agenda did not address the key challenge of SBS transitions—that *NOAA needs to weave social science into its organizational infrastructure*. Specifically, NOAA needs an organizational infrastructure that supports SBS transitions, such as collecting longitudinal data (i.e., data collected over time), data archives, and societal impact performance metrics that drive mission improvements. Until these organizational pieces are in place, measuring success of individual social science projects, as well as large scale change, will remain a challenge.

To start addressing these challenges, the SBS R2O workshop focused on nurturing an understanding of the unique roles, goals, and capacities of people and organizations comprising the social science and weather communities. Workshop presentations and activities helped build shared languages, terminologies, theories, concepts, and methodologies to enhance the SBS R2O process. This workshop fostered opportunities to discuss and develop SBS organizational infrastructure within NOAA by focusing on topics such as long term data collection, sharing research and development policy and products, and transitioning knowledge.

[Link to session and full abstract](#)

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January 13, 2021

Emphasizing Diversity and Inclusion in a Federal Funding Opportunity

Presenter: Matt Mahalik

Time: 1:10 PM

Abstract

NOAA's Weather Program Office (WPO) funds dozens of weather, water, air quality, and social science research and development projects every year. WPO recognizes the importance of creating inclusive opportunities for scientists, and a major component of the office's strategic vision is to integrate and promote diversity and inclusion (D&I) as a core consideration throughout WPO's funding mechanisms. In 2019, applicants to the annual [Notice of Funding Opportunity](#) (NOFO) were required to include a statement on their commitment and/or contribution to D&I in each proposal, which was scored by reviewers as part of the selection process. A subsequent analysis of over 50 D&I statements provided insight into the D&I approaches within the applicant pool and motivated action by WPO to more effectively emphasize it in 2020. This year, using guidance provided by NOAA's Civil Rights Office, Office of Education, and other NOAA program offices, specific examples of effective strategies to incorporate D&I into research proposals were provided, and the weight of the D&I statement was increased relative to the total review score. This presentation will provide an overview of the expanding role of D&I in WPO's annual NOFO, including a preliminary analysis of D&I statements from 2019 and 2020 proposals, lessons learned for increasing the diversity of applicants and reviewers while promoting an inclusive funding competition, and examples of challenges encountered during the process.

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Earth System Modeling Coordination across the Federal Government within the Interagency Committee for Advancing Meteorological Services (ICAMS): A Framework

Presenter: Jessie Carman

Time: 1:45 PM

Abstract

The nation's security and economic well-being rely upon accurate global analysis and prediction of the physical environment over time scales from a few hours to days to a few decades. The need for better-informed decisions is amplified by recent trends in the climate mean and variability, which reduce the reliability of predictions using average conditions and the recent extreme events affecting commerce, defense, infrastructure and water, energy and other resources. The Federal Meteorological Enterprise works toward improving the environmental modeling and decision support systems of environmental products through a disciplined application of Earth System modeling research and eventual transition of that research to operational use for the Nation.

Responding to the Weather Research and Forecast Improvement Act of 2017 (P.L. 115-25), the Federal Meteorological Enterprise established the Interagency Council for the Advancement of Meteorological Services (ICAMS) to direct and coordinate federal agencies on common science to improve each agency's ability to meet its specific mission. Multiple working groups are tasked with common S&T and R&D problems to come to collaborative solutions for the broader enterprise. This presentation will provide an overview of the ICAMS coordination of Earth system modeling S&T, R&D and operations across the federal agencies.

[Link to session and full abstract](#)

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Using Transition Plans to Facilitate R2O Transitions in NOAA

Presenter: Matt Mahalik

Time: 1:55 PM

Abstract

As part of a continuing effort to facilitate research-to-operations (R2O) transitions, NOAA's Office of Oceanic and Atmospheric Research (OAR) began requiring R2O transition plan documents in 2016 for all research and development projects intended to transition into operations. Since then, OAR's Weather Program Office (WPO) and the National Weather Service (NWS) Office of Science and Technology Integration (OSTI) have periodically evaluated the effectiveness of transition plans for OAR-NWS transitions. Resulting steps to streamline the complex R2O planning process include a formalized review and approval process, simplification of templates, collection of feedback from staff and management at research laboratories and operational centers, and adoption of an end-to-end approach to transitions, beginning with the initial call for proposals and extending beyond the ultimate operational implementation. This presentation provides evidence of the utility of transition plans and how they are used by NWS Service Delivery Portfolios to prepare for upcoming transitions. We present lessons learned by WPO and OSTI in the hopes that they may be used to assist in strategic adoption of transition plans for projects funded through other OAR and NOAA programs.

[Link to session and full abstract](#)

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Advances in Research and Modeling of Space Weather Drivers

Panelist: Valbona Kunkel

Time: 3:30 PM

Abstract

Forecasting space weather events presents the ultimate challenge to a space physics model. A forecasting model should satisfy not only observational constraints such as the onset time, severity, and duration of actual events but also the practical requirement of timeliness, accuracy, and robustness under realistic conditions. Modern space weather forecasters and users rely on a wide variety of forecast methods, encompassing simple nonlinear regressions, complex empirical (assimilative) algorithms, physical/theoretical models, and hybrid methods. For a thorough understanding of the mechanisms of solar influences on Earth, models must relate remote sensing data and the driving influences of solar events on the magnetosphere/ionosphere in terms of physical mechanisms.

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9.8 - Lessons Learned from NOAA's Disaster Relief Appropriations (DRAS): Improving the Forecasting Portfolio

Presenter: Ben Woods

Time: 4:15 PM

Abstract

Hurricanes continue to greatly impact the United States. In particular, the impacts from hurricanes Harvey, Irma, Maria, Michael, and Florence were significant to life, property, infrastructure and fisheries. As a result of these impacts, Congress passed both the Bipartisan Budget Act of 2018 on February 9, 2018, and the Additional Supplemental Appropriations for Disaster Relief Act on June 6, 2019. In part, these Bills appropriated funds to NOAA for the following portfolio areas, respectively:

Improving Forecasting and Assimilation (IFAA) to accelerate the planned research on hurricane forecasting, track, and intensity, the planned research on flood forecasting, the planned research on weather forecasting, and the planned research on data assimilation. Improving Forecasting of Hurricanes, Floods, and Wildfires (IFHFW).

[Link to session and full abstract](#)

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January 14, 2021

Bringing Together Snow Measurement, Analysis, and Prediction Communities to Improve Winter Outlooks and Ground-Based Atmospheric Profiling Systems: Achieving the Goal of a Nationwide Network of Networks

Panelist: Bonnie Brown

Time: 3:00 PM

Panel Abstract

Participants in the 2020 joint workshop held by NOAA Research and the National Weather Service on abilities, gaps, and innovations in snow measurement and analysis identified needs for the merging, tagging, and standardization of snow observation databases and their metadata; better quantification and documentation of the uncertainty in snow observations; better understanding of temporal and spatial patterns in snowfall, particularly in mountainous regions; stronger coupling between land, ocean, atmosphere, and cryosphere model components for the prediction of snowfall, snowmelt, and snow accumulation; and incorporating stakeholder needs into the design of snow observing and forecast systems.

Abstracts are solicited on all of the above topics, specifically those that address the snow measurement and prediction issue in the context of NOAA's Unified Forecast System and the specific snow analysis, prediction and monitoring responsibilities of federal agencies such as the National Weather Service, US Geological Survey, Bureau of Reclamation, and research in collaboration therewith.

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January 15, 2021

How Social Science Research and Integration Gives Voice to End Users

Presenter: Gina Eosco

Time: 10:00 AM

Abstract

Building upon the National Academy of Sciences report on Integrating Social and Behavioral Science within the Weather Enterprise, National Oceanic and Atmospheric Administration's (NOAA) Weather Program Office hosted the first Social and Behavioral Science (SBS) Research to Operations (R2O) Workshop September 4th–6th, 2019 in Silver Spring, MD. The initial workshop agenda focused on types of transitions, how to develop a transition plan, and defining social science readiness levels. However, after meeting with various stakeholders within NOAA and external SBS researchers, the WPO Social Science Program realized the previous workshop agenda did not address the key challenge of SBS transitions—that *NOAA needs to weave social science into its organizational infrastructure*. Specifically, NOAA needs an organizational infrastructure that supports SBS transitions, such as collecting longitudinal data (i.e., data collected over time), data archives, and societal impact performance metrics that drive mission improvements. Until these organizational pieces are in place, measuring success of individual social science projects, as well as large scale change, will remain a challenge.

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Metrics connecting earth system processes to useful predictions

Panelist: Bonnie Brown, Jessie Carman

Time: 1:00 PM

Abstract

There is an ongoing societal need to improve extended-range precipitation prediction in location, type, timing, and amount. However, precipitation is an outcome of processes interacting throughout the coupled earth system; further, the water cycle provides a link between synoptic and climate, as well as mesoscale and planetary scale phenomena. To improve precipitation prediction, the research community must trace the errors back to their physical causes and the representation of those causes in models.

This session seeks presentations on metrics and diagnostics that will connect subseasonal to seasonal precipitation prediction errors to phenomena and their teleconnections, such as MJO/ENSO impacts on the extratropics, Arctic ice distribution impacts on the jet stream, stratosphere interactions with the troposphere, and others. Such measures could help diagnose the ongoing model issues that need improvement, and assess that improvement. Metrics connecting processes across coupled air-ocean-land-ice interactions are especially welcome.

[Link to session and full abstract](#)

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Evolving Efforts to Improve the Transition of Research to Applications

Presenter: Matt Mahalik

Time: 1:25 PM

Abstract

NOAA's approaches to research transition continue to evolve as its range of research, operational and non-operational applications, and stakeholders expands. Within the Office of Oceanic and Atmospheric Research (OAR), the Weather Program Office (WPO) has enacted a number of initiatives to improve the transition process for its grants and better align research goals with the needs of end-users and decision makers. In particular, direct coordination with NOAA's National Weather Service for proposed operational project outcomes and an increased emphasis on recognizing and supporting non-operational project outcomes (such as documenting and applying knowledge or a set of recommendations in addition to, or in lieu of, technology transfer) have allowed for opportunities to more clearly define the roles of researchers and stakeholders to streamline the research transition process. This presentation describes the current state of the research transition process for WPO-funded projects, identifies ways for users to provide input when developing research priorities, explores successes and challenges for transitioning a variety of research, and outlines best practices in connecting researchers with transition experts.

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Expanding the Definition of R2O: Findings from the WPO Social and Behavioral Science Research-to-Operations Workshop

Presenter: Castle Williams

Time: 1:30 PM

Abstract

National Oceanic and Atmospheric Administration's (NOAA) Weather Program Office (WPO) hosted the first Social and Behavioral Science (SBS) Research to Operations (R2O) Workshop on September 4th–6th, 2019 in Silver Spring, MD. Across the three day workshop, participants repeatedly emphasized the need to redefine and expand the R2O process as something that is more flexible, agile, and adaptable. In particular, workshop attendees described that improving SBS R2O, and R2O more broadly, requires (1) highlighting the importance of transferring knowledge—or as some described, transferring science—and (2) emphasizing the flexibility and evolving nature of transition plan policies and practice.

This presentation will discuss the various takeaways that emerged around the SBS R2O process and invite the broader meteorological and SBS communities to respond, react, and comment on the workshop findings in hopes of developing an R2O process that is perceived to be more transparent, collaborative, and meaningful. Not only that, but this presentation will highlight how WPO's Social Science Program incorporated user engagement from this workshop into our strategic planning and program initiatives.

[Link to session and full abstract](#)

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The Future of FACETs: Engaging the Weather Enterprise to Advance the FACETs Framework Together

Presenter: Alison Agather

Time: 1:35 PM

Abstract

To empower end-users and promote actionable decision making in the face of high-impact weather events, the National Oceanic and Atmospheric Administration (NOAA) Forecasting A Continuum of Environment Threats Program ([FACETs](#)) developed an updated strategic plan (2.0) to outline the evolution and modernization of operational products, services, and messaging, from deterministic-based methods to being informed by probabilistic hazard information (PHI) for all environmental threats. PHI is an integral component of the FACETs framework for improving the forecasting and communication of hazards for all environmental threats. Within NOAA, both the office of Oceanic and Atmospheric Research (OAR) and the National Weather Service (NWS) support FACETs and efforts to advance hazardous environmental threat forecasting to include PHI. This presentation will detail the background of FACETs, and delve into the programmatic vision, objectives and goals, outlining the future of the FACETs program. Research efforts and plans to advance FACETs will be outlined, as well as, opportunities for the research community to engage in furthering the goals detailed in the strategic plan. Examples of FACETs-related research which are planned for transition to operational products and services will be shared.

[Link to session and full abstract](#)

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WPO Programs

NOAA's Weather Program Office (WPO) works closely with NOAA's National Weather Service (NWS) to develop and transition weather research to operations which could lead to improved knowledge about tropical cyclones, severe storms, extreme precipitation, air pollution, and social science--and to integrate weather, water, and climate forecasting and mitigation. This is accomplished via the following programs:

- Air Quality
- DISASTER-RELATED APPROPRIATION SUPPLEMENTAL [DRAS]
- National Earth System Prediction Capability [ESPC]
- Earth Prediction Innovation Center [EPIC]
- Forecasting a Continuum of Environmental Threats [FACETS]
- Joint Technology Transfer Initiative [JTTI]
- Next Generation Global Prediction System [NGGPS]
- Social Science
- Subseasonal to Seasonal [S2S]
- Testbeds
- The Weather Act
- Weather Observations Research

To learn more about NOAA WPO's Programs click [here](#).

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