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Actionable climate intelligence for our entire planet



Extreme climate events are more *frequent*,
severe, and *disruptive* than ever before.

However, current predictive technologies
have not kept pace to enable *timely*, and
climate-informed decisions.

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Here's how we make climate predictions today

1

Importing of observational climate datasets into physical models

2

Predictions are based on repeated numerical simulations using complex empirical equations

3

Simulation results are typically projections and outputs that require further processing before use

Actionable climate intelligence enables better decision making

- **Large market segment**
75bn in Gross Written Premiums across 230 property & casualty insurance companies in CA

(California Department of Insurance, 2018)
- **Wildfire is a huge problem for insurers globally**
Over 500% increase in global insured losses from wildfires from previous decade (Swiss Re, 2019)
- **Lack of solutions for quantifying wildfire risk**
Existing tools/models are lacking in accuracy, granularity and use of relevant data sources
(California Department of Insurance, 2018)

\$20b

lost by California's homeowners' insurers in 2017/2018 alone (Milliman, 2019), which is twice the industry's cumulative profits since major wildfires in 1991

10%

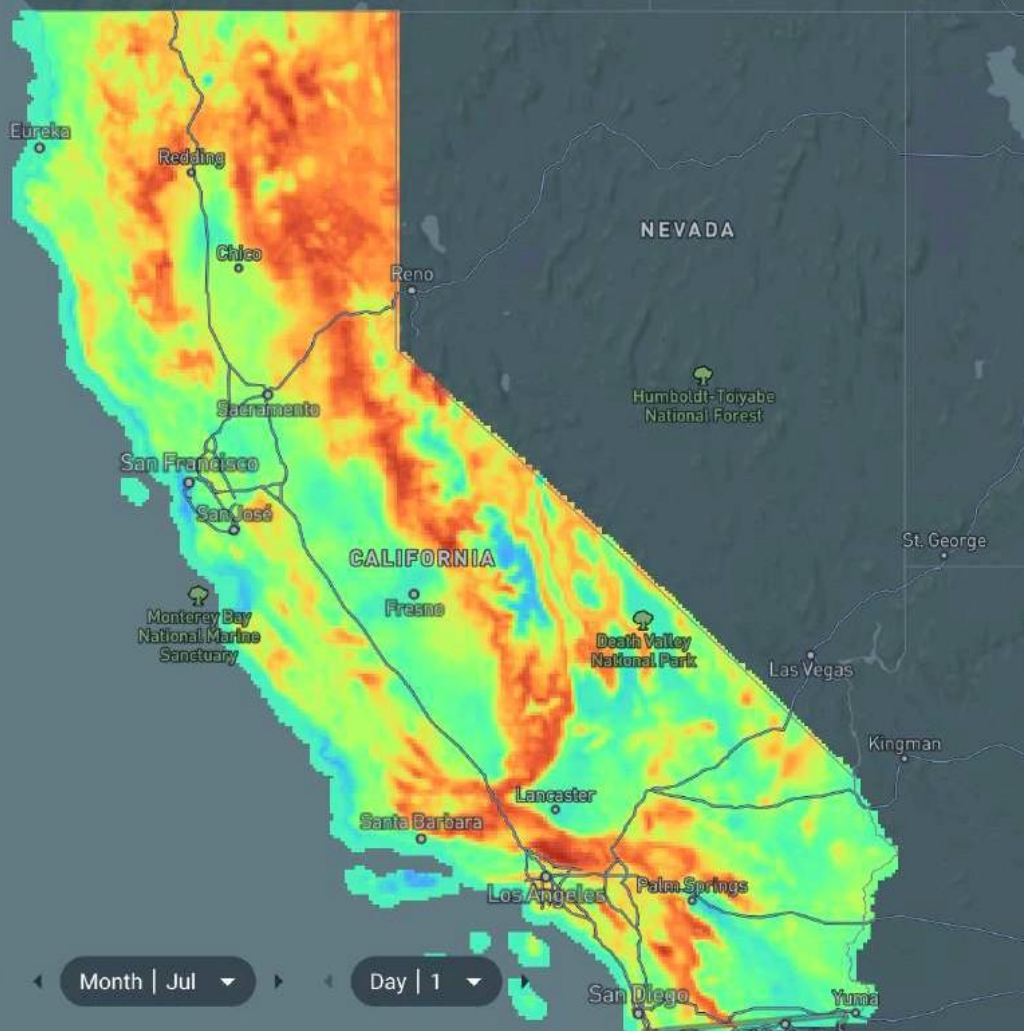
jump in homeowners dropped by their insurance companies in regions affected by 2015 & 2017 wildfires (California Department of Insurance, 2019)

Dec 5, 2019

Monthly Fire Risk ▾

Terrafuse Data Platform

beta customer signup in
Q4/2019-Q1/2020



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Wildfire hazard prediction with machine learning

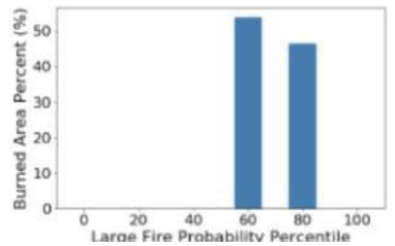
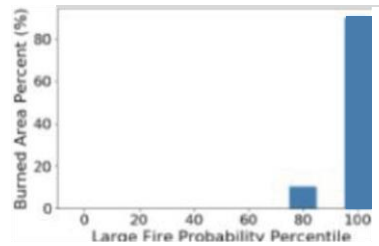
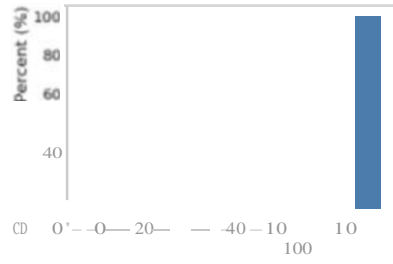
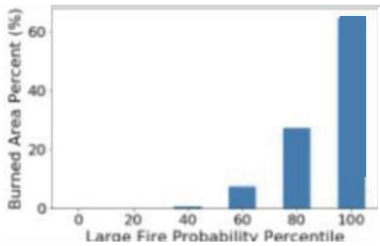
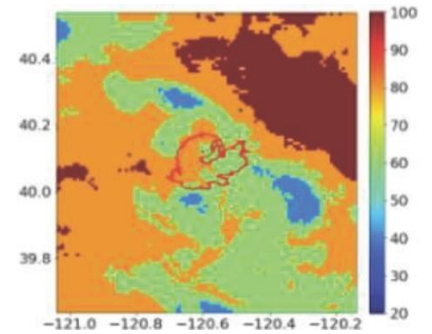
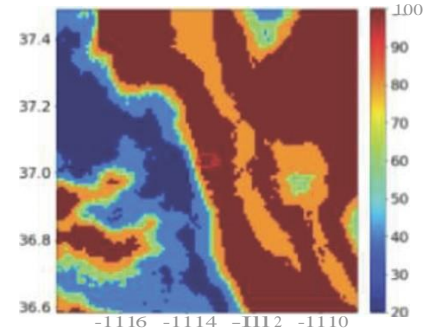
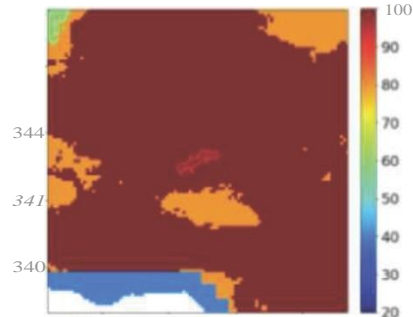
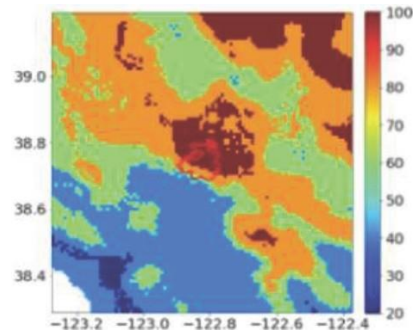


Hazard index: probability that a large wildfire will take place at a given location

- conditional on vegetation, meteorology, and topography patterns
- at different time scales: next-day, next-week, next-month, etc.

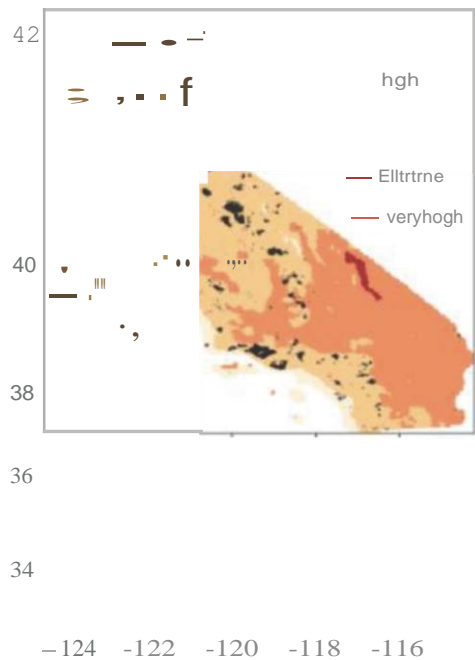
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Terrafuse wildfire hazard index is predictive of spatial wildfire spread

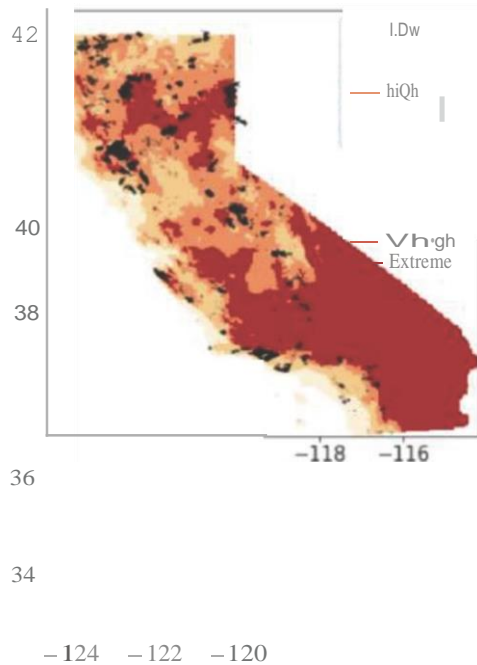


lataA ICJA Prabbilliv P.rc,...tl ←

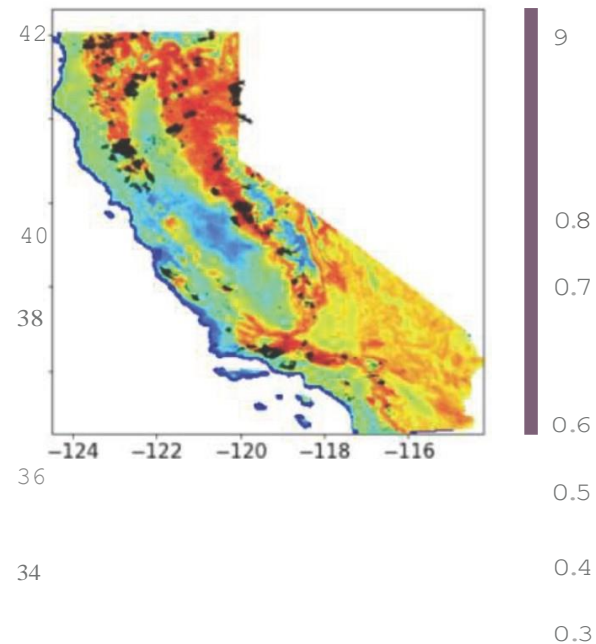
... And is superior in predictive power to existing tools in insurance



(a) FFDI



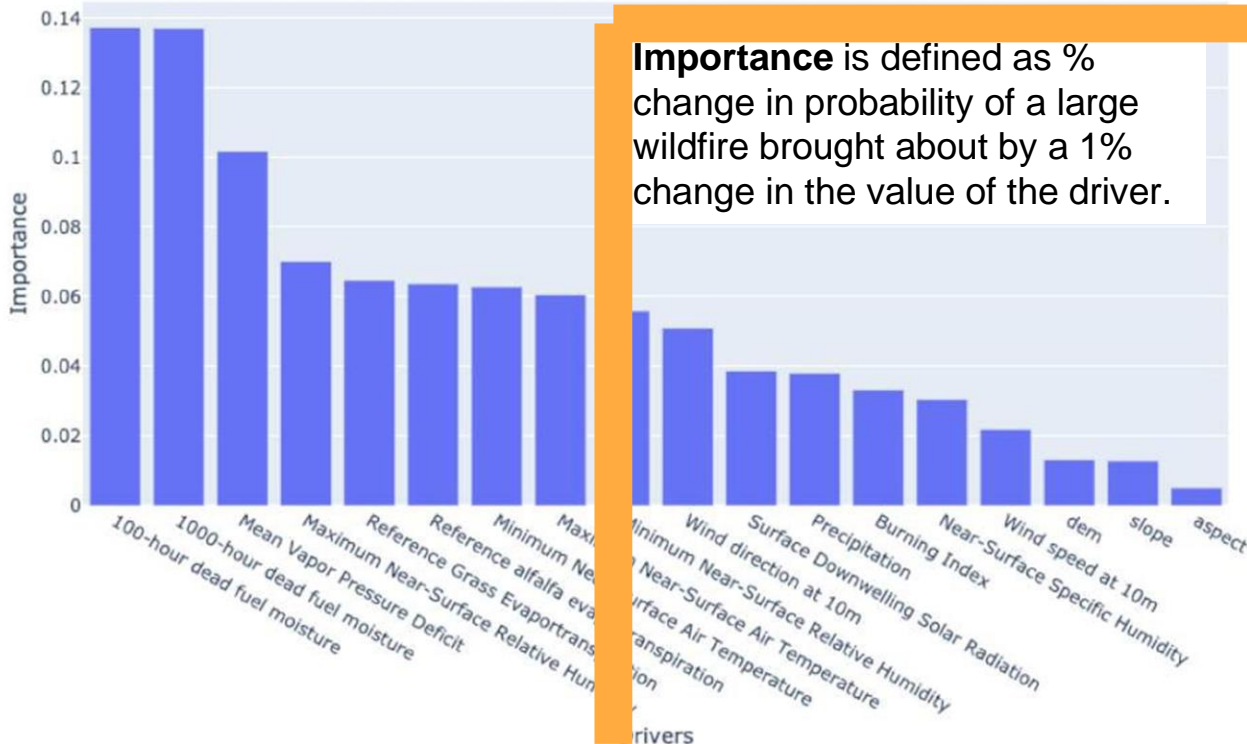
(b) SFDI



(c) Terrafuse

Drivers of (daily) wildfire risk: aggregate view

Importance of variables for fire risk prediction



Importance is defined as % change in probability of a large wildfire brought about by a 1% change in the value of the driver.

Top drivers at monthly timescales are fuel (vegetation) moisture levels

- Medium-term average atmospheric conditions are more important than shorter-term fluctuations
- The model allows to compute driver importance on per-region / per-location (e.g., patch of 10kmx10km) basis



Thank you

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