

Dust Monitoring Compliance

Thursday, September 14, 2023

Morning Program

- | | | | |
|-------|--|-------|---|
| 9:00 | Welcome | 10:45 | Intro to Site Contribution Analysis and Aeroqual's Site Contribution Tool
<i>Connor Porter, Aeroqual</i> |
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| 10:30 | BREAK | | |



Monitoring Program Design and Data Analysis Considerations

September 14, 2023



Equipment Selection



Siting Considerations



Documentation



Quality Assurance &
Performance Criteria



Data Management and
Analysis



Equipment Selection



Siting Considerations



Documentation

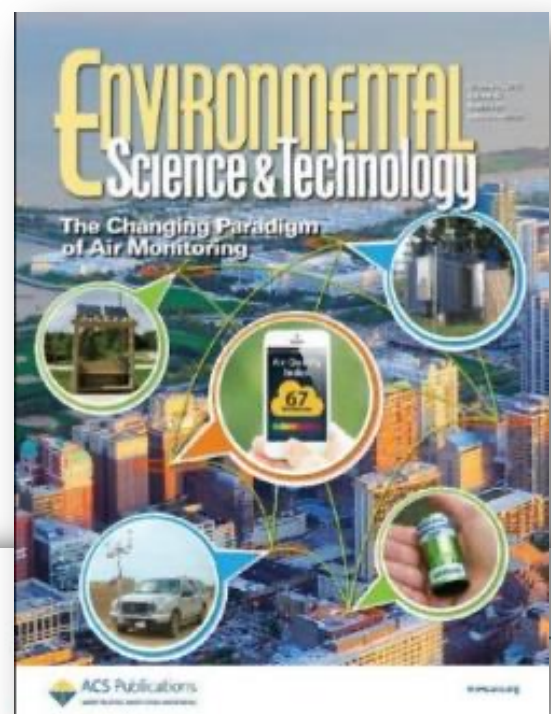
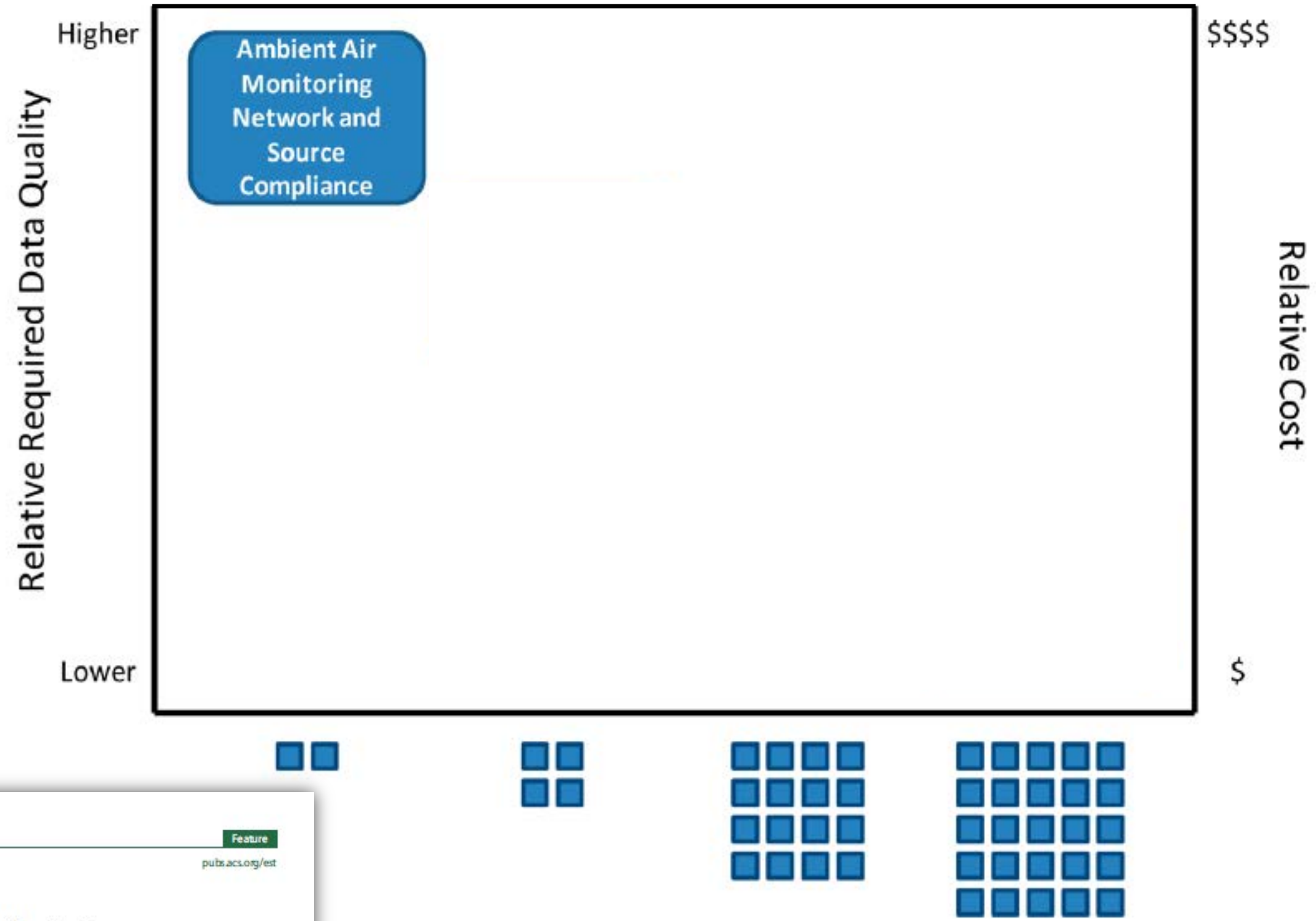


Quality Assurance & Performance Criteria



Data Management and Analysis

PROJECT AND DATA QUALITY OBJECTIVES



The Changing Paradigm of Air Pollution Monitoring
 Emily G. Snyder,^{*,†} Timothy H. Watkins,[†] Paul A. Solomon,[‡] Eben D. Thoma,[†] Ronald W. Williams,[†]
 Gayle S. W. Hagler,[†] David Shelow,[§] David A. Hindin,^{||} Vasu J. Kilaru,[†] and Peter W. Preuss[⊥]

Criteria Pollutants



List of Designated Reference and Equivalent Methods, June 15, 2023

Page 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CENTER FOR ENVIRONMENTAL MEASUREMENTS & MODELING
AIR METHODS & CHARACTERIZATION DIVISION (MD-D205-03)
Research Triangle Park, NC 27711

Office of
Research and Development

LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS

Issue Date: June 15, 2023
(www.epa.gov/ttn/amtic/criteria.html)

PM10 – FRM & FEM



List of Designated Reference and Equivalent Methods, June 15, 2023

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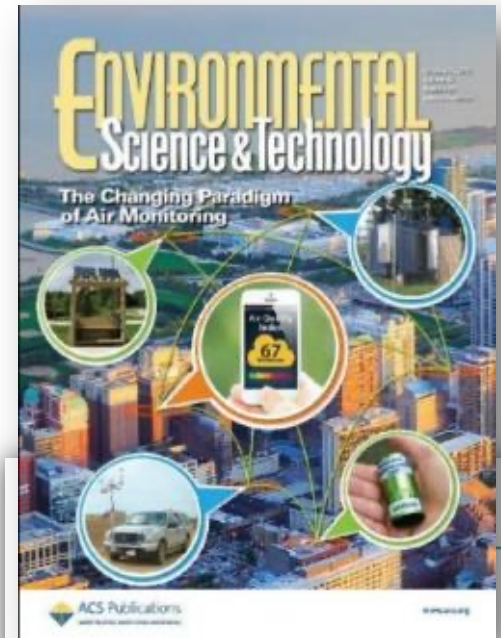
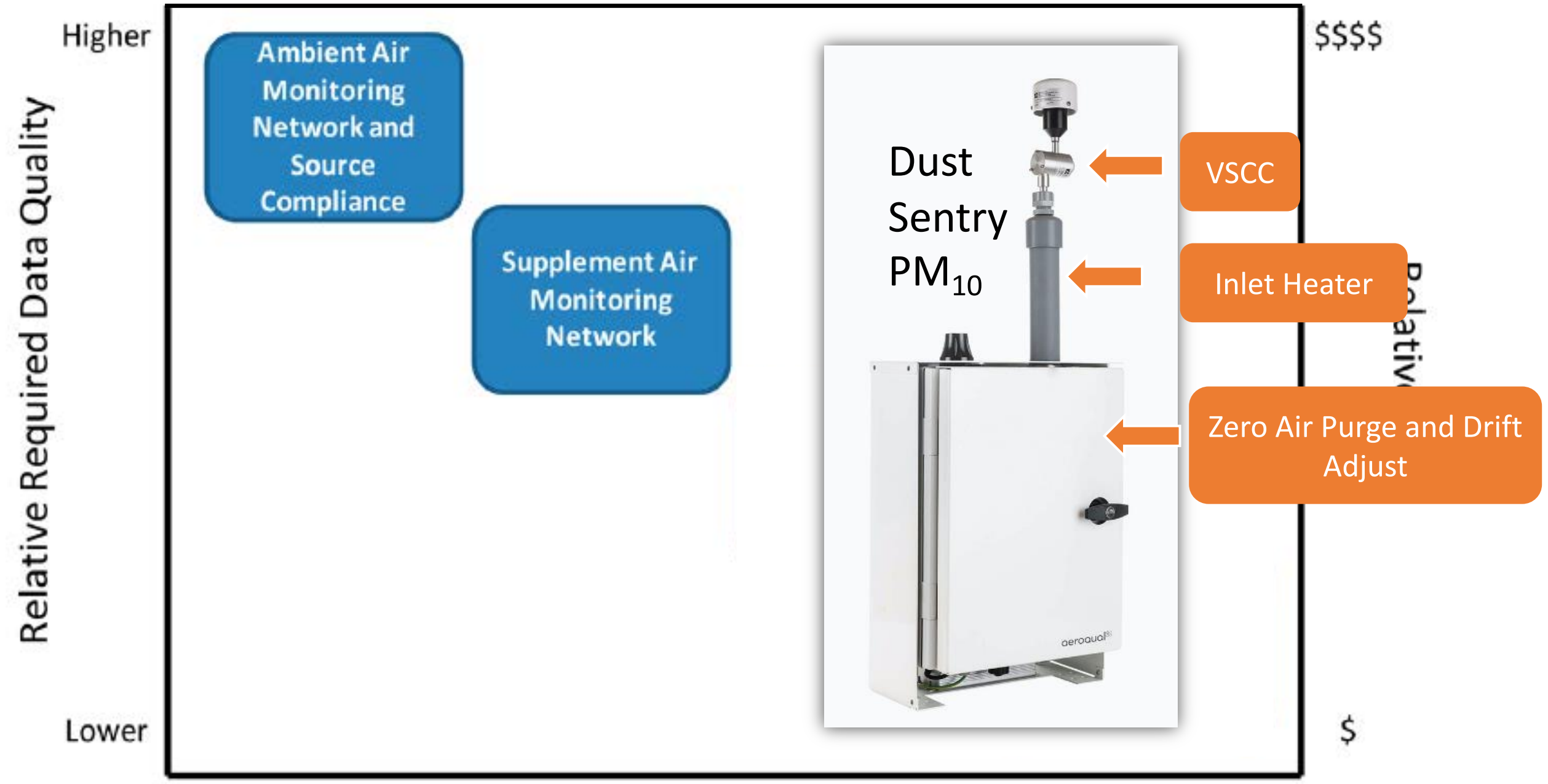
**Teledyne API
T640X**



**Met One
Instruments
E-BAM Plus**

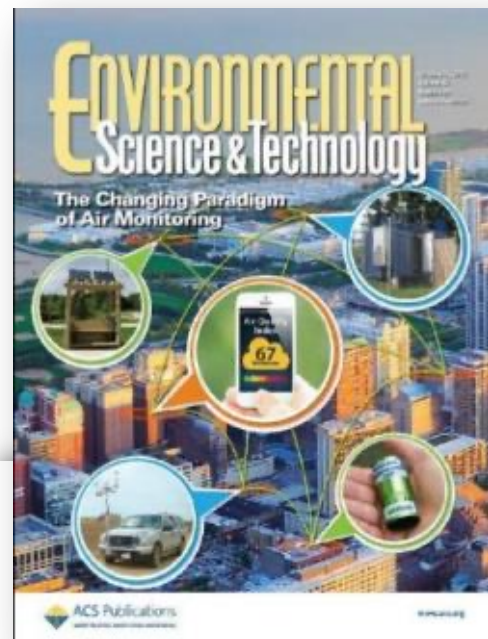
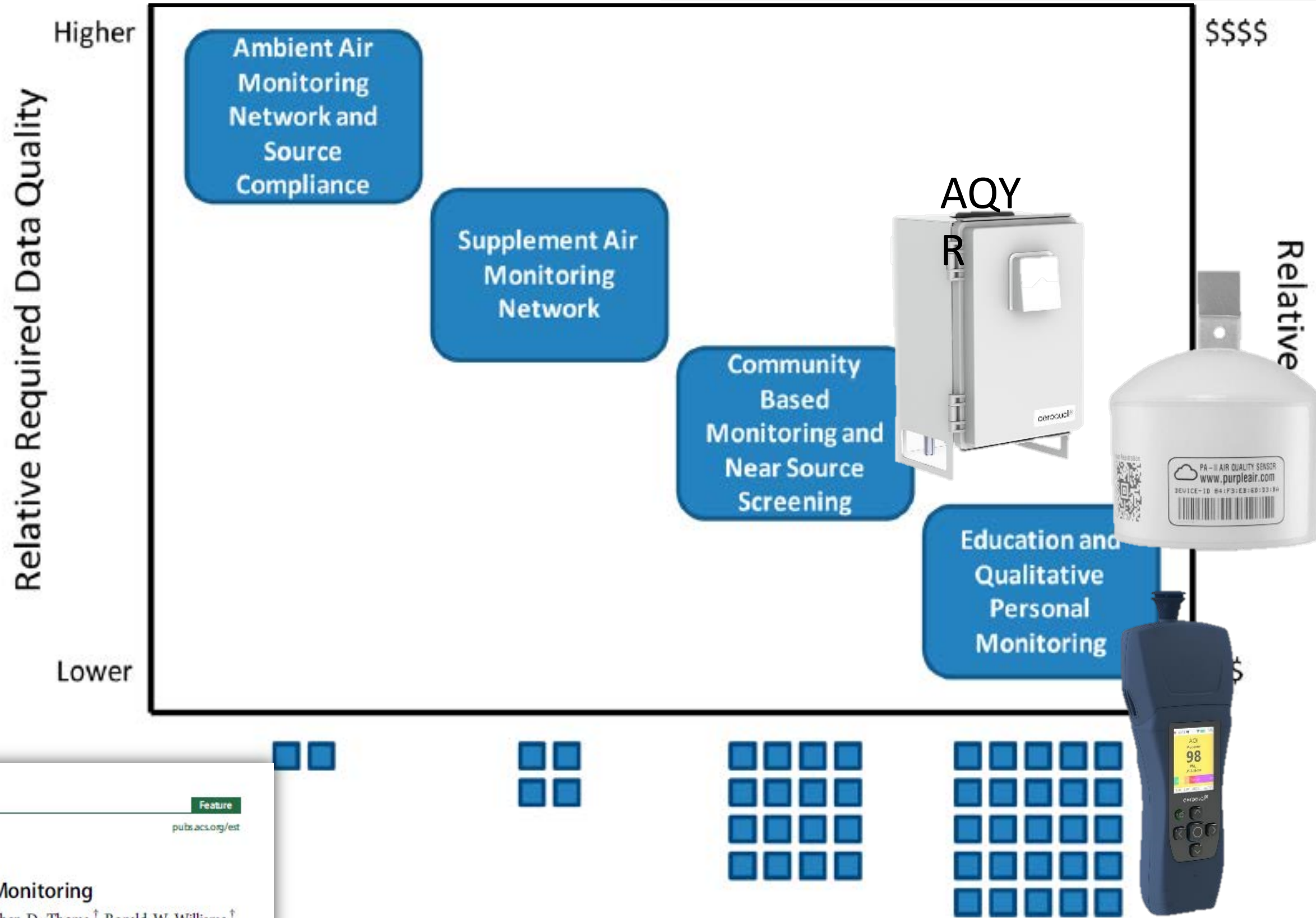


**ThermoScientific
TEOM 1405**



The Changing Paradigm of Air Pollution Monitoring
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The Changing Paradigm of Air Pollution Monitoring

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Feature
pubs.acs.org/est



CITY OF CHICAGO
RULES

FEM ★★★★★

Control of Emissions from Handling and Storing Bulk Materials

Effective January 25, 2019

CITY OF CHICAGO
RULES

★★★★★ **Near-Reference**

Rules for Large Recycling Facilities

Effective June 5, 2020

CITY OF CHICAGO
RULES

★★★★★ **Near-Reference**

DEMOLITION BY IMPLOSION

CITY OF CHICAGO
RULES

★★★★★ **Near-Reference**

Rules for Reprocessable Construction/Demolition Material Facilities

Revised March 7, 2023



Equipment Selection



Siting Considerations



Documentation



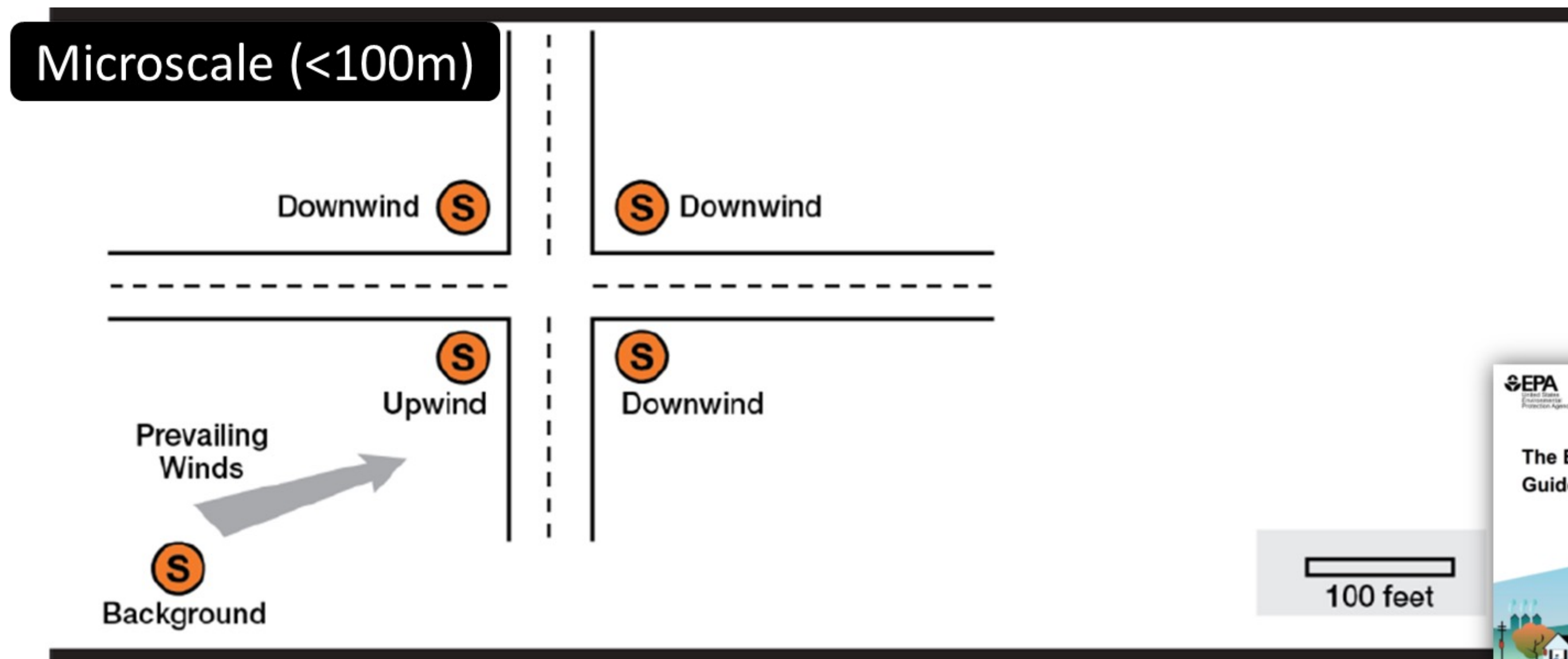
Quality Assurance & Performance Criteria



Data Management and Analysis

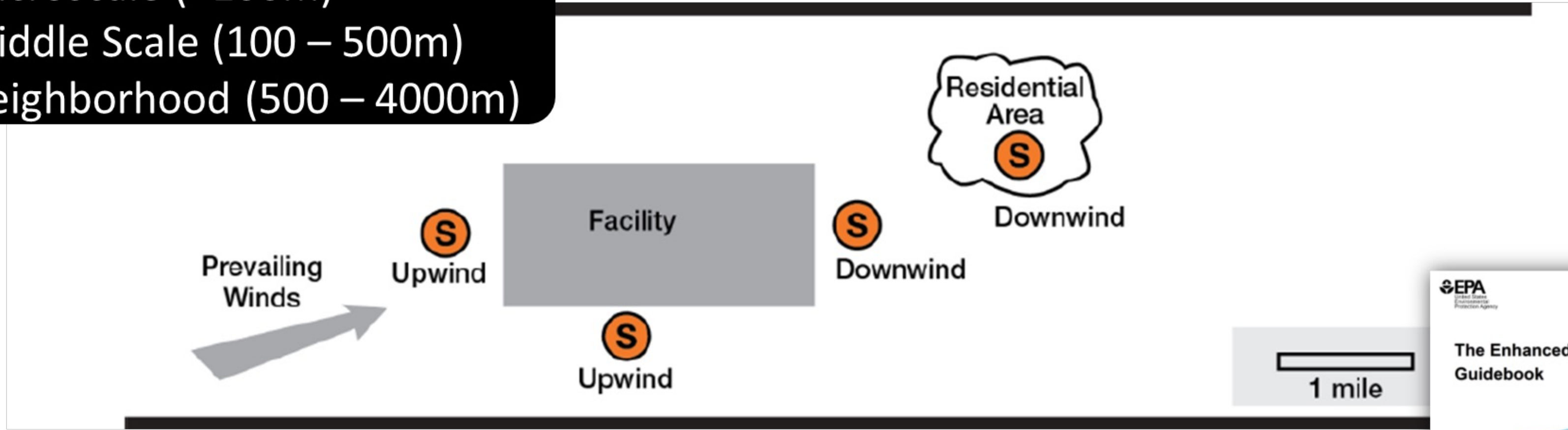
REPRESENTATIVENESS!!!

MAKE SURE THAT THE SPATIAL SCALE OF THE AIR PARCEL THAT IS MEASURED BY THE EQUIPMENT MATCHES YOUR MONITORING OBJECTIVE

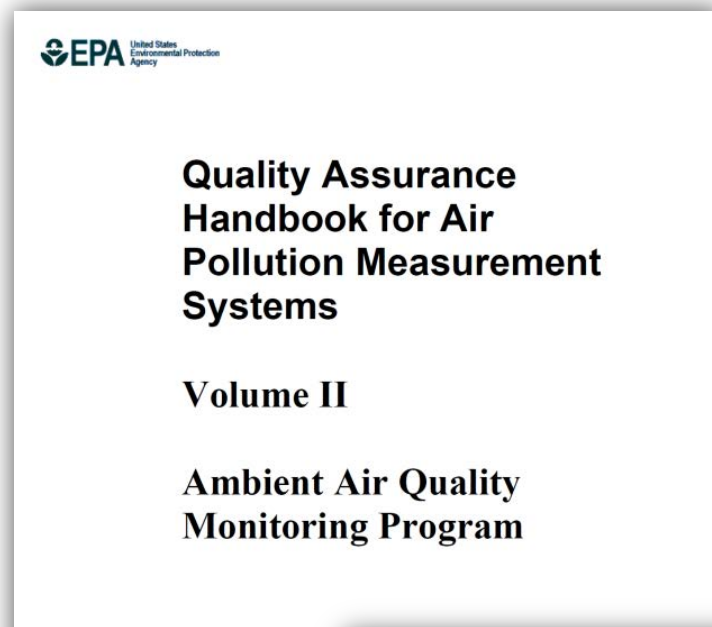


MEASUREMENT SCALES OF GREATEST INTEREST FOR SOURCE IMPACT ASSESSMENT AND CONTRIBUTION ANALYSIS

- Microscale (<100m)
- Middle Scale (100 – 500m)
- Neighborhood (500 – 4000m)



Siting Recommendations



- Follow EPA siting guidance as much as you can (distance from obstructions, roadways, probe inlet height, etc.)
- Final siting is almost always a compromise
- Evaluate the impact and whether the measurement still meets the monitoring objective.
- Document the final locations and deviations from guidelines.

Meteorological Station Siting Is Important

- Source identification and contribution analysis relies on accurate and representative meteorological data
- Tower height requirements
- Distance from obstructions
- Surface properties
- Follow siting guidelines as much as possible and document any deviations and their potential impact



Quality Assurance Handbook for Air
Pollution Measurement Systems

Volume IV: Meteorological Measurements
Version 2.0 (Final)



Equipment Selection



Siting Considerations



Documentation



Quality Assurance &
Performance Criteria



Data Management and
Analysis

QUALITY MANAGEMENT PLAN
For Ambient and Fenceline Monitoring
Services

Defensible Data

CleanAir®
ENGINEERING

Prepared By:
Clean Air Engineering, Inc.
500 West Wood Street
Palatine, Illinois 60067

March 2017

- Quality Assurance Project Plan / Monitoring Plan
- Develop Standard Operating Procedures / Designated Forms
- Document everything: if things are not documented, they never happened.



Equipment Selection



Siting Considerations



Documentation

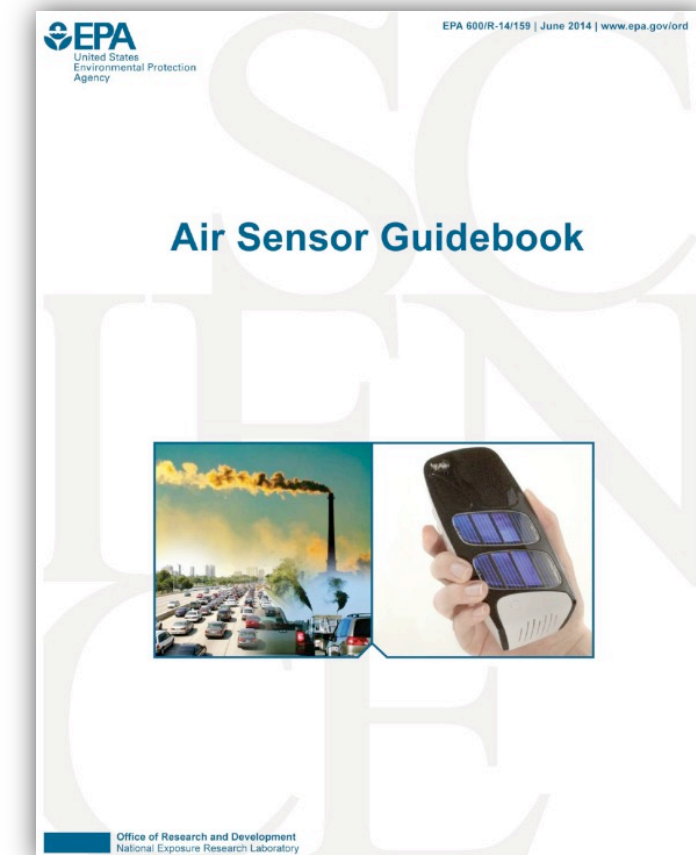


Quality Assurance &
Performance Criteria



Data Management and
Analysis

Tier	Application Area	Pollutants	Precision and Bias Error	Data Completeness
I	Education and Information	All	<50%	≥50%
II	Hotspot Identification and Characterization	All	<30%	≥75%
III	Supplemental Monitoring	Criteria pollutants, Air Toxics (incl. VOCs)	<20%	≥80%
IV	Personal Exposure	All	<30%	≥80%
V	Regulatory Monitoring	O ₃ , CO, SO ₂ NO ₂ , PM _{2.5/10}	<7% <10% <15% <10%	≥75%





Equipment Selection



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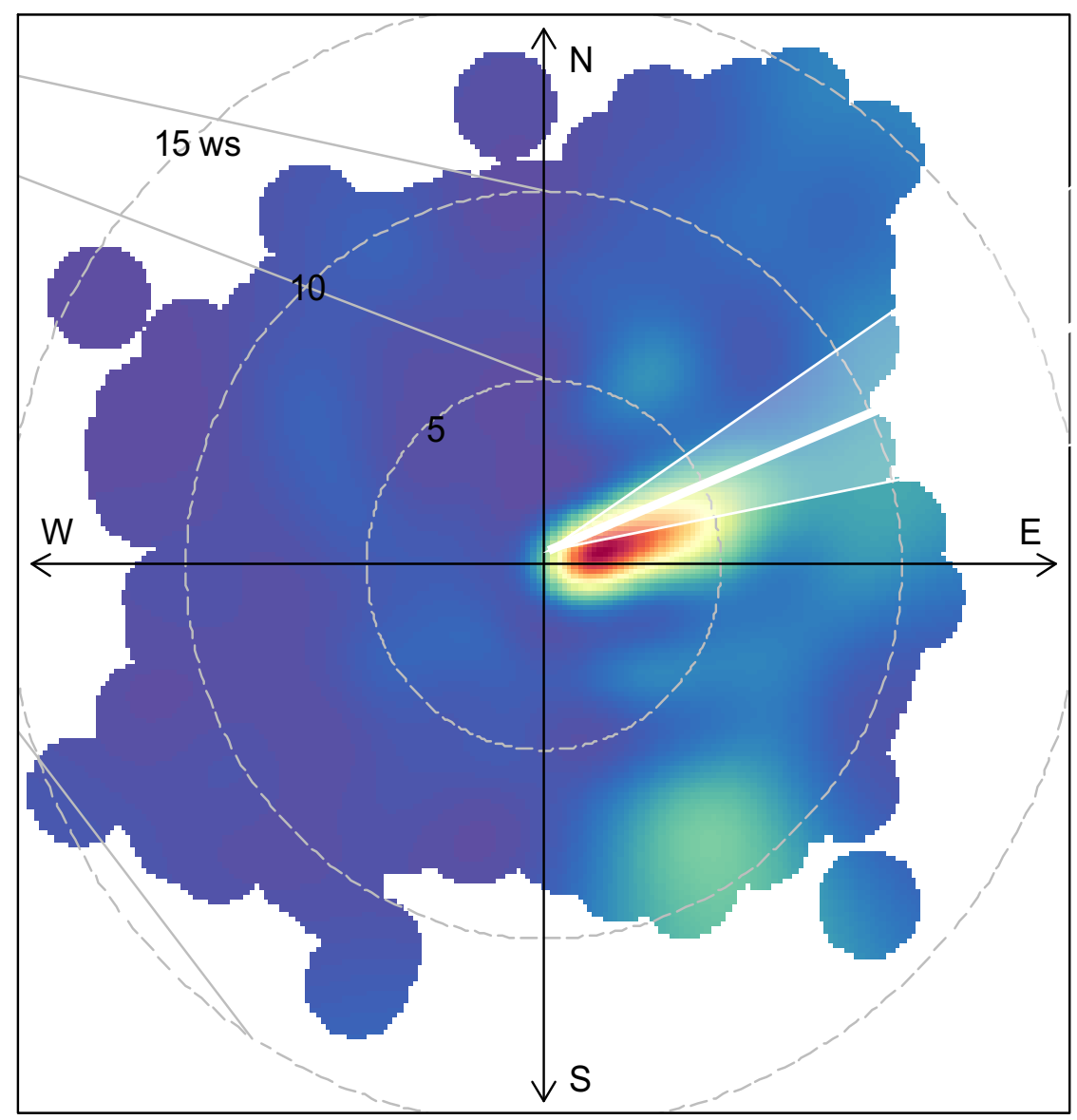


Quality Assurance &
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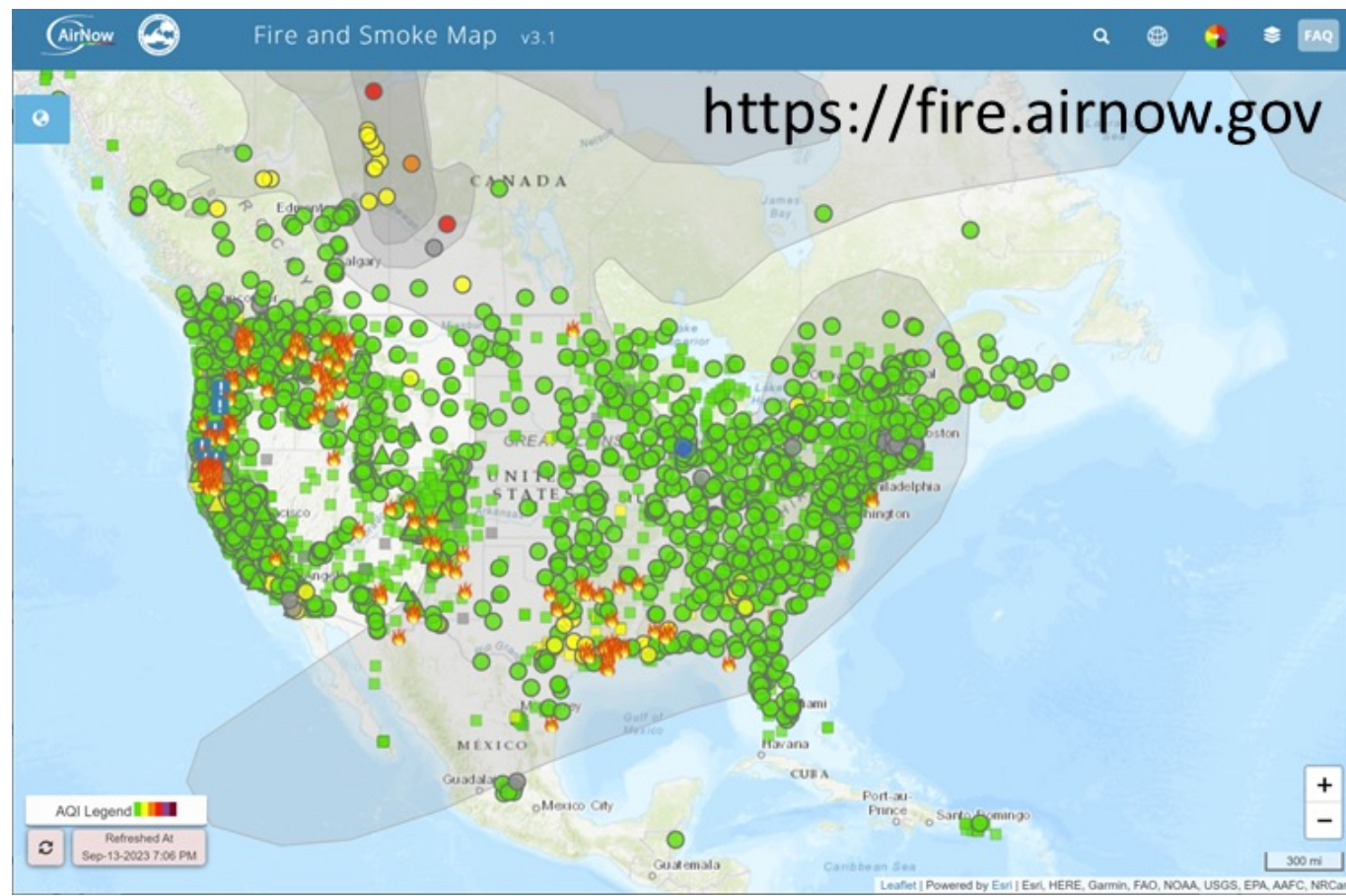


Data Management and
Analysis

Source Direction Indicator Plots



<http://davidcarslaw.github.io/openair/>

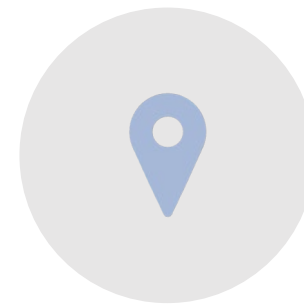


Include Other Data Sources in Your Analysis





Equipment Selection



Siting Considerations



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Quality Assurance &
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Data Management and Analysis



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