Maryland
Department of
the Environment

An MDE Perspective on Air Quality and Greenhouse Gases

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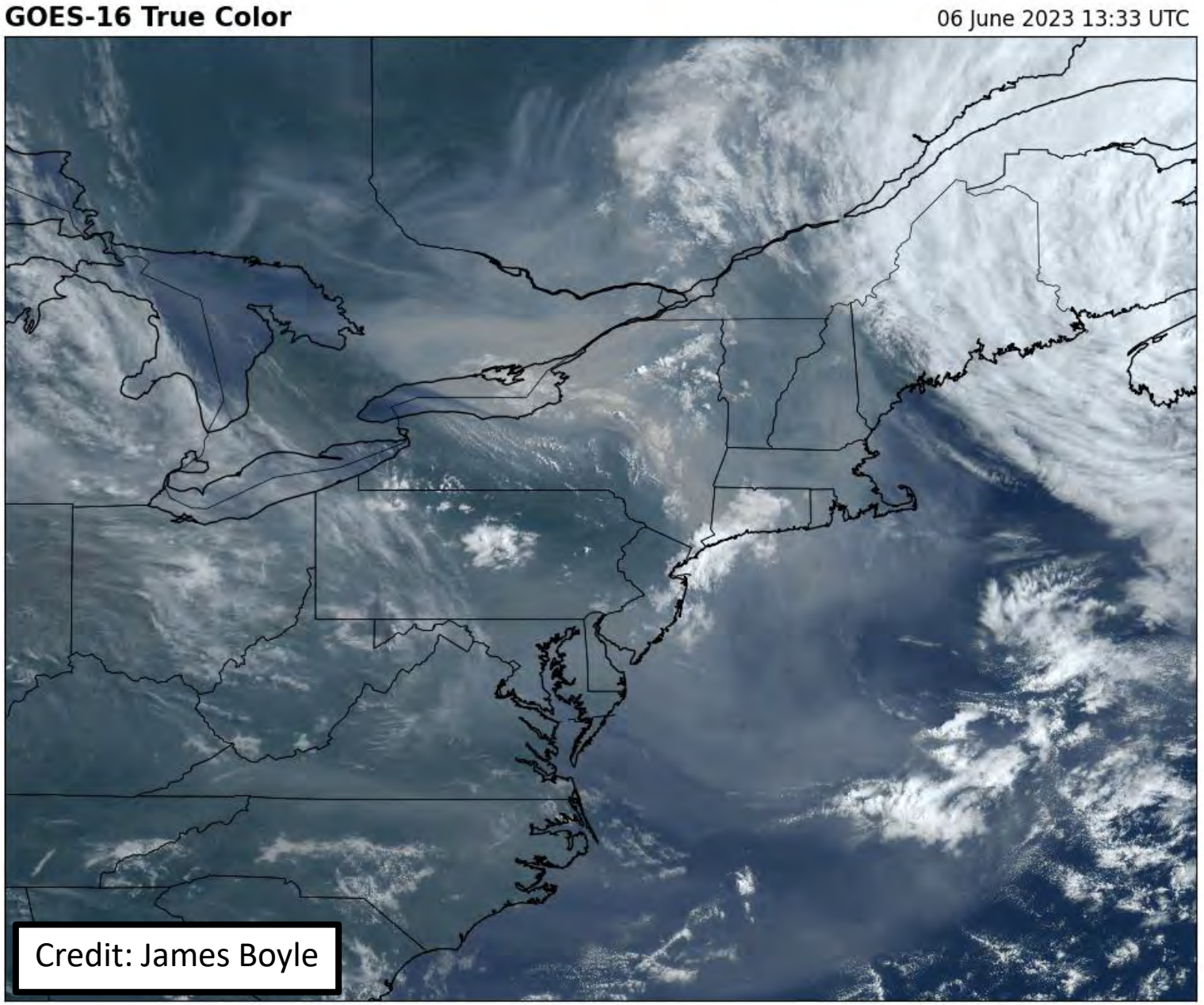
All data is considered preliminary unless otherwise noted

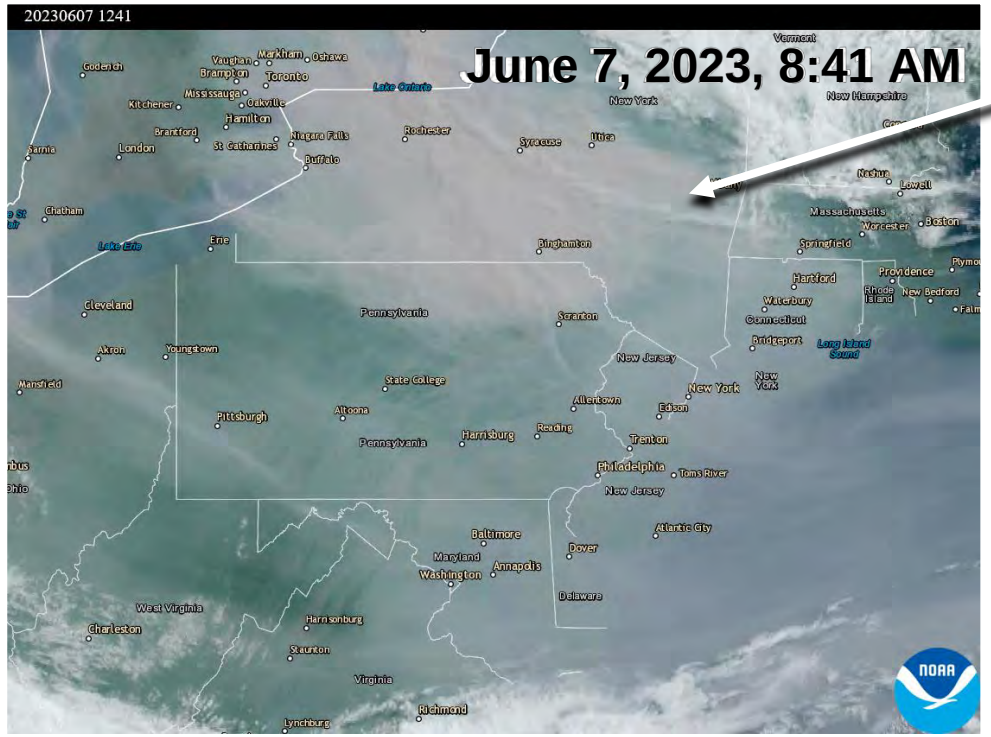
3 Topics to Cover

1. Air Quality
2. Greenhouse Gases
3. Co-Benefits



Air Quality: NAAQS Policies

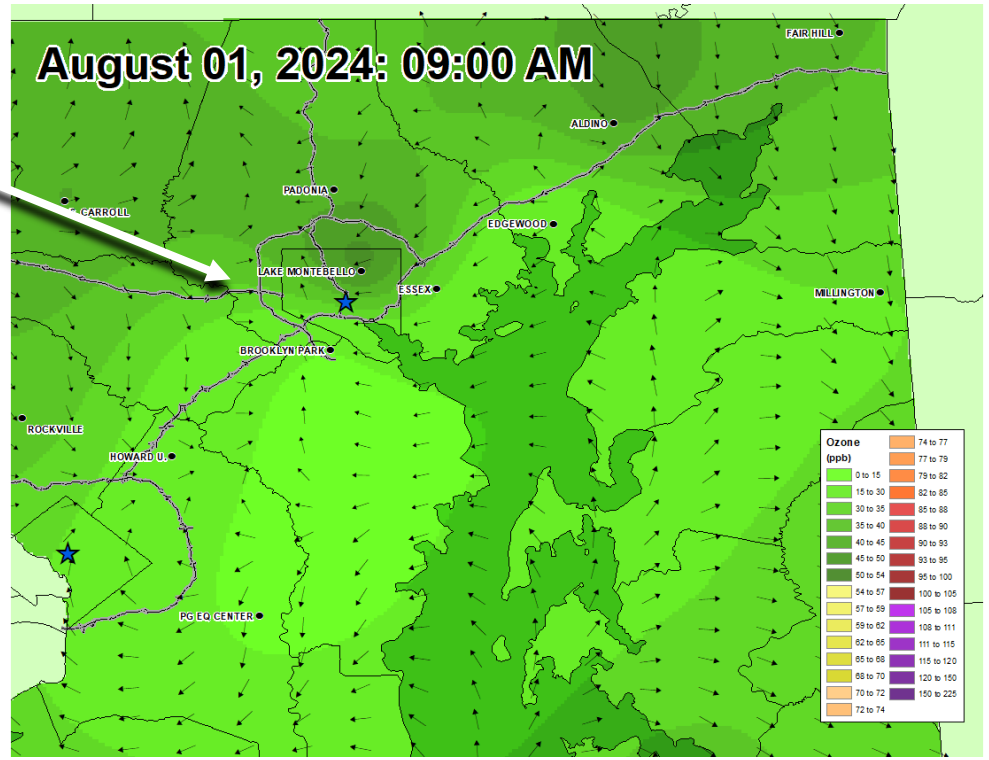
The mission of MDE is to protect and restore the environment for the health and well-being of all Marylanders.



Particles
Ozone
NO_2
SO_2
CO

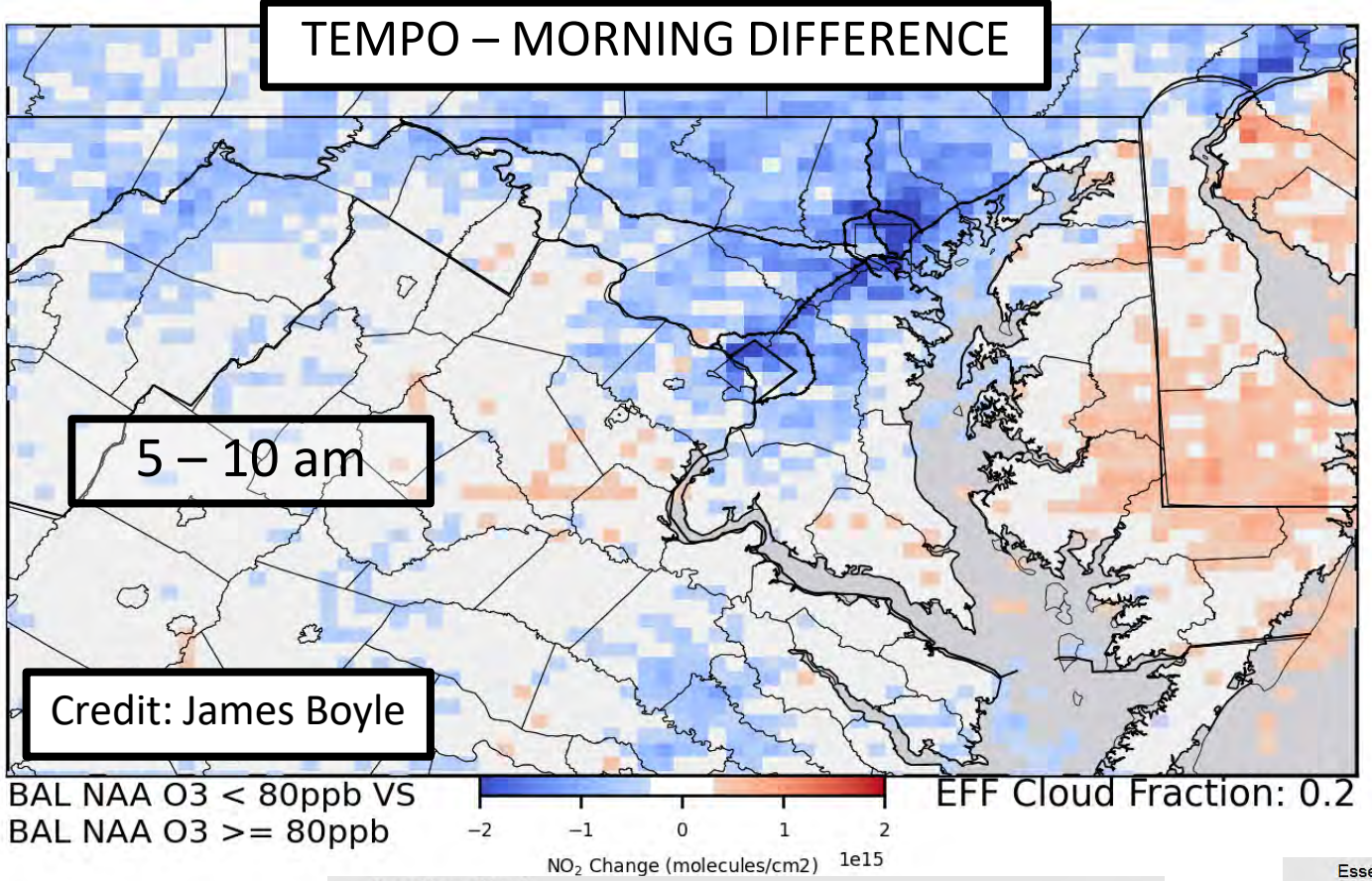
GHGs

How does the state of Maryland reduce these pollutants?

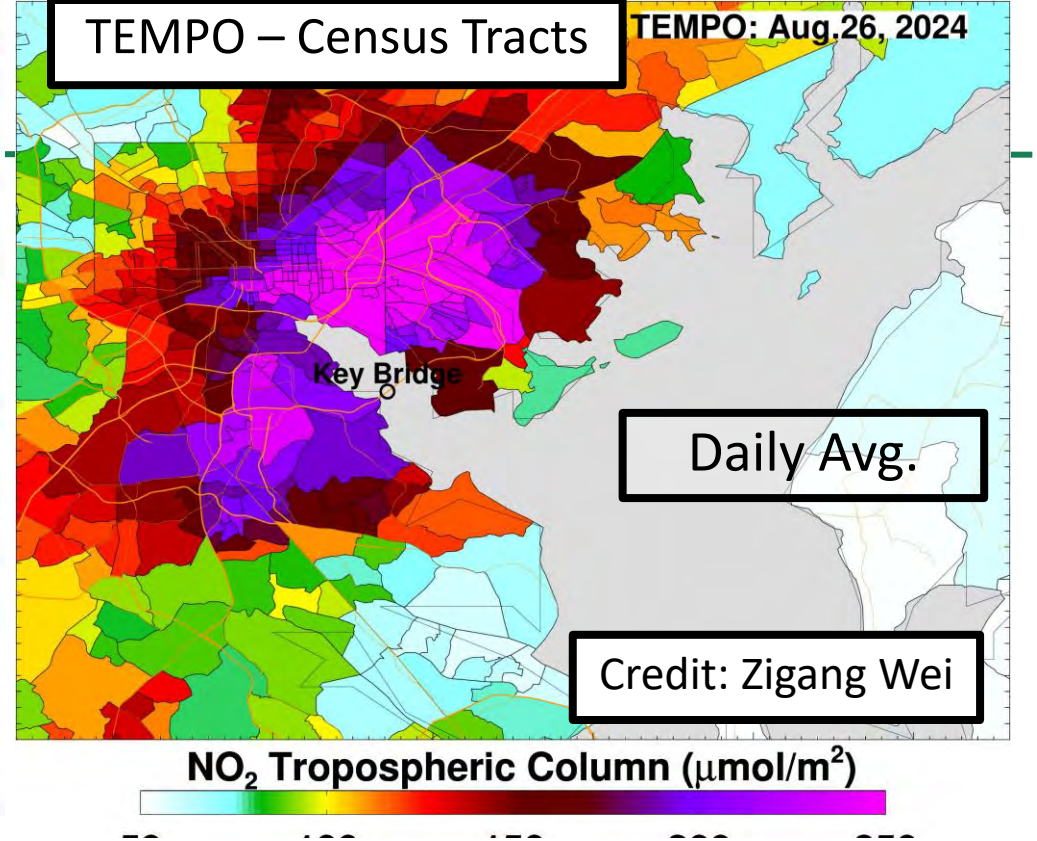


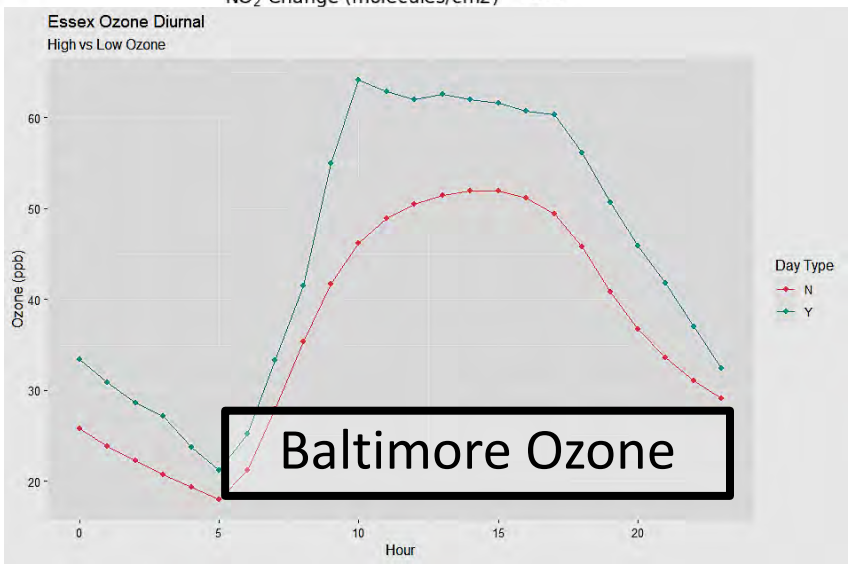
- **Better temporalization and spatial tracking of emissions is vital to understand the evolution of air quality events.**
- **Attainment of Ozone and continued attainment of PM2.5 is dependent of continuing to understanding the changing emissions and atmospheric chemistry in the region.**
- **Fossil fuel usage obviously plays a large role in attainment strategy**
- **Modeling drives our attainment strategy, but observations guide modeling**

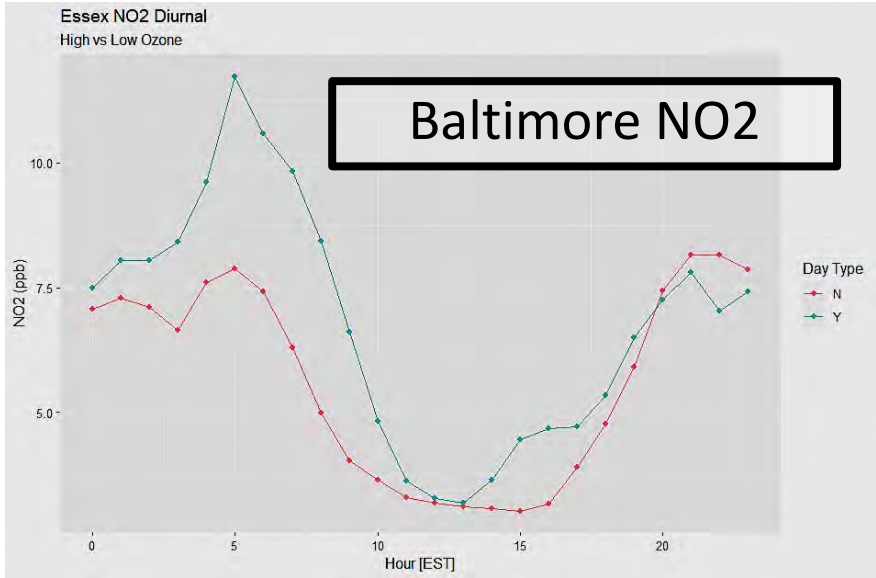
TEMPO – MORNING DIFFERENCE



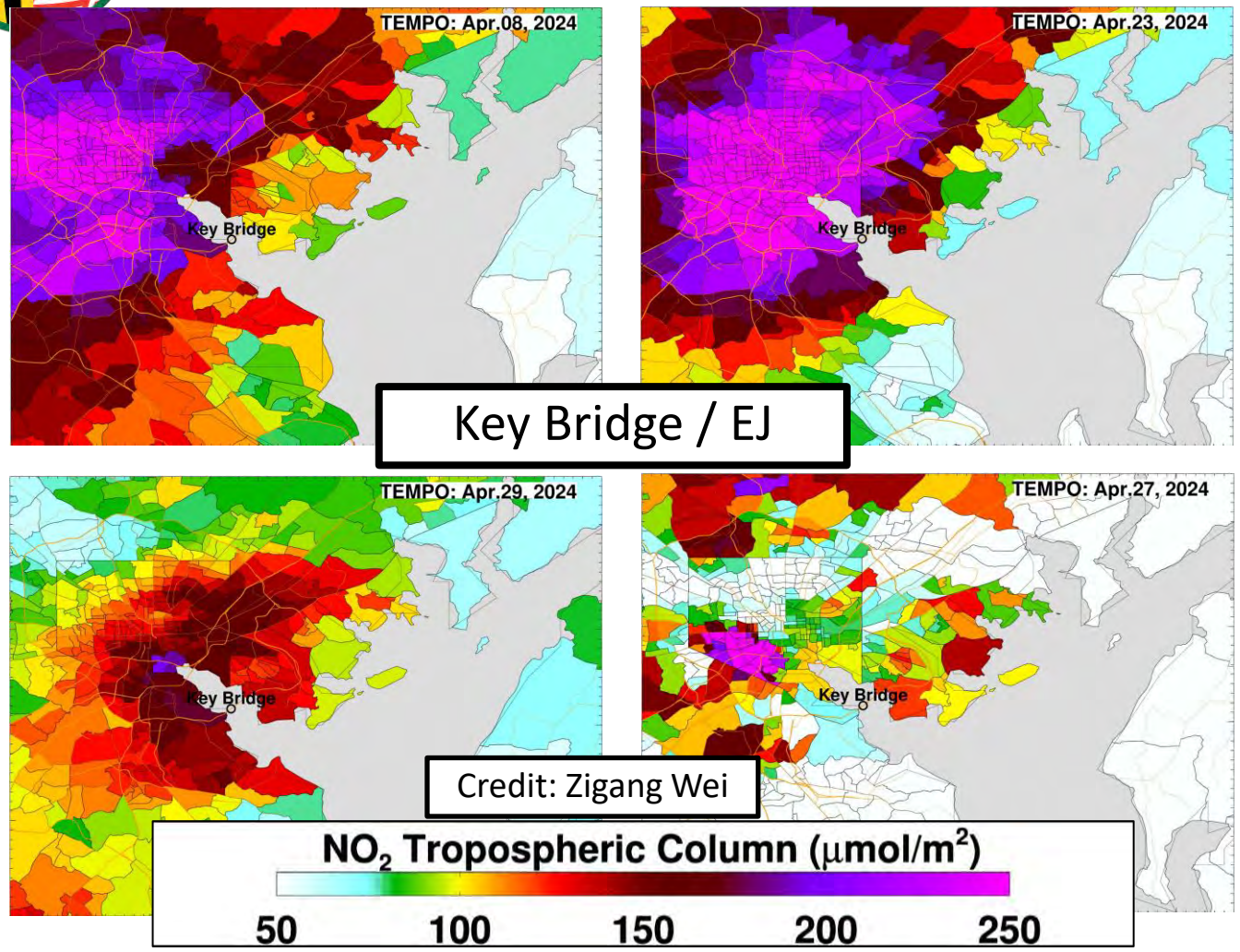
TEMPO – Census Tracts







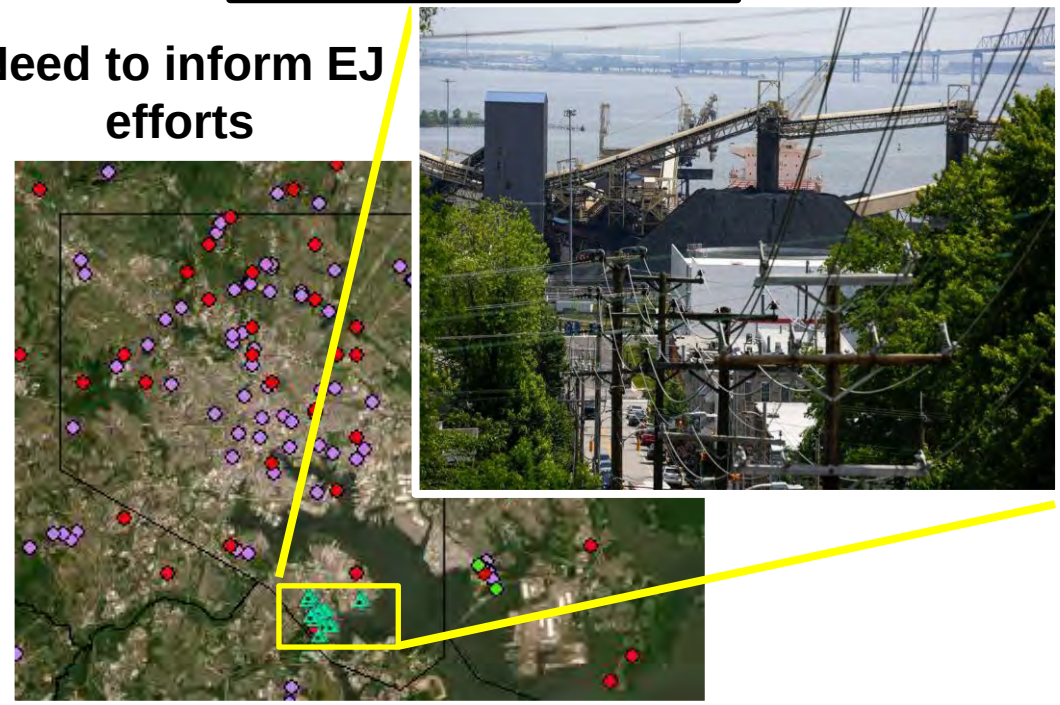
Air Quality: Other Perspectives



MDE is collaborating NESDIS and Dr. Shobha Kondragunta on the ongoing impact of the Key Bridge Collapse and use of satellites by state agencies

EJ / Sensors

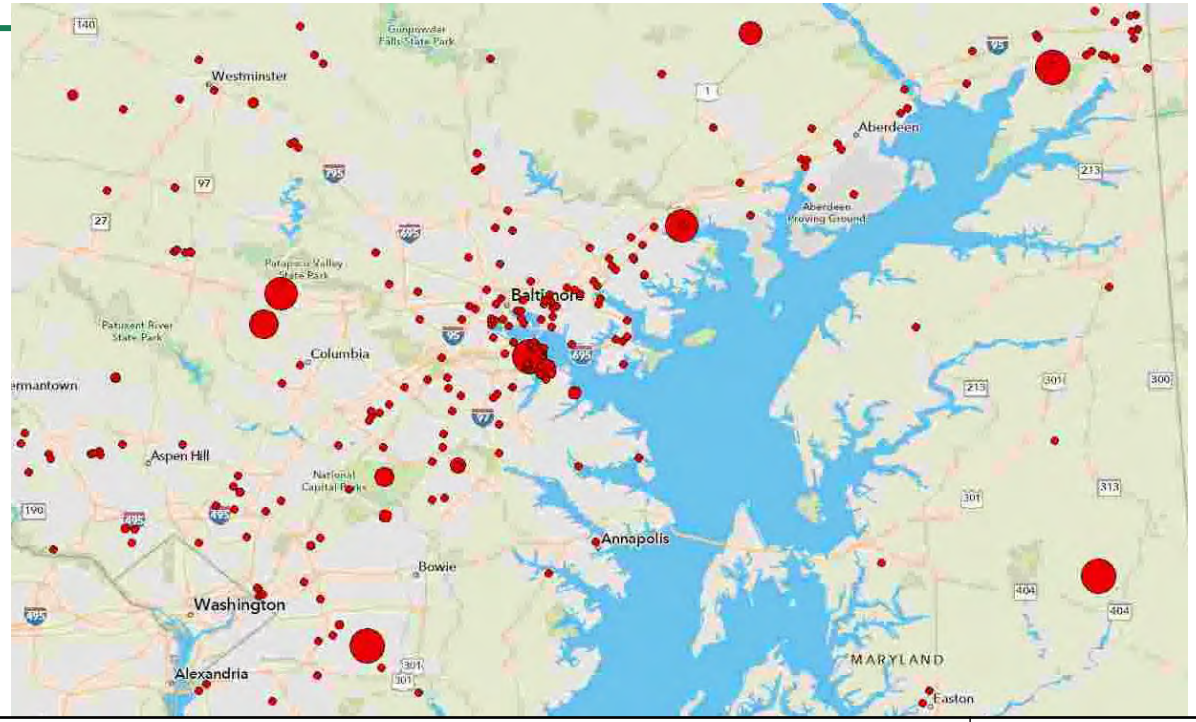
Need to inform EJ efforts



MDE is collaborating with several community organizations throughout the state to look at community-scale needs

Sensors are a big part, but large-scale research / satellites can play a big role

Greenhouse Gasses – MDE's Climate Program



Some of the biggest Issues for the State:

- High ***Uncertainty*** in Inventory, particularly for sectors such as Oil and Gas
- Knowing what ***actions are most beneficial*** for the state to meet its climate goals
- Understanding the GHG picture better
    - Temporally
    - Annually
    - Missed Gasses (Other Hydrocarbons??)

- **MAKE RESEARCH *ACTIONABLE*!!??**
    - **-> Use court of public opinion**

- No idea what an impact policy has until we know what is out there!!!!
    - We need a baseline (measuring stick)

	Facility Name	Annual CH4 (tons)
1	PG County - Brown Station Road Sanitary Landfill	5749
2	CSX Transportation - Curtis Bay Piers	5110
3	Forty West Municipal Landfill	4477
4	Cecil County Central Landfill	3335
5	Midshore II Regional Solid Waste Facility Municipal Landfill	3236
6	Newland Park Municipal Landfill	2978
7	Worcester County Central Municipal Landfill	2180
8	Eastern Sanitary Landfill Solid Waste Management Facility	1840
9	Howard Co. Alpha Ridge Landfill	1820
10	Transcontinental Gas Pipeline Company, LLC Compressor Station	1548

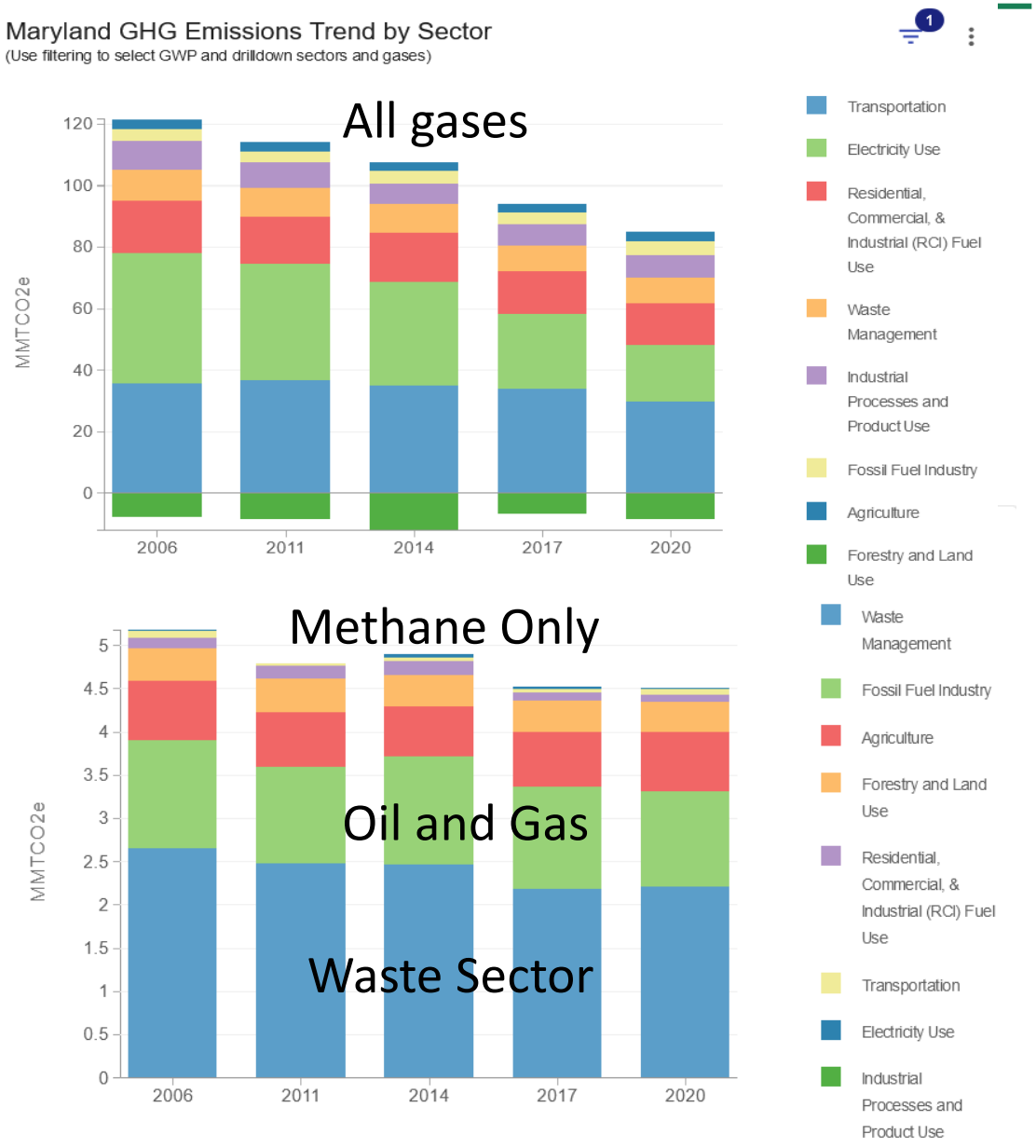
Greenhouse Gasses – MDE's Climate Program, other thoughts

Methane Inventory Thoughts:

- 17 of top 25 point sources are landfills
- #2 point source is open air coal at transport site (not measured or included in inventory)
  - WWTP are not in the inventory fully
  - What else is not in the inventory?
  - Natural Sources (no way of controlling)
    - But dammed structures/ponds are included
    - Can we account for the increased methane in Bay due to humans?
    - Ag methane is accounted for the inventory

Leaky Infrastructure

- "Pruning" vs infrastructure improvements
- $$$$: Can we save the utility money (and thus, the customer) by showing that shutting off gas to certain areas is more cost effective than replacing pipes?



https://mde.maryland.gov/programs/air/ClimateChange/Pages/GreenhouseGasInventory.aspx

Greenhouse Gasses – EPA Request For Information

- EPA RFI: https://www.epa.gov/system/files/documents/2024-08/ghgrp_rfi_2024.pdf

(1) How to translate the measurement data provided by different types of advanced measurement technologies (e.g., methane plume images, satellite retrievals of column methane mixing ratios, ambient methane concentrations) into total tons of methane emissions.

(2) How to extrapolate methane emissions from discrete and intermittent observations into total methane emissions throughout the year (with a specific level of accuracy) and attribute these emissions to a specific equipment type, process, or facility.

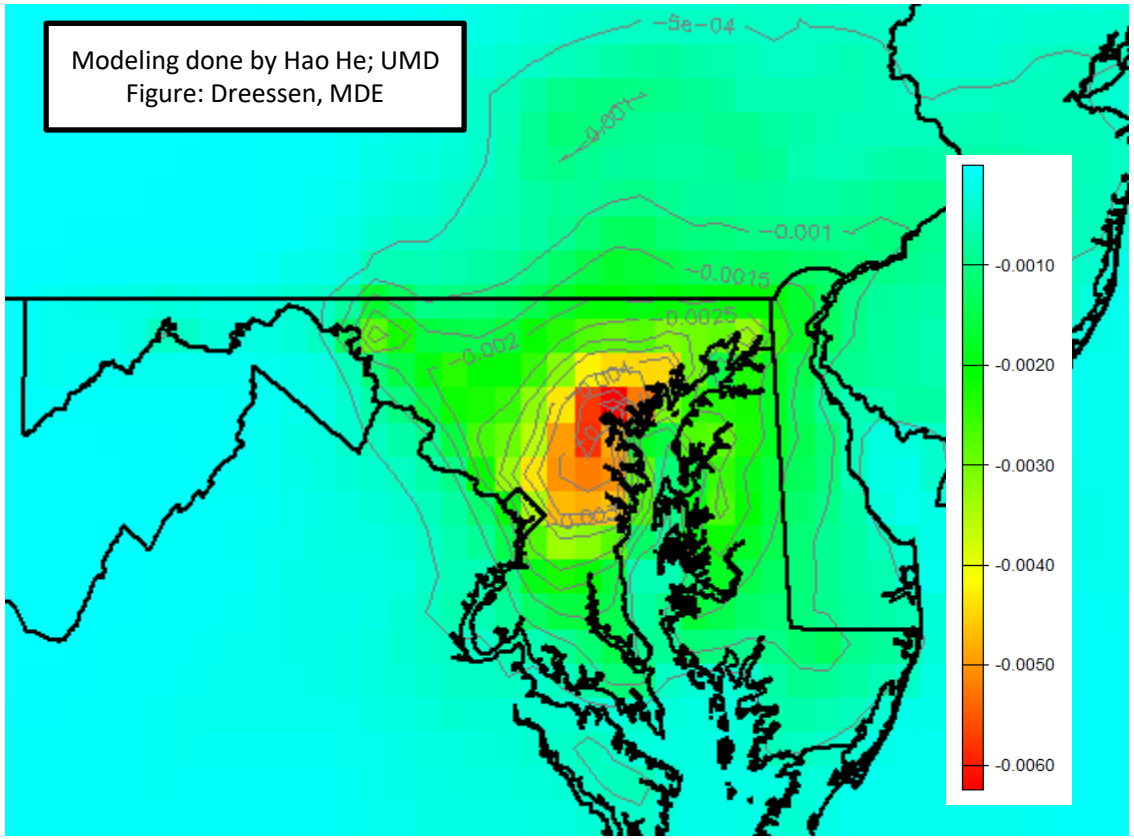
(3) How to identify, attribute, and quantify methane emission events that are below a technology's detection limit, in order to estimate total equipment-, process-, or facility-level emissions throughout the year.

(4) How to set detection, quantification, attribution, verification, and uncertainty criteria and/or protocols for different types of advanced measurement technologies to ensure implementation into the GHGRP in a manner that is applicable to different infrastructures and environmental conditions across the U.S. (e.g., topographies, climates, facility types and layouts).

EPA anticipates that annual quantification approaches may be specific to an emission source, facility type, or type of technology. Therefore, a potential standard or protocol might be specific to a type of methane source (e.g., hydrocarbon liquid storage tanks, landfill working face) and a specific measurement approach (e.g., drone, aircraft, vehicle-based, or multi-platform based).

MDE Co-Benefits

- We can not look at emissions sectors in isolation.
- If you find a methane source to reduce, there's likely to be ***co-benefits*** to general air, water, or land environmental quality. Let's quantify that.
- A challenge to researchers – quantify those co-benefits



Nitrogen deposition reduction by zero-out of on-road diesel in Maryland only.