

Imperial County Community Air Monitoring Project

Using low cost sensors to develop a community air monitoring network



| California Environmental Health Tracking Program
| Comite Civico del Valle
| University of Washington

AQ-SPEC Sensor Conference
September 28, 2017

Paul English, PhD MPH
paul.english@cdph.ca.gov

Project overview

NIEHS grant

- Research to Action
- Jan 2014 – Oct 2018

Main project partners

- CA Environmental Health Tracking Program
- Comite Civico del Valle
- University of Washington
- *Consultants: UCLA, GWU*

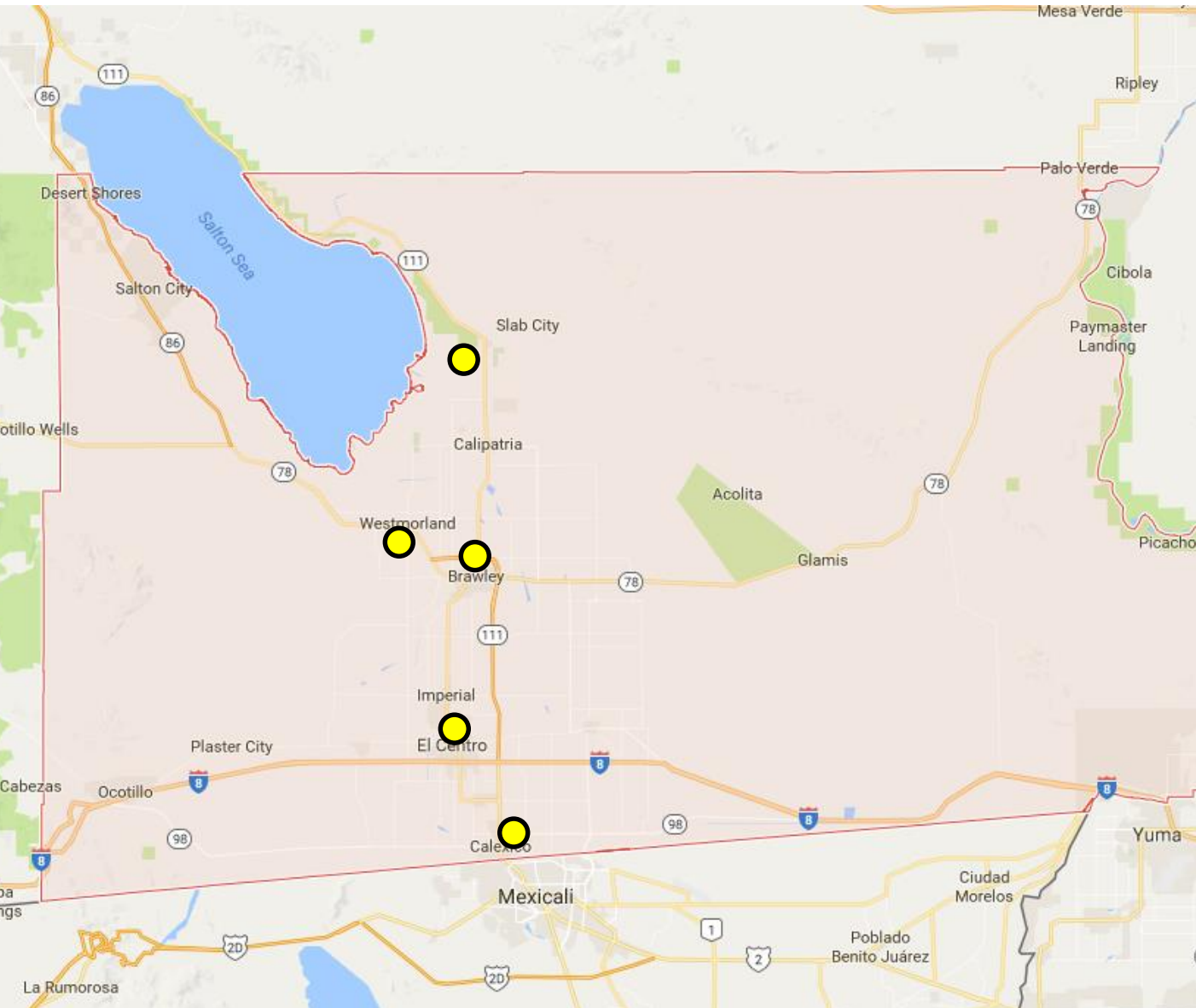
Aims

- Deploy network of 40 PM monitors in Imperial County
- Produce useful, high-quality data
- Implement community actions
- Engage community throughout
- Ensure network sustainability



SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Air quality is a community priority



- PM₁₀ standards unmet
- High rates of asthma
- Few regulatory monitors
- Need for more local air quality data

Locations of regulatory monitors in Imperial County

Community monitoring and low-cost sensors

- New opportunities with next generation sensors
- Democratizing data and science
- Leveraging community knowledge and capacity
- Community air monitoring network as a complement to regulatory monitoring



Establish community participation structures

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graph TD; A[Establish community participation structures] --> B[Design and deploy air monitoring network]; B --> C[Assess, analyze, and interpret data]; C --> D[Display and disseminate air monitoring results]; D --> E[Implement community action strategies];
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Design and deploy air monitoring network

Assess, analyze, and interpret data

Display and disseminate air monitoring results

Real-time

Spatial analysis

Datasets

Implement community action strategies

Best Practices

- Funded, equitable community partnerships
- Establish community advisory group
- Engage technical experts
- Careful selection of monitors and evaluation of data quality
- Community participation in site selection



Best Practices (cont)

- Community participation in site recruitment and monitor deployment
- Community access and ownership of data
- Useful, understandable, accessible data display and dissemination
- Ensure sustainability of monitoring



Sensors for **non-regulatory** monitoring

“Community Air Monitors”



Customized low-cost optical particle counter

+



Small computer & other env sensors (e.g., temp and RH)

+



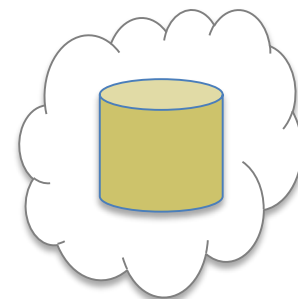
Wireless Networking

+



Robust Enclosure

+



Internet Database on the Cloud with data available on the web

System designed by Graeme Carvlin, PhD student UW
Deployed and maintained by Comite Civico del Valle

Making data accessible, useful & understandable



www.ivanair.org

MENU

IVAN Air Monitoring

Poor air quality can harm your health. Take action to reduce your exposure to air pollutants. Use the [list](#) or [map](#) to view current air quality levels at your nearest air monitor. Sign up to receive [alerts](#) when the air quality near you is unhealthy. Scroll down to learn more.



LIST OF MONITORS
IMPERIAL



MAP OF
MONITORS
View an interactive map of the air
monitors



GET AIR QUALITY
ALERTS

ABOUT THE NETWORK

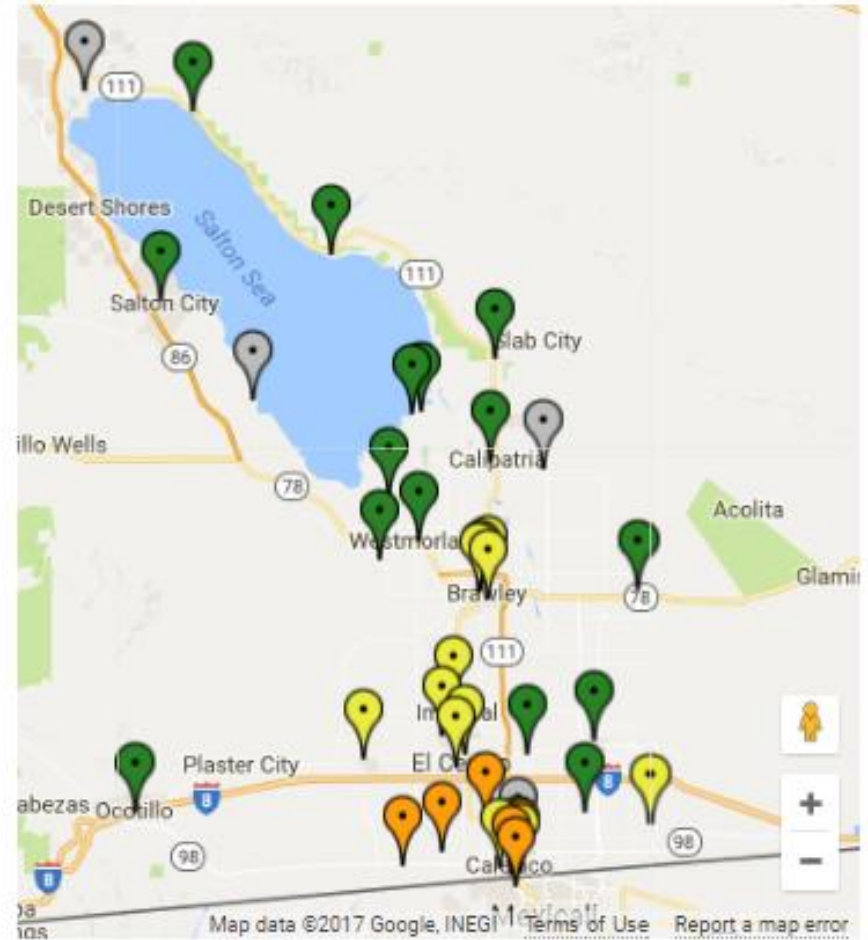
IVAN Air Monitoring is a network of 40 air monitors located throughout Imperial County. These monitors measure current levels of particulate matter air pollution (PM2.5 and PM10). The air quality measurements are displayed on this website.

[IVAN Air Monitoring](#) [About the network](#) [Disclaimer](#) [More info](#) [Government air data](#) [Report an air problem](#)

Better understanding of community air quality



Regulatory monitors



IVAN AIR monitors

Lessons Learned

- **Early community engagement is critical**
 - Provides local knowledge, relationships, capacities
 - Builds trust
 - Improves utility of data
 - Funding is critical
- **Training should be integrated to build capacity and sustainability**
 - Nature of contaminant
 - Monitoring science and siting
 - Hardware/software troubleshooting
 - Monitor calibration
 - QA/QC
 - Data transfer/flow
- **Community should guide decision-making**
 - Monitor locations
 - Data dissemination and visualization methods/platforms
 - Information/messaging that is understandable and useful

Acknowledgments

California Environmental Health Tracking Program

- Paul English
- Galatea King
- Dan Meltzer
- Alexa Wilkie
- Michelle Wong

Comite Civico del Valle

- Esther Bejarano
- Israel Cruz
- Humberto Lugo
- Luis Olmedo

University of Washington

- Graeme Carvlin
- Katie Fellows
- Edmund Seto

George Washington University

- Amanda Northcross

University of California, Los Angeles

- Michael Jerrett

Web Developers

- Tyler Lopez
- Eduardo Murillo
- Carlos Zamora

Community Participants and Air Monitor Hosts

Technical Advisory Group

Equipment loans/colocations

- CA Air Resources Board
- Imperial Irrigation District
- US EPA

Community Steering Committee

- Ray Askins
- Alejandro Bejarano
- Astrid Calderas
- Claudia Cristerna
- Edie Harmon
- John Hernandez
- Jose Flores
- Leticia Ibarra
- Arturo Medina
- Raul Navarro
- Anita Nicklen
- Frances Nicklen
- Vincent Orfiano
- Elizabeth Swerdfeger
- Bianka Velez
- Jose Luis Velez
- Carolina Villa
- Elizabeth Villa
- Patricia Zarate
- Juan Zarate