

warnings associated with microburst producing thunderstorms.

Development of optimal WSR-88D scan strategies and adaptable parameter settings for accurately estimating heavy precipitation amounts.

Development of techniques to improve hydrologic modeling and prediction for Southern U.S. rivers and streams, including calibration of models, improved distributive modeling techniques, and improved soil moisture accounting. Development of methodologies to better predict the type, duration, and severity of arctic outbreaks that result in damaging freezes affecting the NWS Southern Region.

Development of improved methods for utilizing data analysis, manipulation and communication technology (Internet, Web sites, Geographic Information Systems, etc.) for preparing and disseminating high resolution hydrological and meteorological forecasts and products which best serve the changing needs of varied users.

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NWS Central Region Science Priorities

The NWS Central Region science priorities to be addressed by proposals are as follows:

Improve hazardous weather warnings for different geographical locations in Central Region, including the Central Plains, Northern Plains, Ozark Plateau, mid and upper Mississippi Valley, lower Ohio Valley and Great Lakes regions by:

Developing more accurate, region-specific conceptual models for tornado, hail, high wind, heavy precipitation, and elevated nocturnal convection events.

Developing more accurate, region-specific diagnostic strategies/methodologies to interrogate remotely sensed data (radar, satellite, etc.) and numerical weather guidance with emphasis on weaker and shorter lived severe thunderstorm and tornado events.

Improve Central Region winter weather precipitation forecasts by:

Developing a climatology of winter precipitation events including, but not limited to, heavy snow, sleet or freezing rain stratified by Central Region County Warning Forecast Areas and relating it to public products and services. Linking cloud physics and associated micro-physical processes, precipitation efficiency, water vapor distribution, and transport of winter stratiform and/or

convective clouds to improved methodologies for estimating or forecasting winter precipitation amounts.

Improve the accuracy (probability of detection) and average forecast lead time for winter storm warnings by better understanding the development, intensification, and sudden acceleration northeastward of strong mid-west storm systems following Rocky Mountain lee-side cyclogenesis.

Improve aviation forecast products and services by:

Developing a climatology of ceiling, visibility, and low-level wind shear for Central Region county warning forecast areas.

Developing better methodologies to forecast the onset and dissipation of fog and low ceilings for different geographical locations in the Central Region.

Improve the utility and utilization of numerical guidance in the forecast process by developing more efficient and effective methodologies to display, review, and interrogate numerical model output in an operational environment.

Improve the quality of weather services to the public through the development of new and innovative forecast methodologies and products.

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NWS Western Region Science Priorities

The NWS Western Region science needs to be addressed by proposals are as follows:

Improve operational precipitation and hydrological forecasts in complex terrain across a wide range of western U.S. meteorological regimes. In the West, water is a critical and closely managed resource.

Improve wintertime forecasts of snow in complex terrain.

Improve acquisition and use of non-NWS observational networks, such as mesonets.

Improve analysis through better assimilation systems that produce more realistic analysis in complex terrain.

Improve numerical model performance in western complex terrain.

Research, develop and help implement statistical methods to objectively produce bias-corrected model grids (e.g. from grids, not just points) to improve gridded forecasts.

Research, develop and help implement methods to objectively downscale forecast and ensemble grids

to the resolution necessary (2-5km) to help improve IFPS forecasts and forecast methodology.

Improve hydrological modeling, through use of emerging techniques, such as distributed hydrologic modeling, of rain/snow melt processes in complex terrain.

Develop conceptual models that better describe the effect of complex terrain on weather forecasts.

Improve precipitation and flash flooding forecasts produced from high based convection with a deep dry sub cloud layer in the arid inter-mountain region.

Improve forecast of significant precipitation events that produce flooding and affect marine forecasts along the west coast.

Improve forecast of the onset of the monsoon season and flash flooding in the desert Southwest.

Improve snow and wind forecast associated with arctic front intrusion into complex terrain in the northern plains.

Improve fire-weather forecasts and smoke dispersion in the western United States.

Improve forecasters ability to produce forecasts of temperature, humidity, and winds in complex terrain.

Improve forecast and warnings of severe weather unique to the western United States through the better use of observational systems and conceptual models.

Improve the performance of coastal and mountain-top WSR-88D radars on a variety of NWS Western Region weather regimes, such as high based inter-mountain convection and low topped storms along the west coast.

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NWS Alaska Region Science Priorities

The science priorities of the NWS Alaska Region to be addressed by proposals are as follows (in order of importance):

Determine the geomorphic influences on type, amount, duration, and intensity of snow associated with complex terrain to improve forecasts for the Anchorage, Alaska, area, where over 50 percent of the state population resides.

Develop better methodologies to forecast winds over the marine inland waters of southeast Alaska.

Methodologies can include numerical forecasts from mesoscale models.

Improve methodologies to forecast fog in the Alaska coastal communities