



**Asheville-Buncombe**

# **Air Quality Agency**

2023 NASA Health and Air Quality Applications  
Annual Team Meeting

Ashley Featherstone, Asheville Buncombe Air Quality  
Agency

Evan Couzo, UNC Asheville

# History

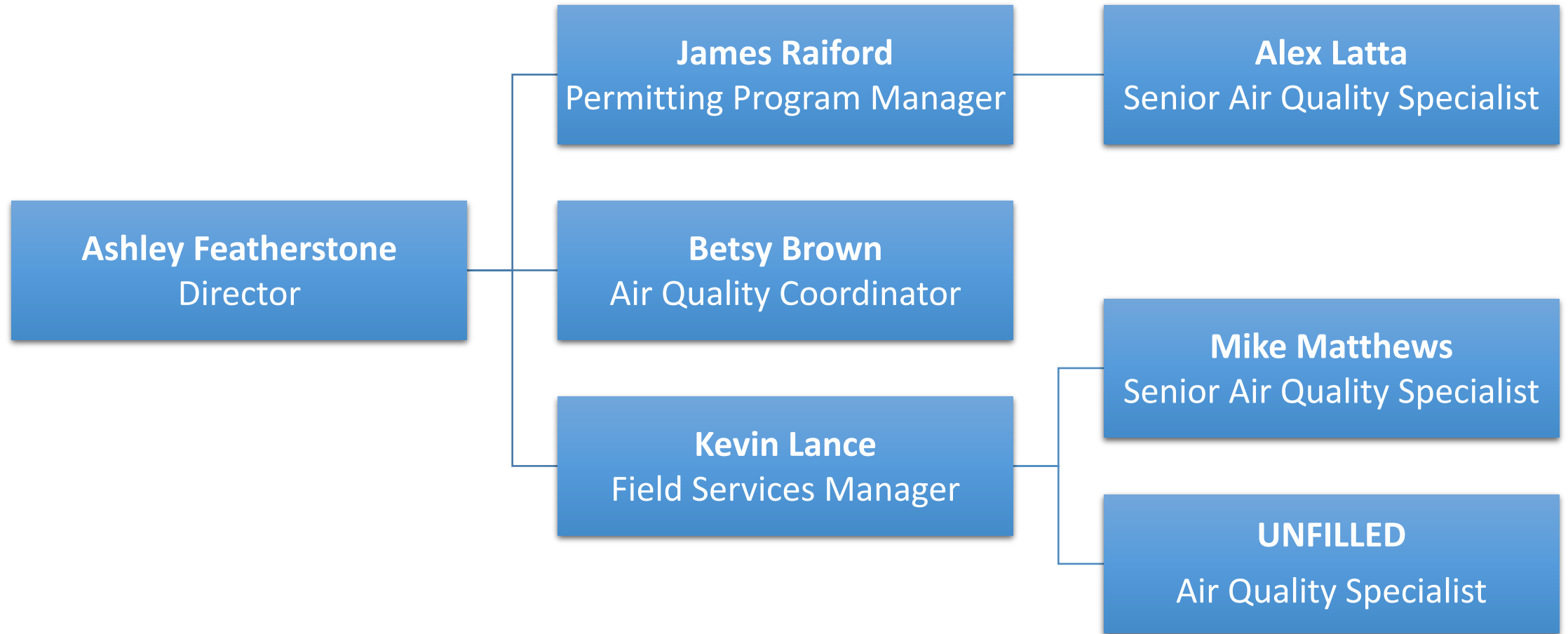
- City of Asheville Smoke Abatement Program – 1947-1967
- Multi-County Agency
  - 1967-1970 Buncombe, Haywood, Henderson, Transylvania
  - 1970-2000 Buncombe and Haywood
  - 2000-Buncombe County and City of Asheville



# AB Air Quality - Overview

- Inter-local Agreement (Pursuant to NCGS 143-215.112 Local Air Pollution Control Programs)
- Governed by an Independent 5 Member Board
  - 3 members are appointed by Buncombe County Commission
  - 2 members are appointed by Asheville City Council
  - The Board meets 6 times a year
- Advisory Committee
  - Several members of the community from diverse backgrounds
  - Residents may apply and are appointed by the board
  - Regular meetings

# Organizational Chart



# AB Air Quality Permitting Program

- 6 Title V Facilities
- 10 Synthetic Minor Facilities
- 56 Small Facilities
- 150 Stage I Vapor Recovery Facilities
- Annual Full Compliance Evaluations of all Title V and Synthetic Minor Facilities
- Biennial Inspections of Small Facilities
- Annual Inspections of Stage I Vapor Recovery Facilities

# AB Air Quality Compliance and Enforcement

- Asbestos and Demolition Permitting and Inspection Program
  - 350+ Permits issued a year
- Open Burning/Fugitive Dust/Odors
  - 70-100 Complaints Annually
  - Same Day Response

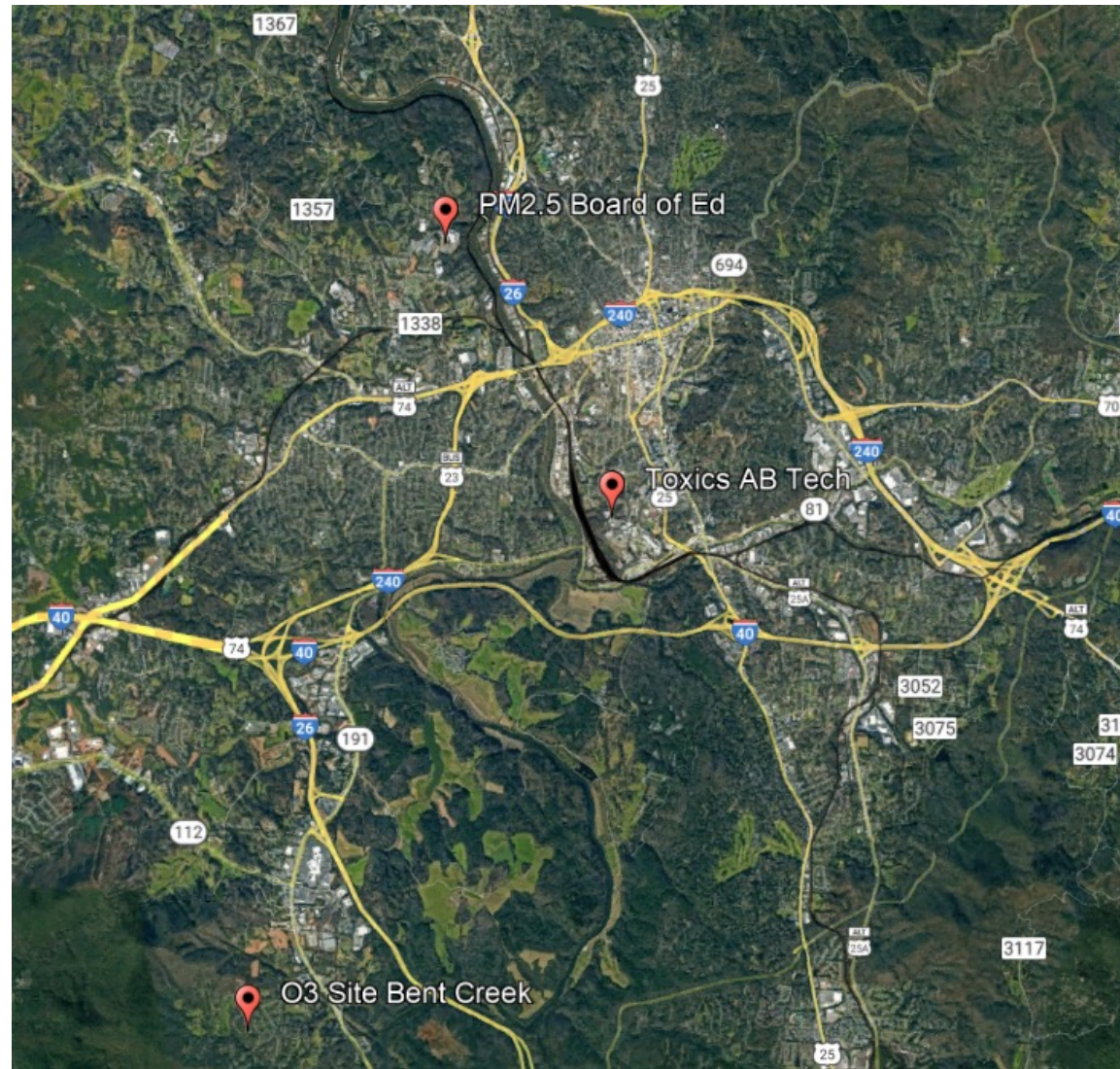


# Monitoring Network

- PM 2.5 – Board of Education Building
  - BAM 1022
  - ThermoFisher 2025i
- Ozone – Bent Creek
  - ThermoFisher Model 49i
- Air Toxics – AB Tech
  - Xonteck 911 Volatile Organic Compound Sampler



# Monitoring Site Locations





# Asheville Board of Education PM Monitoring Site

Existing roof top site



New ground level site



# Citizen Sensor Shelter



# American Rescue Plan Grant (ARP)

Awarded \$75,700 for the purchase of the following:

TeleDyne T640X (PM10)



Thermo Scientific 49iQ Analyzer and  
Primary Standard



# North Carolina and the National Ambient Air Quality Standards

Attaining all federal public health air quality standards for:

2 4 1 8

days...

and counting!

as of April 7, 2022

Ozone

Particulate  
Matter

Lead

Nitrogen  
Dioxide

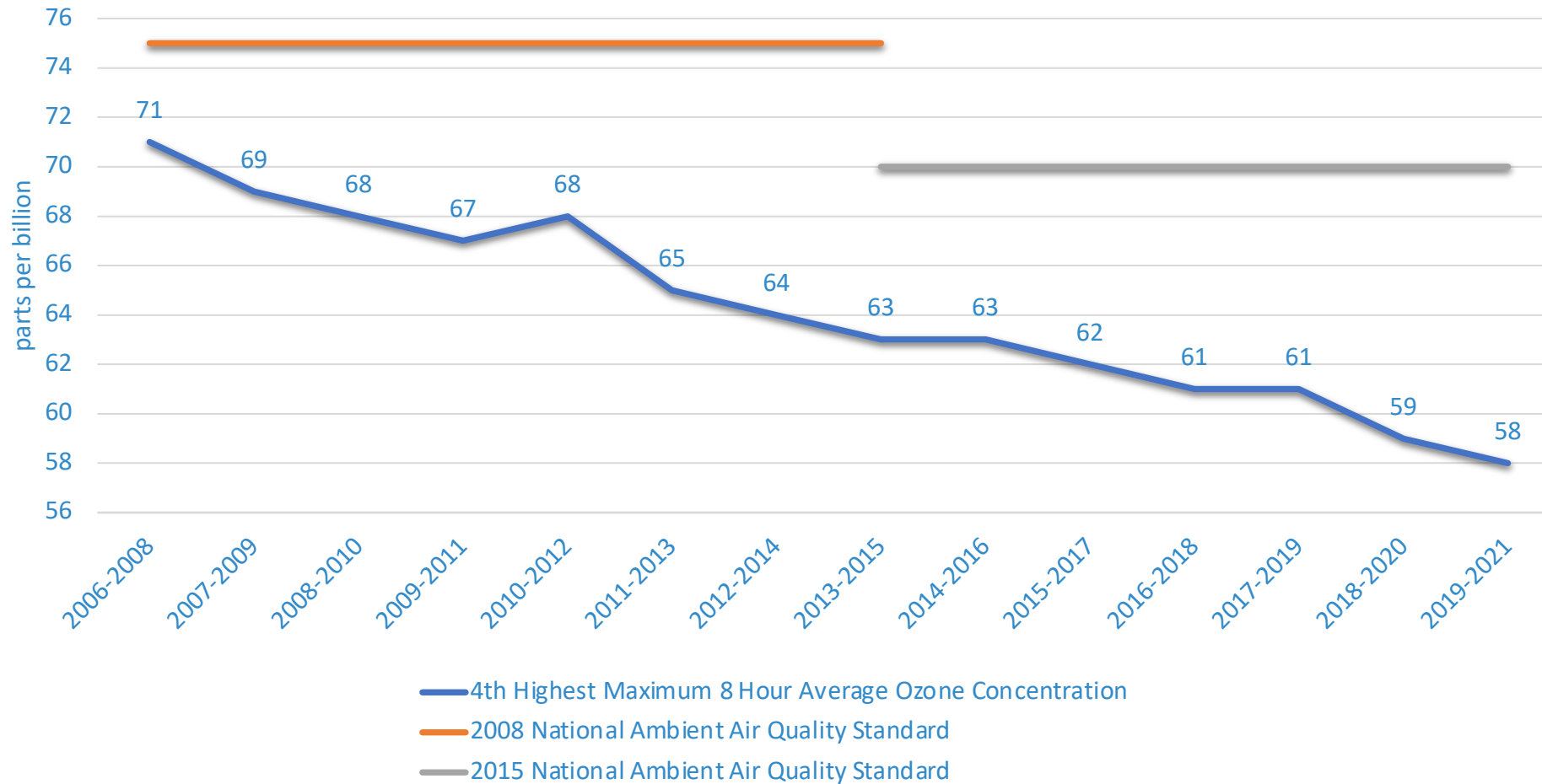
Sulfur  
Dioxide

Carbon  
Monoxide



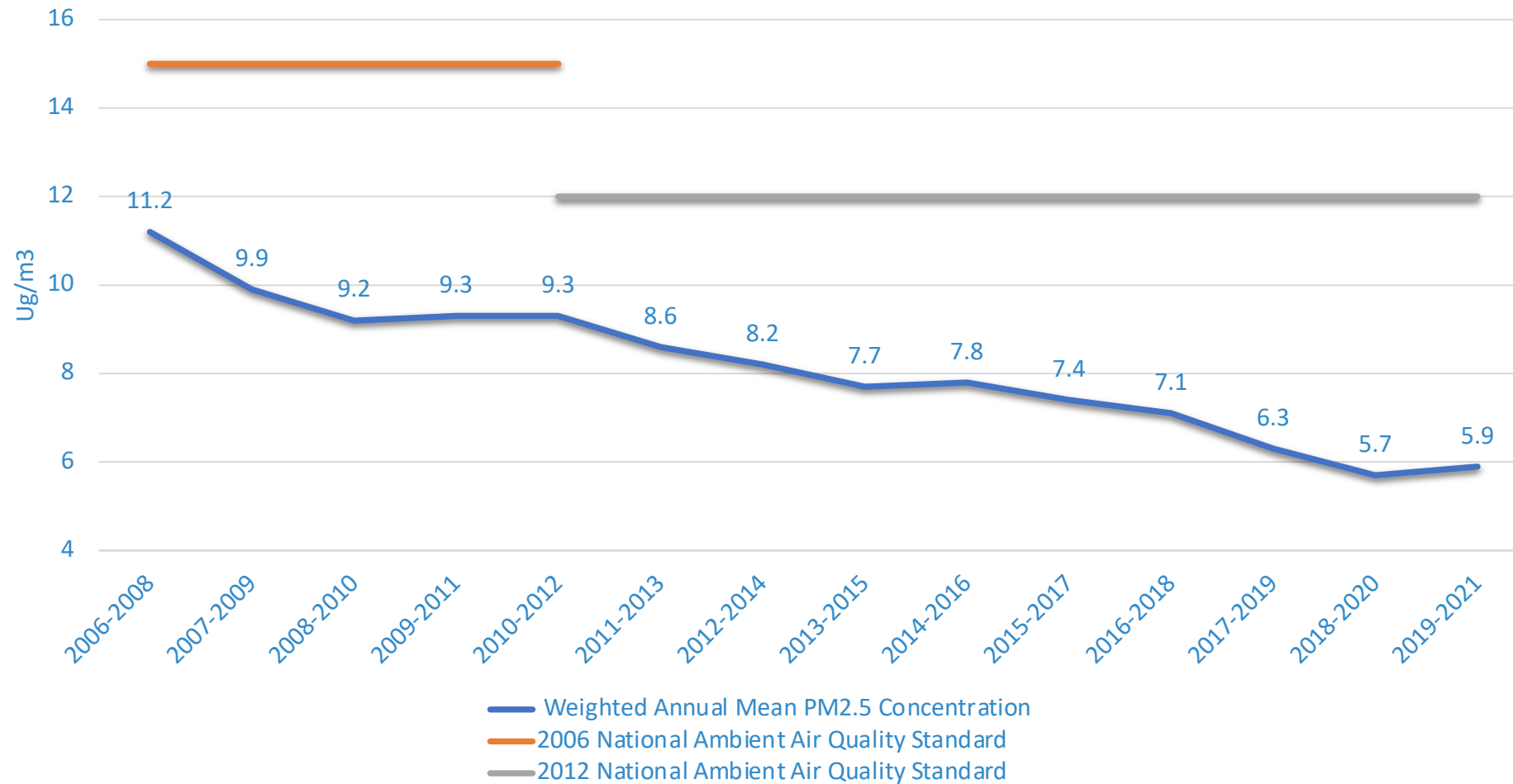
# Ozone Levels in Buncombe County

## Ozone 3-Year Design Values for Buncombe County

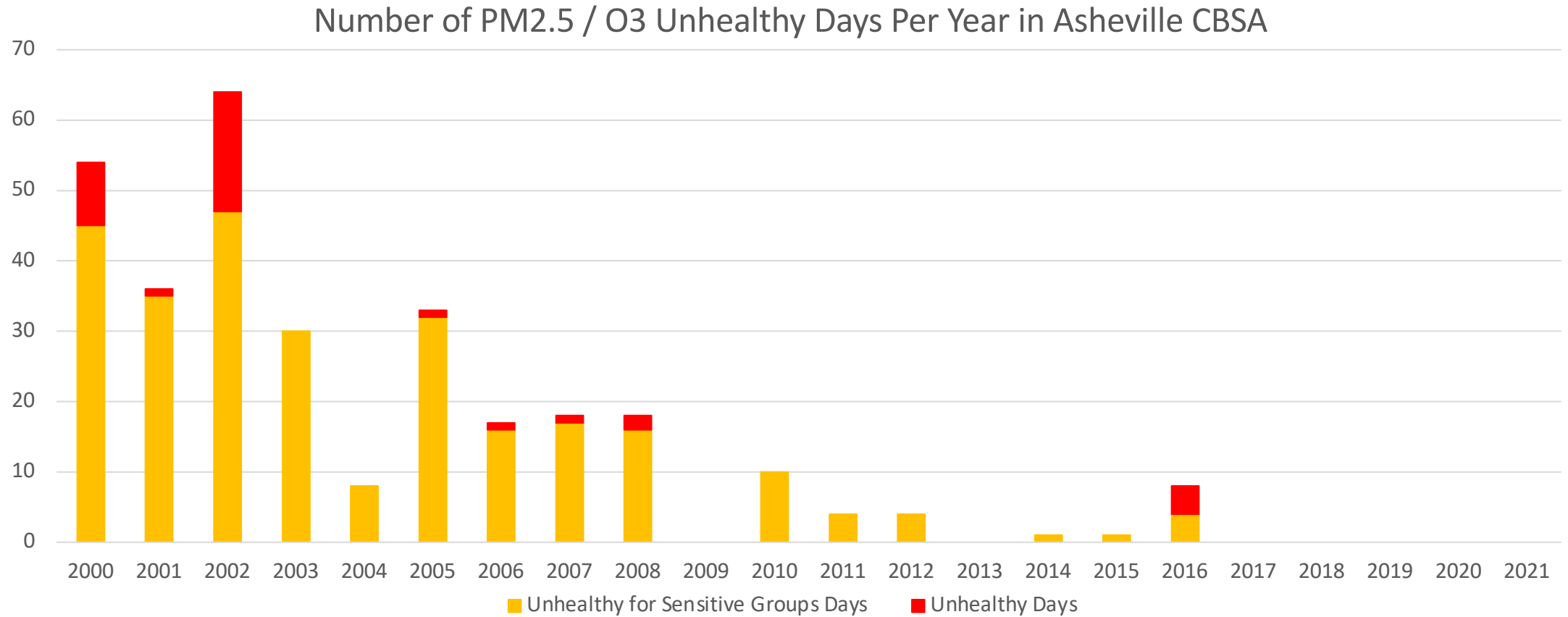


# PM2.5 Levels in Buncombe County

## PM2.5 3-Year Design Values for Buncombe County



# Air Quality Unhealthy Days



# Visibility

## Improvement in Haze on 20% Most Impaired Days at Look Rock



*Then...*

1998

8 mile Visual Range

33 deciviews

*Now...*

2018

40 mile Visual Range

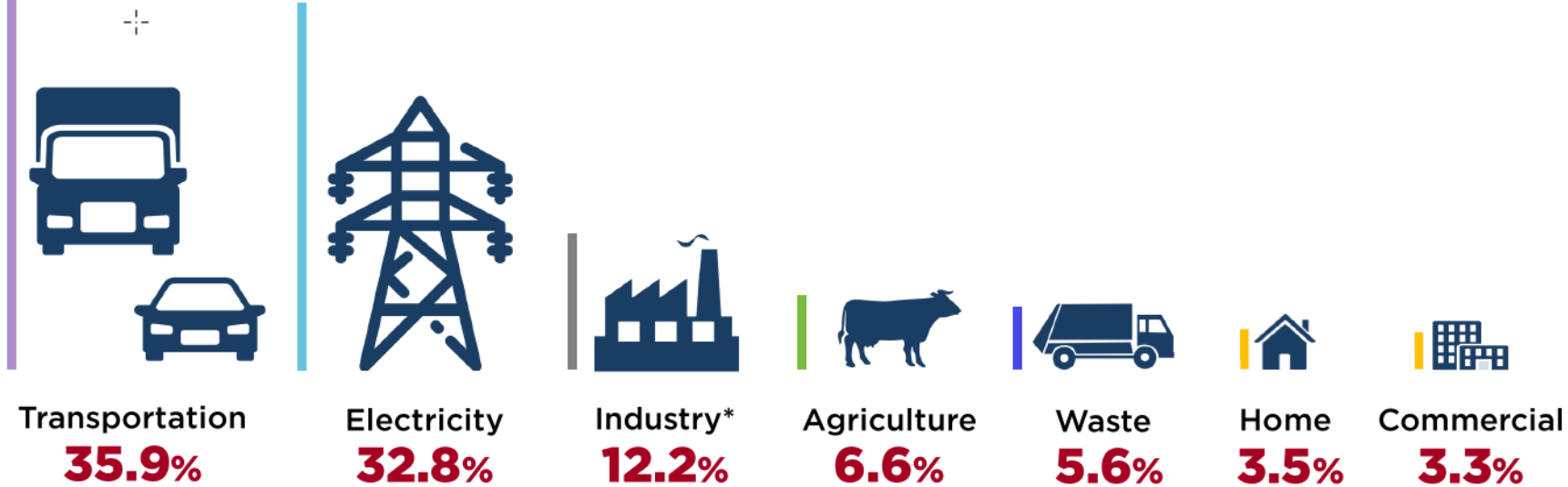
17 deciviews





# NC Greenhouse Gas Emissions Inventory

## Gross GHG Emissions by Economic Sector in 2018



### 2018 Gross GHG Emissions

**159.5** million metric tons of CO<sub>2</sub>e

CO<sub>2</sub> emissions from fossil fuel combustion:

**81.3%**

of total gross emissions

CO<sub>2</sub> emissions removed by forests & other lands:

**26.4%**

of total gross emissions

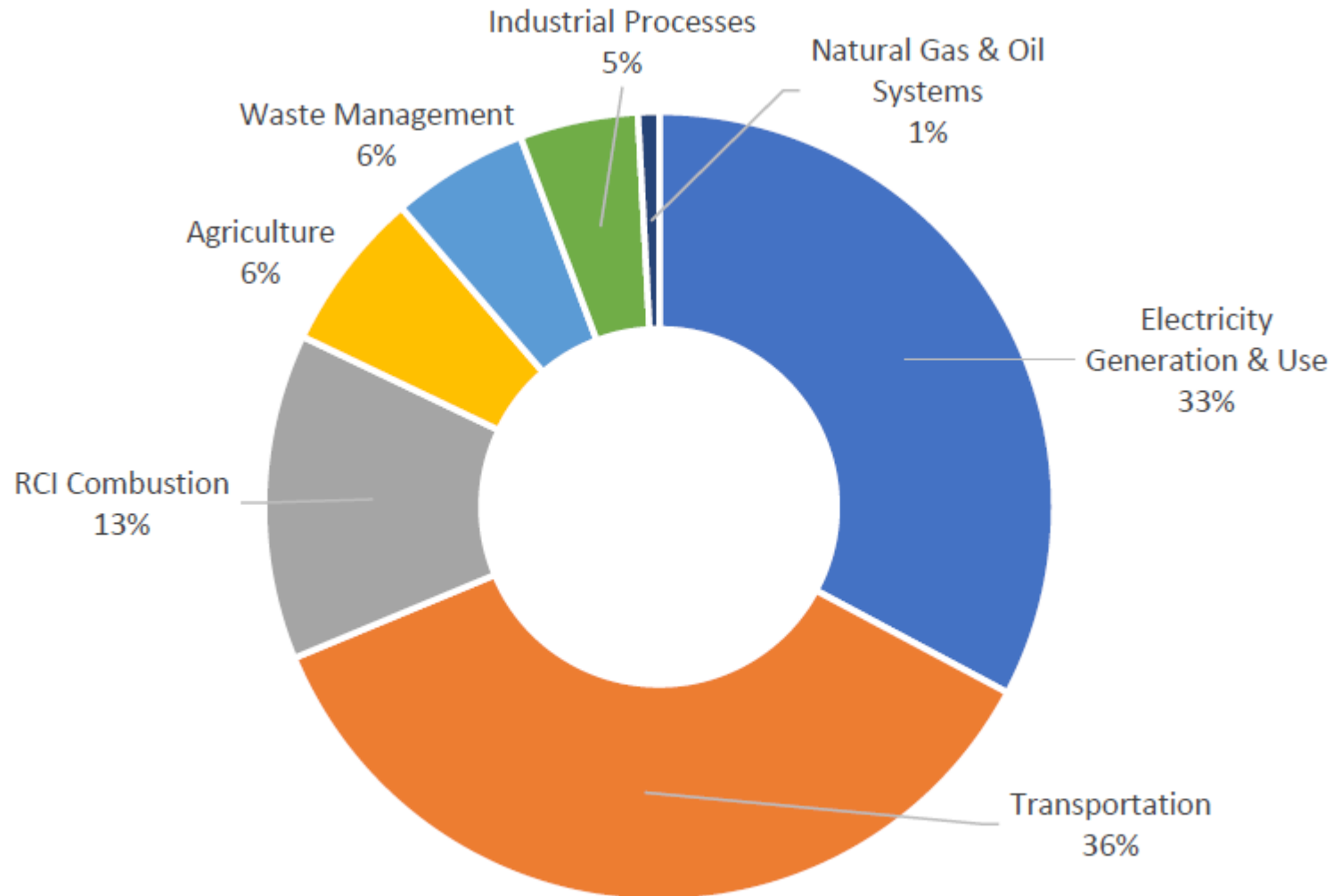
### 2005 - 2018 Change in Gross GHG Emissions

- ▼ **34.7%** — Electric Generation
- ▼ **16.5%** — Residential
- ▼ **3.5%** — Transportation
- ▲ **1.7%** — Industry\*
- ▲ **3.3%** — Commercial

### Statewide Net GHG Reductions (2005-2018)

↓ **23.0%**

# Percentage of NC 2018 GHG Emissions by Source Sector



2018 NC Gross Emissions: 159.48 MMT CO<sub>2</sub>e

North Carolina Greenhouse Gas  
Emissions Inventory January 2022

# What's New

- Duke Energy Progress Western Carolinas Modernization Project
  - 2 new natural gas/fuel oil fired combined cycle are operational.
  - Coal fired units retired on January 29, 2020
- American Rescue Plan and Inflation Reduction Act funds for new air pollution monitors in Buncombe County
  - New PM-10 monitor and replacement equipment for ground level ozone
- Upgrade to Buncombe County Air Pollution Monitoring Site
  - Moving site from Roof to Ground
    - Safety benefits
    - Sensor shelter for citizen science projects



*From NC DAQ*

# What's New

- Electric School Buses-funding available now
  - First Electric School Bus in NC-Cherokee (NC VW settlement funds)
  - EPA Program-5 billion over 5 years. \$500 million per year. BC Schools Applied.
- EPA Advance Program-community partnerships
- Environmental Justice/Equity policies and project opportunities
- Air and Climate-co-benefits and partnerships
- NC Clean Transportation Plan
- NC Advanced Clean Trucks Rule
- Bipartisan legislation SL 2021-165 (House Bill 951)-NC Carbon Plan
- Inflation Reduction Act-Climate Pollution Reduction Grants

# Contact Information

Ashley Featherstone, Director  
Asheville-Buncombe Air Quality Agency  
[Ashley.Featherstone@buncombecounty.org](mailto:Ashley.Featherstone@buncombecounty.org)  
828-250-6778

Evan Couzo  
Associate Professor of Atmospheric Sciences, Associate Professor of STEM Education  
UNC Asheville  
[ecouzo@unca.edu](mailto:ecouzo@unca.edu)  
828-251-6026

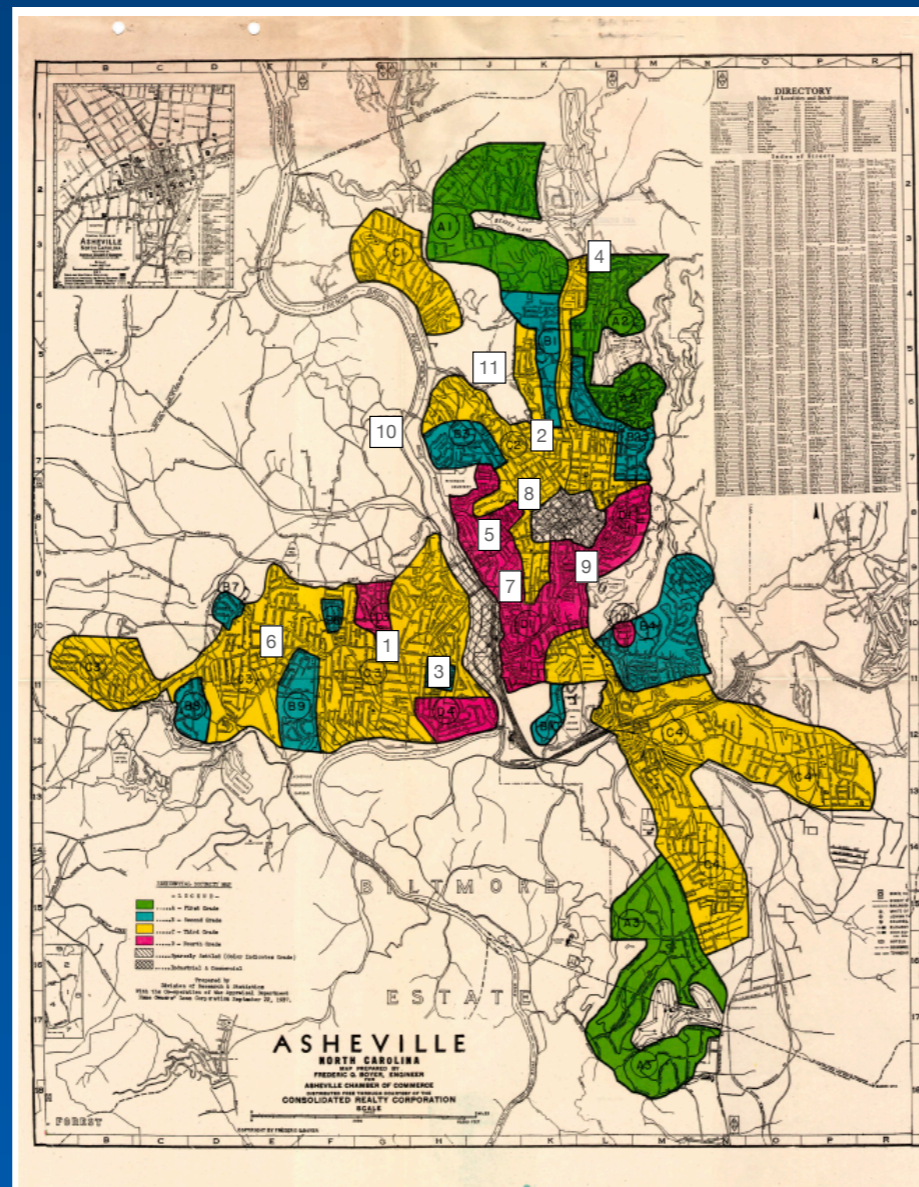
Thank you!

# Mapping air pollution disparities using low-cost particulate sensors

- Two objectives:
  - Design, build, and test low-cost PM<sub>2.5</sub> sensors using Raspberry Pi
  - measure ambient PM<sub>2.5</sub> disparities across Asheville
- Will result in neighborhood-scale PM<sub>2.5</sub> measurements
- Two measurement campaigns
  - Fall 2023
  - Winter 2024
- EPA P3 grant 84057201-0



# Use HOLC "red lining" maps to place sensors



1. Asheville Primary (Yellow/Red)
2. Claxton Elementary (Yellow)
3. Hall Fletcher Elementary (Blue)
4. Ira B. Jones Elementary (near Green)
5. Isaac Dickson Elementary (Red)
6. Lucy S. Herring Elementary (Yellow)
7. Asheville Middle (Red)
8. Montford North Star (Yellow)
9. Asheville High (near Blue/Yellow)
10. WNCRAQA monitors
11. UNC Asheville ECONet

Original map:  
<https://dsl.richmond.edu/panorama/redlining/>

- Well documented that air pollution disproportionately affects low-income and racial minorities
- Not coincidentally, these are often red lined neighborhoods
- Place sensors at Asheville City Schools campuses, UNC Asheville, and ABAQA FEM monitor

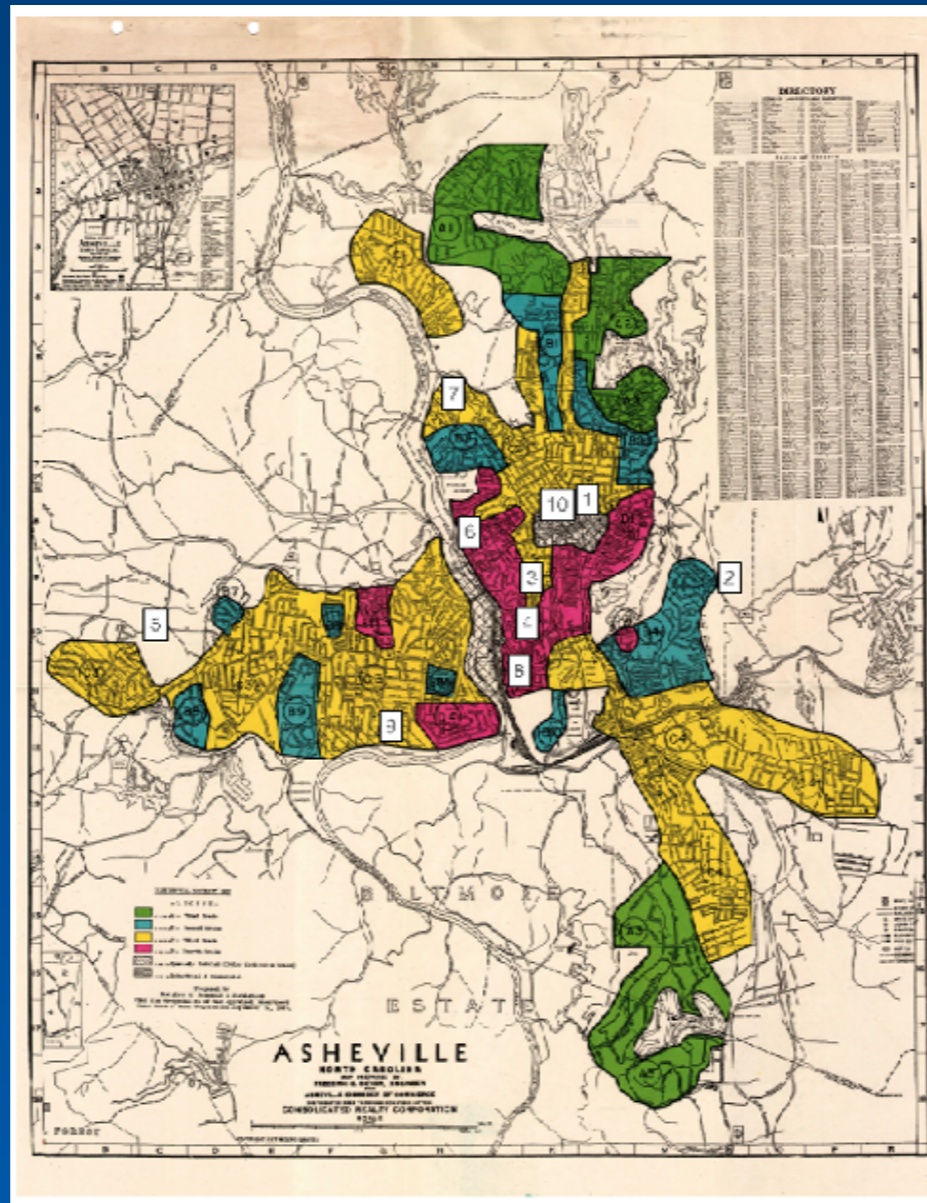


# Asheville reparations and EJ community data initiative

- Two objectives:
  - real time PM<sub>2.5</sub> and temperature measurements for at risk communities
  - long term data record
- Similar to previous project but using commercially available PurpleAir sensors
- Temperature measurements allow us to asses heat stress/urban heat island risk
- funding from UNC Asheville SHIFT initiative



# Deploy sensors in public housing communities



1. Altamont Apartments (near Yellow)
2. Asheville Terrace (near Blue)
3. Aston Park Tower (Yellow)
4. Bartlett Arms Apartments (Red)
5. Deaverview Apartments (near Yellow)
6. Hillcrest Apartments (Red)
7. Klondyke Homes (Yellow)
8. Livingston Apartments (Red)
9. Pisgah View Apartments (Yellow)
10. Woodfin Apartments (near Yellow)

Original map:  
<https://dsl.richmond.edu/panorama/redlining/>

- 10 public housing communities (note overlap with red lined neighborhoods), UNC Asheville, and ABAQA regulatory monitor
- Will also place sensors in wealthier neighborhoods for comparison
- Part of larger study (w/ Kathleen Lawlor, Economics professor) investigating effects of systemic racism in Asheville