

# Short Term Measurements and Air Quality Messaging/ Regulatory Requirements for Data

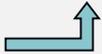
*Kristen Benedict*



## Emerging air monitoring systems (informal classification)



existing

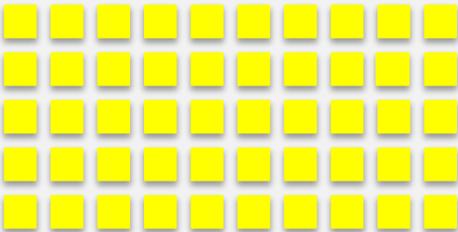


Group 1: Regulatory or regulatory-equivalent air monitoring stations  
Cost: 100Ks (in thousands), Data reliability = A+

emerging



Group 2: Smaller-footprint monitoring systems for community screening and research studies  
Cost: 1-10Ks, Data reliability = B+ (target)



Group 3: Very small, very low cost systems enabling dense sensor networks, citizen science  
Cost: 0.1-1Ks, Data reliability = ?

## Monitoring Requirements for NAAQS Compliance

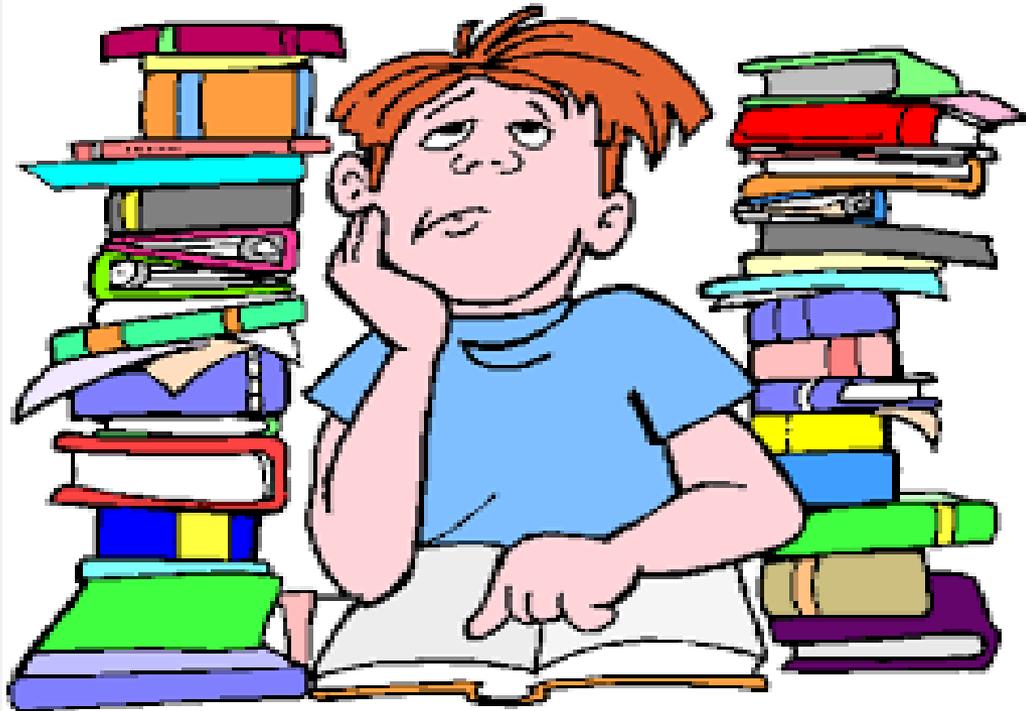
Activity/Procedure	Regulation
FRM/FEM Instrument Approval (1-2 year process)	40 CFR Part 53.20 40 CFR Part 58 Appendix C Ambient Air Monitoring Methodology
Meet method requirements for NAAQS attainment	40 CFR Part 50 Appendices
QAPP approval	40 CFR Part 58 Appendix A and EPA QA Policy
Minimum QA/QC Requirements (e.g. calibration, zero/span checks)	40 CFR Part 58 Appendix A QA Handbook Volume II
Siting Requirements	40 CFR Part 58 Appendix E
Annual Data Certification	40 CFR Part 58.15
Meet reporting requirements	40 CFR Part 58.15

National Air Toxics Trends Stations (NATTS) information can be found at <http://www.epa.gov/ttn/amtic/natts.html>  
Methods and Procedures for Source Testing and Monitoring <http://www.epa.gov/ttn/emc/tmethods.html>

## Communicating Sensor Data is Tricky...



There are no studies to support 1-minute  
ozone and PM<sub>2.5</sub> **health effects** messaging



# The Air Quality Index

*Not for use to interpret non-regulatory data*

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
<i>When the AQI is in this range:</i>	<i>..air quality conditions are:</i>	<i>...as symbolized by this color:</i>
0-50	Good	Green
51-100	Moderate	Yellow
101-150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

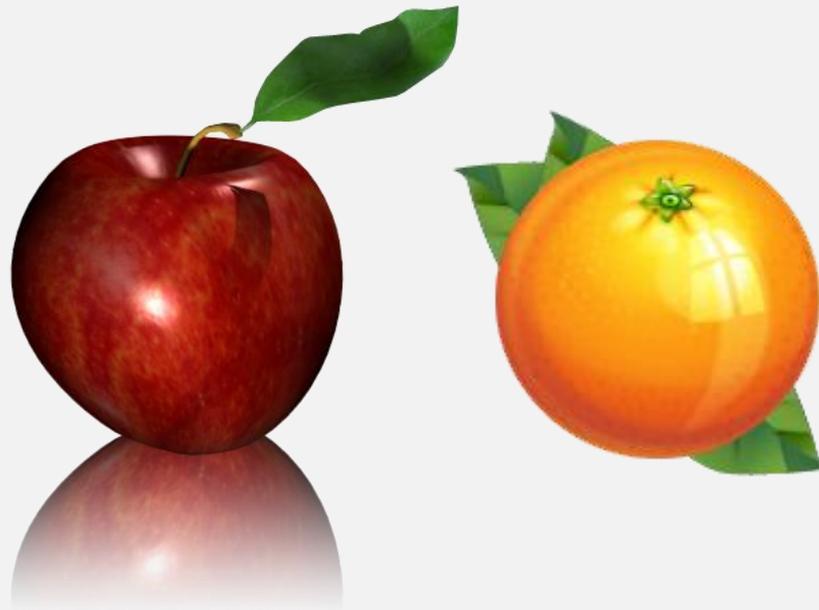
# Sensor Concentration $\neq$ Air Quality Index

## Sensor Reading

Concentration

Short term  
(e.g. 1 minute)

Data Quality  
Unknown

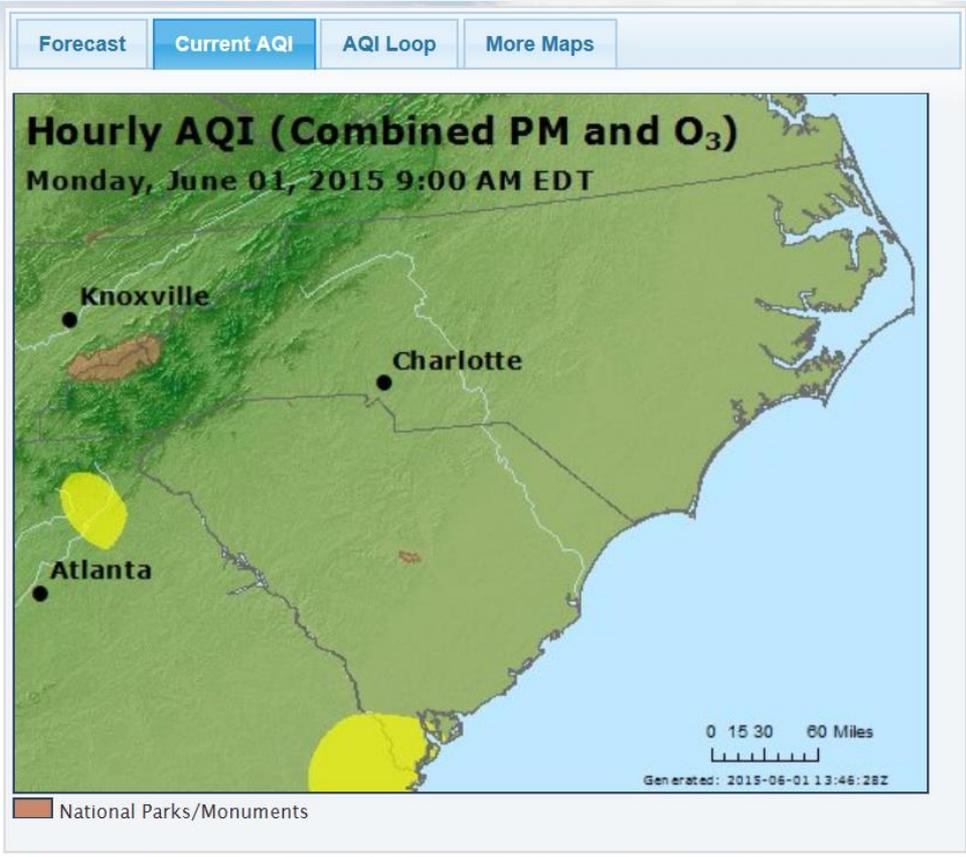


## Air Quality Index

Index Color

Averaged (e.g. 8-  
hour, 24-hour)

Data Quality  
Assured



Good
Moderate
USG
Unhealthy
Very Unhealthy
Hazardous
! Action Day

### Air Quality Forecast

Today's High		Tomorrow's High	
Air Quality Index (AQI)		Air Quality Index (AQI)	
<b>41</b>	<b>Good</b>	<b>41</b>	<b>Good</b>
Health Message: None		Health Message: None	
AQI - Pollutant Details			
Ozone	<b>41</b>	<u>Good</u>	Particles (PM2.5)
Particles (PM2.5)	<b>36</b>	<u>Good</u>	Ozone

### Current Conditions

Air Quality Index (AQI)  
observed at 9:00 EDT

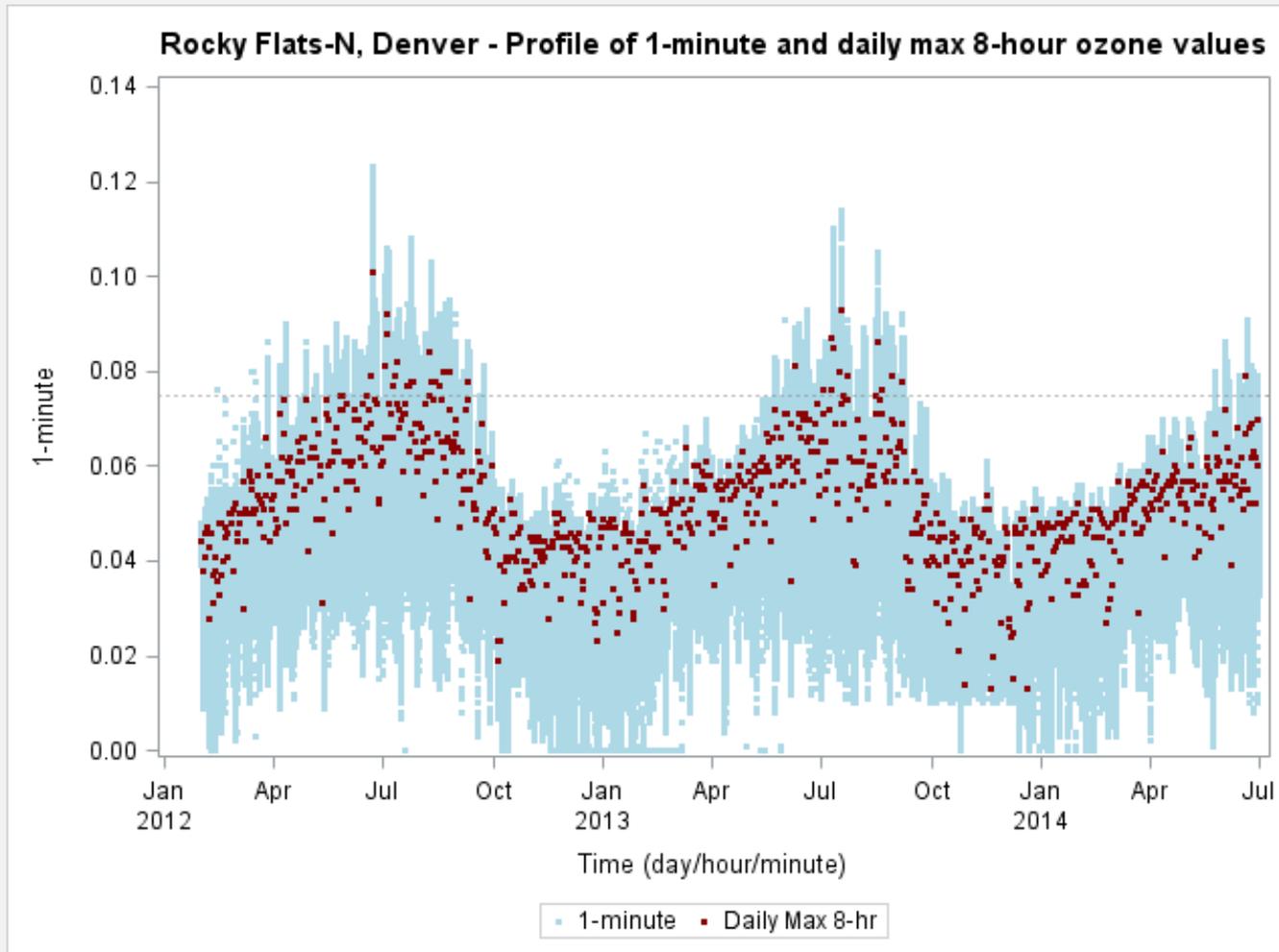
**15** **Good**

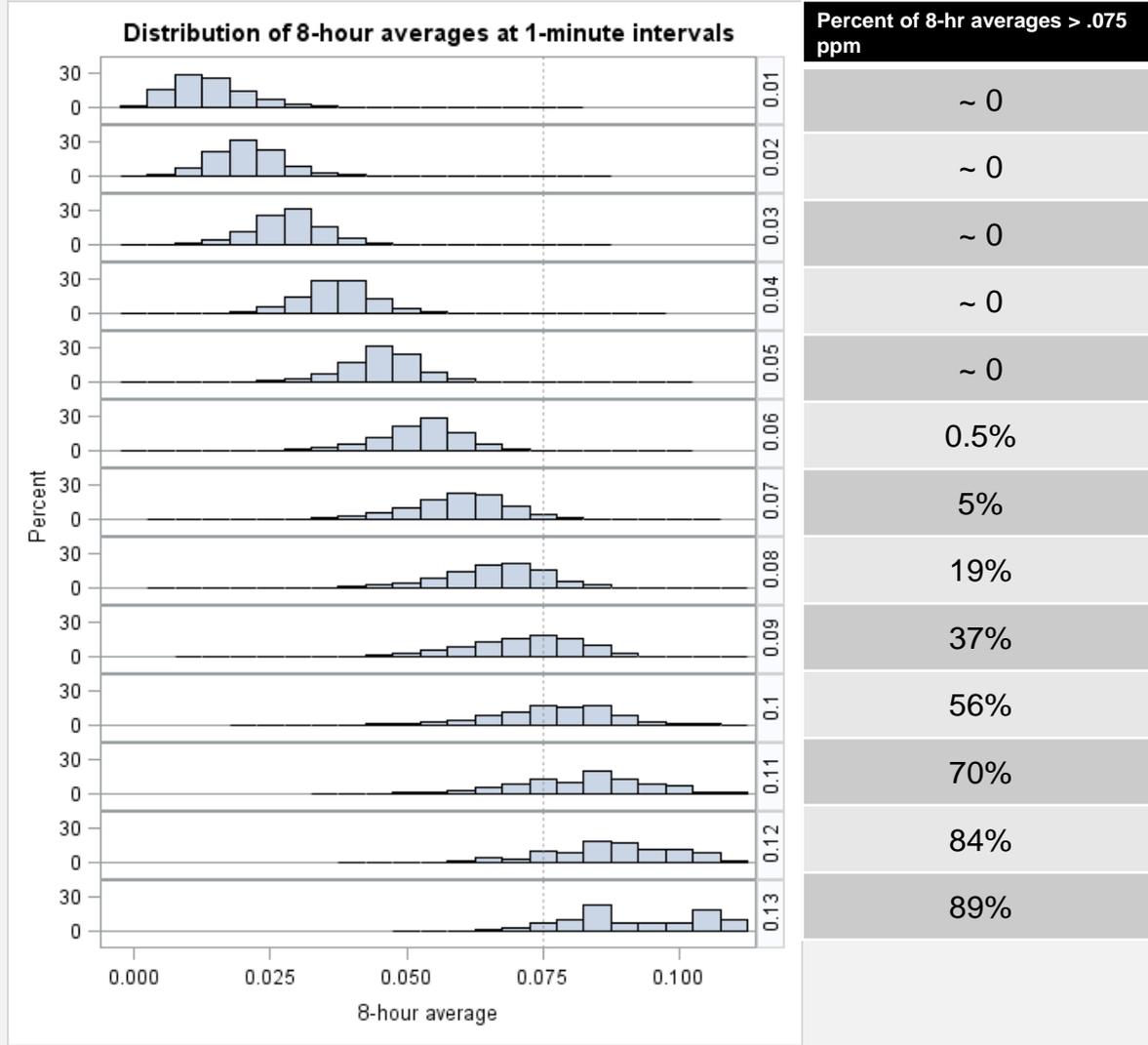
Health Message: None

#### AQI - Pollutant Details

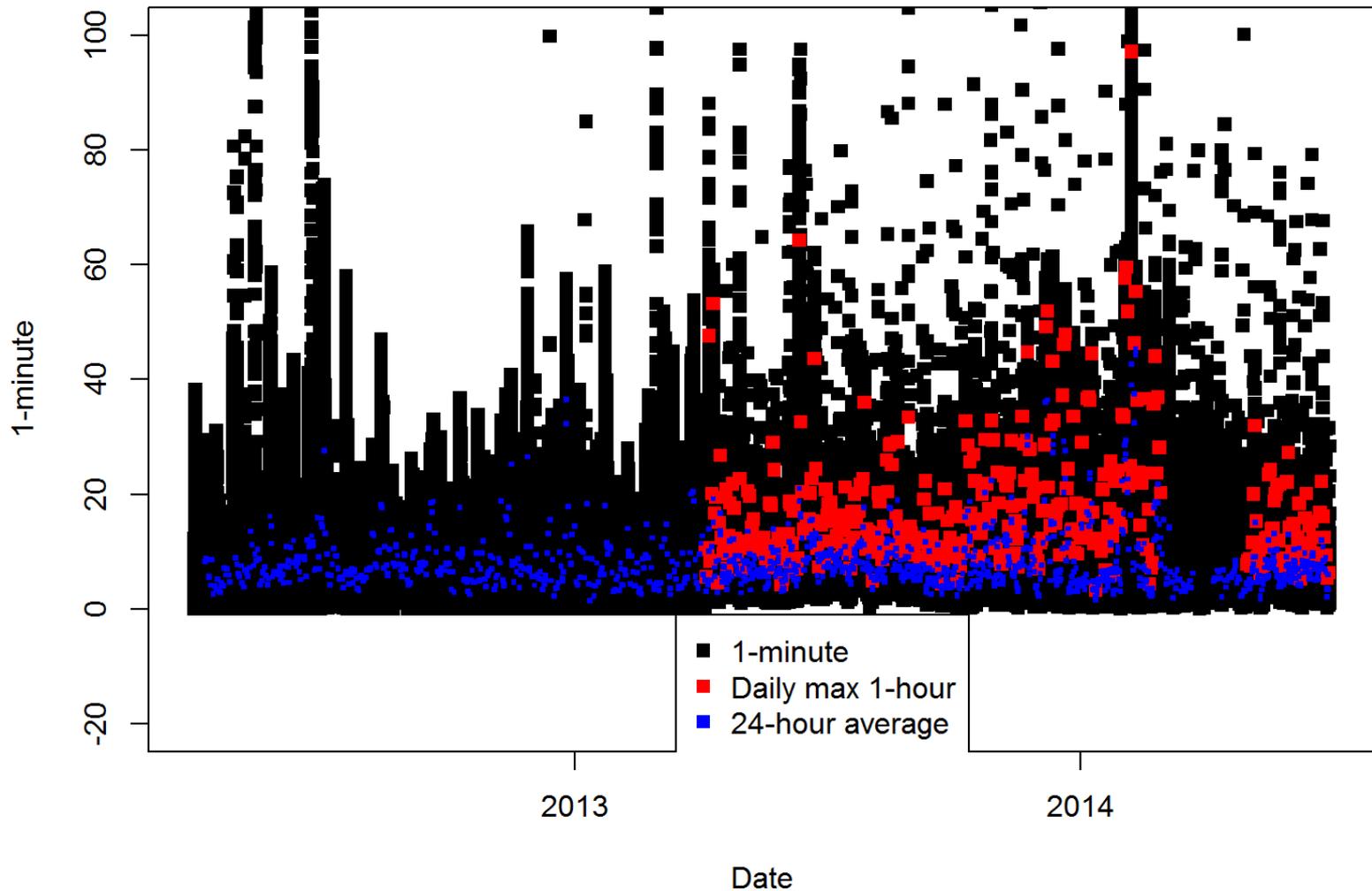
Particles (PM2.5) **15** Good

### Past Air Quality Maps and Data



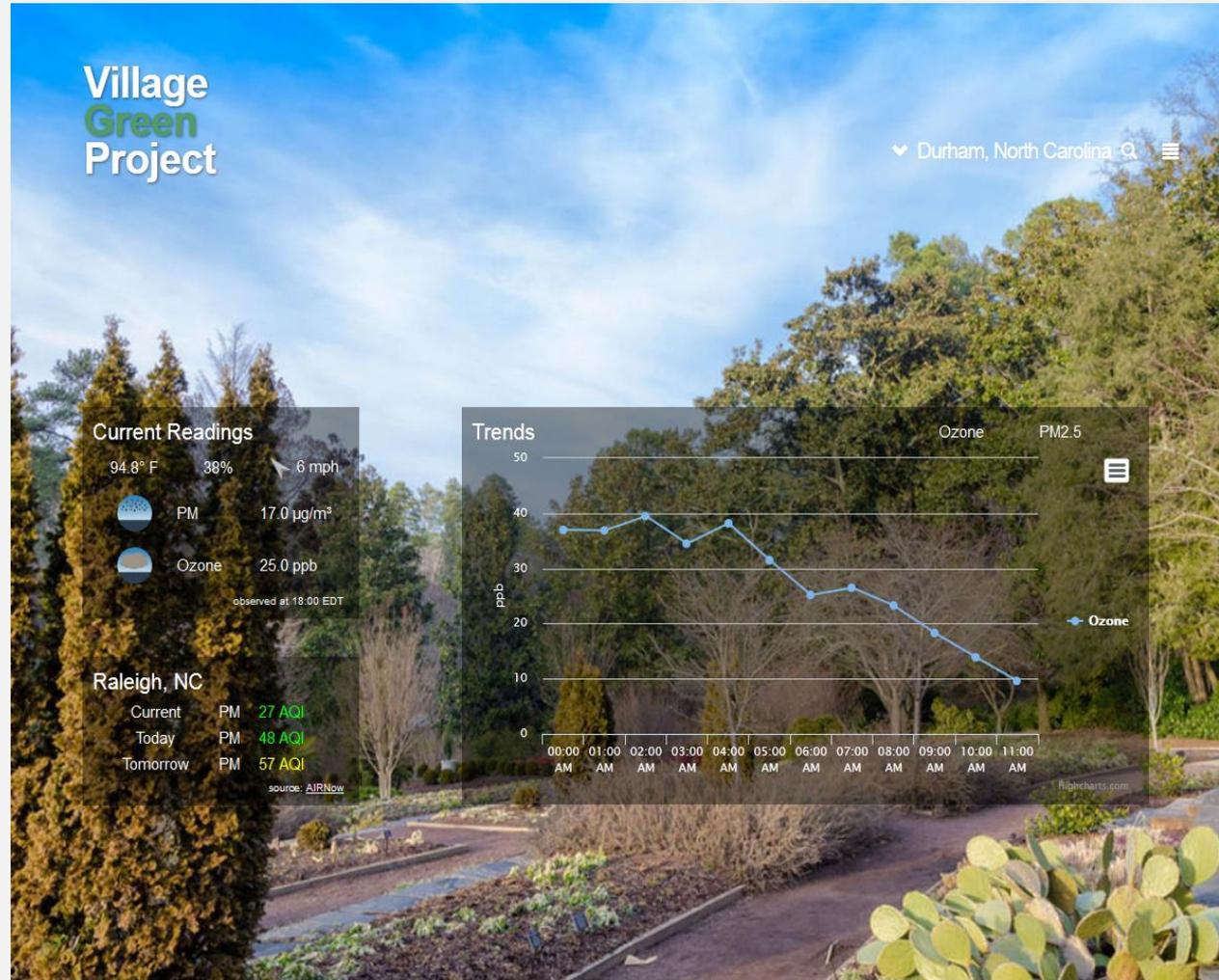
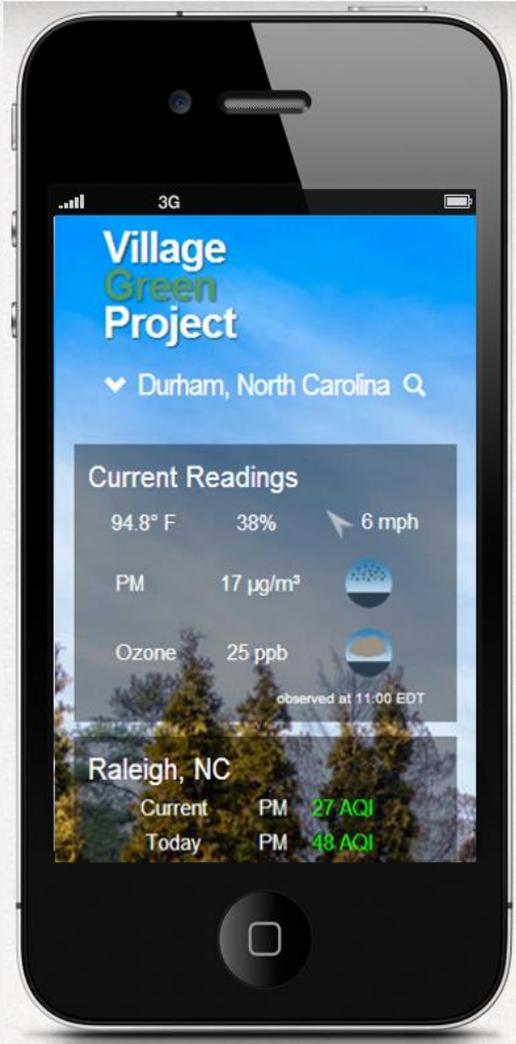


## Denver-Camp, Denver - Profile of 1-minute and max 1-hour PM2.5 values



- Village Green (*funded by E-Enterprise*)
  - Incorporate real-time, 1-minute ozone and PM<sub>2.5</sub> sensor data into AIRNow tech
  - Expand number of sites (4-5)
  - Monitor additional pollutants (VOCs and NO<sub>2</sub>)
  - Fulfill Agency priority goal for two real time air quality data streams to the public





# Messaging Activities

- Sensor Messaging Website
- Village Green Mobile Website
- Data Analysis (Completed)
- Focus Group Testing (In progress)

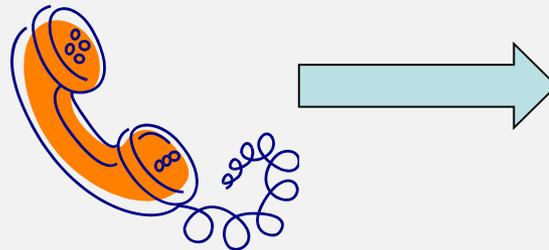


## Questions from Citizens

- Why is this reading different from what AIRNow shows?
- Why do you use hourly or longer averages to set standards? What do shorter peaks in my short term data mean?
- Can I use my information for comparison against the National Ambient Air Quality Standards (NAAQS)?

## CONTACTS:

- Local/State Air Agencies
  - NACAA
  - AAPCA
- EPA
- Others



## RESPONSE:

- Not FEM/FRM Quality (ambient)
- Not an approved test/alternative method (source)
- No action
- Check the AQI

*Inconsistent/inaccurate information without guidance*

# Acknowledgements

## OAQPS Team

- Kristen Benedict  
*(Team Lead)*
- Bryan Hubbell
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## Collaborations

