OpenAQ: Fighting Air Inequality through Open Data and Community

OpenAQ’s goal is to foster an ecosystem of diverse sectors and geographies using open air quality data and connecting with each other to fight air pollution better.

Slides: tinyurl.com/SCAQMD17
First Principles that Drive OpenAQ

- Air pollution is one of the globe’s biggest killers.

Change = Political Will + A Plan

Both require community + data
3 Global AQ Data Gaps:

1. Geography Gap(s)
2. Accessibility Gap
3. The So What Gap
1. Geography Gap

Countries where near real-time gov’t AQ is available *in some form*.*

*That we know of. Know of others? Say so!*
2. Accessibility Gap
Bridging the Accessibility Gap

Calibrating Low-Cost Sensors, Incorporating data with AOD, Forecasting

Public Health  Policy + Analysis

Public Engagement (e.g. apps, bots)

Open, Transparent, Accessible Universal Data Layer

Disparate Public Air Quality Data Across the World

Media

Educational Activities

OpenAQ
Programmatic, transparent access to historical + NRT station AQ data in a universal format:

- $\text{PM}_{10}$, $\text{PM}_{2.5}$, BC, O$_3$, CO, NO$_2$, SO$_2$
- Primarily gov’t sources
- $>100$ million total measurements,
  $\sim250,000+$ added daily
- 7800+ monitored stations in 61 countries
- Data accessible via API, csv files, user-customized files via openaq.org
Grassroots Effort

Open Source:

Thanks to @dolugen, Tuzla, Bosnia AQ data now on OpenAQ! No more recording the data by hand.

New! Tuzla, BiH data on OpenAQ courtesy a Mongolian Community.
A few months ago, before the Sarajevo OpenAQ Workshop, we visited.
People told us that they recording by hand real-time air...
OpenAQ Fetch

- Adapters reach out for new data every 10 minutes
- Validation is technical, not a data quality judgement
3. The So What Gap

- Public Health Researchers
- Air Quality Agency Staff
- Activists
- Journalists
- Medical Doctors
- Think Tank Staff
- Software Developers
- Low-Cost Sensor Developers
- Educators
- Artists

In-Person, via Workshops

Virtually, on Slack:

Delhi OpenAQ, Nov 2016
3. The So What Gap

Firemap: A Dynamic Data-Driven Predictive Wildfire Modeling and Visualization Environment

Abstract
Wildfires are destructive fires over the wildland that can wipe out large areas of vegetation and infrastructure. Such fires are hard to control and manage as they can change directions almost instantly, driven by changing environmental conditions. Effective response to such events requires the ability to monitor and predict the behavior of the fire as fast as they change. The WIFIRE project builds an end-to-end cyberinfrastructure for real-time and data-driven simulation, prediction, and visualization of wildfire behavior. One goal of WIFIRE is to provide the tools to predict a more accurate rate of a spreading wildfire. To this end, WIFIRE has developed interfaces for ingesting and visualizing high-density sensor networks to improve fire and weather predictions, and has created a data model for wildfire resources including sensed and archived data, sensors, satellites, cameras, modeling tools, workflows, and social information including Twitter feeds for wildfire research and response. This paper presents WIFIRE’s Firemap web platform to make these geospatial data and products accessible. Through a web browser, Firemap enables geospatial information visualization and a unified access to geospatial workflows using Kepler. Using GIS capabilities combined with scalable big data integration and processing, Firemap enables simple execution of the model with options for running ensembles by taking the information uncertainty into account. The results are easily viewable, sharable, repeatable, and can be animated as a time series.
Expanding Our Platform

- More gov’t data sources – working directly with gov’ts
- More meta data
- New data types
- More workshops
- Incentivizing open data

#FixtheAQPGap

Suggest Data Sources: tinyurl.com/fixtheaqgap
Collaboration Points

Our goal is to foster an ecosystem of diverse sectors and geographies using open air quality data and connecting with each other to fight air pollution better.

- Data, open-source work, workshops
- Connections with low-cost sensor work
- Connecting communities
- Collaborating on incentivizing open data projects
thank you

• You, for your attention! *(What ways can we collaborate?)*
• Our organizational partners and sponsors

Contact us: openaq.org | christa@openaq.org | @open_aq