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Solving the Ozone Transport Problem

A Proposal for a Collaborative Solution

Technical and Policy Framework for Resolving the Issue Through Complementary "Good Neighbor" and "Attainment" SIPs

Tad Aburn, Air Director, MDE

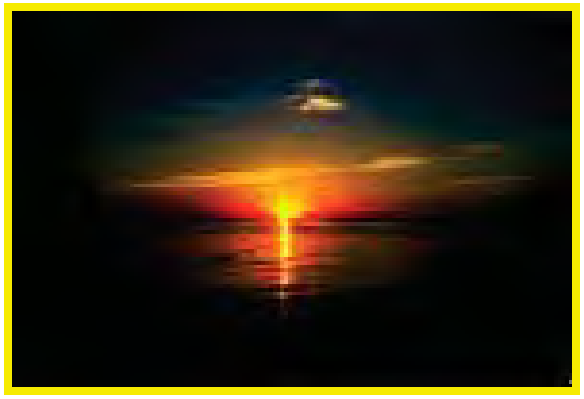
LADCO Air Directors – May 1, 2014

Topics

- Background
- Scenario 7 and 7B Modeling
  - Just a peak at 7B
  - What Do They Tell Us?
- Mobile Sources, Power Plants and Transport
  - Some science, some data and some common sense next steps
  - Addressing mobile sources along the I-95 Corridor
  - Some power plant issues we should discuss
- A “State Initiated Solution” to the ozone transport problem
  - A proposal from Maryland

Background – Ozone Transport

- Many, many balls in the air
  - Supreme Court deliberations
  - "Expand the OTR" Petition under Section 176A of the Clean Air Act (CAA)
  - Challenges to EPA over large nonattainment areas (CAA Section 107)
  - Challenges to EPA over "Good Neighbor" SIPs (CAA Section 110A2D)
  - EPA's Transport Rule Process
  - A collaborative effort between upwind and downwind states to address the ozone transport issue
- Remainder of this presentation will focus on the collaborative effort



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Background – The Collaborative

- On August 6, 2013- Approximately 30 Air Directors participated in a call to begin a technical collaboration on ozone transport in the East
- There was discussion … and general agreement … on beginning technical analyses of a scenario (called "Phase 1") that would try and capture the progress that could be achieved if:
  - The EPA Tier 3 and Low Sulfur Fuel program is effectively implemented
  - The potential changes in the EGU sector from shutdowns and fuel switching driven by MATS, low cost natural gas and other factors were included
  - The potential changes in the ICI Boiler sector driven by Boiler MACT and low cost natural gas were also included
  - There was also general agreement that, at some point, Commissioner level discussions may take place
- In early April 2014, preliminary discussions between Commissioners began
  - A Commissioner level Collaborative is being discussed

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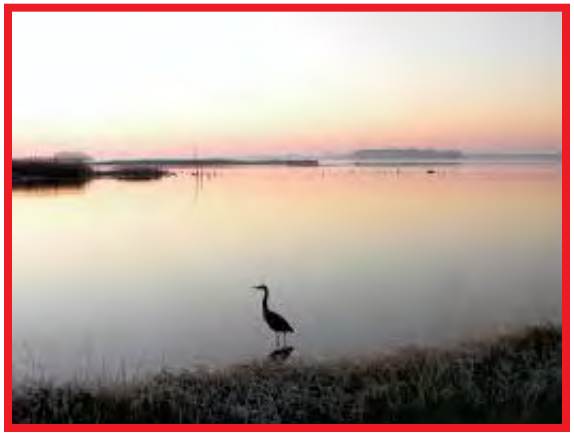
OTC Scenario 7 and 7B

- Preliminary sensitivity runs to try and get a general feel for how the "Phase 1" collaborative strategy will help reduce ozone
- Built from the OTC 2007 Platform
- Will be updated … in many ways … as new data becomes available
  - 2011/2018 EPA information
  - Updated ERTAC projections
  - More
- Basic new controls included in Scenario 7 and 7B
  - Mobile
  - EGU
  - ICI Boiler



Reductions from Mobile Sources

- Adds additional mobile source NOx reductions in the 2018 time frame from EPA's proposed Tier 3 and Low Sulfur Fuel Rule
- Builds off of fairly significant NOx reductions from current mobile source measures including:
  - EPA Tier 2 standards
  - Reformulated gasoline and other fuels
  - I & M Programs
  - More
- Programs like Tier 2 continue to generate more reductions through 2018 as the fleet turns over

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Reductions from EGUs

- Based on overwhelming input from many states on the need to try and capture all of the changes in the EGU sector
- Significant changes:
  - Shutdowns
  - MATS compliance
  - Fuel conversions resulting from low cost natural gas
- What's included in Scenario 7 and 7B?
  - PJM and other announced shutdowns
  - Other changes built into regional ERTAC projections like natural gas conversions
  - Assumptions about loss of capacity being replaced by natural gas and coal generation

Reductions from ICI Boilers

- Preliminary estimates generated working with the Council of Industrial Boiler Owners (CIBO)
- Driven primarily by Boiler MACT and low cost natural gas
- Preliminary estimates may underestimate reductions according to recent discussions with CIBO

	ICI Boiler Emission Reductions in the East	Change in Total Inventory
NOx	52%	2.3%
SO2	76%	13.8%
Direct PM	82%	3.5%

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Model Set-Up and Performance

- No detail in this presentation
- Available, but not really that critical
- Scenario 7 and 7B … again are preliminary sensitivity runs
- Basics
  - Built from OTC 2007 CMAQ Platform
  - Model performance is generally acceptable
  - Do include some recent ERTAC EGU projection work

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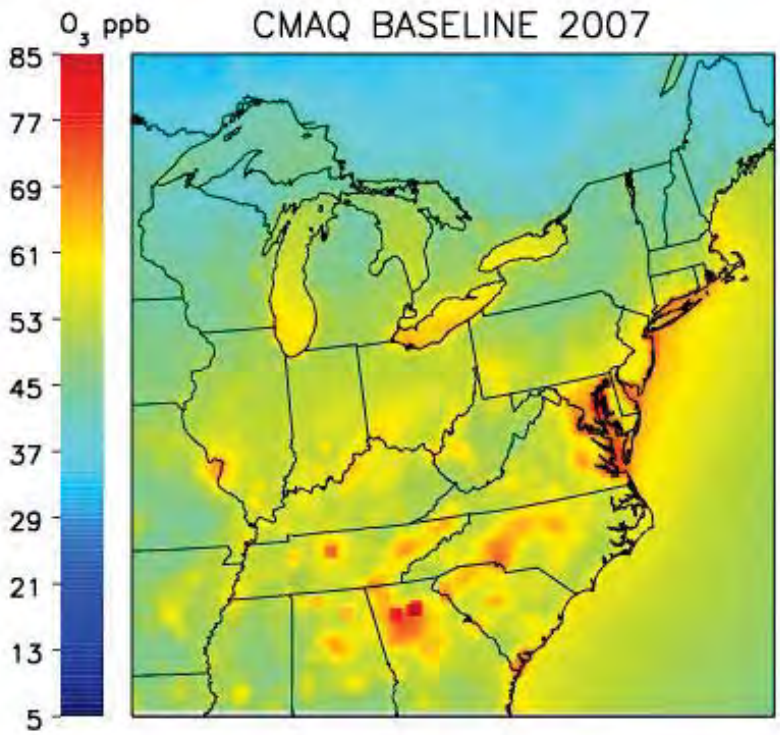
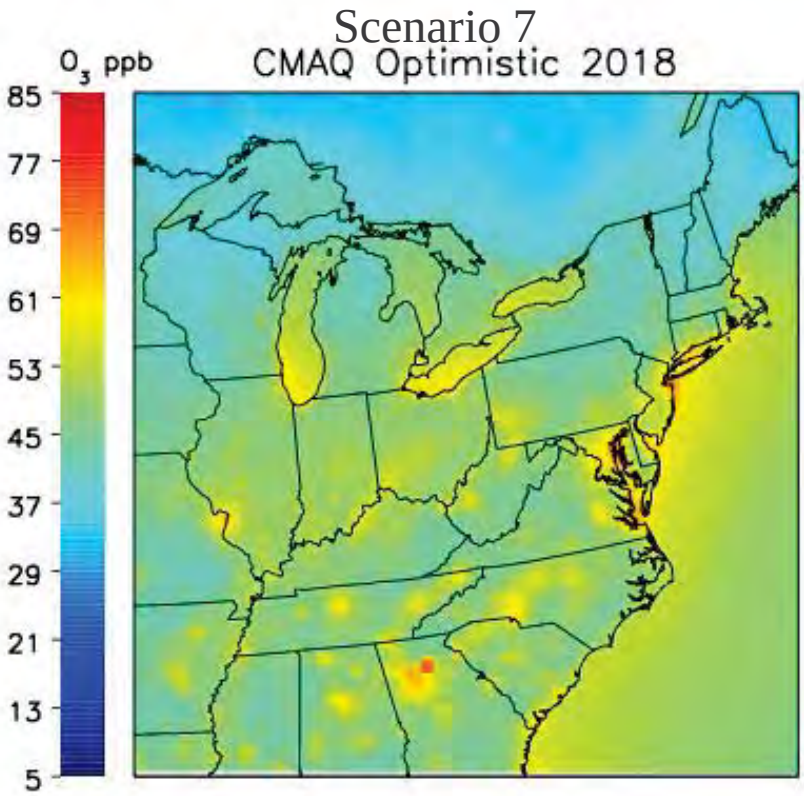
Concentrations – Before and After

Before Scenario 7



After Scenario 7



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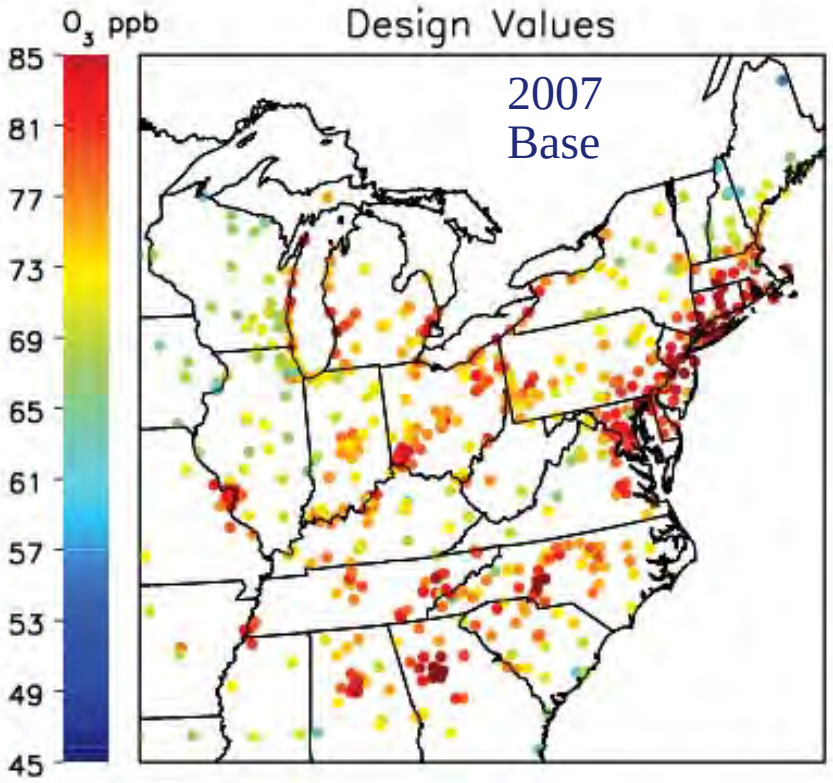
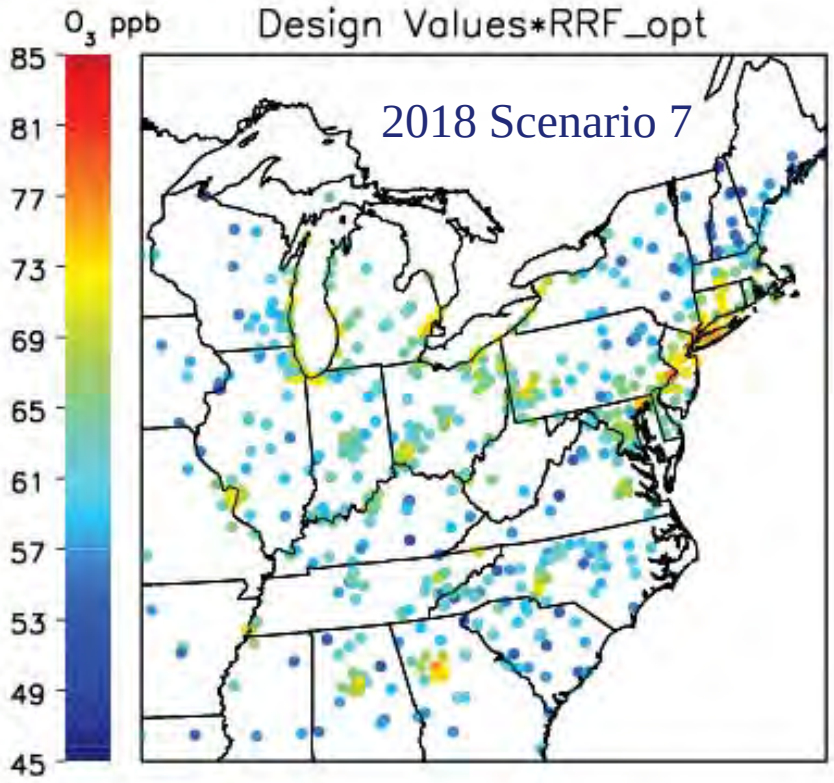
Modeled Design Values

Before Scenario 7



After Scenario 7



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Maryland Design Values

… Before and after Scenario 7

County	Design Value 2007	After Scenario 7 2018
Anne Arundel	85.7	68
Baltimore	77.3	65
Baltimore	83.3	71
Calvert	78	61
Carroll	82.3	66
Cecil	89	74
Charles	80.7	62
Frederick	80.3	65
Garrett	73.3	63
Harford	90.7	76
Harford	87.3	74
Kent	81.3	66
Montgomery	82.7	68
Prince George's	82	67
Prince George's	85.3	68
Washington	76.7	62
Baltimore (City)	67	57

Updated CMAQ Chemistry?

- For years, Maryland and the University of Maryland have been analyzing model performance aloft, where most transport takes place
  - Not always great
- In 2011, the Discover AQ field study in the Mid-Atlantic provided new unique data aloft
- U of M has analyzed aloft chemistry and found some problems with nitrogen chemistry
  - Fails to carry NOx reduction benefits downwind
- Working with ORD on new aloft chemistry concepts
  - Will show small, but important additional benefits from regional scale NOx strategies
  - Maybe an extra 2 ppb benefit in Maryland

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Scenario 7 Screening Modeling Results
High Values - OTR State

State	2018 Scenario 7	State	2018 Scenario 7
CT	76	NJ	78*
DE	69	NY	77
DC	70	PA	79
ME	65	RI	66
MD	76	VT	57
MA	72	VA (OTR)	70
NH	62		

* NJ's highest monitor (85 ppb) is being evaluated for performance

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Scenario 7 Screening Modeling Results
High Values – Other States

State	2018 Scenario 7
Illinois Cook County	73
Kentucky Jefferson County	68
North Carolina Mecklenburg County	72
Georgia DeKalb County	77
Indiana Lake County	75

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Scenario 7B

- An update to Scenario 7
  - Still based on 2007 base year
  - Better ERTAC data
  - Other improvements
  - Lost generation … now also moves to coal … not just natural gas
- Still being reviewed … but
  - Results will be very similar to Scenario 7
- For Maryland, with enhanced chemistry, new local controls that have not yet been included, Tier 3 Vehicle and Fuel Standards and a few fixes to the regional power plant piece of the puzzle (more in a minute)
  - … I believe we will model attainment
- Hope to have modeling with 2011/2018 base year/platform soon
  - Believe the updated platform may actually show greater ozone benefit

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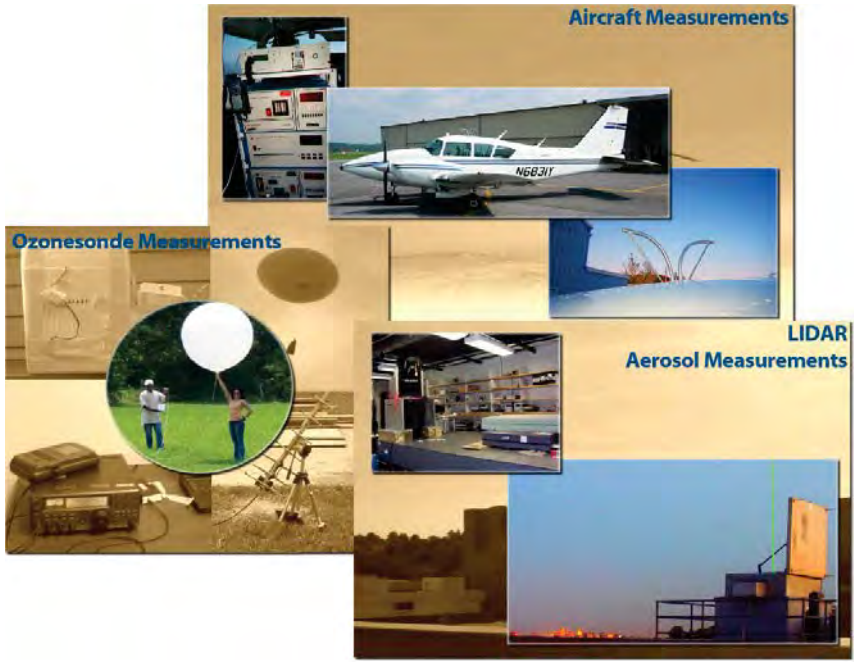
Maryland's Ozone Research Effort



- MDE works in partnership with local universities (UMD at College Park, UMBC, Penn State and Howard University) to study Maryland's air pollution problems
  - Airplanes
  - Balloons
  - Lidar
  - Profilers
  - Satellites
  - Special monitors
  - Modeling
  - More

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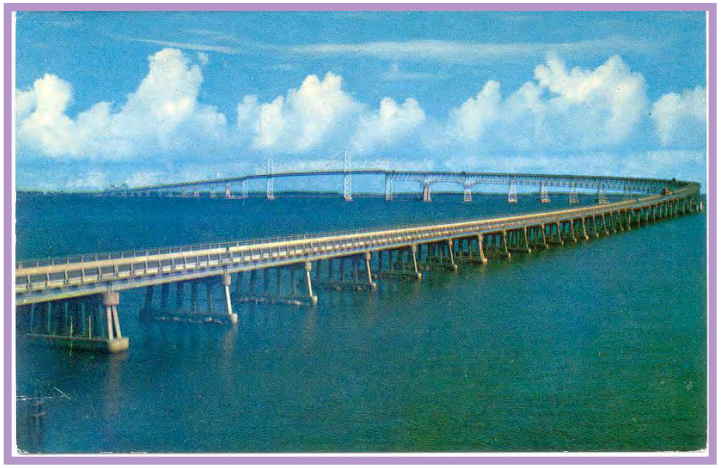
Understanding Ozone Transport

- 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 contributor
  - Night-time, Southerly Transport – Vehicles, power plants, more
  - City to City – Washington to Baltimore … NY to CT, etc. – mostly vehicles



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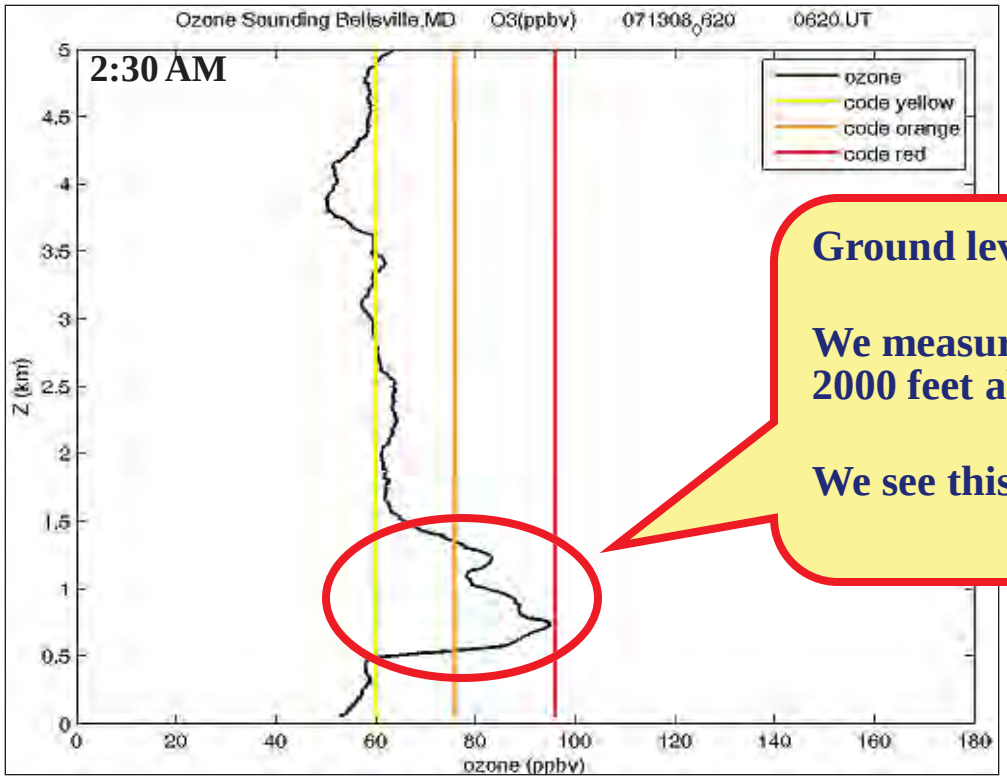
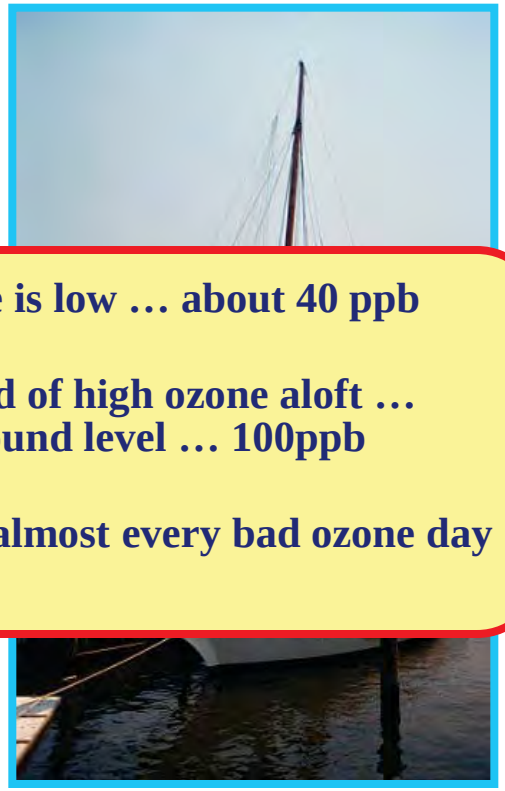
What is This Reservoir?

A balloon launch at 2:30 am south of Baltimore … north of Washington





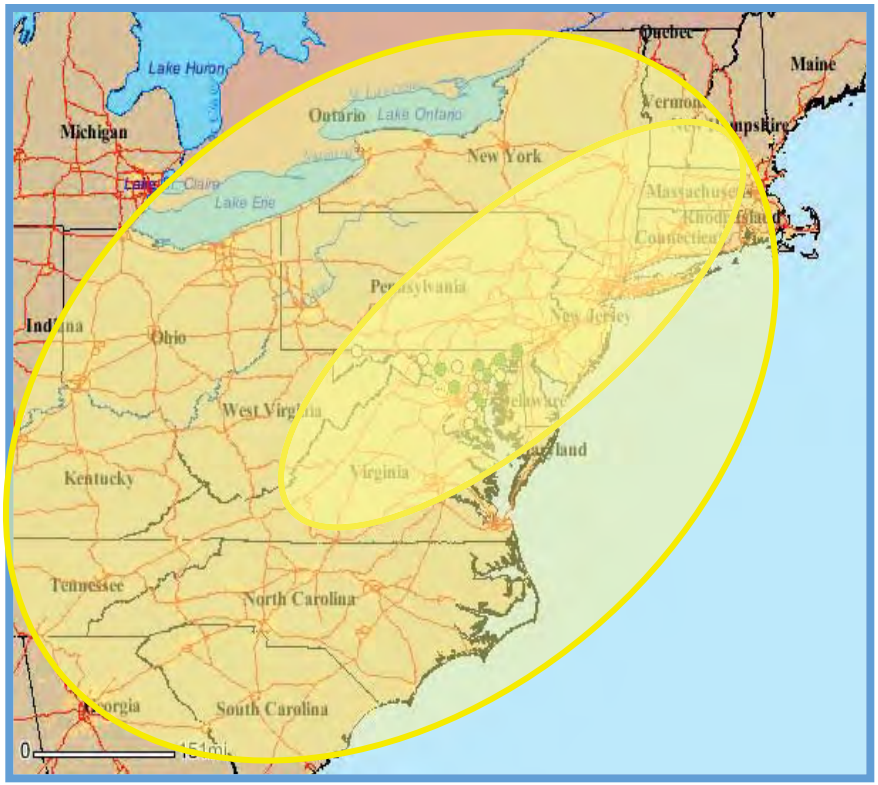
Ground level ozone is low … about 40 ppb

We measure a cloud of high ozone aloft … 2000 feet above ground level … 100ppb

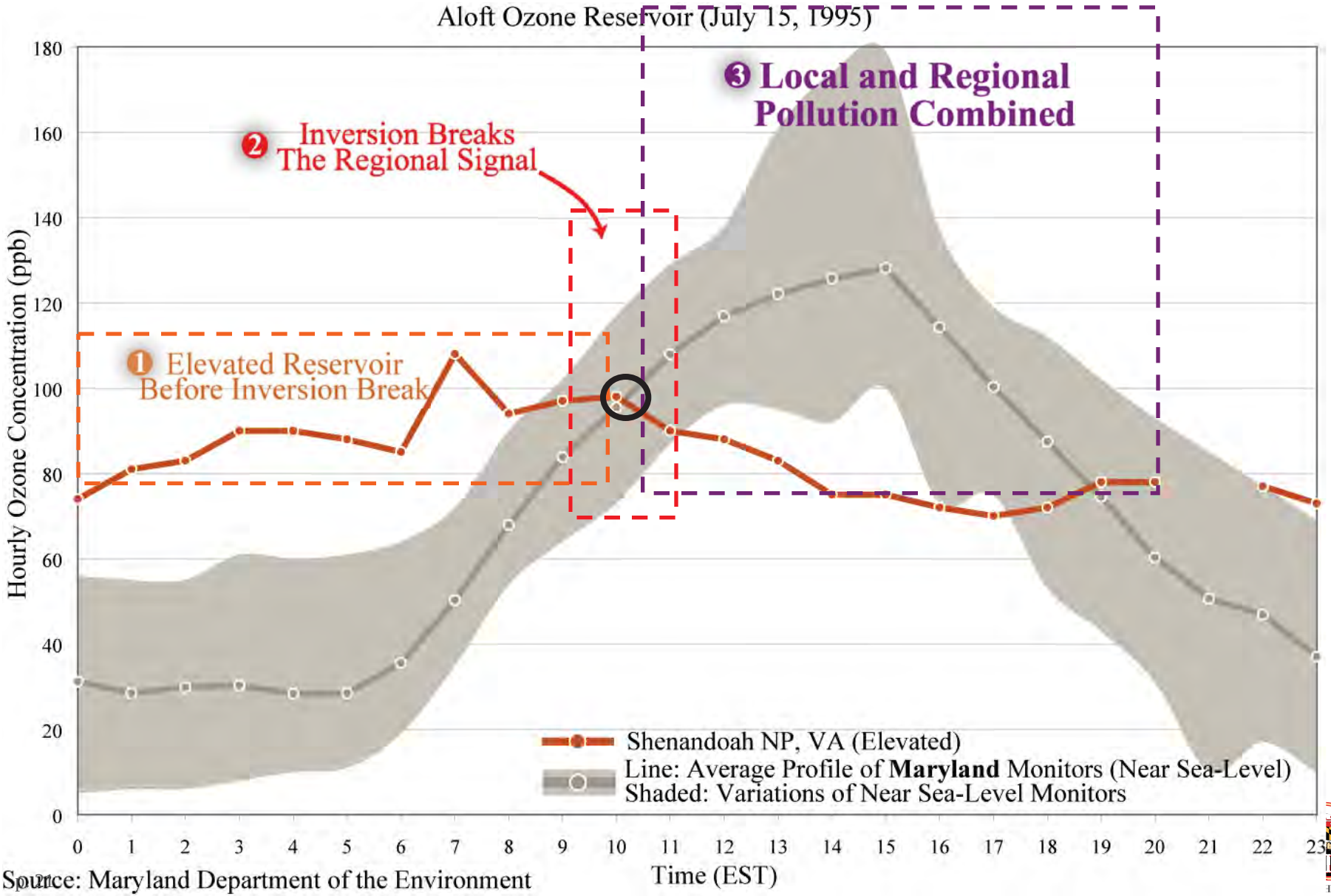
We see this before almost every bad ozone day

The Elevated Ozone Reservoir

- Every bad ozone day, in the morning hours, a large reservoir of ozone sits above Maryland and the Mid-Atlantic waiting to mix down
  - Ozone levels in the reservoir can routinely reach 60 to 100 ppb
  - In the morning, ozone levels at the surface are very low
- Around 10:00 or 11:00 … the "nocturnal inversion" breaks down … and
  - Ozone in the elevated reservoir mixes down to the surface and degrades air quality

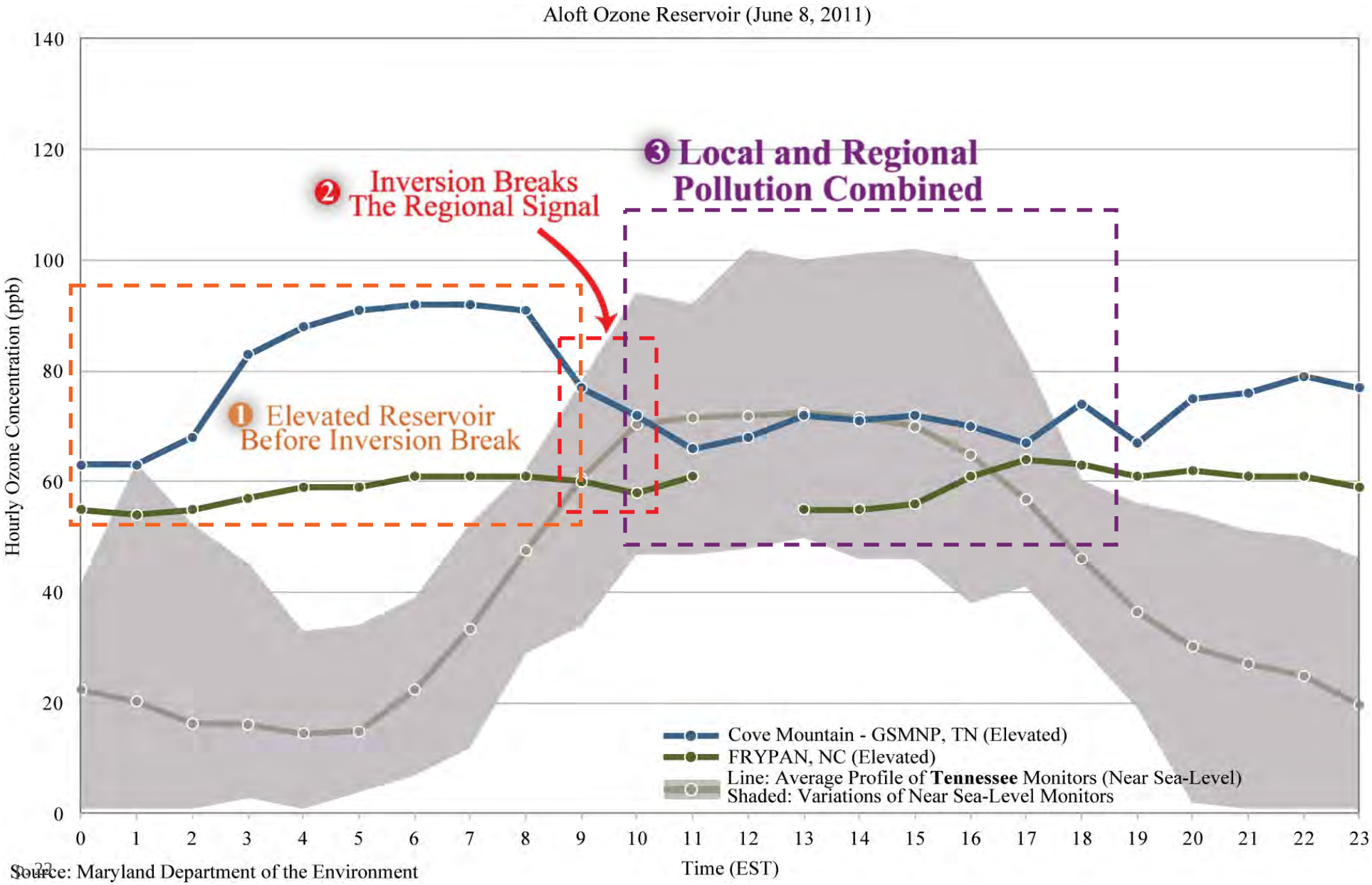


The Elevated Reservoir – The 90's



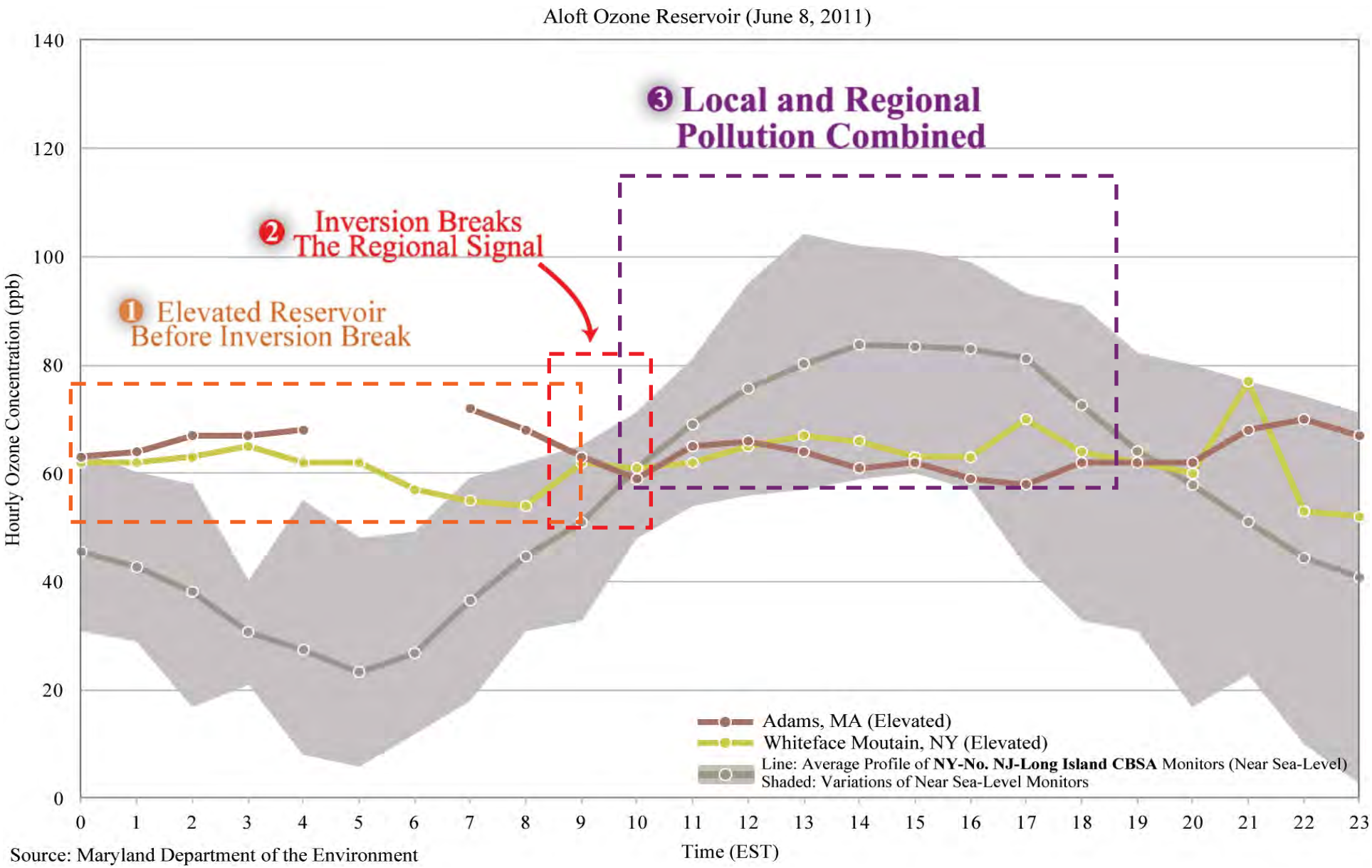
Source: Maryland Department of the Environment

Same Signal – Tennessee 2011



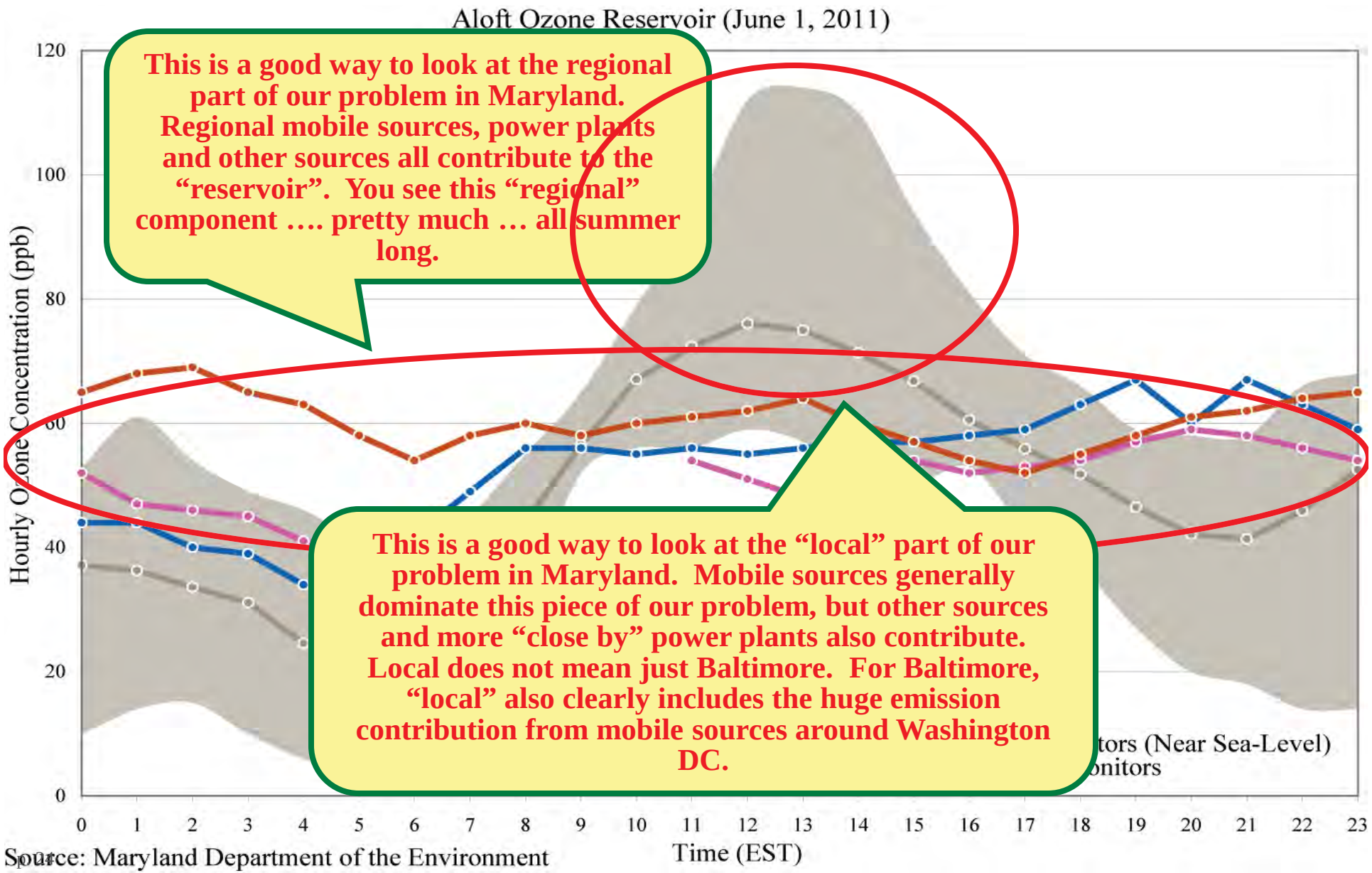
Source: Maryland Department of the Environment

Same Signal – New York 2011



Source: Maryland Department of the Environment

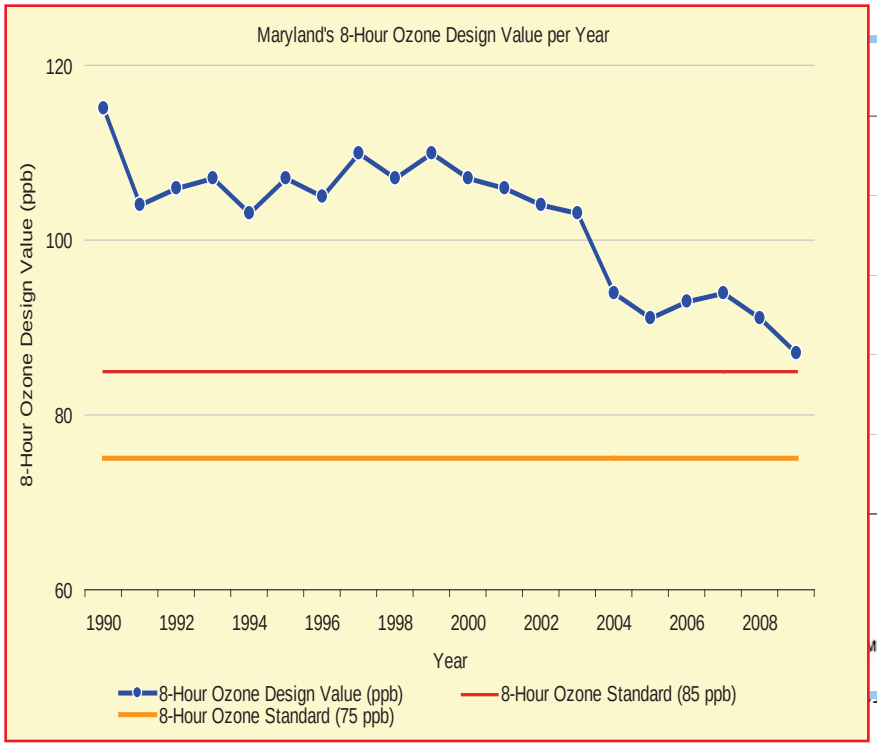
Same Signal – Maryland 2011



Source: Maryland Department of the Environment

Reducing Regional Ozone – A Case Study

Ground Level Ozone Drops Dramatically in the Same Time Frame



- The 2003/2004 NOx SIP Call as a case study. Significant NOx reductions from Federal Tier 2 Vehicle Standards occuring in the same time frame
  - A classic ozone transport success story
  - Incoming ozone levels collect in an elevated reservoir over night
  - Real world programs like the NOx SIP call and Tier 2 Vehicle Standards show that:
    - Adding regional controls …
    - Results in regional NOx emission reductions …
    - Which leads to reduced ozone in the elevated reservoir …
    - Which lead to lower ozone at ground level and public health protection!

So … Where Does This Take Us?

- We understand the science of ozone better than ever
- We've implemented programs that have worked in the real world
- Maryland needs a two-part strategy to continue making progress
  - Local controls are still critical
    - We need to be pushing the envelope on mobile sources
  - National/super-regional controls are also essential
    - EPA's Tier 3 Vehicle and Fuels Standard is the most important new measure needed by Maryland
    - There has been significant progress in reducing NOx from regional power plants
      - But there are a few issues that need to be resolved

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Pushing Local Controls

- Mobile sources
  - Older efforts
    - California car state
    - Enhanced I & M
    - Many other programs
  - New efforts
    - Governor's ZEV MOU
    - Aftermarket catalysts
    - Ports
    - Many diesel initiatives
    - Older vehicle and "legacy fleet" initiatives
    - "Beyond Conformity" (VMT reduction) efforts
- Other sectors
  - Many "Copied from CA" VOC regulations
  - NOx reductions from small and large non-EGU stationary source
  - Diesel generators that participate in demand response programs
  - More

The EGU Issues to Discuss

Conducted Analyses of

EGU data in 11 states

Why West Virginia?

A Good Story

Have 99% of what is needed to submit

an appropriate "Good Neighbor" SIP

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We Would Like Input From Others

Recently Shared with other Air Directors

Purpose

- Maryland is the only Moderate nonattainment area in the East for the 75 ppb ozone standard.
  - This means that Maryland is the only state required to submit an attainment SIP
  - Only state required to perform attainment modeling.
- We are now beginning to build our "SIP Quality" modeling platform.
- We are trying to make sure we capture all of the changes that have occurred in upwind power plants and have put together this small sample package of data and analyses to begin a dialogue with upwind states to make sure we have the best data available.
- We have used readily available data, like the CAMD and ERTAC data, but we recognize that these data sources can be out of date, or not include recent changes.
  - We hope you can help us with making sure we have the best possible data.
- One major issue that our data analyses have uncovered is that many EGU units appear to not be running their controls during the ozone season because of the recent changes in the energy market, reduced coal capacity and inexpensive allowances. This, in many states … like Maryland and many other states … who drive their controls with an "ozone season tonnage cap", is perfectly legal.
  - This is a critical issue that we would also like to begin a dialogue on with you. There appears to be an interest from the EGU sector to discuss this issue and see if a common sense fix can be designed. Maryland believes this fix would be relatively cost-effective compared to the capital cost of the control technologies.
- MDE is also doing the peak day emissions analyses for two additional, large, regional scale, ozone episodes: July 1-7, 2011 and July 1-10, 2012.
- More detailed data and analyses and spreadsheets are available upon request.

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Current Controls?

WV Coal Capacity Breakout

- Total Capacity Coal = 15,849 MW
  - 15 units with SCR = 11,755 MW = 74%
  - 4 with SNCR = 496 MW = 3%
  - 19 without SCR/SNCR = 3597 MW = 23%

DRAFT – April 2, 2014 – Requesting QA of data. For discussion purposes only.

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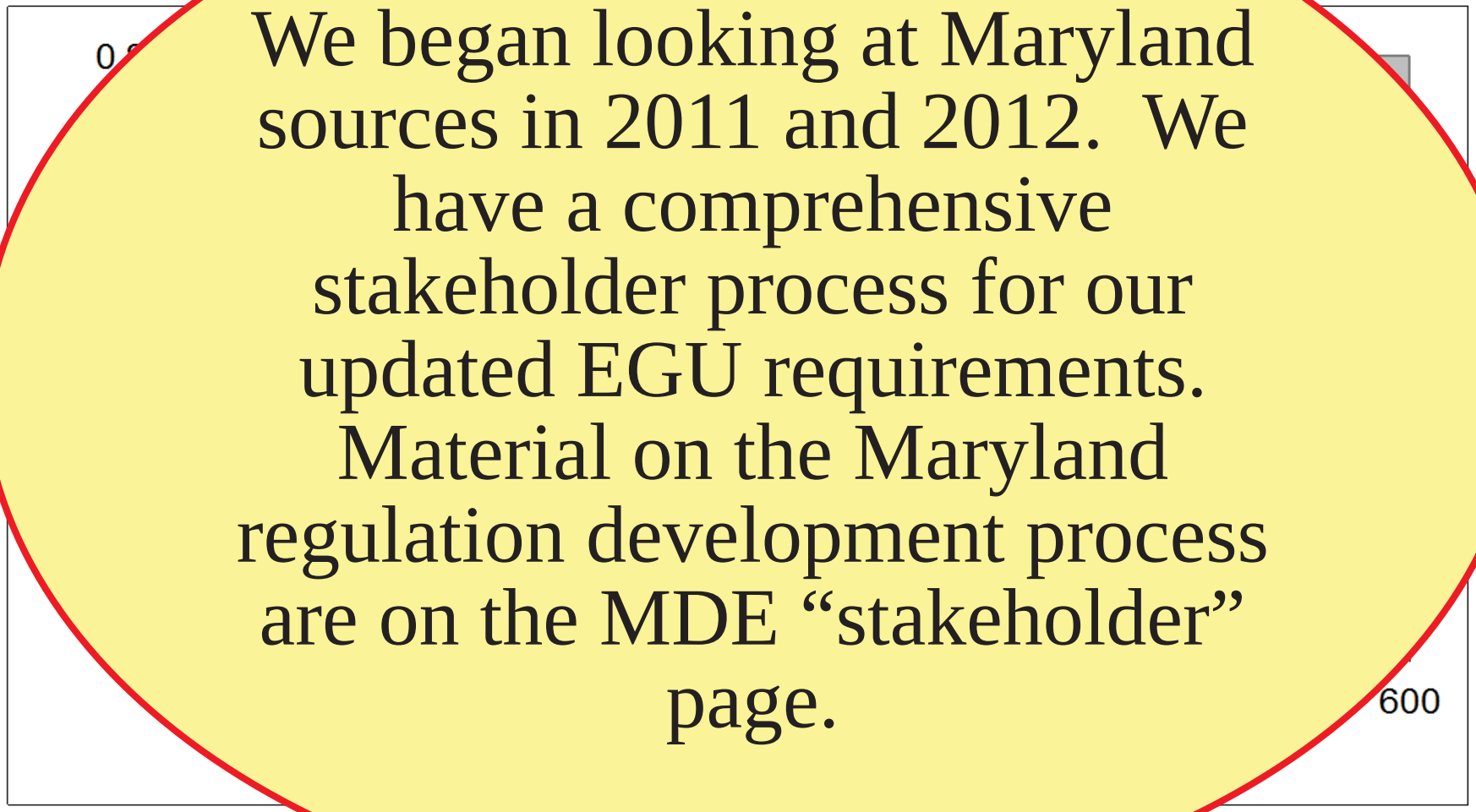
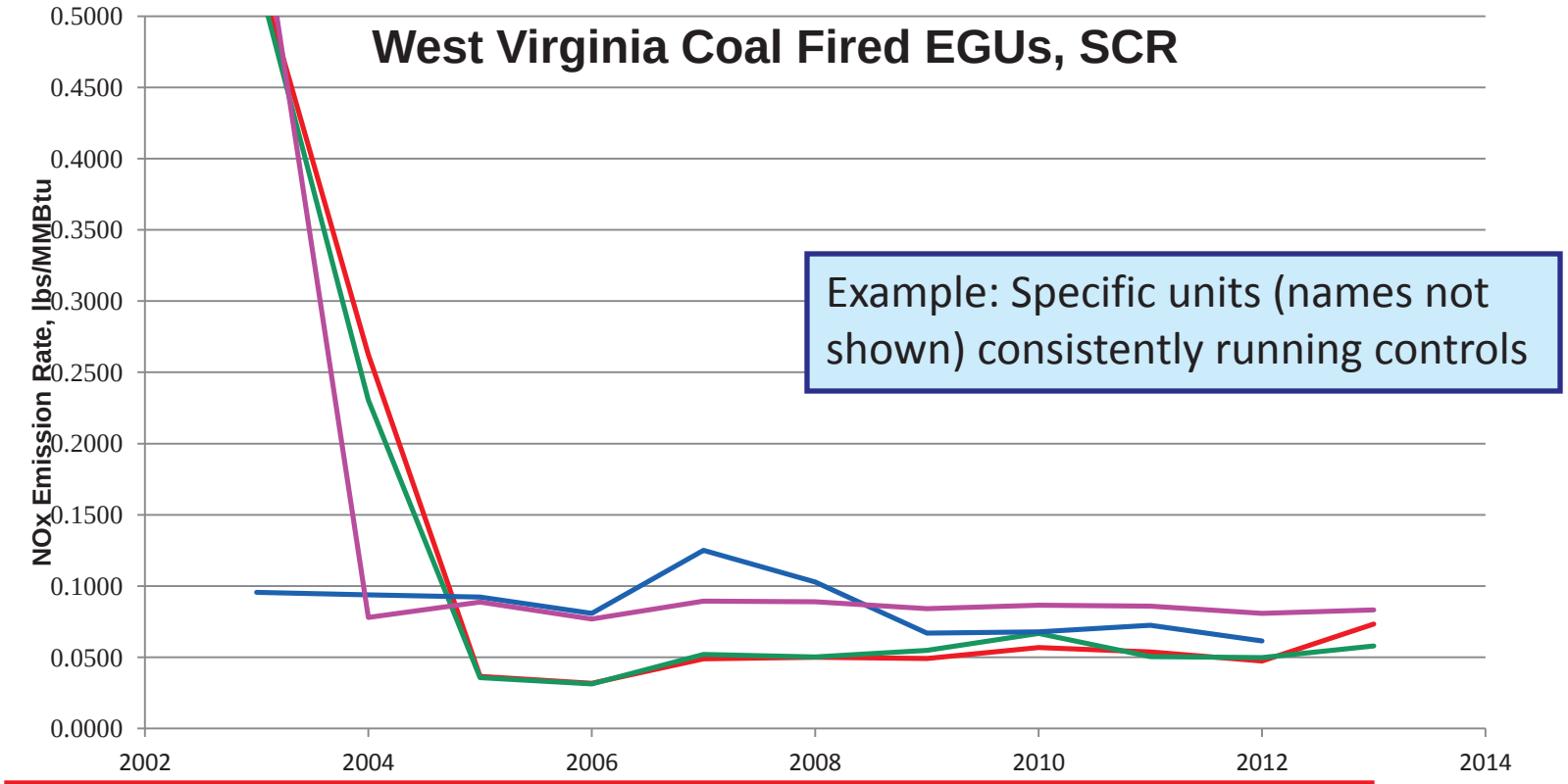
Dickerson (MD) Units 1,2 & 3 - 2012



We began looking at Maryland sources in 2011 and 2012. We have a comprehensive stakeholder process for our updated EGU requirements. Material on the Maryland regulation development process are on the MDE "stakeholder" page.

Running Controls

Average Ozone Season Emission Rates at Specific Units by Year

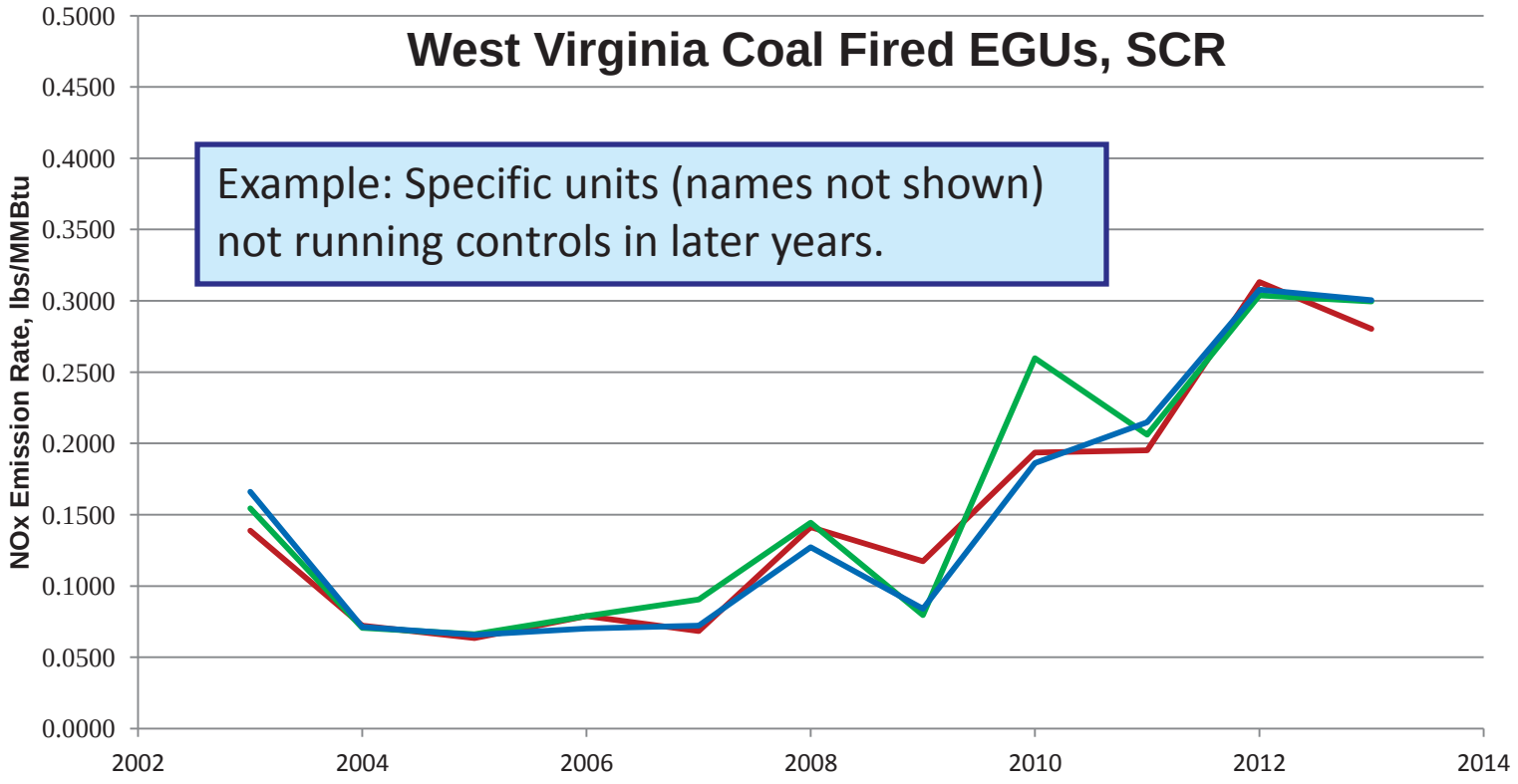


Example: Specific units (names not shown) consistently running controls

DRAFT – April 2, 2014 – Requesting QA of data. For discussion purposes only.

Not Running Controls Well

Average Ozone Season Emission Rates at Specific Units by Year



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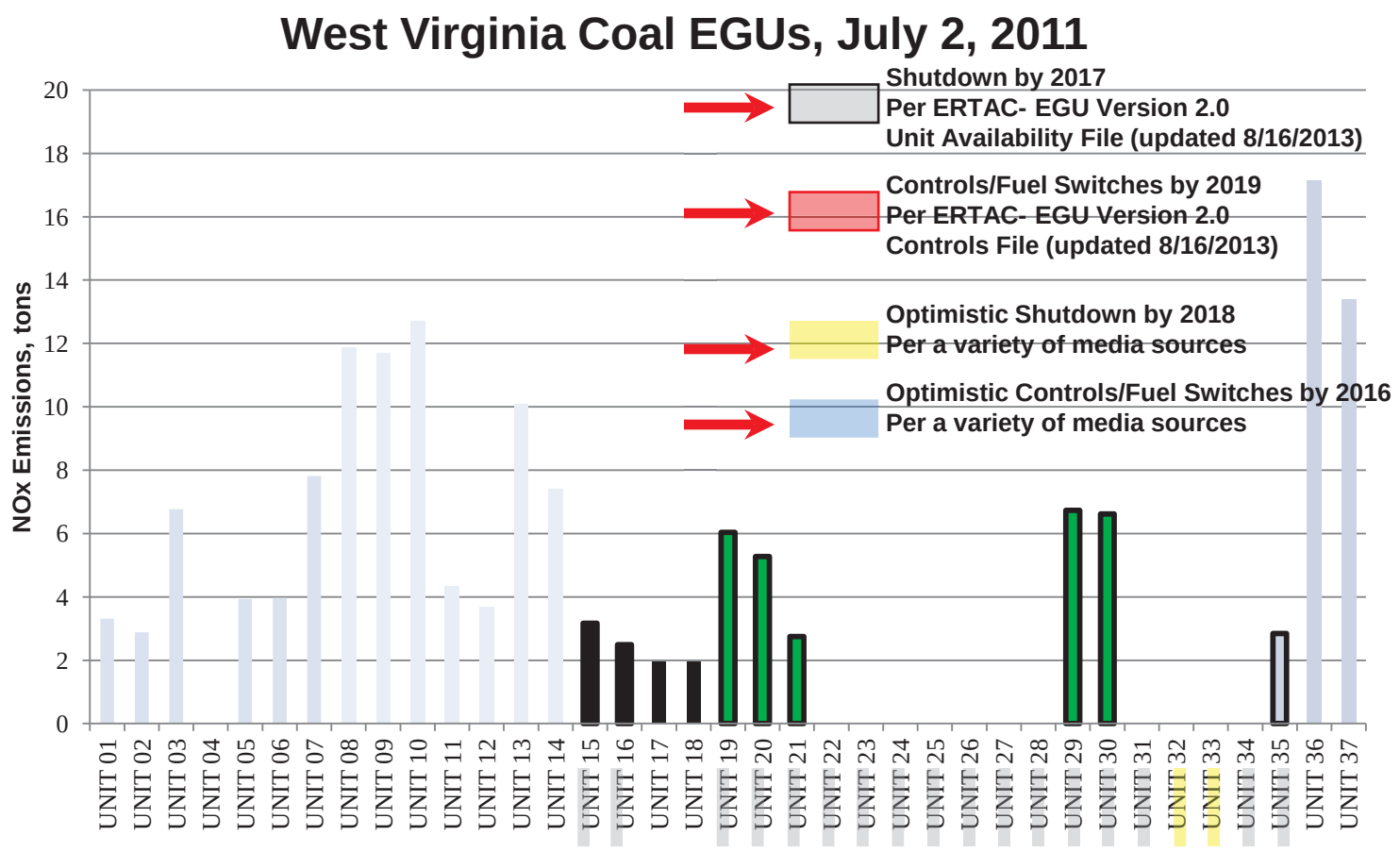
Changes That Are In The Works



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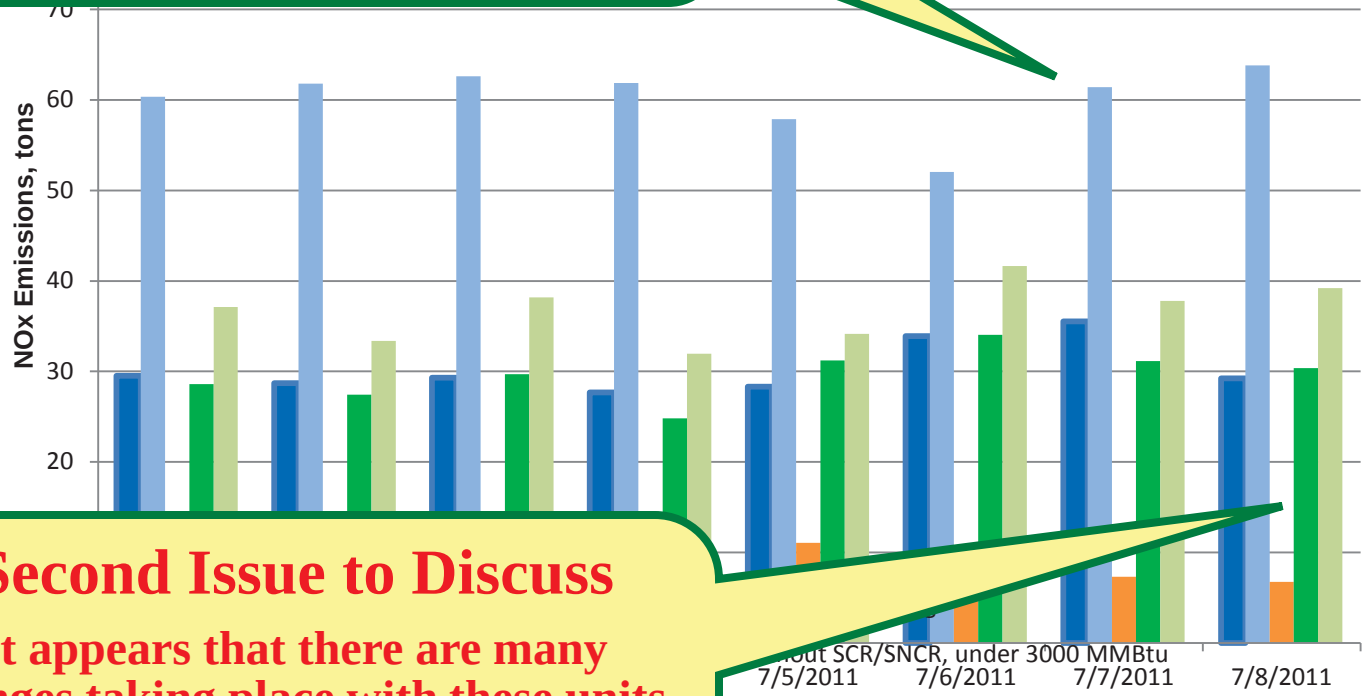
Emissions During Ozone Episodes

Primary Issue to Discuss

Can we find a common sense way to insure controls are run in the core ozone season?

NOx By Control Status

ays in July 2011, Coal



a. For discussion purposes only.

Second Issue to Discuss

It appears that there are many changes taking place with these units. How can we make sure that states like Maryland have the best available data on these units?

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A State Driven Solution?

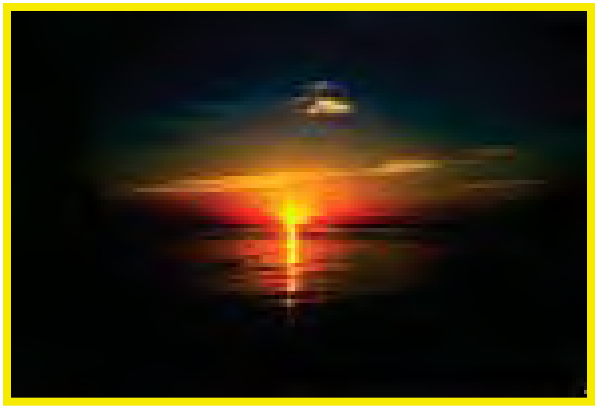
- Scenario 7 and 7B tell us that the 2018 Scenario … we all thought would show major progress … will do just that
- EPA's process is ongoing, but the collaborative modeling could provide a higher quality solution to the issue than the EPA modeling
  - EPA's effort is likely to be challenged
- In 2015 … Areas like Baltimore owe attainment SIPs and modeling
- All states owe "Good Neighbor" SIPs
  - … at some point
- A state partnership proposal by Maryland …

How Do We Move Forward?

- Clearly continue the technical collaboration
  - Commissioner level discussions appear to be supporting the states working together to find a solution
- How do we capture what Scenario 7 and 7B appear to be telling us?
  - Would love to hear thoughts from others
- One idea from Maryland …
  - Upwind and downwind states submit a package of complementary SIPs in 2015
    - Attainment SIPs from states like Maryland
      - We are the only state in the East that owes an attainment SIP in 2015
    - Good Neighbor SIPs from others
    - Supported by collaborative modeling and Maryland's SIP quality modeling
    - This is actually what the Clean Air Act requires
  - Could "trump" the EPA Transport Rule and alter the 176A Petition

Timing

- Maryland Straw Proposal
  - January to December 2014
    - Technical collaboration and stakeholder discussions continue
  - Mid-2014
    - Commissioner level discussions
  - End of 2014
    - Technical work to support “Complementary Package of SIPs” complete
  - Spring 2015 - States submit SIPs
  - This timing works for MD’s SIP, but may also be critical if the “State Solution” is to trump the EPA transport rule and alter the 176A Petition



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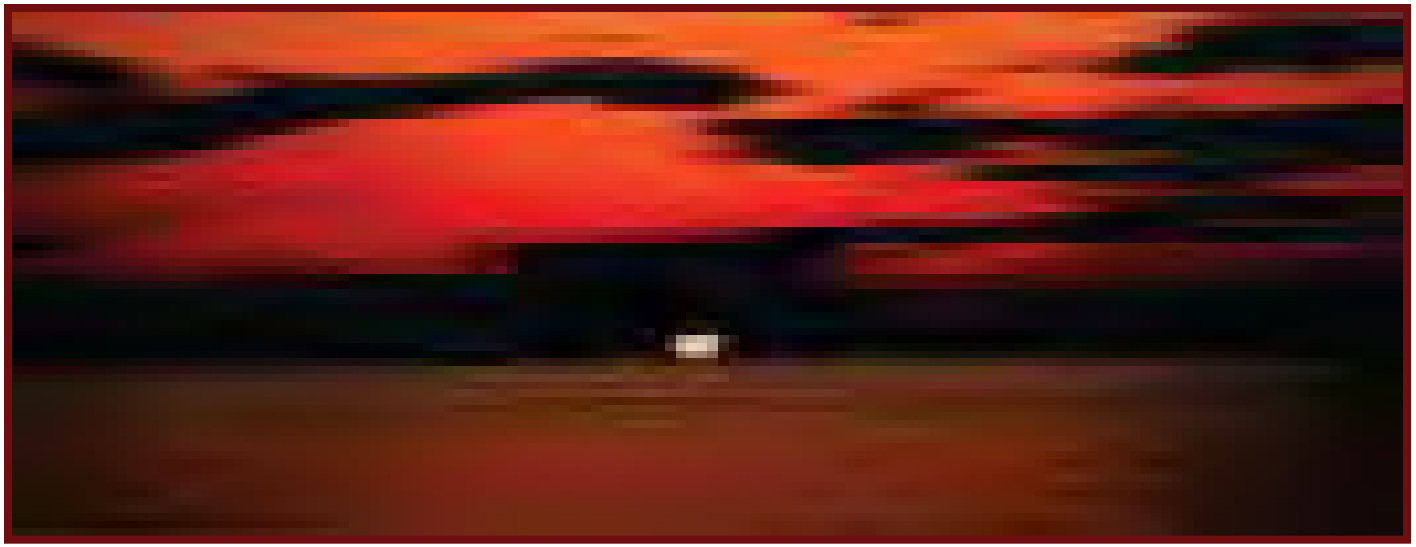
MDE

Thanks



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Tad Aburn, Air Director, MDE

Midwest Ozone Group Meeting – May 9, 2014

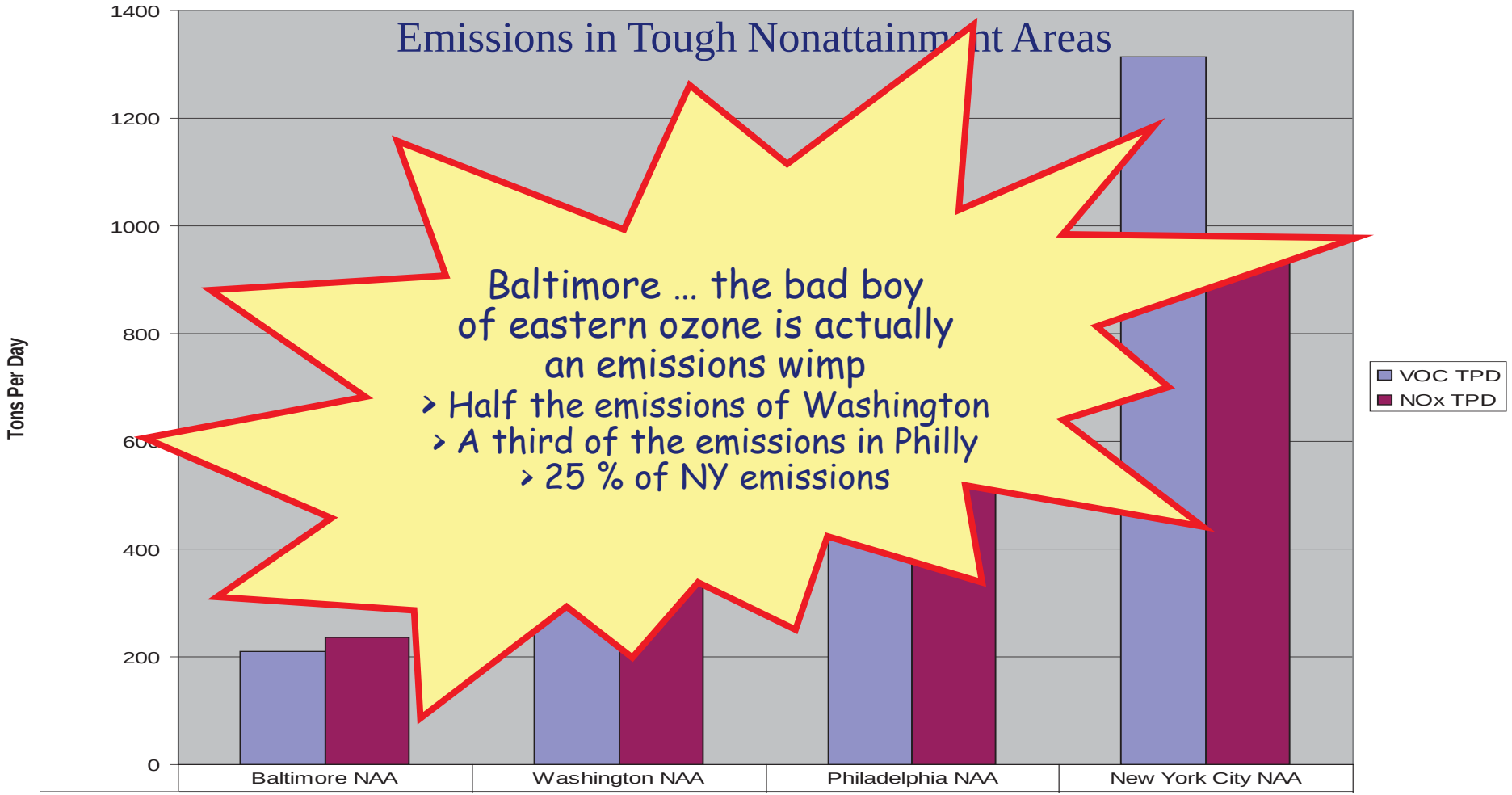
My Dilemma

Just submit the SIP!! …

I don't care what you think - the law says you can clean the air by 2015

But that's scientifically impossible … man

Baltimore – Worst Ozone in the East



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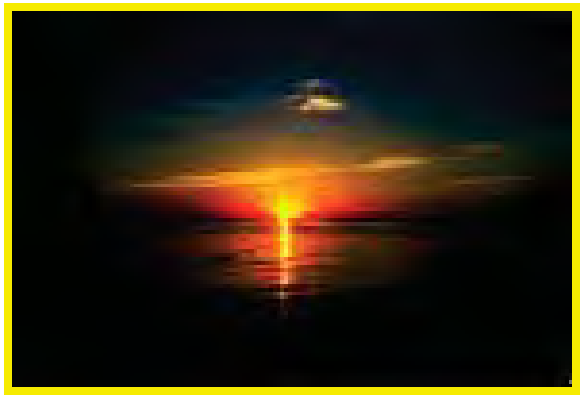

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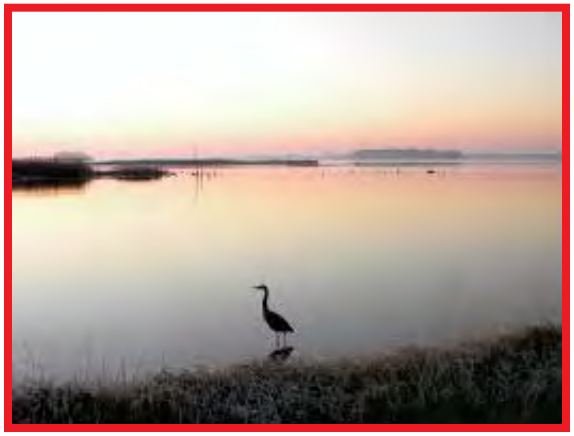
  - The potential changes in the ICI Boiler sector driven by Boiler MACT and low cost natural gas were also included
  - There was also general agreement that, at some point, Commissioner level discussions may take place
- In early April 2014, preliminary discussions between Commissioners began
  - A Commissioner level Collaborative is being discussed

OTC Scenario 7 and 7B

- Preliminary sensitivity runs to try and get a general feel for how the "Phase 1" collaborative strategy will help reduce ozone
- Built from the OTC 2007 Platform
- Will be updated … in many ways … as new data becomes available
  - 2011/2018 EPA information
  - Updated EGU (ERTAC*) projections
  - More
- Basic new controls included in Scenario 7 and 7B
  - Mobile
  - EGU
  - ICI Boiler



* ERTAC = Eastern Regional Technical Advisory Committee – State lead group working on state-of-the art EGU emissions projections and other inventory issues

Reductions from Mobile Sources

- Adds additional mobile source NOx reductions in the 2018 time frame from EPA's proposed Tier 3 and Low Sulfur Fuel Rule
- Builds off of fairly significant NOx reductions from current mobile source measures including:
  - EPA Tier 2 standards
  - Reformulated gasoline and other fuels
  - I & M Programs
  - More
- Programs like Tier 2 continue to generate more reductions through 2018 as the fleet turns over

Reductions from EGUs

- Based on overwhelming input from many states on the need to try and capture all of the changes in the EGU sector
- Significant changes:
  - Shutdowns
  - MATS compliance
  - Fuel conversions resulting from low cost natural gas
- What's included in Scenario 7 and 7B?
  - PJM and other announced shutdowns
  - Other changes built into regional ERTAC projections like natural gas conversions
  - Assumptions about loss of capacity being replaced by natural gas and coal generation

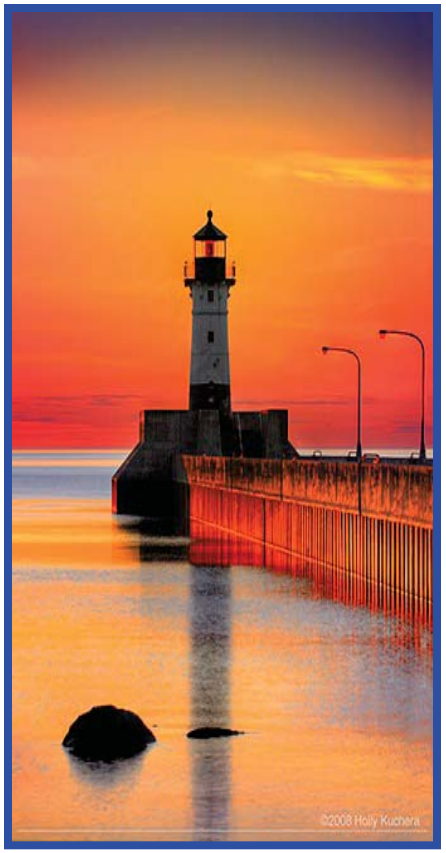
Reductions from ICI Boilers

- Preliminary estimates generated working with the Council of Industrial Boiler Owners (CIBO)
- Driven primarily by Boiler MACT and low cost natural gas
- Preliminary estimates may underestimate reductions according to recent discussions with CIBO

	ICI Boiler Emission Reductions in the East	Change in Total Inventory
NOx	52%	2.3%
SO2	76%	13.8%
Direct PM	82%	3.5%

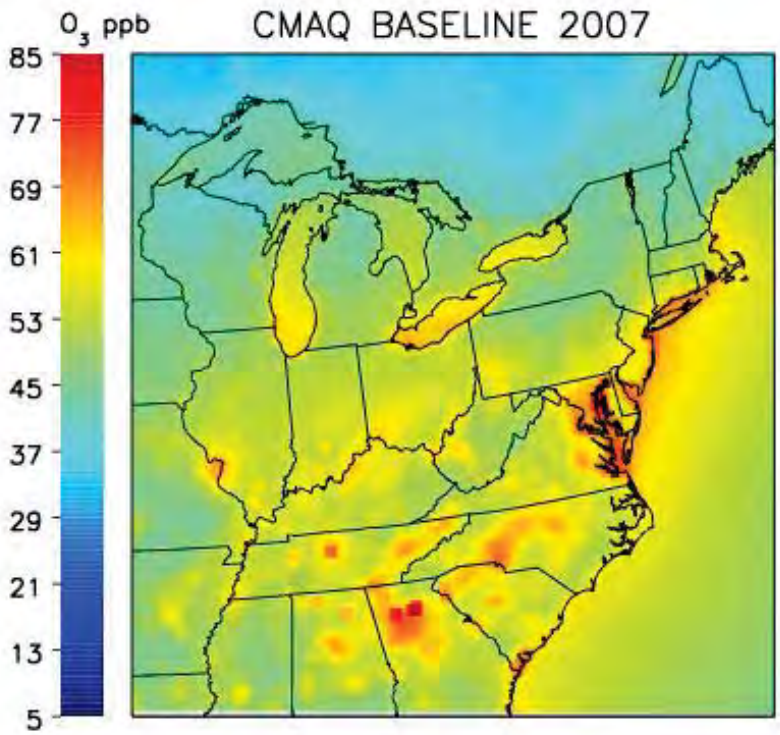
Model Set-Up and Performance

- No detail in this presentation
- Available, but not really that critical
- Scenario 7 and 7B … again are preliminary sensitivity runs
- Basics
  - Built from OTC 2007 CMAQ Platform
  - Model performance is generally acceptable
  - Do include some recent ERTAC EGU projection work

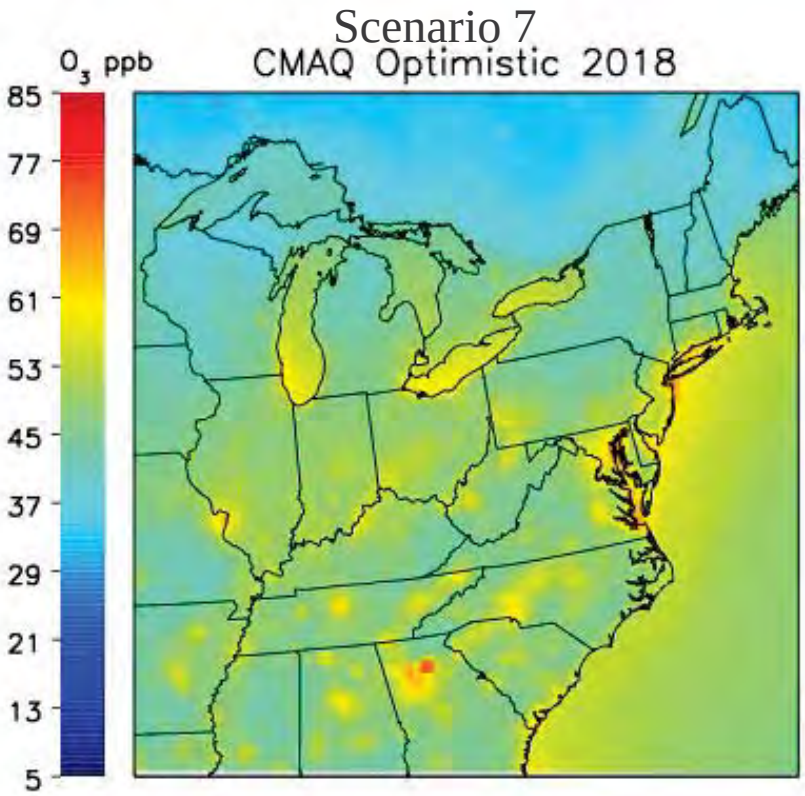


Concentrations – Before and After

Before Scenario 7

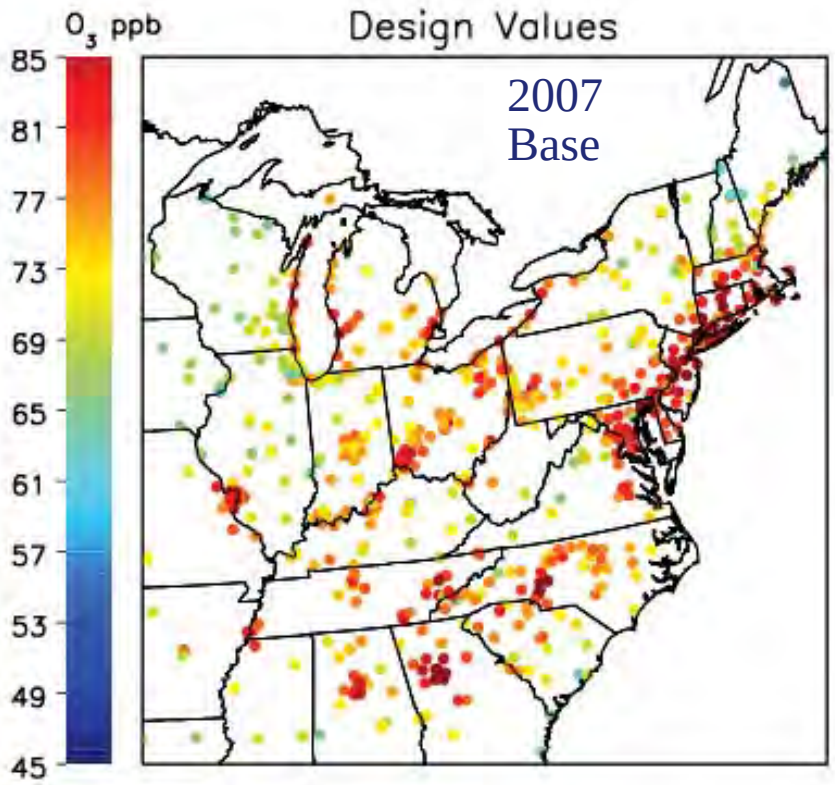


After Scenario 7

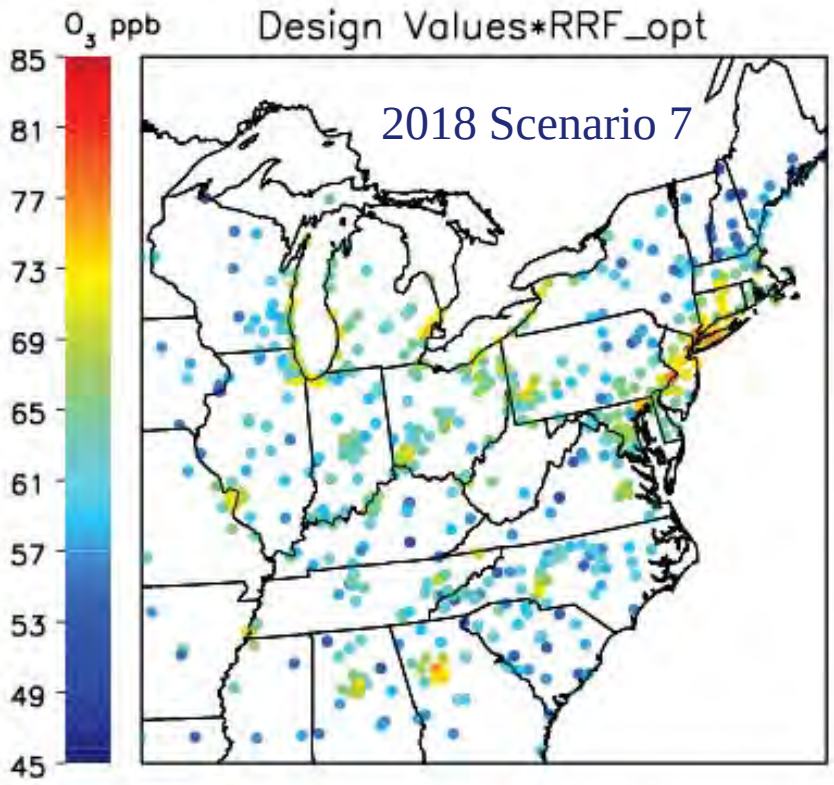


Modeled Design Values

Before Scenario 7



After Scenario 7



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Maryland Design Values

… Before and after Scenario 7

County	Design Value 2007	After Scenario 7 2018
Anne Arundel	85.7	68
Baltimore	77.3	65
Baltimore	83.3	71
Calvert	78	61
Carroll	82.3	66
Cecil	89	74
Charles	80.7	62
Frederick	80.3	65
Garrett	73.3	63
Harford	90.7	76
Harford	87.3	74
Kent	81.3	66
Montgomery	82.7	68
Prince George's	82	67
Prince George's	85.3	68
Washington	76.7	62
Baltimore (City)	67	57

Updated CMAQ Chemistry?

- For years, Maryland and the University of Maryland have been analyzing model performance aloft, where most transport takes place
  - Not always great
- In 2011, the Discover AQ field study in the Mid-Atlantic provided new unique data aloft
- U of M has analyzed aloft chemistry and found some problems with nitrogen chemistry
  - Fails to carry NOx reduction benefits downwind
- Working with ORD on new aloft chemistry concepts
  - Will show small, but important additional benefits from regional scale NOx strategies
  - Maybe an extra 2 ppb benefit in Maryland

Scenario 7 Screening Modeling Results High Values - OTR State

State	2018 Scenario 7	State	2018 Scenario 7
CT	76	NJ	78*
DE	69	NY	77
DC	70	PA	79
ME	65	RI	66
MD	76	VT	57
MA	72	VA (OTR)	70
NH	62		

* NJ's highest monitor (85 ppb) is being evaluated for performance

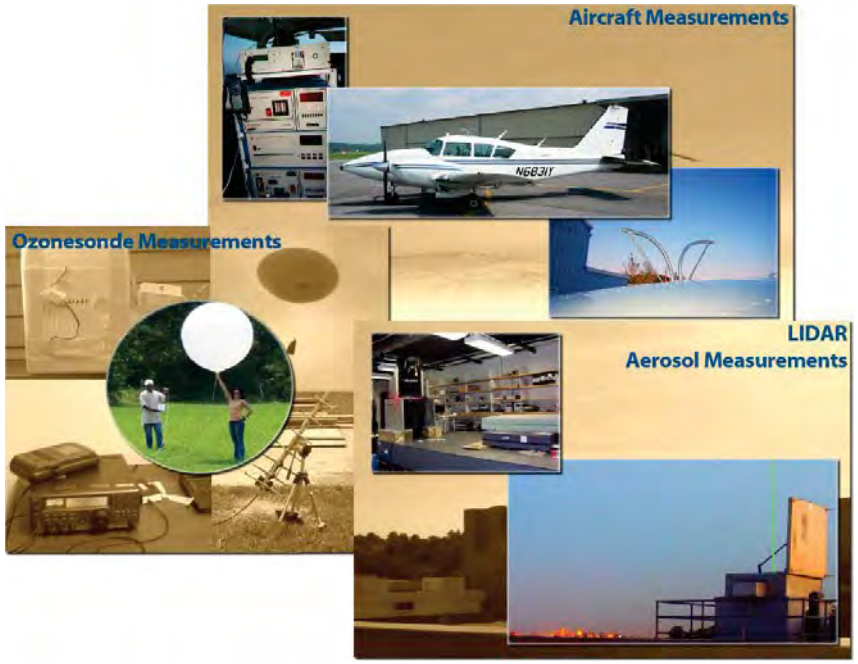
Scenario 7 Screening Modeling Results
High Values – Other States

State	2018 Scenario 7
Illinois Cook County	73
Kentucky Jefferson County	68
North Carolina Mecklenburg County	72
Georgia DeKalb County	77
Indiana Lake County	75

Scenario 7B

- An update to Scenario 7
  - Still based on 2007 base year
  - Better ERTAC data
  - Other improvements
  - Lost generation … now also moves to coal … not just natural gas
- Still being reviewed … but
  - Results will be very similar to Scenario 7
- For Maryland, with enhanced chemistry, new local controls that have not yet been included, Tier 3 Vehicle and Fuel Standards and a few fixes to the regional power plant piece of the puzzle (more in a minute)
  - … I believe we will model attainment
- Hope to have modeling with 2011/2018 base year/platform soon
  - Believe the updated platform may actually show greater ozone benefit

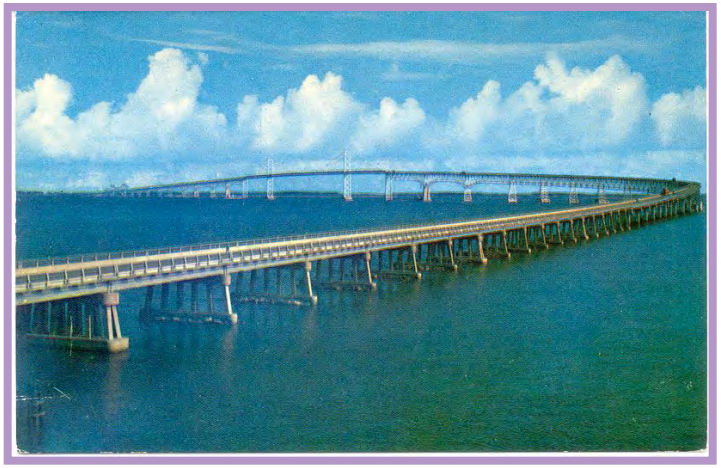
Maryland's Ozone Research Effort



- MDE works in partnership with local universities (UMD at College Park, UMBC, Penn State and Howard University) to study Maryland's air pollution problems
  - Airplanes
  - Balloons
  - Lidar
  - Profilers
  - Satellites
  - Special monitors
  - Modeling
  - More

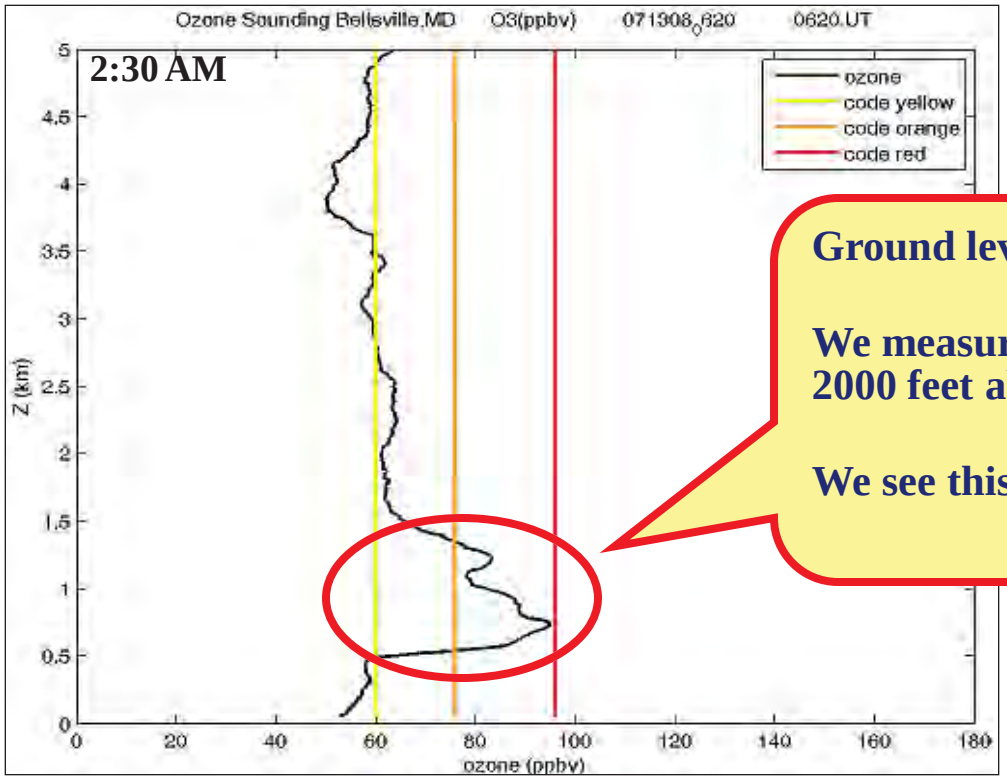
Understanding Ozone Transport

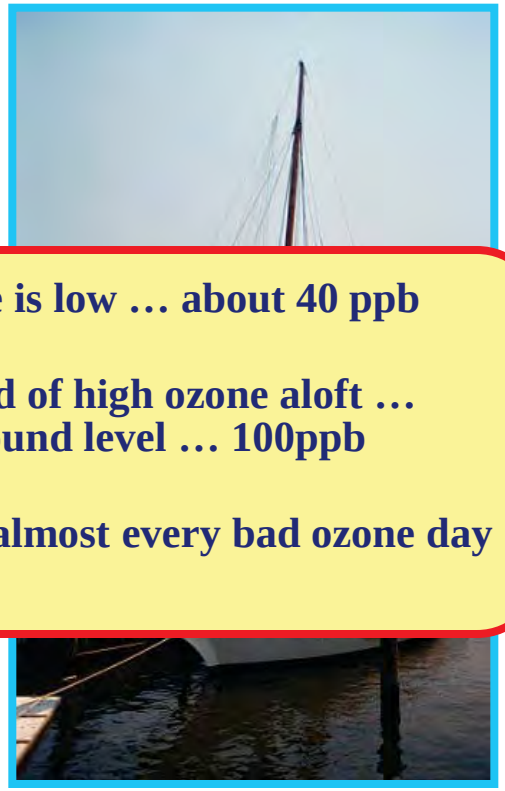
- It's complicated … but not that complicated … some key concepts
- An "elevated reservoir" of ozone
  - A transport cloud
  - An elevated ocean of ozone
  - The residual layer
- Three different types of transport
  - Westerly Transport – Power plants are a contributor
  - Night-time, Southerly Transport – Vehicles, power plants, more
  - City to City – Washington to Baltimore … NY to CT, etc. – mostly vehicles
- Much more on thumb drive



What is This Reservoir?

A balloon launch at 2:30 am south of Baltimore … north of Washington





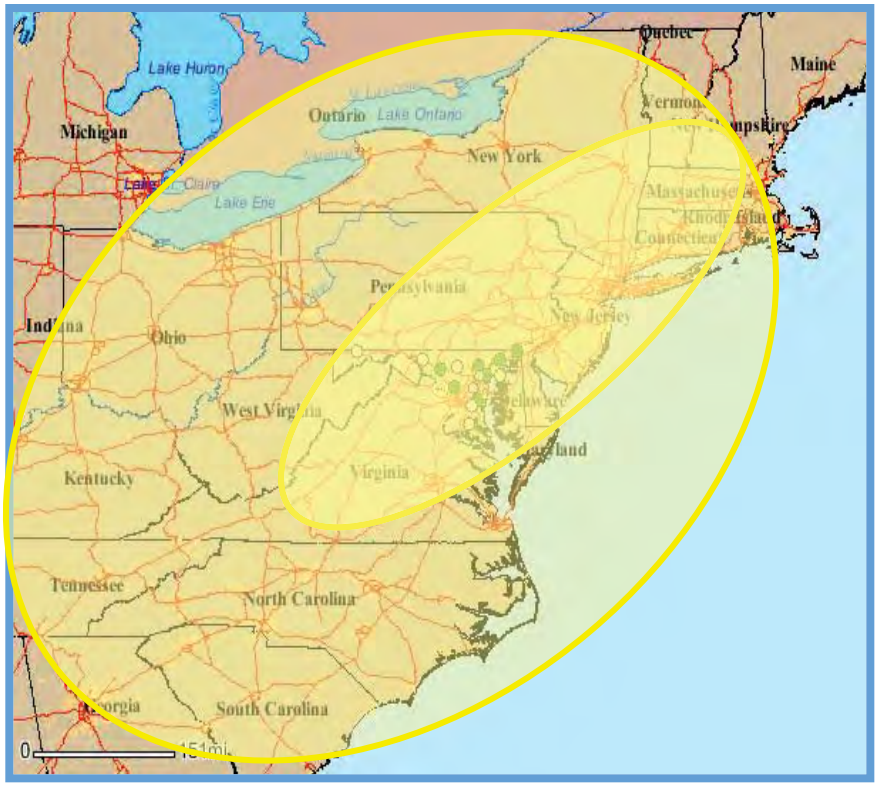
Ground level ozone is low … about 40 ppb

We measure a cloud of high ozone aloft … 2000 feet above ground level … 100ppb

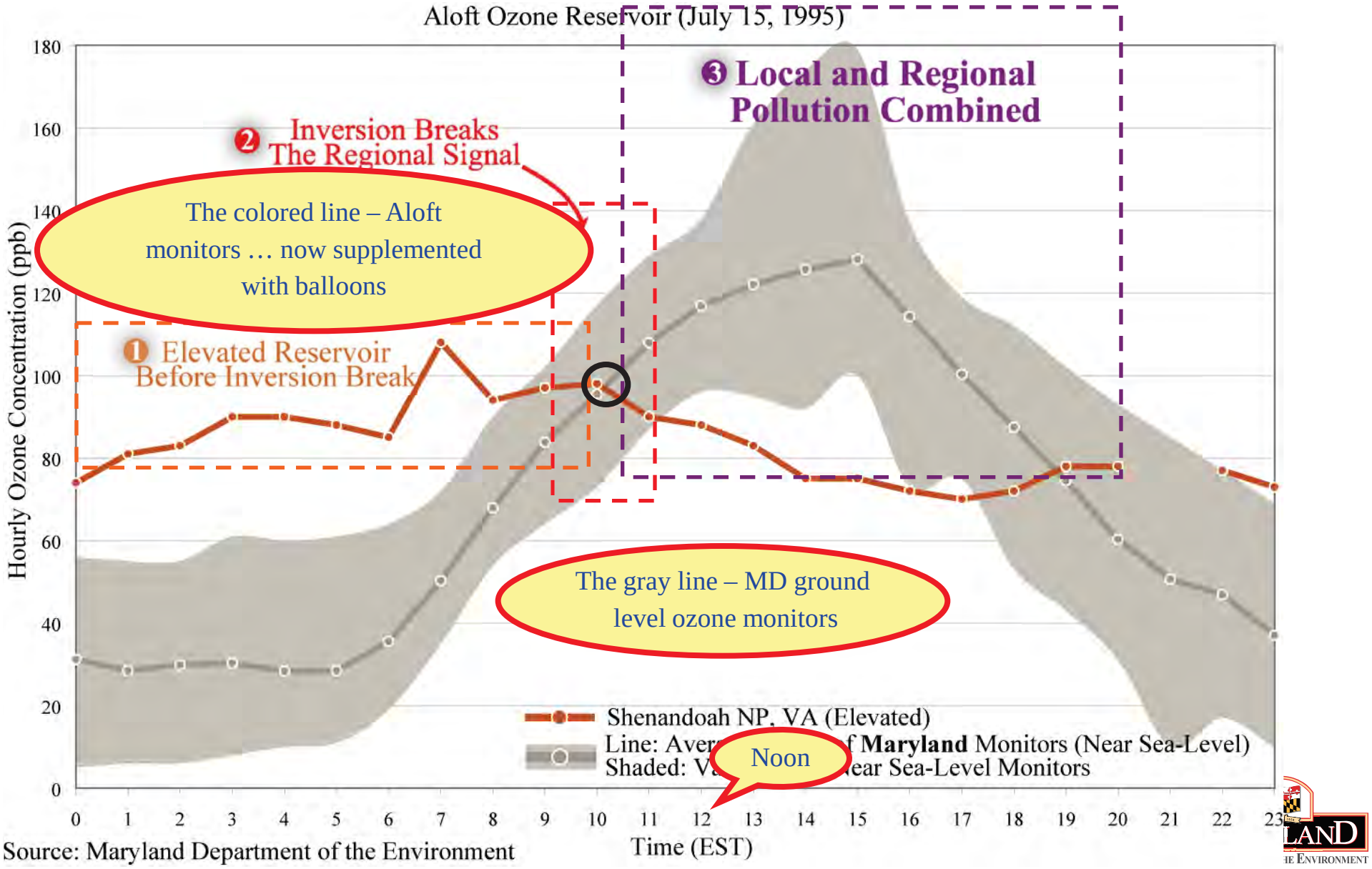
We see this before almost every bad ozone day

The Elevated Ozone Reservoir

- Every bad ozone day, in the morning hours, a large reservoir of ozone sits above Maryland and the Mid-Atlantic waiting to mix down
  - Ozone levels in the reservoir can routinely reach 60 to 100 ppb
  - In the morning, ozone levels at the surface are very low
- Around 10:00 or 11:00 … the "nocturnal inversion" breaks down … and
  - Ozone in the elevated reservoir mixes down to the surface and degrades air quality

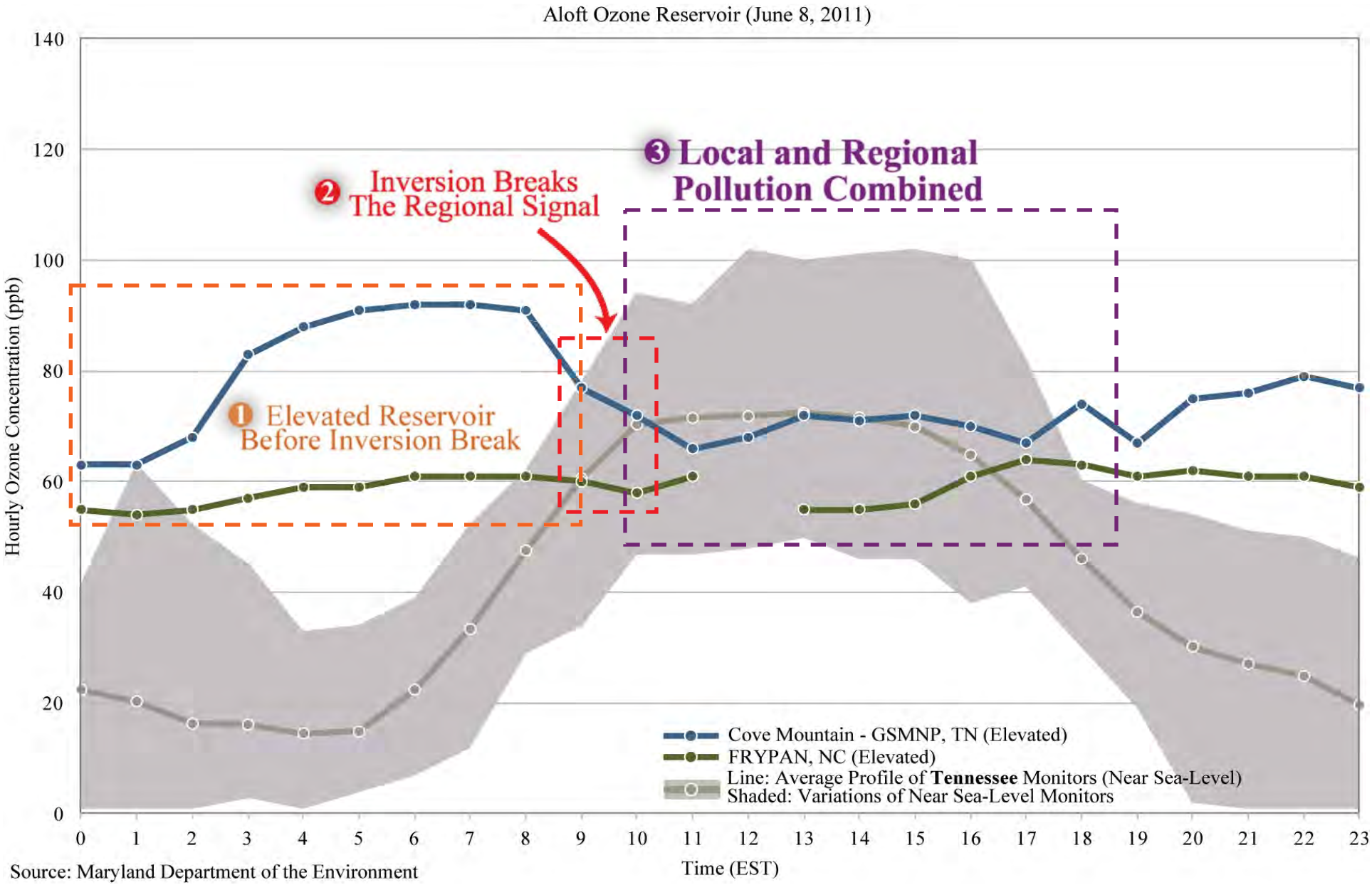


The Elevated Reservoir – The 90's



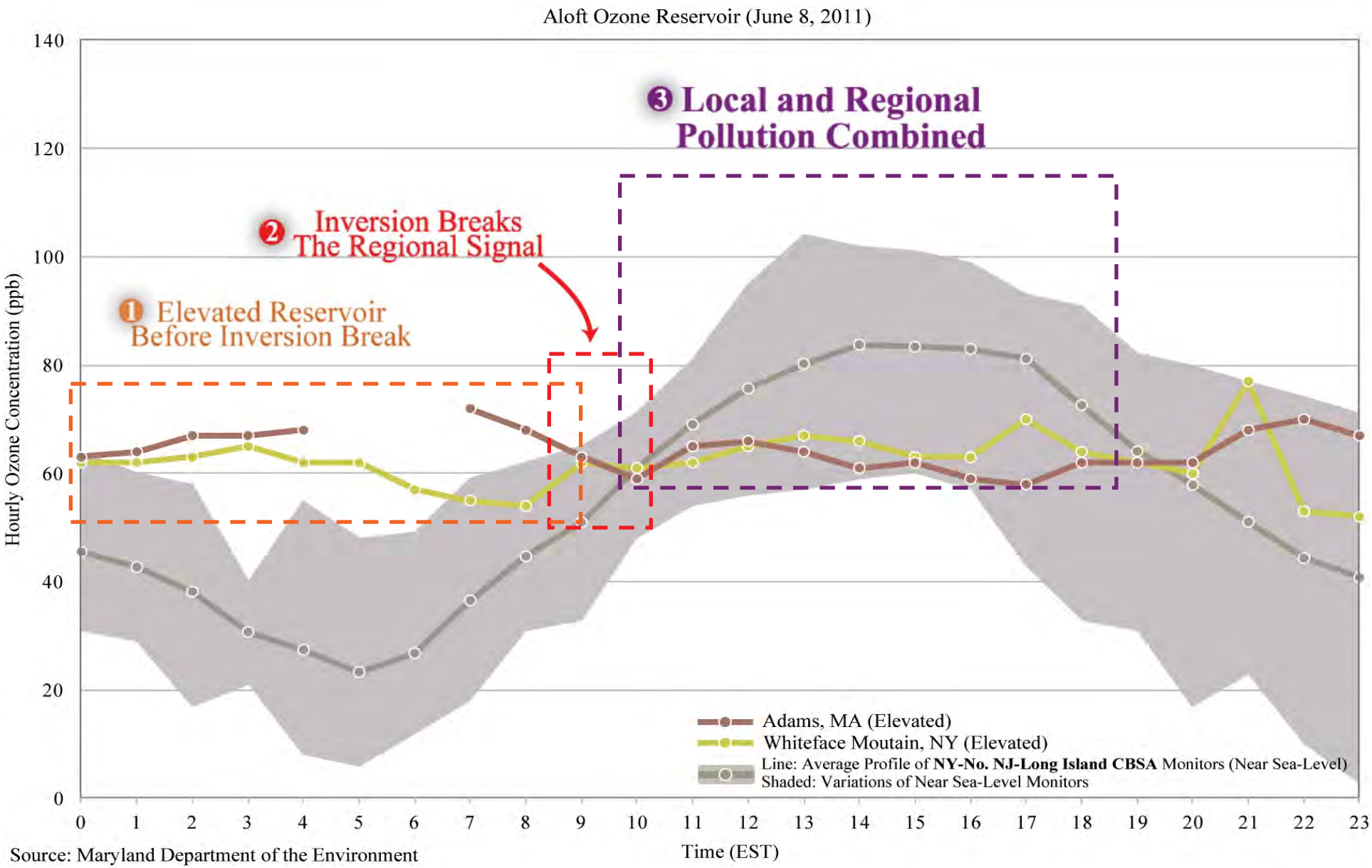
Source: Maryland Department of the Environment

Same Signal – Tennessee 2011



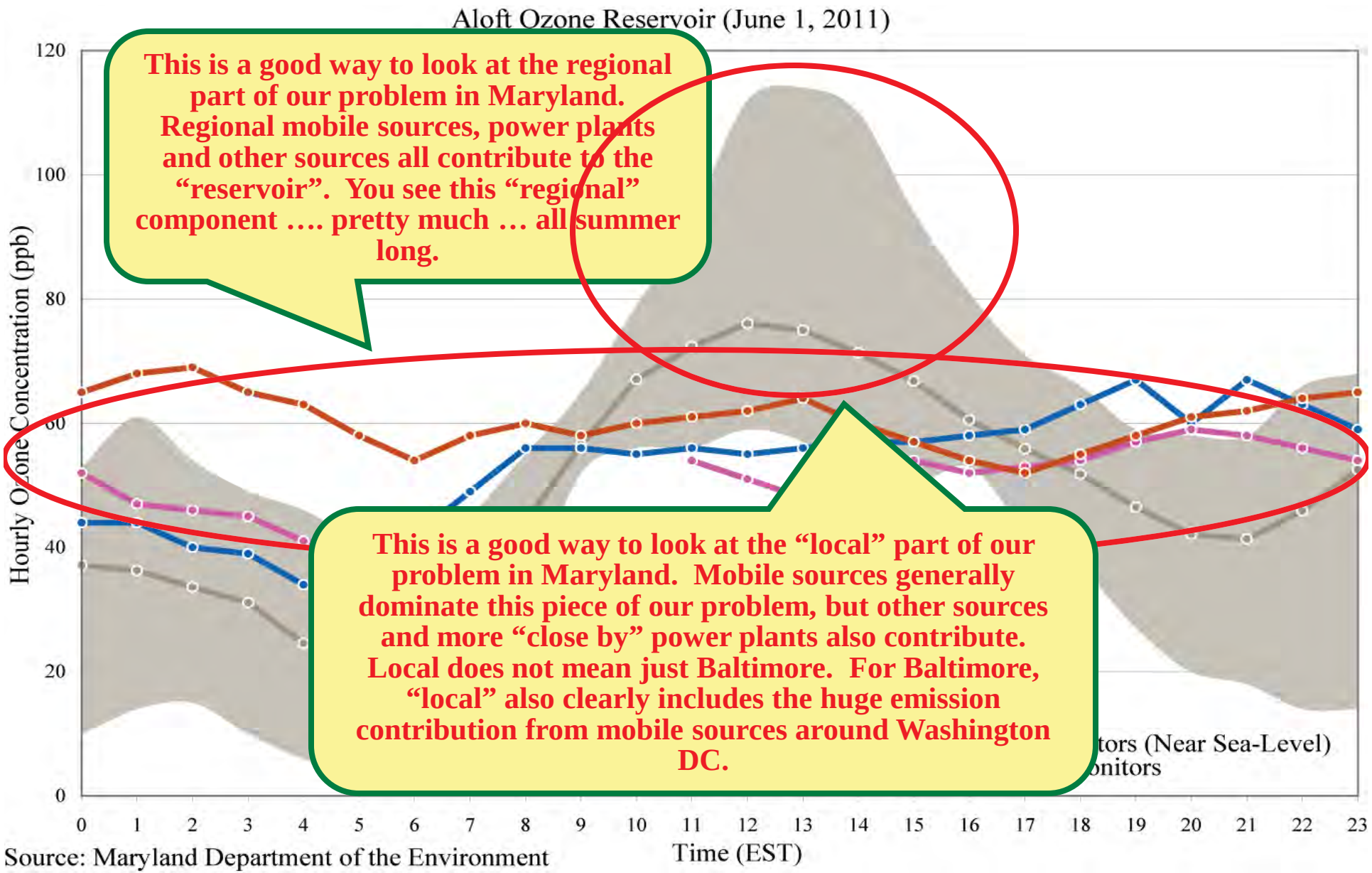
Source: Maryland Department of the Environment

Same Signal – New York 2011



Source: Maryland Department of the Environment

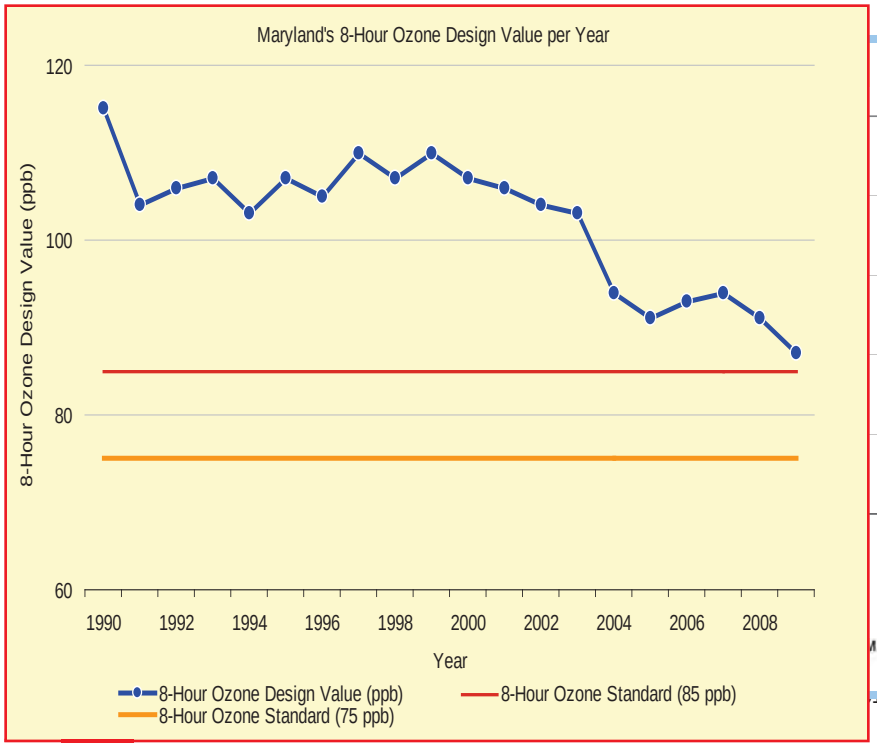
Same Signal – Maryland 2011



Source: Maryland Department of the Environment

Reducing Regional Ozone – A Case Study

Ground Level Ozone Drops Dramatically in the Same Time Frame



- The 2003/2004 NOx SIP Call as a case study. Significant NOx reductions from Federal Tier 2 Vehicle Standards occuring in the same time frame
  - A classic ozone transport success story
  - Incoming ozone levels collect in an elevated reservoir over night
  - Real world programs like the NOx SIP call and Tier 2 Vehicle Standards show that:
    - Adding regional controls …
    - Results in regional NOx emission reductions …
    - Which leads to reduced ozone in the elevated reservoir …
    - Which lead to lower ozone at ground level and public health protection!

So … Where Does This Take Us?

- We understand the science of ozone better than ever
- We've implemented programs that have worked in the real world
- Maryland needs a two-part strategy to continue making progress
  - Local controls are still critical
    - We need to be pushing the envelope on mobile sources
  - National/super-regional controls are also essential
    - EPA's Tier 3 Vehicle and Fuels Standard is the most important new measure needed by Maryland
    - There has been significant progress in reducing NOx from regional power plants
      - But there are a few issues that need to be resolved

Pushing Local Controls

- Mobile sources
  - Older efforts
    - California car state
    - Enhanced I & M
    - Many other programs
  - New efforts
    - Governor's ZEV MOU
    - Elecric vehicle initiatives
    - Aftermarket catalysts
    - Ports
    - Many diesel initiatives
    - Older vehicle and "legacy fleet" initiatives
    - "Beyond Conformity" (VMT reduction) efforts
- Other sectors
  - Many "Copied from CA" VOC regulations
  - NOx reductions from small and large non-EGU stationary source
  - Diesel generators that participate in demand response programs
  - More

The EGU Issues to Discuss

Conducted Analyses of EGU data in 11 states

Why West Virginia?

A Good Story … Have 99% of what is needed to submit an appropriate "Good Neighbor" SIP

April 21, 2014

We Would Like Input From Others

Recently Shared with other Air Directors

Purpose

- Maryland is the only Moderate nonattainment area in the East for the 75 ppb ozone standard.
  - This means that Maryland is the only state required to submit an attainment SIP
  - Only state required to perform attainment modeling.
- We are now beginning to build our "SIP Quality" modeling platform.
- We are trying to make sure we capture all of the changes that have occurred in upwind power plants and have put together this small sample package of data and analyses to begin a dialogue with upwind states to make sure we have the best data available.
- We have used readily available data, like the CAMD and ERTAC data, but we recognize that these data sources can be out of date, or not include recent changes.
  - We hope you can help us with making sure we have the best possible data
- One major issue that our data analyses have uncovered is that many EGU units appear to not be running their controls during the ozone season because of the recent changes in the energy market, reduced coal capacity and inexpensive allowances. This, in many states … like Maryland and many other states … who drive their controls with an "ozone season tonnage cap", is perfectly legal.
  - This is a critical issue that we would also like to begin a dialogue on with you. There appears to be an interest from the EGU sector to discuss this issue and see if a common sense fix can be designed. Maryland believes this fix would be relatively cost-effective compared to the capital cost of the control technologies.
- MDE is also doing the peak day emissions analyses for two additional, large, regional scale, ozone episodes: July 1-7, 2011 and July 1-10, 2012.
- More detailed data and analyses and spreadsheets are available upon request.

Current Controls?

WV Coal Capacity Breakout

- Total Capacity Coal = 15,849 MW
  - 15 units with SCR = 11,755 MW = 74%
  - 4 with SNCR = 496 MW = 3%
  - 19 without SCR/SNCR = 3597 MW = 23%

DRAFT – April 2, 2014 – Requesting QA of data. For discussion purposes only.

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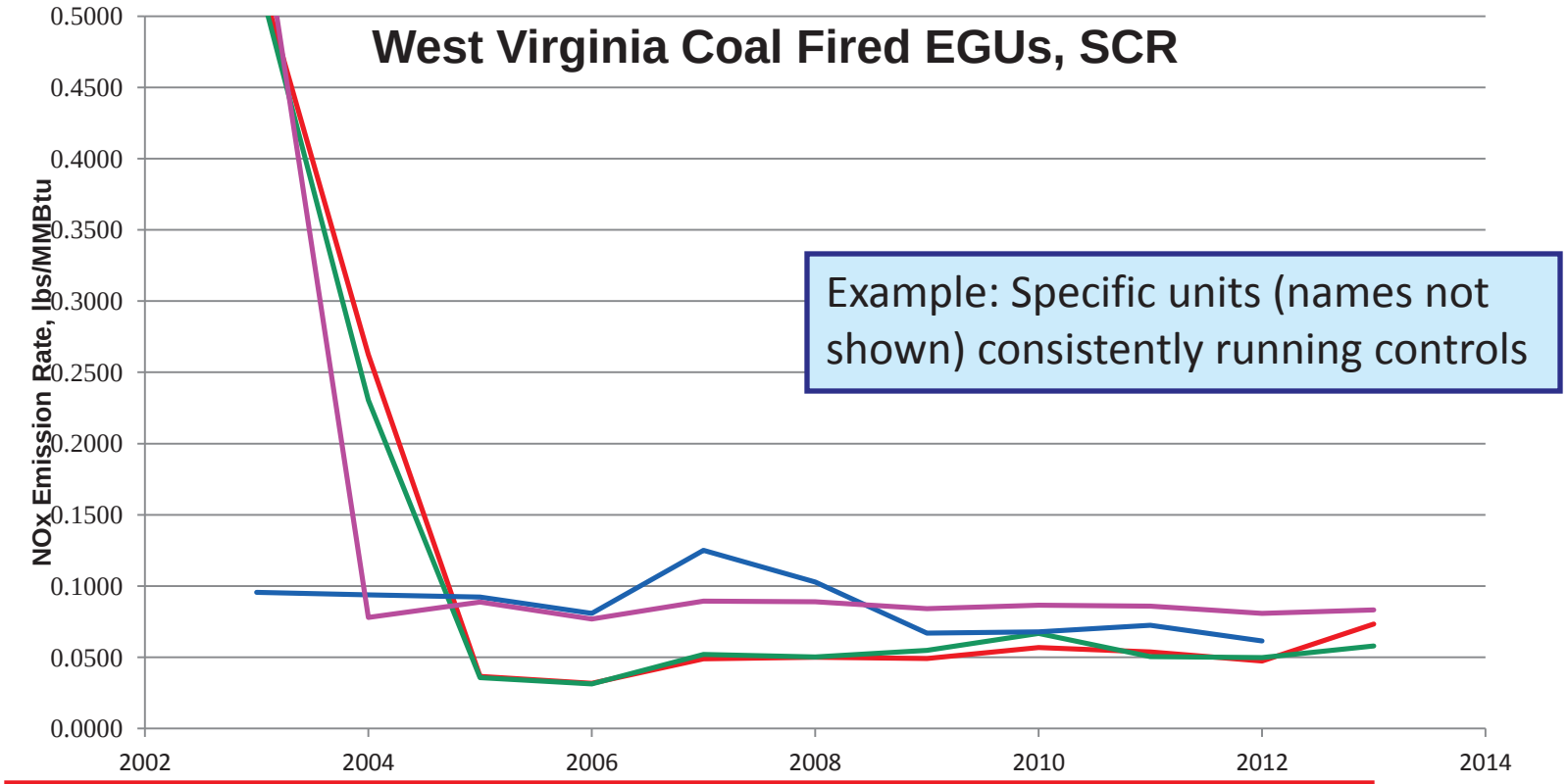
Dicker 3 - 2012

We began looking at Maryland sources in 2011 and 2012. We have a comprehensive stakeholder process for our updated EGU requirements. Material on the Maryland regulation develoment process are on the thumb drive

Running Controls

Average Ozone Season Emission Rates at Specific Units by Year



Example: Specific units (names not shown) consistently running controls

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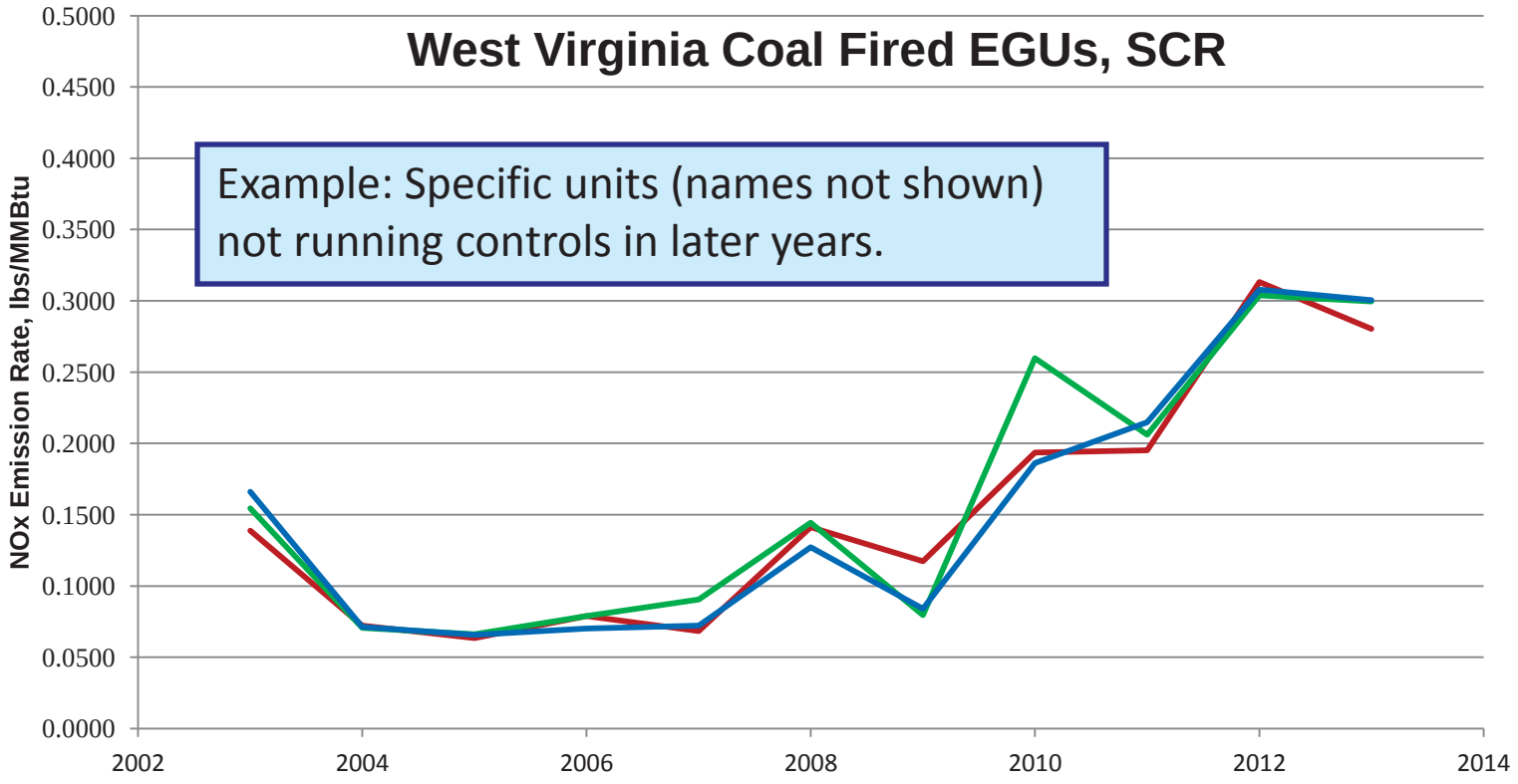
Not Running Controls Well

Average Ozone Season Emission Rates at Specific Units by Year



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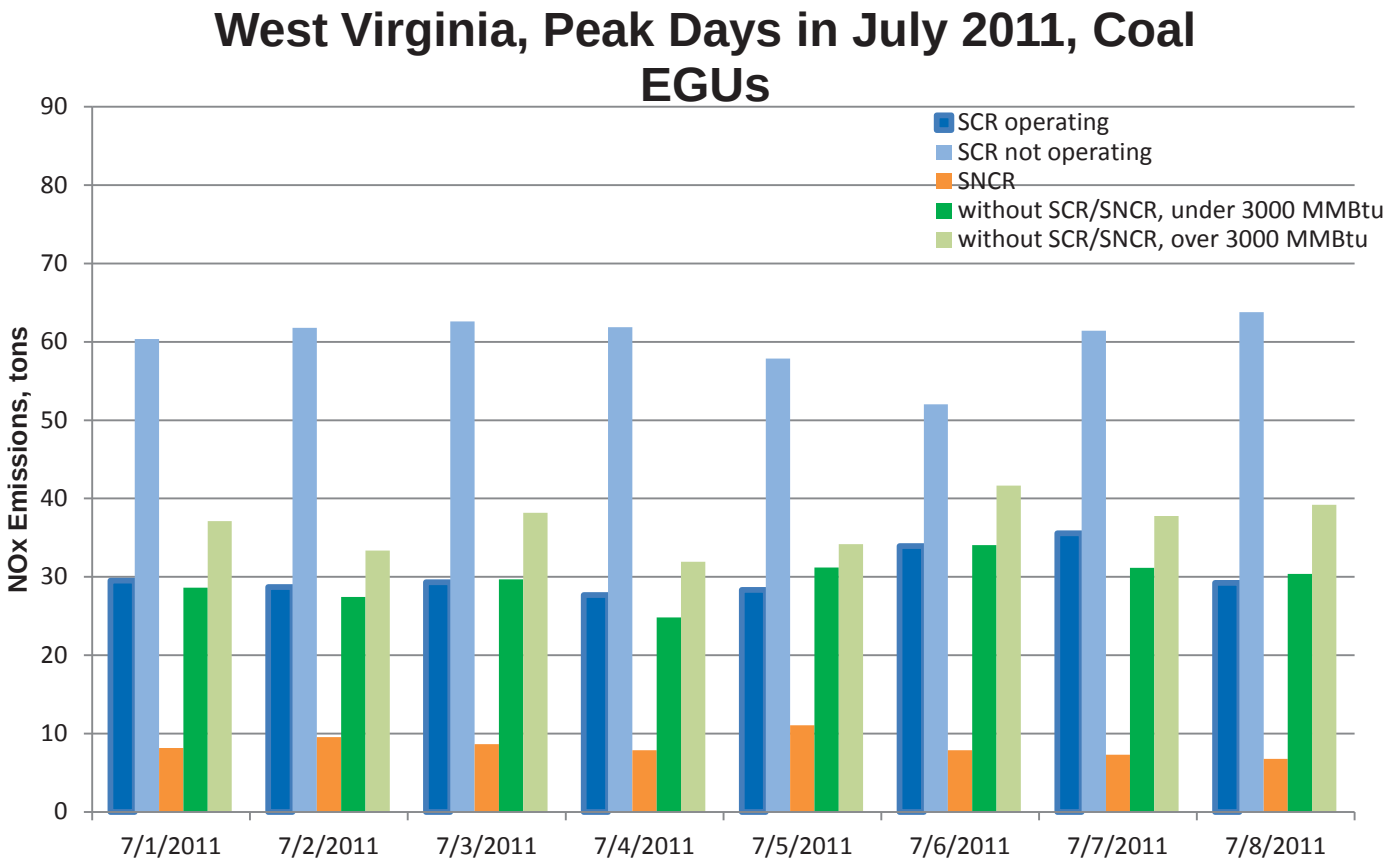
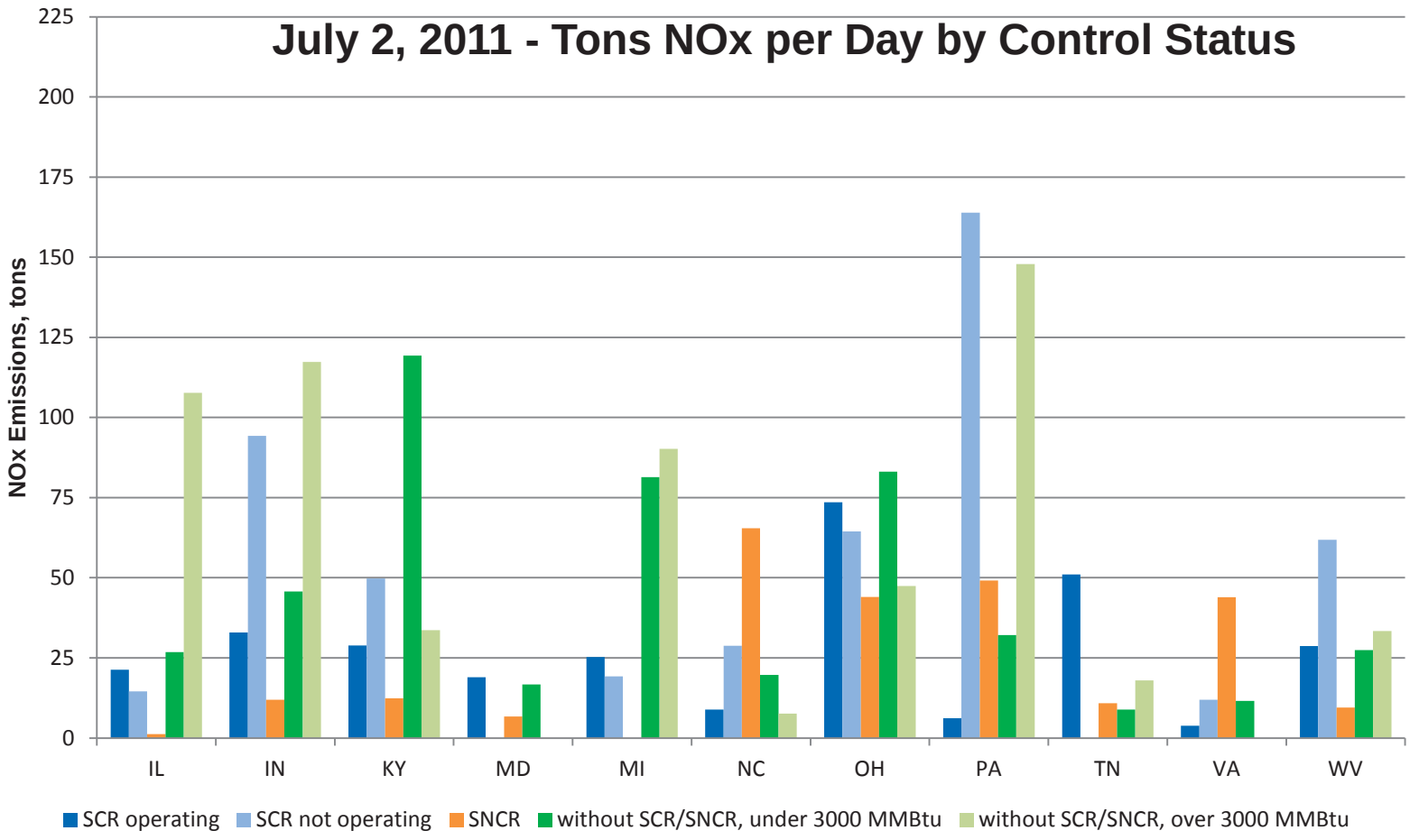
Emissions During Ozone Episodes

WV - Tons Per Day NOx By Control Status



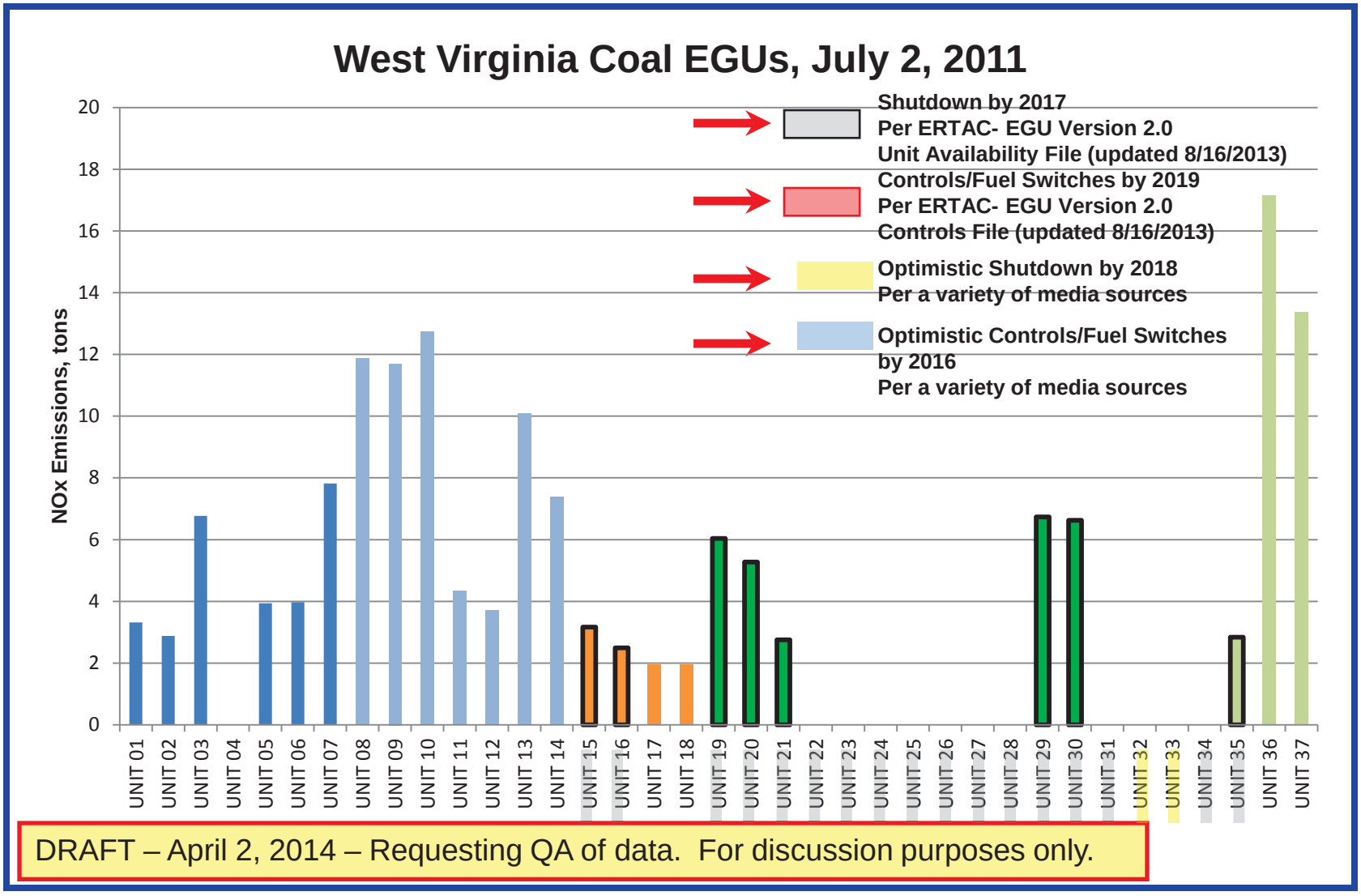
DRAFT – April 2, 2014 – Requesting QA of data. For discussion purposes only.

A Snapshot – Other Areas



DRAFT – April 2, 2014 – Requesting QA of data. For discussion purposes only.

Changes That Are In The Works



DRAFT – April 2, 2014 – Requesting QA of data. For discussion purposes only.

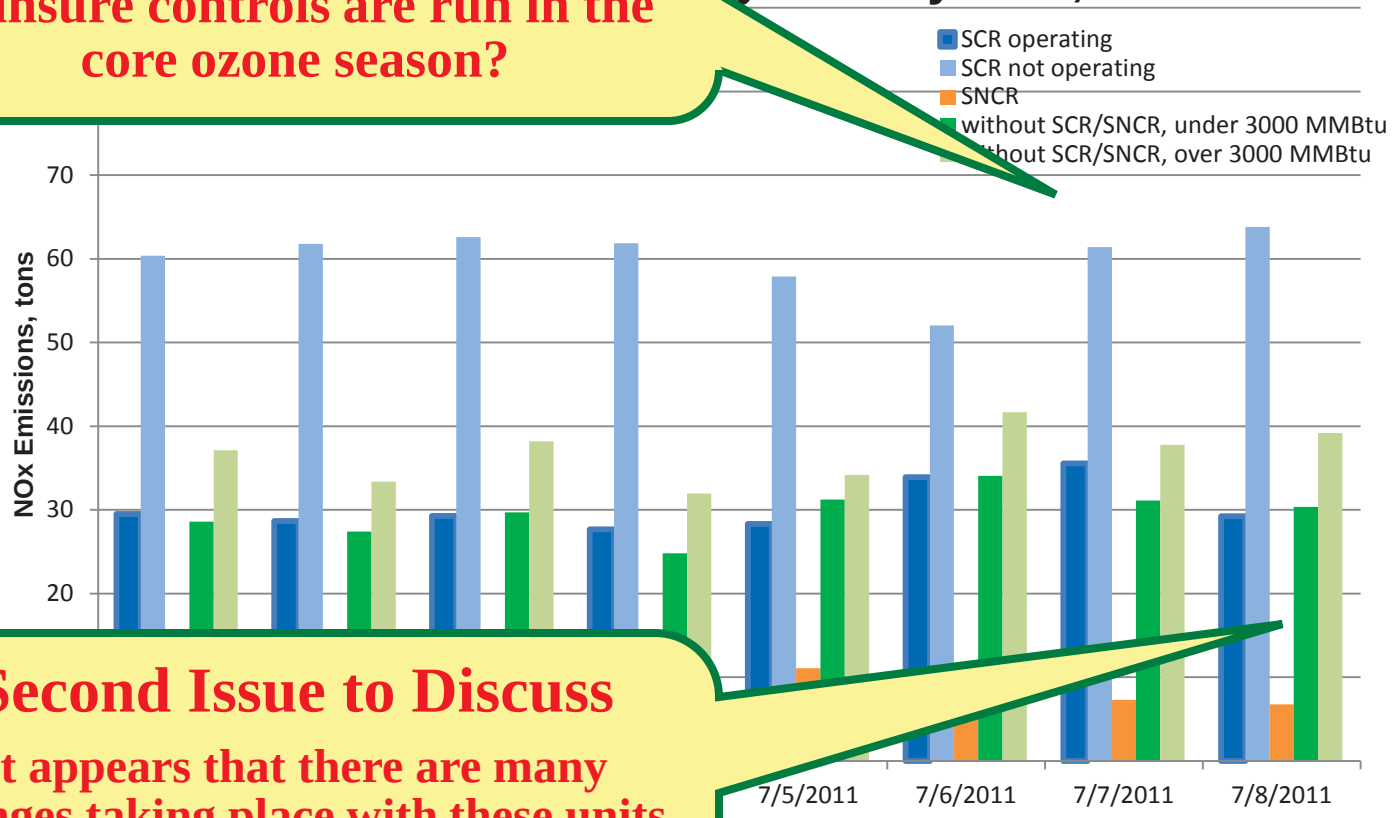
Two Issues to Discuss

Primary Issue to Discuss

Can we find a common sense way to insure controls are run in the core ozone season?

NOx By Control Status

ays in July 2011, Coal



a. For discussion purposes only.

Second Issue to Discuss

It appears that there are many changes taking place with these units. How can we make sure that states like Maryland have the best available data on these units?

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A State Driven Solution?

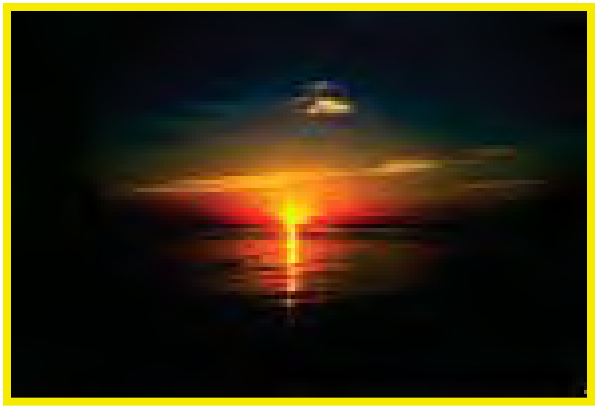
- Scenario 7 and 7B tell us that the 2018 Scenario … we all thought would show major progress … will do just that
- EPA's process is likely to change and slow down
  - The collaborative modeling could provide a higher quality solution to the issue than the EPA modeling
  - EPA efforts are often challenged
- In 2015 … Areas like Baltimore owe attainment SIPs and modeling
- All states owe "Good Neighbor" SIPs
  - … at some point
- A state partnership proposal by Maryland …

How Do We Move Forward?

- Clearly continue the technical collaboration
  - Commissioner level discussions appear to be supporting the states working together to find a solution
- How do we capture what Scenario 7 and 7B appear to be telling us?
  - Would love to hear thoughts from others
- One idea from Maryland …
  - Upwind and downwind states submit a package of complementary SIPs in 2015
    - Attainment SIPs from states like Maryland
      - We are the only state in the East that owes an attainment SIP in 2015
    - Good Neighbor SIPs from others
    - Supported by collaborative modeling and Maryland's SIP quality modeling
    - This is actually what the Clean Air Act requires
  - Could "trump" an EPA Transport Rule, alter the 176A Petition and influence any "CSAPR 2" initiative

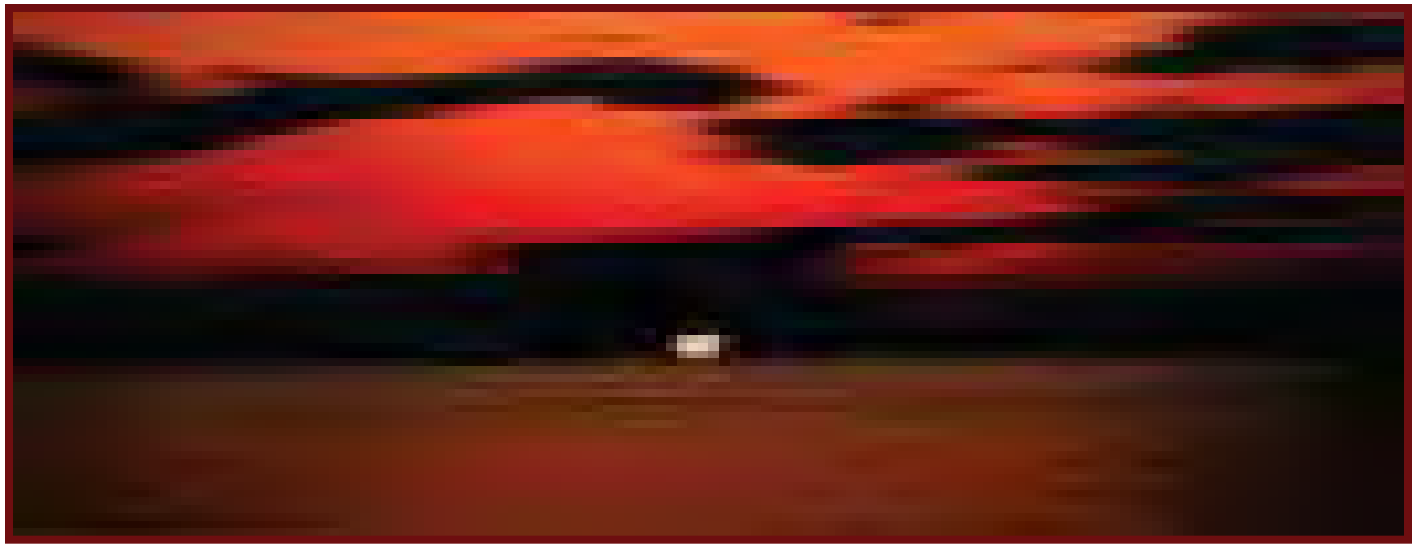
Timing

- Maryland Straw Proposal
  - January to December 2014
    - Technical collaboration and stakeholder discussions continue
  - Mid-2014
    - Commissioner level discussions
  - End of 2014
    - Technical work to support “Complementary Package of SIPs” complete
  - Spring 2015 - States submit SIPs
    - This timing works for MD’s SIP, but may also be critical if the “State Solution” is to influence an EPA transport rule, the 176A Petition or CSAPR 2



MDE

Thanks



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