

To: Dalan Romero, Chair, NWCG Executive Board

From: Robyn Heffernan, Chair, NWCG Fire Environment Committee

Subject: FENC Report to NWCG Tasking Memorandum 16-001: IT Capability Requirements for Fire Weather Data – NWCG Assistance to the Fire Management Board

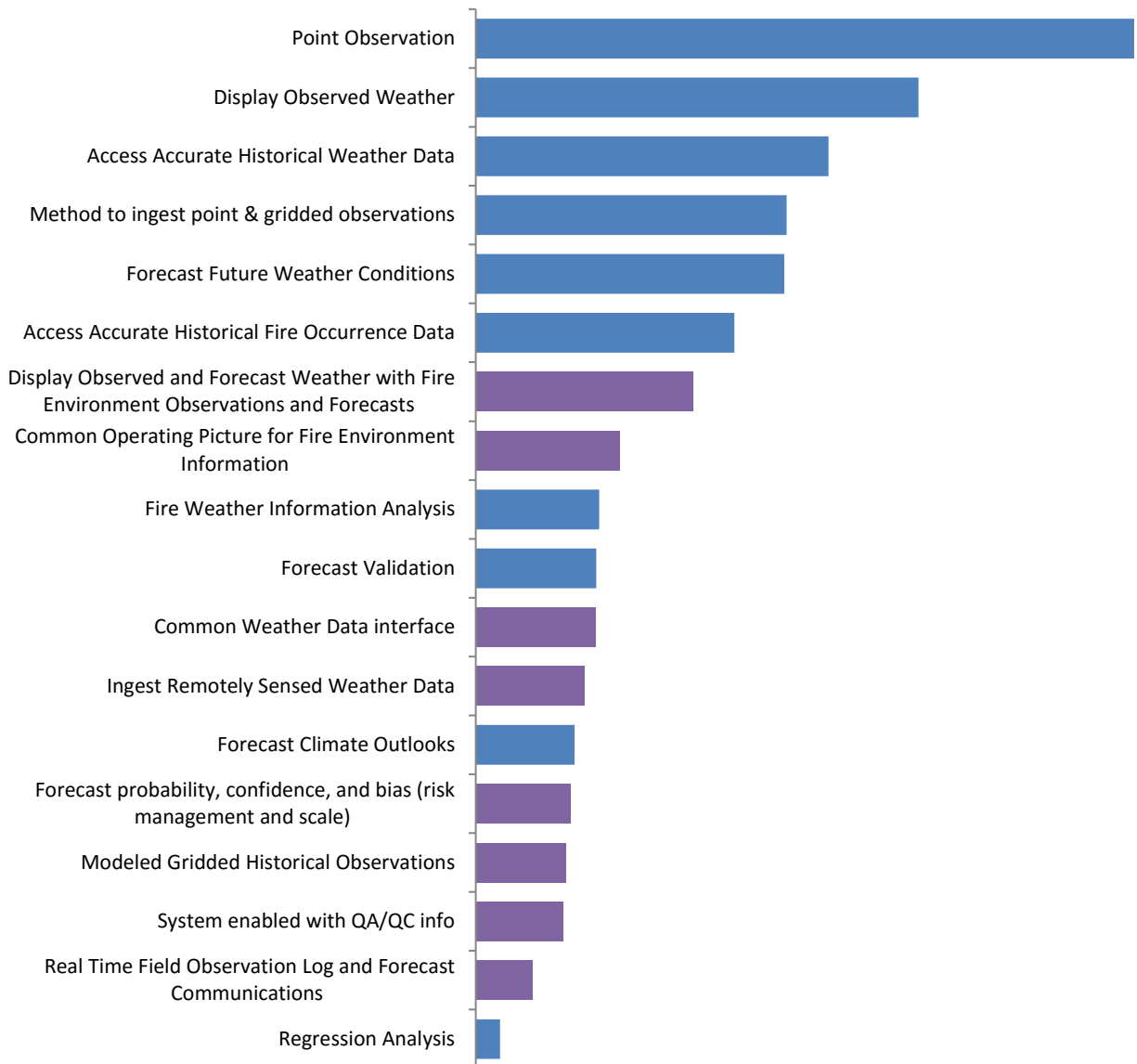
Process: The National Wildfire Coordination Group (NWCG) memorandum tasked the NWCG Fire Environment Committee (FENC) to fulfill a request from the federal Fire Management Board (FMB) to define interagency wildland fire weather IT capability requirements. The FENC worked with the Wildland Fire Information Technology (WFIT) Line of Business study staff, in coordination with the Data Management Committee, the Smoke Committee, and the Predictive Services program review effort, to determine the report findings. The analysis process consisted of: (1) Identification of, and descriptions for, all fire weather related products and services produced for fire management purposes (2) Analyzed the processes to produce fire weather related products and services (3) Determination and definition of fire weather related requirements to fulfill fire weather related products and services (4) Mapped current applications used to fulfill fire weather requirements to previously identified fire weather related products and services and capability requirements (5) Finally, priority measures were identified, defined, and utilized to provide a first cut measure of priority of fire weather capabilities. This analysis was completed with a vision of fire weather capability needs to remain valuable and relevant over the next 10-15 years.

Findings: The fire weather capability analysis resulted in 18 identified fire weather capability requirements that inform 33 fire management products and services. Currently, 46 applications are being utilized to fulfill wildland fire weather capability requirements (this list may not be all-inclusive). Of the 18 identified fire weather capability requirements, 8 of these are identified as future requirements (meaning that the capability does not exist in full extent today). The fire weather capability requirements were prioritized by: technical difficulty, frequency of use, efficiency, human life, efficacy, stability, impacts to values, and impacts to other products.

The top priority fire weather capability requirement is point observations, meaning real-time information from surface weather observing equipment. The land management agencies' Remote Automated Weather Stations (RAWS) program is critical to this capability as they provide the unique niche of observations from remote locations. The second priority is the capability to graphically display and analyze weather observations. Previously this capability was fulfilled by ROMAN. The application that currently fulfills this capability is MesoWest, an academic system at the University of Utah. This system is non-operational, meaning it is not supported 24/7, nor is there an agreement to keep this application running. These top 2, somewhat related, fire weather capabilities were ranked highest largely due to their direct correlation to the protection of human life.

The entire list of FENC analysis of fire weather capability requirements is below. The length of the bar-line indicates the overall priority score. Capabilities colored in purple indicate that all of this capability is not being fulfilled currently, and therefore is denoted as a future requirement.

Fire Environment, Weather Capability Assessment Score



Please see attachment for capability definitions.

Summary: The intent of this analysis is to inform WFIT investments to advance the efficiency and effectiveness of fire environment related products, services and applications; as well as provide a basis for continued support of critical capabilities. This analysis may be used to formulate a roadmap of fire weather related IT investment needs for the next 10-15 years. In addition, this analysis provides a foundation to crosswalk applications that currently fulfill fire weather capabilities to future application investments.

Recommendations: Improvements must be made regarding the dissemination of fire environment information to the field. Priority should be given to a land management agency vested geospatial dissemination process of real-time weather observations.

Contact: Please direct questions regarding this analysis or requests for analysis documentation to Robyn Heffernan (robyn.heffernan@noaa.gov) or Paul Schlobohm (pschlobo@blm.gov).

Attachment:

Fire Environment Weather Capability Definitions

Point Observation: A locally or remotely sensed observation for a specific geospatial location.

Examples include: RAWS, ASOS, Lightning, etc.

Display Observed Weather: Geospatial display of real-time and recent weather observations in a format accessible by the field. Examples include: WFMI, ROMAN, MesoWest, etc.

Access Accurate Historical Weather Data: Easy access to quality controlled historical weather observations, derived from a single authoritative data source for each observation type. Examples include: KCFast, WRCC Historical RAWS Archive, etc.

Method to Ingest Point and Gridded Observations: Technical functionality to collect, reformat, and collate point and gridded data. These data must be accessible via a variety of data formats (e.g. geospatial, comma-delimited, tabular, etc.) for ingest into fire environment systems.

***Display Observed and Forecast Weather with Fire Environment Observations and Forecasts:** Geospatial, graphical, and tabular display of current and recent fire weather observations and forecasts in combination with fire environment observations and forecasts. These data must be accessible by the field. This is a future capability that builds upon the Display Observed Weather capability.

***Common Operating Picture for Fire Environment Information:** An operating environment portal that provides access to observed and forecast fire weather, fire danger, and fire behavior information for a complete fire environment picture. This is a future capability that builds upon the Capability of Common Weather Data Interface.

Fire Weather Information Analysis: Expert, technical analysis of fire weather information from a variety of data sources. Examples include: Meteorologists and Hydrologists that analyze data from AWIPS, Thin Client, Wind Ninja, etc.

Forecast Validation: Ability to use point observations and modeled gridded observations to validate a fire environment forecast.

***Common Weather Data Interface:** A one-stop-shop for weather information for fire management purposes.

***Ingest Remotely Sensed Weather Data:** Ability to access and geospatially view weather data derived from a centralized observing platform (e.g. satellite, radar, LIDAR).

Forecast Climate Outlooks: Skillful forecasts of weather and climate information from intra-seasonal (weeks to months) to seasonal.

***Forecast Probability, Confidence and Bias (risk management and scale):** Value added information beyond the deterministic forecast to assist in risk management. This information may include the

probability of an event occurring, confidence in the deterministic forecast, and likely bias of unanticipated error.

***Modeled Gridded Historical Observations:** A grid of observations that is model interpolated between point observations.

***System Enabled with QA/QC Information:** Ability to validate raw data and adjust or remove bad data before the data are disseminated for common access. Examples include: ROMAN QA/QC process, WRCC manual QA/QC process of historical RAWS observations, utilizing QC flag fields in a RAWS database to indicate a variable's status (e.g., original value, estimated, etc.) for FF+ and other RAWS analysis tools.

***Real-time Observation Log and Forecast Communications:** An interface that provides mobile geospatial display of two-way communication between observations from the field and forecast changes from the technical specialist (i.e. IMET, FBAN, etc.)

Regression Analysis: The statistical ability to relate datasets in order to develop predictive capability. This is a common practice for weather observations and fire occurrence data.

* - Denotes future capability