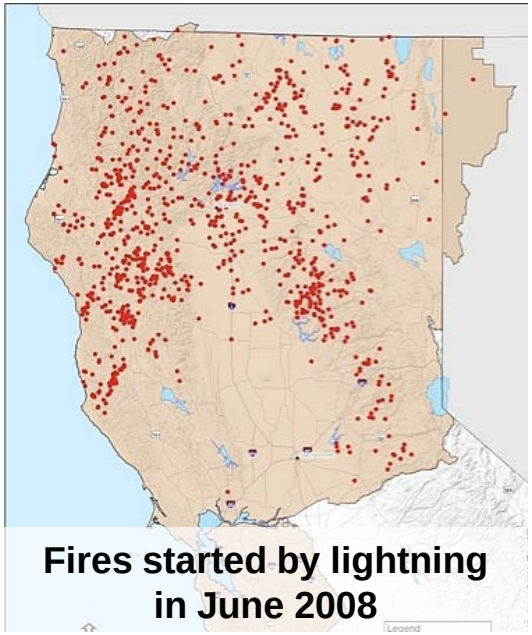
AIRNow Air Monitoring Data Decision Support System

CARPA EBAM training, June 28, 2011

2008 Northern California Wild Fires

Summary of fires

- 1 million+ acres burned
- 2,000+ individual fires burning at the same time
- 25,000+ firefighters
- Thousands of tons of $PM_{2.5}$ emitted each day
- Millions of people affected by smoke
- Unhealthy to Hazardous AQI levels observed (ozone and $PM_{2.5}$)



Fires started by lightning in June 2008

June 23, 2008 6PM (PDT)

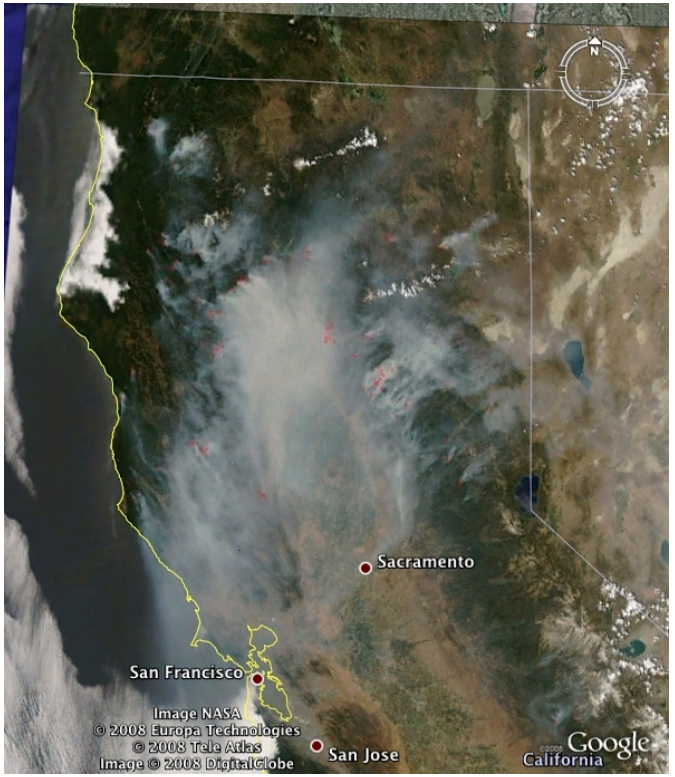
Site Name	Current Ozone AQI	Max Ozone AQI (PDT)
Cool	127	127 at 6PM
Davis	40	74 at 2PM
Elk Grove	71	87 at 4PM
Folsom	185	230 at 5PM
Grass Valley	104	104 at 6PM
North Highlands	48	48 at 5PM
Placerville	177	177 at 6PM
Roseville - N.Sunrise/Douglas	137	140 at 5PM
Sacramento - Airport Road	50	132 at 3PM
Sacramento - Del Paso Manor	11	16 at 5AM
Sacramento - T Street	51	104 at 2PM
Sloughhouse	122	147 at 3PM
Vacaville	38	45 at 3PM
Woodland	49	90 at 4PM
Yuba City	47	47 at 6PM

Source: www.sparetheair.com

Mobile Monitor Deployment (1 of 6)

Motivation

- Fires and widespread regional air quality impacts were expected to continue for weeks or months
- Supplement to existing air quality monitoring network needed to assess wildfire impacts

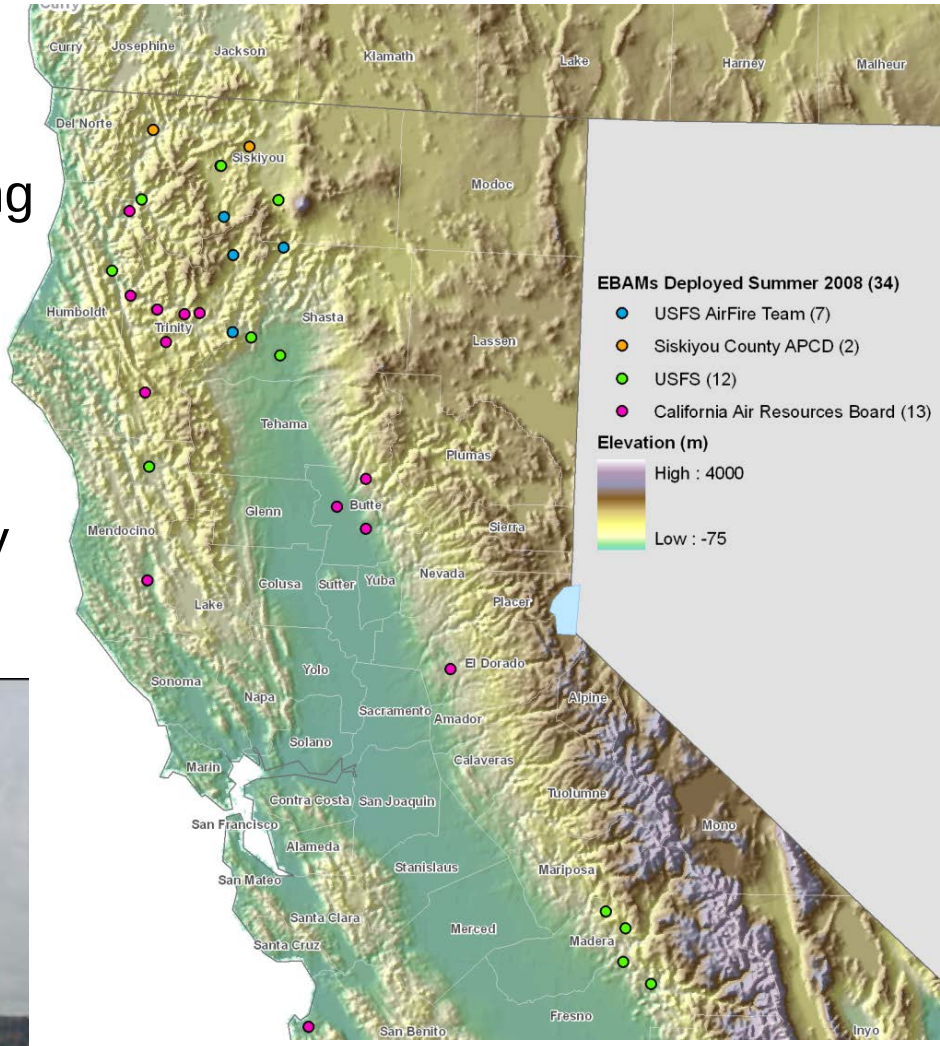


Smoke on July 11, 2008

Mobile Monitor Deployment (2 of 6)

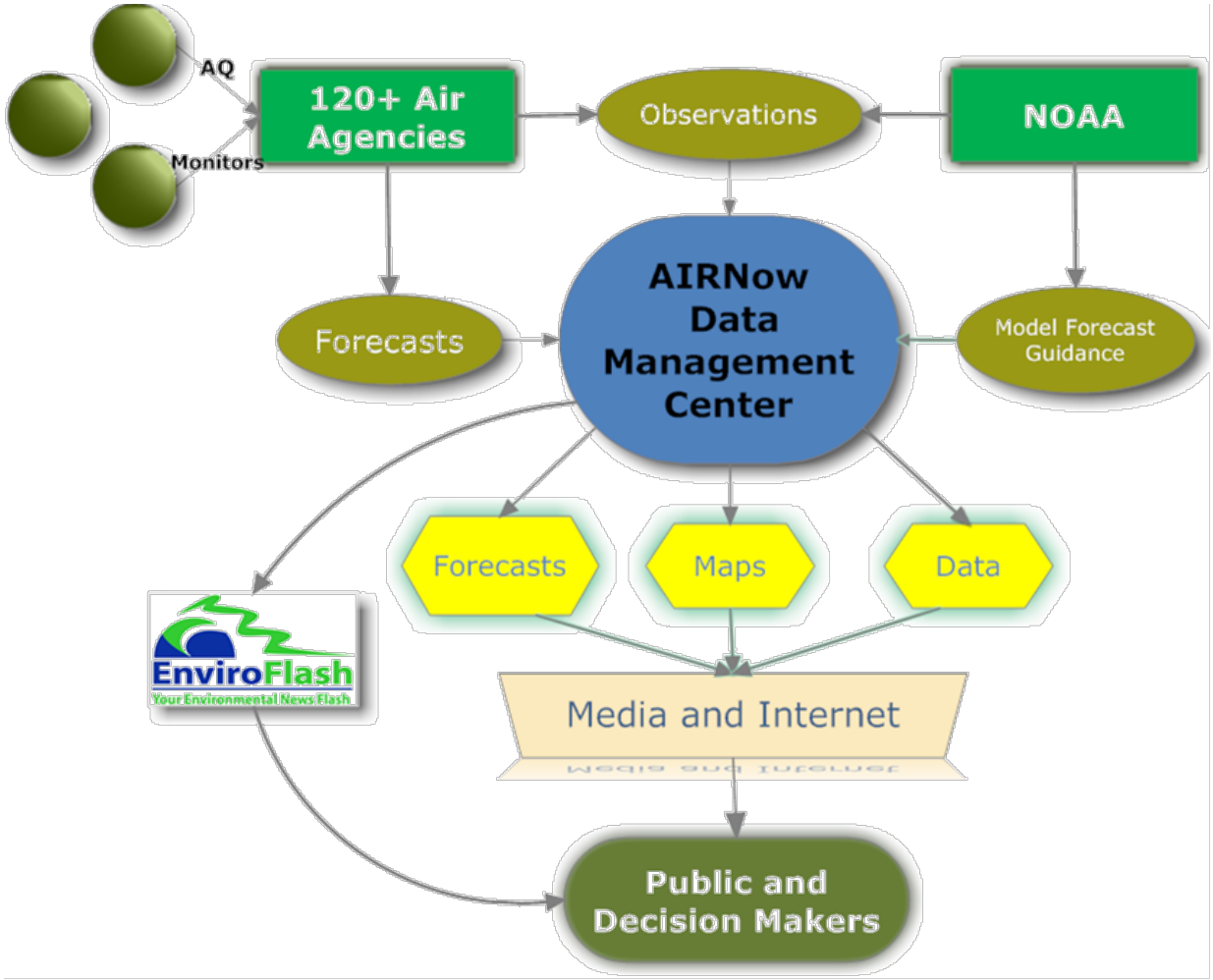
Purpose

- Focus on areas of Northern California with sparse monitoring coverage
- Assess smoke impact
- Support fire management and incident command teams
- Provide resources for air quality agencies



Mobile Monitor Deployment (3 of 6)

Data Flow of Stationary Monitor Data

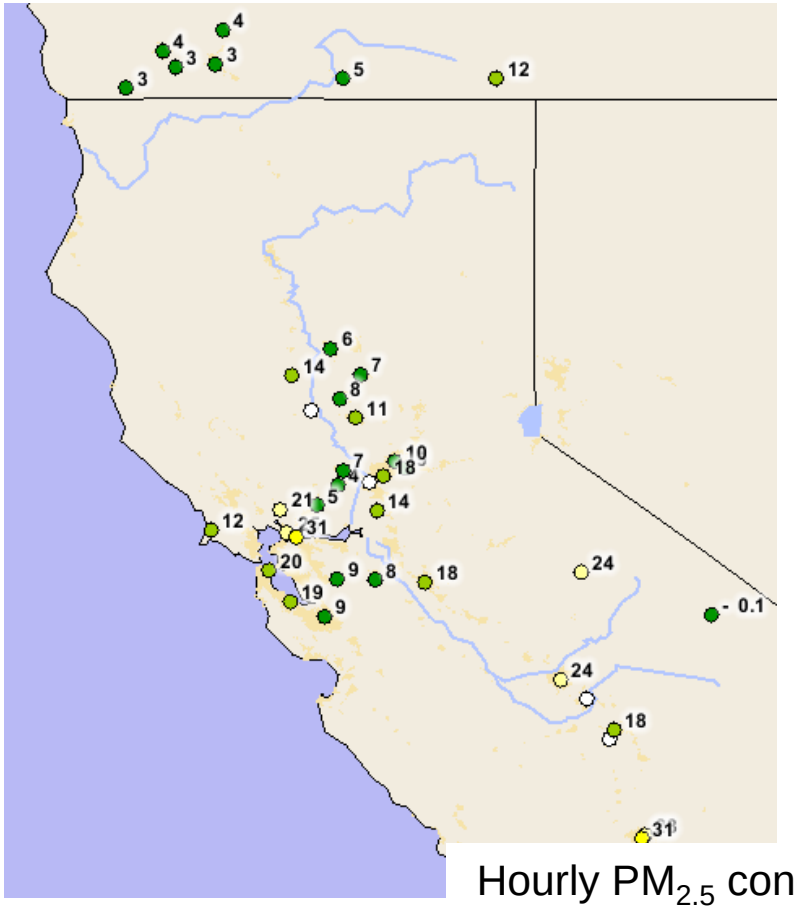


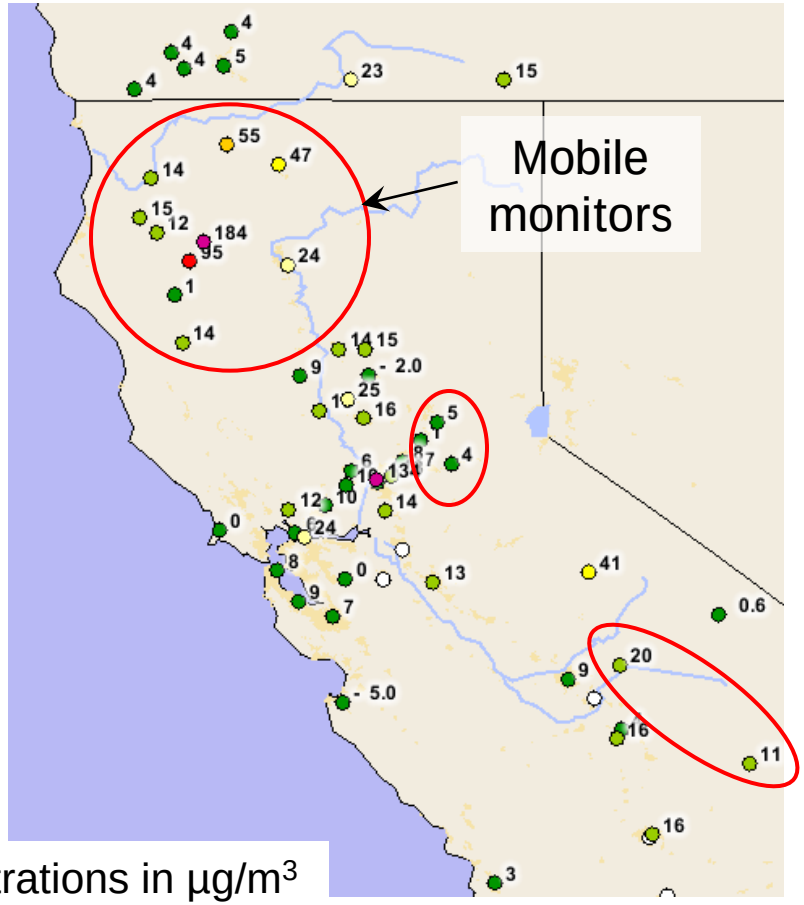
Mobile Monitor Deployment (4 of 6)

Data Flow of Mobile Monitor Data

Mobile Monitor Deployment (5 of 6)

Real-time data stream to EPA AIRNow and AIRNow-Tech



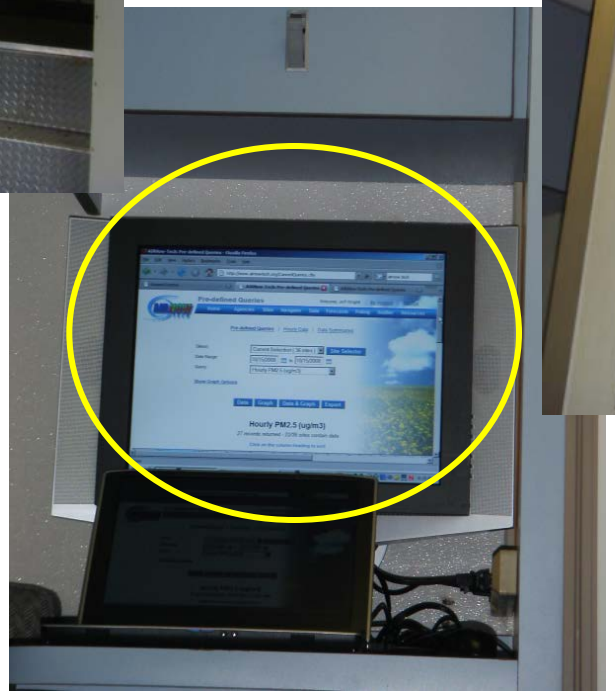


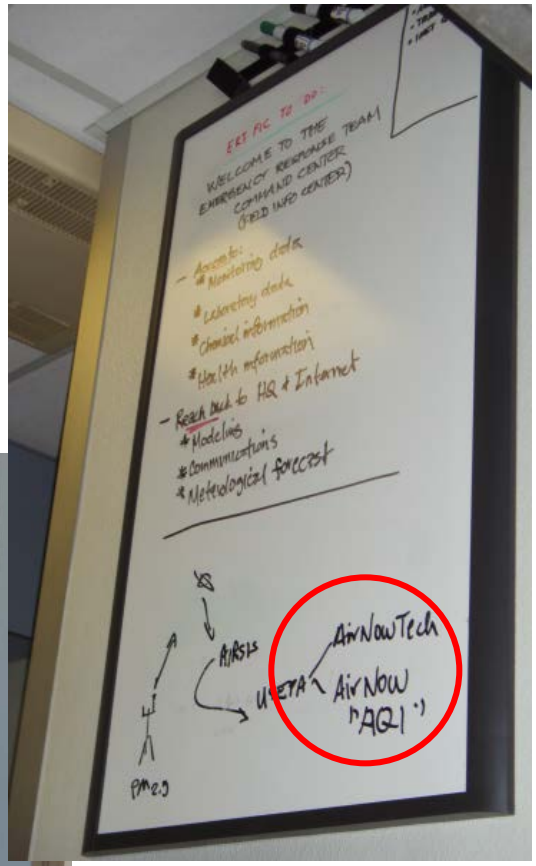
Hourly $PM_{2.5}$ concentrations in µg/m^3

Early June 2008

Late July 2008

Mobile Monitor Deployment (6 of 6)

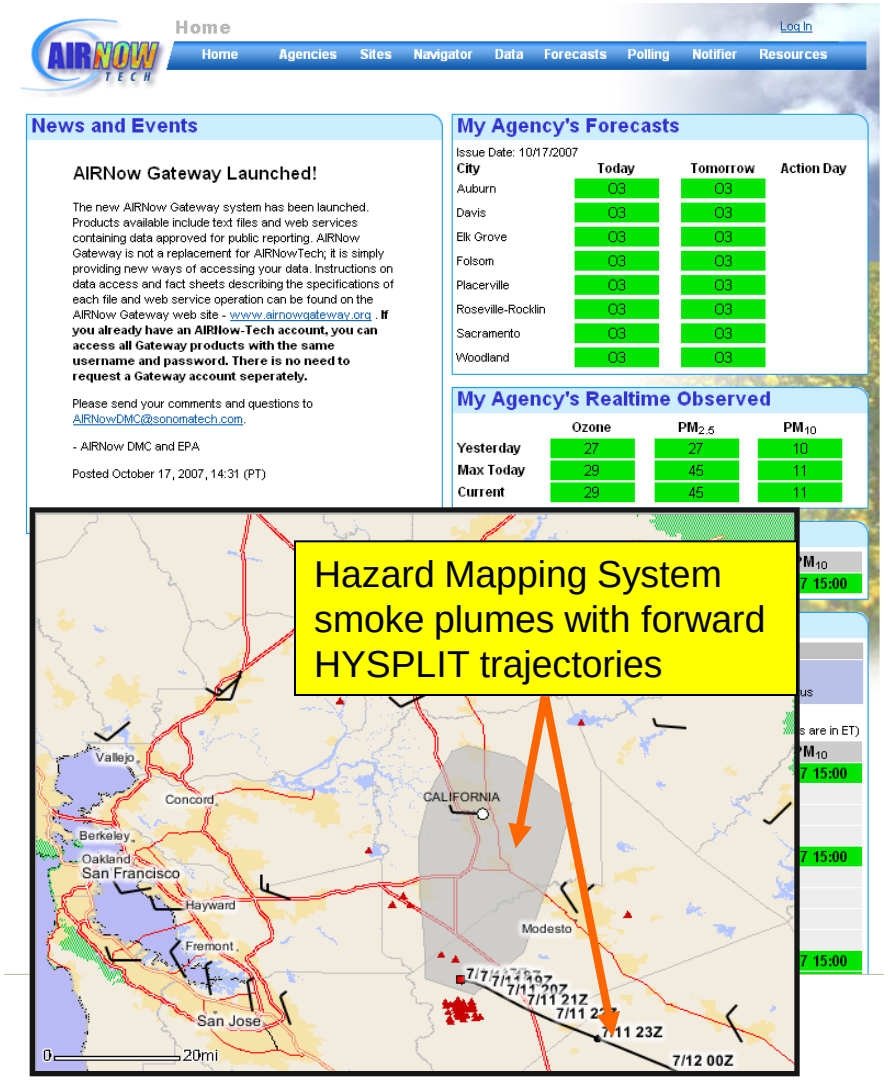




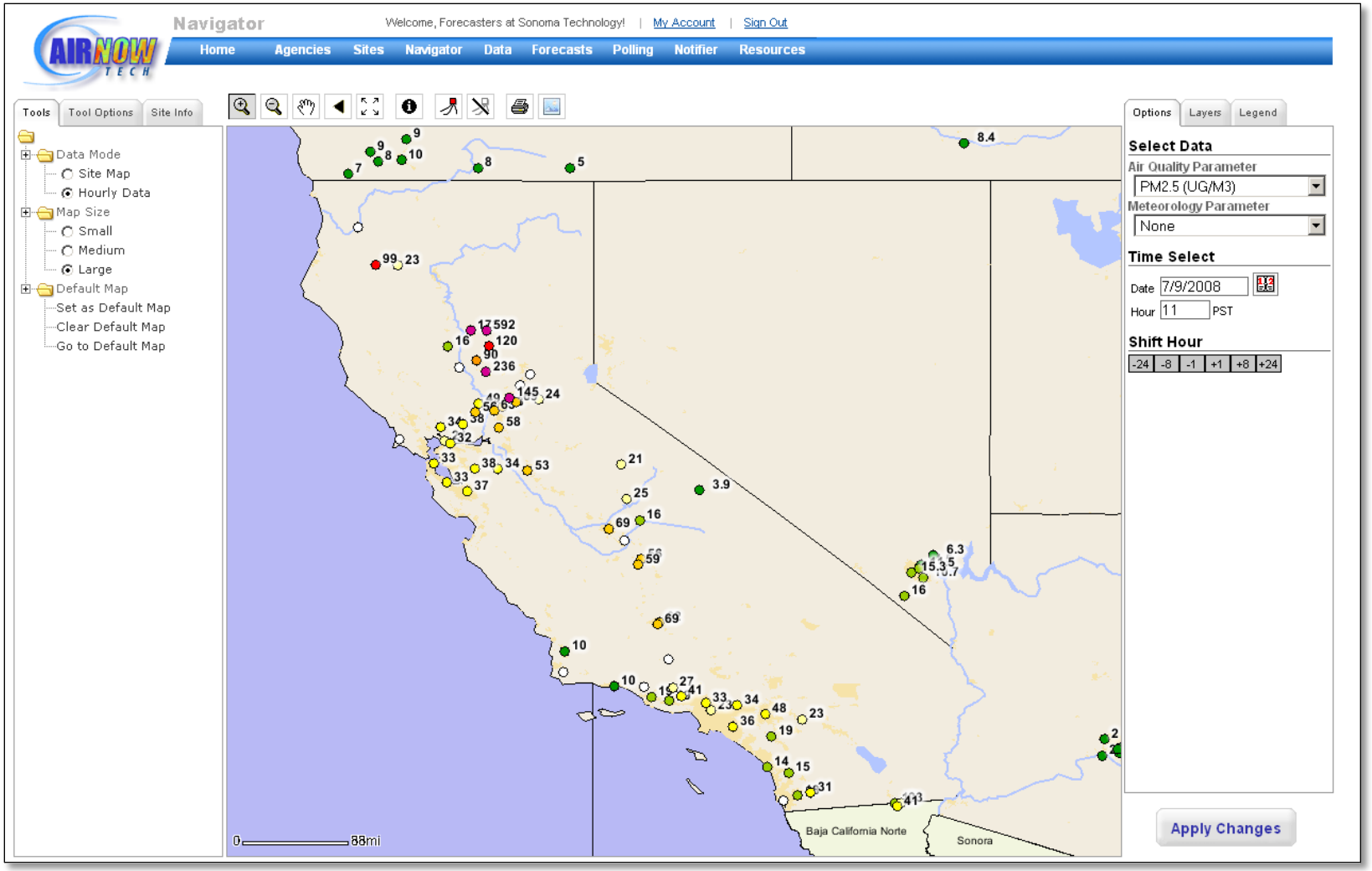
AIRNow-Tech (1 of 5)

AIRNowTech.org

- Decision Support System – management and analysis tool for the AIRNow Program
- Password protected website
- GIS functions – HYSPLIT trajectory tool, satellite, and smoke products
- Data queries, personalized tools, preferences, and services
- Ability to view meteorological and air quality data

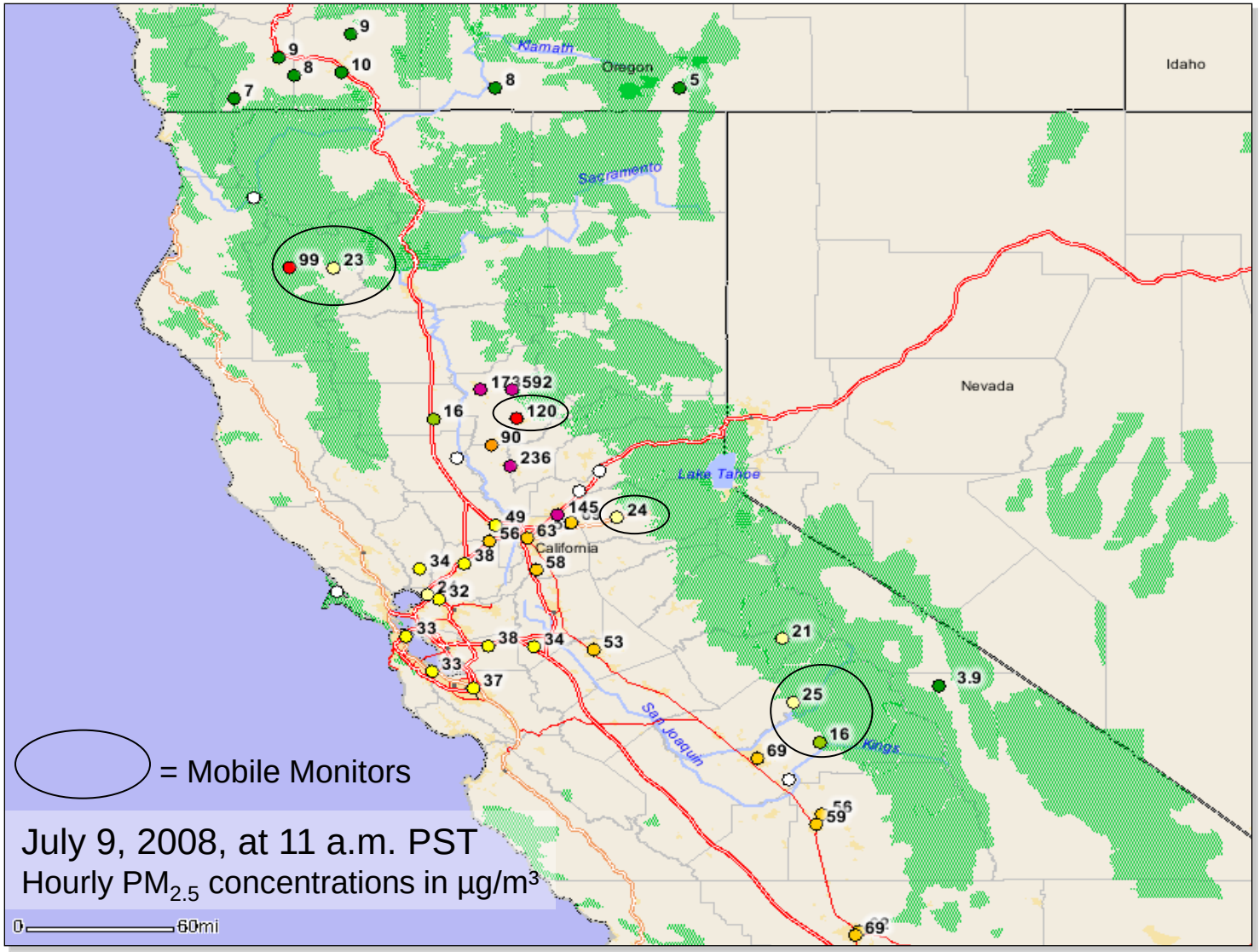


AIRNow-Tech (2 of 5)

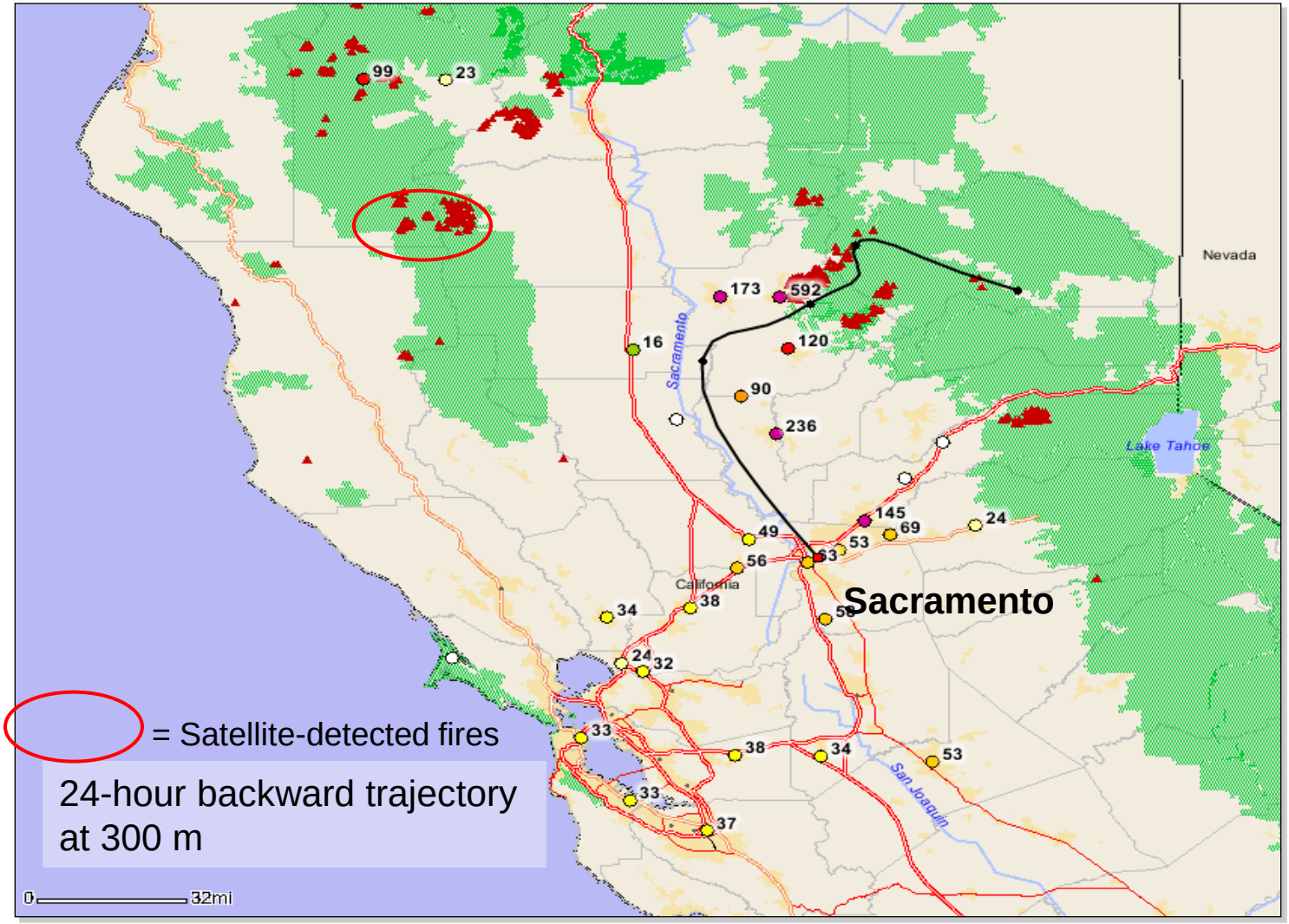


$PM_{2.5}$ concentrations in µg/m³ in AIRNow-Tech's Navigator

AIRNow-Tech (3 of 5)

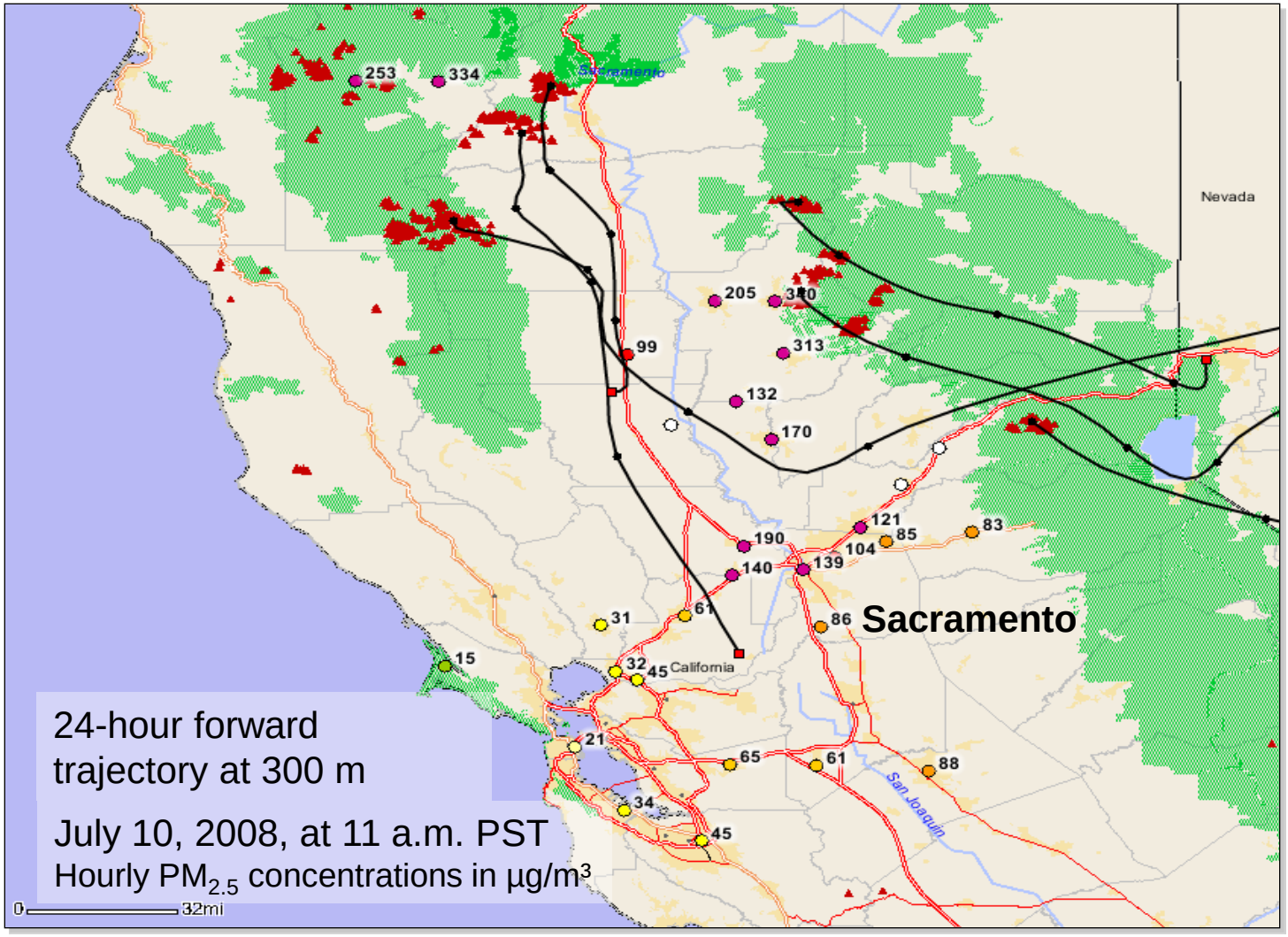


AIRNow-Tech (4 of 5)



Backward trajectory showing where Sacramento's air came from during the last 24 hours

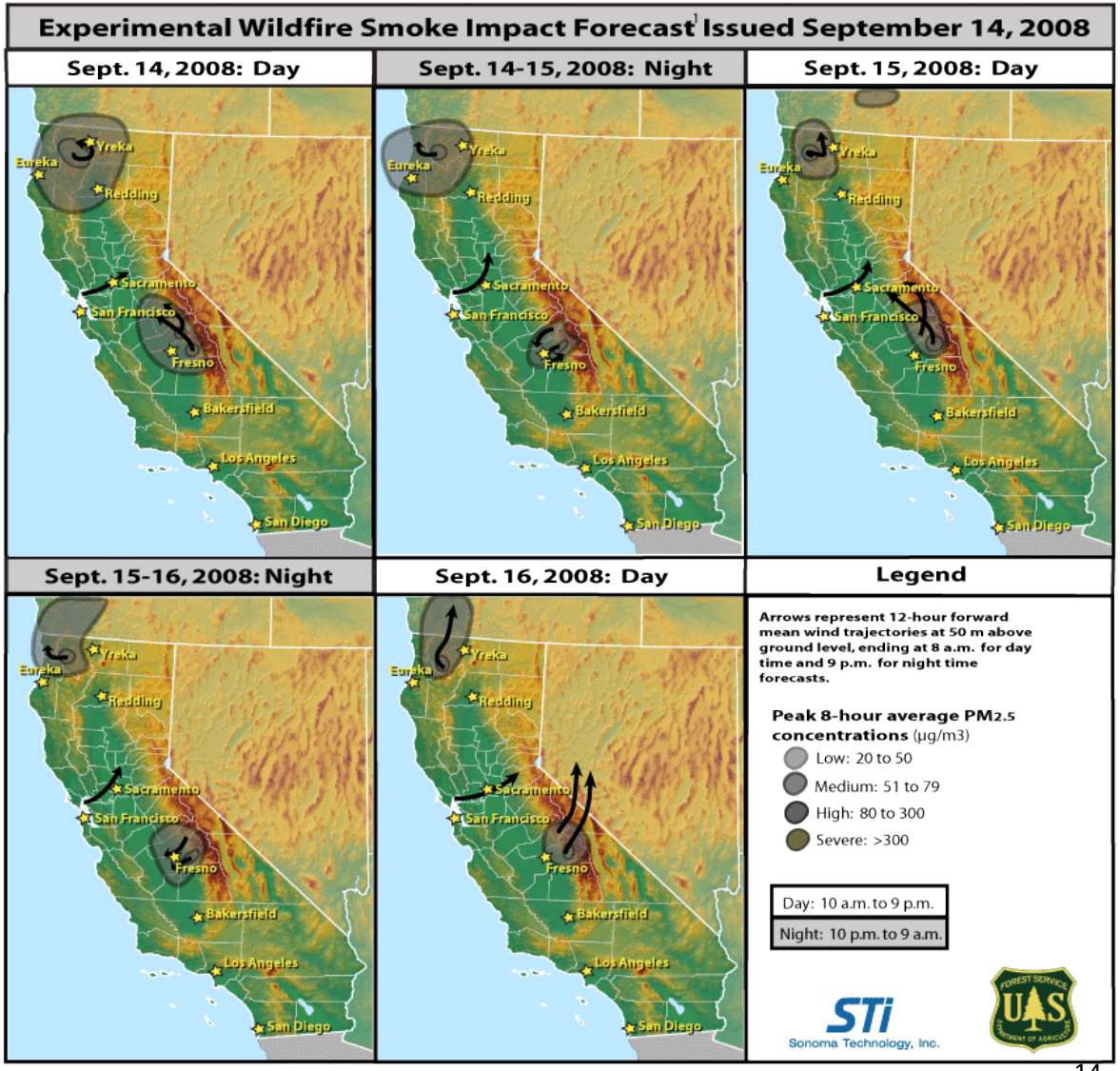
AIRNow-Tech (5 of 5)



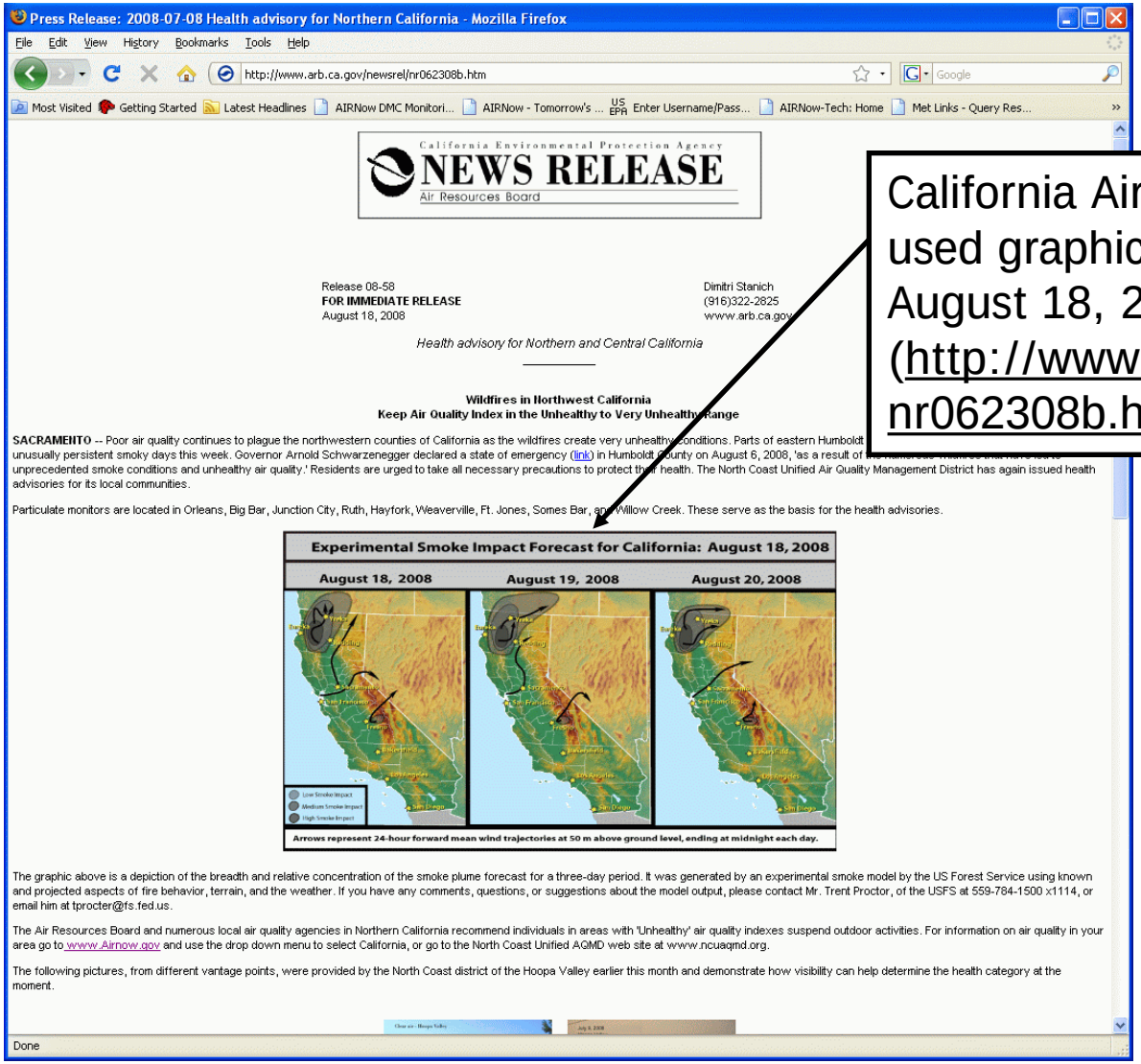
Forward trajectory showing where the smoke from the wildfires was going during the next 24 hours

Use of Data (1 of 2)

- USFS Emergency Smoke Response Systems
- Smoke impact forecasting – daily map and forecast discussions
- Outreach – air quality advisories
- Press releases



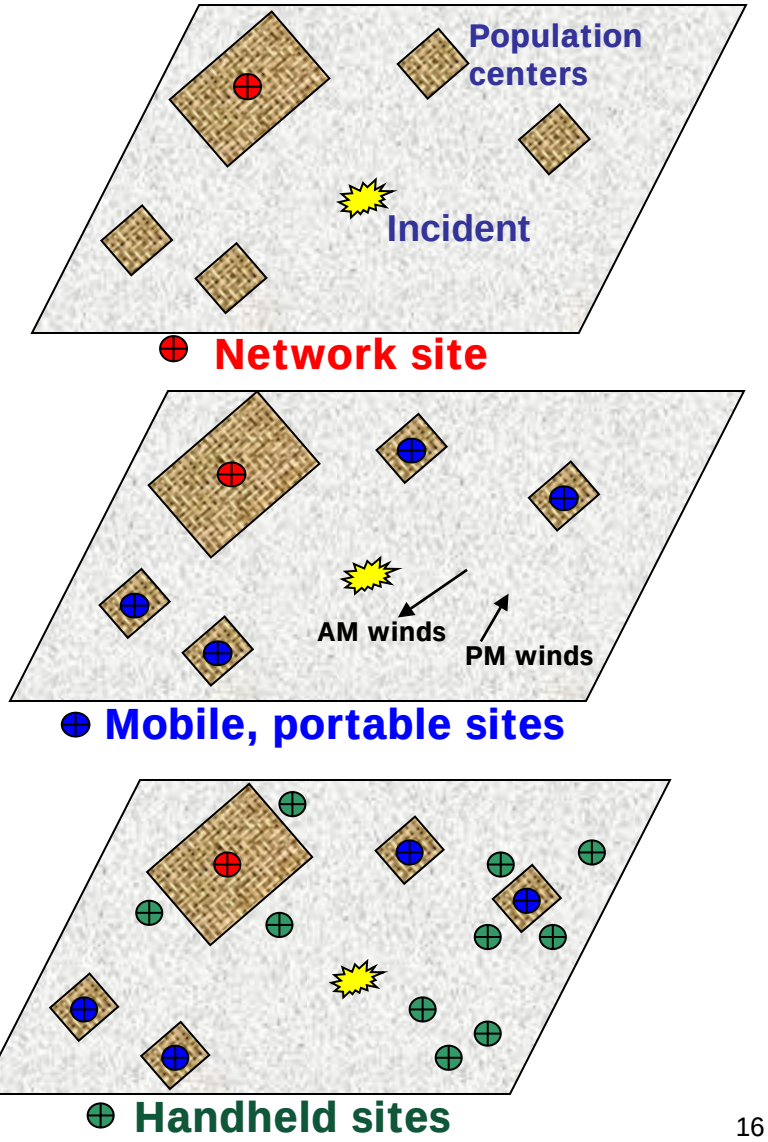
Use of Data (2 of 2)



California Air Resources Board used graphic in news release on August 18, 2008 (http://www.arb.ca.gov/newsrel/nr062308b.htm).

Particulate Matter Monitoring Considerations During Emergency Response

- Monitoring in populated areas
  - Representative of local population
    - Senior centers, schools and day care centers, evacuation centers, town center, residential areas, incident command units
  - Diurnal winds patterns
- Operational considerations
  - Power, security, troubleshooting (all systems), periodic maintenance
- Maintain reserve
  - Back-up, unexpected questions
- Layered approach



Questions ??