

Particulate Matter  
Air Quality Monitoring  
In Emergency Response

...and that *Actionable* thing

CARPA Conference  
October 16, 2008

# Particulate Matter Monitoring Considerations In 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
  - Use diurnal winds
    - Both those you encounter and night time flows
- **Operational Considerations**
  - Power, security, trouble shooting (all systems), periodic maintenance
- **Maintain reserve**
  - Back-up, unexpected
- **Layered Approach**
  - Mobile
  - Portable
  - Network

# Layered PM Mass Monitoring Approach



## Mobile Samplers

Intended for numerous short term investigation.  
Usually a surrogate method v. Network and Portable



## Portable Samplers

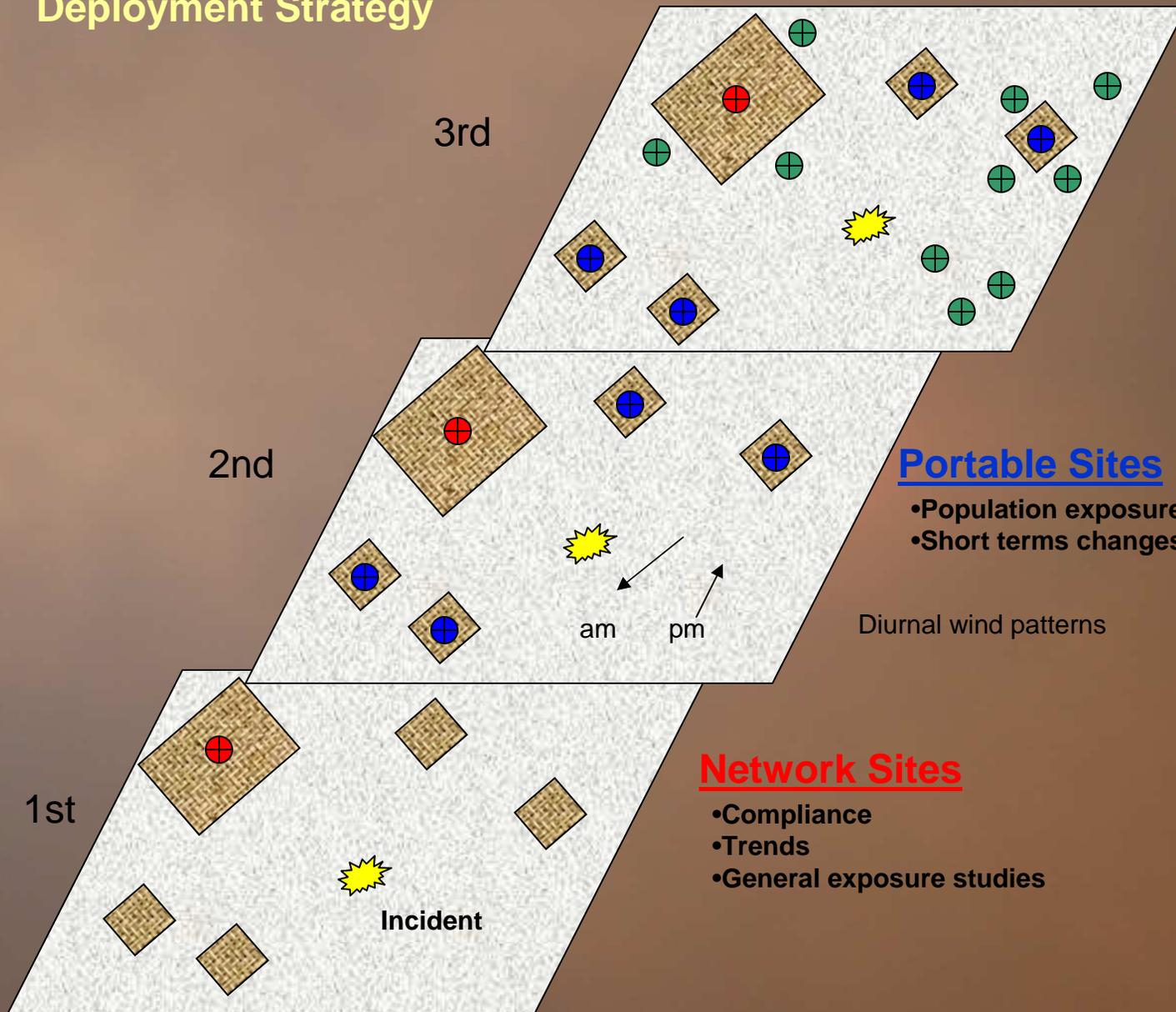
Automated, hourly average, data can be linked  
in near real time to US EPA Air Now.



## Network

Backbone of state, local regularly operated samplers.  
Operated intermittently. Filters pre-weighed at lab,  
exposed in the field, returned to lab for analysis.

# Layered Monitoring Deployment Strategy



## Mobile Sites

- Complaints
- Micro situation
- Follow up to action
- Events

## Portable Sites

- Population exposure
- Short terms changes and trends

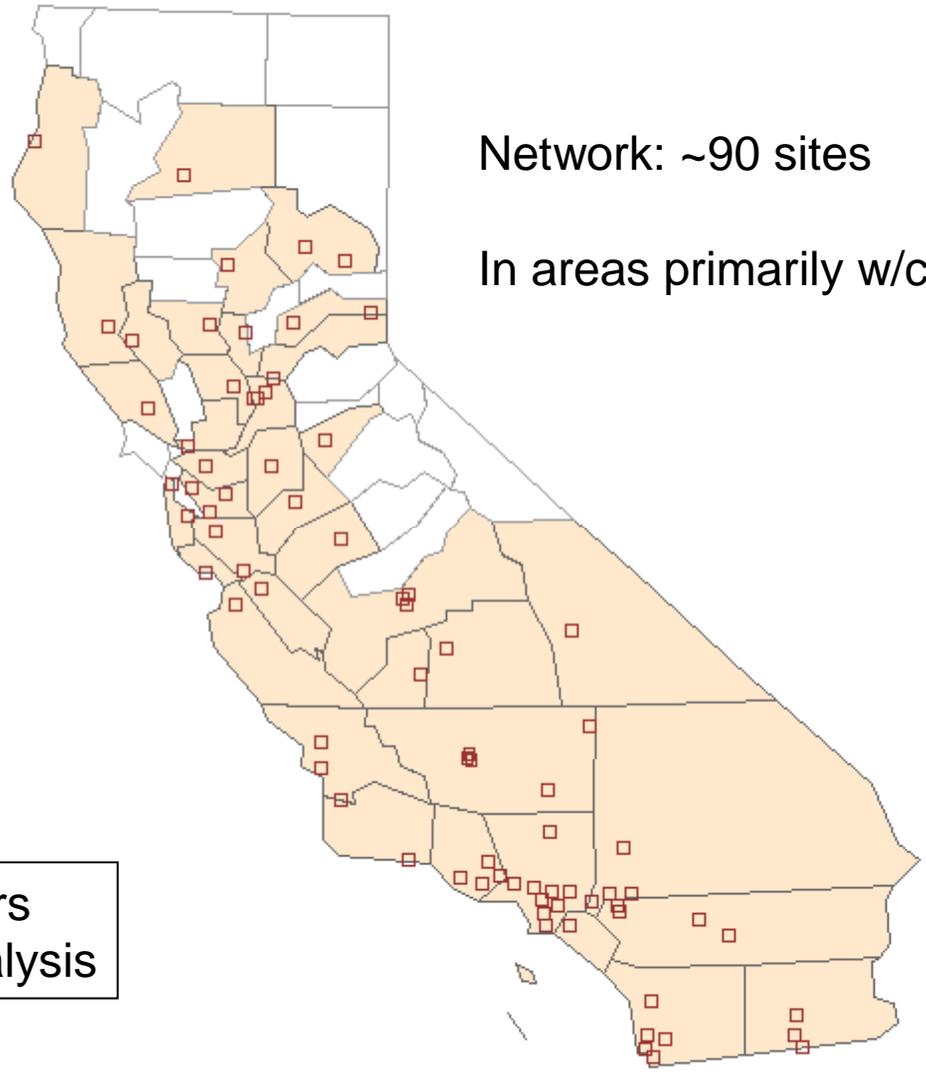
## Network Sites

- Compliance
- Trends
- General exposure studies

# Monitor Locator Map – Criteria Air Pollutants California



Shaded counties have monitors



Network: ~90 sites

In areas primarily w/chronic PM2.5 issues

Filter-based samplers  
requiring off site analysis

Monitor Location: □ PM2.5 (90)

# Particulate Matter Mass Monitoring

Does not include PM species

## Network Sites

- Compliance
- Annual trends
- General exposure studies
- Point of comparison

## Portable Sites

- Population exposure
- Short term changes and trends

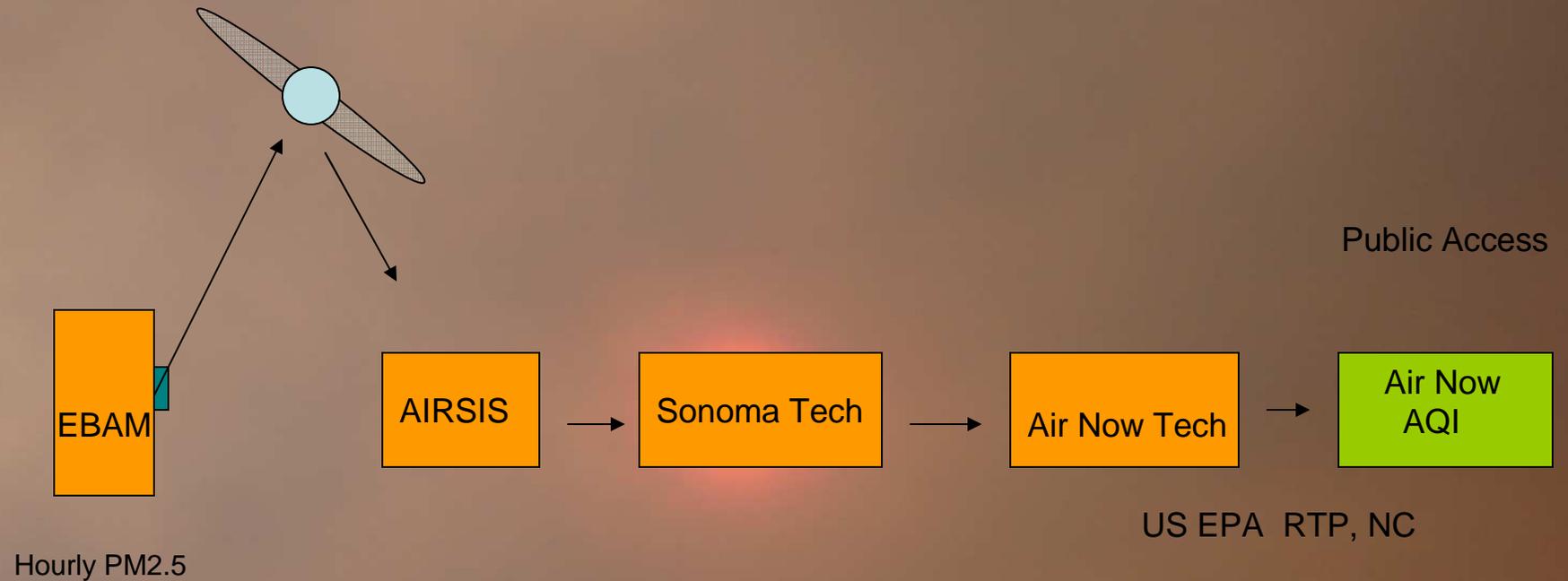
## Mobile Sites

- Complaints
- Micro situation
- Follow up to action
- Events and patterns

*Actionable*

<u>Timely</u> <i>'Suited to health needs'</i>	<b>Poor</b> - Filter/gravimetric (Intermittant, can be increased) <b>Very Good</b> - BAM/TEOM	<b>Very Good</b> EBAM et seq (requires Satellite connection)	<b>Good to Fair</b> Hand held (depends on download method)
<u>Accurate</u> <i>'Suited to use'</i>	<b>Very Good</b>	<b>Very Good to Good</b>	<b>Good to Fair</b> (%RH)
<u>Usable</u> <i>'No need for interpretation'</i>	<b>Very Good</b> (known parameter/known effects)	<b>Very Good</b> (known parameter/known effects)	<b>Very Good</b> (known parameter/known effects)
<u>Accessible</u> <i>'To all levels of govt'</i>	<b>Poor</b> (requires lab analysis, rigorous QC)	<b>Very Good</b> (Web)	<b>Good to Poor</b> (Web or onsite)
<u>Relevant</u> <i>'Measures pollutant of concern'</i>	<b>Very Good</b> (PM mass)	<b>Very Good</b> (PM mass)	<b>Very Good- Good</b> (PM Mass)

# Improving Response Capability for PM Mass 'Timely' and 'Accurate'



Users: ARB, USFS  
Soon: Several Air Districts

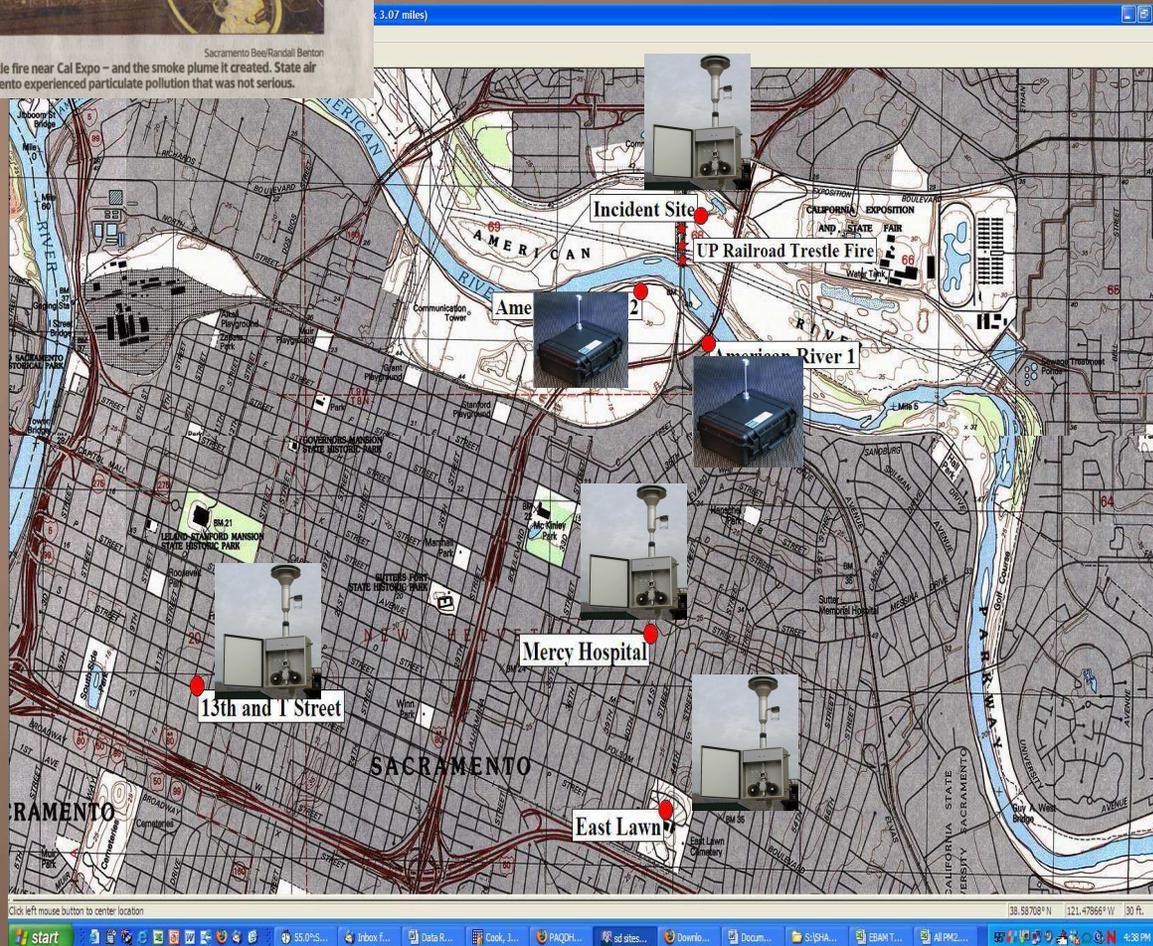


A levee near Alhambra Boulevard and C Street provided a view last Thursday of the trestle fire near Cal Expo – and the smoke plume it created. State air monitoring results released Wednesday suggest densely populated areas of east Sacramento experienced particulate pollution that was not serious.

Sacramento Bee/Randal Benton

# Trestle Fire

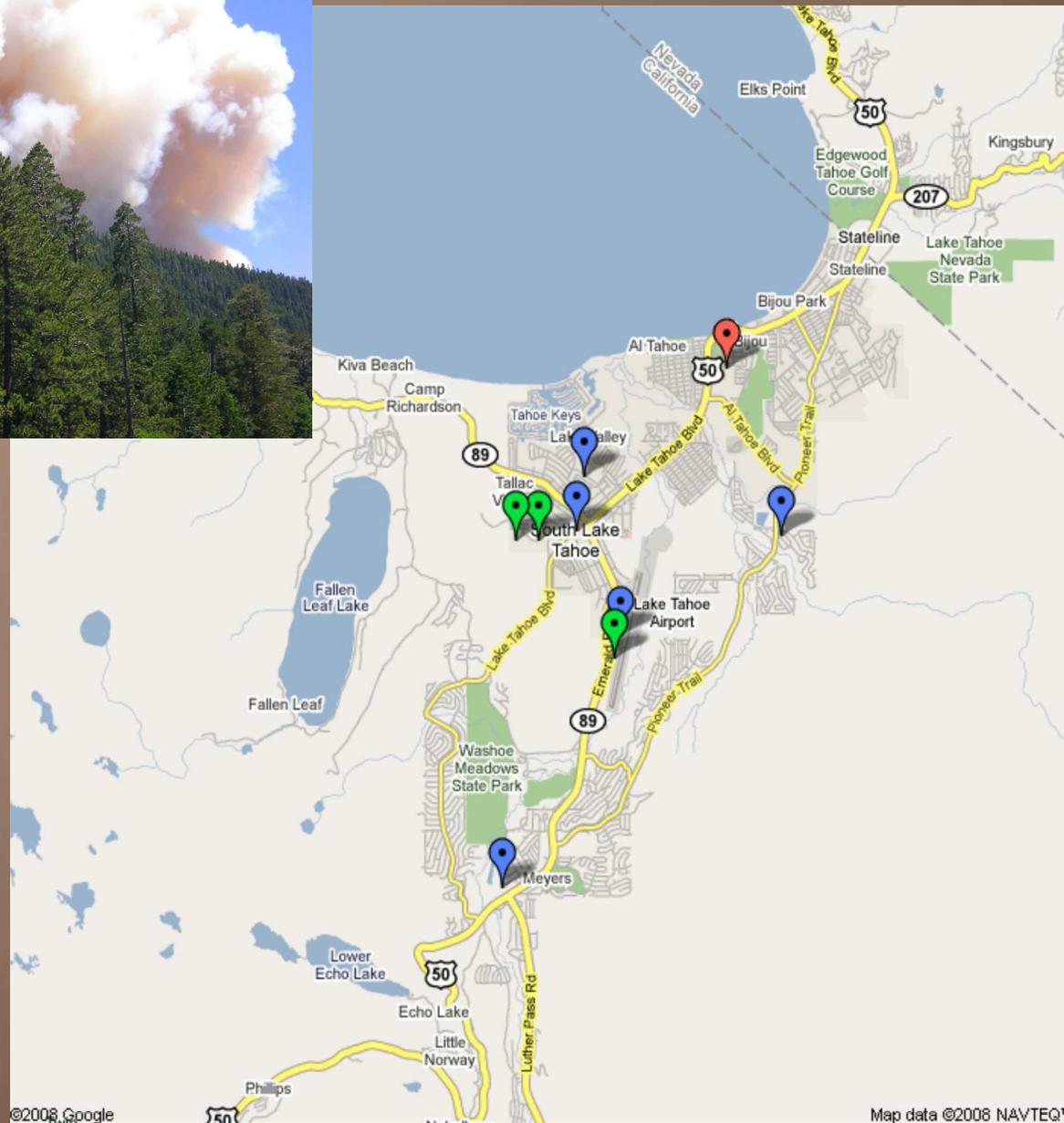
Network:1  
 Portable:3  
 Mobile:2

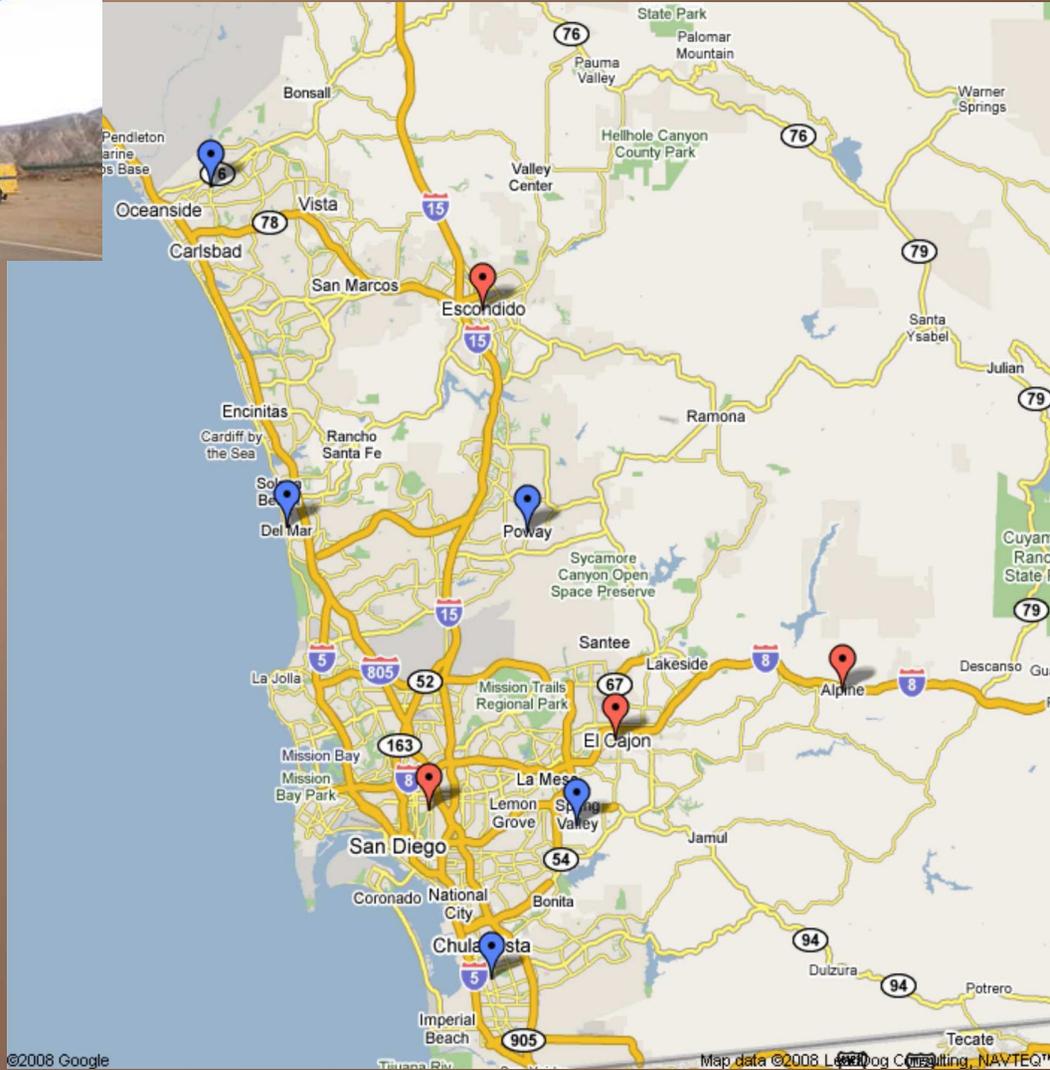




# Angora

Network: 1  
Portable: 5  
Mobile: 3



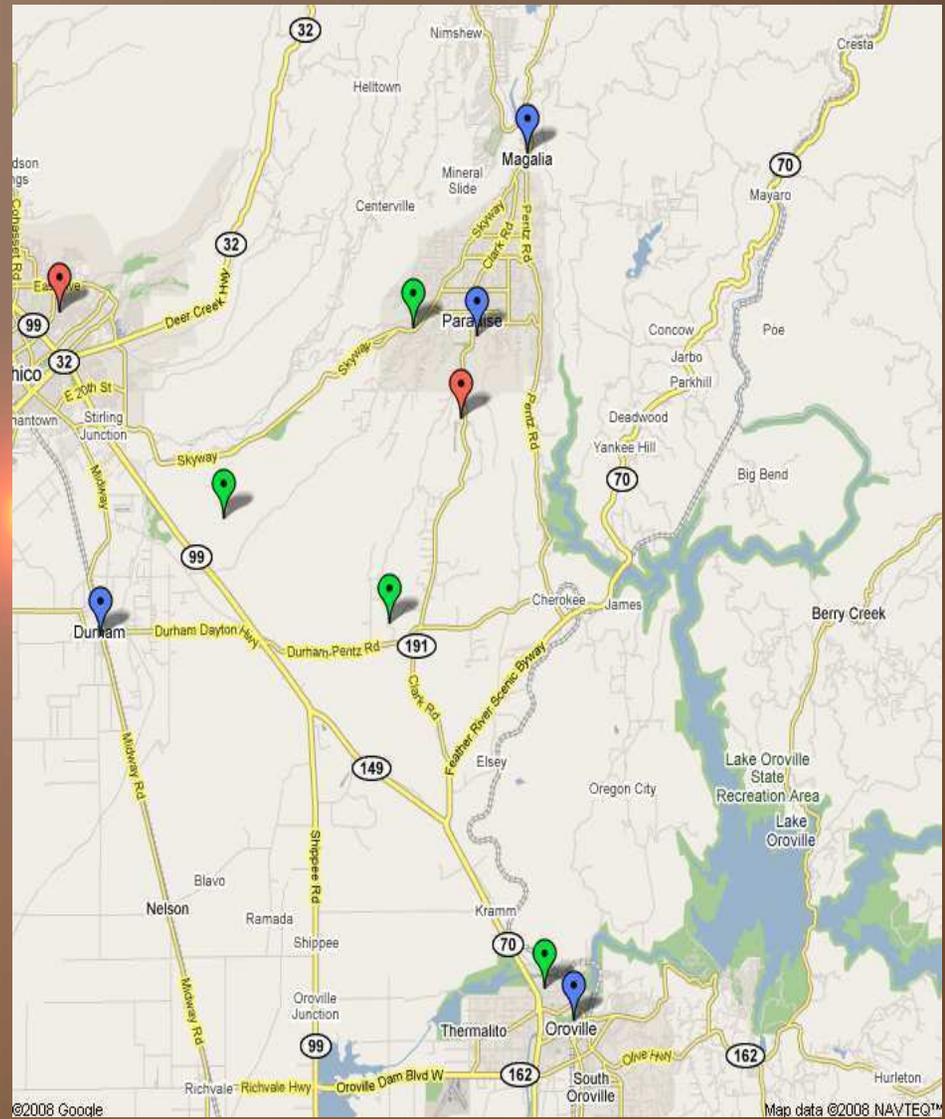


## San Diego '07

Network: 4  
Portable: 5

# Butte County

Network: 2  
Portable: 4  
Mobile: 4

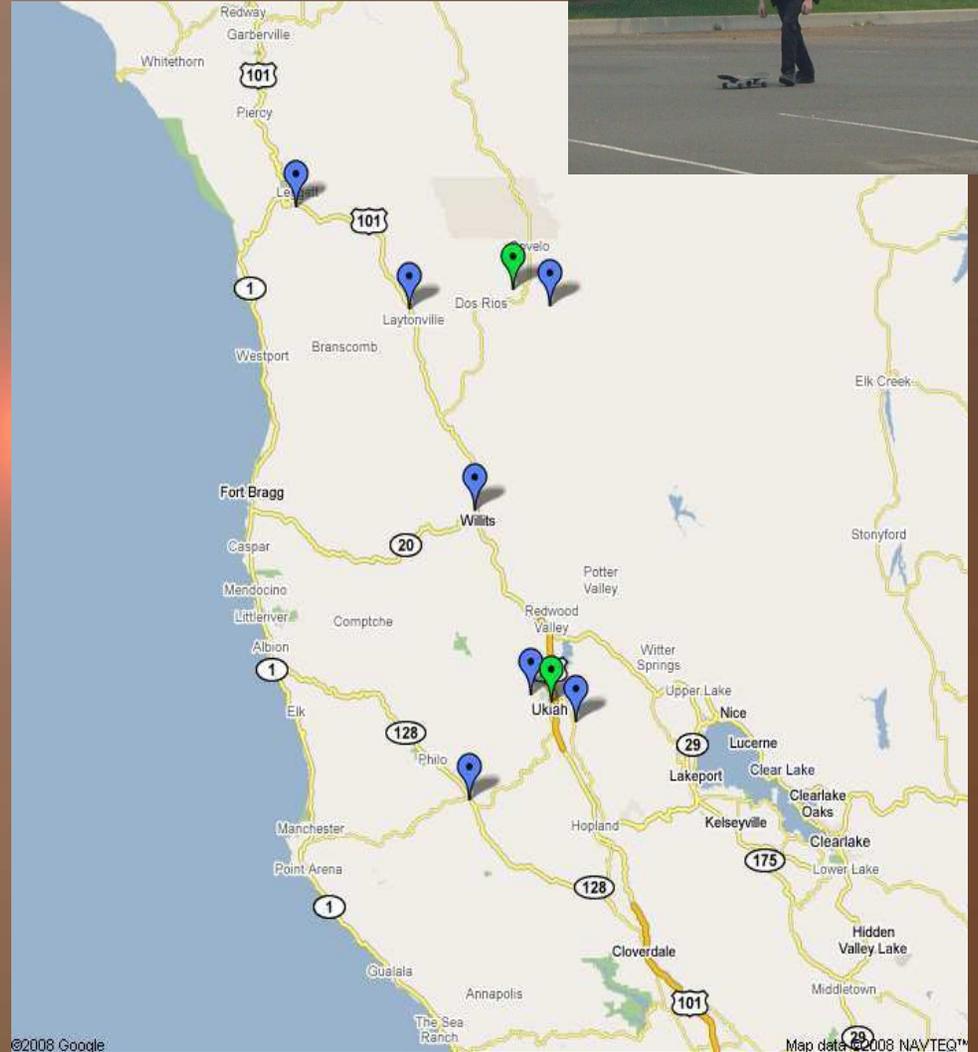




# Mendocino Co

Portable: 2

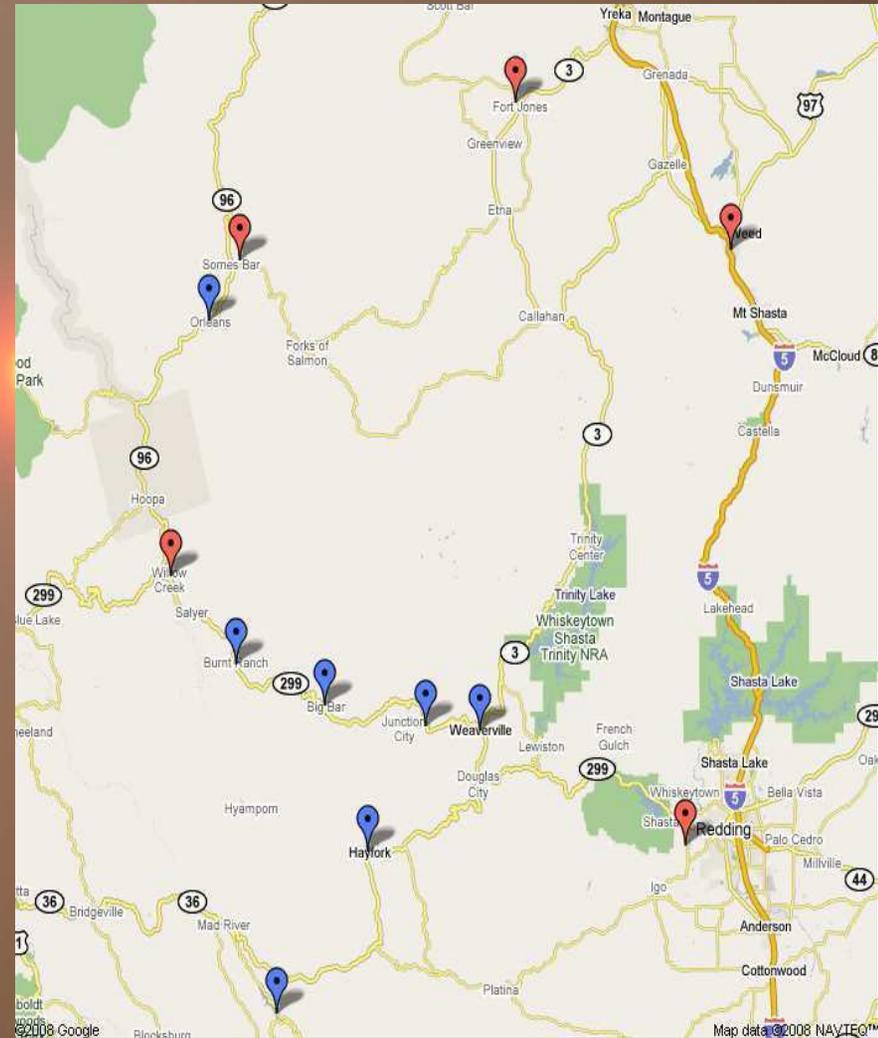
Mobile: 6



# North Coast

Trinity, Humboldt, Del Norte

Portable: 5+ USFS  
7 ARB





## Last 18 Months

Cooperation from and thanks to:

San Diego County  
APCD  
US EPA  
OAQPS  
Region 9  
Sonoma Technology  
El Dorado County  
Health, Environmental  
Health, APCD  
Placer County  
APCD  
Butte County  
APCD, Health  
Mendocino County  
APCD, Health  
North Coast  
AQMD, Health  
USFS  
Santa Barbara County  
APCD  
Monterey County  
APCD  
Sacramento County  
AQMD, Health  
North Coast Tribes  
ARB/ERT  
Field Surveillance  
Monitoring

