

Wildfire & Air Quality: Impacts on your health and business

September 2023

Presented by:

Tyler Knowlton, Director Communications, Communities, Partnerships - Plume Labs by AccuWeather

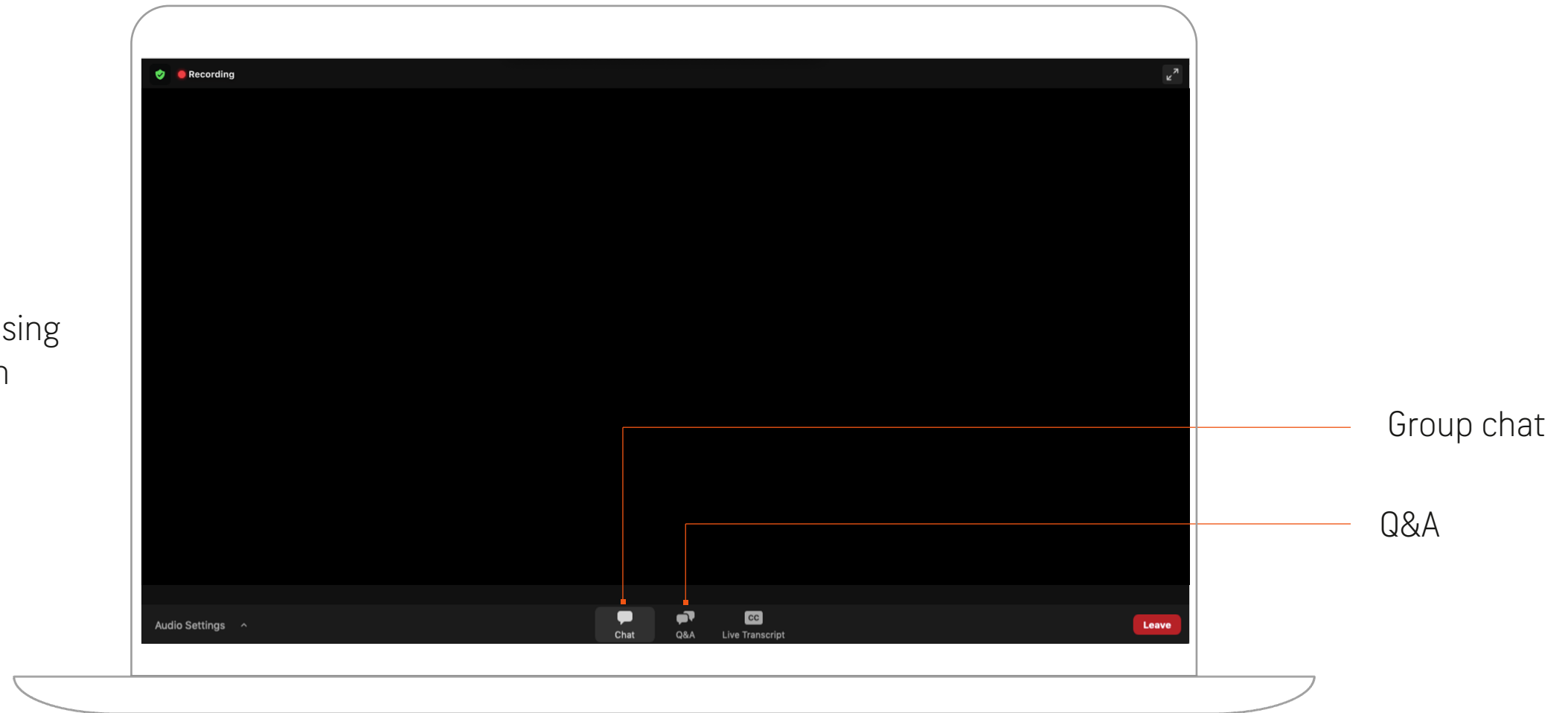
Gregoire Jauvion, Director, Data Science - Plume Labs by AccuWeather

Lou Seidel, Director, Business Development - AccuWeather For Business



How Zoom Webinars Work

Submit a question using
the Q&A function



Meet the Team



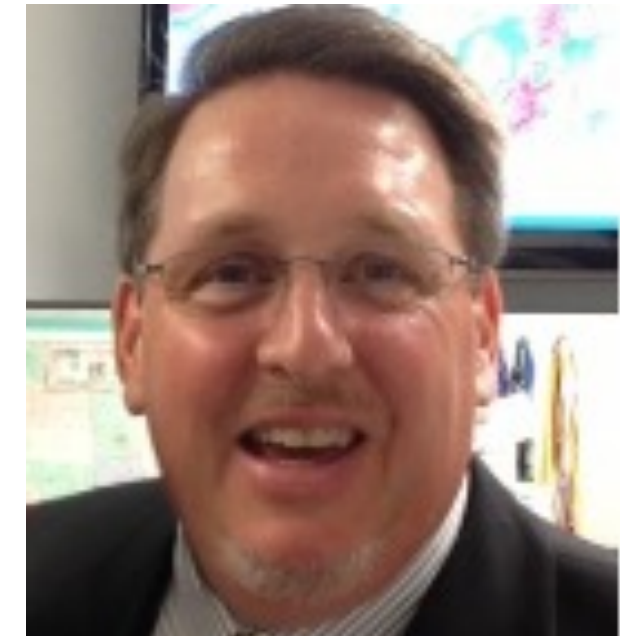
Tyler Knowlton

Director of Communications,
Communities, Partnerships -
Plume Labs by AccuWeather



Gregoire Jauvion

Director Data Science
Plume Labs by AccuWeather



Lou Seidel

Director
Business Development
AccuWeather For Business

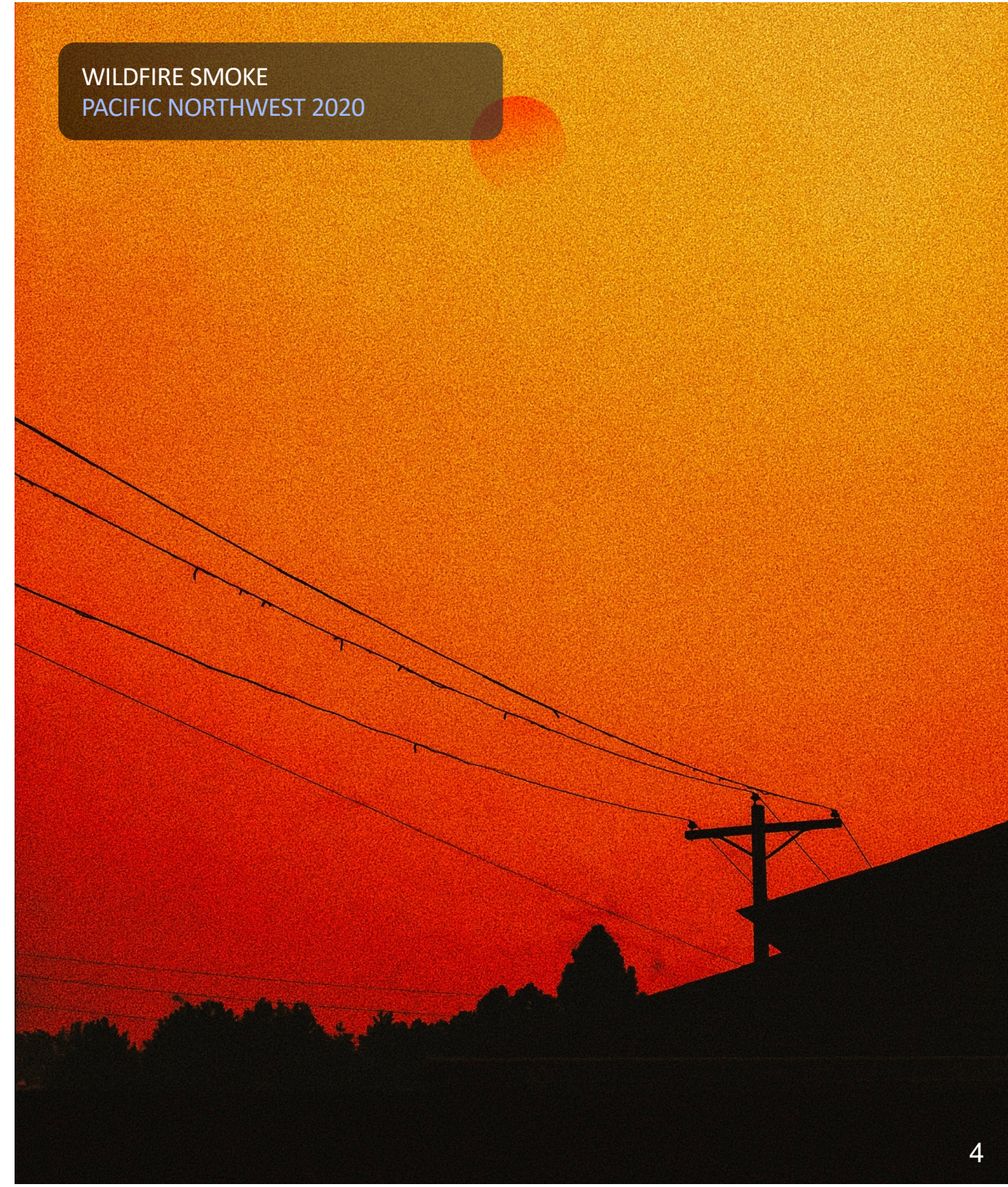
THE PROBLEM

Air pollution is the single greatest threat to health

- Massive costs
 - 4.2 million avoidable deaths
 - \$8.1 trillion economic cost
- Tipping point
 - Canadian wildfires, sustained pollution, ...
 - Increasing awareness - lack of actionable data

Source: [World Health Organization](#) & [World Bank](#)

WILDFIRE SMOKE
PACIFIC NORTHWEST 2020





THE PROBLEM

Air quality is complex and hyperlocal

- Highly variable
 - 5x to 8x variations within a city block
 - Even more between indoors and outdoors
- Hyper-local impact
 - +30% childhood leukemia risk ≤ 500 ft from traffic

Source: [Environmental Defense Fund](#) & [American Journal of Epidemiology](#)



What is Air Pollution?
In a nutshell:

“The release of pollutants into the air that are detrimental to human health and the planet as a whole.”

AIR QUALITY 101

Types of Pollution

Particulate Matter

Also known as aerosols, they mix fine dust and tiny liquid droplets suspended in the air.

- PM10 (coarse)
- PM2.5 (fine)
- PM1 (very fine)

Nitrogen dioxide (NO₂)

A gaseous pollutant in the nitrogen oxides (NO_x) family, along with nitric oxide (NO), characterized by a red-brown color, a pungent, acrid smell, and a high reactivity.

Ground Level Ozone (O₃)

A highly oxidizing gas is easily recognizable by its caustic odor (reminiscent of bleach). O₃ is one of the main components of photochemical smog.

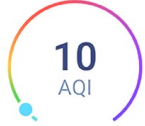
Air Quality Index

An air quality index (AQI) is an indicator to easily communicate air pollution levels. The more polluted the air, the higher the number and the greater the share of the population likely to feel negative effects from pollution.

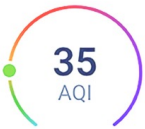
The Plume Labs by AccuWeather AQI gives you an immediate overview of what you are breathing, just as the temperature might give you a first indication of the weather outside.

AIR QUALITY 101

AccuWeather Air Pollution Scale



BLUE/GREEN - Excellent: The air quality is ideal for most individuals; enjoy normal outdoor activities.



YELLOW - Fair: The air quality is generally acceptable for most individuals. However, sensitive groups may experience minor to moderate symptoms from long-term exposure.



ORANGE - Poor: The air has reached a high pollution level and is unhealthy for sensitive groups. Reduce time spent outside if you are feeling symptoms, such as difficulty breathing or throat irritation.



RED - Unhealthy: Health effects may be immediately felt by sensitive groups. Healthy individuals may experience difficulty breathing and throat irritation with prolonged exposure. Limit outdoor activity.



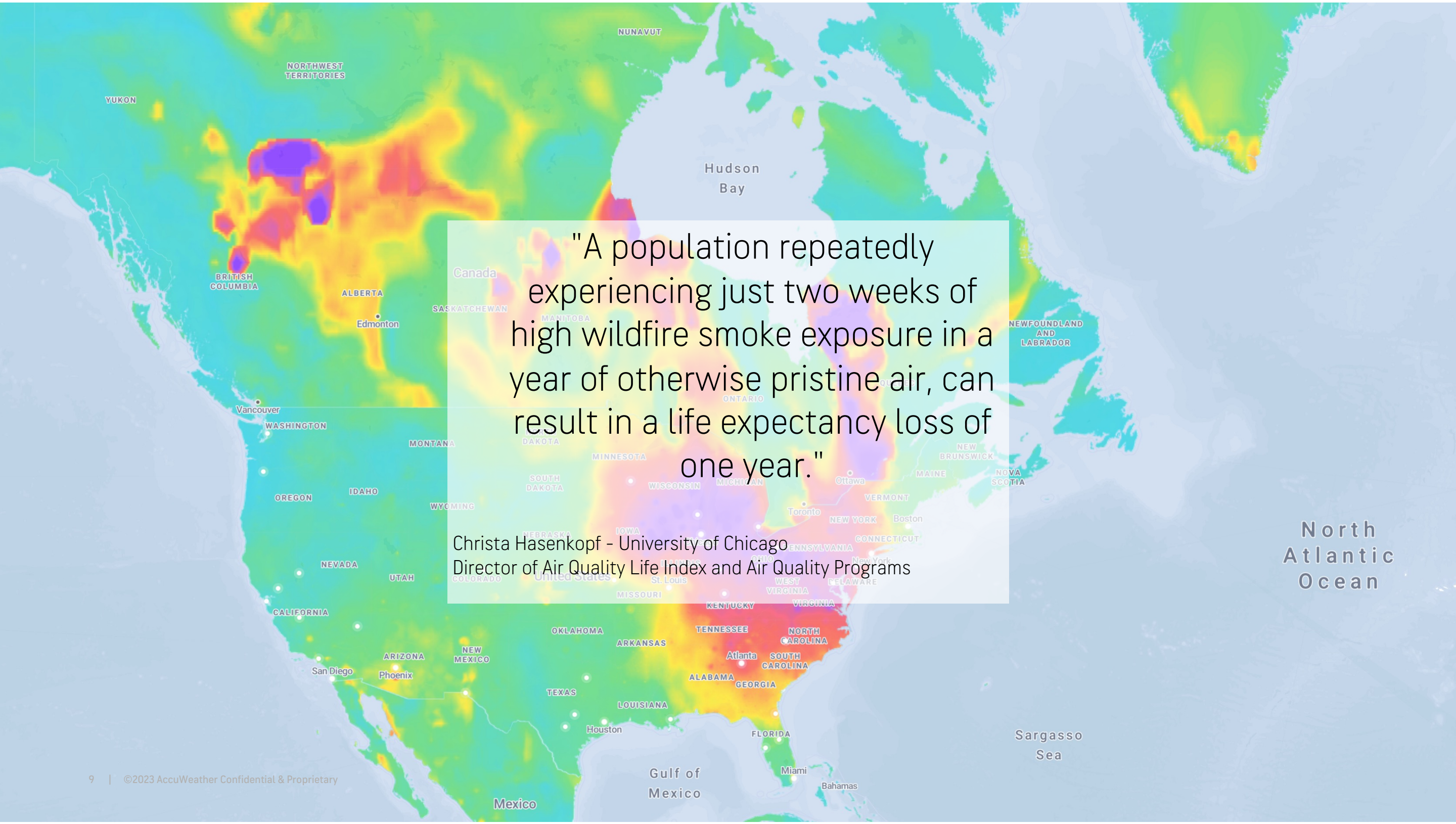
FUCHSIA - Very Unhealthy: Sensitive groups will immediately feel health effects, and they should avoid outdoor activity. Healthy individuals will likely experience difficulty breathing and throat irritation; consider staying indoors and rescheduling outdoor activities.



PURPLE - Dangerous: Any exposure to the air, even for a few minutes, can lead to serious health effects for everybody. Avoid outdoor activities.

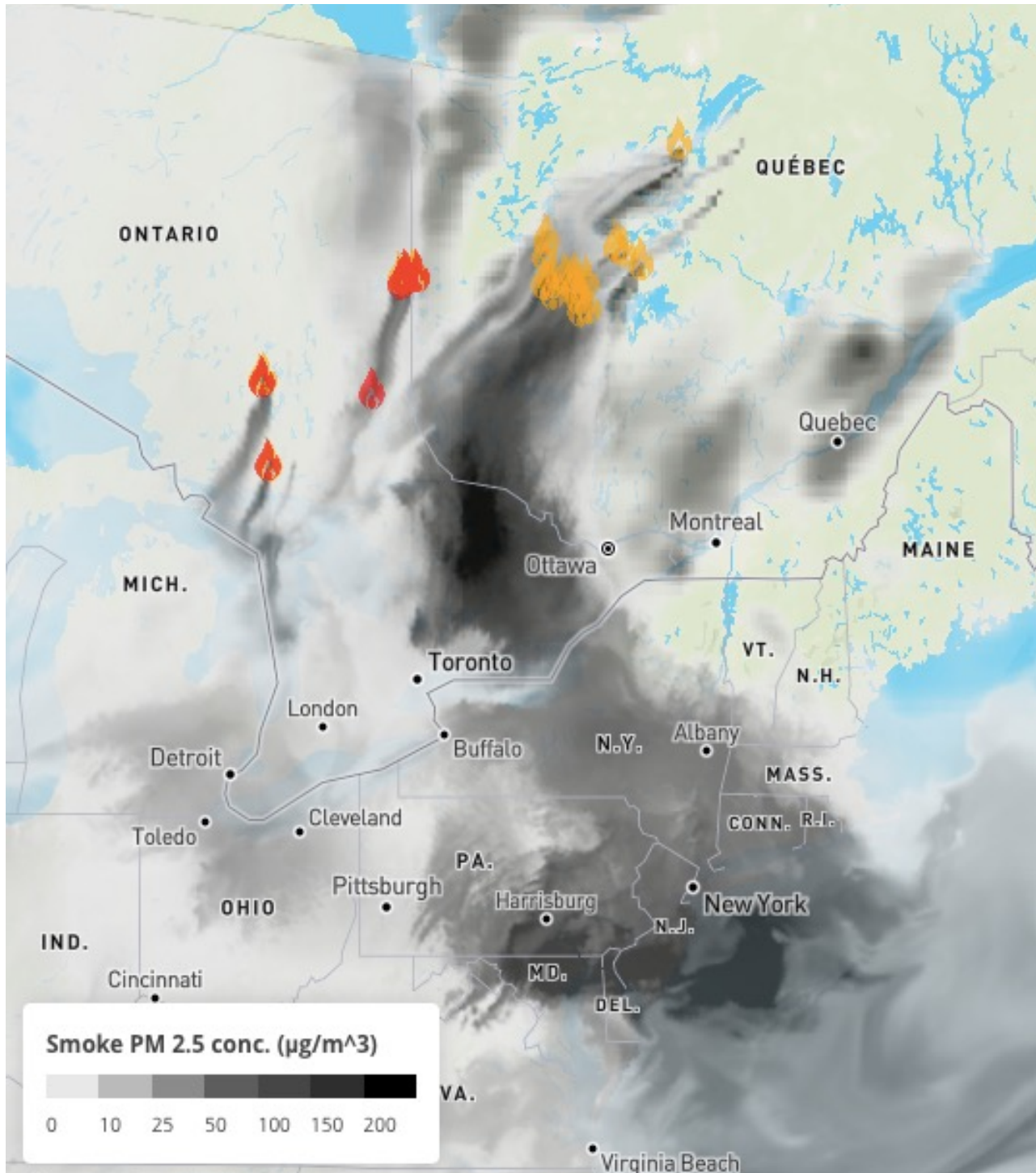
Read the Scale
The higher the number,
the less time you can be exposed





"A population repeatedly experiencing just two weeks of high wildfire smoke exposure in a year of otherwise pristine air, can result in a life expectancy loss of one year."

Christa Hasenkopf - University of Chicago
Director of Air Quality Life Index and Air Quality Programs

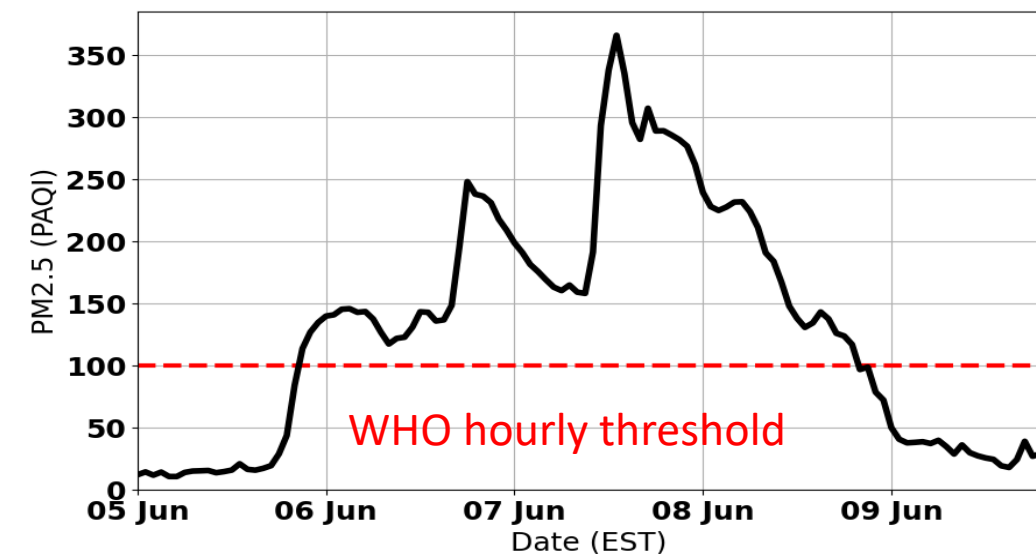


AIR QUALITY 101

Wildfires and Air Quality

June 6-9, NYC

- Intense smoke with PM2.5 levels above WHO hourly recommendations (100 PAQI)
- Dramatic potential health impacts for inhabitants.
- As a reference, very polluted cities like Delhi and Beijing have 2022 annual averages of 195 and 104 PAQI, respectively, where NYC has a 2022 annual average of 32.
- People aware of pollution are equipped to protect against it (air purifier, masks), but many people in NY were not.



Air Quality Data Solutions

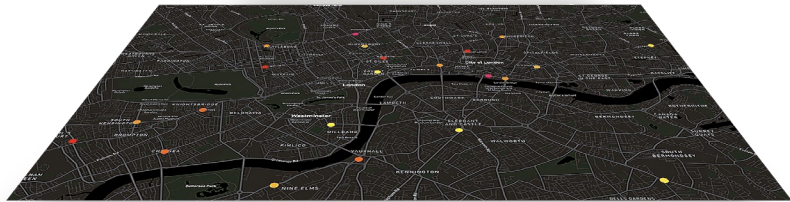
September 2023

Forecast API: Air quality live and forecasts data platform

CATEGORY	UNITS	LIVE UPDATES	FORECAST	RESOLUTION	COVERAGE
PM 2.5 PM 10 NO ₂ O ₃	µg / m ³ AQI scales	HOURLY	HOURLY DATA UP TO 168 HOURS	STREET LEVEL (10m - 100m)	100+ cities (Europe & U.S. + Taiwan)
				ADAPTIVE GRID (200m - 2km)	USA, Europe ¹ , Taiwan, PRC, Japan, South Korea, India, Turkey
				BACKGROUND 40km	Rest of the World
SO ₂ CO	µg / m ³ AQI scales	HOURLY	HOURLY DATA UP TO 96 HOURS	10km	Europe ¹ , Turkey
				40km	Rest of the World
UV	UV Index (WHO)	HOURLY	UP TO 96 HOURS	40km	Worldwide
WILDFIRES	Burning area, burnt area, meta data	HOURLY	CURRENT CONDITIONS	500m	U.S.
	Burning area	TWICE DAILY			Rest of the World

We train air quality forecasting & mapping models.

Data collection



Monitoring stations



Street-by-street traffic data



Weather prediction details



Large-scale transport



Land-use



Road network topology



Satellite feeds (ozone, fires..)

Forecasting



BACKGROUND (40km)

Hourly forecasts

Up to 7 days

Global & regional models

Model: PlumeNet



[PlumeNet: Large-Scale Air Quality Forecasting Using a Convolutional LSTM Neural Network](#)

Downscaling



STREET LEVEL (10m - 100m)

Real-time, 100+ cities



ADAPTIVE GRID (.2km - 2km)

Real-time, US/EU + select countries

Model: DeepPlume



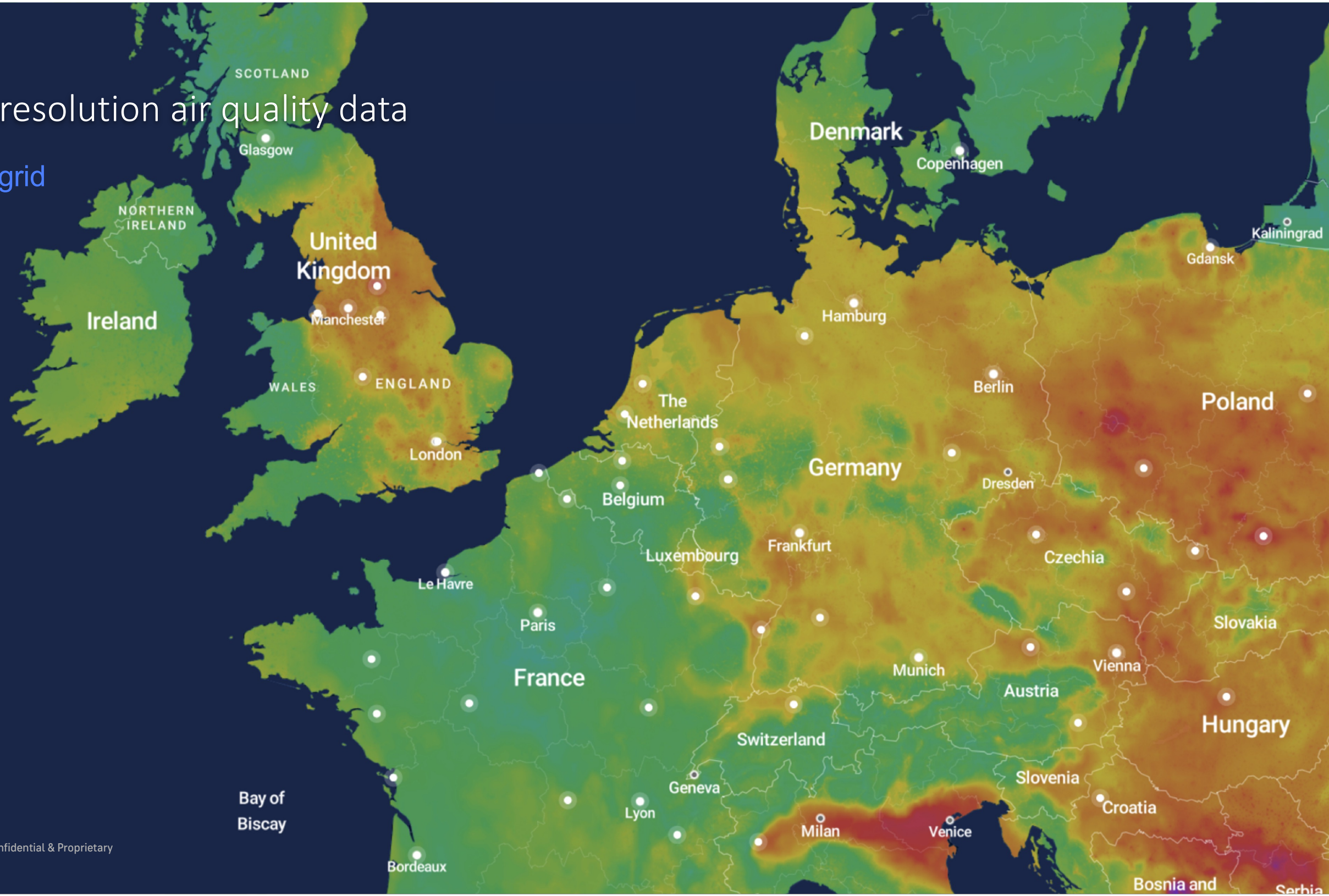
[DeepPlume: Very High Resolution Real-Time Air Quality Mapping](#)



[High-Resolution Air Quality Prediction Using Low-Cost Sensors](#)

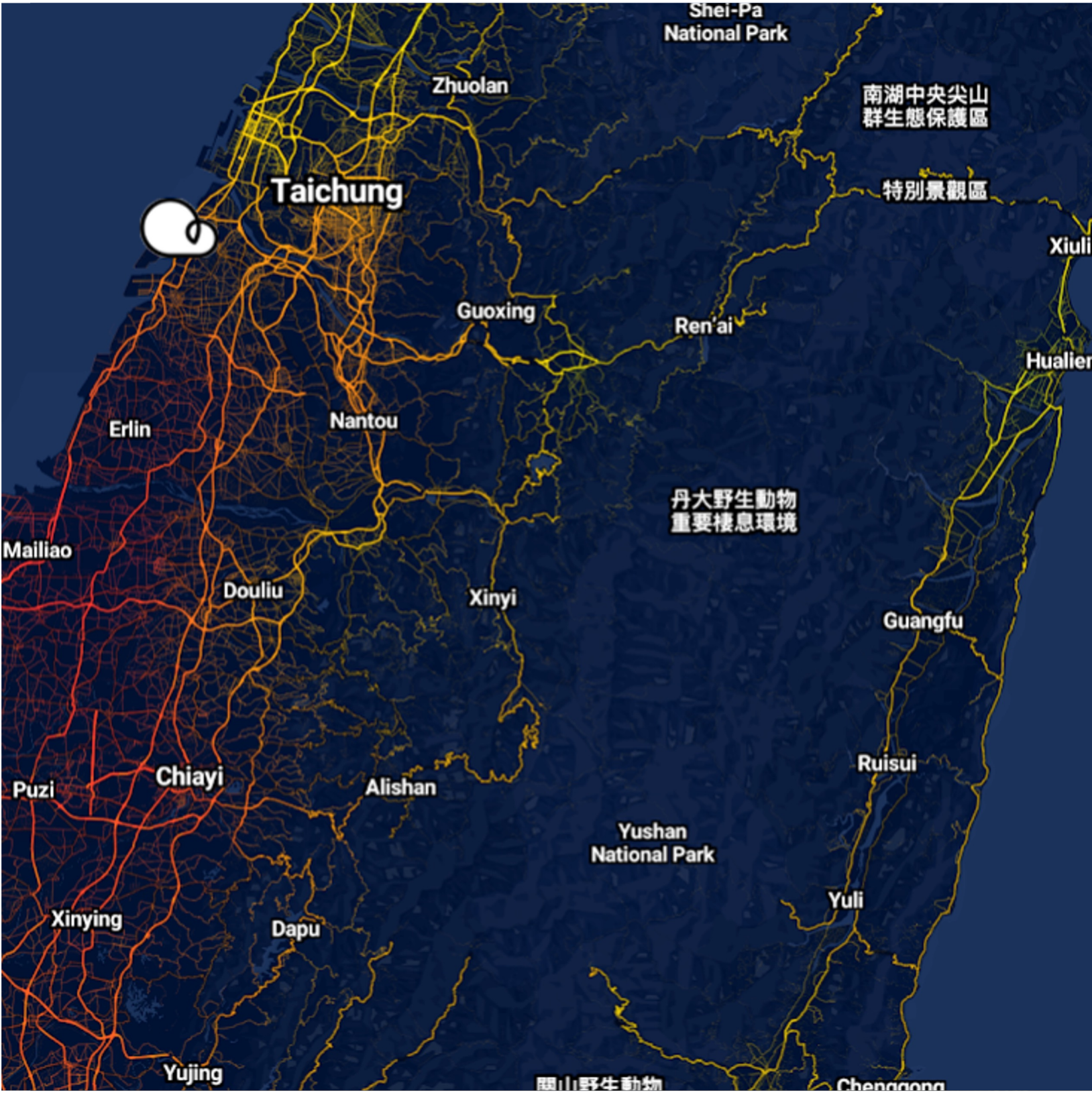
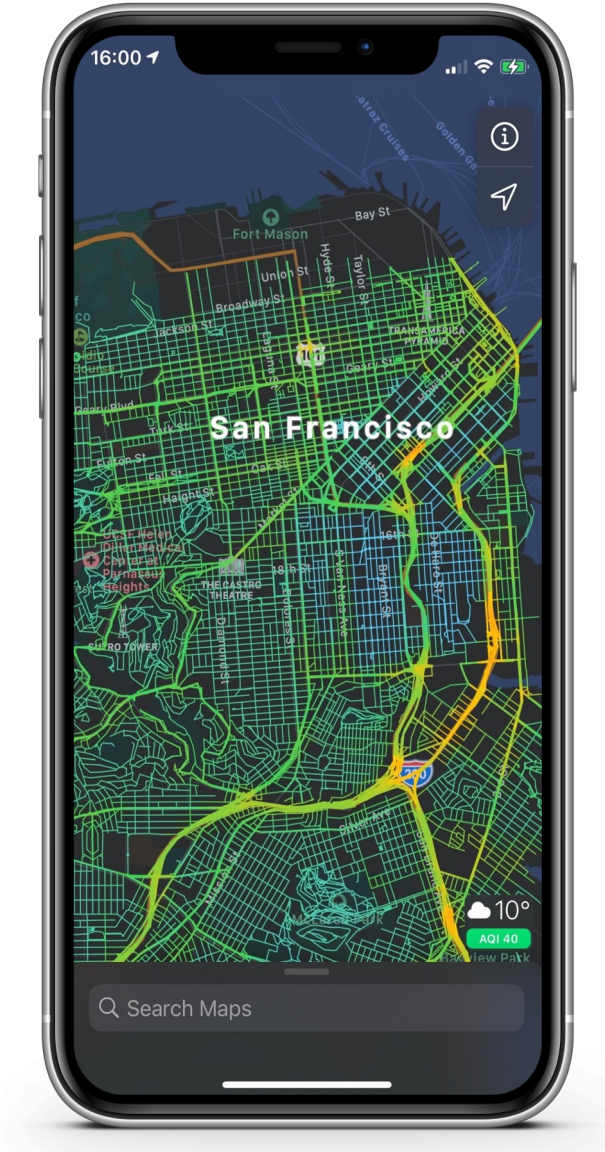
From high-resolution air quality data

200m to 2km grid



To street-level air quality maps

10m-100m resolution



Case study: AQ forecasts in New York when Canadian wildfire smoke hit - June 2023

Comprehensive modeling approach

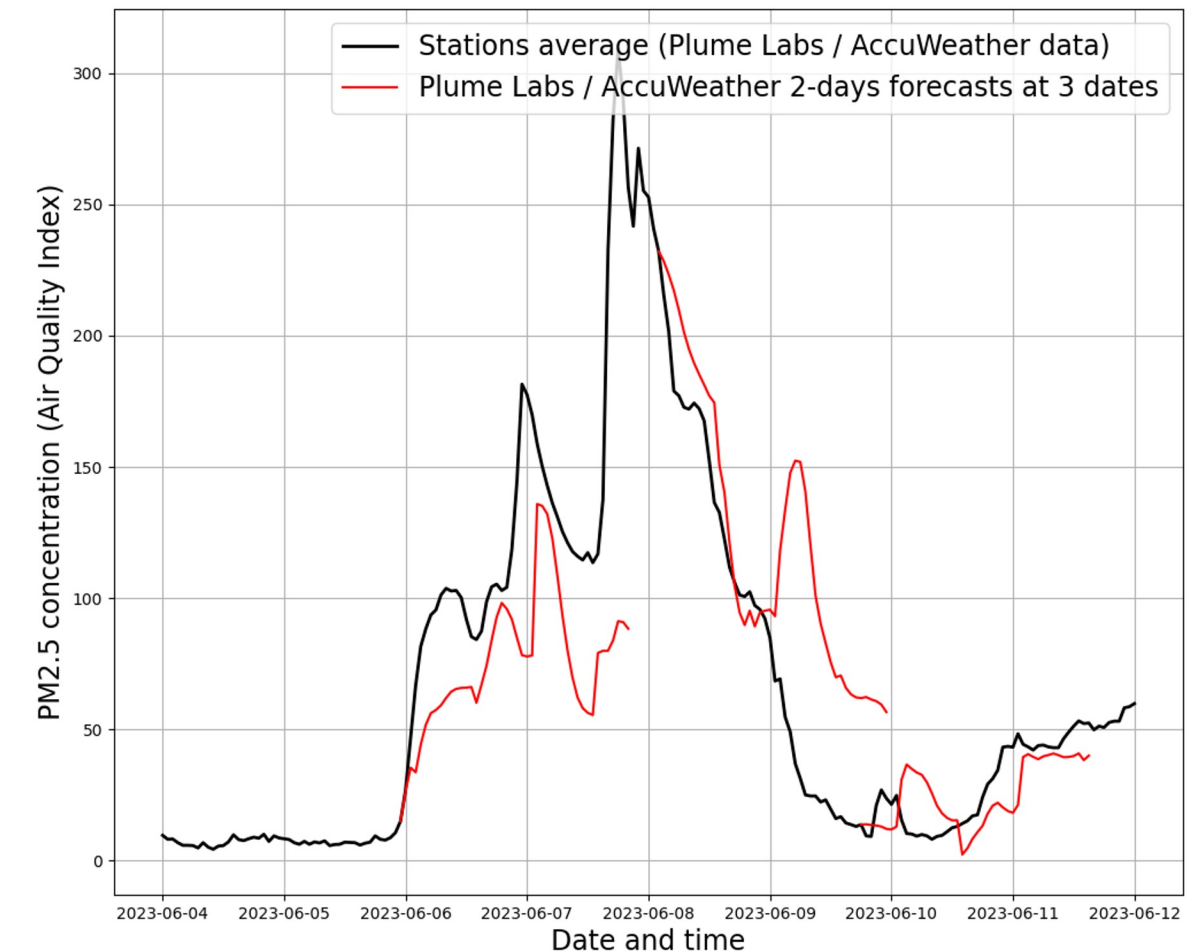
- We combine ML-based forecasts trained on ground monitoring data along with large-scale atmospheric models.
- That includes satellite products such as wildfire detection.
- This means our air quality forecasts integrated the impact of wildfires as soon as their scale was detectable.

Outstanding forecasting accuracy

- We provided reliable forecasts during the air pollution peak from Canadian wildfire smoke hitting New York.

Plume Labs by AccuWeather 2-days ahead forecasts in New York

2-days forecasts as computed at 3 dates when the Canadian wildfire smoke impacted air quality in New York.
Compared to ground truth as measured later by monitoring stations in real-time





AccuWeather's Wildfire Product Suite



A Holistic Suite of Products

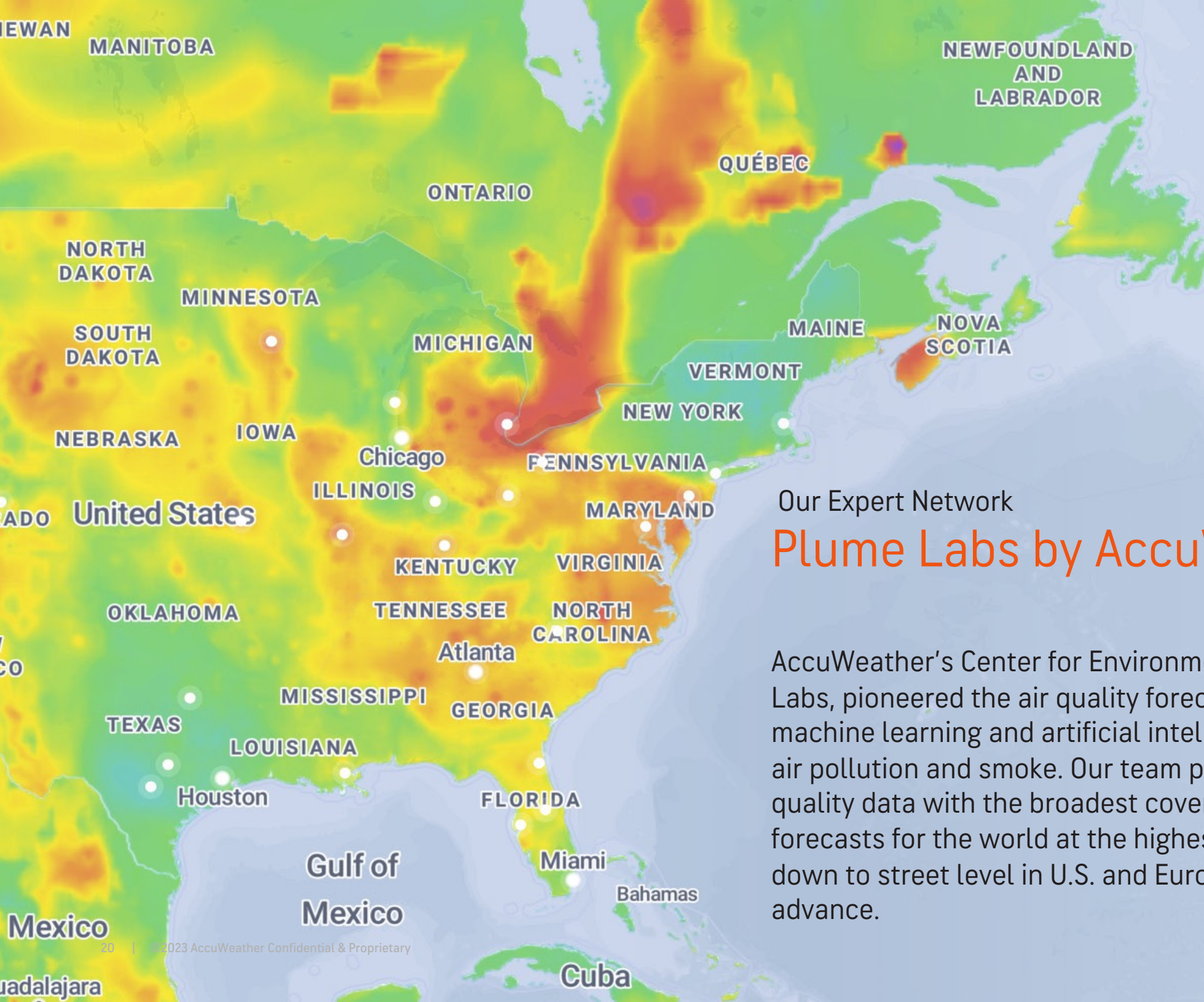
- **Seasonal Forecast**
 - AccuWeather's long-range forecasters and wildfire experts provide the earliest notice about how the wildfire season will evolve.
- **Weekly Wildfire Forecast**
 - These wildfire forecasts are updated twice weekly and provide exclusive insights on wildfire threats over the coming week and detailed descriptions of expected impacts, offering superior decision-making value.
- **Daily Risk Assessment Index & Alerting**
 - Daily risk wildfire assessments are available for your assets wherever they might be.



AccuWeather's Wildfire Product Suite

A Holistic Suite of Products

- **SkyGuard® Wildfire Proximity Alerts**
 - Receive real-time wildfire alerts, integrated with AccuWeather's world-class enterprise-level SkyGuard® platform, for an immediate notification when a large wildfire has sparked within 5 miles of your asset locations so that you can activate safety and business continuity plans.
- **Smoke/Air Quality Forecasts, Maps & Alerts**
 - We provide maps of burning fires, near-surface smoke, and air quality. Access the most accurate air quality and smoke current conditions and forecast out 7 days available exclusively from AccuWeather.
- **Forensic Weather Services & Historical Analysis**
 - Our experts reconstruct weather conditions surrounding a fire, validate or invalidate weather factors in sparking a wildfire, and provide expert witness reports and legal testimony.



Our Expert Network

Plume Labs by AccuWeather

AccuWeather’s Center for Environmental Data and Machine Learning, Plume Labs, pioneered the air quality forecasting industry by advancing geospatial machine learning and artificial intelligence technologies to map and predict air pollution and smoke. Our team provides the most accurate and specific air quality data with the broadest coverage, including current conditions and forecasts for the world at the highest resolution available from any sources, down to street level in U.S. and European urban areas, and up to 7 days in advance.

Q & A



Contact us at afb@accuweather.com to learn more about Wildfire and Air Quality Alerts from Plume Labs and AccuWeather For Business or scan the QR code.

Next Webinar:

Get Your Business Winter Ready: 2023 Seasonal Outlook

WEDNESDAY, OCTOBER 25, 2023

11 AM Eastern



SCAN THE QR CODE TO REGISTER NOW.

Thank you

Contact us to learn more about all the ways you can partner with AccuWeather.

www.afb.accuweather.com



Convergence Blog

Get the latest on the importance of incorporating site and threshold-specific weather information into your emergency response plans. Case studies, high-impact forecast overviews, storm summaries, client stories, and more.

[Subscribe for Updates](#)



FEATURED / HURRICANE

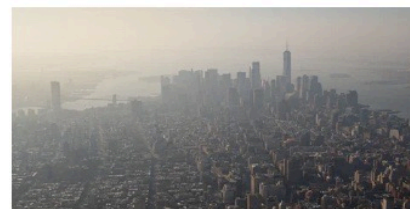
Most Devastating Hurricanes in U.S. History and Lessons Learned

Most Devastating Hurricanes in U.S. History Whenever a hurricane forms, it poses a significant...

[Read More →](#)

What are you looking for?

[Weather Now](#) [Education](#) [Webinars](#) [Retail](#) [Transportation](#) [Energy](#) [Insurance](#) [Healthcare](#) [Manufacturing](#) [Financial Services](#) [Forensics](#) [Telecommunications](#)



Unhealthy Air Quality from Canadian Wildfires Puts Outdoor



The Economic Impact of Hurricanes on Your Business



Hurricane Facts vs. Fiction: What You Need to Know