Wildfire Indicators

DEVELOPING 8–14 DAY EXPERIMENTAL FORECASTS

THE NEED

Wildfires increasingly burn more acreage year after year as the number of large wildfires grows and wildfire seasons lengthen. The risk to life and property is compounded by trends of enhanced drought severity and increased residential developments at wildland urban interfaces. Access to skillful forecasts of fire indicators across a range of time scales is critical for federal, state, and local planning and preparation to mitigate harmful wildfire impacts on communities and sensitive habitats. This research aims to provide skillful probabilistic fire-related forecasts up to two weeks ahead to fill in an existing gap in fire-weather guidance.

THE SCIENCE

The main objective is to improve probabilistic predictions of fire indicators 8 to 14 days ahead by applying advanced post-processing algorithms, which can correct biases (errors) in numerical weather predictions of weather variables that most impact fire intensity and spread. These improved weather predictions are then input to the Global ECMWF Fire Forecasting system to produce forecasts of fire indicators that stakeholders can use to assess above- and below-normal fire conditions two weeks ahead. Results show that we can expect skillful forecasts of above- and below-normal fire conditions at this time scale across the contiguous United States.

APPLICATION

The development of 8-14 day forecast guidance products expands the ability of stakeholders to enhance strategic planning and preparation for wildfires in a number of ways: 1) increased time to apply for additional economic support for suppression and mitigation efforts, 2) movement of mechanical and personnel resources across coordination centers to higher-risk areas, and 3) improved assessment of conditions to issue prescribed burns and enhance public fire awareness.

TRANSITIONS

NOAA's Physical Sciences Laboratory (PSL) is collaborating with the National Weather Service Climate Prediction Center to transfer these post-processing algorithms for use in near real-time operations. When complete, the forecast product will provide 8-14 day forecast guidance of above- and below-normal fire indicators across the contiguous United States during all seasons.

FUTURE WORK

PSL will conduct research to streamline the post-processing algorithms for week-two fire forecasts using machine learning techniques with the potential to expand the forecast guidance out to three and four weeks ahead.

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