

# Kentucky Air Monitoring Network and Air Quality Data Analysis

Southern Transportation & Air Quality Summit 2019

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KENTUCKY ENERGY &  
ENVIRONMENT CABINET

# Kentucky Division for Air Quality Mission Statement

**To protect human health and the environment by achieving and maintaining acceptable air quality through:**

- Operation of a comprehensive air monitoring network;
- Creating effective partnerships with air pollution sources and the public;
- Timely dissemination of accurate and useful information and data;
- Judicious use of program resources; and
- Maintenance of a reasonable and effective compliance program.

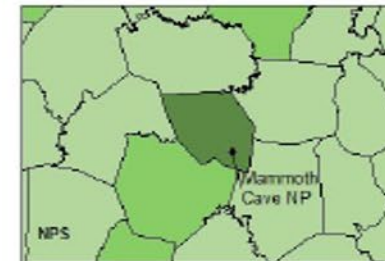
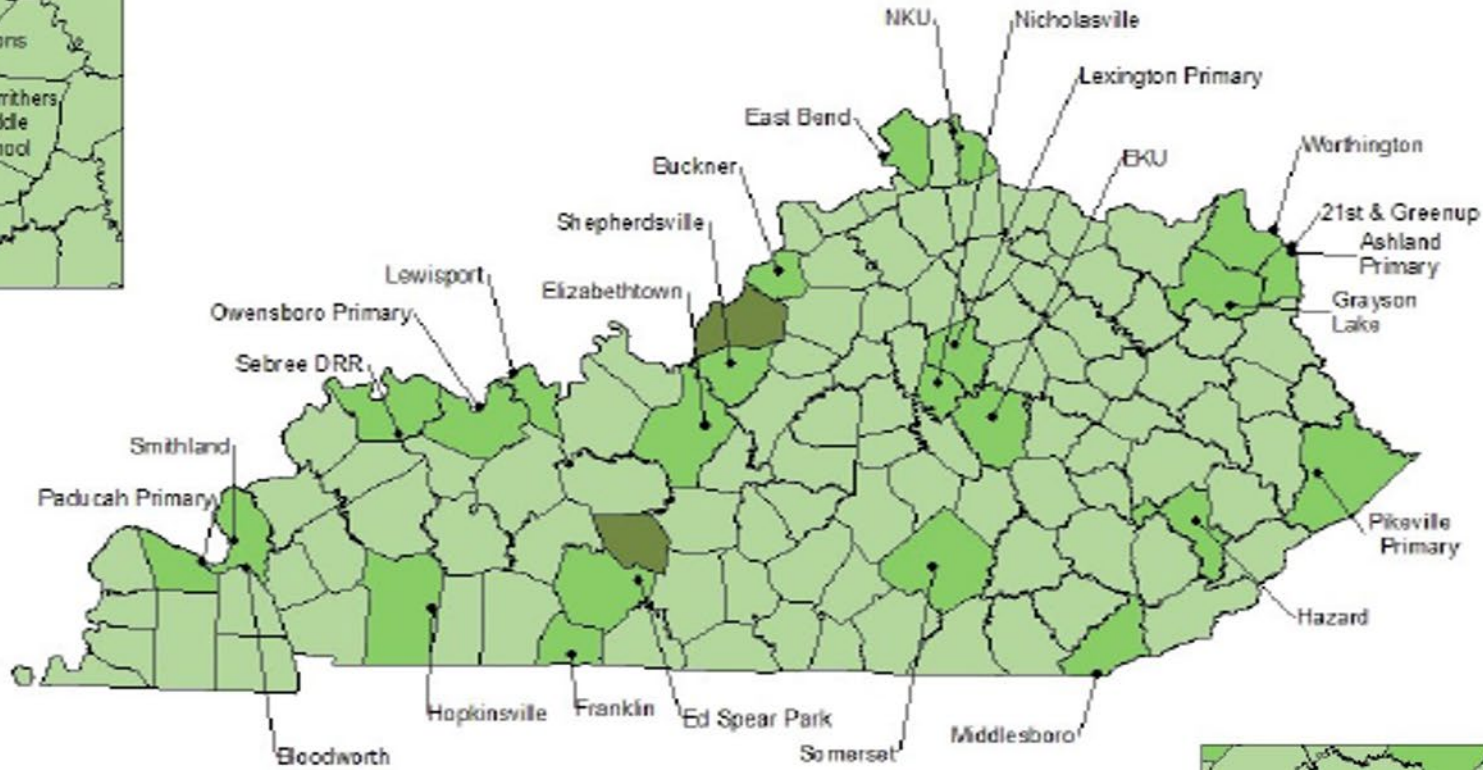
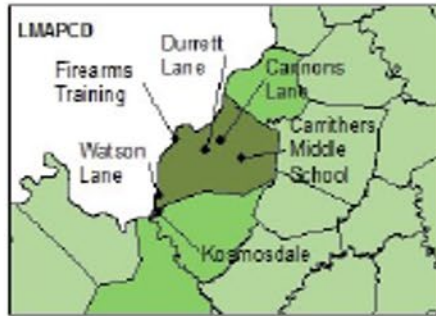


# Division for Air Quality

## Air Monitoring Network Update



# 2019 Ambient Air Monitoring Network



# Ambient Air Monitoring Network



## Intermittent Samplers

PM2.5

PM10

Pb

PM Speciation \*

Air Toxics (VOCs, Carbonyls, PAHs, PM Metals)

Wet/Dry Deposition (passive method) \*

\* Reported at LMAPCD and Mammoth Cave sites only



# Ambient Air Monitoring Network

## Continuous Monitors

O<sub>3</sub>  
NO<sub>x</sub>/NO/NO<sub>2</sub>  
NO<sub>y</sub> \*  
CO \*  
SO<sub>2</sub>  
PM<sub>2.5</sub>  
PM<sub>10</sub> \*  
Air Toxics \*  
Radiation \*\*  
Meteorological



\* Reported at LMAPCD and Mammoth Cave sites only

\*\* Operated by KY DAQ and LMAPCD; Reported by EPA NAREL



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# Annual Network Plan

- Comprised of all monitors operated by KY DAQ, LMAPCD, and NPS
- 2019 Network Plan submitted on June 29, 2017
- Changes in the 2019 plan:
  - Removal of FRM manual PM<sub>2.5</sub> samplers at the Paducah, Owensboro, Pikeville, & Ashland Primary sites (now FEM continuous T640)
  - Addition of FEM continuous T640 monitor at Smiths Grove site
  - Temporary shutdown of special purpose VOC sampling at TVA substation site; Will re-establish new SPM study at Calvert City





# Deployment of Teledyne T-640

- Measurement Principle: broadband spectroscopy (white-light scattering using a polychromatic LED light source)
- Continuous PM<sub>2.5</sub> measurements
- Replaced non-FEM continuous PM2.5 TEOMs
- No filters - Significant cost saving for DAQ; no expense of outsourcing for gravimetric analysis
- 5 remaining sites to deploy for 2019 for the KY DAQ Ambient Air Monitoring Network



# 8872 Digital Data Loggers

- Transitioning from analog data loggers to digital data loggers
- Windows-based system
- Advantages:
  - More remote access capabilities
  - Easier calibrations
  - Instantaneous upload of minute data and electronic documentation
- Goal: Full digitization by 2020



# Automated Gas Chromatograph (Auto-GC)



- Near real-time continuous monitoring of VOCs
- Nearly autonomous and field deployable
- Advantages:
  - Continuous sampling, analysis, and monitoring of ambient VOC concentrations
  - Cost saving – no expense for outsourcing analysis
- Installed at NKU January 31, 2018
- Replace manual samplers at other VOC sites



# Air Quality Data Analysis

- Continuous and intermittent data, as well as air toxics data, is uploaded to the Air Quality System
  - Undergoes extensive QA
  - Suspicious data, as well as data impacted by exceptional events, are coded with specific qualifier flags in the AQS database
  - Used for NAAQS determinations, informs the public, and health studies
- Ambient Air Monitoring Data Certification
  - 2018 criteria pollutant data certified May 1, 2019
  - 2019 criteria pollutant data to be certified to EPA by May 1, 2020
  - 2019 data is considered preliminary until it is certified to EPA



# How are we doing?

Air Quality Score Card					
Kentucky Metropolitan Statistical Areas					
	2015 Ozone	Fine Particles	Course Particles	Nitrogen Dioxide	Sulfur Dioxide
Bowling Green, KY	✓	✓	✓	✓	✓
Cincinnati- Middletown, OH-KY -IN	X	✓	✓	✓	✓
Clarksville, TN-KY	✓	✓	✓	✓	✓
Elizabethtown, KY	✓	✓	✓	✓	✓
Evansville, IN-KY	✓	✓	✓	✓	✓
Huntington- Ashland, WV-KY- OH	✓	✓	✓	✓	✓
Lexington-Fayette,	✓	✓	✓	✓	✓
Louisville-Jefferson	X	✓	✓	✓	X*
Owensboro, KY	✓	✓	✓	✓	✓



# Contact Information

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