Review of Monthly and Seasonal National Wildland Fire Potential Outlooks

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Abstract

In the United States, the Predictive Services program issues monthly and seasonal wildland fire potential outlooks to assist fire managers with strategic resource and prescribed fire planning, including severity funding. These products integrate observed and forecasted information on climate, drought, precipitation, snowpack/snowmelt, vegetation dryness, fuel loading, and fire danger. This poster displays a sample of the 2002-2006 seasonal and monthly outlooks overlayed with the observed wildland fires reaching or exceeding 40 hectares in timber or 120 hectares in grass/brush fuels. A discussion of forecast skill, verification metrics, and future product improvements is also included

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Introduction

Predictive Services is a United States federal interagency program which integrates fire weather, climate, fuels, fire danger, and resource information into a variety of products and services. These products include monthly and seasonal wildland fire potential outlooks to assist fire managers with strategic resource and prescribed fire planning, including the request and approval of severity funding. Predictive Services products integrate factors such as climate, drought, precipitation, snowpack/snowmelt, vegetation dryness, fuel loading, and fire danger

Monthly Wildland Fire Potential Outlooks

For the purpose of fire support, the nation is divided into eleven Geographic Areas with a corresponding Geographic Area Coordination Centers (GACCs) and a National Interagency Coordination Center (NICC). Each month, the Predictive Services units at the eleven GACCs assess current and forecasted fire potential factors. Each Area has its own unique factors which influence fire potential. For instance, fire potential in the southeast United States is more dependent on frequency rather than amount of precipitation. In portions of the West, the lack of winter and spring precipitation will diminish fire potential in the lower elevations due to decreased fine fuel loadings but tend to increase fire potential in timber fuels at higher elevations. The outlooks are issued at the beginning of each month and include a map with areas of above, below and normal fire potential along with a discussion of climate, fuels and fire danger. The GACC outlooks are assembled into national outlooks at the NICC and complied into a national map (as shown in the following examples).

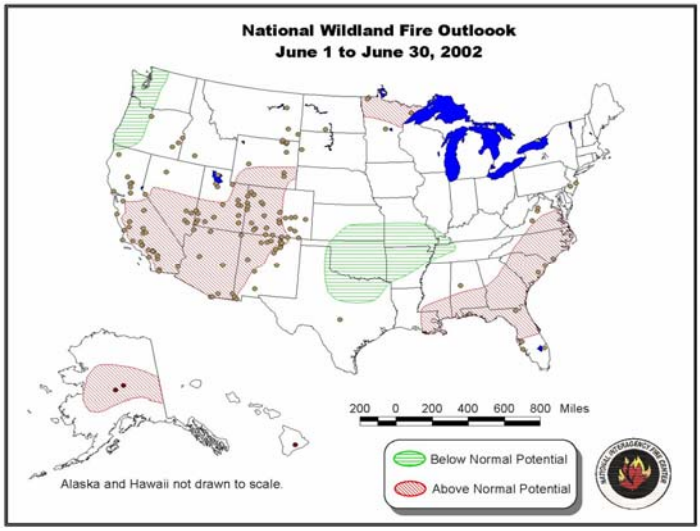

Figure 1—National Wildland Fire Outlook for June 2002 overlaid with large fires (40+ hectares in timber, 120+ hectares in grass/brush fuels).

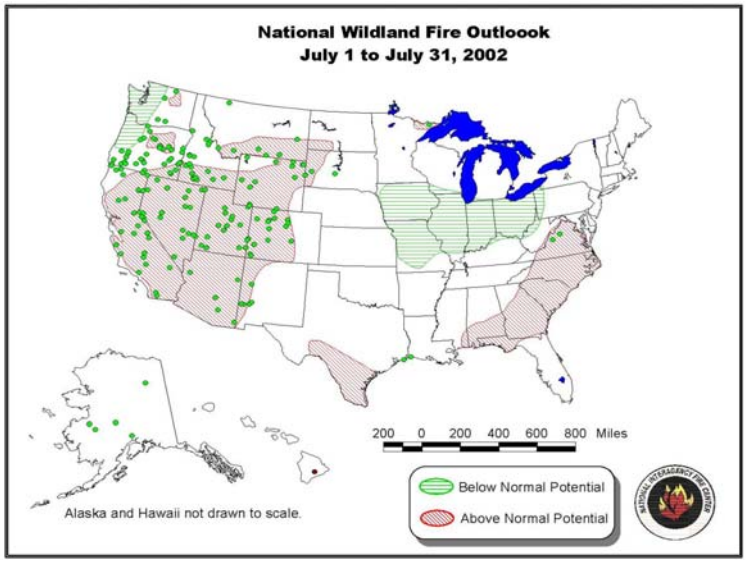

Figure 2— National Wildland Fire Outlook for July 2002 overlaid with large fires (40+ hectares in timber, 120+ hectares in grass/brush fuels).

Seaonal Wildland Fire Potential Outlooks

Currently, seasonal wildland fire potential outlooks are issued prior to the beginning the fire season and are updated at least once during the fire season. Each January, a National Seasonal Assessment Workshop (NSAW) is held to produce a comprehensive weather/climate/fuels outlook for the Eastern, Southern, and Southwest Geographic Areas with participation from Predictive Services meteorologists, climatologists, fire analysts, fuels specialists and fire managers. Similarly, a western NSAW is held in April. The workshops are designed to:

- To improve coordination between Predictive Services and state/regional/federal fire management and climate partners.
- To improve the capabilities of Predictive Services to incorporate new and long-term information into their decision-making processes.
- To support national and Geographic Area decision-making needs and to provide information that can assist fire managers with strategic planning and resource allocation decisions (e.g. determining priorities, assessing trade-offs with regard to resource allocation, pre-positioning of resources, and severity requests).

In 2006, representatives from Canada and Mexico joined the United States Predictive Services to produce the first ever North American Seasonal Wildland Fire Potential Outlook while Australia held a similar workshop to develop their seasonal outlook. Shown below is an example of a National Seasonal Wildland Fire Potential Outlook.

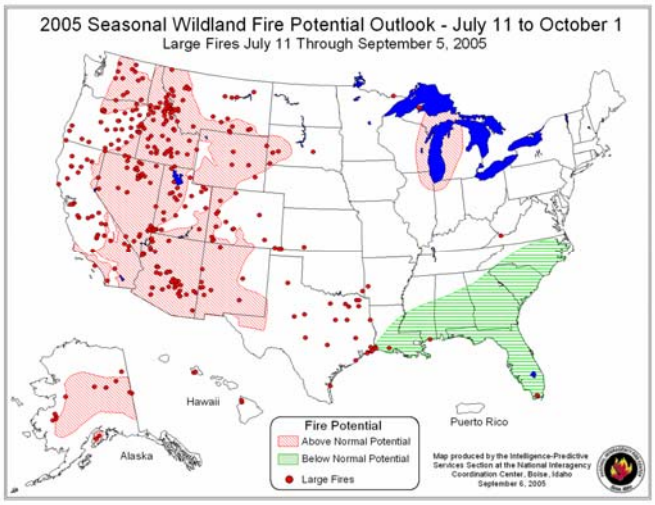

Figure 3— National Wildland Fire Outlook for July through October 2005 overlaid with large fires (40+ hectares in timber, 120+ hectares in grass/brush fuels).

Forecast skill, verification, and future product improvements

Monthly and seasonal wildland fire outlooks portray areas of significant fire potential. Fire potential is based on a sum of factors including weather/climate, fuel conditions, ignition triggers and resource capability. *Significant* fire potential is defined as the likelihood a fire situation will require mobilization of additional resources from outside the area in which the fire situation originates. Thus, measuring and verifying such a complex parameter as significant fire potential is extremely difficult.

One approach to measuring forecast skill is to develop metrics for the elements of fire potential, such as weather and fire danger. However, even these schemes can be difficult. For instance, if a fire danger index such as the National Fire Danger Ranger System (NFDRS) Energy Release Component (ERC) is one standard deviation above normal for the first half of the month and is equally below normal the second half of the month, the month would be classified as normal even though it would not be perceived as such by the user. While Predictive Services is exploring different approaches to verifying monthly and seasonal fire potential outlooks, the current practice is to use large fire occurrence (40+ hectares in timber, 120+ hectares in grass/brush fuels) as a proxy for fire potential. A qualitative review of the past several years has shown improving accuracy in forecasting fire occurrence.

In the future, Predictive Services will likely issue monthly outlooks along with seasonal outlooks for the following three-month period (months 2 through 4). This will help ensure consistency between the outlooks as well as more current information for fire managers.

Summary

Predictive Services issues monthly and seasonal wildland fire potential outlooks to provide for long range guidance on strategic resource allocations, prescribed burning and severity funding. These products are based on a variety of observed and forecasted climate, fuels and fire danger information. National Seasonal Assessment Workshops are used to generate the initial seasonal outlooks and plans are underway to improve seasonal outlooks by issuing seasonal outlooks on a monthly basis.