



Maryland
Department of
the Environment

Hot Topics - End of 2018

A Rapid Fire Overview



Tad Aburn, Air Director, MDE
Air Quality Control Advisory Council
December 10, 2018



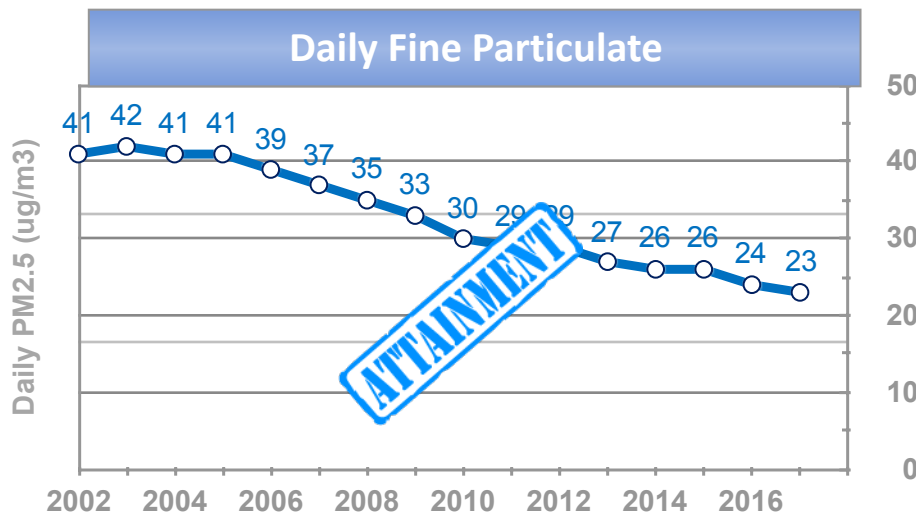
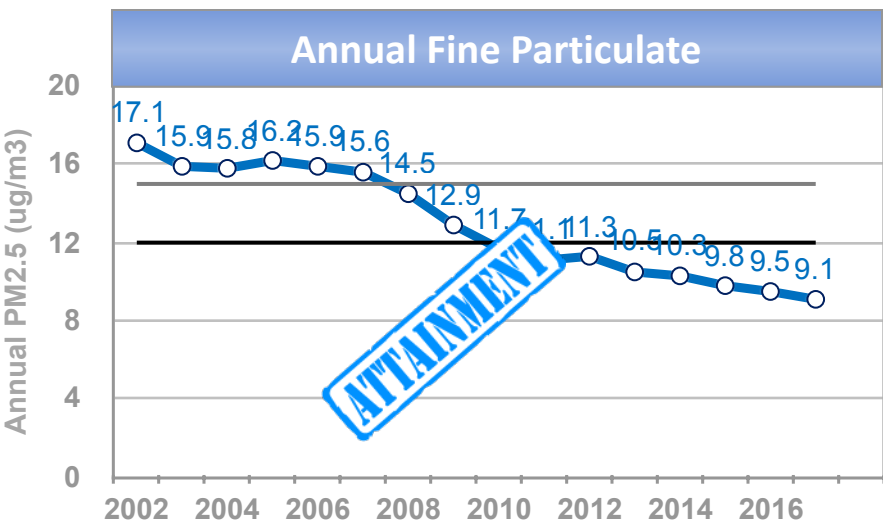
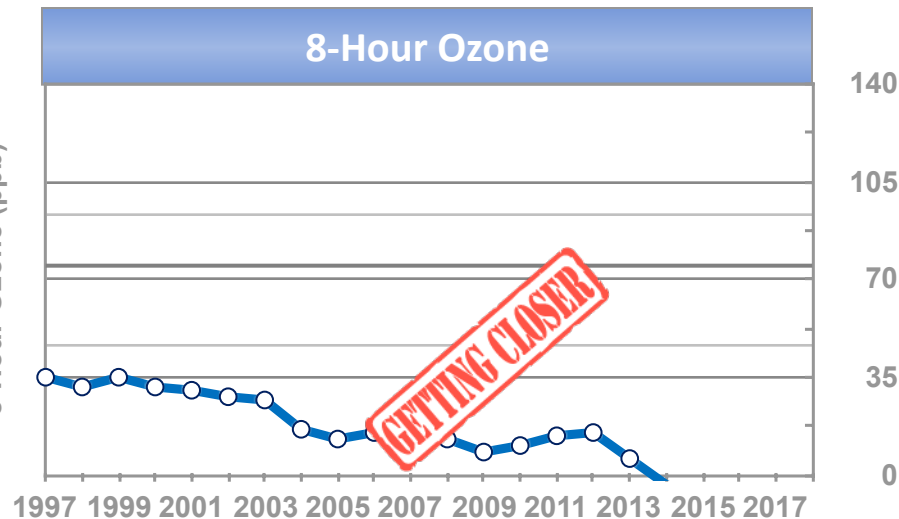
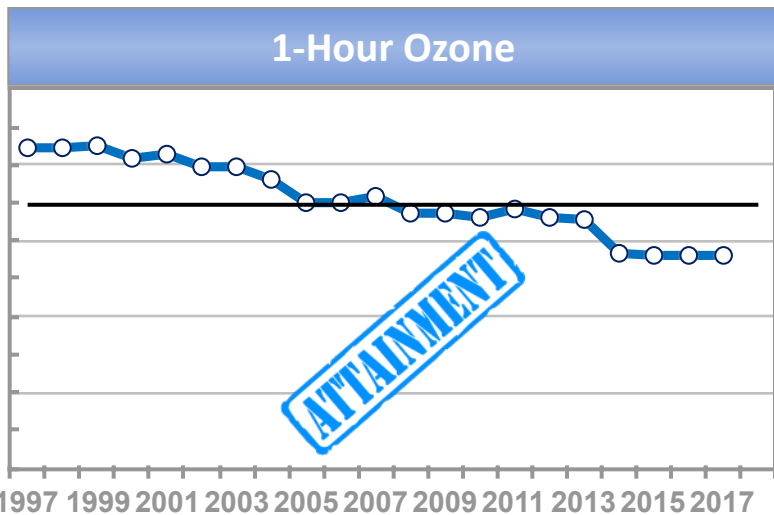
What Will Be Covered

- Improving Air Quality
- The Maryland 126 Petition
- The VW Mitigation Plan
- The 2018 Draft Greenhouse Gas Emission Reduction Plan



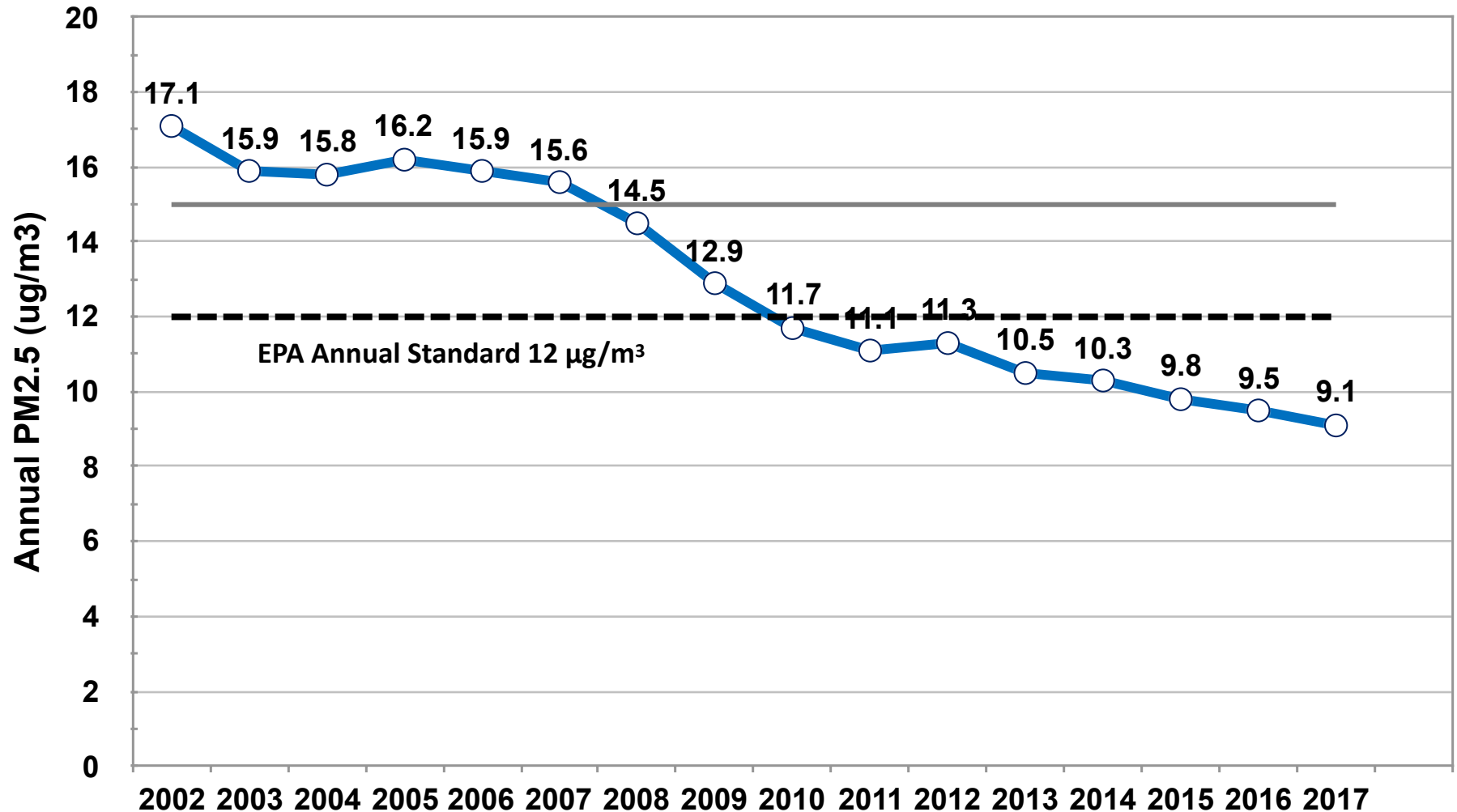


Progress in Cleaning Maryland's Air



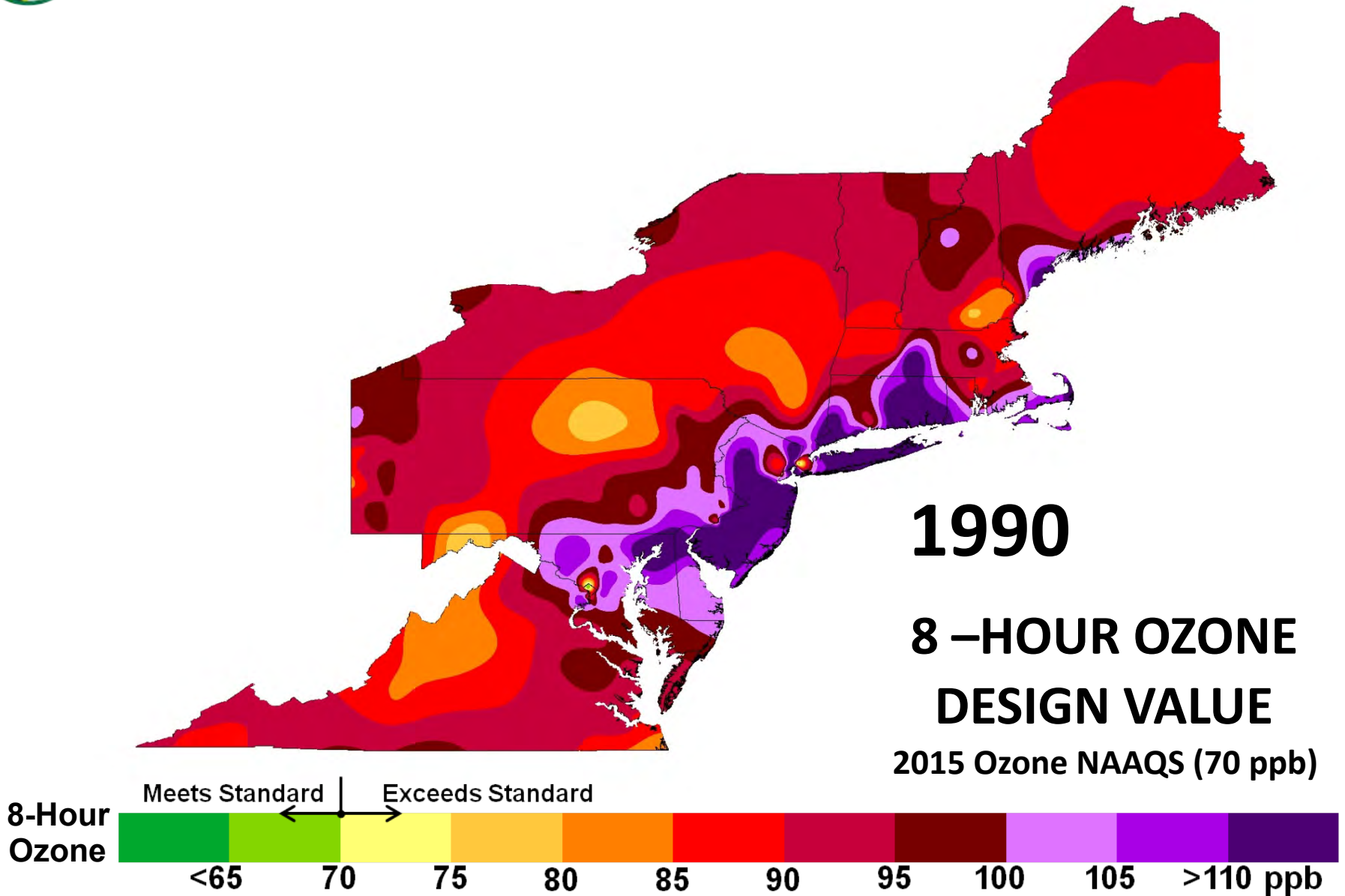


Fine Particle Air Pollution Lower Levels Across the State



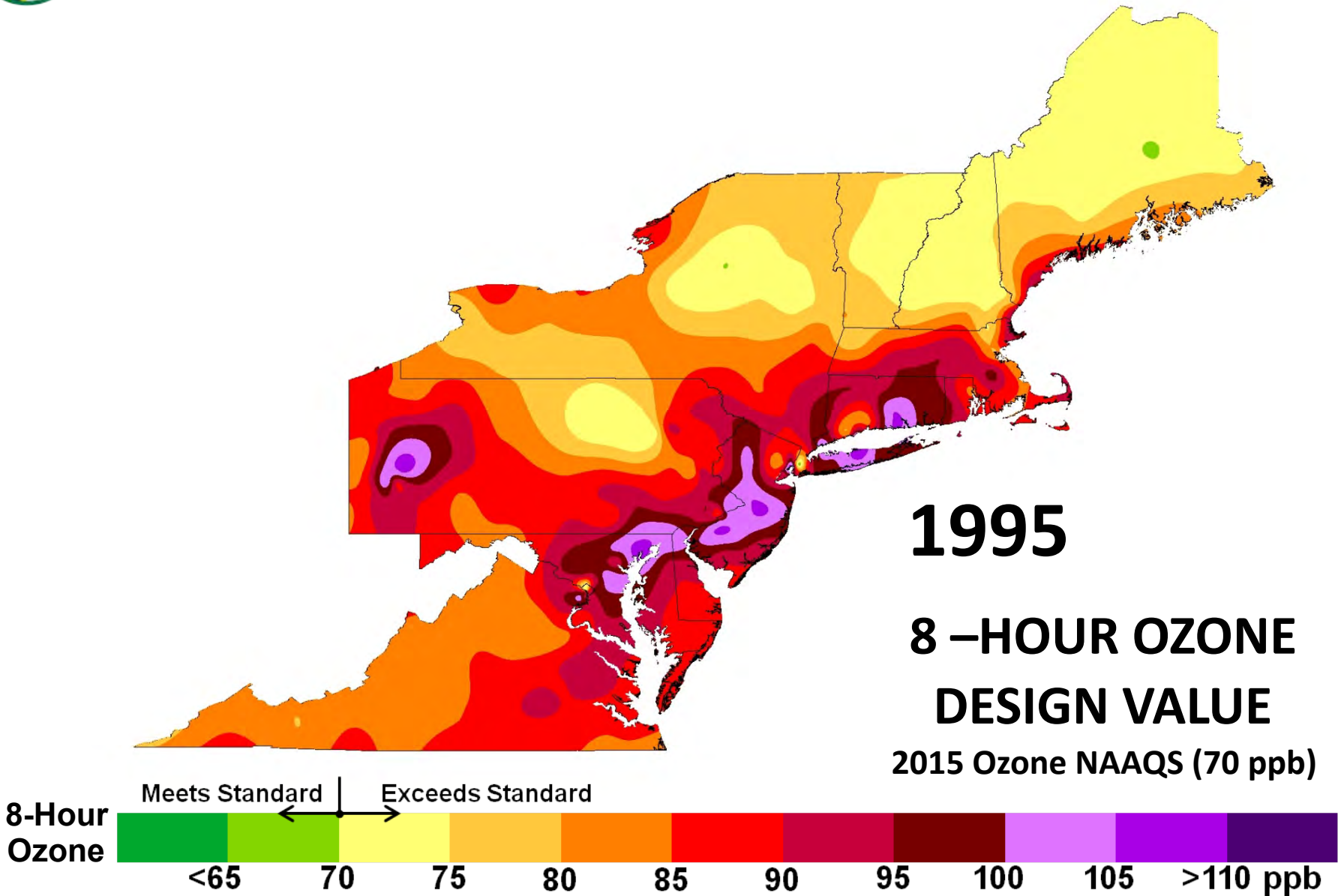


The Shrinking Ozone Problem



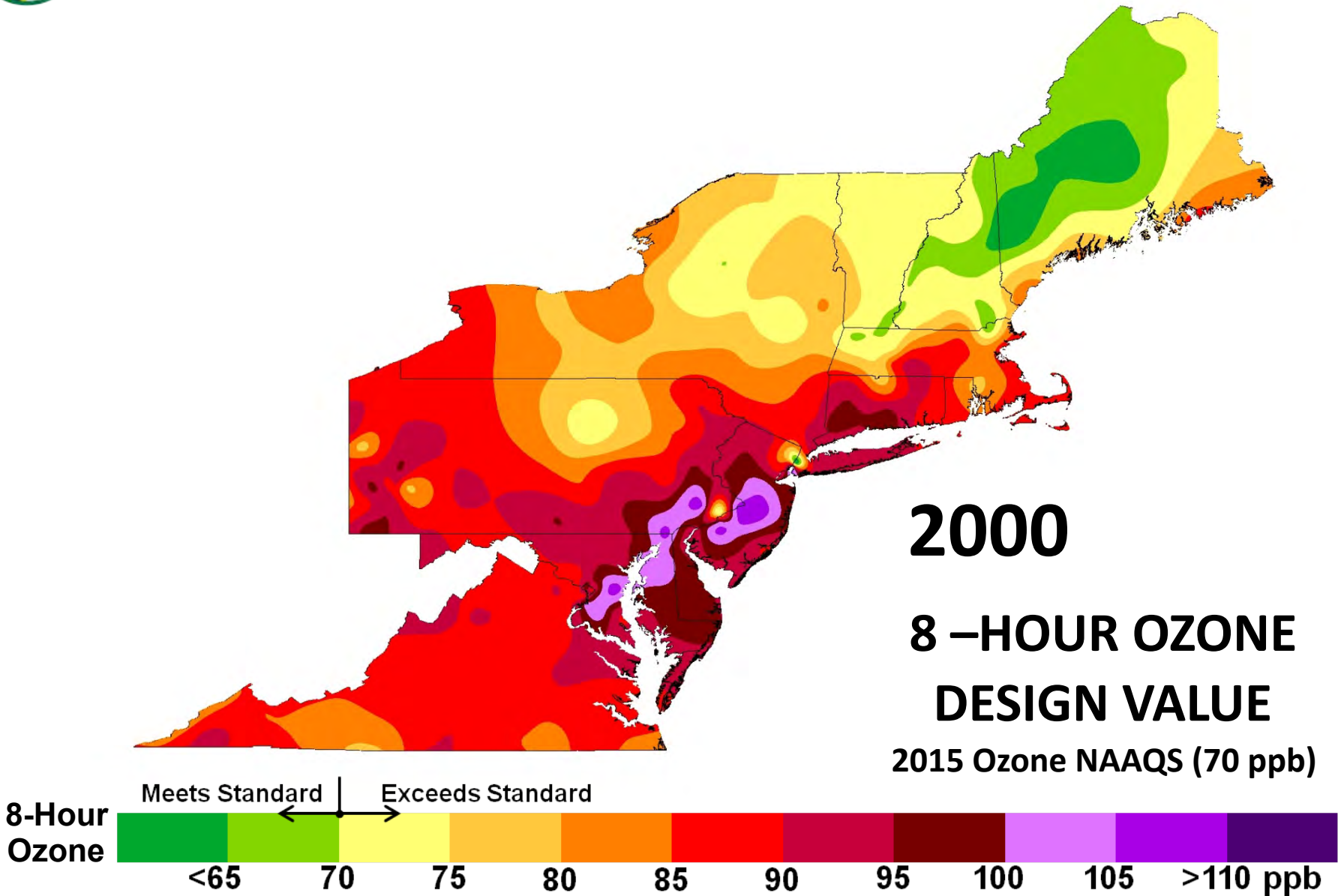


The Shrinking Ozone Problem



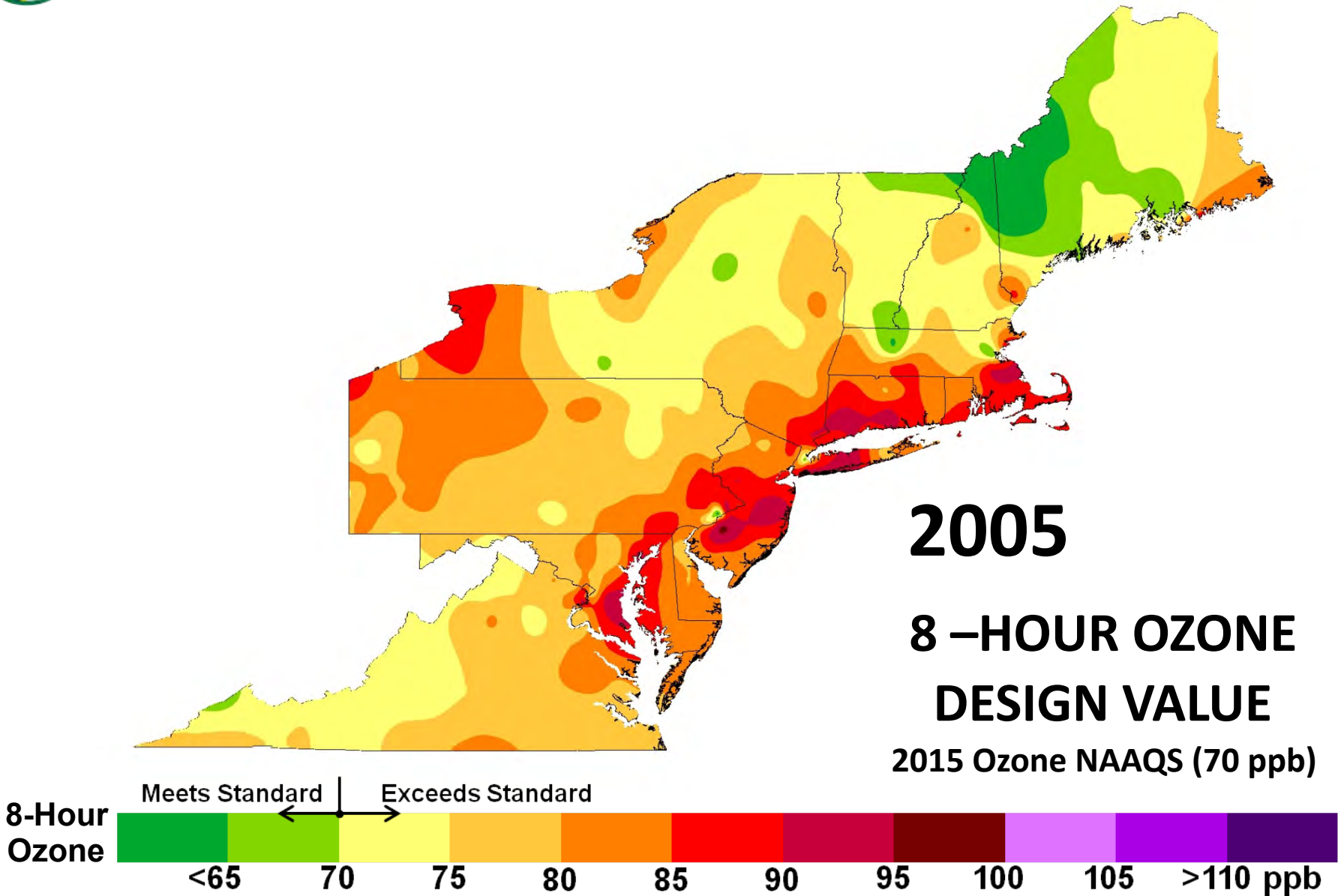


The Shrinking Ozone Problem



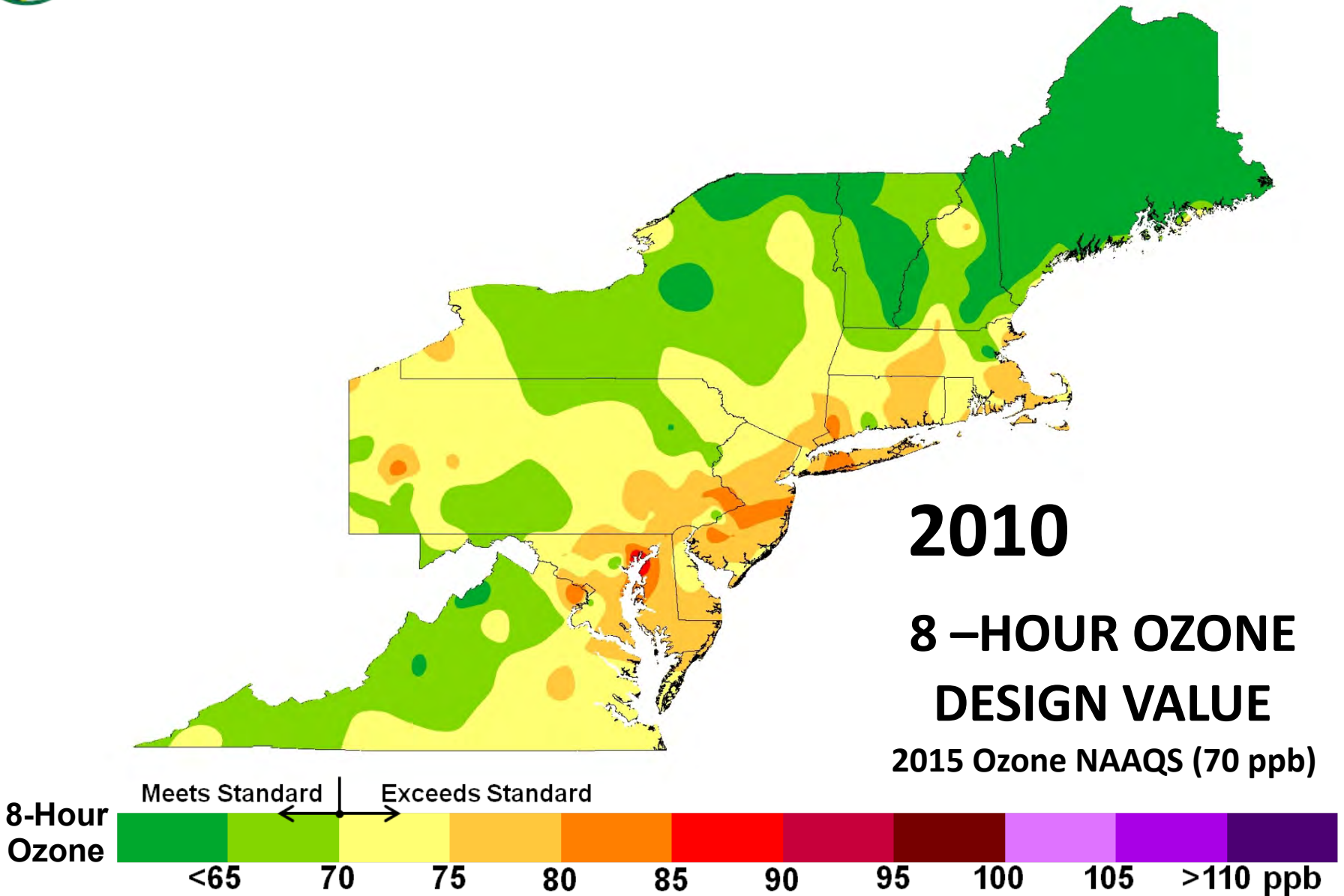


The Shrinking Ozone Problem



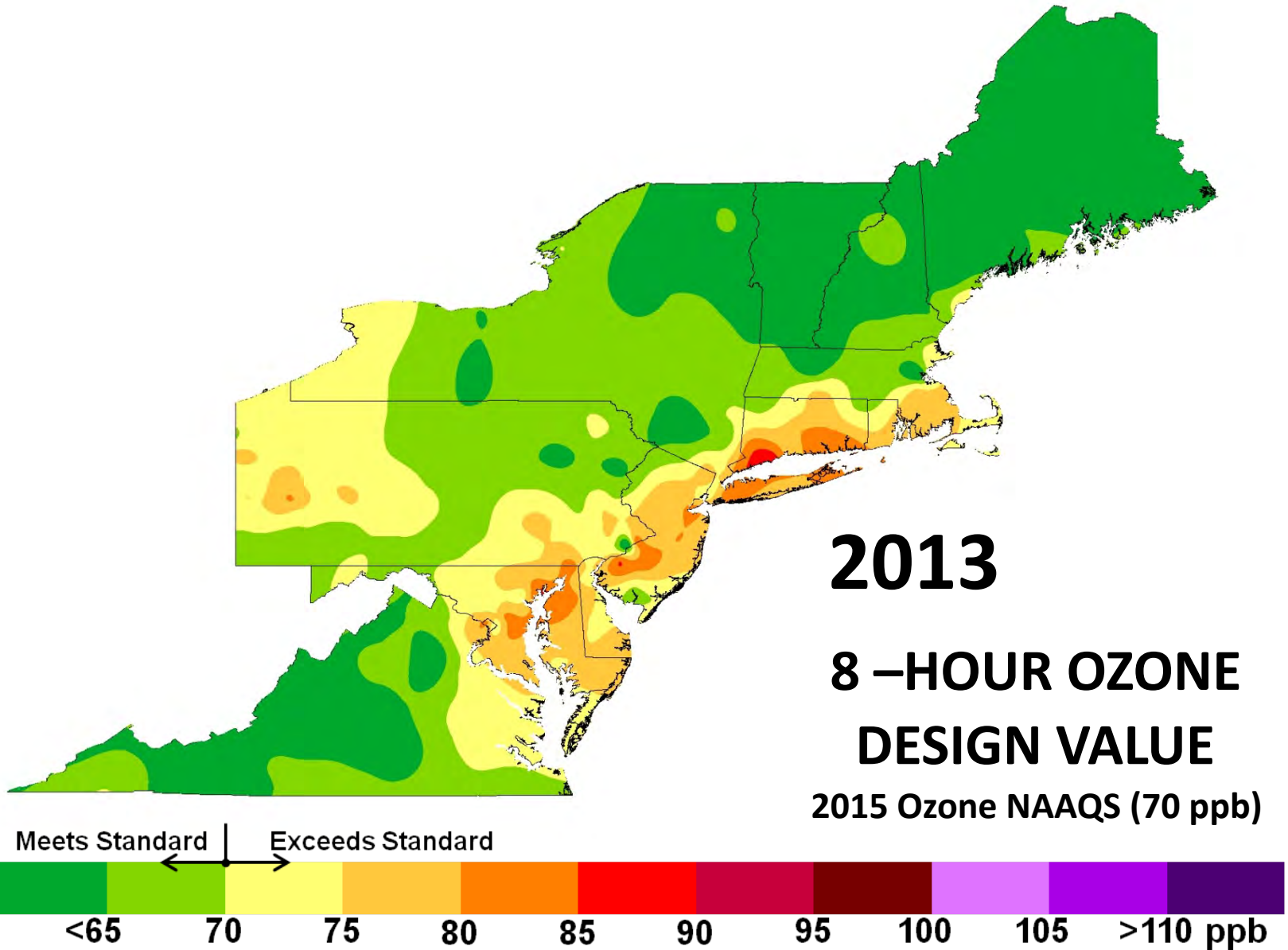


The Shrinking Ozone Problem



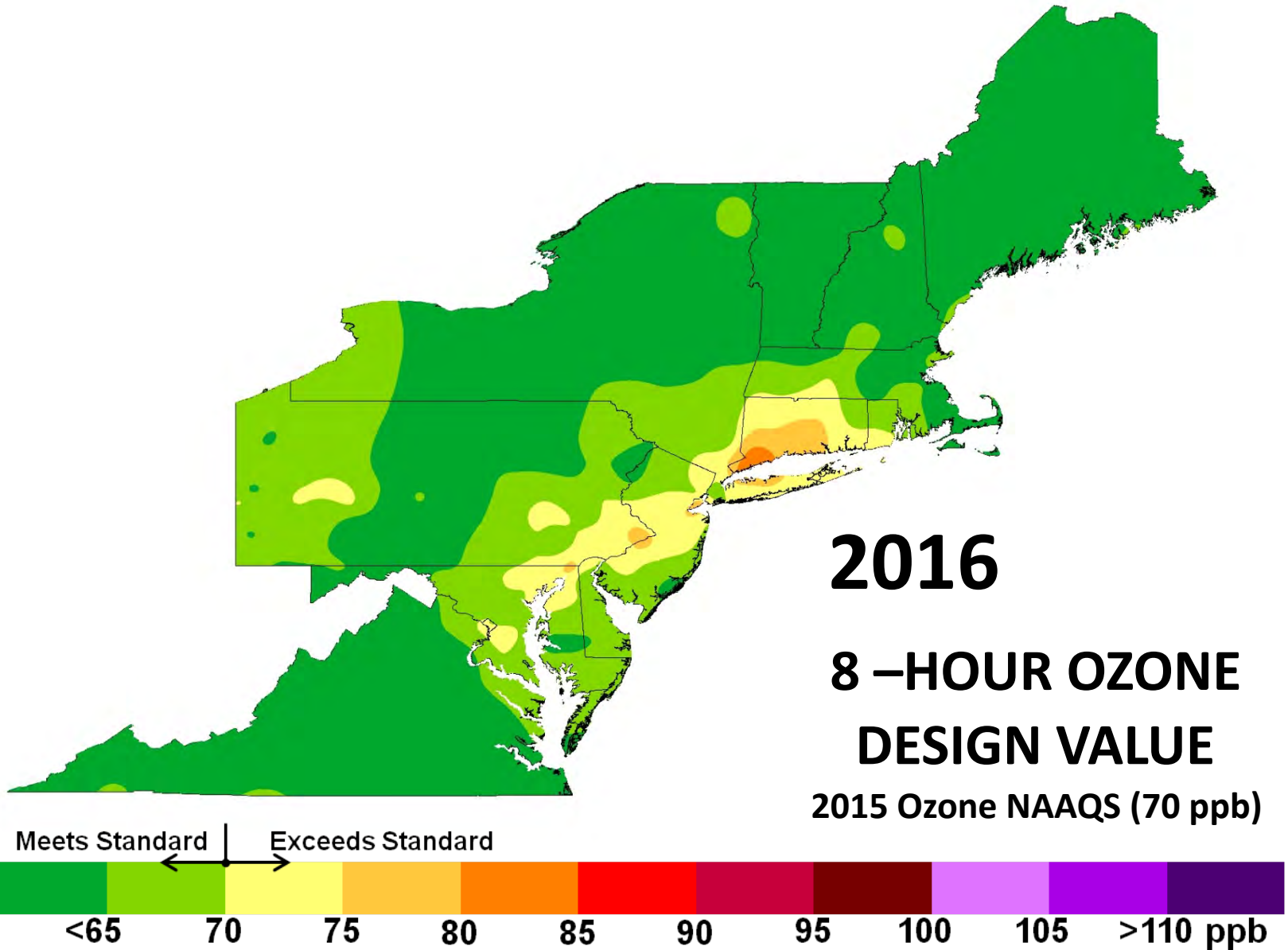


The Shrinking Ozone Problem



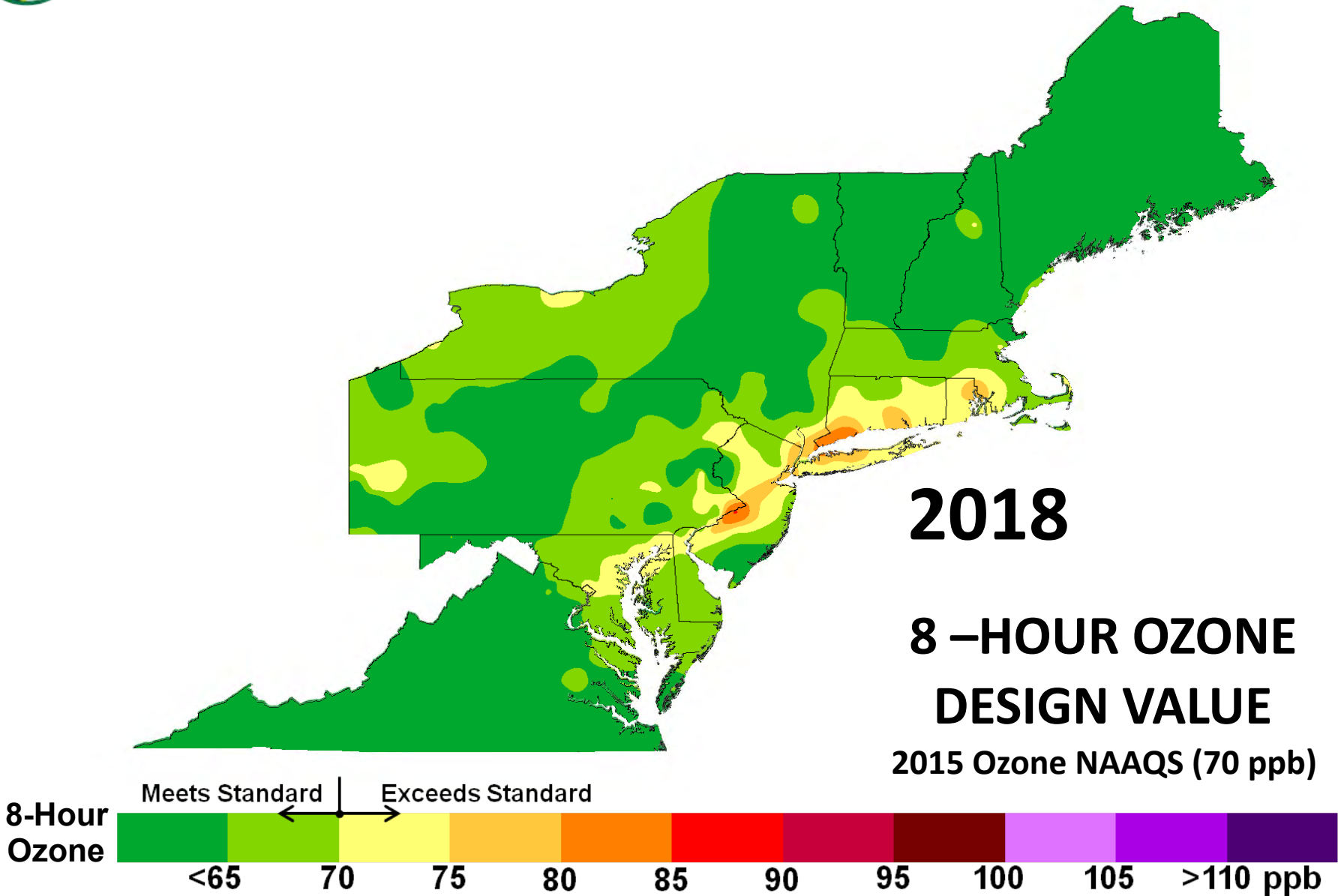


The Shrinking Ozone Problem





The Shrinking Ozone Problem

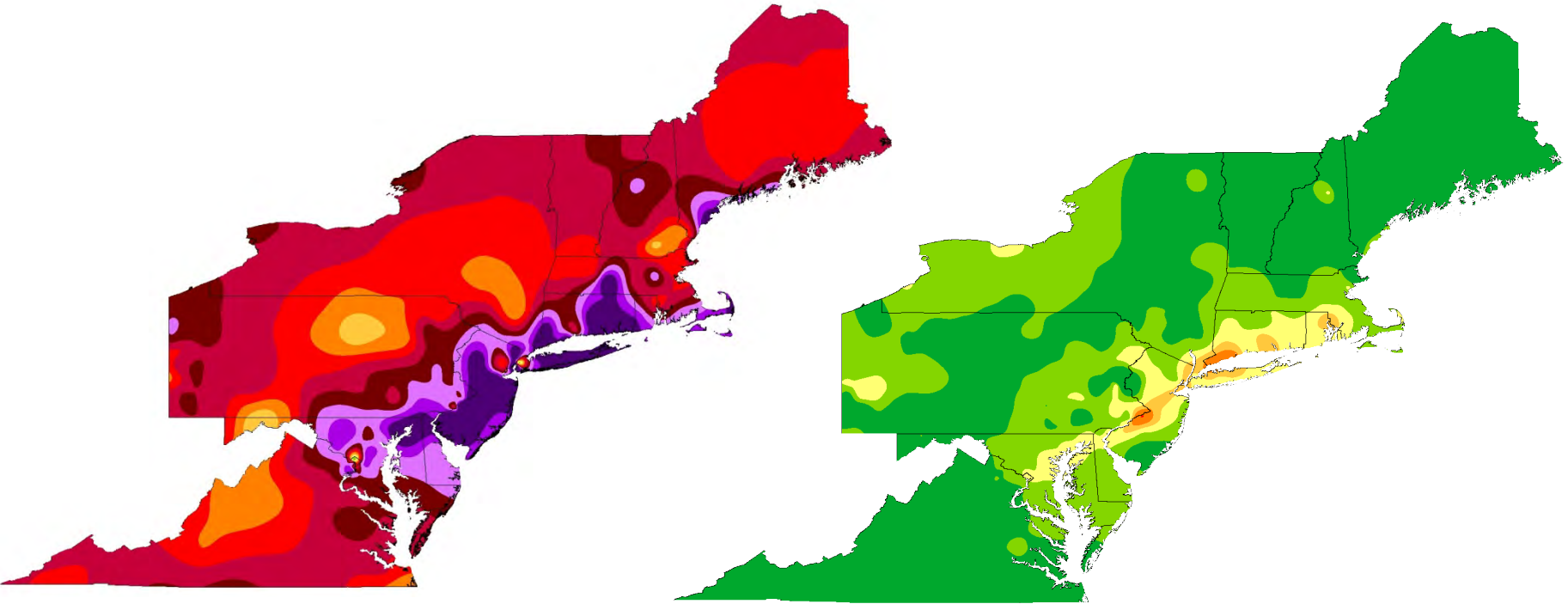




Shrinking Ozone Problem 1998 to 2018

1998

2018*



8-Hour
Ozone

Meets Standard

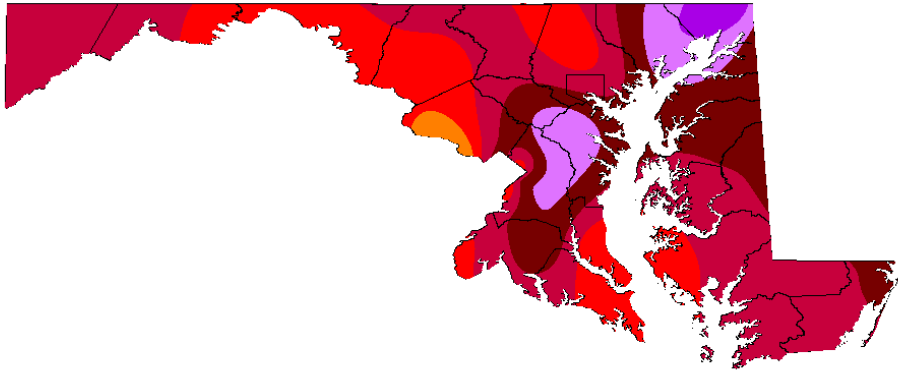
Exceeds Standard

<65 70 75 80 85 90 95 100 105 >110 ppb

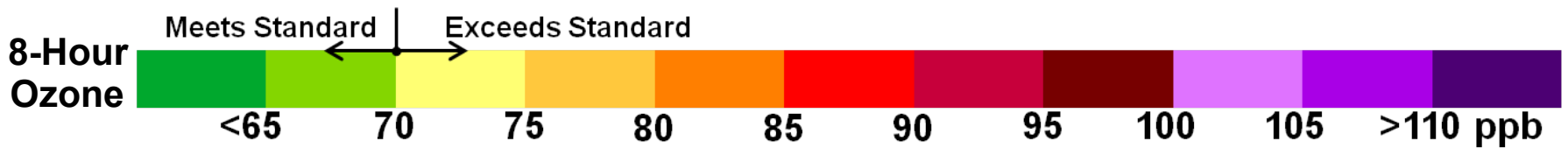
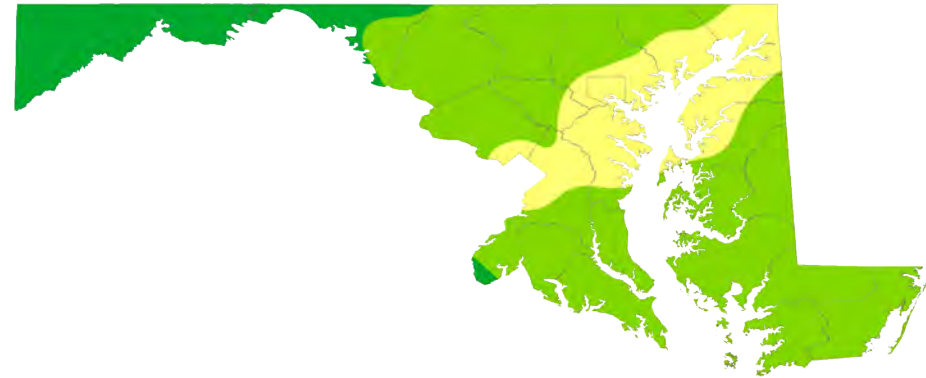


Shrinking Ozone Problem 1998 to 2018

1998



2018*





2018 Ozone Season

- > 2018 ... a slightly warmer but extremely wet summer
- > Second fewest exceedances (days over the standard) ever

YEAR	Exceedance Days	Number of Days > 90 Degrees
2018	16	39
2017	17	31
2016	26	41
2015	20	26
2014	11	14
2013	19	27
2012	42	45
2011	46	40
2010	61	59



Ozone Research



Upper-Air Radar Wind Profiler & RASS (MDE)



- MD works in partnership with the other OTC states and local universities (UMD at College Park, UMBC, Penn State and Howard University) to study ozone and fine particulate air pollution problems
 - MD has the luxury of a dedicated research fund
- Major focus ... Transport
 - Airplanes ... Balloons ... Lidar
 - Profilers ... Satellites ... Special monitors ... Modeling
 - Much, much more
- What have we learned
 - About 70% of Maryland's ozone problem originates in upwind states
 - Reducing nitrogen oxide from power plants and vehicles in upwind states will dramatically reduce ozone in Maryland



Understanding Ozone Transport

- It's complicated ... but not that complicated ... some key concepts
- An “elevated reservoir” of ozone
 - A transport cloud
 - An elevated ocean of ozone
 - The residual layer
- Three different types of transport
 - Westerly Transport – Power plants are a major contributor
 - Night-time, Southerly Transport – Vehicles, power plants, more
 - “Local” or “City-to-City” Transport – An urban soup ... Washington to Baltimore ... Baltimore to Philly ... NJ & NY to CT ... etc. etc. etc







Westerly Transport

2000

H



-  NOx Emissions
 -  SO2 Emissions
- (Size is relative total facility emissions)

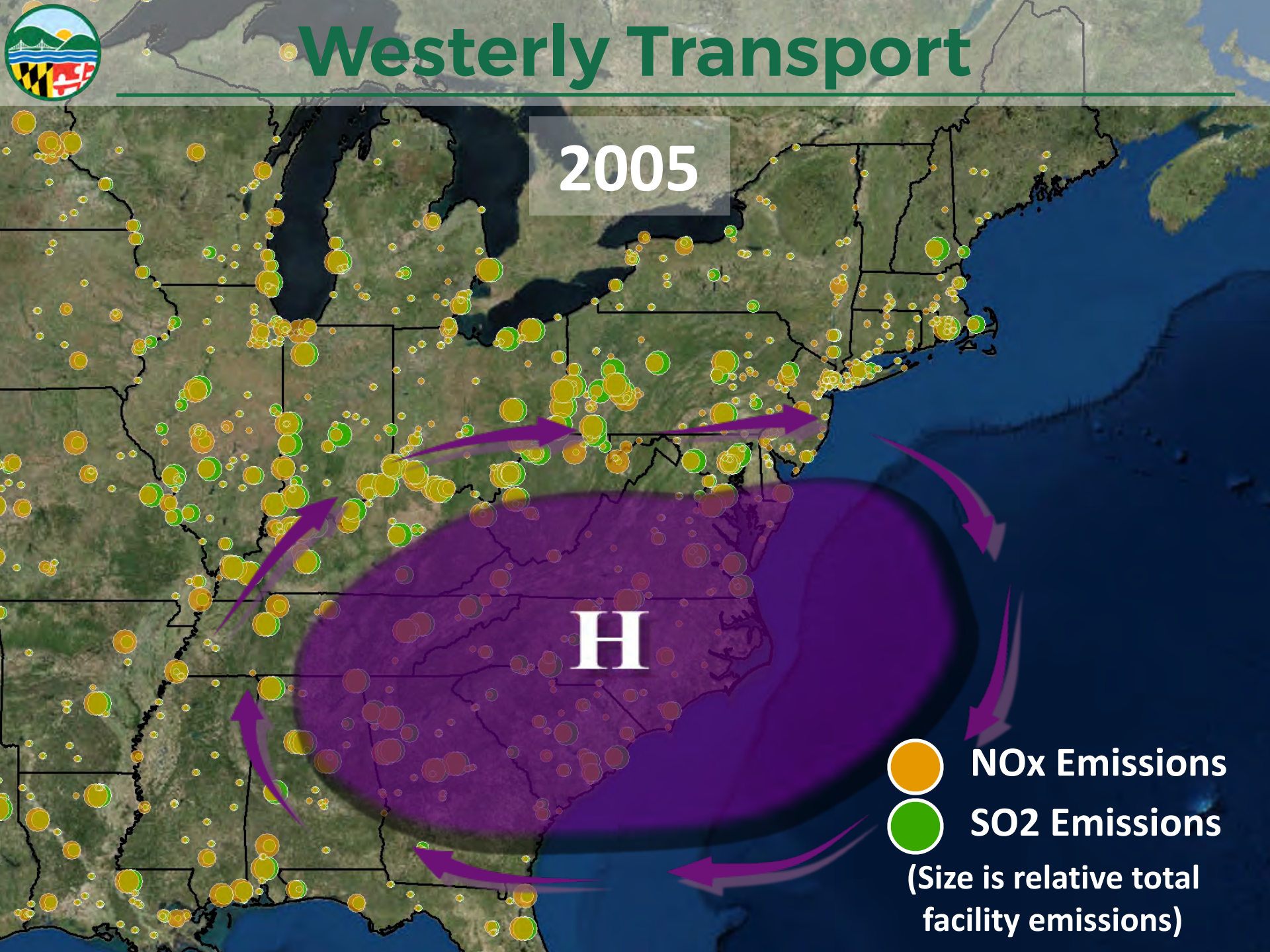


Westerly Transport

2005

H

-  NOx Emissions
 -  SO2 Emissions
- (Size is relative total facility emissions)





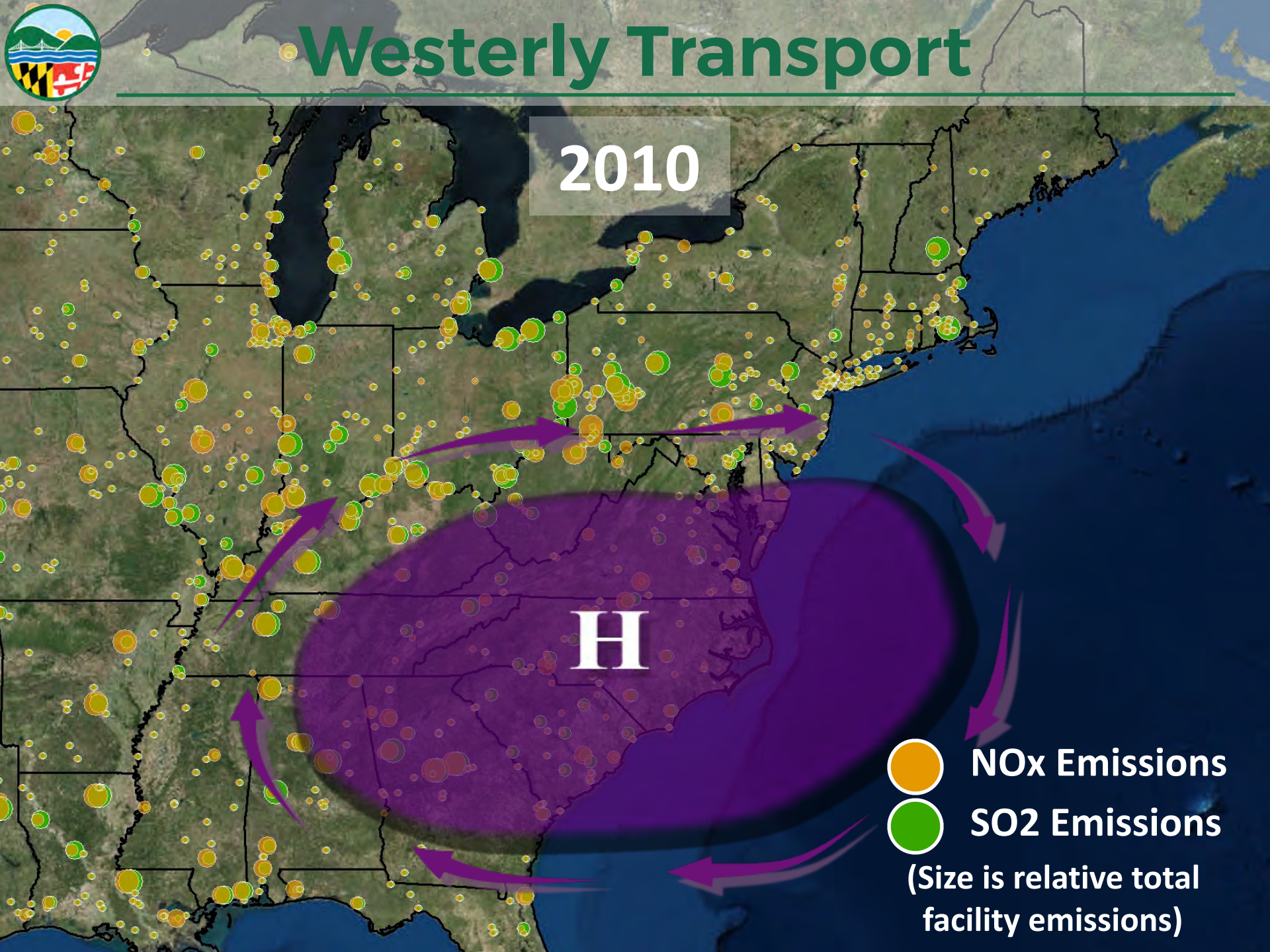


Westerly Transport

2010

H

-  NOx Emissions
 -  SO2 Emissions
- (Size is relative total facility emissions)





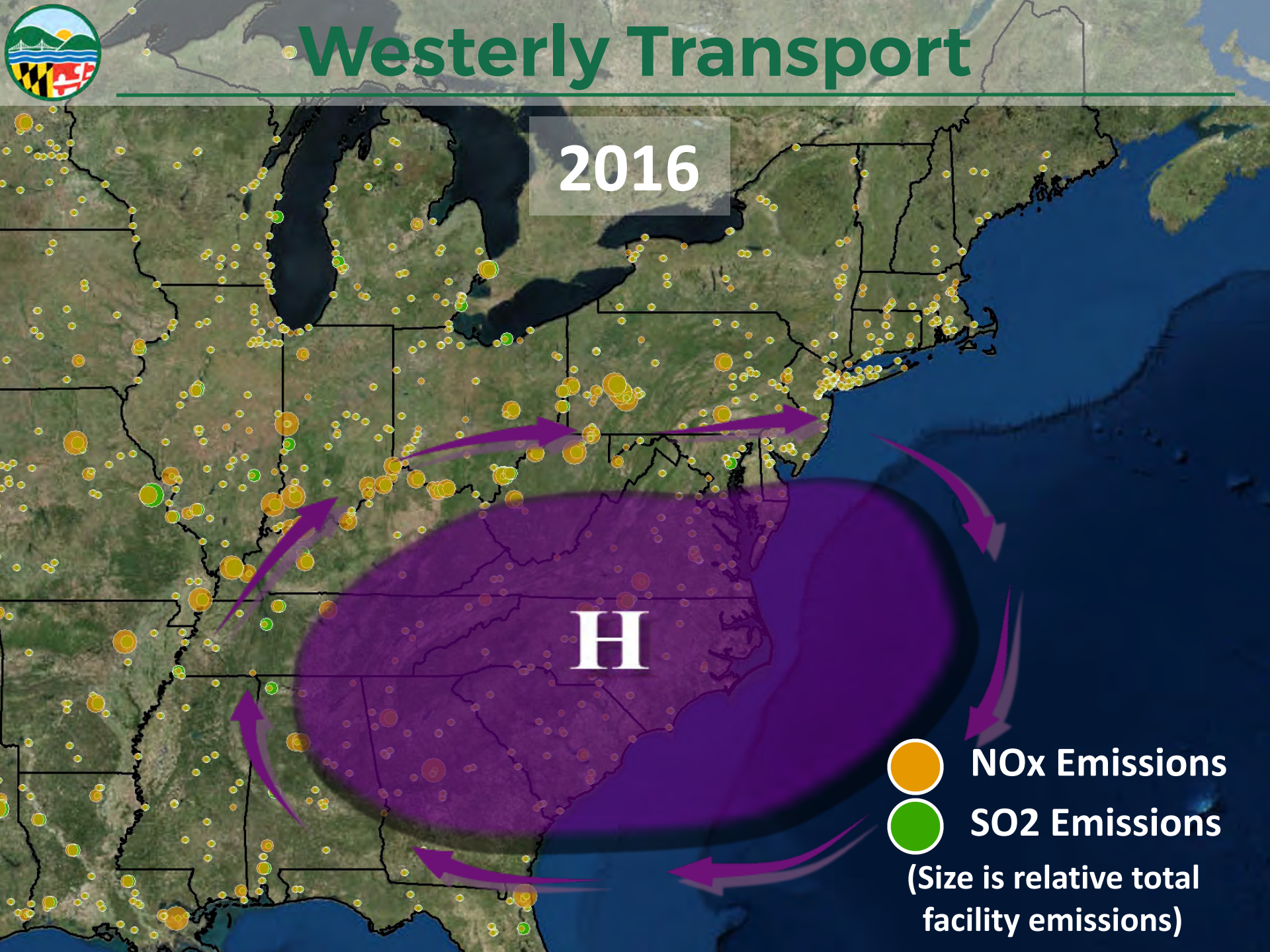


Westerly Transport

2016

H

-  NOx Emissions
 -  SO2 Emissions
- (Size is relative total facility emissions)

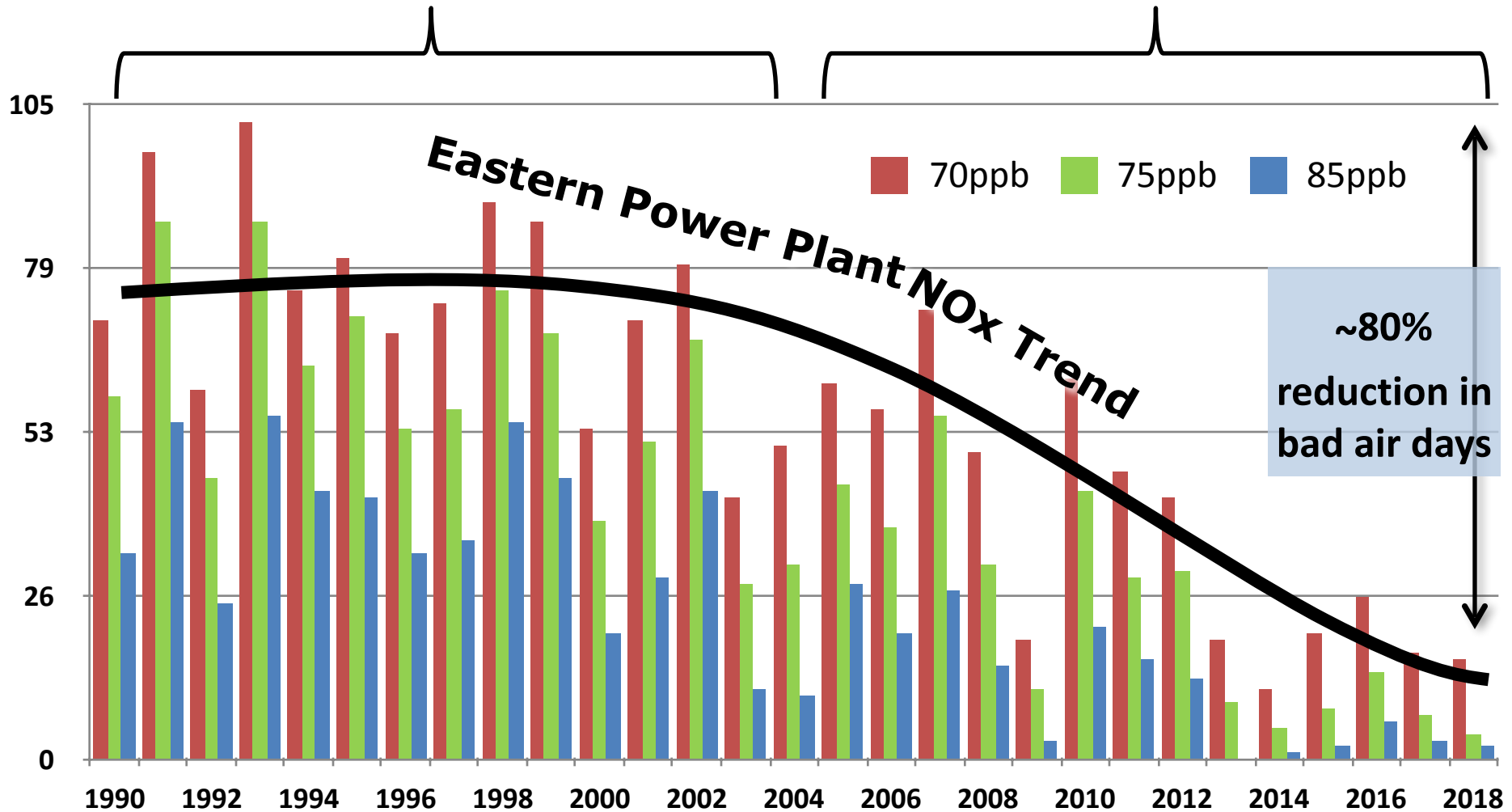




Maryland Exceedance Days are Decreasing Primarily Because of Reduced Transport

Average > 70 = 77

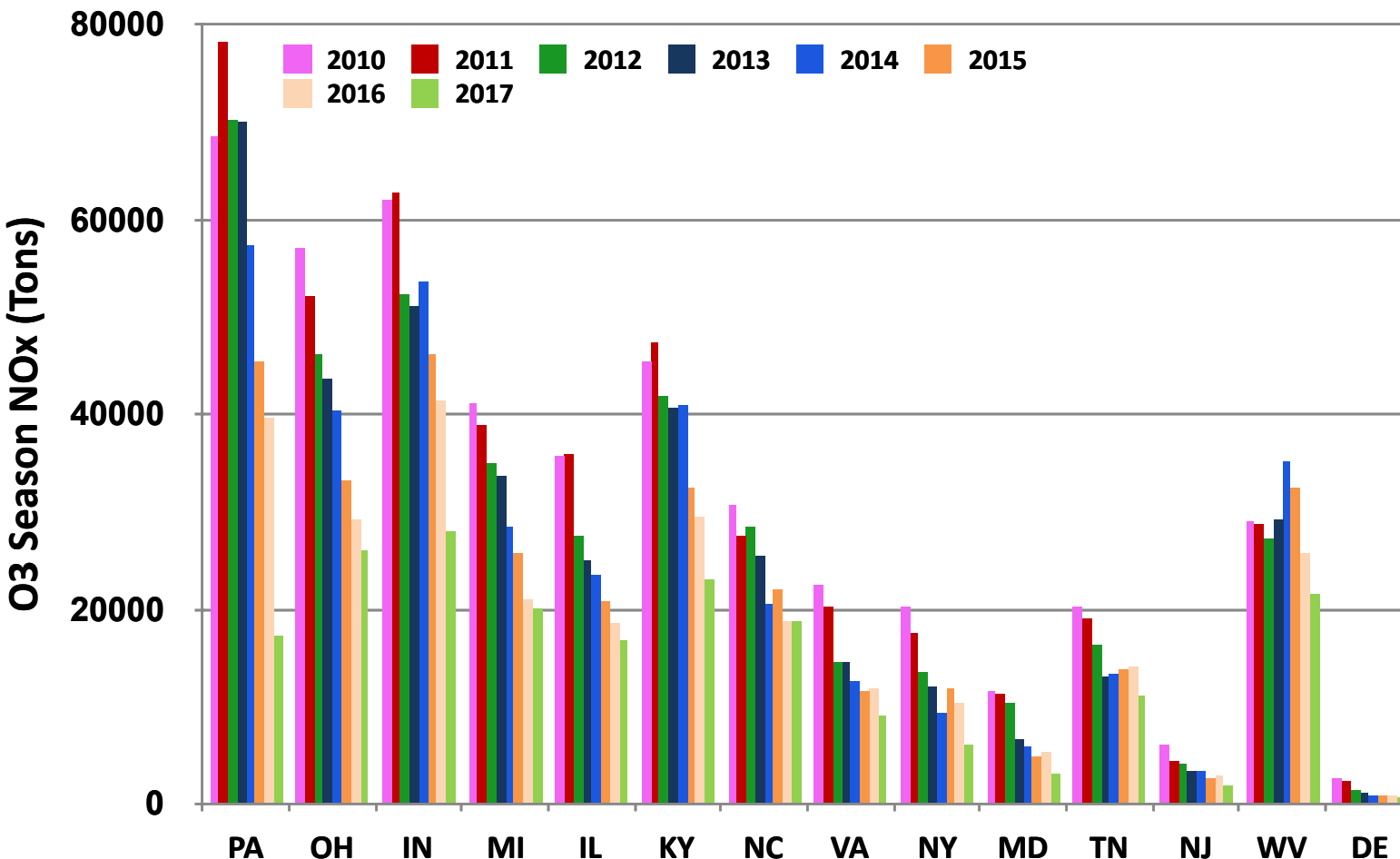
Average > 70 = 38 (18 after 2013)





Have Power Plant Emissions Changed?

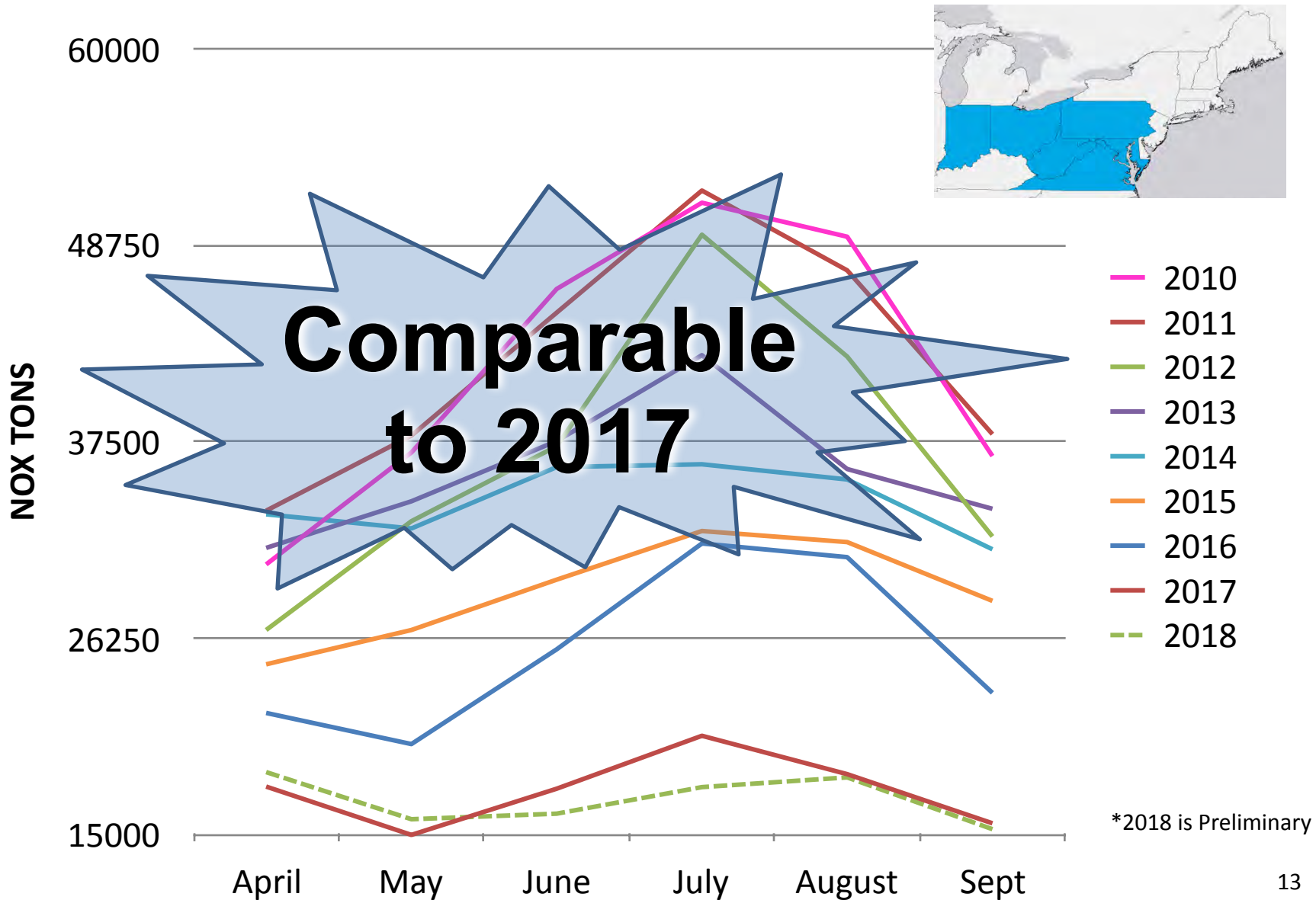
- Ozone season NO_x emissions from Electricity Generating Units (EGUs) continue to decrease in all states
- Most states had lowest ozone season EGU NO_x emissions on record in 2017 and 2018.



Shown are states from which emissions may influence ozone concentrations in MD and other OTC states.

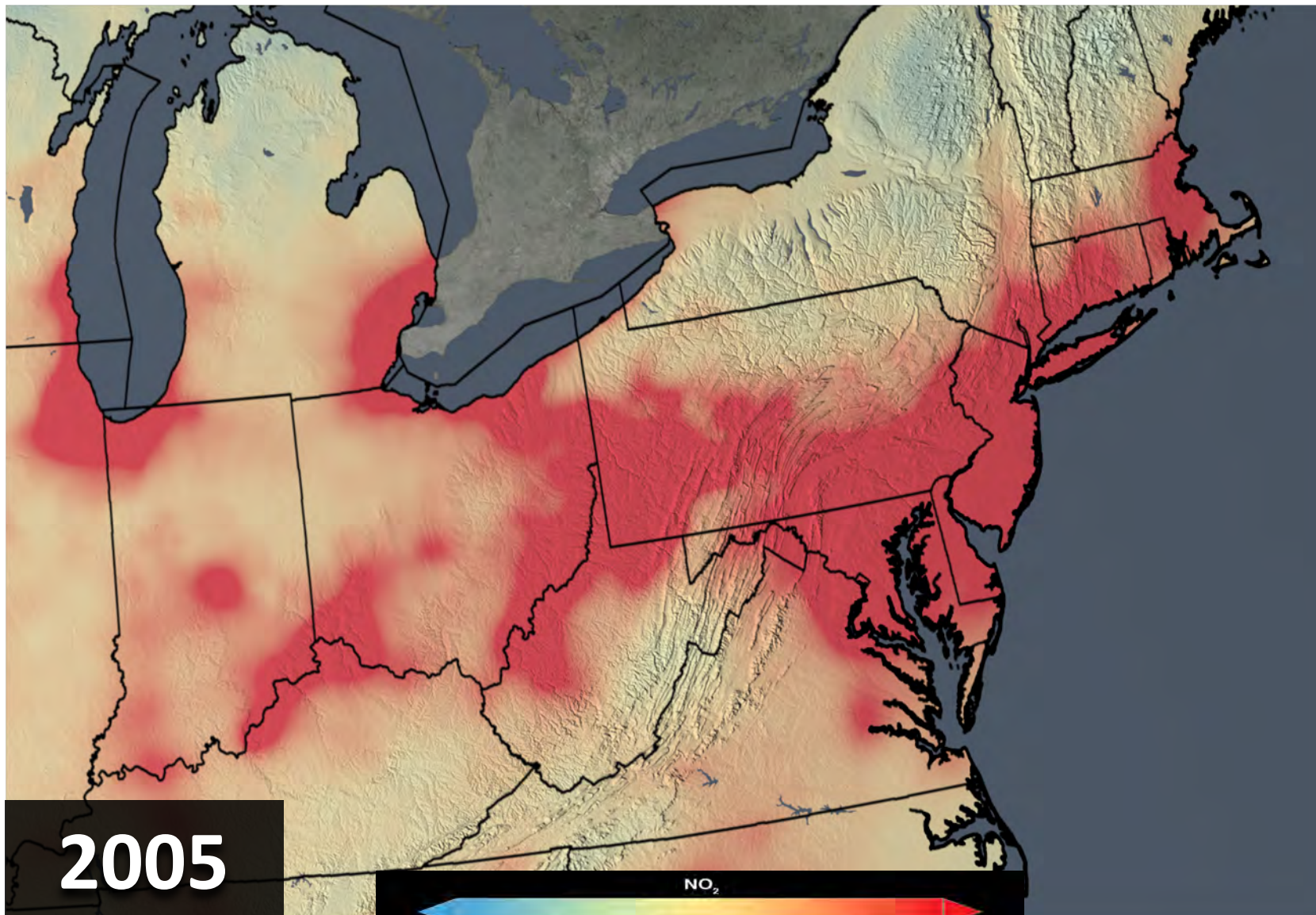


Monthly EGU Emissions From: IN, OH, WV, VA, PA, MD, DC





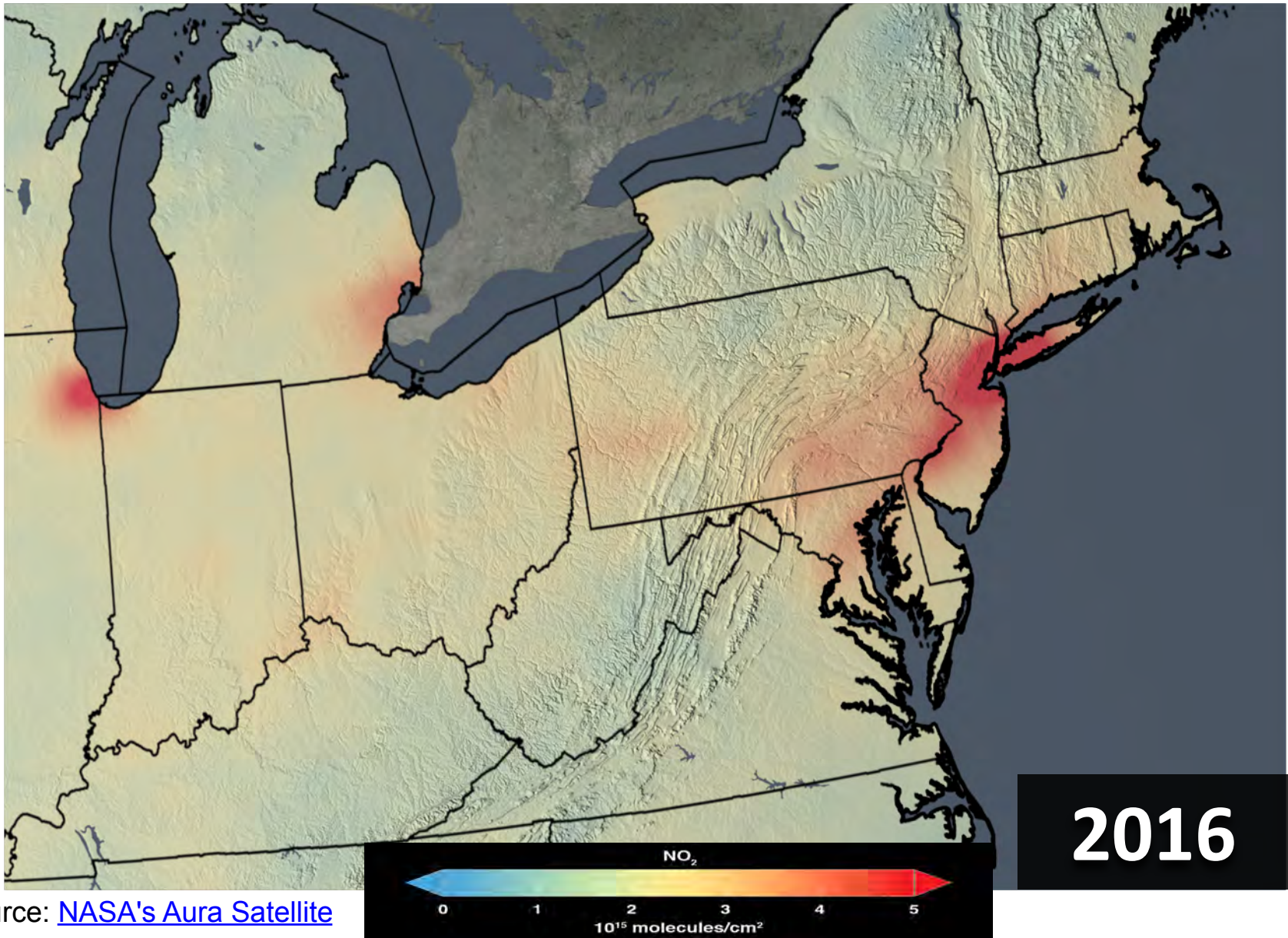
NO₂ Reductions from Space - 2005 to 2016



Source: [NASA's Aura Satellite](https://www.nasa.gov/mission/aura/)



NO₂ Reductions from Space - 2005 to 2016



Source: [NASA's Aura Satellite](https://www.nasa.gov/mission/aura/)



What About the 30% that is from More Local Sources?





OWLETS-2 Participants

Data available: <https://www-air.larc.nasa.gov/missions/owlets/reports.2018/index.html>

- Maryland Department of the Environment (MDE)
- Maryland Environmental Services (MES)
- Maryland Port Administration (MPA)
- Maryland Department of Natural Resources (DNR)
- National Aeronautics and Space Administration (NASA)
- National Oceanic and Atmospheric Administration (NOAA)
- University of Maryland Baltimore County (UMBC)
- University of Maryland College Park (UMCP)
- Howard University (HU)
- Hampton University (HU)
- Virginia Commonwealth University (VCU)
- Anne Arundel County (AAC)
 - PENINSULA DRONE SERVICES, WILLIAMSBURG, VA, 23185, UNITED STATES
 - INFO@PENINSULADRONES.COM
- Bill's Boats
- Tolchester Marina
- Interns
- Many More...



MARYLAND PORT ADMINISTRATION



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Peak Ozone Day Reduction Program

- Pilot Program began July 16th
- When high ozone was forecast, emails were sent out to selected sources requesting voluntary emission reduction efforts

Date	Forecast MD Max O3 (ppb)	Actual MD Max O3 (ppb)
Aug 6 th	72	69
Aug 10 th	71	73
Aug 16 th	73	68
Aug 28 th	80	64

Peak Ozone Day Reduction Program Day Advance Notice

High Ozone Expected Tomorrow!

Thank you for your interest in MDE's 2018 pilot program to reduce nitrogen oxide (NO_x) emissions and lower ozone levels on peak ozone days (the Peak Ozone Day Reduction Program)

An air quality exceedance day is forecasted to occur in Maryland tomorrow **August 6, 2018**. As requested in the previous notification email, MDE is asking you to take all reasonable steps to minimize NO_x emissions tomorrow.

At a minimum, MDE is asking you to consider implementing the measures described below:

For your units subject to the emission reduction optimization requirements of COMAR 26.11.38.03A(2), please make all reasonable efforts to run at rates that are at or below the indicator rates listed at 26.11.38.05A(2).

For Municipal Waste Combustors (MWCs), optimize the use of your current control technologies to minimize NO_x emissions and make all other reasonable efforts to reduce NO_x emissions.

For other units that are not subject to COMAR 26.11.38 and not an MWC, MDE is asking that you either choose not run the unit tomorrow or to make all reasonable efforts to minimize NO_x emissions from the unit if it does run.

Did the voluntary actions help? - Being analyzed now

A bright sun shining through a blue sky with white clouds. The sun is positioned in the upper right quadrant, casting rays across the sky. The clouds are scattered and fluffy, with some larger ones on the left and right sides. The overall scene is bright and clear.

THE MARYLAND 126 PETITION

Maryland's CAA § 126 Petition

- In 2014 and 2015 Maryland worked with about 25 Eastern states to see if additional controls on power plants to reduce ozone transport could be agreed upon
 - The State Cooperative on Ozone Transport (SCOOT)
 - It did not result in new controls
- On November 16, 2016 ... MDE filed a CAA §126(b) Petition with EPA to compel emission reductions in upwind states.
 - Maryland's Petition covers 36 electric generating units in five upwind states: Indiana, Kentucky, Ohio, Pennsylvania and West Virginia
- January 3, 2017- The EPA extended the deadline to act on the Petition until July 15, 2017



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What is Maryland's Ask?

- The petition is fairly simple. It asks EPA to require these 36 EGUs to run their controls on all days during the ozone season.
 - Under cap-and trade programs sources are allowed to NOT run their controls on bad ozone days if they can still meet long-term, “ozone season” tonnage caps
- In 2015, Maryland adopted regulations requiring all coal-fired EGUs to “optimize” the use of their control technologies every day of the ozone season
- On some days, the data shows that these 36 units emit over 400 tons of NOx emissions because they do not optimize controls
 - This is a huge number
 - 2 to 5 ppb of excess ozone created in MD



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What Happened Next?

- On September 27, 2017, Maryland sued EPA for failure to act on the Petition
- On June 13, 2018, the U.S. District Court of Maryland ordered EPA to take final action on Maryland's Petition by September 15, 2018



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EPA's Denial

- On June 8, 2018, the EPA proposed to deny Maryland's Petition
- On June 22, 2018, Secretary Grumbles provided oral testimony at EPA's Public Hearing on the proposed denial of Maryland's Petition
- On July 23, 2018, MDE provided written comments on the proposed denial of Maryland's Petition
- October 5, 2018- EPA's final denial of Maryland's Petition and Delaware's Petitions



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Maryland's Law Suit

- On October 15, 2018, Maryland filed a petition for judicial review with the D.C. Circuit asking the court to review the final action of the EPA
- The Chesapeake Bay Foundation, Environmental Defense, Sierra Club, the Environmental Integrity Project and other environmental groups also filed petitions in support of the Maryland action
 - The D.C. Circuit also combined petitions from Delaware and Environmental NGOs into one lawsuit with Maryland.
 - The State of New York, New York City, and New Jersey have all intervened on Maryland's behalf

Next Steps:

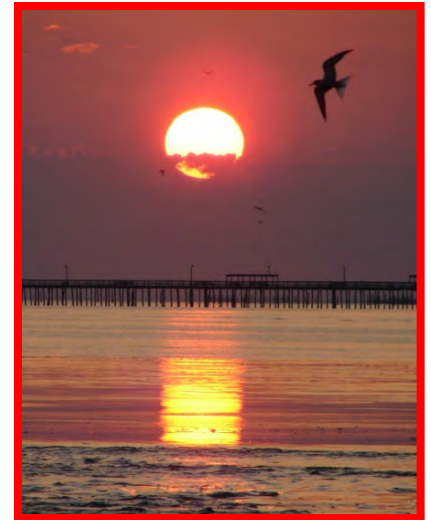
- Maryland will file a brief with the D.C. Circuit
- Oral arguments will be scheduled

A bright sun shining through a blue sky with white clouds. The sun is positioned in the upper right quadrant, creating a lens flare effect. The sky is a deep blue, and the clouds are white and fluffy. The overall scene is bright and clear.

THE VOLKSWAGEN MITIGATION PLAN

The Volkswagen Mitigation Plan

- VW broke the law
- They were caught
- Resulted in a major settlement that involved many states, EPA and others
- One piece of that settlement provided \$76 Million to Maryland to mitigate the excess emissions that resulted from the illegal activities
- MDE, MDOT and MEA working together on the Mitigation Plan



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Maryland's Plan

- Released for public comment several months ago
- The MD Plan identifies some specific projects to be funded, but the bulk of the \$76 Million is set aside for partnerships with the business community, local governments and underserved communities
- MDE held 2 public meetings on the plan
- Hundreds of comments received




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What Can the Funds be Used For?

- All to be invested into pollution control projects to reduce NOx and other emissions
- Will also support electric vehicle implementation, diesel replacement and retrofit efforts, environmental justice initiatives and much more
- Plan to be finalized soon
- Partnership proposals in the Spring of 2019



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A bright sun shining through a blue sky with white clouds. The sun is positioned in the upper right quadrant, casting rays across the sky. The clouds are scattered and fluffy, adding texture to the scene. The overall color palette is dominated by various shades of blue and white.

THE GREENHOUSE GAS EMISSION REDUCTION ACT

The Greenhouse Gas Emissions Reduction Act (GGRA)

- Original GGRA adopted in 2009
 - Reauthorized and enhanced in 2016
- Core elements of the law
 - 25% reduction by 2020 (2009 law)
 - 40% reduction by 2030 (2016 law)
 - Must produce a net economic benefit to the State's economy and a net increase in jobs in the State
 - Many other safeguards
 - On Track for Continual Progress



Photo by Matt Rath/Chesapeake Bay Program



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GGRA Schedule

- 2018 - MDE, other State agencies, and the Maryland Commission on Climate Change research and build the 40 by 30 plan
- December 31, 2018 - Draft plan
- December 31, 2019 - Final plan
- October 1, 2022 – Two Studies Due
 - Independent study by institution of higher education on the economic impact of requiring GHG reductions from manufacturing sector
 - Update from MDE on progress towards achieving required reductions and those needed by 2050
- December 31, 2023 – Law terminates if not reauthorized
- October 1, 2027 – MDE owes second progress report if the law is reauthorized



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Current Status of the 2018 Draft Plan

- Projecting emissions to 2030 & 2050 under all programs currently on the books
 - Also analyzing new potential programs
- Analysis also includes impacts on the economy and job creation
- Using state-of-the-art tools to model all major programs together
 - Interactions automatically captured



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Enhanced Analysis Tools

- The Maryland Commission on Climate Change has pushed for MDE to continuously improve our modeling and other analytical tools
- We have done that:
 - Emissions
 - Economic impacts
 - Jobs
 - Social equity
- Our newest tool ... PATHWAYS
 - State -of-the-art climate change model
 - Being used in other leadership states



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Pathways Policy Scenarios Being Analyzed

1. Reference Case: “Business-as-usual” scenario incorporating effects of major policies as they currently exist on the books.
2. Policy Scenario 1: Extension of current program framework (e.g. EmPOWER extension, higher RPS goal).
3. Policy Scenario 2: New programs and changing program frameworks (e.g. Clean Energy Standard instead of RPS).
4. Policy Scenario 3: Mitigation Working Group scenario: Carbon Price and complementary policies.
5. Policy Scenario 4: “Clean-up” scenario at the end of the process incorporating final decision of programs to include in draft plan.



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Timing

- The clock is ticking
- Plan due by end of year
- Multiple meetings with the Climate Change Commissions Mitigation Working Group in December
- Plan will describe a path forward for 40 by 30 and also look at 80/90 by 50
- Plan will show pros and cons for all measures considered
- Final Plan due at the end of 2019 after an intense year of public input



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A bright sun is positioned in the upper right quadrant of the image, casting a strong glow and creating a lens flare effect. The sky is a deep, clear blue, and several large, fluffy white cumulus clouds are scattered across the scene, particularly on the left and right sides. The overall atmosphere is bright and clear.

QUESTIONS