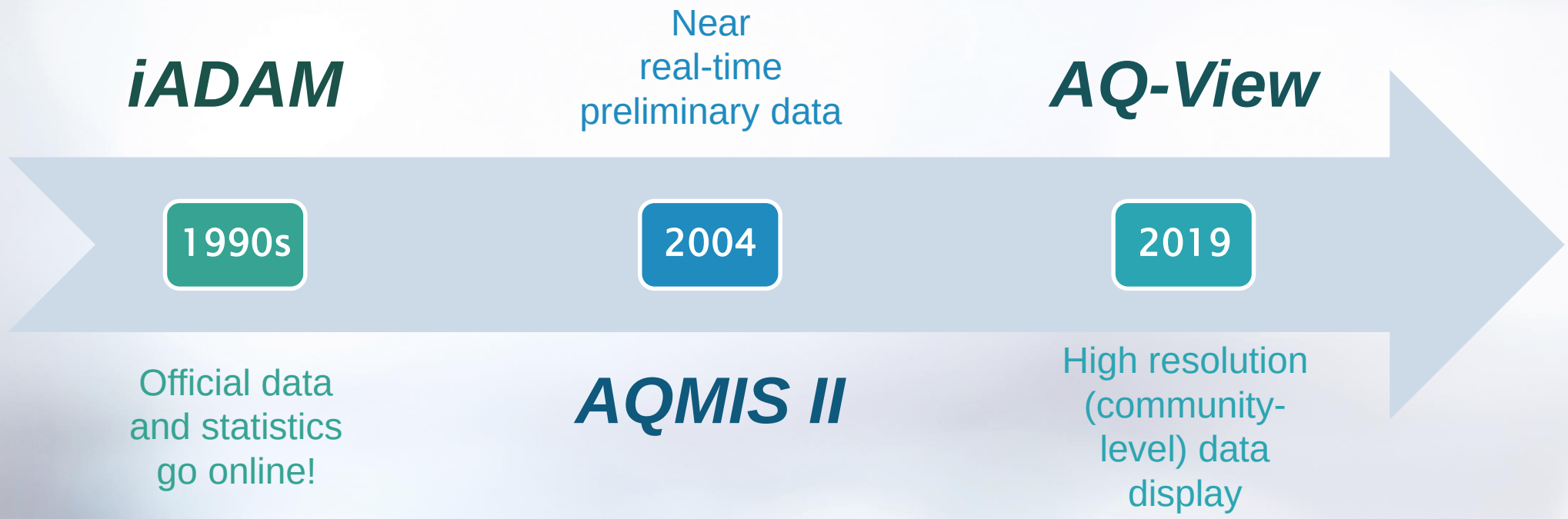
Where Do All the Data Go?

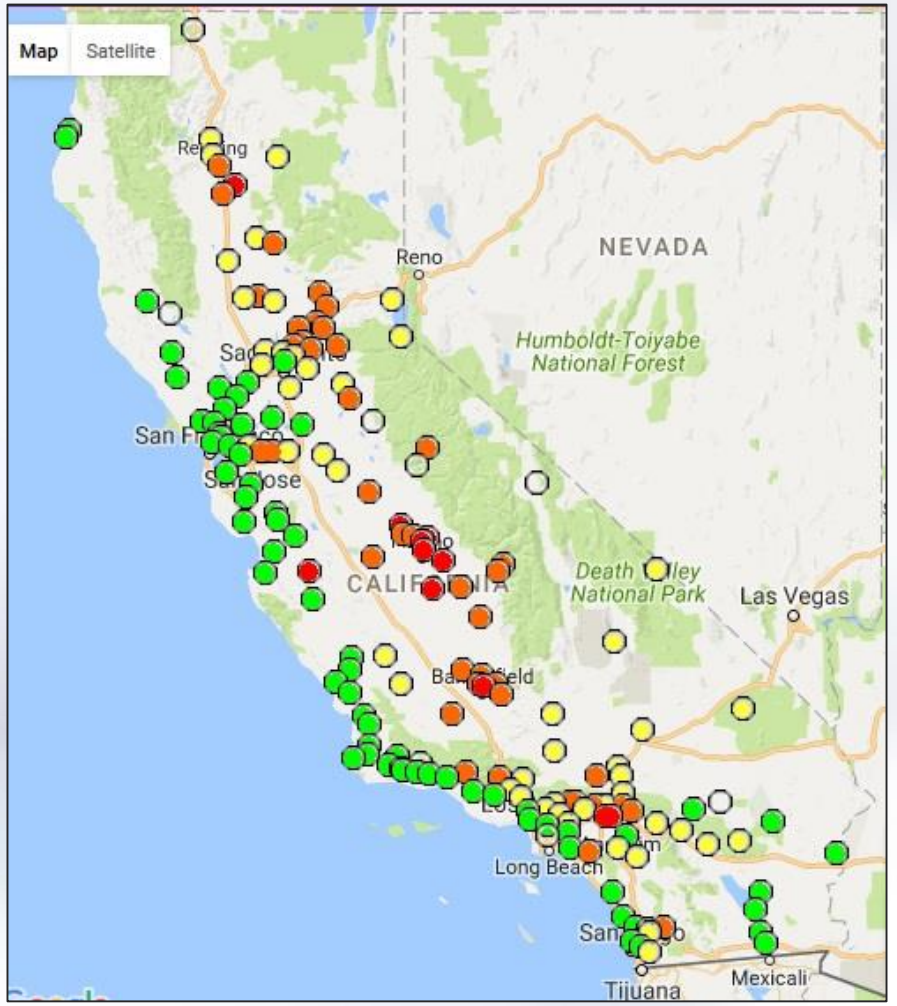
Emily Gorrie
Air Quality Planning and Science Division
June 4, 2019

History of Air Quality Data at CARB



ADAM

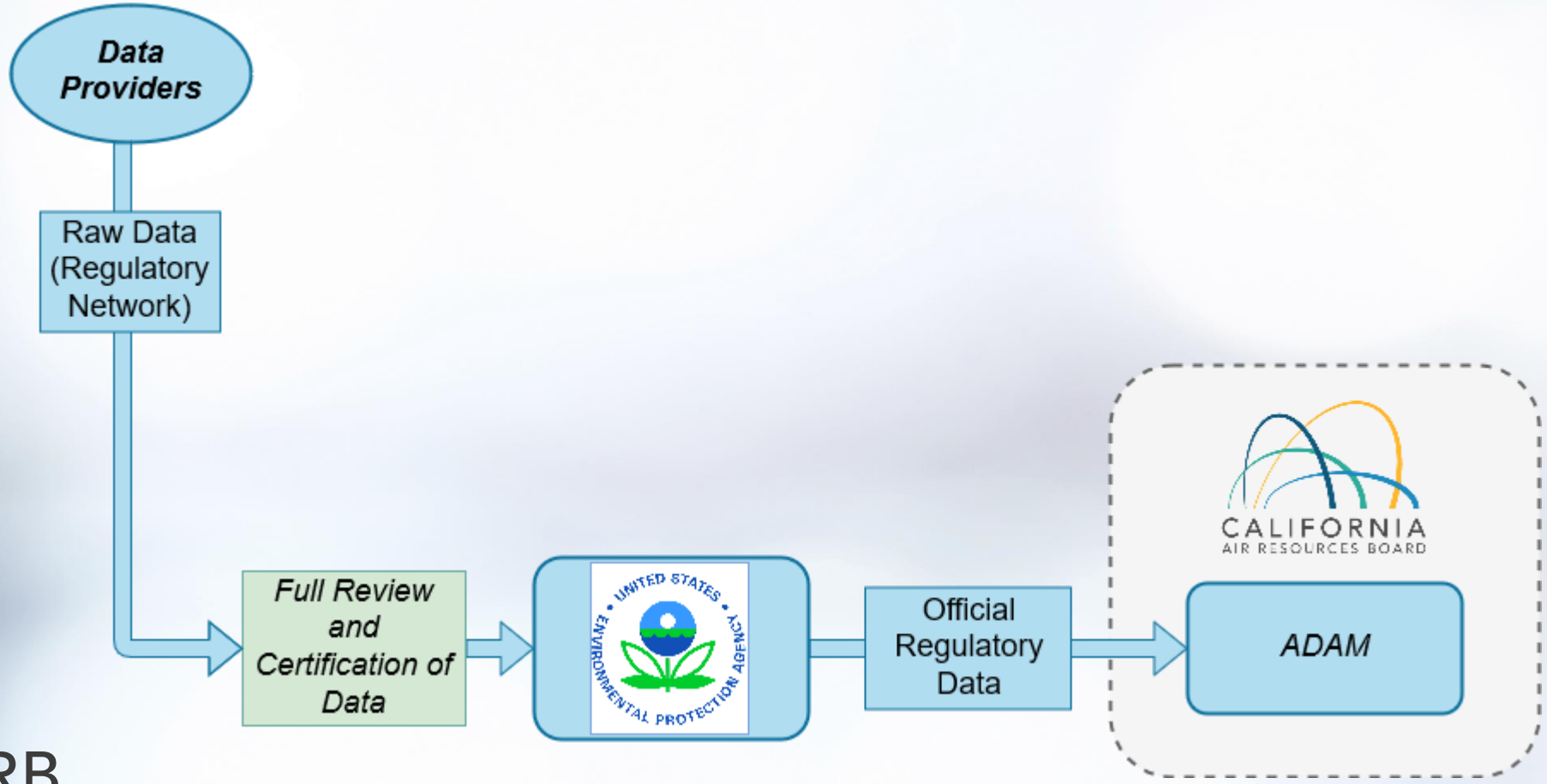
- Official data for current and past standards
  - Supports regulatory National and State statistics
  - Determined exactly as prescribed for National and State rules
- Sources:
  - All California sites that submit to U.S. EPA's Air Quality System (AQS)
  - Near-border sites in Nevada and Mexico
- iADAM: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



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

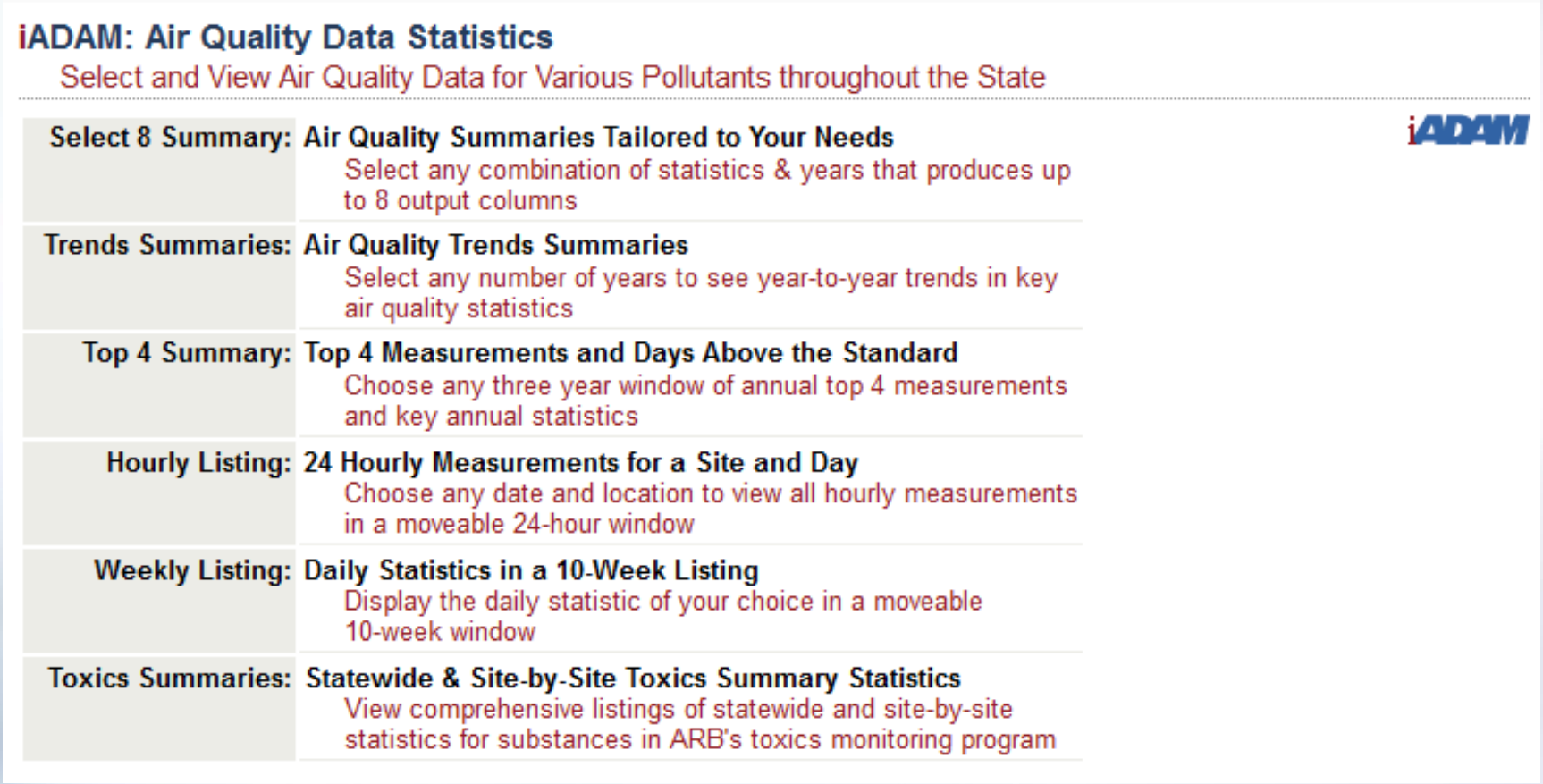
CARB

Official Regulatory Data: ADAM

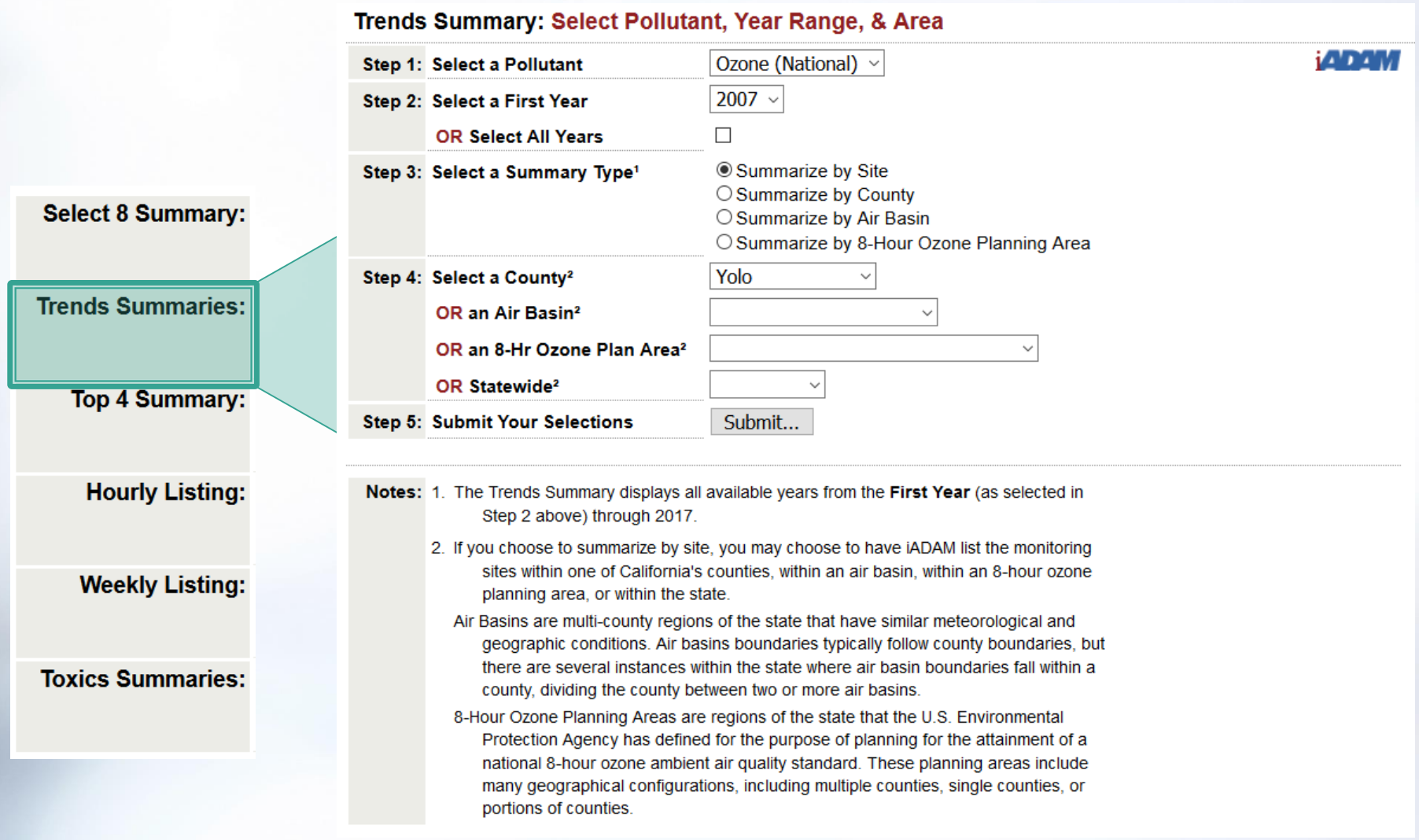


CARB

iADAM Main Page

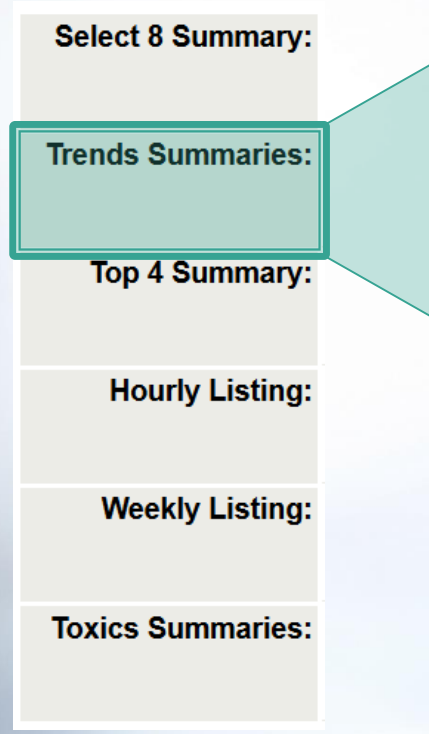


iADAM: Trends



CARB

iADAM: Trends Summary



Trends Summary: National Ozone Statistics

at Davis-UCD Campus

iADAM

Year	Days > Standard: 8-Hour Stds 0.070	0.075	0.08	1-Hour Observations: Max.	EENED[1] 1-Yr	3-Yr	D.V.[2]	8-Hour Averages: 0.070 Std Max.	D.V.[2]	0.075 Std Max.	D.V.[2]	Year Coverage
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	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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

CARB

iADAM: Trends Summary

Trends Summary: National Ozone Statistics

at Davis-UCD Campus

iADAM

Year	Days > Standard: 8-Hour Stds 0.070	8-Hour Stds 0.075	8-Hour Stds 0.08	1-Hour Observations: Max.	EENED[1] 1-Yr	EENED[1] 3-Yr	1-Hour Observations: D.V.[2]	8-Hour Averages: 0.070 Std Max.	0.070 Std D.V.[2]	0.075 Std Max.	0.075 Std D.V.[2]	Year Coverage
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	☐	☐	☐	☐	☐	☐	☑	☐	☑	☐	☐	☐

CARB

iADAM: Trends Summary

Select 8 Summary:

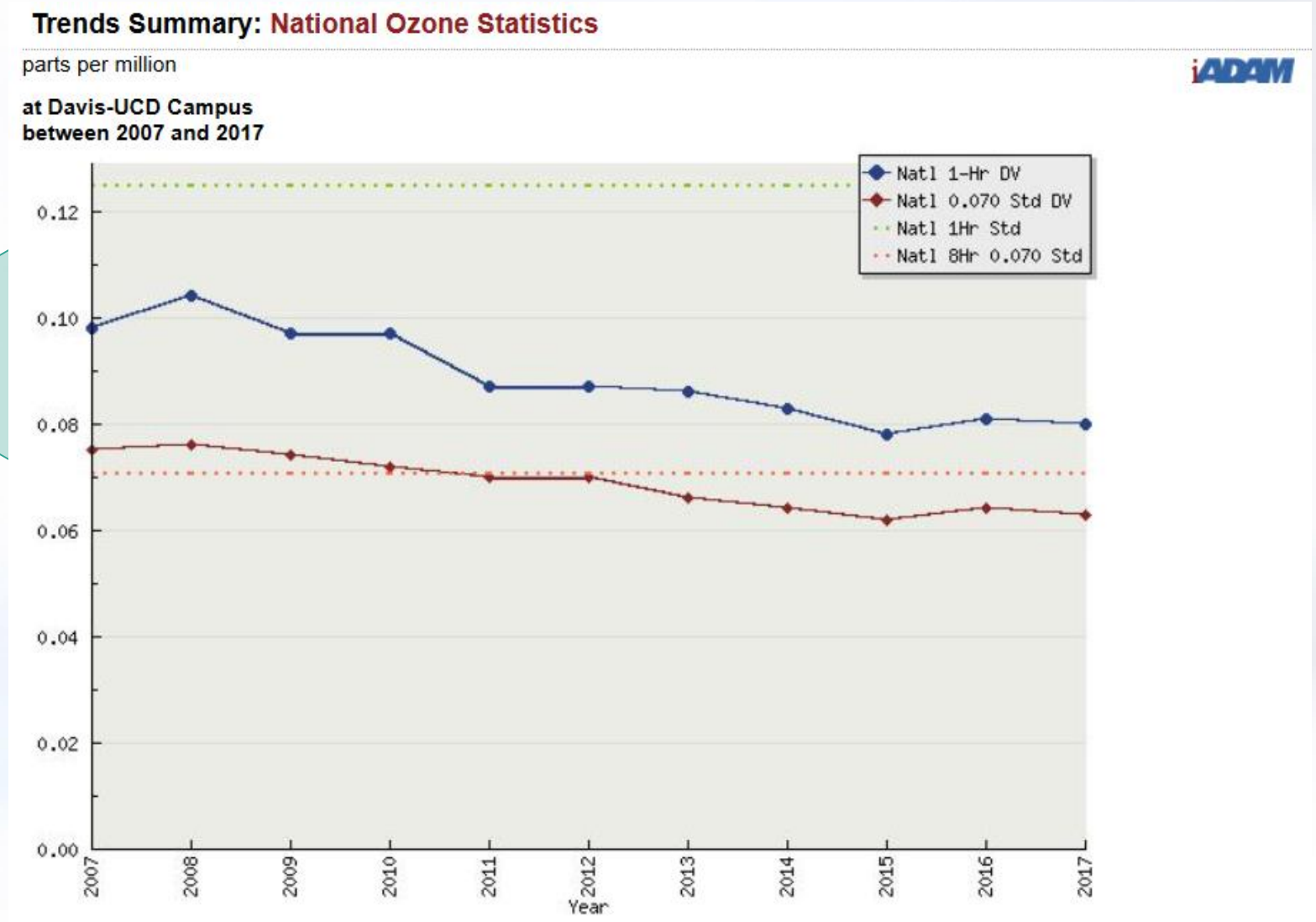
Trends Summaries:

Top 4 Summary:

Hourly Listing:

Weekly Listing:

Toxics Summaries:

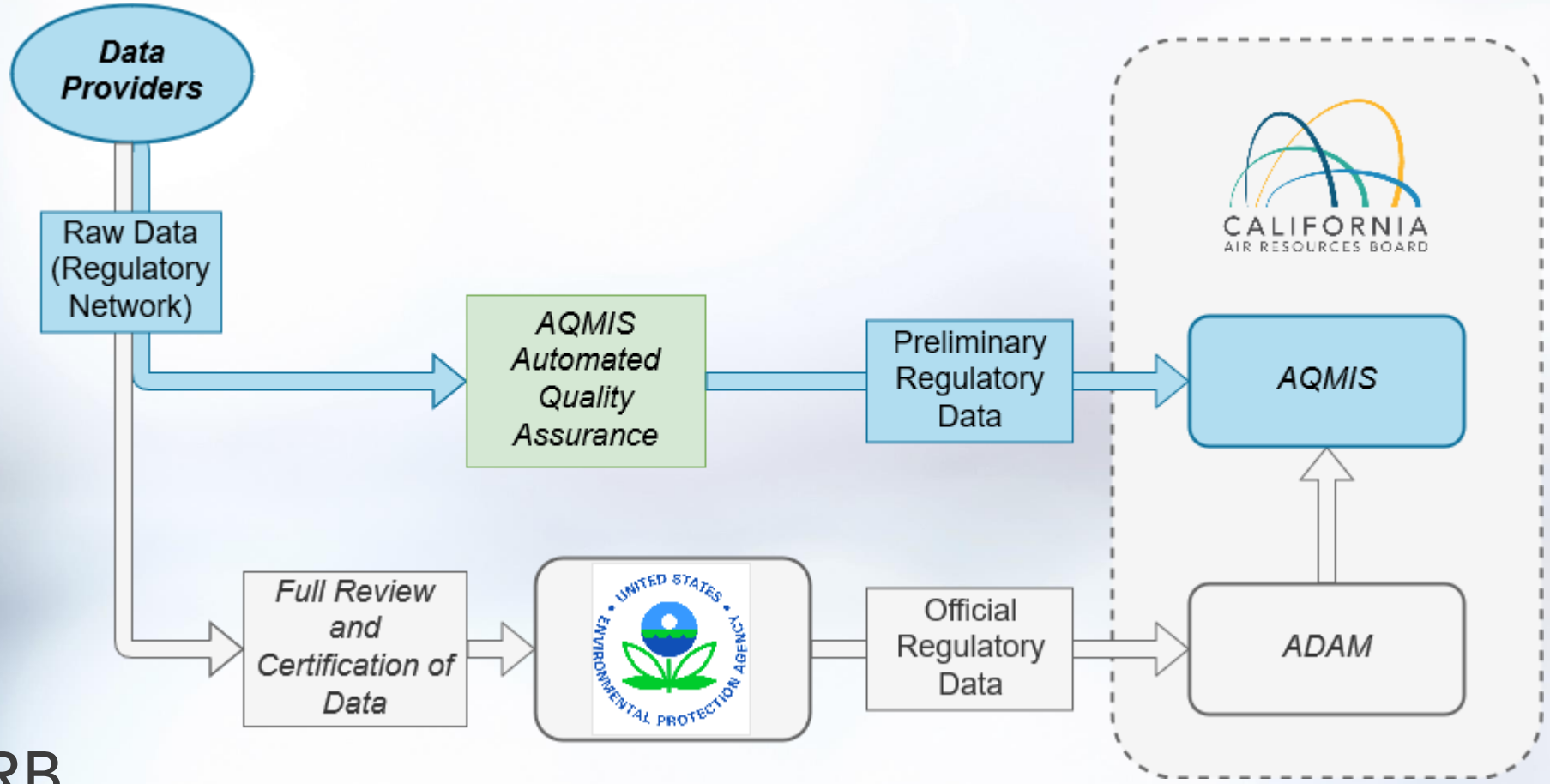


CARB

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

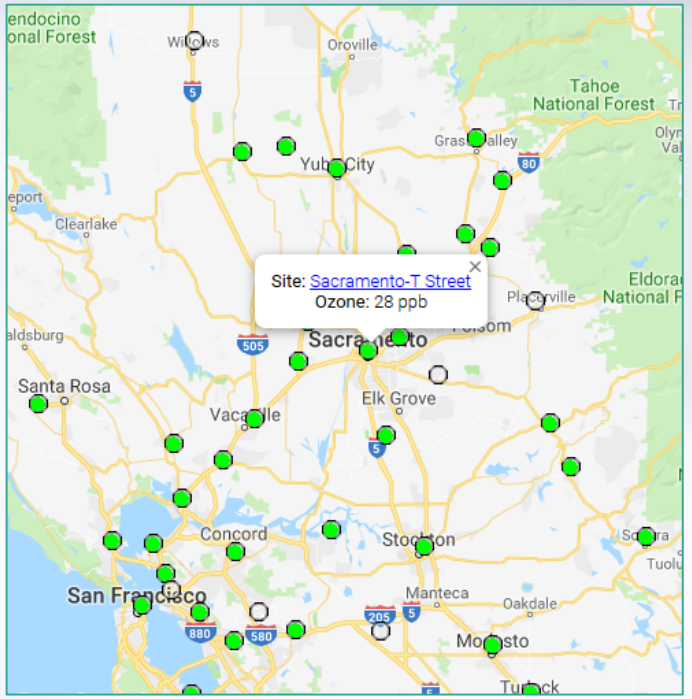
Preliminary & Official Regulatory Data: AQMIS

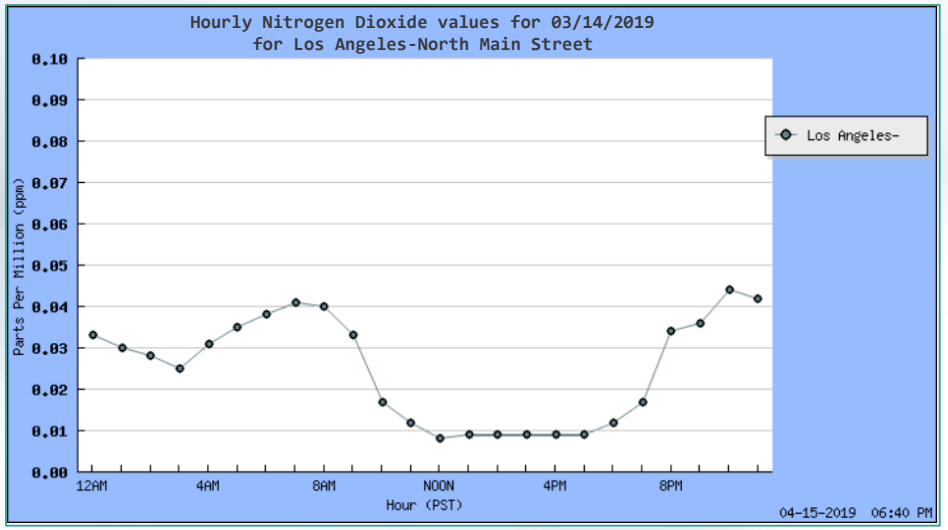


CARB

AQMIS

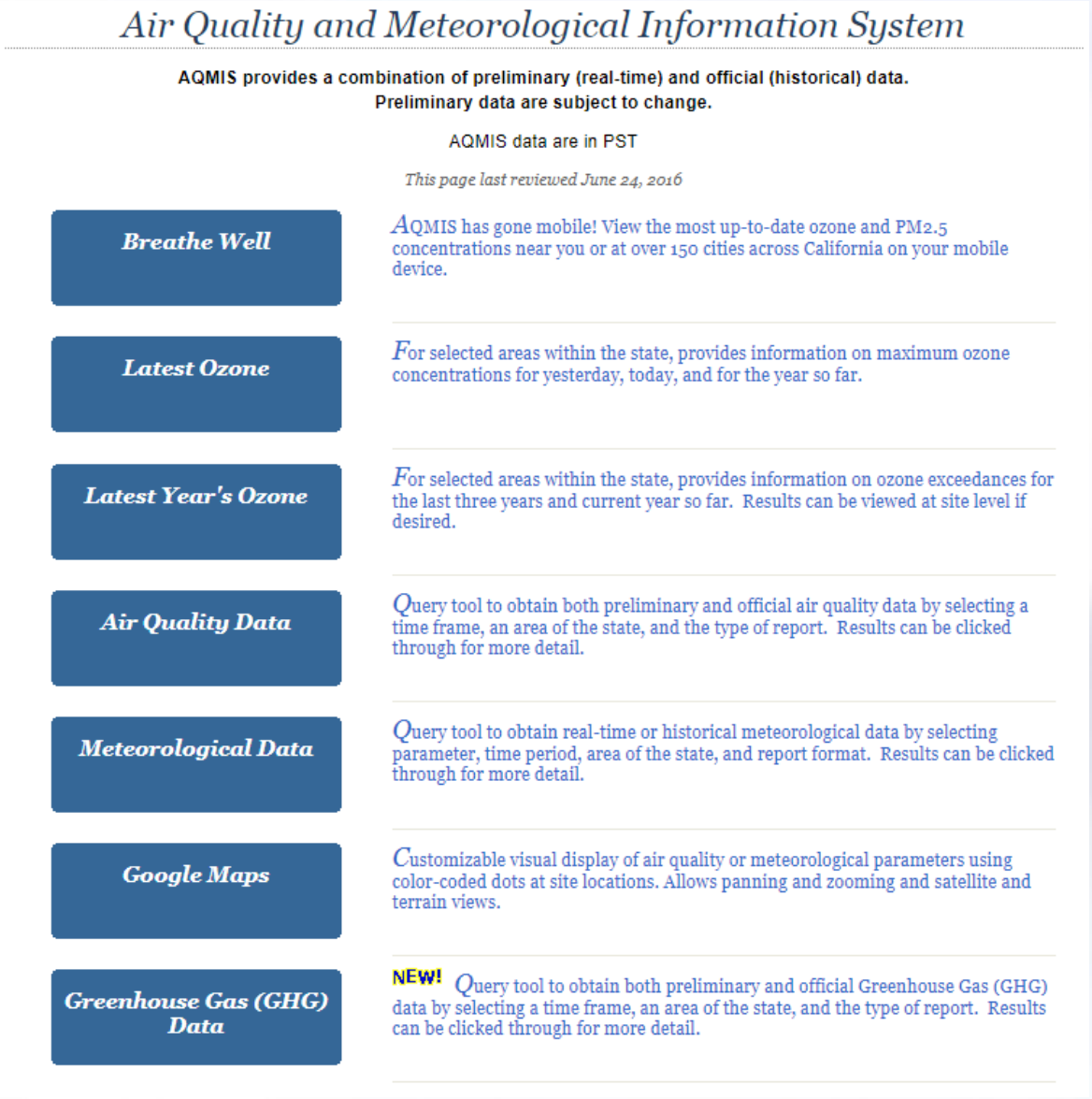
- Data Sources
  - Over 260 air quality sites in California
  - 31 air quality sites in Mexico
  - Over 800 meteorological sites
- Raw hourly data
  - 25 air quality parameters
  - 16 meteorological parameters
- Automated quality assurance routines
  - Improved data capture – issues become apparent sooner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



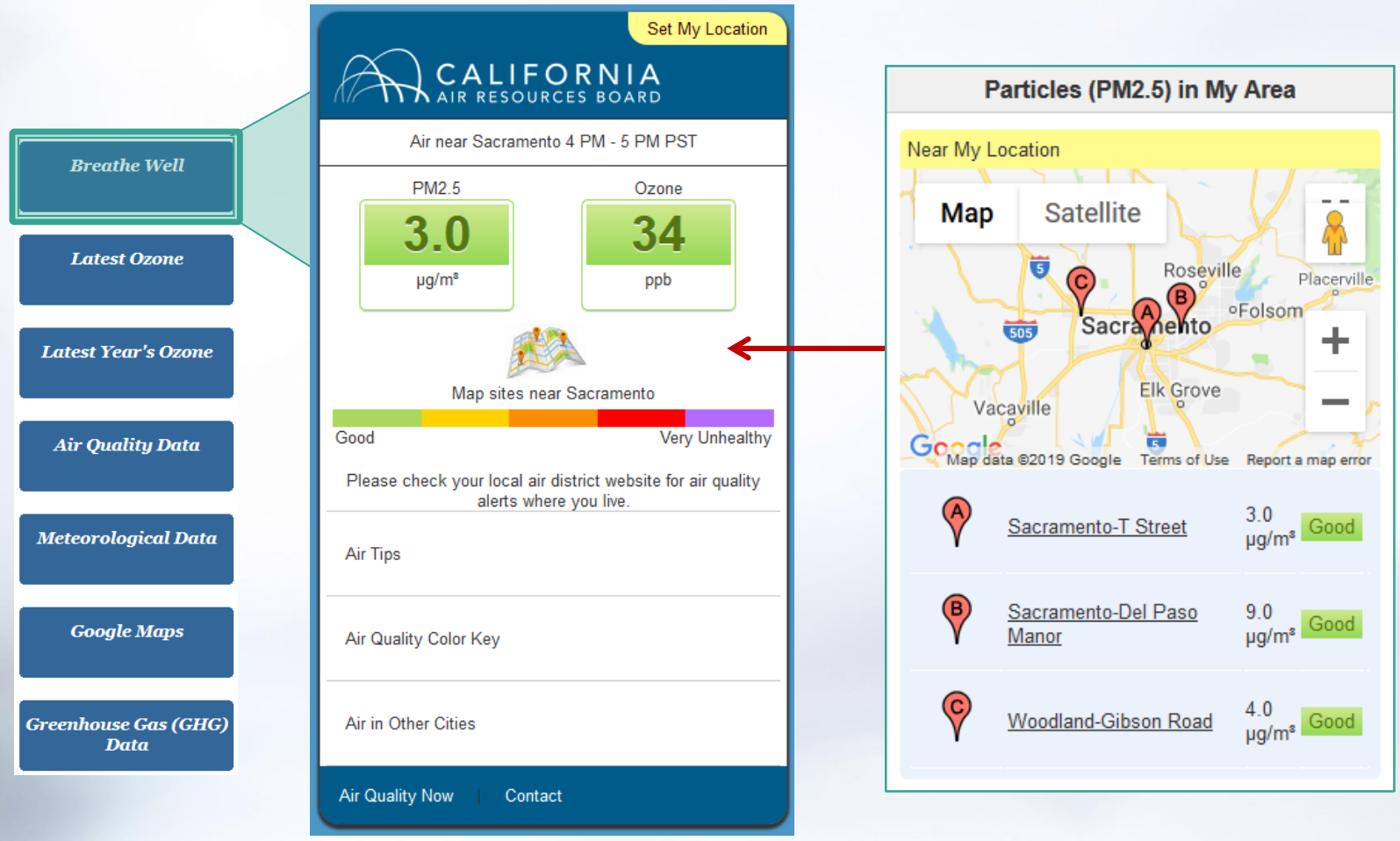


CARB

AQMIS Main Page



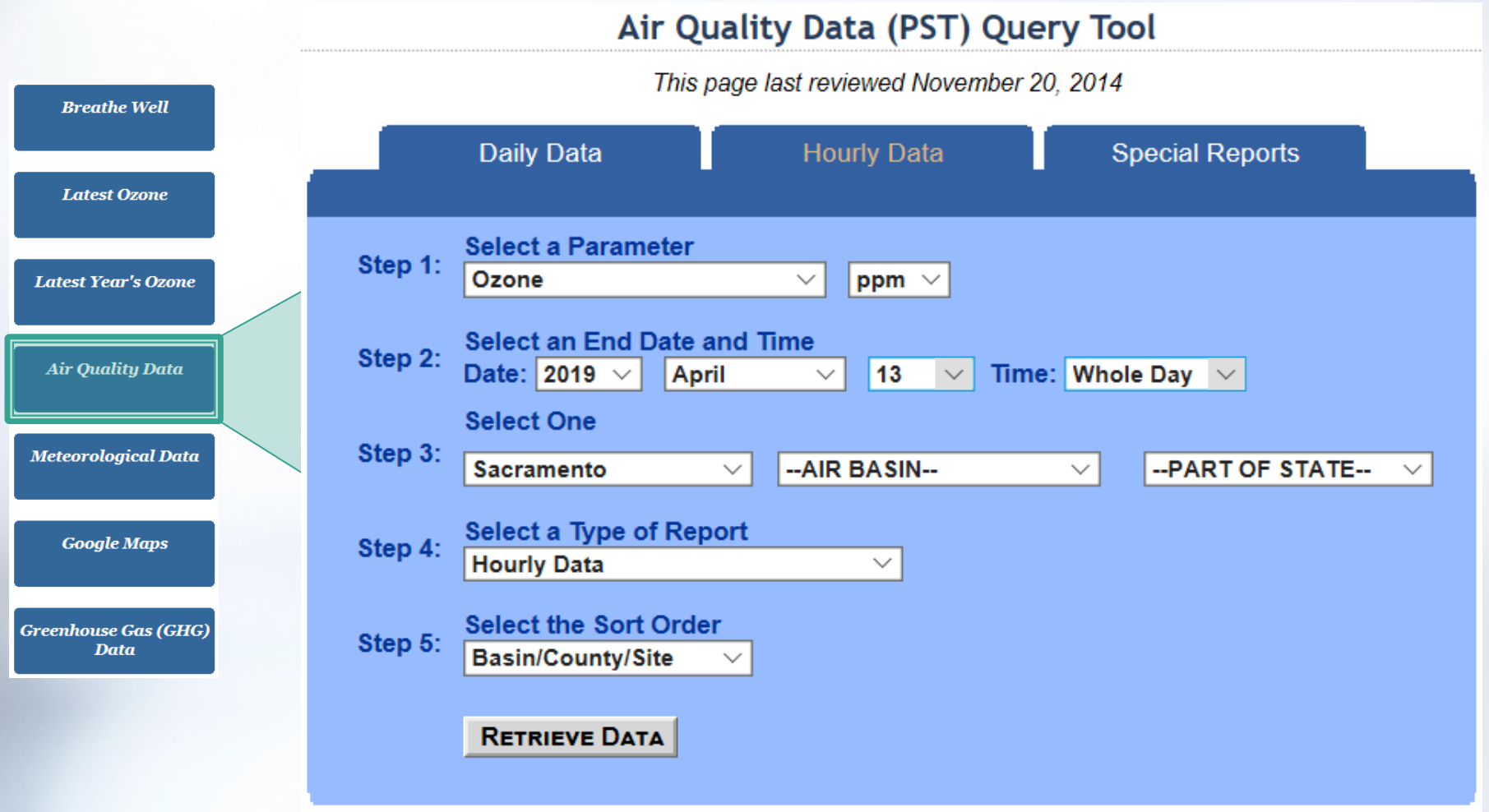
Breathe Well



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

CARB

Hourly Air Quality Data Query



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	☐
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	☐
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	☐
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	☐
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	☐
SV	SAC	Sloughhouse	0.049	0.032	0.028	0.032	0.036	0.039	0.043	0.047	0.049	0.048	☐

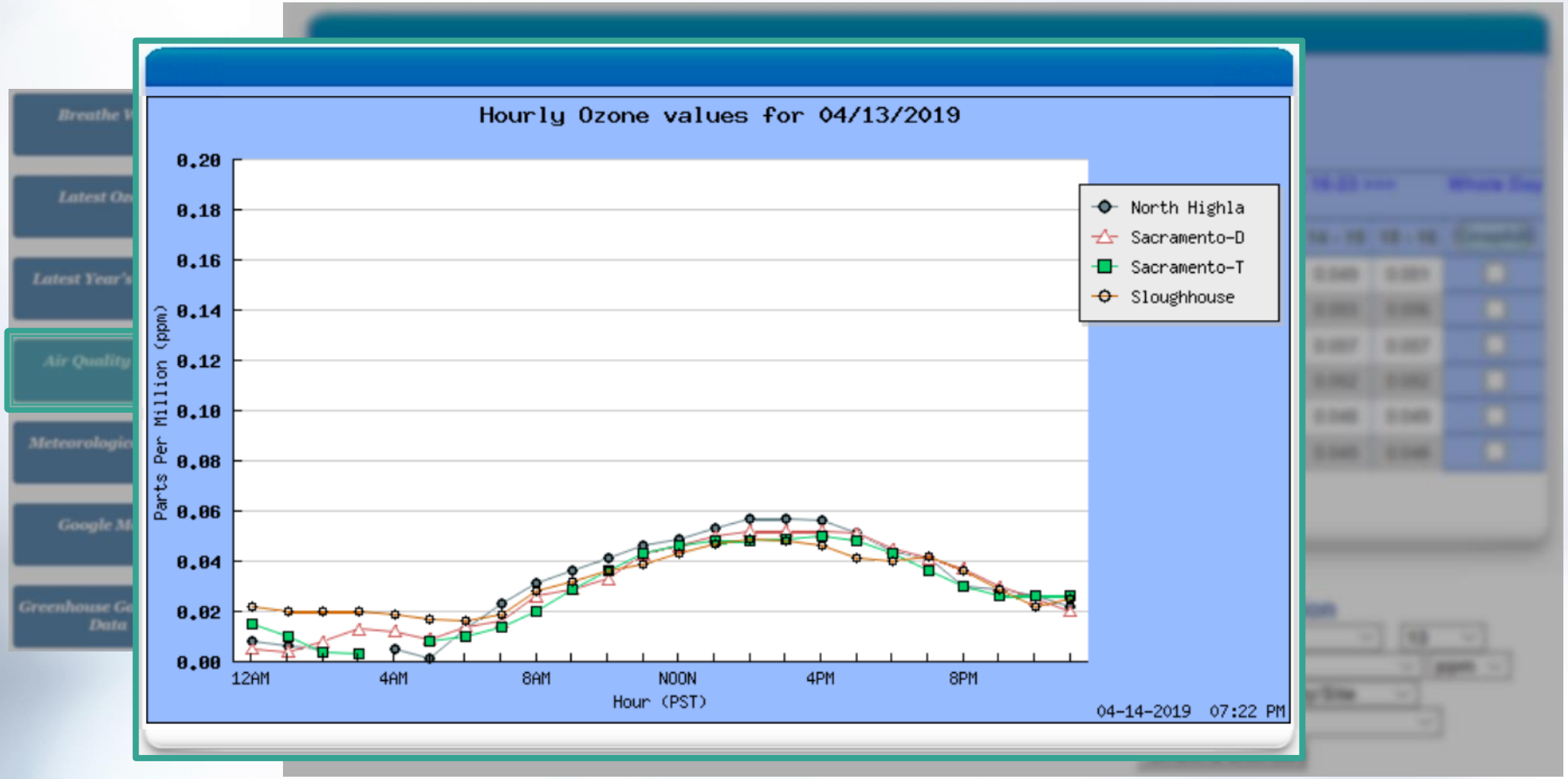
View Daily Data for this Area Pick Sites/Dates for Download Get Additional Information on Sites
Download Data: Quick or Select Format

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

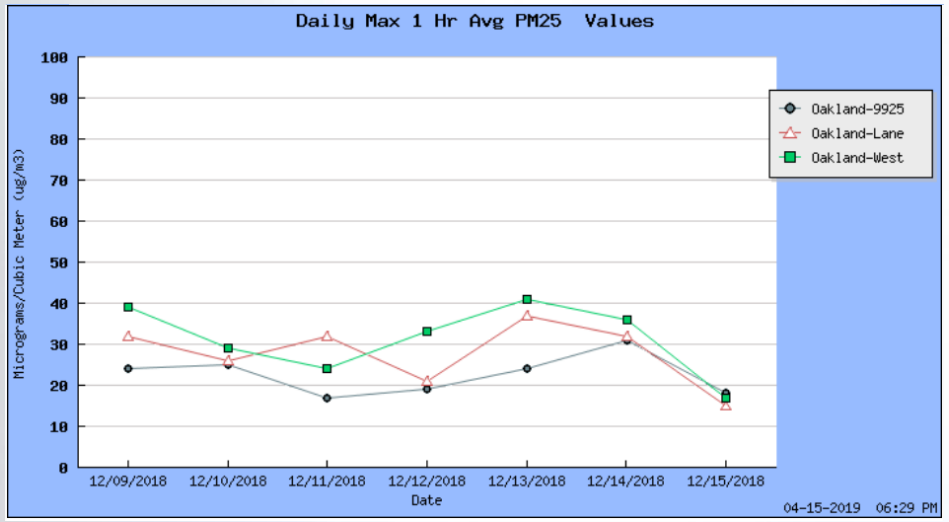
CARB

Hourly Data Graph

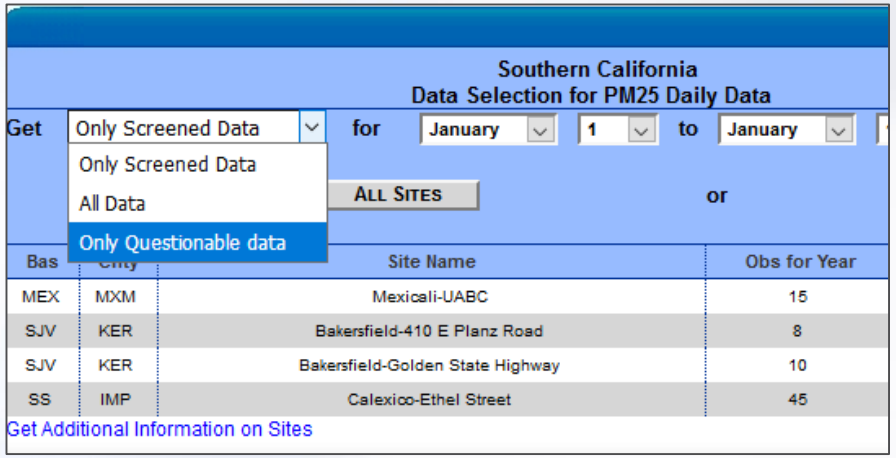


Provider Tools in AQMIS

Compare nearby monitors



Data validation



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	
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 p	H	H

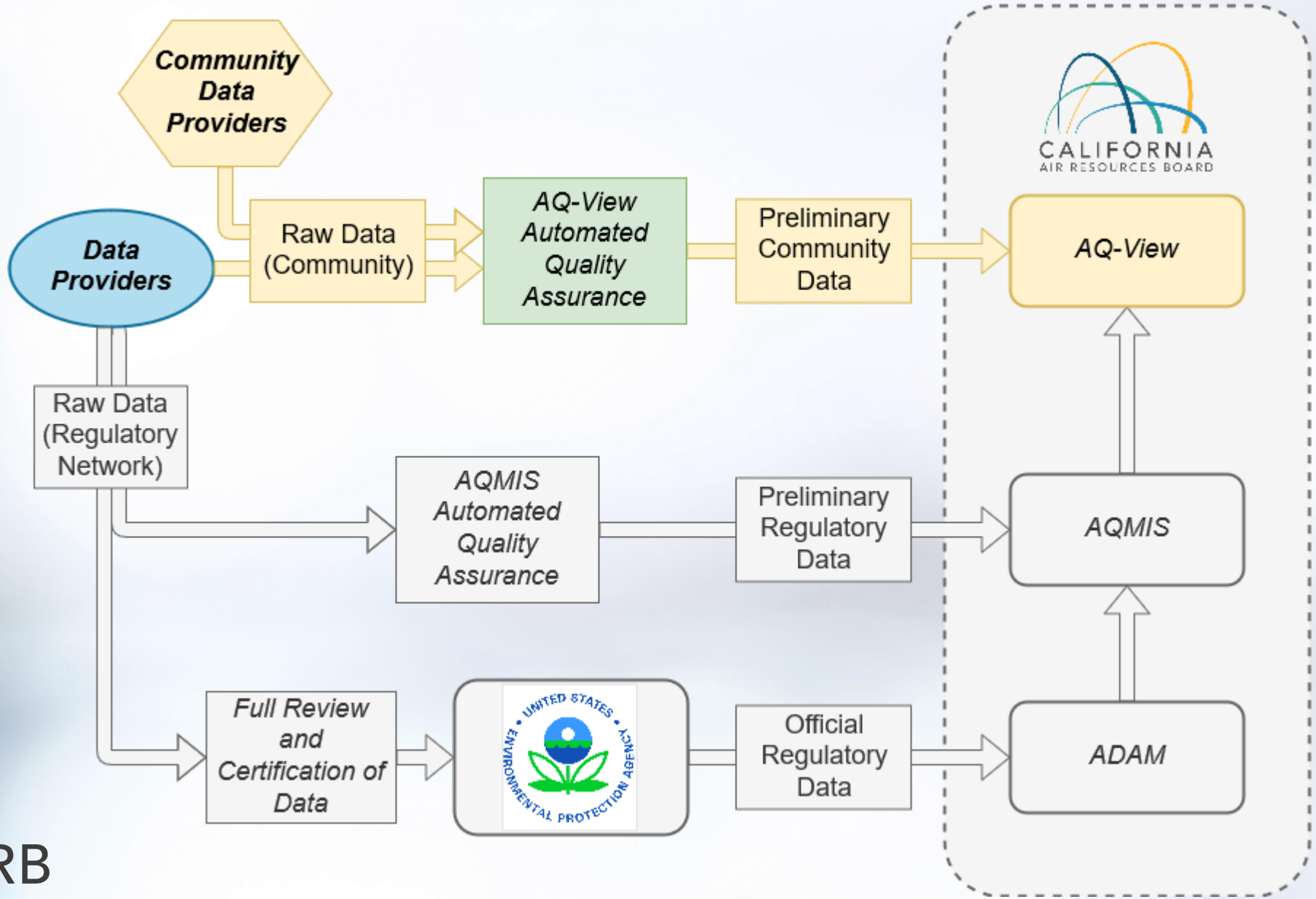
CARB

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
    - CH_4, CO, CO_2, & N_2O at 5 sites in CA
  - Near-Roadway sites

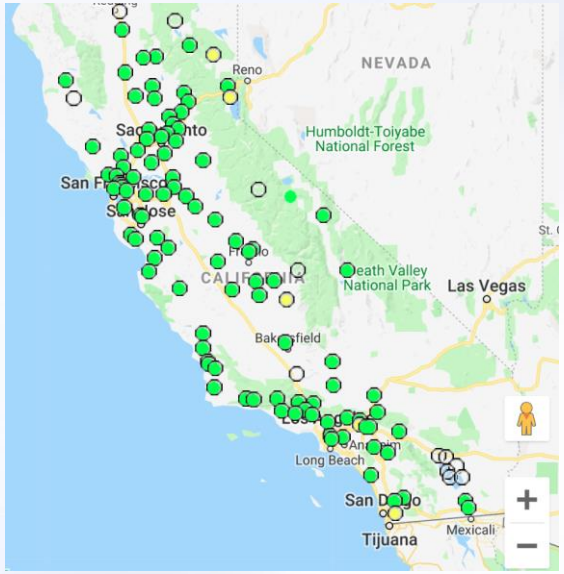
- Future:
  - Long-term trends of ozone

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*.



AQMIS Map

AB 617 Communities

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:

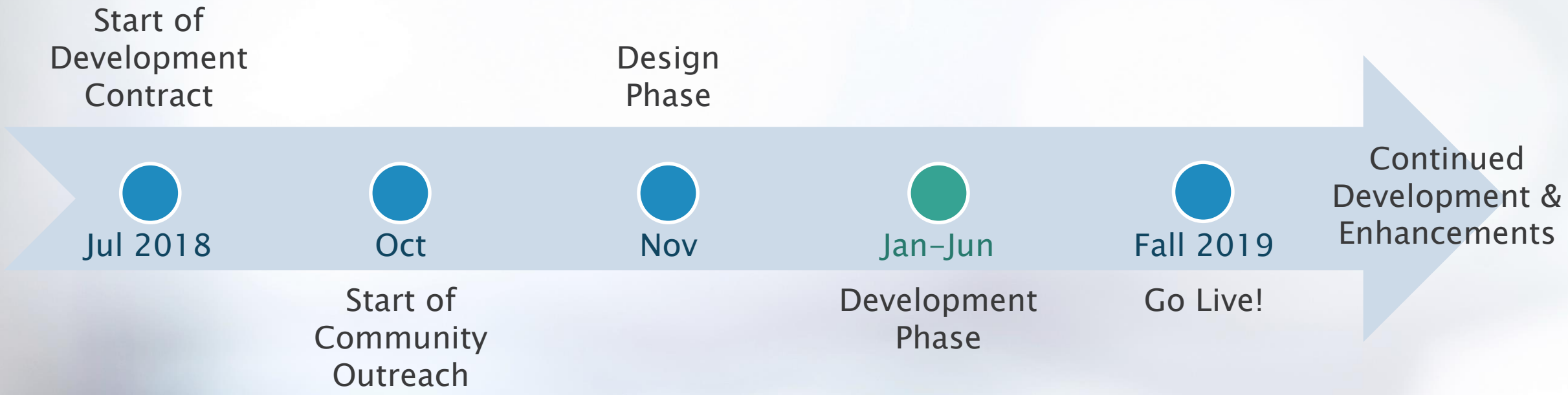
- Various monitoring objectives
- Combination of regulatory-grade equipment and low-cost sensors

Selected Communities (2018)

Air Grant Awardees (2018-2019)

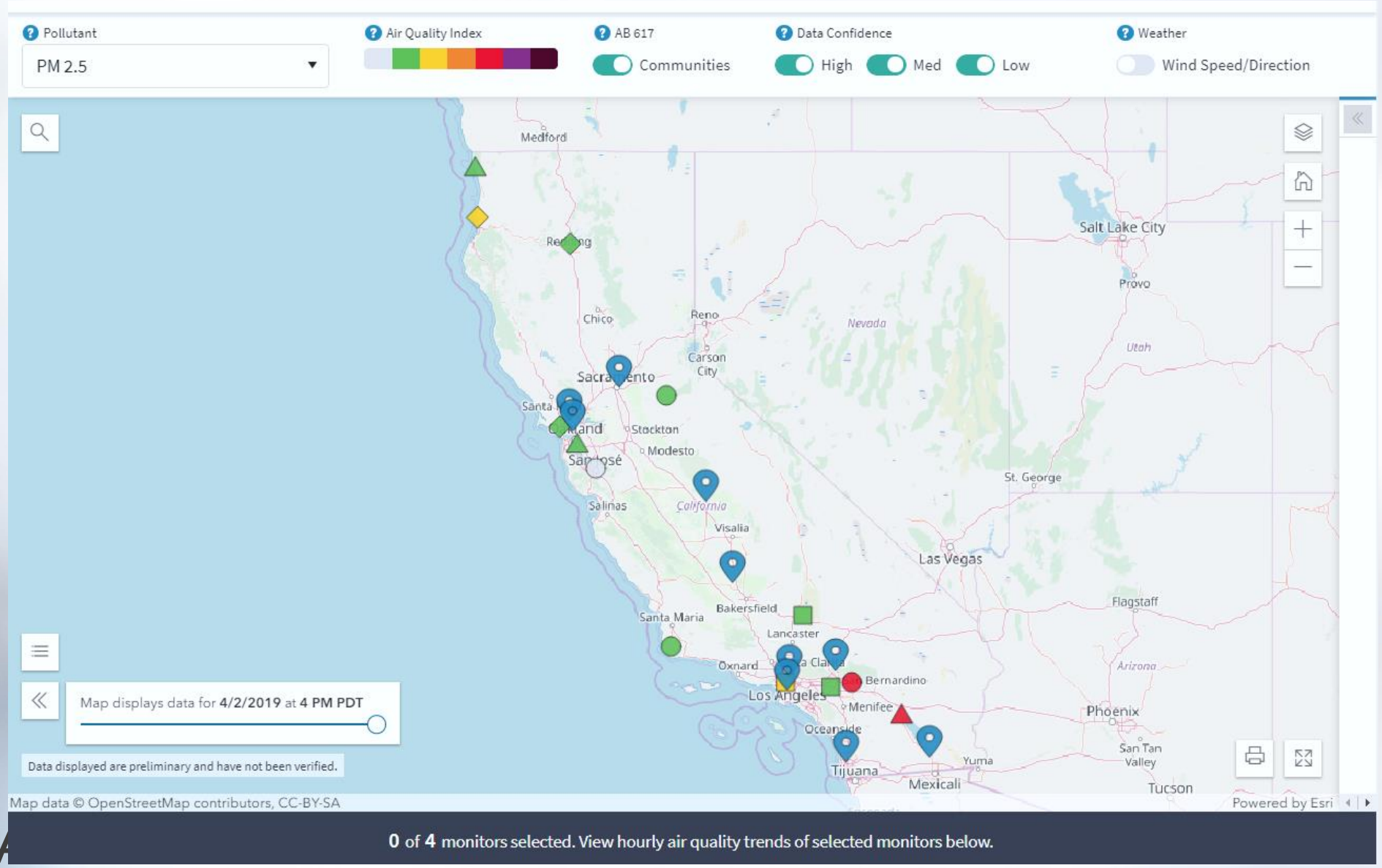
CARB

AQ-View Development Timeline

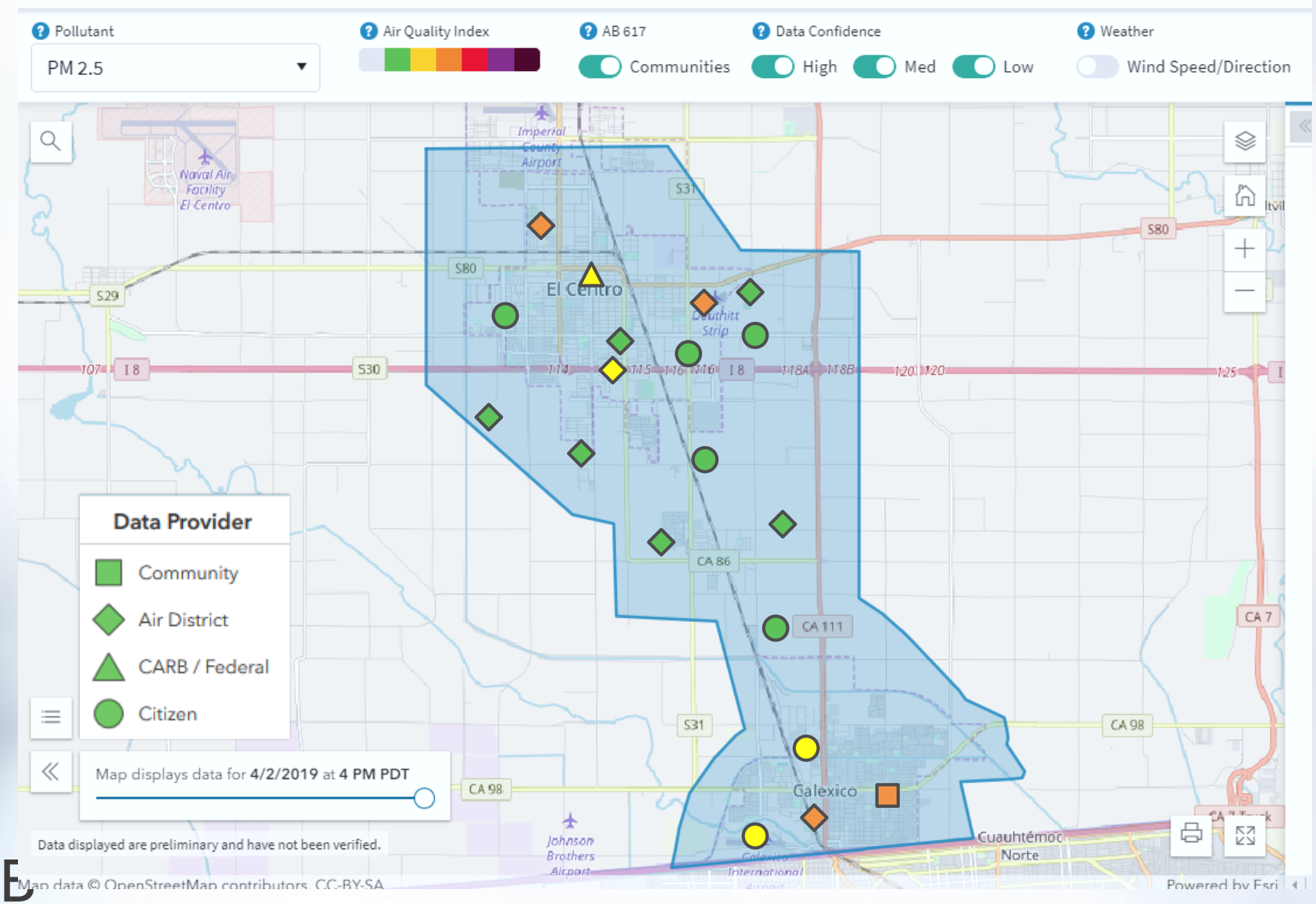


CARB

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:

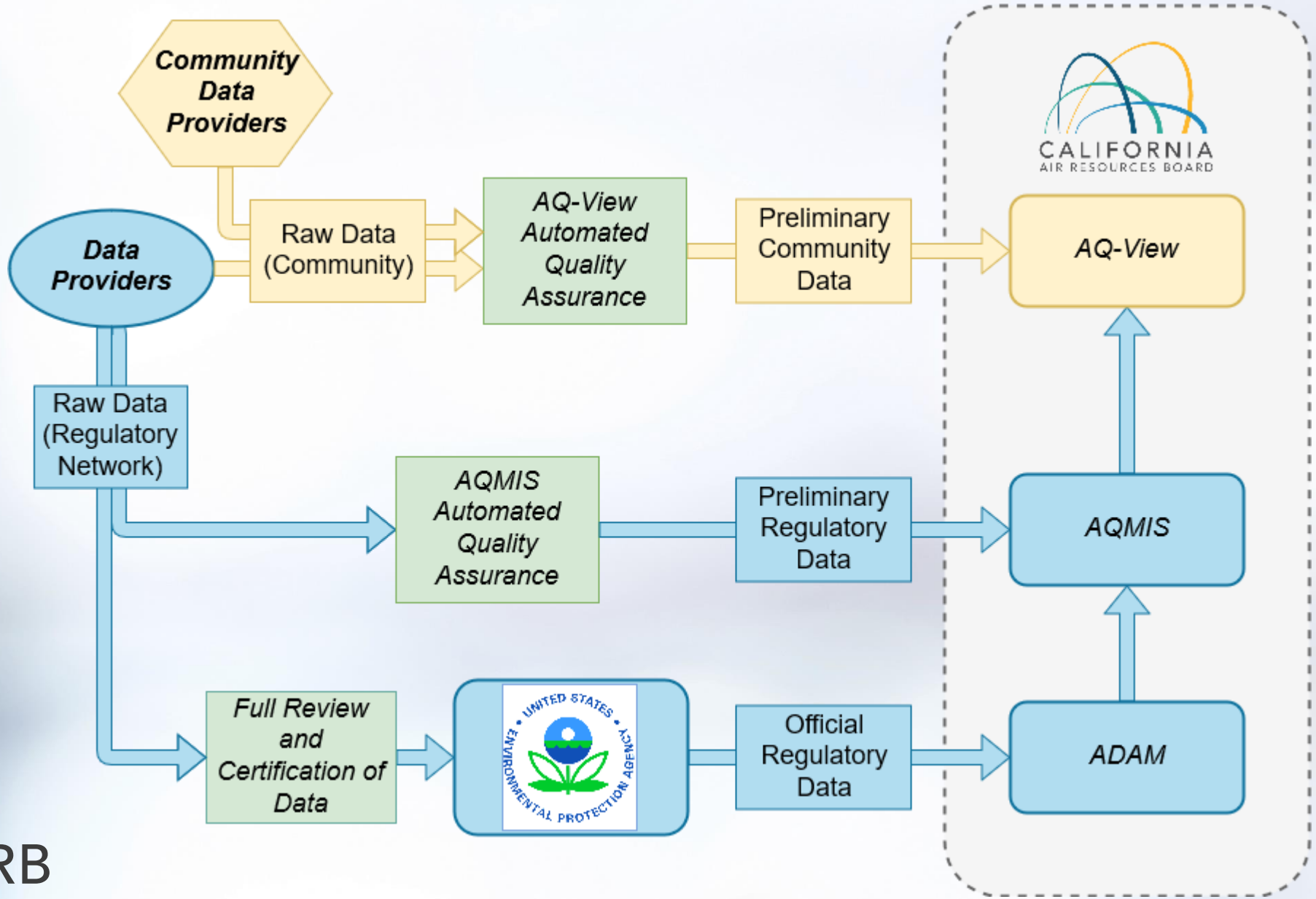
- **AQ-View**
  Coming soon!
- **AQMIS**
  https://www.arb.ca.gov/aqmis2/aqmis2.php
- **Breathe Well** (AQMIS Mobile Website):
  https://mobile.arb.ca.gov/breathewell
- **iADAM**
  https://www.arb.ca.gov/adam

Contacts:

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

CARB

Questions?


Community Data Providers
Data Providers
Raw Data (Community)
AQ-View Automated Quality Assurance
Preliminary Community Data
CALIFORNIA AIR RESOURCES BOARD
AQ-View
Raw Data (Regulatory Network)
AQMIS Automated Quality Assurance
Preliminary Regulatory Data
AQMIS
Full Review and Certification of Data
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Official Regulatory Data
ADAM

Air Quality Data Team

Mena Shah *(Manager)*
Annie Flores
Bob Weller
Emily Gorrie
John Rynearson
Rai Hann
Shengping Qin
Taylor Helgestad

CARB