

E-Enterprise for the Environment

Modernizing the Business of Environmental Protection

Interpreting short term air sensor information

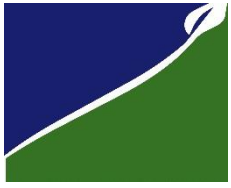
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USEPA Office of Air and Radiation

2016 NACAA Communicating Air Quality

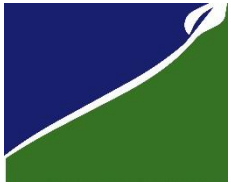
March 16, 2016

Chicago, IL



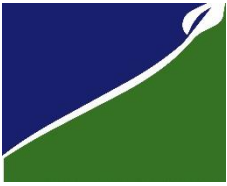
Empowering citizens to understand the air quality around them

- There is a great deal of growth in the availability and use of air quality sensors
- Sensor data are available through a direct read device, a website or an app on a smartphone
- However, questions arise:
 - What does the sensor data mean?
 - What action should I take?



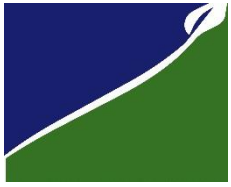
What is the problem?

- There are no health data about the potential harm of being exposed to criteria air pollutants for 1 minute
- Many current sensors are reporting “instantaneous” or one-minute readings with some representation of concern:
 - e.g. good, OK, bad
 - Some scales based on the Air Quality Index (AQI)



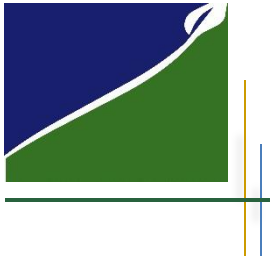
Intuitive but what is it based on?





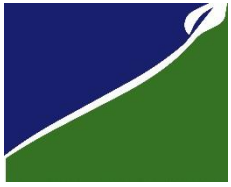
The conundrum

- The potential of the technology to empower people to understand the air quality around them is great
- Right now, it is challenging to interpret the data; existing scales may not be based on health evidence or air quality data
- However, the developers are using whatever information is available currently, e.g., AQI



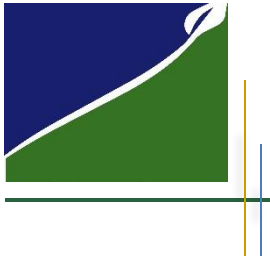
What is our goal?

- Point of departure: we are trying encourage & guide the development of air quality sensor technology
- Trying to provide assistance in interpreting the sensor data consistent with available air quality data and health effects information
- Goal: provide behavioral messages, not health-based messages, to give citizens ideas on actions to consider based on sensor readings



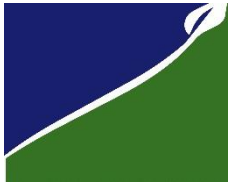
What are we doing?

- Village Green benches have been reporting ozone and PM2.5 one-minute data for over a year
- Using this data and from other sources, provide alternative scales for use by the developers
- Caveat: this will evolve over time as technology and understanding grows



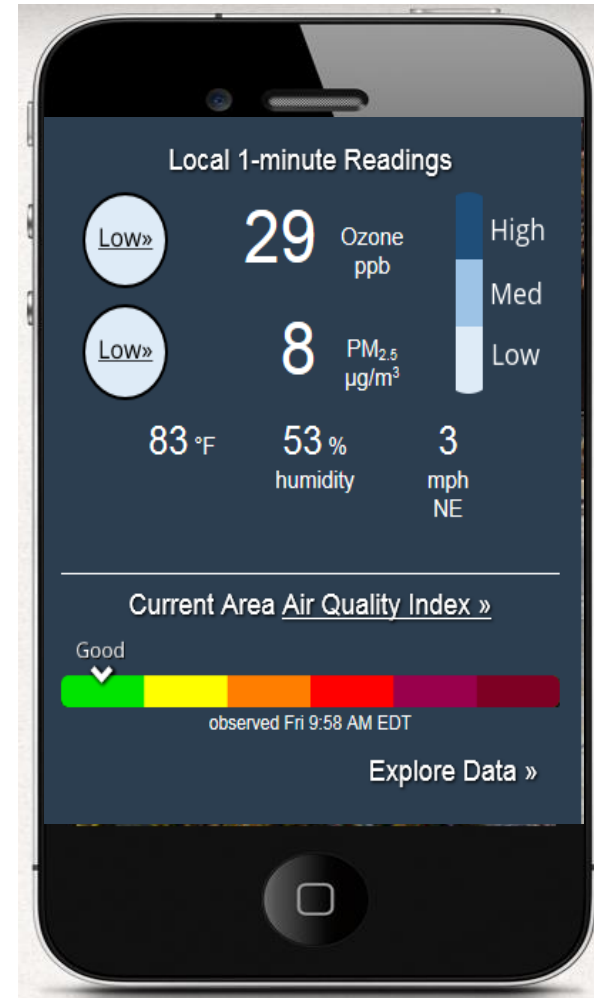
Important considerations

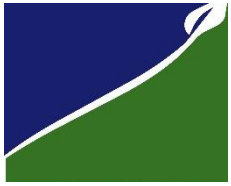
- Focus group testing indicated “high – medium – low” messages were desirable.
 - Both the breakpoints and messages should be based on our understanding of the broad body of health evidence.
 - Should consider what is the population we want to advise (e.g., sensitive subpopulations) and how early do we want to advise them (e.g., when air quality is in the “moderate” or “unhealthy for sensitive groups”).
 - Sensor category breakpoints and messages should minimize:
 - LOW messages when the AQI indicates that the air quality concentration is unhealthy (e.g., in the “unhealthy for sensitive groups” or “unhealthy” categories).
 - HIGH messages when the AQI indicates that the air quality concentration is in the “good” or “moderate” categories.
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Going public

- Planning to release prototype mobile app and website during Air Quality Awareness Week in early May 2016
 - Website will include FAQs and other information
- Will display the 6 (and counting) Village Green data streams





Draft Ozone approach

Ozone

!	Your sensor may not be working properly, check the Air Quality Index (AQI).
Low 0-59 ppb	Enjoy your outdoor activities.
Medium 60-89 ppb	If medium readings continue, use the Air Quality Index (AQI) to plan outdoor activities
High 90-149 ppb	If high readings continue, consider adjusting your outdoor activities, especially if you are sensitive to ozone. Check the AQI to find out.
Very High >150 ppb	If high readings continue, consider adjusting your outdoor activities. Check the Air Quality Index (AQI) for your area to find out. Note that very high ozone readings may indicate that your sensor is not working properly. Check your sensor instructions.



Draft PM2.5 approach

PM2.5

!

Your sensor may not be working properly, check the Air Quality Index (AQI).

Low

0-(30-40) ug/m3

Enjoy your outdoor activities.

Medium

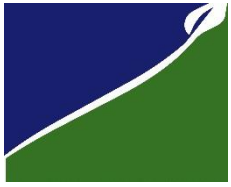
(30-40) - (70-100) ug/m3

If medium readings continue, use the Air Quality Index (AQI) to plan outdoor activities.

High

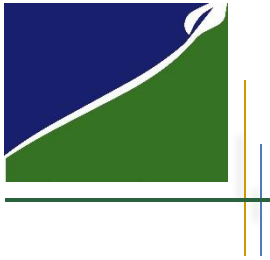
>(70-100) ug/m3

You may be near a sources of particle pollution like dust, smoke, or exhaust. Move to a different location where the readings may decrease. Check the AQI for your area.



These tables are a start

- These tables are based on available AQ data and what we know about exposure and health effects.
- The fact is, an instantaneous air quality reading has little or no meaning relative to exposures over a period of time.
- However, we recognize that there is a demand for actionable instant information so our tables represent improvements over existing scales.
- Our goal is to encourage developers to provide air quality data that are rolled up to longer averaging times that are more relevant to potential health outcomes.
- For example, Village Green data is reported by minute but also hourly, daily and monthly to promote understanding



How can you help?

- The information shown in the tables and the mobile app have been focus tested and we have solicited previously from other stakeholders
- Looking for feedback, are we on the right track?
- Just to repeat, what we are releasing during Air Quality Awareness Week is Version 1.0. We are planning to update this over time as we get more feedback and information.
- Feedback: evans.ron@epa.gov