Energy Research and Development Division

Comprehensive Open-Source Development of Next Generation Wildfire Models for Grid Resiliency

Workgroup 3: Near-term Risk Forecast Outputs (Task 6)

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PREPARED BY:
Primary Author(s): Chris Lautenberger (Reax) and **Shane Romsos** (Spatial Informatics Group, LLC)

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David Saah (Spatial Informatics Group, LLC)
Principal Investigator

Shane Romsos (Spatial Informatics Group, LLC)
Project Manager

PREPARED FOR:
California Energy Commission

David Stoms and Alex Horangic (former)
Commission Agreement Manager

Near-Term Risk Forecast Outputs

This document constitutes the "Near-Term Risk Forecast Outputs" deliverable. It has four components:

1. Near-Term Risk Forecasts Outputs for examples of forecasted risk to electric grid assets on a near-term time horizon and estimated fire threat from ignitions from electric assets: The web application at https://pyrecast.org provides twice-daily forecasts of fire threat from future fires to the electric grid (Figure 1) as well as potential impacts from fires ignited in proximity to transmission lines in California and in adjacent states (Figure 2). All model outputs can be downloaded from the project data repository (https://data.pyregence.org/) or connected to web services on the project's GeoServer (https://data.pyregence.org/geoserver/web/).

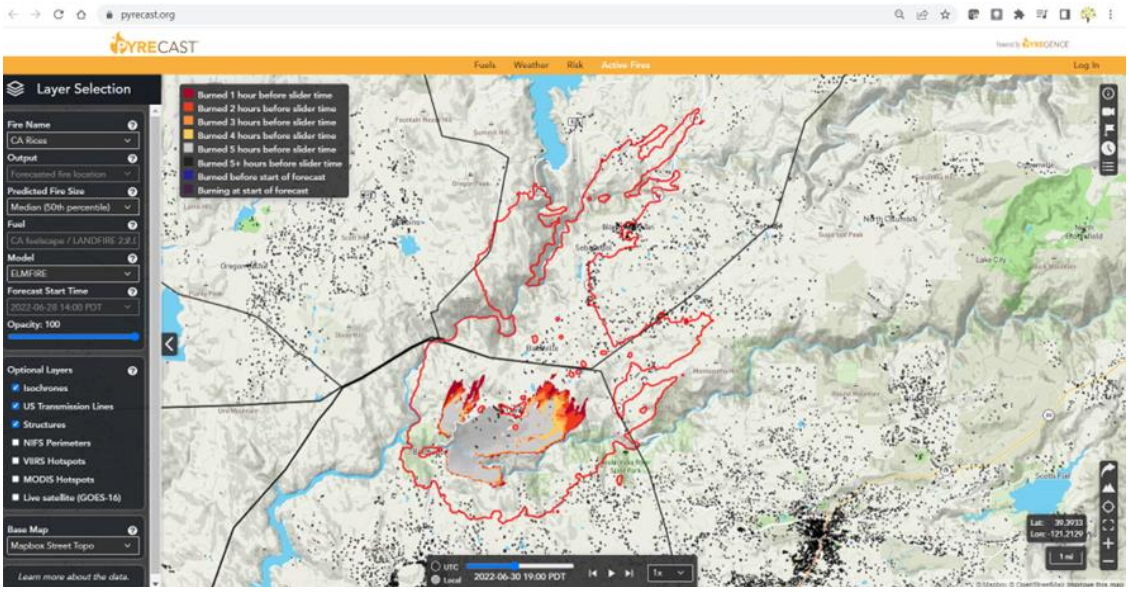

Figure 1. Screenshot of the "Active Fire Tool" in the PyreCast system to illustrate fire progression (Rices Fire, as modeled and forecasted for June 30, 2022, at 7pm) and modeled end of forecast fire perimeter (red outline) relative to electrical transmission lines (black lines) and structures (black dots).

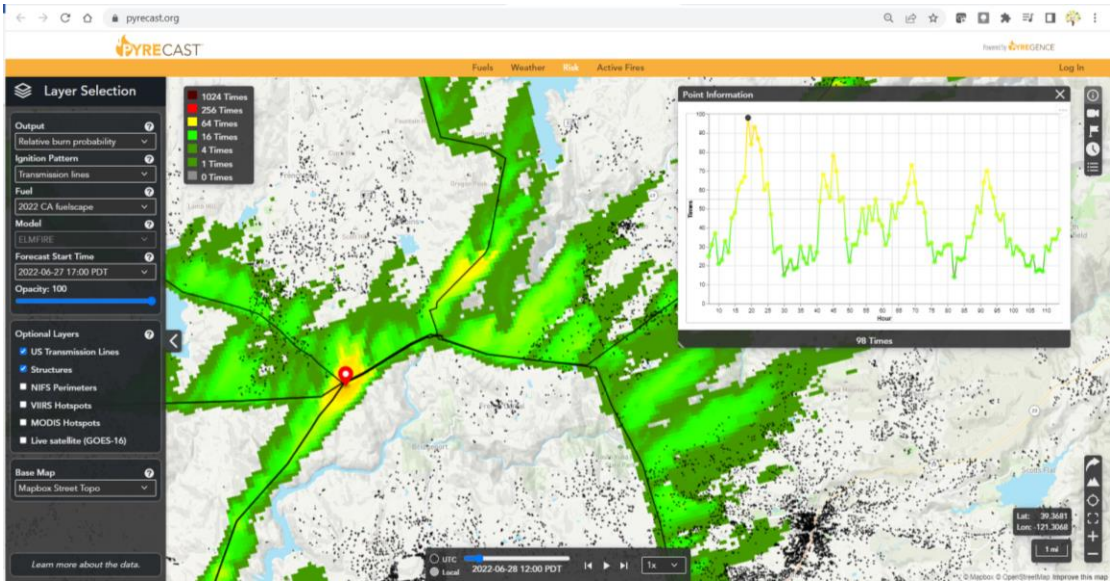

Figure 2. Screenshot of the "Risk Forecast Tool" in the PyreCast system to illustrate relative burn probability along transmission lines (as modeled and forecasted for June 28, 2022, at 12pm).

Real-time outputs from Pyrecast are available from the following online locations:

Description	URL
PyreCast web application	https://pyrecast.org
API – active fires	https://trinity.pyregence.org/geoserver/web/
API – all other layers	https://shasta.pyregence.org/geoserver/web/
Web server	https://data.pyrecast.org/

2. Near-Term Risk Forecasts Docker Container which will include a single package to deploy the version 2 near-term risk forecasts on conventional High-Performance Computing (HPC) resources: At the time the proposal was crafted identifying this specific deliverable, we did not envision that the web application (now PyreCast) would be sufficiently developed to be running operationally. Consequently, we offer https://pyrecast.org as a replacement for the docker container. In lieu of the Docker container, source code and installation instructions are available on an as-needed basis (see #4 below).

3. Near-term Risk Forecasts User's Guide to provide guidance on deploying, running, analyzing, and visualizing the Near-Term Risk Forecast outputs: This item was delivered under a separate cover on 6/27/2022.

4. Set of open-source code for models: All source code developed under this work is licensed under EPLv2 open-source licenses and is hosted across several GitHub repositories. Code for models can be accessed from the following locations:

Description	URL
ELMFIRE fire spread model	https://github.com/lautenberger/elmfire https://elmfire.io
GRIDFIRE fire spread model	https://github.com/pyregence/gridfire

PyreCast web application	https://github.com/pyregence/pyregence
Geosync utility for GeoServer management	https://github.com/pyregence/geosync