

Air Quality Sensors Study

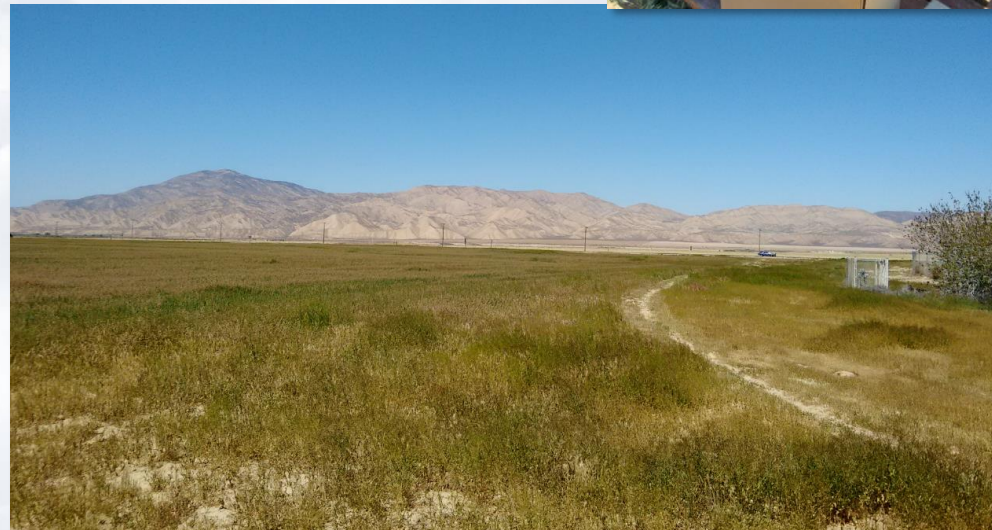
Board of Directors Santa Barbara County Air Pollution Control District

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Supervisor
May 19, 2016



Overview

- Air District Monitoring Networks
- Portable Air Quality Sensors
- Santa Barbara County Context
- Study in New Cuyama



Air District Monitoring Networks

- Federal-equivalent method equipment
- Regional information
- Fixed siting determined by state and federal rules
- Quality-assured data:
 - Compare against health-based standards
 - Determine attainment of standards



Portable Air Quality Sensors

- Portable, inexpensive equipment, wide variability
- Localized information
 - Applications in a range of settings (for example wildfire smoke and ash)
- Data:
 - not quality assured
 - do not compare against standards



Application and Technology Fast Evolving

Example: Aclima-EPA-Google

 **EPA**
United States Environmental Protection Agency

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Private, Government Collaboration Advances Air Sensor Technology

Published July 30, 2015

EPA and Aclima Inc., a San Francisco-based technology company, are jointly developing new kinds of small, low-cost air pollution sensors that will provide real-time air quality information to the public and push the envelope of exciting new technologies. The cooperative research and development agreement (CRADA) represents a collaboration between the federal government, private sector, and academia through Aclima.

"Our goal is to deploy large networks of sensors and give citizens access to hyper-local data to empower them to make decisions about their health and exposure every day," says Aclima chief executive officer Davida Herzl. "For us, it's about ensuring that citizens are receiving reliable data. That's where the EPA's expertise has been very valuable."

Several research projects are under way. Researchers from EPA and Aclima worked together on a pilot project in Denver, Colo. in 2014 to assemble a real-time view of pollutant levels and meteorological conditions at the street level. The project involved mapping pollutants measured by three Google Street View cars outfitted with Aclima's mobile platform of air



Google car equipped with Aclima sensors. Photo courtesy of Aclima.

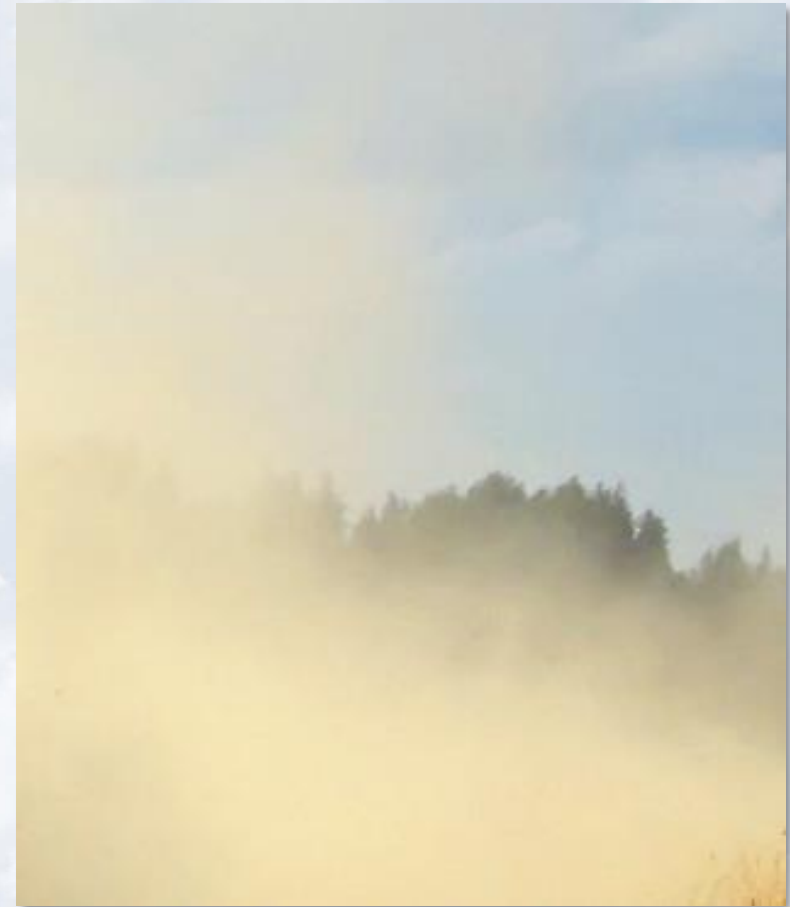
Agencies Evaluating

- EPA
- SCAQMD-AQ-SPEC
- Testing in lab and in the field (urban settings)



Santa Barbara County Context

- High wind events resulting in high levels of dust or particulate matter (PM)
 - Localized effects
 - Areas affected vary widely
 - Typically short-term events



New Cuyama Study

Goals

- Test 2 types of portable PM sensors in rural application;
- Evaluate against federal-equivalent method and higher-level PM equipment;
- Engage Cuyama Valley High School students in understanding and evaluating this new technology; and
- Establish strong technical foundation for future efforts with schools and to obtain funding for more activities.

Expertise

- Sonoma Technology, Inc.
 - Expert in air district monitoring
 - Expert in portable air sensors
 - Sensors school programs
 - Work with EPA on AirNow and Air Sensors Guidebook

Kids Making Sense

Empowering students to clear the air and improve public health

[Home](#) [Blog](#) [Interactive Map](#) [Videos](#) [FAQs](#) [Contact](#)

Air pollution in many parts of the world is harming millions of people, shortening lives, and taking a toll on our ecosystem. Cities in [India](#), [China](#), and even the [U.S.](#) frequently exceed air quality standards, and soaring pollution levels put people at risk. To complicate matters, regulatory monitoring sites are sparsely distributed and cannot adequately measure pollution levels throughout the world. Yet learning about local pollution levels can be a powerful driver for change.

Developed by [Sonoma Technology, Inc.](#) and [HabitatMap](#), Kids Making Sense unites STEM education with a complete, open source measurement and education system that empowers youth to drive positive change in their communities. Initial funding for Kids Making Sense was provided by the [Knight Prototype Fund](#).

Recent posts

[Kids Making Sense Program Publishes New Student Workbook and Teacher's Guide](#) February 29, 2016



EPA 600/R-14/159 | June 2014 | www.epa.gov/ord

Air Sensor Guidebook



Office of Research and Development
National Exposure Research Laboratory

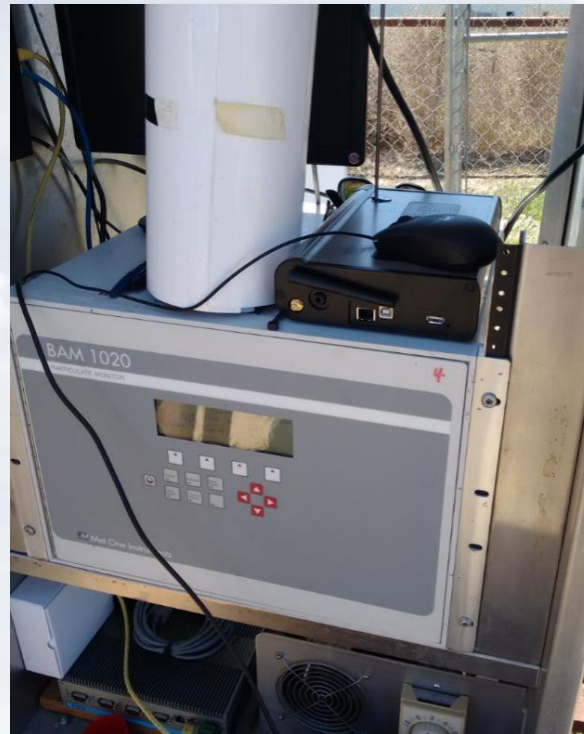
New Cuyama Study Overview

- Overview
 - Procurement
 - Testing
 - Siting
 - Setup
 - Sampling



New Cuyama Study -Array

- Alphasense and Air Beam
 - 3 of each to test variability
- GRIMM particle sizer and BAM 1020



New Cuyama Study E-BAM

- EBAM Portable Sampler
- Similar to BAM 1020
- Non-FEM
- Used for Smoke and Ash
- Gain Knowledge with Dust



Next Steps

- Complete sampling (through June)
- Analyze data
- Report results
- Determine optimal applications



Questions

