

WFEIS

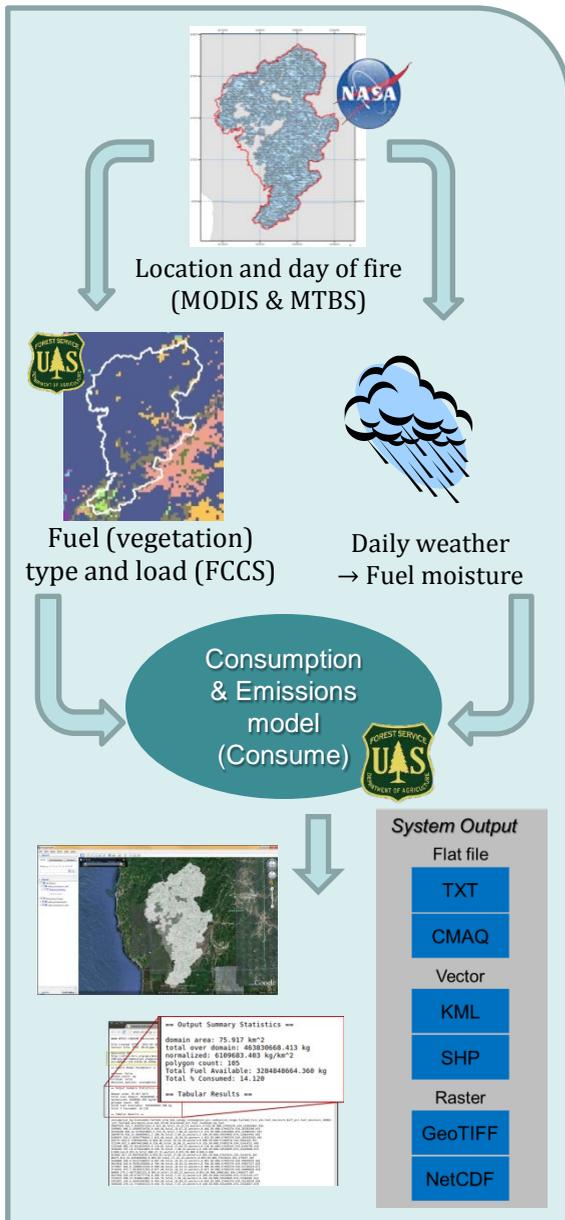


Photo Courtesy of Merritt Turetsky

WILDLAND FIRE EMISSIONS INFORMATION SYSTEM



A web-based geospatial tool for calculating carbon and trace gas emissions from fire



INTRODUCTION

The emission of carbon-based gases from biomass burning is an important factor in the global carbon cycle. Emissions from fire are also a health hazard to nearby communities, can impair air quality and visibility for hundreds of kilometers downwind, and contribute greatly to the global aerosol budget.

WFEIS on the WEB

The Wildland Fire Emissions Information System (WFEIS) is a web-based tool that provides a simple user interface for computing wildland fire emissions at landscape to regional scales (1-km spatial resolution). WFEIS is not an inventory of fire emissions, but rather a system that provides open access to the modeling tools needed to quantify emissions from past fires. WFEIS provides access to fire perimeter maps along with corresponding fuel loading data and fuel consumption models to geospatially compute wildland fire fuel consumption and fire emissions for user-specified locations and date ranges. The system currently calculates emissions from fires within the United States from 1984 to 2010.

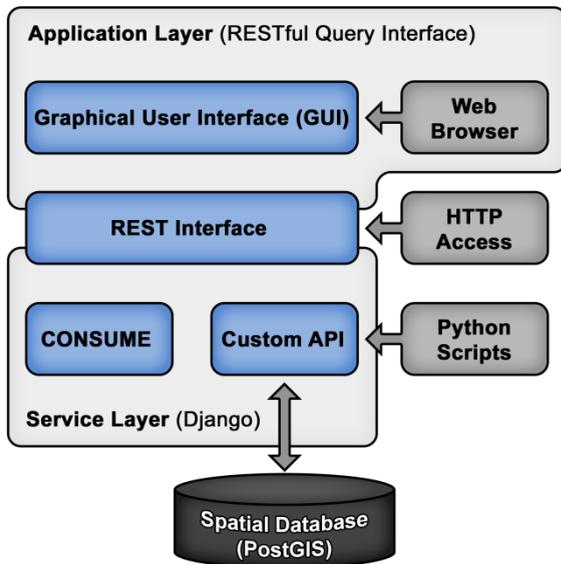
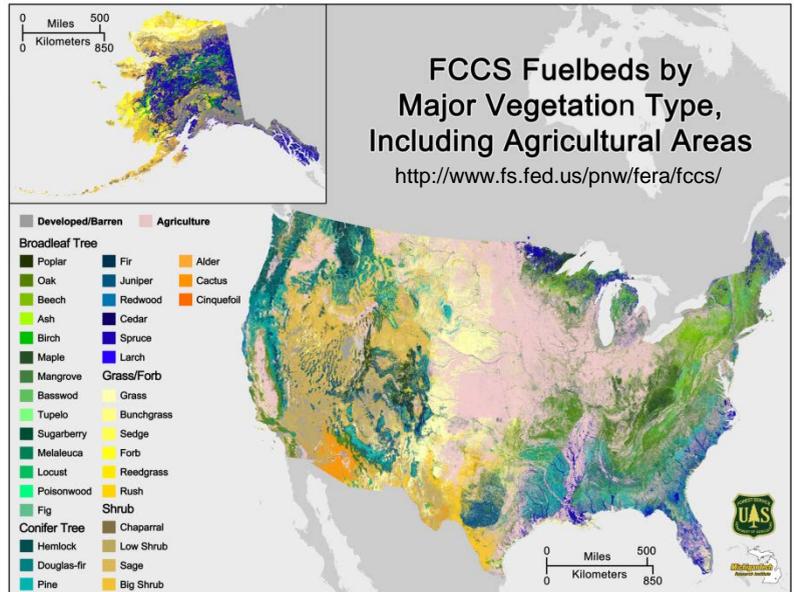


<http://wfeis.mtri.org>

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DATA AND MODELING RESOURCES

The WFEIS is currently operational for the US to integrate existing data sets and modeling resources for computing fire emissions and providing easy access to fire emissions information. Burn area is based on MODIS and Landsat-mapped perimeters. Fuel type and loading is supplied within WFEIS from a new map of fuelbeds based on the Fuel Characteristic Classification System (FCCS; shown right; McKenzie et al. 2012). WFEIS uses the Consume emissions model (Ottmar et al. 2014).



SYSTEM ARCHITECTURE

WFEIS was designed as a web-enabled tool for emissions estimation with the philosophy of free access to data, emissions modeling methods, and software tools. With this in mind, WFEIS is built entirely from open-source software components: a Django/Apache2 web framework; a PostgreSQL/PostGIS database backend; and a user-interface designed using Sencha Ext JS JavaScript framework. WFEIS uses RESTful software architecture to implement its Application Programming Interface (API) for producing emissions estimates. Users can retrieve fuel consumption and emissions estimates in a variety of output formats (text, shapefile, KML, GeoTIFF, NetCDF) either through the **Emissions Calculator** user interface or via properly encoded URL requests. The latter method can be used to manually or programmatically run batch queries.

SIGNIFICANCE & APPLICATIONS

WFEIS is intended to serve several user communities, from operational land managers, smoke and atmospheric modelers, scientists, and regulatory groups. WFEIS has been used in science investigations and is being considered as a tool for improving national-level assessment of emissions for greenhouse gas assessment and reporting needs.

French, N. H. F., et al. 2014. Modeling regional-scale fire emissions with the Wildland Fire Emissions Information System, *Earth Interactions*, 18, 1-26, doi:10.1175/EI-D-14-0002.1.
 McKenzie, D., N.H.F. French, and R.D. Ottmar, 2012. National database for calculating fuel available to wildfires. *EOS*, 93, 57-58.
 Ottmar, R.D., 2014: Wildland fire emissions, carbon, and climate: Modeling fuel consumption. *Forest Ecol. Man.*, 317, 41-50.

For Additional Information on WFEIS see <http://wfeis.mtri.org>

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