

## Look forward in confidence with Athena's Intelligence

Athena's Intelligence is built on combining vast amounts of data originating from various wildfire and environmental agencies and organizations. In its original form, the data is disaggregated and unstructured. Athena's Voice of the Acre™ technology synthesizes this data into a useable and computable format.

### Summary

This document contains 3 wildfires from 2019 and 2020 in Sonoma County, California. Also included are 605 geo-located houses affected in the each of the wildfires that originate from official damage inspection reports. The housing values utilized come from a 3<sup>rd</sup> party building information vendor. Athena applied its conditional fingerprinting to the census blocks and buildings within the wildfire perimeters. Then ran the fingerprinted census blocks and properties through its geo-conditional probability and prediction models.



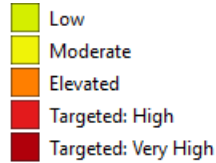
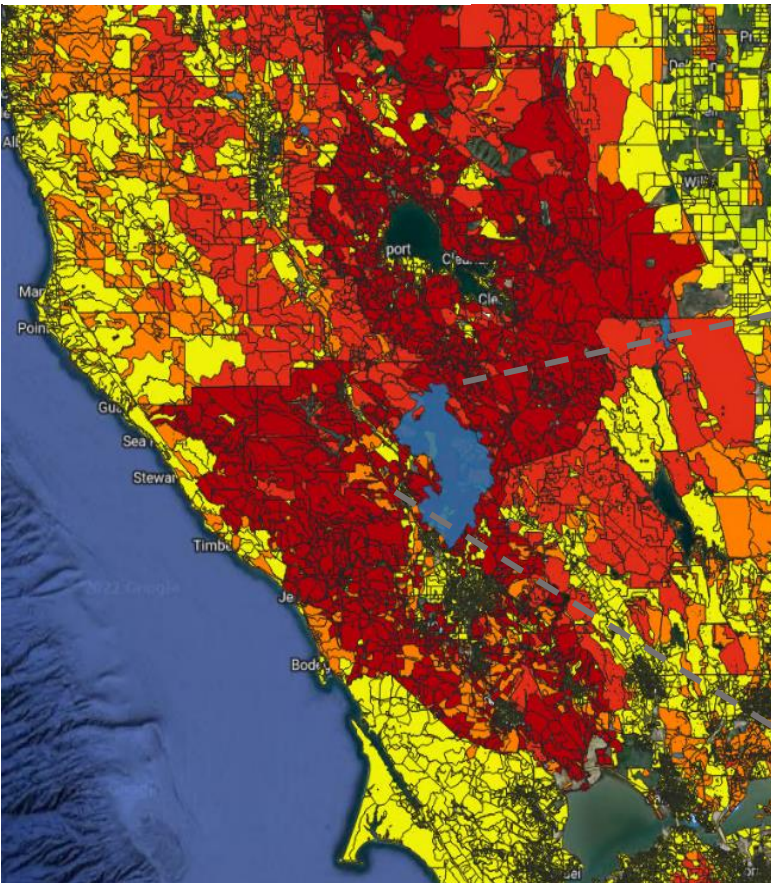
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### Highlights

The 3 wildfires covered 129 census blocks and a sampling of housing units totaled over \$955 million in value. The fingerprints were generated 8 to 10 months prior to each wildfire. Athena's geo-conditional probability model projects the spatial area of potential wildfire perimeters. Athena correctly projected and classified **89 census blocks, or 69%** as a Targeted Wildfire Risk. From the 605 houses utilized, Athena made **519 correct predictions or 86%**. Of the \$955 million of total housing value, \$207,981,000 were damaged or destroyed and \$747,881,000 were left undamaged. Athena's Wildfire Damage Prediction Model correctly predicted **\$102,877,000 or 50% of the total damaged value and \$738,702,000 or 98% of the undamaged value...8 to 10 months in advance.**

## What is the value of having this level of foresight?

- Identify the highest risk and highest probable locations
- Determine which policies can/should non-renew
- Consider reinsurance strategy
- Identify areas of lower fire hazard for premium growth
- Provide vital intelligence to an organization's enterprise risk management protocols (ERM)

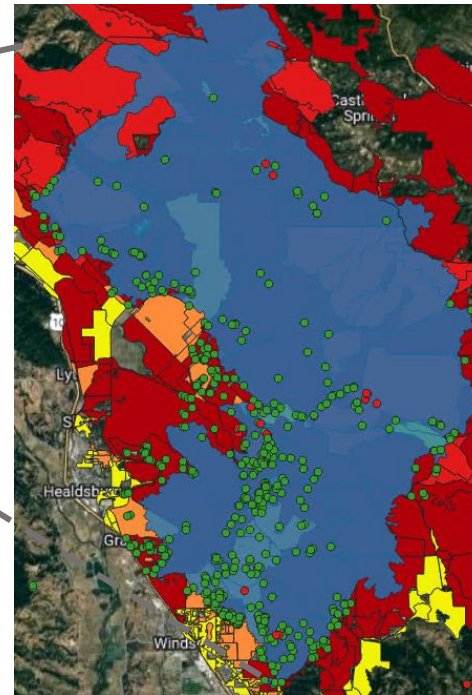


## 2019 Geo Conditional Probability Map: North Bay California

Generated December 2018

Kincadee Wildfire (wildfire perimeter in blue): Oct 2019

More than 120 buildings damaged or destroyed



### Perimeter Projections & Probability

Total Census Blocks Affected: 44

# of Census Blocks Athena Projected as a Targeted Probability Risk: 27

### Fingerprinted Building Predictions

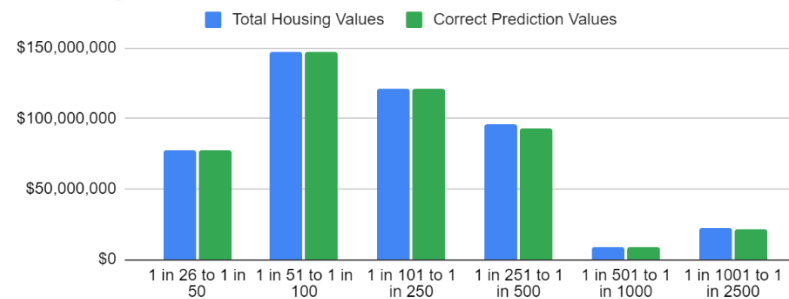
# of Bldgs within Athena's Targeted Census Blocks: 171

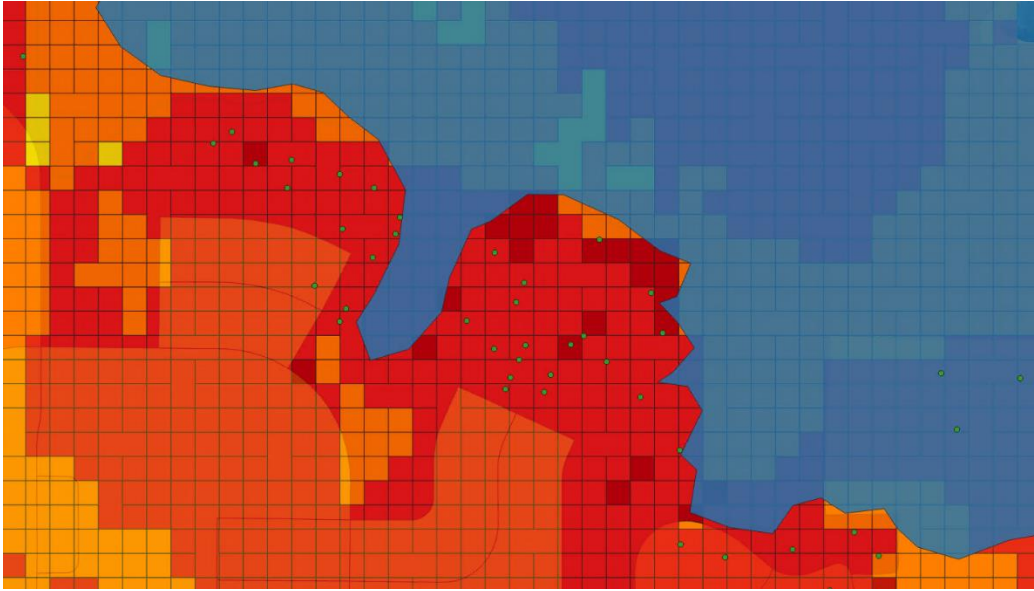
# of Correct Predictions in Targeted areas (if building would be damaged or not): 169

Green dots in picture represent building locations of Athena's predictions. Buildings and their actual result from wildfire originate from CalFire's Damage Inspection report. Green equals correct prediction, Red equals incorrect.

Probability Risk Class	Census Blocks	Houses	Correct Predictions
Targeted:	27	171	169
Elevated	14	45	45
Moderate	1	7	7
Low	2	26	26
<b>Grand Total</b>	<b>44</b>	<b>249</b>	<b>247</b>

Total Housing Values and Correct Prediction Values





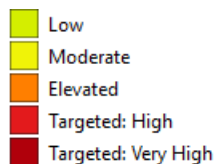
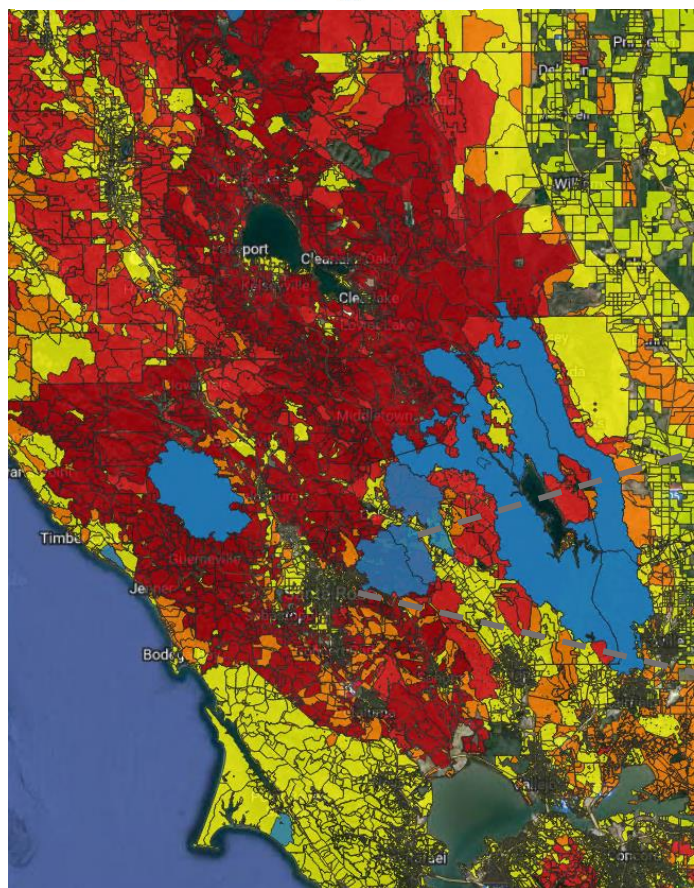
Zoom in on perimeter boundary.

Behind the classification of every census block exists millions of pixels. Each 30 X 30 sq meter pixel is made up of Athena's Voice of the Acre™ composite score. This allows Athena's modeling to generate a high level of resolution in its targeting of specific risk profiles.

Housing values, supplied by Athena's property information partner, were applied to buildings in order to demonstrate the real world value of Athena's Voice of the Acre™.

KINCADE FIRE		Predicted		Actual		Difference
Targeted Group Odds	Total Targeted Value	Damaged	No Damage	Damage	No Damage	Damage
1 in 1001 to 1 in 2500	\$ 24,833,000	\$ 2,960,000	\$ 21,873,000	\$ 7,855,000	\$ 16,978,000	\$ (4,895,000)
1 in 501 to 1 in 1000	\$ 2,017,000	\$ -	\$ 2,017,000	\$ -	\$ 2,017,000	\$ -
1 in 251 to 1 in 500	\$ 107,083,000	\$ 6,839,000	\$ 100,244,000	\$ 1,980,000	\$ 105,103,000	\$ 4,859,000
1 in 101 to 1 in 250	\$ 51,096,000	\$ 961,000	\$ 50,135,000	\$ 1,723,000	\$ 49,373,000	\$ (762,000)
1 in 51 to 1 in 100	\$ 164,958,000	\$ 7,612,000	\$ 157,346,000	\$ 7,568,000	\$ 157,390,000	\$ 44,000
1 in 26 to 1 in 50	\$ 66,831,000	\$ 1,162,000	\$ 65,669,000	\$ 914,000	\$ 65,917,000	\$ 248,000
<b>Totals</b>	<b>\$ 405,560,000</b>	<b>\$ 19,534,000</b>	<b>\$ 397,284,000</b>	<b>\$ 20,040,000</b>	<b>\$ 396,778,000</b>	<b>\$ (506,000)</b>



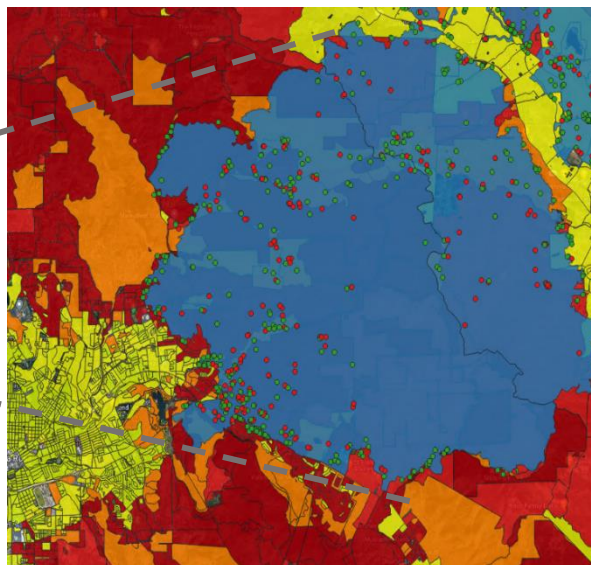


## 2020 Geo Conditional Probability Map: North Bay California

Generated end of year 2019

Glass Wildfire (wildfire perimeter in blue): Sept 2020

1,555 structures destroyed (334 homes in Sonoma County)



### Perimeter Projections & Probability

Total Census Blocks Affected: 58

# of Census Blocks Athena Projected as a Targeted Probability Risk: 39

### Fingerprinted Building Predictions

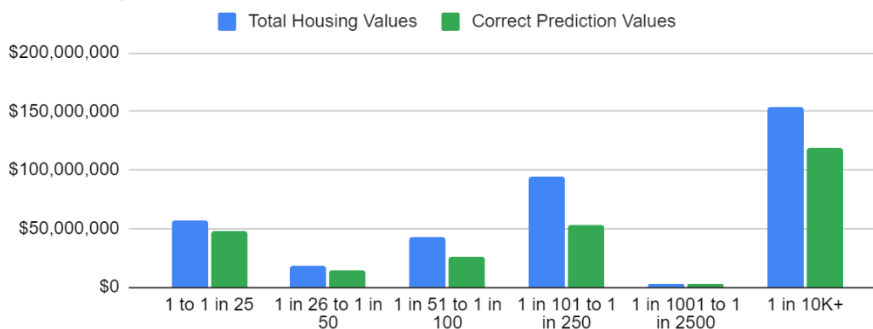
# of Bldgs within Athena's Targeted Census Blocks: 287

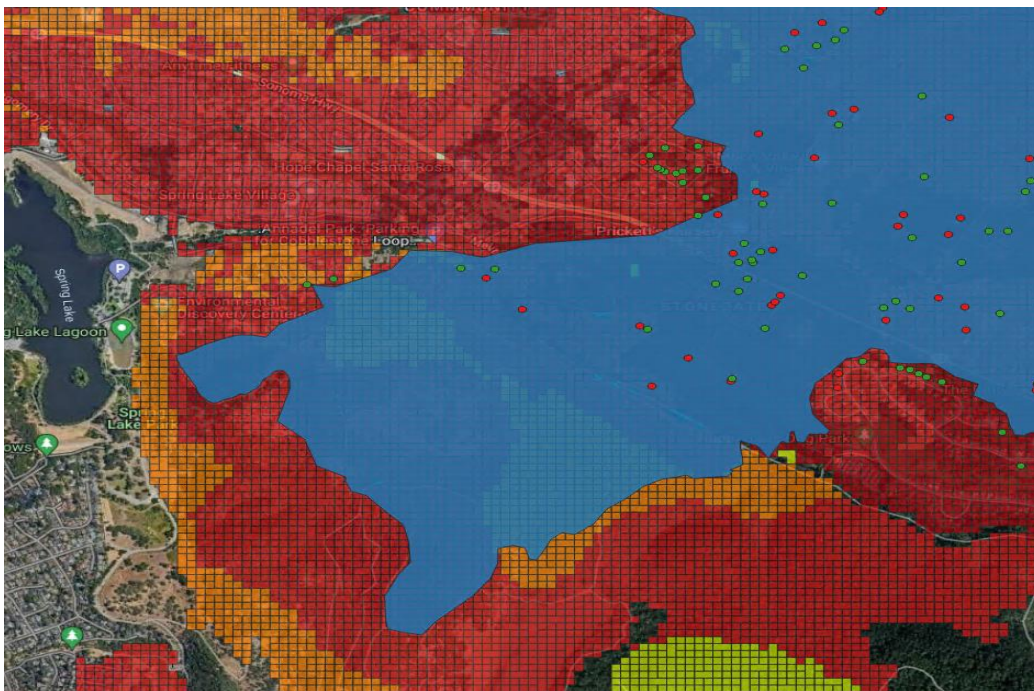
# of Correct Predictions in Targeted areas (if building would be damaged or not): 191

Green dots in picture represent building locations of Athena's predictions. Buildings and their actual result from wildfire originate from CalFire's Damage Inspection report. Green equals correct prediction, Red equals incorrect

Probability Risk Class	Census Blocks	Houses	Correct Predictions
Targeted:	39	191	138
Elevated	15	86	61
Moderate	3	6	4
Low	1	4	4
<b>Grand Total</b>	<b>58</b>	<b>287</b>	<b>207</b>

Total Housing Values and Correct Prediction Values





Zoom in on perimeter boundary.

Behind the classification of every census block exists millions of pixels. Each 30 X 30 sq meter pixel is made up of Athena's Voice of the Acre™ composite score. This allows Athena's modeling to generate a high level of resolution in its targeting of specific risk profiles.

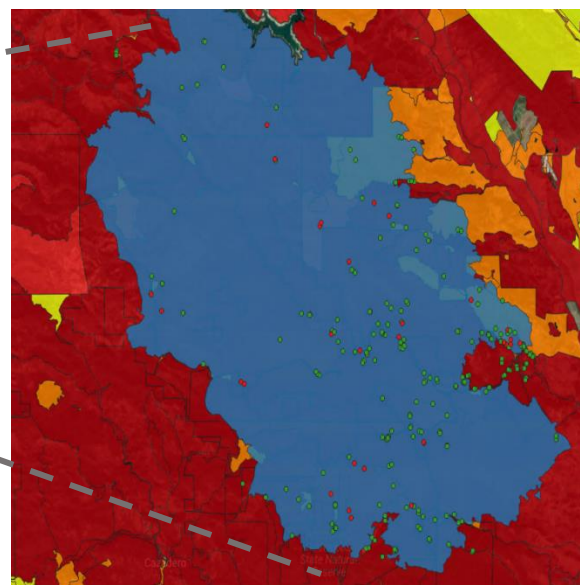
GLASS FIRE		Predicted		Actual		Difference
Targeted Group Odds	Total Targeted Value	Damaged	No Damage	Damage	No Damage	Damage
1 in 10K+	\$ 48,990,000	\$ 9,246,000	\$ 39,744,000	\$ 21,817,000	\$ 27,173,000	\$ (12,571,000)
1 in 1001 to 1 in 2500	\$ 4,668,000	\$ -	\$ -	\$ -	\$ 4,668,000	\$ -
1 in 251 to 1 in 500	\$ 6,700,000	\$ 6,700,000	\$ -	\$ -	\$ 6,700,000	\$ 6,700,000
1 in 101 to 1 in 250	\$ 134,425,000	\$ 26,650,000	\$ 107,775,000	\$ 64,713,000	\$ 69,712,000	\$ (38,063,000)
1 in 51 to 1 in 100	\$ 73,487,000	\$ 22,886,000	\$ 50,601,000	\$ 49,288,000	\$ 24,199,000	\$ (26,402,000)
1 in 26 to 1 in 50	\$ 23,895,000	\$ 7,710,000	\$ 16,185,000	\$ 13,984,000	\$ 9,911,000	\$ (6,274,000)
1 to 1 in 25	\$ 65,970,000	\$ 4,572,000	\$ 61,398,000	\$ 9,395,000	\$ 56,575,000	\$ (4,823,000)
<b>Totals</b>	<b>\$ 358,135,000</b>	<b>\$ 77,764,000</b>	<b>\$ 275,703,000</b>	<b>\$ 159,197,000</b>	<b>\$ 198,938,000</b>	<b>\$ (81,433,000)</b>



Generated end of year 2019

**LNU Lightning Complex Wildfire\_Sonoma (wildfire perimeter in blue): Aug 2020**

**1,491 buildings destroyed**



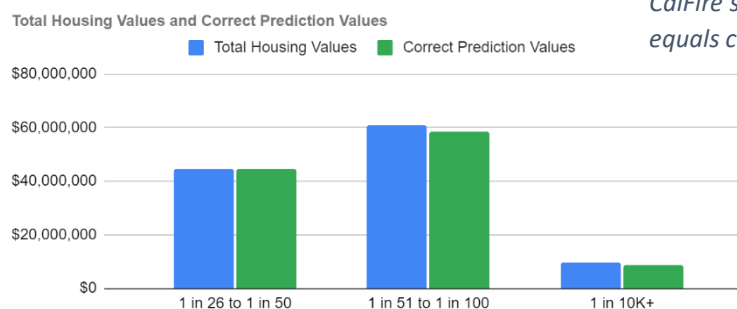
Total Census Blocks Affected:	28
# of Census Blocks Athena Projected as a Targeted Probability Risk:	24

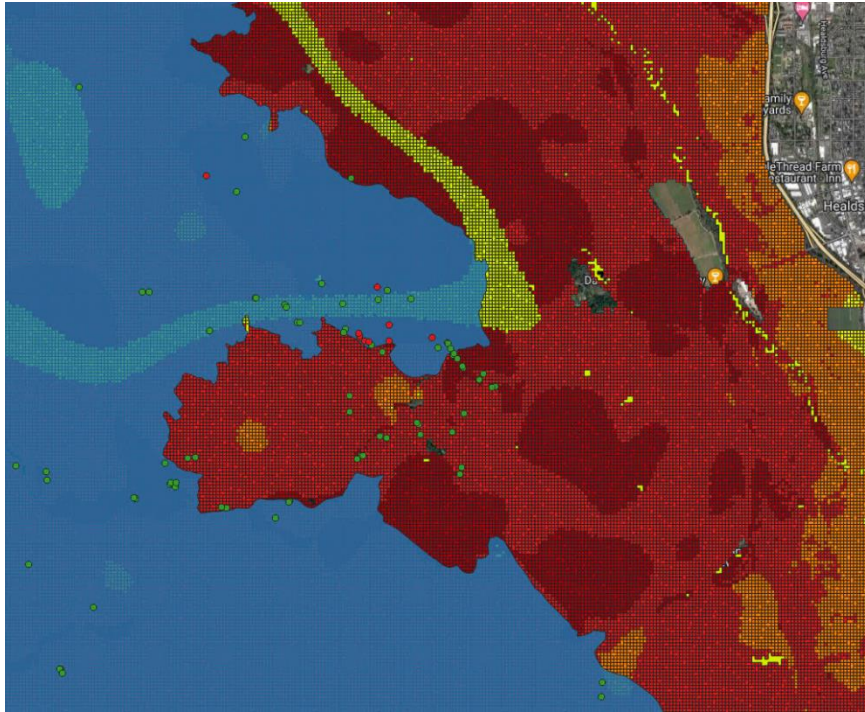
# of Bldgs within Athena's Targeted Census Blocks: 61

# of **Correct Predictions in Targeted areas**  
(if building would be damaged or not): 58

Green dots in picture represent building locations of Athena's predictions. Buildings and their actual result from wildfire originate from CalFire's Damage Inspection report. Green equals correct prediction, Red equals incorrect

Probability Risk Class	Census Blocks	Houses	Correct Predictions
Targeted:	24	61	58
Elevated	3	5	5
Moderate	1	3	2
<b>Grand Total</b>	<b>28</b>	<b>69</b>	<b>65</b>





Zoom in on perimeter boundary.

Behind the classification of every census block exists millions of pixels. Each 30 X 30 sq meter pixel is made up of Athena's Voice of the Acre™ composite score. This allows Athena's modeling to generate a high level of resolution in its targeting of specific risk profiles.

Athena's modeling allows an insurer to target.....

LNU Complex Fire		Predicted		Actual		Difference
Targeted Group Odds	Total Targeted Value	Damaged	No Damage	Damage	No Damage	Damage
1 in 51 to 1 in 100	\$ 85,833,000	\$ -	\$ 85,833,000	\$ -	\$ 85,833,000	\$ -
1 in 26 to 1 in 50	\$ 91,892,000	\$ 25,538,000	\$ 66,354,000	\$ 33,884,000	\$ 58,008,000	\$ (8,346,000)
<b>Totals</b>	<b>\$ 177,725,000</b>	<b>\$ 25,538,000</b>	<b>\$ 152,187,000</b>	<b>\$ 33,884,000</b>	<b>\$ 143,841,000</b>	<b>\$ (8,346,000)</b>



Athena's Intelligence in real time for 2022.

Athena  Intelligence

Look forward in confidence with Athena Intelligence  
and avoid looking backwards in regret.

Additional information can be found at the below link:

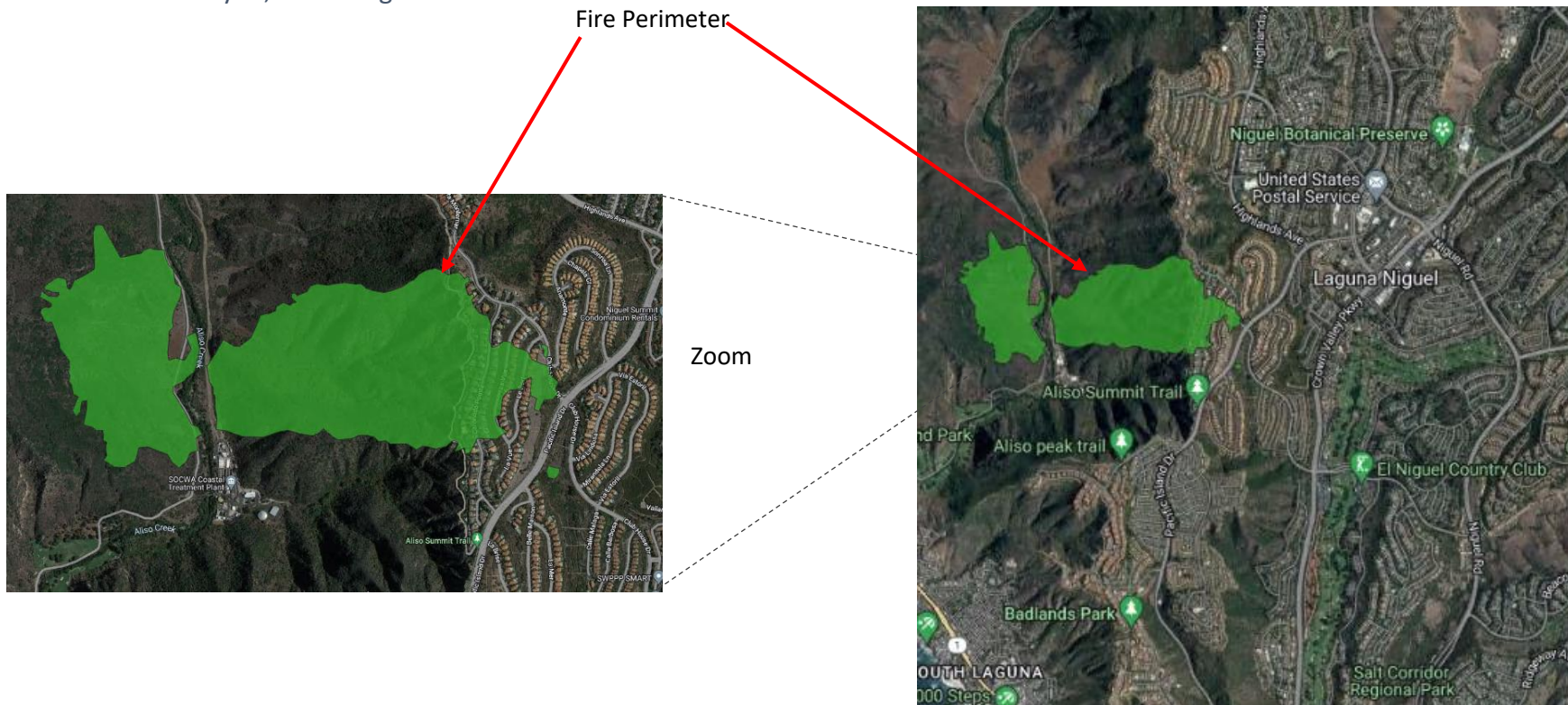
<https://public.tableau.com/app/profile/david.sypnieski2863/viz/VoiceoftheAcreLagunaNiguelWildfire/FirePerimeter>

## COASTAL FIRE

May 2022

Laguna Niguel, Orange County CA

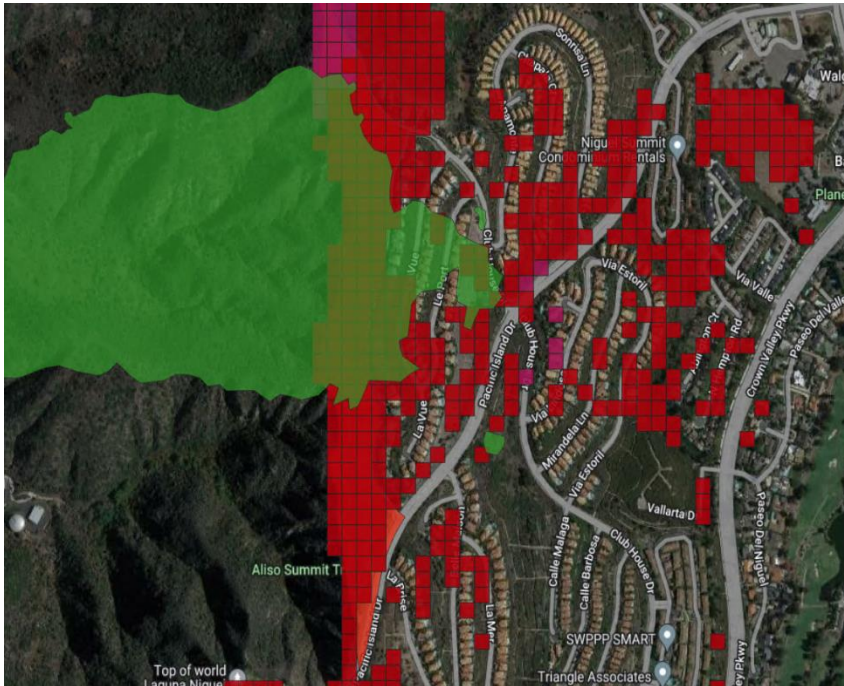
20 homes destroyed, 11 damaged





Athena's CA 2022 conditional fingerprint was produced in December 2021.

The risk to a property from wildfire isn't exclusively based on the vegetation immediately surrounding the property. It also isn't exclusively driven by the general region it exists in. Rather it is an integrated relationship between the general region, local ecosystem, *and* the specific conditions of the property itself.



Zoom

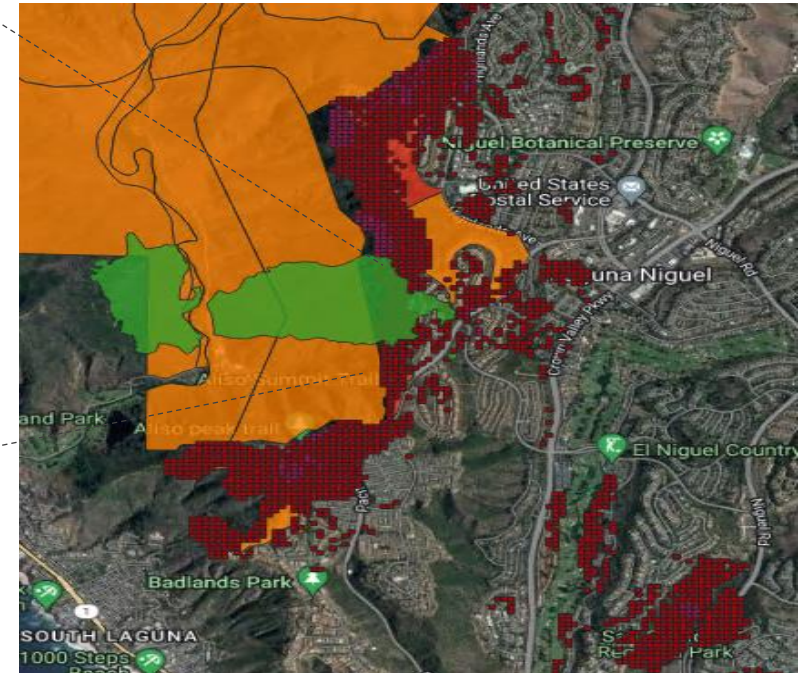
Athena’s projection of the extent of a wildfire perimeter is represented by the “fading out” of the pixels covering the landscape. The gaps between the pixels *actually represent* properties that have a higher probability of not incurring an insurable loss vs those properties with pixels covering them.

Orange = Uninhabited zones that don't possess any insurable loss risk, but *do have* an influential impact on the potential for an insurable loss.

Purple and Red = Represent conditional profiles that have both:

- 1) 90%+ probability of burning in the event of a wildfire
- 2) When burned in a wildfire, have had homes destroyed

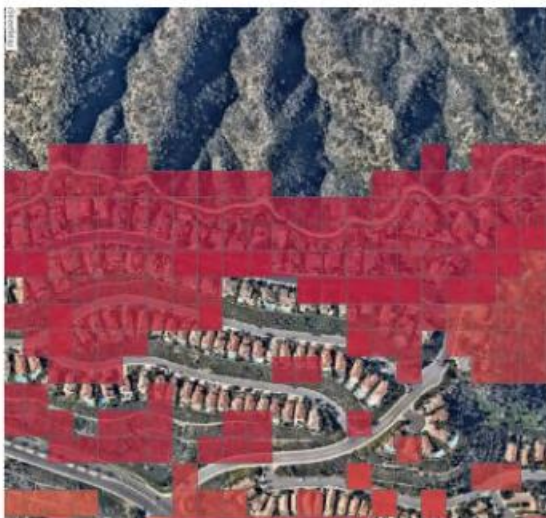
**Clear Areas = Athena's projections of the extent of a wildfire perimeter and where the risk of an insurable loss from wildfire**



Destroyed and damaged homes. Devastating for families, and insurance companies.



Pixels overlayed with homes destroyed or damaged. The Very High pixels had the highest coverage



Verification Image of Accuracy







**David Sypnieski**

**Founder, CEO**

David is the inventor of the Voice of the Acre™ technology and started the company in the AgTech and Food Supply Chain industry. He has an extensive background in early-stage technology companies and has been successful at putting together innovative teams and solutions that open new areas of value to mature and developed industries.



**John Rafferty**

**Chief Actuary, SVP**

John brings over 35 years actuarial pricing, risk management, Stochastic modeling, portfolio management, applications development For the Property & Casualty Insurance Industry. He brings over ten years of Senior Consulting experience for Fortune 25 property & casualty insurers

**We help enterprises navigate through risks from shifting climate realities.**

**Our proprietary Voice of the Acre™ IP creates “digital spatial fingerprints” of Earth’s landscape. These fingerprints are the foundation that delivers data driven environmental intelligence to the insurance and financial markets.**

