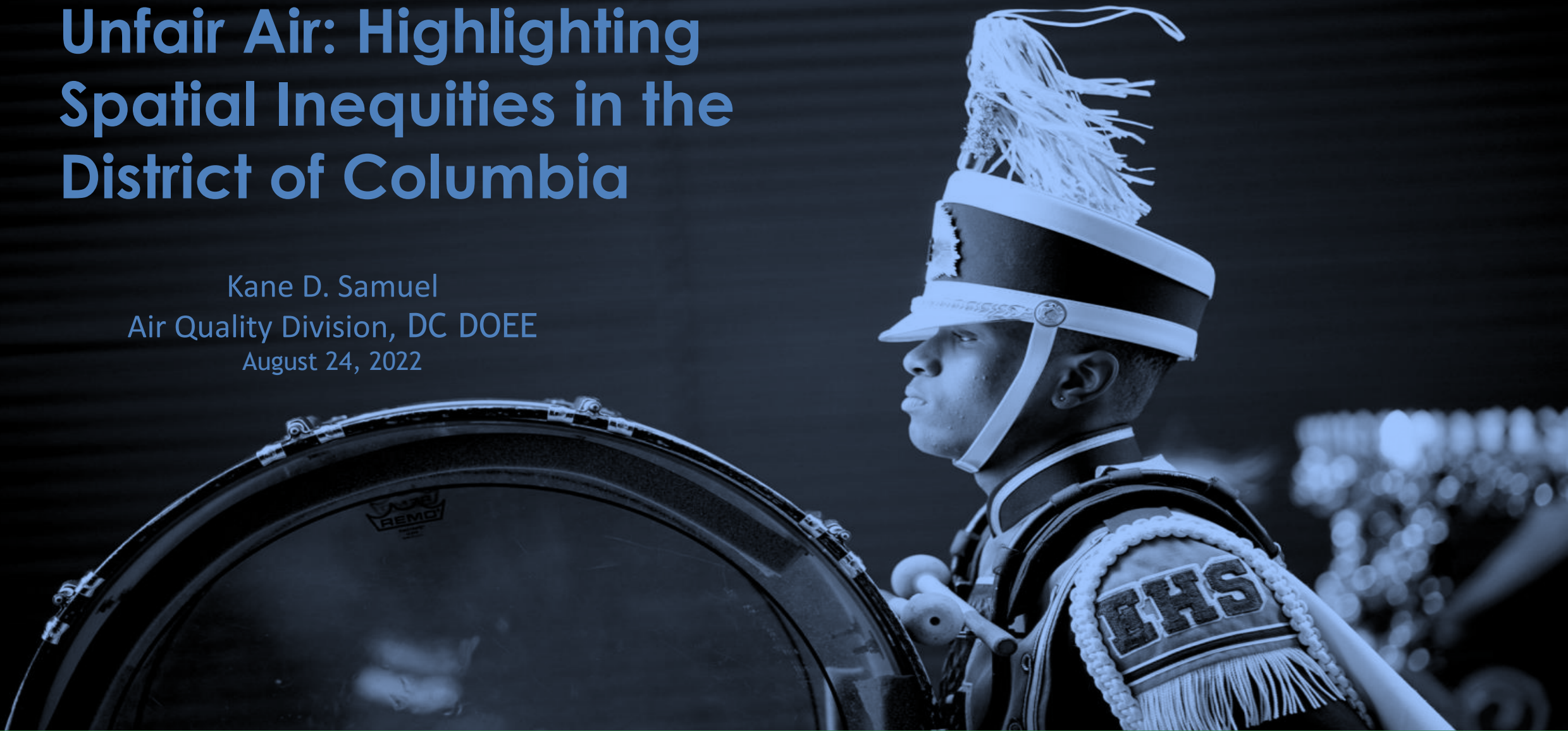


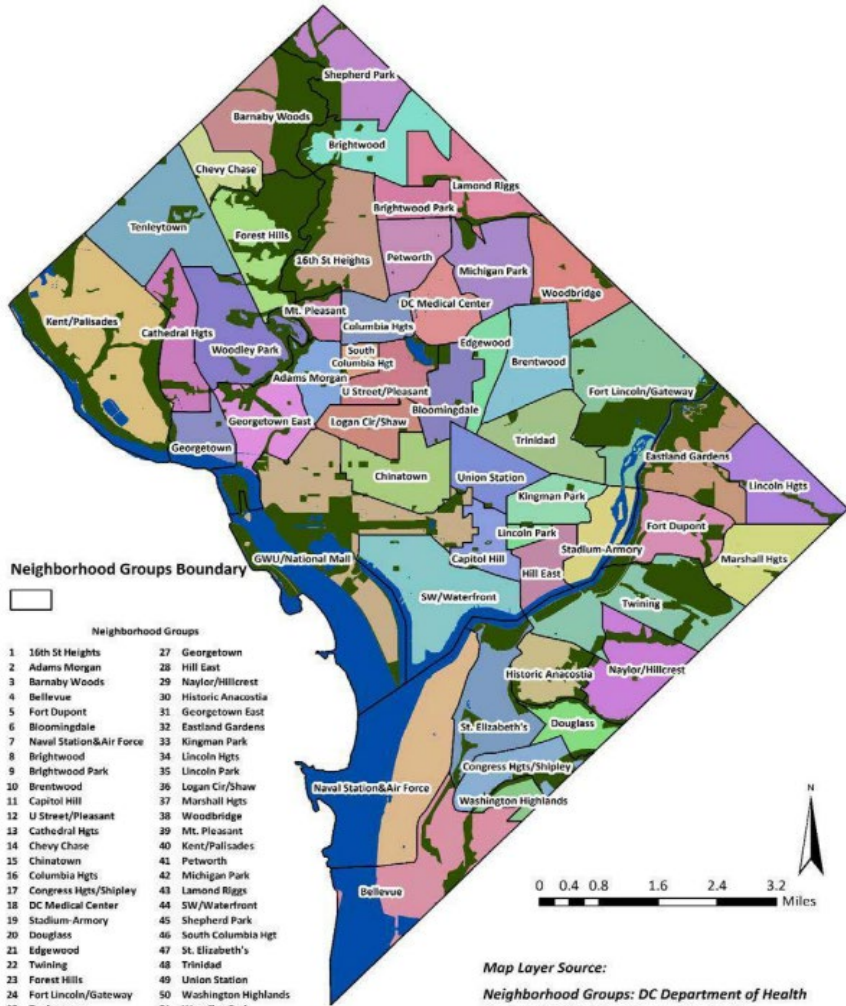
Unfair Air: Highlighting Spatial Inequities in the District of Columbia

Kane D. Samuel
Air Quality Division, DC DOEE
August 24, 2022



GOVERNMENT OF THE
DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

DISTRICT OF COLUMBIA



- 705,000 people
- 68 sq mi/170 km
- 46% black, 37% white, 11% Latinx, 4% Asian
- 14% foreign born
- \$82,605 average HH income
- 16% poverty rate

Map Layer Source:
Neighborhood Groups: DC Department of Health
Center of Policy, Planning and Evaluation

DISTRICT OF COLUMBIA



White:
\$284,000

The net worth of white households in DC is 81 times higher than black households.ⁱⁱ



Between **2007** and **2014**, the median household income in DC increased by **\$10,000** but remained flat for black households.ⁱⁱⁱ

There are **43,000** D.C. residents who qualify as "extremely low-income."

91% of "extremely low-income" families are African-American.^{iv}



108,732 DC residents lived below the poverty line in **2012**.

115,119 residents lived below the poverty line in **2017**.^v

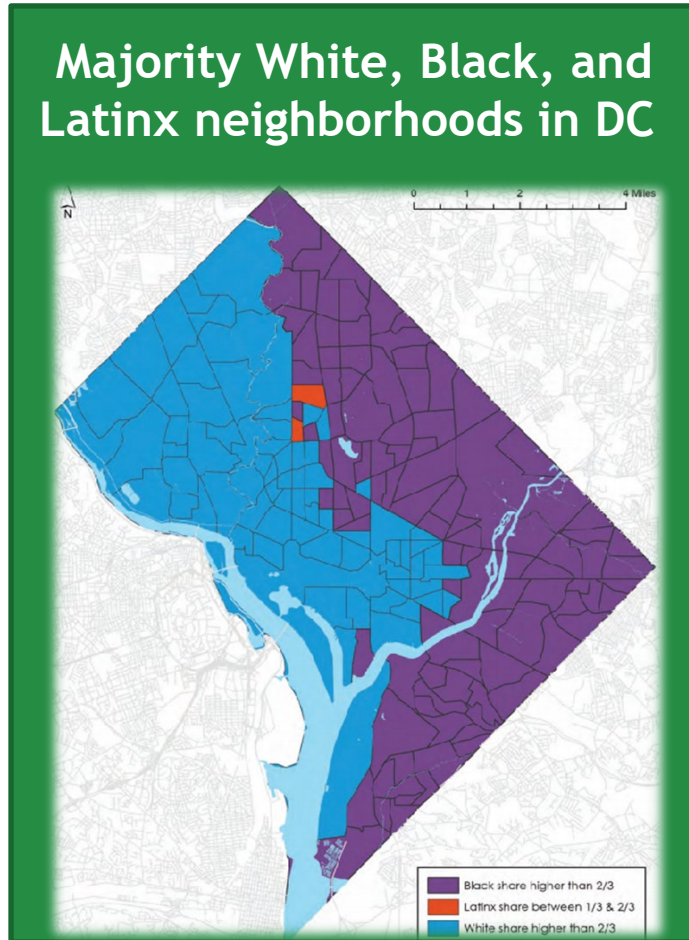
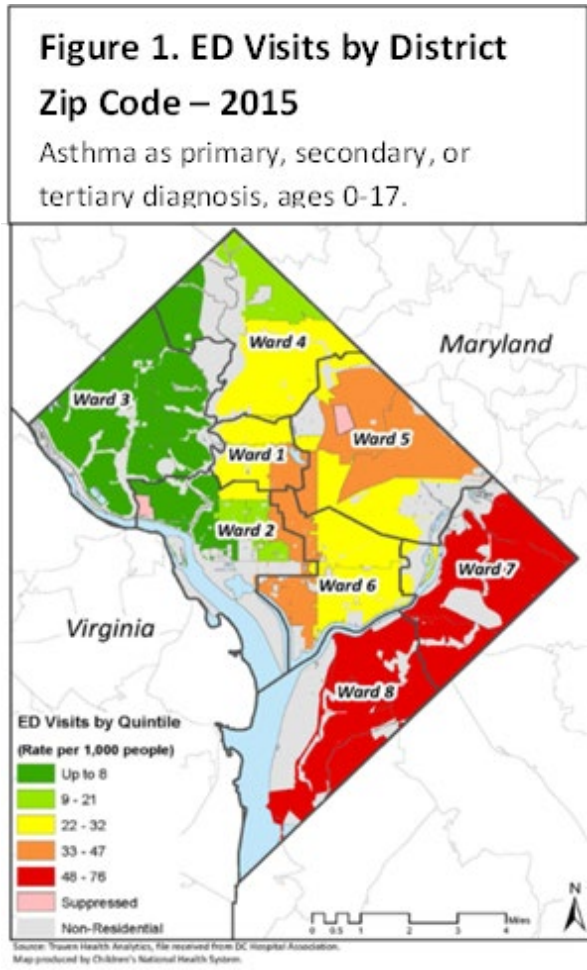


DC has the highest food assistance program use percentage in the U.S.^{vi}

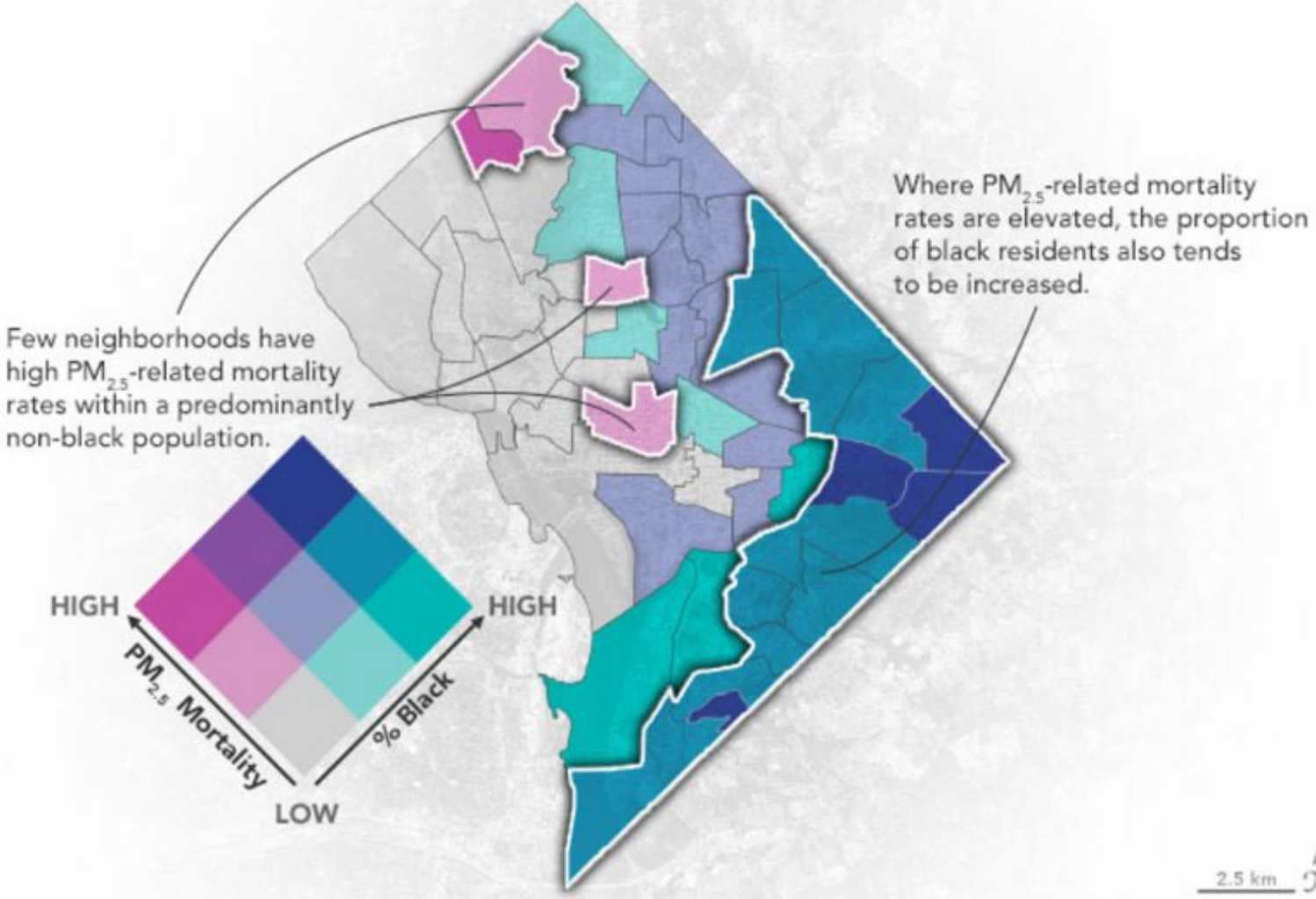


DC has a **\$22,803** median student loan balance, the highest among any U.S. metropolitan area.^{vii}

Asthma and Race in DC



PM2.5 related mortality



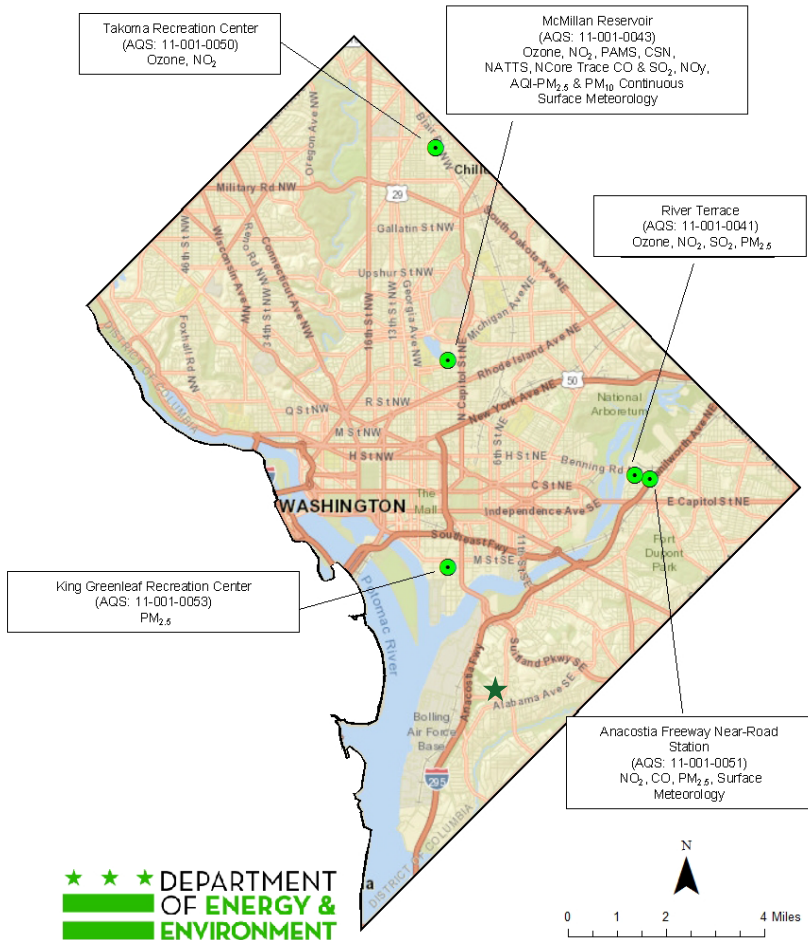
Air Monitoring in the District

- 14 cities dust-fall measurement study 1931-1933
- 10 cities SO₂ & ozone study 1953-1954
- National Air Sampling Network 1953-1959
- Continuous Air Monitoring Program 1962/1963
 - First continuous measurement program:
Ozone, SO₂, NO₂, NO, CO, total oxidants, total hydrocarbons
 - 7 cities:
New Orleans, Chicago, Philadelphia, Cincinnati, San Francisco, Los Angeles, and Washington, DC (at CAMP Station)



District's CAMP station

DOEE Air Monitoring Network Overview



Site Name	Chemicals Measured	Location Setting
McMillan Reservoir	PM _{2.5} , PM ₁₀ , O ₃ , SO ₂ , NO _x , CO	Urban
River Terrace Education Center	PM _{2.5} , O ₃ , NO _x	Urban / overburden community
I-295 Near-Road Station	PM _{2.5} , PM ₁₀ , NO _x , CO	Urban / overburden community
King Greenleaf Rec Center	PM _{2.5} , PM ₁₀	Urban / overburden community
Takoma Rec Center	O ₃ , NO _x	Urban

Air Monitoring Stations



McMillan
Monitoring Site



King Green Leaf
Monitoring Site



Near Road
Monitoring Site

Air Monitoring Stations



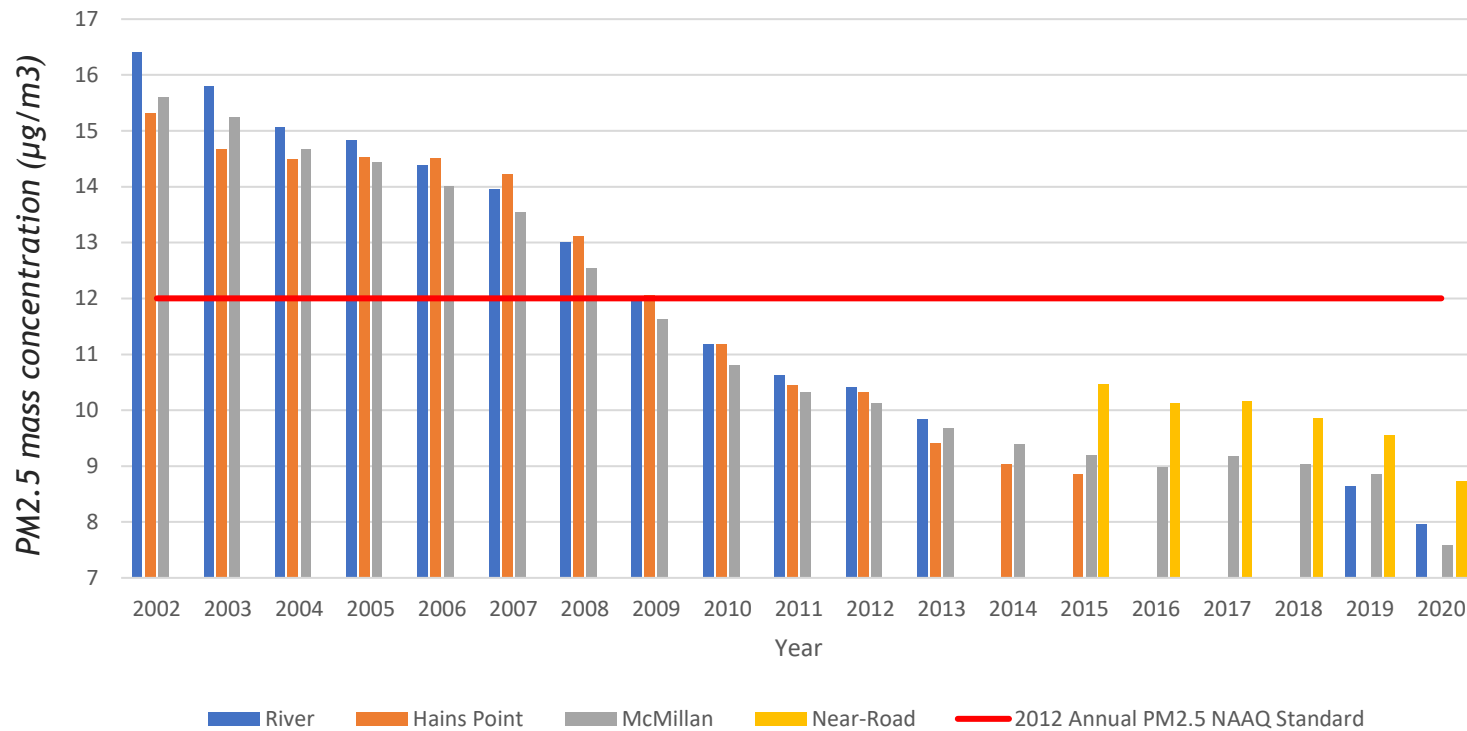
McMillan Monitoring Site

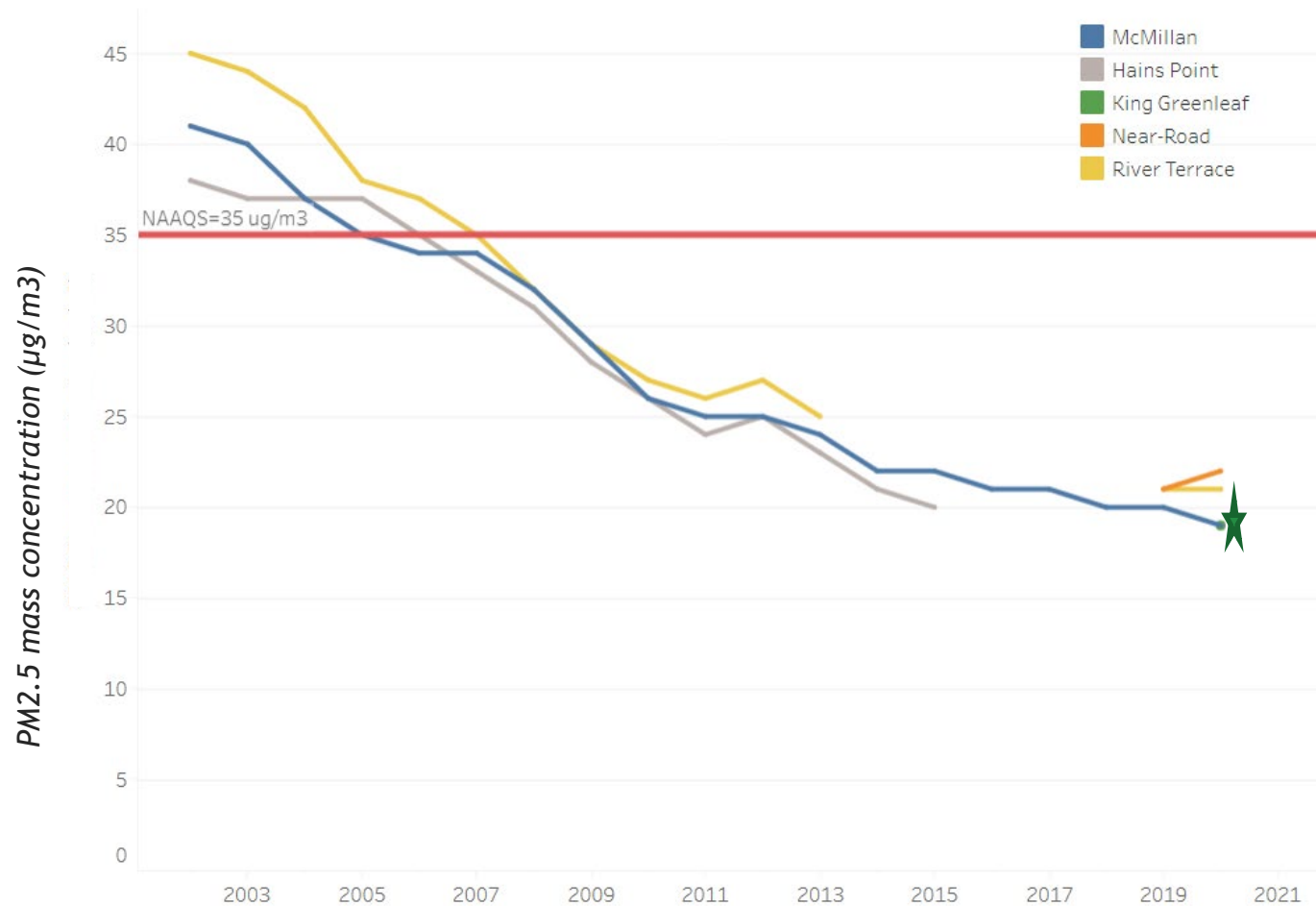


River Terrace
Monitoring Site

Long-term PM_{2.5} trends In the District

- Annual PM_{2.5} levels have gradually declined each year since 2004 in the District.

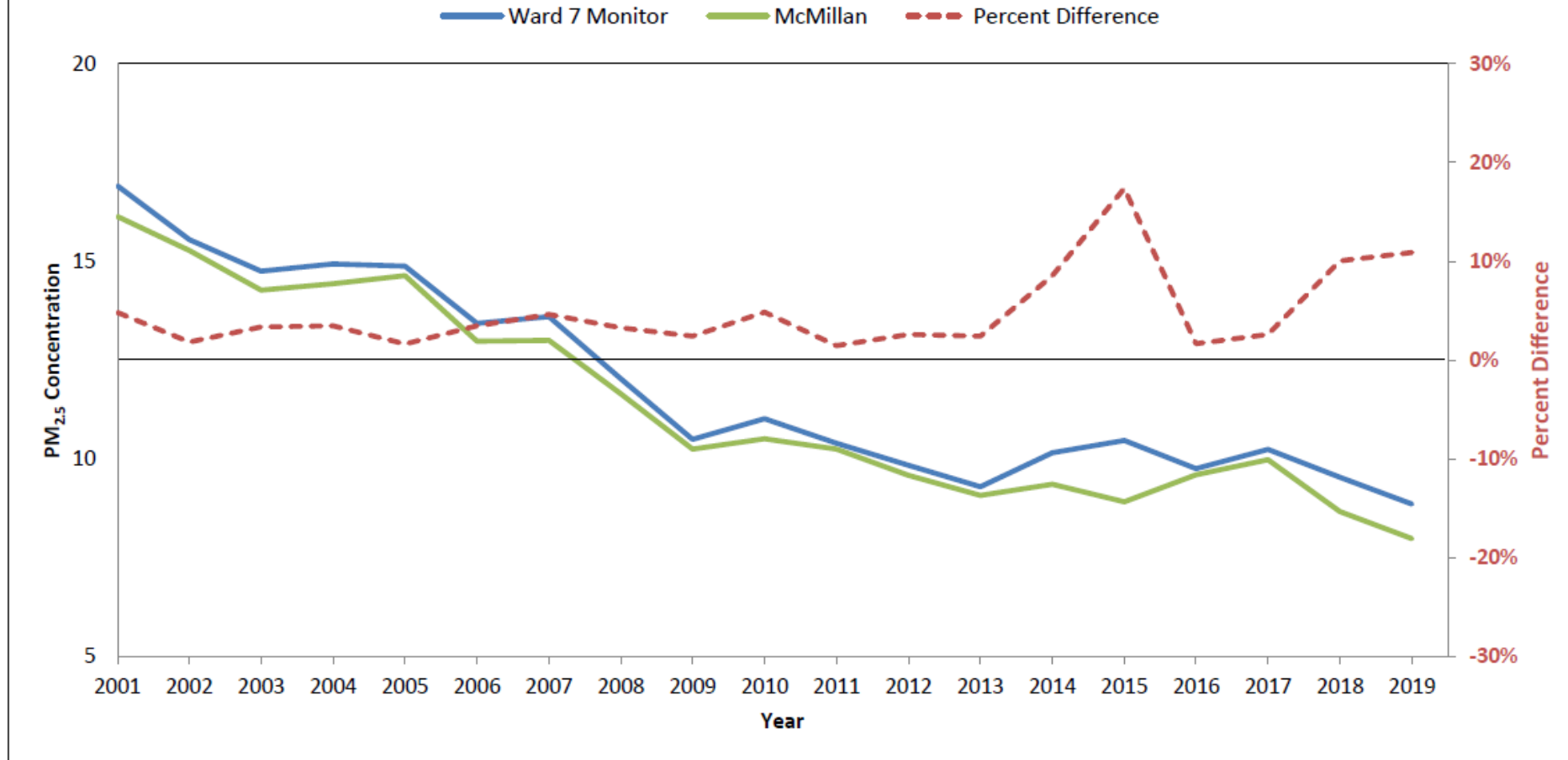




PM_{2.5} 24-Hour Design Values Trends

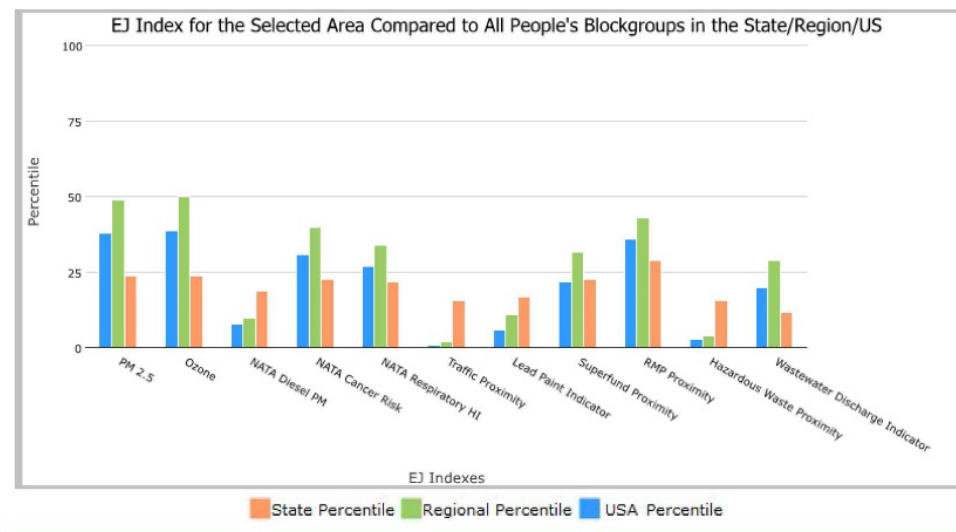
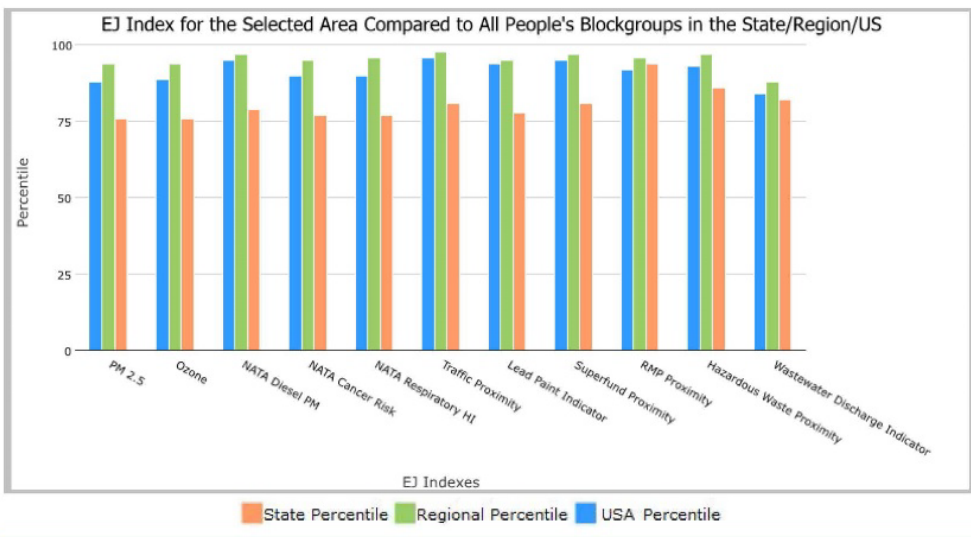
PM_{2.5} Design Values Compared to the 24-hour NAAQS in the District from 2002 - 2020

Annual PM_{2.5} Air Quality; 2001-2019 Ward 7 Monitor Vs. McMillan



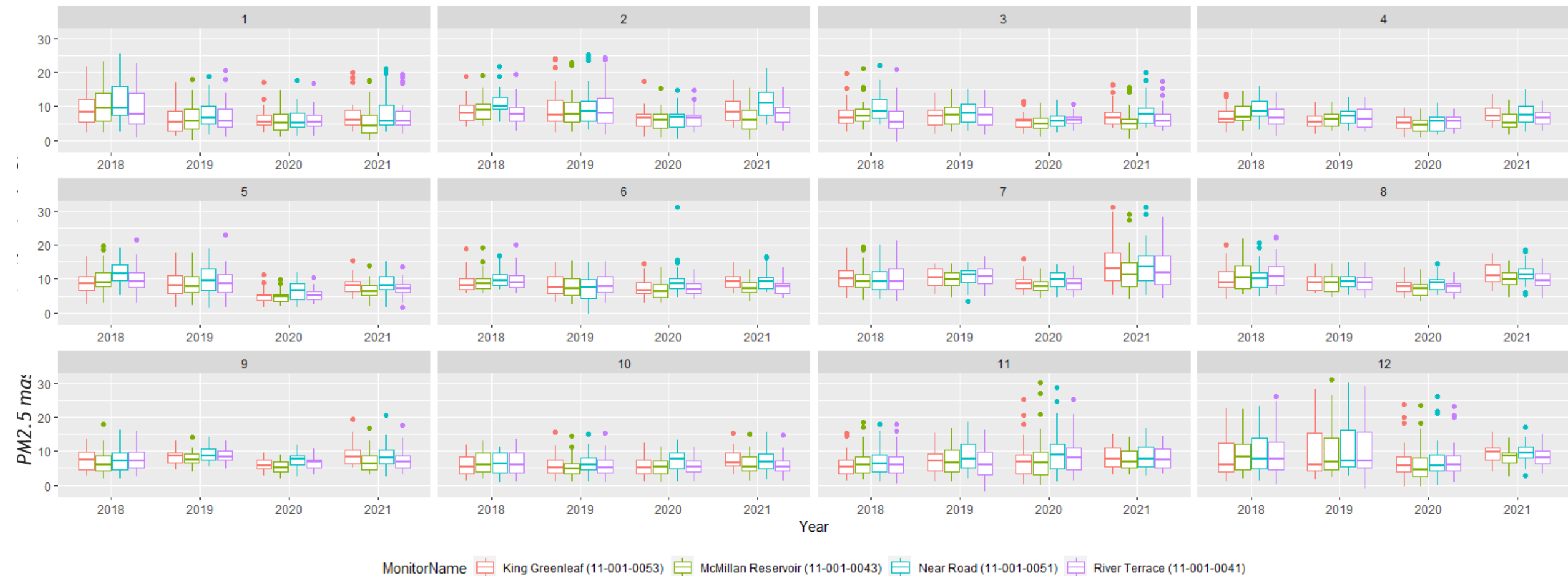
Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	76	94	88
EJ Index for Ozone	76	94	89
EJ Index for NATA [*] Diesel PM	79	97	95
EJ Index for NATA [*] Air Toxics Cancer Risk	77	95	90
EJ Index for NATA [*] Respiratory Hazard Index	77	96	90
EJ Index for Traffic Proximity and Volume	81	98	96
EJ Index for Lead Paint Indicator	78	95	94
EJ Index for Superfund Proximity	81	97	95
EJ Index for RMP Proximity	94	96	92
EJ Index for Hazardous Waste Proximity	86	97	93
EJ Index for Wastewater Discharge Indicator	82	88	84

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	24	49	38
EJ Index for Ozone	24	50	39
EJ Index for NATA [*] Diesel PM	19	10	8
EJ Index for NATA [*] Air Toxics Cancer Risk	23	40	31
EJ Index for NATA [*] Respiratory Hazard Index	22	34	27
EJ Index for Traffic Proximity and Volume	16	2	1
EJ Index for Lead Paint Indicator	17	11	6
EJ Index for Superfund Proximity	23	32	22
EJ Index for RMP Proximity	29	43	36
EJ Index for Hazardous Waste Proximity	16	4	3
EJ Index for Wastewater Discharge Indicator	12	29	20



IVY CITY (Ward 5)

GEORGETOWN (Ward 2)



PM_{2.5} trends in the District

Daily average PM_{2.5} (µg/m³) by monitor, month, and year from 2018 - 2021, excluding data on July 4 & 5

Hourly PM_{2.5} (µg/m³) from July 1-8 from 2018 to 2021

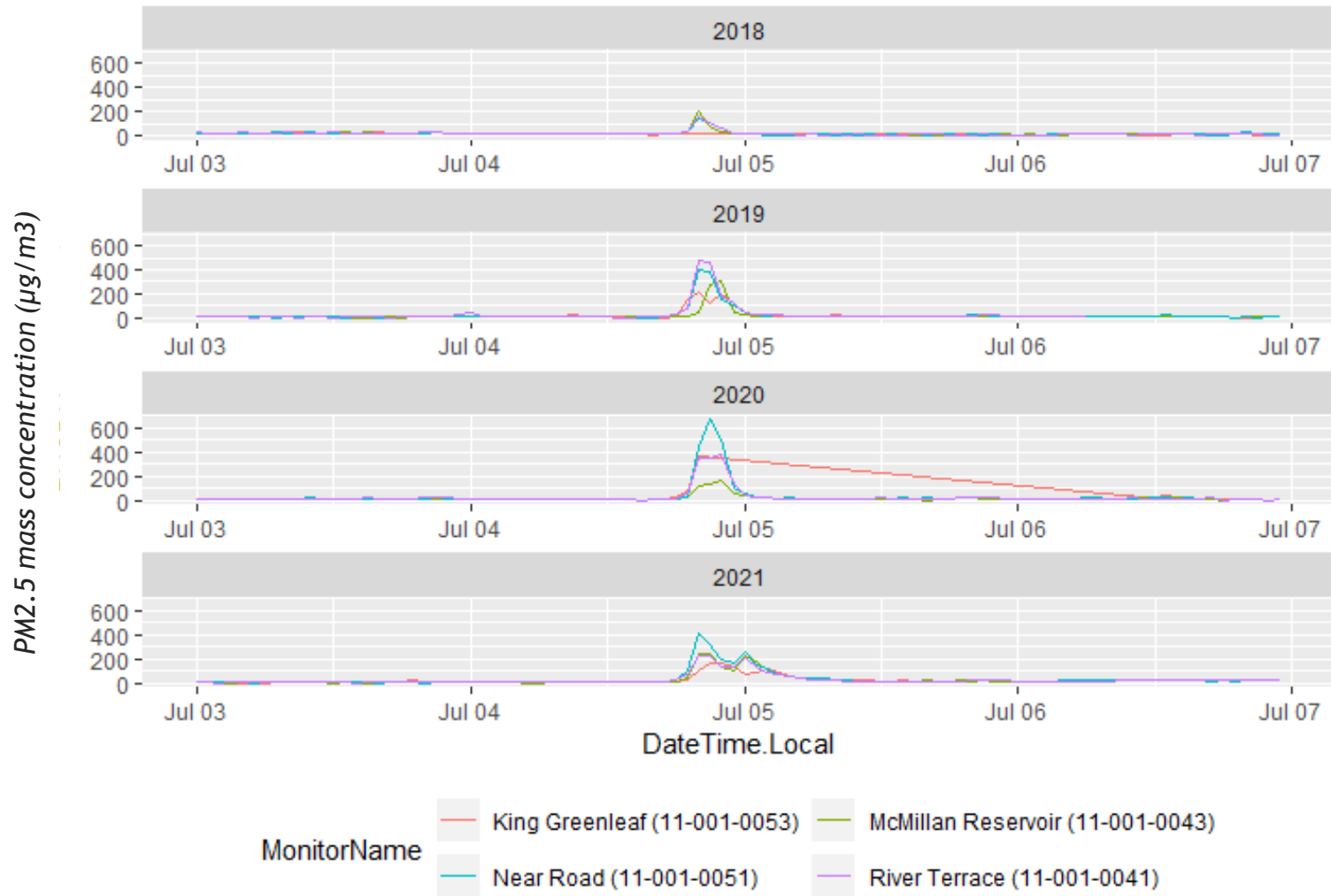


Photo Credit: Anthony Quintano

Moving Forward

Community Scale Monitoring

- Deploying hyperlocal mobile monitoring
- Pilot of four neighborhoods - beginning soon
- District wide-baseline FY23

Ward 8 Monitoring Site

- Introducing a new monitoring site in an underserved community
- Funds under ARPA

Continued Community Outreach

- Keeping residents of the District engaged through:
 - Clearing the Air workshops
 - Air Quality Awareness Week
 - Tabling community events

THANK YOU!



Acknowledgments

- DOEE Air Quality Division
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- Howard University
 - Joseph Wilkins, Assistant Professor

Questions?
