



To collaborate with us,  
contact:  
[altintas@sdsc.edu](mailto:altintas@sdsc.edu)

# Firemap: A Web Tool for Dynamic Data-Driven Predictive Wildfire Modeling Powered by the WIFIRE Cyberinfrastructure

Improving the Usability of Climate, Extreme Event, and Hazard Data and Information Products for Community Decision Makers

Daniel Crawl<sup>1</sup>, Jessica Block<sup>2</sup>, Tomas Artes<sup>1</sup>, Charles Cowart<sup>1</sup>, Raymond de Callafon<sup>3</sup>, Thomas DeFanti<sup>2</sup>, John Graham<sup>2</sup>, Larry Smarr<sup>2</sup>, Thayjes Srivas<sup>3</sup>, Ilkay Altintas<sup>1</sup>

1-San Diego Supercomputer Center, UC San Diego, 2-California Institute for Telecommunications and Information Technology, UC San Diego

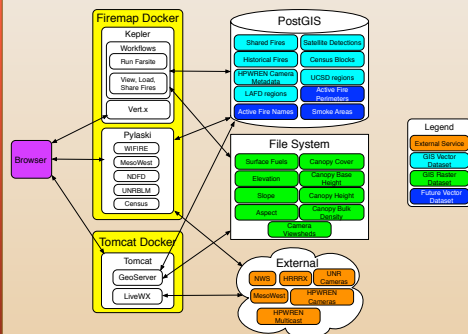
3-Mechanical and Aerospace Engineering, UC San Diego



PA23B-2234

## What is Firemap

The NSF-funded WIFIRE project has designed a web-based wildfire modeling simulation and visualization tool called Firemap. The tool executes FARSITE to model fire propagation using dynamic weather and fire data, configuration settings provided by the user, and static topography and fuel datasets already built-in. Using GIS capabilities combined with scalable big data integration and processing, Firemap enables simple execution of the model with options for running ensembles by taking the information uncertainty into account. The results are easily viewable, sharable, repeatable, and can be animated as a time series. From these capabilities, users can model real-time fire behavior, analyze what-if scenarios, and keep a history of model runs over time for sharing with collaborators.



### Data and modeling sources:

- Fire modeling: FARSITE
- Weather stations: HPWREN, SDG&E, and MesoWest & SynopticsLabs
- Weather forecast: NOAA HRRRX and NWS National Digital Forecast Database
- Cameras: HPWREN, SDG&E, UNR Seismological Laboratory, and NV BLM
- Historical fire perimeters: CAL FIRE FRAP Program and USGS GeoMAC
- Fuels: USGS LANDFIRE Program
- Satellite fire detections: NASA FIRMS

### Firemap is made with open source tools:

- Leaflet, Highcharts
- GDAL, GeoServer, Kepler, PostGIS, Vert.x

## Landscape Layers

- Surface and Crown Fuels
- Historical Fires
- DEM

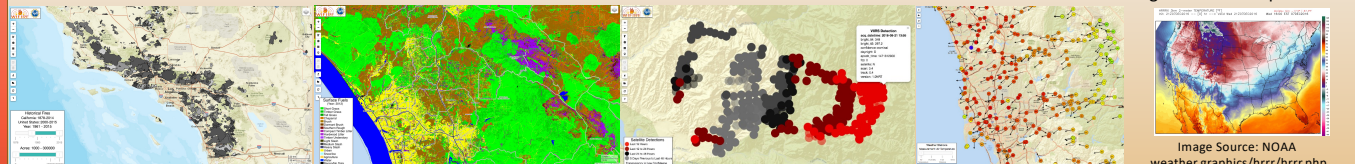
## Firemap Layers

### Live Satellite Layers

- Satellite Fire detections from VIIRS and MODIS

## Weather Layers

- Weather Stations
- NWS Forecast
- HRRRX Forecast



High Resolution Rapid Refresh

Image Source: NOAA  
weather.graphics/hrrr/hrrr.php

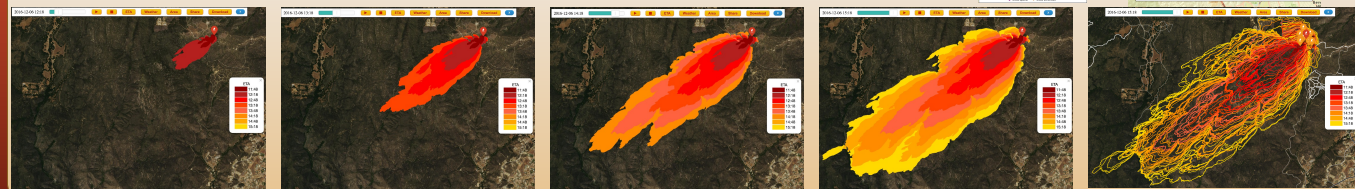
**firemap.sdsc.edu**

## Fire Model

- FARSITE: Fire perimeters using forecasted weather or manually inputted parameters
- Output to Shapefile, KML, WMS, and WFS

## Live Data from Weather Station

## Forecasted or Manually Entered Data



WIFIRE is funded by NSF 1331615 under CI, Information Technology Research and SEES Hazards programs. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).