

# North Carolina's Air Quality Management Process Work Plan



**Prepared by:**

**North Carolina Department of Environment and Natural Resources  
Division of Air Quality**

**June 2008**

# North Carolina's AQMP Work Plan

## **BACKGROUND**

The United States Environmental Protection Agency (EPA) is working with three pilot areas to integrate non-traditional planning into air quality management: (1) Illinois and Missouri; (2) New York; and (3) North Carolina. Many state, local and tribal governments are moving away from single-pollutant planning towards multi-pollutant strategies that address future air quality needs. EPA's AQMP Project is an effort that encourages state and local governments to create comprehensive air quality plans that will provide a more efficient pollution control process. Air quality management plans address air quality concerns and goals such as nonattainment and maintenance of criteria pollutant standards, sector-based emissions, regional haze, visibility, ecosystem health, and risk reductions of Hazardous Air Pollutants. These plans may address other considerations such as land-use, transportation, energy and climate change. The goal is to integrate the requirements of the current SIP process into a more comprehensive plan for air quality in a manner consistent with the 2004 NAS report, "Air Quality Management in the United States," and the 2007 Clean Air Act Advisory Committee recommendations. The goal is also to develop a process that will be more efficient than the current air management process and produce the same, if not more environmental benefits.

## **PURPOSE**

The overall purpose of the AQMP pilot project in North Carolina is to define the process by which an integrated air plan will be developed in the State, and to define the implementation steps and timeline for such a plan.

### **Task #2: Summary of Current Status**

**Purpose: This document will describe the current air quality issues in North Carolina, including the challenges that lay ahead for the state. This document will provide a building block on which the conceptual model will be developed. The following topic areas will be addressed:**

The current issues document will cover:

1. Air quality issues and concerns:
  - a. Status of compliance with current National Ambient Air Quality Standards (NAAQS), potential violating areas under new standards
  - b. Air toxics
  - c. Other air quality issues and concerns for North Carolina
2. Climate change, greenhouse gas initiatives
3. Energy issues, renewable energy, energy efficiency
4. Ecosystem health
  - Examples will include:
    - a. Specific ecosystems that are endangered at least in part due to air pollution
    - b. Services provided by ecosystems that are threatened due to air pollution

5. Public health related issues and how they relate to the AQMP (e.g., human health effects due to poor air quality)
6. Growth issues and how those will be addressed in the AQMP
7. Stakeholder involvement in the air quality management process
8. Process for implementing air quality management  
Process must be consistent with Federal/State/Local legislation and regulation
9. Other planning efforts that will have some impact on the AQMP (e.g.: transportation plans, watershed plans, climate action plans, adaptation issues, emergency or contingency planning)
10. Regional and neighboring state issues (e.g., importance of RPO process to provide emissions and other data for surrounding states)

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## Chapter 1. Air Quality Issues and Concerns

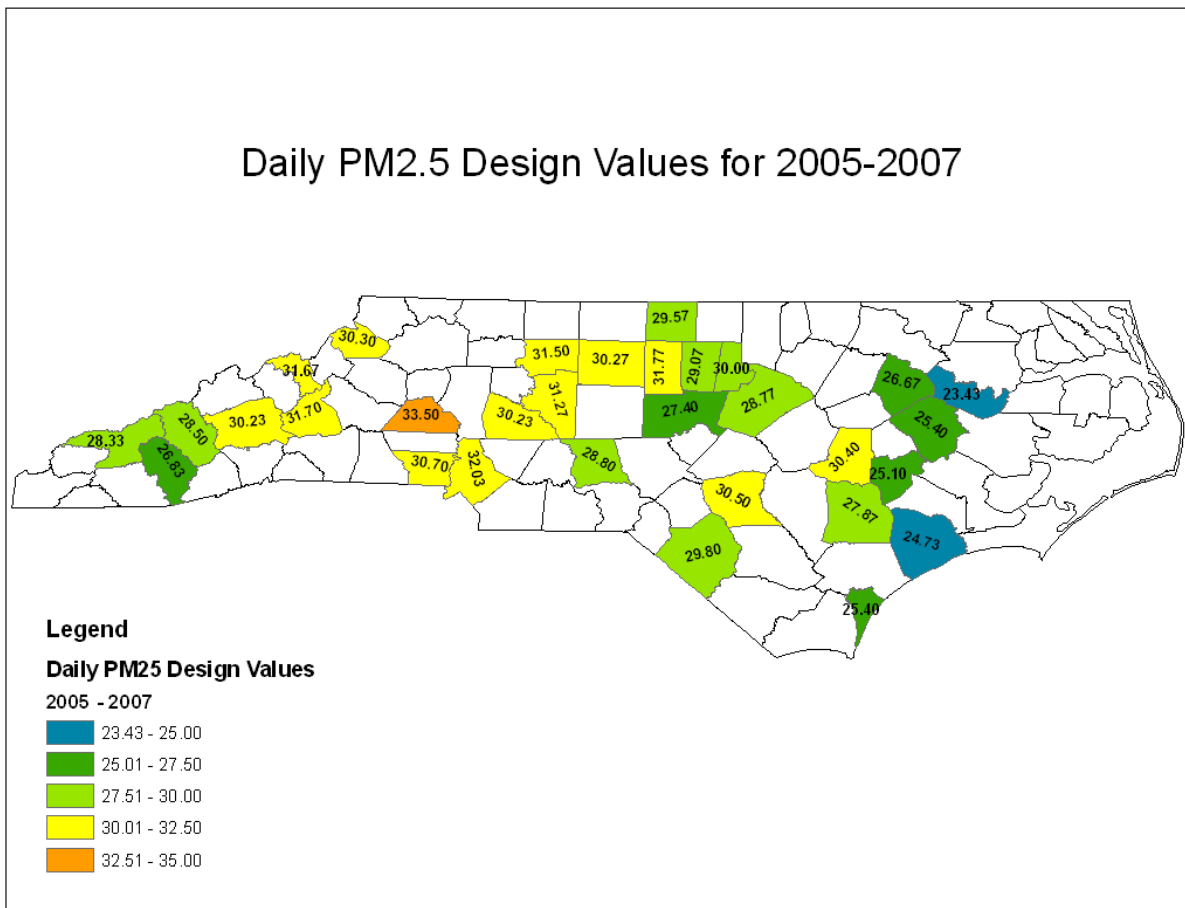
### **a. Status of Compliance with the Current National Ambient Air Quality Standards (NAAQS), Potential Concerns with New Standards**

Currently, North Carolina is in attainment in all counties for the following criteria pollutants: Carbon Monoxide, Nitrogen Dioxide, Sulfur Dioxide, and Lead. North Carolina has some counties designated nonattainment for the 8-hour ozone standard (1997), and the annual fine particle standard (PM<sub>2.5</sub>).

#### **PM<sub>2.5</sub>**

For the annual PM<sub>2.5</sub> standard, three counties are currently designated nonattainment: Catawba, Davidson and Guilford. The Division of Air Quality (DAQ) expects these counties to be measuring compliance with the annual PM<sub>2.5</sub> standard by the end of 2008. At that time, the DAQ will prepare a redesignation request and maintenance plan for these counties. It should be noted that North Carolina recommended that no areas be designated nonattainment for the daily PM<sub>2.5</sub> standard since no monitors in the State violated the standard. Figure 1 below presents the PM<sub>2.5</sub> data from 2005-2007. The monitor in Hickory, North Carolina has the highest value of 33.50 micrograms per cubic meter (ug/m<sup>3</sup>), which is below the daily standard of 35 ug/m<sup>3</sup>. The United States Environmental Protection Agency (EPA) plans to finalize the nonattainment boundary designations for the daily PM<sub>2.5</sub> standard by December 2008.

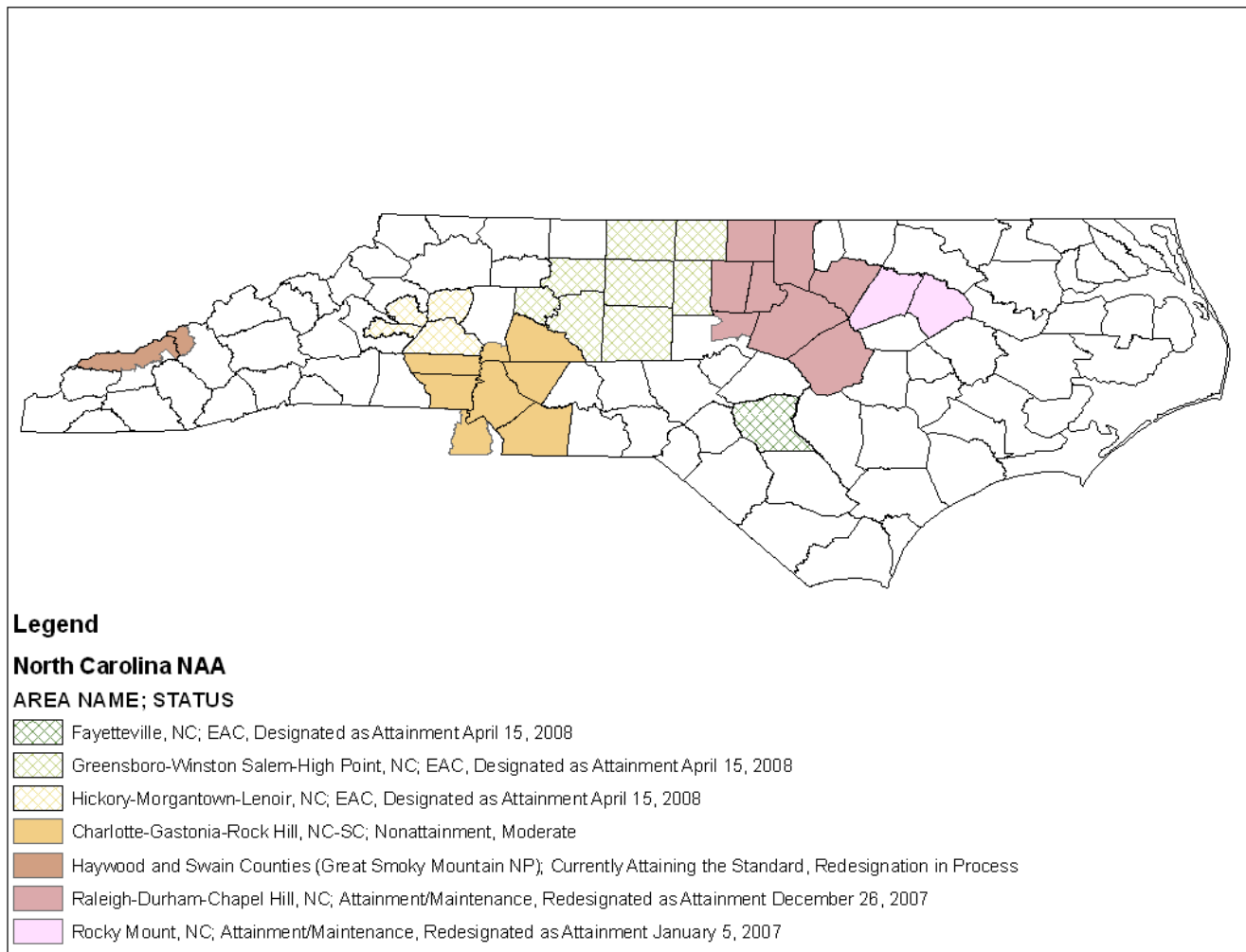
Figure 1: Daily PM<sub>2.5</sub> Design Values for North Carolina



## Ozone

With regard to the 1997 8-hour ozone standard of 0.08 parts per million, all but one area of the state has attained the standard. Figure 2 shows the various areas that were designated as nonattainment, and their applicable redesignation dates. The Charlotte-Gastonia-Rock Hill (Metrolina) area still has four monitors that violate the standard as of the end of the 2007 ozone season. The Metrolina area is designated as a moderate nonattainment area, with a required attainment date of June 15, 2010. The determination as to whether the area has attained the 1997 standard will be based on data from 2007, 2008, and 2009 since the attainment date falls in the middle of the 2010 ozone season. The map in Figure 3 presents the ambient data for the 2005 through 2007 period.

Figure 2: Current Designation of North Carolina Areas Under the 1997 8-Hour Ozone Standard





The EPA Administrator signed a rule to establish a new, lower ozone standard on March 12, 2008. The new standard is set at 0.075 parts per million of ozone. Like the 1997 ozone standard, the new standard is based on the average of the fourth highest value at a given monitor over a three-year period. EPA will use data from 2007 through 2009 to designate areas as nonattainment under the new ozone standard. Currently, only six of the North Carolina counties have ozone monitors that attain the ozone NAAQS, as shown in Figure 3. The counties shaded in green have ozone monitors with values below the new standard. The counties shaded in orange have at least one ozone monitor violating the new standard. Counties shaded in white do not have an ozone monitor. However, more emission reductions are expected from a variety of Federal and state regulations in 2008 and 2009, and ambient air ozone levels are expected to continue to decline across North Carolina for years to come. Nevertheless, the new ozone standard will have a large impact on the State.

### **b. Air Toxics**

The North Carolina Division of Air Quality's air toxics program is a "risk-based" regulatory program designed to protect the public health by limiting emissions of toxic air pollutants from man-made sources.

At the outset of its air toxics program, North Carolina decided that the philosophy of the program would be based upon protection of public health. It established airborne concentrations of specific chemicals "above which the substance may be considered to have an adverse effect on human health." These chemicals became known as toxic air pollutants or TAPs and the concentrations became known as Acceptable Ambient Levels (AALs). The AALs are expressed in weight per unit volume, most often as milligrams per cubic meter of air (mg/m<sup>3</sup>). North Carolina has developed AALs for 97 toxic air pollutants. By their nature, AALs are intrinsically different from measured air concentrations, and an understanding of this distinction is necessary to prevent misunderstanding and misapplication of AALs.

Historically, AALs were established by two means:

- (1) For health effects other than cancer, the AALs were determined by taking occupational exposure standards and lowering exposure guidelines to acceptable concentration levels by safety factors of 10 to 160 to protect human health. Safety factors were used because the state recognized that chemical compounds differed in the nature and severity of the toxic effects and how much was known about the health effects of a chemical. Highly toxic chemicals such as mercury have larger safety factors and lower AALs. (Occupational exposure standards are essentially "no effect levels" and as such, safety factors tend to decrease those standards well below the levels at which adverse health effects have been seen in occupationally exposed humans).
- (2) For substances known to cause cancer (carcinogens) in humans, AALs are set at levels calculated to represent an increment of "one in a million" risk. That is, if one million individuals are exposed continuously for 70 years, to a carcinogen at the concentration of the AAL, one person might be expected to contract cancer as a result of that exposure.

For “probable” human carcinogens, the risk levels increase to either “one in one hundred thousand” or “one in ten thousand”.

The DAQ maintains a scientific body of experts known as the Scientific Advisory Board (SAB) whose job it is to continually review the scientific information that forms the basis of the AALs. As this information changes, the SAB recommends updates to the AALs. The SAB’s objective is to recommend safe exposure concentrations for toxic air pollutants that allow an ample margin of safety for potentially exposed people. The Environmental Management Commission reviews the SAB recommendations and gives direction to DAQ as to appropriate rule changes to incorporate the SAB Recommendations. See Section 8 for a more detailed explanation of the rule adoption process in North Carolina.

North Carolina’s air toxics program does not set state-wide or even community ambient standards for TAPs in the same sense as national air standards are set for criteria air pollutants such as ozone, sulfur dioxide, nitrogen oxides, particulate matter, lead, and carbon monoxide. National Ambient Air Quality Standards (NAAQS) are established for these criteria pollutants by the Environmental Protection Agency, to protect public health and the air quality in every state is expected to meet these national standards. States maintain and operate extensive air monitoring programs designed to measure criteria air pollutant concentrations to ensure that compliance with the national standards is being maintained. Wide-ranging pollution control strategies are adopted to enable states to meet the standards for the criteria pollutants. By contrast and although termed “acceptable ambient levels,” North Carolina’s AALs are used in pollution permitting to insure that toxic air pollutants from new or modified facilities do not make toxic air pollutant levels worse, on a case by case basis. Generally, monitoring for toxic air pollutants is limited to specific areas and specific pollutants.

When contrasted to the national standards, AALs are applied on a much smaller scale. Since there is not enough monitoring information to know the general ambient concentrations for each of the 97 TAPs, the North Carolina program focuses on what a facility’s air pollutant emissions adds to the existing environment. What a facility adds to the environment is determined in a two-step process. First, the facility determines how much of a toxic air pollutant it emits. Determining emissions can be difficult, but generally there are standard techniques available. For example, a facility can perform testing at its emissions points to determine emission quantities and rates. If available, a facility may also use a published “emission factor” that has been determined to be a typical emission rate for a particular pollutant from a generic source such as spray booths. If the pollutant is emitted from the emission source at a rate above what is allowed by the toxics program, then an air dispersion computer model is run. If the air dispersion model results show that the toxic air pollutant concentration is below the AAL, a conclusion is made that the facility has not added concentrations of toxic air pollutants to the air that contribute to a determinable increased risk.

Air dispersion computer models use mathematical equations to simulate the real world. These equations attempt to account for all conditions affecting the release and dispersal of a pollutant, such as wind speed, wind direction, temperature, terrain, height of the emissions, how fast the emissions are released and so on. The model is used to predict the downwind concentrations or off-site concentrations of a given pollutant from the input information. The model output can

show a picture of areas of equal concentrations or isopleths, and predict the areas of the highest pollution levels from an emissions source. Since air modeling is conducted only for the source of interest, the resulting modeled air concentration is directly comparable to the AAL.

At first glance, AALs may appear to be directly comparable to air concentrations measured during ambient monitoring. However, such comparisons are misleading. Although a constituent of interest may be emitted from several different sources, its AAL is applicable only to the portion of the air concentration emitted from a specific industrial source. The NAAQS for the criteria air pollutants are established and monitored with total loading as a consideration. When monitoring for toxic air pollutants is conducted, the measured air concentration for a particular air pollutant can usually only be compared with its AALs if the source emitting that pollutant can somehow be isolated from all other sources. Such isolation is usually not possible or achievable. Furthermore, because air monitoring measures the total loading of a constituent from all emission sources, the resulting measurement is likely to be greater than the AAL for that constituent. Many toxic compounds such as benzene and arsenic can be found in a sample of ambient air in concentrations above the AAL as a result of the many contributing sources. If such a sample were taken at the property line of a facility, it would not automatically imply that a given facility has exceeded an AAL.

Additional information would be needed to draw appropriate conclusions about what the sample represented. Such additional information has to include information about all other contributing sources, near-site meteorology and the dispersion characteristics of released emissions.

### **North Carolina Toxics Issues**

Following is a brief description of some of the more challenging issues related to the air toxics program.

**Mercury-** Mercury is one of the most significant toxics issue in North Carolina. Methyl mercury is bio-accumulative. Combustion of coal in coal-fired power plants is a main source of mercury emissions within North Carolina. The eastern part of the state has ideal conditions for the conversion of introduced mercury to methyl mercury. The MACT rule under Section 111 of the Clear Air Act was vacated. This leaves North Carolina with the challenge of regulating sources of mercury.

**Funds for Toxic Air Pollutant Monitoring -** Limited funds are available for the determination/investigation of toxic air pollutants across North Carolina. Funds when available are dedicated to projects of limited scope and investigative time frames. North Carolina Toxic Air Pollutant monitoring capabilities are extensive in response to emergency toxic air pollutant releases to address immediate public health concerns and provide assistance and technical expertise to other responding agencies.

**MACT/GACT-** Area source MACT/GACT has created a “perfect storm” of implementation challenges because of a compressed court-ordered schedule for EPA to promulgate final standards, with rules that often have little-to-no lead time in advance of compliance deadlines, and the fact that the rules affect thousands of unpermitted sources or activities. Still, the cumulative impact of these many small sources is significant, so the Division is taking the

program seriously. Resource limitations do not support the traditional permit and inspection type of regulatory approach. Instead, the Division is depending upon outreach and notification of known sources, with inspections being complaint-driven. We also reserve the right to issue a Director's call to permit a source sector when warranted.

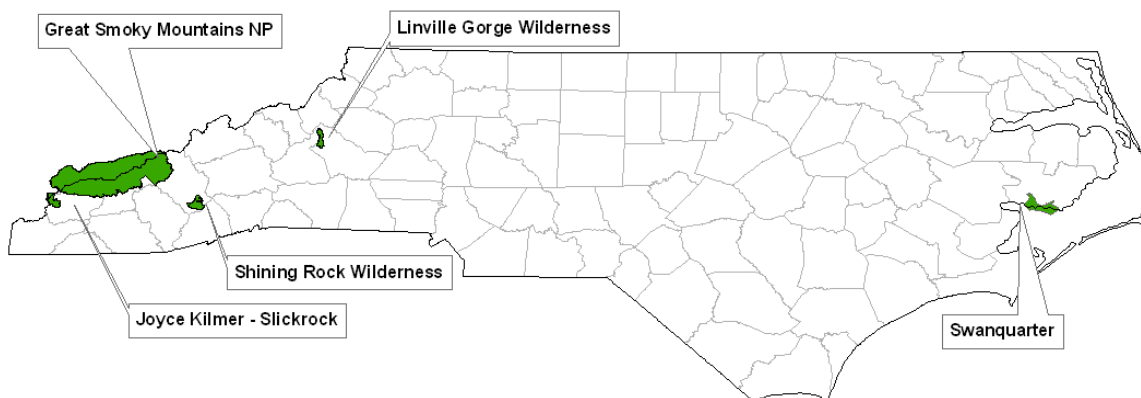
### c. Other Air Quality Issues

Regional haze is pollution that impairs visibility over a large region, including national parks, forests, and wilderness areas (many termed "Class I" areas). Regional haze is caused by sources and activities emitting fine particles and their precursors, often transported over large distances and across state borders. Particles affect visibility through the scattering and absorption of light. Reducing fine particles in the atmosphere is an effective method of improving visibility. In the southeast, the most important sources of haze-forming emissions are coal-fired power plants, industrial boilers and other combustion sources, but also include mobile source emissions, area sources, fires, and wind blown dust.

States are required to submit state implementation plans (SIPs) to the United States Environmental Protection Agency that set out each states' plan for meeting the national goal of a return to natural visibility conditions by 2064. The plan includes the states' reasonable progress goals, expressed in deciviews, for visibility improvement at each affected Class I area for each 10-year period until 2064. The DAQ completed the first regional haze SIP and submitted it to EPA on December 17, 2007. The DAQ is now working on the tracking progress report that is due in December 2012.

Visibility has important implications for the state's tourist economy, because haze can obscure views and detract from scenery - a critical issue in the mountains. In addition, haze impacts the quality of life of those citizens living in the mountains, as well as all across the state, since urban visibility and coastal visibility can also be issues on certain days.

North Carolina has five Class I areas within its borders: Great Smoky Mountains National Park, Joyce Kilmer-Slickrock Wilderness Area, Linville Gorge Wilderness Area, Shining Rock Wilderness Area, and Swanquarter Wildlife Refuge. Both the Great Smoky Mountains National Park and Joyce Kilmer-Slickrock Wilderness Area are located in both North Carolina and Tennessee. The figure below illustrates the location of these Class I areas.



**Figure 4: Map of North Carolina's Class I Areas**

## **Open Burning**

Smoke from outdoor burning pollutes the air and is unhealthy to breathe. An EPA study found that backyard burning of trash from a family of four can emit as much of pollutants as a well-controlled municipal incinerator serving tens of thousands of households. Open burning is the DAQ's most widespread enforcement problem. The state Open Burning Rule prohibits most outdoor burning, with exceptions allowed for campfires, land-clearing under certain conditions, disposing of vegetative storm debris, and agricultural pest control.

## **Animal Odors**

Animal odors are a significant concern in North Carolina, largely due to the explosive growth of the hog industry. In 1999, the Environmental Management Commissions (EMC) adopted rules for controlling odors from animal operations, one of the first rules of this type in the nation. The DAQ is responsible for enforcing these rules, which apply to livestock operations that use liquid waste-management systems and meet certain size thresholds. The rules set minimum guidelines that eligible operations must follow and give DAQ the authority to require "best management plans" and equipment for controlling odors at farms where DAQ staff have documented an objectionable odor problem.

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## **Chapter 2. Climate Action Planning, Climate Change, Greenhouse Gas Initiatives**

It was determined to be prudent by the leaders in the Division of Air Quality and the State of North Carolina to examine the steps that could and should be taken by North Carolina to address Climate Change and the manmade components contributing to the problem. In 2002 the Clean Smoke Stack Act (CSA) was passed which has and will continue to require major reductions in Sulfur Dioxide and Oxides of Nitrogen emissions from coal fired power plants in North Carolina. The CSA also charged the Division of Air Quality with studying and reporting on controls to reduce Carbon Dioxide (CO<sub>2</sub>) emissions from coal fired power plants. A series of reports followed including the recommendation for NC to develop a Climate Action Plan. These reports developed growth models showing the projected growth in Green House Gas (GHG) emissions by sectors in North Carolina, as shown in Figure 5.

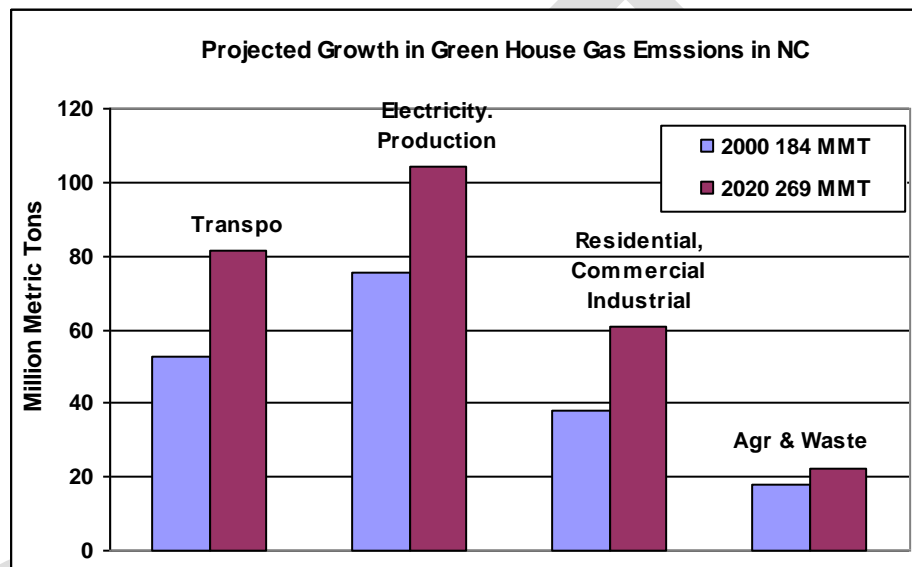


Figure 5: Projected Growth in Green House Gas Emissions

In 2005 the General Assembly of North Carolina established the Legislative Commission on Global Climate Change (LCGCC) and subsequent the LCGCC requested the Division of Air Quality to provide technical analysis and support to the Goals of the LCGCC. In 2005 the DAQ initiated a facilitated stakeholder process to develop and consider long-term mitigation options for the reduction of Green House Gas (GHG) emissions in North Carolina.

The facilitated process was initiated and led by DAQ with over 40 volunteer stakeholders representing a broad range of interest and expertise to form the Climate Action Plan Advisory Group (CAPAG). The volunteer stakeholders from North Carolina represented business, industry, public utilities, environmental groups, community organizations, and governments. Workgroups under the direction of the CAPAG were formed with the directed task to focus on specific sectors of North Carolina. Each Technical Workgroup was tasked with developing and evaluating Mitigation Options specifically for the reduction of Green House Gases in that sector. The five workgroups of the CAPAG are: Residential, Commercial, and Industrial; Energy Supply; Transportation and Land Use; Agriculture, Forestry and Waste; and Cross Cutting Issues.

The two-year effort of the CAPAG developed 56 North Carolina Specific Recommended Mitigation Options for Controlling and Reducing Greenhouse Emissions. These broad reaching recommended options for potential adoption are believed to be the most effective in reducing GHG in North Carolina. The potential impact resulting from the full adoption of the recommended mitigation options will reduce North Carolina’s green house gas emissions to 1990 levels by the year 2020. If complete adoption and implementation of each recommended option occurs, the Gross Projected GHG emissions in 2020 would be reduced from a projected 256 million metric tons of carbon dioxide equivalents (MMT $\text{CO}_2\text{e}$ ) to 137 MMT $\text{CO}_2\text{e}$  or by 47%. The cumulative reduced emissions though the full implementation period would reduce North Carolina’s GHG emissions by 828 MMT $\text{CO}_2\text{e}$ . Although not complete, Figure 6 below presents 7 major areas where substantial reductions in GHG emissions could be realized.

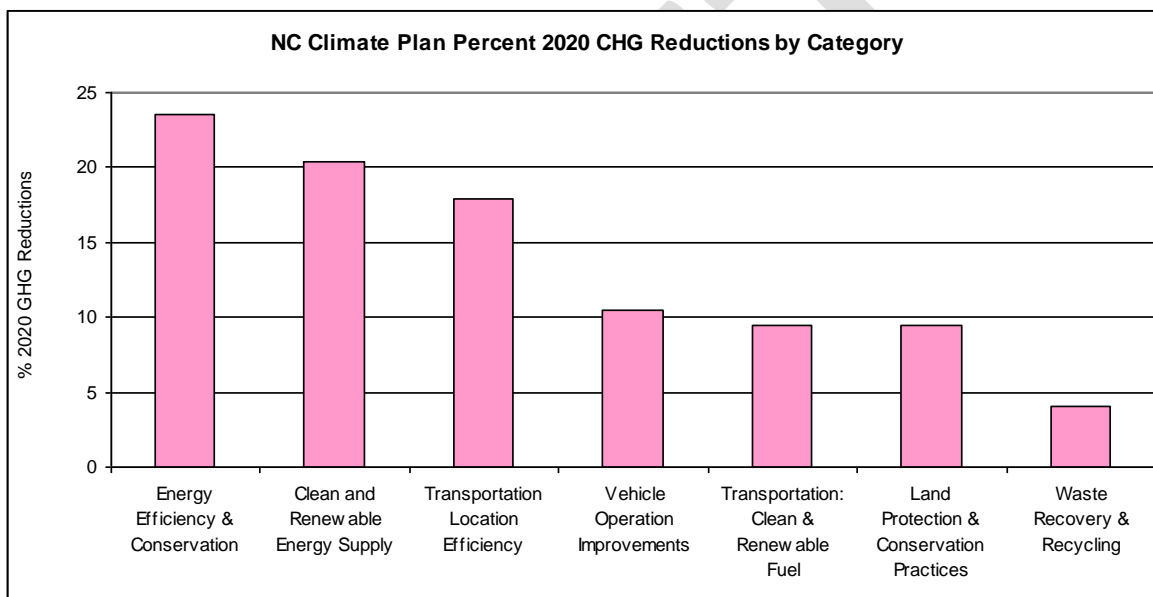


Figure 6: Projected Green House Gas Emission Reductions by Category

The comprehensive analysis and mitigation options developed by the CAPAG provide a roadmap appropriate to North Carolina in reducing green house gas emissions. A full, detailed description of the 56 recommended mitigation options is available in the draft final CAPAG Report, which is available for download at [www.ncclimatchange.us](http://www.ncclimatchange.us).

The DAQ has provided and continues to provide support to the efforts and goals of the LCGCC. The General Assembly of the State of North Carolina enacted Session Law 2005-442 to establish the LCGCC with the purpose of studying issues related to Global Warming, the emerging Carbon Economy, and to determine whether or not it is appropriate and desirable for the state to establish a global warming pollutant reduction goal. Then if desirable and appropriate, the LCGCC is authorized to develop a recommended goal for global warming pollutant reduction.

Prior to receiving the final report from the LCGCC the General Assembly has moved forward in the reduction of Greenhouse Gases in North Carolina through the enactment of Session Law 2007-397 commonly known as the Renewable Energy and Energy Efficiency Portfolio Standard (REPS). This significant legislation requires that investor owned utilities to meet up to 12.5% of their energy needs through renewable energy resources or energy efficiency measures and rural cooperatives and municipalities to meet up to 10% of their electricity needs. This legislation establishes the State of North Carolina as a leader in addressing the necessary efforts to reduce GHG. In addition, the General Assembly also passed Senate Bill 668, which establishes specific performance criteria and goals for sustainable, energy efficient public buildings. Both of these actions were recommended in the draft final CAPAG report, and represent the first of many initiatives to reduce green house gases in the state.

Many additional efforts are being undertaken to conserve energy and directly address GHG emissions by doing so. A few examples of the major efforts presently underway in North Carolina to quantify and reduce GHG emissions in NC include:

- The Division of Air Quality through authorization by the Clean Smokestacks Act is collecting Green House Gas Emissions Inventory data from all Title V facilities in the State of North Carolina.
- The North Carolina Department of Environment and Natural Resources has joined “The Climate Registry” as a Founding Reporter and the Deputy Director of the Division of Air Quality serves as the North Carolina Board Member, member of the Executive Committee of the Board, and Co-Chairman of the Stakeholder Advisory Committee.
- The North Carolina State Energy Office, which leads many state efforts in Alternative Fuels, Renewable Energy, Residential and Industrial Energy Savings Programs, and Awareness and Education is developing a new State Energy Plan.
- Major utilities have expanded existing demand-side management programs in the Residential, Commercial, and Industrial Sector.
- The North Carolina Utilities Commission has authorized the collection of a Public Benefits Charge on electricity sales a portion of which is managed by the Advanced Energy Corporation and used to fund energy efficiency and development programs.
- North Carolina Green Power coordinates a voluntary program of green power purchasing for consumers in the governmental, residential, commercial, and industrial sectors.
- The requirement for the state motor fleet to meet goals in the purchasing of flex-fueled vehicles, hybrid technology, and other high mileage low emitting vehicles continues to expand.
- Many additional bills have been passed by the state legislature and ratified by the Governor include:
  - Senate Bill 567 – Allowing E85 to be dispensed from fuel dispensers approved for E10 provided the manufacturer has initiated the approval process buy an independent testing laboratory.

- Senate Bill 1272 – An individual that produces biodiesel for personal use in private vehicles is exempt from motor fuels tax.
- Senate Bill 1277 – Every new diesel vehicle purchased by the state shall be covered by express manufacturer warranty that allows use of B20 (20% biodiesel) fuel.
- Senate Bill 1452 – Requires 2% of the annual diesel fuel used by school buses to be B20 by June 2008
- Senate Bill 670 – Eliminating ordinance, deed, covenant, and other similar agreement restrictions prohibiting the installation of Solar Collectors on detached single family residences.

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### **Chapter 3. Energy Issues, Renewable Energy, Energy Efficiency**

North Carolina is experiencing a period of sustained economic growth, with related growth in industry and population -- growth that is projected to continue well into the future. With these prosperous conditions come competing challenges to satisfy increased energy demand yet maintain a healthy environment.

To meet these challenges, significant legislation has been passed by the North Carolina General Assembly. The Clean Smokestacks Act (CSA) is cleaning up existing coal-fired power plants, while the Renewable Energy and Energy Efficiency Portfolio Standard (REPS) addresses future electrical generation. The CSA, which was passed in advance of similar Federal regulations, requires North Carolina's 14 coal-fired power plants to reduce NO<sub>x</sub> by 78% and SO<sub>2</sub> by 74%. The REPS requires at least 12.5% of North Carolina's public utilities' retail sales in 2021 and after come from renewable energy sources and energy conservation. The REPS includes incremental goals on the way to the 12.5% goal, and includes goals for solar energy and poultry and swine waste.

Following the passage of the REPS, North Carolina is experiencing a surge in interest in the development of renewable energy facilities throughout the state. These facilities would generate electric power and other forms of energy through the use of renewable energy resources including solar, wind, methane capture and biomass (animal waste, wood waste and agricultural waste).

Section 2(c) of Session Law 2007-397 (REPS) provides the Environmental Management Commission (EMC) with the authority to establish standards to ensure that the consumption of natural resources and renewable energy technologies do not harm the environment and to evaluate whether existing regulatory programs are sufficient to implement these standards.

Accordingly, the EMC established an Alternative Energy Committee and launched a scoping process to lay the groundwork for evaluating whether North Carolina has in place the proper regulatory framework to guide the development of renewable energy facilities.

The Division of Air Quality recently approved a permit to construct a new coal-burning power plant, but included state-of-the-art control equipment and a requirement to completely offset the plant's CO<sub>2</sub> emissions – believed to be the first such requirement in the nation.

## **Chapter 4. Ecosystem Health**

The main ecosystems at risk due in part to air pollution are the aquatic ecosystems in the State. For example, the mountain streams in the mountains in the western part of North Carolina are stressed due to acid deposition. The eastern estuaries such as the Neuse and the Tar-Pamlico river basins are impacted by nitrogen deposition. Finally, mercury deposition is an issue in the streams across the entire State. There are significant control programs underway that will begin to mitigate the impact that air emissions are having on these streams. The NO<sub>x</sub> control strategy for ozone will result in significant NO<sub>x</sub> reductions from mobile sources, utility and industrial boilers. The Clean Smokestacks Act and CAIR will result in NO<sub>x</sub>, SO<sub>2</sub>, and mercury emission reductions from utility boilers. The DAQ will work with the Division of Water Quality and the Federal Land Managers to evaluate what additional air emission reductions may be needed to help these ecosystems recover.

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## **Chapter 5. Public Health Related Issues and How They Relate to AQMP**

The NAAQS are set to protect the public's health. As North Carolina develops and implements attainment plans for ozone and fine particulate matter under the AQMP, it is expected that the respiratory and cardiovascular health issues associated with those two pollutants will decrease. Mercury reductions achieved through the implementation of the Clean Smokestacks Act and the Clean Air Mercury Rule will hopefully result in less mercury deposition into North Carolina's waterways, and therefore less bioaccumulation of mercury in fish. The North Carolina Air Toxics Program will continue to require sources to evaluate and mitigate any impacts that are over the AAL's in the state. Through the DAQ's efforts to improve air quality, it is expected that the public health of the citizens of North Carolina will also improve.

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## **Chapter 6. Growth Issues and How Those will be Addressed in AQMP**

North Carolina is a growing state, particularly in terms of population. As of July 1, 2007 North Carolina had a total population of 9,061,032. Based on this statistic, North Carolina is currently the 10<sup>th</sup> largest state by population. By 2010, North Carolina is projected to have a total population of 9,450,494. By 2020, North Carolina is projected to have a total population of 10,850,228. By 2030, North Carolina is projected to have a total population of 12,274,433, and is projected to be the 7<sup>th</sup> largest state by population. Figure 7 below shows this population growth trend. The county-by-county population projections are contained in Appendix A.

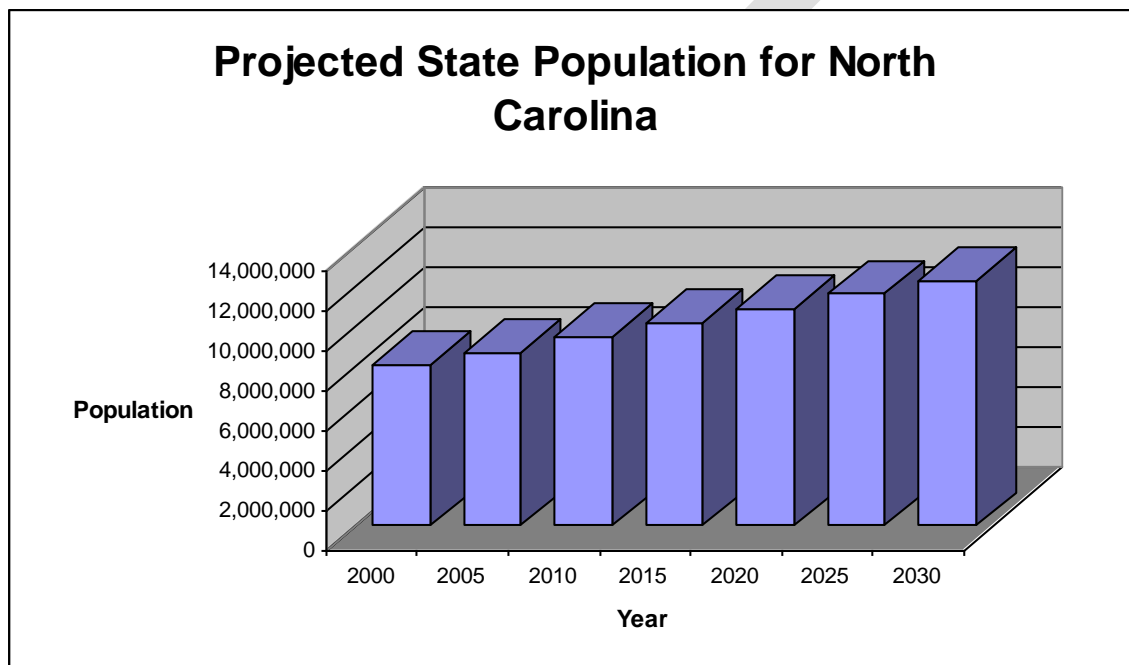
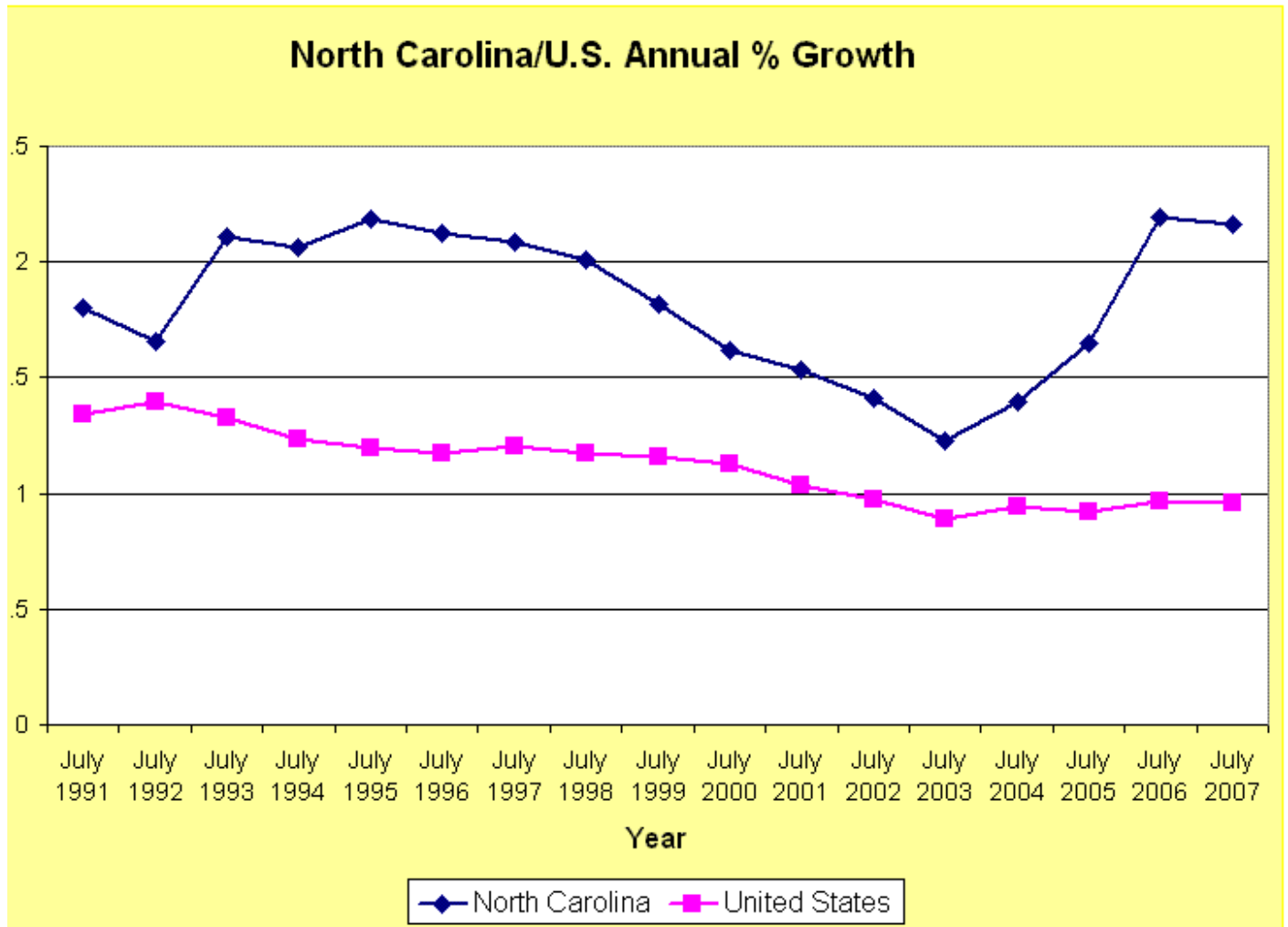


Figure 7: Projected Population Growth for North Carolina

From April 1, 2000 to July 1, 2007, North Carolina had a population increase of 12.6%. This increase gives North Carolina the 6<sup>th</sup> largest state increase in actual population and the 9<sup>th</sup> largest state increase in percent of population. During this time period, the average population increase for all states was 6.2%. The highest was 28.4% (Nevada) and the lowest was -3.9% (Louisiana.)

From July 1990 to July 2007, North Carolina had an average annual population increase of 1.83%. The average annual increase in the U.S. population was 1.12% over that same period. Appendix A contains a table showing the year-by-year differences in population growth between North Carolina and the United States. Figure 8 presents the different growth rates in a line graph.

Figure 8: Comparison of Population Growth Rates Between North Carolina and the United States



Included in Appendix B are population density maps for North Carolina for 1990 and 2000, as well as projected population density for 2010. Additionally, maps showing the percent population growth by county between 1990 and 2000, and the projected population growth between 2000 and 2010 are included in Appendix B.

With population growth comes additional issues that impact air quality such as growth in vehicle miles traveled (VMT) and growth in electricity demand. How the State and local communities handle this growth could have significant impacts on future air quality in North Carolina. Figure 9 below shows the expected VMT growth for North Carolina. It is expected that VMT will grow about two percent per year between 2000 and 2030. Mobile emissions represent a significant portion of the emissions of nitrogen oxides, the limiting precursor for ozone formation in North Carolina.

Appendix C contains the commuting ratio data derived from the Census, which helps predict the driving patterns and future VMT for particular counties. The data, provided by the North Carolina State Data Center, are used to help define vehicle inspection and maintenance program penetration by county, since the program is only operational in 48 counties of the state.

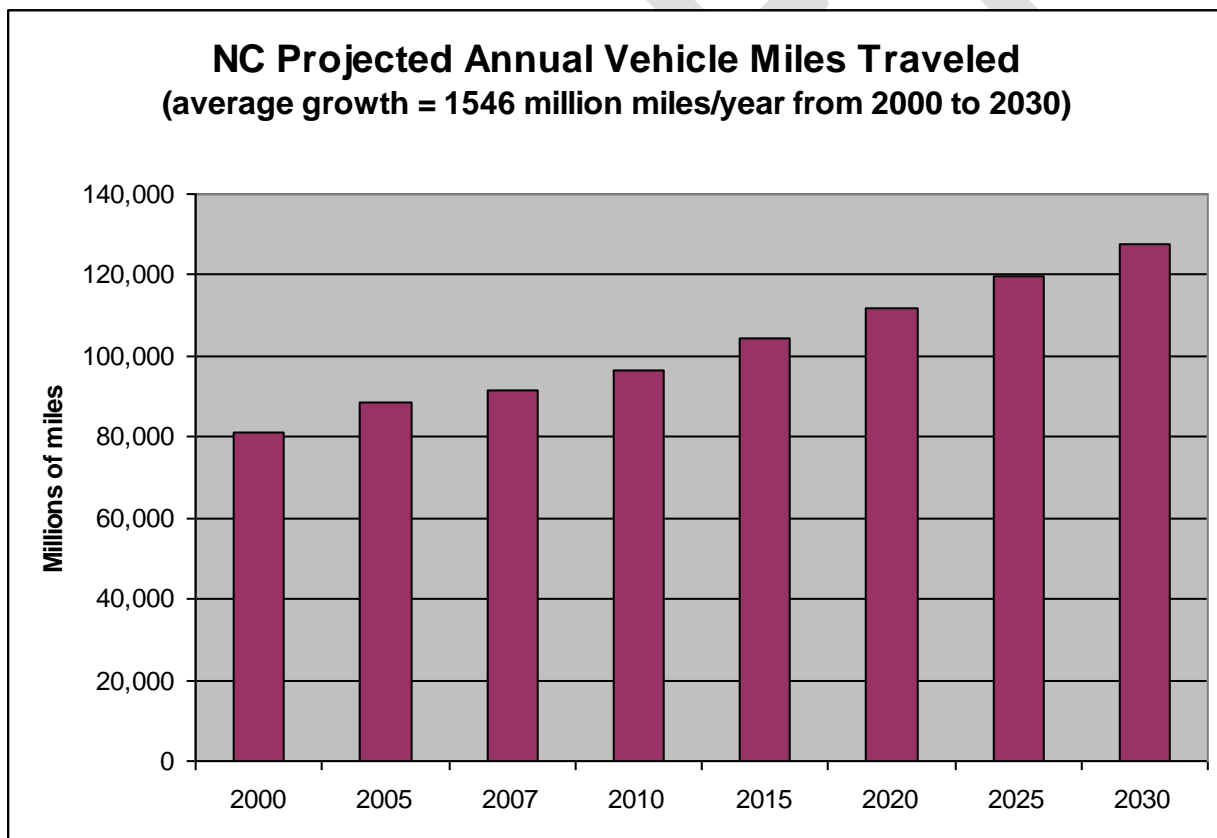


Figure 9: Expected Growth in Vehicle Miles Traveled in North Carolina

In the next ten years, the emissions reductions from a number of control programs including Clean Smokestacks Act, Clean Air Interstate Rule, cleaner engine and fuel standards for a variety of fleets, both on-road and non-road, will help offset the growth in population and activity in North Carolina. Appendix D shows the emission density changes between 2002, 2009 and 2018 for oxides of nitrogen and sulfur dioxide emissions due to the control programs listed above. Finally, Appendix E presents the modeling results for 2009 and 2018 for ozone and PM<sub>2.5</sub>, which shows significant improvement compared to the current day values presented in Chapter 1. In order to fully realize the benefits of the control programs, however, North Carolina needs to deal effectively with growth. This issue is a significant challenge to the air quality planning process.

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## **Chapter 7. Stakeholder Involvement in the AQMP**

There will be several levels of stakeholder involvement in the AQMP. For example, in the development of the technical products, technical staff from the regulated community interested in the detailed modeling will participate. The transportation partners will participate in discussions of assumptions for the mobile emissions modeling, as well as any transportation strategy discussions. The environmental groups and the general public will participate in annual updates. The local elected officials will participate in the annual or more frequent updates and in the control measure design discussions. The following list is a starting point for identifying all of the stakeholders in the process:

Other North Carolina State Agencies – Department of Transportation, Department of Commerce, Department of Agriculture, Department of Administration, Department of Public Instruction, Department of Health and Human Services

Other State Air Agencies – Representatives from the States participating in VISTAS and ASIP (Alabama, Florida, Georgia, Kentucky, Mississippi, South Carolina, Tennessee, Virginia, West Virginia)

Other Agencies within DENR – Division of Forest Resources, Division of Water Quality, Division of Pollution Prevention and Environmental Assistance

Federal Agencies – EPA, Federal Highway Administration, Federal Transit Administration, National Park Service, USDA Forest Service, US Fish and Wildlife Service, DOE, Fort Bragg, Camp Lejeune, Seymour-Johnson

Local Agencies – Local Air Programs, Metropolitan Planning Organizations, Rural Planning Organizations, Councils of Government, Elected Officials

Regulated Community

Environmental Groups

The DAQ will develop a list serve for the project so that all stakeholders can be informed of meetings and can choose whether or not to participate in particular meetings or other events.

In addition, there are a number of local stakeholder groups, some growing out of the Early Action Compact process, and another out of the Sustainable Environment for Quality of Life project in the Metrolina area. The DAQ will continue to interact with and engage these groups in addressing air quality issues. Additionally, the DAQ will help form and foster additional local stakeholder groups, where appropriate. This interaction with local entities will become more important in addressing the new ozone standard, as most of the state level measures have already been implemented. To meet the new ozone standard, many communities will need to adopt and implement a number of local control measures. The DAQ will assist the local stakeholder groups as they consider appropriate and effective control measures.

## **Chapter 8. Process for Implementing Air Quality Management**

There are a number of steps and many parties involved in various aspects at different points in time in the rulemaking process in North Carolina. Several key parties are described below.

The Environmental Management Commission (EMC) adopts most regulations dealing with air quality. The Environmental Management Commission is a 19-member Commission appointed by the Governor, the Senate Pro Tempore and the Speaker of the House. The Commission is responsible for adopting rules for the protection, preservation and enhancement of the State's air and water resources. Commission members are chosen to represent various interests, including the medical profession, agriculture, engineering, fish and wildlife, groundwater, air and water pollution control, municipal or county government, and the public at large. The Commission oversees and adopts rules for several divisions of the Department of Environment and Natural Resources, including the Divisions of Air Quality, Land Resources, Water Quality, and Water Resources.

The DAQ provides staff recommendations to the Air Quality Committee (AQC) of the EMC for new rules and rule updates. In addition, the DAQ takes direction from the AQC and the EMC as to new rule initiatives the members want the DAQ to undertake. The actual rulemaking process can be lengthy, due to the Administrative Procedures Act, which must be followed. This legislation instructs the regulatory agencies as to the official process for introducing a new rule through the public hearing and adoption phase. A new or revised rule can take up to 2 years from initial concept stage through final adoption and legislative review.

The actual steps in the rulemaking process are numerous and can be lengthy. In general the process proceeds as follows. A concept for a rule is developed and presented to the Air Quality Committee for approval for DAQ to move forward with drafting a rule. A draft rule is then developed and distributed internally for review by the various DAQ workgroups, staff, and management. In addition a state and local fiscal note and economic assessment are developed. The draft rule is posted on the DAQ website and sent to the rulemaking list. Stakeholder meetings are conducted where appropriate. At a subsequent meeting of the AQC, the draft rule and associated economic assessment are presented for approval to proceed to the full Environmental Management Commission (EMC) with a request to proceed to public hearing. The draft rule, fiscal notes, economic assessment and other paperwork are submitted to the DENR Rulemaking Coordinator who distributes the package to the Office of State Budget and Management (OSBM) and DENR fiscal analyst for review and approval. At this point in the process the DAQ also submits the draft rule package including the fiscal notes and economic assessment to the League of Municipalities, the Association of County Commissioners, and Fiscal Research Division of the legislature. The package must also be sent to the Governor's Office at least 30 days prior to publication in the *North Carolina Register* (NCR) if the fiscal note concludes that local governments' expenditures or revenues will be impacted. In addition the package must be sent to the Department of Transportation (DOT) at least 30 days prior to publication in the NCR if adoption of the rule would result in increased costs to DOT. Note that rules involving fees must also be submitted for review to the Governmental Operations Committee of the legislature. Typically the draft rule and request to proceed to hearing are presented to the full EMC and voted upon at a meeting that occurs at least 30 days after

presentation of the concept to the AQC. The AQC must take a vote in order for the draft rules to proceed to the EMC with a request to take the rules to public hearing. This vote typically occurs at the AQC meeting immediately preceding the EMC meeting. The EMC meets regularly every other month beginning in January on the second Thursday of the month and the AQC and other subcommittees meet on the Wednesday prior to the EMC meetings.

Once approval to proceed to hearing is obtained, members of the EMC are appointed by the Chair of the EMC as hearing officers, arrangements are made for a hearing, and a hearing announcement is filed for publication in the NCR. A public notice is also published in several newspapers across the state. DAQ distributes the public notice package to its regional offices, EPA Region 4, local programs, the rulemaking mailing list, and posts it on the DAQ webpage. No sooner than 15 days after publication in the NCR, the DAQ can conduct the hearing.

Following the hearing and close of the 60 day comment period, the DAQ staff prepare responses to the comments received, make any necessary adjustments to the draft rule, review the record with the DAQ Director and hearing officers, and schedule the hearing officers' presentation for a subsequent EMC meeting. At the EMC meeting the hearing officers present a summary of the record and their recommendations and the EMC votes on whether to approve the rules.

Once the rules are adopted by the EMC, the DAQ files the rules and associated forms with the DENR Rulemaking Coordinator who files them for review by the Rules Review Commission at its next meeting, which is typically the following month. Once the RRC approves the rule, it becomes effective the first day of the following month. If the RRC receives ten letters of objection requesting review by the legislature by no later than 5:00 p.m. the day following the day the RRC adopts the rule, the rule is sent to the legislature for review. Such rules sent to the legislature for review become effective on the earlier of the thirty-first legislative day or the day of adjournment of the next regular session of the General Assembly that begins at least 25 days after the date the Commission approved the rule if a bill specifically disapproving the rule is not introduced before the thirty-first legislative day.

A worksheet for rule adoption is included as Appendix F. This document describes the various steps of the rule adoption process in North Carolina.

The administrative review is conducted by the Rules Review Commission (RRC). The RRC consists of ten members appointed by the General Assembly, five upon the recommendation of the President Pro Tempore of the Senate, and five upon the recommendation of the Speaker of the House of Representatives. The RRC reviews all State rules adopted by agencies such as the EMC to ensure:

- 1) the rule is within the authority delegated to the agency by the General Assembly;
- 2) the rule is clear and unambiguous;
- 3) the rule is reasonably necessary to implement or interpret an enactment of the General Assembly, or of Congress, or a regulation of a federal agency considering the cumulative effect of all rules adopted by the agency related to the specific purpose for which the rule is proposed; and
- 4) the rule was adopted in accordance with the Administrative Procedures Act.

In addition to review by the RRC, rules are potentially subject to another level of review. The Joint Legislative Administrative Procedures Oversight Committee of the General Assembly is the body that receives approved rules about which the RRC receives ten or more letters of objection. The committee consists of sixteen members, eight senators and eight representatives. Their powers and duties consist of review of the state rulemaking process; review of rules objected to by RRC to determine if statutory changes are needed; review of state regulatory programs to determine if the programs overlap, have conflicting goals, or could be simplified and still achieve the purpose of the regulation; review of existing rules to determine if the rules are necessary or if the rules can be streamlined; review of other concerns regarding administrative law; reporting to the General Assembly periodically; receiving reports from the RRC; and preparing a notebook containing approved rules and making it available to members of the General Assembly. The Committee does not approve or disapprove rules, however the Committee may recommend a bill to disapprove a RRC approved rule. Any committee member has the authority to introduce a bill to disapprove a rule.

Several counties in North Carolina operate their own local air quality programs. In these areas, the local program is responsible for enforcing state or federal air quality regulations. Local Programs in North Carolina include the:

Forsyth County Environmental Affairs Department  
Mecklenburg County Air Quality  
Western North Carolina Regional Air Quality Agency

These local programs each have their own local environmental boards. After a rule is adopted by the local program's board, then it is submitted to the DAQ for review and submittal to the EPA.

It should be noted that the above discussion covers only the regulatory process. DAQ also relies on other implementation processes, such as education and outreach, voluntary initiatives, permitting, and enforcement and compliance to fully administer the air quality program in North Carolina.

## **Chapter 9. Other Planning Efforts Impacting the AQMP**

There are a number of other planning efforts that can impact the NCDAQ's effort in implementing the AQMP. These efforts can include planning efforts from transportation planners, legislative actions on climate change, and watershed planners.

### **Transportation Planners**

Across the State there are numerous Metropolitan Planning Organizations (MPOs) that work with the North Carolina Department of Transportation (NCDOT) to develop long range transportation plans (LRTPs) that go out at least 25 years into the future. The LRTPs analyzes a set number of years within the planning period, usually in ten-year increments, and they must be updated at least every four years. Additionally, the NCDOT develops the Statewide Transportation Improvement Plan, which is currently updated every two years and is developed for a six-year period for which funding is available.

Issues can occur in obtaining the on-road mobile source relevant data from transportation partners in a timely manner to meet the air quality modeling needs. Not all of the MPOs are on the same schedule for their planning process and the years that are analyzed may not be the same for all planning organizations. This makes it difficult to get the actual years that will be needed for both the base year modeling, as well as the various future years modeling that will be needed.

Additionally, it would be a benefit to the air quality modeling to obtain the transportation networks from the MPOs so that spatial surrogates for air quality modeling could be developed for the base year and the future years. However, currently there are no tools available that can easily take the raw data from the various travel demand models and translate it to the appropriate spatial surrogate. An added complication is that the various travel demand models do not output data in the same format, so any tools developed would have to be able to handle outputs from the current travel models and be adaptable enough to deal with outputs from travel models that will be developed in the future.

### **Legislative Actions on Climate Change**

Being a progressive State, the North Carolina General Assembly has created a legislative commission to look into Global Climate Change and consider economic opportunities for action to reduce the State's greenhouse gas (GHG) emissions. As a first step, the North Carolina General Assembly passed into law in 2007 a requirement for the use of renewable energy. The Commission is currently reviewing recommendations from the North Carolina Climate Action Plan Advisory Group as to other measures from various source sectors that will reduce the State's GHG emissions.

Issues can occur in determining how industry will respond to the legislative actions. For instance, the renewable energy bill requires a certain percentage of the energy demand to come from renewable energy sources including solar, wind, biomass and animal waste. It is difficult to develop future year emissions inventories without knowing where the renewable energy source will be located and if there will be emissions associated with it. If most of the energy is from burning biomass or animal waste, what will be the air quality impact from these sources?

Additionally, some of the measures being considered by the Commission may result in adaptation measures as well as emission reduction measures. It is difficult to plan without knowing what the Commission may present to the General Assembly to consider for legislative action.

#### Watershed Planners

It is well known that nitrogen deposition can cause problems in watersheds, resulting in increased acidity, which can harm both plant and animal life. Some of the nitrogen deposited into watersheds comes from air emissions of nitrogen oxides and ammonia. Only recently have efforts been made to try and couple air quality modeling results with watershed models.

Issues occur when the watershed modelers need data at a different grid resolution than what the air quality models were run. Additionally, the base year modeling needed for the two modelers may not be consistent. Trying to address the needs of multiple users of the data may lead to many additional years needing to be modeled as well as multiple grid resolutions. This can cause a strain on the air quality modeling resources.

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## **Chapter 10. Regional and Neighboring State Issues**

Many of our neighboring states have similar issues as North Carolina, primarily ozone, PM2.5, visibility, mercury and climate change issues. We have learned through the regional haze, ozone and PM2.5 planning process for the SIP's that have just been submitted in the last year, that regional planning and cooperation is essential. The technical work performed through VISTAS and Association for Southeastern Integrated Planning (ASIP) represented the best collaborative effort to date. The benefit of all the States focusing on a single technical analysis versus individual State efforts resulted in a significant cost savings and a superior technical product. Such efforts will continue to be needed as the States work on designing strategies for the new ozone standard, tackle climate change, and prepare for the next round of regional haze SIP's. States and EPA need to support such collaborative endeavors, as it is in the best interest of the public's health and welfare, and is a better use of public monies. The DAQ intends to work with the neighboring States as the technical work is performed for the AQMP.

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**Appendix A: Population Growth Information for North Carolina**

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## State Population Growth: April 1, 2000 to July 1, 2007

State or Nation	7/1/2007 Population	Size Rank	4/1/2000 Population	7.25 Yr. Population Growth			
				Amount		Percent	
				Value	Rank	Value	Rank
<b>United States</b>	301,621,157	<b>n/a</b>	281,424,602	20,196,555	<b>n/a</b>	7.177	<b>n/a</b>
<b>California</b>	36,553,215	<b>1</b>	33,871,653	2,681,562	<b>2</b>	7.917	<b>18</b>
<b>Texas</b>	23,904,380	<b>2</b>	20,851,790	3,052,590	<b>1</b>	14.63	<b>6</b>
<b>New York</b>	19,297,729	<b>3</b>	18,976,821	320,908	<b>17</b>	1.691	<b>42</b>
<b>Florida</b>	18,251,243	<b>4</b>	15,982,824	2,268,419	<b>3</b>	14.19	<b>7</b>
<b>Illinois</b>	12,852,548	<b>5</b>	12,419,647	432,901	<b>12</b>	3.486	<b>34</b>
<b>Pennsylvania</b>	12,432,792	<b>6</b>	12,281,054	151,738	<b>28</b>	1.236	<b>45</b>
<b>Ohio</b>	11,466,917	<b>7</b>	11,353,145	113,772	<b>31</b>	1.002	<b>46</b>
<b>Michigan</b>	10,071,822	<b>8</b>	9,938,480	133,342	<b>30</b>	1.342	<b>44</b>
<b>Georgia</b>	9,544,750	<b>9</b>	8,186,816	1,357,934	<b>4</b>	16.58	<b>4</b>
<b>North Carolina</b>	9,061,032	<b>10</b>	8,046,491	1,014,541	<b>6</b>	12.60	<b>9</b>
<b>New Jersey</b>	8,685,920	<b>11</b>	8,414,347	271,573	<b>20</b>	3.227	<b>37</b>
<b>Virginia</b>	7,712,091	<b>12</b>	7,079,030	633,061	<b>7</b>	8.943	<b>15</b>
<b>Washington</b>	6,468,424	<b>13</b>	5,894,140	574,284	<b>8</b>	9.743	<b>12</b>
<b>Massachusetts</b>	6,449,755	<b>14</b>	6,349,105	100,650	<b>32</b>	1.585	<b>43</b>
<b>Indiana</b>	6,345,289	<b>15</b>	6,080,517	264,772	<b>21</b>	4.354	<b>31</b>
<b>Arizona</b>	6,338,755	<b>16</b>	5,130,632	1,208,123	<b>5</b>	23.54	<b>2</b>
<b>Tennessee</b>	6,156,719	<b>17</b>	5,689,262	467,457	<b>11</b>	8.216	<b>17</b>
<b>Missouri</b>	5,878,415	<b>18</b>	5,596,683	281,732	<b>18</b>	5.034	<b>27</b>
<b>Maryland</b>	5,618,344	<b>19</b>	5,296,506	321,838	<b>16</b>	6.076	<b>21</b>
<b>Wisconsin</b>	5,601,640	<b>20</b>	5,363,715	237,925	<b>22</b>	4.436	<b>30</b>
<b>Minnesota</b>	5,197,621	<b>21</b>	4,919,492	278,129	<b>19</b>	5.654	<b>25</b>
<b>Colorado</b>	4,861,515	<b>22</b>	4,302,015	559,500	<b>10</b>	13.00	<b>8</b>
<b>Alabama</b>	4,627,851	<b>23</b>	4,447,351	180,500	<b>25</b>	4.059	<b>32</b>
<b>South Carolina</b>	4,407,709	<b>24</b>	4,011,816	395,893	<b>14</b>	9.868	<b>11</b>
<b>Louisiana</b>	4,293,204	<b>25</b>	4,468,958	-175,754	<b>50</b>	-	<b>50</b>
<b>Kentucky</b>	4,241,474	<b>26</b>	4,042,285	199,189	<b>24</b>	3.933	<b>28</b>
<b>Oregon</b>	3,747,455	<b>27</b>	3,421,436	326,019	<b>15</b>	4.928	<b>13</b>
<b>Oklahoma</b>	3,617,316	<b>28</b>	3,450,654	166,662	<b>26</b>	9.529	<b>29</b>
<b>Connecticut</b>	3,502,309	<b>29</b>	3,405,602	96,707	<b>33</b>	4.830	<b>38</b>
<b>Iowa</b>	2,988,046	<b>30</b>	2,926,382	61,664	<b>40</b>	2.840	<b>40</b>
<b>Mississippi</b>	2,918,785	<b>31</b>	2,844,656	74,129	<b>37</b>	2.107	<b>40</b>
<b>Arkansas</b>	2,834,797	<b>32</b>	2,673,398	161,399	<b>27</b>	2.606	<b>39</b>
						6.037	<b>22</b>

<b>Kansas</b>	2,775,997	<b>33</b>	2,688,824	87,173	<b>34</b>	3.242	<b>36</b>
<b>Utah</b>	2,645,330	<b>34</b>	2,233,198	412,132	<b>13</b>	18.455	<b>3</b>
<b>Nevada</b>	2,565,382	<b>35</b>	1,998,257	567,125	<b>9</b>	28.381	<b>1</b>
<b>New Mexico</b>	1,969,915	<b>36</b>	1,819,046	150,869	<b>29</b>	8.294	<b>16</b>
<b>West Virginia</b>	1,812,035	<b>37</b>	1,808,350	3,685	<b>48</b>	0.204	<b>48</b>
<b>Nebraska</b>	1,774,571	<b>38</b>	1,711,265	63,306	<b>39</b>	3.699	<b>33</b>
<b>Idaho</b>	1,499,402	<b>39</b>	1,293,956	205,446	<b>23</b>	15.877	<b>5</b>
<b>Maine</b>	1,317,207	<b>40</b>	1,274,923	42,284	<b>43</b>	3.317	<b>35</b>
<b>New Hampshire</b>	1,315,828	<b>41</b>	1,235,786	80,042	<b>36</b>	6.477	<b>19</b>
<b>Hawaii</b>	1,283,388	<b>42</b>	1,211,537	71,851	<b>38</b>	5.931	<b>23</b>
<b>Rhode Island</b>	1,057,832	<b>43</b>	1,048,319	9,513	<b>47</b>	0.907	<b>47</b>
<b>Montana</b>	957,861	<b>44</b>	902,195	55,666	<b>42</b>	6.170	<b>20</b>
<b>Delaware</b>	864,764	<b>45</b>	783,600	81,164	<b>35</b>	10.358	<b>10</b>
<b>South Dakota</b>	796,214	<b>46</b>	754,844	41,370	<b>44</b>	5.481	<b>26</b>
<b>Alaska</b>	683,478	<b>47</b>	626,931	56,547	<b>41</b>	9.020	<b>14</b>
<b>North Dakota</b>	639,715	<b>48</b>	642,200	-2,485	<b>49</b>	0.387	<b>49</b>
<b>Vermont</b>	621,254	<b>49</b>	608,827	12,427	<b>46</b>	2.041	<b>41</b>
<b>District of Columbia</b>	588,292	<b>n/a</b>	572,059	16,233	<b>n/a</b>	2.838	<b>n/a</b>
<b>Wyoming</b>	522,830	<b>50</b>	493,782	29,048	<b>45</b>	5.883	<b>24</b>

## Annual Population Growth --- North Carolina/United States

Date	North Carolina Population	Growth		United States Population	Growth		Difference NC-US
		Amount	Percent		Amount	Percent	
July 1990	6,662,523			249,622,814			
		120,301	1.8056		3,358,127	1.3453	0.4604
July 1991	6,782,824			252,980,941			
		112,604	1.6601		3,533,283	1.3967	0.2635
July 1992	6,895,428			256,514,224			
		145,593	2.1114		3,404,364	1.3272	0.7843
July 1993	7,041,021			259,918,588			
		144,992	2.0592		3,207,233	1.2339	0.8253
July 1994	7,186,013			263,125,821			
		157,168	2.1871		3,152,572	1.1981	0.9890
July 1995	7,343,181			266,278,393			
		156,095	2.1257		3,115,891	1.1702	0.9556
July 1996	7,499,276			269,394,284			
		156,248	2.0835		3,252,641	1.2074	0.8761
July 1997	7,655,524			272,646,925			
		153,527	2.0054		3,207,179	1.1763	0.8291
July 1998	7,809,051			275,854,104			
		142,100	1.8197		3,186,064	1.1550	0.6647
July 1999	7,951,151			279,040,168			
		128,626	1.6177		3,154,140	1.1304	0.4873
July 2000	8,079,777			282,194,308			
		123,788	1.5321		2,917,722	1.0339	0.4981
July 2001	8,203,565			285,112,030			
		115,728	1.4107		2,775,991	0.9736	0.4371
July 2002	8,319,293			287,888,021			
		101,856	1.2243		2,559,623	0.8891	0.3352
July 2003	8,421,149			290,447,644			
		117,229	1.3921		2,743,867	0.9447	0.4474
July 2004	8,538,378			293,191,511			
		140,711	1.6480		2,704,386	0.9224	0.7256
July 2005	8,679,089			295,895,897			
		190,353	2.1932		2,858,922	0.9662	1.2270
July 2006	8,869,442			298,754,819			
		191,590	2.1601		2,866,338	0.9594	1.2007
July 2007	9,061,032			301,621,157			

## Annual County Population Totals 2000-2009

<b>County</b>	<b>Estimated</b>							<b>Projected</b>		
	<b>July 2000</b>	<b>July 2001</b>	<b>July 2002</b>	<b>July 2003</b>	<b>July 2004</b>	<b>July 2005</b>	<b>July 2006</b>	<b>July 2007</b>	<b>July 2008</b>	<b>July 2009</b>
ALAMANCE	131,405	133,736	135,874	136,252	137,031	138,364	139,786	141,466	143,122	144,715
ALEXANDER	33,694	33,974	34,262	34,535	35,146	35,818	36,296	36,778	37,173	37,540
ALLEGHANY	10,703	10,776	10,852	10,798	10,868	10,877	11,012	11,120	11,192	11,268
ANSON	25,314	25,276	25,262	25,180	25,628	25,672	25,371	25,107	24,894	24,753
ASHE	24,477	24,804	24,754	25,072	25,108	25,420	25,774	26,120	26,427	26,650
AVERY	17,335	17,663	17,835	17,990	17,862	17,906	18,174	18,256	18,282	18,297
BEAUFORT	45,039	45,282	45,480	45,518	45,682	45,896	46,346	46,770	47,081	47,342
BERTIE	19,764	19,758	19,765	19,744	19,612	19,526	19,355	19,186	19,064	18,945
BLADEN	32,326	32,469	32,572	32,666	32,908	32,805	32,870	32,972	33,029	33,179
BRUNSWICK	73,874	76,676	79,227	81,817	85,060	89,481	94,964	100,107	104,485	108,178
BUNCOMBE	206,780	208,306	210,034	212,224	214,976	216,272	221,320	226,175	229,486	232,639
BURKE	89,225	89,172	89,094	88,744	88,744	88,267	88,663	89,280	89,508	89,806
CABARRUS	132,146	136,316	139,878	143,340	146,168	150,228	157,179	163,804	169,181	173,695
CALDWELL	77,813	78,092	78,372	78,208	78,434	78,640	79,298	79,940	80,387	80,793
CAMDEN	6,921	7,054	7,302	7,848	8,496	9,020	9,284	9,560	9,905	10,279
CARTERET	59,454	59,692	60,124	60,756	61,882	62,900	63,558	64,200	64,971	65,775
CASWELL	23,559	23,663	23,722	23,716	23,624	23,674	23,523	23,457	23,480	23,525
CATAWBA	142,466	145,378	146,299	146,608	147,687	148,797	151,128	153,455	155,315	157,080
CHATHAM	49,697	51,062	52,520	53,742	54,868	56,123	57,707	59,243	60,595	61,845
CHEROKEE	24,369	24,609	25,010	25,250	25,769	26,113	26,816	27,316	27,771	28,223
CHOWAN	14,157	14,158	14,316	14,294	14,397	14,411	14,664	14,921	15,041	15,142
CLAY	8,817	8,971	9,177	9,375	9,636	9,865	10,144	10,356	10,576	10,790
CLEVELAND	96,428	96,731	97,047	97,376	97,216	96,818	96,714	96,744	96,740	96,854
COLUMBUS	54,760	54,731	54,746	54,473	54,404	54,248	54,656	55,087	55,277	55,455
CRAVEN	91,665	92,706	92,494	93,402	93,192	94,208	95,558	96,872	97,833	98,661
CUMBERLAND	302,921	302,545	305,767	308,217	309,862	304,382	306,545	308,255	308,984	310,541
CURRITUCK	18,301	18,810	19,658	20,598	21,894	22,976	23,518	24,171	24,940	25,777
DARE	30,211	31,134	32,216	33,310	34,223	34,576	34,674	34,945	35,300	35,860

DAVIDSON	147,674	148,999	150,606	151,867	152,978	154,180	155,348	156,591	157,932	159,332
DAVIE	35,112	36,157	36,712	37,190	37,868	38,814	39,836	40,831	41,761	42,592
DUPLIN	49,259	49,945	50,562	50,791	51,436	51,788	52,710	53,640	54,352	55,103
DURHAM	224,586	229,340	232,935	235,388	238,294	241,681	246,824	251,667	255,670	259,419
EDGEcombe	55,525	55,032	54,773	53,844	53,637	52,890	52,644	52,382	51,922	51,563
FORSYTH	307,105	310,752	314,130	317,150	320,132	325,724	331,859	337,726	343,085	347,692
FRANKLIN	47,596	48,826	50,398	51,656	52,778	54,005	55,315	56,677	57,866	59,028
GASTON	190,573	191,217	191,428	191,183	191,600	193,771	197,232	200,415	202,851	204,614
GATES	10,529	10,562	10,695	10,790	10,910	11,188	11,602	11,910	12,194	12,408
GRAHAM	8,010	8,064	8,044	8,052	8,069	8,048	8,109	8,165	8,194	8,228
GRANVILLE	48,863	49,954	51,478	52,258	52,667	53,196	53,840	54,606	55,332	56,016
GREENE	18,979	19,059	19,504	19,854	19,969	20,186	20,833	20,978	21,164	21,378
GUILFORD	422,065	425,380	427,841	430,744	433,808	440,914	449,078	456,757	463,933	470,364
HALIFAX	57,314	57,197	56,986	56,725	56,400	55,959	55,606	55,273	54,956	54,707
HARNETT	91,581	93,856	96,056	97,619	99,447	101,486	103,714	105,892	107,961	110,051
HAYWOOD	54,195	54,706	55,180	55,838	56,296	56,249	56,662	57,101	57,376	57,759
HENDERSON	89,680	91,416	92,856	94,538	96,158	97,751	100,107	102,424	104,399	106,293
HERTFORD	22,905	23,180	23,871	23,736	23,678	23,781	23,878	24,004	24,066	24,113
HOKE	33,919	34,842	35,955	36,922	38,518	40,429	42,202	43,866	45,544	47,157
HYDE	5,844	5,736	5,833	5,695	5,590	5,562	5,511	5,489	5,457	5,426
IREDELL	123,765	127,949	130,488	133,229	135,831	139,419	145,234	150,787	155,194	158,965
JACKSON	33,232	33,644	34,122	34,950	35,528	35,650	36,312	36,920	37,331	37,745
JOHNSTON	123,095	127,719	132,491	136,407	141,422	146,222	151,589	156,887	161,889	166,843
JONES	10,379	10,286	10,224	10,176	10,219	10,224	10,318	10,409	10,461	10,512
LEE	49,430	50,370	51,226	52,014	52,992	54,152	55,282	56,387	57,472	58,488
LENOIR	59,583	59,286	59,080	58,780	58,367	58,210	58,172	58,189	58,161	58,083
LINCOLN	64,137	65,458	66,340	67,349	68,054	69,438	71,302	73,107	74,677	76,008
MCDOWELL	42,345	42,786	42,840	43,032	43,017	43,119	43,632	44,167	44,525	44,853
MACON	29,944	30,448	30,950	31,330	31,846	32,373	33,076	33,797	34,427	35,028
MADISON	19,660	19,718	19,815	19,972	20,186	20,259	20,454	20,673	20,846	21,018
MARTIN	25,502	25,281	25,092	24,882	24,655	24,458	24,396	24,338	24,231	24,112
MECKLENBURG	699,742	715,905	732,253	749,804	767,609	795,362	826,893	857,379	885,061	909,258
MITCHELL	15,728	15,866	15,945	15,910	15,984	15,851	15,906	15,942	15,925	15,949

MONTGOMERY	26,885	27,044	27,155	27,323	27,080	27,342	27,506	27,697	27,900	28,069
MOORE	75,046	75,962	77,284	78,123	79,314	80,628	82,292	83,933	85,416	86,828
NASH	87,570	88,192	88,874	89,492	90,494	91,393	92,220	93,088	93,969	94,871
NEW HANOVER	161,032	163,711	166,054	168,977	174,217	179,944	184,120	188,206	192,925	197,578
NORTHAMPTON	22,086	22,064	21,758	21,722	21,464	21,488	21,524	21,554	21,567	21,544
ONslow	149,462	149,698	152,205	156,646	159,674	157,760	161,212	163,688	164,791	166,175
ORANGE	116,134	118,376	119,376	120,168	120,644	122,052	123,766	125,046	126,576	128,049
PAMLICO	12,919	12,824	12,975	12,986	13,004	13,068	13,097	13,131	13,175	13,236
PASQUOTANK	34,938	34,955	35,855	36,352	37,536	38,760	39,956	41,069	42,057	42,937
PENDER	41,292	42,038	43,178	43,706	45,060	46,599	48,724	50,757	52,456	53,981
PERQUIMANS	11,411	11,564	11,661	11,706	11,788	12,148	12,442	12,757	13,045	13,247
PERSON	35,727	36,078	36,730	36,936	36,858	37,125	37,448	37,776	38,114	38,390
PITT	134,019	135,046	137,472	138,726	141,080	143,126	146,403	149,397	151,959	154,430
POLK	18,418	18,761	18,832	18,846	18,874	18,950	19,080	19,247	19,402	19,562
RANDOLPH	130,919	132,483	133,488	134,887	135,708	137,122	138,586	140,134	141,761	143,341
RICHMOND	46,575	46,598	46,595	46,410	46,329	46,586	46,700	46,824	46,970	47,032
ROBESON	123,483	124,266	124,779	125,422	126,304	127,644	129,048	130,474	131,821	133,120
ROCKINGHAM	91,965	91,948	92,423	92,362	91,795	91,737	91,830	91,977	92,084	92,095
ROWAN	130,684	131,958	132,862	133,080	132,798	133,157	134,540	135,931	137,053	138,024
RUTHERFORD	63,029	63,436	63,250	63,357	63,116	63,185	63,178	63,226	63,342	63,447
SAMPSON	60,362	61,058	61,679	62,128	62,552	63,403	64,057	64,764	65,641	66,508
SCOTLAND	35,939	35,759	35,658	35,520	36,716	36,761	36,994	37,246	37,382	37,533
STANLY	58,284	58,713	58,871	58,851	58,834	58,854	59,128	59,431	59,662	59,901
STOKES	44,812	45,153	45,350	45,637	45,960	46,156	46,335	46,560	46,841	47,201
SURRY	71,315	71,540	71,848	71,912	72,092	72,878	72,990	73,196	73,731	74,243
SWAIN	13,017	13,168	13,287	13,342	13,436	13,650	13,938	14,219	14,455	14,645
TRANSYLVANIA	29,348	29,336	29,420	29,452	29,652	29,846	30,360	30,815	31,133	31,414
TYRRELL	4,123	4,178	4,134	4,238	4,174	4,205	4,240	4,289	4,325	4,334
UNION	125,405	131,876	138,883	144,747	151,862	161,260	172,087	182,304	191,072	198,696
VANCE	43,130	43,757	44,082	43,750	43,683	43,478	43,920	44,367	44,543	44,702
WAKE	634,599	660,625	680,350	701,177	723,849	755,968	790,007	822,356	853,260	881,117
WARREN	20,030	19,968	19,944	19,994	19,943	20,088	19,969	19,894	19,888	19,920
WASHINGTON	13,698	13,572	13,580	13,456	13,419	13,414	13,360	13,314	13,281	13,243

WATAUGA	42,726	42,774	42,920	42,742	42,798	42,855	43,410	43,775	44,016	44,253
WAYNE	113,382	113,468	113,768	113,883	114,809	115,328	114,930	115,100	115,613	116,281
WILKES	65,771	66,270	66,693	66,886	66,846	66,682	66,925	67,201	67,344	67,519
WILSON	73,980	74,454	75,264	75,585	76,139	76,730	77,468	78,224	78,912	79,574
YADKIN	36,413	36,608	36,948	36,804	37,050	37,409	37,810	38,229	38,650	39,060
YANCEY	17,837	18,055	17,926	17,896	18,022	18,143	18,368	18,589	18,765	18,932

	Estimated							Projected		
NORTH	July 2000	July 2001	July 2002	July 2003	July 2004	July 2005	July 2006	July 2007	July 2008	July 2009
<b>CAROLINA</b>	8,079,242	8,199,814	8,313,779	8,415,955	8,531,293	8,672,544	8,860,341	9,040,824	9,201,151	9,348,744

### Metropolitan Statistical Area Population Estimates for July 1, 2006

MeSA		July_06	April_00	Growth	
	County	Estimate	EstBase	Number	...%...
<b>Asheville</b>		<b>398,543</b>	<b>369,172</b>	<b>29,371</b>	<b>8.0</b>
	BUNCOMBE	221,320	206,299	15,021	7.3
	HAYWOOD	56,662	54,034	2,628	4.9
	HENDERSON	100,107	89,204	10,903	12.2
	MADISON	20,454	19,635	819	4.2
<b>Burlington</b>		<b>139,786</b>	<b>130,794</b>	<b>8,992</b>	<b>6.9</b>
	ALAMANCE	139,786	130,794	8,992	6.9
<b>Charlotte-Gastonia-Concord</b>		<b>1,378,762</b>	<b>1,165,780</b>	<b>212,982</b>	<b>18.3</b>
	ANSON	25,371	25,275	96	0.4
	CABARRUS	157,179	131,030	26,149	20.0
	GASTON	197,232	190,310	6,922	3.6
	MECKLENBURG	826,893	695,427	131,466	18.9
	UNION	172,087	123,738	48,349	39.1
<b>Durham</b>		<b>465,745</b>	<b>423,800</b>	<b>41,945</b>	<b>9.9</b>
	CHATHAM	57,707	49,334	8,373	17.0
	DURHAM	246,824	223,306	23,518	10.5
	ORANGE	123,766	115,537	8,229	7.1
	PERSON	37,448	35,623	1,825	5.1
<b>Fayetteville</b>		<b>348,747</b>	<b>336,608</b>	<b>12,139</b>	<b>3.6</b>

	CUMBERLAND	306,545	302,962	3,583	1.2
	HOKE	42,202	33,646	8,556	25.4
<b>Goldsboro</b>		<b>114,930</b>	<b>113,329</b>	<b>1,601</b>	<b>1.4</b>
	WAYNE	114,930	113,329	1,601	1.4
<b>Greensboro-High Point</b>		<b>679,494</b>	<b>643,446</b>	<b>36,048</b>	<b>5.6</b>
	GUILFORD	449,078	421,048	28,030	6.7
	RANDOLPH	138,586	130,470	8,116	6.2
	ROCKINGHAM	91,830	91,928	-98	-0.1
<b>Greenville</b>		<b>167,236</b>	<b>152,693</b>	<b>14,543</b>	<b>9.5</b>
	GREENE	20,833	18,974	1,859	9.8
	PITT	146,403	133,719	12,684	9.5
<b>Hickory-Morganton-Lenoir</b>		<b>355,385</b>	<b>342,141</b>	<b>13,244</b>	<b>3.9</b>
	ALEXANDER	36,296	33,609	2,687	8.0
	BURKE	88,663	89,145	-482	-0.5
	CALDWELL	79,298	77,710	1,588	2.0
	CATAWBA	151,128	141,677	9,451	6.7
<b>Jacksonville</b>		<b>161,212</b>	<b>150,355</b>	<b>10,857</b>	<b>7.2</b>
	ONslow	161,212	150,355	10,857	7.2
<b>Raleigh-Cary</b>		<b>996,911</b>	<b>797,025</b>	<b>199,886</b>	<b>25.1</b>
	FRANKLIN	55,315	47,260	8,055	17.0
	JOHNSTON	151,589	121,900	29,689	24.4
	WAKE	790,007	627,865	162,142	25.8
<b>Rocky Mount</b>		<b>144,864</b>	<b>142,991</b>	<b>1,873</b>	<b>1.3</b>
	EDGEcombe	52,644	55,606	-2,962	-5.3
	NASH	92,220	87,385	4,835	5.5
<b>Va. Beach-Norfolk-Newport News</b>		<b>23,518</b>	<b>18,190</b>	<b>5,328</b>	<b>29.3</b>
	CURRITUCK	23,518	18,190	5,328	29.3
<b>Wilmington</b>		<b>327,808</b>	<b>274,550</b>	<b>53,258</b>	<b>19.4</b>
	BRUNSWICK	94,964	73,141	21,823	29.8
	NEW HANOVER	184,120	160,327	23,793	14.8
	PENDER	48,724	41,082	7,642	18.6
<b>Winston-Salem</b>		<b>455,840</b>	<b>421,934</b>	<b>33,906</b>	<b>8.0</b>
	DAVIE	39,836	34,835	5,001	14.4

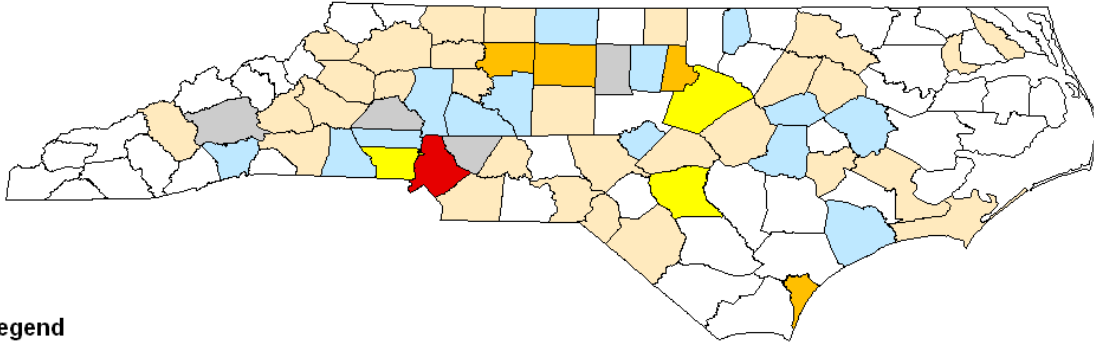
	FORSYTH	331,859	306,044	25,815	8.4
	STOKES	46,335	44,707	1,628	3.6
	YADKIN	37,810	36,348	1,462	4.0
	<b>Total MeSA</b>	<b>6,158,781</b>	<b>5,482,808</b>	<b>675,973</b>	<b>12.3</b>
	<b>Total MiSA</b>	<b>1,975,082</b>	<b>1,869,171</b>	<b>105,911</b>	<b>5.7</b>
	<b>NON MeSA-MiSA</b>	<b>726,478</b>	<b>694,834</b>	<b>31,644</b>	<b>4.6</b>
	<b>NORTH CAROLINA</b>	<b>8,860,341</b>	<b>8,046,813</b>	<b>813,528</b>	<b>10.1</b>

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**Appendix B: Population Density Maps for North Carolina**

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# 1990 Population Density



## Legend

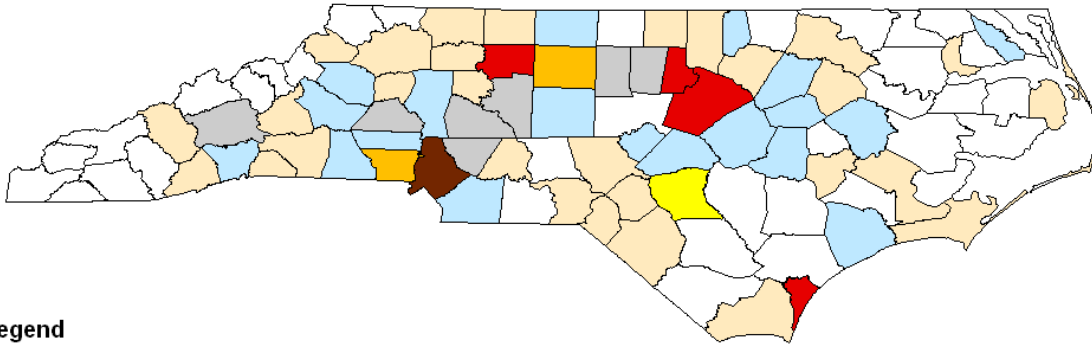
### 1990 Population Density

1990 Population / Area (SQ MILES)

	8.83003288 - 75.0000000
	75.0000001 - 150.0000000
	150.000001 - 250.0000000
	250.000001 - 375.0000000
	375.000001 - 525.0000000
	525.000001 - 700.0000000
	700.000001 - 1000.0000000
	1000.00001 - 2000.0000000
	2000.00001 - 5000.0000000

DR

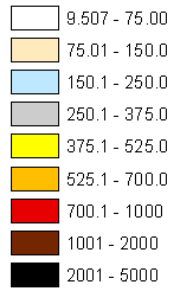
## 2000 Population Density



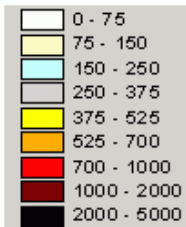
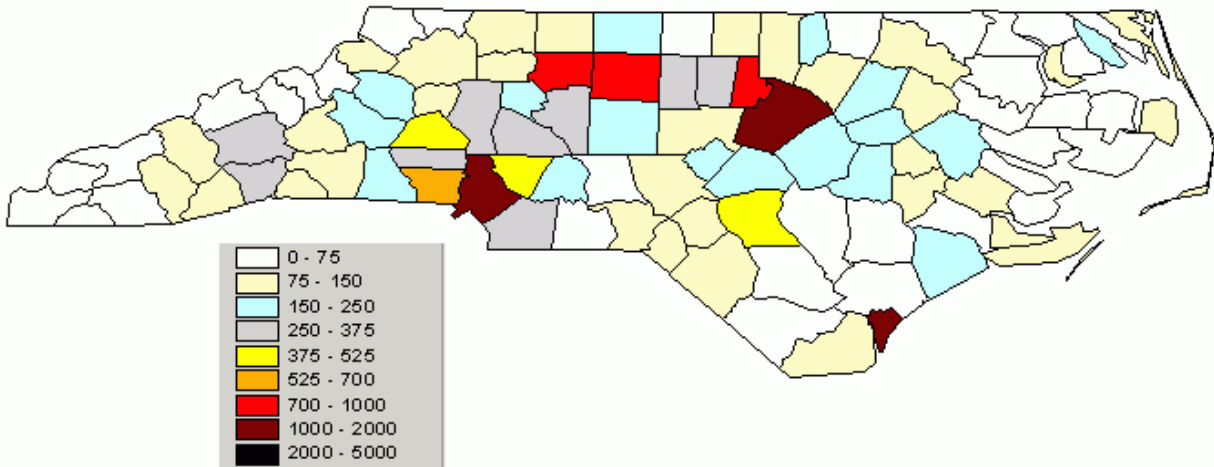
### Legend

#### 2000 Population Density

2000 Population / Area (SQ MILES)

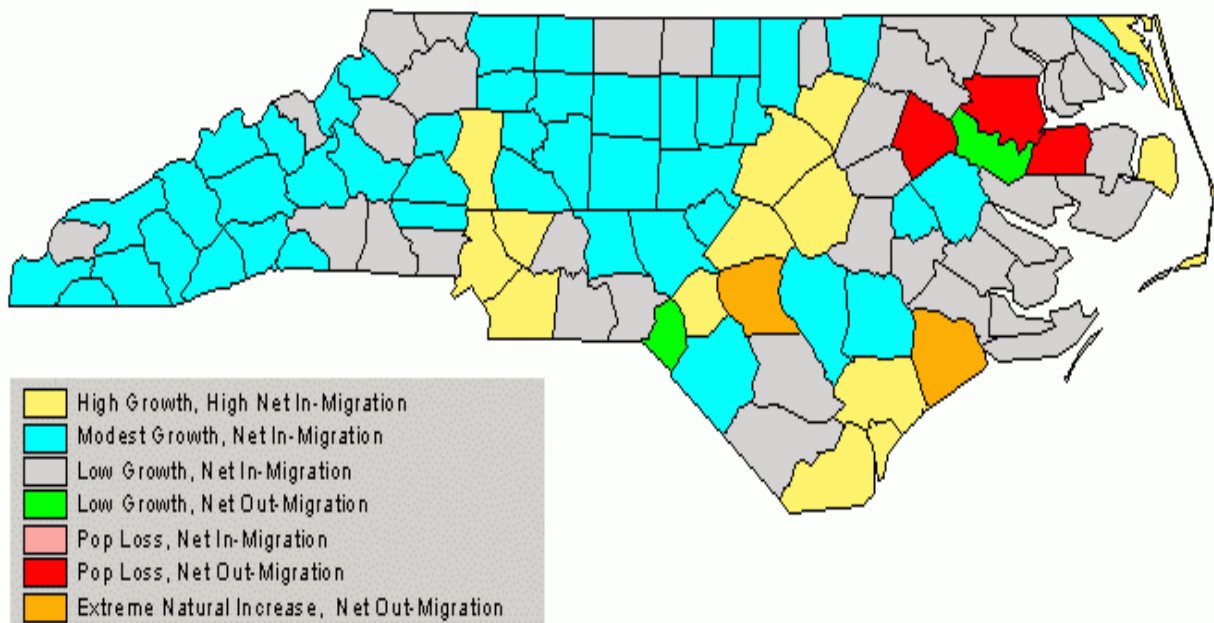


## Population Density, 2010



Density is defined as persons per square mile of land area.

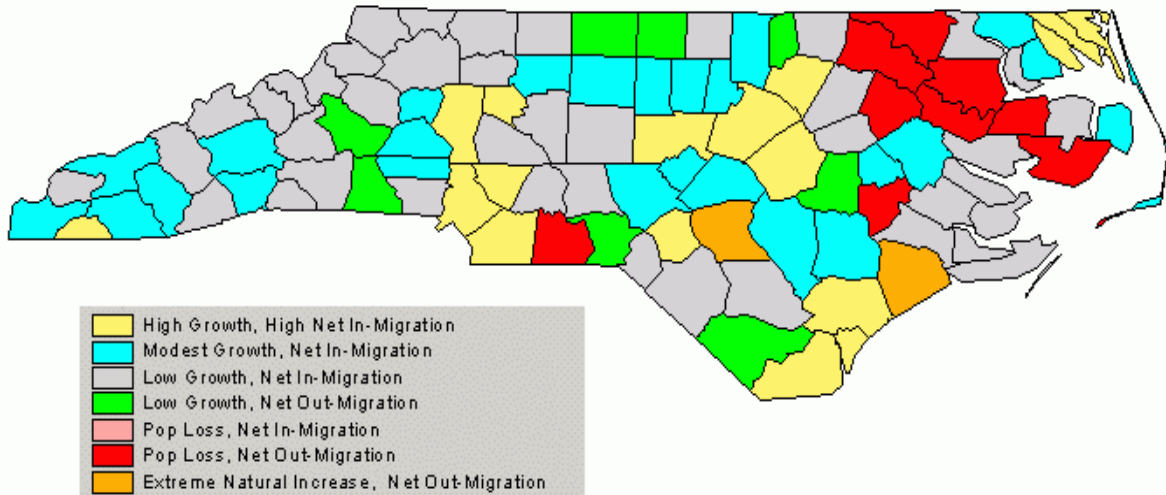
## POPULATION GROWTH 1990 TO 2000



Average county growth is equivalent to the growth rate of the State as whole. Since the growth rate of the State as a whole for this map (21.32%) is positive, Modest Growth is centered around this rate. To give Modest Growth and Low Growth equal ranges, Modest Growth is defined as from  $\frac{2}{3}$  to  $1\frac{1}{3}$  the State Growth rate. Thus, for this map:

High Growth	-----	greater than 28.43%
Modest Growth	-----	14.22% to 28.43%
Low Growth	-----	0.00% to 14.22%

## POPULATION GROWTH 2000 TO 2010



Average county growth is equivalent to the growth rate of the State as whole. Since the growth rate of the State as a whole for this map (17.44%) is positive, Modest Growth is centered around this rate. To give Modest Growth and Low Growth equal ranges, Modest Growth is defined as from  $\frac{2}{3}$  to  $1\frac{1}{3}$  the State Growth rate. Thus, for this map:

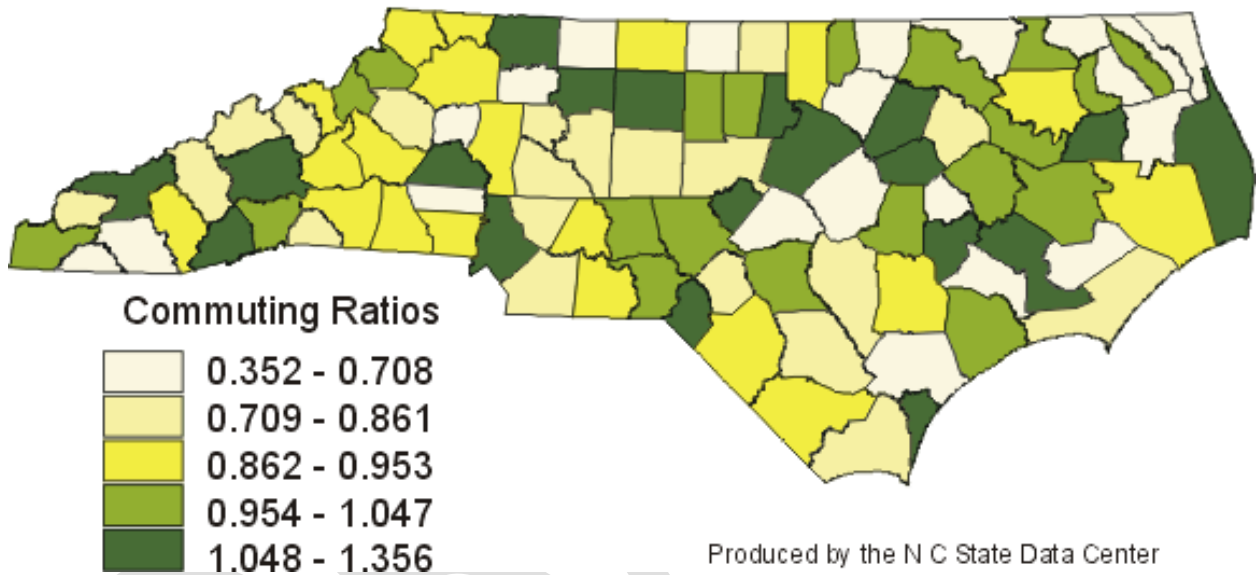
High Growth	-----	greater than 23.26%
Modest Growth	-----	11.63% to 23.26%
Low Growth	-----	0.00% to 11.63%

**Appendix C: Commuting Patterns for North Carolina Counties**

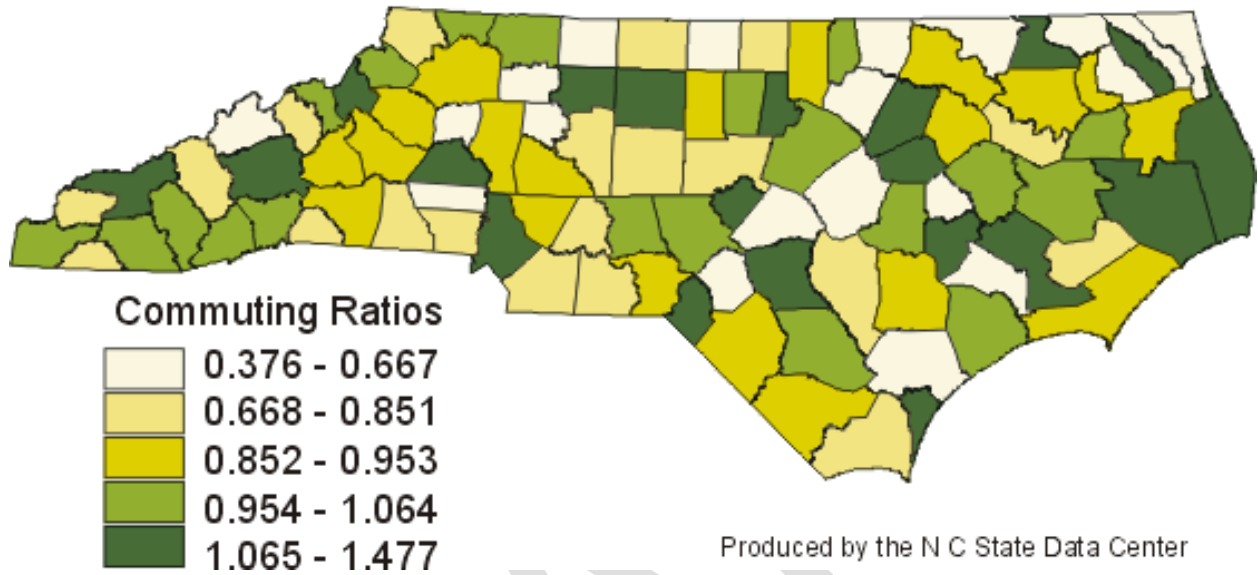
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**Commuting Ratio** -- The ratio of persons working in the county to employed residents of the county. A value of one implies zero net commuting; a value greater than one corresponds to net in commuting; less than one, to net out commuting.

## Commuting Ratios, 1990



# Commuting Ratios, 2000

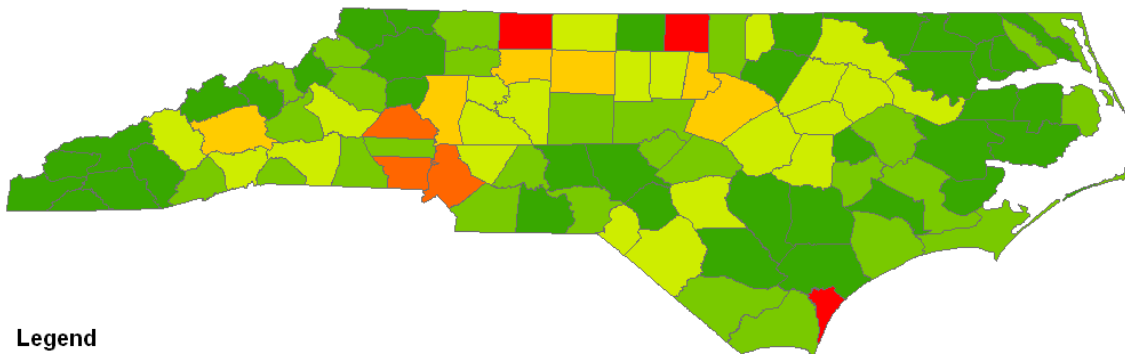


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**Appendix D: Emission Density Plots for North Carolina**

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## County Total 2002 NOx Emissions, Normalized By Area



### Legend

2002

TOTAL NOx / AREA (SQ MILES)

0.984329623 - 5.00000000

5.00000001 - 10.00000000

10.00000001 - 25.00000000

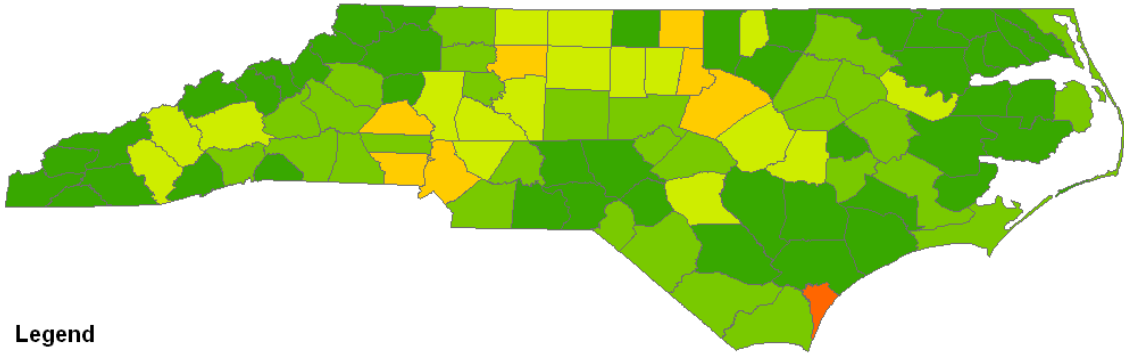
25.00000001 - 50.00000000

50.00000001 - 75.00000000

75.00000001 - 100.00000000

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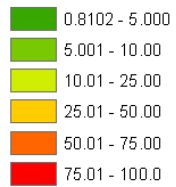
## County Total 2009 NOx Emissions, Normalized By Area



### Legend

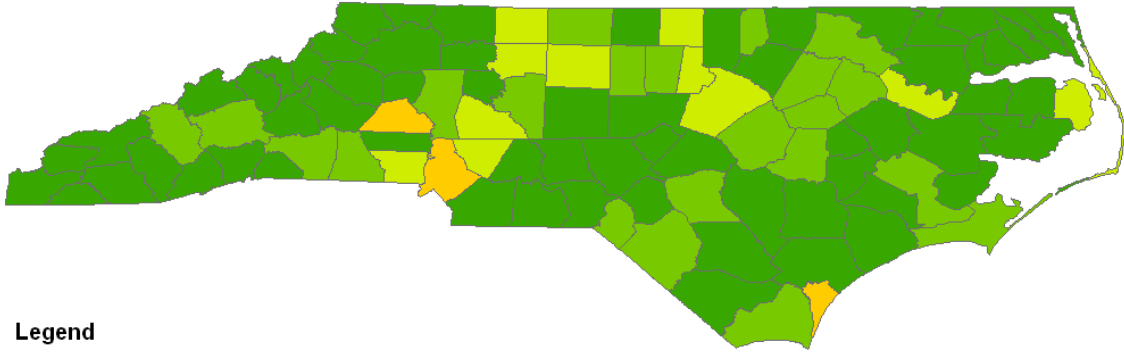
2009

TOTAL NOX / AREA (SQ MILES)



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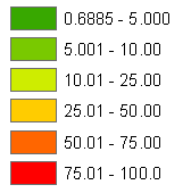
## County Total 2018 NOx Emissions, Normalized By Area



### Legend

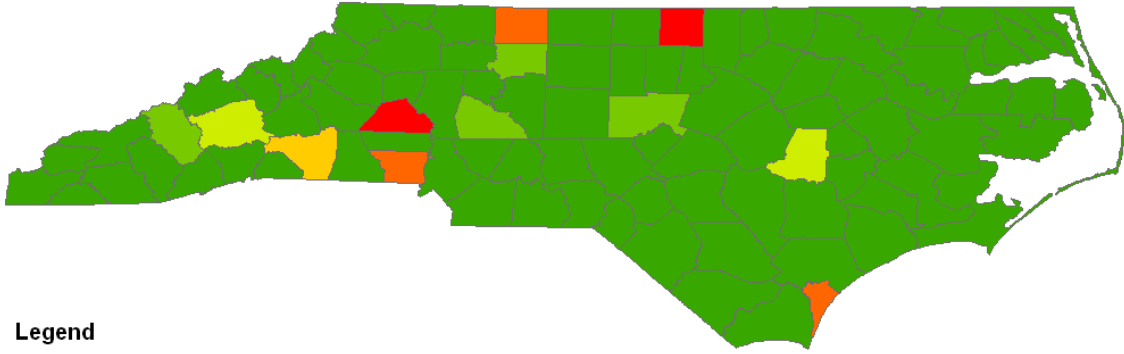
2018

TOTAL NOX / AREA (SQ MILES)



DRK

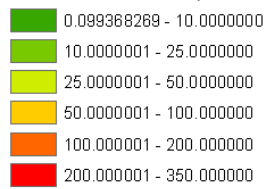
## County Total 2002 SO2 Emissions, Normalized By Area



### Legend

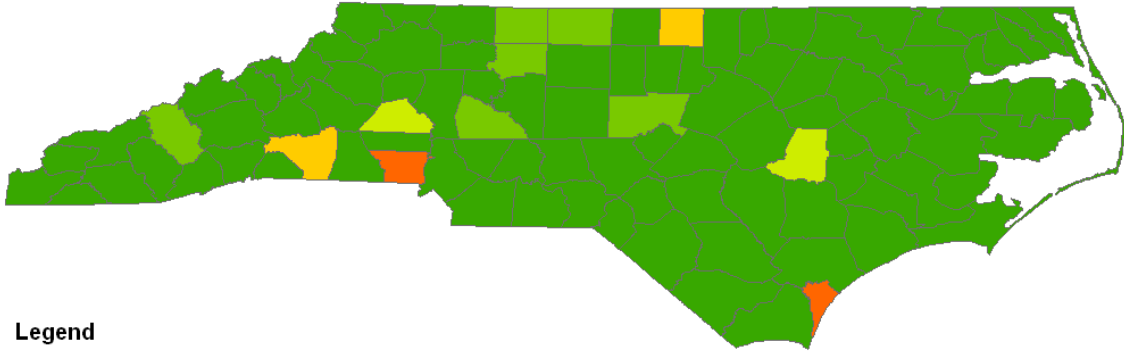
2002

TOTAL SO2 / AREA (SQ MILES)



DRK

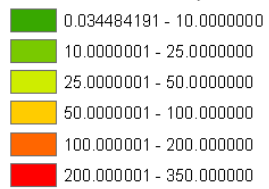
## County Total 2009 SO2 Emissions, Normalized By Area



### Legend

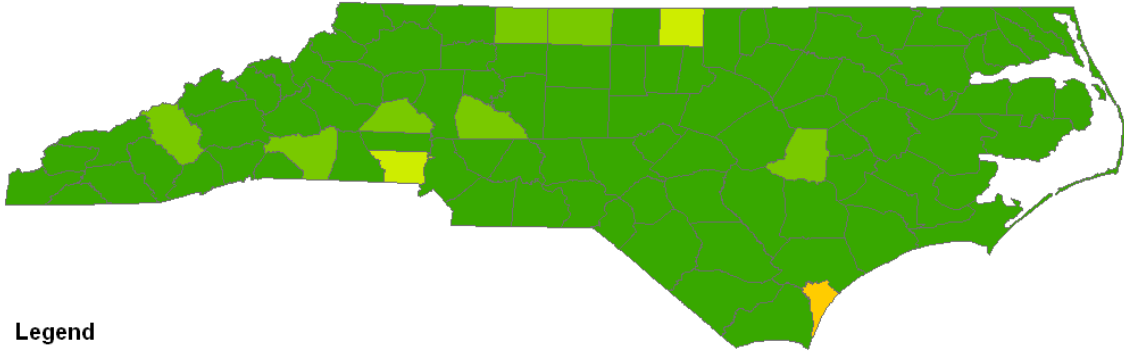
2009

TOTAL SO2 / AREA (SQ MILES)



DRK

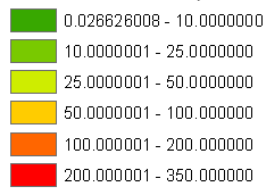
## County Total 2018 SO2 Emissions, Normalized By Area



### Legend

2018

TOTAL SO2 / AREA (SQ MILES)

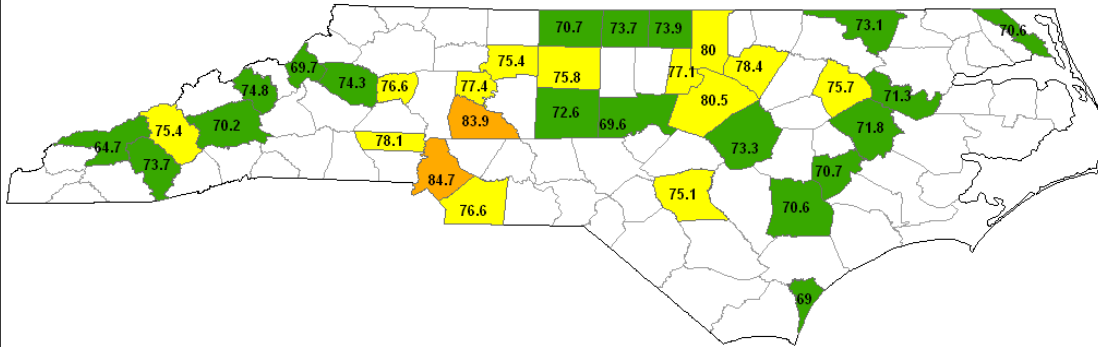


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**Appendix E: 2009 and 2018 Modeling Projections for North Carolina for Ozone and Fine Particulate Matter**

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## VISTAS/ASIP 2009 8-hour Ozone Future Design Values



### Legend

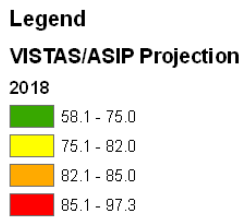
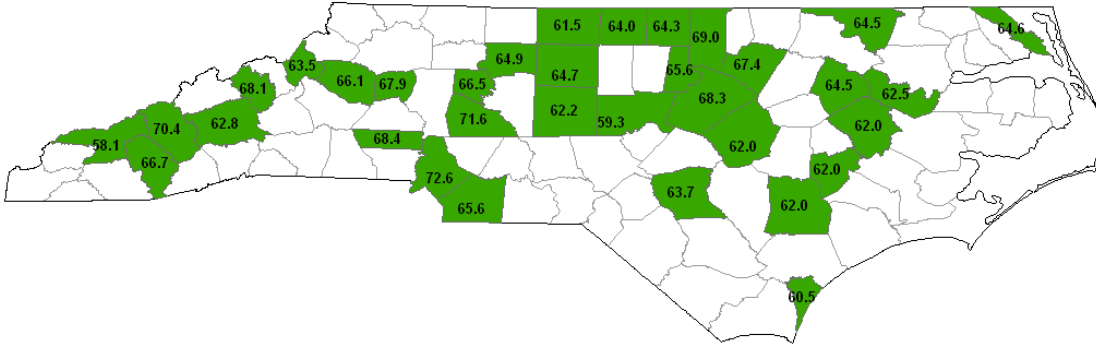
#### VISTAS/ASIP Projection

2009

- 64.7 - 75.0
- 75.1 - 82.0
- 82.1 - 85.0
- 85.1 - 97.3

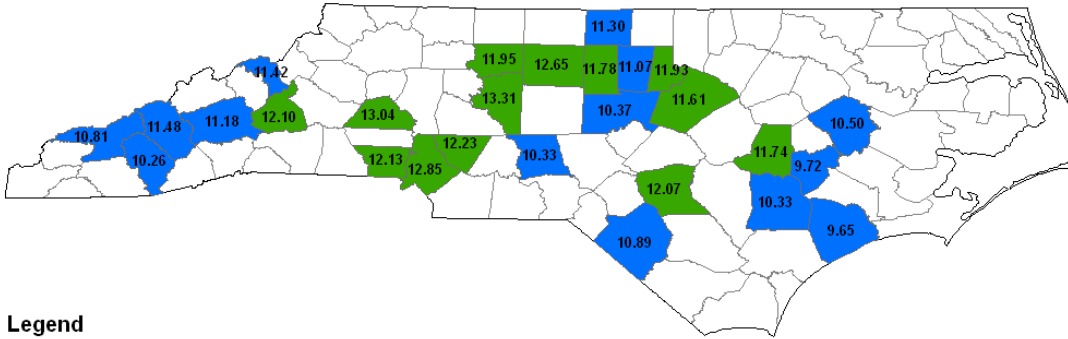
DRAFT

**VISTAS/ASIP 2018 8-hour Ozone Future  
Design Values**



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## VISTAS/ASIP 2009 Annual PM2.5 Future Design Values



### Legend

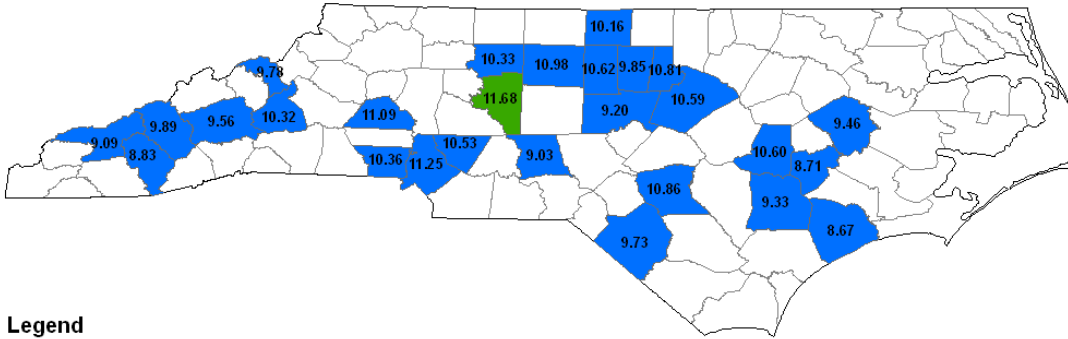
VISTAS/ASIP Projection Annual PM2.5

2009

- 9.65 - 11.50
- 11.51 - 13.50
- 13.51 - 14.50
- 14.51 - 15.00
- 15.01 - 15.50
- 15.51 - 16.01

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## VISTAS/ASIP 2018 Annual PM2.5 Future Design Values



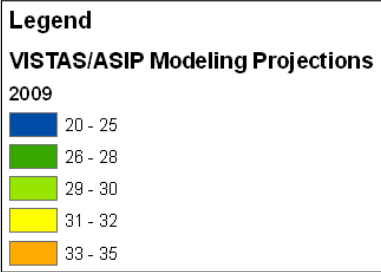
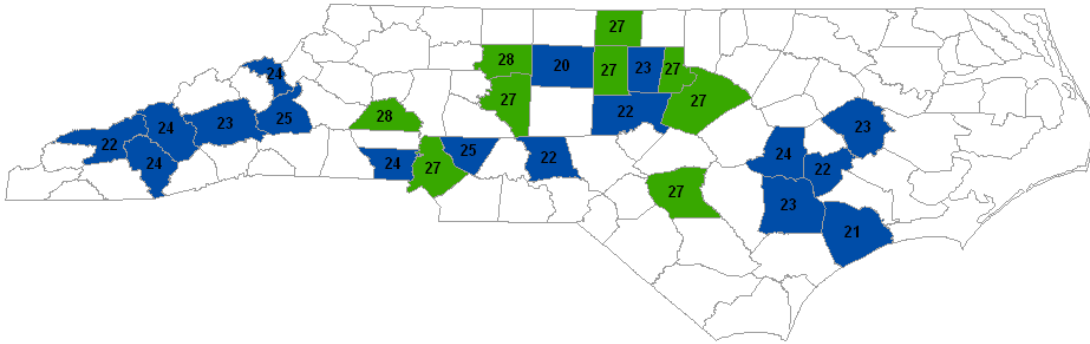
### Legend

VISTAS/ASIP Projection Annual PM2.5  
2018

- 8.67 - 11.50
- 11.51 - 13.50
- 13.51 - 14.50
- 14.51 - 15.00
- 15.01 - 15.50
- 15.51 - 16.01

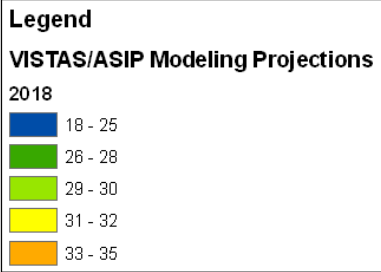
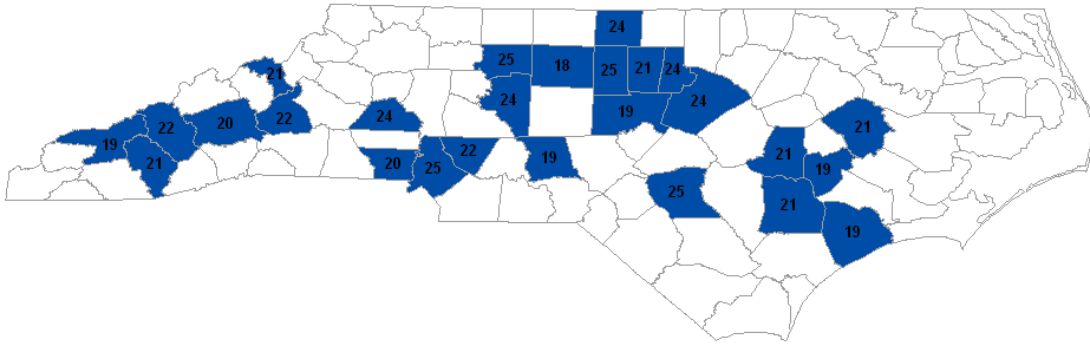
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VISTAS/ASIP 2009 Daily PM2.5  
Future Design Values



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VISTAS/ASIP 2018 Daily PM2.5  
Future Design Values



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**Appendix F: Rule Worksheet for North Carolina**

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## RULE WORKSHEET

The purpose of this worksheet is to highlight and track steps required to carry a rule from concept to final rule status.

Present Rule Concept for Approval:	
	The rule concept is presented to the AQC for approval to proceed with formalizing a draft rule.
	Write the draft rule.
	Email internal draft rule to central office supervisors, regional air quality supervisors, permit coordinators, and compliance coordinators.
	Conduct stakeholders' meeting if appropriate.
	Post draft rule on <a href="http://daq.state.nc.us/rules/draft">http://daq.state.nc.us/rules/draft</a> .
	Email website link to Mike's update list.
	Email website link to all of DAQ.
Present the Draft Rule:	
	Present the draft rule to the AQC.
*	Note 1. Ideally this is done after the completion of the draft economic assessment and a summary table, which are included as part of the agenda item presenting the draft rule to the AQC for a vote. If the summary table is not included, put a short statement before the draft rule describing the rule change and purpose.
	Submit the 101 package (draft rule, 101 Form, statement of purpose, OSBM Fiscal Form, economic assessment, rule summary table, and occasionally a federal form [e.g., CAMR, BART]) to the Administrative Procedures Coordinator (APAC) to obtain signatures.
*	Note 2. Presentation of the draft rule to the AQC and submittal of the 101 package to the APAC are usually done about the same time.
*	<b>Note 3. The OSBM must review and approve the draft economic assessment prior to publication in the NC Register if State expenditures will increase due to the draft rule or the assessment concludes that the annual expenditures by all parties will be "substantial" (at least \$3,000,000 per 12 month period).</b>
*	Note 4. The APAC will submit the completed 101 package with a transmittal letter to the Governor's office at least 30 days prior to publication in the NC Register if the fiscal note concludes that local governments' expenditures or revenues will be impacted from rule adoption.
*	Note 5. The APAC will submit completed package with transmittal letter to the Department of Transportation at least 30 days prior to publication in the NC Register if the adoption of the rule by the EMC would result in an increase costs to DOT.
	Submit fiscal note package (draft rule, 101 Form, summary table, economic assessment, OSBM Fiscal Form) with transmittal letter when the 101 package is filed to: <ol style="list-style-type: none"> <li>1. League of Municipalities (Ann Watkins)</li> <li>2. Association of County Commissioner (Jim Blackburn)</li> <li>3. Fiscal Research (Kristin Walker).</li> </ol>
	Present the draft rule to the EMC with a request to take the rule to public hearing.
	Note 6. Presentation to the EMC normally occurs 30 days after approval by the AQC, unless the AQC requests a waiver of the 30 day requirement from the EMC.
Filing the Hearing Announcement in the North Carolina Register	
	Request a hearing officer assignment (Director requests the EMC Chairman to assign).
*	Note 7. Typically, staff finds an EMC member who agrees to be the hearing officer. Staff requests the Director to email the EMC Chairman to request the appoint the hearing officer.
	Establish the hearing officer's availability
	Arrange for hearing room assignments
	Send Notice of Text and Hearing Form along with copy of draft rule for APAC's signature.
*	Note 8. Each rule starts on a new page with the appropriate comment for filing with the NC Register
*	Note 9. If there are many pages, talk to APAC to see if Rule Development Branch should provide three hard copies of the draft rules.
	Prepare five newspaper transmittal letters, public notices, and the hearing officer's appointment letter for the Director's signature.

*	Note 10. Fax the newspaper letters with the public notice along with a promise to send an electronic copy of the public notice if requested (insures receipt of fax by newspaper as they will request it electronically).
*	Note 11. Public notice required 30 days prior to the hearing (EPA requirement).
	Draft regional office transmittal letter with copy of rule and public notice.
	Remove the draft rule from <a href="http://daq.state.nc.us/draft">http://daq.state.nc.us/draft</a> and post a copy of the hearing notice and draft rule at <a href="http://daq.state.nc.us/rules/hearings/">http://daq.state.nc.us/rules/hearings/</a> .
	Draft EPA transmittal letter for Director's signature with copy of public note and draft rule.
*	Note 12. Send EPA package so they receive it at least 30 days before the hearing.
	Draft local program transmittal letters with copy of public note and draft rule for Mike's signature.
	Mail public notice with return card to people on the mailing list.
	Mail public notice, return card, and copy of draft rule to people on the paid list.
<b>Rule Hearing</b>	
	Arrange for staff, supplies, and transportation to hearing site.
	Assist the hearing officer with hearing comments.
<b>Assemble the Hearing Record</b>	
	Assemble the hearing record.
	Discuss the hearing record with the Director or Deputy Director.
	Send an electronic copy or a hard copy (hearing officer's preference).
	Discuss the hearing record with the hearing officer and modify as necessary.
	Place the hearing officer's report on the EMC agenda after the hearing officer approves the hearing record.
	Send the EMC Administrator (EMCA) an electronic copy of the hearing record.
*	Note 13. Ask EMCA for the agenda page numbering system to be used in the hearing record and then deliver the hearing record to her approximately 20 days prior to the next EMC meeting (for printing and mailing to EMC members). If there are less than 20 days before the next EMC meeting, the EMCA will provide shipping labels to Rule Development to send out CDs or hard copies of the hearing report to Commission members. If the hearing record is greater than 100 pages, discuss with EMCA what hearing record format she wishes to receive (electronic or hard copy).
<b>Hearing Officer Presents Hearing Record to the EMC</b>	
	Assist the hearing officer with hearing record presentation.
<b>Filing for the Code - Post EMC Rule Approval</b>	
	Submit permanent rule form and copy of each EMC adopted rule to the APAC.
*	Note 14. Submit forms (one for each rule) and rules to the APAC with the appropriate comment (e.g., code or with changes) before the 20th of the month that the EMC adopted the rule. Ask the APAC if she wants the forms and rules in electronic form or hard copies (original and four copies). The APAC signs the permanent rule form for the EMC Chairman. The APAC will submit the rules to the Rules Review Commission (RRC) for approval.
<b>Attend the RRC Meeting</b>	
*	Note 15. Rules approved by the RRC will be sent by RRC to OAH for publication in the NCAC.
*	Note 16. Rules with RRC recommended technical changes will be changed by DAQ and returned to the RRC before the formal RRC meeting.
*	Note 17. A rule objected to by the RRC will be reintroduced to the EMC by DAQ after modification to satisfy the RRC's objection. The EMC will approve or disapprove the modification. If approved, the rule will be returned to the RRC for final approval. The rule will be sent by RRC to OAH for publication in the NCAC. If the EMC disapproves the modification the rule dies.
<b>Post Rule Adoption Requirements</b>	
	Draft transmittal letters to EPA requesting approval of the rule as part of the SIP with five copies of the hearing record and rule. Include a copy of each of the five affidavit of printing the newspaper hearing announcement.
*	Note 18. Additionally, send appropriate transmittal letters to appropriate EPA program administrators [e.g., Title V, HAP, etc.] other than the SIP Administrator along with a copy of the rule, affidavits of printing, and a copy of the hearing record.
	After RRC rule approval, remove the draft rule from <a href="http://daq.state.nc.us/hearing/">http://daq.state.nc.us/hearing/</a> and post a copy of the final rule at <a href="http://daq.state.nc.us/rules/adopted/">http://daq.state.nc.us/rules/adopted/</a> .
	Mail copies of the rule to people who requested a copy at the rule (filled out the hearing card).

	Mail a rule copy to each local program.
	Mail four rule copies to the Office of the Attorney General.
	Mail two rule copies to the Small Business Office.
	Update the Rule Book.
	Place the original copy of the hearing record and supporting documents in with the permanent files.
	Save five copies of the hearing record in files for possible future use.
	Remove the rule from <a href="http://daq.state.nc.us/adopted">http://daq.state.nc.us/adopted</a> and post updated rule at <a href="http://daq.state.nc.us/rules/rules/">http://daq.state.nc.us/rules/rules/</a> .

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