

January 2020 National Weather Service Partners Meeting Summary

On January 16th, 2020, the National Weather Service (NWS) conducted a Partners Meeting with a diverse group of individuals from the industry, government, and academic sectors of the Weather Enterprise. This meeting was held during the American Meteorological Society's Annual Meeting in Boston, Massachusetts, which brings representatives from across the weather, water, and climate enterprise together in one location. The meeting agenda is available [here](#).

The meeting provided a means for partners to identify and discuss challenges that exist within the Weather Enterprise (specifically across the New England region) and what each sector can do to address those challenges. The overall objectives for the meeting were as follows:

- Clarify and leverage the unique roles and capabilities of Weather Enterprise partners to respond to the increasing demand for actionable weather, water, and climate information.
- Expand public-private partnerships that enhance private Enterprise innovations, strengthen relationships, eliminate barriers, and share best practices to focus on continuous improvements.
- Identify emerging issues and future opportunities for collaboration within the Weather Enterprise.
- Discuss specific Weather Enterprise service areas, identify any gaps in those services, and brainstorm ideas to fill those service gaps by developing "action items" from these discussions for participants to collaboratively work on beyond the Partners Meeting.
- Provide NWS updates and share information on timely topics and operational issues of interest to the broader Weather Enterprise and gain relevant feedback.

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Summary of Meeting Sessions and Activities

Welcoming Remarks: Peyton Robertson, NWS Director Office of Organizational Excellence



Peyton Robertson started the meeting by welcoming everyone and thanking them for their attendance. He highlighted the different sectors of the Weather Enterprise that were in attendance and how their continued interest and participation in these Partners Meetings has been very valuable. Peyton provided an overview of the meeting agenda, emphasizing the theme of assessing the past, present, and future actions of the Weather Enterprise.

NWS Updates: Louis Uccellini, NWS Director



In the spirit of the NWS celebrating its 150th anniversary, Louis Uccellini shared background on the heritage of the NWS, reviewing several crossroads in weather history that contributed to the NWS making operational advances in support of building a Weather-Ready Nation. Louis highlighted how our partnerships have evolved and grown over the years. We have come a long way as a Weather Enterprise, and are now aligned and coordinated to make some instrumental progress in preparedness, response, and resilience efforts. There is still plenty of work to be done, but we've made great progress and it's exciting to see the best minds in the Weather Enterprise getting focused and working together on numerous initiatives.

Louis highlighted the following key areas of focus for the NWS over the upcoming year: advancing IDSS across all services, improving both physical and social sciences, strengthening public-private partnerships, EPIC, and celebrating NWS's 150th anniversary. He also highlighted the recent release of the BAMS article on [Evolving the National Weather Service to Build a Weather-Ready Nation](#).

Summer 2019 NWS Partners Meeting Small Group Discussion Outcomes: "Where Are We Now?"

For this session, we invited three individuals who led small group discussions at the last NWS Partners Meeting in August 2019 to share a development update on their groups' topic and to share potential targets of opportunity moving forward. Peyton Robertson briefly introduced this session and the guest speakers by providing an [overview of the small group discussions](#) that occurred during the Summer 2019 Partners Meeting.

Erica Grow, a policy fellow with the American Meteorological Society, reported on the topic of IDSS and shared how strengthening the Weather-Ready Nation (WRN) Ambassador program within the NWS could aid in increased and improved IDSS for partners into the future. The AMS Policy program is starting to take a fresh look at WRN Ambassadors from an enterprise honest broker perspective, and they plan to send surveys out soon to current and potential WRN Ambassadors to learn how the WRN Ambassador program could be of greater assistance.



Nick Powell, a principal systems engineer for Raytheon, briefed on the topic of Industry Engagement for R2O. Industry research and development is driven by understanding the link between weather, water, and climate to business profits and losses. He noted that there have been struggles in getting new talent into industry, so how can we combine efforts as an Enterprise to better educate and advertise to the academic sector the diverse career opportunities that exist across all sectors for atmospheric science majors? There could be opportunities to partner with academia to help them better understand what skill sets would be valuable for atmospheric science students to acquire for industry jobs. It also was discussed that the development of an Atmospheric Science Industry summit could be beneficial to bring heightened awareness of the need for atmospheric science majors in industry and what those job opportunities would look like.



William Mahoney, Director of the Research Applications Laboratory at NCAR, provided an update on Fire Weather Risks and Technologies. The AMS Commission on the Weather, Water, and Climate Enterprise established a new Ad Hoc Committee on Wildfire Weather, Technology and Risk in Fall 2019. The objective of this committee is to promote collaboration, bring together stakeholders, elicit input, and coordinate community feedback regarding critical fire weather, air quality, and weather and climate risk issues. The committee also will educate wildland fire, weather and climate enterprise stakeholders on respective information needs, operational requirements and constraints, and current capabilities and emerging technologies that could be used to improve decision making that would reduce property losses, save lives, and improve rangeland and forest management. This topic is of high interest across federal, state, and local agencies, including Congress. Activities that this committee could focus on include: exploring how to bring the weather and fire communities closer for increased collaboration, discuss observational gaps, assess who “owns” fire behavior modeling, integrate social science research to improve communications, working more closely with emergency managers, and focusing on the aspects of air quality and human health impacts. The committee’s first activity



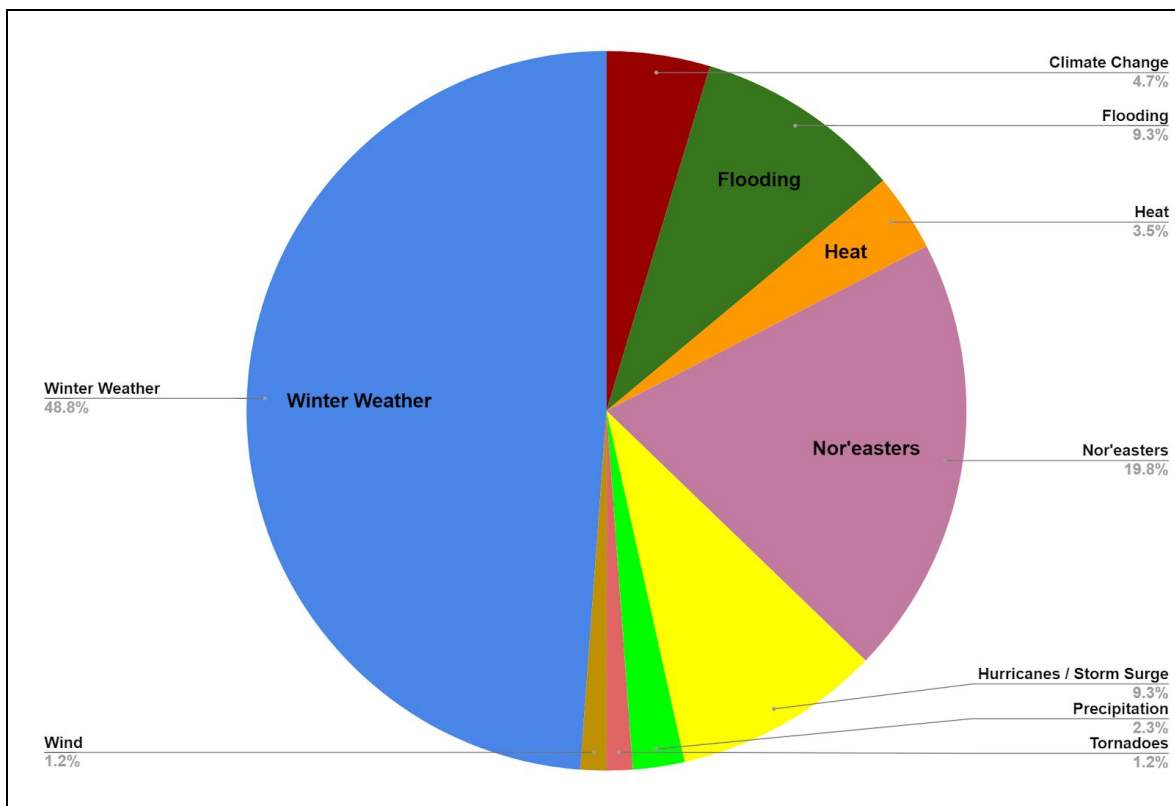
will be the AMS Washington Forum: Wildfire Weather Panel Discussion, which is scheduled for April 22, 2020.

Panel Discussion: “What Weather Phenomena Have the Greatest Impacts on Life and Property in New England?”

Audra Hennecke, acting Partner Engagement Lead for the NWS Office of Organizational Excellence, facilitated a panel discussion with local New England members of the Weather Enterprise, spanning from the NWS, FEMA, media sector, and transportation sector. The objectives of this panel discussion were to discuss the different types of weather phenomena that cause the most significant loss of life or economic impacts in the New England region, and to identify any known gaps or potential limitations in services currently provided within the Weather Enterprise for different weather hazards.



Prior to the meeting, attendees were asked to answer the following survey question: What weather phenomena do you think has the greatest impact on life and property in the New England region?”. Here are the results from this pre-meeting survey question:



Based on these results, the panel discussion focused on the following weather phenomena: winter weather, hurricanes and storm surge, flooding, and climate change/extreme weather events. Panelists shared that, in terms of the frequency of events, winter weather certainly has the greatest impact in the New England region. However, in terms of greatest impact from a single occurrence, hurricanes and tropical storms definitely cause the greatest impacts.

Winter weather creates challenges for all sectors, especially aviation, utilities and infrastructure, and has a significant impact on societal response decisions, such as school closures. Increased education on winter weather preparedness and response is critical to ensuring communities are ready for the impacts of winter weather. There are opportunities for improvement regarding how we communicate the expected impacts of an approaching winter storm [i.e., how much snow is expected (most likely and worst-case scenarios)?, will it be a wet or dry snow?, how will blowing snow impact travel conditions?]. By providing more context when communicating these forecast details, it may help end-users better understand the degree of impacts and hopefully result in individuals taking preventative actions in advance to avoid the impacts. The media has expanded its use of “impact graphics”, such as power outage graphics, to help in communicating what the expected impacts will be and where the greatest impacts may occur. The transportation industry has greatly improved how they prepare for and work through winter weather events due to the expansion of road weather stations and reporting of real-time conditions to aid them in knowing what type of material to apply and when to apply it. For hurricanes, one of the greatest challenges is effectively communicating expected impacts to the public and convincing them of the significance of those impacts. It has been several years since a land-falling hurricane has impacted the New England region, with Hurricane Sandy only side-swiping the region. The Weather Enterprise can aid communities in preparing for potential impacts from future land-falling hurricanes to hopefully minimize the severity of the impacts. Inland flooding causes significant impacts to the region, and there is growing concern for how New England communities can handle excessive rainfall amounts from tropical systems. Additionally, some panelists highlighted how one of the biggest gaps in our service delivery is with freshwater flooding, as our forecasting and warning capabilities need to be improved to match the quality of those for storm surge. FEMA is interested in interacting with the private sector in new ways in order to connect people to preparedness and response information more directly via apps. There also was discussion on how we can improve the lead time for tropical system impacts (through more probabilistic forecasts) to allow more time for decision makers to take the necessary precautionary actions. The NWS WRN Ambassador program could serve as a driving force so that important planning information is distributed and received well in advance of hazardous weather. Panelists also discussed concerns for more extreme weather events and climate change across the New England region. With projected sea-level rise along with strong storms and increasing populations and infrastructure, there is concern for increased vulnerabilities into the future. If two strong storms impact the region within a short period of time, the degree of these impacts and vulnerabilities will be even greater.

Challenges: Effective coordination within the Weather Enterprise is critical for us to build a safer and more resilient society. As an enterprise, we have the challenge of trying to clearly

communicate and translate key forecast information to decision makers and the public, and that message is not necessarily the same for all end-users. There is still room for improvement within the Weather Enterprise to gain a better understanding of what information decision makers need and when they need it in order to act, and how we can better communicate areas of uncertainty with timing and precipitation/accumulation amounts, which can change where the greatest impacts may be and how communities need to respond to stay safe.

Small Group Discussions on Panel Discussion Topic

Participants were split up into small groups to discuss a particular weather hazard within the New England area. Each small group assessed what the key limitations or service gaps currently are within the Weather Enterprise for their group's assigned weather hazard, and then worked together to identify potential solutions to those challenges. Here are the highlights from each of the small group discussions:

Group #1: Winter Weather



Challenges:

- Inconsistent messaging/forecasts
 - Warnings between adjacent offices and ensuring similar call-to-action statements
- Tailor the message to the needs of the recipients
 - Work more with them to learn their needs

Discussion:

- The consistent challenge is deterministic forecast inconsistency on days 7-10. This is an enterprise credibility challenge because we're driven to make these forecasts before we're actually confident enough to make the forecasts.

Groups #2 and #3: Hurricanes/Storm Surge



Challenges:

- Communicating the difference between inland and coastal flooding
- Cultural change
 - How our political system operates, and changes in tourism population/behavior
- How can we get people to respect the power of these storms if they've never experienced one? -- leverage technology to help map what the event would look like
- Modeling -- getting storm surge and total rainfall forecasts more accurate
- Public awareness

Solutions:

- Bring more preparedness information into the schools
- Embed people in high-risk communities via WRN Ambassadors
- Tabletop exercises for hurricane events

Discussion:

- How do we help people in New England understand the difference in impacts between a hurricane that skims the coast vs. a tropical storm that produces significant inland rain?
- The NWS Water Center is developing flood inundation mapping capabilities (demo complete by early next FY)

Group #4: Flooding



Challenges:

- Inconsistent understanding of individual risks
- Granularity of extreme event forecasts
- Evacuation infrastructure

Solutions:

- Multi-level messaging
 - Virtual reality/AI to show people
 - Are there systems that could be built into phones/cars?
- Develop a hyper-localized water model
- Communications development with respect to the evacuation

Discussion:

- Can we incorporate weather alerts into Waze or similar apps?
 - The private sector is working on this
- Communications strategy: give those approaching a hazard an alternative (i.e. flooded road ahead - here's an alternative route)
- Putting notices on variable message signs (they're already doing this in some places)

Group #5: Climate Change



Challenges:

- Educating the public to understand the increasing number/severity of these huge events
- Infrastructure is not ready for these huge events. How can we as a community impact building codes? -- scientific expertise/economic impact
- Limits of predictability

Discussion:

- What role do insurance companies play in any of this? (they are the ones that end up having to pay to rebuild)
 - Insurance in the US is a for-profit business. They take action based on what makes money
 - They'll insure anything as long as you pay the money

Reflection Remarks: Mary Erickson, NWS Deputy Director



In her Reflection Remarks, Mary Erickson emphasized that public/private partnerships are woven into the NWS genetic code and that we depend on the entire Weather Enterprise, especially since people seek corroborated weather information with an authoritative voice. Looking into the future, we will continue to focus on transparency and dialogue between our partners. Changes are expected in the realms of open data and data rights, cloud-computing and dissemination, and technology acceleration. The core future investments of the NWS will be: IDSS, Water Services, National Ice Center (NIC), increased social science integration with physical science, public-private partnerships, EPIC, space weather, and observations (SLEP, mesonets, and satellite data). The key challenges we still face are with software engineering, integrating human factors into decision-making prior to and during life-threatening weather events, and alerting systems with regards to delivery mechanisms of the future and the role of social communication channels. It will take involvement of the entire Weather Enterprise to help tackle these challenges, and we look forward to building our partnerships into the future to help build a more ready, responsive, and resilient society.

Conclusion:

Peyton Robertson concluded the meeting by thanking all of the participants for their attendance and valuable contributions. He also announced that the next Partners Meeting will be held in conjunction with the AMS Summer Community Meeting scheduled for July 28-29, 2020 in Norman, Oklahoma.

Attendees:

First Name	Last Name	Affiliation/Organization/Company
Philip	Ardanuy	Innovim
Matthew	Alto	AccuWeather
Jeremy	Andrucyk	NOAA National Weather Service
Karen	Argain	NOAA National Weather Service
Bruce	Arvand	IBSS Corp.
Don	Avart	RedLine Performance Solutions, LLC
Jim	Bailey	Integrated Systems Solutions
Richard	Bandy	NOAA National Weather Service
Brooke	Bingaman	NOAA National Weather Service
Jasmine	Blackwell	NOAA National Weather Service
Andrea	Bleistein	NOAA National Weather Service
Kandis	Boyd	NOAA/OAR/OWAQ
Nick	Boyd	MassDOT
Tom	Bucher	Integrated Systems Solutions
Bill	Callahan	Earth Networks
Julie	Campbell	CMG, Inc
Tracey	Carpenter	Accenture Federal Services
Eirik	Cooper	IBSS Corp.
Becky	Cosgrove	NCEP
Tom	Cuff	NOAA National Weather Service
Steve	Early	IBM / The Weather Company
Pamela	Emch	Northrop Grumman
Mary	Erickson	NOAA National Weather Service
Tom	Evans	NOAA National Weather Service
Glenn	Field	NOAA National Weather Service
Bryce	Ford	SpectraSensors/Endress+Hauser
Bill	Gail	Global Weather Corporation
Ilse	Gayl	Advanced Environmental Monitoring
Lenny	Giuliano	RIDEM-ER
Bob	Goldhammer	WeatherCall Services LLC
Tom	Graziano	NOAA National Weather Service
Mike	Grogan	IBM / The Weather Company

Gregg	Grosshans	NOAA NWS SPC
Erica	Grow	American Meteorological Society
Elyse	Hagner	NOAA National Weather Service
Tim	Hall	Aerospace
Katherine	Hawley	NESDIS/STAR
Audra	Hennecke	NOAA National Weather Service
Ronla	Henry-Reeves	NOAA National Weather Service
William	Hooke	American Meteorological Society
John	Hynes	MassDOT
Steve	James	Integrated Systems Solutions
Carmen	Jenkins	IBSS Corp.
Bruce	Jones	Midland Radio Corporation
George	Jungbluth	NOAA National Weather Service
Stan	Kanarowski	Synoptic Data PBC
Ed	Kearns	NOAA
Alexandra	Keclik	NOAA National Weather Service
Carissa	Klemmer	NCEP
Beckie	Koonge	NOAA National Weather Service
Renee	Leduc	Narayan Strategy
Harvey	Leonard	Channel 5 News Boston
William	Lewis	Verizon
Jeff	Lupfer	NetApp
William	Mahoney	NCAR
Michelle	Mainelli	NOAA National Weather Service
Kenneth	McCallister	DTN
David	Michaud	NOAA National Weather Service
Mark	Miller	NOAA National Weather Service
Shawn	Miller	Raytheon
Tim	Morin	MassDOT
John	Murphy	NOAA National Weather Service
Andy	Nash	NOAA National Weather Service
Doug	Newlon	Alpha Omega Integration
Bryan	Norcross	WPLG-TV ABC Miami
John	Ogren	NOAA National Weather Service

Carolyn	Pasti	RedLine Performance Solutions
Melissa	Petty	OAR/ESRL/GSD
John	Pereira	Raytheon
John	Potts	NOAA National Weather Service
Nick	Powell	Raytheon
Diandong	Ren	Curtin University
Scott	Reynolds	NOAA National Weather Service
Peyton	Robertson	NOAA National Weather Service
Greg	Romano	NOAA National Weather Service
Richard D.	Rosen	American Meteorological Society
Leigh	Ryan	NCEP / GAMA-1 Technologies
Mario	Sabha	MassDOT
Sharon	Schilling	MWOBS (Mount Washington)
Mary Jean	Schmitt	NetApp
Timothy	Schneider	NCAR
Greg	Schoor	NOAA National Weather Service
Steve	Schotz	NOAA National Weather Service
Mark	Seiler	NOAA NWS CFO
Wendy	Sellers	NOAA National Weather Service
Patrick	Serengulian	Alpha Omega Integration, LLC
John	Sokich	NOAA National Weather Service
Albert	Spencer	NOAA National Weather Service
Gerald	Stark	GAMA-1 Technologies
Andy	Stern	NOAA National Weather Service
Dan	Stillman	L3Harris
John	Ten Hoeve	NOAA National Weather Service
Louis	Uccellini	NOAA National Weather Service
David	Vallee	NOAA National Weather Service
Jean	Vieux	Vieux & Associates, Inc.
Elizabeth	Weatherhead	Jupiter
Russ	Webster	FEMA Region 1
Elizabeth	Wilson	Synoptic Data PBC
Steve	Woll	Synoptic Data PBC