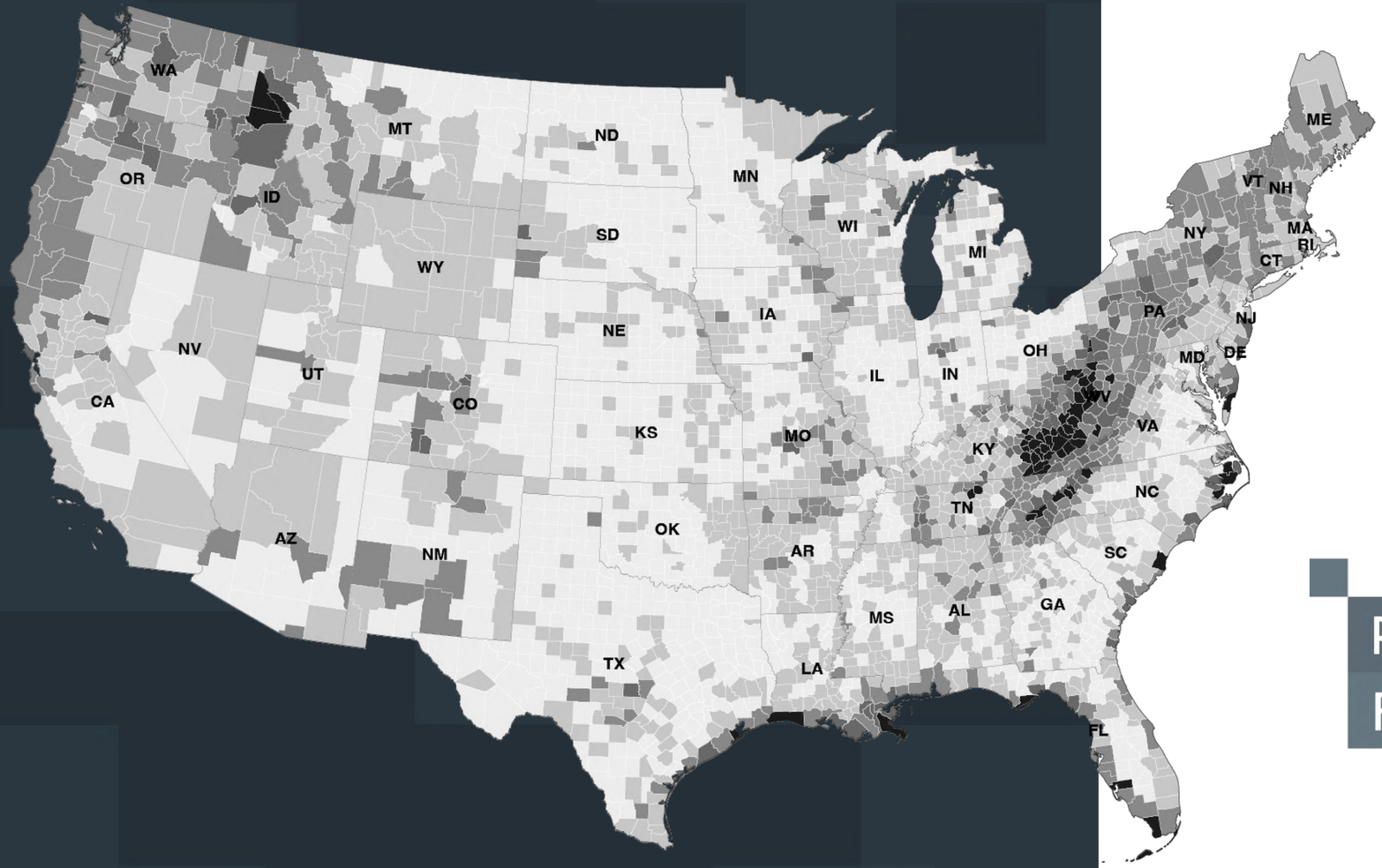


RISK FACTOR PRO

Risk Factor Pro calculates risk from the property, up.

How physical climate hazards impact a structure depends on the specific vulnerability of the building. Using the First Street Foundation hazard models to understand the properties exposure matched with the building characteristics, Risk Factor Pro leverages fragility curves from the global engineering firm Arup to understand every buildings vulnerability and consequence.

- Flood
- Fire
- Heat

Roof Type
A combustible roof type like wood shingles increases burn probability by 110%

Defensible space
Combustible material within 50 ft increases burn probability by 240%

Construction material
Combustible exterior walls increase burn probability by 82%





AC/Cooling
Based on the Sq Ft of the home, year built for age of AC, and temp, we derive KwH and cost by year

First floor elevation
The height of the first finished floor determines the likelihood of severity of flood damage

Basement
The presence of a basement and finish of the basement changes damage functions

Vent exposure
Vents in eaves increases burn probability by 186%

Open and transparent: flooding methodology

The First Street Foundation Flood Model (FSF-FM) is a nationwide probabilistic flood model created at a 3-meter resolution to calculate the risk of flooding at any location in the contiguous 48 states, Puerto Rico and Hawaii due to rainfall (pluvial), riverine flooding (fluvial), and coastal surge flooding. In collaboration with more than 80 scientists, technologists, and experts, the First Street Foundation has built on decades of peer-reviewed research and models from climatology, hydrology, and statistics to create an unprecedented flood model of the entire United States.

Read the full 2020 technical methodology here>

Read the peer reviewed paper from water resource research here>

Read the 2022 flood methodological updates here>

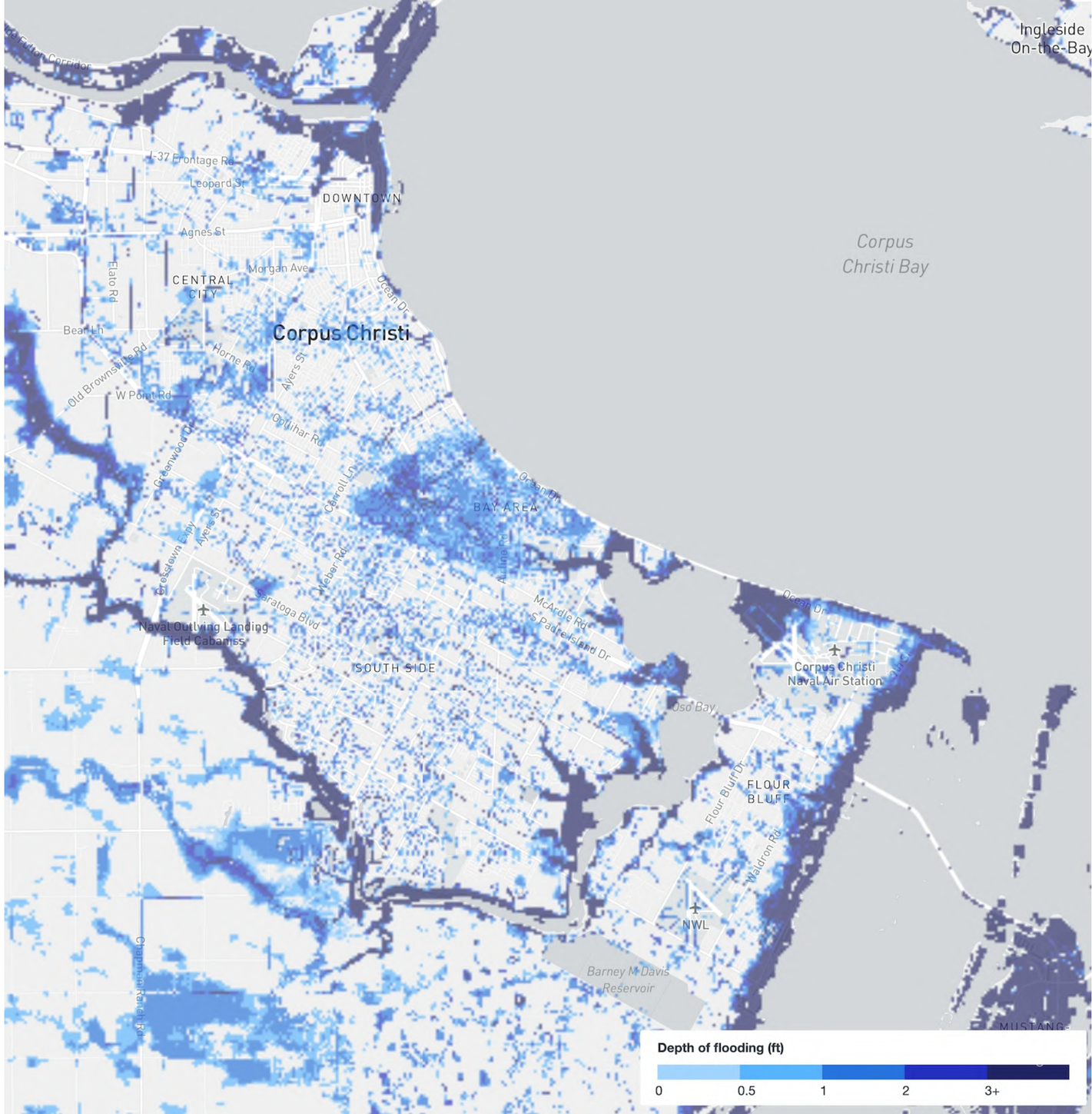
Report: The first national flood risk report>

Report: The cost of climate, America's growing flood risk>

Report: Infrastructure on the brink>

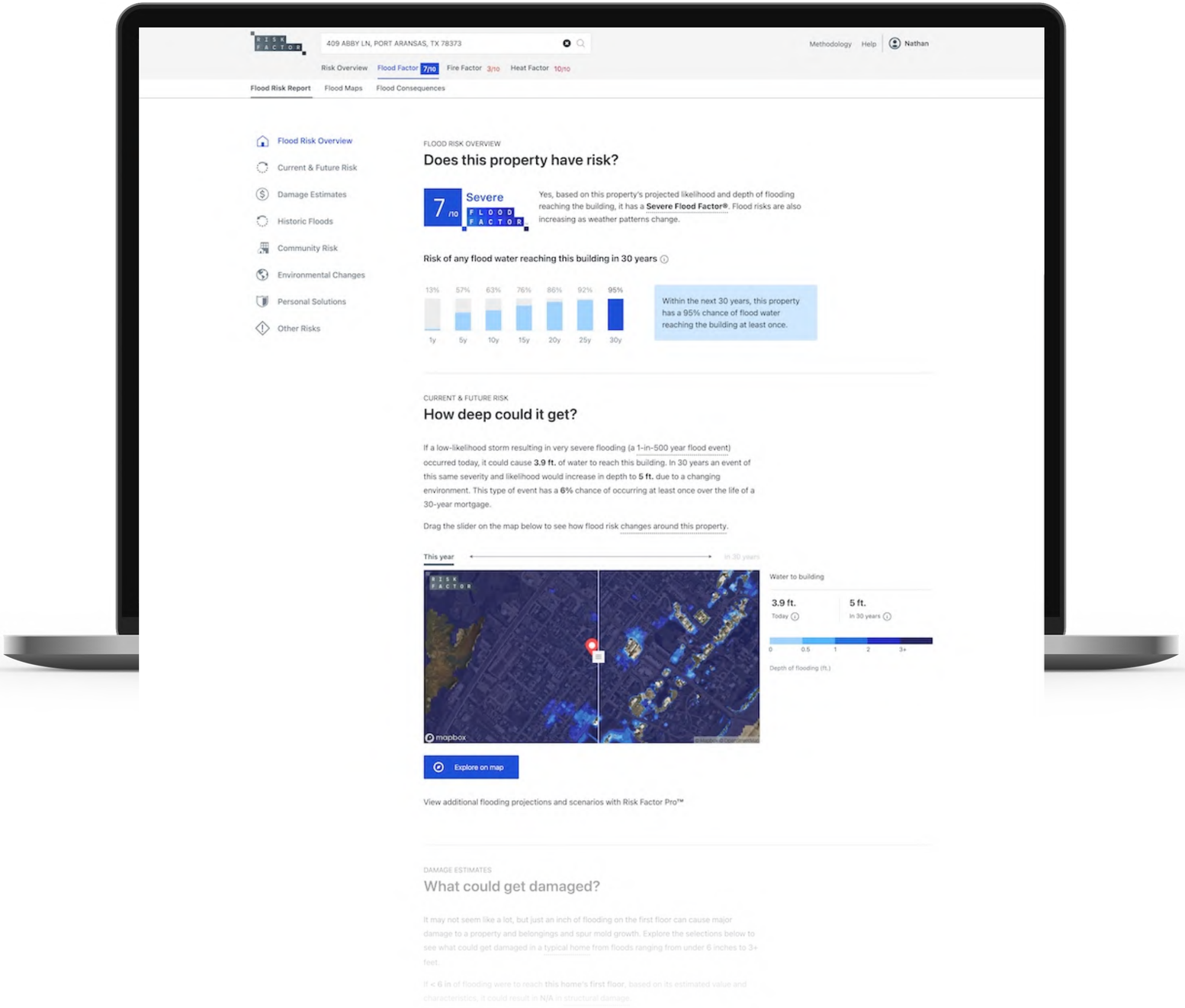
Report: Climbing commercial closures>

Read the peer reviewed paper from SSRN on damage functions>



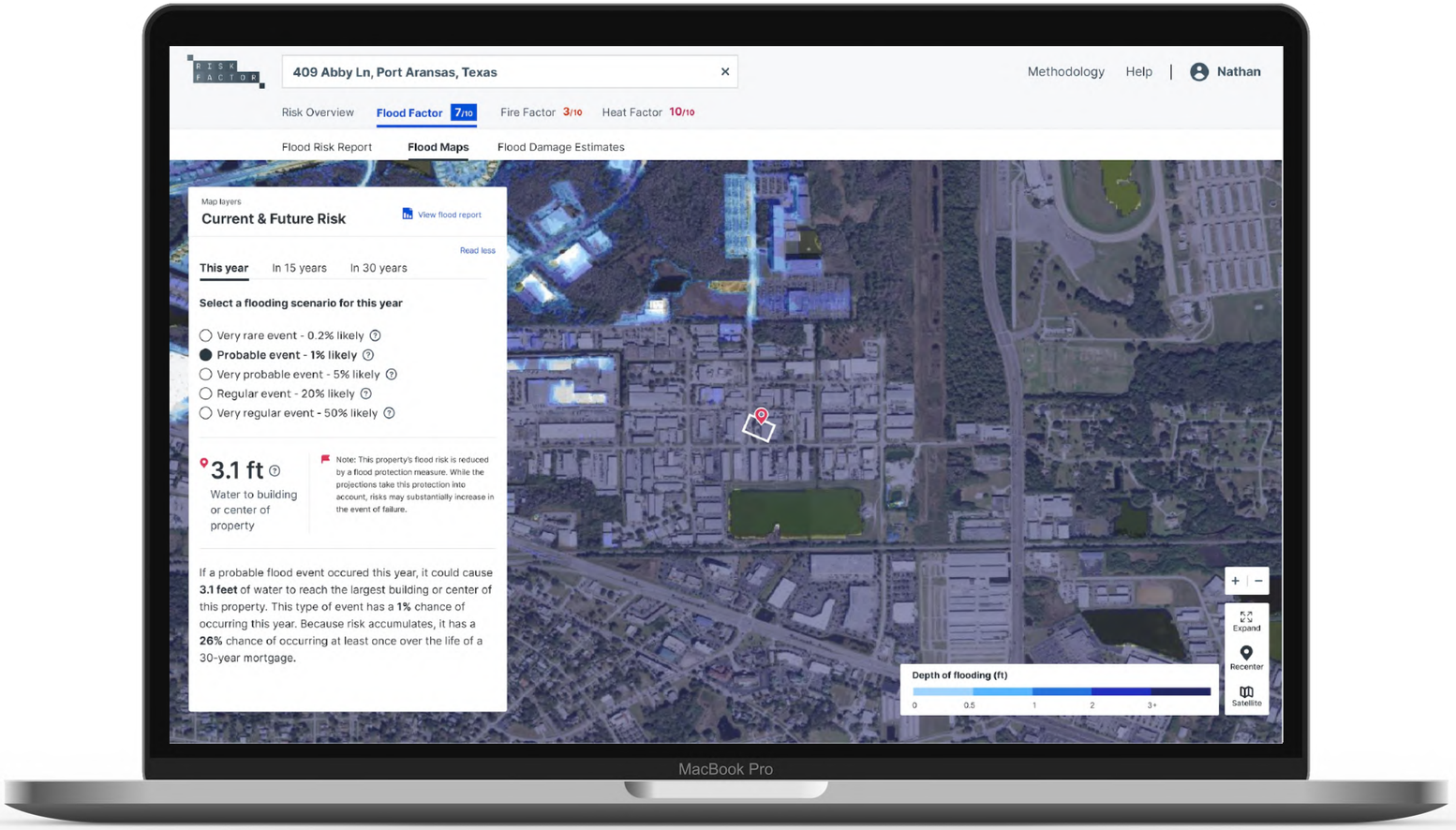
Flood Factor property report

Every property has a Flood Factor and based on properties specific risk, the user is presented with a customized exposure report. This allows the user to understand the likelihood of any flood water reaching the building, what the worst case (1:500) flood event would visually look like today and 30 years into the future, and high level details about historic flooding and community flooding.



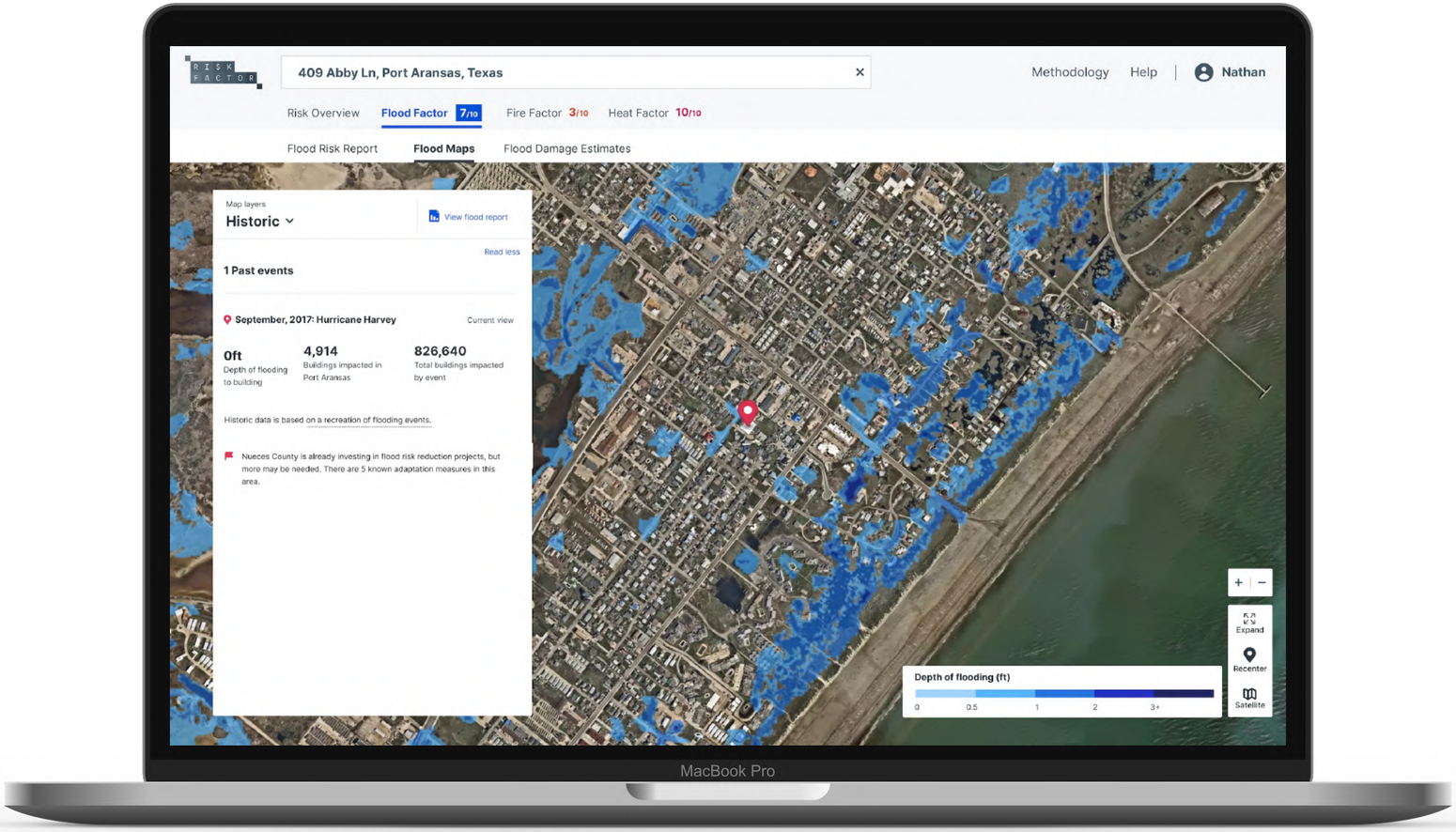
Flood Factor maps : current and future risk.

Another great feature that is unlocked with Risk Factor Pro is the ability to visualize all return periods today, in 15 years, and in 30 years. Not only can the user see the forecasted depths around the property, you can visually see the depth of water to the building footprint or other relevant locations like the parking lot.



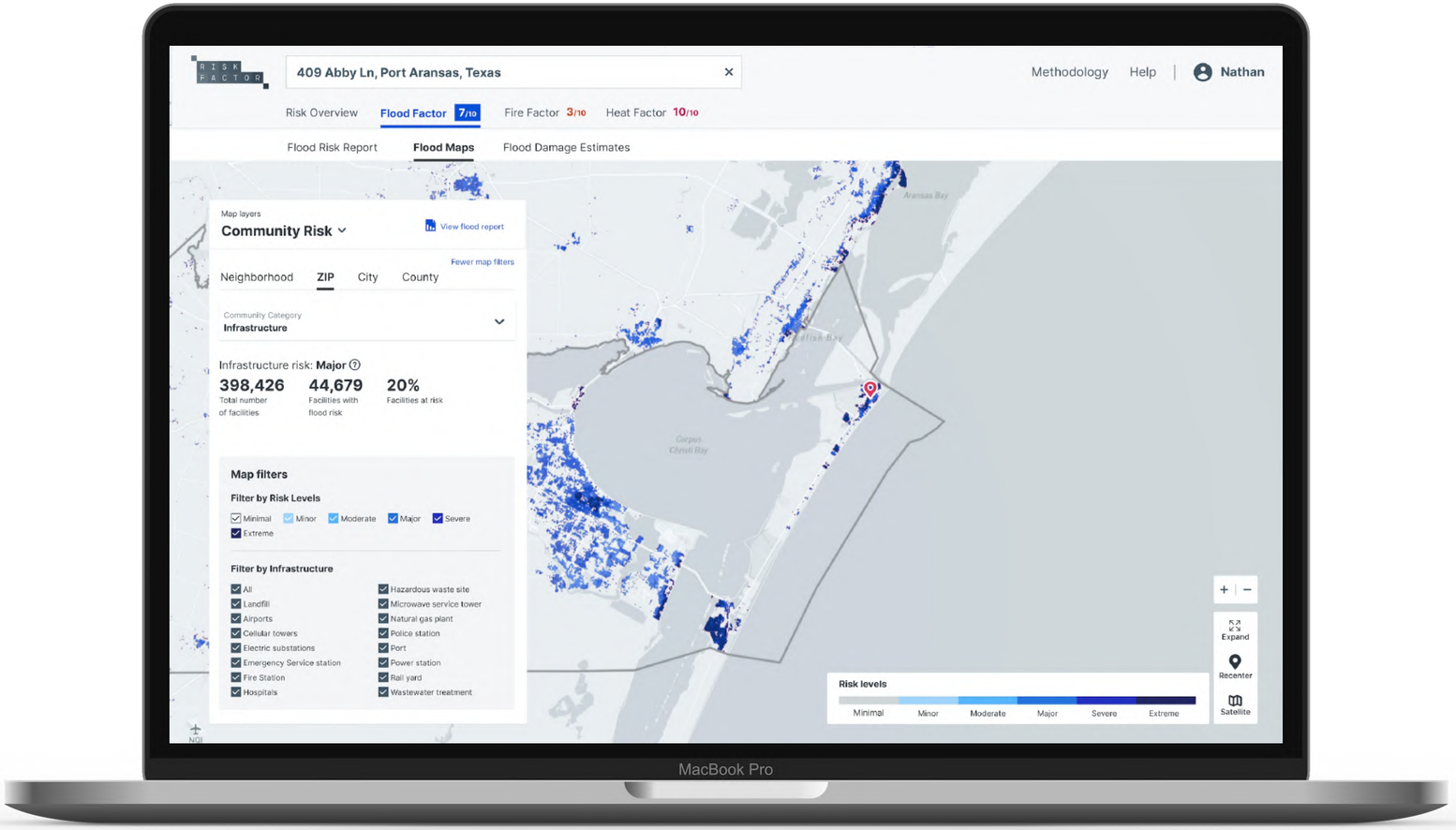
Flood Factor maps: historic flooding

Risk Factor Pro has roughly 100 major historical floods recreated using the First Street Foundation hydrodynamic flood model. The impacted areas and the associated depths are all visualized if a flooding event has taken place at the property or in the surrounding area and presented with relevant stats.



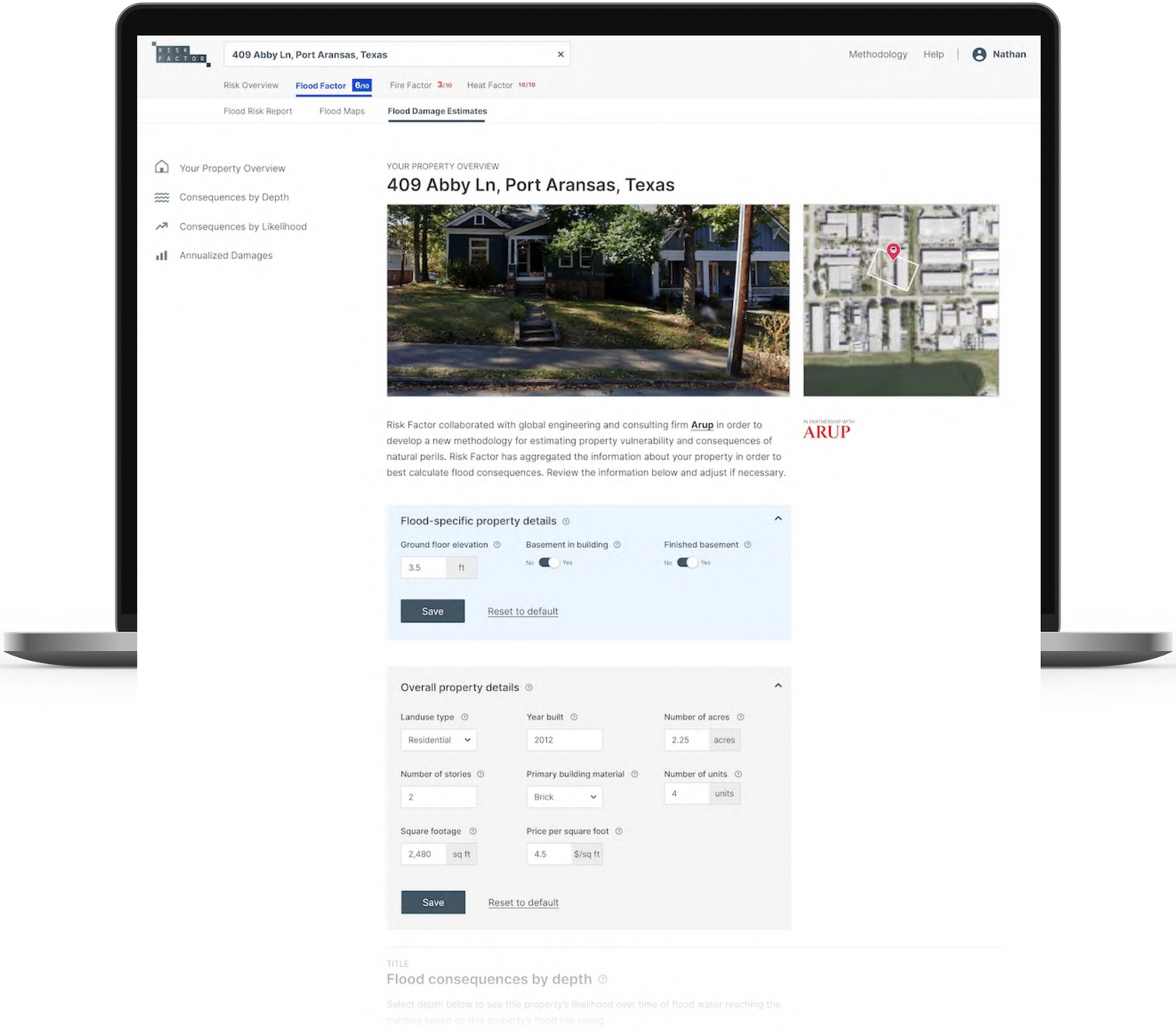
Flood Factor maps: community risk.

The last map layers that are available through Risk Factor Pro highlight the risk beyond the property and to the community. The user can easily toggle through critical infrastructure, social infrastructure, commercial buildings, roads, and residential buildings to fully understand risk as the neighborhood, zip, city and county levels. Users can also sort by infrastructure type or by risk level.



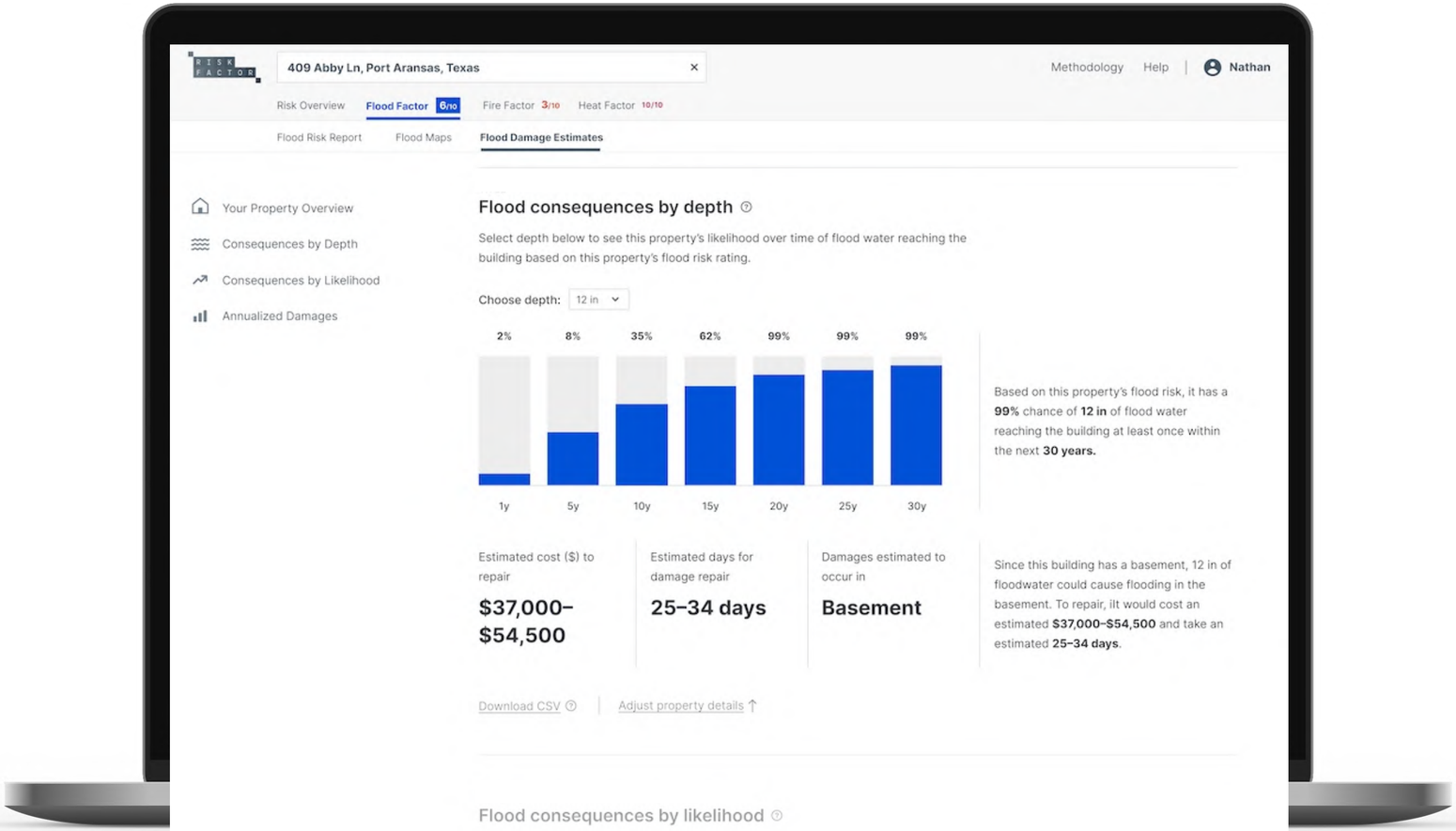
Flood Factor building specific consequences.

How flooding impacts a structure depends on the specific vulnerability of the building. Using the properties exposure matched with the exact building characteristics, Risk Factor Pro calculates every home's unique risk profile in partnership with global engineering and consulting firm Arup.



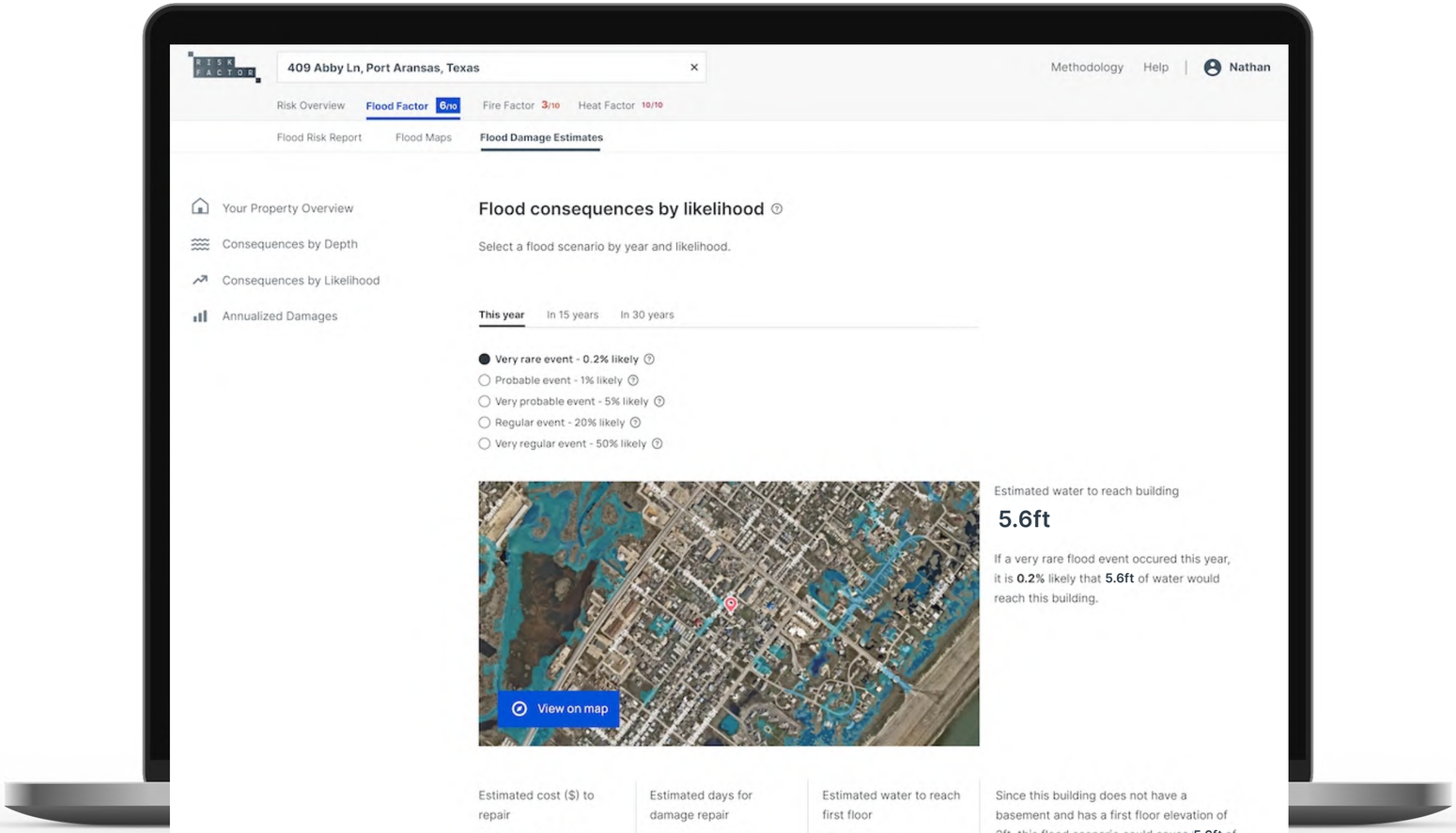
Flood Factor consequences by depth, a parametric view.

Risk Factor Pro allows the user to select the depth of flooding to the building and subsequently displays a graph to show the likelihood of that event to occur over different hold periods and estimated consequences of the event based on the specific building details and vulnerability.



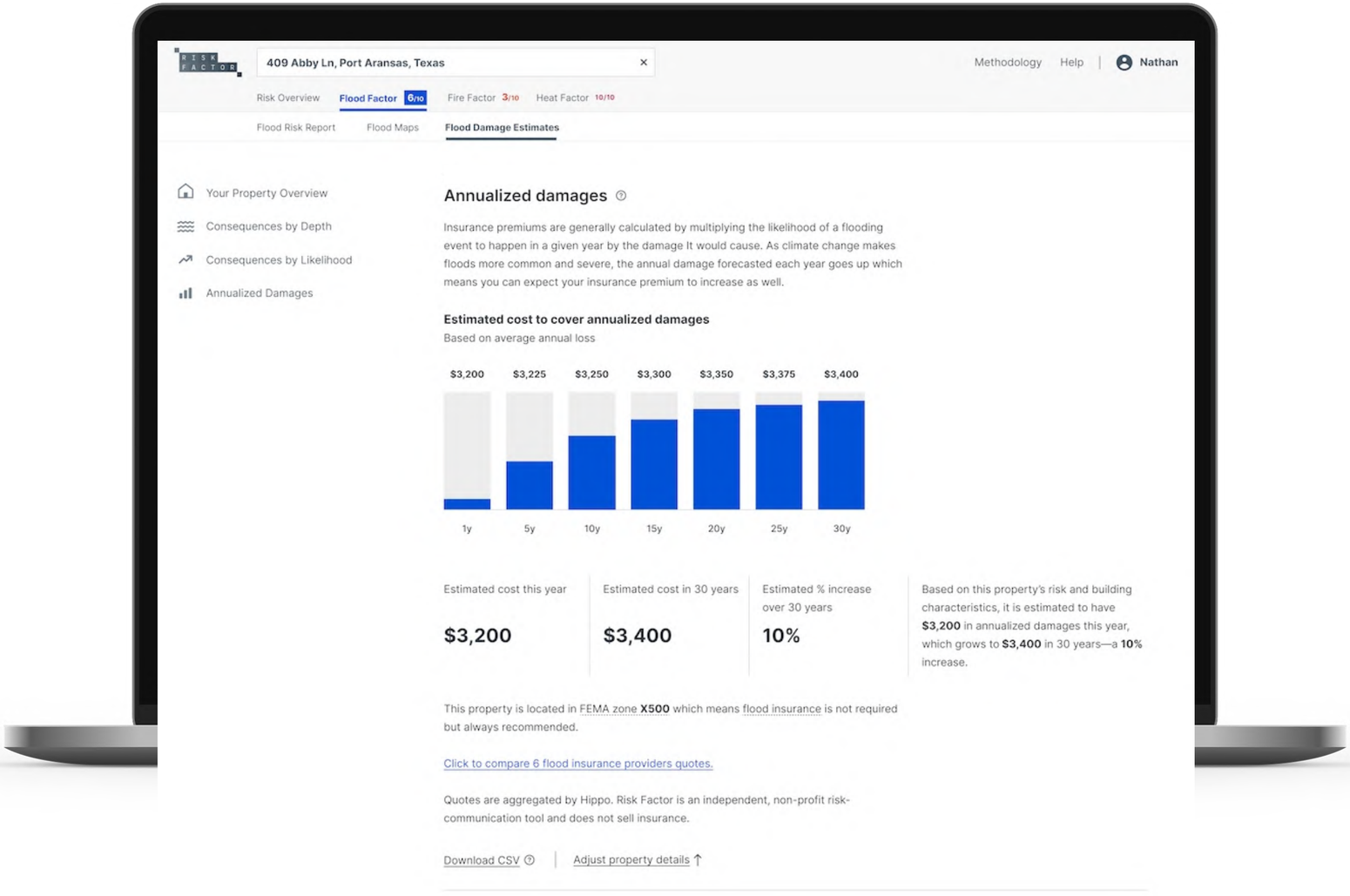
Flood Factor consequences by likelihood.

Another way Risk Factor Pro allows the user to understand building specific risk is by looking at the outcomes of each return period (probability), today and into the future. Under each return period, you can visualize and quantify the depth of water to the building, understand the level at which water that makes it inside the building based on the first floor elevation, and the forecasted damage and downtime from the water inside the structure.



Flood Factor consequences by average annual loss (AAL)

Based on the building characteristics and the overall risk under each return period, Risk Factor Pro calculates the buildings average annual loss today, and every five years up to 30 years into the future. This is a good proxy for understanding how insurance and overall carrying costs may increase over time as the properties risk increases.



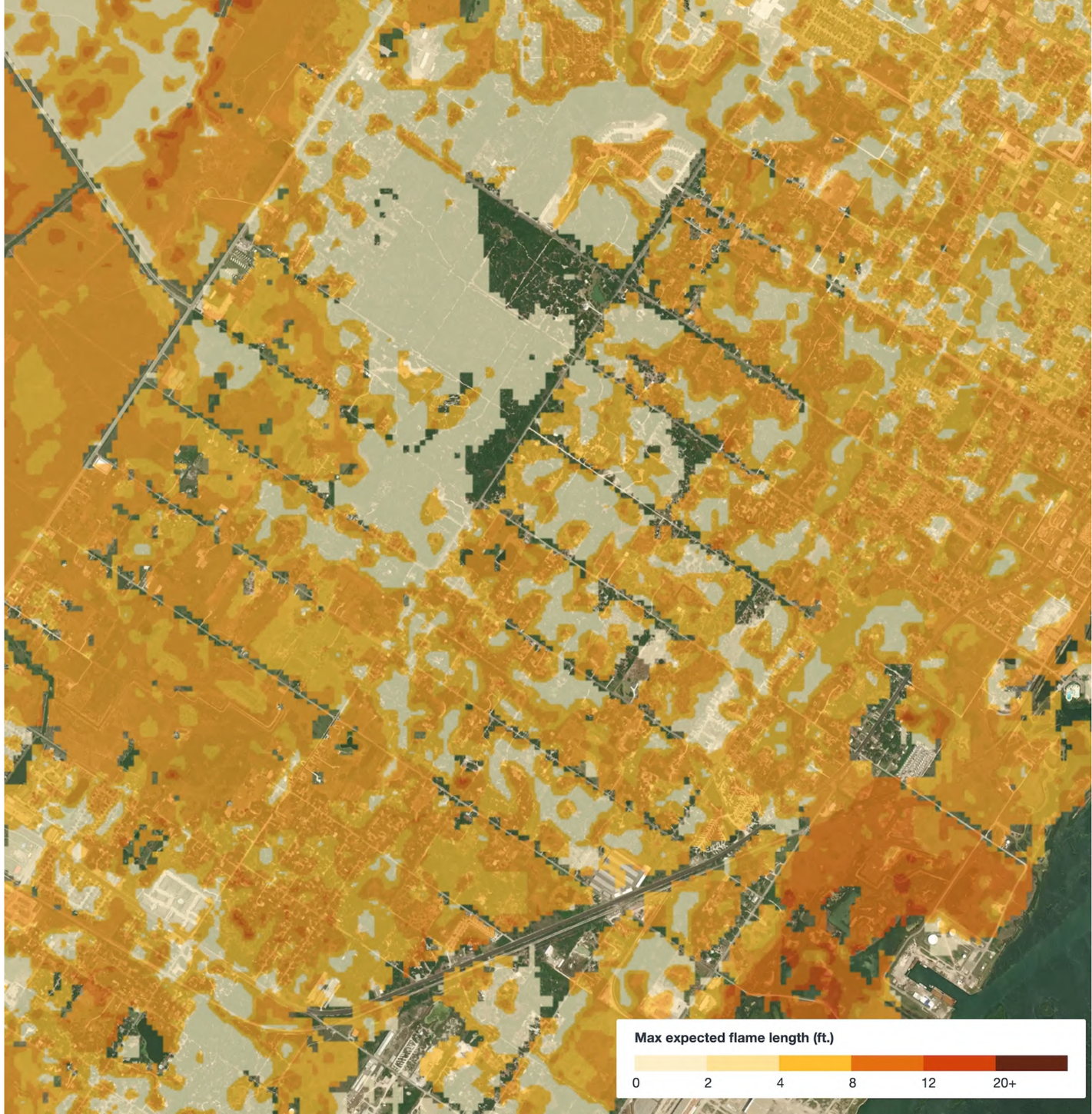
Open and transparent: wildfire methodology

The First Street Foundation-Wildfire Model (FSF-WFM) is a 30 meter resolution model representing the wildfire exposure for any specific location in the contiguous US, today and with the future climate change. The risk of wildfire is derived from a series of inputs associated with fire fuels, weather, human influence, and fire movement. Bringing all of these inputs together, at a national scale, in a high-resolution, climate-adjusted model represents a first-of-its-kind property-level wildfire risk model that was the effort of more than 50 wildfire experts.

Read the full 2022 technical methodology here>

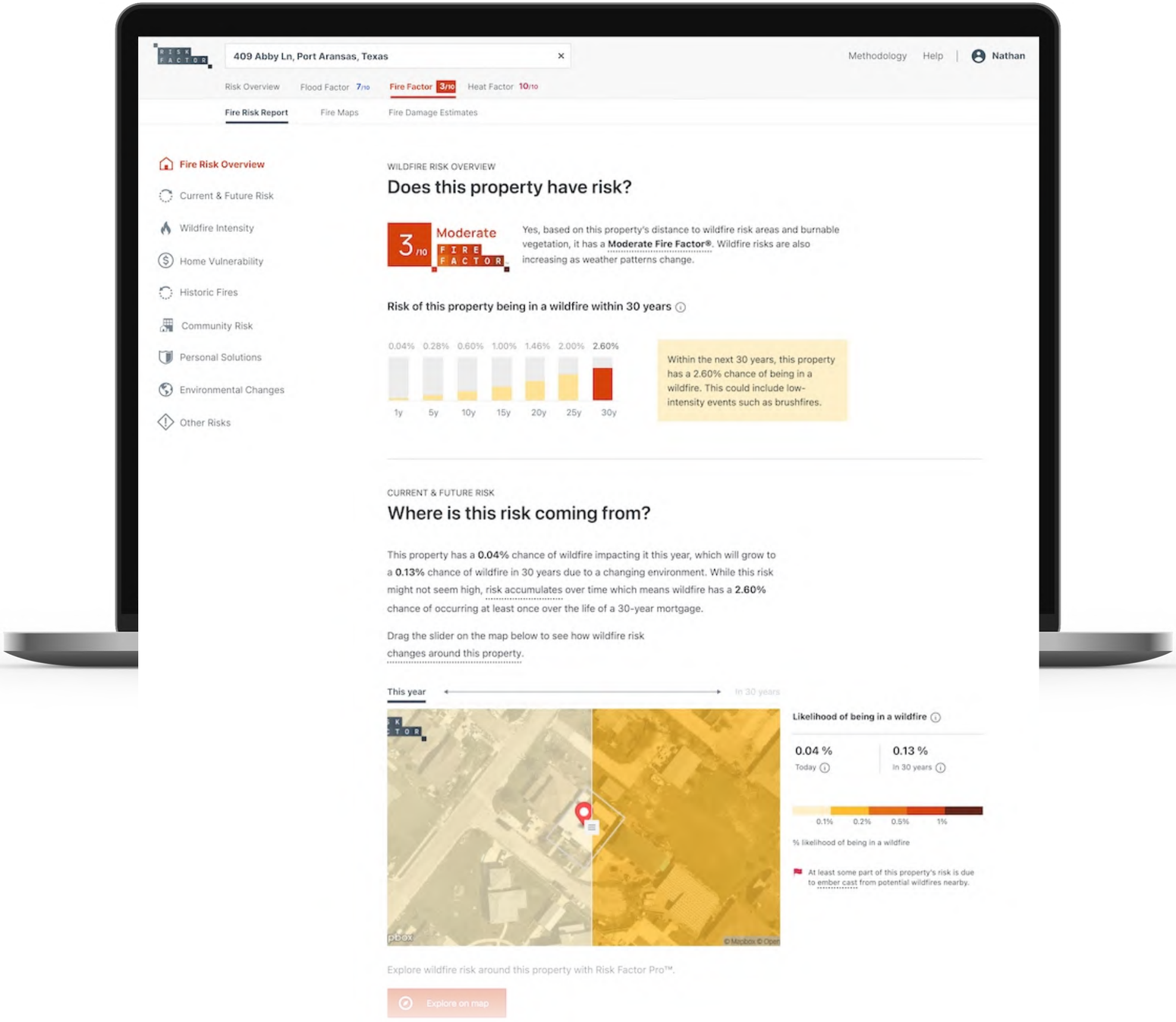
Read the peer reviewed research published in the journal fire>

Report: Fueling the Flames>



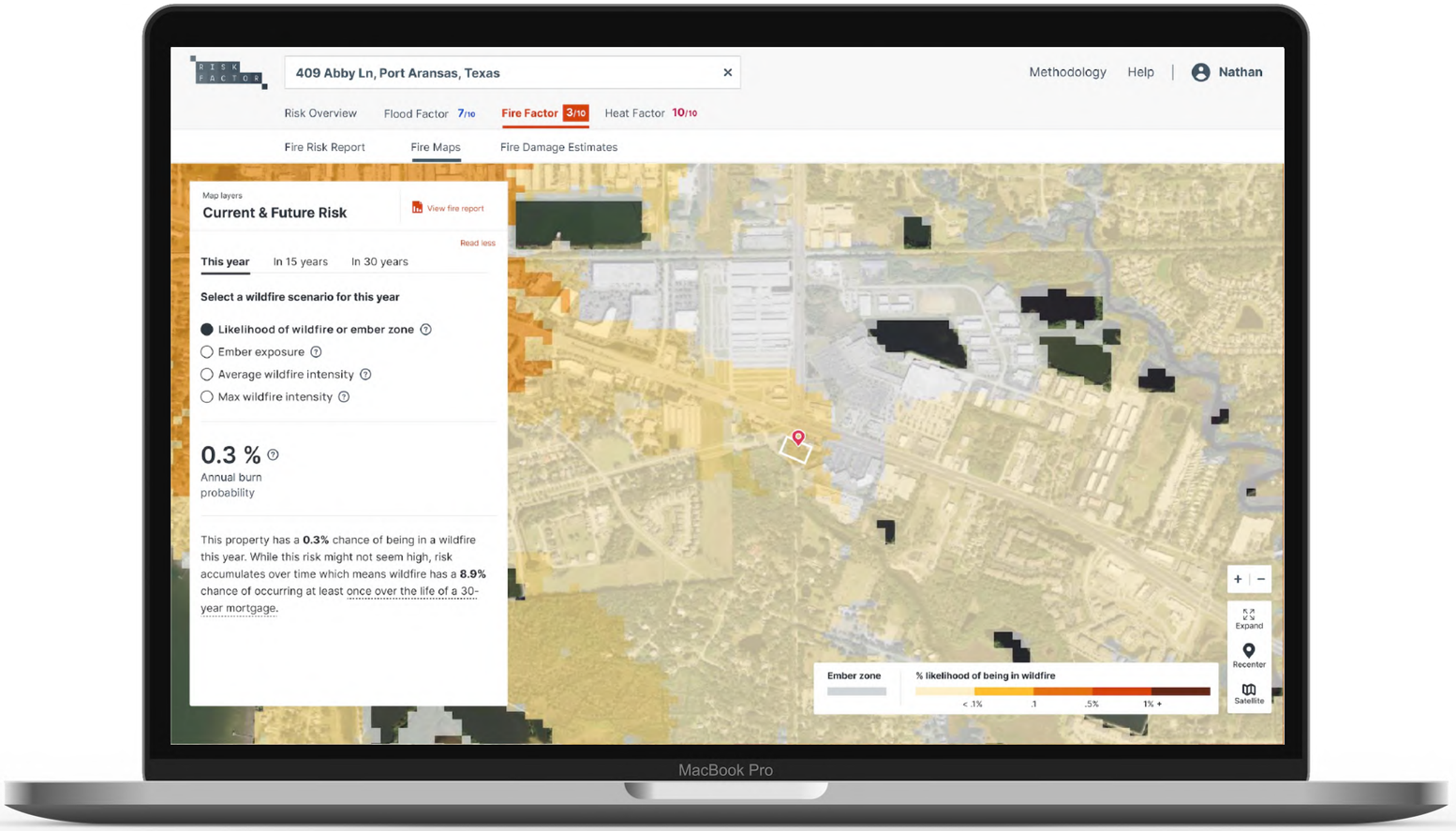
Fire Factor property report

Like Flood Factor, every property has a Fire Factor and based on its specific risk, the user is presented with a customized exposure report. This allows the user to understand the likelihood of flames to reach the building, how wildfire risk changes over the next 30 years, if there is exposure to embers, the proximity to historic wildfire risk and overall community risk.



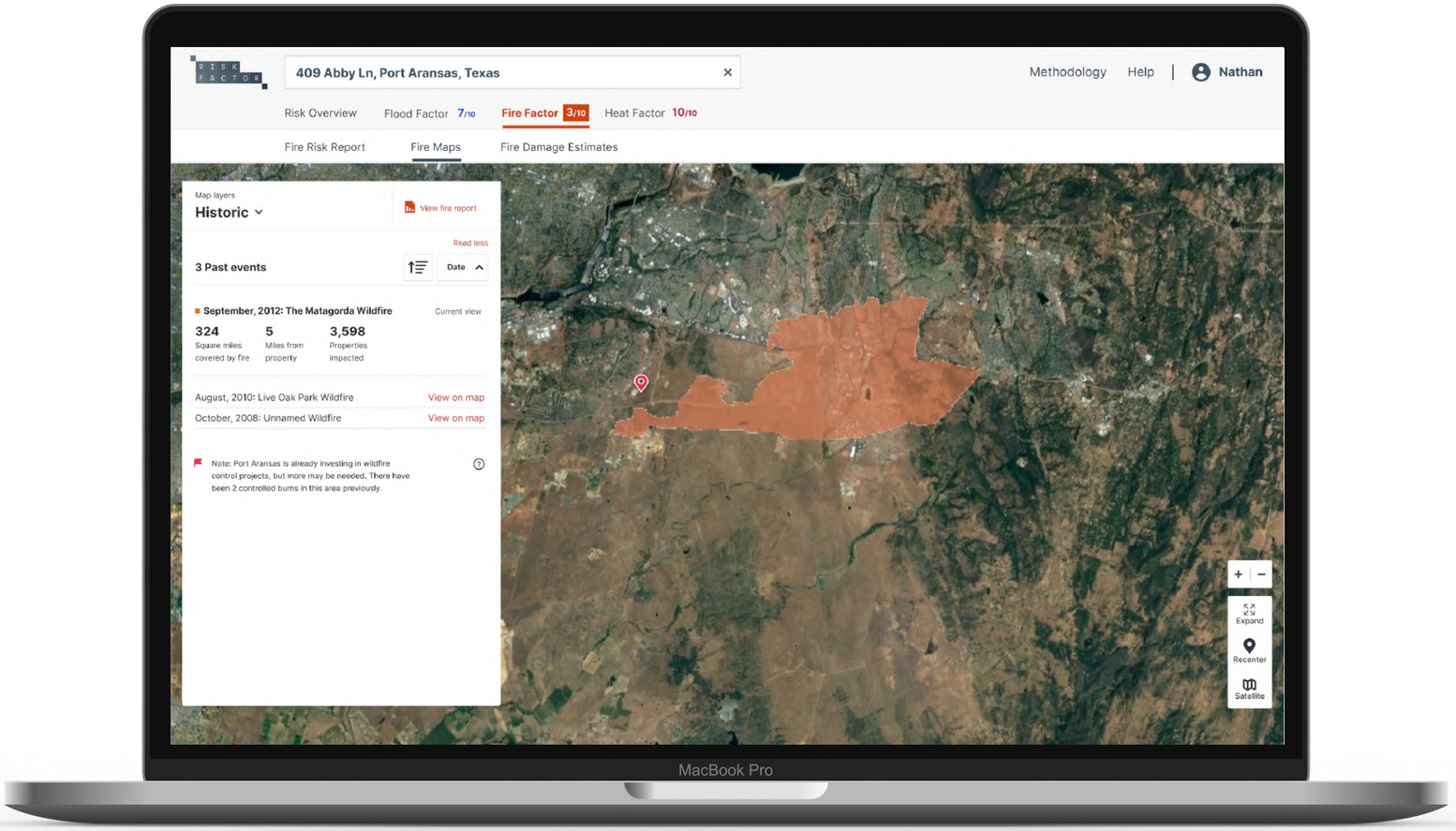
Fire Factor maps: current and future.

Risk Factor Pro is the first platform to allow you to visualize probability of embers or wildfire flames to reach a building today, in 15 years or in 30 years. It also allows the user to visualize the average flame intensity of all modeled simulat and the worst case, maximum wildfire intensity.



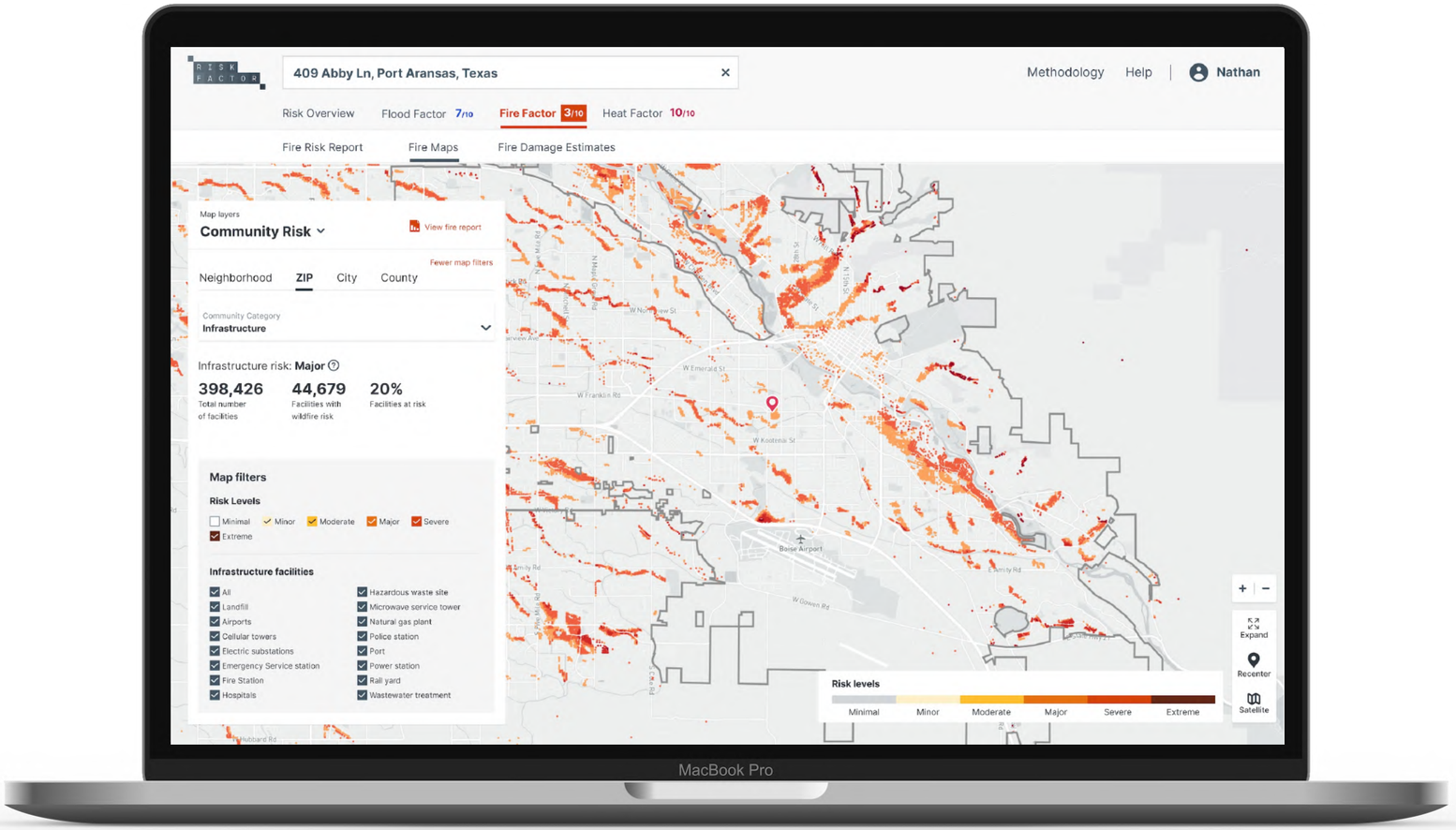
Fire Factor maps: historical

The Risk Factor Pro platform has ingested the burn perimeter and houses exposed to wildfire from all tracked events from 1984 to 2020. This allows users to know if a property has been within a burn perimeter before, visualize that wildfire, and also visualize and calculate the distance to any wildfire that has come within 20 miles of the structure.



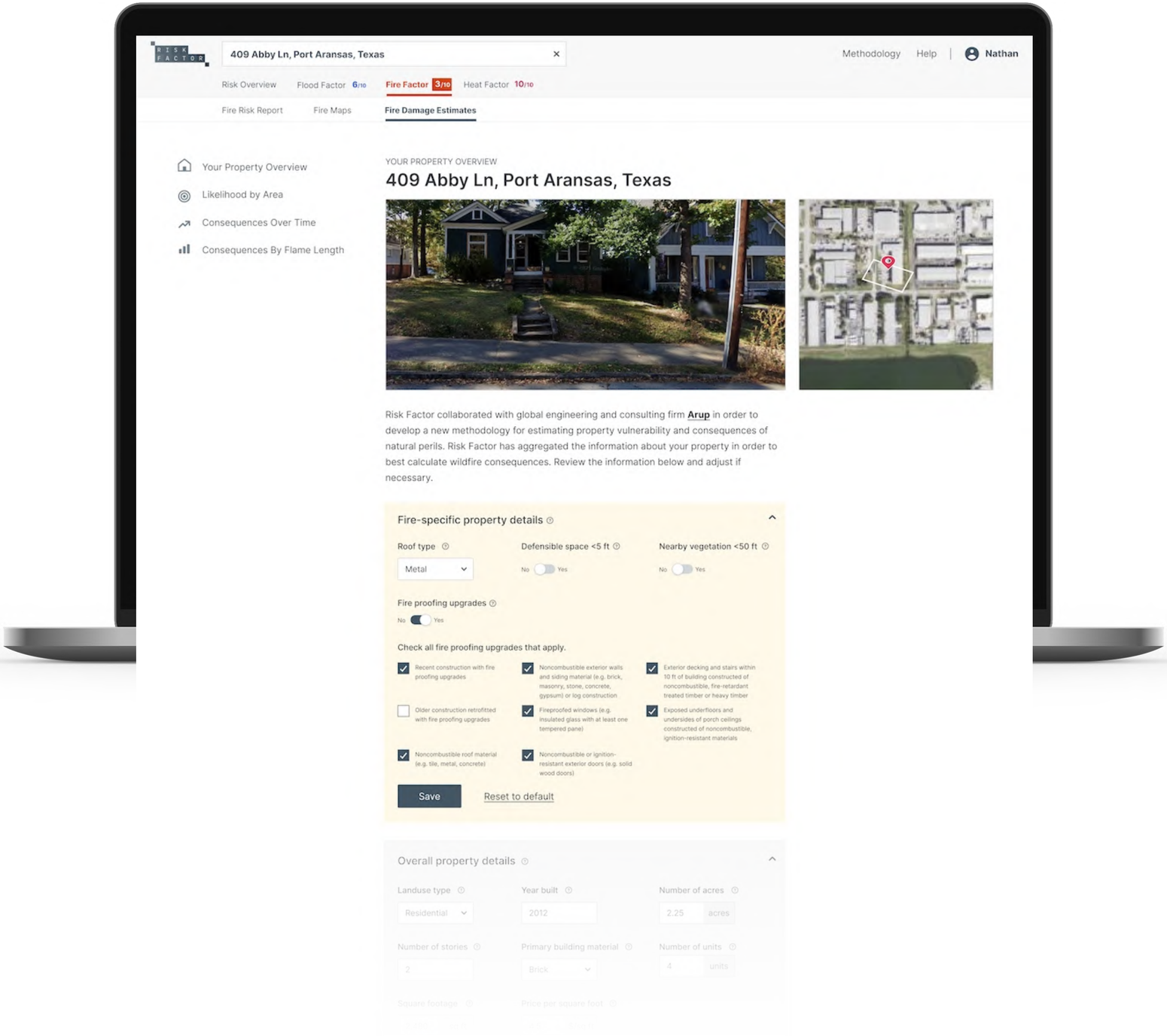
Fire Factor maps: community risk.

Lastly, Risk Factor Pro highlights the risk beyond the property and to the community. The user can easily toggle through critical infrastructure, social infrastructure, commercial buildings, and residential buildings to fully understand risk as the neighborhood, zip, city and county levels over a 30 year period. Users can also sort by infrastructure type or by risk level.



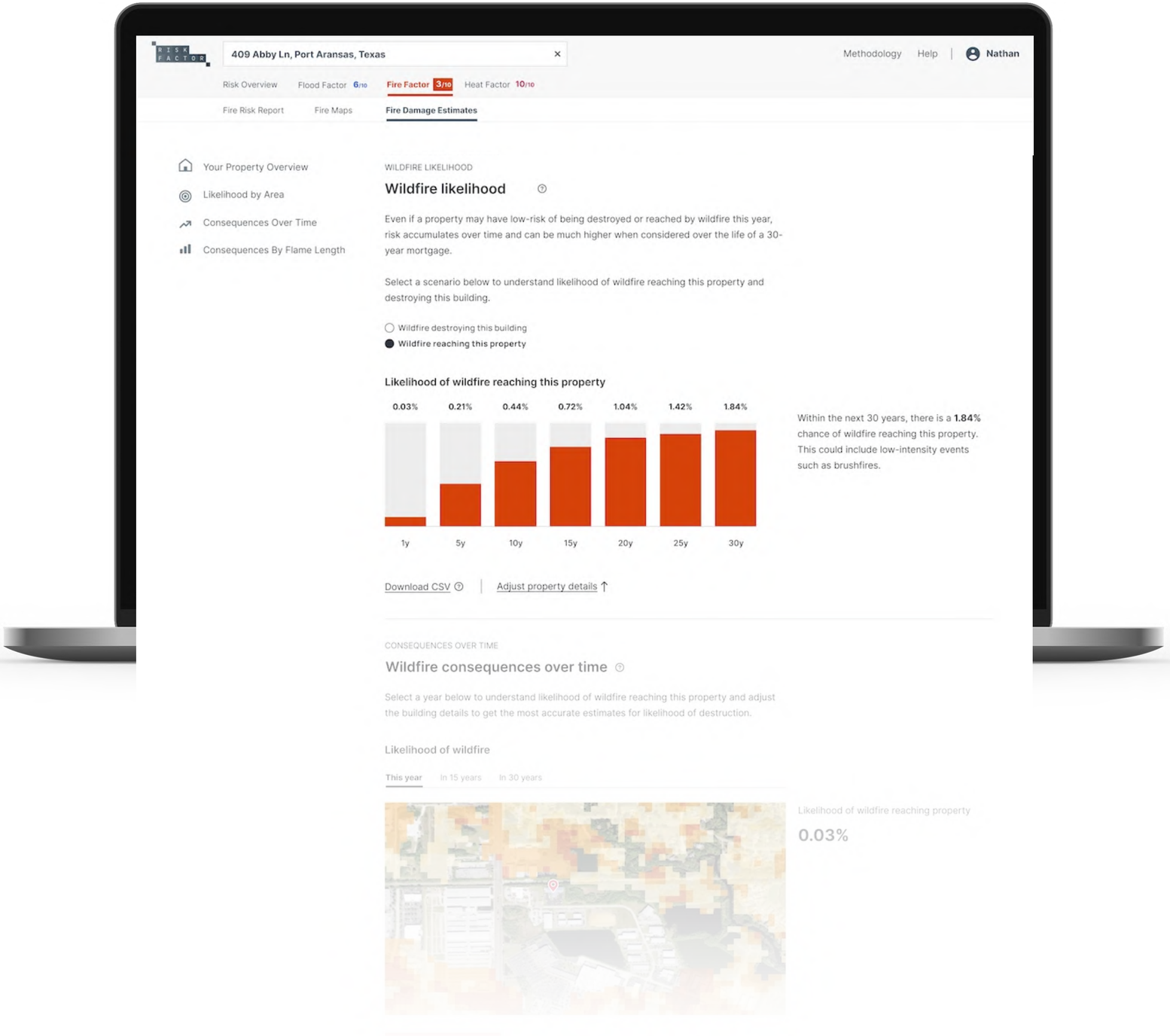
Fire Factor building specific consequences.

How wildfires impact a structure depend on the specific vulnerability of the building matched withe the intensity of the wildfire exposure. Using the properties exposure matched with the exact building characteristics, Risk Factor Pro calculates every home's unique wildfire consequence profile in partnership with global engineering and consulting firm Arup.



Fire Factor consequences, a parametric view.

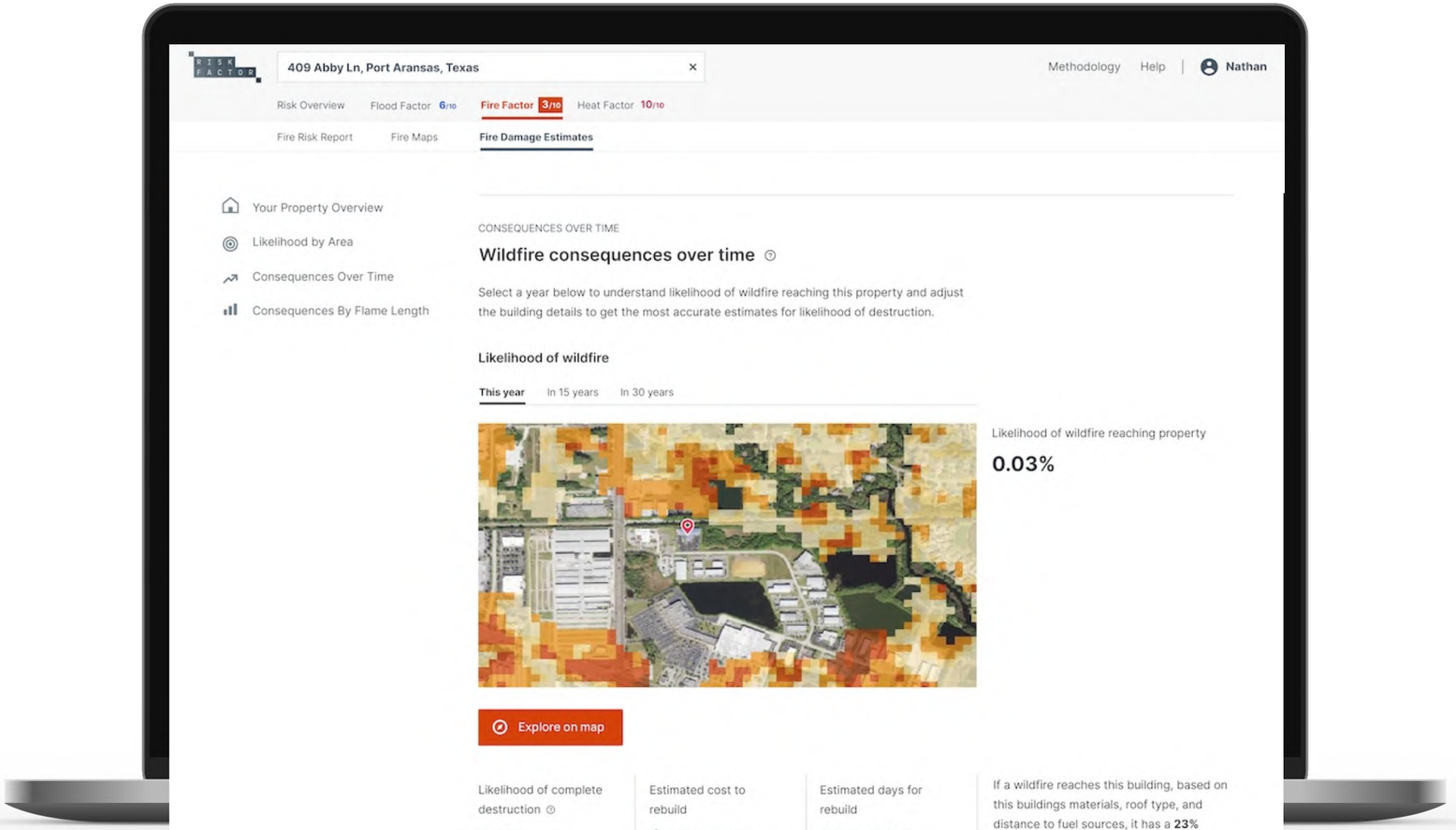
Risk Factor Pro allows the user to select the outcome of wildfire to the building or complete destruction from wildfire and displays a graph to show the likelihood of that event to occur over different hold periods.



Fire Factor likelihood and consequence by year.

Another way Risk Factor Pro allows the user to understand building specific wildfire risk is by looking at the likelihood (probability) of exposure today, in 15 years, or in 30 years, and calculating the outcome of that exposure.

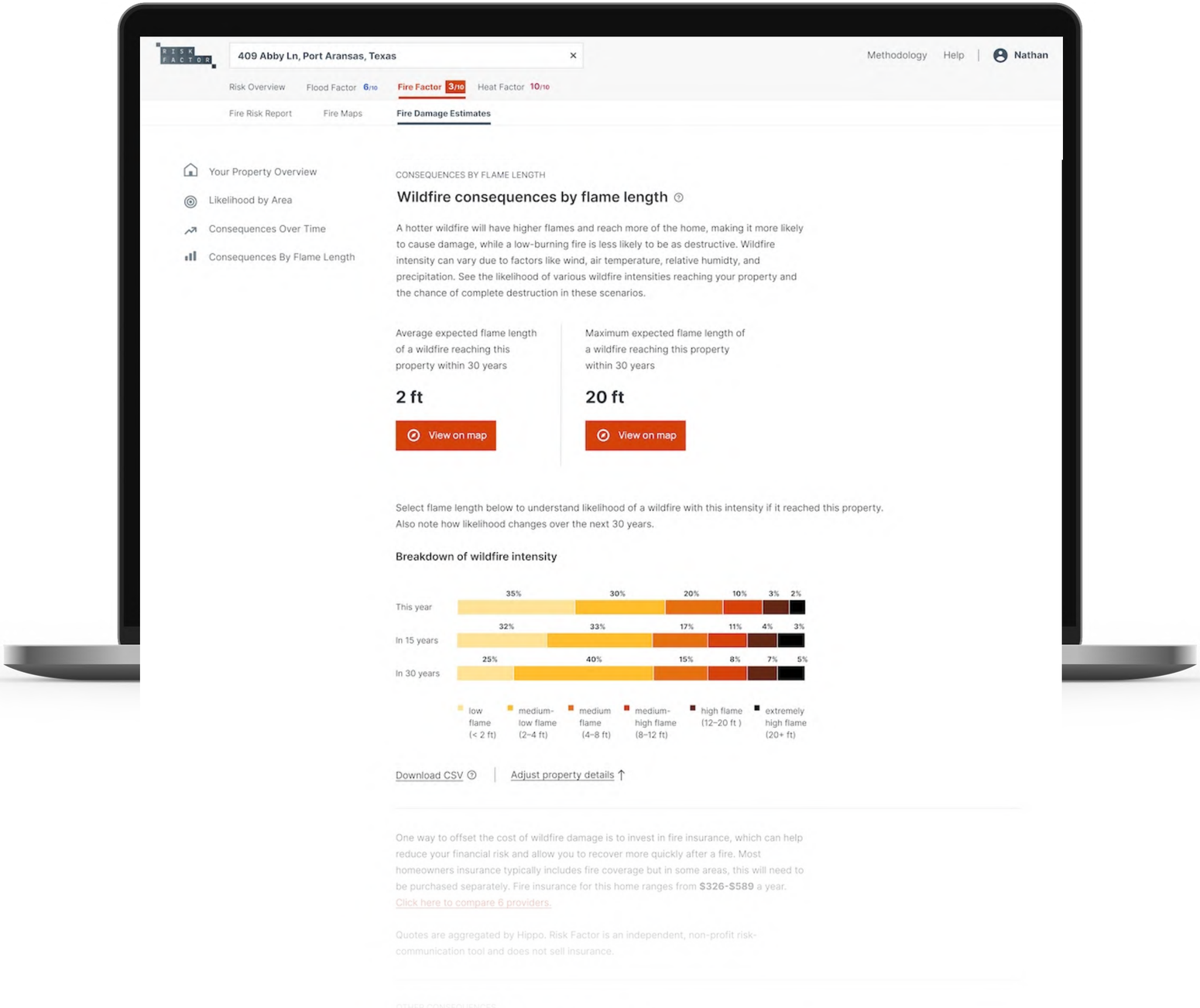
This allows you to not only visualize your risk over a 30 year period, but understand the likelihood of complete destruction if exposed to wildfire and the subsequent damage and downtime.



Fire Factor consequences by wildfire scenario.

Because the wildfire model is created by simulating 100,000,000 wildfires this year and another 100,000,000 wildfire simulations in the future, Risk Factor Pro is able to determine the breakdown of the intensity of all the simulated events that made it to each building.

With this module the user is not only able to understand and visualize the average intensity and maximum intensity of all modeled wildfires by flame length but also graph the breakdown of all intensities this year, in 15 years and in 30 years.



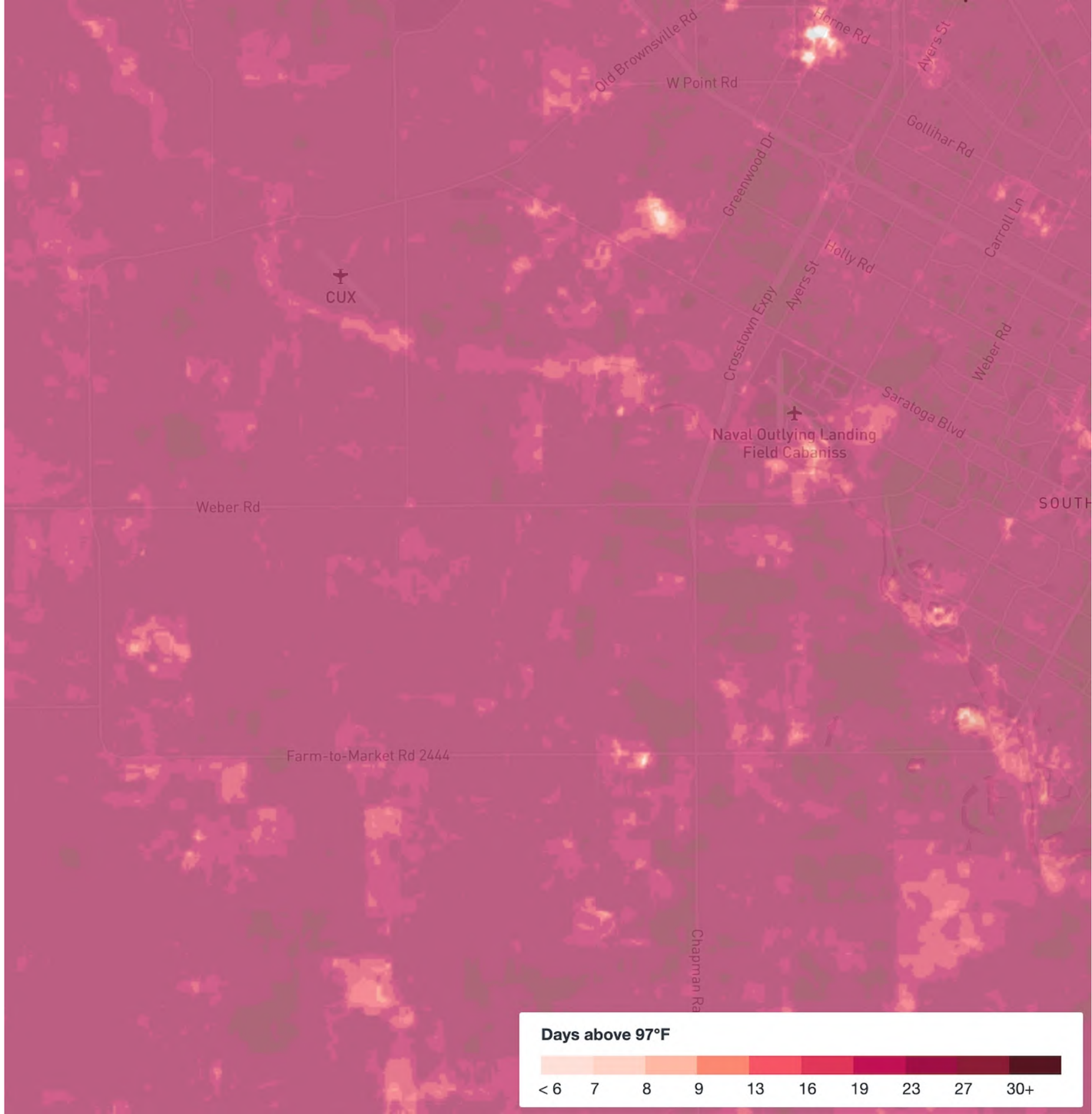
Open and transparent: extreme heat methodology.

The First Street Foundation - Extreme Heat Model (FSF-EHM) utilizes several existing methods from the heat science community combined with scalable computational techniques and satellite imagery to produce new high-resolution heat hazards across the contiguous United States (CONUS) at a 30-meter resolution. This was an effort that built on decades of peer-reviewed research and resulted in the first ever, nationally available high resolution, property specific and climate adjusted heat model.

Read the full 2022 technical methodology here>

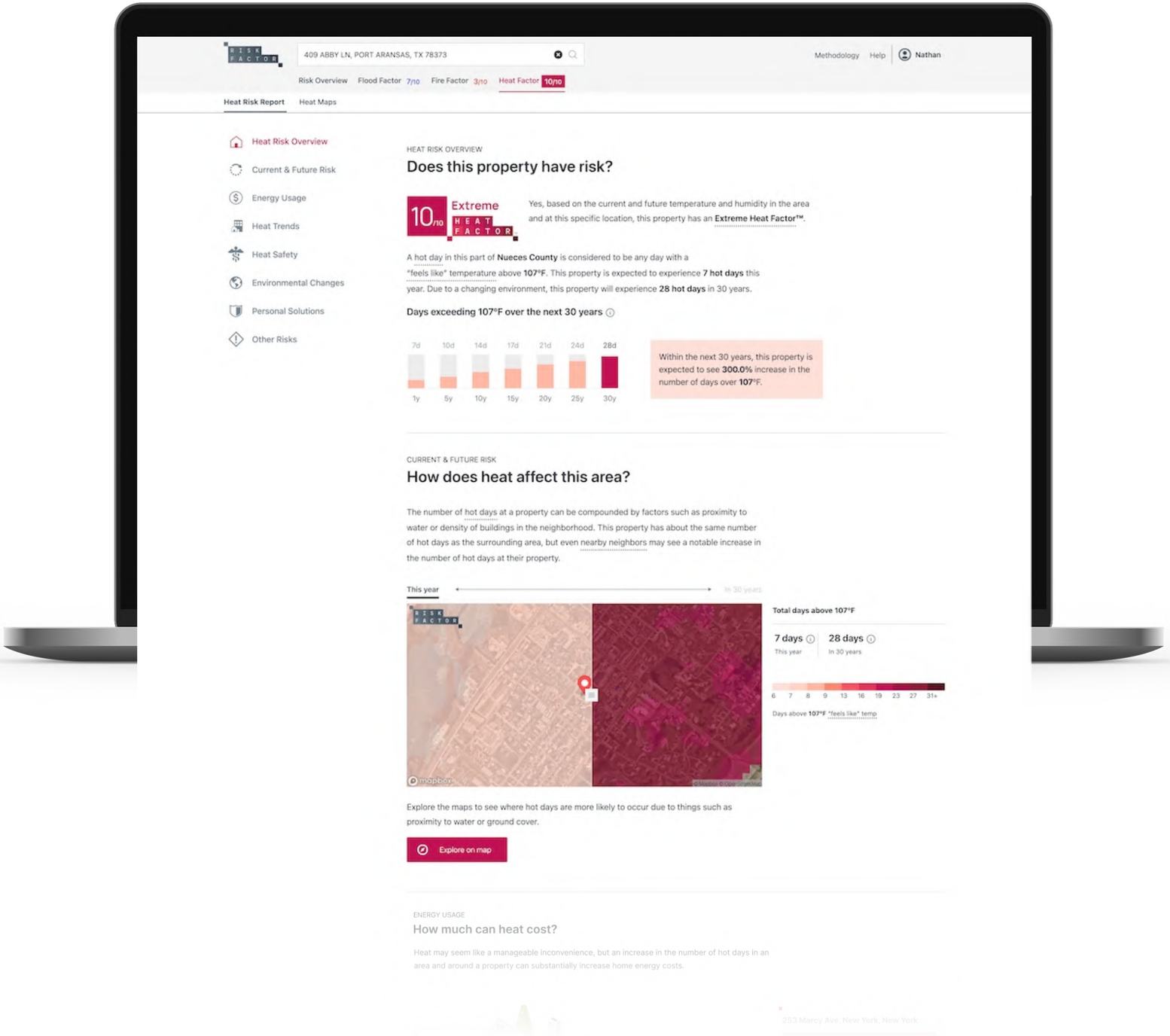
Read the peer reviewed paper from the journal climate here>

Report: Hazardous Heat>



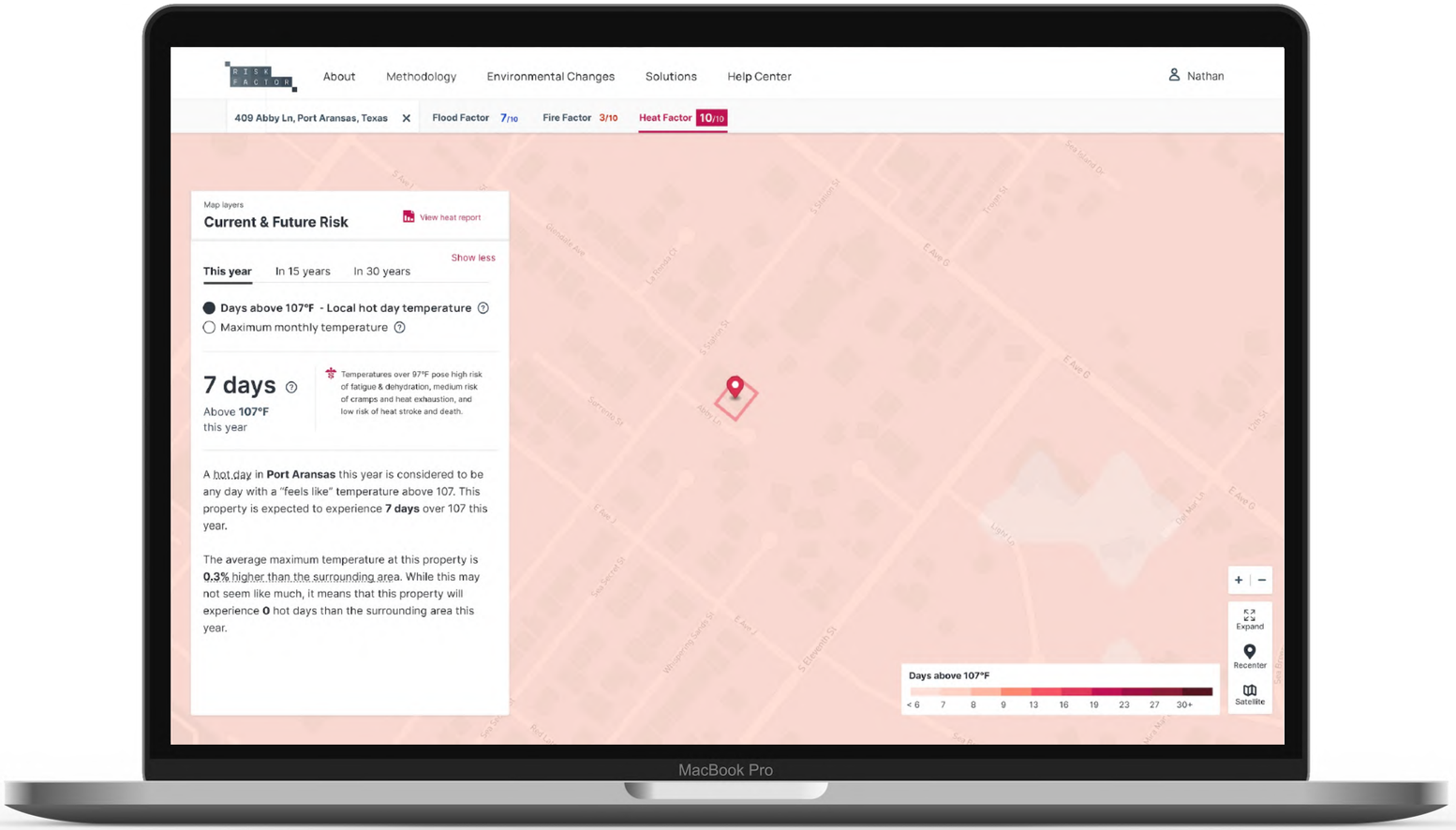
Heat Factor property report

Like Flood Factor and Fire Factor, every property has a Heat Factor and based on its specific risk, the user is presented with a customized exposure report. This allows the user to understand the current hottest 7 days a year (98th percentile) at the building and how that will change over the next 30 years, a visual of the local areas heat islands today and into the future, the impact on AC costs and energy consumption, and the number of days by temperature range with health implications.



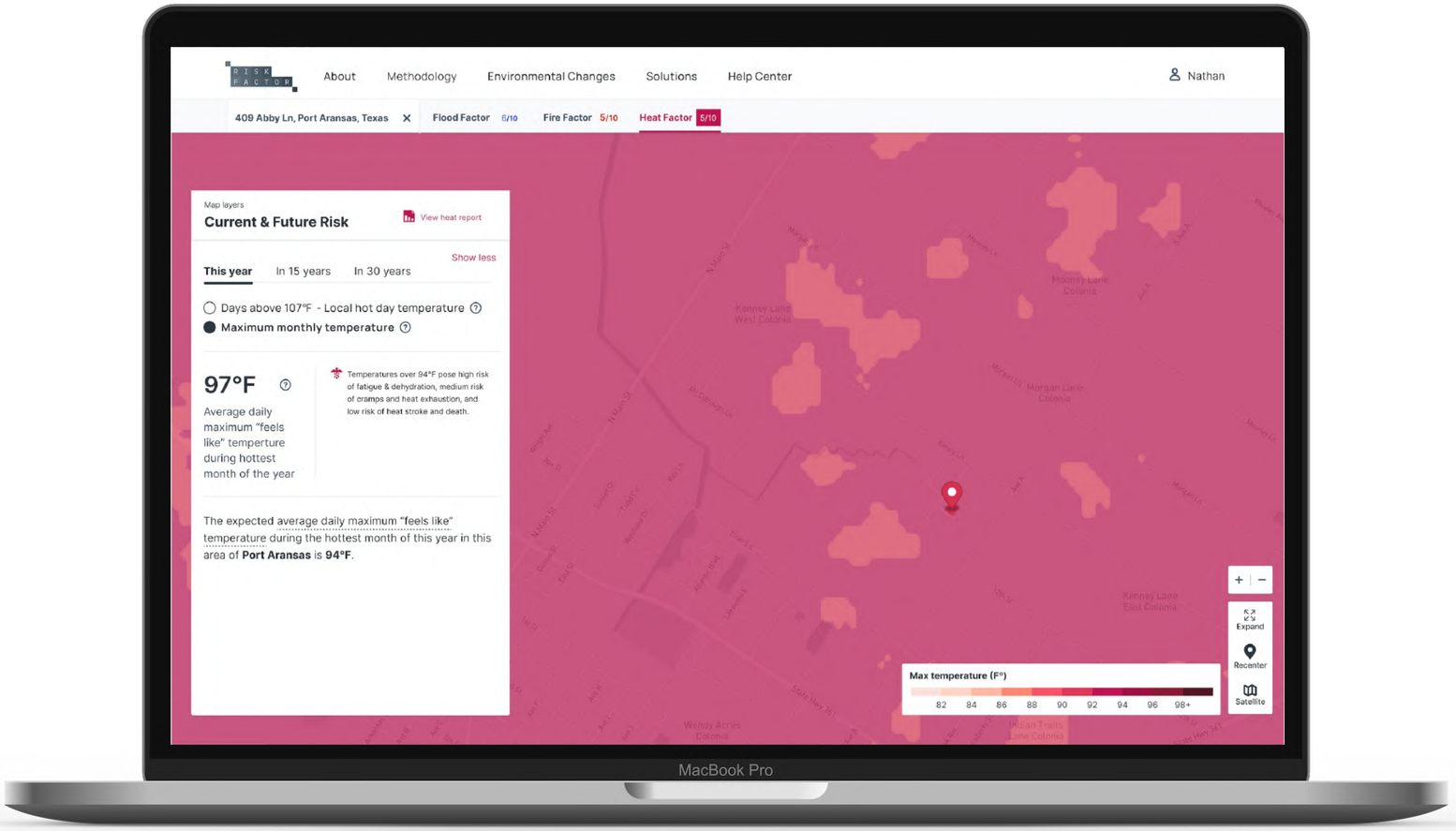
Heat Factor maps: current and future.

Risk Factor Pro is the first hyper local and climate adjusted hazard view at a 30 meter resolution. It allows the user to understand what the 98th percentile day is today and how it will change over the next 30 years. It also allows the user to see local heat islands or cooler locations that benefit from proximity to water, canopy cover, etc.



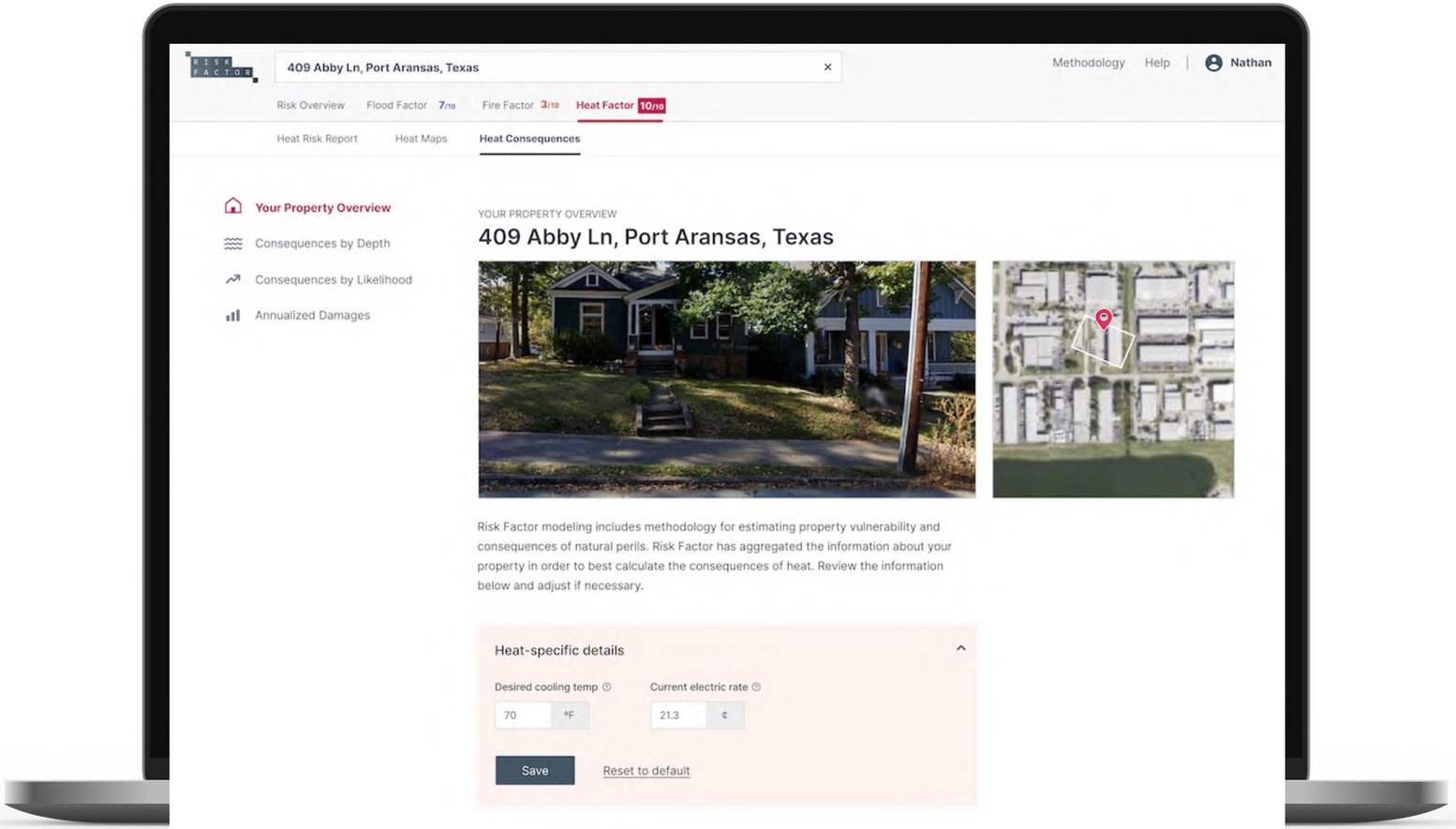
Heat Factor maps: current and future.

Lastly, with Risk Factor Pro you are able to see the average temperature for the hottest month of the year today, in 15 years, and in 30 years. This gives the user the ability to understand the longer term temperature exposure for a given year vs the 98th percentile of hottest days.



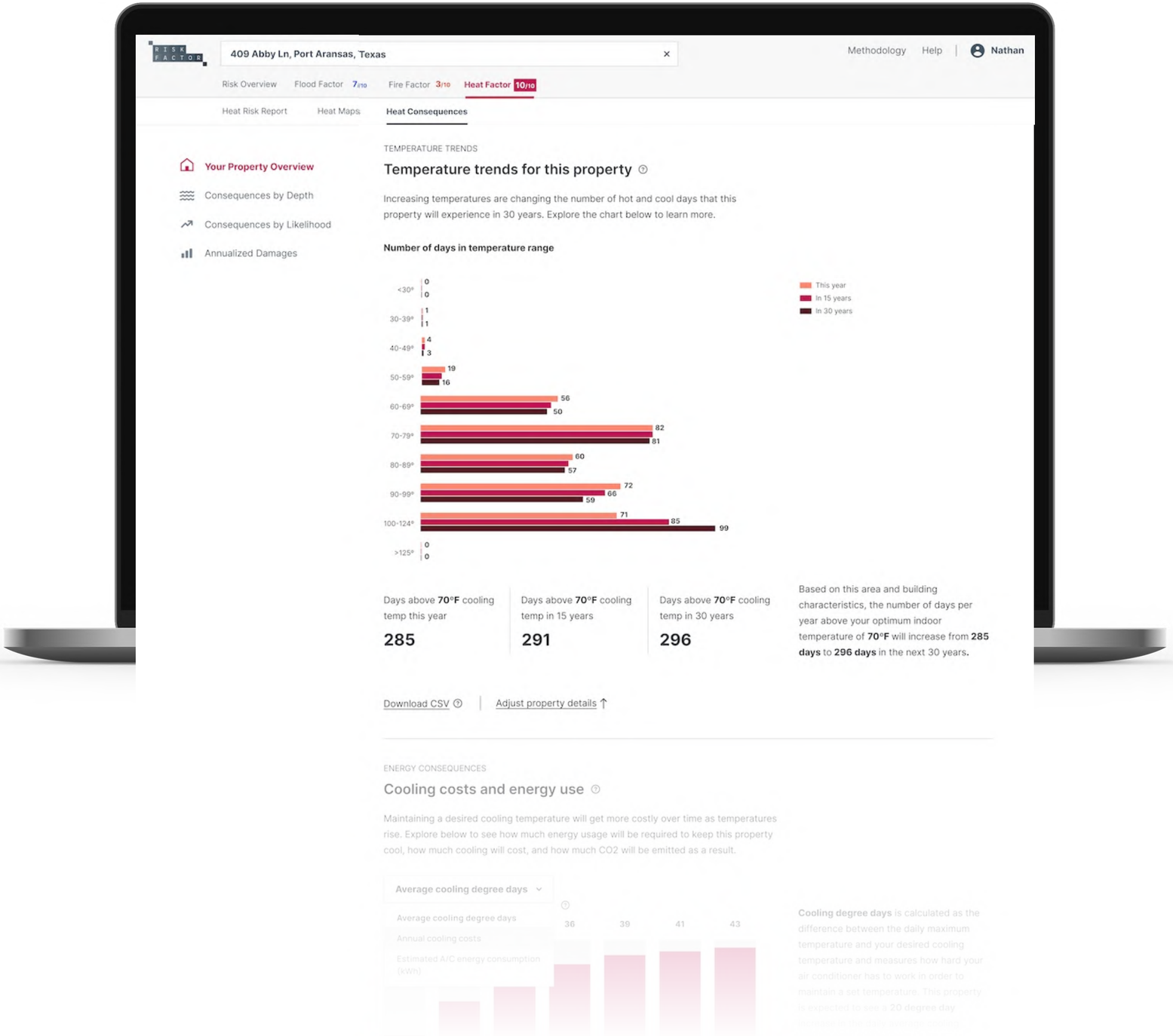
Heat Factor building specific consequences.

How extreme heat impacts a structure will mostly depend on the specific elements of the building such as square footage matched with the desired internal temperature of the building. Using the properties exposure matched with the exact building characteristics, Risk Factor Pro calculates every properties unique heat consequence profile.



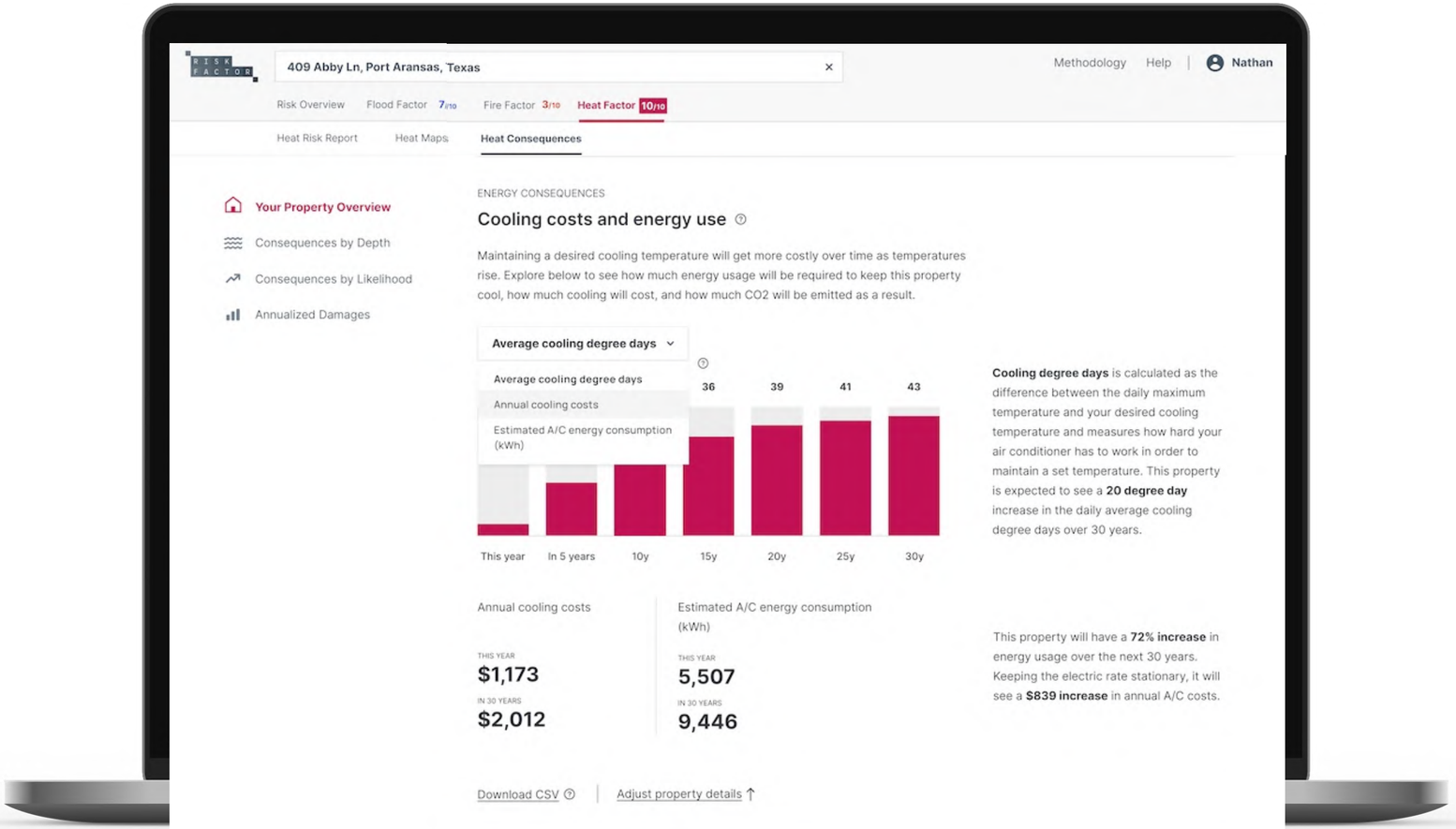
Heat Factor binned temperatures

Risk Factor Pro allows the user to view the number of days expected for each specific temperature bin today, in 15 years and up to 30 years in the future. It also calculates the number of cooling days expected based off the desired cooling temperature of the building.



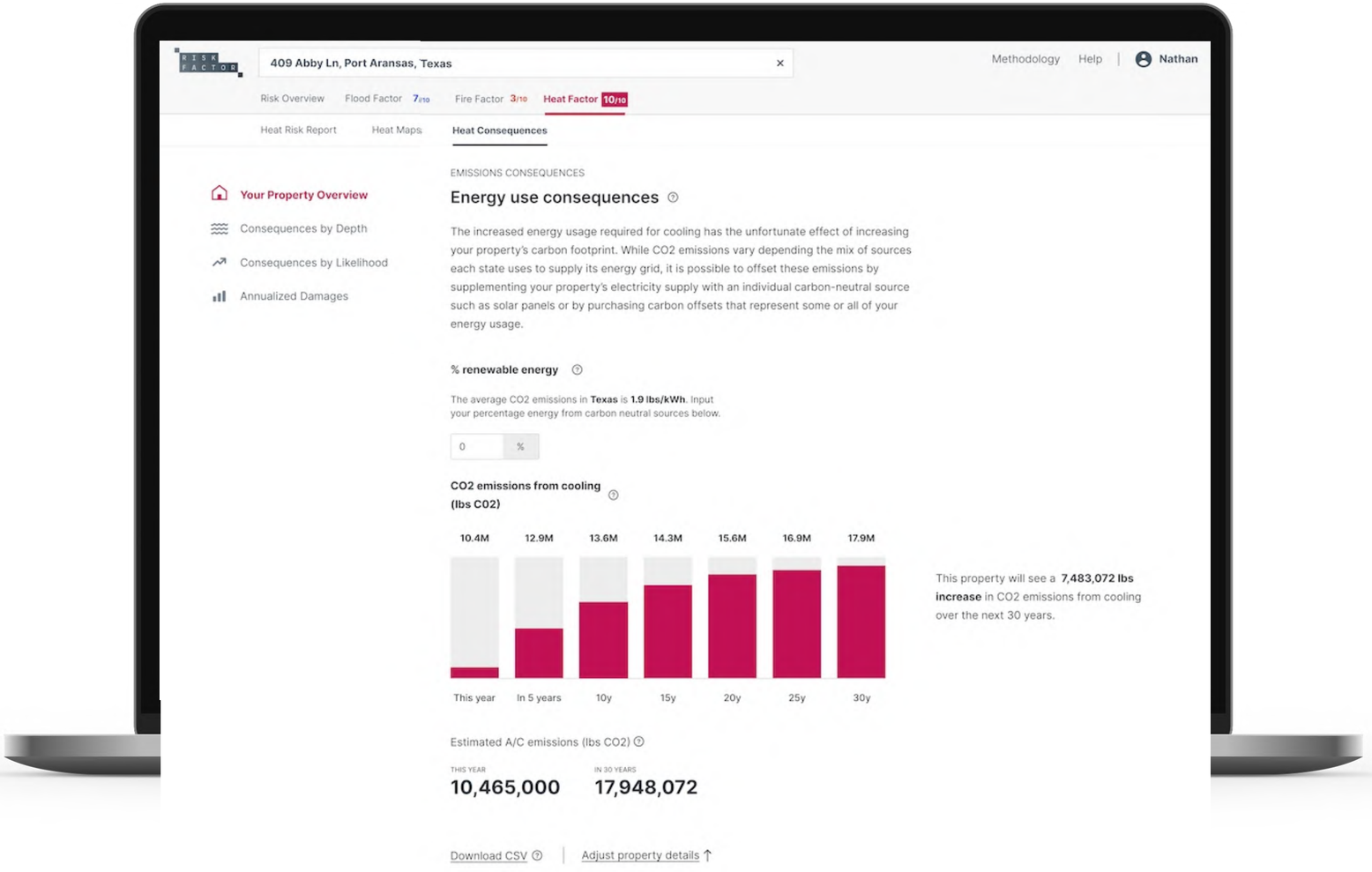
Heat Factor cooling cost consequences.

Based on the buildings square footage, year built, and cost per KwH, Risk Factor Pro is able to calculate the buildings specific cooling degree days (temperature - desired temperature) and use that to quantify the amount of energy needed to cool the building, and the associated cost per year, today and up to 30 years in the future.



Heat Factor emission consequences.

Given the KwH consumption that is calculated in the previous module, Risk Factor Pro is then able to take the state level CO2 emissions per KwH and estimate the emissions generated purely from cooling this building. It also allows the user to understand how purchasing offsets or implementing some level of clean energy into the mix would offset the buildings impacts.



RISK FACTOR™

Thank you.