



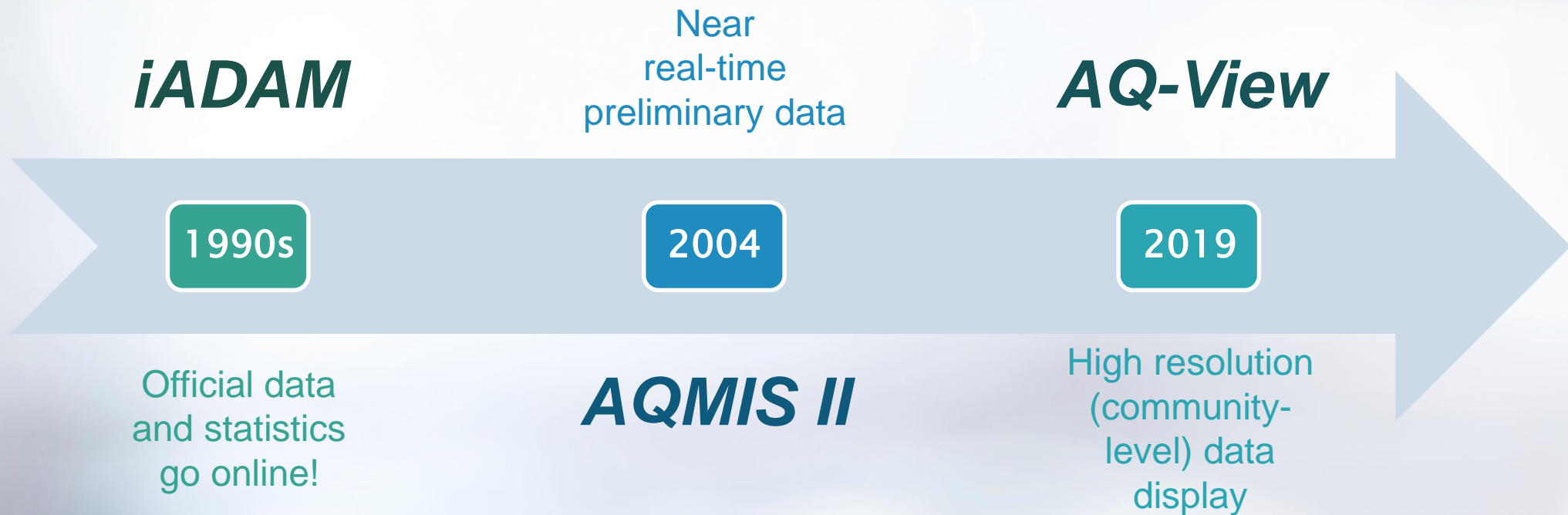
Where Do All the Data Go?

Emily Gorrie

Air Quality Planning and Science Division

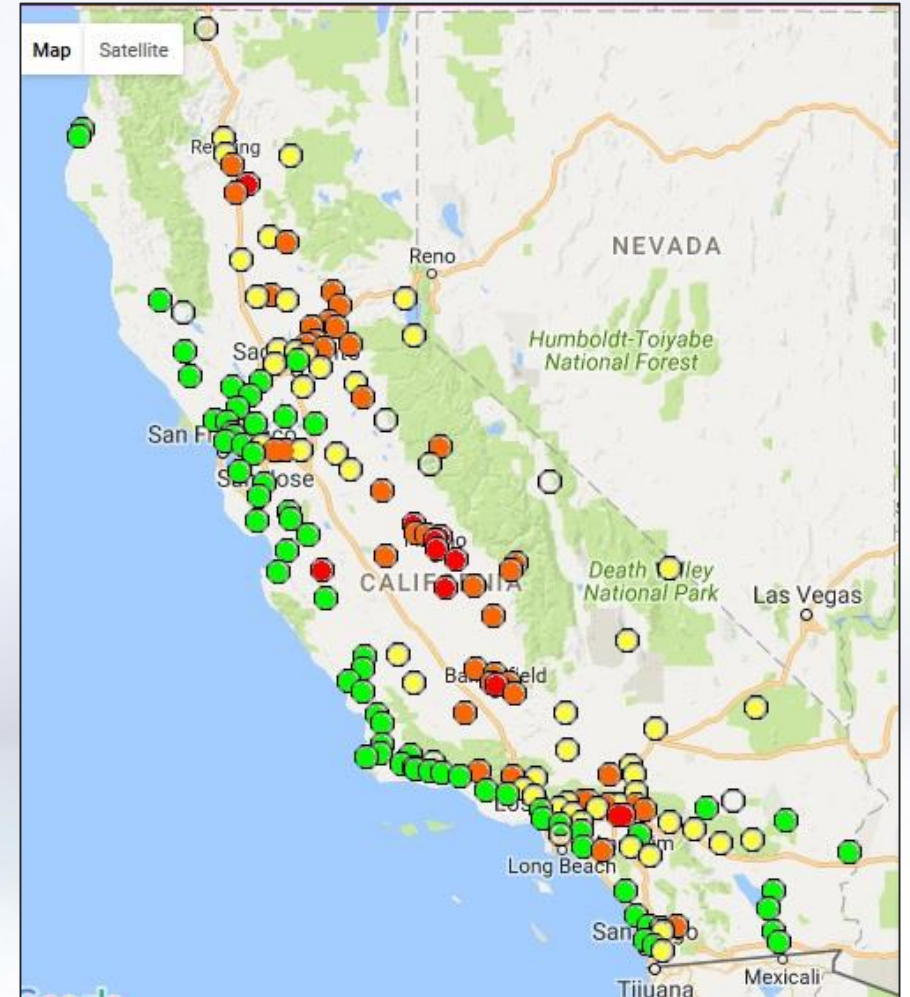
June 4, 2019

History of Air Quality Data at CARB



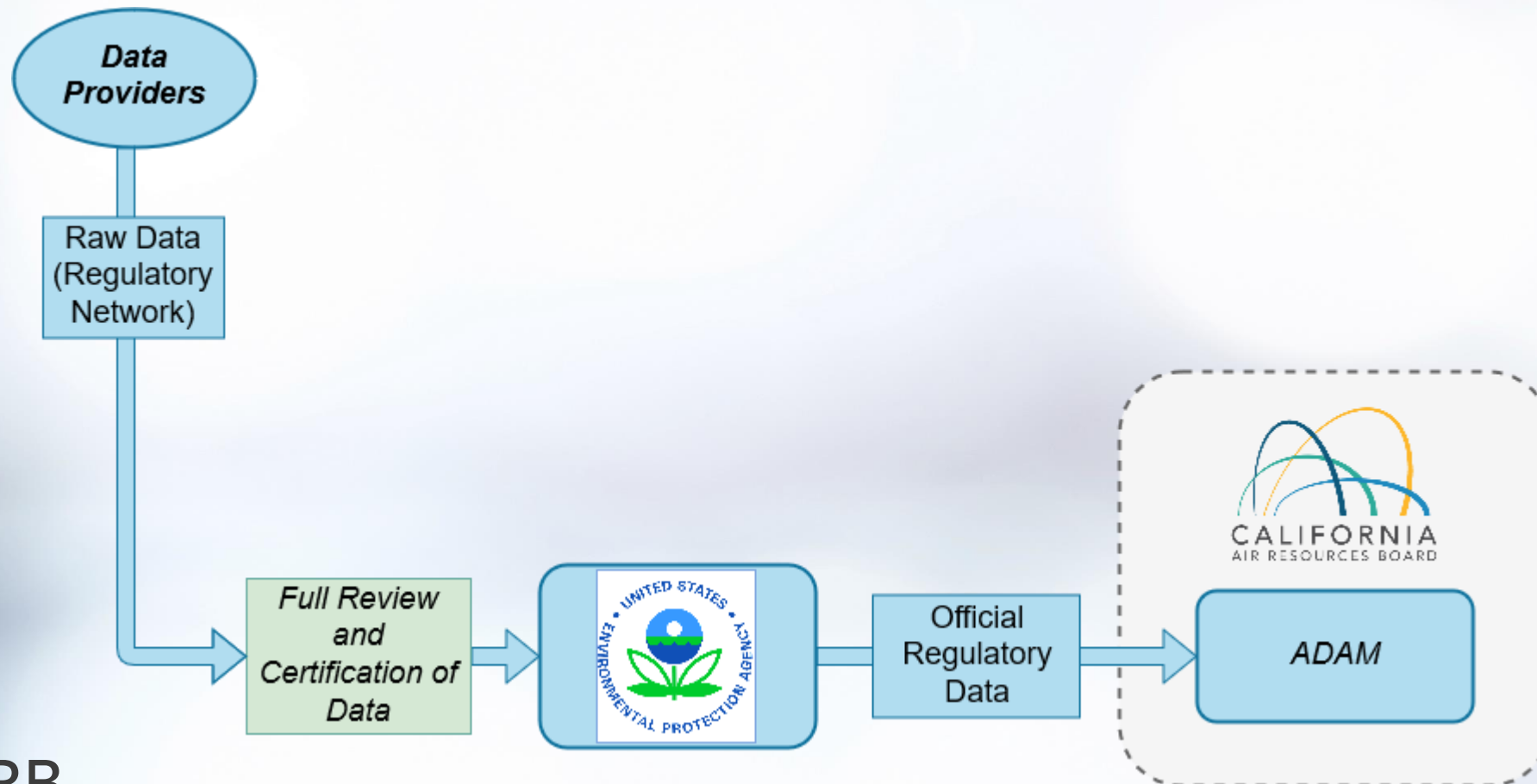
ADAM

- Official data for current and past standards
 - Supports regulatory National and State statistics
 - Determined exactly as prescribed for National and State rules
- Sources:
 - All California sites that submit to U.S. EPA's Air Quality System (AQS)
 - Near-border sites in Nevada and Mexico
- iADAM: ADAM's Web interface
 - Graphing and flexible data selection



https://www.arb.ca.gov/aqmis2/map_pages/gmap.php

Official Regulatory Data: ADAM



iADAM Main Page

iADAM: Air Quality Data Statistics

Select and View Air Quality Data for Various Pollutants throughout the State

Select 8 Summary:	Air Quality Summaries Tailored to Your Needs Select any combination of statistics & years that produces up to 8 output columns
Trends Summaries:	Air Quality Trends Summaries Select any number of years to see year-to-year trends in key air quality statistics
Top 4 Summary:	Top 4 Measurements and Days Above the Standard Choose any three year window of annual top 4 measurements and key annual statistics
Hourly Listing:	24 Hourly Measurements for a Site and Day Choose any date and location to view all hourly measurements in a moveable 24-hour window
Weekly Listing:	Daily Statistics in a 10-Week Listing Display the daily statistic of your choice in a moveable 10-week window
Toxics Summaries:	Statewide & Site-by-Site Toxics Summary Statistics View comprehensive listings of statewide and site-by-site statistics for substances in ARB's toxics monitoring program



iADAM: Trends

- Select 8 Summary:
- Trends Summaries:**
- Top 4 Summary:
- Hourly Listing:
- Weekly Listing:
- Toxics Summaries:

Trends Summary: **Select Pollutant, Year Range, & Area**

Step 1: Select a Pollutant	Ozone (National) ▾	iADAM
Step 2: Select a First Year	2007 ▾	
OR Select All Years	<input type="checkbox"/>	
Step 3: Select a Summary Type ¹	<input checked="" type="radio"/> Summarize by Site <input type="radio"/> Summarize by County <input type="radio"/> Summarize by Air Basin <input type="radio"/> Summarize by 8-Hour Ozone Planning Area	
Step 4: Select a County ²	Yolo ▾	
OR an Air Basin ²	▾	
OR an 8-Hr Ozone Plan Area ²	▾	
OR Statewide ²	▾	
Step 5: Submit Your Selections	Submit...	

- Notes:**
1. The Trends Summary displays all available years from the **First Year** (as selected in Step 2 above) through 2017.
 2. If you choose to summarize by site, you may choose to have iADAM list the monitoring sites within one of California's counties, within an air basin, within an 8-hour ozone planning area, or within the state.

Air Basins are multi-county regions of the state that have similar meteorological and geographic conditions. Air basins boundaries typically follow county boundaries, but there are several instances within the state where air basin boundaries fall within a county, dividing the county between two or more air basins.

8-Hour Ozone Planning Areas are regions of the state that the U.S. Environmental Protection Agency has defined for the purpose of planning for the attainment of a national 8-hour ozone ambient air quality standard. These planning areas include many geographical configurations, including multiple counties, single counties, or portions of counties.

iADAM: Trends Summary

Trends Summary: National Ozone Statistics

at Davis-UCD Campus



Year	Days > Standard			1-Hour Observations				8-Hour Averages				Year Coverage
	8-Hour Stds			Max.	EENED ¹			0.070 Std		0.075 Std		
	0.070	0.075	0.08		1-Yr	3-Yr	D.V. ²	Max.	D.V. ²	Max.	D.V. ²	
2017	1	0	0	0.078	0.0	0.0	0.080	0.071	0.063	0.071	0.063	87
2016	1	0	0	0.083	0.0	0.0	0.081	0.072	0.064	0.072	0.064	92
2015	1	0	0	0.081	0.0	0.0	0.078	0.071	0.062	0.071	0.062	100
2014	0	0	0	0.081	0.0	0.0	0.083	0.067	0.064	0.067	0.064	93
2013	0	0	0	0.075	0.0	0.0	0.086	0.062	0.066	0.062	0.066	98
2012	4	1	0	0.092	0.0	0.0	0.087	0.076	0.070	0.076	0.070	97
2011	1	1	0	0.087	0.0	0.0	0.087	0.082	0.070	0.082	0.070	99
2010	2	0	0	0.094	0.0	0.0	0.097	0.072	0.072	0.072	0.072	84
2009	6	1	0	0.092	0.0	0.0	0.097	0.081	0.074	0.081	0.074	100
2008	9	5	1	0.112	0.0	0.0	0.104	0.098	0.076	0.098	0.076	97
2007	4	3	1	0.105	0.0	0.0	0.098	0.091	0.075	0.091	0.075	100
Graph	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Select 8 Summary:
- Trends Summaries:
- Top 4 Summary:
- Hourly Listing:
- Weekly Listing:
- Toxics Summaries:

Info:
Click on a column header for more information about the statistic in that column.

Area:
Yolo County; Sacramento Valley Air Basin;
Sacramento Metro Area 8-Hour Ozone Planning Area

District:
Yolo-Solano APCD

Years:
Annual Ozone statistics are available for this site from 1987 through 2017.

Notes:
All concentrations expressed in parts per million.
The national 1-hour ozone standard was revoked in June 2005. Statistics related to the national 1-hour ozone standard are shown in *italics* or *italics*.
orange exceeds a national ambient air quality standard.
An exceedance of a standard is not necessarily related to a violation of the standard.
Daily maximum 8-hour averages associated with the National 0.070 ppm standard exclude those 8-hour averages that have first hours between midnight and 6:00 am, Pacific Standard Time.
Daily maximum 8-hour averages associated with the National 0.070 ppm standard include only those 8-hour averages from days that have sufficient data for the day to be considered valid.
Daily maximum 8-hour averages associated with the National 0.075 ppm and 0.08 ppm standards may come from days that don't have sufficient data for the day to be considered valid, provided the daily maximum 8-hour average itself includes sufficient data to be considered valid.

¹ EENED = Estimated Expected Number of Exceedance Days
² D.V. = National Design Value
***** means there was insufficient data available to determine the value.

Available Pollutants:

National Ozone | State Ozone | PM2.5 | PM10

iADAM: Trends Summary

Trends Summary: National Ozone Statistics

at Davis-UCD Campus iADAM

Year	Days > Standard			1-Hour Observations			8-Hour Averages				Year Coverage	
	8-Hour Stds			Max.	EENED ¹		D.V. ²	0.070 Std		0.075 Std		
	0.070	0.075	0.08		1-Yr	3-Yr		Max.	D.V. ²	Max.		D.V. ²
2017	1	0	0	0.078	0.0	0.0	0.080	0.071	0.063	0.071	0.063	87
2016	1	0	0	0.083	0.0	0.0	0.081	0.072	0.064	0.072	0.064	92
2015	1	0	0	0.081	0.0	0.0	0.078	0.071	0.062	0.071	0.062	100
2014	0	0	0	0.081	0.0	0.0	0.083	0.067	0.064	0.067	0.064	93
2013	0	0	0	0.075	0.0	0.0	0.086	0.062	0.066	0.062	0.066	98
2012	4	1	0	0.092	0.0	0.0	0.087	0.076	0.070	0.076	0.070	97
2011	1	1	0	0.087	0.0	0.0	0.087	0.082	0.070	0.082	0.070	99
2010	2	0	0	0.094	0.0	0.0	0.097	0.072	0.072	0.072	0.072	84
2009	6	1	0	0.092	0.0	0.0	0.097	0.081	0.074	0.081	0.074	100
2008	9	5	1	0.112	0.0	0.0	0.104	0.098	0.076	0.098	0.076	97
2007	4	3	1	0.105	0.0	0.0	0.098	0.091	0.075	0.091	0.075	100
Graph	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

considered valid
¹EENED = Estimated Expected Number of Exceedance Days
²D.V. = National Design Value
 ■ means there was insufficient data available to determine the value.

Available Pollutants: National Ozone | State Ozone | PM2.5 | PM10

iADAM: Trends Summary

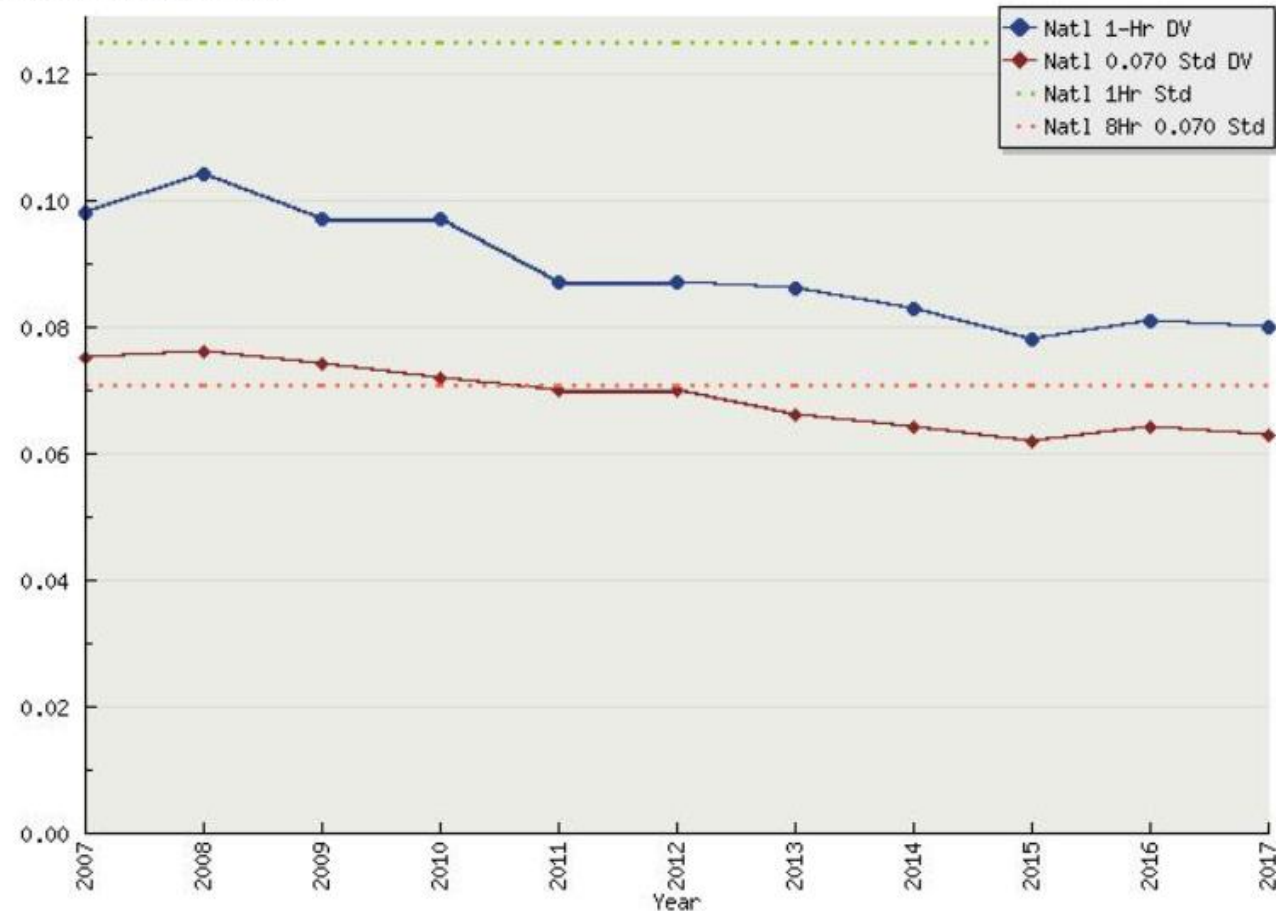
- Select 8 Summary:
- Trends Summaries:**
- Top 4 Summary:
- Hourly Listing:
- Weekly Listing:
- Toxics Summaries:

Trends Summary: National Ozone Statistics

parts per million



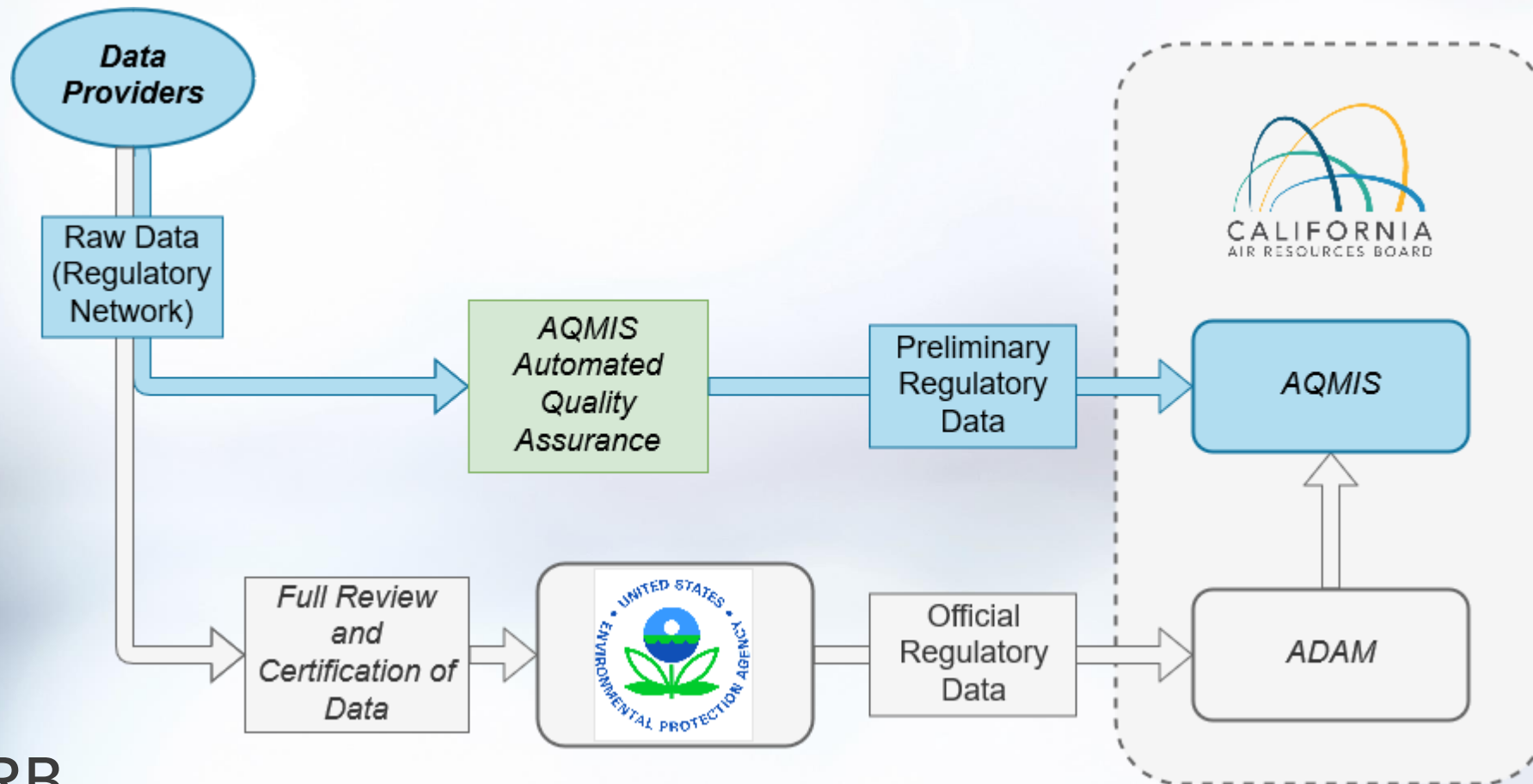
at Davis-UCD Campus
between 2007 and 2017



Future ADAM Developments

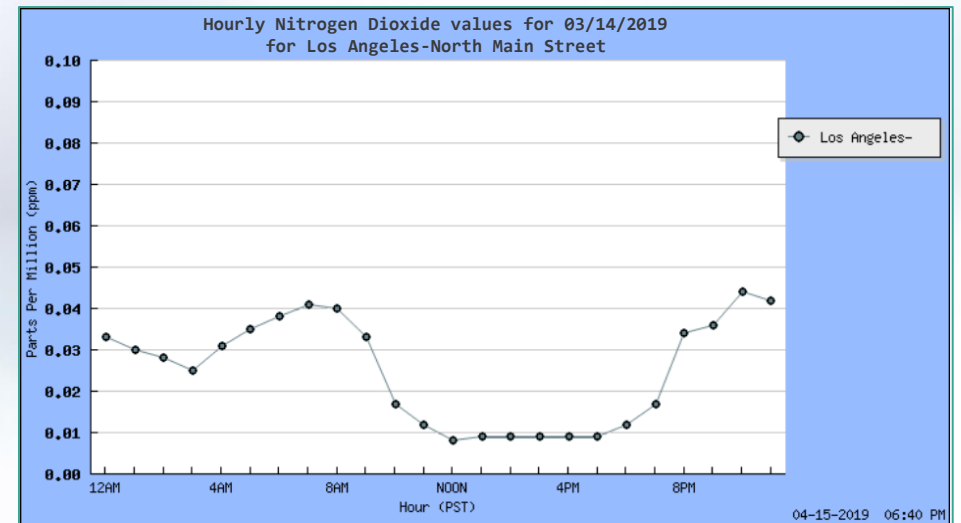
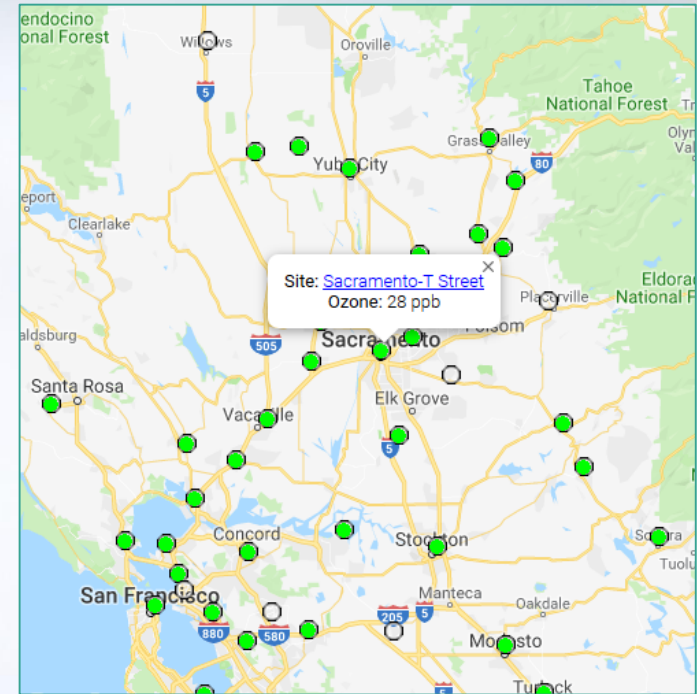
- Restoration of Support:
 - Carbon monoxide standards
 - Sulfur dioxide standards
- Expand PM_{2.5} Support:
 - 12.0 µg/m³ annual standard
 - 65 µg/m³ 24-hour standard
 - All latest versions of Appendix N
- PM_{2.5} speciation
- Support lead standards
- Greenhouse gas data
- Meteorological data
- iADAM:
 - Download capability
 - GIS functionality

Preliminary & Official Regulatory Data: AQMIS



AQMIS

- Data Sources
 - Over 260 air quality sites in California
 - 31 air quality sites in Mexico
 - Over 800 meteorological sites
- Raw hourly data
 - 25 air quality parameters
 - 16 meteorological parameters
- Automated quality assurance routines
 - Improved data capture – issues become apparent sooner
- Map displays of hourly data, data download, and graphing capabilities
- Mobile Web: Breathe Well (<https://mobile.arb.ca.gov/breathewell>)



AQMIS Main Page

Air Quality and Meteorological Information System

AQMIS provides a combination of preliminary (real-time) and official (historical) data.
Preliminary data are subject to change.

AQMIS data are in PST

This page last reviewed June 24, 2016

Breathe Well

AQMIS has gone mobile! View the most up-to-date ozone and PM_{2.5} concentrations near you or at over 150 cities across California on your mobile device.

Latest Ozone

For selected areas within the state, provides information on maximum ozone concentrations for yesterday, today, and for the year so far.

Latest Year's Ozone

For selected areas within the state, provides information on ozone exceedances for the last three years and current year so far. Results can be viewed at site level if desired.

Air Quality Data

Query tool to obtain both preliminary and official air quality data by selecting a time frame, an area of the state, and the type of report. Results can be clicked through for more detail.

Meteorological Data

Query tool to obtain real-time or historical meteorological data by selecting parameter, time period, area of the state, and report format. Results can be clicked through for more detail.

Google Maps

Customizable visual display of air quality or meteorological parameters using color-coded dots at site locations. Allows panning and zooming and satellite and terrain views.

*Greenhouse Gas (GHG)
Data*

NEW! Query tool to obtain both preliminary and official Greenhouse Gas (GHG) data by selecting a time frame, an area of the state, and the type of report. Results can be clicked through for more detail.

Breathe Well

Breathe Well

Latest Ozone

Latest Year's Ozone

Air Quality Data

Meteorological Data

Google Maps

Greenhouse Gas (GHG) Data

CALIFORNIA AIR RESOURCES BOARD

Set My Location

Air near Sacramento 4 PM - 5 PM PST

PM2.5: 3.0 µg/m³

Ozone: 34 ppb

Map sites near Sacramento

Good | Very Unhealthy

Please check your local air district website for air quality alerts where you live.

Air Tips

Air Quality Color Key

Air in Other Cities

Air Quality Now | Contact

Particles (PM2.5) in My Area

Near My Location

Map | Satellite

Sacramento

A	Sacramento-T Street	3.0 µg/m ³	Good
B	Sacramento-Del Paso Manor	9.0 µg/m ³	Good
C	Woodland-Gibson Road	4.0 µg/m ³	Good

<http://mobile.arb.ca.gov/breathewell/>

Hourly Air Quality Data Query

Air Quality Data (PST) Query Tool

This page last reviewed November 20, 2014

Daily Data **Hourly Data** **Special Reports**

Step 1: Select a Parameter
Ozone ppm

Step 2: Select an End Date and Time
Date: 2019 April 13 Time: Whole Day

Step 3: Select One
Sacramento --AIR BASIN-- --PART OF STATE--

Step 4: Select a Type of Report
Hourly Data

Step 5: Select the Sort Order
Basin/County/Site

RETRIEVE DATA

Hourly Data Display

Breathe Well

Latest Ozone

Latest Year's Ozone

Air Quality Data

Meteorological Data

Google Maps

Greenhouse Gas (GHG) Data

Sacramento County Hourly Ozone 04/13/2019 MIDDAY Parts Per Million (ppm)													
					<<< Hours 00-07	Hours 08-15	Hours 16-23 >>>	Whole Day					
Bas	Cnty	Site Name	Day's Max	Day's Avg	08 - 09	09 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	GraphIt
SV	SAC	Elk Grove-Bruceville Road	0.051	0.029	0.022	0.029	0.034	0.043	0.047	0.049	0.049	0.051	<input type="checkbox"/>
SV	SAC	Folsom-Natoma Street	0.057	0.04	0.038	0.040	0.042	0.046	0.049	0.050	0.053	0.056	<input type="checkbox"/>
SV	SAC	North Highlands-Blackfoot Way	0.057	0.032	0.031	0.036	0.041	0.046	0.049	0.053	0.057	0.057	<input type="checkbox"/>
SV	SAC	Sacramento-Del Paso Manor	0.052	0.03	0.026	0.029	0.033	0.043	0.046	0.050	0.052	0.052	<input type="checkbox"/>
SV	SAC	Sacramento-T Street	0.05	0.029	0.020	0.029	0.036	0.043	0.046	0.048	0.048	0.049	<input type="checkbox"/>
SV	SAC	Sloughhouse	0.049	0.032	0.028	0.032	0.036	0.039	0.043	0.047	0.049	0.048	<input type="checkbox"/>

View Daily Data for this Area Pick Sites/Dates for Download Get Additional Information on Sites
Download Data: [Quick](#) or [Select Format](#)

Hours listed are in Pacific Standard Time. Add one hour to convert to PDT.

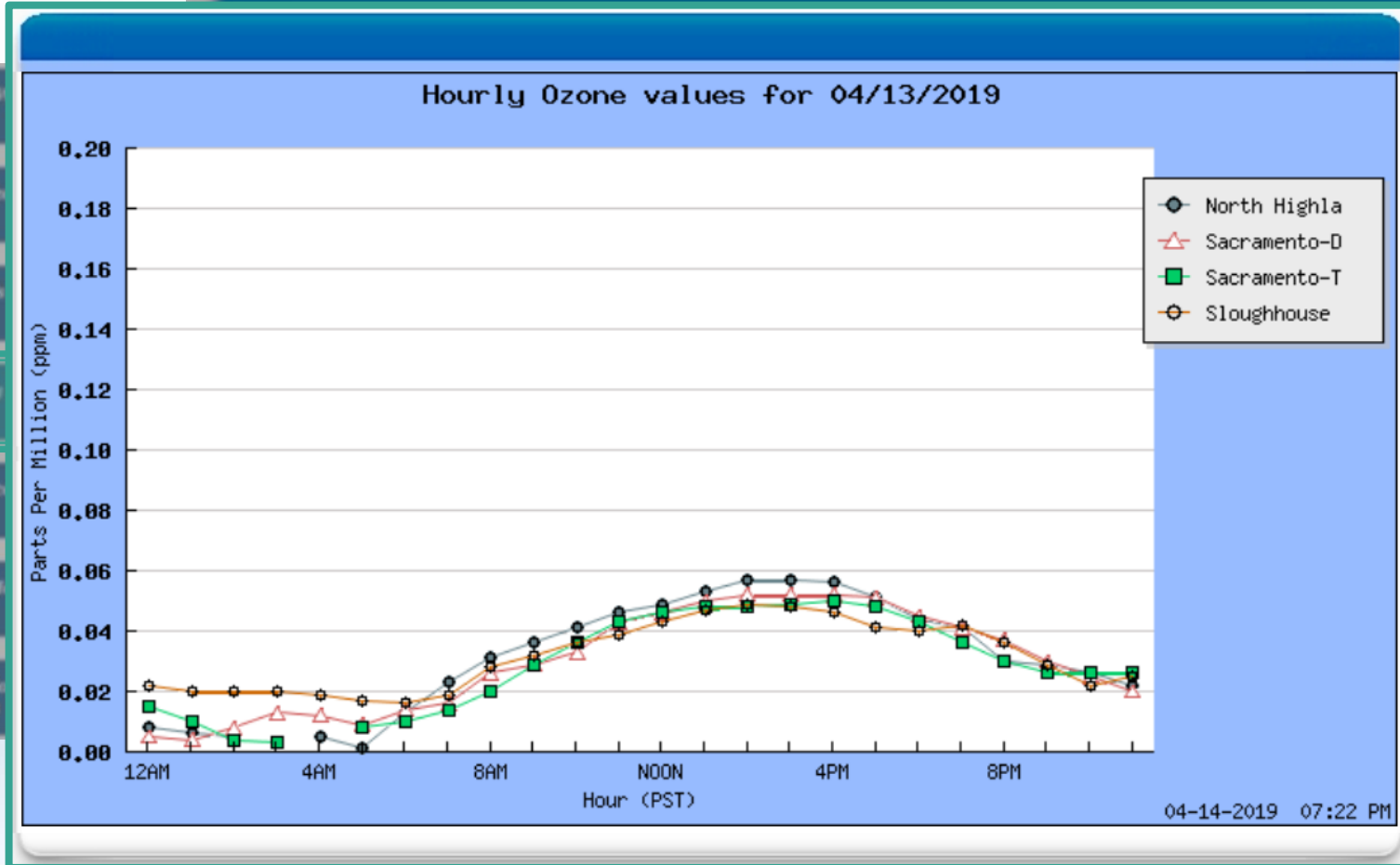
Blank values indicate data not available.

Check up to 4 boxes and click "GraphIt" button to see a graph.

Change Selection

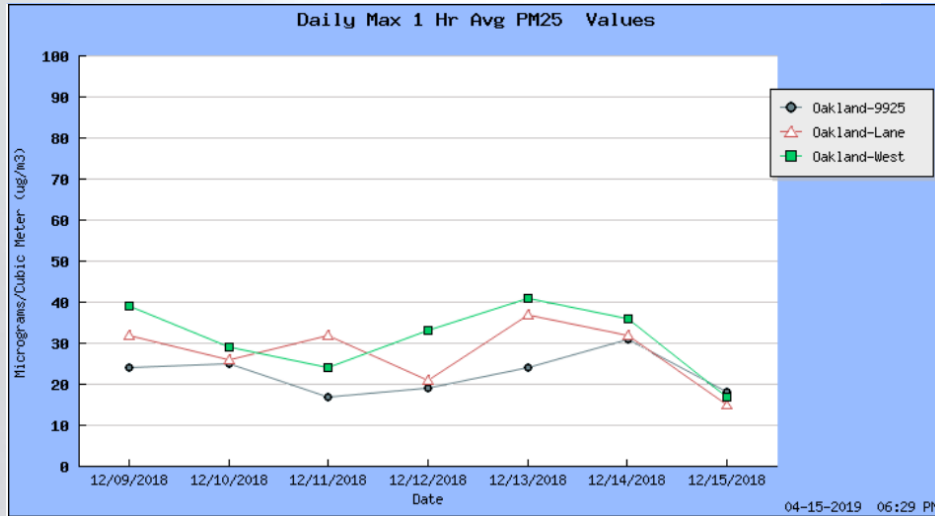
2019 ▾ April ▾ 13 ▾
 Ozone ▾ ppm ▾
 Sort: Basin/County/Site ▾
 Daily Average ▾
 UPDATE DISPLAY

Hourly Data Graph



Provider Tools in AQMIS

Compare nearby monitors



Data validation

Southern California
Data Selection for PM25 Daily Data

Get for to

or

Bas	Cnty	Site Name	Obs for Year
MEX	MXM	Mexicali-UABC	15
SJV	KER	Bakersfield-410 E Planz Road	8
SJV	KER	Bakersfield-Golden State Highway	10
SS	IMP	Calexico-Ethel Street	45

[Get Additional Information on Sites](#)

Find gaps in data submission

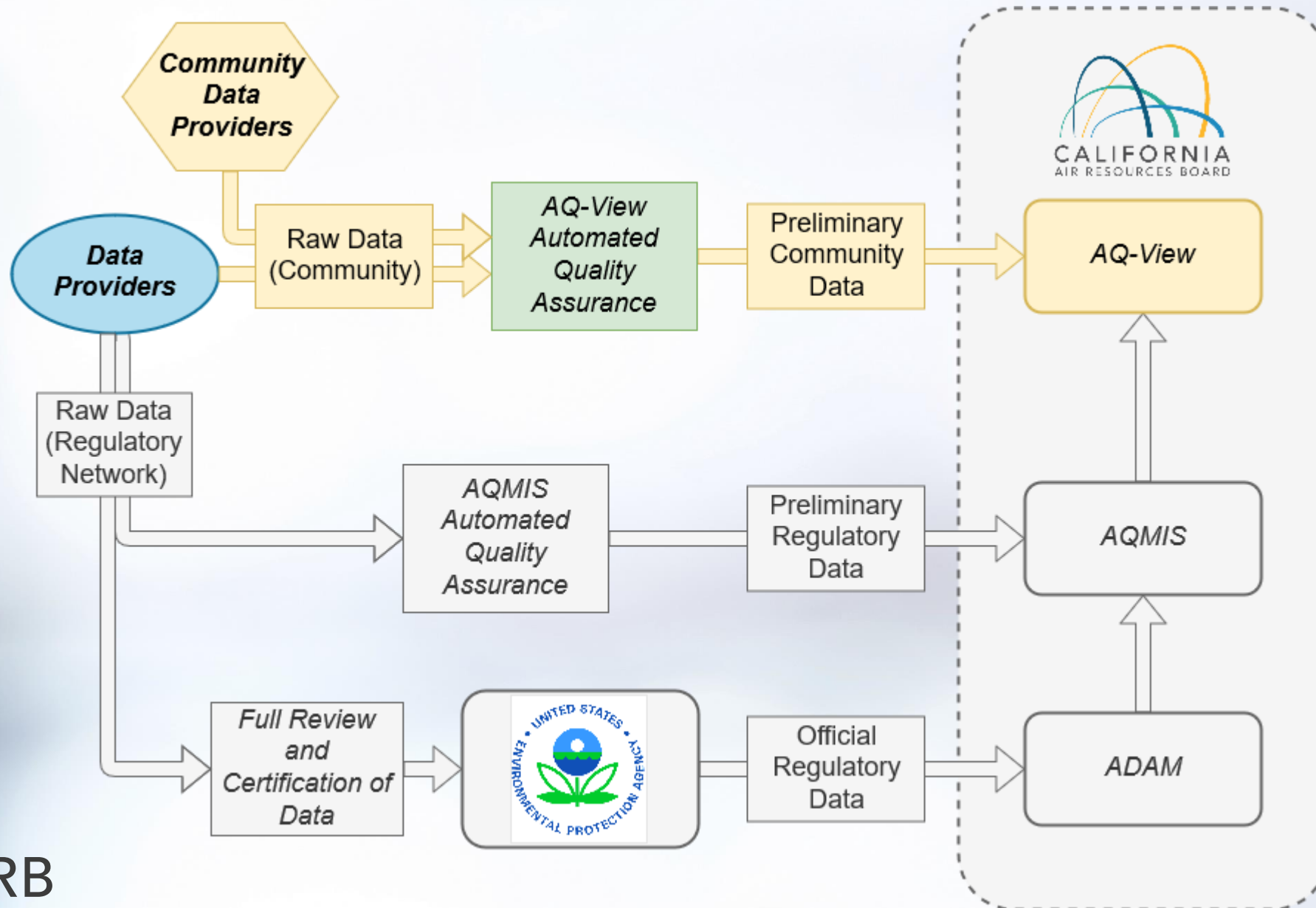
Sacramento Valley Air Basin
Monthly Data Availability for Ozone Data
2018

Bas	Cnty	Site Name	Daily	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
SV	BUT	Chico-East Avenue	D	H	H	H	H	H	H	H	H	H	H p	H p	H p
SV	BUT	Paradise-4405 Airport Road	D	H	H	H	H	H	H	H	H	H	H p	H p	H p
SV	COL	Colusa-Sunrise Blvd	D	H	H	H	H	H	H	H	H	H	H p	H p	H p
SV	GLE	Willows-720 N Colusa Street	D	H	H	H	H	H	H	H	H	H	H p	H p	H p
SV	PLA	Auburn-11645 Atwood Road	D	H	H	H	H	H	H	H	H	H	H	H	H
SV	PLA	Lincoln-2885 Moore Road	D	H	H	H	H	H	H	H	H	H	H p	H	H

New and Future Developments in AQMIS

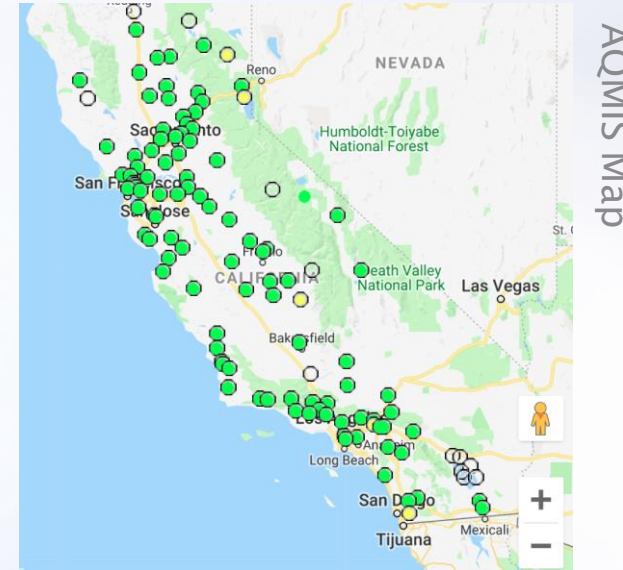
- New:
 - Statistics related to the newly promulgated 2015 8-hr ozone standard of 0.070 ppm
 - CARB's Greenhouse Gas Monitoring Network
 - CH₄, CO, CO₂, & N₂O at 5 sites in CA
 - Near-Roadway sites
- Future:
 - Long-term trends of ozone

Community-Level Data: AQ-View



Assembly Bill 617 (AB 617)

Existing Regulatory Network – Air quality monitoring network for assessing Clean Air Act attainment. Air quality monitored on regional scale.



AB 617 – requires new community-focused and community-driven action to reduce air pollution and improve public health in communities that experience disproportionate burdens from exposure to air pollutants. Air quality monitored on community scale.

Community Air Monitoring

AB 617 – Year One

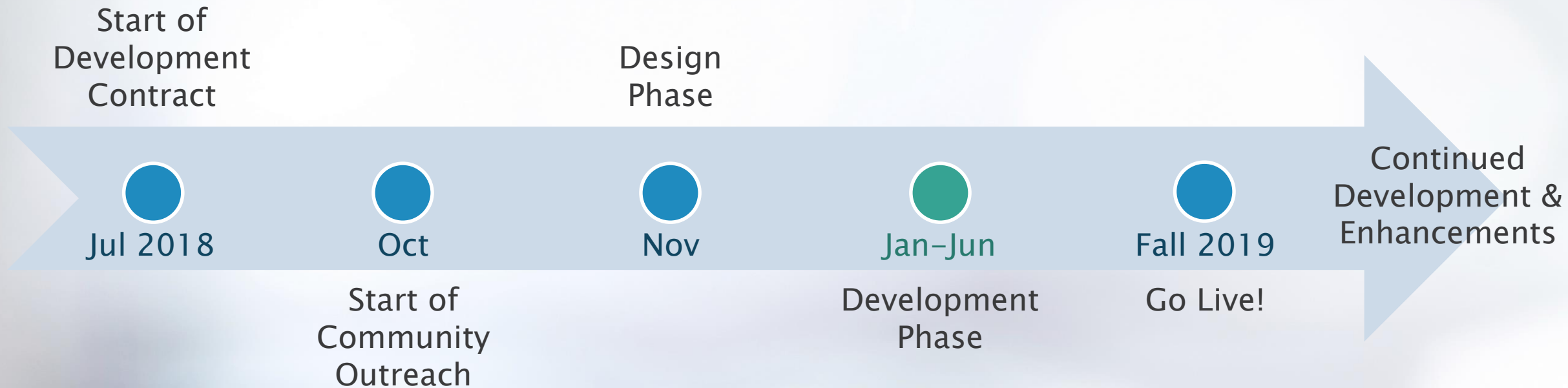
- 9 communities selected for monitoring programs
 - Monitoring efforts led by Air Districts
- 23 projects with monitoring selected for Community Air Grants
 - Monitoring efforts led by Community Based Organizations

Challenges:

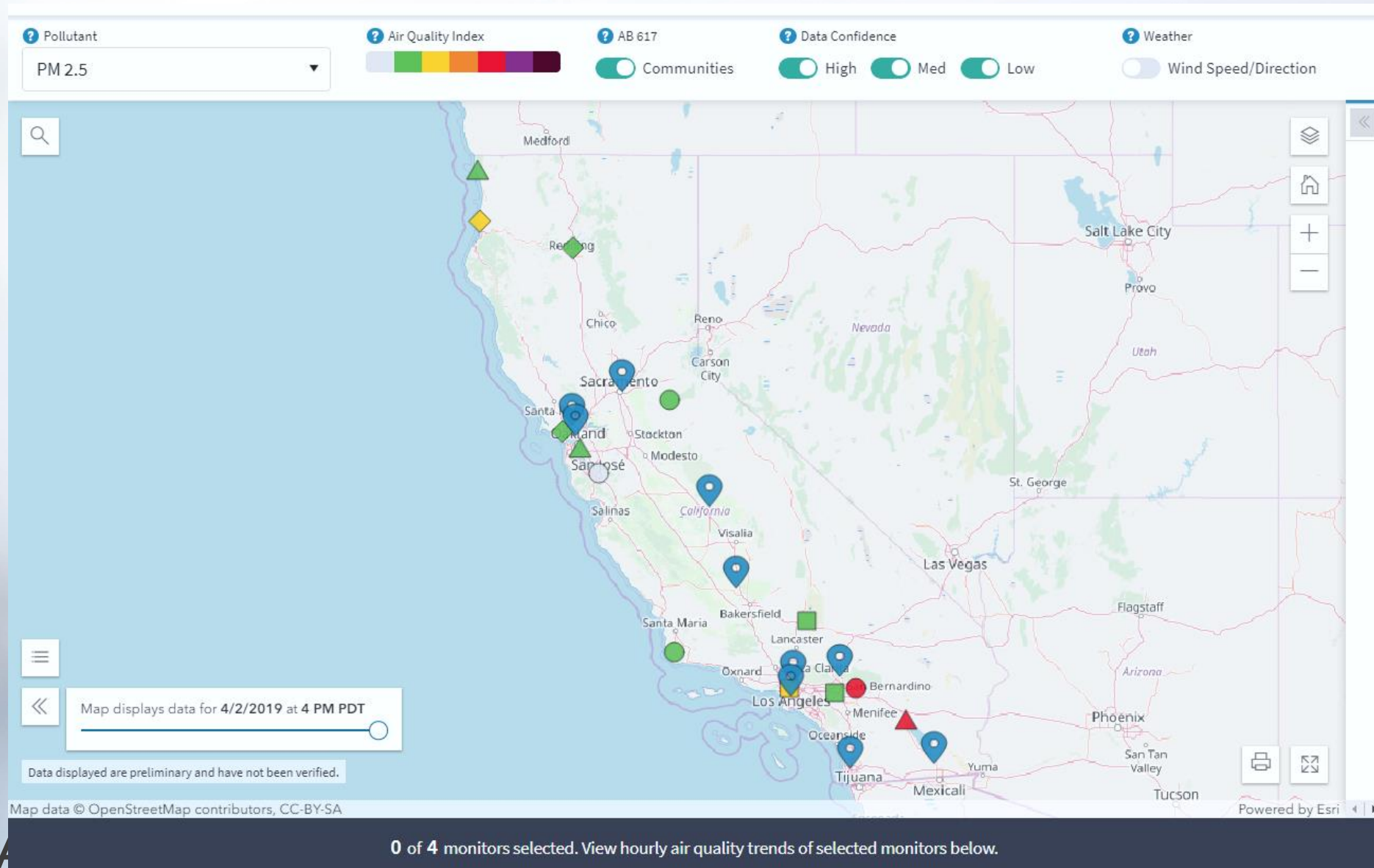
- Various monitoring objectives
- Combination of regulatory-grade equipment and low-cost sensors



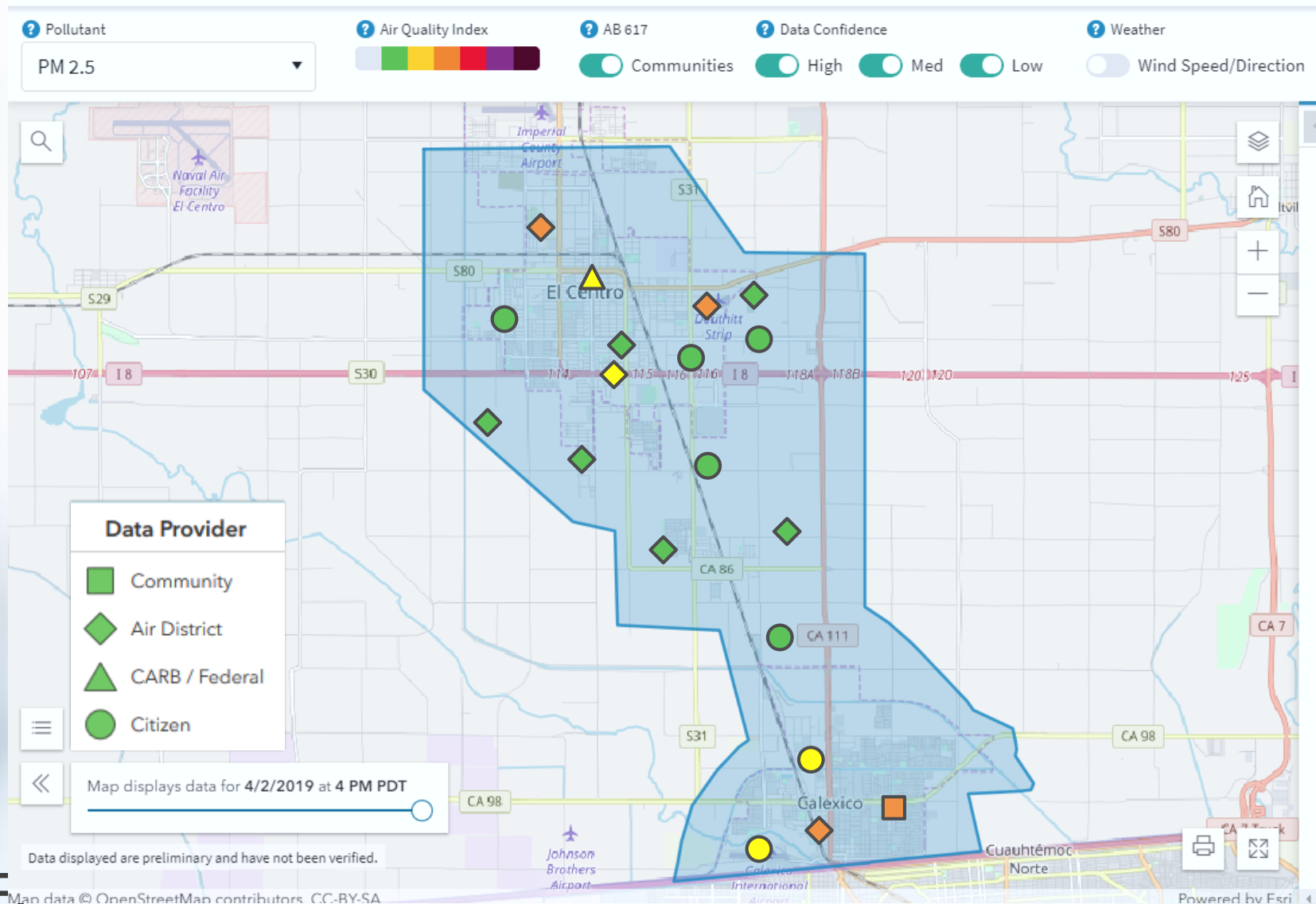
AQ-View Development Timeline



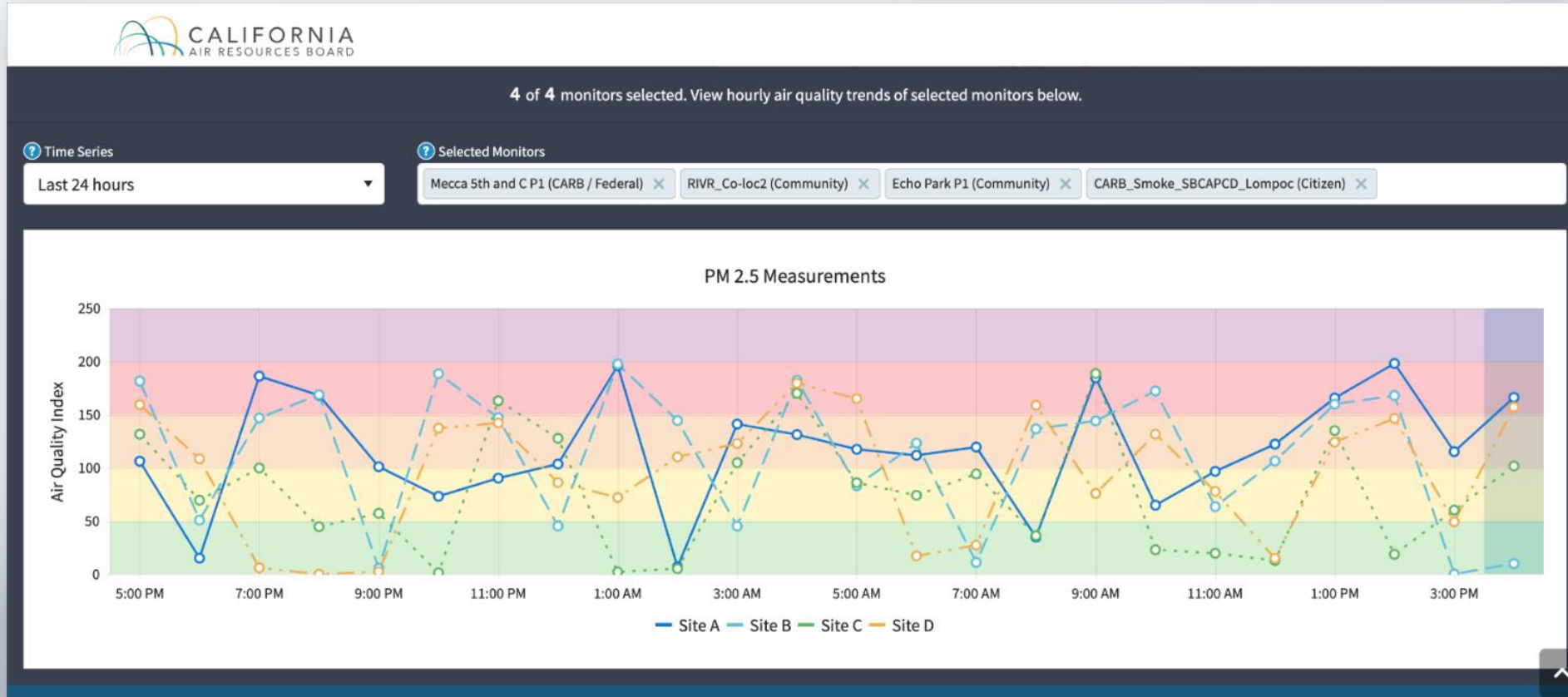
AQ-View Map: State View (Draft!)



AQ-View Map: Community View (Draft!)



AQ-View Time Series (Draft!)



AQ-View Vision

Short Term (by Fall 2019)

- Work internally (with CARB) and externally with communities, air districts, and ERG (contractor) to finish design
- Develop system: Air quality and meteorological data collection, QA/QC, processing, and visualization
- Work with data providers to store and display data for communities and air grants

Mid Term (by 2021)

- Merge AQMIS with AQ-View, add data from new communities and air grant projects
- Enhance download capabilities, create additional data visualization aids, provide air quality notifications
- Add data management tools, like data provider dashboards to track tasks, view QA results, identify high sites, etc.
- Support multilingual capabilities

Long Term (by 2024)

- Identify and link with other emission and meteorological data related systems
- Develop tools for calculating summary statistics to track progress
- Maintain and update to accommodate new needs and requirements

Summary

ADAM

- Select and graph variety of data combinations
- Official Air Quality Data
- Supports National and State Standards

AQMIS

- Preliminary air quality and meteorological data
- Near real-time data tool
 - Determine data gaps
 - Flag data

AQ-View

- New community monitoring data portal launching in Fall 2019
- Higher resolution preliminary air quality and meteorological data
- Real-time data visualization
 - AB 617 data
 - Community data
 - Regulatory network data
 - Low-cost sensor data

Links and Contacts

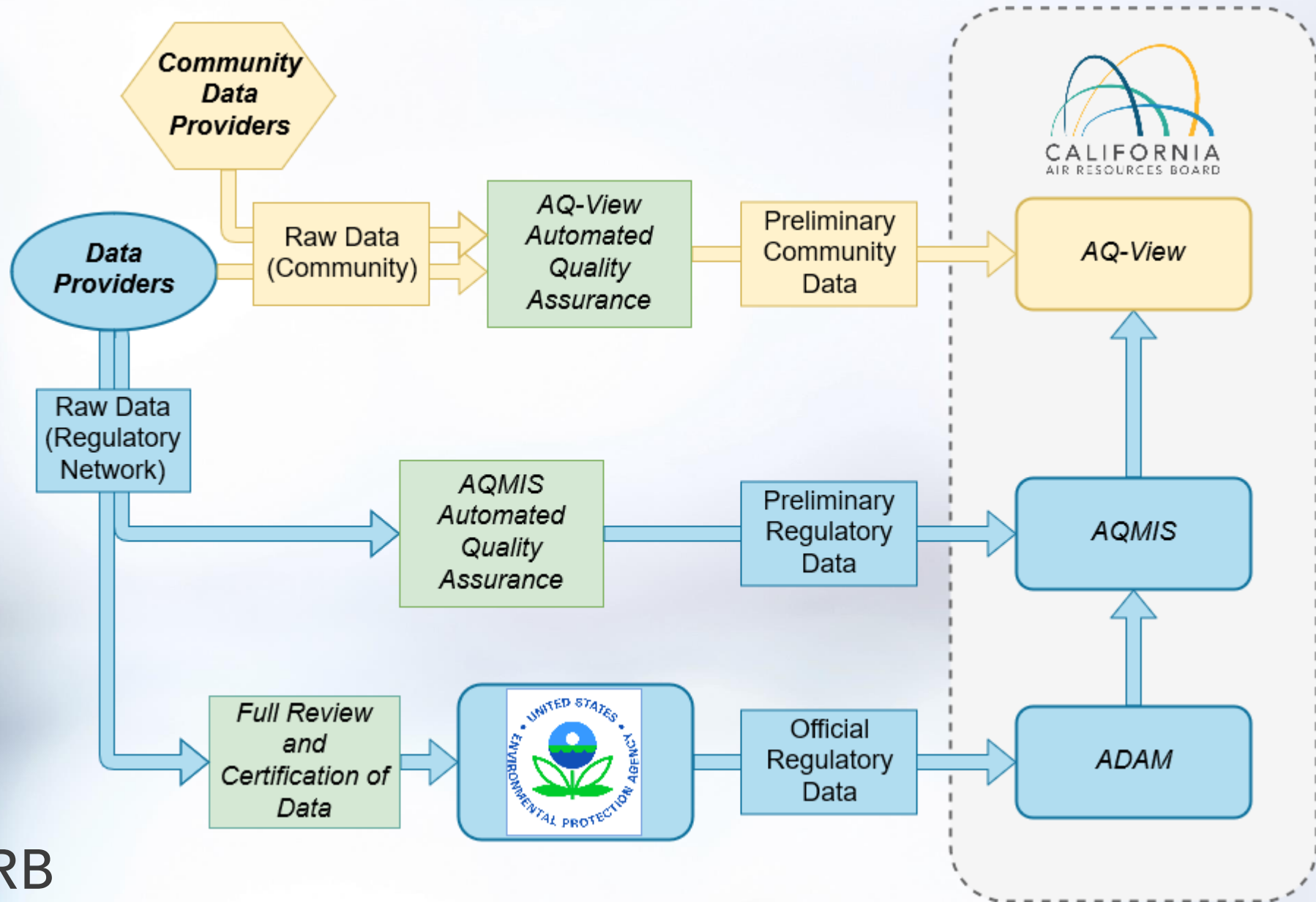
Links:

- **AQ-View**
Coming soon!
- **AQMIS**
<https://www.arb.ca.gov/aqmis2/aqmis2.php>
- **Breathe Well (AQMIS Mobile Website):**
<https://mobile.arb.ca.gov/breathewell>
- **iADAM**
<https://www.arb.ca.gov/adam>

Contacts:

- ❖ **AQ-View:** aqview@arb.ca.gov
- ❖ **AQMIS:** aqmis@arb.ca.gov
- ❖ **ADAM:** adam@arb.ca.gov

Questions?



Air Quality Data Team



Mena Shah (*Manager*)

Annie Flores

Bob Weller

Emily Gorrie

John Rynearson

Rai Hann

Shengping Qin

Taylor Helgestad