Air Sensors – An EPA Perspective

Air Sensors International Conference

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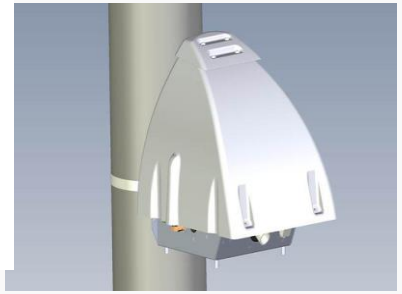
Disclaimer: Material presented is for informational purposes only. EPA does not recommend nor endorse any particular sensor product or data management platform.

Low Cost Sensors & Real-time Data



Resources & Evaluations (Past & Present)

Initial Performance Evaluations (in lab and field)

Short Term Studies/Applications

EPA Air Sensors Toolbox

https://www.epa.gov/air-sensor-toolbox

AQ Spec

http://www.aqmd.gov/aq-spec

Networks (Present)

Smart Cities

Local Networks

Community Engagement

Near Source Monitoring

Long Term Performance Characterization

Integration (Future)

Data Quality

Data Interpretation

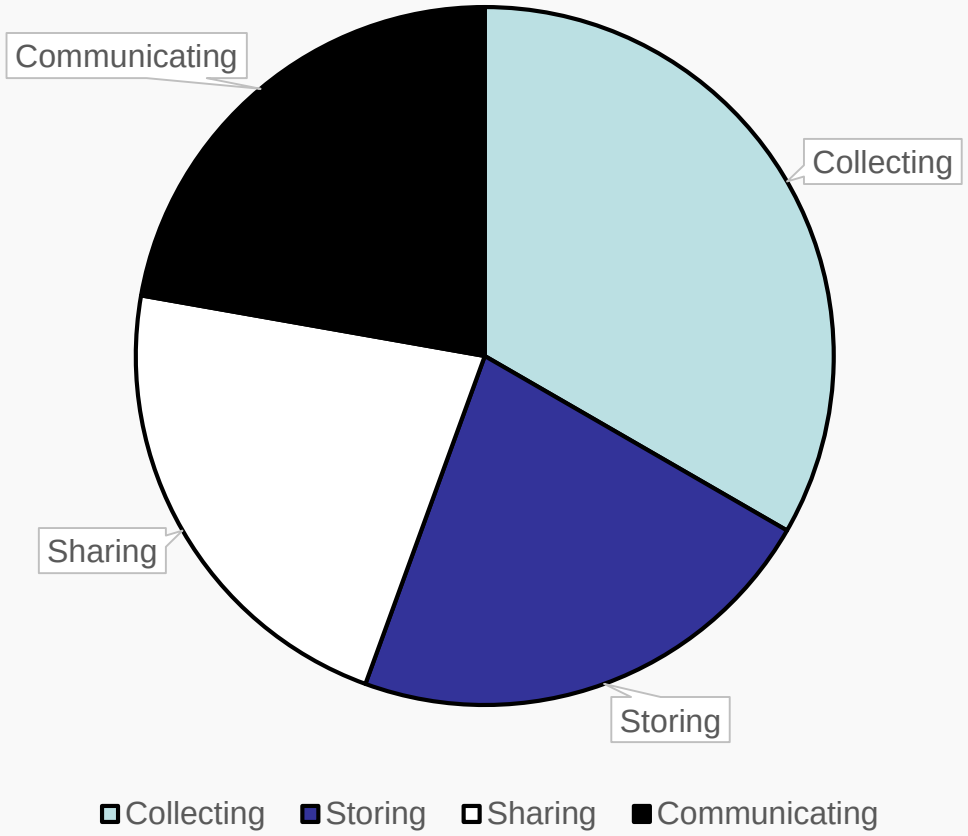
Data Management

Personal Exposure

Data Fusion

Collection of Air Data

Air Quality - Traditional Government Role



Air Quality – Complex Current State

Data Sets
Sensors
Satellites
Monitoring networks

Participants
Citizens/Communities
Researchers/Academics
Nonprofits
Businesses
Governments

Information Technology
Cloud storage
Data access
Advanced analytics
Visualizations
Consumer products

Policy Memo

- Purpose: To address recent questions from local and state agencies regarding the use of air sensor data (e.g. National Ambient Air Quality Standards (NAAQS) compliance)
- In general, instruments - **including sensors -** should:
  - Meet the applicable requirements in the Code of Federal Regulations (CFR) - Part(s) of Title 40, Protection of Environment
  - Meet the requirements in other state environmental regulations
  - Include detailed sampling, siting, and quality assurance conditions
- Sensors not meeting the above criteria may be useful in other applications (e.g. better understanding local air quality, siting regulatory monitors, and identifying hot spots) assuming known data quality and proper interpretation
- Release of memo – Fall/Winter 2018

Advancing Sensors: Focus Areas

1. Data Quality
2. Data Interpretation
3. Data Management

Data Quality

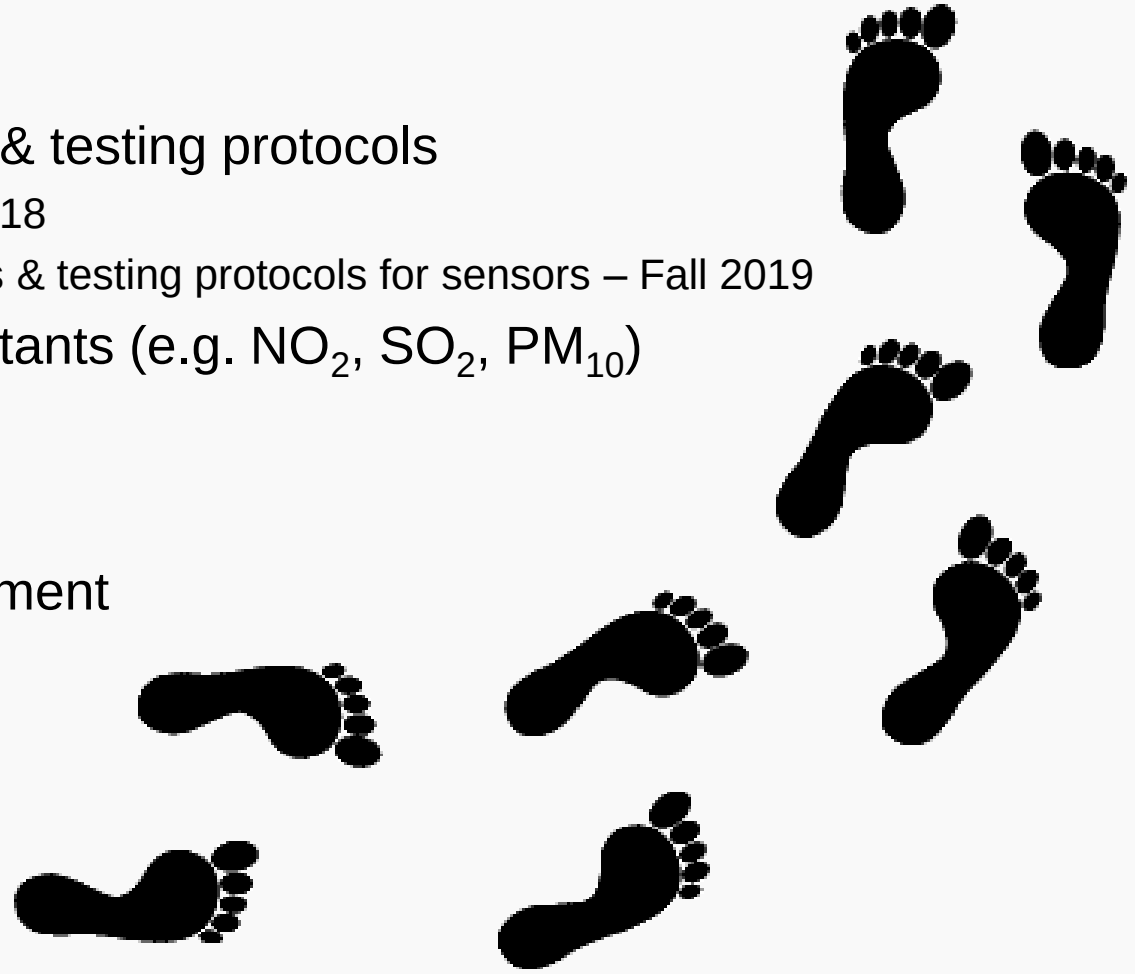
- Lack of systematic data quality characterization
- Disparity in how well technologies perform under various meteorological conditions
- Variations in meeting basic data quality indicators of performance (e.g. accuracy and precision)
- Uncertainty in how long the devices perform over time
- Questions in accuracy of measurements near sources

Deliberating Performance Targets for Air Quality Sensors (June 25-26, 2018)		
Attendee	**Approximate % of Various Groups**	**Note**
International	**8%**	**~700 registered participants representing dozens of countries**
Private Sector/Manufacturers	**26%**	
Academics	**22%**	
State/Local/Tribal Agencies	**25%**	
Community Groups/Nonprofits	**5%**	
EPA & Other Federal Government Agencies	**14%**	

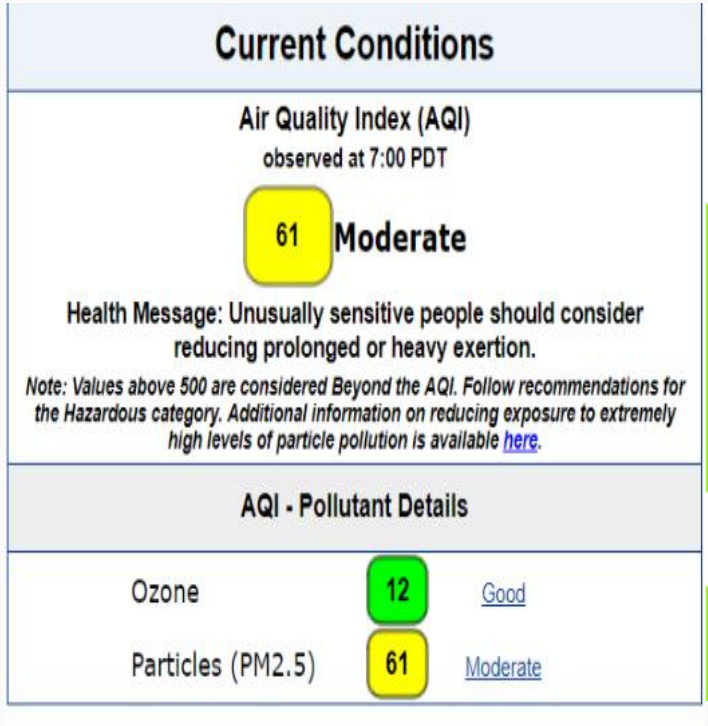
https://www.epa.gov/air-research/presentations-deliberating-performance-targets-air-quality-sensors-workshop

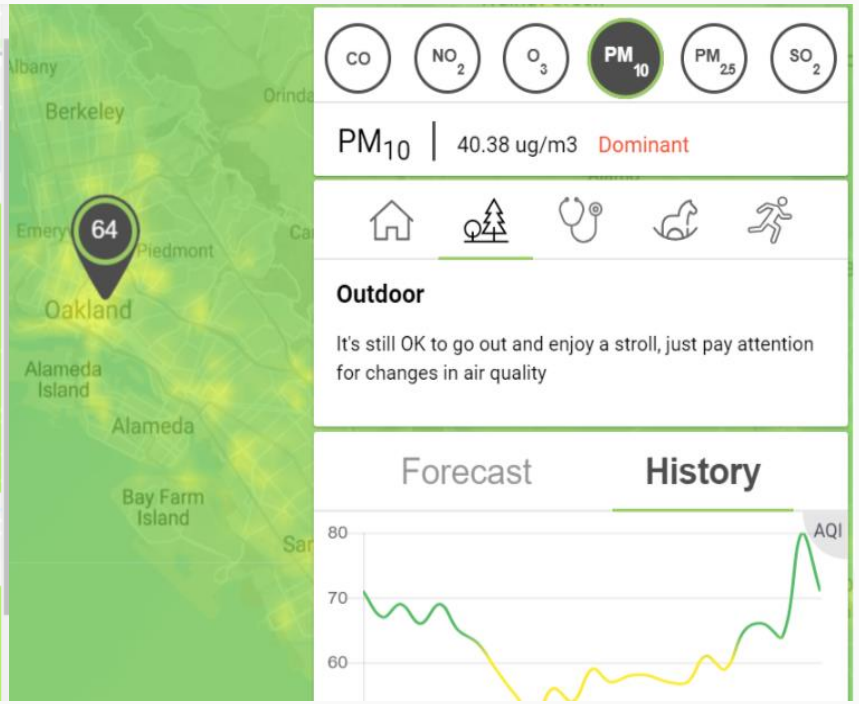
Data Quality

- Next Steps (Ongoing)
  - Non-regulatory $PM_{2.5}$ & O_3 performance targets & testing protocols
    - » Journal publication of workshop findings – late 2018
    - » ORD EPA interim report with performance targets & testing protocols for sensors – Fall 2019
  - 2019 Late Summer Workshop – additional pollutants (e.g. NO_2, SO_2, PM_{10})
  - Long term performance evaluations
- Intermediate Steps (1-2 years)
  - Additional lab and field testing protocol development
  - Coordinating public/private partnership initiative
  - Possible VOC workshop
- Future Steps (2-3 years)
  - Evolving, TBD in agile manner



Data Interpretation



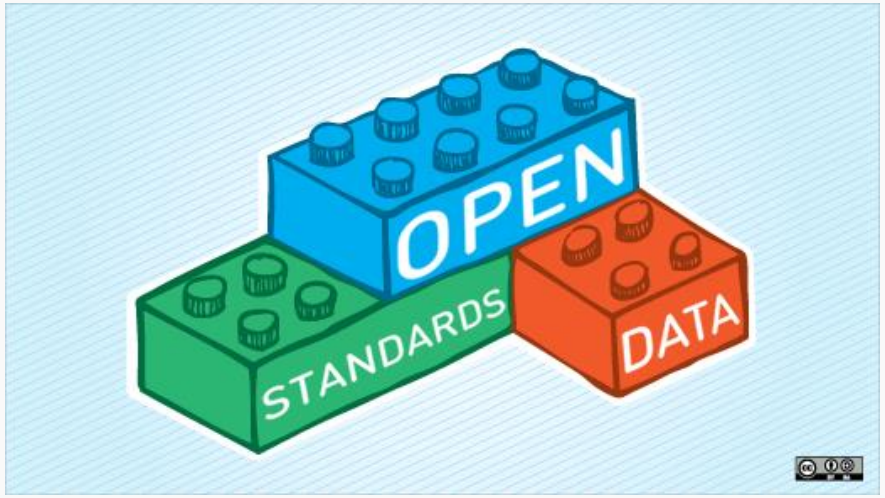


Current Conditions in Oakland, CA ~7:50am on 9/11/18

https://www.airnow.gov/

Data Management Questions

1. Ownership - Who owns the data?
2. Standardized formats and exchange
   - Facilitation of data from different devices
3. Security – FedRAMP approval?
4. Privacy – Tracking individuals
5. Fusion – How are different data sets being merged together?
6. Algorithms/Assumptions/Models – What adjustments are being made on raw measurements, are the corrections ‘proprietary’?



Join us during the Federal Connections Plenary Panel

September 13, 2018 @ 4:45pm


THANK
YOU