Catastrophe Modelling:

Verisk Wildfire Model for the United States

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Introduction to Verisk

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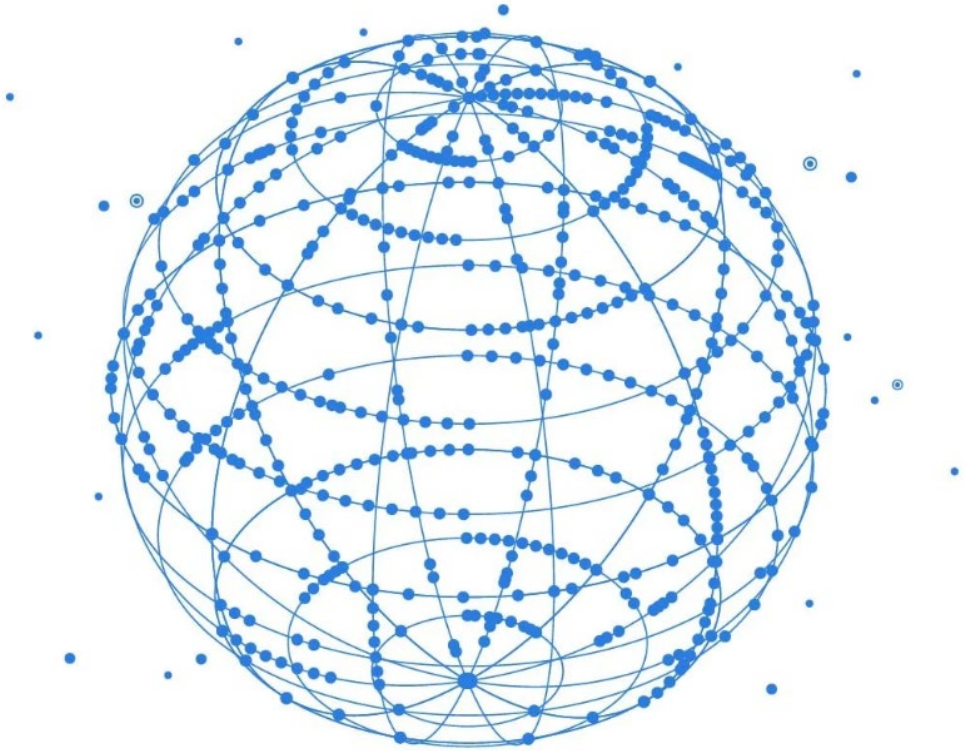
Company Overview

- Data analytics
- Focus on risk assessment
- Many different groups within Verisk
  - Insurance Services Office
  - Xactware
  - Extreme Event Solutions



A Brief History

Verisk Extreme Event Solutions

- Founded the catastrophe modeling industry in 1987
- Scientific leader of risk modeling software and consulting services
- Grown to serve more than 400 clients in a wide range of industries, including insurance, reinsurance, finance, corporate, and government

- How we fit into Verisk
  - Ability to leverage Verisk data for model validation
  - ISO utilizes our model results in their public filings
  - Work with Respond to provide real time event loss estimates and footprints

Regulatory Client Services Team

Evaluation

- Model Submissions
- Reviews

Education

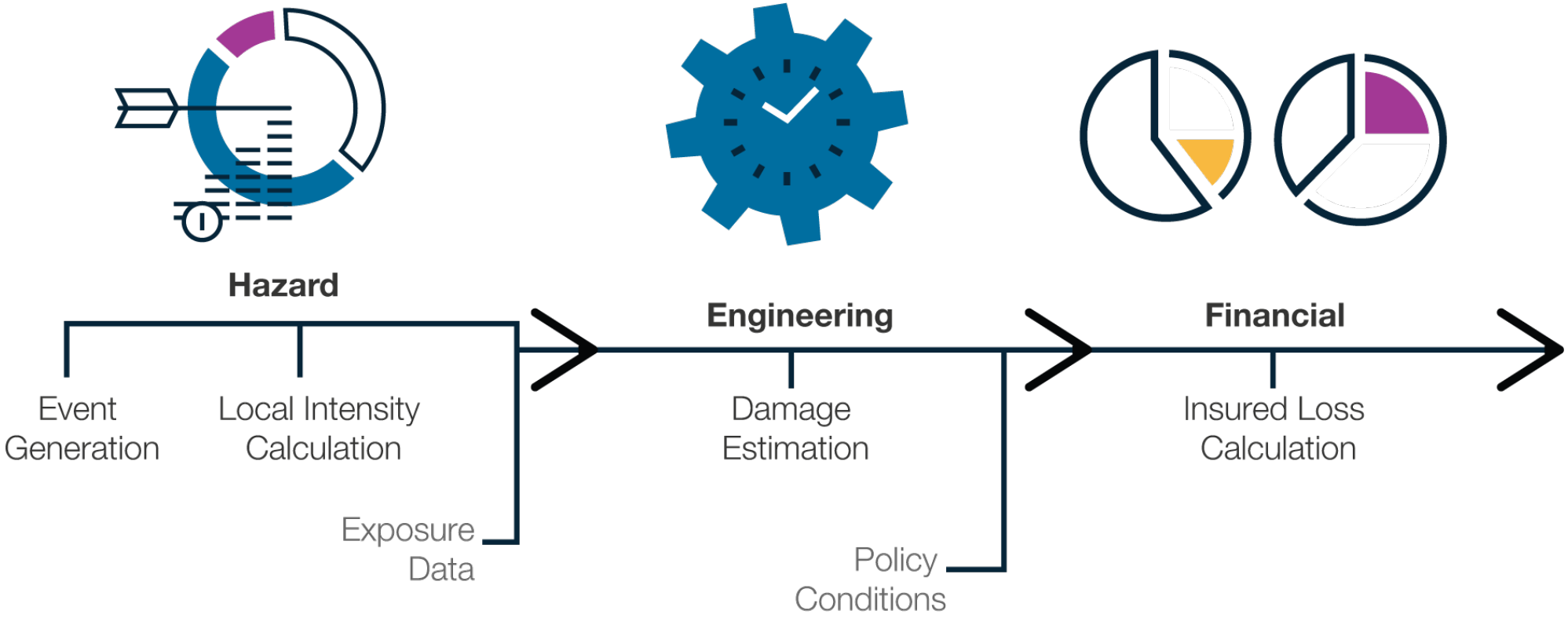
- Presentations
- Webinars
- Blogs
- Whitepapers

Support

- Rate filings
- Solvency surveys
- Data calls
- Regulation

Catastrophe Modeling Framework

- Models simulate low frequency, high impact events
- Frequent events have **abundant historical loss data** to accurately estimate losses
- Infrequent events do not, and require the use of **probabilistic models** to estimate losses
- Goal: Create numerous **realistic simulations** of loss-producing events



Touchstone Platform – Inputs, Models, Outputs

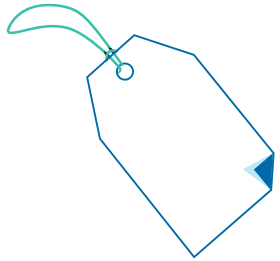
Company Detailed Exposures

TOUCHSTONE®

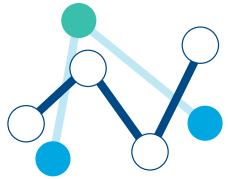
Catastrophe Loss Estimates

Catastrophe Model Use Cases Have Broadened Over Time

Risk Selection



Pricing



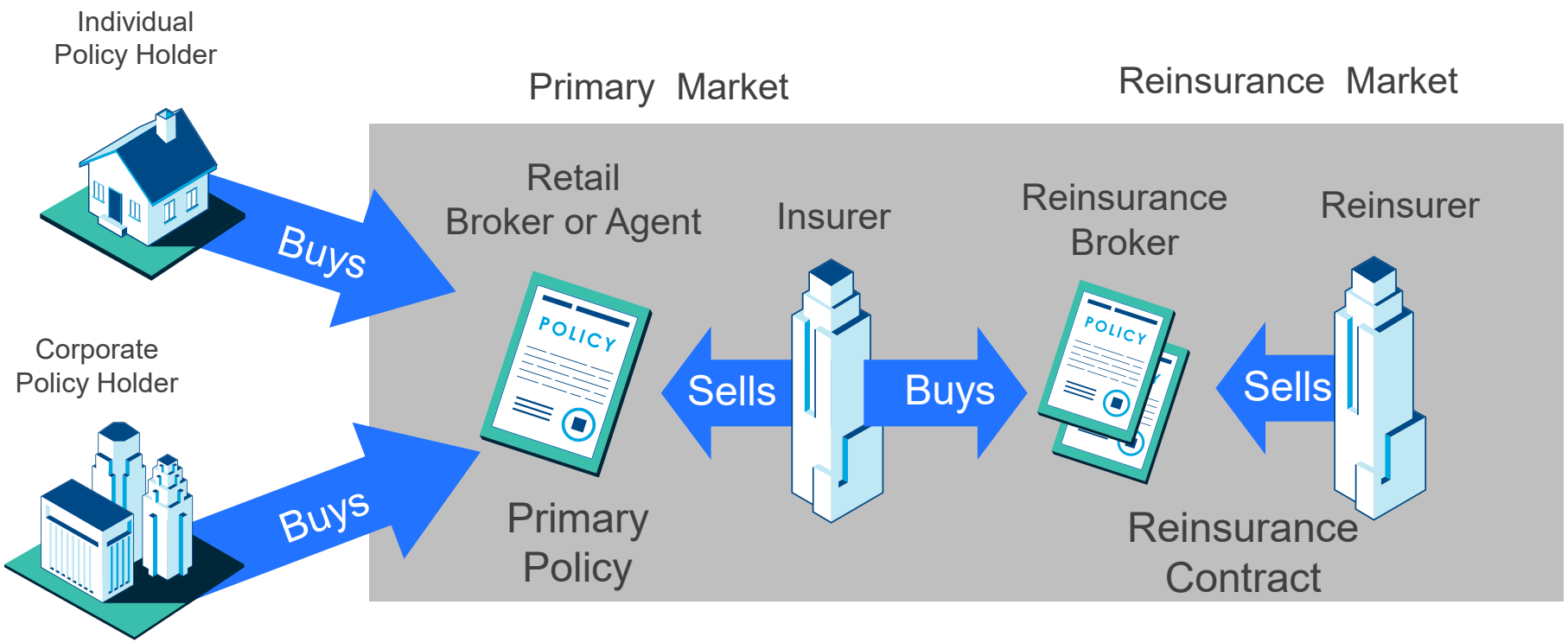
Portfolio Optimization

Enterprise Risk Management

Claims

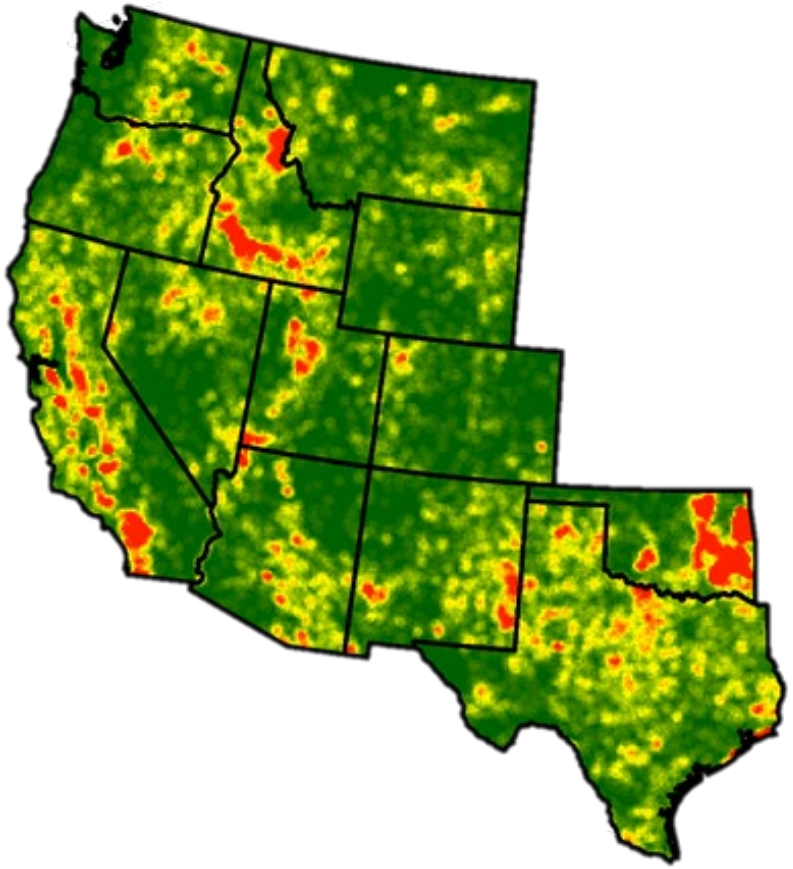
Risk Transfer

Risk Transfer in the Insurance Industry



Modeling Wildfire

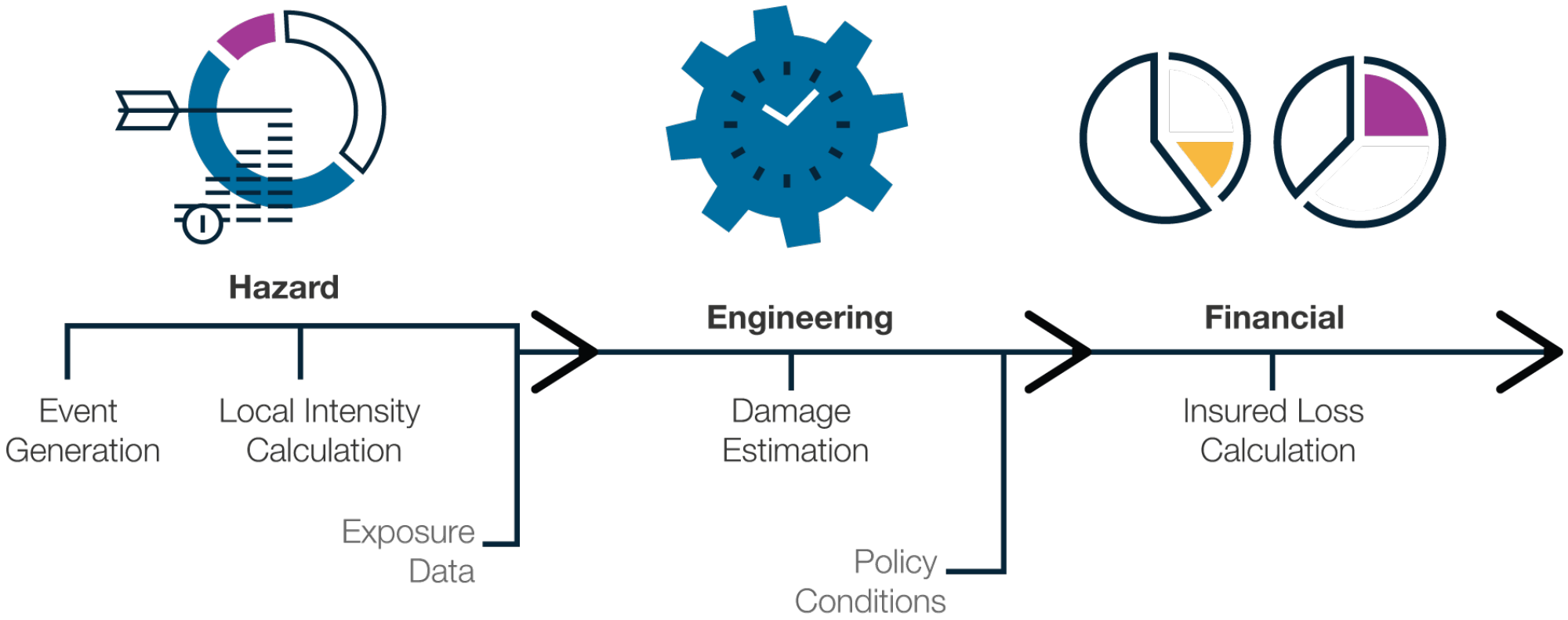
U.S. Wildfire Model Captures Top-Loss Causing States



Historical Ignitions ≥100 Acres (1992–2015)

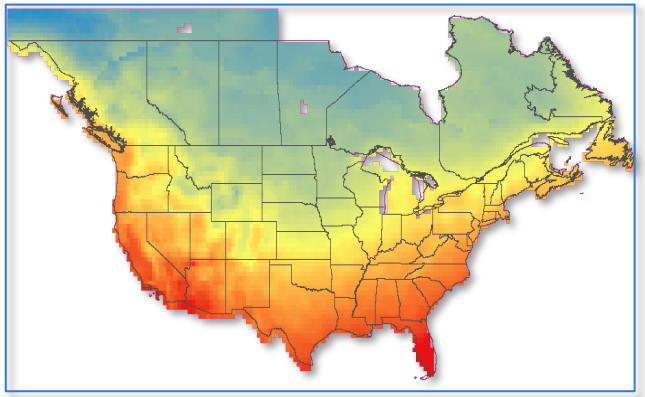
Arizona
California
Colorado
Idaho
Montana
Nevada
New Mexico
Oklahoma
Oregon
Texas
Utah
Washington
Wyoming

Verisk Model Framework

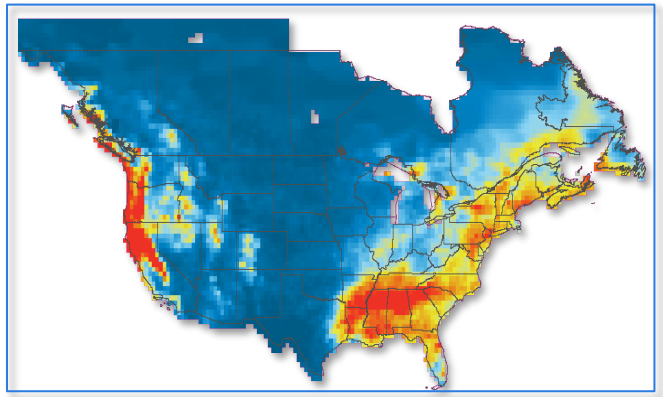


Event Catalog Considers Variability in Weather and Fuels

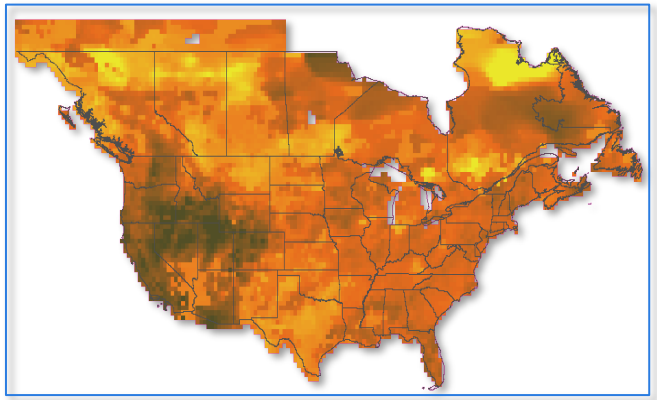
Temperature



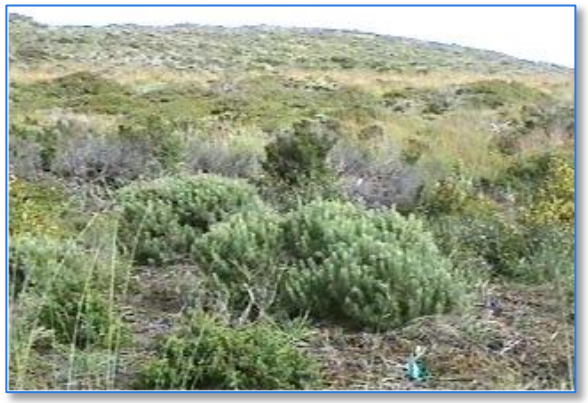
Precipitation



Drought

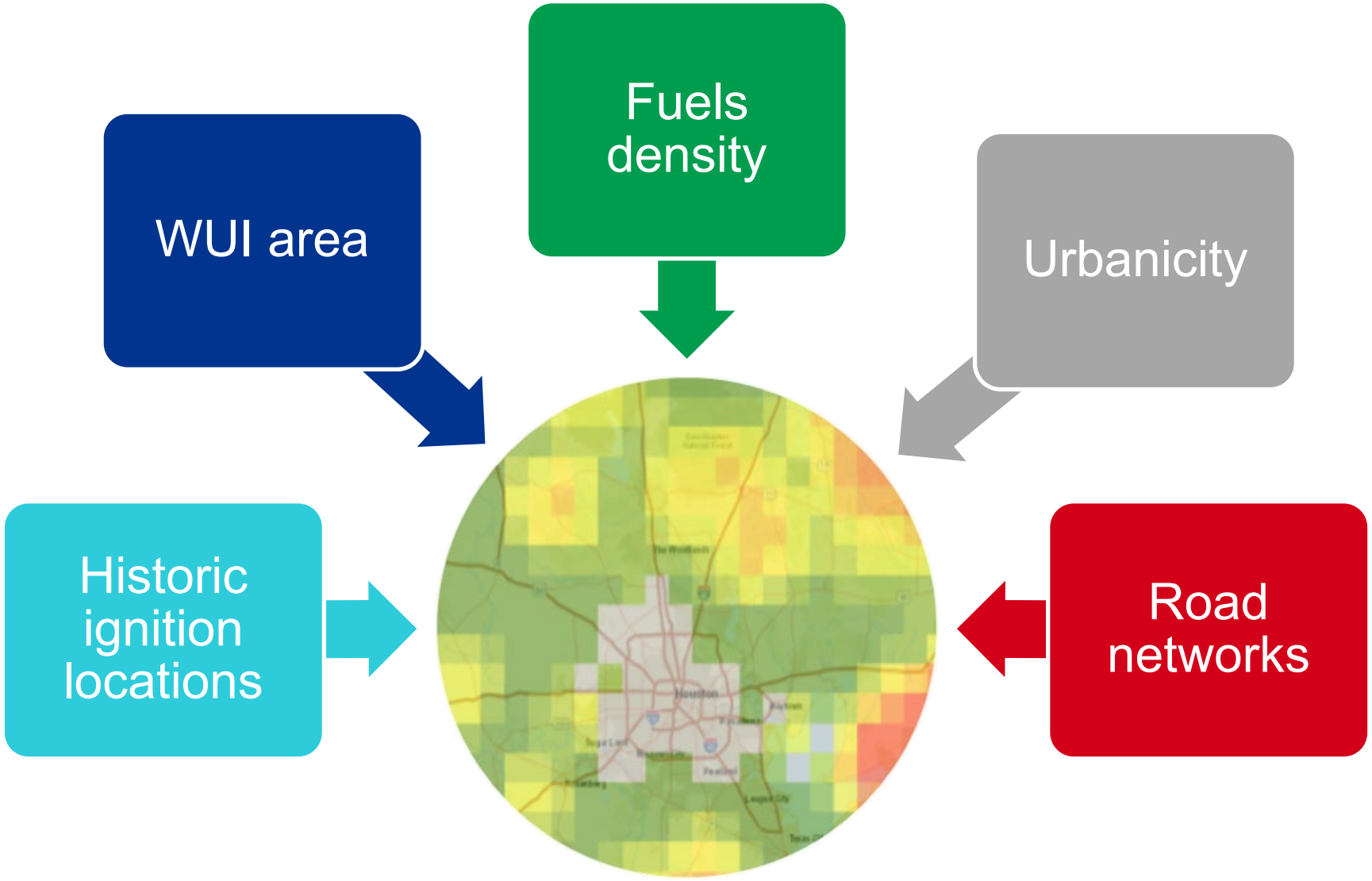


Grass/Shrub/Mixed



Forest

Model Captures Ignitions and Likelihood to Burn

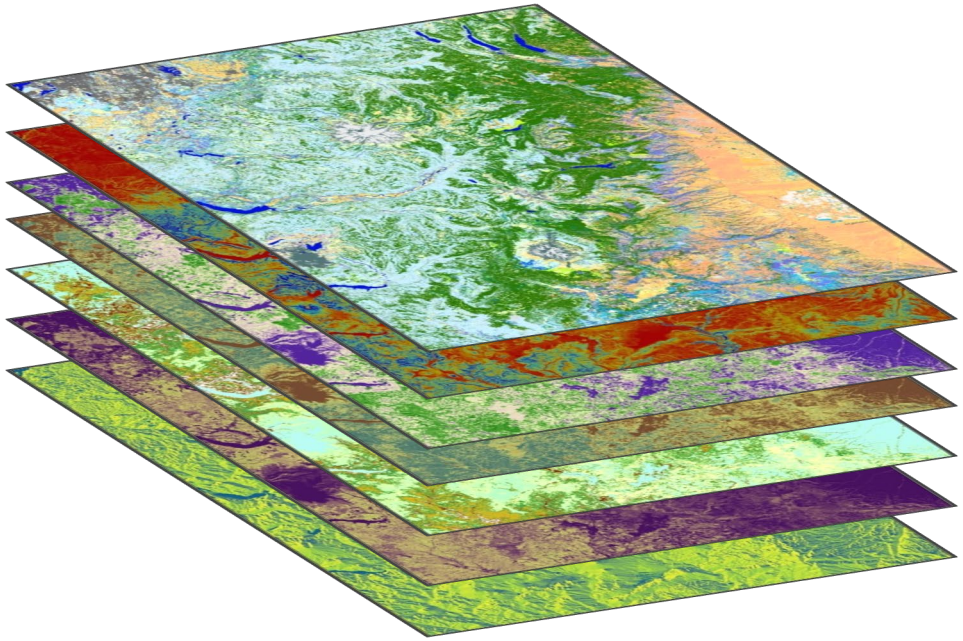


Ignition Risk Grid

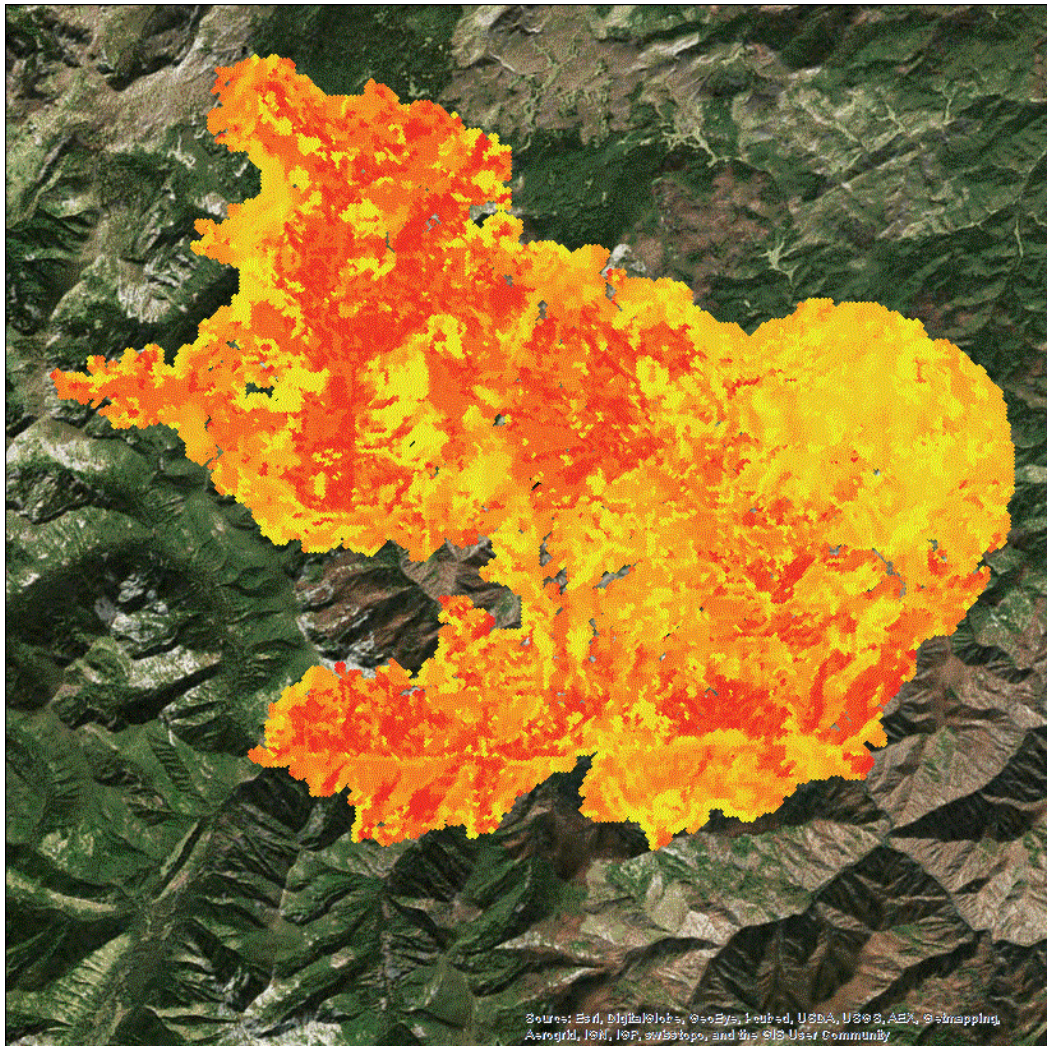
Physically-Based Model Realistically Captures Fire Spread Across a Landscape

Ways a Fire Can Spread

- Surface Spread
- Surface-to-Canopy Transition
- Canopy Spread
- Fire Branding/Spotting



Fuel Model
Slope
Aspect
Canopy Height
Canopy Cover
Base Height
Bulk Density

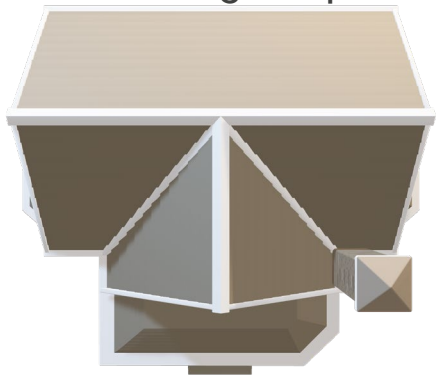


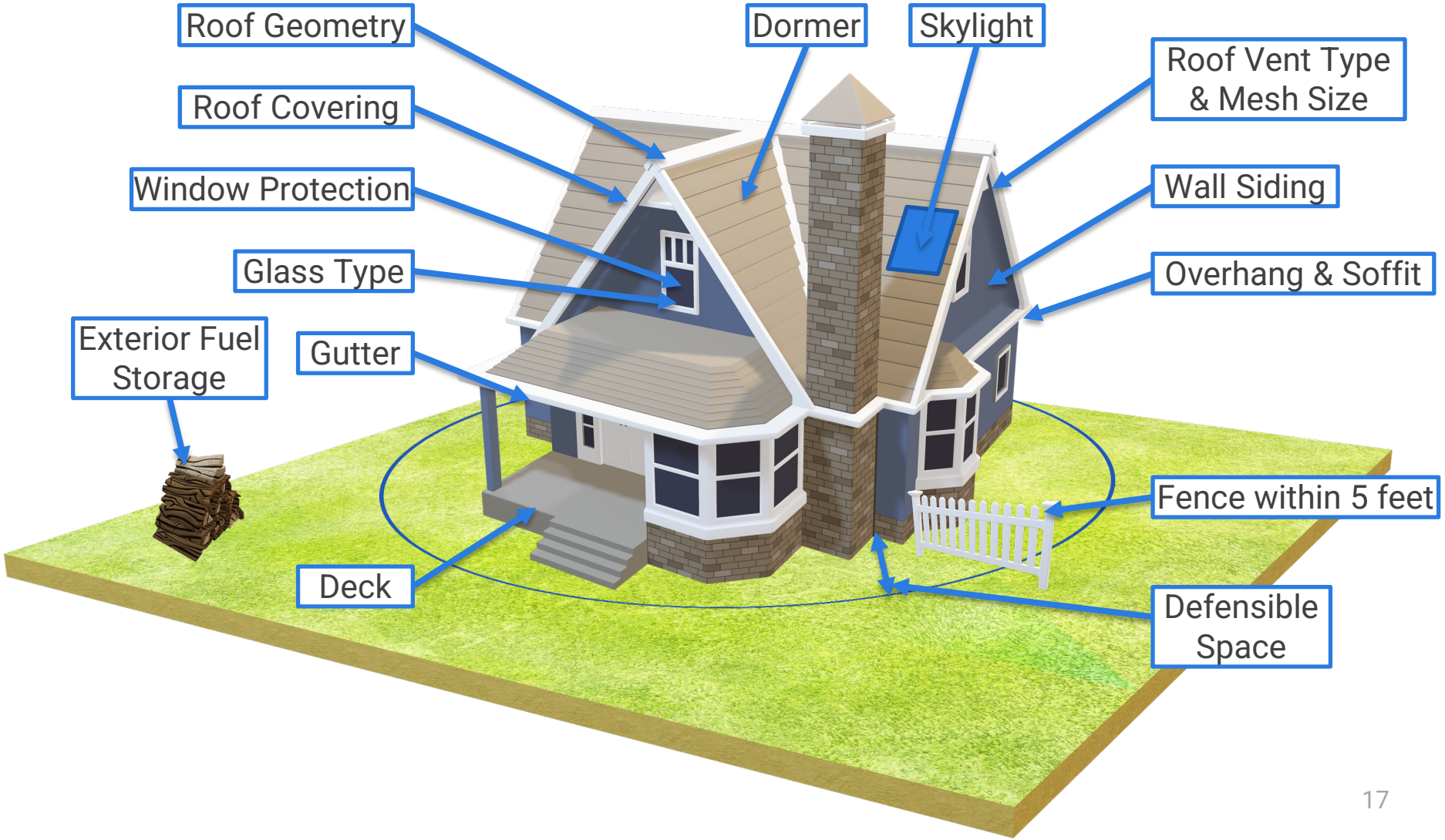
Explicitly Accounts for Different Fire Spread Mechanisms

- Surface Spread
- Surface-to-Canopy Transition
- Canopy Spread
- Fire Branding/Spotting

Model Accounts for Building Features

Building Shape



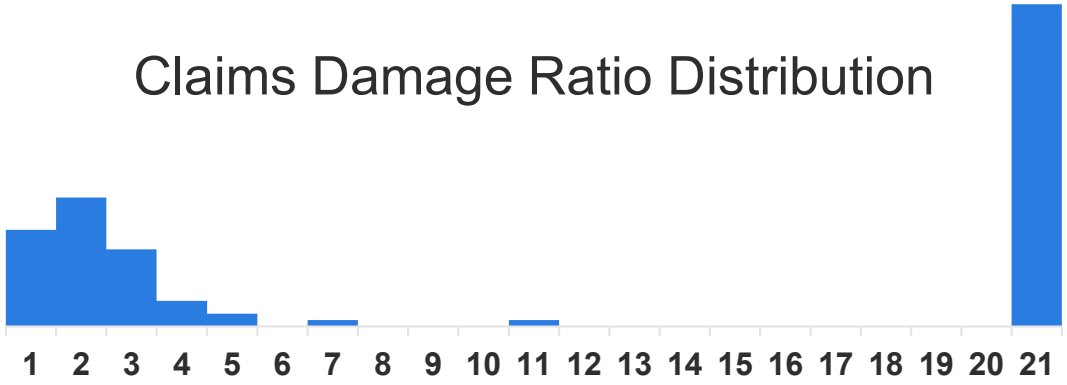


Insurance Institute for Business & Home Safety®

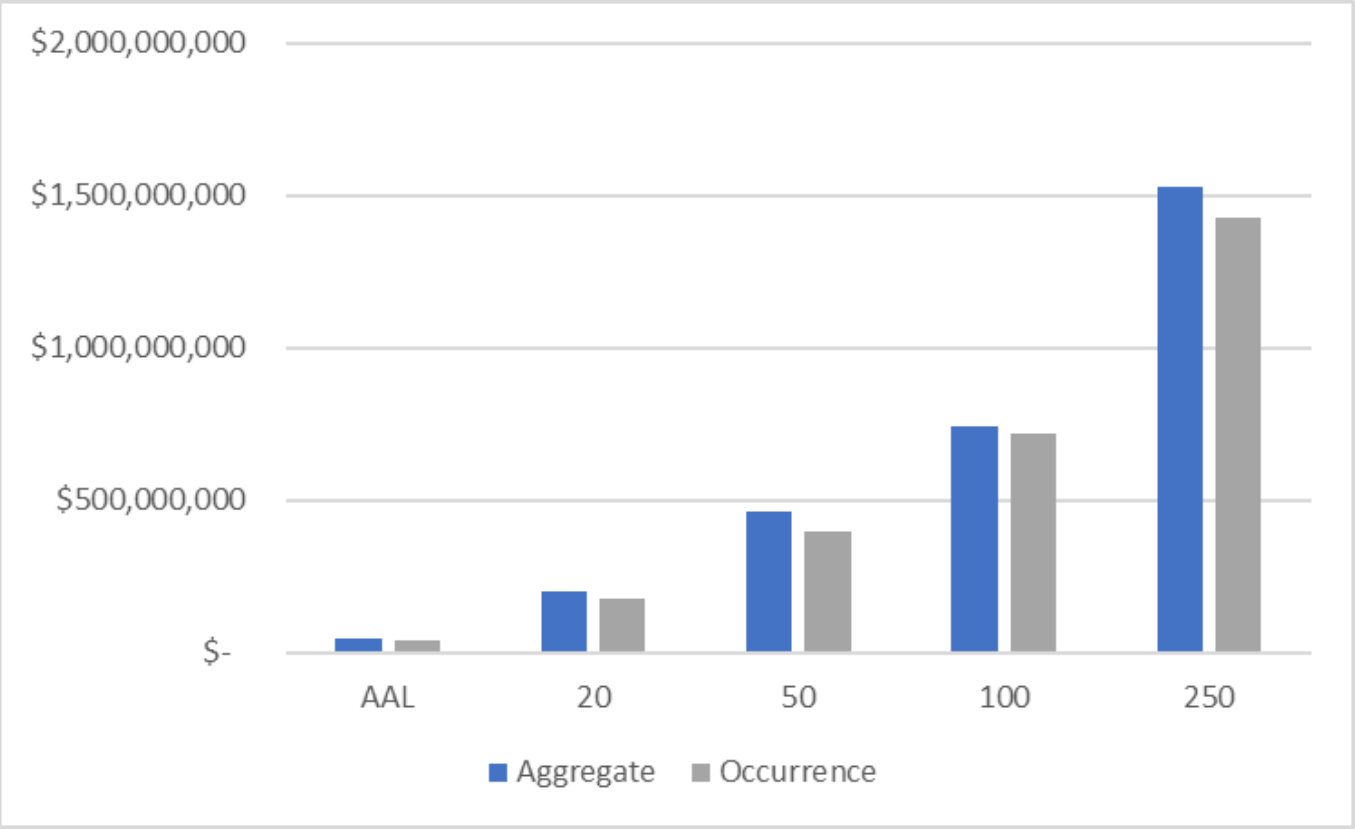
https://ibhs.org/

Damage Surveys and Claims Data

Verisk Damage Survey Photos
(Tubbs Fire, 2017)



Financial Component



Average Annual Loss (AAL): The loss that can be expected to occur per year, on average, over a period of many years

Occurrence Loss: The largest loss in each simulated year

Aggregate Loss: The sum of all loss-causing events in each simulated year

Catastrophe Model Summary

- Catastrophe models augment historical data for low frequency, high severity events
- Wildfire catastrophe models provide realistic simulations of potential losses
  - Includes weather, fuels and ignition data
  - Employs physically-based fire spread
  - Incorporates property information, building codes, wildfire mitigation and fire suppression
  - Considers increases in development and exposure over time
- Loss estimates support risk management, enabling the goal of providing financial resilience

To learn more visit: https://www.air-worldwide.com/models/wildfire2/Introducing-AIR-s-Wildfire-Model-for-the-United-States/

Questions

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