GUIDEWIRE

May 27th 2025
CASTF Book Club Meeting

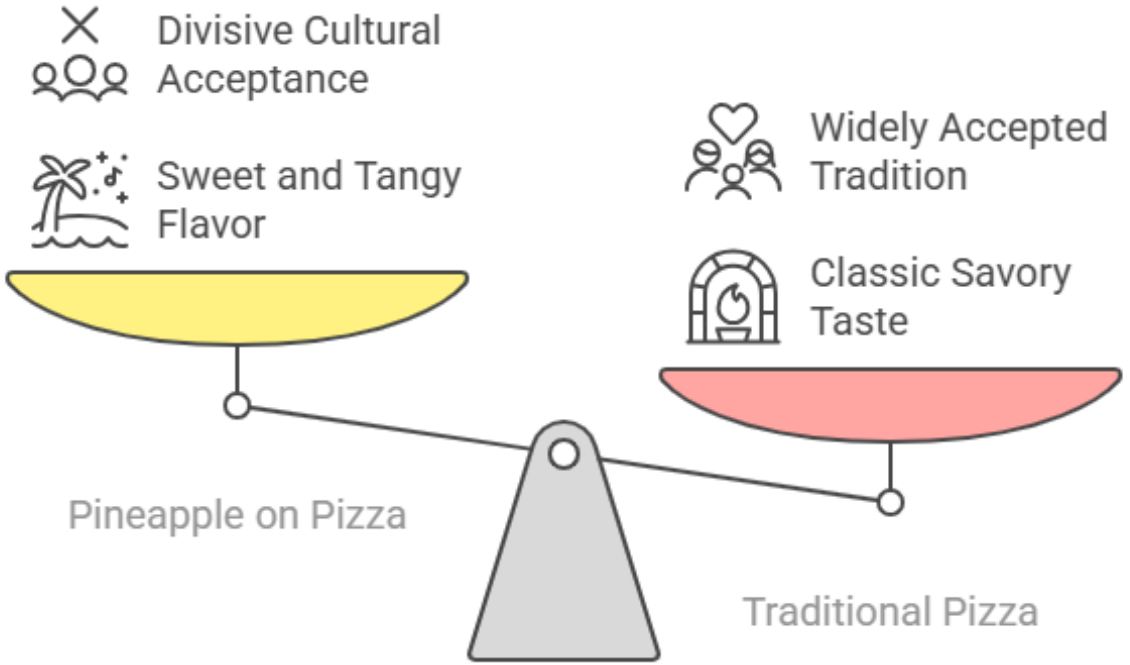
Presentator: Huairen Ye PhD

Agenda

1. Fun Question & Introduction - 5~10min
2. WF3.0 Presentation - 25~30 min
3. Question & Discussion - 5~10min

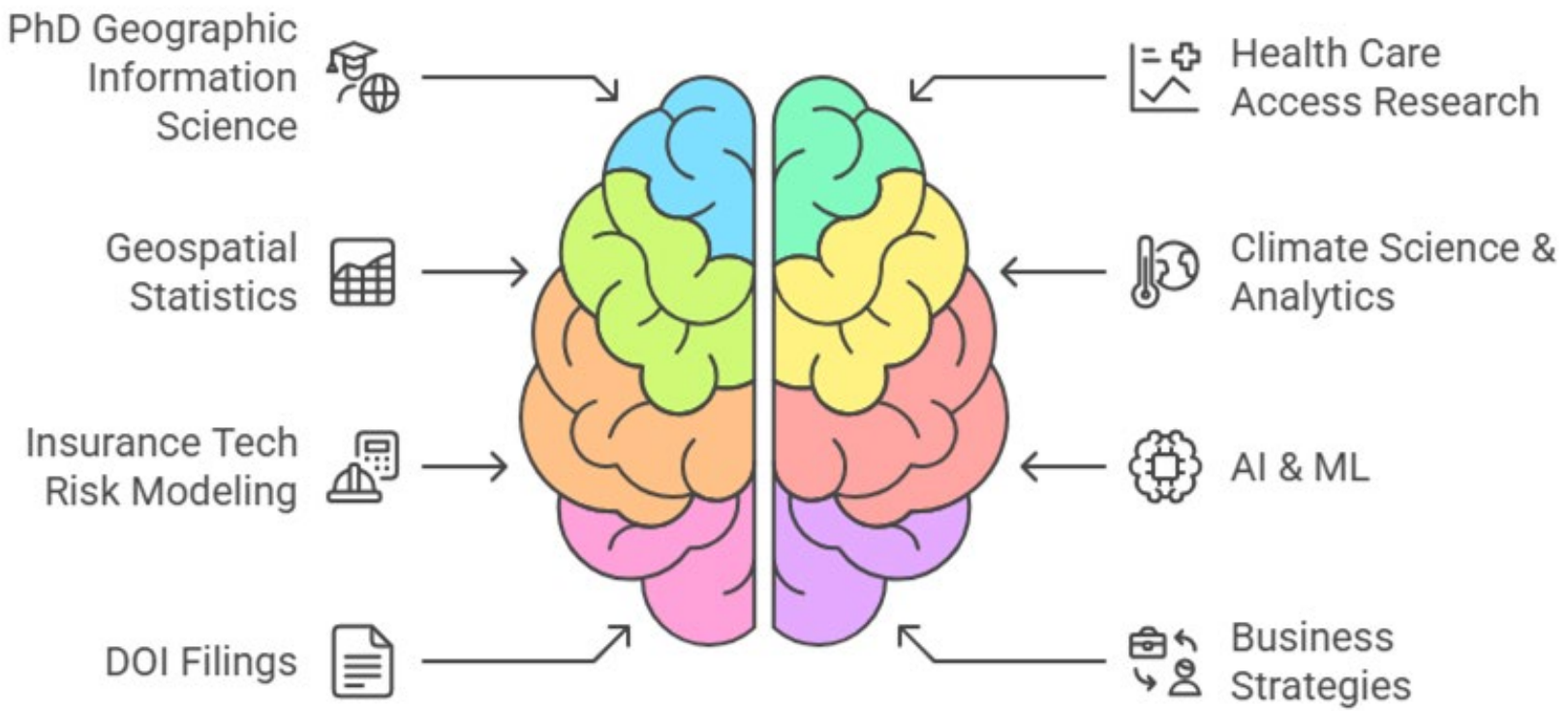
Question - The Ultimate Pizza Debate

From a regulator’s perspective: does Pineapple Belong on Pizza?



Introduction

Huairen Ye, PhD
Sr. Manager Data Science
hye@guidewire.com



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WF3.0 – Empowering Risk-Based Wildfire Underwriting & Pricing

Huairen Ye, PhD

May 27th, 2025

Challenge: Escalating Wildfire Risks & Insufficient Risk Assessment Tools

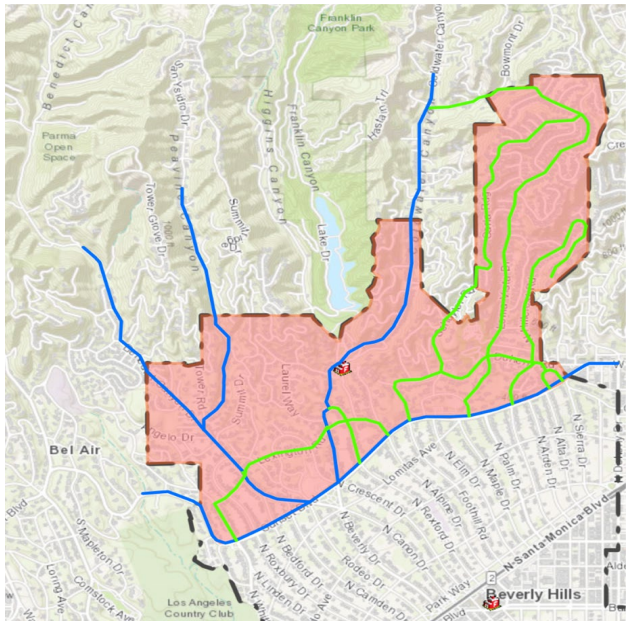
Big Loss Peril

- Wildfire has generated **$100 B+** in U.S. insured losses in the last five seasons alone.
- The 2025 Los Angeles wildfires are tracking **$25 – $39 B** insured loss (Milliman est.)

Outdated Legacy Products

- Have **limited** number of model inputs.
- **Not updated** for decades.
- **Inaccurate** risk assessment.

Insufficient Territory Rating



Question

What are the consequences if we cannot underwrite/price profitably?

Without an effective tool to underwrite and price profitably

Insurers are likely to experience:

- Skyrocketing loss costs
- Insurers exiting cat-exposed territories
- Loss reserve inadequacy
- Insolvency Risk

Pioneering Property-Specific Assessment - WF3.0

- Pinpoint Wildfire Risk at the Property Level
- Power Predictions with Machine Learning
- Unlock Insights with Guidewire Claims Data
- Built for Regulatory Confidence

Model Structure

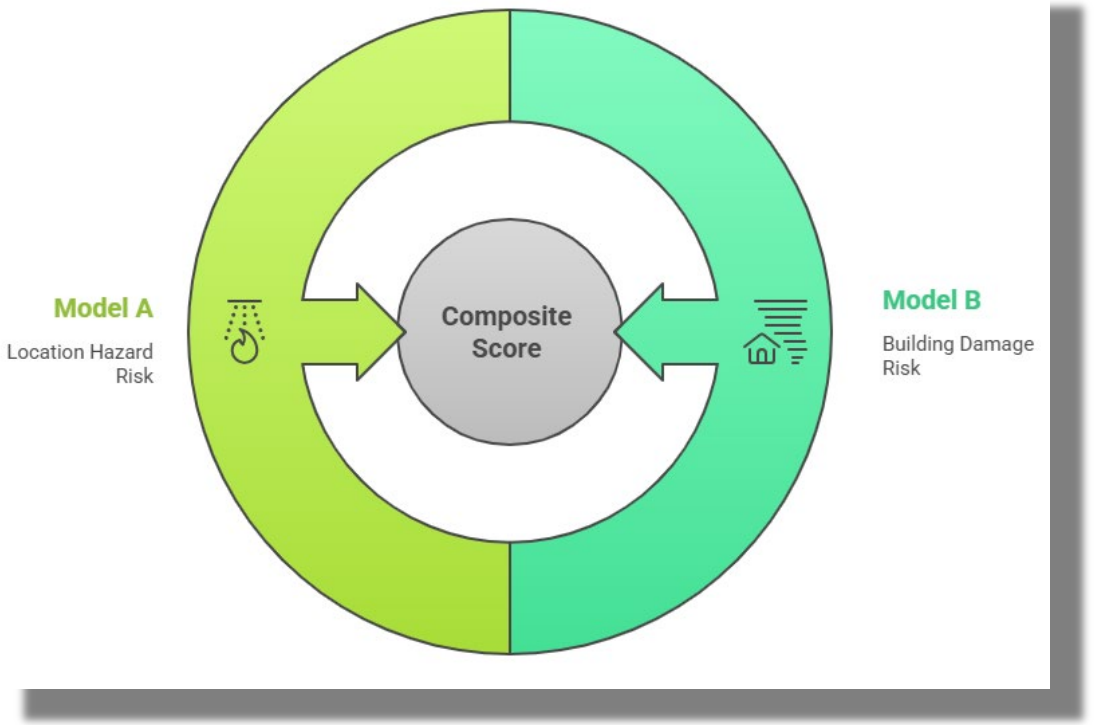
Model Structure

- Trained on millions of records, the model has a two layer structure:
- Composite Score = Model A*Model B
  - Model A - Wildfire Hazard

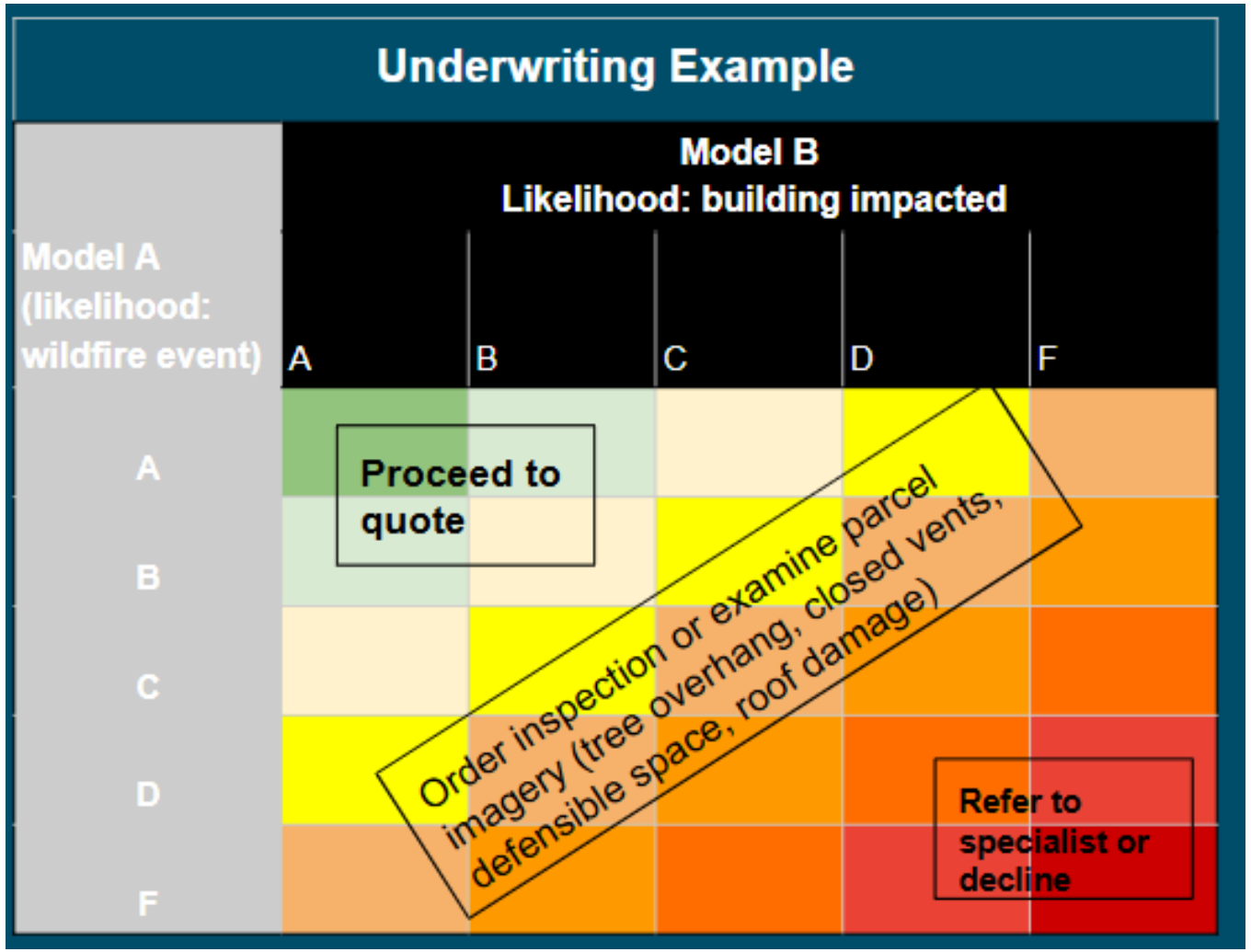
The risk of a location having a wildfire event

  - Model B - Structure Impact

The risk of a property being damaged if it’s in a wildfire event



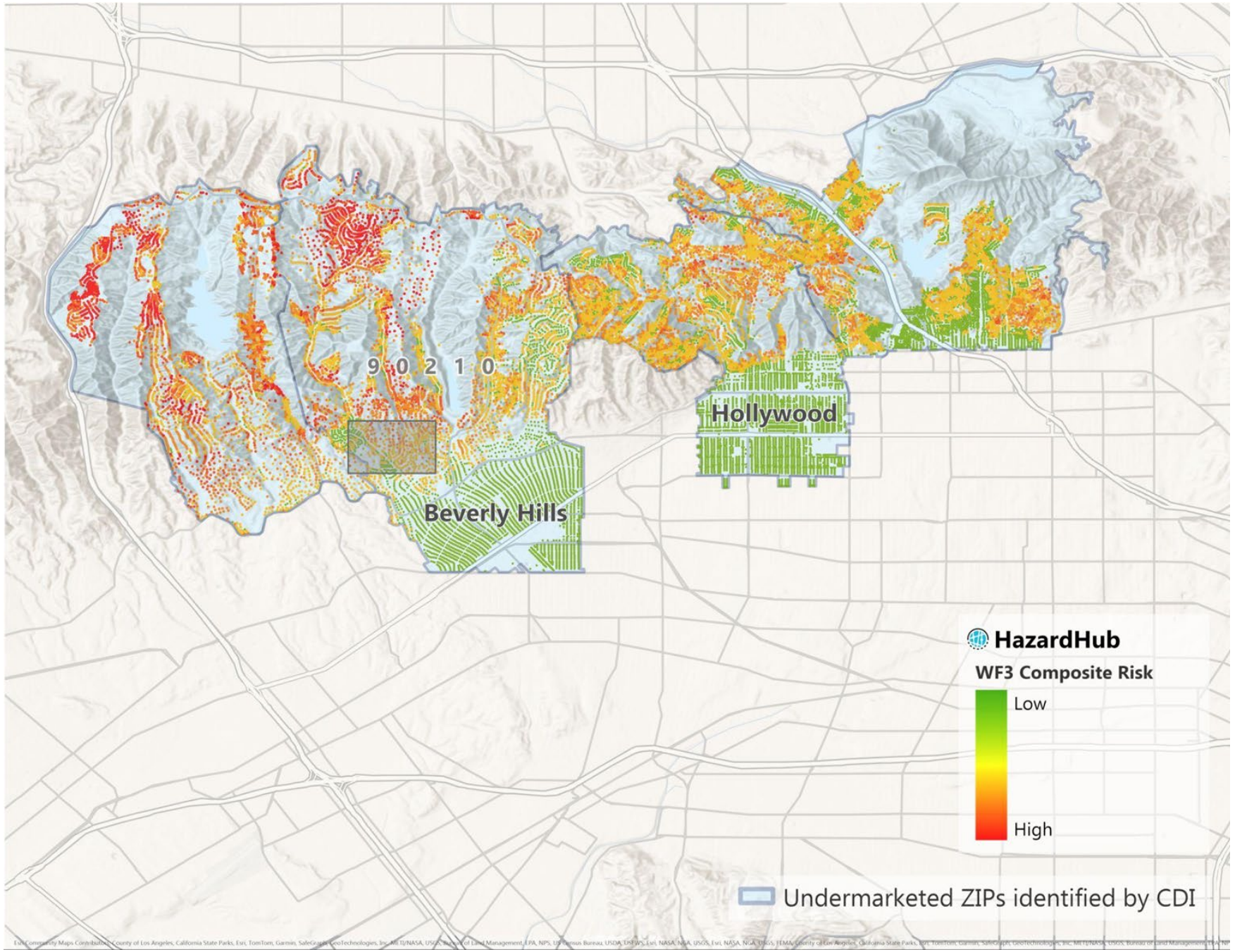
Underwriting Example - WF3.0



Property Level Resolution

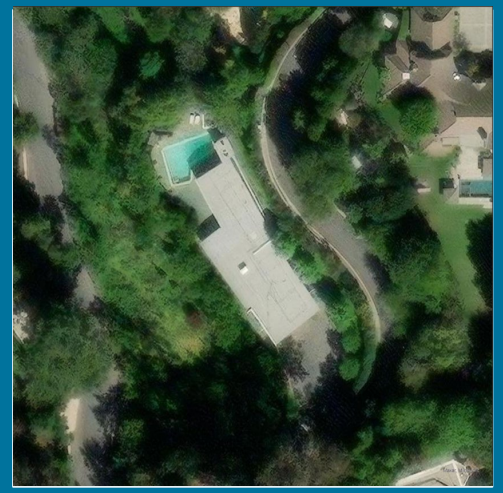
Los Angeles County

California



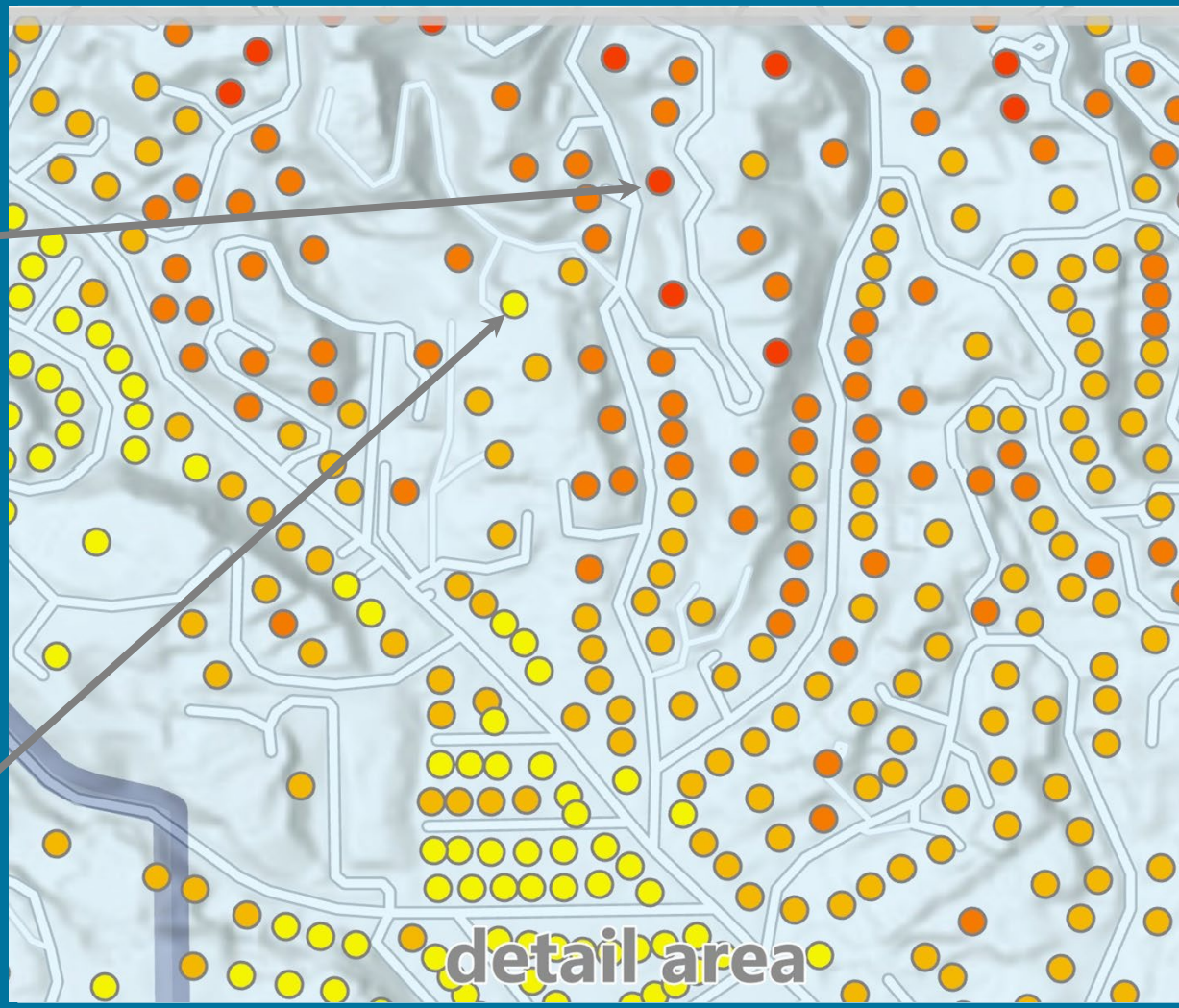
Los Angeles County

Note:
Under Probability Score we listed the top 3 factors driving difference in probability scoring between these two properties. Given the properties are within proximity of each other, number of wildfire incidents within 5 miles are the same for both properties.



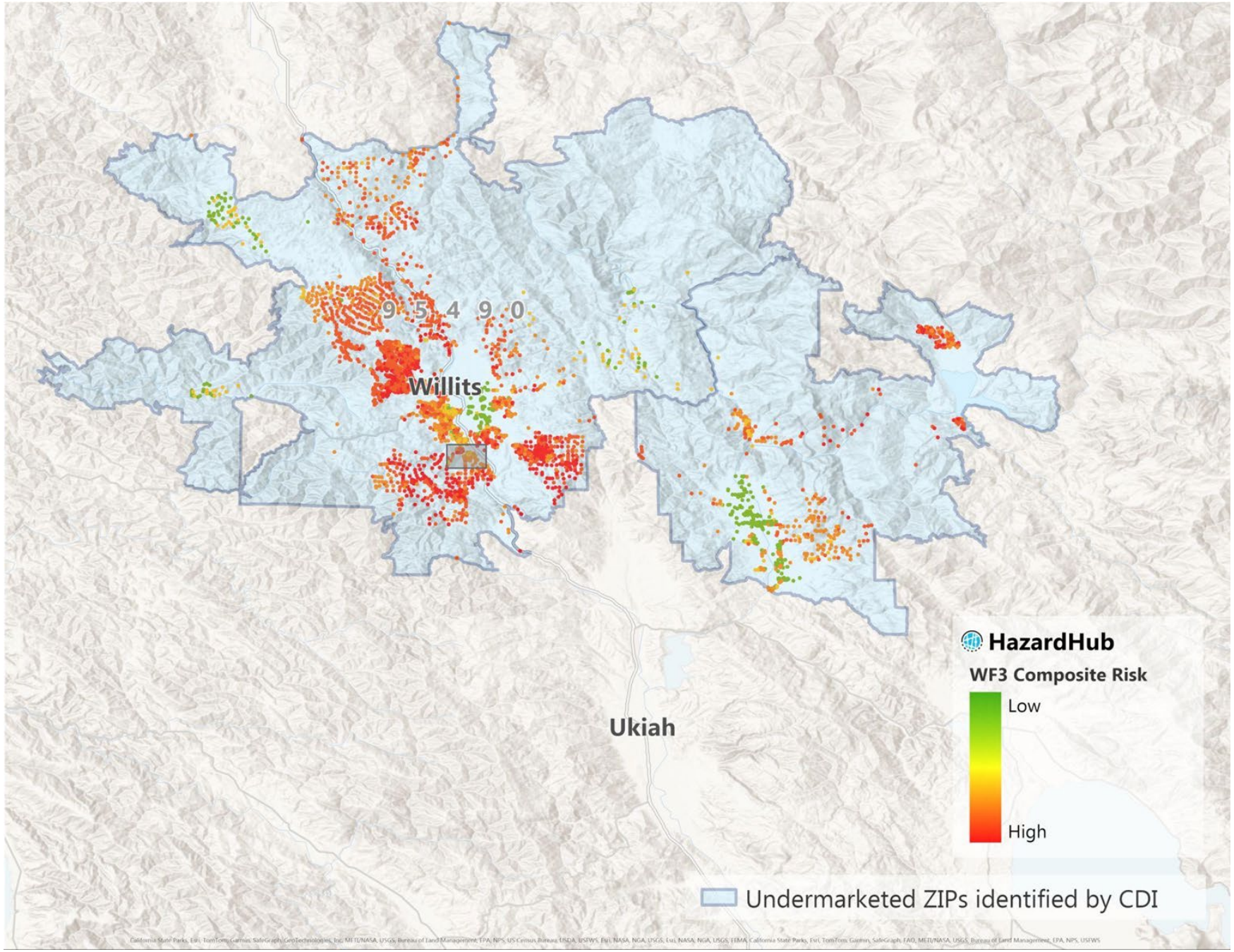
1149 Tower Rd, Beverly Hills, CA 90210	
Composite Score	30
Probability	31%
Elevation (ft)	573
Slope (degrees)	22
Hydrants within 1000 feet	9
Wildfire Incidents within 5 miles (2014-2024)	9

9920 Tower Ln, Beverly Hills, CA 90210	
Composite Score	7
Probability	7%
Elevation (ft)	549
Slope (degrees)	3
Hydrants within 1000 feet	14
Wildfire Incidents within 5 miles (2014-2024)	9



Mendocino County

California

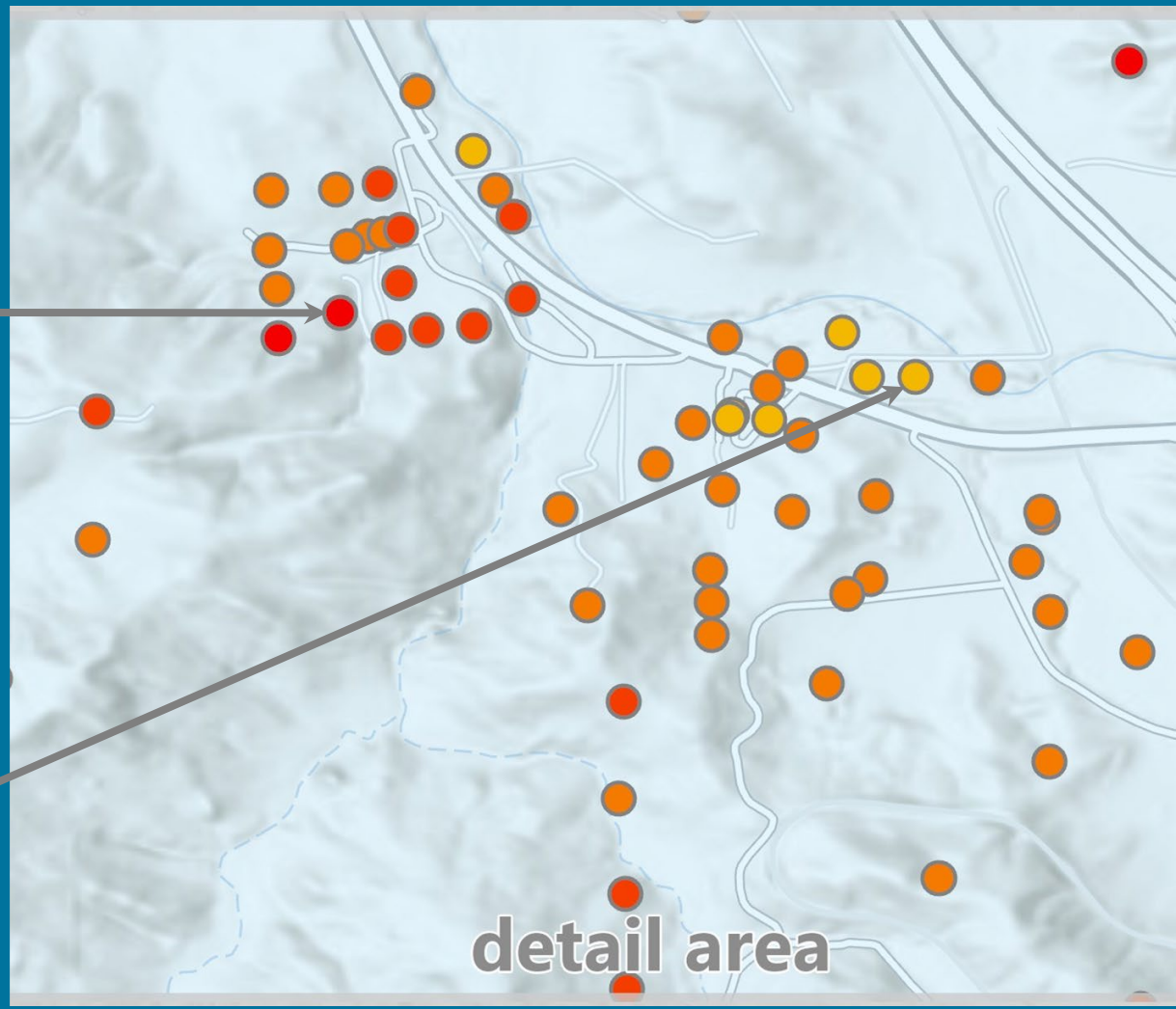


Mendocino County

Note:
Under Probability Score we listed the top 3 factors driving difference in probability scoring between these two properties. Given the properties are within proximity of each other, number of wildfire incidents within 5 miles are the same for both properties.

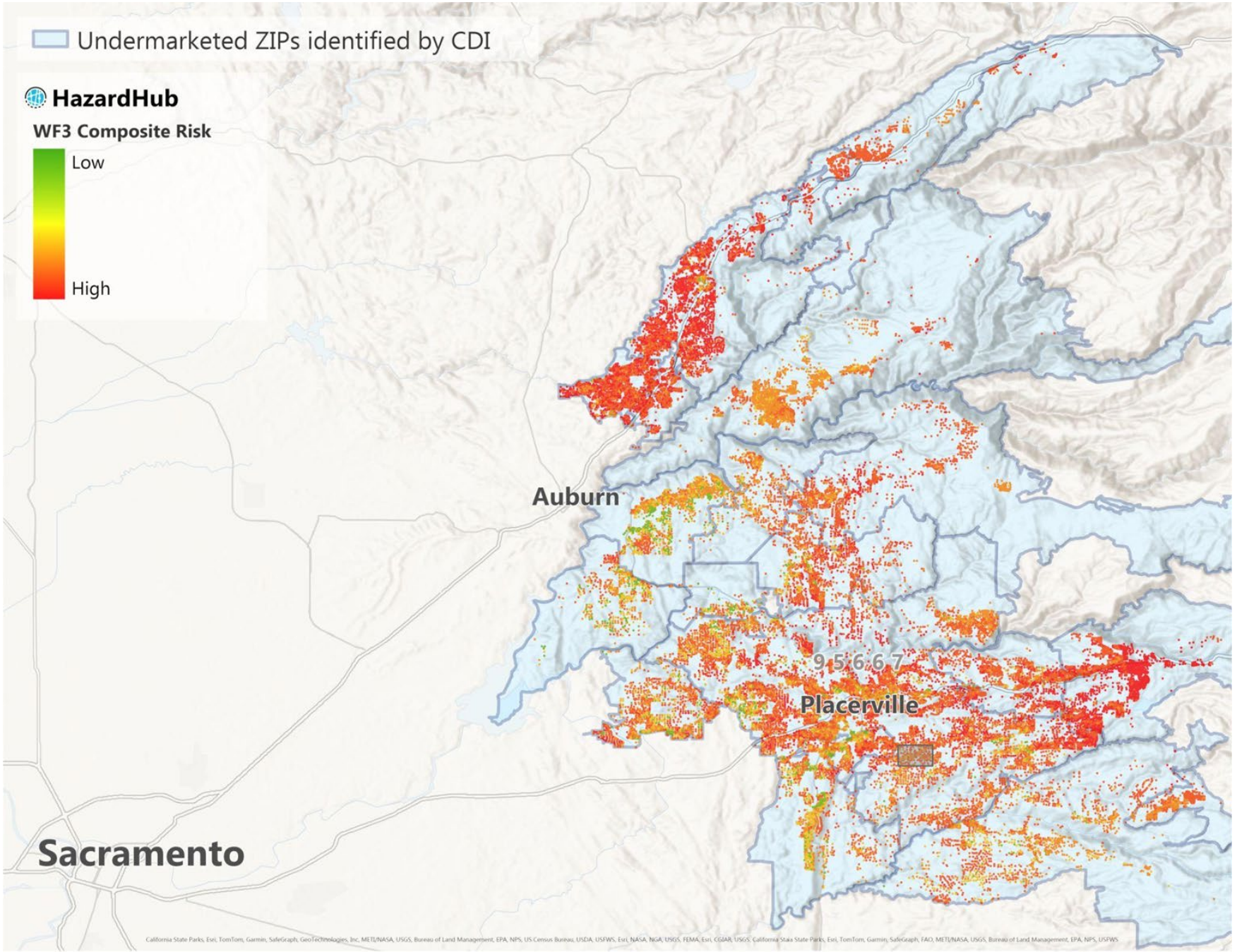
20198 Hollands Ln, Willits, CA 95490	
Composite Score	184
Probability	75%
Landcover Class	Mixed and Evergreen Forest
Slope (degrees)	23
Hydrants within 1000 feet	0
Wildfire Incidents within 5 miles (2014-2024)	17

19853 S Main St, Willits, CA 95490	
Composite Score	42
Probability	17%
Landcover Class	Shrub/Scrub
Slope (degrees)	1
Hydrants within 1000 feet	0
Wildfire Incidents within 5 miles (2014-2024)	17



El Dorado / Placer County

California



El Dorado County

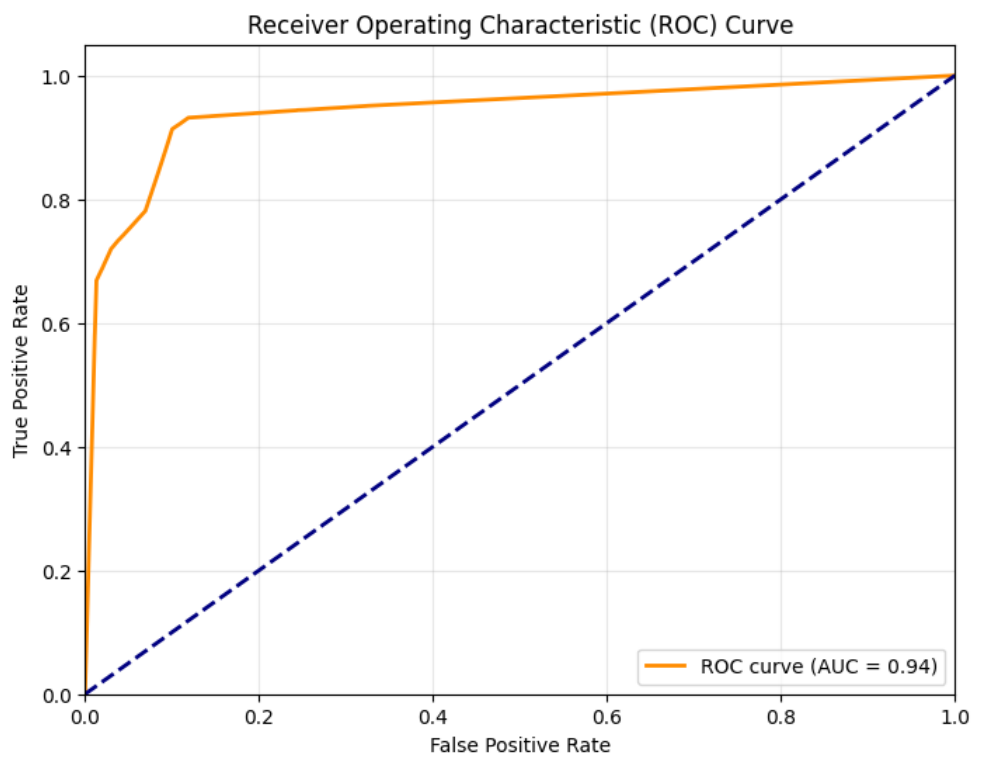
Note:
Under Probability Score we listed the top 3 factors driving difference in probability scoring between these two properties. Given the properties are within proximity of each other, number of wildfire incidents within 5 miles are the same for both properties.

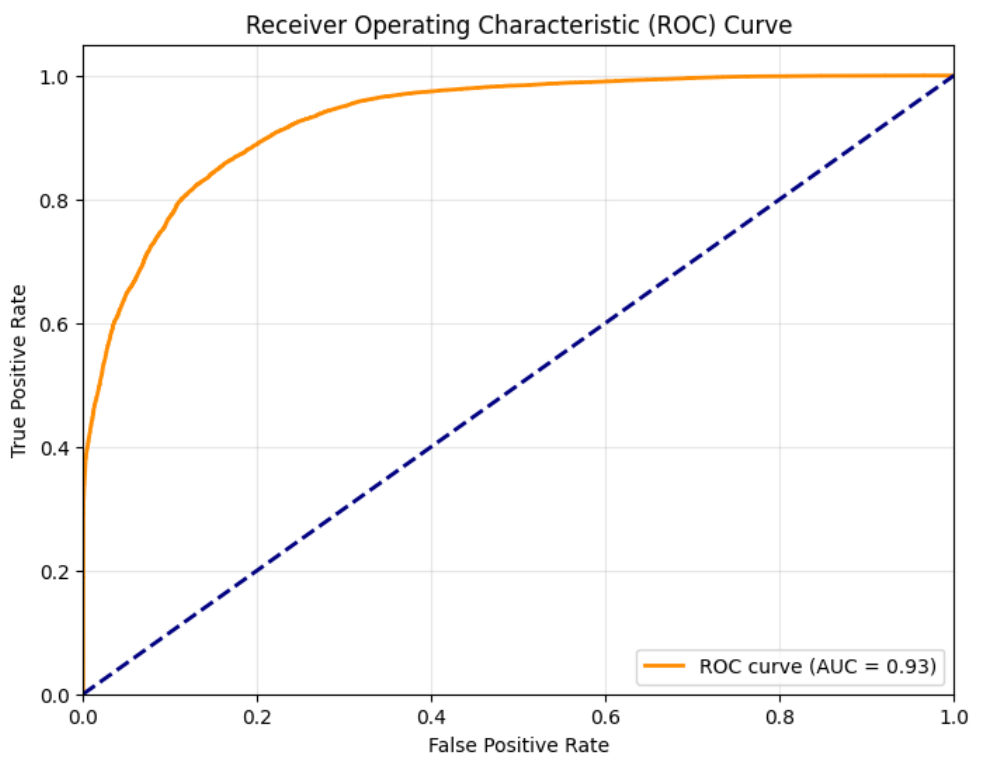
1839 Pleasant Valley Rd, Placerville, CA 95667	
Composite Score	238
Probability	72%
Aspect	South
Slope (degrees)	12
Hydrants within 1000 feet	1
Wildfire Incidents within 5 miles (2014-2024)	49

1903 Pleasant Valley Rd, Placerville, CA 95667	
Composite Score	152
Probability	46%
Aspect	North
Slope (degrees)	5
Hydrants within 1000 feet	1
Wildfire Incidents within 5 miles (2014-2024)	49

Model Performance

Strong Model Performance on Cross-fold Validation





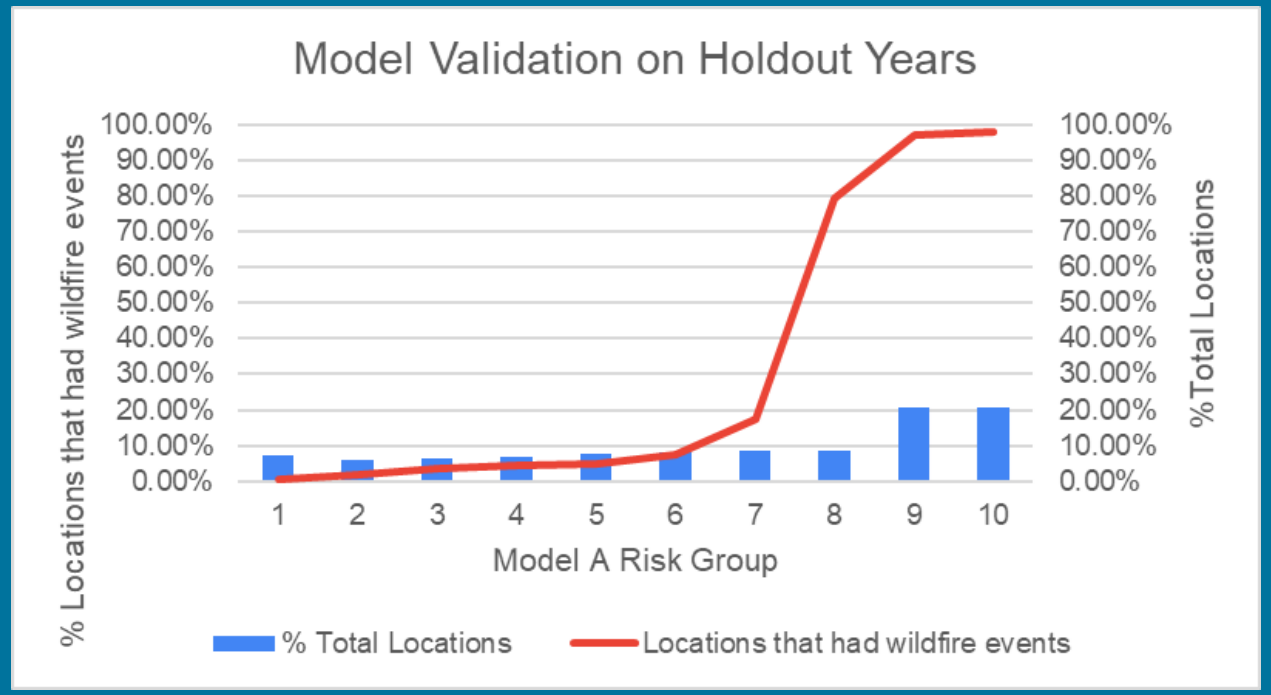
Model A: Wildfire Likelihood

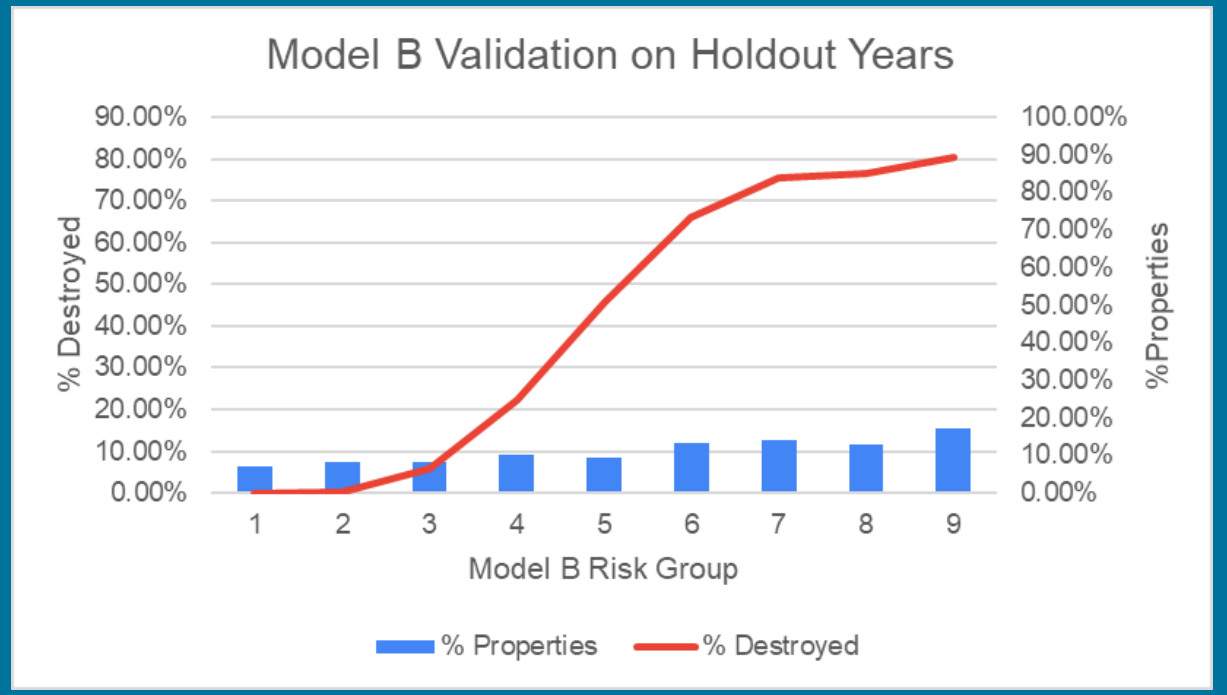
- Precision: 0.91
- Recall: 0.90
- Accuracy: 0.91
- F1 Score: 0.92
- AUC-ROC: 0.94

Model B: Structure Impact Likelihood

- Precision: 0.85
- Recall: 0.85
- Accuracy: 0.85
- F1 Score: 0.85
- AUC-ROC: 0.93

Strong Model Performance on Holdout Years





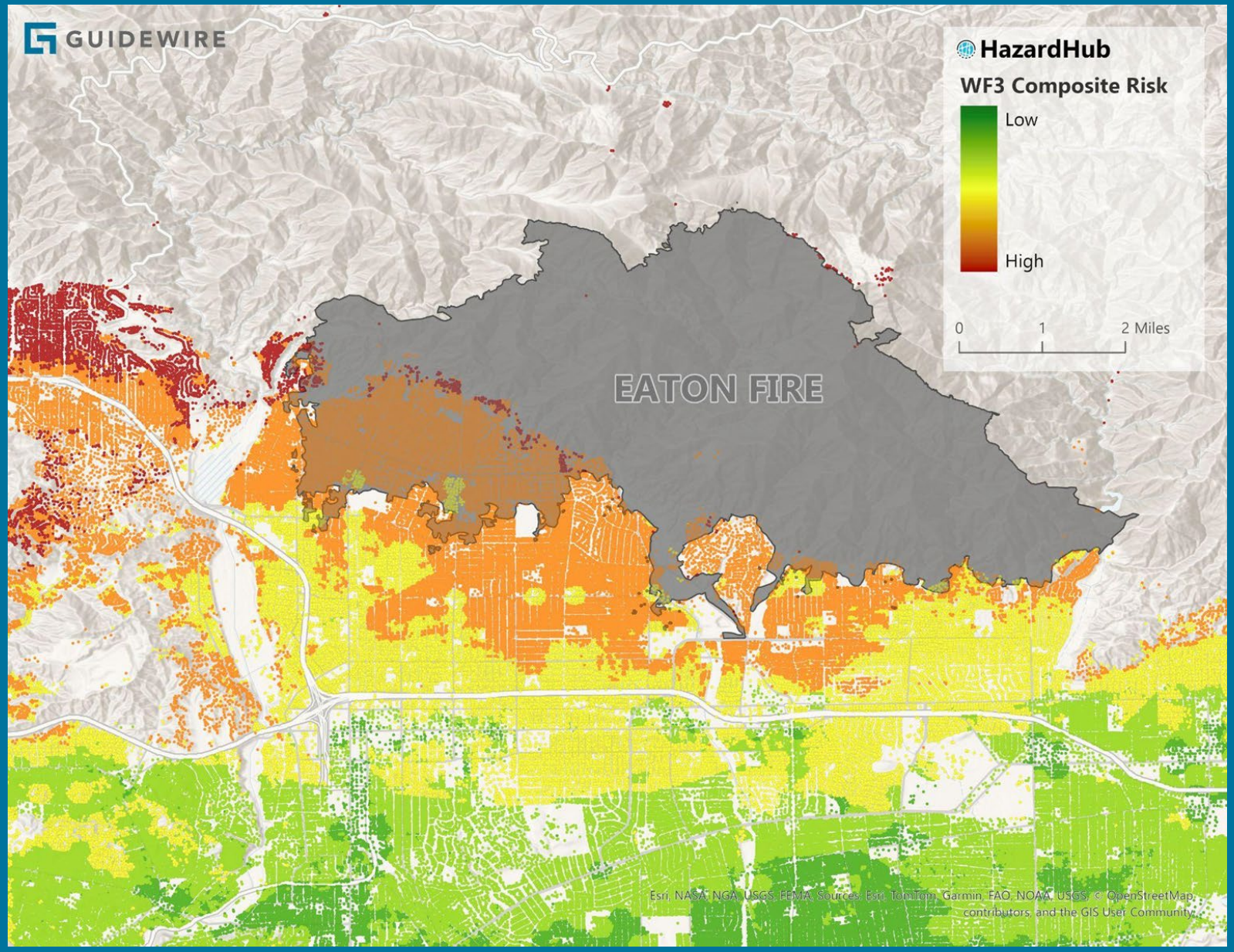
LA Fire Case Study

LA Case Study - Eaton Fire

Risk of being within the wildfire perimeter:

- 96% of properties within the wildfire perimeter are graded D-F
- 4% of properties within the wildfire perimeter are graded C.

WF3 National Grade	No.Properties	%Properties
A	0	0%
B	0	0%
C	405	4%
D	9107	93%
F	332	3%
Total	9,844	

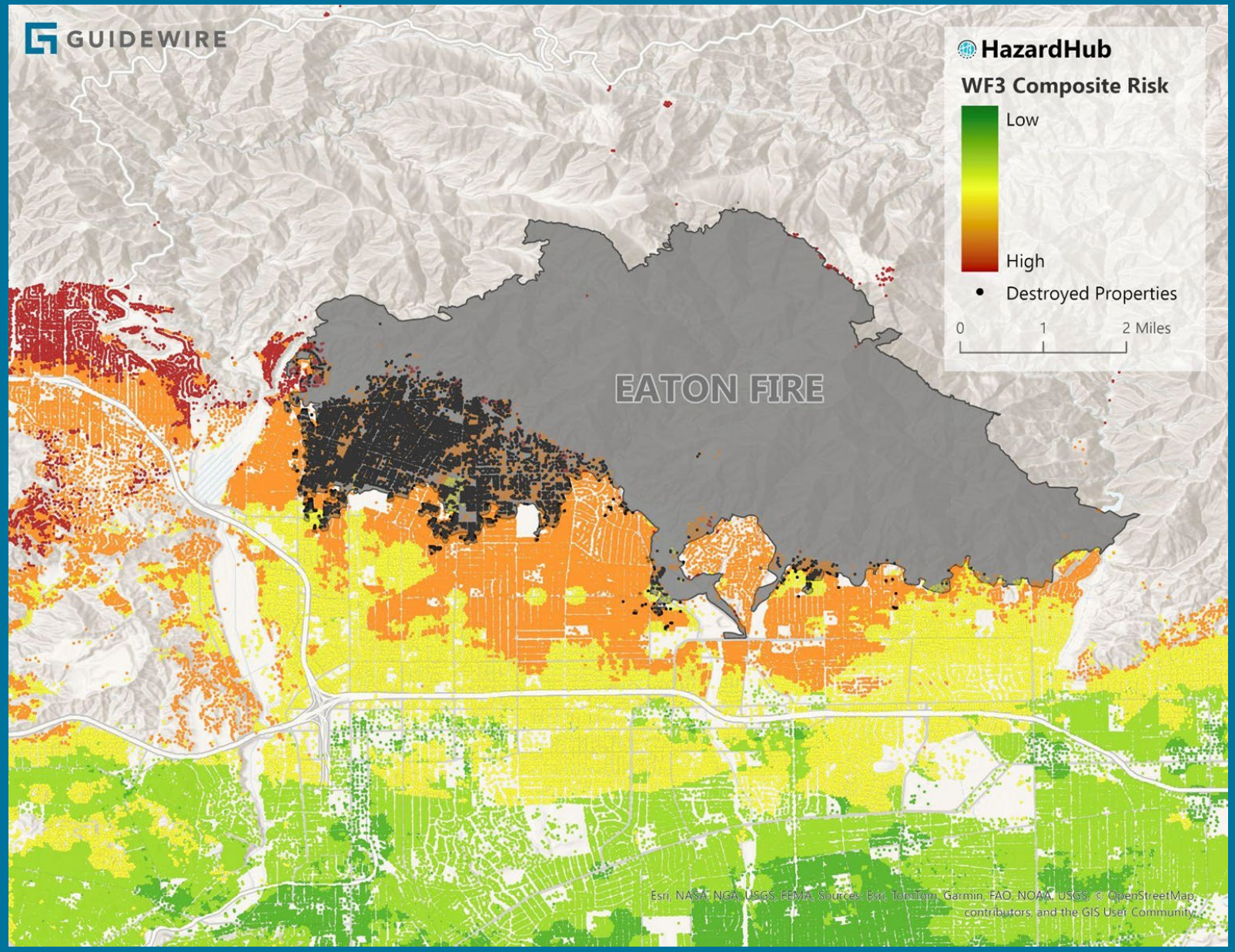


LA Case Study - Eaton Fire

Risk of being damaged in a wildfire event.

- Damage data was collected while the wildfire was still going on.
- Recall Rate 96.8%
- High True Positive
- Low False Negative

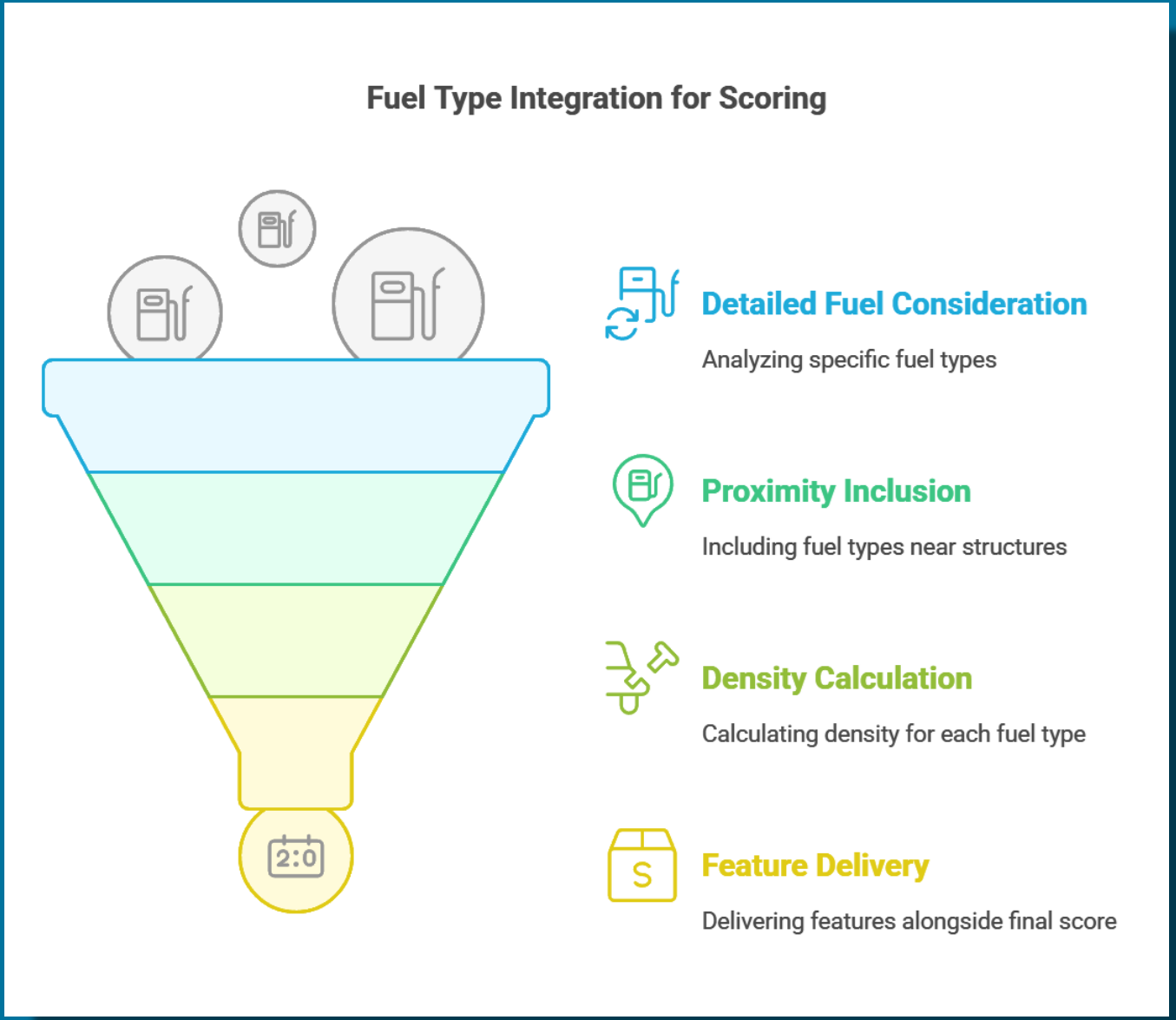
WF3 - Eaton	Actual High Risk (Destroyed)	Actual Low Risk (Not Destroyed)
Predicted High - D or F	6518	2921
Predicted Med - C	216	189
Predicted Low - A or B	0	0
Recall Rate	96.8%	



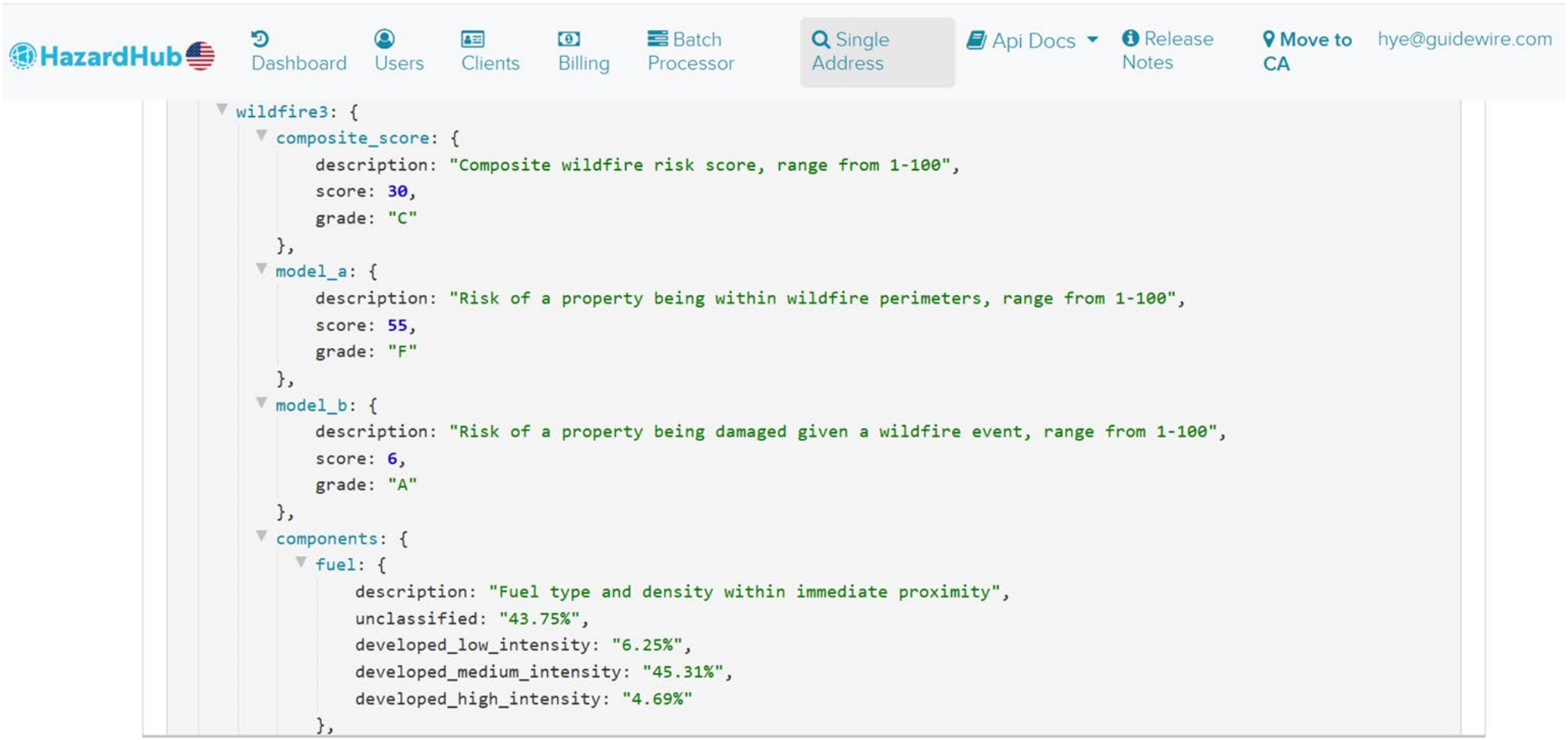
API Demo

Feature Engineering Example - Fuel type & density

- Each feature that goes into the model will be delivered along with the final score on the API.
- The model considers detailed fuel type.
- ALL fuel types within the proximity of a structure are included.
- Density for each fuel type is included in the model.



WF3.0 API Demo



Questions

1. What are your biggest concern when it comes to third party vendor Wildfire models?
2. What could make a model like this easier to review in rate filings?

Thank You