

An Impact-Based Decision Support Paradigm for National Weather Service Wildfire Forecast and Warning Services

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The National Weather Service's (NWS) fire weather program, including the successful legacy of Incident Meteorologists (IMETs), is a model for the agency's evolution toward Impact-Based Decision Support Services (IDSS) in a Weather-Ready Nation. In addition to the support provided by IMETs at wildfires and other incidents, the NWS is tasked with issuing Red Flag Warnings (RFWs) for extreme wildland fire conditions that threaten life and property. Generally, RFWs are based on arbitrary thresholds of weather, and validity is not correlated to observed wildland fire behavior. Thus, a grave disconnect can sometime exist between RFW issuance and the occurrence of large and damaging wildland fires. To date, a clear vision for an IDSS-era evolution of NWS fire services has not been adopted. While predictive methods and inter-agency logistics are not specified here, experimental proofs-of-concept are demonstrated to propose a strategic and tactical paradigm of IDSS based upon quantified measures of significant wildfire potential. Probabilistic significant wildfire outlooks have supported strategic preparation by land and emergency management agencies prior to dangerous wildfires on the southern Plains since 2011. In 2016, forecasters initiated fire-specific notifications for emerging wildfires detected via high-resolution meteorological remote sensing in Oklahoma. Such 'warnings' aid tactical routing of pre-deployed firefighting resources in critical fire environments for rapid initial attack suppression and impact mitigation. These prototypes are consistent with Forecasting a Continuum of Environmental Threats concepts and may inform future wildland fire services analogous to those applied to other forms of hazardous weather.