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An Early-Warning Mapping Tool for Forecasting Fire Risk on DoD Lands in the Arid West

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Deliverable: User's guide for web application

Overview

This document outlines the key features and functionalities of the 'Wildfire Risk Explorer'. For more information about the methods used to derive mapped products displayed in this interactive mapping tool (i.e. 'tool'), please see the document linked on the website called 'Metadata'. In addition, a recorded webinar with a demonstration of the tool and example use cases is available here (13 September 2018):

<http://www.dodnaturalresources.net/Webinar-Series.html>

For further questions about the data products or use of this tool, please contact Miranda Gray at miranda@csp-inc.org.

1. Viewing map layers of fire risk from 2005 through to the present week

The main landing page of the tool looks like Figure 1 below. The most recent fire risk map, which is refreshed every Monday morning at 04:00 Pacific Standard Time, is displayed as the default background map. To change the fire risk map that is displayed, use the drop-down on the sidebar titled 'Select Date to Display Fire Risk' (Figure 1a). The dates available in this drop-down correspond to the 'Dates of Interest' currently selected in the sidebar (Figure 1b). To change the dates in the drop-down, and that are available to display as the background fire risk map, simply change the selected 'Dates of Interest'. Change the opacity of the fire risk map with the scroll bar called 'Layer Opacity' (Figure 1c). Zoom in and out, and change the basemap from either a 'Satellite' or 'Streets' basemap with the buttons in the top left of the map display (Figure 1d).

Scroll over the icon in the bottom left of the map display to show a map legend (Figure 1e).

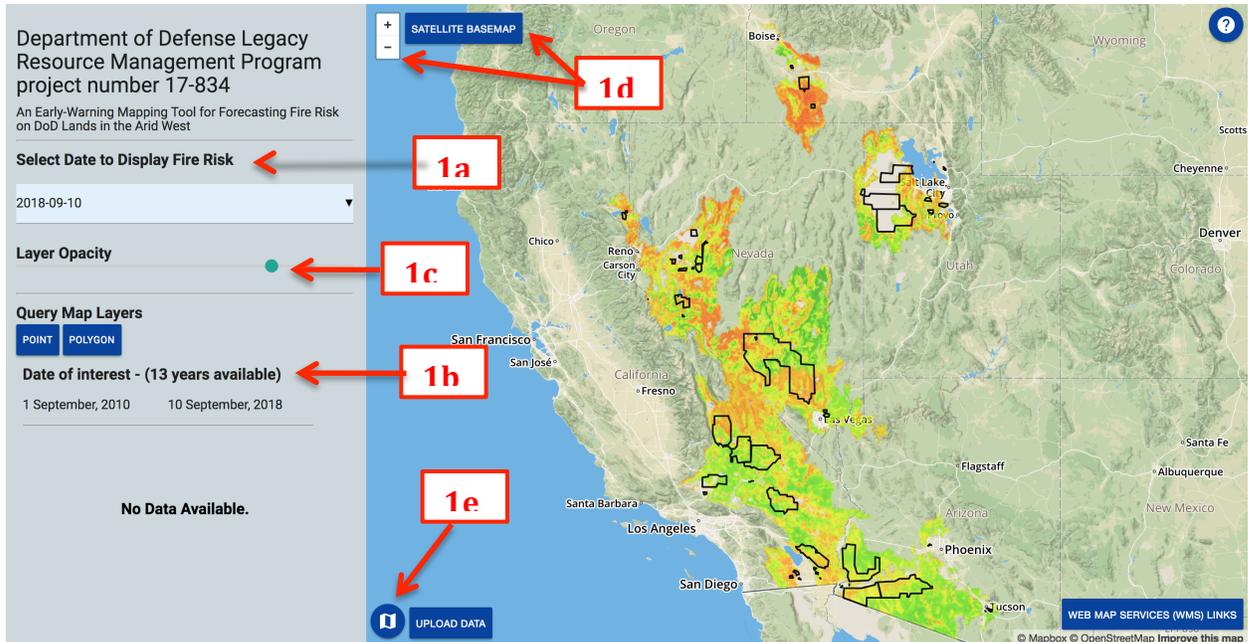


Figure 1. Features and functionalities of the interactive mapping tool, corresponding to Section 1 of this document

2. Querying map layers with points and polygons

Fire risk map layers may be queried by either clicking at points on the map, or by drawing polygons on the map. To query by point, click on the 'Point' button on the sidebar (Figure 2a). Click anywhere on the fire risk map that is not masked out. A graph will display in the sidebar with the probability of large fire (i.e., fire risk) on the x-axis, and date on the y-axis (Figure 2b). The fire risk is bounded by a measure of uncertainty, which is the standard deviation of fire risk estimates. **The operational definition of fire risk as used by this tool is defined as follows: The probability that an area on the landscape will burn in a large wildfire (i.e., >300 acres), conditional on an ignition event or fire spreading to that area.** To read about how the mean and standard deviation of fire risk were derived, please see the 'Metadata' document linked on the tool. To toggle on and off the graph lines, click on the legend items on the graph (2d). To

change the dates that are displayed on the graph, select new 'Dates of Interest' in the sidebar (Figure 2c; note: for points, only 4 continuous years may be queried at a time). To query by polygon, click on the 'Polygon' button on the sidebar (2e). Draw a polygon anywhere on the fire risk map and a graph will display in the sidebar with mean fire risk (averaged over the entire polygon) on the x-axis, and date on the y-axis. For polygons, only 2 continuous years may be queried at a time.

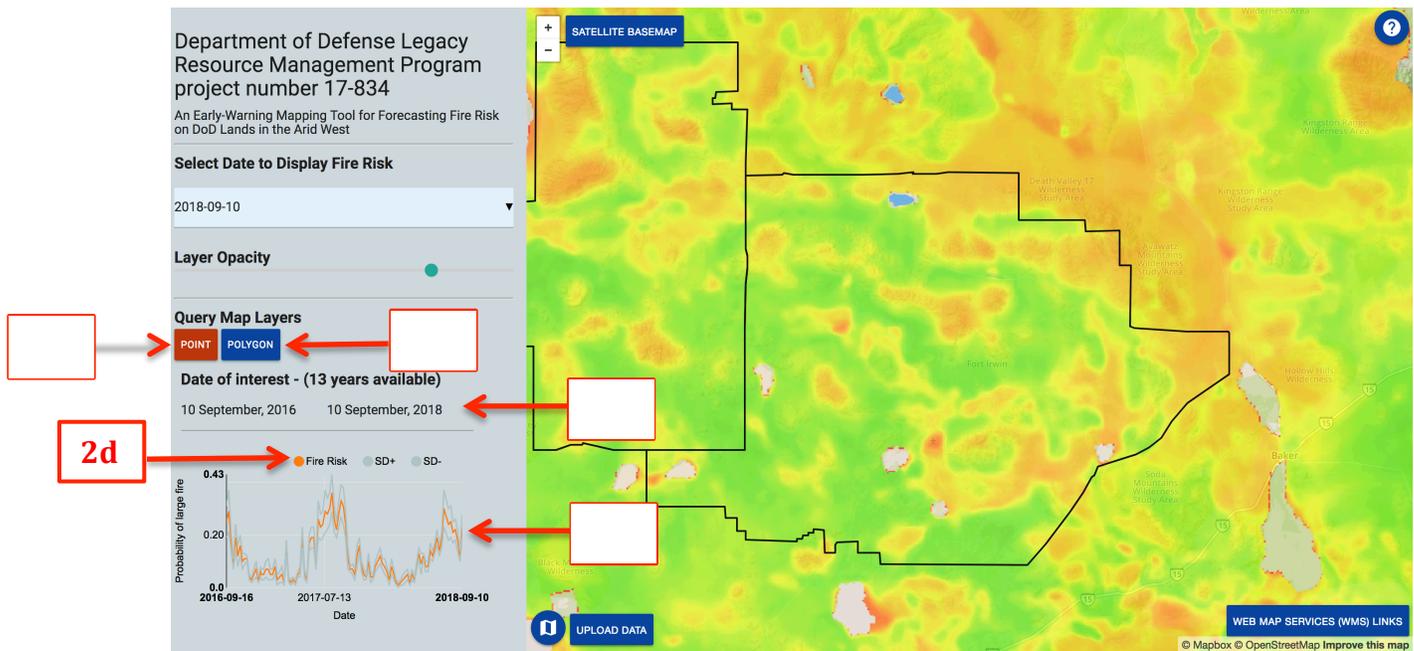


Figure 2. Features and functionalities of the interactive mapping tool, corresponding to Section 2 of this document

3. Uploading custom points and polygons

Point and polygon files can be uploaded from your local computer and added to the map display. These files must be in shapefile format (see <http://desktop.arcgis.com/en/arcmap/10.3/manage-data/shapefiles/what-is-a-shapefile.htm>) and must also be compressed or 'zipped' (e.g., see <https://support.microsoft.com/en-us/help/14200/windows-compress-uncompress-zip-files>). To upload a file, click on the 'Upload Data' button on the bottom left of the map display (Figure 3a). A file explorer window will pop up, and you can select the

compressed file to add. The shapefile will be added to the map display (Figure 3b). The tool only allows one custom file to be displayed at a time, and so when adding a new file to the map, any file that was previously displayed will be replaced. Use the point and polygon query functions to click on points or draw polygons over your custom data and display the fire risk within custom data.

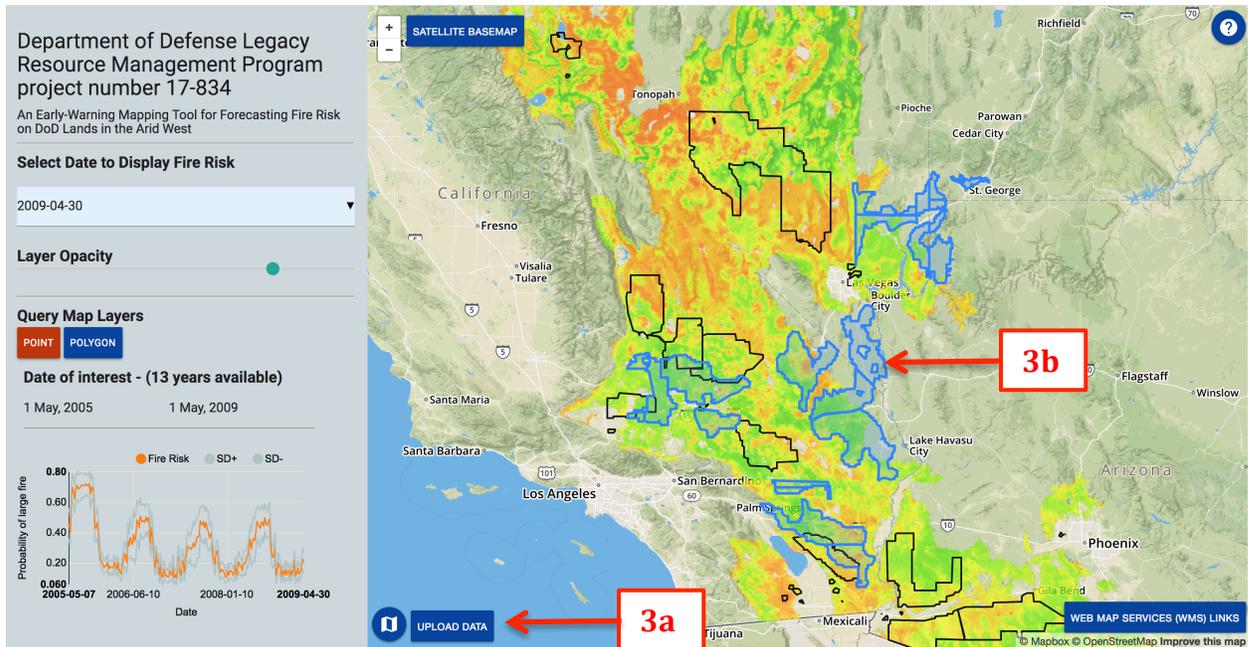


Figure 3. Features and functionalities of the interactive mapping tool, corresponding to Section 3 of this document

4. Adding Web Map Service (WMS) layers to a stand-alone GIS

Web map service (WMS) is a standard protocol for serving georeferenced map images over the internet. WMS fire risk layers from 2005 through to the present week can be linked from within a stand-alone Geographic Information System (GIS) application on your computer, such as Esri ArcGIS. To get the link that you will need to provide to ArcGIS or some other GIS application, click on the 'Web Map Services (WMS) Links' button in the bottom right of the map display (Figure 4a). A pop-up will display the url link (Figure 4b), as well as provide a link for further instruction for Esri users (Figure 4c).

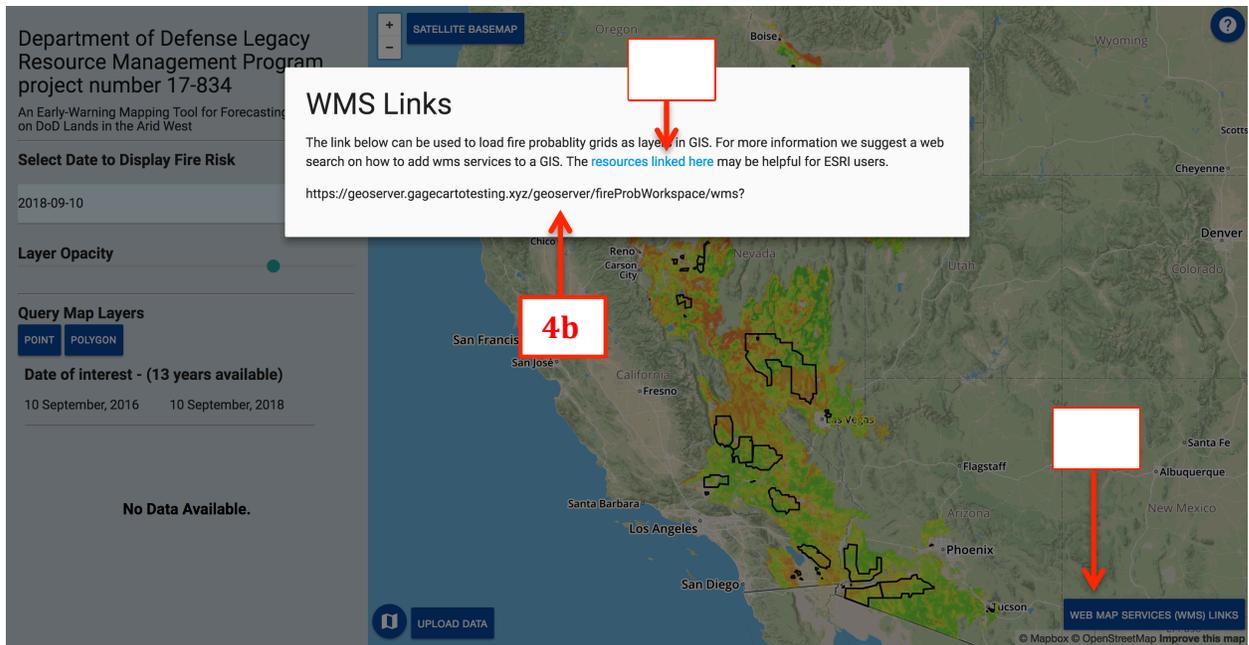


Figure 4. Features and functionalities of the interactive mapping tool, corresponding to Section 4 of this document

5. Displaying Web Map Service Layers in ArcMAP

The WMS used by this tool does not support any geoprocessing on the map images, so once they are loaded in a GIS, they can only be displayed (e.g., you can not export or extract any part of the layers). In ArcMAP, the layers will initially display with a red background and zero opacity (Figure 5a). To change this default display in ArcMAP, open the properties of the 'GeoServer Web Map Service' from the layer table of contents, and click on the 'Advanced' Tab (Figure 5b). Change the Background color to 'No Color', and change the 'Layer Image Format' to JPEG (Figure 5c). You can also adjust the opacity with the 'Layer Transparency' scroll bar.

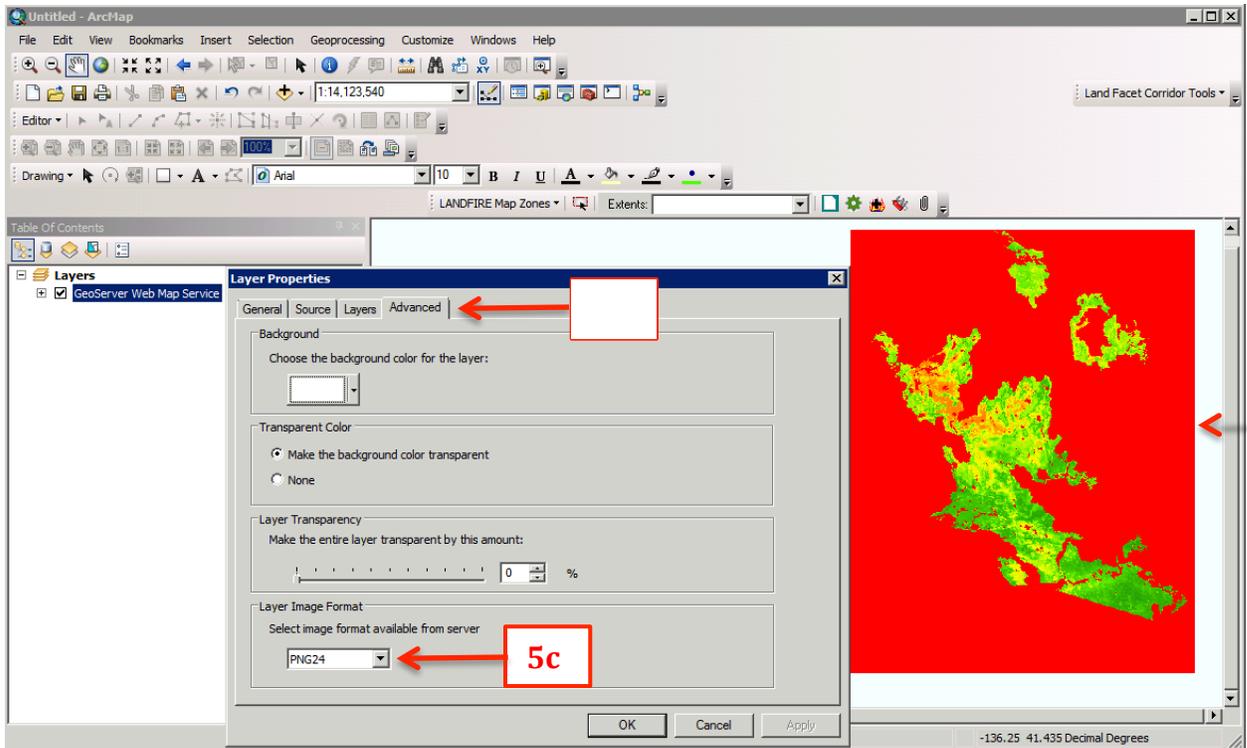


Figure 5. Features and functionalities of the interactive mapping tool, corresponding to Section 5 of this document