

Comprehensive open-source development of next generation wildfire models for grid resiliency

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CHANGE THE WORLD FROM HERE



Spatial Informatics Group

Project Motivation



- Extreme wildfire events ***threaten public and the integrity of electricity grid***
- Impacts to grid have ***increased costs, reduced safety*** and reliability to ratepayers
- ***Science lacks underlying information to forecast risk***
 - Current models cannot predict fire behaviors from large dead trees and duff fuels.
 - Fire-weather forecast underestimate extreme weather events
 - Models unable to forecast mid- to late-century fire risk
- ***IOUs need improved forecast capabilities*** to mitigate wildfire impacts



Project Team



Project Administration

David Saah (Lead PI) – Spatial Informatic Group
Shane Romsos – Spatial Informatics Group
Jean Pierre Wack – Spatial Informatics Group
Christiana Darlington - Clere
Andrea Drew – Drew Consulting

Weather Analysis and Weather Station Optimization

Janice Coen (Lead) – UCAR/NCAR
Owen Doherty – Eagle Rock Analytics
Tami Lavezzi - Sonoma Technology

Tree Mortality and Fuel Measurement and Mapping

Scott Stephens, PhD (Lead) – UC Berkeley
Brandon Collins, PhD – UC Berkeley
Mark Finney, PhD – US Forest Service
John Battles, PhD – UC Berkeley
David Marvin, PhD – Salo Sciences
Chris Anderson, PhD – Salo Sciences

Near-term Risk Forecast Model & Decision Support Tool

Chris Lautenberger, PhD (Lead) – Reax Engineering
Gary Johnson, PhD – Spatial Informatics Group
Ali Tohidi, PhD – Spatial Informatics Group
Mariko Geronimo – Lumen Energy Strategy

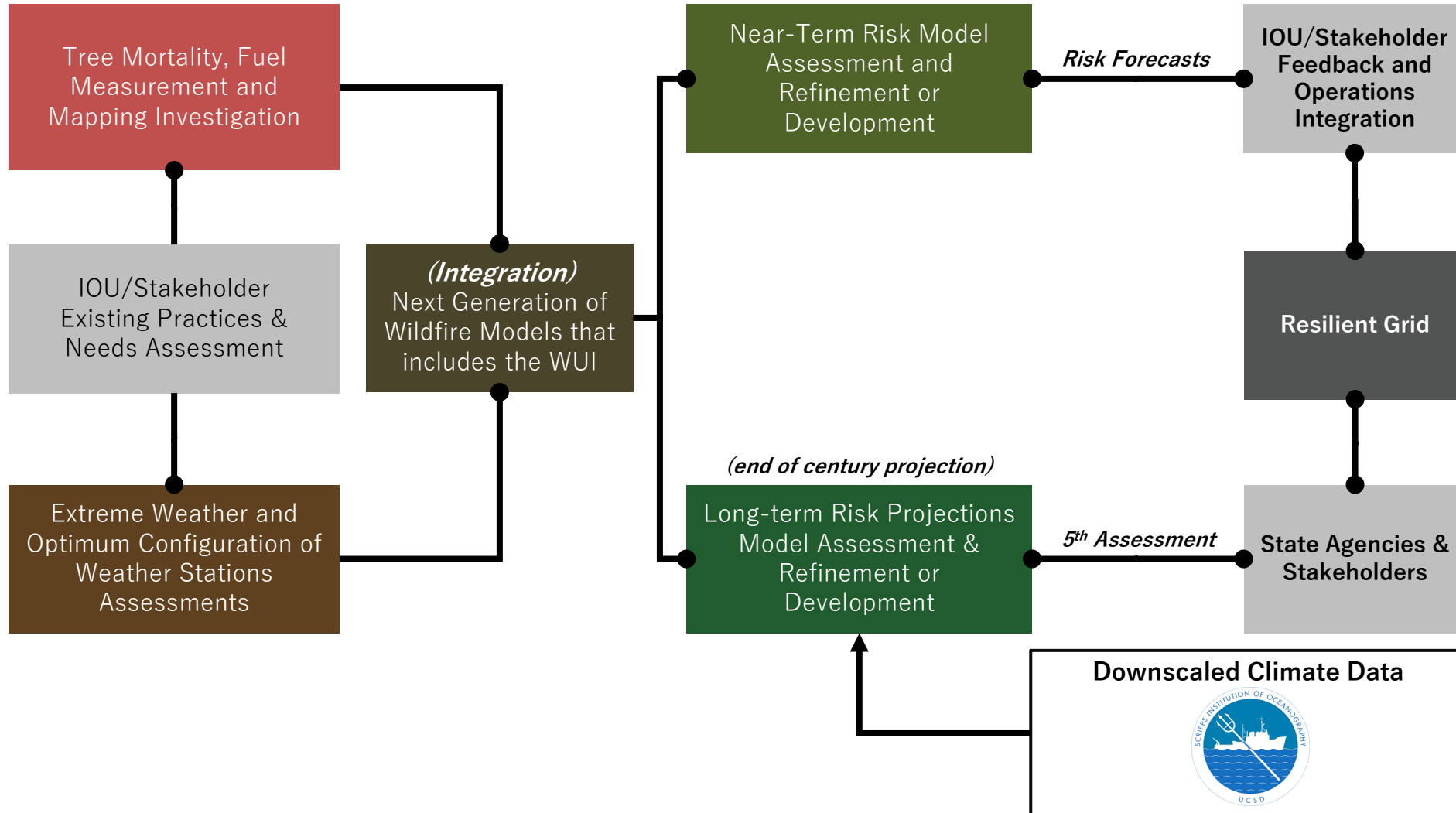
Long-term Projection Model and Planning Tool

Leroy Westerling, PhD (Lead) – UC Merced
Matt Hurteau, PhD – University of New Mexico
David Marvin, PhD – Salo Sciences
Todd Hawbaker, PhD – US Geological Survey
Ben Sleeter, PhD – US Geological Survey

Integration Team

John Battles, PhD (Lead) – UC Berkeley
Max Moritz, PhD – UC Santa Barbara
Joe Scott – Pyrologix
Zeke Lunder – Deer Creek Resources
Phil Dye – Prometheus Fire Consulting Services

Project Workflow



Key Outputs



- **Weather Station** Siting Framework
- **Extreme Weather** Historical Analysis Report and Data Archive
- **State of Wildfire Science** Report
- Contemporary **Tree Mortality** Report and Data Archive
- **Near-term Forecast Modeling Framework**, Data Archive, **Decision Support Tool**
- **Long-term Risk Projection Modeling Framework**, Data Archive, **Planning Support Tool**
- **Cost-benefit** Analysis and Fact Sheets
- **Near-term and Long-term Results Integration** with IOUs, Stakeholders and California's Fifth Climate Change Assessment
- **Open-source code for all models**

Ensemble Fire Forecasts



- Multiple simulations are run with model inputs perturbed from baseline values
 - Wind speed and direction
 - Fuel moistures
 - Canopy layers
 - Spotting parameters
- Forecasts are aggregated to calculate burn probabilities
- Animation to the right is a series of 24-hour fire spread forecasts condensed to 2 seconds

Long-Term Risk Projections



Annual Area Burned
averaged over 10 years*

Model: CNRM-CM5 (Cooler/Wetter)

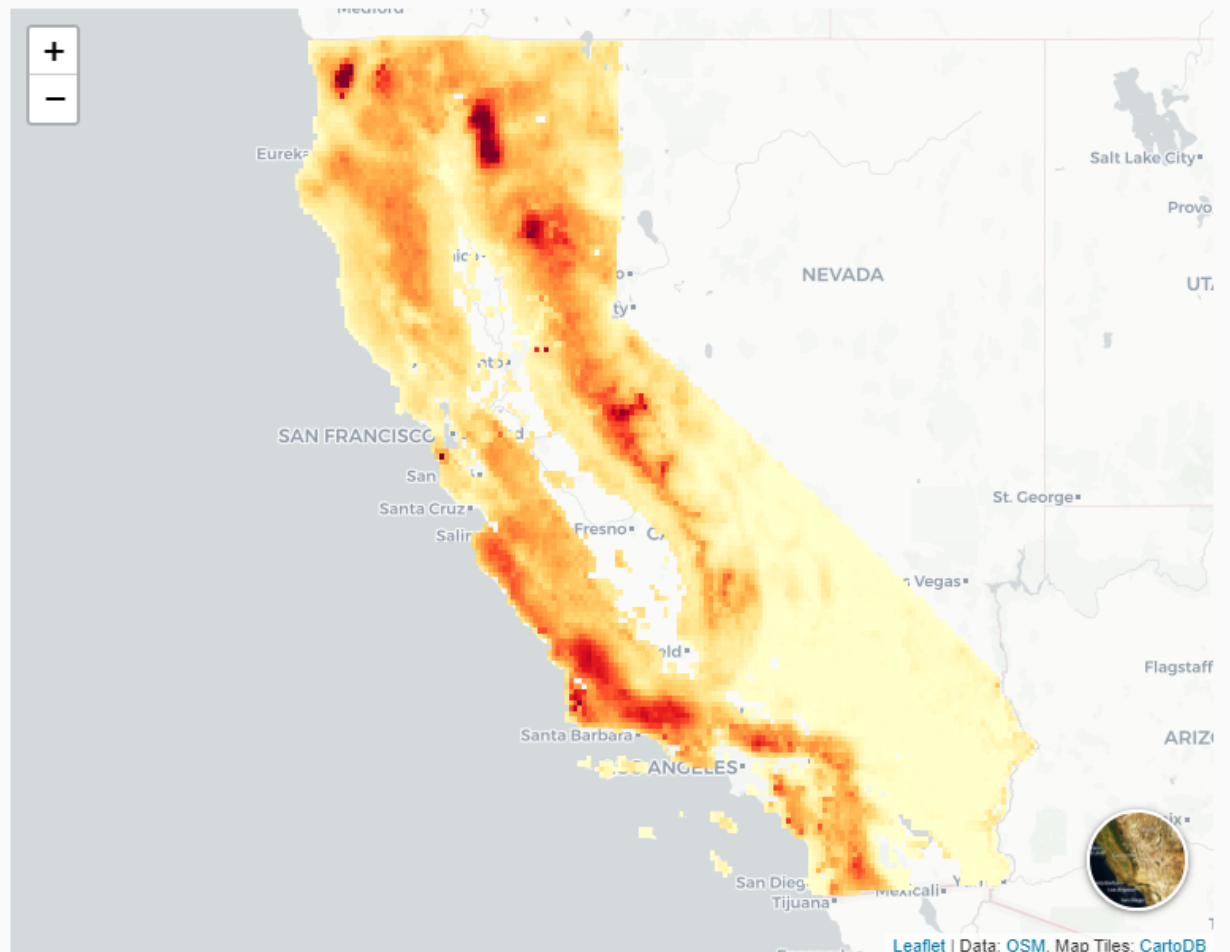
Scenario: RCP 4.5

Population Growth Scenario: Central

2070–2079



PLAY ANIMATION



Thank You

