



AirNow and Wildfires: 2021 Improvements and Thoughts for 2022 and Beyond

Clean Air Act Advisory Committee (CAAAC)

October 18, 2021



Presentation Outline

- **Quick overview of program**
 - AirNow program values and mission
- **Recent wildfire improvements (2020/2021)**
 - Airnow.gov website
 - Fire and Smoke map
 - AirNow mobile device app
- **Future capabilities being explored**
 - AirNow Vision

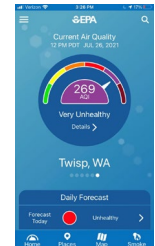
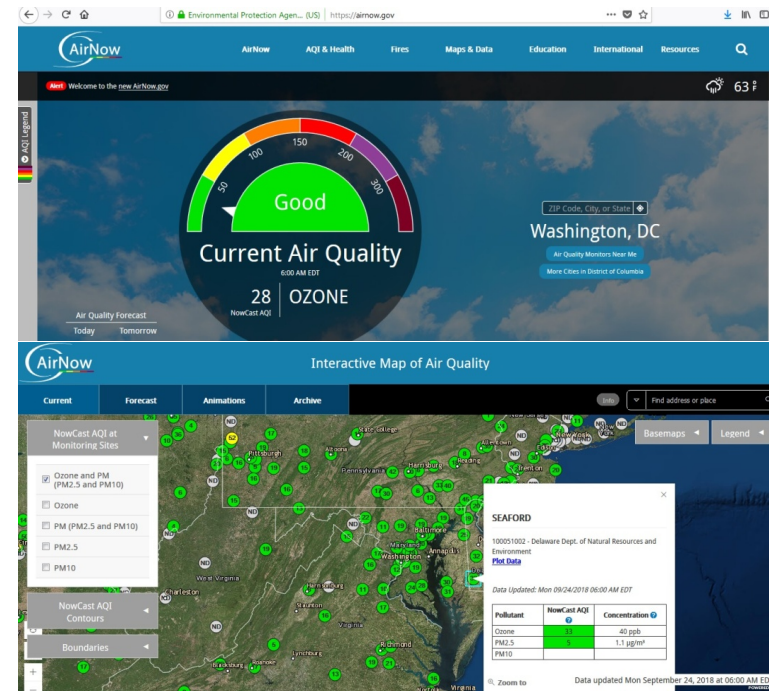


Quick Overview of AirNow

AirNow is the national framework for acquiring and distributing air quality information (AQI)

- Gathers and quality assures hourly data provided by 150+ federal, state, tribal, and local air quality agencies
 - ✓ U.S. Embassy data worldwide
 - ✓ Canada, Mexico
- Next-day AQI forecasts for nearly 500 cities
- Provides information on air quality and health
- Partnerships with NOAA/NWS and USFS

America's "go to" resource for current and forecasted air quality information





Important AirNow Program Values

- **It is a Partnership**

- AirNow is completely voluntary

- ✓ Relies on the participation of state, local, tribal, and federal agencies that supply data

- **Our Mission is Twofold**

- Our audience is the public (AQI reporting)

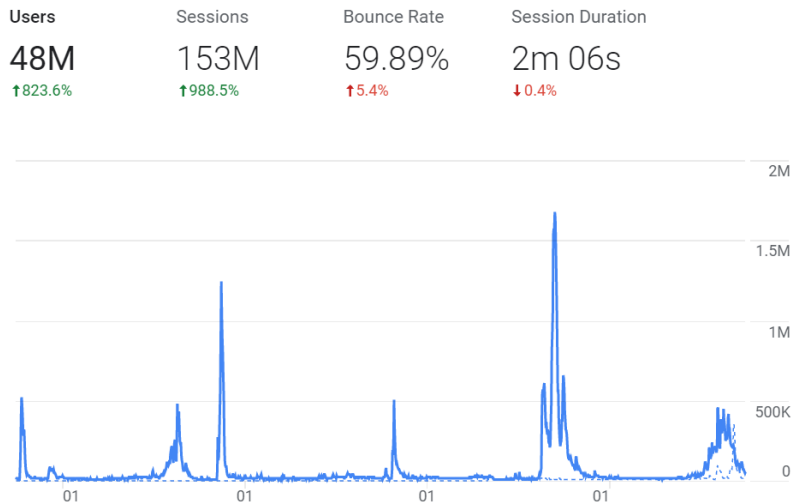
- ✓ Strive to provide the timeliest information possible so individuals can take action to reduce exposure

- Provide tools to help our data partners in their air quality mission

- ✓ AirNow-Tech

Wildfires and the AirNow Program

Website traffic (2017-2021)



Spikes are wildfire events

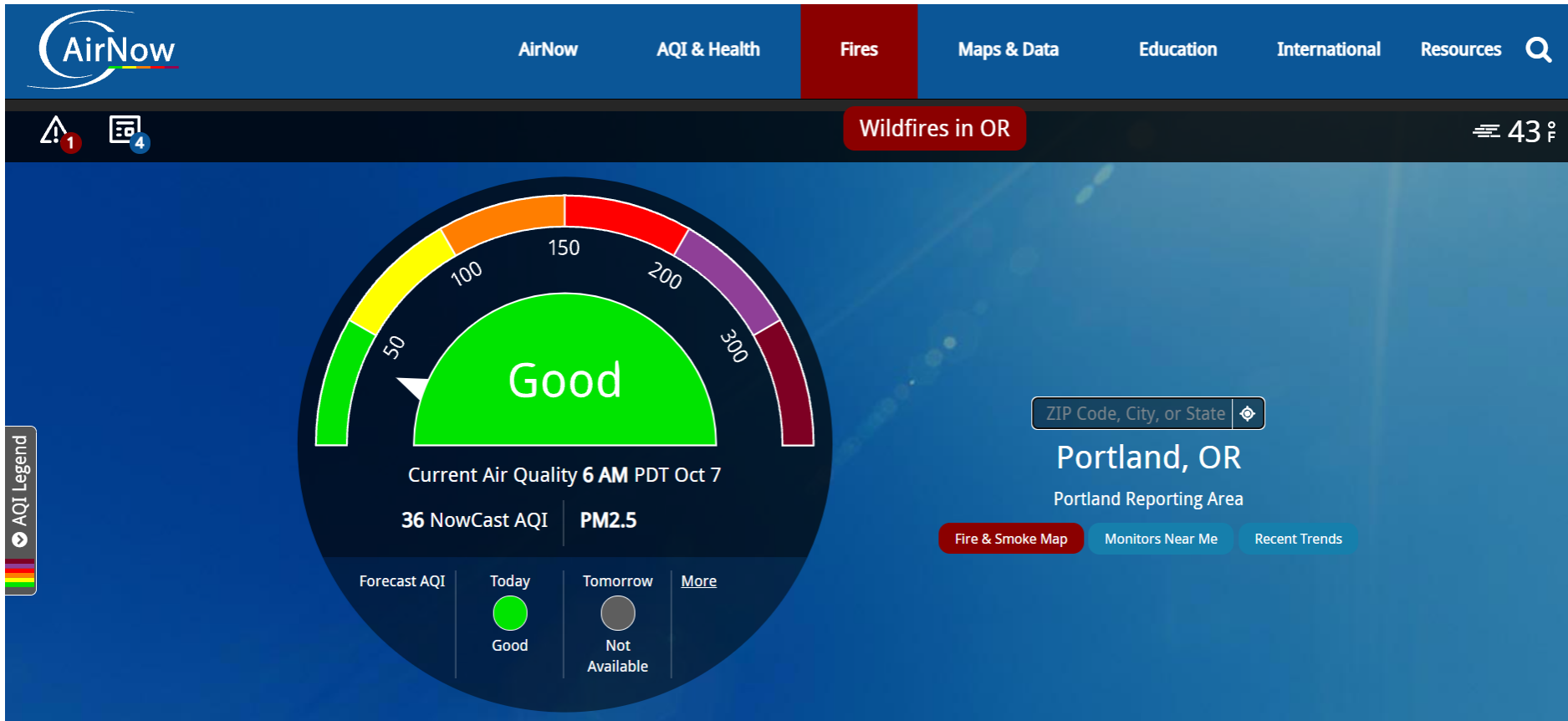
- The public relies heavily upon **AirNow** as a source of information, especially during wildfires
- During wildfire events, AirNow usage is often 100 times that of an average day
- Major improvements made in 2020/2021 to help the public protect their health
 - ✓ Website infrastructure on cloud.gov to handle increased traffic



AirNow Website Improvements for Wildfires

The screenshot displays the AirNow website interface. At the top, the navigation menu includes 'AirNow', 'AQI & Health', 'Fires', 'Maps & Data', 'Education', 'International', and 'Resources'. The 'Fires' menu is expanded, showing options for 'Fires', 'Fire and Smoke Map', 'Using AirNow During Wildfires', 'Smoke Advisories', and 'Fires and Health'. A 'System Alerts' pop-up is visible, titled 'Wildfires in Multiple States' with a date of '2021-07-23'. The alert text reads: 'There are multiple wildfires across the United States. Explore the [Fire & Smoke Map](#) for more details.' Below the alert is a 'View All (1)' link. At the bottom, there is a search bar labeled 'ZIP Code, City, or State' with a location pin icon and the text 'Get air quality data where you live.'

AirNow Website Improvements for Wildfires



AirNow AirNow AQI & Health **Fires** Maps & Data Education International Resources

Wildfires in OR 43°F

Good

Current Air Quality 6 AM PDT Oct 7

36 NowCast AQI | PM2.5

Forecast AQI Today Tomorrow More

Good Not Available

ZIP Code, City, or State

Portland, OR

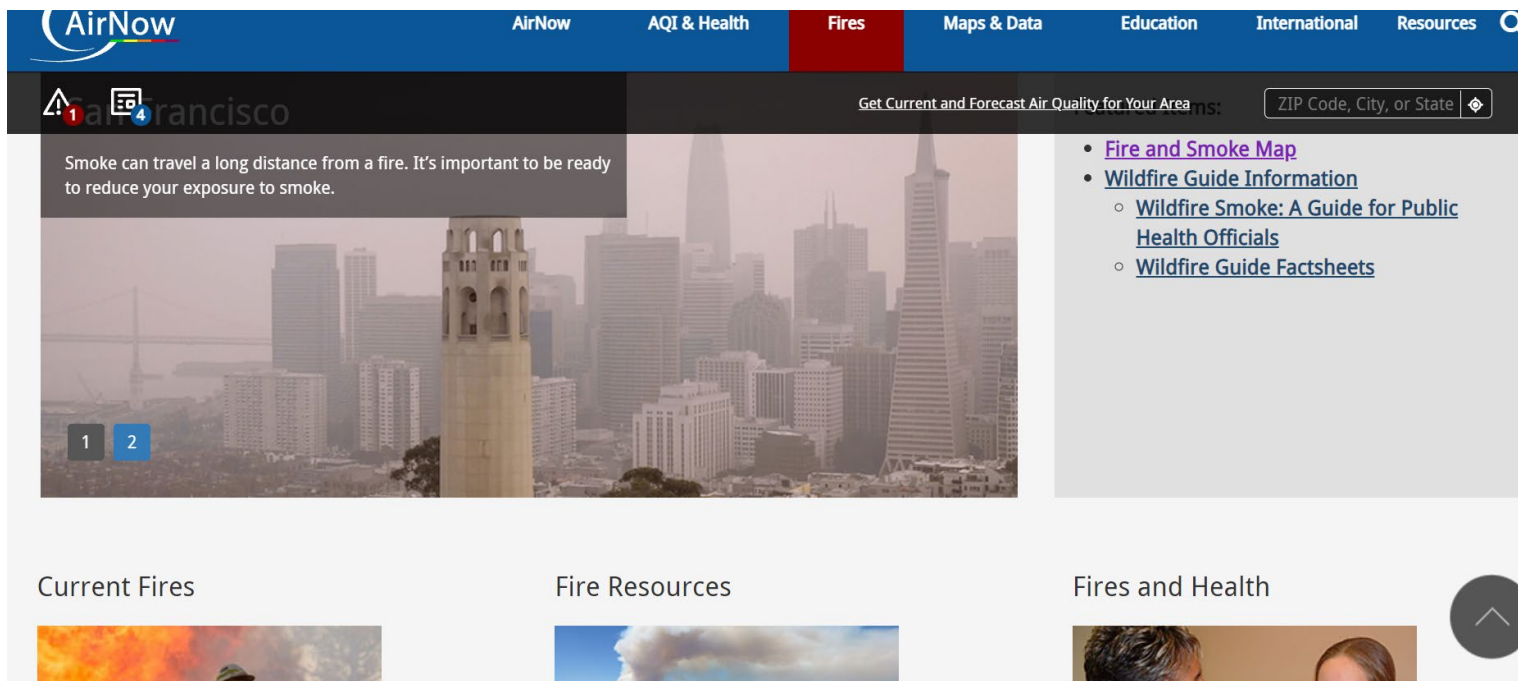
Portland Reporting Area

Fire & Smoke Map Monitors Near Me Recent Trends

AQI Legend

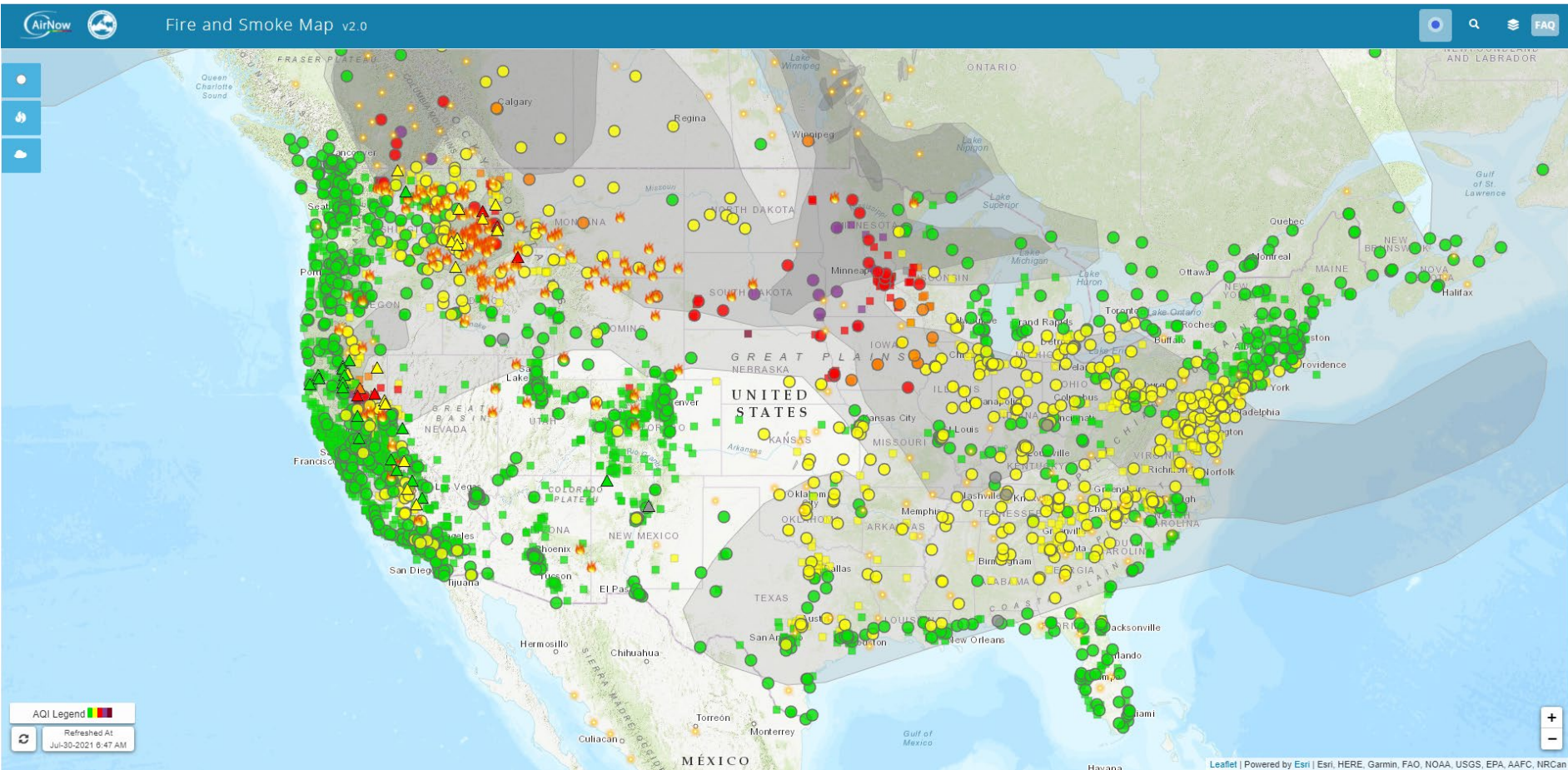
AirNow Website Improvements for Wildfires

- Adding multi-language capability
- Revising the main Fires landing page



AirNow Wildfire Improvements: the Fire and Smoke Map

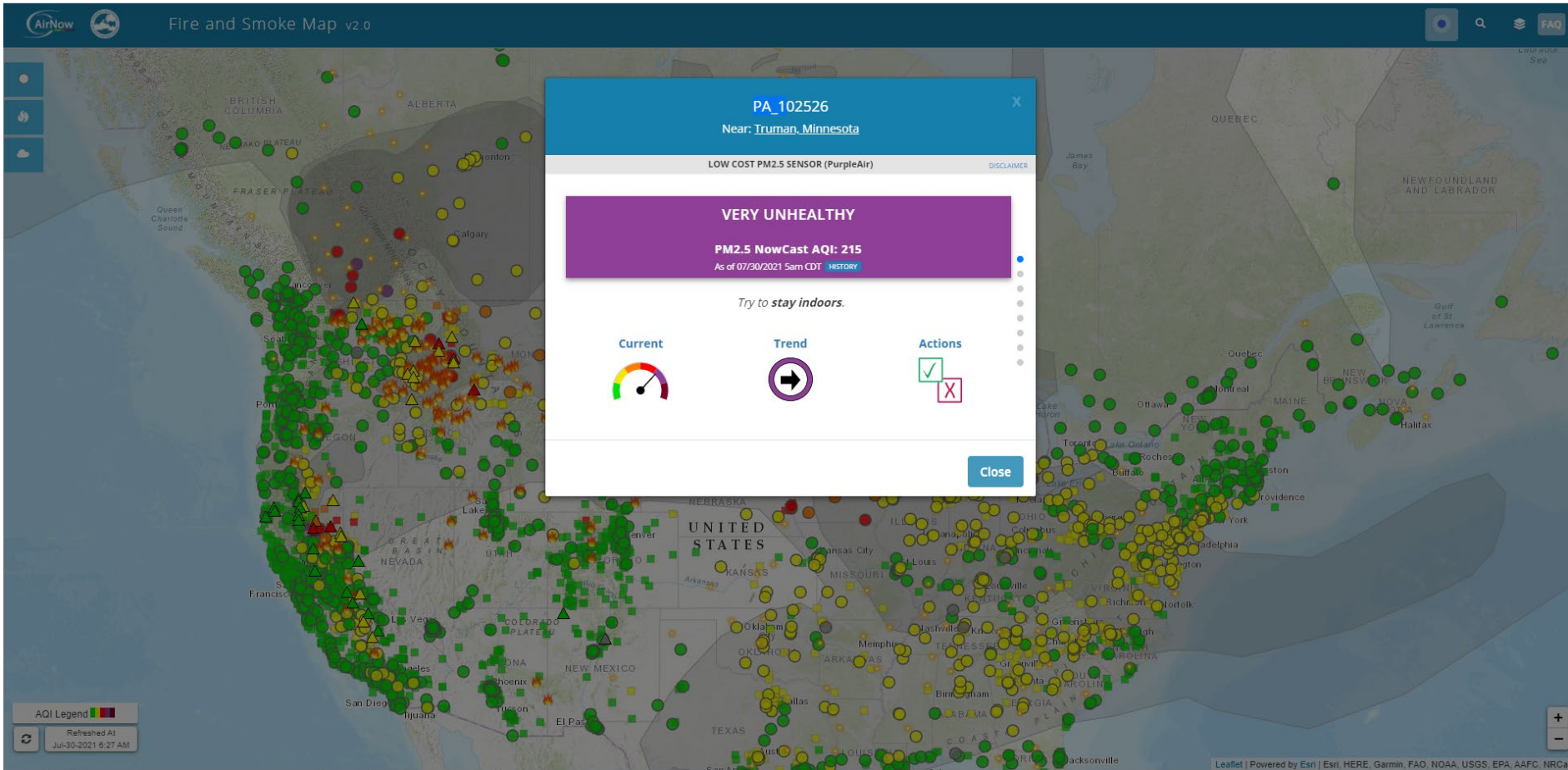
[AirNow Fire and Smoke Map](#)



AirNow Fire and Smoke Map

- **Partnership with US Forest Service and EPA's Office of Research and Development**
- **Considerable involvement with our SLT partners prior to first release in August 2020**
 - Password-protected preview website, over 200 comments received
 - Six webinars prior to release with hundreds of attendees
- **94 million pageviews of the sensor fire map since release**
 - Highest was 400k in one day
 - Average 40k per day during fires
- **Significant media attention both locally and nationally**
- **During wildfires, the Fire and Smoke map gets nearly the same amount of traffic as the AirNow homepage**

AirNow Fire and Smoke Map

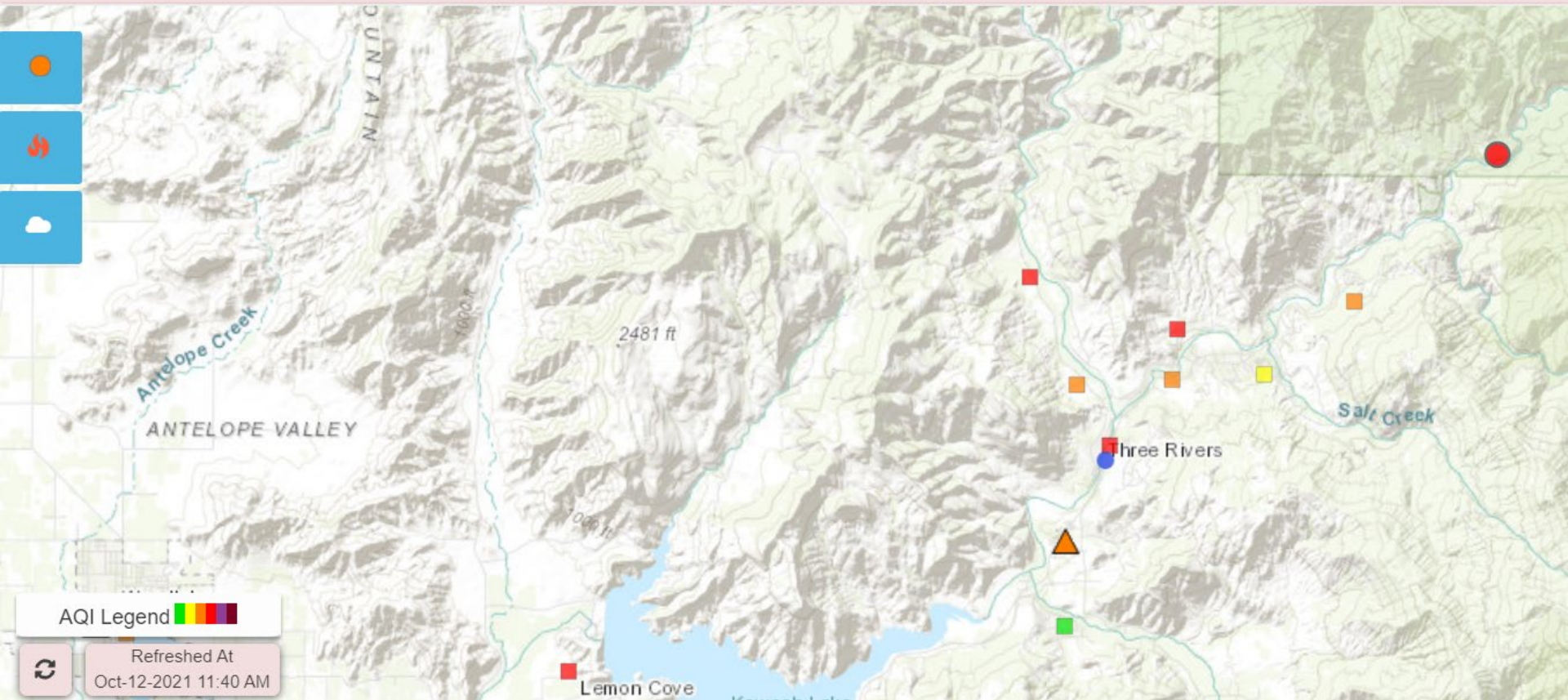


Version 2 (summer 2021 release) has more features and information for the user

AirNow Fire and Smoke Map


New Data May Be Available: [Click to Refresh Data Layers](#)

Special Smoke Statement Issued for Your Location



AirNow Fire and Smoke Map

- **Location-specific information for the user**
 - ✓ Nearby monitors (permanent, temporary, and low-cost sensors)
 - ✓ Fire location
 - ✓ Smoke plumes
 - ✓ Special smoke statements




Conditions Near Location 

Three Rivers, California




Smoke Statement Issued In This Area

AIR QUALITY (PM_{2.5}) ▾


NEAREST MONITORS

-  Three Rivers
-  Sequoia and Kings Canyon - Ash ...
-  Woodlake-125 N Walnut St

NEAREST SENSORS

-  PA_108846...
-  PA_11118...
-  PA_11116...

[Learn More](#)

Conditions Near Location 

Three Rivers, California

Smoke Statement Issued In This Area

AIR QUALITY (PM_{2.5}) >


FIRE INFORMATION ▾

SATELLITE DETECTIONS

There are **Many** satellite fire detections within a **150 mile** radius of this location. The nearest satellite fire detection is approximately **11 miles away to the NE.**

LARGE INCIDENTS

There are **6** large fire incidents within a **150 mile** radius of this location. The nearest large fire incident is approximately **9 miles away to the NE.**

Conditions Near Location 

Three Rivers, California

Smoke Statement Issued In This Area

AIR QUALITY (PM_{2.5}) >

FIRE INFORMATION >


SMOKE PLUMES >

SMOKE STATEMENTS ▾

Special Smoke Statement Issued for This Location

Title: Fresno CA
Forecast Date: 10/11/2021
Link: [View this Outlook](#)

[View All Smoke Statements](#)

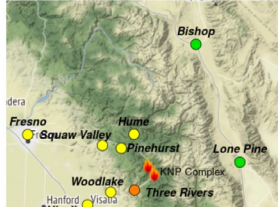
 **Smoke Outlook** 10/12 - 10/13

Fresno CA - KNP Complex

Issued: 2021-10-12 07:15 (PDT)
By: Ariane Sarzotti, Air Resource Advisor, ariane_sarzotti@epa.gov

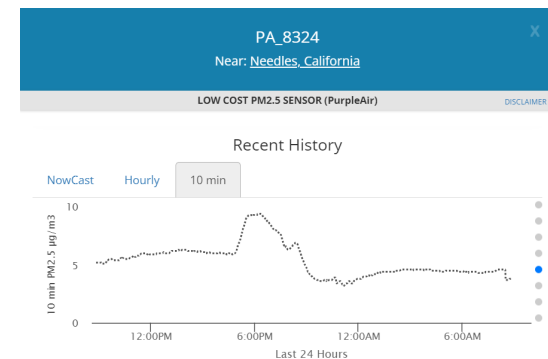
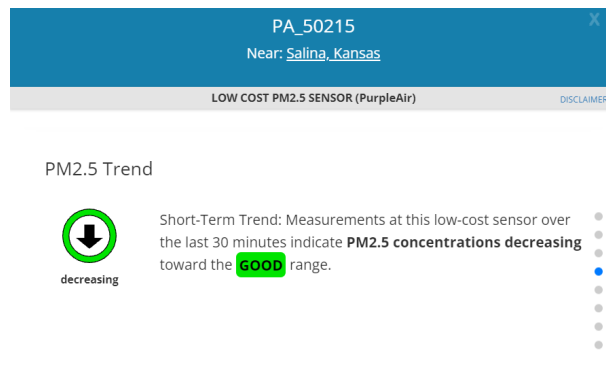
Fire
 Yesterday, minimal fire activity was observed overall due to a cold front passage. Fuel moistures have risen with precipitation and higher relative humidity. Smoldering and creeping to more moderate activity where fuels are available and sheltered from precipitation is forecasted. Interior pockets of fuel will continue to burn. For more information see [incweb.mnec.gov](#).

Smoke
 Yesterday saw Good to Unhealthy for Sensitive Groups (USG) air quality in the forecast area. High pressure is forecasted to build over the fire area and region this week which will bring in a warming trend and lighter winds. Terrain driven winds will be dominant which will bring any smoke produced down drainages overnight. Inversion conditions will prevail with smoke trapped in lower drainages until the inversion breaks in the late morning. Smoke impacts will be heavily dependent on fire activity.



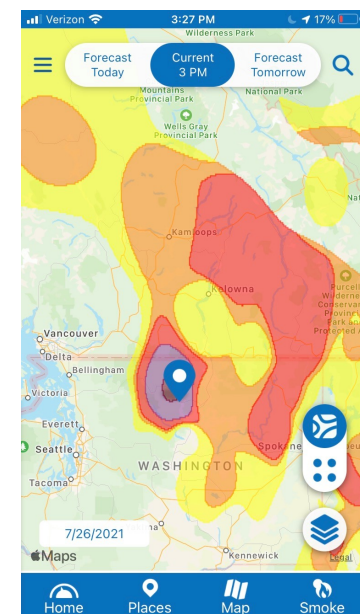
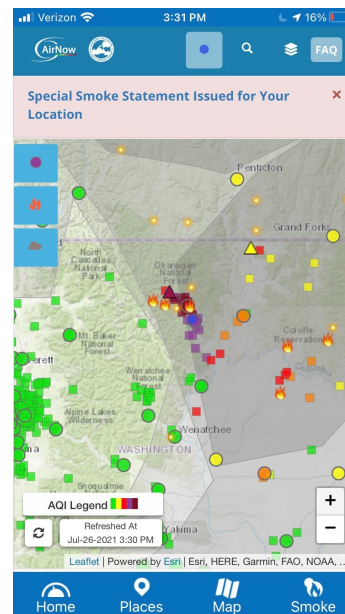
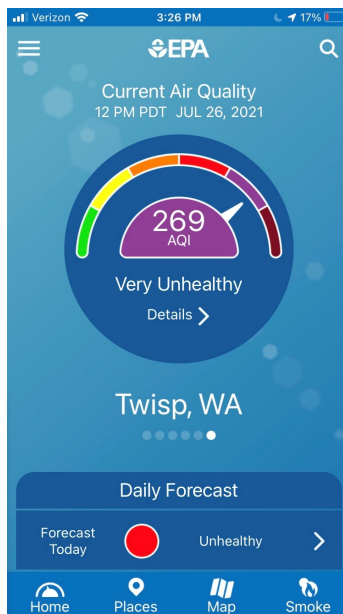
AirNow Fire and Smoke Map

- Numerous comments from the public and government agencies welcoming the new information
 - Receiving many suggestions for improvements or clarifications
 - Consistent with an Agile design, some corrections and improvements have already occurred and are planned
- Common question is on differences between AirNow and PurpleAir
 - Trend and Recent History features are designed to help
- Looking at requirements that other sensors will need to meet in order to be added to the map



AirNow App Improvements for Wildfires

- Added Interactive Air Quality Map
- Added the AirNow Fire and Smoke map
- Designing a notification capability to replace the decade-old EnviroFlash email system
- Adding trends and ability to share screenshots via social media



2022 and Beyond: Guiding the Future of AirNow

- **AirNow Vision:**
AirNow is the authoritative source for reliable, accurate, clear and actionable air quality and health information.
- **OAQPS Advisory Board**
 - ✓ Input to AirNow at the OAQPS senior management level
 - ❖ Monthly meetings to review AirNow progress, make decisions, and allow input from across OAQPS
 - ✓ Board guided the development of the innovative Fire and Smoke map
- **Public has ample and widespread access to conflicting AQI information**
 - ✓ To maintain public trust (plus meet the growing demand for hyperlocal air quality information), AirNow must develop new capabilities!

Looking into the Future of AQI Reporting...

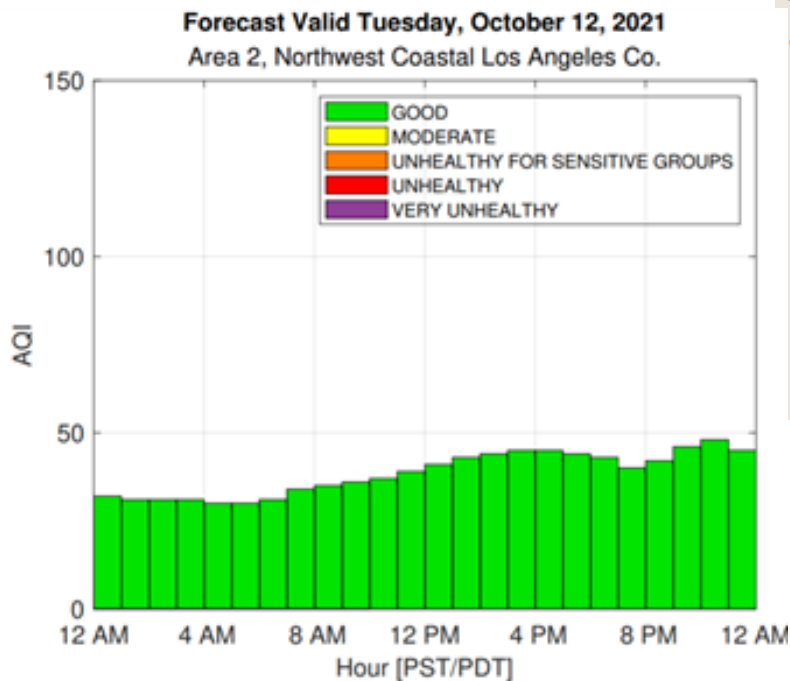
- **Radical changes in technology since AirNow started in 1998**
 - ✓ Smartphones are ubiquitous
 - ✓ Small sensors are flooding the consumer market
- **There is now widespread demand for air quality information**
 - ✓ Private industry is responding with products (weather/phone apps and integration)
 - ✓ Those products are currently developed by individual companies and conflict with each other and with AirNow
 - ✓ Air quality information available at hyperlocal levels using non-monitored sources of information (global models for example)
- **Our long-term goal is to provide scalable local, real-time air quality information and forecasts to enable the public to make health-based decisions.**

2022 and Beyond

- **Exploring Integrating Other Air Quality Datasets**
 - ✓ Develop a “fused” approach in which satellite, models, and low-cost sensor data (as well as other data sources that may not exist today) contribute to the most accurate air quality surface possible for all localities
 - ❖ Will be more comparable to other air quality vendor/sources of air quality information
 - ✓ Provide air quality information for everyone and for more localized conditions
 - ❖ Currently the AirNow dial reports the highest monitor in an area
 - Can over-report if the user is far from the monitor
 - Some areas only have ozone or PM10 monitors
 - Many gaps in AQI reporting in the U.S.
 - ✓ South Coast AQMD is a tangible operational example of data fusion/AQI reporting
 - ❖ Combining observations, low-cost sensors, and NOAA air quality model

2022 and Beyond

- Continue to explore moving from daily forecasting toward hourly air quality forecasting
 - ✓ Arizona and South Coast AQMD do this now



Air Quality Hourly Forecast | Phoenix

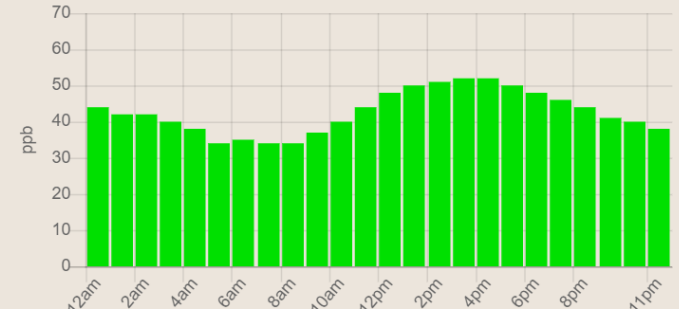
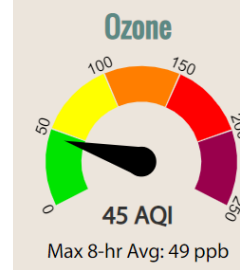
Updated On: 10/12/2021 - 10:13 AM

Click on each day to view forecast.

- Tuesday**
- Wednesday
- Thursday
- Friday
- Saturday

Tuesday Forecast:

HPA Alert: PM₁₀ High Pollution Advisory in effect for Tuesday



Questions and Discussion