



Air Quality Issues

North Carolina Division of Air Quality

**Environmental Review Commission
November 12, 2009**



Topics

- **EPA's Reconsideration of the Ozone Standard and the Impact on NC**
- **Ozone Control Strategy Options**
- **NC's Idle Reduction Rule**
- **NC's Mobile Source Grant Program**
- **DAQ's Climate Initiatives**



The NC Ozone Picture Now and After Reconsideration

North Carolina Division of Air Quality

Keith Overcash

Director

NCDAQ

November 12, 2009



History of the Ozone Standards

- One hour standard of 0.08 parts per million (ppm) set in 1971
- One hour standard of 0.12 ppm set in 1979
- Eight-hour standard of 0.08 ppm set in 1997
- Eight-hour standard of 0.075 ppm set in 2008
- Primary standard = Secondary Standard



EPA's Reconsideration of the Ozone Standards

- **Sept. 16, 2009 – EPA announced it would reconsider the 2008 ozone standards (primary and secondary) of 0.075 ppm**
- **2008 ozone standards were not as protective as recommended by EPA's panel of science advisors, the Clean Air Scientific Advisory Committee (CASAC)**



EPA's Reconsideration of the Ozone Standards

- **CASAC recommended a range of 0.060-0.070 ppm for the primary (public health) standard, and a separate vegetation exposure type level for the secondary or welfare based standard**
- **Note, 0.075 ppm = 75 parts per billion (ppb)**



Schedule

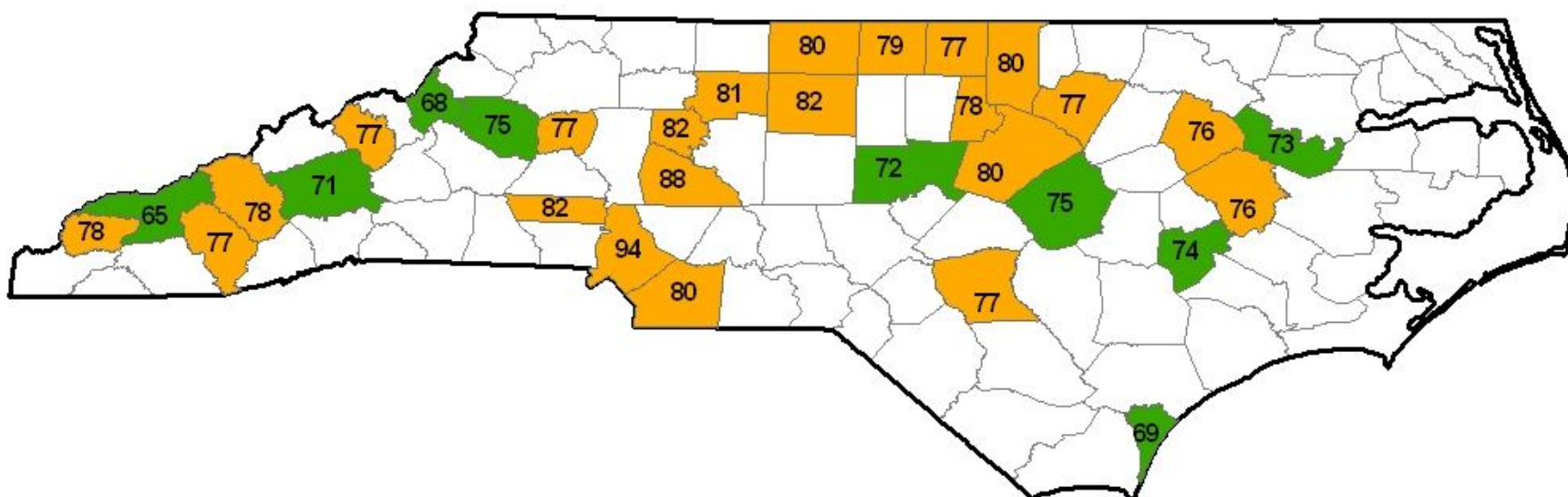
- **December 2009 – Proposed Reconsidered Ozone Standards**
- **August 2010 – Final Reconsidered Ozone Standards**
- **August 2011- Final Boundary Designations**
- **December 2013 – State Implementation Plans (SIPs) Due**



What Does Nonattainment Mean?

- EPA label declaring that air quality does not meet the National standards
- Requires State to develop a plan demonstrating what control measures are needed to meet & maintain the standard
- Requires transportation conformity
- Requires new source review on new major industrial sources & major modification on existing sources

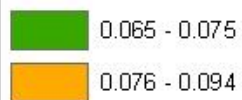
8-hour Ozone Current Design Values
(Maximum value per county, based on 2006 - 2008 Monitoring data)



Legend

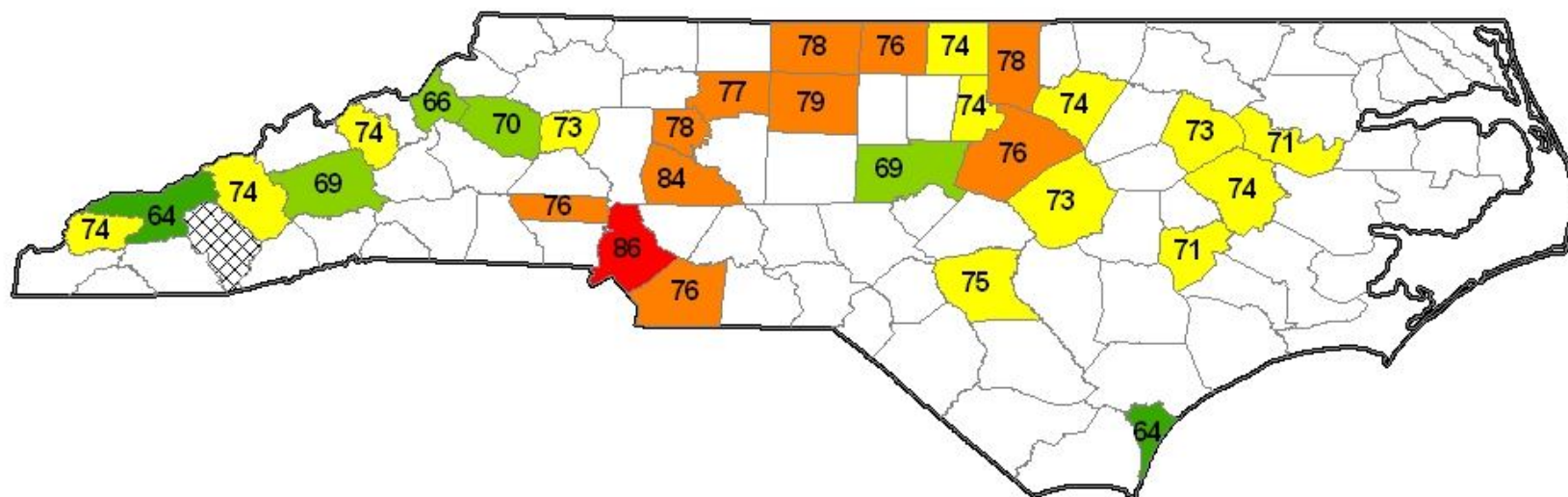
Design Value

2006 -2008



Current 3-Year Design Values as of 10/09/2009

(Labeled with Highest Current Design Value for the County)



Legend

Current 3YR Design Value

(2007 - 2009)

0.064 - 0.065

0.066 - 0.070

0.071 - 0.075

0.076 - 0.084

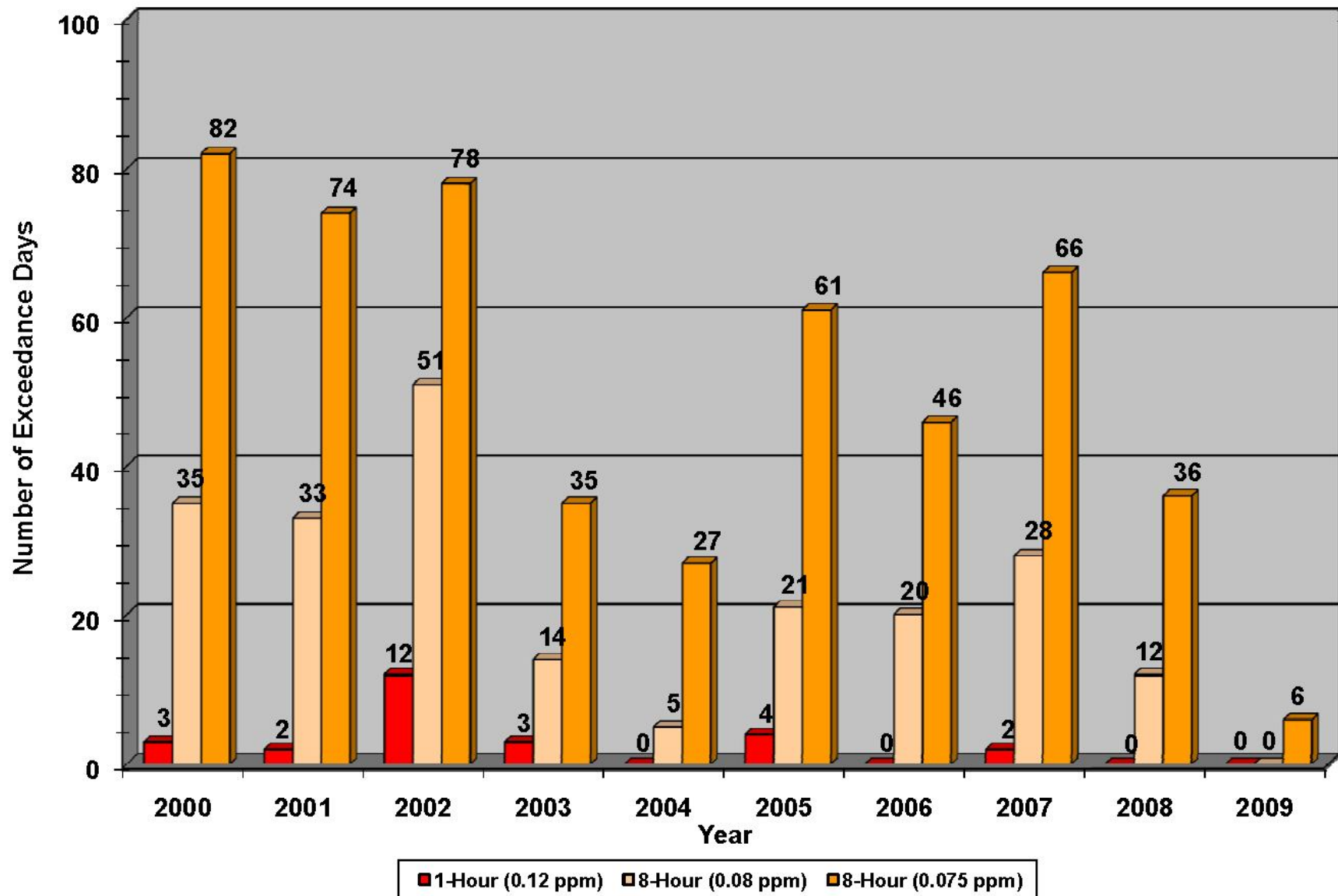
0.085 - 0.086

Incomplete Design Value Data

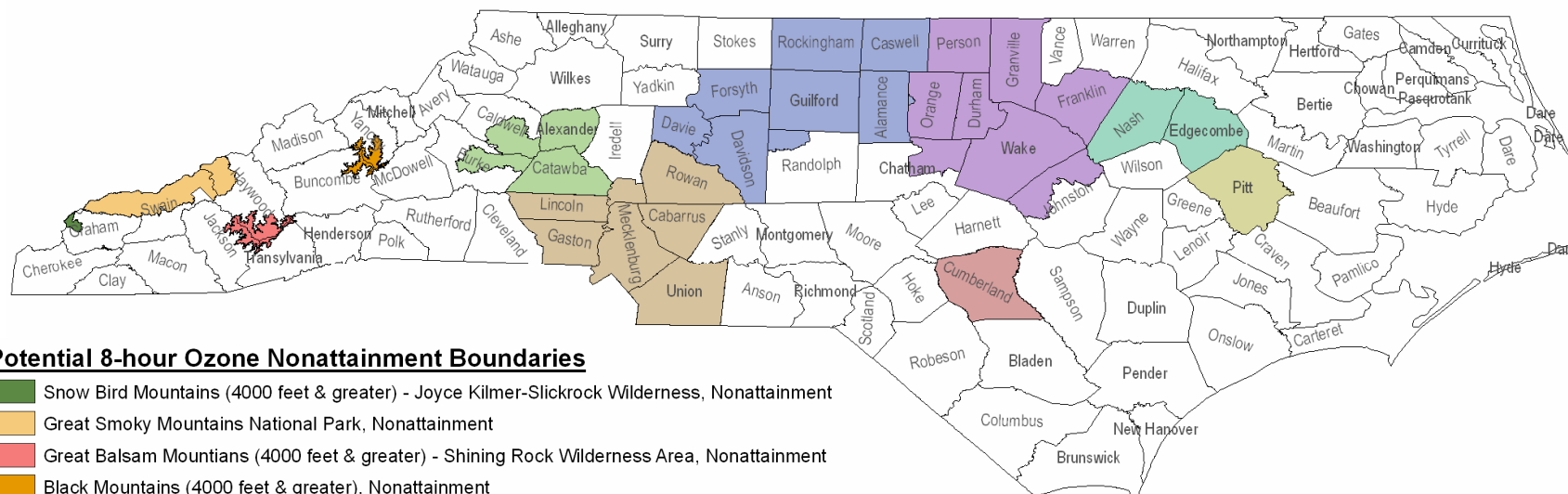
DRAFT

NCDENR - DAQ
Attainment Planning
Map Created
10/12/2009 (BD)

NC Statewide **1-Hour** and **8-Hour** Ozone Exceedance Days



North Carolina Nonattainment Boundary Recommendations



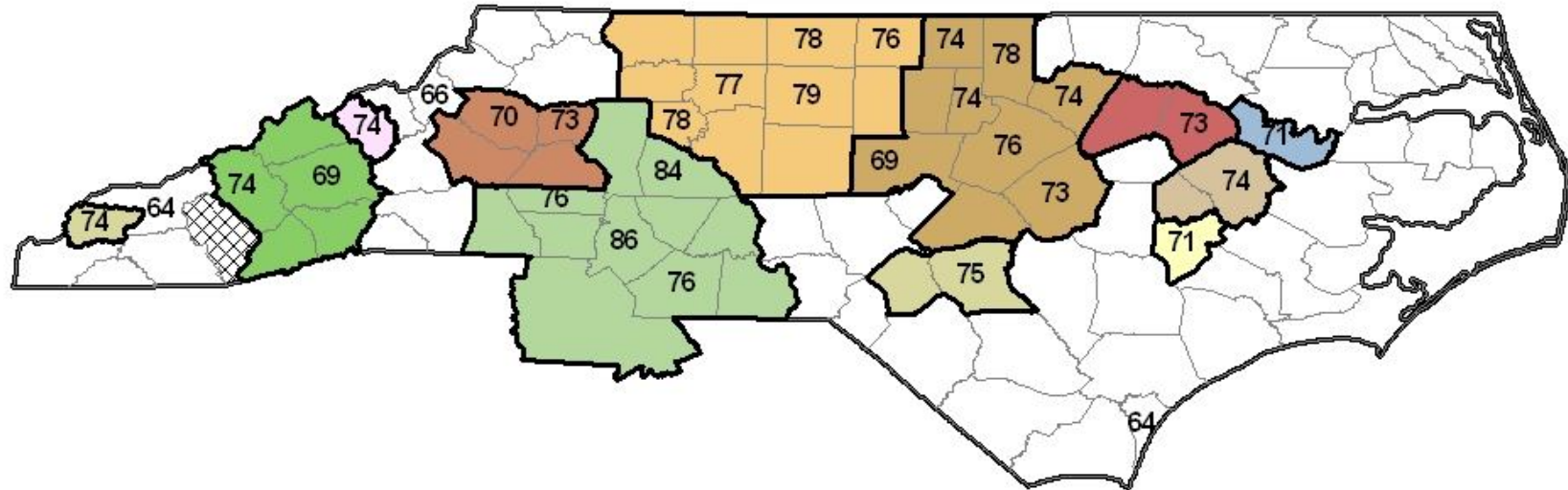
Potential 8-hour Ozone Nonattainment Boundaries

- | |
|--|
| Snow Bird Mountains (4000 feet & greater) - Joyce Kilmer-Slickrock Wilderness, Nonattainment |
| Great Smoky Mountains National Park, Nonattainment |
| Great Balsam Mountains (4000 feet & greater) - Shining Rock Wilderness Area, Nonattainment |
| Black Mountains (4000 feet & greater), Nonattainment |
| Hickory-Lenoir-Morganton, Nonattainment |
| Charlotte-Gastonia-Salisbury, Nonattainment |
| Greensboro-Winston-Salem-High Point, Nonattainment |
| Raleigh-Durham-Cary, Nonattainment |
| Fayetteville, Nonattainment |
| Rocky Mount, Nonattainment |
| Greenville, Unclassifiable |

Map Drawn To Approximate Scale
North Is Represented As Up
Map Valid: 03-12-2009

Areas USEPA would likely propose to be designated as nonattainment under a 70 ppb standard.

(Labeled with Highest Current Design Value for the County)



Legend



Incomplete Design Value Data

Counties outside CSA*



Graham



Lenoir



Martin



Yancey

CSA with Nonattaining Monitors



Asheville-Brevard, NC



Charlotte-Gastonia-Salisbury, NC-SC



Fayetteville, NC



Greensboro-Winston Salem-High Point,



Greenville, NC



Hickory, NC



Raleigh-Durham_Cary, NC



Rocky Mount, NC

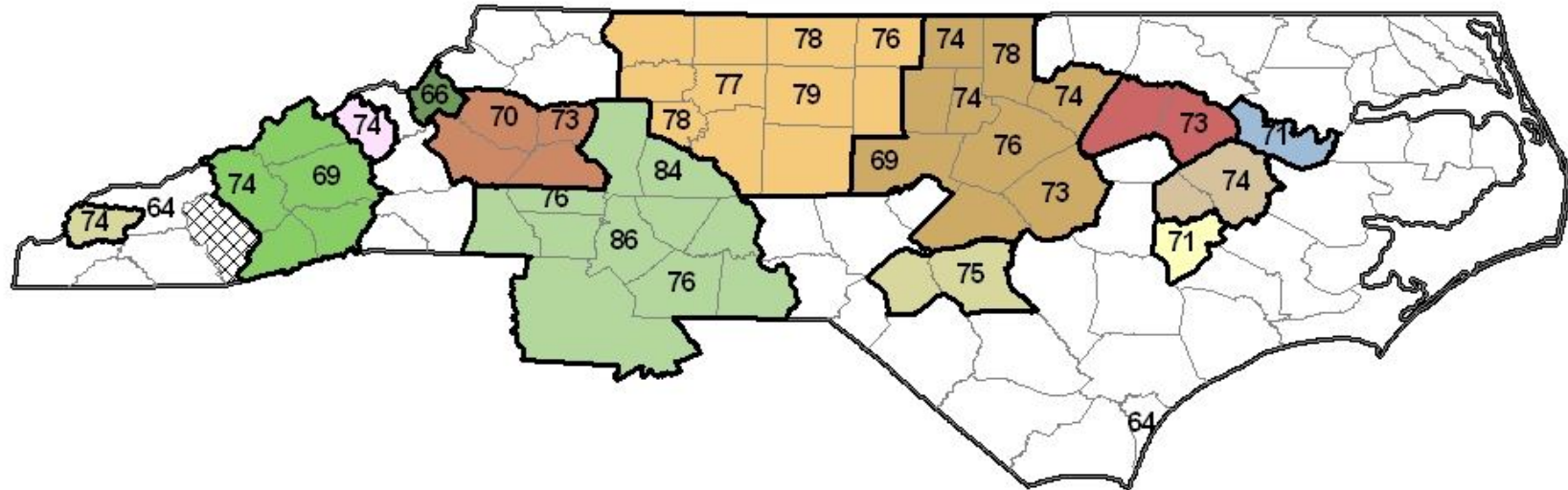
* Includes counties with nonattaining monitors and counties included in previously designated Ozone nonattainment areas

DRAFT

NC DENR - DAQ
Attainment Planning
Map Created
09/21/2009 (BD)

Areas USEPA would likely propose to be designated as nonattainment under a 65 ppb standard.

(Labeled with Highest Current Design Value for the County)



Legend

Incomplete Design Value Data

Counties outside CSA*

- Avery
- Graham
- Lenoir
- Martin
- Yancey

CSA with Nonattaining Monitors

- Asheville-Brevard, NC
- Charlotte-Gastonia-Salisbury, NC-SC
- Fayetteville, NC
- Greensboro-Winston Salem-High Point,
- Greenville, NC
- Hickory, NC
- Raleigh-Durham_Cary, NC
- Rocky Mount, NC

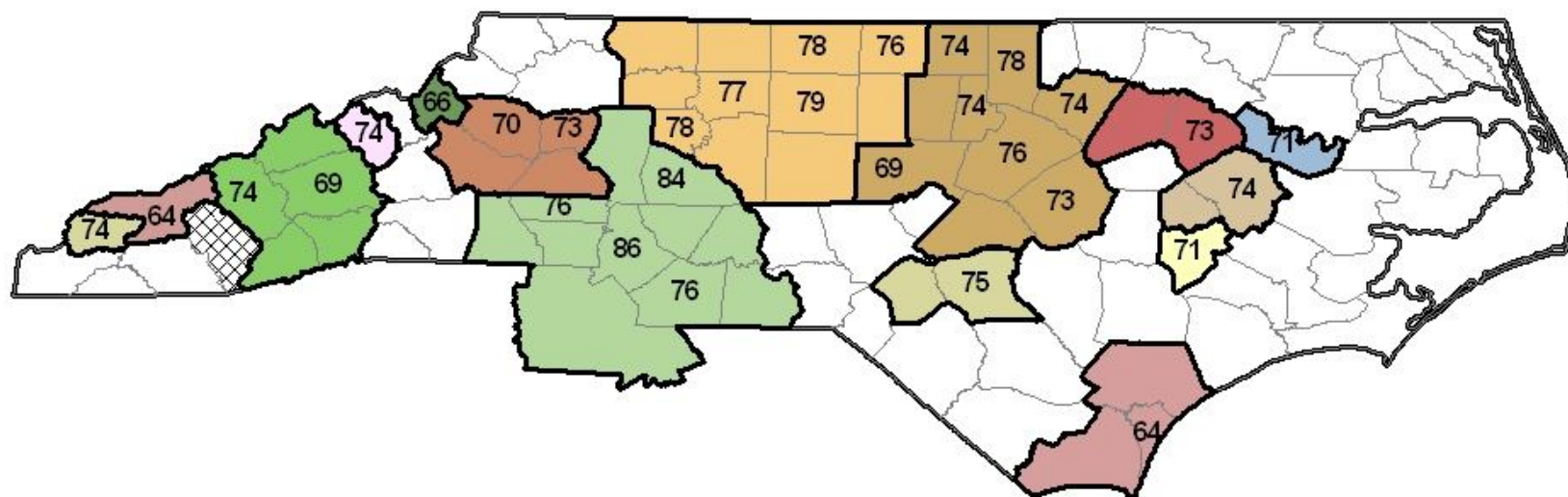
* Includes counties with nonattaining monitors and counties included in previously designated Ozone nonattainment areas

DRAFT

NCDENR - DAQ
Attainment Planning
Map Created
09/21/2009 (BD)

Areas USEPA would likely propose to be designated as nonattainment under a 60 ppb standard.

(Labeled with Highest Current Design Value for the County)



Legend



Incomplete Design Value Data

Counties outside CSA*

- Avery
- Graham
- Lenoir
- Martin
- Swain
- Yancey

CSA with Nonattaining Monitors

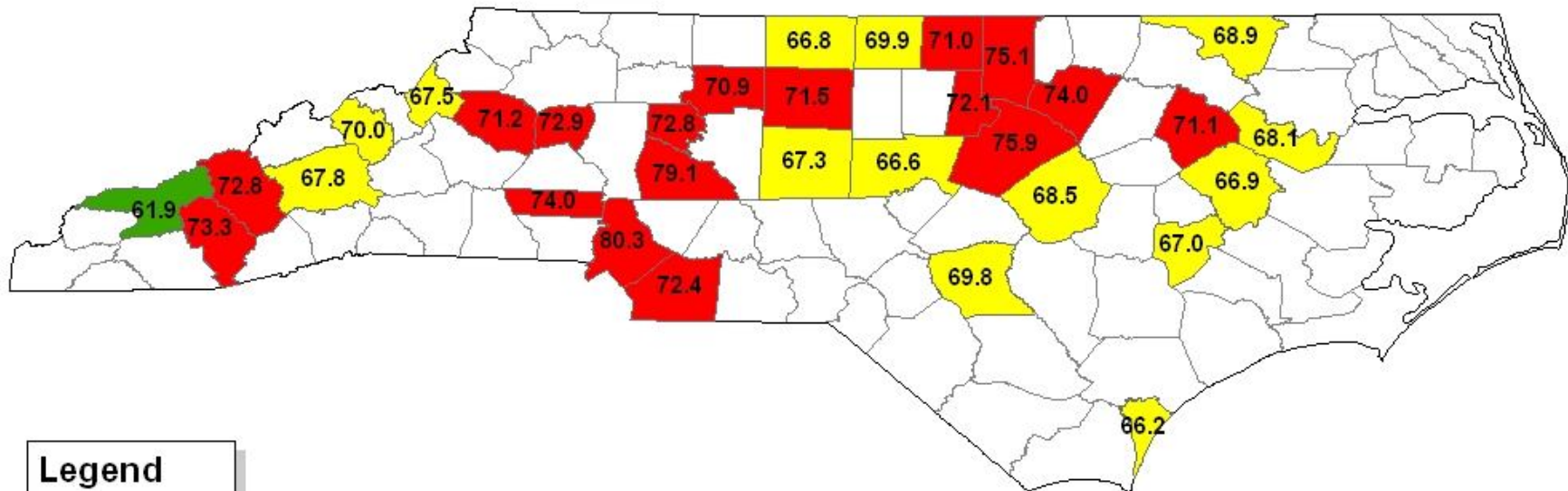
- Asheville-Brevard, NC
- Charlotte-Gastonia-Salisbury, NC-SC
- Fayetteville, NC
- Greensboro-Winston Salem-High Point,
- Greenville, NC
- Hickory, NC
- Raleigh-Durham_Cary, NC
- Rocky Mount, NC
- Wilmington, NC

* Includes counties with nonattaining monitors and counties included in previously designated Ozone nonattainment areas

DRAFT

NC DENR - DAQ
Attainment Planning
Map Created
09/21/2009 (BD)

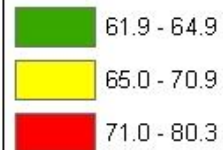
2012 Future Design Values
(Maximum value per county, based on
VISTAS/ASIP baseG4a model run)



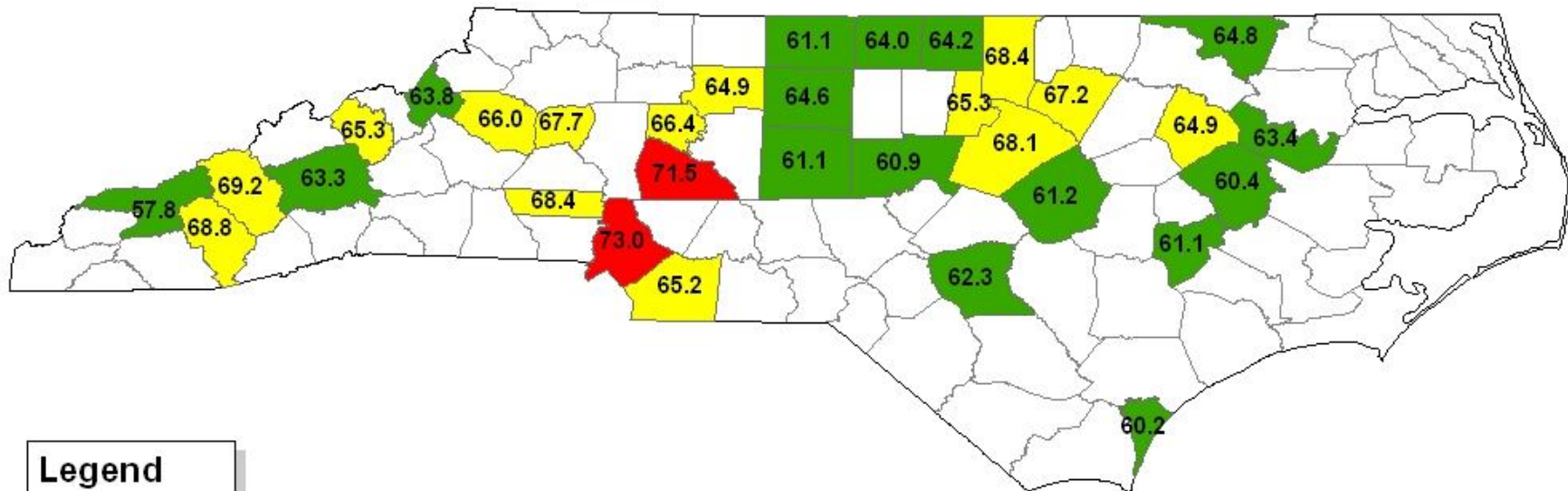
Legend

BaseG4a

DVF 2012



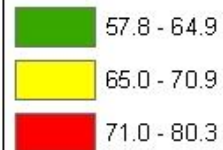
2018 Future Design Values
(Maximum value per county, based on
VISTAS/ASIP baseG4a model run)



Legend

BaseG4a

DVF 2018





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Ozone Control Strategy Options

North Carolina Division of Air Quality

**Sheila Holman
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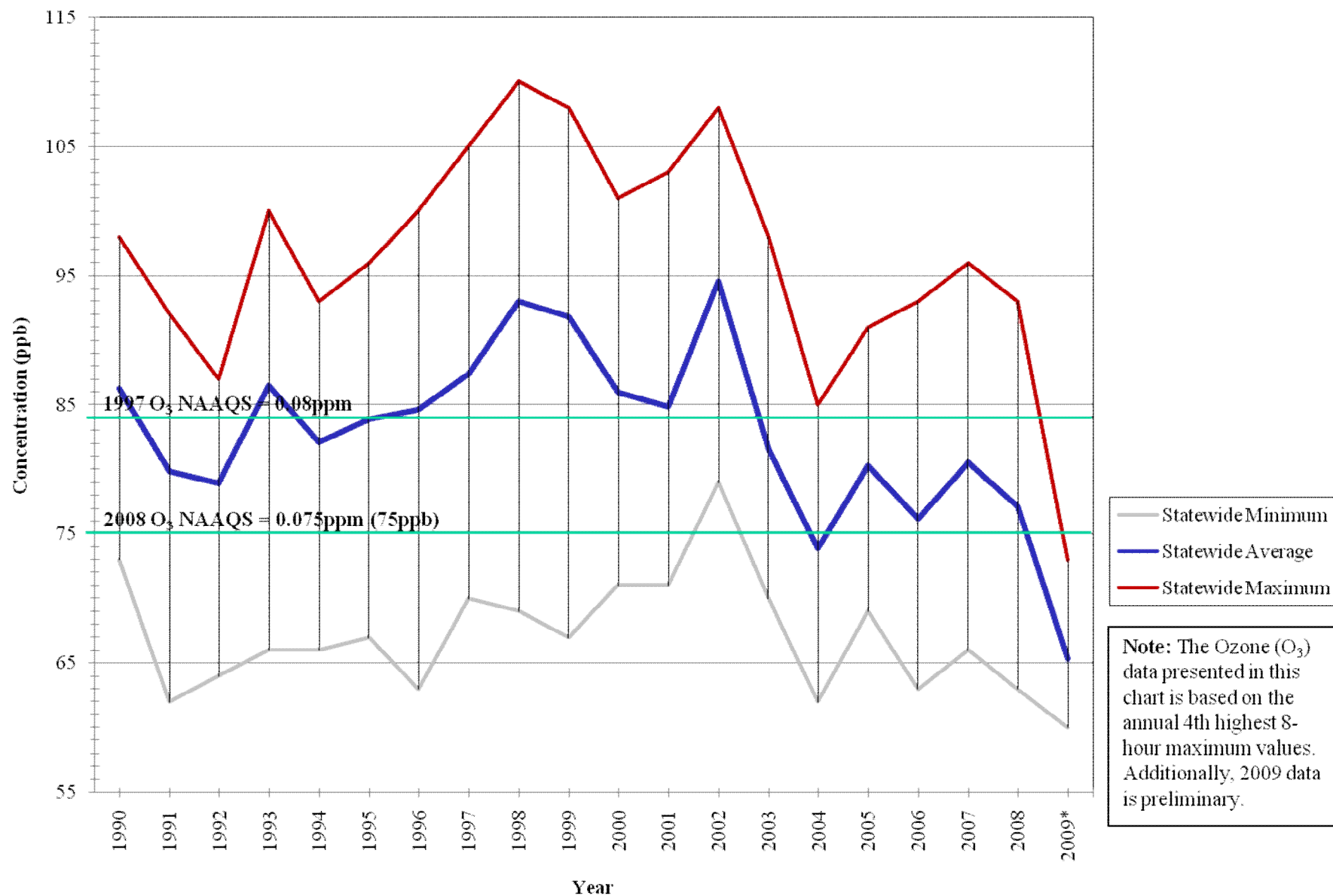
November 12, 2009



Ozone Control Strategy Implementation

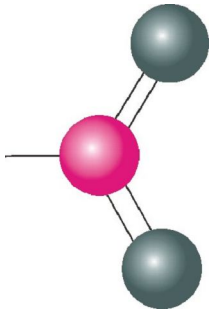
- Significant progress has been made in this decade to reduce emissions and lower ozone levels
- Reductions have been realized
 - utility sector (Clean Smokestacks Act),
 - industrial boilers (NO_x SIP Call rule),
 - mobile (Federal engine and fuel standards, State vehicle inspection program)
 - nonroad (Federal engine standards)

Ozone (O₃) Trend In North Carolina (1990-2009)

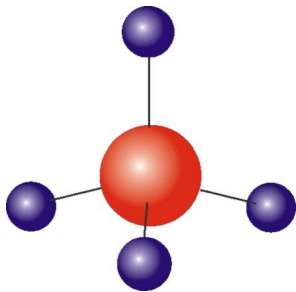


Formation of Ground-level Ozone

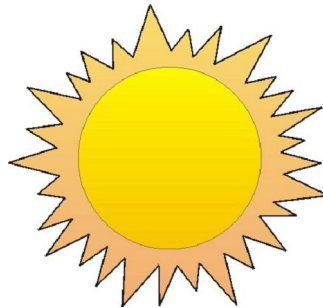
Oxides of Nitrogen (NO_x)



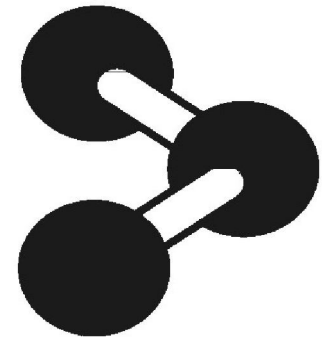
- AND -



Volatile Organic
Compounds (VOCs)



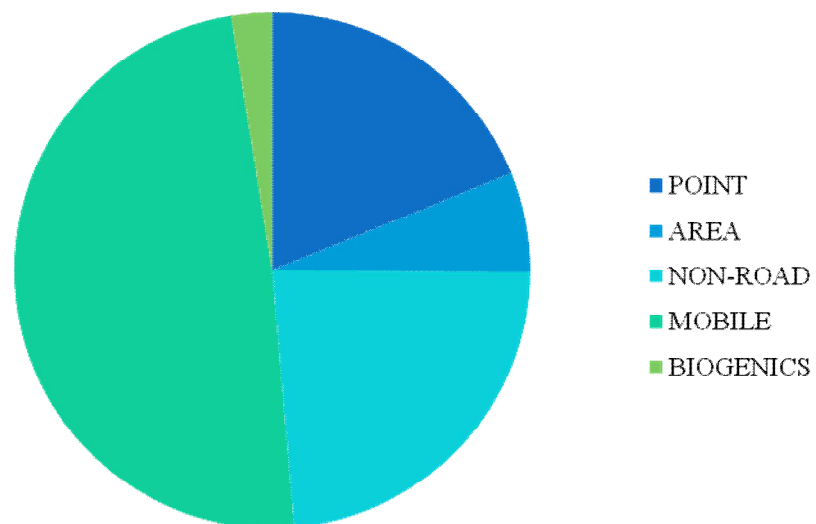
Strong Spring or Summer Sun
(with low RH & light winds)



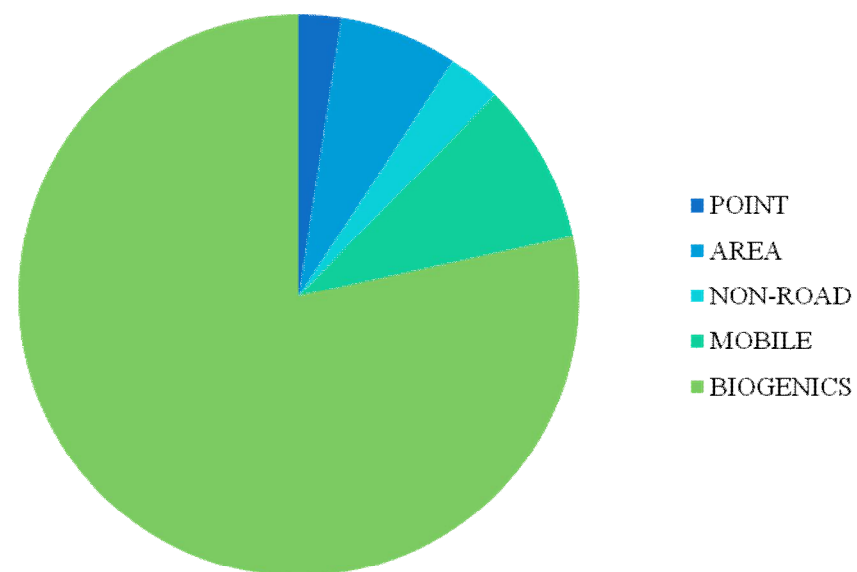
Ozone (O₃)

2009 Episode Emission Summaries for Metrolina Counties (tons/summer day)

Total Metrolina NOx Emissions



Total Metrolina VOC Emissions

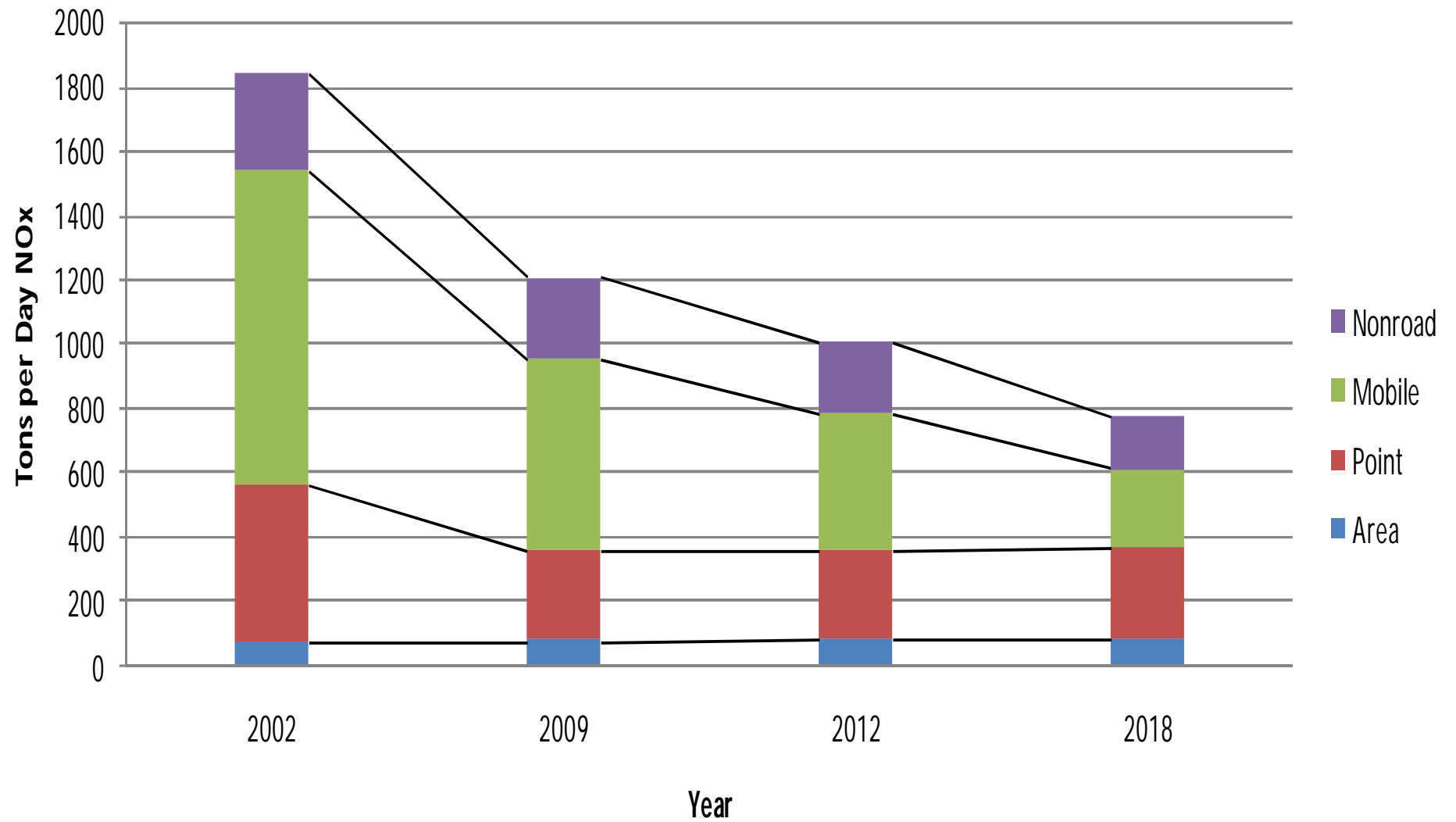




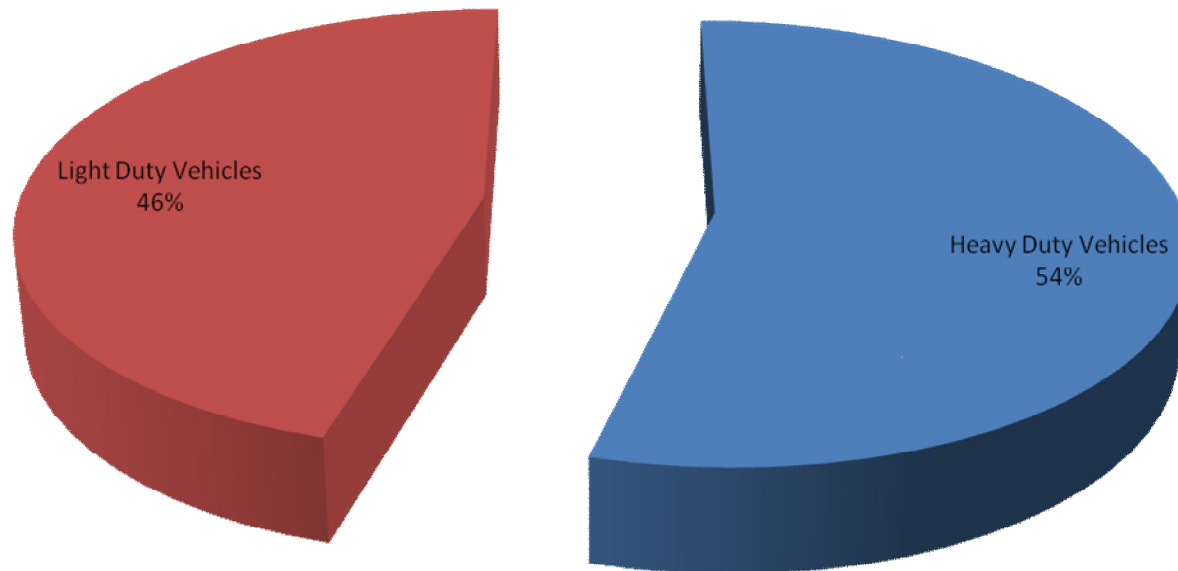
Federal Emission Reductions On the Way

- **Onroad Vehicle Standards**
 - Light duty gasoline trucks & cars (2007+)
 - Heavy duty vehicles (2007+)
- **Nonroad Vehicle Standards**
 - Large nonroad diesel engine standards (2008-2014+)
 - Locomotive engine standards (2015+)
 - Commercial marine diesel engine standards (2014+)
- **Large Stationary Sources**
 - Clean Air Interstate Rule replacement (2011)

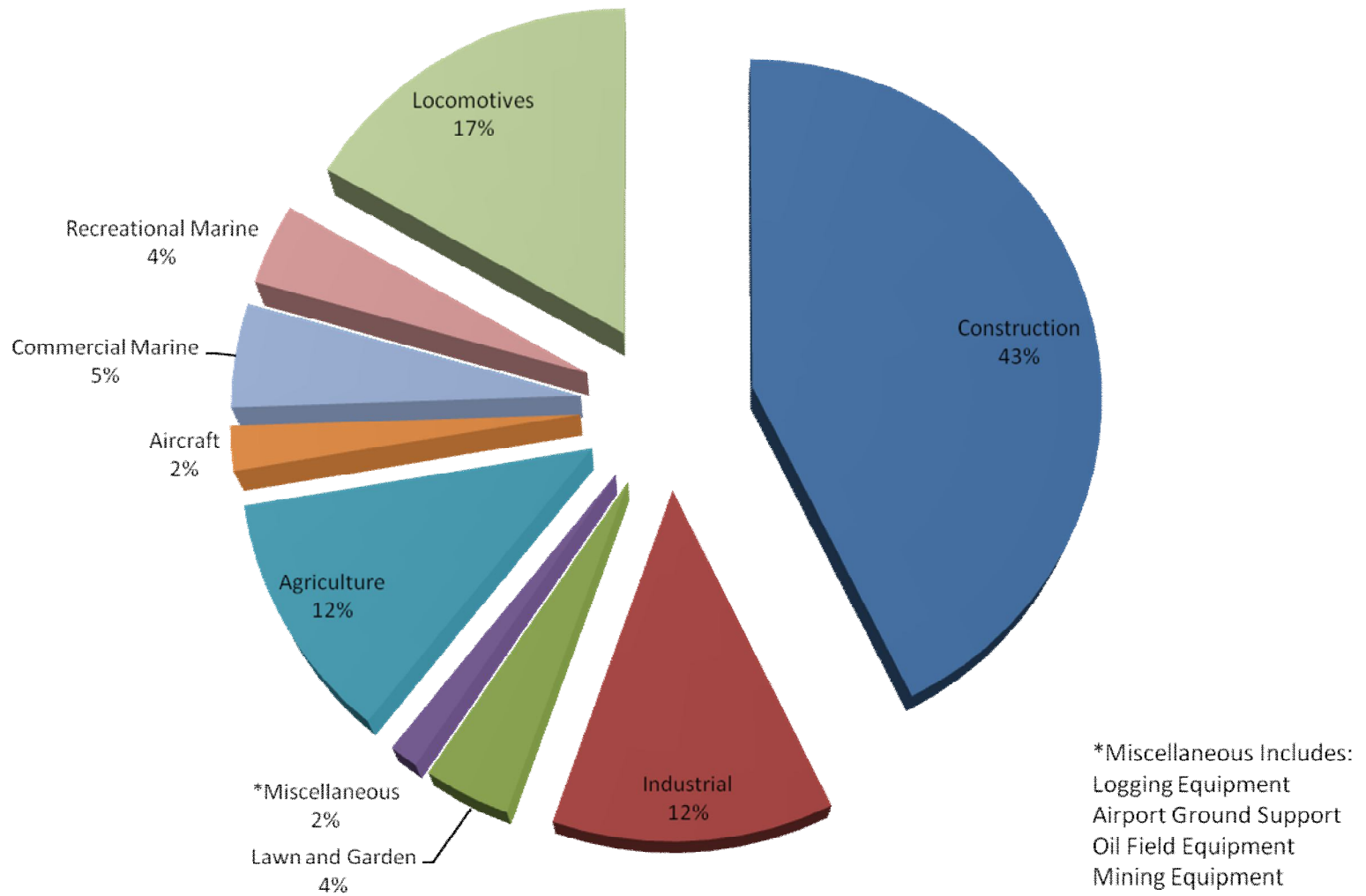
North Carolina NOx Emission Estimates



2009 North Carolina Onroad Mobile NO_x Emissions from Heavy Duty and Light Duty Vehicles



2009 North Carolina Nonroad NOx Emission Estimates





Control Strategies for New Ozone Standards

- Focus will need to continue to be on stationary sources, mobile and nonroad sectors
- What are cost effective control options for the stationary sources?
- What are control options to address the heavy duty portion of the mobile fleet?
- What are control options to address the construction, locomotive, industrial and agricultural sectors?



Control Strategies for New Ozone Standards

- Attaining the new standards will require effective partnerships by Federal, State and local governments, as well as business and industry
- Innovative ideas to find funding for engine replacement



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Eliminating Unnecessary Idling of On-road Heavy Duty Vehicles

North Carolina Division of Air Quality

Mike Abraczinskas

Rules Development Branch Supervisor

NCDAQ

November 12, 2009



Goal of the rule

- **Eliminate unnecessary idling from on-road heavy-duty vehicles**
- **Why?**
 - **Comply with Federal air quality standards**
 - **Reduce localized risks associated with fine particles (PM_{2.5}) and toxics from idling vehicles**
 - **Reduce carbon footprint**



Rule Requirements

- **Limits idling of on-road heavy-duty vehicles to 5 consecutive minutes in any 60 minute period.**



Rule Exemptions

- **Safety**
- **Health**
- **Commerce**
- **Military**
- **Farm vehicles**
- **Sleeper-berth cabs until May 1, 2011**





Idle Reduction - Projected Benefits

- **DAQ estimated:**
 - **Up to 9 million gallons of fuel per year can be saved**
 - **Up to 1,300 tons per year of Nitrogen Oxides (NOx) can be reduced**



Idle Reduction for Sleeper-Berths

- **Options:**
 - **Primary alternative to idling the main engine is installing an Auxiliary Power Unit (APU)**

Assume \$10,000 investment in an APU:

- **Payback period is:**
 - **1.1 years when diesel is \$2/gallon**
 - **0.7 years when diesel is \$3/gallon**
 - **0.5 years when diesel is \$4/gallon**



The Rule-Making Process

- **DAQ held 2 stakeholder meetings before starting the official rule-making process**
- **Original concepts of the rule were amended to incorporate feedback**
 - **Including the sun-setting of the sleeper-berth exemption**



The Rule-Making Process

- **Only 5 written comments were received during the official 60-day comment period.**
- **The Environmental Management Commission unanimously approved the rule.**



The Rule-Making Process

- **18 letters of objection**
- **Requested legislative review**
- **Stated concern in some of the letters was the sun-setting of the sleeper-berth exemption in May of 2011.**



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Diesel Grants/ Funding

North Carolina Division of Air Quality

**Heather Hildebrandt
Environmental Engineer
NCDAQ**

November 12, 2009



Diesel Grants/ Funding

- Fuel Tax
 - Mobile Source Emissions Reduction Grants (MSERG)
 - Targets all mobile sectors with emphasis on diesel projects in most recent years.
- Diesel Emissions Reduction Act (DERA)
 - Rolled 2008 & 2009 State Allocation into 2009 MSERG call for projects
 - All selected projects must reduce emissions from diesel engines.



Diesel Grants/ Funding Cont.

- DERA Competitive Award
 - NC Leading to Early Adoption of Diesel Emission Reductions (NC LEADER) Grant
 - Targeted Diesel Construction Equipment
 - Grants to Replace Aging Diesel Engines (GRADE)
 - Mecklenburg County Air Quality (MCAQ) received DERA funding to continue their GRADE program.



Diesel Grants/ Funding Cont.

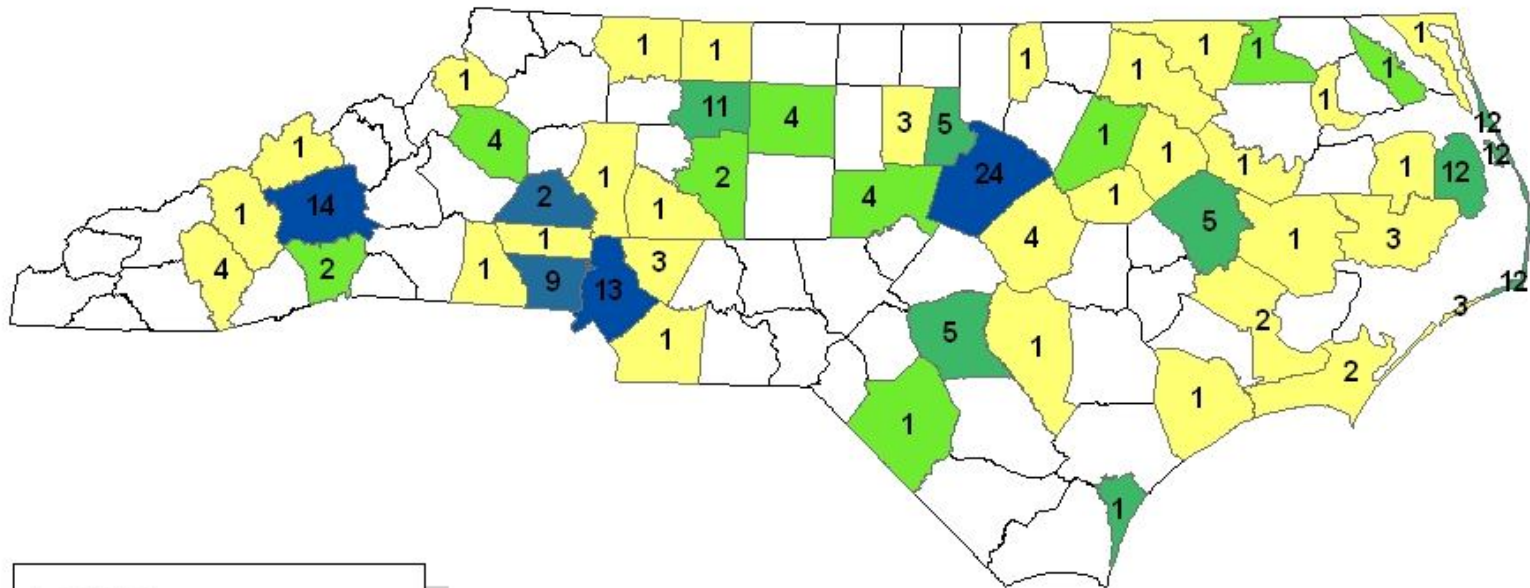
- American Recovery and Reinvestment Act
DERA
 - NC Diesel Emissions-Economic Recovery Grant
 - Targeted all mobile diesel sectors
 - NC Auxiliary Power Unit Rebate
 - Wilson, Edgecombe, Pitt, and Nash (WEPN) Retrofit Program
 - Provides funding for school bus retrofits and early replacements.
 - GRADE +
 - Expands MCAQ GRADE Program to more diesel sectors and more counties (including a few in South Carolina).



Diesel Grants/ Funding Cont.

- School Bus Retrofit Law (HB 1912, Session Law 2007-465)
 - Provides \$2.5 Million to retrofit school buses with priority given to level 3 emission control devices.
 - All eligible counties have been contacted and preferred technologies identified.
 - Addressed technological issues with other states, Department of Instruction, and vendors to ensure best use of funds.

Counties Receiving Funding from NCDAQ Grants 1995 - 2009



Legend

FUNDING

	8600.00 - 110000.00
	110000.01 - 285000.00
	285000.01 - 576500.00
	576500.01 - 914800.00
	914800.01 - 2024200.00



Other NC Efforts

- Clean Fuel Advanced Technology Grant
 - Congestion Mitigation Air Quality money funded to NC Solar Center.
- DOE Clean Energy Award
 - Awarded to Triangle J Council of Governments.



Potential Future Funding

- Combined 2009/2010 Competitive DERA Awards
 - NC LEADER 2
 - Will expand NC LEADER Grant to all non-road mobile diesel engines and stationary diesel pumps and generators.
 - NC Clean Ferries
 - NC Clean Ports



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Climate Change Initiatives

North Carolina Division of Air Quality

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November 12, 2009



Implement Regulations

- Proposed Greenhouse Gas (GHG) Tailoring Rule
 - Title V Facilities & New Sources
- Senate Climate Bill (*introduced 9/30/09*)
 - EPA can regulate large sources and administer emission reduction program
 - Cap & trade program implemented through Title V permit program



Implement NC Climate Action Plan Advisory Group Recommendations

- Restrictions on Heavy Duty Vehicle Idling
- Member of The Climate Registry (TCR)



GHG Emissions Inventory For NC

- Encourage Voluntary Reporting For NC Facilities
 - Provide Technical Assistance
- Develop State Inventory Model
 - Annual estimates
 - Track impacts of future policy actions



DENR's Unified Approach to Address Climate Change

- DENR Strategic Plan (*August 2009*)
- Climate Change Steering Committee
 - Coordinate strategies across programs
 - Partner with other state, federal, and non-governmental orgs.
- Reduce DENR's Energy and Water Usage (*Session Law 2007-546, SB 668*)
- Education and Outreach



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