



NWSEO Vision – Future of the National Weather Service

The National Weather Service (NWS) will continue to protect, lives, property, livelihoods and enhance the Nation's commerce. The NWS will do this by providing responsive and relevant information to enable partners' decisions when weather, water, or climate has a direct impact. We can achieve this vision by utilizing cutting edge technologies and scientifically proven methodologies to effectively forecast and communicate the impact of meteorological events.

While it is clear that the NWS needs to evolve to meet the ever-expanding need for local, regional, national and international impact-based decision support services (IDSS), this evolution must ensure that the provision of accurate, timely, and locally-focused weather forecasts and warnings are maintained at the current high level. The highly successful Modernization and Associated Restructuring (MAR) process built a framework of highly educated, trained and skilled people throughout the entire United States. These experts know and understand unique local forecasting challenges and the impacts those challenges may have on the safety and lives of people residing in their local communities. The future evolution of the NWS must continue to use the expert local knowledge that has grown in the Weather Forecast Offices and allow the NWS to expand meeting the needs of our IDSS stakeholders.

The NWSEO vision aligns with the NWS mission to grow a Weather Ready Nation. This is accomplished by fully understanding and meeting the evolving needs of key decision makers in emergency management, government, business and the first responder community who serve the needs of the public. NWS will leverage emerging scientific and technological advances and develop logical processes that empower decision making and allow us to effectively forecast and communicate timely, accurate and relevant impactful weather, water and climate information.

By definition, Decision Support helps people make decisions about problems that may be rapidly changing and not easily specified in advance. In a weather context this means empowering forecasters to make nimble judgments on changing weather conditions in order to analyze and convey a threat to those it may impact. To achieve this, forecasters must be free from constraints and allowed to give the best forecast possible to the user in whatever unique format that the stakeholder requires.

We envision an agency that provides resources for a process that is less dependent on the production of regularly scheduled products and instead provides users with customized forecasts to meet their needs. We accept that there are many users of our regularly scheduled products; forecasters should know the impacts of the weather on their communities and focus on the portion of the forecast that addresses those impacts. To accomplish this, capital investments must be made to ensure the NWS has state of the art analysis, modeling and communication tools as well as foundational observation networks including COOP, buoys, etc., available at all local level offices (WFOs, CWSUs, RFCs, WSOs and DCOs with IDSS functions).

According to the National Research Council, “local knowledge of phenomena, terrain, and infrastructure is an important factor in forecasting, and it needs to be accounted for in any potential regionalization of functions.” The Council therefore found that:

“An in-depth statistical analysis of the relative comparison of the local product to the NWP-[numerical weather prediction] produced guidance will be necessary before the NWS considers moving some or all of this public forecasting task to regional centers. ... Such a consideration would include a statistical analysis of the added value of the human element in day-to-day fair weather forecasting, as well as the value of experience in such forecasting in improving severe weather forecast skill.” (National Research Council, *Weather Services for the Nation: Becoming Second to None* (National Academies Press, 2012) at 42).

However, no such statistical analysis demonstrating that an automated forecast based on computer models is as reliable as the experienced human forecaster with local knowledge has been conducted. Shifting primary responsibility/ownership of the gridded forecast database (National Digital Forecast Database – “NDFD”) from the Weather Forecast Offices (WFOs) to the Weather Prediction Center (WPC) via a supposed “collaborative” process, where WPC becomes responsible for the great majority of gridded forecast production and WFOs are reduced to primarily an advisory role would represent an enormous reduction in the role of the WFO. This change would introduce a host of problems. One of the most critical resulting problems would be the disconnect that would develop between the largely centralized “forecast” as represented by the gridded database and the associated derived products, and the local Integrated Decision Support Services (IDSS) that WFO forecasters would provide. Forecasters would be routinely placed in a compromising position of having to choose between a briefing based on an official/centralized forecast with which they disagreed, or briefing based on their own judgment informed by extensive local knowledge. The ownership of the forecast must be at the final point of delivery.

Shifting long-fused watch responsibility for areas such as hydrology, winter weather and fire weather from the WFOs to WPC and shifting short-fused warning responsibility to a regional or even national model, with short-fused convective warnings issued by regional centers or possibly even a national center would be a degradation of services currently offered. WFOs would be reduced to an advisory/collaborative role, such as occurs currently with convective and coastal tropical watches.

As the local offices would no longer operate 24x7, severe weather warning functions would, of necessity, be centralized elsewhere, and the NWS and NOAA are developing other computer models that they hope will issue warnings of severe weather automatically. The National Research Council wrote that even if it was demonstrated that centralized forecasts based on models were proven to be as

reliable as the human forecaster, “[t]he responsibility for hazardous weather outlooks, advisories, and warnings would still reside at the local offices.”

All operational offices must be equipped to communicate information clearly and concisely in a manner customers can easily interpret and utilize. The NWS must remain technically nimble and agile leveraging emerging information streams while providing information in customer preferred formats such as Apps, GIS layers and emerging Social Media streams, etc. Dedicated local information technology support is essential to maintain this agility.

National Centers will provide national and international products and warnings to support national and international agreements. National Centers will provide decision support for national and international partners. National Centers should provide decision support services when needed.

NWS Headquarters should evolve from less of a policy writing role to more of a support role. Two examples would be investigating and evaluating the latest DSS tools or coordinating national level communications during large scale events. Like private sector corporations, NWS Headquarters should take the lead in operational research and development for the NWS service delivery.

Principles of the NWSEO Vision

NWSEO believes that the following principles must be observed during the upcoming evolution of the NWS:

- 1) WFOs must retain primary ownership of all forecasts, watches and warnings for their local area. Primary ownership of forecasts, watches and warnings for the entire United States (or large portions thereof) and international areas, as spelled out in treaties and agreements, will be placed with the appropriate NCEP center, with the exception of certain international forecasts and warnings which are or may be provided by local offices as per past practices or future agreements. Primary ownership of the forecast within the local offices will allow these forecasts to remain focused on local conditions, and to be rapidly updated in order to provide the best possible IDSS to local partners. Only the WFO forecasters with extensive local knowledge can respond appropriately to quickly changing conditions. Local IT and electronics support staff are essential to this life saving effort. To succeed in IDSS we need an approach that provides the most accurate and responsive weather intelligence to the decision makers we support. We’ve worked hard to earn their trust and need to ensure we keep it.
- 2) WPC should provide enhanced guidance to the WFOs for use as a common starting point in the forecast process. This guidance may include significant use of the National Blend of Models (NBM). However, blended models struggle in many circumstances. Highly trained meteorologists with local knowledge are uniquely positioned to mitigate model shortfalls. To that end, WFOs will not be required at any time to re-initialize their forecast database with any NBM or WPC generated grids.
- 3) NWS culture should support and encourage the most judicious use of local office resources in the development of their forecasts. To that end, all local offices should constantly research impactful weather events to improve our decision support service delivery.

4) NWSEO recognizes that existing gridded forecast production processes have some inefficiencies. These inefficiencies are, in part, deeply rooted in technical issues that date back to the initial deployment of NDFD and the Graphical Forecast Editor (GFE) in the early 2000s. NWSEO recognizes there is a need for more efficient processes that will free up local WFO forecaster time for other high priority efforts, such as enhanced partner outreach/interaction and increased IDSS. To this end, local offices must be provided with enhanced tools for proper IDSS. These tools should be created within a scientifically-based framework and meet certain consistency standards across the NWS. These tools would enable critical local effects to be developed and maintained within a forecast database that would also be nationally consistent.

5) Any future efficiency improvements within the forecast production process must recognize that, due to large variations in weather/climate regimes and diverse challenges faced by WFOs across the NWS, “one size fits all” solutions will not work. While it is important to maintain consistency of service and of scientific principles across the entire agency, there will necessarily continue to be regional/local variations driven by local, unique IDSS/partner needs.

6) NWSEO will never find acceptable any transfer of existing watch/warning/advisory (W/W/A) responsibility out of the local offices. There may be opportunities for WPC, other NCEP Centers, National Water Center or the Regional Operations Centers (ROCs) to play a larger role in coordination and collaboration of W/W/A products in the future, especially for synoptic-scale products that cover large geographic areas. National Centers will play a larger role in providing decision support services to the local offices; however, the final decision-making authority for any W/W/A product must always rest with the local office.

7) NWSEO insists that 24/7/365 meteorologist coverage continue at all 122 WFOs. The existing “two-person” rule for WFOs (two people on duty in the building at any given time) must continue to ensure employee safety as well as to meet the increased need for meteorologists to deploy or be embedded at times outside of the WFO. This is absolutely critical for maintenance of public safety.

8) The continuing need to maintain two people on duty at all times who are capable of providing operational support within the local offices, along with increased need for DSS deployments/embedding, points to the need for greater training and utilization, along with new career progression opportunities, for the existing HMT and meteorological technician workforce.

9) Local offices will continue to expand into detailed IDSS to meet our customer needs. This will necessitate changes in staffing levels to meet these needs. These additional services crucial to the protection of life and property can be achieved with a minimum of new FTEs for the NWS. With a redesign away from cookie cutter offices, some resources including repurposing some management positions, could be redeployed to facilitate this need. The NWSEO envisions approximately 3 FTEs per office could be utilized to facilitate these changes.

Conclusion

NWSEO is eager to partner with management in the evolution of the NWS to meet the future needs of our key partners and the American People. Our plan is a dynamic plan, built by the employees of the NWS who are emergency essential employees on the frontline of delivering lifesaving forecasts and warnings. These employees have their finger on the pulse of our customer's needs. NWSEO plans to work with important users of NWS services, including the emergency management community to further build a NWS of the future and serve the needs of a Weather Ready Nation.

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