



SFE Fact Sheet 2018-7

Online Tools for Weather Information

Jennifer Fill and Raelene Crandall, University of Florida

Basic information on past, current and future weather conditions is critical for making decisions in prescribed fire and wildfire operations. It is not surprising that weather is one side of the fire behavior triangle. Weather patterns prior to a fire affect fuel moisture and availability. Small weather changes during a fire can drastically alter fire and smoke behavior. Post-fire precipitation and relative humidity can affect smoldering behavior, smoke dispersion, and the potential for flare-ups. Day-to-day variation in temperature, relative humidity, and wind speed can dramatically change the outcomes of a fire. Past conditions and future predictions for these simple elements, as well as for weather-based indices such as the Keetch-Byram Drought Index (KBDI), help us interpret past events and plan future actions. In practice, therefore, it is useful to examine different types of weather information at different spatial resolutions. For example, regional KBDI conditions can help prioritize areas for burning, while the predicted local weather conditions are essential for planning prescribed burns within priority areas.

Two organizations, the National Weather Service (NWS) and the State Climate Office of North Carolina, have been

developing web-based tools that allow anyone to explore and customize map displays of various weather elements simultaneously. The NWS Enhanced Data Display (<https://preview.weather.gov/edd/>) is an online Geographic Information System (GIS) that allows you to explore interactions among many different environmental features (e.g., rivers, hazards) and data types (e.g., forecasts, radar) on an interactive map of the USA, scalable down to your local area. The North Carolina Fire Weather Intelligence Portal (<https://climate.ncsu.edu/fwip/index.php>) is also a web-based interactive map. It displays data on weather and fire risk for the 13 states in the U.S. Forest Service's southern region. This factsheet introduces these tools and provides a brief overview of how to get started.

NWS ENHANCED DATA DISPLAY (NWS EDD)

One of the best features of the EDD is its versatility. You can make and save a customized version of the map for a specific use. For example, a fire manager could be interested in maps displaying the locations of active fires in

the region, the predicted weather forecast, and smoke spread predictions. The NWS EDD can be tailored to keep these layers and leave out irrelevant information, and saved as a link to view again later. This application is best used on a desktop or laptop (via Firefox, Chrome, Internet Explorer (10 or higher) or Safari) but it can be viewed on mobile devices.

The web link brings you to an interactive map that has a sidebar on the left with a



Figure 1. Home screen of the NWS Enhanced Data Display

variety of data layers (Fig. 1). Each layer displays information about the element (e.g., “rivers”) that you can add to the map by clicking on the green plus button. The legend for that layer shows up when you click the “Legend” button on the top right of the screen.

The “Interface” dropdown menu at the top of the left sidebar allows you to select a category of layers that the EDD will filter for you. Selecting “Fire”, for example, will keep layers relevant to fire management and filter out the others. One particularly useful feature is the ability to retrieve the fire weather forecast by right-clicking on any location on the map. First, control what happens when you right-click on the map by scrolling to the bottom of the left sidebar and picking an option from the dropdown menu under “Mouse Click Control and Tools”. To see the forecast, be sure you have the mouse click set to “fire weather forecast” before right-clicking on a location on the map. A window will pop up with four tabs that provide the standard NWS zone forecast, 48-hour graphical and tabular point forecasts (see SFE Fact Sheet 2011-1 for more detail) and a tab for requesting Spot weather forecasts (Fig. 2). To close the forecast window, click the “x” at the top right of the window.

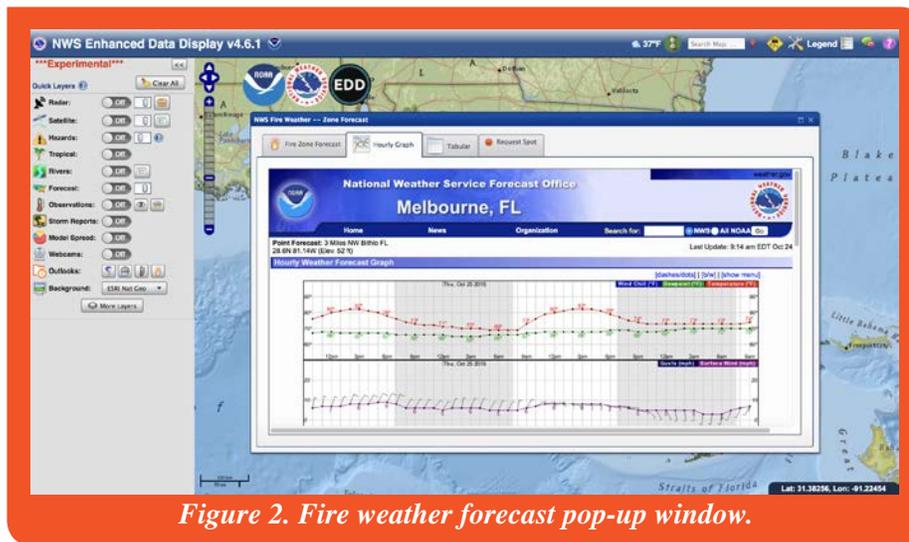


Figure 2. Fire weather forecast pop-up window.

The EDD can also display real-time weather observations across a geographic area from stations associated with multiple weather networks. This can be useful for tracking temperature, precipitation, relative humidity and wind simultaneously across various locations. To display multiple stations, click the “plus” sign next to “Observations” on the left sidebar. A pop-up window will appear. In the drop-down menu next to “Show” you can select the meteorological observation type that you would like to display (e.g. RH, temperature, wind, and heat index). Next to the “Networks” button, click “Show All” to

display all the observational networks available within the region.

You can add additional layers to the map (such as emergency management and even vacation) by clicking on the “More Layers” button below the default list of layers in the sidebar. (To see all the additional layers available, keep the Interface set to “Advanced”.) Clicking the button with a broom image at the top of the Additional Layers list will clear any layers you’ve added from that list. All these layers automatically update at the user-specified interval (click the hourglass button at the top right of the screen). If you want to save or share the map you’ve created after adding and manipulating layers, click on the Tools image to the left of the Legend button at the top of the screen. Scroll down to “Save EDD’s Current State”, and a box will appear with a “TinyURL” that you can copy and paste into an email.

The NWS EDD should be very useful when planning prescribed fires. You can easily filter the layers for those relevant to fire management, by selecting the Fire interface. Additional layers in the More Layers list include elements such as MODIS fire detections, energy release component,

and past precipitation. For more instruction on the many ways to use the EDD, there are a number of tutorials on YouTube from the National Weather Service Charleston, WV office, including this comprehensive video: (<https://www.youtube.com/watch?v=vQ07158i2nc>). Take your time in becoming familiar with the website; it is well worth your time.

NC FIRE WEATHER INTELLIGENCE PORTAL

The Fire Weather Intelligence Portal is a very user-friendly interface that also displays customized weather and climate

data on a web browser-based map. Although it is best used on a desktop or laptop (via Chrome, Firefox, or Internet Explorer) it is mobile-friendly. The application link brings you to the homepage that has three tabs: one for past conditions, one for current conditions, and one for the forecast conditions (Fig. 3). Each tab lets you customize the information that will be shown on the map. You can allow the application to choose your current location or you can select a specific location. The map will show the weather for the most recent hour up until 15 minutes past the next hour. For past observations, you can choose any date and time (“Observation Time”) between 1/1/2002 and

present. The forecast weather display can show point weather forecasts with fire information (e.g. ERC, KBDI, and BI) and the gridded forecast can show some regional seamless forecast weather information.

In the Past, Current and Forecast conditions tabs, you can add point and gridded weather data of many types. Point data include the weather elements usually recorded at weather stations (precipitation, humidity, wind speed), as well as National Fire Danger Rating System (NFDRS) calculations, which are done once per day at 1:00 PM. These calculations include KBDI, Burning Index, and the ERC. You can examine the observations from a specific weather station and graphs of weather history from that station. Gridded data include weather and fire hazards (e.g., lightning locations and intensity), precipitation patterns and drought indices (at 5 km-resolution), and high resolution (2.5-km) conditions of air temperature, relative humidity, and wind speed.

In a similar way to the NWS EDD, the Portal allows users to create a bookmarkable link (through Menu button top left corner) that saves your location and parameters of interest so you can load them each time you open the portal. Click on the “Menu” button at the top left corner, and the dropdown panel will display a “Bookmarkable Link”. You can copy this link and paste it into a new tab, and bookmark that tab to view it later. For additional information on the data, the data sources, and how data are displayed (including important caveats on interpretation), visit this page: <https://climate.ncsu.edu/fwip/documentation.php>. For a webinar explaining and demonstrating the Fire Weather Intelligence Portal, check out this SFE webinar: <https://youtu.be/XfBNbmNF7H0>.



Figure 3. Home screen of the Fire Weather Intelligence Portal

IN SUMMARY

Both the NWS Enhanced Data Display and the Fire Weather Intelligence Portal should greatly assist prescribed fire and wildland fire planning and management decisions. These tools allow users to quickly visualize and assess past, present and forecast meteorological, climate, and fuel data across geographic areas.



Authors

Jennifer Fill and Raelene Crandall, University of Florida

For more information on the Southern Fire Exchange, visit www.southernfireexchange.org or email contactus@southernfireexchange.org.



SOUTHERN
Fire Exchange

The Southern Fire Exchange is funded through the Joint Fire Science Program, in agreement with the United States Forest Service, Southern Research Station. This institution is an equal opportunity provider.