Appendix A

North Carolina's 2006-2008 8-Hour Ozone Design Values Map & Table

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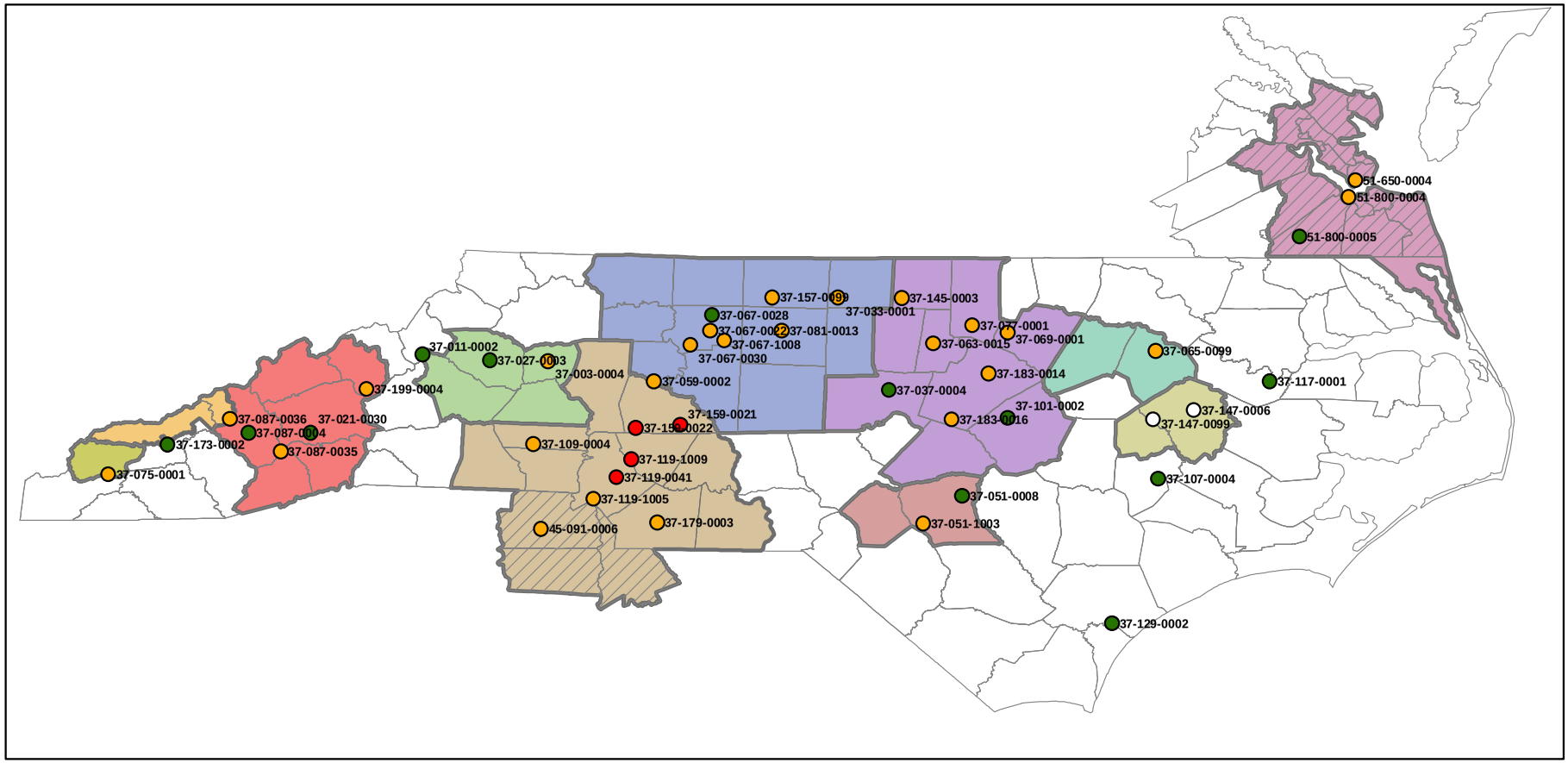
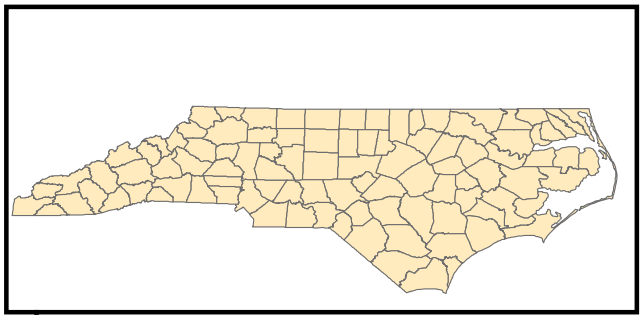
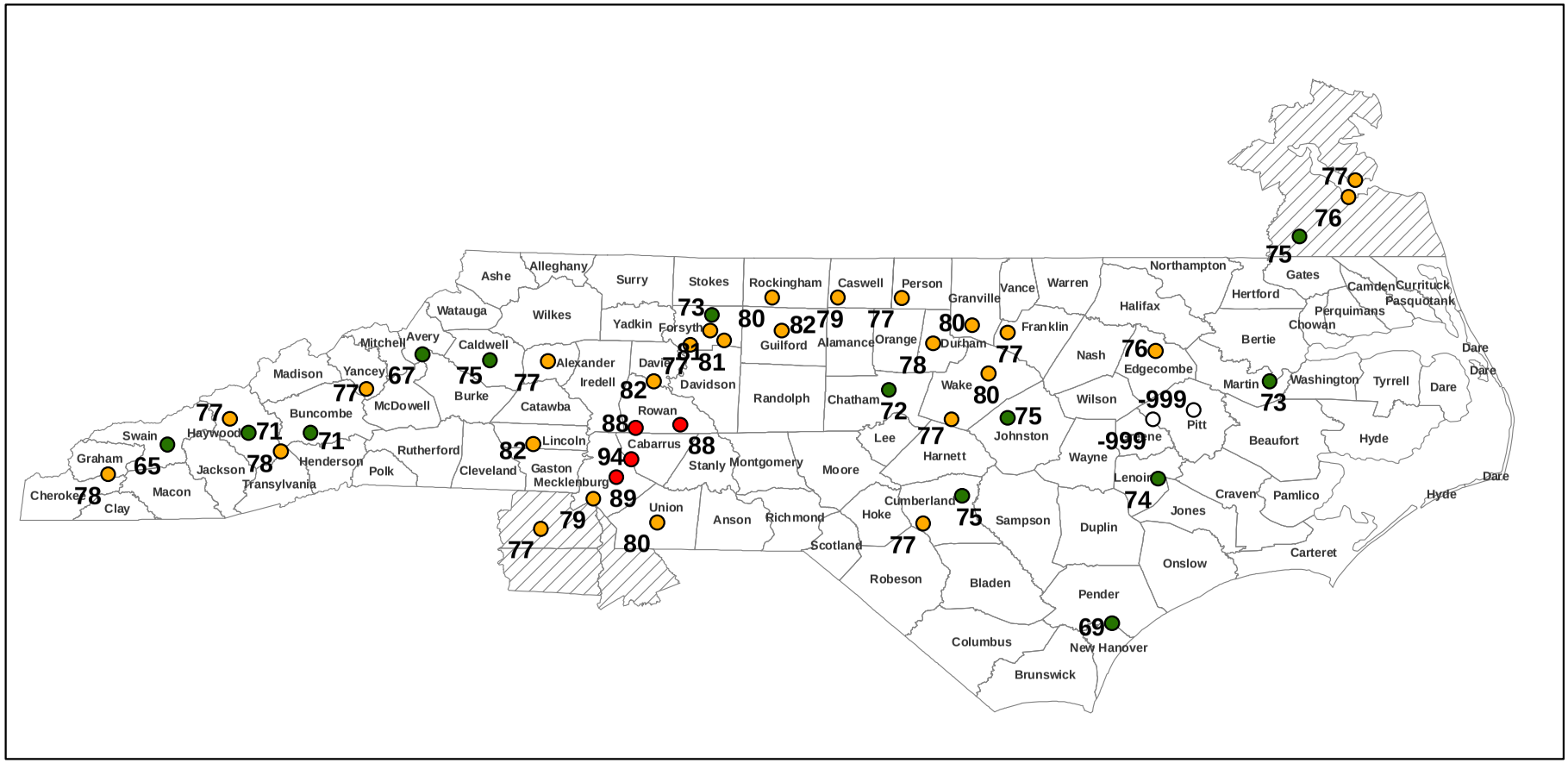


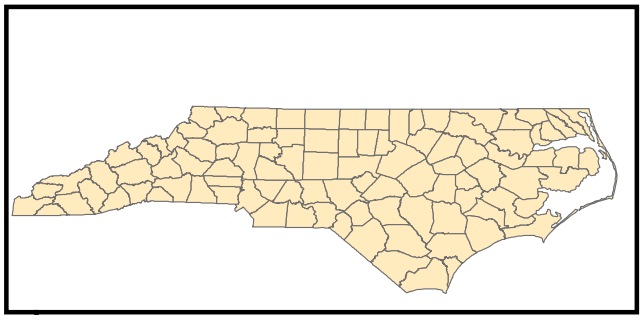


Statewide 8-Hour Ozone Design Values

2006-2008 8-Hour Ozone Design Values

- ○ Incalculable (-999)
- ● Attaining (75ppb and below)
- ● Nonattaining (76ppb to 84ppb)
- ● Nonattaining (85ppb and above)





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- ● Nonattaining (85ppb and above)

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
	Waggin Trail	37-003-0004	0.080	0.076	0.081	0.076	0.079	0.077
	Linville	37-011-0002	0.074	0.067	0.066	0.069	0.069	0.067
	Bent Creek	37-021-0030	0.079	0.071	0.073	0.071	0.074	0.071
	Lenoir	37-027-0003	0.075	0.076	0.077	0.072	0.076	0.075
	Cherry Grove	37-033-0001	0.076	0.075	0.082	0.080	0.077	0.079
	Pittsboro	37-037-0004	0.079	0.070	0.075	0.072	0.074	0.072
	Wade	37-051-0008	0.084	0.072	0.080	0.075	0.078	0.075
	Golfview	37-051-1003	0.091	0.074	0.082	0.075	0.082	0.077
	Cooleemee	37-059-0002	0.084	0.080	0.085	0.081	0.083	0.082
	Durham Armory	37-063-0015	0.076	0.078	0.080	0.076	0.078	0.078
	Leggett	37-065-0099	0.079	0.074	0.080	0.075	0.077	0.076
	Hattie Ave.	37-067-0022	0.074	0.082	0.082	0.081	0.079	0.081
	Shiloh Church	37-067-0028	0.078	0.067	0.076	0.077	0.073	0.073
	Clemmons	37-067-0030	0.075	0.077	0.078	0.078	0.076	0.077
	Union Cross	37-067-1008	0.080	0.082	0.083	0.078	0.081	0.081
	Franklinton	37-069-0001	0.080	0.074	0.080	0.078	0.078	0.077
	Joanna Bald	37-075-0001	0.079	0.076	0.081	0.078	0.078	0.078
	Butner	37-077-0001	0.085	0.076	0.083	0.081	0.081	0.080
	Mendenhall	37-081-0013	0.082	0.080	0.086	0.081	0.082	0.082
	Waynesville	37-087-0004	0.074	0.069	0.074	0.071	0.072	0.071
	Frying Pan	37-087-0035	0.082	0.079	0.077	0.080	0.079	0.078
	Purchase Knob	37-087-0036	0.084	0.073	0.078	0.080	0.078	0.077
	Barnet Knob	37-099-0005	0.069	0.081	0.080	0.072	0.076	0.077
	W. Johnston	37-101-0002	0.083	0.072	0.078	0.076	0.077	0.075
	Lenoir College	37-107-0004	0.081	0.071	0.077	0.074	0.076	0.074
	Crouse	37-109-0004	0.082	0.082	0.085	0.079	0.083	0.082
	Jamesville	37-117-0001	0.079	0.070	0.075	0.074	0.074	0.073
	Garinger	37-119-0041	0.088	0.091	0.093	0.085	0.090	0.089
	Arrowood	37-119-1005	0.085	0.078	0.087	0.073	0.083	0.079
	County Line	37-119-1009	0.090	0.093	0.096	0.093	0.093	0.094
	Castle Hayne	37-129-0002	0.075	0.072	0.071	0.066	0.072	0.069

Region	Monitoring Sites	AIRS ID	Annual 4th Highest 8-Hour Average				Design Value	
			2005	2006	2007	2008	05-07	06-08
	Bushy Fork	37-145-0003	0.079	0.075	0.079	0.078	0.077	0.077
	Pitt County Ag Center	37-147-0006				0.077		
	Farmville	37-147-0099	0.080	0.072	0.079		0.077	
	Bethany	37-157-0099	0.078	0.075	0.082	0.084	0.078	0.080
	Rockwell	37-159-0021	0.086	0.085	0.096	0.084	0.089	0.088
	Enochville	37-159-0022	0.088	0.089	0.095	0.082	0.090	0.088
	Bryson	37-173-0002	0.070	0.063	0.066	0.068	0.066	0.065
	Monroe	37-179-0003	0.082	0.080	0.082	0.080	0.081	0.080
	Millbrook	37-183-0014	0.082	0.078	0.084	0.078	0.081	0.080
	Fuquay-Varina	37-183-0016	0.085	0.073	0.080	0.078	0.079	0.077
	Mt. Mitchell	37-199-0004	0.080	0.075	0.079	0.078	0.078	0.077
	York (South Carolina)	45-091-0006	0.079	0.078	0.080	0.075	0.079	0.077
	Hampton (Virginia)	51-650-0004	0.078	0.076	0.076	0.079	0.076	0.077
	Sulfolk (Virginia)	51-800-0004	0.077	0.077	0.076	0.077	0.076	0.076
	Sulfolk (Virginia)	51-800-0005	0.078	0.071	0.078	0.078	0.075	0.075

Appendix B

Local Government and Public Comments Received

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Appendix B

Local Government and Public Comments Received

(Statewide Comments)

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North Dakota

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January 28, 2009

B. Keith Overcash
Director
N.C. Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

RE: Designation of North Carolina Nonattainment Areas Under the Revised Eight-Hour Ozone Standard

Dear Mr. Overcash:

The Southern Environmental Law Center ("SELC") submits these comments in response to the NC Division of Air Quality's request for public input on potential North Carolina nonattainment designations under the revised eight-hour ozone standard. SELC, a non-profit, regional, environmental organization dedicated to the protection of natural resources in North Carolina and throughout the Southeast, is committed to ensuring that the nonattainment boundaries for the revised 8-hour standard are set in a manner that is consistent with the requirements and intent of the Clean Air Act ("CAA" or "the Act") to protect public health with an adequate margin of safety. See 42 U.S.C. 7409(a).

For this reason, we strongly support the "presumptive" boundaries recommended by EPA, which encompass the entire "core-based statistical area" or "combined statistical area" where a monitor signals nonattainment, or if the monitor is located outside of such an area, the entire county containing the monitor. We further support the designation of any area that contributes to a violation in a nonattainment area, even if the contributing area is itself not in violation of the 8-hour standard. We object to the proposed nonattainment boundaries presented by DAQ in recent public meetings because they are arbitrarily circumscribed and insufficient to ensure adequate protection of public health. The legal and policy reasons for this position are discussed below.

Introduction

Pursuant to the CAA, EPA is required to set National Ambient Air Quality Standards ("NAAQS") sufficient to protect the public health with an adequate margin of safety. 42 U.S.C. § 7409 (a) & (b). In 2007, EPA's Clean Air Scientific Advisory Committee unanimously

recommended selection of an 8-hour average ozone standard within the range of 0.060 to 0.070 parts per million ("ppm") for the primary "human-health based" NAAQS. The Committee recommended an alternative secondary standard of cumulative form to meet the CAA's requirement to protect human welfare. EPA declined to follow the recommendations of its scientific advisory committee, however, and instead set both the primary and secondary NAAQS for ozone to .075 ppm measured over 8-hour intervals ("the 8-hour standard"). While this downward revision marked an improvement on the existing .08 ppm 8-hour standard, EPA's scientific advisory committee made clear in an April 7, 2008 letter that its members "do not endorse the new primary ozone standard as being sufficiently protective of public health."

Along with many areas of the country, North Carolina has a serious problem with ozone pollution that is threatening the health and well being of its citizens and damaging its environment. Public health experts have estimated that air pollution in North Carolina kills 50 infants, causes 1500 emergency room visits for childhood asthma, triggers 100,000 asthma attacks and results in 300,000 missed school days each year.[1] The American Lung Association's annual "State of the Air" report ranks Charlotte as the 16th most polluted city in the country.[2] And according to the best scientific knowledge available, much of the rest of North Carolina's population is breathing air that is damaging to its health.

Nonattainment designations provide areas with important tools to help bring them into compliance with the federal health-based air quality standards. For stationary sources, these tools include additional pollution control technology requirements for existing and new sources of pollution and pollution offset requirements for new sources of pollution. For mobile sources, the primary source of ozone pollution in North Carolina's largest metro areas, a nonattainment designation brings with it the requirement of transportation conformity.

For the following reasons, we urge DAQ and Governor Perdue to concur with EPA's presumptive boundaries to define North Carolina's nonattainment areas for the eight-hour ozone standard. By doing so, you will greatly enhance the state's ability to fulfill its responsibility to address the serious problem of ozone pollution and implement the standards as intended by Congress. This proactive approach will also help to ensure compliance in the future when the standards are strengthened to a level that is fully protective of public health.

I. The Clean Air Act Requires Nonattainment Designations to Include Areas Containing Violating Monitors, Plus Nearby Areas That Contribute to Violations of the Eight-Hour Standard.

Pursuant to § 107(d)(1)(A) of the CAA, governors are required to submit to EPA proposed designations of all areas of the state as attainment, nonattainment, or unclassifiable following the promulgation of new or revised NAAQS. Governors are required to designate as nonattainment "any area that does not meet (or that contributes to ambient air quality in a nearby

[1] *See* Environment North Carolina. "Air Pollution And Public Health In North Carolina." (2006) *available at*: http://www.environmentnorthcarolina.org/reports/clean-air/clean-air-program-reports/air-pollution-and-public-health-in-north-carolina2

[2] *See* http://lungaction.org/reports/sota07_cities.html#2b

area that does not meet) the national primary or secondary ambient air quality standard for the pollutant." 42 U.S.C. § 7407(d)(1)(A)(i) (emphasis added). EPA may then "make such modifications as the Administrator deems necessary" in promulgating the final nonattainment boundary designations. Id. § 7407(d)(1)(B)(ii). In its report on the 1990 Amendments, the United States Senate highlighted Congress' intent that nonattainment areas be defined broadly, noting that "[t]he bill explicitly provides that EPA may include within the boundary [of a nonattainment area] an area that may cause or contribute to nonattainment in another area, regardless of whether pollutant concentrations in the first area exceed the standard." S. Rep. No. 228, 101st Cong., 2nd Sess. 15, reprinted in 1990 CAA Legislative History 8338, 8353.

Even prior to the 1990 Amendments, which made explicit the breadth of EPA's powers to designate nonattainment areas, EPA designated and courts upheld broad nonattainment boundaries in order to fulfill the basic purposes of the Act. In Western Oil and Gas Ass'n v. United States Environmental Protection Agency, 767 F.2d 603 (9th Cir. 1985), for example, the Ninth Circuit rejected an industry challenge to the inclusion of counties without violating monitors in a designated nonattainment area. The EPA included the disputed counties because they contributed significantly to the monitored violations of the ozone and carbon monoxide standards in neighboring counties. In upholding EPA's decision, the court agreed with the agency's reasoning that a nonattainment area should be large enough to allow for the imposition of needed control measures on the sources that are contributing to the violation of an air quality standard. The court also agreed that the alternative – narrowly defined boundaries – risked over-control of sources within the nonattainment area and probable under-control of sources outside of the area. This, in turn, could result in an economically and technically unreasonable pollution control strategy.

Likewise, in State of Ohio v. Ruckelshaus, 776 F.2d 1333, 1340 (6th Cir. 1985), Ohio petitioned EPA for the redesignation of a portion of the Cleveland ozone nonattainment area to attainment because air quality monitors there did not show violations. In upholding EPA's denial of the petition, the court reasoned:

> It appears a permissible exercise of [its] authority for EPA to deny redesignation with respect to a component of a nonattainment area which produces a substantial portion of the area's pollution even though the air within that component tests at an acceptable level. If it were otherwise, the fortuitous circumstance that pollutants and precursors emitted within a county are moved by prevailing winds to a neighboring county would deprive EPA of the tools Congress provided for attacking pollution in the area of which the county is logically a part.

776 F.2d at 1340. See also, United States Steel Corp. v. United States Environmental Protection Agency, 605 F.2d 283 (7th Cir. 1979), cert. denied, 444 U.S. 1035 (1980), (upholding EPA's designation of a broad nonattainment area based on monitoring and modeling results showing air quality violations in the area).

II. North Carolina Should Follow EPA Guidance and Designate the Core Based Statistical Areas, or County in Non-CBS Areas, Containing Violating Monitors as the Boundaries of Nonattainment Areas.

Closely following the CAA's statutory requirements and legislative intent, EPA's 2008 guidance for implementation of the eight-hour ozone standard also calls for broadly drawn nonattainment boundaries:

> Section 107(d)(1) of the CAA defines an area as nonattainment if it is violating the NAAQS or if it is contributing to a violation in a nearby area. Ground-level ozone and ozone precursor emissions are pervasive and readily transported. Therefore, EPA believes it is important to examine ozone-contributing emissions across a relatively broad geographic area. Accordingly, we recommend that the Core Based Statistical Area (CBSA) or Combined Statistical Area (which includes 2 or more adjacent CBSA's) associated with the violating monitor(s) serve as the starting point or "presumptive" boundary for evaluating the geographic boundaries of an ozone nonattainment area. CBSA is a collective term that refers to both metropolitan and micropolitan statistical areas, which are distinguished based on population size. Each CBSA consists of a county or counties containing at least one urban core plus adjacent counties that have a high degree of social and economic integration with the urban core as measured by commuting ties. EPA recommends starting with this presumption because the factors used to establish the CBSAs and CSAs are similar to the factors EPA plans to consider in determining whether a nearby area is contributing to the violation(s) of the standard. EPA used this same conceptual approach in the designations process for the 1997 ozone NAAQS. Where a violating monitor is not located in a CBSA or CSA, we recommend that the boundary of the county containing the monitor serve as the starting point for considering the extent of the nonattainment area.

2008 Guidance at 3 (emphasis added).

Thus, in order to "best ensure public health protection from the adverse effects of ozone pollution," EPA's guidance applies the following presumptions:

- Any CBSA with a violating monitor will be designated nonattainment in its entirety.
- Any non-CBSA county with a violating monitor will be designated nonattainment in its entirety.
- Any county contributing to a violation will be designated nonattainment in its entirety, even if the contributing area shows attainment.

EPA *may* allow a state to deviate from these presumptive boundaries if the state addresses each of nine factors identified in the guidance and demonstrates that "the resulting recommendation is consistent with § 107(d)(1) of the Act." Id. at 4.

To date DAQ has provided minimal justification for its substantial departure from EPA's use of full counties and CBSAs. Although during recent presentations DAQ staff has stated generally that the agency has considered EPA's factors, it has provided little particularized evidence for its proposal to reduce the size of several presumed nonattainment areas in the state. Reviewing the maps and the monitoring information provided by DAQ at its presentation, the proposed boundaries appear likely to exacerbate rather than help to control air pollution by encouraging sprawling land use and polluting facilities outside of DAQ's suggested boundary.

Indeed, DAQ has proposed boundaries smaller than EPA's guidance in some of the most polluted, fastest growing areas of the state. Charlotte, the 16th most polluted city in the country, has failed to meet current deadlines under the laxer current Clean Air Act standard and could soon lose its federal highway funding as the result of a "conformity lapse." According to DAQ's projections, monitors in Mecklenburg and Rowan counties will continue to be in nonattainment in 2012. Yet Iredell County, which borders Mecklenburg County to the north and Rowan County to the west, is mostly excluded from DAQ's proposed boundaries. Iredell County's exemption from the transportation conformity requirements that apply to the counties surrounding it (Davie, Alexander and Catawba counties are also designated nonattainment) will undermine efforts to bring Charlotte into compliance with the CAA under the new, tougher standard. DAQ has not offered a clear explanation to justify departure from EPA's guidance.

Other examples of inadequate explanation for partial designations in high growth areas are found in Johnston, Chatham, and Hoke counties. All of these counties are part of metropolitan CBSAs but are either partially or entirely excluded by the DAQ proposed boundaries. These counties have large population bases and high rates of "vehicle miles traveled." These two factors alone would indicate that these counties should be included within the nonattainment boundary in full in order to reap the benefits of coordinated planning through the federal tool of transportation conformity. One study by researchers at Cornell and Rutgers Universities ranked the Triad and the Triangle as the second and third most sprawling metro areas in the United States.[3] Nonattainment designations and transportation conformity should be seen as an opportunity to address transportation emissions by discouraging sprawl-inducing highway projects.

As these examples illustrate, using CBSA boundaries to delineate nonattainment areas is not only consistent with EPA's 2008 Guidance, but also promotes both air quality benefits and economic fairness. The general concept of a CBSA "is that of a core area containing a large population nucleus, together with adjacent communities having a high degree of economic and social integration with that core."[4] Given the high degree of economic and social integration of communities within a CBSA, there is an equally high probability that pollution sources throughout the CBSA, including the cars of commuters traveling to urban centers, contribute to air quality violations within the CBSA. It is also likely that these areas will share recruiting for key industries. It would produce absurd air quality results, as well as an inequitable distribution of economic costs and benefits, if new industries were encouraged to locate immediately outside

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[3] *See* Ewing, Pendall & Chenge. "Measuring Sprawl and its Impact" *available at http://www.smartgrowthamerica.org/sprawlindex/sprawlexecsum.html*

[4] *See* U.S. Bureau of the Census, About Metropolitan and Micropolitan Statistical Areas *available at* http://www.census.gov/population/www/metroareas/aboutmetro.html.

of a narrowly drawn boundary while the industries and individuals on the other side of the line were required to bear the costs of that outside industry's pollution. This problem is significantly lessened with broader-drawn boundaries, rather than in existing suburban or ex-urban areas where growth is continuing to expand.

The DAQ's proposal to designate only the mountaintops of Western North Carolina as nonattainment areas presents a similar problem. The Asheville metropolitan area has experienced rapid growth in recent years. Some of the ozone pollution in this area indisputably blows over from neighboring states or even from the Charlotte and Triad areas. But just as any area that contributes to poor ambient air quality in a nearby area must be classified as nonattainment, it makes no sense to circumscribe a presumptive nonattainment area just because other sources contribute to the problem. In fact, according to the monitor in Buncombe County, air quality in the Asheville area is close to violating the standard, in addition to contributing to the mountaintop readings above the standard. Unless DAQ can demonstrate that sources within the Asheville CBSA do not make important contributions to the violating monitors nearby, the agency should implement EPA's presumptive boundaries and designate the entire metro area. The same is true for Currituck County, which is presumptively in nonattainment because of its proximity to Virginia Beach.

To the degree that DAQ wishes to depart from EPA's guidance, any recommendation to exclude parts of a CBSA or county containing a violating monitor from the designated nonattainment area should be supported by air quality modeling that demonstrates that sources within the excluded portions of the CBSA or county do not contribute to ozone formation in the nonattainment area under any weather conditions. It should also discuss with particularity, on a county-by-county basis, all nine factors in EPA's guidance. Only with complete information on these matters will EPA and the citizens of North Carolina be able to evaluate whether DHEC's proposed nonattainment designations will be effective in carrying out the public health purposes of the Clean Air Act. SELC reserves the right to comment further on North Carolina's proposed boundaries once DHEC publicly issues a detailed analysis of the applicability of EPA's nine factors.

III. North Carolina Must Also Include In Its Proposal Areas That Contribute to Ambient Air Quality In a Nearby Area That Does Not Meet The 8-Hour Standard

Finally, the materials made available by DAQ provide no information about sources outside of counties with nonattaining monitors that may contribute to nonattainment areas, and hence, by the terms of the statute, must be included in the nonattainment boundaries. Such information must be made available to EPA and be considered during the nonattainment boundary recommendation process.

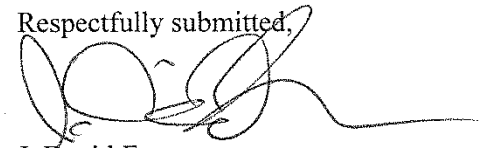
As stated previously, under 42 U.S.C. § 7407(d)(1)(A) and EPA guidance, if DAQ has reason to believe that sources contribute to ozone violations in nearby areas, it must draw the nonattainment boundaries to capture these sources. It is not acceptable for DAQ simply to promise that appropriate control strategies and regulations will be developed for such sources in the event that they are excluded from the nonattainment area. The purpose of giving EPA the authority to broadly define nonattainment areas is to better equip the state and EPA with tools

necessary to clean up sources contributing to violations of air quality standards. As the Sixth Circuit noted in rejecting a scheme identical to that now being contemplated by DAQ, "were [it] otherwise, the fortuitous circumstance that pollutants and precursors emitted within a county are moved by prevailing winds to a neighboring county would deprive EPA of the tools Congress provided for attacking pollution in the area of which the county is logically a part." State of Ohio v. Ruckelshaus, 776 F.2d at 1340.

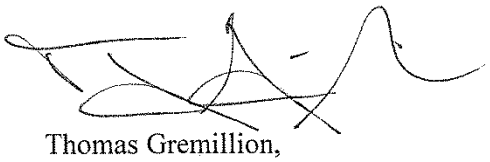
Conclusion

It is imperative that North Carolina act decisively to protect our health and natural resources from ozone pollution. It can do so by recommending an appropriate designation of nonattainment areas for the new eight-hour ozone standard. For all of the foregoing reasons, we urge North Carolina to accept EPA's presumptive boundaries in designating these areas. We thank you for the opportunity to submit these comments.

Respectfully submitted,



J. David Farren,
Senior Attorney



Thomas Gremillion,
Associate Attorney

CC: Beverly Perdue, Governor
Sheila Holman, NC DAQ

Beverly Banister, EPA Region 4
Carol Kemker, EPA Region 4
Richard Schutt, EPA Region 4

BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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February 6, 2009

George M. Bridgers, Meteorologist II
NC DENR, Division of Air Quality
Planning Section, Attainment Planning Branch
1641 Mail Service Center
Raleigh, NC 27699-1641
Email: George.Bridgers@ncmail.net

Re: North Carolina Proposed Nonattainment Ozone Boundaries

Dear Mr. Bridgers:

We appreciate that you have permitted us to submit our comments to you after the announced deadline (Jan. 31, 2009), on behalf of the Blue Ridge Environmental Defense League (BREDL), in response to the NC Division Air Quality's request for comments on its Proposed Boundaries for Ozone Nonattainment Areas in North Carolina.

BREDL is a regional, community-based non-profit organization committed to protecting human health and the environment. Our founding principles are Earth stewardship, environmental democracy, social justice and community empowerment. We have over 2,500 members, and over 30 active chapters dedicated to protecting public health and the environment.

BREDL is committed to ensuring that nonattainment boundaries are set in a manner that is consistent with the requirements of the Clean Air Act (CAA) to protect public health. For this reason we strongly support the findings of EPA's National Ambient Air Quality Standards for Ozone: Final Rule (40CFR, Parts 50 and 59, March 27, 2008) that lowers the new primary ozone standard from 0.08 ppm to a level of 0.075 ppm. This new standard was based on numerous epidemiological studies conducted over the past decade in which may of the health effects associated with exposures to ozone were identified. http://www.epa.gov/fedrgstr/EPA-AIR/2008/March/Day-27/a5645.pdf

We request that the NC DAQ support the following recommendations to its Proposed Nonattainment Boundaries:

- Follow the EPA's guidance in adopting a regional approach in determining nonattainment boundaries by including all NC counties in whole as cited in EPA's Presumptive Boundaries.
- Consider combined contributions of air toxics - VOCs, carbonyl compounds and PM components - that contribute to ozone pollution.
- Consider single sources of ozone pollution in rural counties, such as incinerators and coal-fired power plants, in nonattainment boundaries.
- Consider permits from significant ozone contributing industries, such as Fibrowatt LLC, that plan to build incinerators in rural counties.

- Consider combustion sources from industry that are contributors to ozone pollution.
- Consider the impacts of multiple sources of "ozone contributors" in rural counties and adjacent counties.
- Purchase additional ozone air monitors to accurately assess ozone levels in nonattainment areas.

Two decades later: NOx and ozone still an issue

The Clean Air Act Amendments of 1990 identified NOx and other criteria pollutants as major air pollution problems. At that time, the state's approach to air pollution was piecemeal at best. In 1999, BREDL submitted comments on the nitrogen oxide reduction plan proposed by the NC Department of Environment and Natural Resources. We submitted a plan for an 80% reduction in NOx emissions from the 14 large coal-fired power plants operated by Carolina Power & Light and Duke Energy, a reduction plan that was deemed achievable by the NC Division of Air Quality's Technical Services.

The problem of ozone pollution in NC was further delineated in comments made to the Environmental Management Commission (EMC) by Louis Zeller, BREDL, "Reduce Nitrogen Oxide Emissions From Coal-fired Electric Utility Boilers," at a Public Hearing on July 17, 2000:

High ozone levels caused the state to issue health advisories telling people to stay indoors to avoid breathing problems, asthma attacks, and respiratory infections. Ozone inhibits plant growth and damages crops. NOx emissions create ozone, reduce visibility, and contribute to acid rain, nitrate hazards in drinking water, and formation of toxic air pollution. National parks and other Class I areas, which are supposed to have the most pristine air in the country, are more polluted than cities. In fact, the two most polluted national parks in the nation are the Great Smoky Mountain and the Shenandoah National Parks. http://www.bredl.org/air/ncnox070500.htm

Nine years later, we continue to grapple with the same ozone pollution that threatens North Carolina cities, urban neighborhoods and rural areas, as well as the entire mountain region of the state. Our organization is working hard to reduce air pollution from all fossil-fuel burning sources including utility power plants and industrial boilers. As such, we advocate for a regional approach to the effort to reduce air pollution. Air pollutants, including ozone, NOx, SO2, air toxics, and particulate pollution are all part of the same problem for communities. They affect health, visibility, and the economy.

Much of North Carolina is experiencing rapid growth, and with that growth come increased levels of pollution and increased levels of ozone. Nonattainment boundaries should not be limited to urban areas alone; counties that are largely rural are being targeted as sites for big industry, polluting industries that will be contributing to higher levels of ozone as well as other types of pollution.

We know that human activities contribute to various levels of pollution that ultimately result in the formation of ozone. Such activities involve using leaf blowers, furnaces, power boats, jet skis, grilling steaks on charcoal grills, cutting grass using gas-powered lawn mowers, and driving gas-guzzling cars. Businesses that contribute to ozone are dry cleaners, commercial printers, gas stations, lawn mowers, airline industries, waste-to-

energy plants (i.e., incinerators), landfills, and coal-fired power plants. All of these contribute to various levels of ozone formation.

Waste-to-energy - or waste-to-pollution?

For example, Fibrowatt LLC is targeting a number of rural counties in NC for poultry waste burners. So far, two sites have been selected for plants in Surry and Sampson Counties in NC. These so-called clean "waste-to-energy" poultry waste burners produce more ozone pollution than a new coal-fired power plant, and will be major sources of contributors to ozone, emitting enormous amounts of NOx and other pollutants. http://www.bredl.org/energy/fibrowatt.htm

The NC Environmental Management Commission (EMC) supports our findings concerning the threat of burning poultry waste that is listed among other "clean energy" solutions in the state's renewable portfolio. To review the EMC's findings, see the attached document, "Comparison of Emissions from Controlled Coal and Biomass Combustion," NC Environmental Management Commission, Renewable Energy Committee, July 9, 2008. The graphs show that PM and CO emissions from poultry burners are higher than the same emissions from new coal-fired power plants. NOx emissions from poultry manure burning plants are almost four-times the amount of NOx emissions (based on power production) from new coal-fired power plants.

It has been said that the expansion of the auto emissions testing program, and the passing of the Clean Smokestacks Act, in 2002, have tremendously improved North Carolina's air quality. However, despite these improvements, people continue to breathe unhealthy levels of ozone. Poor atmospheric mixing and air inversions can increase ozone concentrations in populated areas to dangerous levels in a matter of hours. The risk to the very young, the elderly, and to people with heart or respiratory disease, and children is especially serious.

Health and environmental impacts from ozone pollution in NC

All children are at risk from ozone exposure because they often spend a large part of the summer playing outdoors, their lungs are still developing, they breathe more air per pound of body weight, and they are less likely to notice symptoms. Health studies have indicated that high ambient ozone concentrations may impair lung function growth in children, resulting in reduced lung function in adulthood. Both children and adults who frequently exercise outdoors are particularly vulnerable to ozone's negative health effects, because they may be repeatedly exposed to elevated ozone concentrations while breathing at an increased respiratory rate.

Asthmatics and other individuals with respiratory disease are especially at risk from elevated ozone concentrations. Ozone can worsen, and may trigger, asthma attacks. Ozone may also contribute to the development of asthma. A recent study published in the British medical journal The Lancet found a strong association between elevated ambient ozone levels and the development of asthma in physically active children. http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(02)07597-9/abstract Ozone pollutes our surface waters. The nitrogen oxides that contribute to ozone pollution fall back to the earth as nitrogen compounds, contributing to nutrient pollution of streams, rivers, and estuaries. As much as half of the nitrogen pollution in North Carolina's coastal waters may come from air pollution, and nutrient pollution contributes to algal blooms, reduced oxygen content of water, and fish kills.

Ozone pollution can damage plant tissues, reducing growth rates and agricultural yields. Ozone interferes with the ability of plants to produce and store food, making them more susceptible to disease, insects, other pollutants, and harsh weather. In 1995, ozone pollution caused $2.7 billion in crop loss nationwide, according to the U.S. EPA. Ground-level ozone damages the foliage of trees and other plants, impacting the landscape of cities, national parks and forests, and recreation areas.
http://daq.state.nc.us/airaware/ThinkActBreathe/details2.shtml

In addition to NOx, VOCs contribute to ozone pollution. Ozone is a secondary pollutant, and is formed as a result of a complex interaction between ozone precursors, meteorological conditions and photochemistry. Volatile organic compound (VOCs) concentrations are part of the root causes of ozone formation.

VOCs contribute significantly to ozone pollution

We also wish to emphasize the importance of toxic air pollutants, and specifically, the role of VOCs as contributors to ozone formulation. There are forty-nine (49) air toxics indentified as significant contributors to ozone formation. These include:

Volatile Organic Compounds
1,3-butadioene
Methylene chloride
Methyl *tert* butyl ether
Chloroprene
Carbon tetrachloride
Benzene
Trichloroethylene, and toluene
Tetrachloroethylene
Ethyl benzene
O,m,& p-xylenes
Styrene
1,4-dichlorobenzene
d-limonene
a- and b-pinene

Carbonyl Compounds
Formaldehyde
Acetaldehyde, and acrolein
Crotonaldehyde
Glyoxal
Acetone
Propionaldehyde
Benzaldehyde
Hexaldehyde
Isovaleraldehyde
Valeraldehyde
o-toluladehyde
m&p-tolualdehyde

PM Components
PM 2.5
http://files.harc.edu/Sites/TERC/About/Events/SAC200506/SpecificIssuesAirToxics.pdf

Ozone is not usually emitted directly into the air, but is created by a chemical reaction between oxides of nitrogen (NOx) and VOCs in the presence of sunlight. Many urban areas tend to have high levels of "bad" ozone, but rural areas are also subject to increased ozone levels because wind carries ozone and pollutants that contribute to its formation hundreds of miles away from their original sources.
http://www.epa.gov/air/ozonepollution/

EPA's regional approach to nonattainment areas

A 2008 Memorandum from EPA to Regional Administrators, "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards," notes that Section 107(d)(1) of the CAA defines an area as being in nonattainment if it is violating the National Ambient Air Quality Standards (NAAQS), or if it is contributing to a violation in a nearby area.

The Memorandum further notes that the EPA *"believes it is important to examine ozone-contributing emissions across a relatively broad geographic area;"* therefore, the EPA recommends that the Core Based Statistical Area (CBSA) or Combined Statistical Area (which includes two or more adjacent CBSAs) associated with the violating monitor(s) serve as the starting point for or presumptive boundary for evaluating the geographic areas of an ozone nonattainment area. Where there is not a violating monitor(s) located in a CBSA or CSA, the EPA recommends that the boundary of the county containing the monitor serve as the starting point for considering the extent of the nonattainment area.
http://www.scdhec.gov/environment/baq/docs/OzoneBoundaries/20081204_AreaDesignations2008RevisedOzoneNAAQSGuidanceUpdated.pdf

The EPA's Presumptive Nonattainment Boundaries include the following counties in whole: Stokes, Surry, Yadkin, Harnett, Iredell, Johnston, Chatham, Anson, Stanly, Haywood, Swain, Currituck and Hoke Counties. In contrast, the DAQ's Proposed Non-Attainment Boundaries omit all of these counties, and include only portions of Chatham, Johnston, Caswell, Haywood, Swain and Burke Counties. After a careful review of the EPA's *Green Book,* "Nonattainment Status for Each County by Year Report," it appears that DAQ has merely taken those counties designated as "Part" in the column "County N/A Whole/Part," and used the designation literally by assigning them *partial designations* in its Proposed Nonattainment Boundaries. However, the EPA has included each of these counties in whole in its final Presumptive Nonattainment Boundaries assessment.

We agree with EPA's recommendation that each of these counties be included in NC's Proposed Nonattainment Boundaries in whole due to their locations adjacent to counties currently in nonattainment. It is very likely that many of these counties will soon have industries that will be major contributors to ozone pollution. Others, like Stokes County, already have industries in place that are major contributors to ozone pollution.

Children are exposed to ozone and other air toxics in rural counties

Some of the examples below cite the USA Today report, "The Smokestack Effect: Toxic Air and America's Schools," concerning exposures from toxic air pollutants from industries on school children living in various counties across the nation. We cite the USA Today report for two reasons: 1) to show that some of these industries release compounds known to contribute to ozone formation; and 2) to show that emissions from

some industries, such as coal-fired power plants, know no boundaries and cross county lines to contribute to ozone pollution in other counties.

The measures in the report are based on a model and estimates emissions, thus they are subject to some limitations. Toxicity assessments for each school are based on emissions data collected by the U.S. Environmental Protection Agency as part of its Toxics Release Inventory program (TRI). Generally, only large industrial and government facilities are required to report to the TRI, meaning there are many other potential sources of pollution that are not included in the agency's data. As a result, those sources also are not included in toxicity assessments for schools.

For example, the model makes certain assumptions about topography, the height of smokestacks and the toxicity of certain chemicals, any of which could influence the assessment of toxicity in a particular location. In some cases, the EPA model appeared to underestimate exposure to toxic chemicals. In others, it appeared to overstate it. Also, the model is not meant to assess risk, your chances of getting sick.
http://content.usatoday.com/news/nation/environment/smokestack/methodology

A primary source of NOx in North Carolina is coal-burning in electric utility power plants. Duke Power and Carolina Power & Light operate fourteen (14) coal fired plants which emit a combined total of 490 million pounds of NOx per year; these plants produce 72% of the NOx pollution emitted by all stationary sources in North Carolina. Coal-fired power plants are a major source of ozone pollution.
http://www.bredl.org/air/ncnox070500.htm

As the state's largest coal-fired power plant, the Belews Creek Steam Station in Stokes County is the largest contributor to ozone pollution in Stokes County. Adjacent counties at risk for ozone pollution from the Belews Creek Steam Station include Surry, Yadkin, Forsyth, Guilford and Rockingham. Both Surry and Yadkin have been omitted from NC's Proposed Nonattainment Boundaries.

Additional contributors to ozone

According to a list of statewide combustion sources provided to BREDL by the DAQ, the Belews plant has 4 combustion sources, auxiliary boilers that use a combination of #2 fuel oil, propane and diesel fuels. In addition to the Belews Creek Steam Station, Stokes County has a number of combustion sources that emit VOCs and other pollutants that contribute to ozone formation from industries that include Bill Hanks Lumber; JPS Elastomerics Corp; and Kobe Wieland Copper Products.

In contrast, Surry County has no power plant, but is home to a number of polluting industries with over three-dozen combustion sources at the following industries: Bassett Furniture; Candle Corp of America; Elkin Asphalt Plant; Henredon Furniture; Interface Fabrics Group South; Kentucky Derby Hosiery; RMC Mid-Atlantic; Sara Lee Sock Co; NC Granite Corp; Vaughan- Bassett Furniture; Wayne Farms; and Weyerhaeuser Co. – all contributors at various levels to ozone pollution. Lastly, Surry County may soon be the location of the state's largest contributor to ozone pollution, the Fibrowatt LLC poultry waste burning plant.

Because Surry may soon be home to the state's largest contributor to ozone pollution, we encourage the Division to include Sampson County in the state's Proposed Nonattainment Boundaries. Sampson is also located next to Cumberland County to its

west, and Johnston County to its north, both of which are included in NC's Proposed Nonattainment Boundaries and EPA's Presumptive Nonattainment Boundaries.

Yadkin County should be considered for inclusion as a Nonattainment County because of its strategic location to the southwest of Stokes County's coal-fired power plant, and Surry's three dozen combustion sources.

Iredell County is a veritable industrial center, home to ASMU NC; Bien Fang Products; Bruce hardwood Flooring; Cardinal Glass; Statesville WWTP; Carris Reeling; Donwalt Industries; FoamCOR; G&M Milling; Hexcell Reinforcement; John Boyle & Co.; Kewaunee Scientific Corp.; Lake Norman Regional Medical Center; Matshushita Compressors; Purina Mills; Ready Mixed Concrete; Sara Lee Apparel; Somers Lumber and Manufacturing; Spicer Off-Hwy Products; Thomasville Furniture; Tire Centers, LLC; Transcontinental Gas Pipeline; Troutman Chair Co.; Tyson Foods; Union Grove Moulding and Milling; and last but not least, Warlick Paint Company, Inc. All of these industries have at least one or more multiple combustion sources with emissions that contribute to ozone formation.

Hoke County, located to the west of Cumberland County, is small, but has at least two major industries, Burlington and Conopco, Inc., both located in Reaford. These industries emit numerous pollutants that contribute to ozone pollution. Because Cumberland is home to two major chemical companies, Du Pont and Borden Chemical, and two military bases with multiple combustion sources, ABN Corps & Fort Bragg and Pope Air Force Base, Hoke County should be included on NC's Proposed Nonattainment Boundaries list. Also of note: Fort Bragg will soon be expanding, bringing more people and traffic to surrounding counties, including Hoke County.

Stanly County is home to Alcoa, Inc., as well as several other industries with combustion sources. According to a USA Today report on toxic exposures from industries to school children, the Duke Energy Corp's Buck Steam Station, the oldest coal-fired power plant in the state, is located on the border of Davidson and Rowan Counties adjacent to Stanly County. The Buck Steam Station is cited as a contributor to children's exposures to air toxics at the Albemarle High School in Stanly County. As a coal-fired power plant, it is also a contributor to ozone pollution.
http://content.usatoday.com/news/nation/environment/smokestack/school/66473

Anson County, south of Stanly, has a number of industries that include Wade Manufacturing Co.; Valley Protein; Triangle Brick Co.; and Hornwood, Inc. Air pollutants from these industries include acrolein and formaldehyde, contributors to ozone formation.
http://content.usatoday.com/news/nation/environment/smokestack/school/64789

Harnett County lists a number of industries responsible for toxics outside schools in Harnett County, citing formaldehyde as a toxic pollutant. The report names Fort Bragg; Progress Energy, Inc.; Carolinas Cape Fear Steam Electric in Moncure, North Carolina; Hexion Specialty Chemicals, Inc.; Triangle Brick Co.; and Lee Brick & Tile Co.
http://content.usatoday.com/news/nation/environment/smokestack/school/65597

NC DAQ gave partial designations for Nonattainment Boundaries to Haywood, Swain, Johnston, Caswell, and Burke Counties. Johnston County has Bayer Corp., Andrew Corp., CP&L Generators, Keener Lumber, NC Natural Gas, and PGI Interwovens – as well as the MSW Landfill, all of which have emissions from combustion sources.

Swain and Haywood Counties, located on the western rim of the state, were included for partial designation. Blue Ridge Paper Products resides in Haywood County, the subject of statewide controversy when it was ranked as one of the worst counties in NC in terms of school children's exposures to air toxics. The report named Blue Ridge Paper Products and Blue Ridge Metals as the main contributors to exposures to children at Bethel Christian Academy, ranked in the 1st percentile for high levels of children's exposures to air toxics, specifically from formaldehyde and acetaldehyde, carbonyl compounds that contribute to ozone formation.
http://content.usatoday.com/news/nation/environment/smokestack/school/118297

The report lists chlorine and chlorine dioxide as additional releases from Blue Ridge Paper products. The Union of Concerned Scientists concludes: *When chlorine is released into the atmosphere, it drifts up into the stratosphere, pushed by winds and atmospheric mixing. At that high altitude, energetic light rays (UV-C radiation) can break down such molecules in a reaction that liberates an atom of chlorine (Cl). This chlorine atom can react with ozone and break it down to chlorine oxide and O2. Chlorine oxide will break down as well, releasing the Cl to go on destroying ozone. In fact, one Cl can destroy up to 10,000 ozone molecules!*
http://www.ucsusa.org/global_warming/science_and_impacts/science/faq-about-ozone-depletion-and.html

The report also names Carolina Power & Light Co., in Asheville, as a contributor to exposures to children in Haywood County schools from toxic air pollutants. Swain County is located to the southwest (downstream) of Haywood County. Because of Haywood's location, both Haywood and Swain Counties should be placed on the state's Proposed Boundaries for Nonattainment list in whole.
http://content.usatoday.com/news/nation/environment/smokestack/school/118297

The USA Today report concluded that polluting industries most responsible for toxics outside Johnston schools include Carolina Power & Light Co.'s H.F. Lee Steam Electric Station in Goldsboro, North Carolina, and U.S. Army Base at Fort Bragg, NC.
http://content.usatoday.com/news/nation/environment/smokestack/school/65730

Chatham County had it own numbers of polluting industries (10+); however, once again the USA Today report cited Progress Energy, Inc., Carolinas Cape Fear Steam Electric, as contributing to exposures to children at Chatham Early College in Pittsboro, as well as other schools in other areas of Chatham, as contributing to exposures to children from air toxics. http://content.usatoday.com/news/nation/environment/smokestack/school/65086

Both Burke and Caswell Counties are located next to Alexander and Catawba Counties, which have been listed by EPA and NC DAQ as nonattainment counties. However, Burke is home to dozens of polluting industries, mainly furniture, textile and chemical plants, many with combustion sources contributing to ozone pollution. In contrast,

Alexander County has fewer industries than Burke County, so it is unclear why Alexander is a listed by NC as a nonattainment county, and Caswell County has been given partial nonattainment status by the state.

In lieu of another piecemeal approach that proposes to partially solve the problem through a partial solution, we respectfully request that the NC Division of Air Quality adopt the EPA's Presumptive Nonattainment Boundaries as recommended by the EPA.

A straightforward, regional approach such as that recommended by the EPA will safeguard the health of citizens in urban as well as rural areas that may be impacted by ozone pollution from adjacent counties in nonattainment.

Under the newly proposed standards, there are 21 counties of the 30 counties where DAQ operates air monitors to detect ozone levels, thus we recommend that DAQ purchase more air monitors for its ozone nonattainment program in order to assess ozone pollution levels in additional counties.

Thank you for your consideration. If you have any questions regarding these comments please feel free to contact me at: 336-525-2003.

Sincerely yours,

Susan Dayton, Statewide Coordinator
BREDL NC Healthy Communities

Comparison of Emissions from Controlled Coal and Biomass Combustion

North Carolina Environmental Management Commission

Renewable Energy Committee

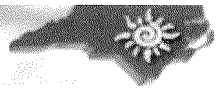
July 9, 2008

Brock M. Nicholson, P.E.
Deputy Director
Division of Air Quality

Assumptions

Heat rate, mm Btu/mW-hr				
New wood	New coal	Existing coal	Existing biomass	poultry litter
13.00	8.90	12.80	13.06	14.10

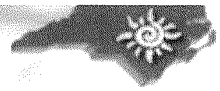
Controls				
Unit	PM-10	NOx	CO	SO2
New Wood	Bagfilter or ESP	SNCR	Good combustion	Spray dryer or Scrubber
New Coal	Bagfilter or ESP	SCR	Good combustion	Scrubber
Existing coal	ESP	Low NOx Burners	Good combustion	None
Existing biomass	Multiclone and ESP	None	Good combustion	None
Poultry litter	Bagfilter	SNCR	Good combustion	Spray dryer



Emissions based of Fuel Fired

Emission Factor, lb/mmBtu					
Pollutant	New wood	New coal**	Existing coal*	Existing biomass (55.8 mW)**	Poultry litter (57 mW)**
CO	0.350	0.120	0.0213	0.450	0.240
PM	0.025	0.012	0.049	0.020	0.020
NOx	0.200	0.070	0.290	0.230	0.160
SO2	0.025	0.130	1.295	0.010	0.070
CO2	209	206	206	209	216

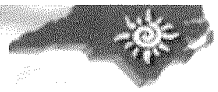
** permitted * test data



Emissions Based on Power Production

	Emission Factor, lb/mw-hr				
Pollutant	New Wood	New Coal**	Existing coal*	Existing biomass** (55.8 mW)	Poultry litter** (57 mW)
CO	4.550	1.10	0.27	5.88	3.38
PM	0.325	0.11	0.63	0.26	0.28
NOx	2.600	0.62	3.71	3.00	2.26
SO2	0.325	1.16	16.6	0.13	0.99
CO2	2,715	1,830	2,620	2,730	3,040

* test data ** permitted



Emissions of Comparable Size Units

Hourly emissions, pounds per hour 50 mw boiler					
Pollutant	New Wood	New Coal	Existing coal	Existing biomass	Poultry litter
CO	227.5	55.0	13.6	293.9	169.0
PM	16.25	5.5	31.4	13.1	14.0
NOx	130	31.2	185.6	150.2	113.0
SO2	16.25	57.9	828.8	6.5	49.5
CO2	135,750	91,500	131,000	136,477	152,000

Air Toxics and Ozone Formation

Volatile Organic Compounds:

- **1,3-butadiene**
- Methylene chloride
- Methyl *tert* butyl ether
- Chloroprene
- Chloroform
- Carbon tetrachloride
- **Benzene**
- Trichloroethylene
- **Toluene**
- Tetrachloroethylene
- **Ethyl benzene**
- ***o,m* & *p*-xylenes**
- **Styrene**
- 1,4-dichlorobenzene
- *d*-limonene
- ***α*- and *β*-pinene**

Carbonyl Compounds:

- **Formaldehyde**
- **Acetaldehyde**
- Acrolein
- **Crotonaldehyde**
- Glyoxal
- Methylglyoxal
- Acetone
- **Propionaldehyde**
- **Benzaldehyde**
- **Hexaldehyde**
- **Isovaleraldehyde**
- **Valeraldehyde**
- **o-toluladehyde**
- **m&p-tolualdehyde**

PM Components:

- $PM_{2.5}$

BOLD= Ozone Precursor

MICKEY LELAND NATIONAL URBAN AIR TOXICS RESEARCH CENTER

Air Toxics Research and Ozone Research

- Why should air toxics research be part of research program focused on ozone and atmospheric chemistry?
  - Ozone formation, understanding and mitigation is a complex regional issue. VOCs (many are defined air toxics) are a local contributor to ozone formation.
  - Ozone is formed by a complex interaction between ozone precursors, meteorological conditions and photochemistry. VOC concentrations are part of this reaction.
  - Ozone is a secondary pollutant. It is important to understand the root components. VOCs are emitted directly and are part of the root causes of ozone formation.
  - Foundation of all air quality regulation is the protection of the public health and welfare. Understanding the air toxics contribution to ozone formation increases the ability to efficiently protect the public health by potentially reducing both air toxics and ozone.
  - Ozone research has a mature and well developed measurement infrastructure. Air toxics research measurement infrastructure is developing and can contribute new innovative local measurement methods that can enhance understanding of air toxics and ozone.

MICKEY LELAND NATIONAL URBAN AIR TOXICS RESEARCH CENTER

Saratoga Co	8-Hr Ozone	Albany-Schenectady-Troy, NY	04 05 06 07 08	/ /	Subpart 1	Whole
Schenectady Co	8-Hr Ozone	Albany-Schenectady-Troy, NY	04 05 06 07 08	/ /	Subpart 1	Whole
Schoharie Co	8-Hr Ozone	Albany-Schenectady-Troy, NY	04 05 06 07 08	/ /	Subpart 1	Whole
Suffolk Co	8-Hr Ozone	New York-N. New Jersey-Long Island,NY-NJ-CT	04 05 06 07 08	/ /	Moderate	Whole
Suffolk Co	PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT	05 06 07 08	/ /	Nonattainment	Whole
Wayne Co	8-Hr Ozone	Rochester, NY	04 05 06 07 08	/ /	Subpart 1	Whole
Westchester Co	8-Hr Ozone	New York-N. New Jersey-Long Island,NY-NJ-CT	04 05 06 07 08	/ /	Moderate	Whole
Westchester Co	CO	New York-N. New Jersey-Long Island, NY-NJ-CT	92 93 94 95 96 97 98 99 00 01	05/20/2002	Moderate > 12.7ppm	Whole
Westchester Co	PM-2.5	New York-N. New Jersey-Long Island,NY-NJ-CT	05 06 07 08	/ /	Nonattainment	Whole
NORTH CAROLINA						
Cabarrus Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Whole
Catawba Co	PM-2.5	Hickory, NC	05 06 07 08	/ /	Nonattainment	Whole
Chatham Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Part
Davidson Co	PM-2.5	Greensboro-Winston Salem-High Point, NC	05 06 07 08	/ /	Nonattainment	Whole
Durham Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Durham Co	CO	Raleigh-Durham, NC	92 93 94 95	09/18/1995	Moderate <= 12.7ppm	Whole
Edgecombe Co	8-Hr Ozone	Rocky Mount, NC	04 05 06	01/05/2007	Subpart 1	Whole
Forsyth Co	CO	Winston-Salem, NC	92 93 94	11/07/1994	Moderate <= 12.7ppm	Whole
Franklin Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Gaston Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Whole
Granville Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Guilford Co	PM-2.5	Greensboro-Winston Salem-High Point, NC	05 06 07 08	/ /	Nonattainment	Whole
Haywood Co	8-Hr Ozone	Haywood and Swain Cos (Great Smoky NP), NC	04 05 06 07 08	/ /	Subpart 1	Part
Iredell Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Part
Johnston Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Lincoln Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Whole
Mecklenburg Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Whole
Mecklenburg Co	CO	Charlotte, NC	92 93 94 95	09/18/1995	Not Classified	Whole
Nash Co	8-Hr Ozone	Rocky Mount, NC	04 05 06	01/05/2007	Subpart 1	Whole
Orange Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Person Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Rowan Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Whole
Swain Co	8-Hr Ozone	Haywood and Swain Cos (Great Smoky NP), NC	04 05 06 07 08	/ /	Subpart 1	Part
Union Co	8-Hr Ozone	Charlotte-Gastonia-Rock Hill, NC-SC	04 05 06 07 08	/ /	Moderate	Whole
Wake Co	8-Hr Ozone	Raleigh-Durham-Chapel Hill, NC	04 05 06 07	12/26/2007	Subpart 1	Whole
Wake Co	CO	Raleigh-Durham, NC	92 93 94 95	09/18/1995	Moderate <= 12.7ppm	Whole
OHIO						
Adams Co	PM-2.5	Huntington-Ashland, WV-KY-OH	05 06 07 08	/ /	Nonattainment	Part
Allen Co	8-Hr Ozone	Lima, OH	04 05 06	06/15/2007	Subpart 1	Whole
Ashtabula Co	8-Hr Ozone	Cleveland-Akron-Lorain, OH	04 05 06 07 08	/ /	Moderate	Whole
Ashtabula Co	PM-2.5	Cleveland-Akron-Lorain, OH	05 06 07 08	/ /	Nonattainment	Part
Belmont Co	8-Hr Ozone	Wheeling, WV-OH	04 05 06	06/15/2007	Subpart 1	Whole
Belmont Co	PM-2.5	Wheeling, WV-OH	05 06 07 08	/ /	Nonattainment	Whole
Butler Co	8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN	04 05 06 07 08	/ /	Subpart 1	Whole
Butler Co	PM-2.5	Cincinnati-Hamilton, OH-KY-IN	05 06 07 08	/ /	Nonattainment	Whole
Clark Co	8-Hr Ozone	Dayton-Springfield, OH	04 05 06 07	08/13/2007	Subpart 1	Whole
Clark Co	PM-2.5	Dayton-Springfield, OH	05 06 07 08	/ /	Nonattainment	Whole
Clermont Co	8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN	04 05 06 07 08	/ /	Subpart 1	Whole
Clermont Co	PM-2.5	Cincinnati-Hamilton, OH-KY-IN	05 06 07 08	/ /	Nonattainment	Whole
Clinton Co	8-Hr Ozone	Cincinnati-Hamilton, OH-KY-IN	04 05 06 07 08	/ /	Subpart 1	Whole
Columbiana Co	8-Hr Ozone	Youngstown-Warren-Sharon, OH-PA	04 05 06	06/12/2007	Subpart 1	Whole
Coshocton Co	PM-2.5	Columbus, OH	05 06 07 08	/ /	Nonattainment	Part
Coshocton Co	SO2	Franklin Township (Coshocton County), OH	92 93 94 95 96 97 98 99 00	07/05/2000	Primary	Part
Cuyahoga Co	8-Hr Ozone	Cleveland-Akron-Lorain, OH	04 05 06 07 08	/ /	Moderate	Whole
Cuyahoga Co	CO	Cleveland, OH	92 93	03/07/1994	Moderate <= 12.7ppm	Whole
Cuyahoga Co	PM-10	Cuyahoga Co, OH		01/10/2001	Moderate	Whole

January 16, 2009

To those receiving public comments about air quality standards:

Continued insistence that loops and other *new* roadways receive financing indicates that improving air quality is low on the agenda for the Triad. It is of lesser importance in spite of the fact that the EPA strengthened regulations which state that new road construction may not further compromise the air quality.

Building NEW roads does just that. Not only do roads affect air quality, developers touting them as a means to invite millions of new residents into our state perpetuate sprawl which takes out tree canopies and further compromises a self-limiting water supply.

At least one business is working to control the noise pollution of air freight service. However, the strategies they are developing cannot be implemented in the US. The green space needed to reduce noise is insufficient (we have become strip cities) in airport areas to buffer take offs and landings.

It is time for a change in thinking! In a state that is half the land mass of Texas and with as many miles of paved roads; efforts for improving the air quality are past due. Expanding the bus systems and developing passenger and freight rail would begin to move us in the right direction.

Thank you for listening to my concerns.

Best regards,
Donna Bonds Donna Bonds
205 Emerywood Court
Kernersville, NC 27284
336/993-5782

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Appendix B

Local Government and Public Comments Received

(Western NC Comments)

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January 13th, 2009

Comments

Asheville and Western NC -- January 13th, Tuesday, 7:00 PM,
Colonial Theater, Colonial Annex, 53 Park Street, Canton.

N.C. Division of Air Quality (DAQ)

Hello, my name is Margaret O'Nan and I am a youth president of the Blue Ridge Environmental Defense League. I am here tonight to urge more thorough regulation of ozone causing pollutants. Asthma and chronic respiratory diseases are becoming more common in our state, not to mention that we can no longer see our mountains.

We already know 21 of the 30 monitored counties are not within the new EPA ranges. These ranges are put in place for our protection and should be made a priority.

We need to encourage rail transportation to reduce the exhaust produced by cars and trucks and create strict regulation of our industries that use combustion, including our coal power plants. There is also the outdated and unhealthy exemption (Air Toxics Rule 15A NCAC 2Q.0700) for certain combustion sources that can only add to our ozone pollution.

If we want to preserve our beautiful state, the intrinsic tourist value and our health we must address this problem fully.

Thank you for your time.

Margaret O'Nan
396 Sugar Cove Rd.
Marion, NC 28752
(828) 724 4221
eonan@emptyo.com

January 13, 2009

Comments

Asheville and Western North Carolina -- January 13, Tuesday, 7 p.m., Colonial Theatre, Colonial Annex, 53 Park St., Canton.

N.C. Division of Air Quality (DAQ)

My name is Elizabeth O'Nan; I am here tonight to represent the McDowell Environmental Health Authority, a McDowell County chapter of the Blue Ridge Environmental Defense League.

McDowell County has no Ozone Monitoring device in our county despite the fact that we have excessive levels of Ozone. We also have elevated rates of cancer, asthma, and diabetes as determined by a recent health survey. Asthma is the prevalent cause of absenteeism in our schools. We are located in an area where thermal conversions are present. Further, we have several Title V polluters in our county that potentially contribute to Ozone levels. This permits Ozone levels to reach deadly levels in a very short time.

Tourism is adversely affected by current Ozone levels as well as our local health. With ever greater numbers of industries closing in McDowell County, tourism is of tremendous importance to our current economy and is being adversely affected by Ozone and other air pollution.

We must reduce current levels of Ozone to improve our health and lower our health costs as well as making our county more attractive to tourists who wish to enjoy our many outdoor activities.

Included in our county is the Linville Falls area that needs and deserves special protection and is a federally designated protected area.

I own acreage in the upper Buck Creek area and have been continually depressed over the loss of our forests health. Many plants that flourished there 13 years ago are now sick and dying. As to how much of this may be due to Ozone levels that make me ill as well as my farms forests, since there is too little research into this pollution we may never know. I do know that we must do all that we can to preserve our air quality.

I would generally request that the current Ozone levels be lowered as the current levels are obviously not low enough to meet the mandate to protect our health and environment. We are dying from poor regulation of air pollution. Just because we don't know exactly which of us will die from Ozone pollution does not negate this fact. To allow these unnecessary deaths to continue is nothing short of premeditated random homicide.

Specifically, I urgently propose that Ozone monitoring devices be placed near appropriate industry and high ozone areas within McDowell County. We can not know the extent of Ozone danger and damage until we look. It is incumbent upon the NC Division of Air Quality to protect our health and environment. This is the least that should be done in fulfillment of that duty.

Sincerely,

Elizabeth O'Nan, president
McDowell Environmental Health Authority
396 Sugar Cove Road, Marion, NC 28752-6228
Phone: 828 724 4221
Email: pace@mcdowell.main.nc.us

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Appendix B

Local Government and Public Comments Received

(Hickory-Lenoir-Morganton Area Comments)

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Western Piedmont Council of Governments
736 Fourth Street SW, Hickory, NC 28602
PO Box 9026, Hickory, NC 28603
828.322.9191 • Fax: 828.322.5991 • www.wpcog.org

40 Years of Regional Leadership

January 23, 2009

Mr. George M. Bridgers
Meteorologist
NCDENR-Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Subject: 8-Hour Ozone Non-Attainment Boundaries

Dear Mr. Bridgers:

We are writing on behalf of the Unifour Air Quality Oversight Committee and the Unifour Air Quality Committee (UAQC), representing the Hickory-Morganton-Lenoir areas in North Carolina (also known as the Unifour Area). We have been diligently working on our Early Action Compact (EAC) Milestones since December 2002. The EAC process proved successful, as our area was deemed in attainment status for ozone in April 2008.

Our new focus is the proposed Non-Attainment Boundaries for the new lower ozone standards that are under consideration at the present time. We are concerned that EPA may designate all four counties in our area as Non-Attainment of the new 8-Hour Ozone Standard. We realize that many factors are examined when making the designations for Non-Attainment areas and for that reason we would like EPA to examine closely boundaries that are currently being reviewed. We believe that the most logical boundary would follow the MPO planning boundary in Burke, Caldwell and Catawba Counties (See Map Insert). In Alexander County the most logical boundary would follow Census Tracts 403, 404, 406 and 407. Inside of these Census Tracts are the Hickory portion of the urbanized area that is in Alexander County, the Taylorsville Urbanized Cluster, and the Taylorsville Ozone Monitor which is currently violating the new standard. Using the MPO Boundary in Burke, Caldwell and Catawba Counties and Census Tracts 403, 404, 406 and 407 in Alexander County would capture the majority of population and traffic for this area that is contributing to the ozone problem. Since mobile sources are a large reason for our high levels of ozone, then it would make sense to concentrate on the source of the problem rather than the areas outside those boundaries. There are large rural areas that would be included if whole county areas were designated. The rural areas are already at a disadvantage in numerous ways, but to add the "Non-Attainment" label to these areas would be detrimental.

We appreciate your careful review of our area and the boundaries that will be designated. Please feel free to contact us if you have any questions regarding our area.

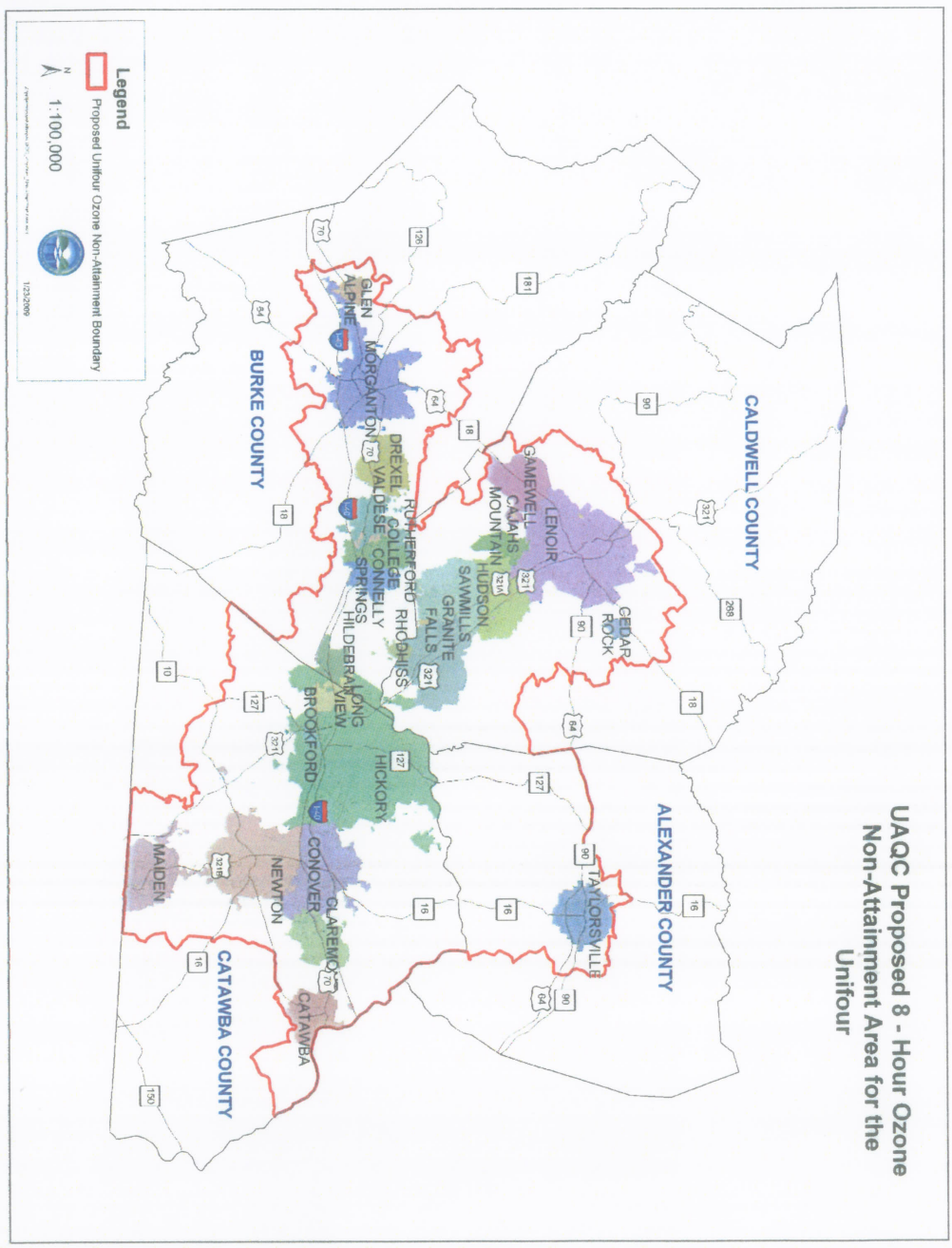
Sincerely,

Dr. Marjorie Strawn
Vice-Chair UAQOC

Doug Urland,
Chairman, UAQC

Western Piedmont Council of Governments
736 Fourth Street SW, Hickory, NC 28602
PO Box 9026, Hickory, NC 28603
828.322.9191 • Fax: 828.322.5991 • www.wpcog.org

40 Years of Regional Leadership



Alexander County

Administrative Offices

February 16, 2009

Mr. George M. Bridgers
Meteorologist
NCDENR – Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Subject: 8-Hour Ozone Non-Attainment Boundaries

Dear Mr. Bridgers,

We are writing on behalf of Alexander County and as members of the Unifour Air Quality Oversight and Unifour Air Quality Committees, representing the Hickory-Morganton-Lenoir areas in North Carolina (also known as the Unifour Area). We have worked diligently on the Early Action Compact (EAC) Milestones since December 2002 and the process proved successful as our area was deemed in-attainment status for ozone in April 2008.

Our attention is now focused on the proposed non-attainment boundary for the lower ozone standards presently under consideration. We are concerned that EPA may designate all four Unifour counties as non-attainment of the new 8-hour ozone standard. We realize that many factors are examined when making the designations for non-attainment areas and for that reason we would like EPA to examine closely the boundaries currently being reviewed. We believe that the most logical boundary would follow the MPO planning boundary in Burke, Caldwell and Catawba Counties and follow Census Tracts 403, 404, 406 and 407 boundaries in Alexander County. Inside of these census tracts is Alexander County's portion of the Hickory Urbanized Area, the Taylorsville Urbanized Cluster and the Taylorsville Ozone Monitor Site; which is currently violating the new standard. Using the MPO boundary in Burke, Caldwell and Catawba Counties and census tracts 403, 404, 406 and 407 in Alexander County would capture the majority of population and traffic contributing to the ozone problem. Since mobile sources are a large reason for our high levels of ozone, then it would make sense to concentrate on the source of the problem rather than the areas outside those boundaries. There are large rural areas that would be affected if the entire county jurisdictions were designated. The rural areas are already

621 Liledoun Road, Taylorsville, NC 28681
Phone (828) 632-7332 Fax (828) 632-0059

at a disadvantage in numerous ways, but to add the "non-attainment" label to these areas would be detrimental.

We appreciate your careful review of our area and the boundaries that will be designated. Please feel free to contact us if you have any questions regarding our area.

Sincerely,

W. Darrell Robertson, Chairman
Alexander County Commissioners

cc: File

621 Liledoun Road, Taylorsville, NC 28681
Phone (828) 632-4332 Fax (828) 632-0059

City of Conover

February 6, 2009

Mr. George M. Bridgers
Meteorologist
NCDENR-Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Subject: 8-Hour Ozone Non-Attainment Boundaries

Dear Mr. Bridgers:

I am writing on behalf of the City of Conover and as member of the Unifour Air Quality Oversight Committee and the Unifour Air Quality Committee (UAQC), representing the Hickory-Morganton-Lenoir areas in North Carolina (also known as the Unifour Area). We have been diligently working on our Early Action Compact (EAC) Milestones since December 2002. The EAC process proved successful, as our area was deemed in attainment status for ozone in April 2008.

Our new focus is the proposed Non-Attainment Boundaries for the new lower ozone standards that are under consideration at the present time. We are concerned that EPA may designate all four counties in our area as Non-Attainment of the new 8-Hour Ozone Standard. We realize that many factors are examined when making the designations for Non-Attainment areas and for that reason we would like EPA to examine closely boundaries that are currently being reviewed. We believe that the most logical boundary would follow the MPO planning boundary in Burke, Caldwell and Catawba Counties (See Map Insert). In Alexander County the most logical boundary would follow Census Tracts 403, 404, 406 and 407. Inside of these Census Tracts are the Hickory portion of the urbanized area that is in Alexander County, the Taylorsville Urbanized Cluster, and the Taylorsville Ozone Monitor which is currently violating the new standard. Using the MPO Boundary in Burke, Caldwell and Catawba Counties and Census Tracts 403, 404, 406 and 407 in Alexander County would capture the majority of population and traffic for this area that is contributing to the ozone problem. Since mobile sources are a large reason for our high levels of ozone, then it would make sense to concentrate on the source of the problem rather than the areas outside those boundaries. There are large rural areas that would be included if whole county areas were designated. The rural areas are already at a disadvantage in numerous ways, but to add the "Non-Attainment" label to these areas would be detrimental.

We appreciate your careful review of our area and the boundaries that will be designated. Please feel free to contact us if you have any questions regarding our area.

Sincerely,

Johnny Brown
Mayor Pro-Temp

[Post Office Box 549 | Conover, North Carolina | 28613 | voice/tdd (828) 464-1191 | fax (828) 465-5177]

CITY OF MORGANTON
NORTH CAROLINA
OFFICE OF THE MAYOR

February 11, 2009

Mr. George M. Bridgers
Meteorologist
NCDENR – Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Subject: 8-Hour Ozone Non-Attainment Boundaries

Dear Mr. Bridgers:

The Morganton City Council, at its regular meeting of February 2, 2009, voted to endorse the recommendations of the Unifour Air Quality Committee and the Unifour Air Quality Oversight Committee regarding proposed boundaries for 8-Hour Ozone non-attainment zones in the Hickory-Morganton-Lenoir area. You should already have received correspondence from the Western Piedmont Council of Governments giving the details of their recommended boundary.

In Burke County this proposed boundary includes the municipalities and more Populated areas of the central part of the County along Interstate 40. It excludes the more rural part of the County where a number of state parks and natural areas are located. It is the same boundary that was previously designated when area governments worked together on the Ozone Early Action Compact. Maintaining this same boundary will lead to easier public acceptance and understanding as citizens and organizations within this boundary are already familiar with the ozone problem and ozone reduction strategies.

While we would hope that our area would not be designated non-attainment for ozone, we think this recommended boundary is reasonable should designation be required.

We appreciate your consideration of our views on this important matter.

Respectfully,

Mel L. Cohen, Mayor

MLC/dbo

cc: Dee Freeman, Secretary NCDENR

Telephone (828) 438-5228
citymayor@ci.morganton.nc.us
305 E Union Street, Suite A100
Morganton, NC 28655
Post Office Box 3448
Morganton, NC 28680-3448

CITY OF Newton
WHERE THE HEART IS!

Post Office Box 550 • Newton, North Carolina 28658 • (704) 465-7400

OFFICE OF THE MAYOR

February 23, 2009

Mr. George M. Bridgers
Meteorologist
NCDENR-Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Subject: 8 Hour Ozone Non-Attainment Boundaries

Dear Mr. Bridgers:

I am writing on behalf of the City of Newton and as a member of the Unifour Air Quality Oversight Committee and the Unifour Air Quality Committee (UAQC), representing the Hickory-Morganton-Lenoir areas in North Carolina (also known as the Unifour Area). We have been diligently working on our Early Action Compact (EAC) Milestones since December 2002. The EAC process proved successful, as our area was deemed in attainment status for ozone in April 2008.

Our new focus is the proposed Non-Attainment Boundaries for the new lower ozone standards that are under consideration at the present time. We are concerned that EPA may designate all four counties in our area as Non-Attainment of the new 8-Hour Ozone Standard. We realize that many factors are examined when making the designations for Non-Attainment areas and for that reason we would like EPA to examine closely boundaries that are currently being reviewed. We believe that the most logical boundary would follow the MPO planning boundary in Burke, Caldwell and Catawba Counties (See Map Insert). In Alexander County the most logical boundary would follow Census Tracts 403, 404,406 and 407. Inside of these Census Tracts are the Hickory Portion of the urbanized area that is in Alexander County, the Taylorsville Urbanized Cluster, and the Taylorsville Ozone Monitor which is currently violating the new standard. Using the MPO Boundary in Burke, Caldwell and Catawba Counties and Census Tracts 403, 404, 406 and 407 in Alexander County would capture the majority of population and traffic for this area that is contributing to the ozone problem. Since mobile sources are a large reason for our high levels of ozone, then it would make sense to concentrate on the source of the problem rather than the areas outside those boundaries. These are large rural areas that would be included if whole county areas were designated. The rural areas are already at a disadvantage in numerous ways, but to add the "Non-Attainment" label to these areas would be detrimental.

We appreciate your careful review of our area and the boundaries that will be designated. Please feel free to contact us if you have any questions regarding our area.

Sincerely,

Robert A. Mullinax, Mayor

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Appendix B

Local Government and Public Comments Received

(Charlotte-Gastonia-Rock Hill Area Comments)

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LAKE NORMAN RPO

1300 Baxter Street,
Suite 450
P. O. Box 35008
Charlotte, NC 28235

(704) 372-2416
FAX (704) 347-4710
www.lakenormanrpo.org
www.centralina.org

Centralina
Council of Governments

Lake Norman Rural Planning Organization Resolution Recommending 8-Hour Ozone Non-Attainment Boundary Delineations for the Charlotte-Gastonia-Rock Hill, NC-SC 8-Hour Ozone Non-Attainment Area

Whereas, On March 12, 2008, the U.S. Environmental Protection Agency (EPA) promulgated a revised national ambient air quality standard for ozone, the 8-hour ozone standard; and

Whereas, the EPA has asked North Carolina to submit boundary recommendations on the new Ozone standard by March 12, 2009; and

Whereas, non-attainment designations have been viewed as harmful to economic development efforts; and

Whereas, those portions of the RPO do not have growth rates or commuting patterns that meet the standards for identified linkages with Mecklenburg County, two factors considered in the EPA designation process; and

Whereas, relevant pollution strategies already utilized in the non-attainment portions of the Charlotte region are also in effect in all of the RPO, negating the effect of an expanded non-attainment designation.

Now, Therefore, Be It Resolved that the Lake Norman Rural Planning Organization Transportation Advisory Committee is opposed to the expansion of the Charlotte-Gastonia-Rock Hill, NC-SC 8-Hour Ozone Non-Attainment Area to include Cleveland County or northern Iredell County.

Adopted this 27th day of January, 2009.

Michael Johnson
Chairman, Lake Norman Rural Planning Organization

Carolinas Clean Air Coalition

Restoring clean and healthy air for a vibrant community

February 9, 2009

B. Keith Overcash
Director
North Carolina Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Designation of North Carolina Nonattainment Areas Under the Revised Eight-Hour Ozone Standard

Dear Mr. Overcash:

Carolinas Clean Air Coalition ("CCAC") submits these comments in response to the NC Division of Air Quality's request for public input on potential nonattainment designations under the revised eight-hour ozone standard. As a non-profit organization dedicated to restoring clean and healthy air to the Charlotte region and other areas of North Carolina, CCAC urges DAQ to set nonattainment boundaries that would provide the greatest protection of public health and the greatest likelihood of achieving significant improvement in air quality with an adequate margin of safety.

We strongly support EPA's "presumptive" boundaries. For the reasons detailed by the Southern Environmental Law Center ("SELC") in its January 7, 2009 letter, we object to the proposed nonattainment boundaries presented by DAQ in recent public meetings. We incorporate by reference SELC's comments, but we also highlight several areas of special concern to our organization.

1. Especially since the new 8-hour ozone standard does not adequately protect public health, DAQ should use all available tools to ensure that every county meets the standard.

In setting the new standard at 0.075 parts per million, EPA refused to follow the recommendation of its own scientific committee, whose members "do not endorse the new primary ozone standard as being sufficiently protective of public health."

Air pollution causes significant harm to many North Carolinians, contributing to countless asthma attacks and other respiratory problems, thousands of hospitalizations, and many premature deaths every year. Because we're failing to meet a standard that fails to protect public health, we should use any tool available for promoting compliance, including a broadly designated nonattainment area.

1801 North Tryon Street • Suite 326 • Charlotte, NC 28206 • 704.342.9161 • Fax: 704.405.4979
info@clean-air-coalition.org • www.clean-air-coalition.org • www.cleanschoolbusaction.org

2. The 8-hour ozone standard will likely be strengthened to conform to the recommendations of EPA's scientific committee.

President Obama has clearly stated that agencies in his administration will return science to a prominent role in policy decisions. Thus, the new, inadequate standard is not likely to stand for long. If DAQ excludes areas that would presumptively be included under a too-weak standard, our entire region will face an uphill battle when required to meet the expected revised, stronger standard. Adopting EPA's presumptive boundaries would not only better protect the breathing public, but also avoid drastic actions when we must comply with an even stronger standard.

3. Because global warming will exacerbate our ozone problem, reducing ozone aggressively now is essential.

All but the most extreme skeptics have ceased to dispute that the planet is warming. In a January 18 article, The Guardian quoted NASA's Dr. James Hansen: "Before the end of Obama's first term, we will be seeing new record temperatures. I can promise the president that."

Warming will bring more ground-level ozone -- not only because the chemical reactions that form ozone are temperature dependent, but also because biogenic emissions of VOCs increase with rising temperatures. Constable JVH et al.Glob Chang Biol 5:791-806 (1999) Using models that project a 1.6 to 3.2 Centigrade rise in temperature by 2050, one study found that for 50 US cities (including Charlotte), the average number of days exceeding the old 0.08 ppb standard could increase 68% by 2050. Bell ML et al. Climatic Change 82:61-76 (2007) Faced with higher temperatures and greater VOC emissions that we cannot control, we should use all available tools to control the one ozone ingredient we can control – NOx. One of those tools is to designate broad noncompliance boundaries that would require Cleveland, Stanly, Anson, and Iredell to address their contributions to our region's dirty air.

4. DAQ's proposed boundaries put Mecklenburg County and other neighboring counties in the nonattainment area at an unfair disadvantage.

Just like pollution emitted from TVA's coal plants drifts into North Carolina, pollution from nearby counties drifts into Mecklenburg, Cabarrus, Gaston, Lincoln, Rowan and Union Counties. Furthermore, many of the cars coming into Mecklenburg come from outlying counties. Our efforts to make our air safe to breathe will be undermined if other counties nearby are not required to address their contribution to the problem.

By excluding Cleveland, Stanly, Anson, and Iredell from the nonattainment area, DAQ would make it harder for our region to clean up our air. At the January 7 public meeting held in Charlotte, DAQ said Charlotte "will be on the precipice of serious nonattainment." "Serious" nonattainment means very dirty, dangerous air that makes people sick. But it also means more

EPA restrictions and supervision, including limitations on recruitment of new businesses and threats to federal highway funds. Excluding Cleveland, Stanly, Anson, and Iredell from nonattainment designation would encourage more sprawling development and polluting facilities

that will exacerbate the region's problems. It would also give those counties a short-term advantage in recruiting new businesses and put the nonattainment areas at a distinct competitive disadvantage.

5. We need foresight and long-term thinking.

Failing to aggressively address our region's ozone problem now would simply delay the inevitable and make the task more daunting in the future. We can foresee a stricter standard; we can foresee a warming climate; we can foresee more sprawling development and polluting industries in Cleveland, Stanly, Anson, and Iredell counties. By designating all the presumptive areas as nonattainment, DAQ could "take the bull by the horns" and compel the entire region to deal now with problems that delay would only exacerbate.

Corporations, chambers of commerce, and business development organizations focus on creating jobs and maximizing profits in the short term. That is their job. In contrast, DAQ's job is to protect our air -- a long-term responsibility. Even in a time of economic downturn, we urge DAQ to stay focused on its statutory purpose: "To Protect and Improve the Outdoor Air Quality of North Carolina."

Thank you for the opportunity to submit these comments.

Sincerely,

June Blotnick

June Blotnick
Executive Director
Carolinas Clean Air Coalition

CC: Beverly Purdue, Governor
Sheila Holman, NC DAQ
Beverly Banister, EPA Region 4
Carol Kemker, EPA Region 4
Richard Schutt, EPA, Region 4

Subject: Nonattainment areas under new 8-hour ozone standard
From: "beth henry" <bethhenry@carolina.rr.com>
Date: Mon, 9 Feb 2009 13:35:55 -0500
To: <keith.overcash@ncmail.net>

Dear Mr. Overcash:

I am a Mecklenburg County resident concerned about our region's deteriorating air and water quality and the looming impacts of climate change. I attended the January 7 meeting in Charlotte about DAQ's proposed new nonattainment boundaries.

I was surprised and disheartened by the presentation. As I said at the meeting, the underlying premise seemed to be that EPA is the enemy and DAQ's job is to help our state deflect EPA's interference. No reasons were given for rejecting EPA's presumptive nonattainment boundaries. DAQ representatives bluntly acknowledged that "EPA will disagree" with DAQ's recommendations. When asked why EPA would presumptively include more areas, the response was, "Unfortunately we put these monitors out in the counties and found bad air when we didn't have to." Unfortunately?

When I asked about protecting public health, the responses were about "balance" and the need to protect jobs. One example was given: "If we expanded the nonattainment area to include Hickory, furniture factories might have to shut down, leaving employees without health insurance." They will certainly need health insurance if DAQ doesn't protect them from the asthma, lung disease, heart disease, and other health problems caused by air pollution. And these health impacts are predicted to worsen as climate change increases temperatures and natural VOC emissions.

DAQ's statutory purpose is "To Protect and Improve the Outdoor Air Quality of North Carolina." DAQ could best protect our air by adopting EPA's presumptive boundaries. Expanding the boundaries would give outlying counties both incentives and tools to reduce their contribution to our region's ozone pollution. If Mecklenburg County is "on the precipice of serious nonattainment," as reported at the meeting, why doesn't DAQ use all available means to clean up our air?

Please keep DAQ focused on protecting our air and thus our health and future prosperity. Let the Department of Commerce and legions of economic development organizations focus on jobs and employee health insurance.

Sincerely,

L. Elizabeth Henry

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Appendix B

Local Government and Public Comments Received

(Greensboro-Winston-Salem-High Point Area Comments)

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PIEDMONT TRIAD COUNCIL OF GOVERNMENTS

Wilmington Building, Suite 201
2216 W. Meadowview Road
Greensboro, NC 27407-3480

Randall L. Billings, Executive Director

January 29, 2009

George Bridgers, Meteorologist
NC DENR, Division of Air Quality
Planning Section, Attainment Planning Branch
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear George:

Thank you for the opportunity to comment on the 8-hour ozone nonattainment boundaries being proposed by the Division of Air Quality. As you are well aware, the Triad region has been grappling with air quality issues for decades. In 2002, we took a regional approach to attaining the 8-hour standard through our Early Action Compact with great success. No matter the final designation boundaries, we hope that this regional approach will continue to be accepted both by the Division of Air Quality and Environmental Protection Agency.

My primary area of responsibility in our region is the Piedmont Triad Rural Planning Organization, made up of our five rural counties – Caswell, Davidson, Montgomery, Randolph and Rockingham. Based on the currently proposed ozone non-attainment boundaries that were shared at the public hearing on January 13, 2009, four of these five rural counties are proposed to be included in the new non-attainment area.

While these counties are parted of the combined statistical area (CSA), they do not share the same travel characteristics as the rest of the region. Based on the limited number of high-volume transportation facilities located in these counties, their relatively low population densities, and relatively low share of the region's vehicle miles traveled (VMT), we request your consideration for the removal of Caswell, Rockingham and the portions of Randolph County outside the High Point Urban Area Metropolitan Planning Organization from the proposed designation area.

The ozone readings at the monitors in Rockingham (Bethany) and Caswell (Cherry Grove) Counties are likely due to drift from the urbanized area. Without monitoring sites in Davidson and Randolph counties, it is difficult to quantify their contribution to the ozone problem, thereby making it difficult to justify as well.

Thank you for considering our request.

With warmest regards,

Hanna Cockburn

Hanna Cockburn, AICP
Planning Program Manager

Voice: 336.294.4950 – **Fax**: 336.632.0457 – info@ptcog.org – www.ptcog.org

HPMPO
High Point Urban Area Metropolitan Planning Organization

January 21, 2009

High Point

Mrs. Laura A. Boothe
Attainment Planning Branch Chief
NCDENR-DAQ
Archdale
1641 Mail Service Center
Raleigh, NC 27699-1641

Jamestown

SUBJECT: COMMENTS ON OZONE PROPOSED OZONE DESIGNATIONS UNDER THE 0.075 PPM EIGHT-HOUR OZONE STANDARD

Thomasville

Dear Mrs. Boothe:

Trinity

The High Point Metropolitan appreciates the opportunity provided by the Division of Air Quality to comment on the proposed ozone designations before North Carolina makes recommendations to the United States Environmental Protection Agency. We apologize for the delay in giving you our comments; however, as you are aware this is a complex regulatory endeavor that is driven in part by schedules imposed by other organizations.

Wallburg

Davidson County

Forsyth County

Based upon the information in hand we concur with the designating Davidson, Forsyth, and Guilford Counties as nonattainment under the new ozone standard. The monitoring data combined with other available lead us to conclude that these designations are appropriate, albeit unwelcome. However, our review of conditions in Randolph County leads us to another conclusion. Based on the low population density, primarily rural land uses, commuting patterns and low commute patterns and the low growth rates we request that all or part of Randolph County be excluded from designation as nonattainment for ozone under the clean air act. A copy of an analysis by Wilbur Smith Associates supporting our conclusion is attached for your reference.

Thank you again for this opportunity. If you need additional information you can contact me at (336) 883-3233

Guilford County

Sincerely,

Randolph County

David W. Hyder, P.E.
Transportation Planning Administrator

211 South Hamilton St., High Point, N.C. 27261
Telephone (336) 883-3225 FAX (336) 883-8568 TDD (336) 883-8517

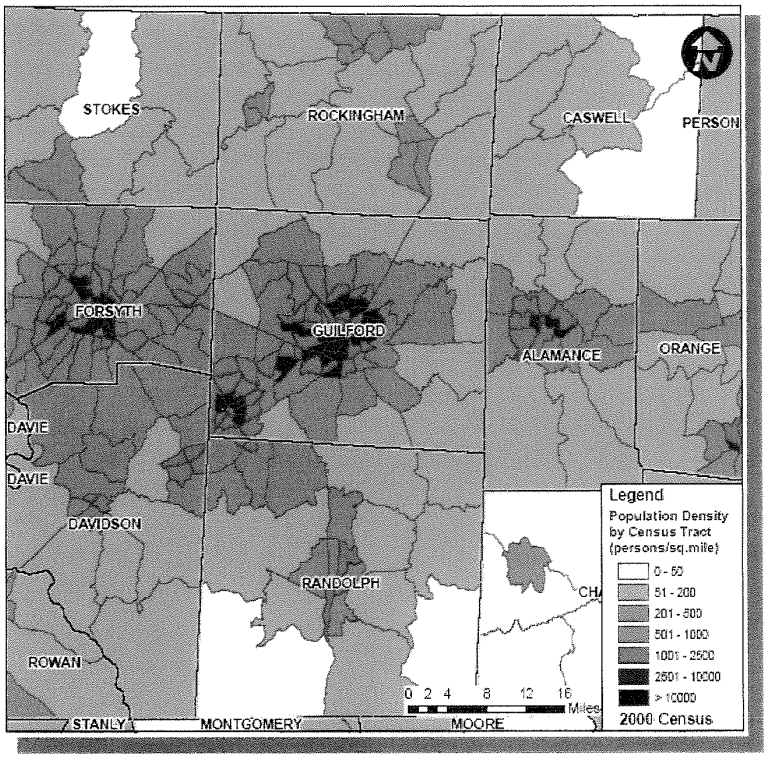
Attachment

CC: Mr. Darryl Frye, Randolph County Commission
Mayor Bert Lance-Stone, Archdale
Mayor Fran Andrews, Trinity
Mike Bruff, P.E. Transportation Planning Branch
Mrs. Hannah Cockburn, Piedmont Triad COG
Mr. Hal Johnson, Randolph County
Mrs. Anne Bailie, Trinity
Mr. Jeff Wells, Archdale
File

FINAL

Traffic Commuter Analysis and Emission Estimate Study

For
Randolph County
North Carolina



Prepared For:

High Point Metropolitan Planning Organization

City of High Point
211 S. Hamilton Street, Room 210
High Point, NC 27261

ENGINEERS
PLANNERS
ECONOMISTS

WilburSmith
ASSOCIATES

Submitted: January 16, 2009
WSA # 103220

FINAL

Traffic Commuter Analysis and Emission Estimate Study

For

Randolph County
North Carolina

Prepared For:

High Point Metropolitan Planning Organization
City of High Point
211 S. Hamilton Street, Room 210
High Point, NC 27261

Prepared By:

421 Fayetteville Street, Suite 1303
Raleigh, NC 27601
(919) 755-0583

January 16, 2009
(WSA Project No. 103220)

WilburSmith ASSOCIATES

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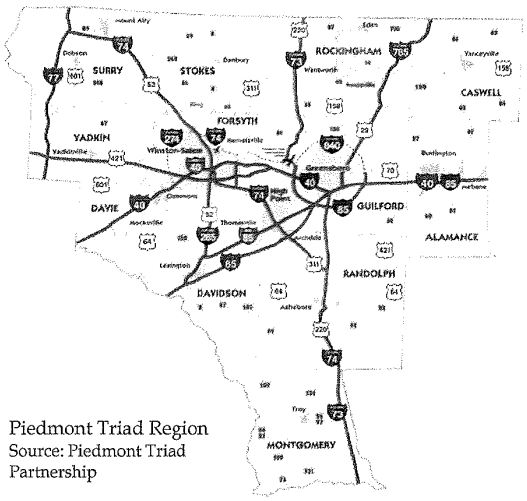
I. Introduction

The purpose of this report is to evaluate the traffic and commuter patterns and develop emissions estimates for the Randolph County commuters in the Triad region as an aid to determining the appropriate boundary for an ozone nonattainment area that includes North Carolina's Piedmont Triad. The report also discusses the ozone standard, factors that USEPA considers in setting nonattainment boundaries, and population and employment growth in the Triad region. Non-attainment areas are geographic areas, defined by EPA, where air quality does not meet the National Ambient Air Quality Standards (NAAQS). Under the requirements of the Clean Air Act Amendments of 1990 (CAAA90), the impact of certain transportation projects on air quality must be studied to determine if they conform to the purpose of the State Implementation Plan which is the attainment of the NAAQS.



Piedmont Triad Region
Source: Piedmont Triad Partnership

Randolph County is the 11th largest county in North Carolina with 790 square miles. Nine municipalities are incorporated within the county with Asheboro being the largest. Randolph County is a part of the Piedmont Triad region, which centers around the cities of Greensboro, High Point and Winston-Salem. According to 2000 Census data, Randolph County has a population of 130,454 with a density of 166 persons per square mile. The 2000 Census data is included in Appendix A.

Randolph County is part of a previously designated non-attainment area by the EPA for 8-hour ozone. However, the Triad counties chose to implement an Early Action Compact, promising earlier compliance with the ozone standard. Upon satisfying EAC requirements in the Triad region, Randolph County has been designated as an attainment area for Ozone (8-hour standard) by U. S. Environmental Protection Agency (USEPA) with an effective date of April 15, 2008. However, the USEPA has released new and tougher standards for the 8-hour ozone on March 12, 2008, which requires regions to comply with the new standard of 0.75 ppm. USEPA will designate new boundaries based on this new standard on March 12, 2010.

The schedule on the new standards for 8-hour Ozone is as follows:

March 12, 2008 - EPA promulgates new standard
January 15, 2009 - Local Input Due to State Air Agencies
March 12, 2009 - State recommends boundaries for nonattainment areas based on 2006-2008 data
November 12, 2009 - EPA Provides Proposed Boundaries to States
January 12, 2010 - State Responses to Proposals Due
March 12, 2010 - EPA designates nonattainment areas

EPA guidance indicates that any county with an ozone monitor violating the NAAQS needs to be designated nonattainment. Nearby contributing areas should also be designated as nonattainment. EPA uses the criteria below to assess the contribution of nearby adjacent geographic areas to violations or potential violations of national air quality standards.

EPA's December 4th, 2009 guidance memorandum on ozone designation lists nine factors to be considered when recommending nonattainment boundaries. They are:

1. Air quality data
2. Emissions data (location of sources & contribution to ozone concentrations)
3. Population density and degree of urbanization
4. Traffic and commuting patterns
5. Growth rates and patterns
6. Meteorology (weather/transport)
7. Geography/topography
8. Jurisdictional boundaries
9. Level of control of emission sources

This report concentrates on items 1, 3, 4, 5, and 9 of the above list.

II. The Ozone Standard

The NAAQS for Ozone is provided in Table 1. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone also attacks synthetic rubber, textiles, and other materials. Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include volatile organic compounds (VOC) and oxides of nitrogen (NOX), react in the atmosphere in the presence of sunlight to form ozone. Because reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors VOC and NOX are emitted by mobile sources and by stationary combustion equipment. State and federal standards for ozone have been set for an 8-hour averaging time. The current federal 8-hour standard is 0.075 ppm, not to be exceeded more than three times in any 3-year period. Ground level ozone is a pollutant, while high altitude ozone protects the earth from harmful ultra-violet rays.

In accordance with the Clean Air Act of 1990 (amended 1994), the USEPA established National Ambient Air Quality Standards (NAAQS) for six (6) atmospheric pollutants: carbon monoxide, lead, nitrogen oxides, ozone, fine particulates, and sulphur oxides. The primary pollutants to which mobile sources contribute are ozone, carbon monoxide and fine particulates. Ozone is a secondary pollutant meaning that it is the result of a chemical reaction between several precursor chemicals in the atmosphere. Because these reactions take place over a period of several hours, maximum concentrations of ozone are often found far downwind of the precursor sources. Thus, ozone is considered a regional pollutant.

Table 1 - National Ambient Air Quality Standards (Source : EPA)				
	Primary Standards		Secondary Standards	
Pollutant	Level	Averaging Time	Level	Averaging Time
Ozone	0.075 ppm (2008 std)	8-hour (1)	Same as Primary	
	0.08 ppm (1997 std)	8-hour (2)	Same as Primary	
	0.12 ppm	1-hour (3) (Applies only in limited areas)	Same as Primary	

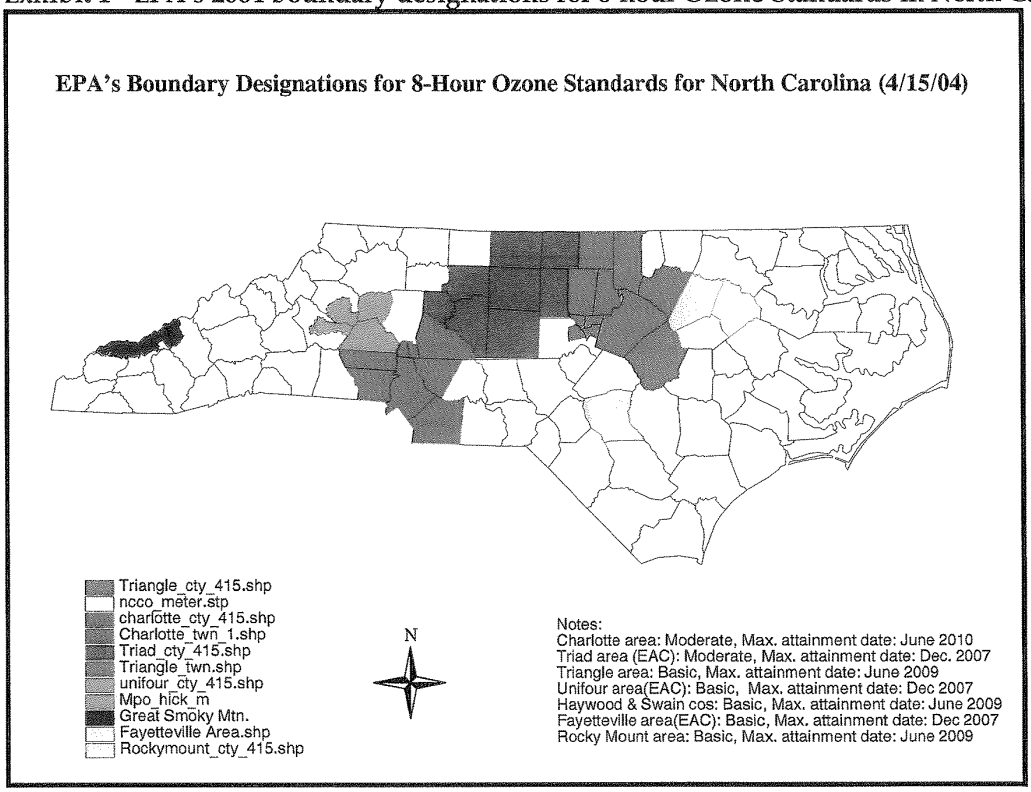
(1) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
(2) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(3) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

III. Ozone in the Triad Region

In the late 1980s, Forsyth County violated the 1-hour ozone NAAQS and was designated ozone nonattainment by the USEPA. This was followed by Guilford County in 1992 for 1-hour ozone. Both counties were redesignated as maintenace areas in 1993. In 1997, USEPA promulgated regulations for 8-hour standards. Lawsuits delayed implementation of the eight-hour ozone standard until 2004.

In 2004, USEPA completed the 8-hour ozone designation process and the Rockingham, Caswell, Guilford, Alamance, Randolph, Forsyth, Davie and Davidson counties were classified as nonattainment. Exhibit 1 shows the EPA's boundary designations for 8-hour Ozone Standards in North Carolina.

Exhibit 1 - EPA's 2004 boundary designations for 8-hour Ozone Standards in North Carolina.



Source: EPA

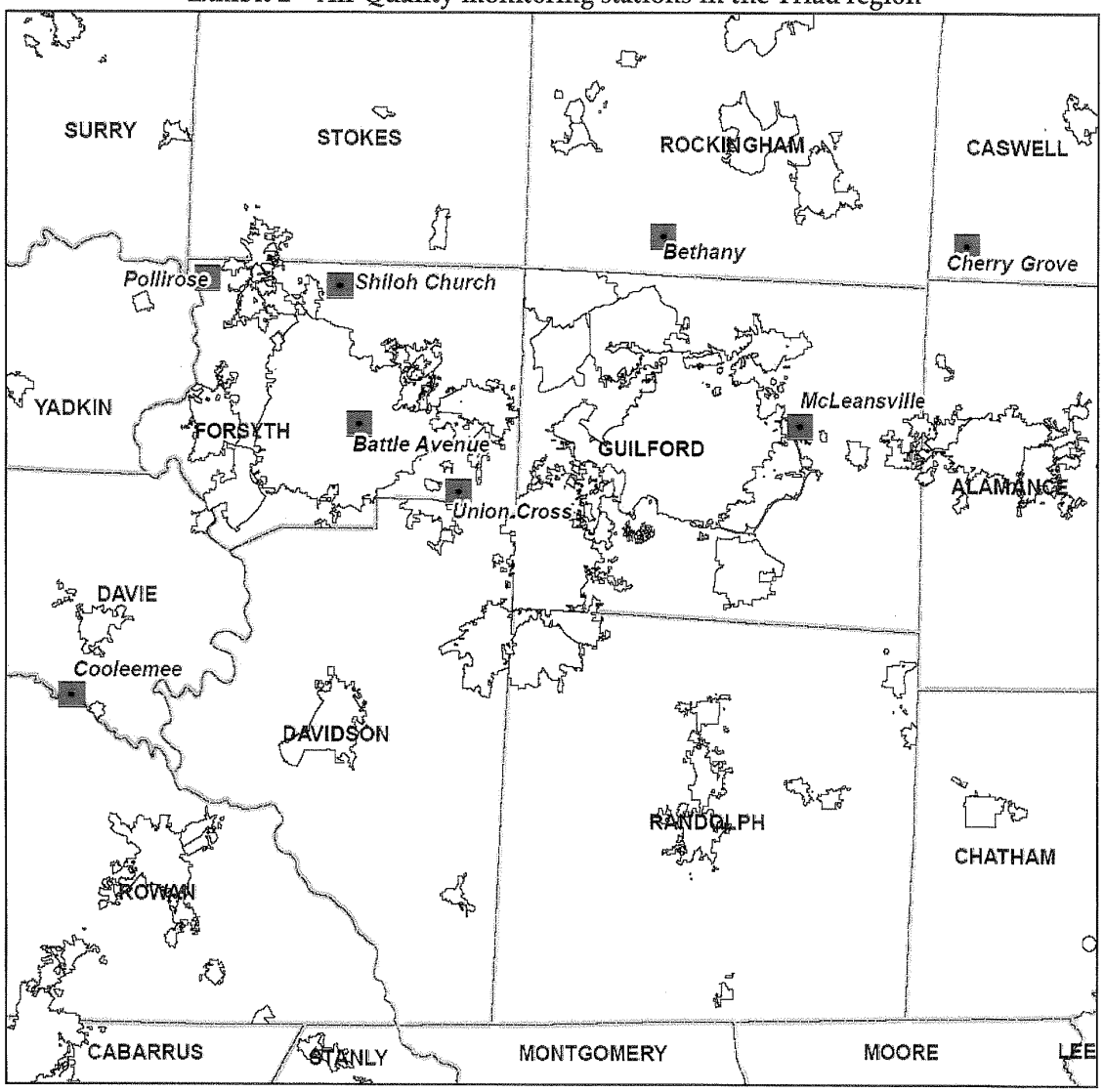
In 2002, Triad formed an Early Action Compact (EAC), an option offered by EPA that deferred an area's designation as nonattainment for the 8-hour standard from December 31, 2004 to December 31, 2007 in order to attain the ozone standard earlier than would be the case using the Clean Air Act's regulatory regimen. If compliance is not met in the given timeframe, EPA could revoke the status to non attainment. Members of the Triad EAC include Alamance, Caswell, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry, and Yadkin. The EAC control measures included emission reduction by inspection and maintenance, an open burning rule, improved transit by Piedmont Triad Regional Transit (PART), constructing sidewalks, greenways, bicycle routes, mixed use development, park and ride lots, electrification of truck stops etc. to improve air quality in the region. On successfully satisfying the milestones set by EAC in the Triad, on April 15, 2008 EPA designated all Triad counties as attainment for the 8-hour ozone. The 8-hour design value reported to EPA during this designation was 0.83 ppm.

While the Triad Counties achieved attainment on April 15, 2008, USEPA released new and tougher standards for the 8-hour ozone on March 15, 2008; the ozone standard is now 0.75 ppm.

Air Quality Monitors

NCDENR currently maintains 8 ozone monitoring stations in the Triad area as shown on Exhibit 2. However, there is currently no active ozone monitoring station in Randolph County.

Exhibit 2 – Air Quality monitoring stations in the Triad region



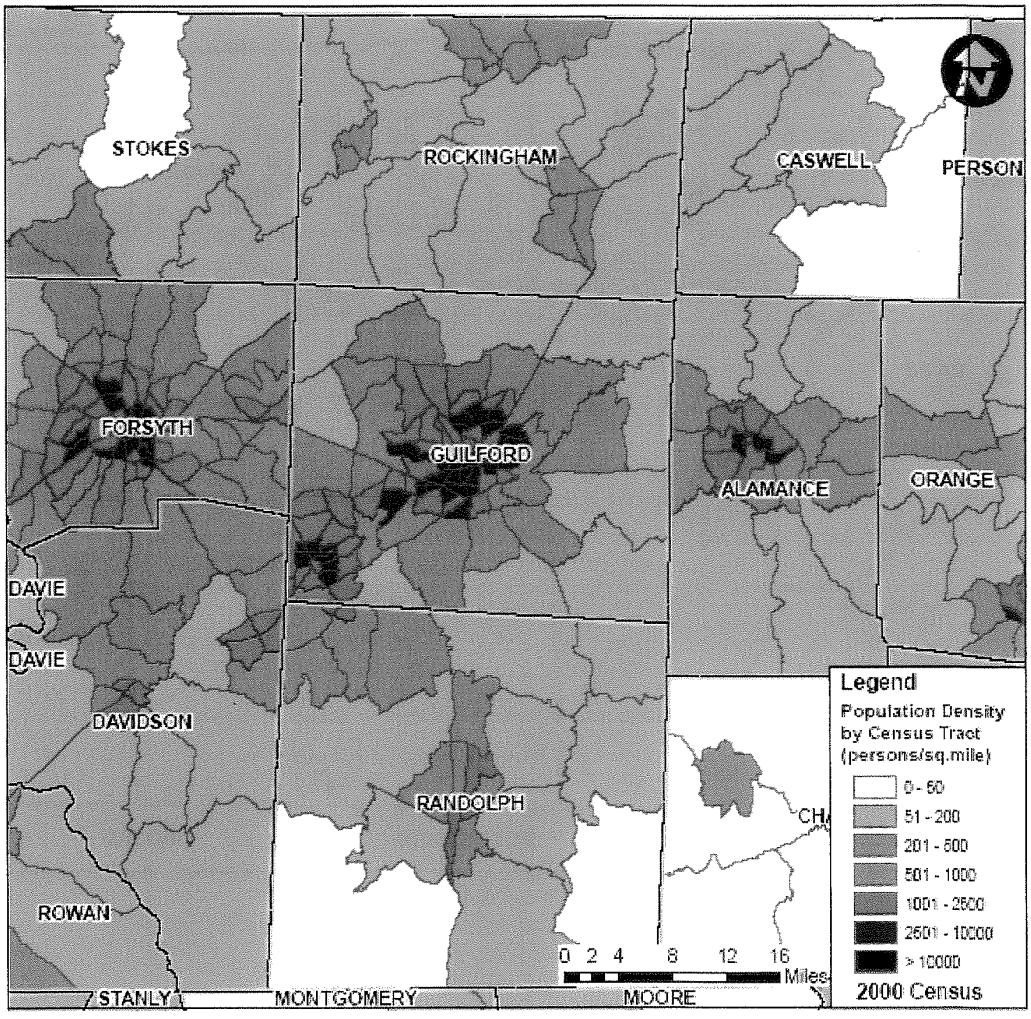
Source: NCDENR

IV. Population Density and Degree of Urbanization

Despite its large size and close proximity to the Triad Region's urban core Randolph County exhibits a low degree of urbanization. Average population density in 2000 was approximately 166 persons per square mile. The approximate population density in 2006 was approximately 178 persons per square mile. The Department of Census uses five thousand (5,000) persons per square mile as the typical urban population density.

Amongst the twenty-four census tracts in Randolph County the mean population density of the census tracts is 575.86 persons per square mile while the median tract density is 339.92 persons per square mile. This indicates that a few census tracts skew the estimate of population density upward. These data imply a low degree of urbanization even along the northern tier of census tracts in Randolph County. Exhibit 3 shows the population density by census tract in 2000.

Exhibit 3 – Population density by census tract in the Triad region



V. Commuting Patterns from the 2000 Census

The 2000 Census Transportation Planning Package (CTPP) compiled by the US Census Bureau contains tabulations of commuting patterns including workers by place of residence, place of work, and flows between home and work. The CTPP is used in this study to evaluate characteristics of the workers who live and work in the High Point MPO area. This area consists of Alamance, Guilford, Randolph, Davidson, and Forsyth counties and focuses on Randolph County.

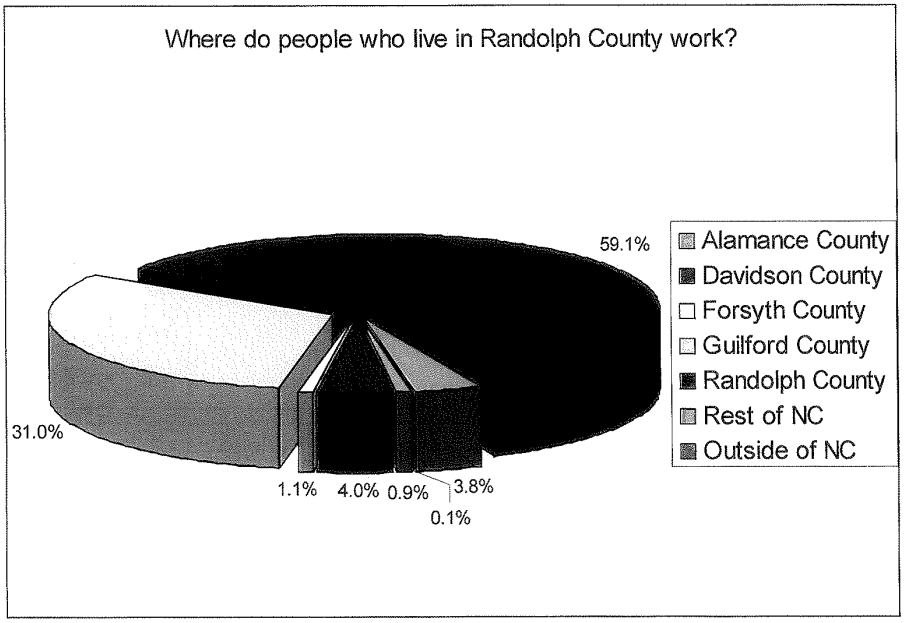
The CTPP data has the following limitations

- The 2000 Census counts employed persons, not jobs. For persons with more than one job, characteristics on only the principal job are collected.
- Only those workers 16 years or older who are at work during the reference week are reported. Thus, those workers absent during the reference week are not reported.
- Values between one and seven are rounded to four and values eight and over are rounded to the nearest five. The Census uses rounding to protect confidentiality.
- The 2000 Census is based on one work week in April 2000. For those traveling workers, the state at which the worker is working will be reported for that week.

Randolph County Commuting Pattern

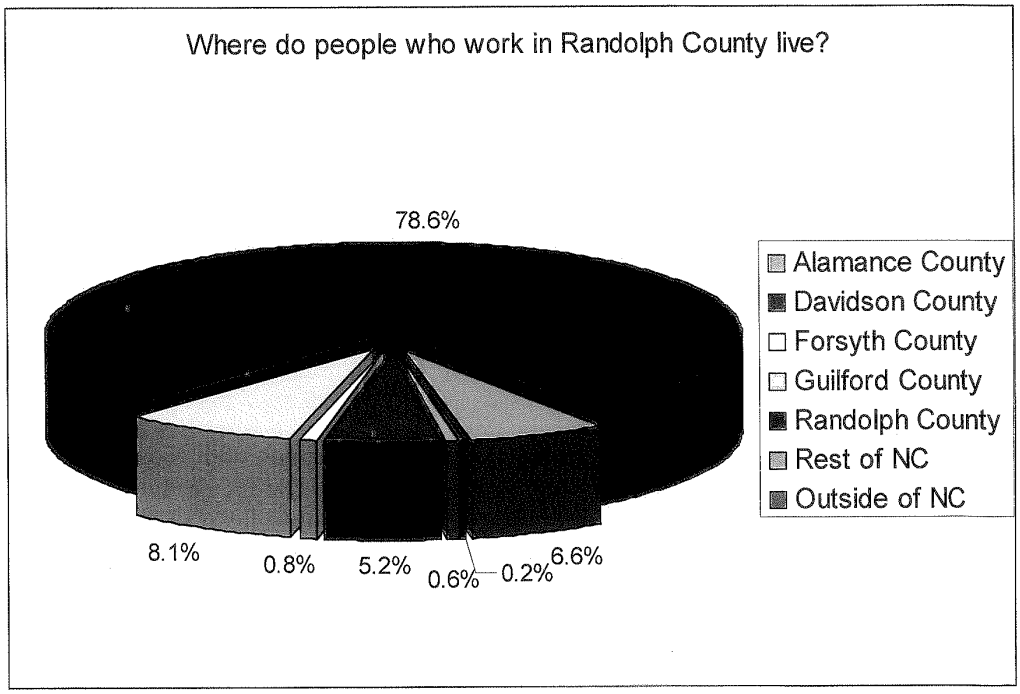
Randolph County ranks 7th in the top 25 North Carolina counties with maximum number of county worker flow. Randolph County commuting patterns show that of workers who live in the county 59% also work in Randolph County and 31% commute to Guilford County. The fewest work trips within the study area are to Alamance County. Thus, most Randolph County residents work in Randolph County while those workers not working in Randolph County are most likely working in Guilford County as shown in Exhibit 4.

Exhibit 4 - Where do people who live in Randolph County work?



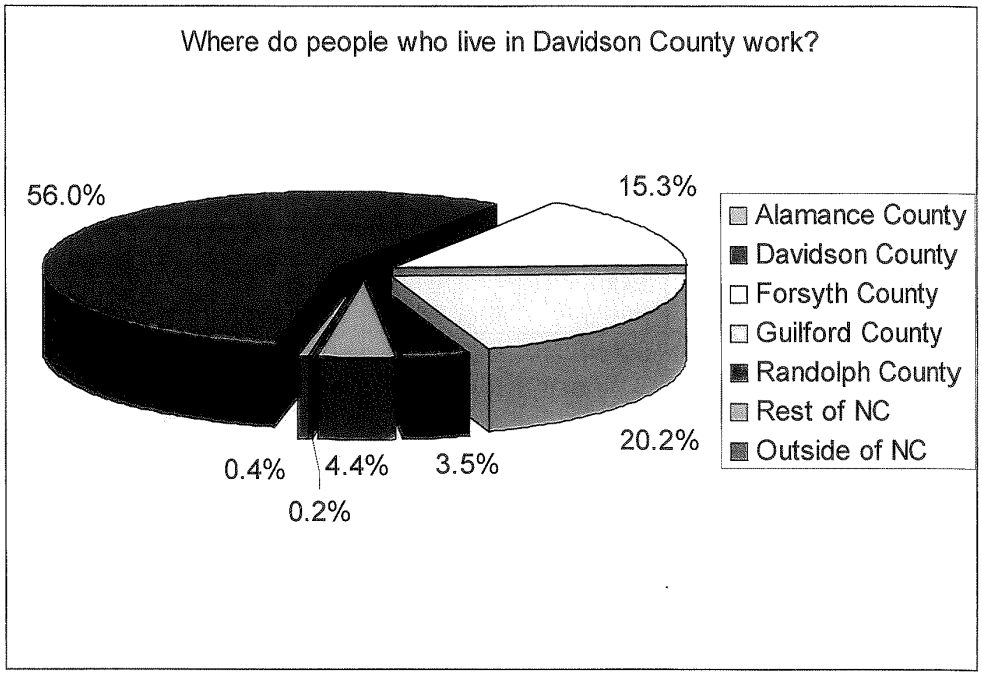
Randolph County commuting patterns show that of workers working in the county most also live in Randolph County and 8% commute from Guilford County. The fewest number of workers live in Alamance County. Additionally, about 7% of workers are coming from outside the study area. Thus, Randolph County reflects strong work-live characteristics, corresponding to shorter commutes. Most workers travel to work without crossing county lines in Randolph County. Exhibit 5 summarizes the live-work characteristics.

Exhibit 5 – Where do people who work in Randolph County live?



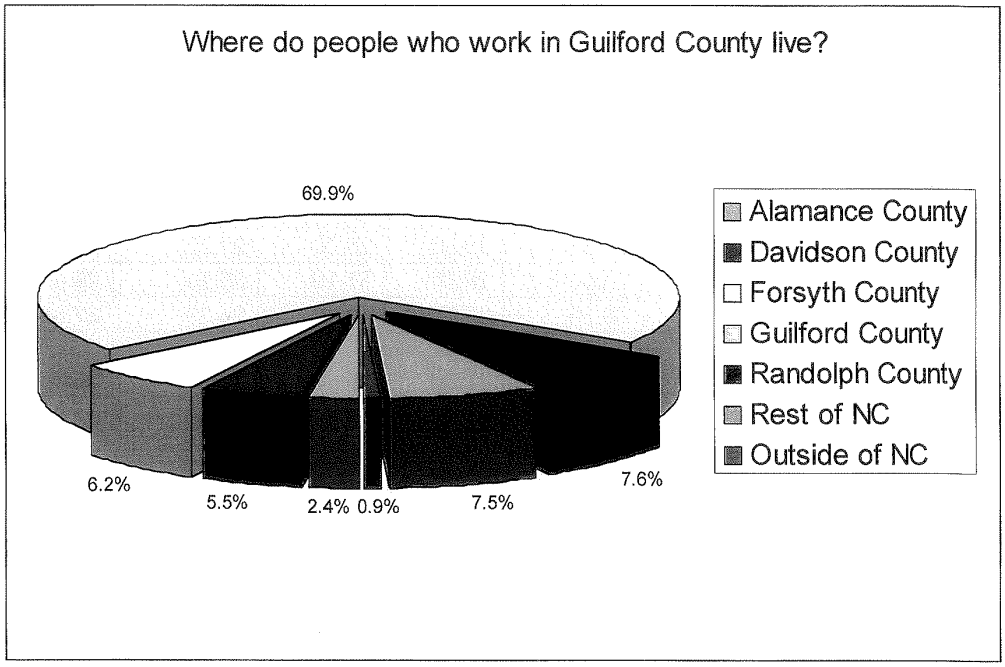
For workers living in other counties, the county with the highest percentage of workers who commute to Randolph County is Davidson County at 3.5 percent. All other counties have less than 2 percent of workers who live in that county and work in Randolph County as shown in Exhibit 6.

Exhibit 6 - Where do people who live in Davidson County work?



For workers working in other counties, the county with the highest percentage of who live in Randolph County is Guilford County at 7.6 percent. All other counties have less than 5 percent of workers who work in that county and live in Randolph County.

Exhibit 7 - Where do people who work in Guilford County live?



Study Area Commuting Patterns

For the entire study area, Randolph County has the second fewest number of workers who live in Randolph County (second to Alamance County) and the fewest workers who work in Randolph County.

Table 2: Commuting Patterns

	Place of Residence		Place of Work	
County	2000 Workers	% of Total	2000 Workers	% of Total
Alamance County	63,090	11.3%	60,015	10.0%
Davidson County	72,505	13.0%	53,380	8.9%
Forsyth County	147,010	26.3%	169,350	28.2%
Guilford County	211,865	37.8%	267,590	44.6%
Randolph County	**65,340**	**11.7%**	**49,175**	**8.2%**
TOTAL	559,810	100.0%	599,510	100.0%

Table 3 shows the average commute times for workers in the Triad. The average commute time for all workers living in Randolph County is 30.4 minutes and the average commute time for all workers who work in Randolph County is 27.6 minutes. For those workers who work and live in Randolph County, the average commute time is 17.60 minutes.

The longest commute time for those workers living in Randolph County is 44 minutes to work in Forsyth County. The longest commute time for those workers working in Randolph County is 35.5 minutes from their home in Forsyth County. Thus, commutes between Randolph Count and Forsyth County have longer travel times as shown in Table 3.

Table 3: Average Travel Time (minutes)

County Res/Work	Alamance	Davidson	Forsyth	Guilford	**Randolph**	**AVERAGE**
Alamance County	16.80	31.40	43.60	32.90	**31.40**	**31.22**
Davidson County	33.30	17.60	25.60	28.20	**27.20**	**26.38**
Forsyth County	34.90	23.60	18.10	31.10	**35.50**	**28.64**
Guilford County	30.60	30.30	33.00	19.30	**26.20**	**27.88**
Randolph County	**37.20**	**22.70**	**44.00**	**30.30**	**17.60**	**30.36**
AVERAGE	**30.56**	**25.12**	**32.86**	**28.36**	**27.58**	**28.90**

The average number of workers per vehicle and working is shown in Table 4. The average number of commuters per vehicle for all workers living and working in Randolph County is 1.08. For those commuters who work and live in Randolph County, the average number of workers per vehicle is 1.09 as shown in Table 4.

Table 4: Workers per Vehicle						
County Res/Work	Alamance	Davidson	Forsyth	Guilford	**Randolph**	**AVERAGE**
Alamance County	1.09	1.23	1.18	1.05	**1.03**	**1.12**
Davidson County	1.10	1.10	1.06	1.07	**1.11**	**1.09**
Forsyth County	1.05	1.10	1.08	1.08	**1.13**	**1.09**
Guilford County	1.06	1.11	1.06	1.08	**1.09**	**1.08**
Randolph County	**1.08**	**1.07**	**1.08**	**1.08**	**1.09**	**1.08**
AVERAGE	**1.08**	**1.12**	**1.09**	**1.07**	**1.09**	**1.09**

Study Area Growth

Growth in the study area is evaluated using Woods and Poole Complete Economic and Demographic Data Source (CEDDS) as well as the Piedmont Triad Regional Model data. Both data sources provide data on total population and total employment. However, the PTRM only includes a portion of Randolph County.

The Woods and Poole CEDDS contains regional data and projections from 1969-2030 for the U.S. and all regions, states, Combined Statistical Areas (CSAs), Metropolitan Statistical Areas (MSAs), Micropolitan Statistical Areas (MICROs), Metropolitan Divisions (MDIVs), Designated Market Areas (DMAs), and counties. The Woods and Poole total population and total employment growth by county is shown in Table 5.

Table 5: Woods and Poole CEDDS Growth

Population (Thousands)							
County	**2000**	**2002**	**2005**	**2008**	**00-02 Growth Rate**	**00-05 Growth Rate**	**00-08 Growth Rate**
Alamance	131.49	135.64	140.23	144.72	1.57%	1.30%	1.21%
Davidson	147.69	150.78	154.53	159.23	1.04%	0.91%	0.94%
Forsyth	306.93	314.29	325.73	339.21	1.19%	1.20%	1.26%
Guilford	422.37	430.16	443.54	457.90	0.92%	0.98%	1.01%
Randolph	**131.11**	**133.70**	**138.18**	**142.46**	**0.99%**	**1.06%**	**1.04%**
				Average	**1.14%**	**1.09%**	**1.09%**
Employment (Thousands)							
County	**2000**	**2002**	**2005**	**2008**	**00-02 Growth Rate**	**00-05 Growth Rate**	**00-08 Growth Rate**
Alamance	81.83	78.70	79.42	82.90	-1.93%	-0.60%	0.16%
Davidson	74.12	71.25	72.85	76.51	-1.95%	-0.34%	0.40%
Forsyth	220.05	215.81	224.78	237.71	-0.97%	0.43%	0.97%
Guilford	333.16	323.76	336.69	348.93	-1.42%	0.21%	0.58%
Randolph	**64.45**	**60.09**	**63.21**	**65.37**	**-3.44%**	**-0.39%**	**0.18%**
				Average	**-1.94%**	**-0.14%**	**0.46%**

Based on the Woods and Poole data over the past eight years Randolph County's population has grown at an annual rate of 1.04 percent per year. At this rate of growth it would take almost seventy years for the population density to double. At the same time county employment has been growing at a rate of 0.18 percent per year. The employment growth rate is a low value and indicates that economic growth in the county is limited to job replacement. The average annual growth rate in employment in the Triad is 0.46 percent.

VI. Randolph County Emissions Estimate

Commuter estimates for 2008 are developed based on the 2000 census commuter data and the Woods and Poole CEDDS growth rate for the region. Since population is not strongly correlated with growth in workers, employment data available from Woods and Poole CEDDS data is used to estimate 2008 workers. An average growth rate of 0.46% in employment from Table 5 is used for the region.

The 2000 census data indicted that Triad residents commute an average of 32 miles one way to work. This number is consistent with the VMT reduction estimates prepared by PART in the 2008 ridership challenge and therefore used to compute the average vehicle miles traveled by a typical commuter in the region.

In order to estimate the emission for NOx and VOC for the region, emission rates were derived from NCDOT urban spreadsheet which provides the grams/mile of VOC and NOX emissions. Assuming workers travel to urban areas to work, emission factor from the NCDOT "urban_county_ef_vmt-reduction-reduction_projects.xls" is used. Emissions factor for an average vehicle with average speed was chosen for the analysis. This methodology is consistent with the DAQ guidance for CMAQ applicants. Also, the final draft conformity analysis and determination report developed by PART for the Triad region describes this emissions analysis source for VMT and speed of travel.

The 0.46% average employment growth rate is applied the 2000 census commuter data to calculate the 2008 commuter estimate. This estimate is then multiplied by 32 miles to compute the commuter VMT. Finally, commuter VMT is multiplied by NOx and VOC emission factors to obtain emission estimate by county in grams per mile. To convert to lbs/day, the result is multiplied by 0.0022. The NOx and VOC emission estimate is developed for Alamance, Davidson, Forsyth, Guilford and Randolph counties for 2008. Guidance indicating emission factor calculation and NCDOT emission spreadsheet is included in Appendix B. The total NOx emission and VOC emissions is summarized in Table 6.

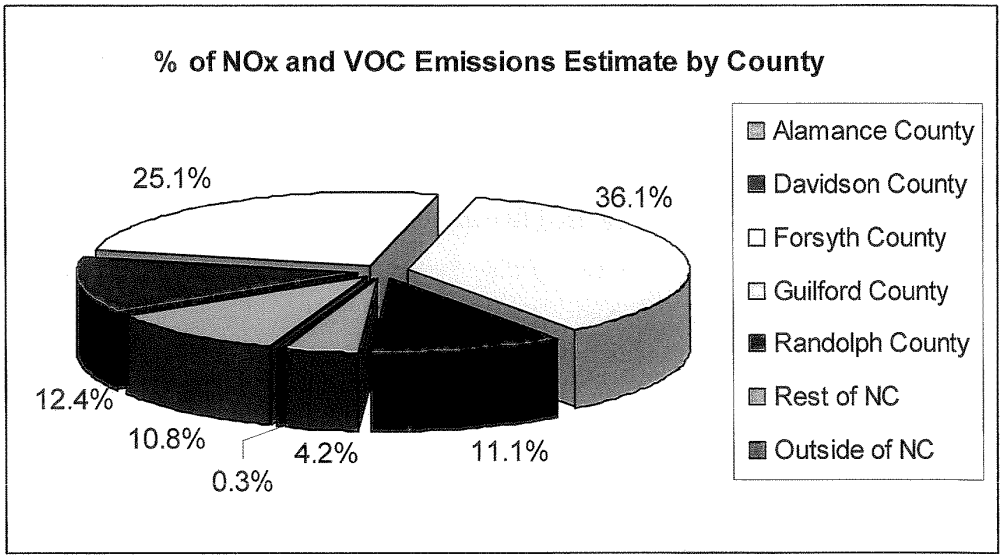
Table 6: NOx and VOC Emissions Estimate by County

County	2000 Commuters	2008 Commuters	Commuter VMT	Nox (lbs/day)	VOC (lbs/day)	% Emission
Alamance	63,090	65,449	2,094,382	4,899	2,489	10.8%
Davidson	72,505	75,217	2,406,929	5,630	2,860	12.4%
Forsyth	147,010	152,508	4,880,252	11,415	5,799	25.1%
Guilford	211,865	219,788	7,033,226	16,451	8,358	36.1%
Randolph	65,340	67,784	2,169,075	5,074	2,577	11.1%
Rest of NC	24,695	25,619	819,793	1,918	974	4.2%
Outside of NC	1,715	1,779	56,932	133	68	0.3%
Total	**586,220**	**608,143**	**19,460,590**	**45,520**	**23,125**	**100%**

Based on the analysis, Randolph County commuters contribute 5,074 lbs/day of NOx and 2,577 lbs/day of VOC totaling 11.1% of the total emissions in the region. Guilford County has the highest contribution with 16,415 lbs/day of NOx and 8,358 lbs/day of VOC totaling 36.1%

followed by Forsyth County at 25.1%. Exhibit 8 shows the percentage share by county for the region.

Exhibit 8 - Percent NOx and VOC Emissions Estimate by County



In order to calculate the emission contribution of Randolph commuters alone, the same methodology is applied to Randolph commuter trips assuming 32 miles per commuter. Based on the analysis, 59% of the emission stays within the county. With 21,038 commuter trips estimated to Guilford County in 2008, Randolph commuters contribute 1,575 lbs/day of NOx and 800 lbs/day of VOC. The total contribution by Randolph commuters is 5,074 lbs/day of NOx and 2,577 of VOC. Table 7 summarizes the NOx and VOC Emissions Estimate by Randolph Commuters. For the Triad, Randolph County drivers contribute approximately eleven percent of the on-road mobile source emissions.

Table 7: NOx and VOC Emissions Estimate by Randolph Commuters

County	2000 Commuters	2008 Commuters	Commuter VMT	Nox (lbs/day)	VOC (lbs/day)	% Emissions
Alamance	580	602	19,254	45	23	0.9%
Davidson	2605	2,702	86,477	202	103	4.0%
Forsyth	695	721	23,072	54	27	1.1%
Guilford	20280	21,038	673,230	1,575	800	31.0%
Randolph	38635	40,080	1,282,556	3,000	1,524	59.1%
Rest of NC	2455	2,547	81,498	191	97	3.8%
Outside of NC	90	93	2,988	7	4	0.1%
Total	**65,340**	**67,784**	**2,169,075**	**5,074**	**2,577**	**100%**

VII. Vehicle Miles Traveled (VMT)

The NCDOT VMT data is based on vehicles registered with the North Carolina Division of Motor Vehicles. There are two methodologies to generate VMT data:

1. VMT derived from EAC SIP travel demand models for Davidson, Forsyth and Guilford counties.
2. VMT derived from NCDOT data that is reported to the Federal Highway Administration for national highway systems.

On average, VMT derived from the EAC SIP travel demand models were reported to be 25-40% higher than NCDOT VMT data. The VMT data for the Triad region based on these methodologies is summarized in Table 8 and Table 9.

Table 8: Annual VMT Growth Rate Based on 2000 - 2007 EAC SIP

Triad Area			
County	2000 VMT (miles/day)	2007 VMT (miles/day)	Annual VMT Growth Rate*
Alamance	3,598,930	4,176,499	2.15%
Caswell	619,580	723,600	2.24%
Davidson	4,112,280	4,924,498	2.61%
Davie	1,245,080	1,464,200	2.34%
Forsyth	9,595,433	11,153,970	2.17%
Guilford	14,349,184	16,533,141	2.04%
Randolph	**3,675,570**	**4,414,300**	**2.65%**
Rockingham	2,469,390	2,874,500	2.19%
Stokes	924,340	1,066,800	2.07%
Surry	2,485,200	2,937,501	2.42%
Yadkin	1,330,380	1,544,000	2.15%
Total Area	**44,405,367**	**51,813,009**	**2.23%**

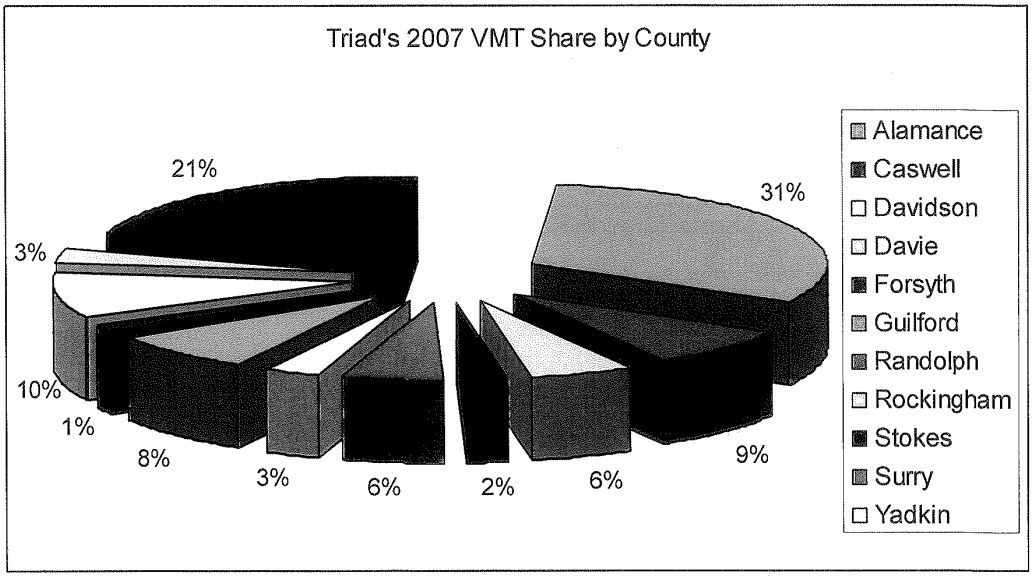
* - Compound Annual Growth Rate

Table 9 : Annual VMT Growth Rate Based on 2000-2004 Universe Data			
	Triad Area		
County	2000 VMT (miles/day)	2004 VMT (miles/day)	Annual VMT Growth Rate*
Alamance	3,598,930	3,682,400	0.57%
Caswell	619,580	599,760	-0.81%
Davidson	4,112,280	4,269,430	0.94%
Davie	1,245,080	1,332,770	1.72%
Forsyth	7,882,840	8,419,940	1.66%
Guilford	10,740,240	11,784,250	2.35%
Randolph	**3,675,570**	**3,775,820**	**0.68%**
Rockingham	2,469,390	2,444,080	-0.26%
Stokes	924,340	985,500	1.61%
Surry	2,485,200	2,471,110	-0.14%
Yadkin	1,330,380	1,386,020	1.03%
Total Area	**39,083,830**	**41,151,080**	**1.30%**

* - Compound Annual Growth Rate

Since the Triad regional model reflects the characteristics of the region rather than the universe data, the data derived from Table 8 is used to calculate Randolph County's contribution in VMT to the Triad area. Exhibit 9, pie chart shown below compares Randolph's share of VMT in the region.

Exhibit 9 - Triad's 2007 VMT Share by County



As seen in Exhibit 9, Randolph share is 9% of the total VMT in the region. Randolph ranks fourth behind Guilford (31%), Forsyth (21%) and Davidson (10%).

VIII. Current Emissions Control Measures

There are three regulatory emission controls enforced in Randolph County. These measures are motor vehicle inspection using OBD II, an open burning ban, and an anti-idling regulation for school buses that is enforced at state level.

Additional voluntary measures include participation in the Piedmont Authority for Regional Transportation's (PART) transit programs, a strong alternative fuel program at the North Carolina Zoo in Asheboro, and building efficiency initiatives in local government and industry.

IX. Conclusion

In the Triad region, Randolph County commuters contribute 5,074 lbs/day of NOx and 2,557 lbs/day of VOC totaling 11.1% of the total motor vehicle emission in the region. Guilford County has the maximum contribution with 16,451 lbs/per of NOx and 8,358 lbs/day of VOC totaling 36.1% followed by Forsyth County at 25.1%. Also, Randolph County's share of the total VMT in the region is 9%, behind Guilford (31%), Forsyth (21%) and Davidson (10%). Traffic commuting patterns indicate that the majority of Randolph County residents live and work in Randolph County but that a substantial minority of Randolph County residents works outside the county, primarily in Guilford County. Because of poor employment opportunities in Randolph County only about twenty-one percent of employees commute into Randolph County exhibits a low degree of urbanization coupled with a slow population growth and replacement level economic growth.

Appendix A

Randolph County
2000 Census Data

WilburSmith ASSOCIATES

Table A1: Where do people who live in Randolph County work?		
Place of Work	**2000 Workers**	**% of Total**
Alamance County	580	0.9%
Davidson County	2,605	4.0%
Forsyth County	695	1.1%
Guilford County	20,280	31.0%
Randolph County	**38,635**	**59.1%**
Rest of NC	2,455	3.8%
Outside of NC	90	0.1%
TOTAL	65,340	100.0%

Table A2: Where do people who work in Randolph County live?		
Place of Residence	**2000 Workers**	**% of Total**
Alamance County	300	0.6%
Davidson County	2,540	5.2%
Forsyth County	390	0.8%
Guilford County	3,985	8.1%
Randolph County	**38,635**	**78.6%**
Rest of NC	3,250	6.6%
Outside of NC	75	0.2%
TOTAL	49,175	100.0%

Table A3: Where do people who live in Davidson County work?		
Place of Work	**2000 Workers**	**% of Total**
Alamance County	325	0.4%
Davidson County	40,620	56.0%
Forsyth County	11,060	15.3%
Guilford County	14,670	20.2%
Randolph County	**2,540**	**3.5%**
Rest of NC	3,170	4.4%
Outside of NC	120	0.2%
TOTAL	72,505	100.0%

Table A4: Where do people who work in Guilford County live?		
Place of Residence	**2000 Workers**	**% of Total**
Alamance County	6,445	2.4%
Davidson County	14,670	5.5%
Forsyth County	16,515	6.2%
Guilford County	187,150	69.9%
Randolph County	**20,280**	**7.6%**
Rest of NC	20,010	7.5%
Outside of NC	2,520	0.9%
TOTAL	267,590	100.0%

Randolph County (NC)
December 2008

NORTH CAROLINA
THE STATE OF MINDS

EDIS
Economic Development Intelligence System

County Profile Contact (919) 715-6374

Commerce Economic Development Contact (919) 733-4977

Demographics

Population & Growth	Population	Annual Growth Rate
2013 Total Population	151,048	1.2%
2008 Total Population	142,600	1.1%
2000 Total Population	130,454	
July 2007 Certified Population Estimate	139,422	
July 2007 Certified Population Growth	8,951	
July 2007 Certified Net Migration	4,273	

Urban/Rural Representation		Urban/Rural Percent
2000 Total Population: Urban - inside Urbanized Area	19,898	15.3%
2000 Total Population: Urban - inside Urbanized Clusters	31,905	24.5%
2000 Total Population: Rural - Farm	1,694	1.3%
2000 Total Population: Rural - Nonfarm	76,957	59.0%

Estimated Population by Age		Pop by Age, % Est.
2013 Median Age	40	
2008 Median Age	39	
2000 Median Age	36	
2008 Total Pop 0-19	37,257	26.1%
2008 Total Pop 20-29	16,914	11.9%
2008 Total Pop 30-39	20,161	14.1%
2008 Total Pop 40-49	22,655	15.9%
2008 Total Pop 50-59	19,764	13.9%
2008 Total Pop 60+	25,849	18.1%

Working Commuters, 2000 Census

Workers, Travel Time	
Avg Travel Time, Not at Home	24
Workers Not Working at Home	64,422
Travel Time to Work: < 5 minutes	1,986
Travel Time to Work: 5-9 minutes	6,613
Travel Time to Work: 10-14 minutes	10,190
Travel Time to Work: 15-19 minutes	11,915
Travel Time to Work: 20-24 minutes	10,595
Travel Time to Work: 25-29 minutes	4,212
Travel Time to Work: 30-34 minutes	8,497
Travel Time to Work: 35-39 minutes	1,894
Travel Time to Work: 40-44 minutes	1,747
Travel Time to Work: 45-59 minutes	3,739
Travel Time to Work: 60-89 minutes	1,650
Travel Time to Work: 90+ minutes	1,384

Workers, By Transportation	
Worker Mode, Base	65,803
Work at Home	1,381
Drove Car/Truck/Van Alone	53,531
Carpooled Car/Truck/Van	9,159
Bus/Trolley Bus	35
Streetcar/Trolley Car	12
Subway/Elevated	0
Railroad	0
Ferryboat	0
Taxicab	11
Motorcycle	73
Bicycle	35
Walked	925
Other Means	641

Travel to Work	Commuters	Percent by Residence
Worked in State/County of Residence	38,637	58.7%
Worked in State/Outside County of Residence	26,764	40.7%
Worked Outside State of Residence	402	0.6%

Education

		Pop Age 25+, %
2007-08 Kindergarten-12th Enrollment	23,215	
2008 Average SAT score (2400 scale)	1,451	
2008 Percent of Graduates taking SAT	47%	
2006-07 Higher Education Completions	44	
2006-07 Higher Education Total Enrollment	3,250	
2000 Education Attainment - At Least High School Graduate	61,191	70.0%
2000 Education Attainment - At Least Bachelor`s Degree	9,681	11.1%

Housing

		Growth / Appreciation Est
2013 Total Housing	64,964	7.0%
2008 Total Housing	60,710	
2013 Median Value of Owner Occupied Housing	122,066	5.2%
2008 Median Value of Owner Occupied Housing	116,037	34.7%
2008 Owner Occupied Housing	42,115	
2008 Renter Occupied Housing	13,179	
2008 Total Households	55,294	
2000 Median Year Housing Structure Built	1,977	

Income

		Growth Estimated
2013 Median Family Income	$62,221	14.7%
2008 Median Family Income	$54,236	22.3%
2000 Median Family Income	$44,358	
2013 Median Household Income	$53,934	14.7%
2008 Median Household Income	$47,023	22.8%
2000 Median Household Income	$38,292	
2008 Median Disposable Income	$37,681	
2008-2013 Per Capita Income: Annual Compound Growth Rate %		2.2%
2013 Per Capita Income	$24,241	11.3%
2008 Per Capita Income	$21,777	19.4%
2000 Per Capita Income	$18,236	
2000 Total Pop with Income Below Poverty Level	11,802	
2000 Percent of Pop with Income Below Poverty Level		9.1%

Employment / Unemployment

	Year to Date	2007 Annual
Employment, 2008Q2YTD	71,409	71,792
Unemployment, 2008Q2YTD	4,835	3,477
Unemployment Rate, 2008Q2YTD	6.3%	4.6%
Announced Job Creation, Sept08YTD	70	347
Total Announced Investments ($mil), Sept08YTD	$20	$5
Lost Jobs, Closings & Layoffs, Nov08YTD	393	101
Establishment Events, Closings & Layoffs, Nov08YTD	5	4

Employment / Wages by Industry	2007 4th Qtr Employment	2007 Annual Employment	2007 4th Qtr Avg Weekly Wage	2007 Avg Weekly Wage
Total All Industries	48,922	48,447	$617	$589
Total Government	6,200	5,884	$709	$657
Total Private Industry	42,722	42,563	$604	$580
Agriculture Forestry Fishing & Hunting	0	0	.	.
Mining	0	0	.	.
Utilities	139	133	$1,123	$1,114
Construction	3,427	3,376	$755	$689
Manufacturing	17,658	17,873	$655	$632
Wholesale Trade	1,980	1,952	$851	$885
Retail Trade	4,300	4,220	$471	$440
Transportation and Warehousing	1,033	1,036	$729	$686
Information	277	266	$711	$708
Finance and Insurance	895	888	$928	$843
Real Estate and Rental and Leasing	355	344	$573	$530
Professional and Technical Services	551	572	$722	$673
Management of Companies and Enterprises	316	307	$468	$458
Administrative and Waste Services	2,818	2,659	$386	$399
Educational Services	3,866	3,570	$707	$641
Health Care and Social Assistance	4,247	4,181	$630	$599
Arts, Entertainment and Recreation	499	554	$659	$564
Accommodation and Food Services	3,138	3,153	$229	$220
Other Services Ex. Public Admin	1,099	1,089	$522	$479
Public Administration	2,183	2,154	$676	$653
Unclassified	141	120	$477	$416

Commercial/Retail/Industrial

Local Businesses

2008 Available Industrial Buildings	132
2007 Establishments: Total Private Industry	2,677
2007 Establishments: Manufacturing	338

Local Retail Business

2008 Total Retail Sales (With Food/Drink) ($mil)	$1,173.7
2008 Total Retail Businesses (With Food/Drink)	1,057
2008 Avg Sales/Business Total (with Food/Drink)	$1,110,385

Quality of Life

Taxes

FY2008-09 Property Tax Rate per $100 Value	$0.5550
FY2007-08 Annual Taxable Retail Sales ($mil)	$750.7
2009 Tier designation	2

Childcare

Sept 2008 Licensed Child Care Facilities	92
Sept 2008 Licensed Child Care Enrollment	3,315

Weather

Annual Rainfall	49
Annual Snowfall	8
Average Annual Temperature	58
Average Annual High Temperature	69
Average Annual Low Temperature	46

Healthcare Providers

2006 Number of Physicians	123
2006 Physicians per 10,000 population	9
2006 RNs per 10,000 population	41
2006 Dentists per 10,000 population	2
2006 Pharmacists per 10,000 population	5

Sources:
ESRI for demographics, working population, educational attainment, housing, income, crime, weather, and retail data. http://www.esri.com
NC Dept. of Education and various state education departments for SAT data by county system. http://www.ncpublicschools.org
US Dept. of Education, National Center for Education Statistics for higher education data. http://nces.ed.gov/ipeds/
NC Commerce for announced new jobs and investment, NC tiers, and number of industrial buildings. http://www.nccommerce.com/en
NC Employment Security Commission for lost jobs and affected establishments data. http://www.ncesc.com
NC Dept. of Health & Human Services for childcare data. http://www.ncdhhs.gov/
UNC Sheps Center for healthcare provider statistics. http://www.shepscenter.unc.edu/
US Bureau of Labor Statistics for employment and unemployment, wages and establishments by industry. http://www.bls.gov
Notes:
Data are the latest available at the date the profile was prepared. SAT scores use the new scoring system including a writing test for a perfect score of 2400 and represent county systems. ESRI 2008/2013 data are projections. Some data may be available only for North Carolina. For further details or questions, please check the Data Sources Guide at https://edis.commerce.state.nc.us/docs/bibliography/EDISdataGuide.htm.

Guilford
Alamance
Randolph
Davidson
Montgomery
Moore
Chatham
Thomasville
High Point
Archdale
Trinity
Randleman
Asheboro
Seagrove
Pleasant Garden
Ramseur
Liberty
Staley
Robbins
Legend
Hospital
Public University
Private University
NC Community Colleges
School
Limited Access
Highway
Major Road
Local Road
Minor Road
Other Road
Ramp
Ferry
Pedestrian Way
Railroads (Local)
Airport Area
Stream
Intermittent Stream
Canal
Dam
National Park or Forest
State Park or Forest
Local Park or Recreation Area
Municipal Boundaries
0
4
8
Miles
Prepared by North Carolina Department of Commerce,
Division of Policy, Research & Strategic Planning, February 2008

Appendix B

Project Information

Attached are two spreadsheets and two word documents. This information should help some of the CMAQ applicants with their emissions reductions calculations.

1) The file named "urban_county_ef_vmt_reduction_projects.xls" will help applicants estimate emissions for projects that will result in quantifiable reductions in VMT in the following counties: Gaston, Mecklenburg, Davidson, Forsyth, Guilford, Durham, Granville and Wake.

2) The file named "rural_county_ef_vmt_reduction_projects.xls" will help applicants estimate emissions for projects that will result in quantifiable reductions in VMT in all other CMAQ eligible counties not listed above in #1.

In both of the spreadsheets above, there are 3 tabs (one each for NOx, VOC and CO). Emission factors are provided in each sheet in units of grams per mile. Applicants can simply multiply their daily VMT reduction resulting from their project by the applicable emission factor to get an emissions estimate in grams/day. (Example: NOx emission factor from light duty trucks = 0.2 g/mile * 50,000 vehicle miles travelled/day = 10,000 g/day NOx reduction.)

If the applicant has a project that applies to all vehicles, then I strongly suggest using only the emission factors provided in column "AE" labeled ALL VEH.

3) The word document named "Mobile6Classifications.doc" provides an explanation of the vehicle type column headings in the spreadsheets.

4) The word document named "readme.doc" contains the instructions in #1 through #3 above.

DAQ will provide additional general guidance for traffic flow improvement projects next week.

Urban Nox Emission Factors

Description	Pol Name	LDGV	LDGT1	LDGT2	LDGT3	LDGT4	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B	LDDV	LDDT12	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B	MC	HDGB	HDDBT	HDDBS	LDDT34	ALL VEH	Avg Spd
Rural interstate	NOX	0.369	0.442	0.629	0.670	0.934	2.192	2.270	2.674	2.564	2.511	2.845	3.241	0.000	0.509	4.249	3.618	3.812	4.938	5.248	6.502	8.084	9.418	11.231	1.699	6.733	15.373	12.650	0.904	2.457	65
Rural principle arterial	NOX	0.362	0.433	0.617	0.658	0.919	2.123	2.198	2.590	2.483	2.432	2.755	3.139	0.000	0.418	3.536	2.951	3.110	4.028	4.281	5.313	6.606	7.782	9.309	1.563	6.520	12.494	10.279	0.741	1.312	60
Rural minor arterial	NOX	0.348	0.413	0.592	0.632	0.890	1.972	2.042	2.406	2.307	2.259	2.559	2.916	0.000	0.308	2.676	2.147	2.262	2.930	3.114	3.771	4.690	5.316	6.338	1.279	6.057	9.022	7.420	0.544	0.942	49
Rural major collector	NOX	0.343	0.406	0.583	0.623	0.880	1.916	1.984	2.337	2.241	2.194	2.486	2.832	0.000	0.285	2.499	1.982	2.088	2.704	2.875	3.477	4.324	4.910	5.862	1.222	5.884	8.309	6.833	0.503	0.813	45
Rural minor collector	NOX	0.342	0.405	0.581	0.621	0.877	1.903	1.971	2.321	2.226	2.180	2.470	2.814	0.000	0.282	2.476	1.960	2.065	2.675	2.843	3.439	4.276	4.857	5.800	1.218	5.845	8.216	6.756	0.498	0.805	44
Rural local	NOX	0.342	0.405	0.581	0.621	0.877	1.903	1.971	2.321	2.226	2.180	2.470	2.814	0.000	0.282	2.476	1.960	2.065	2.675	2.843	3.439	4.276	4.857	5.800	1.218	5.845	8.216	6.756	0.498	0.793	44
Urban interstate	NOX	0.364	0.435	0.620	0.660	0.922	2.138	2.214	2.608	2.501	2.449	2.774	3.160	0.000	0.437	3.688	3.093	3.259	4.221	4.487	5.566	6.921	8.130	9.719	1.592	6.566	13.107	10.785	0.776	1.554	61
Urban freeway	NOX	0.367	0.438	0.624	0.665	0.928	2.166	2.243	2.642	2.533	2.481	2.811	3.202	0.000	0.474	3.977	3.364	3.545	4.591	4.880	6.049	7.521	8.795	10.499	1.647	6.652	14.276	11.747	0.842	1.210	63
Urban principle arterial	NOX	0.339	0.401	0.577	0.616	0.873	1.876	1.943	2.289	2.195	2.149	2.435	2.774	0.000	0.276	2.427	1.914	2.017	2.612	2.776	3.356	4.174	4.744	5.666	1.209	5.763	8.016	6.592	0.486	0.772	42
Urban minor arterial	NOX	0.339	0.401	0.577	0.616	0.873	1.876	1.943	2.289	2.195	2.149	2.435	2.774	0.000	0.276	2.427	1.914	2.017	2.612	2.776	3.356	4.174	4.744	5.666	1.209	5.763	8.016	6.592	0.486	0.700	42
Urban collector	NOX	0.335	0.394	0.568	0.607	0.863	1.807	1.872	2.205	2.114	2.070	2.346	2.672	0.000	0.265	2.343	1.836	1.934	2.505	2.663	3.217	4.000	4.552	5.441	1.182	5.551	7.678	6.314	0.467	0.652	37
Urban local	NOX	0.335	0.395	0.569	0.609	0.865	1.821	1.886	2.221	2.130	2.086	2.364	2.692	0.000	0.266	2.353	1.845	1.944	2.518	2.677	3.234	4.022	4.575	5.469	1.188	5.593	7.720	6.348	0.470	0.725	38
																													Average	1.061	

Urban VOC Emission Factors

Description	Pol Name	LDGV	LDGT1	LDGT2	LDGT3	LDGT4	HDGV2B	HDGV3	HDGV4	HDGV5	HDGV6	HDGV7	HDGV8A	HDGV8B	LDDV	LDDT12	HDDV2B	HDDV3	HDDV4	HDDV5	HDDV6	HDDV7	HDDV8A	HDDV8B	MC	HDGB	HDDBT	HDDB5	LDDT34	ALL VEH	Avg Spd
Rural interstate	VOC	0.397	0.674	0.655	0.627	0.623	0.577	0.705	1.199	0.955	0.920	1.012	1.188	0.000	0.114	2.376	0.096	0.104	0.127	0.138	0.173	0.213	0.225	0.264	2.583	2.026	0.168	0.313	0.233	0.478	65
Rural principle arterial	VOC	0.422	0.631	0.662	0.594	0.630	0.510	0.707	1.202	0.957	0.922	1.014	1.188	0.000	0.114	2.376	0.096	0.104	0.127	0.138	0.173	0.213	0.225	0.264	2.285	2.042	0.168	0.313	0.233	0.511	60
Rural minor arterial	VOC	0.418	0.653	0.683	0.614	0.651	0.537	0.732	1.243	0.986	0.950	1.044	1.225	0.000	0.119	2.421	0.103	0.112	0.138	0.149	0.187	0.231	0.243	0.288	1.991	2.170	0.182	0.338	0.244	0.536	49
Rural major collector	VOC	0.426	0.662	0.693	0.623	0.660	0.555	0.748	1.269	1.005	0.969	1.065	1.250	0.000	0.123	2.454	0.109	0.116	0.145	0.157	0.198	0.244	0.256	0.301	2.004	2.243	0.192	0.357	0.253	0.548	45
Rural minor collector	VOC	0.428	0.664	0.695	0.625	0.662	0.560	0.754	1.276	1.011	0.975	1.071	1.257	0.000	0.124	2.464	0.111	0.120	0.148	0.160	0.201	0.248	0.261	0.307	2.013	2.264	0.195	0.363	0.255	0.553	44
Rural local	VOC	0.428	0.664	0.695	0.625	0.662	0.560	0.754	1.276	1.011	0.975	1.071	1.257	0.000	0.124	2.464	0.111	0.120	0.148	0.160	0.201	0.248	0.261	0.307	2.013	2.264	0.195	0.363	0.255	0.556	44
Urban interstate	VOC	0.401	0.629	0.660	0.592	0.628	0.509	0.707	1.202	0.957	0.922	1.014	1.189	0.000	0.114	2.376	0.096	0.104	0.127	0.138	0.173	0.213	0.225	0.264	2.470	2.032	0.168	0.313	0.233	0.514	63
Urban freeway	VOC	0.399	0.627	0.657	0.589	0.625	0.506	0.703	1.195	0.952	0.917	1.013	1.187	0.000	0.114	2.376	0.095	0.104	0.127	0.138	0.173	0.213	0.225	0.264	2.349	2.039	0.168	0.313	0.233	0.503	61
Urban principle arterial	VOC	0.423	0.658	0.690	0.620	0.657	0.572	0.765	1.292	1.024	0.987	1.085	1.273	0.000	0.127	2.487	0.115	0.124	0.153	0.166	0.208	0.256	0.270	0.317	2.032	2.308	0.202	0.375	0.261	0.557	42
Urban minor arterial	VOC	0.433	0.669	0.700	0.629	0.667	0.572	0.765	1.292	1.024	0.987	1.085	1.273	0.000	0.127	2.487	0.115	0.124	0.153	0.166	0.209	0.256	0.270	0.317	2.032	2.308	0.202	0.375	0.261	0.563	42
Urban collector	VOC	0.446	0.682	0.713	0.642	0.680	0.597	0.799	1.343	1.063	1.025	1.127	1.323	0.000	0.135	2.597	0.127	0.138	0.169	0.183	0.230	0.284	0.288	0.351	2.103	2.446	0.223	0.415	0.279	0.577	37
Urban local	VOC	0.443	0.680	0.710	0.639	0.677	0.589	0.791	1.331	1.054	1.016	1.118	1.311	0.000	0.133	2.541	0.124	0.135	0.165	0.179	0.225	0.277	0.282	0.343	2.085	2.414	0.218	0.465	0.275	0.575	38
																													Average	0.539	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Appendix B

Local Government and Public Comments Received

(Raleigh-Durham-Cary Area Comments)

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Subject: Re: Air Quality Meeting Announcement - Revised 8-hour Ozone NonattainmentBoundary Recommendations
From: "John Hodges-Copple" <johnhc@tjcog.org>
Date: Tue, 13 Jan 2009 10:52:31 -0500
To: "George.Bridgers" <George.Bridgers@ncmail.net>, "Laura Boothe" <Laura.Boothe@ncmail.net>
CC: "Bob Bacon" <bob@tjcog.org>, "Edward Dancausse" <Edward.Dancausse@fhwa.dot.gov>

Hi George and Laura,

Good to see you yesterday. I am attaching two maps as pdfs that will help illustrate the MPOs: one for the Triangle Ozone Area and one for Burlington-Graham MPO (showing its 2 "tails:" one extending into Orange and the other into Guilford). TJCOG GIS staff: can you send George and Laura shapefiles for the following:

1. The Burlington-Graham MPO boundary: hopefully the full thing, but at least the portion in Orange County (shown in red on the attached Triangle Ozone Map; September created it).
2. Township boundaries in Orange County.
3. The DCHC MPO and CAMPO boundaries (shown in red on the attached Triangle Ozone Map; September created it)
4. The Triangle Regional Model boundary map (shown in purple on the attached Triangle Ozone Map; September created it)

Thanks,

John Hodges-Copple, Planning Director
Triangle J Council of Governments
PO Box 12276
Research Triangle Park, NC 27709
919-558-9320
johnhc@tjcog.org
www.tjcog.org

> ----- Original Message -----
> **From:** George.Bridgers
> **To:** DENR.DAQ.SICM
> **Sent:** Monday, December 22, 2008 4:22 PM
> **Subject:** Air Quality Meeting Announcement - Revised 8-hour Ozone NonattainmentBoundary Recommendations
>
> Greetings to all,
>
> The NC Division of Air Quality will host a series of five Public Meeting across North Carolina during the first half of January 2009 to discuss new 8-hour ozone nonattainment boundaries that will impact many portions of our state by March 12, 2010. These Public Meetings will provide us the opportunity to present our initial projections for the 8-hour ozone nonattainment boundaries / regions and to seek feedback from all those in attendance on these new nonattainment boundaries. This feedback, along with feedback from other portions of State Government, transportation partners, and locally elected officials, will aid the NC Division of Air Quality in making our recommendations to the Department of Environment and Natural Resources Secretary and to the Governor for final State recommendations to the U.S.EPA.
>
> Here is some very brief background information:
>
> On March 12, 2008, U.S.EPA promulgated a revised 8-hour ozone standard (0.075ppm) that was approximately ten percent more stringent than the previous standard (0.08ppm) established in 1997. While the majority of North Carolina was meeting the older 1997 standard, all of the largest metropolitan regions (Triangle, Triad, and Metrolina), some of the larger cities (Hickory, Fayetteville, Greenville, and Rocky Mount), and the higher elevations of the NC Mountains (near/around Asheville) are currently violating the revised 2008 standard. The Clean Air Act requires the U.S.EPA to make nonattainment boundary designations within two years of a new standard's promulgation. One year prior to such designations, the State has an opportunity to make nonattainment boundary recommendations to the U.S.EPA.
>
> The Public Meetings outlined below have been established to provide some focus to the five generalized regions of North Carolina impacted by the revised 8-hour ozone standard. Though, ozone nonattainment will be discussed as a whole statewide in each of the Public Meetings. Each meeting should not last more than one hour or one and a half hours, depending on the amount of questions / discussion. We encourage and welcome all that want to attend. By all means, feel free to pass the meeting information along to others. We will also post shortly the meeting information on our Division's web site along with a formal Press Release.
>
> Here is the rundown of meeting information:

Wednesday, January 7th at 3pm

Charlotte/Metrolina (Western Piedmont)

Mecklenburg County Air Quality
700 North Tryon Street
Charlotte, NC 28202
Auditoriums 1 & 2

Thursday, January 8th at 7pm
or
Monday, January 12th at 7pm

Greenville (Eastern North Carolina)

These are tentative dates for this meeting.
Further information will be provided once
a meeting location has been finalized.

Monday, January 12th at 2pm

Triangle, Rocky Mount, and Fayetteville (Central Piedmont and Sandhills)

NC Division of Air Quality
2728 Capital Boulevard
Raleigh, NC 27604
Air Quality Training Room (AQ526)

Tuesday, January 13th at 2pm

Triad and Hickory (Western Piedmont and Foothills)

Forsyth County Environmental Affairs Department
537 North Spruce Street
Winston-Salem, NC 27101
Main Conference Room

Tuesday, January 13th at 7pm

Asheville and Mountains (Western North Carolina)

Colonial Theatre
53 Park Street
Canton, NC 28716
Colonial Annex

Please do not hesitate to email or call me with questions concerning these public meetings. I will be checking email and voice mail over the holiday break.

Happy Holidays and Happy New Year,
George

--

George M. Bridgers, Meteorologist II
NC DENR, Division of Air Quality
Planning Section, Attainment Planning Branch
1641 Mail Service Center
Raleigh, NC 27699-1641
Phone: 919-715-6287
Fax : 919-715-7476
Email: George.Bridgers@ncmail.net
Web : http://www.ncair.org

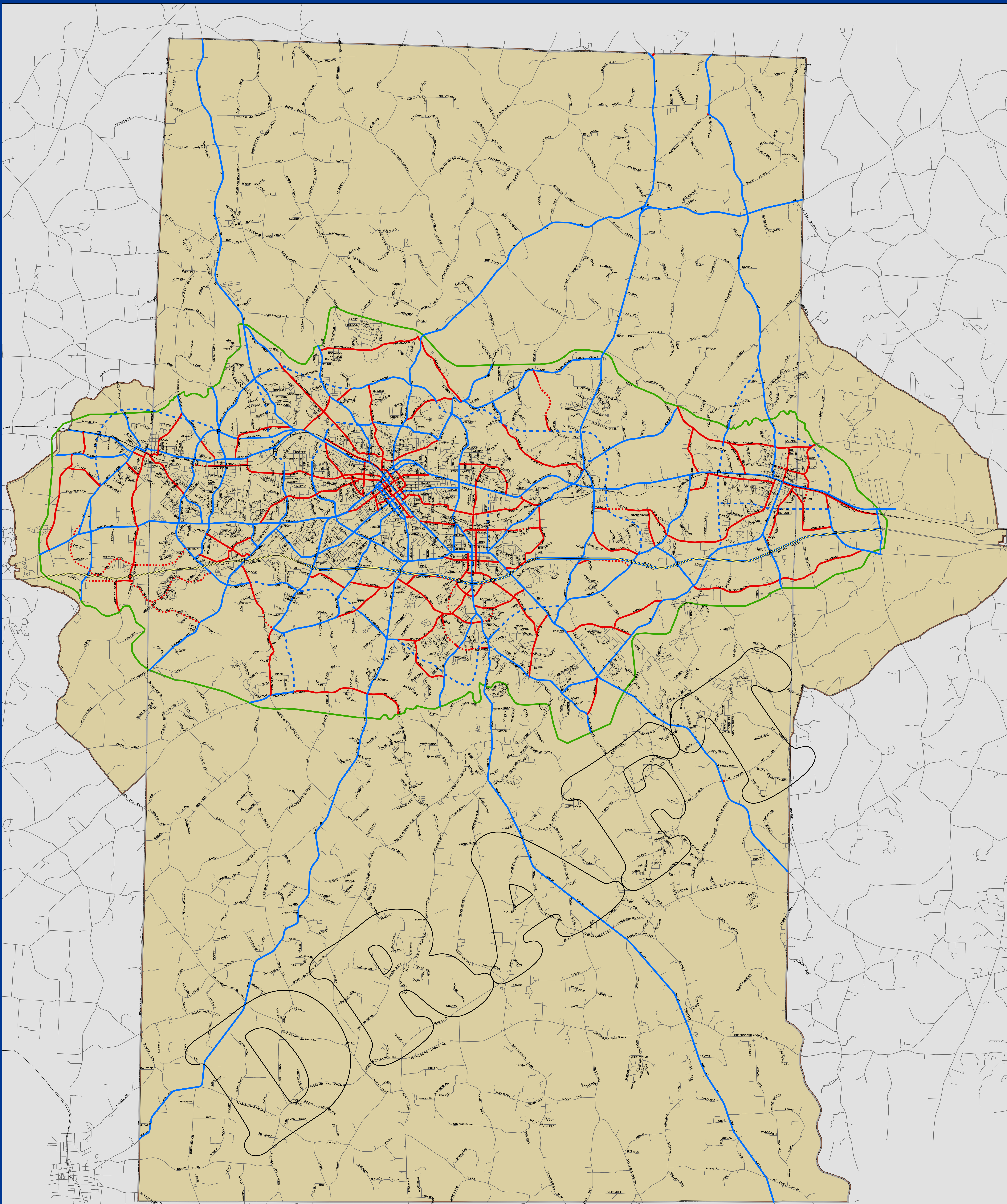
_____

DENR.DAQ.SICM mailing list
DENR.DAQ.SICM@lists.ncmail.net

BG MPO Thoroughfare_Plan.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

Triangle Ozone Area Map.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

Burlington - Graham M.P.O.- Thoroughfare Plan



Legend

- CountyBoundary
- MPO_Urbanized_Area_Boundary
- BGMPO_TazBoundary
- AlamanceCenterLines
- gdtrailroads

! Interchange - Existing
P Interchange - Proposed
O Grade Seperation - Existing
R Grade Seperation - Proposed

- Interstate
- Major Thoroughfare
- Major Thoroughfare (Future)
- Minor Thoroughfare
- Minor Thoroughfare (Future)

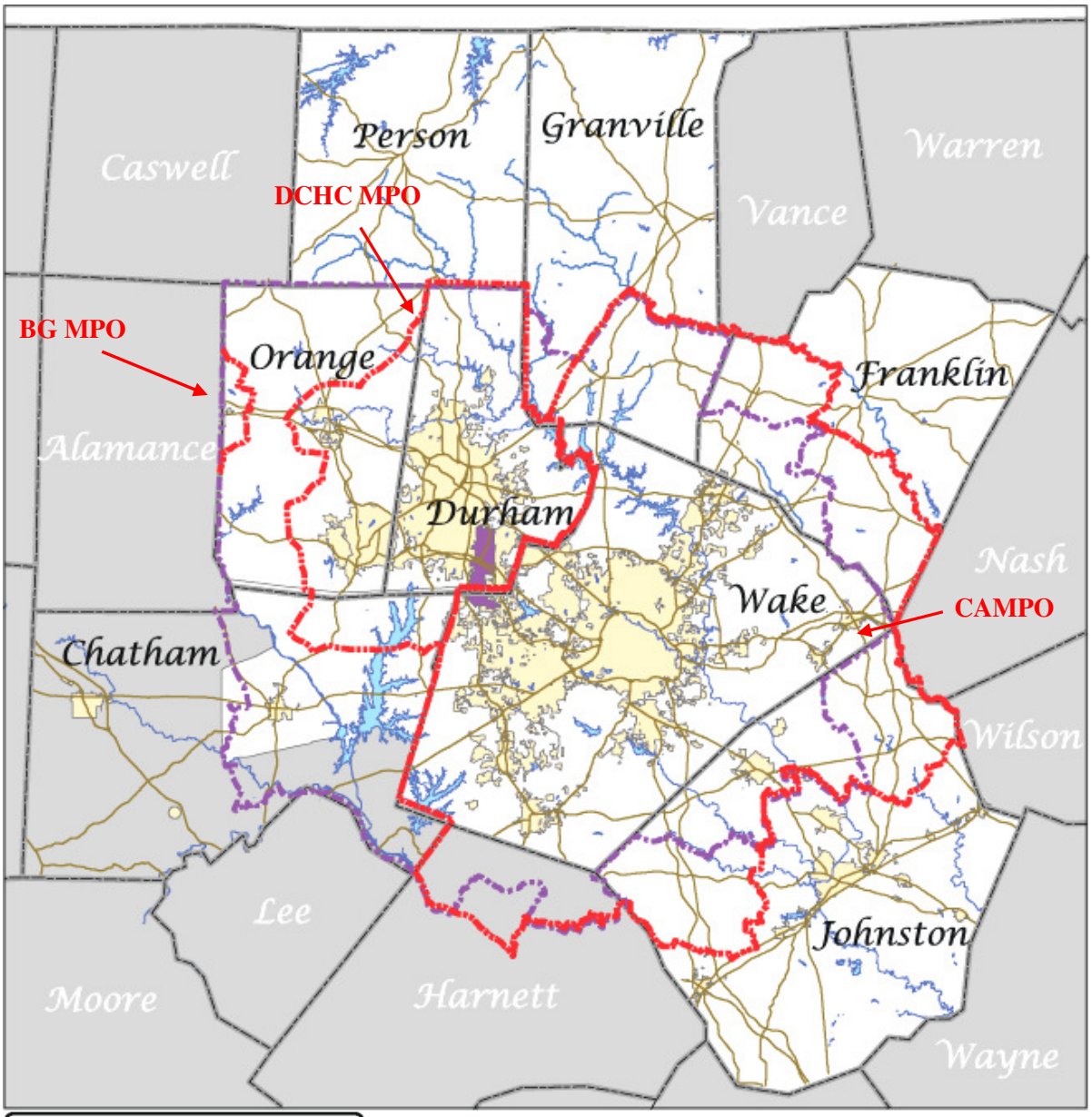
City of Burlington, GIS Division
November 17, 2005

Scale:
1 inch equals 3,779.68 feet

4

Disclaimer:
This map was compiled from the GIS resources of the Burlington Regional GIS Partnership for public planning and agency support purposes. These resources include public information sources of different scale, time, origin, definition and accuracy, which aspects produce inconsistencies among features represented together on this map. Neither the City of Burlington nor the Partnership shall be held liable for any errors in this map or supporting data. Primary public information sources from which this map was compiled, in conjunction with field surveys where required must be consulted for the verification of the information contained within this map.

Triangle Ozone Maintenance Area (area shown in white)



BG MPO is Burlington-Graham MPO (small part of Orange County in the maintenance area).

CAMPO is Capital Area MPO (all of Wake County and parts of Franklin, Granville, Harnett and Johnston Counties)

DCHC MPO is Durham-Chapel Hill-Carrboro MPO (all of Durham and parts of Orange and Chatham Counties.

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Appendix B

Local Government and Public Comments Received

(Fayetteville Area Comments)

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BRAC Regional Task Force P.O. Box 70999 • Ft. Bragg, NC 28307 • (910) 436-1345

January 13, 2009

Donald D. Redmond, Jr.
Assistant Planning Chief
Division of Air Quality
NC Department of Environment and Natural Resources
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear Mr. Redmond:

We understand that Hoke County has been proposed as part of the Cumberland County MSA for the purpose of a non-attainment designation by EPA. Because of Hoke County's largely rural nature and low population density, we ask that the NCDAQ reconsider Hoke County's proposed non-attainment designation.

Hoke County is a rural county located in southeastern North Carolina; however, it has experienced significant growth during the past decade, which is expected to continue due to an influx of new residents expected from the growth at Fort Bragg. Hoke's population is projected to grow to 56,704 by 2013.

To mitigate impacts from this growth, BRAC Regional Task Force is working with Hoke County government to establish sound transportation and growth management strategies that will (1) focus new growth along designated corridors and activity nodes; (2) promote the construction of pedestrian-oriented and transit-friendly residential and mixed-use development; and (3) substantially reduce vehicle miles traveled (VMT) as compared to current levels.

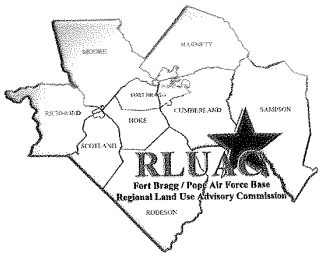
Furthermore, as we understand it, Cumberland County's ozone levels were only a fraction above new ozone standards, and there are no monitoring stations located in Hoke County.

Based on the information as described above, we believe that Hoke County should not be included as part of any non-attainment designation.

Sincerely,

Paul Dordal
Executive Director

cc: Laura A. Boothe, Attainment Planning Chief, NC Division of Air Quality
George M. Bridgers, Meteorologist, NC Division of Air Quality
James Perry, Executive Director, Lumber River Council of Governments
Tim Johnson, Hoke County Manager



January 15, 2009

Donald D. Redmond, Jr.
Assistant Planning Chief
Division of Air Quality
NC Department of Environment
& Natural Resources
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear Mr. Redmond:

The Fort Bragg / Pope Air Force Base Regional Land Use Advisory Commission (RLUAC) is submitting this letter in support of the effort to exclude Hoke County from the Cumberland County MSA for the purpose of a non-attainment designation by the U.S. Environmental Protection Agency (EPA). It is our belief that Hoke County does not belong in a non-attainment designation due to its rural nature and lack of factors that would contribute to air quality concerns.

Hoke County, with a 2000 Census population of only 33,646 people, is a located in southeastern North Carolina. Nearly one-third of its territory is owned by Fort Bragg and is not available for urban development. The County's only incorporated municipality (Raeford) contains a population of only 3,000 people. Nearly all of the county's industry is located in and around Raeford. The balance of the County is predominantly farmland and low-density residential development.

Since no ozone monitoring stations were included within or near Hoke County during the most recent evaluation period, it seems unreasonable to link Hoke County with Cumberland's ozone levels -- especially since Cumberland's results were listed as being only a fraction above the new EPA standards.

Based on the above information, RLUAC believes that Hoke County should not be included as part of any non-attainment designation.

Sincerely,

James Dougherty
Executive Director

Fort Bragg / Pope Air Force Base Regional Land Use Advisory Commission ● P.O. Drawer 1510, Fayetteville, N.C. 28302
Counties of Cumberland, Harnett, Hoke, Moore, Richmond, Robeson, Sampson, Scotland ● Municipalities of Aberdeen, Fayetteville, Hope Mills, Laurinburg, Lillington, Pinehurst, Raeford, Spring Lake, Southern Pines, St. Pauls, Vass, Wagram, Whispering Pines ● Fort Bragg and Pope Air Force Base

LRCOG

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Lumber River Council of Governments
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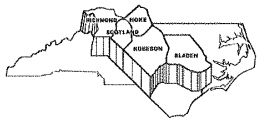

December 22, 2008

Donald D. Redmond, Jr.
Assistant Planning Chief
Division of Air Quality
NC Department of Environment
and Natural Resources
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear Mr. Redmond:

We are writing this letter in support of Hoke County not being included as part of the Cumberland County MSA for the purpose of a non-attainment designation by EPA. It is our belief that Hoke County does not belong in any non-attainment designation due to its rural nature and lack of factors that would contribute to air quality concerns.

Hoke County is a rural county located in southeastern North Carolina. The county has a population of 33,646 according to the 2000 Census. It has one incorporated municipality in the City of Raeford, with a population of approximately 3,000. Industry that is present in the County is generally located in and around Raeford. The balance of the County is predominantly farmland and low density housing. Approximately one-third of the land area, located in the north, is a part of Fort Bragg; however, this acreage is forest land used for training and has no significant military structure.

According to monitoring information, Cumberland County's ozone levels were only a fraction about the new ozone standards and the monitoring stations were not located near Hoke County.

Based on the above information, we believe that Hoke County should not be included as part of any non-attainment designation.

Sincerely,

James Perry
Executive Director

C Laura Booth, Attainment Planning Branch Chief
George M. Bridgers, Meteorologist

www.lumberrivercog.org

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Maxton
McDonald
Orrum
Parkton
Pembroke
Proctorville
Red Springs
Rennert
Rowland
St. Pauls

SCOTLAND COUNTY
Gibson
Laurinburg
Wagram

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Appendix B

Local Government and Public Comments Received

(Greenville Area Comments)

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WARD AND SMITH, P.A.

FRANK H. SHEFFIELD, JR., Attorney at Law

1001 College Court (28562)
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New Bern, NC 28563-0867

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F: 252.672.5477
fhs@wardandsmith.com

February 9, 2009

Mr. George M. Bridgers
NCDENR - Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

RE: Pitt County: Proposed Non-Attainment Boundaries for 8-Hour Ozone National Ambient Air Quality Standard
Our File 030345-00002-001

Dear Mr. Bridgers:

We have been retained by Pitt County to represent its interests with regard to the proposed recommendation of the North Carolina Department of Environment and Natural Resources, Division of Air Quality ("DAQ") to designate Pitt County as a non-attainment area for the recently revised 8-Hour Ozone National Ambient Air Quality Standard (the "Ozone Standard"). This letter is intended to provide a response to the information provided by DAQ at its January 26, 2009, meeting with County and municipal elected officials and its February 2, 2009, meeting for the citizens of Pitt County.

Pitt County officials recognize and consider air quality as an important issue, both for the health of residents of Pitt County as well as for the continued economic vitality of the area. As you know, until the Ozone Standard was revised by the EPA in 2008, Pitt County historically always has been considered an area of attainment. Due to EPA's modification of the Ozone Standard to 0.075 parts per million ("ppm") in March 2008, it appears that Pitt County now is under consideration for re-designation as a non-attainment area, primarily based on a questionable ozone measurement of 0.077 parts per million ("ppm") in 2008.

Pitt County officials are concerned that EPA may designate the entire County as non-attainment, a designation that will result in higher costs for local industries, delay much-needed transportation improvements, and negatively impact Pitt County's ability to attract and retain

industry. In addition, County officials are concerned that the types of controls EPA may impose as a result of such a designation may not impact or improve the air quality in Pitt County. If, in fact, Pitt County air is exceeding the Ozone Standard and adversely affecting the health or welfare of its citizens as a result of emissions from within Pitt County, County officials agree that steps should be taken to rectify the problem, including the possibility of a nonattainment designation. However, of the factors considered when making nonattainment area designations, several should be examined more closely prior to any decision to reclassify Pitt County. The factors of concern are:

1. The Proposed Nonattainment Designation Is Based On Suspect Air Quality Data.

Pitt County's measurements for the annual fourth highest daily maximum 8-hour average were recorded at 0.072 ppm in 2006, 0.079 ppm in 2007, and 0.077 ppm in 2008, resulting in a 3-year average of 0.076 ppm. In 2006 and 2007, the Ozone Standard was 0.084 ppm; thus, Pitt County clearly was in attainment for those years. Pitt County would have retained that status in 2008 had EPA not reduced the Ozone Standard, but even with the new standard, the County is on the borderline of attainment. This means that even one of the factors below could result in a different, lower, 3-year average as a result of "exceptional data" per EPA's guidelines.

As you know, ozone is one of the few pollutants of concern that is formed over time by other pollutants (VOC and NOx) acting as precursors. Therefore, the ozone concentrations in Pitt County may not be a result of Pitt County emissions. In this case, designation of Pitt County as nonattainment and requirement of reductions in emissions only within the County would not affect ozone concentrations in the County. All the control costs would do is damage the economy of the area. Therefore, there are several factors that contributed to and/or caused levels in excess of the new Ozone Standard that need to be considered and fully analyzed by DAQ before making its recommendation:

a. Transport of ozone from sources west/southwest of Pitt County.

The monitor readings compiled for the 3-year average were taken at two different monitoring locations. The 2006 and 2007 readings were taken at a monitor location in Farmville on the western side of Pitt County. The 2008 readings were taken at the current monitor location at the Agricultural Center north of Greenville. The results of both the Pitt County and Farmville monitors likely are not reflective of the actual sources within DAQ's proposed boundary contributing to non-attainment of the Ozone Standard in Pitt County. The ozone concentrations instead likely are due to the transport of ozone from more urbanized areas and specific sources west/southwest of Pitt County.

First, the Progress Energy coal-fired power plant in Goldsboro, 40 miles southwest of the Pitt County monitor, is a major contributor to ozone, reporting over 4,000 tons of NOx alone in 2007. This power plant could easily be the primary stationary emission source contributing to Pitt

County's higher ozone levels. The location of the Progress Energy Plant in relation to the Greenville monitor is illustrated in Attachment 1 to this letter. The Progress Energy plant is subject to the Clean Smokestacks Act and a number of other programs to reduce emissions at power plants that, hopefully, will reduce its emissions further. That alone may suffice to allow Pitt County to achieve attainment in the future. Even if no additional reductions are forthcoming for the Goldsboro plant, the designation of Pitt County as nonattainment would not affect the Goldsboro plant's emissions. This is because it is not in the proposed Pitt County nonattainment area, so its emissions would not be subject to reasonably available control technology ("RACT") requirements or any other requirements imposed for the nonattainment area. However, even if the facility were subject to RACT, RACT is unlikely to be more stringent than the requirements already in place for that facility. The only solution to Pitt County nonattainment, then, may be to enact sufficiently stringent source-specific limitations on NOx emissions from the Progress Energy Goldsboro plant.

Second, ozone pre-cursors from the Triangle areas of Orange, Durham, and Wake Counties travel in western prevailing winds to Pitt County, and must be considered a significant contributing factor to Pitt County's ozone levels. In particular, there likely is a correlation between Pitt County's 0.079 ppm maximum 8-hour average in 2007, a spike up from 2006, and the extreme hot and dry conditions the Piedmont metropolitan areas experienced in the summer of 2007 because winds generally were from the west during that period.

b. The 2008 data is not representative because an exceptional event influenced the April 18, 2008 average.

Only four daily maximum 8-hour average values were above the new Ozone Standard during the entire 2008 season. The first value, 0.084 ppm, occurred on April 18, 2008. Such a high reading is uncommonly early for the beginning of the ozone season; indeed, it is flanked by seasonably low readings on the 17th and the 19th. This high reading likely is due to a large fire that occurred on the previous evening which consumed an abandoned, historic tobacco warehouse in the center of Greenville. The turn-of-the-century three-story tobacco plant covering two city blocks burned uncontrolled for well over two hours and then smoldered into the night. It was reported by the local newspaper that flames shot more than 100 feet into the air and the smoke plume was visible from five miles away. The warehouse was located approximately two miles south-southwest of the Greenville monitoring station and is illustrated in Attachment 2 to this letter.

Pitt County officials are concerned that the warehouse fire adversely influenced the monitor reading for April 18, 2008, and believe it should be treated as an "exceptional event" in accordance with the EPA's Standards for Treatment of Data Influenced by Exceptional Events, 72 Fed. Reg. 13,560 (March 22, 2007) (to be codified at 40 C.F.R. §§ 50, 51), attached hereto as Attachment 3. It is common knowledge that wood combustion generates both NOx and other compounds of incomplete combustion, in the form of VOCs. Being that these compounds were generated at night and light winds prevailed, these compounds remained in the area and did not

have a potential to form ozone until after sunrise on April 18, 2008. A review of the meteorological data for April 18, 2008 indicates low humidity and calm-to light winds from the west-southwest from 6 A.M. to 6 P.M., causing the precursors from the warehouse fire to drift towards the monitoring station. A sampling of such data is attached hereto as Attachment 4. It appears the monitor was recording ozone that was generated as a result of the fire. Pitt County officials request the State's concurrence with these findings, and that it invalidate and eliminate from consideration the April 18, 2008 data.

Eliminating the April reading due to the warehouse fire brings the fourth highest reading for 2008 to 0.074 ppm occurring on June 12, 2008. When 0.074 is averaged with the like readings from 2006 and 2007, the 3-year average for Pitt County is 0.075 ppm. This 3-year average meets the Ozone Standard, is a more accurate reflection of Pitt County's air quality, and requires continued designation of Pitt County as "attainment."

c. Different Monitoring Locations.

The readings compiled for Pitt County's 3-year average were not taken at the same monitoring station location. As indicated above in paragraph 1.a., the 2006 and 2007 readings were taken at the Farmville monitor location that was clearly upwind of Pitt County emission sources. On the other hand, the 2008 readings were taken at the Greenville monitor location in the north-central part of the County. The rationale for moving the monitor is unclear, but using two different monitors at locations that may be affected by different wind patterns and sources is inappropriate as the basis for such an important decision as reclassifying the area. Pitt County officials request that DAQ suspend judgment on nonattainment until three years of data are available from the Greenville monitor location. Otherwise, averaging ozone readings from two different locations in the County is of questionable validity and arguably would not withstand challenge.

d. Jamesville Monitor Better Reflects Pitt County Emissions.

The Jamesville monitor in Martin County may provide a more accurate representation of emissions from Pitt County. The Jamesville monitor is located 30 miles northeast of Pitt County, and it would receive emissions blown by southwesterly winds particularly from the urbanized area of Greenville in the center of the Pitt County. With a 3-year average of 0.073 ppm, it is a more accurate reflection that Greenville and Pitt County are not contributing to any violation of the Ozone Standard. It would be inequitable to impose upon Pitt County non-attainment restrictions, particularly with regard to transportation conformity requirements, when it clearly is not contributing to a violation of the Ozone Standard in another area.

Considering the above, and in light of projections by DAQ that ozone levels in Pitt County will decrease dramatically even without further regulatory actions in the next one to five years, Pitt County officials urge DAQ to recommend to Governor Perdue, and ultimately to EPA, that Pitt County retain its present attainment designation.

2. **If DAQ Must Recommend Non-Attainment, Only A Limited Portion Of Pitt County Should Be Designated.**

Pitt County officials were made aware at the Public Meeting held by DAQ on January 26, 2009, that the EPA may be reluctant to accept an attainment recommendation for a county whose 3-year average of the fourth highest daily maximum 8-hour average is in excess of the new Ozone Standard. If DAQ does not eliminate the April 18, 2008, reading due to the warehouse fire as an exceptional event, or cannot otherwise consider Pitt County as having attained the Ozone Standard as requested above, then Pitt County officials request DAQ to recommend a partial county non-attainment designation based on factors other than air quality data.

Any partial designation should be limited to Pitt County's Urban Core because the main source of ozone precursors in Pitt County appears to be motor vehicles concentrated in urban areas. An illustration of the Urban Core is provided as Attachment 5, the Map of Pitt County's Population Density. Pitt County's urbanized areas are shown in red and are reflective of 2000 census block groups that have a population density of at least 1,000 people per square mile. The areas of Greenville south of the Tar River and Winterville, as well as a small pocket in Farmville, are the areas most likely to contribute to Pitt County's ozone levels due to population density, increasing urbanization, and future traffic and commuting patterns. In addition, previously-projected growth rates and locations for Pitt County have occurred in the Urban Core and areas south, as reflected in the attached Map of Proposed Development 2004-2008 (Attachment 6). Pitt County officials expect growth rates and locations to continue this trend. Although growth is not anticipated to include high emissions, Pitt County officials are willing to take steps to reduce or hold emissions at attainment standards.

Further, there are large rural areas with few emissions sources outside of the Urban Core that would be treated as non-attainment if the whole of Pitt County was designated. These rural areas are already disadvantaged in numerous ways. As you acknowledged in both the January 26 and the February 2 meetings, the primary factor within Pitt County's limits contributing to ozone levels is automotive emissions. Using the Urban Core as the non-attainment boundary would capture the majority of traffic, population, and growth for this area which contributes to Pitt County's ozone levels. It makes more sense to concentrate on the potential source of the problem rather than to include the rural, non-contributing areas outside those boundaries.

3. **DWQ Should Recommend Pitt County As A Candidate For An Early Action Compact With EPA.**

To further air quality protection efforts and to defer a County-wide nonattainment designation, Pitt County officials would be willing to enter into an Early Action Compact ("EAC") with EPA. In the past, under the previous Ozone Standard, EAC's have proven successful for non-attainment areas to achieve and maintain clean, healthful air. If designated as non-attainment, Pitt County almost certainly would be classified as marginal and would make an ideal participant in an EAC. With the assistance of DAQ and the EPA, Pitt County officials would develop and

implement additional air pollution control and emission reduction strategies in Pitt County, concentrating on the Urban Core, to account for growth and to achieve and maintain the new Ozone Standard. Officials plan to take a proactive role to protect air quality, and already have spoken with DAQ officials for assistance with a public awareness education program.

Conclusion

Pitt County officials urge DAQ to recommend to Governor Perdue that Pitt County retain its present attainment designation.

It would be unjust and inequitable to impose upon Pitt County the restrictions of a 20-year transportation conformity plan requirement and other measures when (1) significant sources outside of Pitt County contribute to its ozone readings through long-range transport; (2) the air quality data suggesting nonattainment is questionable; and, (3) DAQ has predicted that Pitt County will be in attainment as early as this year without any further regulatory action (Attachment 7). If a non-attainment designation is unavoidable, then Pitt County requests a partial-county designation limited to its Urban Core and designation as an EAC.

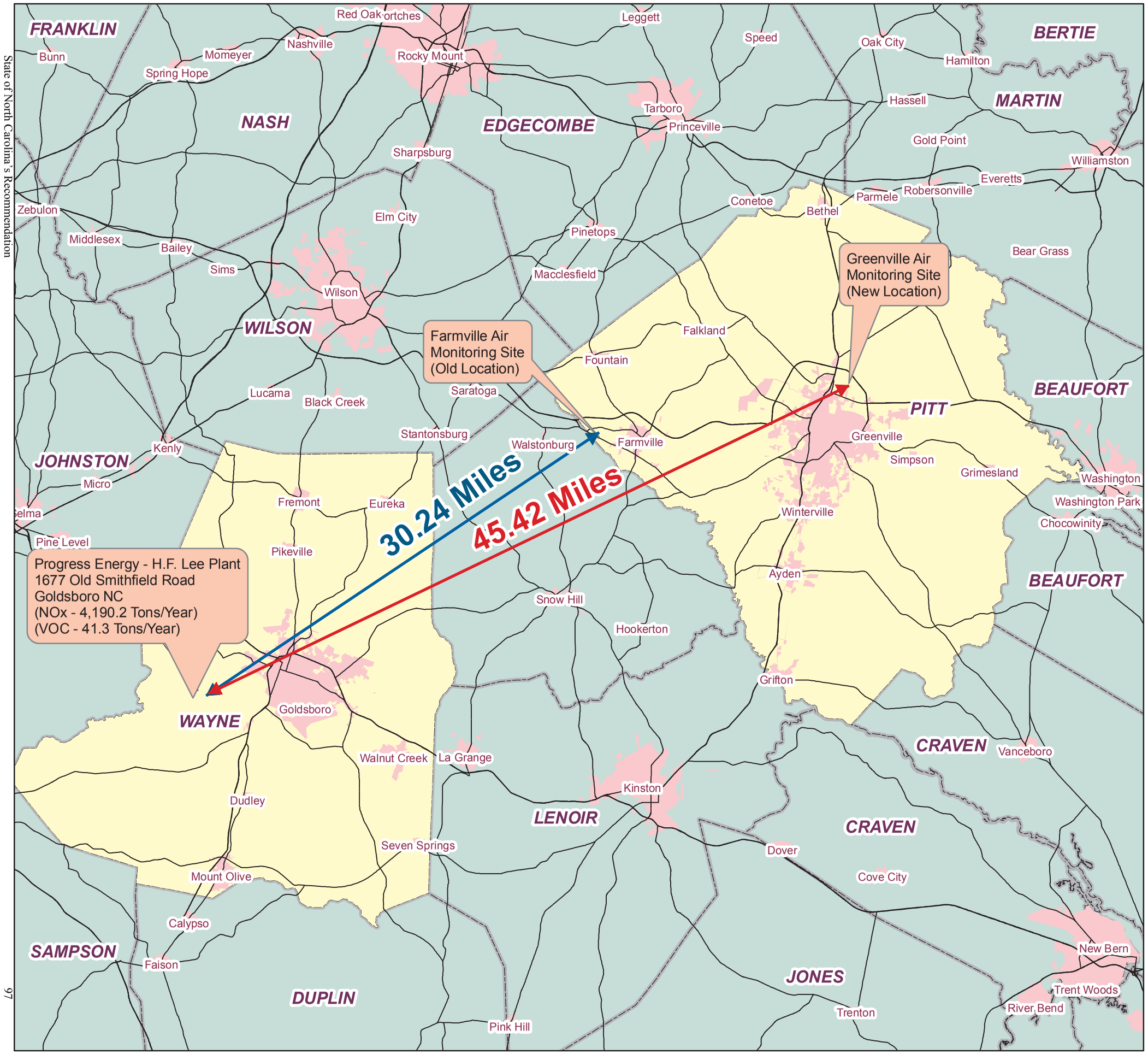
Please call us if you have any questions regarding this supplemental information.

Yours truly,

Frank Sheffield

Frank H. Sheffield, Jr.

FHS:apw
NBMAIN\809659\3
cc: Secretary Dee Freeman, DENR
Janis E. Gallagher, Esq.
Scott Elliott
James Rhodes
Wanda Yuhas



Progress Energy Site Relative to Pitt County

Legend

- Wayne & Pitt County
- Primary Roads
- Municipal Boundaries
- NC Counties

N
W E
S

February 2009

Map Produced By:
Pitt County Planning Department

Imperial Warehouse Fire Location

Greenville Monitoring Station

Imperial Warehouse Fire Location

Roads

Tar River

Fire Incident Date: April 17, 2008
Fire Incident Time: Approximately 6:30 p.m.

N
W E
S

Map produced by
Pitt County
Planning Department

February 2009

0 500 1,000 2,000 Feet

1 inch = 1,200 feet

Federal Register

Thursday,
March 22, 2007

Part II

Environmental Protection Agency

40 CFR Parts 50 and 51
Treatment of Data Influenced by Exceptional Events; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 50 and 51

[EPA–HQ–OAR–2005–0159; FRL–8289–5]

RIN 2060–AN40

Treatment of Data Influenced by Exceptional Events

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action finalizes a rule to govern the review and handling of air quality monitoring data influenced by exceptional events. Exceptional events are events for which the normal planning and regulatory process established by the Clean Air Act (CAA) is not appropriate. In this rulemaking action, EPA is finalizing the proposal to: Implement section 319(b)(3)(B) and section 107(d)(3) authority to exclude air quality monitoring data from regulatory determinations related to exceedances or violations of the National Ambient Air Quality Standards (NAAQS) and avoid designating an area as nonattainment, redesignating an area as nonattainment, or reclassifying an existing nonattainment area to a higher classification if a State adequately demonstrates that an exceptional event has caused an exceedance or violation of a NAAQS. The EPA is also requiring States to take reasonable measures to mitigate the impacts of an exceptional event.

DATES: This final rule is effective May 21, 2007.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2005–0159. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, i.e., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the OAR Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air and Radiation Docket and Information Center is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: General questions regarding the final rule should be addressed to Mr. Larry D. Wallace, PhD, Office of Air Quality Planning and Standards, Air Quality Policy Division, Mail Code C539–01, Research Triangle Park, NC 27711; telephone (919) 541–0906, and e-mail address *wallace.larry@epa.gov*.

Questions concerning technical and analytical issues related to this final rule should be addressed to Mr. Neil Frank, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Mail Code C304–01, Research Triangle Park, NC 27711; telephone (919) 541–5560, and e-mail address *frank.neil@epa.gov*.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does This Action Apply to Me?

Regulated Entities. This final rule will affect State and local air quality agencies. This rule may also affect Tribal air quality agencies that have implemented air quality monitoring networks or have authority to implement air quality programs.

This list is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This list gives examples of the types of entities EPA is now aware could potentially be regulated by this action. Other types of entities not listed could also be affected. To determine whether your facility, company, business, organization, etc., is regulated by this action, you should examine the applicability criteria in section IV of this preamble. If you have any questions regarding the applicability of this action to a particular entity, consult the people listed in the preceding section.

B. How Is This Preamble Organized?

Table of Contents

The following is an outline of the preamble.

II. Preamble Glossary of Terms and Acronyms

The following are abbreviations of terms used in the preamble.

ARM Approved Regional Methods.
AQS Air Quality System.
BACM Best Available Control Measures.
CAA Clean Air Act.
CAAA Clean Air Act Amendments.
EPA Environmental Protection Agency.
FEM Federal Equivalent Methods.
FIP Federal Implementation Plan.
FR **Federal Register.**
FRM Federal Reference Methods.
NAAQS National Ambient Air Quality Standards.
NEAP Natural Events Action Plan.
NEPA National Environmental Policy Act.
NTTA National Technology Transfer Advancement Act of 1995.
OAQPS Office of Air Quality Planning and Standards.
OMB Office of Management and Budget.
PM Particulate matter.
PM_{10} Particles with a nominal mean aerodynamic diameter less than or equal to 10 micrometers.
$PM_{10-2.5}$ Particles with a nominal mean aerodynamic diameter greater than 2.5 micrometers and less than or equal to 10 micrometers.
$PM_{2.5}$ Particles with a nominal mean aerodynamic diameter less than or equal to 2.5 micrometers.
RACM Reasonably Available Control Measures.
SIP State Implementation Plan.
SAFE–TEA–LU Safe Accountable Flexible Efficient-Transportation Equity Act—A Legacy for Users.
SMP Smoke Management Program.
TAR Tribal Authority Rule.
TIP Tribal Implementation Plan.
UMRA Unfunded Mandates Reform Act.
USDA U.S. Department of Agriculture.
VCS Voluntary Consensus Standards.

III. Background and Purpose of This Rulemaking

A. Legislative Requirements

We [1] are finalizing a rule to govern the review and handling of air quality monitoring data influenced by exceptional events. As discussed below, these are events for which the normal planning and regulatory process established by the CAA is not appropriate. Section 319 of the CAA, as amended by section 6013 of the Safe Accountable Flexible Efficient-Transportation Equity Act: A Legacy for Users (SAFE–TEA–LU) of 2005, required EPA to publish the proposed rule in the **Federal Register** no later than March 1, 2006.[2] Further, EPA must issue this final rule no later than 1 year from the date of proposal. The EPA published the proposed rule on March 10, 2006 (See 71 FR 12592).

In this final rule, EPA is establishing procedures and criteria related to the identification, evaluation, interpretation, and use of air quality monitoring data related to any NAAQS where States petition EPA to exclude data that are affected by exceptional events.

Section 319 defines an event as an exceptional event if the event affects air quality; is an event that is not reasonably controllable or preventable; is an event caused by human activity that is unlikely to recur at a particular location or a natural event; and is determined by EPA to be an exceptional event. The statutory definition of exceptional event specifically excludes stagnation of air masses or meteorological inversions; a meteorological event involving high temperatures or lack of precipitation; or air pollution relating to source noncompliance.

Section 319(b)(3)(B)(i) requires a State air quality agency to demonstrate through "reliable, accurate data that is promptly produced" that an exceptional event occurred.[3] Section 319(b)(3)(B)(ii) requires that "a clear causal relationship" be established between a measured exceedance of a NAAQS and the exceptional event demonstrating "that the exceptional event caused a specific air pollution concentration at a particular location." In addition, section 319(b)(3)(B)(iii) requires a public process to determine whether an event is an exceptional event. Finally, section 319(b)(3)(B)(iv) requires criteria and procedures for a Governor to petition the Administrator to exclude air quality monitoring data that is directly due to exceptional events from use in determinations with respect to exceedances or violations of the NAAQS.

The term exceedance refers to a measured or modeled concentration greater than the level of one or more for a pollutant. The NAAQS are also set with particular averaging periods (e.g., 3 years for ozone and $PM_{2.5}$) such that a violation of the NAAQS for ozone and $PM_{2.5}$ requires an average annual concentration level specified by appendix I and N to 40 CFR 50 to be greater than the level of the NAAQS. Public comments favored the consideration of data contributing to both exceedances and violations for data exclusion under this Rule. As discussed in section V.C, exceedances of any NAAQS will be eligible for consideration for data exclusion and any data contributing to violations of daily or sub-daily standards will also be eligible for consideration (e.g. 8-hour or 24-hour standards). Data contributing to annual violations without being exceedances themselves are considered too close to background air quality levels for exclusion under this Rule.

Section 319 also contains a set of five principles for EPA to follow in developing regulations to implement section 319:

(i) Protection of public health is the highest priority;

(ii) Timely information should be provided to the public in any case in which the air quality is unhealthy;

(iii) All ambient air quality data should be included in a timely manner in an appropriate Federal air quality database that is accessible to the public;

(iv) Each State must take necessary measures to safeguard public health regardless of the source of the air pollution; and

(v) Air quality data should be carefully screened to ensure that events not likely to recur are represented accurately in all monitoring data and analyses (42 U.S.C. 7619(b)(3)(A)).

In adopting revisions to section 319, Congress sought to provide statutory relief to States to allow them to avoid being designated as nonattainment or to avoid continuing to be designated

[1] The U.S. Environmental Protection Agency.

[2] All subsequent references to section 319 of the CAA in this proposal are to section 319 as amended by SAFE–TEA–LU unless otherwise noted.

[3] While this document refers primarily to States as the entity responsible for flagging data impacted by exceptional events, other agencies, such as local or Tribal government agencies, may also have standing to flag data as being affected by these types of events, and the criteria and procedures that are discussed in this rulemaking also apply to these entities.

nonattainment as a result of exceptional events in appropriate circumstances. To accomplish this goal, Congress enumerated certain minimum requirements for this rulemaking. In addition, Congress provided certain statutory principles for EPA to follow in promulgating regulations to exclude data affected by exceptional events.

B. Historical Experience Concerning Exceptional and Natural Events

Since 1977, EPA guidance and regulations have either implied or documented the need for a flagging system for data affected by an exceptional event. The first EPA guidance related to the exclusion or discounting of data affected by an exceptional event was an Office of Air Quality Planning and Standards (OAQPS) guidance document entitled, "Guideline for the Interpretation of Air Quality Standards," Guideline No. 1.2–008 (revised February 1977).[4]

In July 1986, EPA issued the guidance entitled, "Guideline On the Identification and Use of Air Quality Data Affected By Exceptional Events" (the Exceptional Events Policy). The Exceptional Events Policy provided criteria for States to use in making decisions related to identifying data that have been influenced by an exceptional event.

In addition to the Exceptional Events Policy, on July 1, 1987, EPA promulgated the NAAQS for PM_{10} (particulate matter with an aerodynamic diameter of 10 micrometers or less), which also addressed the issue of excluding or discounting data affected by exceptional events.[5] Appendix K of that rule allows for special consideration of data determined to be affected by an exceptional event. Section 2.4 of appendix K authorizes EPA to discount from consideration in making attainment or nonattainment determinations air quality data that are attributable to "an uncontrollable event caused by natural sources" of PM_{10}, or "an event that is not expected to recur at a given location." Section 2.4 of appendix K, together with EPA guidance contained in the Exceptional Events Policy, describes the steps that should be taken for flagging PM_{10} data that a State believes are affected by an exceptional or natural event.

In 1990, section 188(f) was added to the CAA. This section of the CAA provided EPA authority to waive either a specific attainment date or certain planning requirements for serious PM_{10} nonattainment areas that are affected by nonanthropogenic sources. In response to section 188(f), and in consideration of the CAA consequences for areas affected by elevated concentrations caused by natural events, in 1996 EPA issued a policy to address data affected by natural events entitled, "Areas Affected by PM_{10} Natural Events," (the PM_{10} Natural Events Policy).[6]

On July 18, 1997, EPA issued a revised NAAQS for ozone and a new NAAQS addressing $PM_{2.5}$. For ozone, the revised NAAQS provided for an 8-hour averaging period (versus 1 hour for the previous NAAQS), and the level of the standard was changed from 0.12 ppm to 0.08 ppm (62 FR 38856). For the $PM_{2.5}$ NAAQS, EPA established both a new 24-hour standard and a new annual standard. In that **Federal Register**, EPA also promulgated appendices I and N to 40 CFR 50. Appendices I and N provided the methodologies for determining whether an area is in attainment of the 8-hour ozone and $PM_{2.5}$ NAAQS respectively, using ambient air quality data. Section 1.0 of appendix I, related to the ozone standard, addresses the treatment of data determined to be influenced natural events, and section 1.0(b) of appendix N, related to the $PM_{2.5}$ standard, provides that EPA may give special consideration to data determined to be affected by an exceptional or natural event.

Appendices K, I, and N, which are parts of the NAAQS for the affected pollutants as described above, provide that, while States must submit all valid ambient air quality data to EPA's Air Quality System (AQS) database for use in making regulatory decisions, in some cases it may be appropriate for EPA to exclude, discount, weight, or make adjustments to data that have been appropriately flagged from calculations in determining whether or not an area has attained the standard. These decisions are to be made on a case-by-case basis using all available information related to the event in question, and are required to be made available to the public for review. It should also be noted that, while it would be desirable to be able to adjust the daily value to exclude only those portions of the data that are attributable to the exceptional event, due to technical limitations, such subtraction has not been possible, and EPA's historical practice has been to exclude a daily measured value in its entirety when that value is found to be largely caused by an exceptional event.

Following the promulgation of the 8-hour ozone and the $PM_{2.5}$ NAAQS, EPA provided additional guidance to States on how to address data affected by exceptional and natural events.[7] That guidance directed the States to follow three specific EPA guidance documents in making determinations related to data influenced by exceptional and natural events: (1) The Exceptional Events Policy; (2) The PM_{10} Natural Events Policy; and (3) The Interim Air Quality Policy on Wildland and Prescribed Fires, Memorandum from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, to EPA Regional Administrators, May 15, 1998. The Interim Air Quality Policy on Wildland and Prescribed Fires addressed the treatment of air quality monitoring data that are affected by wildland and prescribed fires that are managed for resource benefits.[8]

IV. This Final Action

A. To Whom and to What Pollutants Does This Rule Apply?

Under the statutory scheme established by the CAA, States are primarily responsible for the administration of air quality management programs within their borders. This includes the monitoring and analysis of ambient air quality and submission of monitoring data to EPA, which are then stored in EPA's AQS database. The EPA retains an important oversight responsibility for ensuring compliance with CAA requirements. With respect to the treatment of air quality monitoring data, States are responsible for ensuring data quality and validity and for identifying measurements that they believe warrant special consideration, while EPA is

[4] "Guideline for Interpretation of Air quality Standards," U.S. Environmental Protection Agency, Office of Air quality Planning and Standards, Research Triangle Park, N.C. OAQPS No. 1.2–008 (Revised February 1977). The guidance indicated the need for a data flagging system which would require the submittal of detailed information establishing that a violation was due to uncontrollable natural sources and that the information could be used in decision making related to the feasibility of modifying control strategies.

[5] **Federal Register** (52 FR 24667), July 1, 1987.

[6] Memorandum from Mary D. Nicols, Assistant Administrator for Air and Radiation, to EPA Regional Offices entitled, "Areas Affected by PM_{10} Natural Events," May 30, 1996.

[7] "Guideline on Data Handling Conventions for the PM NAAQS," United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711, EPA–454/R–98–017, December 1998.

[8] Following the promulgation of this rule, it is EPA's intention to begin the process to revise the "Interim Air Quality Policy on Wildland and Prescribed Fires" in calendar year 2007 to update the policy and to ensure that the policy is consistent with this final rulemaking action. In addition, it is EPA's intent that agricultural prescribed burning will be addressed when this policy is updated and will also address basic smoke management practices.

responsible for reviewing and approving or disapproving any requests for such consideration. Therefore, this final rule applies to all States; to local air quality agencies to whom a State has delegated relevant responsibilities for air quality management, including air quality monitoring and data analysis; and, as discussed below, to Tribal air quality agencies where appropriate. This rule governs EPA's actions in reviewing and approving or disapproving the relevant actions taken or requested by States. Where EPA implements air quality management programs on Tribal lands, this rule would govern those actions as well.

At present, only the NAAQS for ozone and particulate matter (PM) contain provisions which allow for the special handling of air quality data affected by exceptional and natural events (40 CFR part 50, appendices K, I, and N). The language of section 319 of the CAA is broad in terms of making its provisions applicable to events that "affect air quality" and to exceedances or violations of "the national ambient air quality standards" (42 U.S.C. 7619(b)(1)(A)(i), (b)(3)(B)(iv)). Thus, its provisions can apply to the NAAQS for any criteria pollutant. Because the NAAQS established for other criteria pollutants do not currently contain provisions permitting the discounting or exclusion of data due to exceptional events, we are only applying the provisions of this rule initially to ozone and PM.[9] As we review and consider the need for revisions to the NAAQS for other pollutants, we will include provisions to address exceptional events in those NAAQS in accordance with section 319, as appropriate at that time. Because issuance of a new or revised NAAQS will necessitate the initiation of the designation process, EPA believes that the NAAQS rules are an appropriate place to make provisions for exceptional events in the evaluation of air quality data. In the interim, where exceptional events result in exceedances or violations of NAAQS that do not currently provide for special treatment of the data, we intend to use our discretion as outlined under section 107(d)(3) not to redesignate affected areas as nonattainment based on these events. We also intend to use our discretion under this rule to address determinations for the ozone standard related to the treatment of data influenced by both exceptional and natural events. Currently, appendix I, only addresses the treatment of data determined to be influenced by a stratospheric ozone intrusion and other natural events, but does not address the handling of data influenced by other exceptional events.

[9] Section IV.G of the preamble to the Proposed Rule discussed special considerations relevant to a new NAAQS for $PM_{10-2.5}$ proposed by EPA on December 20, 2005. This proposed standard would have drawn a distinction between coarse particles of urban versus non-urban origin, which raised new issues about the handling of exceedances of the coarse particle standard caused by exceptional events. However, in EPA's final rule on the PM NAAQS, issued September 21, 2006, EPA retained the existing 24-hour PM_{10} standard instead of promulgating the proposed $PM_{10-2.5}$ standard. Thus, section IV.G of the preamble to the Proposed Rule is no longer relevant and has been removed from this Preamble.

B. How Does This Rule Relate to Indian Tribes?

Under the CAA and the Tribal Authority Rule (TAR), eligible Indian Tribes may develop and submit Tribal Implementation Plans (TIPs) for EPA approval, to administer requirements under the CAA on their reservations and other areas under their jurisdiction. However, Tribes are not required to develop TIPs or otherwise implement relevant programs under the CAA. The EPA has stated that it will continue to ensure the protection of air quality throughout the nation, including in Indian country, and will issue Federal Implementation Plans (FIPs) as necessary or appropriate to fill gaps in program implementation in affected areas of Indian country (63 FR 7254, 7265; February 12, 1998).

In cases where a Tribal air quality agency has implemented an air quality monitoring network, which is affected by emissions from exceptional events, the criteria and procedures identified in this final rule may be used to exclude or discount data for regulatory purposes. Certain Tribes may implement all relevant components of an air quality program for purposes of meeting the various requirements of this rule. In some cases, however, a Tribe may implement only portions of the relevant program and may not be in a position to address each of the procedures and requirements associated with excluding or discounting emissions data (e.g., a particular Tribe may operate a monitoring network for purposes of gathering and identifying appropriate data, but may not implement relevant programs for the purpose of mitigating the effects of exceptional events required under this rule). The EPA intends to work with Tribes on the implementation of this rule, which may include appropriate implementation by EPA of program elements ensuring that any exclusion or discounting of data in Indian country areas with air quality affected by exceptional events comports with the procedures and requirements of this rule.

C. Comments Submitted on the Proposed Rule

The proposed rule on the "Treatment of Data Influenced by Exceptional Events" was issued on March 10, 2006 (71 FR 12592). We received 98 letters from commenters representing 587 comments from private citizens, State and local governments, industry, environmental groups, and Federal agencies. Sections V, VI, VII, and VIII of this notice describe the primary elements and requirements concerning the process for the handling of data influenced by exceptional events. Each section summarizes the relevant issues and options discussed in the proposed rule and provides the final decisions related to the issues for each section. In this preamble, we have provided responses to certain significant comments to elaborate or provide clarification for EPA's decision on an issue discussed in the relevant section of the rule. We have developed a response to comments document which addresses all of the timely comments received on the proposed rule. Following the promulgation of this rule, the response to comments document will be placed into the docket of this rulemaking action for public review (See Docket No. EPA–HQ–OAR–2005–0159).

D. What Is an Exceptional Event?

In accordance with the language in section 319, EPA is defining the term "exceptional event" to mean an event that:

(i) Affects air quality;

(ii) Is not reasonably controllable or preventable;

(iii) Is an event caused by human activity that is unlikely to recur at a particular location or a natural event; and

(iv) Is determined by EPA through the process established in these regulations to be an exceptional event.

It is important to note that natural events, which are one form of exceptional events according to this definition, may recur, sometimes frequently (e.g., western wildfires). For the purposes of this rule, EPA is defining "natural event" as an event in which human activity plays little or no direct causal role to the event in question. We recognize that over time, certain human activities may have had some impact on the conditions which later give rise to a "natural" air pollution event. However, we do not believe that small historical human contributions should preclude an event from being deemed "natural." In adopting section 188(f) of part D, subpart 4, of the 1990 amendments to

the CAA, Congress recognized and provided for distinctions between these types of events with respect to waiver of applicable requirements and the extension of otherwise applicable attainment dates for the PM_{10} standard. In approving section 188(f) of the CAA, the House committee of jurisdiction discussed a circumstance in which recurring emissions from a source should be considered to be anthropogenic. The House report noted EPA statements that, in the cited case, high concentrations of dust from a lakebed were due to human activity, i.e., the long-term diversion of water from a lake. (See Pub. L. 101–549, CAA Amendments of 1990 House Report No. 101–290(l), May 17, 1990; and discussion of Mono Lake, California therein). Also, EPA recognized, in recently acting to retain PM_{10} as a measure of coarse particulate, that in some instances exceedances of this NAAQS "may be caused in whole or in part, by exceptional events, including natural events such as windstorms * * *, (and that) an exceedance may be treated as an exceptional event even though anthropogenic sources such as agricultural and mining emissions contribute to the exceedance." (71 FR 61216; October 17, 2006).

In this final rule, EPA also defines the term "exceedance" with respect to compliance with the NAAQS and establishes criteria for determining when an event can be said to "affect air quality." We are not finalizing more detailed requirements for determining when an event is "not reasonably controllable or preventable" because we believe that such determinations will necessarily be dependent on specific facts and circumstances that cannot be prescribed by rule.

E. Examples of Exceptional Events

The EPA believes that the following types of events meet the definition of exceptional events, as defined above. This means that air quality data affected by these types of events may qualify for exclusion under this rule provided that all other requirements of the rule are met. By providing the examples listed below, EPA is not determining that such events are the only types of events that may qualify for exclusion under the rule as exceptional events. Other events that meet the statutory criteria for an exceptional event as defined in this rule may also qualify for exclusion. The AQS user documentation contains a list of other similar events that may be flagged for special consideration. (*http://www.epa.gov/ttn/airs/airsaqs/manuals/qualifiers.htm*).[10]

In addition, in the sections below, we have provided responses to certain significant comments received during the comment period for the proposed rule regarding the examples of events that may meet the definition of an exceptional event in order to elaborate upon or provide clarification about what constitutes an exceptional event.

1. Chemical Spills and Industrial Accidents

Emissions that result from accidents such as fires, explosions, power outages, train derailments, vehicular accidents, or combinations of these may be flagged as an exceptional event.

Comments and Responses

Comment: Several commenters stated that "Chemical Spills and Industrial Accidents" should generally not be considered exceptional events. Commenters stated that most industrial accidents and chemical spills are reasonably controllable and preventable with proper planning and mitigation efforts. These commenters stated that allowing for accidents or spills that could have been avoided is inconsistent with the CAA.

Response: It is EPA's belief that air quality data that has been affected by emissions from chemical spills, industrial accidents, or structural fires may be flagged by a State as an exceptional event and reviewed by EPA for exclusion on a case-by-case basis to determine whether it meets the criteria for exceptional events as defined in this rule. In particular, data influenced by chemical spills or industrial accidents must be demonstrated to have "affected air quality" and must be demonstrated to be due to circumstances that were not reasonably controllable or preventable and are events that are unlikely to recur in a particular location. The EPA agrees with the commenters that industrial or point source emissions due to malfunctions or non-compliance would not be considered exceptional events and should be addressed through the normal State Implementation Planning process.

2. Structural Fires

Structural fires include any accidental fire involving a manmade structure.

Comments and Responses

Comment: Several commenters indicated that "Structural Fires" should generally not be considered exceptional events. Commenters stated that these types of events should be considered as emissions from anthropogenic sources and handled within the form of the respective air quality standards where a certain number of exceedances of the standards are allowed over a 3-year period. Commenters assert that structural fires, lasting for several hours, are unlikely to cause an area to reach the level of nonattainment. In cases where structural fires are determined to be the cause of a monitored violation of the NAAQS, commenters stated that EPA should adopt a case-by-case review of these events.

Response: The definition of structural fires under this rule pertains to any accidental fire involving a manmade structure. The EPA believes that structural fires could be an exceptional event under this rule, provided all other requirements of the rule are met, because they could "affect air quality," could be an event that is not "reasonably controllable" or "preventable," and could be events that are caused by human activity that are unlikely to recur at the same location. However, EPA agrees with the commenters that these types of events, as well as other similar types of events, should be reviewed on a case-by-case basis to determine whether they meet the criteria for an exceptional event as defined by this rule.

3. Exceedances Due to Transported Pollution

Transported pollution, whether national or international in origin, and whether from natural or anthropogenic sources, may cause exceedances eligible for exclusion under this rule, as long as all of the criteria and requirements related to exceptional events are met as defined in this rule. For example, States may flag, and EPA may exclude, data associated with fires occurring outside of the borders of the United States, such as forest fires in Mexico, Central America, and Canada; or transport events such as African dust and Asian dust which contribute significantly to ambient concentrations of a pollutant in an area, leading to exceedances or violations of a NAAQS. An example of interstate transported emissions which may be flagged as due to an exceptional event would be emissions due to smoke from wildfires or wildland fire use fires which cause exceedances or violations of the NAAQS at monitoring sites in other States. Other examples could include data affected by emissions from mining and agricultural activities when such emissions are subjected to long-range transport, and the criteria and

[10] The EPA will be revising the list of events contained in the AQS database following the promulgation of this rule to ensure that the list is consistent with the requirements of the rule.

requirements related to an exceptional event are met as defined in this rule. In general, events due to transported pollution may be considered on a case-by-case basis.

Comments and Responses

Comment: Several commenters expressed concern over EPA allowing the exceptional events rule to be used to exclude data that has been affected by emissions emanating from sources outside the borders of the United States.

Response: States may flag data that has been affected by sources emanating from outside the United States that meet the criteria for an exceptional event as defined under this rule, including requirements for causation and documentation. In cases where an area is impacted by emissions from sources outside of the United States which do not meet the criteria for an exceptional event under this rule, and these emissions contribute to an area being designated as nonattainment, the emissions may be addressed under section 179B of the CAA related to "International Border Areas." Section 179B provides that where a State is required to submit a State Implementation Plan (SIP) to address issues related to a nonattainment designation, EPA may approve the SIP for the area provided that the plan (1) meets all the applicable requirements called for under the CAA, other than the requirement that the plan demonstrate attainment or maintenance of the NAAQS, and (2) the SIP must demonstrate that the affected area would be able to attain the standard by the applicable attainment date "but for" emissions emanating from outside the United States.

4. Exceedances Due to a Terrorist Attack

Emissions that result from a terrorist attack such as smoke from fires, dust, explosions, power outages, train derailments, vehicular accidents, or combinations of these may be flagged as an exceptional event.

Comments and Responses

No comments were received on this topic.

5. Natural Events

The natural events addressed by this final rule are: (1) Natural disasters and associated cleanup activities; (2) volcanic and seismic activities; (3) high wind events; (4) wildfires and wildland fire use fires; and (5) stratospheric ozone intrusions. The EPA will consider other types of natural events on a case-by-case basis.

a. Natural Disasters and Associated Clean-Up Activities

For the purpose of flagging, major natural disasters such as hurricanes and tornadoes for which State, local, or Federal relief has been granted, and clean-up activities associated with these events, may be considered exceptional events. The EPA believes that for a major natural disaster, a timeframe up to 12 months is a reasonable time period to allow for clean-up activities associated with these types of activities. In cases where the damage caused by the event is so substantial that a 12-month period is inadequate to address the clean up that is necessary, a State may submit a request to EPA for an extension of the 12-month time period. The EPA will grant requests for extensions of the time period related to such events on a case-by-case basis if the States submit adequate supporting information concerning the reason for the extension as well as the length of time being requested for the extension.

Comments and Responses

Comment: Several commenters indicated that EPA should limit the time period associated with clean-up activities due to a natural disaster. One commenter indicated that the exceptional events rule as proposed would allow States to apply the term "natural disaster" very broadly to include circumstances that would circumvent the intent of the CAA. For example, declaring an episode of high summer temperatures to be a natural disaster could potentially allow a State to exclude high ozone levels which commonly occur during hot weather.

Response: A time period up to 12 months for clean-up activities is permitted for major natural disasters, such as hurricanes and tornadoes, for which State, local, or Federal relief has been granted, may be flagged for exclusion as exceptional events under this rule. The clean-up activities associated with these types of events may also be flagged for exclusion as being due to an exceptional event. Given the nature of a major natural disaster, the 12-month time period allowed for clean-up activities following such disaster is a reasonable time period, and is consistent with the time period being allowed for volcanic and seismic activities under this rule. The period of high summer temperatures noted in the comment would not represent a major natural disaster, as described above, subject to the 12-month clean-up period.

b. Volcanic and Seismic Activities

Ambient concentrations of particulate matter for which volcanic or seismic activity caused or significantly contributed to high levels of particulate matter in an affected area will be treated as natural events. While generally not occurring frequently, volcanic and seismic activity can affect air quality data related to the particulate matter NAAQS for an extended period of time after an event. Volcanic activities can contribute to ambient concentrations in several ways: it may influence concentrations of particulate matter due to primary emissions (e.g., ash), and emissions of precursor pollutants (e.g., sulfur dioxide) that contribute to the secondary formation of particulate matter. Seismic activity (e.g., earthquakes) can also contribute to ambient particulate matter concentrations by shaking the ground, causing structures to collapse, and otherwise raising dust which may lead to exceedances or violations of the NAAQS.

Comments and Responses

Comment: Several commenters indicated that the rule should provide sufficient flexibility for data to be excluded where the duration of the event may last for a long period of time. An example of such an event is where volcanic activities last for several days.

Response: The EPA agrees with the commenters and notes that the rule allows for States to flag data and submit documentation related to events such as long-term volcanic and seismic activities. States may also submit requests to EPA to extend the time period up to 12 months for major natural disasters, for clean-up activities following volcanic and seismic events. States are encouraged to submit supporting information related to the reasons for the requested extension and the length of time being requested for the extension.

c. High Wind Events

High wind events are events that affect ambient particulate matter concentrations through the raising of dust or through the re-entrainment of material that has been deposited. In some locations, concentrations of coarse particles like PM_{10} are most likely affected by these types of events, although $PM_{2.5}$ standards may be exceeded under such circumstances as well. Section VII.B. also includes a discussion of this issue.

Comments and Responses

Comment: Several commenters suggested that EPA replace the term

"high winds" with the term "wind-generated dust" because (1) it places the emphasis on the natural mechanism, (2) dust may become entrained at relatively low wind velocities, and (3) the change will eliminate confusion between the wind speeds associated with a natural event and wind speeds needed to qualify for a "high wind" exceptional event under EPA's 1986 guidance.

Response: The EPA is retaining the term "high wind" event because it accurately connotes the type of natural event that should be excluded under this rule, as well as the action which caused the exceedance or violation of the standard. The term also serves as an indicator concerning the level of wind which caused the exceedance or violation of the standard and indicates that it was unusually high for the affected area during the time period that the event occurred. Therefore, States must provide appropriate documentation to substantiate why the level of wind speed associated with the event in question should be considered unusual for the affected area during the time of year that the event occurred. The EPA will evaluate such instances on a case-by-case basis, including factors such as historically typical windspeed levels for the season of the year that the event is claimed.[11]

d. Wildland Fires

Federal land managers have afforded recognition to several different types of wildland fires (i.e., wildfire, wildland fire use fire and prescribed fire), depending on their causal circumstances and the role that such fires play in the affected ecosystems. Prescribed fire is addressed more fully in the following section.

The question of what is a natural versus an anthropogenic fire has particular significance when considering the impacts of wildland fires (wildfire, wildland fire use fire and prescribed fire) on air quality and how these impacts should be regarded under this rule. A "wildfire" is defined as an unplanned, unwanted wildland fire (such as a fire caused by lightning), and include unauthorized human-caused fires (such as arson or acts of carelessness by campers), escaped prescribed fire projects (escaped control due to unforeseen circumstances), where the appropriate management response includes the objective to suppress the fire. In contrast, a "wildland fire use" fire is the application of the appropriate management response to a naturally-ignited (e.g., as the result of lightning) wildland fire to accomplish specific resource management objectives in predefined and designated areas where fire is necessary and outlined in fire management or land management plans.

Using these definitions, we believe that both wildfires and wildland fire use fires fall within the meaning of "natural events" as that term is used in section 319. Therefore, ambient particulate matter and ozone concentrations due to smoke from a wildland fire will be considered for treatment as an exceptional event if the fire is determined to be either a wildfire or wildland fire use fire.

Comments and Responses

Comment: In general, commenters strongly supported exempting wildfires as exceptional events under the rule.

Response: The EPA acknowledges support for the proposal to classify wildfires as a potential exceptional event. As noted above, the Agency states that wildland fires will be excluded as exceptional events if they meet the criteria and requirements of the exceptional events rule.

Comment: The Agency received comments both supporting and opposing the proposal allowing wildland fire use fires to qualify as an exceptional event.

Response: After reviewing Congress' revisions to section 319, the various Agency policies cited in the proposal, and comments received, the Agency has determined that wildland fire use fires may also qualify as an exceptional event. However, these types of fires must also meet certain criteria. For example, these fires must occur on lands that have been designated in fire management or land management plans as areas where fires are necessary and desirable to accomplish specific resource management objectives.

Comment: Many commenters supported EPA's commitment to update the 1998 Interim Air Quality Policy on Wildland and Prescribed Fires to be consistent with this rule.

Response: The Agency plans to begin revising this policy in 2007 as part of its overall Fire Strategy after promulgation of this rule.

e. Stratospheric Ozone Intrusions

Stratospheric ozone intrusion is considered to be a natural event. A stratospheric ozone intrusion occurs when a parcel of air originating in the stratosphere, which is at an average height of 20 km or 12.4 miles, is transported directly to the surface of the earth. Stratospheric ozone intrusions are very infrequent, localized events of short duration. They are typically associated with strong frontal passages and, thus, may occur primarily during the spring season.

Comments and Responses

Comment: One commenter stated that EPA should update its approach to stratospheric events, establish criteria by which such events may be determined, and credit States for the impact of intrusion events on non-compliant ozone monitor readings.

Response: Stratospheric ozone intrusion is identified as a natural event under 40 CFR part 50, appendix I, for ozone, and will be considered for treatment as an exceptional event.

6. Prescribed Fire

A "prescribed fire" is defined as any fire ignited by management actions to meet specific resource management objectives. According to existing Federal policy, prior to ignition a prescribed fire must have an approved prescribed fire plan and must meet the National Environmental Policy Act (NEPA) requirements (where applicable)(see National Wildland Fire Coordination Group Glossary of Wildland Fire Terminology, 2003). For purposes of section 319, a prescribed fire cannot be classified as "natural," given the extent of the direct human causal connection, however, a prescribed fire may meet the statutory criteria defined in section 319 of "affect[ing] air quality," being "unlikely to recur at a particular location" and is "not reasonably controllable or preventable." The determination of whether a prescribed fire can be considered an exceptional event should be made on a case-by-case basis taking into account the factors described below.

A prescribed fire carried out for resource management objectives is frequently designed to restore essential ecological processes of fire and mimic fire under natural conditions. As such, a prescribed fire's expected frequency can vary widely, depending on the natural fire return interval of a particular landscape or wildland ecosystem. The natural fire return

[11] As described elsewhere in the preamble, EPA is adopting a weight of evidence approach to demonstrate that an exceptional event caused an exceedance or violation. Therefore, in instances where the level of the wind speed results in exceedances or violations of particulate matter, for data affected by these events to be considered for exclusion under the weight of evidence approach, a clear causal relationship must be demonstrated between the exceedances measured at the air quality monitoring site and the high wind event in question. EPA will consider in the weight of evidence analysis winds that produce emissions contributed to by anthropogenic activities that have been controlled to the extent possible through use of all reasonably available reasonable and appropriate measures.

interval can range from once every year to less frequently than once in more than 200 years. Thus, in many, though not all cases, it may be possible to demonstrate that the likelihood of recurrence is sufficiently small enough to show that a prescribed fire under these conditions meets the "unlikely to recur at a particular location" requirement of the statutory language.

A prescribed fire may also meet the condition of "not reasonably controllable or preventable" by examining whether there are reasonable alternatives to the use of fire in light of the needs and objectives to be served by it. For instance, there may be a significant build-up of forest fuels in a particular area that if left unaddressed would pose an unacceptable risk of catastrophic wildfire, which could result in adverse impacts of much greater magnitude, duration, and severity than would result from careful use of prescribed fire. A particular ecosystem may also be highly dependent on a natural fire return interval to maintain a sustainable natural species composition. Alternatively, pest or disease outbreaks in an area may be such that there are no reasonable alternatives to prescribed fire. In some cases, other legal requirements may preclude the use of mechanical fuel reduction methods such as in designated wilderness or National Parks. Where such ecological conditions exist, or where mechanical or other treatments are not reasonably feasible for reasons that include, but are not limited to, a lack of access, or severe topography, we believe that prescribed fire qualifies as being "not reasonably controllable or preventable." Thus, we believe that a prescribed fire, conducted by Federal, State, Tribal or private wildland managers or owners, under the conditions described above may qualify as an exceptional event.

In addition, one of the principles contained in SAFE–TEA–LU, section 6013(b)(3)(A), includes the principle that States must take necessary measures to safeguard public health regardless of the source of air pollution. We believe it reasonable to tie the qualifying criteria for an anthropogenically generated prescribed fire to State accountability for public health protection. Consistent with historical practice governed by the guidance contained in the "Interim Air Quality Policy on Wildland and Prescribed Fires," issued on May 15, 1998, EPA approval of exceedances linked to a prescribed fire used for resource management purposes is contingent on the State certifying that it has adopted and is implementing a Smoke Management Program (SMP) as described in that policy. A State SMP establishes a basic framework of procedures and requirements for managing smoke from a prescribed fire managed for resource benefits. A SMP is typically developed by a State or Tribe with cooperation and participation by wildland managers, both public and private, and the general public. As reflected in the Interim Air Quality Policy on Wildland and Prescribed Fires, States are provided flexibility on the structure of a SMP. Thus, a SMP can be extensive and detailed, or simply identify the basic smoke management practices for minimizing emissions, and controlling impacts from a prescribed fire.[12] In the proposal to this rule, EPA proposed to continue the use of that approach. We also proposed to expand the criteria for contingent approval to a prescribed fire where, in lieu of a SMP, basic smoke management practices, that minimize emissions and control impacts, are being employed by burners. In order to protect public health in areas where a SMP has not been adopted, in the final rule, the Agency has elected to expand, on a case-by-case basis, the qualifying criteria by which a prescribed fire may qualify as an exceptional event. In those cases, the Agency will judge on a case-by-case basis whether the State has ensured that appropriate basic smoke management practices have been employed in determining whether the prescribed fire qualifies as an exceptional event. If an exceptional event occurs using the basic smoke management practices approach, the State must undertake a review of their approach to ensure public health is being protected and must include consideration of development of a SMP.

Comments and Responses

Comment: Several commenters supported classifying prescribed fire as qualifying as an exceptional event. However, some commenters indicated that there should be limitations placed on when this type of fire should be considered as an exceptional event. A number of commenters also disapproved of allowing prescribed fire to be considered as an exceptional event because they believe that this type of fire is anthropogenic and does not meet the statutory definition of exceptional event. Some commenters also favored expanding the criteria for contingent approval to include instances where basic smoke management practices are used in lieu of a SMP, while other commenters did not favor this expansion.

Response: The EPA believes that a prescribed fire may be excluded as an exceptional event under this rule only in cases where the event meets the criteria for an exceptional event as defined in this rule, if documentation is submitted to show that the fire meets the requirement, as described above, of "affect[ing] air quality," being "not reasonably controllable or preventable" and "unlikely to recur at location" and provided the other requirements of the rule including, among others, the schedules and procedures for flagging and demonstration are met. In those instances where a prescribed fire meets the criteria for an exceptional event, the State must also provide appropriate documentation to show that a certified SMP was in place or that the burner employed basic smoke management practices and that the appropriate practices were being followed at the time that the event occurred. Because a prescribed fire is an anthropogenic source of emissions for purposes of section 319, even though it may qualify as an exceptional event, a State can attempt to limit the health impact of a prescribed fire through the thoughtful development and implementation of a SMP or ensuring that basic smoke management practices were employed that minimize emissions and control impacts from prescribed fires.

V. The Management of Air Quality Data Affected by Exceptional Events

The EPA proposed that, in order to exclude air quality data from consideration for regulatory purposes, States must follow the procedures, timelines, and other requirements described in the proposed rule. Under the Final Rule, if an event is determined to be a qualifying exceptional event according to section IV.D, a State, Tribe, or designated local agency may petition EPA to classify the event as exceptional and submit a demonstration to justify data exclusion.[13] For data exclusion, States must clearly identify, or "flag,"

[12] Basic smoke management practices could include, among other practices, steps that will minimize air pollutant emissions during and after the burn, evaluate dispersion conditions to minimize exposure of sensitive populations, actions to notify populations and authorities at sensitive receptors and contingency actions during the fire to reduce exposure of people at such receptors, identify steps taken to monitor the effects of the fire on air quality, and identify procedures to ensure that burners are using basic smoke management practices.

[13] Although a single qualifying exceptional event may affect air quality for multiple days and at multiple monitors, the discussions below consider an individual demonstration as justifying exclusion of a single AQS data point. The EPA encourages State submittals to package demonstrations about single exceptional events to expedite the review process.

data they believe to be influenced by such events. The demonstration to justify data exclusion shall provide evidence that: (a) The event qualifies in accordance with section IV.D and with EPA policies and guidance for certain events as described in section IV.E, (b) there is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area, (c) the event is associated with an unusual measured concentration beyond typical fluctuations including background, and (d) that there would have been no exceedance or violation but for the event.

The SAFE–TEA–LU requirements for exclusion of data from exceptional events are: (1) The occurrence of the exceptional event must be demonstrated by reliable and accurate data; (2) the State must show that there is a "clear causal relationship" between the NAAQS exceedances and the event; (3) there must be a public review process related to the exceptional event determination; and (4) the rule must set criteria and procedures for States to petition EPA to exclude data directly affected by an exceptional event. The sections below describe how each of these requirements must be met.

The sections below address the flagging of data as exceptional events that are determined to have affected air quality, submittal of demonstrations to request data exclusion, public review, and the schedule and timing for these processes. After an exceptional event occurs (judged according to section IV.D) and an agency determines that the event affected ambient air quality, flagging may occur according to section V.A. Section V.B describes the evaluation of whether or not the event affected ambient air quality. Section V.C describes the necessary "but-for" test that data would have complied with the applicable standard but for the occurrence of the exceptional event. Section V.D explains the schedules and procedures for the flagging and demonstration submittals, section V.E discusses the applicability to hourly readings, section V.F states the requirements for determination submittals if the agency requests EPA to exclude the data from consideration for regulatory purposes, and section V.G describes the public review requirements. Some commenters suggested that all data occurring from exceptional events should be flagged, and EPA will allow these flags for informational purposes, even if the data do not qualify for exclusion. If EPA concurs on the exclusion of data from qualifying exceptional events, the data will be excluded from regulatory consideration but will still count toward data capture requirements.

A. Flagging of Data in the AQS Database

1. Background

Air quality data are required, pursuant to 40 CFR 58.16, to be submitted to EPA by each State on a calendar quarterly basis, with submissions due not later than 90 days after the end of a quarterly reporting period. Once air quality data have been submitted to EPA, it is possible to "flag" specific values for various purposes. "Data flagging" refers to the act of making a notation in a designated field of an electronic data record. The principal purpose of the data flagging system in the AQS database is to identify those air quality measurements for which special attention or treatment is warranted. These include, but are not limited to, those measurements that are influenced by exceptional events.

The preamble to the proposed rule stated: "In the case of exceptional events, States place the initial flag on the data in the AQS database. Following an evaluation of the supporting documentation, EPA will decide whether to concur with the flag; concurrence will be marked by the placement of a second flag in the AQS database by EPA. Once EPA has concurred on the flag, the data will be excluded from regulatory decisions such as determinations of attainment or nonattainment."

- "While the flagging of data by the State is the first step in an exceptional events demonstration, it is insufficient by itself to allow for the exclusion of data. In order to have EPA concur on a flag, States must meet the additional requirements described below. As stated previously, the State has the responsibility to document both the occurrence of the event and the causal connection to the monitoring data under consideration. Because the initial step of flagging the data is a relatively simple one, States may flag many more days than the number of days for which they ultimately submit documentation to support exclusion."

2. Final Rule

In the case of exceptional events, States and Tribes place the initial flag on the data in the AQS database, but EPA determines the available flags.[14] States may also delegate authority to local agencies to submit flags and documentation. In any event, States should work with their local agencies for the identification and review of exceptional events and consider requests to flag data from those agencies. At the time the flag is inserted into the AQS database, the State must also provide an initial description of the event in the AQS comment field. This initial description should include such information as the direction and distance from the event to the air quality monitor in question, as well as the direction of the wind on the day in question. The flags, and the initial event description, must be inserted into the AQS database prior to July 1st following the year in which the event occurred. Schedules for demonstrations are discussed in section V.D.

Following an evaluation of the supporting documentation, EPA will make a decision concerning whether to concur with the flag; concurrence will be marked by the placement of a second flag in the AQS database by EPA. If EPA has concurred on the flag, the data will be excluded from regulatory determinations such as determinations related to attainment or nonattainment, or determinations concerning SIP development. The EPA will use the second flag to indicate the following conditions: EPA concurrence, EPA non-concurrence, and documentation submitted with EPA decision pending.

While flagging of the data in the AQS database by the affected State, local, or Tribe authority is the first step in an exceptional events demonstration, it is insufficient in and of itself to allow for the exclusion of data. In order for EPA to concur on an exceptional events flag, States, Tribes, and local agencies must meet the additional requirements described below. As explained, the State, Tribe, or local agency has the responsibility to document the occurrence of the event in question, to demonstrate that the event qualifies as an exceptional event in accordance with section IV.D, is consistent with EPA policies and guidance for certain events as described in section IV.E, has provided for public review in accordance with section V.G, and to document the causal connection between the measurement under consideration and the event that is claimed to have affected the air quality in the area. The State, Tribe, or local agency must also demonstrate that the event is associated with an unusual measured concentration beyond typical fluctuations including background, and that there would have been no exceedance or violation "but for" the event. Because the initial step of

[14] It is EPA's intention, for purposes of consistency with this rule, to review the list of exceptional events that are currently in the AQS database following the promulgation of the rule.

flagging the data is a relatively simple one, States, Tribes, and local agencies may flag more days than the number of days for which they ultimately intend to submit demonstrations to justify data exclusion.

3. Comments and Responses

Comment: One commenter supported flagging data related to any fire that caused an exceedance.

Response: This Rule does not preclude a State, Tribe, or Local agency from flagging any data allegedly influenced by exceptional events. However, for the data to qualify as an exceptional event and to exclude it from regulatory decisions, the data must meet all of the criteria described in this Rule and all the procedures delineated must be followed.

B. What Does It Mean for an Event To "Affect Air Quality"?

1. Background

It is important to recognize that any emissions-producing event has the potential to have some influence on downwind air quality. Indeed, on any given day, measured air quality at any given location will reflect the influences of a variety of activities, including both natural and anthropogenic emissions from both local as well as remote upwind sources. Given the directive in section 319(b)(3)(B)(ii), that a clear causal connection must exist between the "measured exceedances" and the exceptional event, EPA believes that it would be unreasonable to exclude data affected by an exceptional event simply because of a trivial contribution of an event to air quality. Furthermore, we believe that it would be unreasonable to exclude more significant, but routine background air quality impacts, as this would disregard an important part of the public's exposure to air pollution upon which EPA's air quality standards are based. The effect of such exclusion would be an inappropriate reduction in the stringency of the NAAQS, rather than providing specific relief under the circumstances provided in section 319 for which States should not be designated nonattainment or be required to prepare costly SIP control strategies.

Neither section 319, nor its legislative history, provides precise guidance on what should be considered when determining whether an event "affects air quality" and thus qualifies to be considered for exclusion or special treatment. However, section 319(b)(3)(B)(ii) and (iv) provides that there must be a "clear causal relationship" between a measured exceedance of a standard and the event to show that the event "caused a specific air pollution concentration;" and it must be shown that the data in question are "directly due" to an exceptional event. Moreover, one of the principles provided by section 319(b)(3)(A) indicates that the protection of public health is the highest priority. For these reasons, we proposed three conditions under which an event may qualify as "exceptional" for purposes of special regulatory consideration: Its air quality impact must (1) fall both above the level of the applicable standard (i.e., must be an "exceedance" as required by section 319), (2) be significantly beyond the normal fluctuating range of air quality, including background air quality concentrations, and (3) should be large enough such that without it there would have been no exceedance.

We next provided several alternative approaches to determining whether and when air quality is "affected by" exceptional events and requested comment on which of these approaches was most suitable for demonstrating such impacts. These approaches primarily applied to condition (2) above. Two of the approaches involved statistical comparisons of existing flagged data. The final rule most closely reflects the third proposed option with some modifications. This option considered a case-by-case evaluation of the data against historical, seasonally adjusted air quality levels. Finally, the proposed rule provided details regarding what is meant by an exceedance (1) and the "but-for" condition (3). These are discussed in detail in section V.C.

2. Final Rule

Under the Final Rule, the demonstration to justify data exclusion must provide a justification that: (a) The event qualifies in accordance with section IV.D. and if applicable, with EPA policies and guidance for certain events as described in section IV.E, (b) there is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area, (c) the event is associated with an unusual measured concentration beyond typical fluctuations including background, and (d) there would have been no exceedance or violation but for the event (discussed in section V.C). The second and third criteria establish that the event affected air quality.

The second criterion that the event caused an air quality impact may be shown through a number of methods including, but not limited to, modeling and speciation analysis. The third criterion distinguishes common events from those that are exceptional and may be accomplished through the presentation of historical evidence.

The final rule permits a case-by-case evaluation, without prescribed threshold criteria, to demonstrate that an event affected air quality. This demonstration would be based on the weight of available evidence, but must consider the historical frequency of such measured concentrations. While a State may determine the specific approach to use for such analysis, it must compare contemporary concentrations with the distribution of all measured data during the past several years. The evidence that an event affected air quality may be presented on a seasonal or other temporal basis to best compare contemporary concentrations with the distribution of historical values. For consistency with data reporting and computation of NAAQS statistics, a calendar quarter basis is suggested. Baseline data may also be defined differently for each event type (e.g., April and May data may be the most relevant information for statistical comparison with certain dust events).

The general statistical approach of using all measured data during the past several years is independent of historical flagging practices and allows States to accurately represent events not likely to recur by including all monitoring data in analyses.

In addition, the magnitude of the measured concentration on days affected by exceptional events relative to historical, temporally adjusted air quality levels can guide the level of necessary analysis and documentation to demonstrate that the event affected air quality. For extremely high concentrations relative to historical values (e.g., concentrations greater than the 95th percentile), a lesser amount of documentation or evidence may be required to demonstrate that the event affected air quality. The closer the event concentration is to typical levels (e.g., values less than the historical 75th percentile), the stronger the necessary evidence would have to be to justify exclusion of data for regulatory purposes. This weight of evidence approach is most nearly analogous to our historical treatment of exceptional events.

3. Comments and Responses

Comment: One commenter noted that EPA's proposed rule concedes that the third option would "provide the least definitive guidance to assist States in their evaluations," and "may make it

difficult for EPA regions to be consistent when determining whether to concur on a flag." Moreover, "the case-by-case approach allows for consideration of days with ambient concentrations which are not necessarily among the highest concentrations that have been historically observed. While such days are unlikely to impact short-term standards, discounting such days can certainly have an impact on an annual average concentration." The commenter asserted that EPA's description of the proposed case-by-case evaluation makes the case for rejecting that option because it fails to provide the guidance mandated by section 319, and is so vague as to be arbitrary.

Response: The EPA disagrees with the commenter that this option fails to provide guidance and is so vague as to be arbitrary. The EPA has explained above the criteria that it will use in making its case-by-case evaluations. The commenter's concern that the event must represent concentrations that are not typically observed is addressed by the third criterion that the event must be associated with an unusual measured concentration beyond typical fluctuations including background. Demonstration of the magnitude of the measured concentrations with respect to historical frequency under similar conditions will provide a new level of consistency across monitoring locations.

Comment: If an area exceeds the NAAQS, one commenter stated that use of a 95th percentile criterion better ensures that the definition of an exceptional event is met (i.e., unlikely to recur at a particular location).

Response: The EPA recognizes that extreme concentrations (e.g., corresponding to values greater than the 95th percentile of historical values) are more likely associated with exceptional events. With the final rule, we are not assuming that such values are definitely exceptional. In fact, some extreme concentrations may be associated with various emission sources and atmospheric conditions which are unrelated to a causal connection to the claimed exceptional event. Instead, the frequency of occurrence relative to historical concentrations would be used as an important part of the overall weight of evidence to demonstrate the exceptional nature of the claimed air quality impact.

C. Use of a "But For" Test

1. Background

There may be instances in which exceptional events may have a significant impact on air quality on days when concentrations are already above the applicable standard in the absence of the influence of such events. In such cases, it is important to preserve and consider all valid air quality data influenced by such activities, which properly fall within the responsibilities of States to manage for purposes of air quality attainment and maintenance. For this reason, we proposed to require that air quality data may not be excluded except where States show that exceedances or violations of applicable standards would not have occurred "but for" the influence of exceptional events.

In other words, to the extent that it is possible to determine that the resulting air quality concentrations and appropriate design values for an area would be above the level of the standards even without the influence of the exceptional event, the air quality data for the day(s) in question should not be excluded. However, consideration of the impacts of exceptional events on air quality values for control strategy planning purposes may be appropriate, and States are encouraged to consult with the appropriate EPA regional office to further discuss this issue.

2. Final Rule

The EPA will maintain the proposed "but-for" requirement that air quality data may not be excluded except where States, Tribes, or local agencies show that exceedances or violations of applicable standards would not have occurred "but for" the influence of exceptional events. Through analyses, it is possible to demonstrate that an exceedance or violation would not have occurred but for the event [See sample "but-for" analysis in memo to docket, Husar *et al.* 2006 (*http://www.regulations.gov*, EPA–HQ–OAR–2003–0061–0733 thru 0733.5)]. This analysis does not require a precise estimate of the estimated air quality impact from the event. The weight of evidence demonstration can present a range of possible concentrations which is not as technically demanding as justifying a specific adjustment to a measured value.

Because there are two standards for $PM_{2.5}$, clarification is needed regarding the measurements that contributed to an exceedance or a violation that are eligible to be excluded. This rule is limited to values above the annual standard for $PM_{2.5}$ because this simplifies the process for determining which values are eligible for flagging according to the intent of section 319. The short-term $PM_{2.5}$ NAAQS is based on a 3-year average of the annual 98th percentile of 24-hour values. Therefore, it is possible that one or two of these annual concentration values may be below the level of the NAAQS while the 3-year average is above the level of the NAAQS. Because three annual 98th percentile concentration values are included in the determination of a short-term $PM_{2.5}$ NAAQS violation, individual measurements below the NAAQS may contribute to a violation.

On the other hand, the annual $PM_{2.5}$ NAAQS is also a standard based on a 3-year average. However, violations of the annual standard that are caused by measurements which are not exceedances of that standard will be difficult to distinguish from typical air quality concentrations including background. To accommodate the 3-year form of the $PM_{2.5}$ NAAQS, this rule will allow measurements whose concentrations are greater than the level of the annual NAAQS to be flagged as being affected by exceptional events for the purposes of contributing to an exceedance or violation of the $PM_{2.5}$ NAAQS. Thus, we provide the following clarification that individual measured values greater than the annual $PM_{2.5}$ NAAQS will be considered "exceedances" under this rule and therefore eligible to be considered for exclusion for comparisons to either the annual or 24-hour NAAQS.

3. Comments and Responses

Comment: One commenter stated that, while some of those measurements may not individually be above the NAAQS, taken together they might be sufficient to put an area in violation of an annual standard. Any "but for" determination must take into account the aggregate of exceptional events that occurred within the applicable NAAQS period.

Response: The rule acknowledges that it is possible that an event can affect multiple days. The "but for" provision allows for data exclusion if but for the entire event there would have been no exceedance or violation. Therefore, for those events that can be shown to affect air quality on multiple consecutive days, measurements for the entire period are eligible for data exclusion, provided that at least one measurement day during the episode is an exceedance as defined by this rule and the air quality impact on each day are considered exceptional.

Comment: One commenter cautioned EPA about using the phrase "to the extent it is possible to determine" because a "bright line" distinction between the contribution from natural and anthropogenic sources often does not exist.

Response: We agree with this comment and for this reason we will permit a weight of evidence-based

approach to demonstrate that there would not have been an exceedance or violation but for the event.

D. Schedules and Procedures for Flagging and Requesting Exclusion of Data

1. Background

In establishing procedures and time tables for States to request, and EPA to grant, exclusion of data affected by exceptional events, we are guided by two competing considerations: Ensuring States have adequate time and opportunity to compile and evaluate all relevant and available information in support of such requests; and making determinations in a timely manner so that all pertinent and valid air quality data would be appropriately considered in regulatory determinations. To assist EPA in determining the best approach to managing the data flagging process and submissions of demonstrations for the final rule, we proposed three alternatives for public review and comment. Public comments showed that each option had desirable aspects, and these are incorporated into the final rule.

2. Final Rule

A multi-step process will be established for identification of data and submission of demonstrations. The process is designed to ensure that States, Tribes, and local agencies have adequate opportunity to compile and present evidence of exceptional and natural events but also ensures timely submittals in order to make regulatory decisions and ensure the protection of human health through NAAQS determinations. The steps include State flagging, annual State submission of an initial event description, State submission of a demonstration to justify data exclusion and EPA review followed by approval or disapproval. Where air quality in an area is influenced by a relatively small set of emission sources with well-defined emission profiles and limited pollutant species, a demonstration that an air quality measurement influenced by a particular event merits exclusion may be relatively simple to make. In other cases, such as where the number and types of sources contributing to measured air quality concentrations are extremely complex and varied, making it more difficult to distinguish between the effects of routine activities and unusual ones, more time and effort will be needed for a State, Tribe, or local agency to provide an adequate demonstration in support of its request.

States, Tribes, and local agencies are encouraged to flag the data that they believe to be affected by exceptional events at the time of submission of the air quality data to EPA's AQS database, in accordance with the schedule described in 40 CFR 58.16, which is generally no later than 90 days after the end of the calendar quarter. This includes both flagging of data and insertion of the initial event description into the AQS comment field. This constitutes notification of the appropriate EPA Regional Office concerning the State's intention to seek exclusion of data. This approach would ensure that the flagging process remains consistent with the timeline set forth in rules governing data submission requirements. The EPA recognizes that laboratory analyses may delay these submissions and therefore is extending the required time period for submission to 180 days after the end of the calendar year (i.e., all flags, along with initial event descriptions, for a calendar year must be reported by July 1 of the following year).

We encourage States, Tribes, and local agencies to submit the demonstration to justify data exclusion annually for exceedances of short-term NAAQS by July 1. However, the demonstration to justify data exclusion must also be submitted no later than 12 months prior to a regulatory decision. For all flagged events, the demonstration to justify data exclusion must be submitted within 3 years of the calendar quarter following an event, but no later than 12 months prior to a regulatory decision. This period should be used primarily to support NAAQS compliance with annual averages and violations of the short-term standard that were not anticipated. For nonattainment designations, this would occur with the Governor's letter recommending the list of nonattainment areas. We also recognize that special circumstances could dictate more expedited data delivery, flagging, and minimal demonstrations (e.g., $PM_{2.5}$ designations using 2002–2004 data). The submitted demonstration to justify data exclusion as well as the EPA responses and the rationale for the EPA decision will be made publicly available through EPA. The reason for providing the 3-year timeframe is that for ozone and PM, decisions regarding whether or not an area is attaining the applicable standard are based on the most recent 3 years of air quality data. Providing 3 years for submission of demonstrations would provide States, Tribes, and local agencies with an opportunity to evaluate whether the influence of one or more exceptional events will be relevant to determinations of attainment or nonattainment before undertaking the effort of preparing and submitting demonstrations.

Once EPA receives a State's demonstration, EPA generally will undertake to review the demonstration and provide a concurrence or nonconcurrence on the flag in the AQS database within 60 days. The EPA expects that, in most cases, this time period should be enough time to review and provide a concurrence or non-concurrence related to a State's request to exclude data affected by an exceptional event. However, for more complex demonstrations, EPA may require additional time to make its decision and will notify the State of the additional time required.

3. Comments and Responses

Comment: One commenter supported arguments on why the proposed rule must include a procedure for retrospective flagging that addresses the full set of the State's needs so that the end result is that the State can flag any and all events impacted by natural events.

Response: With the Final Rule, EPA requires annual submittal of flags. States may, if they so choose, submit them sooner. This schedule ensures that data are collected and retained shortly after the event and identification of potential (non-routine) events is done in a timely fashion to ensure that appropriate corrective actions can be taken. States would only maintain minimal documentation supporting the decision to flag the data. The full demonstrations, however, can come later, in order to allow States time to focus efforts on those events that are determined to have an impact on attainment. The Agency notes that the Exceptional Events Rule does not apply to routine natural events that are part of background air quality.

Comment: One commenter was concerned that a State may have failed to flag data impacted by a natural event because the data values were below the current NAAQS, only to find the State threatened with nonattainment after NAAQS revisions.

Response: For data collected before the effective date of this rule, States may include a demonstration to justify data exclusion with the Governor's recommendation letter on nonattainment areas, provided that there was notice and opportunity for public comment. After considering this and other comments, for $PM_{2.5}$ data collected during calendar years 2004–2006, that the State identifies as resulting from an exceptional event,

EPA is permitting the State to flag and submit an initial description of the event provided that these are submitted no later than October 1, 2007. In cases where the State is able to show that this time period is inadequate, a State may submit a request for an extension and EPA will grant this request for an extension up to but no later than December 1, 2007. This procedure should accommodate States concerned about potential $PM_{2.5}$ nonattainment areas using the 2004–2006 data sets. The EPA may consider a similar exemption of the schedules for submittal of data for future revision of standards.

Comment: One commenter stated that EPA should also make allowances for those situations when a State neglects to flag a value or submit documentation within the required timeframes. In these cases, the commenter asserted that EPA should provide some type of petitioning process.

Response: If a State fails to meet the schedule for flagging or document submittal, late petitions will not be considered. Policy decisions, SIP planning, and dissemination of data should not be delayed or altered based on a State's failure to submit documentation or follow the regulatory procedures in a timely manner.

E. Exclusion of Entire 24-Hour Value as Opposed to a Partial Adjustment of the 24-Hour Value

1. Background

In general, EPA's historical practice has been to exclude a daily measured value in its entirety when an exceptional event causes that value, and we retained this approach in the proposed rule. With this approach, a determination is made that emissions from the event are largely responsible for the resultant ambient air pollutant concentration. For example, if the observed concentration is 200 $\mu g/m^3$ for $PM_{2.5}$ and is associated with a nearby forest fire, then EPA is likely to concur with the claim that the event was responsible for the ambient concentration. The measured value would be excluded in its entirety from the data used to judge attainment (as per 40 CFR 50, appendix N), although the measurement would still count towards meeting minimum data capture requirements.

We believe it would be desirable to adjust the daily value to exclude only those portions of the data that are attributable to the exceptional event in question, and to retain the remainder of the day's measurement if appropriate and accurate methods were available to make such adjustments. For example, if an area affected by a wildfire had a measured 24-hour $PM_{2.5}$ concentration of 50 $\mu g/m^3$ and the estimated event impact was 30 $\mu g/m^3$, then the expected value that would have occurred but for the event would have been 20 $\mu g/m^3$. Normal air quality for this location might be 16 $\mu g/m^3$ and, therefore, the "but-for" concentration of 20 $\mu g/m^3$ is above average. Discounting the entire event day could, therefore, inappropriately bias a determination of nonattainment with the annual $PM_{2.5}$ NAAQS (currently set at 15 $\mu g/m^3$). We are currently seeking to develop and evaluate new analytical methods that would allow us to discount only the portion of the daily value attributable to the exceptional event. However, at present, we are not aware of the existence of precise and universally applicable techniques that are administratively and technically feasible and that could support partial adjustment of air quality data except perhaps in limited cases, such as where the number and type of pollutant species and contributing sources are relatively less complex or potentially when sufficient spatial, temporal, meteorological and chemical data are available [See memo to docket, Husar *et al.* 2006, (*http://www.regulations.gov*, EPA–HQ–OAR–2003–0061–0733 thru 0733.5)]. When we determine that techniques for adjustment of air quality data are sufficiently well-demonstrated for use in exceptional events determinations, we will publish a notice of proposed rulemaking to seek comment on the appropriateness and scope of such use and its impact on the requirements set forth in this rule for determining an exceptional event.

2. Final Rule

We are retaining in this rule EPA's historical practice to exclude a daily measured value in its entirety when that value is found to be caused by a qualifying exceptional event that affected air quality in accordance with the conditions described in sections V.B and V.D. If precise and universally applicable techniques that are administratively and technically feasible and that could support partial adjustment of air quality data become available in the future, EPA will, through a rulemaking, propose, and as appropriate, finalize a technique for partial adjustment of data as well as any other matters in this rule which may be affected by the availability of this technology.

One exception may be made to this exclusion of the entire daily value for monitoring locations with hourly measurements by Federal Reference Methods (FRM), Federal Equivalent Methods (FEM), and/or Approved Regional Methods (ARM) where such data are submitted routinely to AQS. For example, in cases where stratospheric ozone intrusion occurs, those hourly (but not sub-hourly) measurements affected by the intrusion may be excluded in order to calculate the ozone measurements for the day. The individual hours are to be excluded however, if the resulting calculated NAAQS averaging time value exceeds the level of the standard, not just if the individual hourly values exceed that level. Thus, in the case of ozone, the resulting 8-hour average must exceed 0.08 ppm, and the resulting 24-hour average must exceed 15.0 $\mu g/m^3$ for $PM_{2.5}$. Incomplete data substitution protocols shall also be considered when evaluating the original and revised NAAQS averaging time value. In other words, an 8-hour ozone period is considered valid when fewer than six valid hours are present if one half the minimum detection limit can be substituted for the missing hours and the resultant 8-hour value still exceeds 0.08 ppm; a daily (24-hour) $PM_{2.5}$ value is considered valid when fewer than eighteen valid hours are present if zeroes can be substituted for the missing hours and the resultant 24-hour value still exceeds 15.0 $\mu g/m^3$.

3. Comments and Responses

Comment: One commenter supported value adjustment rather than exclusion when, and only when, such adjustment can be accomplished by the application of various quantitative or semi-quantitative approaches. When this is not possible, the value in question should be replaced with a long-term seasonal mean value.

Response: The EPA will consider such analyses as part of the weight of evidence to judge "but-for," but will not make quantitative adjustments to reported measured values because EPA does not believe sufficient quantitative methods are available at this time.

F. What Should States Be Required To Submit in Their Exceptional Events Demonstrations?

1. Background

Section 319 requires that, in order to have a flagged value excluded from regulatory determinations, a State must make an affirmative demonstration that an event occurred (as shown by reliable and accurate data that is promptly produced) and that there is a clear causal relationship between measured exceedances or violations of a standard and the exceptional event in question to

"demonstrate that the exceptional event caused a specific air pollution concentration" (42 U.S.C. 7619(b)(3)(B)(ii), (iv)). Section 319 also indicates that regulations promulgated under the section should provide for criteria and procedures to exclude air quality monitoring data "directly due to exceptional events from use in determinations by the Administrator with respect to exceedances or violations of the national ambient air quality standards."

Therefore, after flagging data in the AQS database, States are expected to develop appropriate documentation to support each individual flag. As a general matter, we believe that such demonstrations should include documentation showing that the event in fact occurred and that emissions related to the event were transported in the direction of the monitor(s) where measurements were recorded; the size of the area affected by the transported emissions; the relationship in time between the event, transport of emissions, and recorded concentrations; and, as appropriate, pollutant species-specific information supporting a causal relationship between the event and the measured concentration. The latter information could be based on available data provided by routine speciation, monitoring networks, or from selective laboratory analysis of archived particulate matter filters for the day thought to be impacted by specific events. In certain situations, such data might be useful for evaluation of impacts from exceptional events, e.g., to distinguish between impacts caused by natural fires versus impacts caused by industrial sources. States also need to show that appropriate mitigation actions were taken at the time that the event occurred, or after an event occurred in order to protect public health.

The following examples are intended to further illustrate the kinds of information that States could consider in preparing their demonstrations:

- Information demonstrating the occurrence of the event and its subsequent transport to the affected monitors. This could include, for instance, documentation from land owners/managers, satellite-derived pixels (portions of digital images) indicating the presence of fires; satellite images of the dispersing smoke and smoke plume transport or trajectory calculations (calculations to determine the direction of transport of pollutant emissions from their point of origin) connecting fires with the receptors.
- Identification of the spatial pattern of the affected area (the size, shape, and area of geographic coverage). This could include, for instance, the use of satellite or surface measurement data.
- Information about temporal patterns (e.g., the time and duration of an event in relation to measured downwind concentrations, air quality trends over time and space). This could include, for instance, observed sequential concentration spikes at multiple locations in a downwind direction.
- Identification of the chemical composition of measured concentrations. This could include, for instance, organic or crustal material in excess of typically observed quantities to differentiate from other high concentration events.
- High wind speeds relative to historically typical levels for the season of the year in which the claimed event occurred.

This list is not exhaustive and not all of these kinds of information and/or documentation will need to be provided in every instance. A particular instance may require more or less documentation, depending on the particular facts or circumstances in that instance. The simplest demonstrations could consist of newspaper accounts or satellite images to demonstrate that an event occurred together with daily and seasonal average ambient concentrations to demonstrate an unusually high ambient concentration level, which is clearly indicative of an exceptional impact. Such is the case with events such as volcanic eruptions and nearby forest fires. In one instance, we determined that wildfires upwind of the San Diego area very likely caused high concentrations of particulate matter measured in October 2003 based on the actual physical damage caused by fire to the ambient monitor. Depending on the nature of the event, meteorological conditions, severity and spatial extent of measured ambient concentrations (including relevant chemical components when available) relative to what typically occurs in the area, and on emissions of pollutants from the exceptional event which have similar characteristics to those of other sources in the area, additional showings could be required on a case-by-case basis. In particular, we anticipate that significantly more effort will be needed to establish that an exceptional event caused a particular concentration in an urban area in which there are numerous and diverse sources and complex meteorology and topography, and where the emissions from the event in question may well be similar to those from other sources contributing to measured concentrations, as compared to an area that has relatively few sources, simple terrain and less complex meteorology, and where emissions associated with the event are both substantially greater than and different in composition from those of other nearby sources.

2. Final Rule

The demonstration to justify data exclusion will address specific monitor readings reported to the AQS database. As stated in the previous sections, a complete demonstration shall justify that: (a) The event qualifies in accordance with section IV.D. and with EPA policies and guidance for certain events as described in section IV.E, (b) there is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area, (c) the event is associated with an unusual measured concentration beyond typical fluctuations including background, (d) there would have been no exceedance or violation but for the event, and (e) the State has provided an opportunity for the public to comment as required under section V.G. The level of documentation may vary by the type of event and can be guided in part by the relative magnitude of the observed concentrations. To obtain concurrence, EPA must determine that the demonstration is complete and provides a reasonable technical demonstration.

Because of the variability in the nature of exceptional events and the resulting demonstration requirements, States should consult with the appropriate EPA Regional Office early in the process of preparing their demonstrations. We are not specifying what will be required as a minimum level of documentation in all cases because facts and circumstances will vary significantly based on, among other things, geography, meteorology and the relative complexity of source contributions to measured concentrations in any particular location. We believe, however, that at a minimum, the elements of such a demonstration should include a showing that an event occurred at a time when meteorological conditions were conducive to transporting emissions from the event downwind to the monitor recording a high concentration of one or more criteria pollutants. Acceptable documentation will be determined through consultation with the EPA regional offices. However, certain minimum requirements (e.g., "but for" test) will be necessary as discussed in the earlier sections of this rule.

3. Comments and Responses

Comment: In cases where high wind data cannot be found, one commenter stated that EPA should use a "weight of evidence" approach, and should recognize that not accepting a demonstration that such exceedances are exceptional events is equivalent to a determination that the exceedances were caused by recurring anthropogenic sources.

Response: The EPA agrees that a weight of evidence approach is the most appropriate for demonstrations of exceptional impact.

Comment: One commenter asserted that States should be allowed to choose not to submit any demonstration, if the flagged value does not impact a regulatory determination or if more detailed investigation indicates that the value may not have been caused by an exceptional event after all. In these cases, the agency should have the option to remove the flag.

Response: We agree that the flag can be removed in these circumstances or left for informational purposes only.

Comment: One commenter stated that EPA must provide a reasonable explanation and documentation for their decision to deny any request for the flagging of data.

Response: The EPA regional offices will work with the States, Tribes, and local agencies to ensure that proper documentation is submitted to justify data exclusion. The EPA will make the response and associated explanation publicly available.

Comment: One commenter stated that EPA must establish a technically-based appellate process for States to follow when Regional Offices do not concur with a data flag.

Response: The EPA does not believe that an appellate process is necessary because we anticipate that the States and Regional Offices will be working closely through the data and documentation submission process.

G. Public Availability of Air Quality Data and Demonstrations Related to Exceptional Events

1. Background

Section 40 CFR part 58.16 of EPA's air quality monitoring rules state that all ambient air quality data and associated quality assurance data, including metadata records and information specified by the AQS Data Coding Manual *epa.gov/ttn/airs/airsaqs/manuals/manuals.htm* must be reported to EPA via AQS. This information includes exceptional event flags.

2. Final Rule

We are requiring that all relevant flagged data, along with the reasons for the data being flagged, and a demonstration that the flagged data are caused by exceptional events be made available by the State for 30 days of public review and comment. The State or designated local agency should consider the public comments prior to the final demonstration being submitted to EPA for a decision concerning whether to exclude the data from regulatory consideration. Notice and availability of such data and demonstrations must be adequate and consistent with States' administrative procedures governing similar submissions. The EPA does not require that public hearings be held on exceptional events demonstrations but leaves this matter to the States' discretion consistent with their administrative procedures. With the submission of the demonstration, the State should document that the public comment process was followed.

3. Comments and Responses

Comment: One commenter stated that any new rules related to the flagging of exceptional events should be consistent with prior EPA policies and provide sufficient time for States to engage the public in the process prior to data being flagged in the AQS.

Response: The EPA believes that the data demonstration requirements of the final rule provide sufficient time to engage the public. Not only does the final rule require that the public be accorded an opportunity to comment on the State's findings, but in some instances there will be further opportunities for public review and comment at the time that EPA proposes to base specific actions, *e.g.*, approval or disapproval of SIP revisions. Thus, we do not believe that additional public review and comment provisions are necessary or appropriate.

VI. Additional Requirements

Pursuant to section 319, EPA is finalizing this rule to address data that has been influenced by exceptional events. Also, EPA is finalizing one of four options put forth in the proposed rule to address the issue of whether, and to what extent, States are required to adopt specific mitigation plans or measures to protect the public from emissions due to exceptional events. Section 319 states that in promulgating regulations under the section, EPA shall follow certain, enumerated principles and that regulations must contain certain requirements. Section 319(b)(3)(A) contains five principles, including the principle that each State "must take necessary measures to safeguard public health regardless of the source of air pollution." In order to address this principle, EPA is finalizing its proposal to exclude trivial and more routine air quality impacts from qualifying as an exceptional event and is also finalizing a "but for" test as a precondition to qualification as an exceptional event (See: section V.C above).

A. Requirements for States To Provide Public Notification, Public Education, and Appropriate and Reasonable Measures To Protect Public Health

1. Background

The EPA proposed one approach and took comments on three alternative options concerning what actions a State should take in anticipation of, or in response to, the occurrence of an exceptional event. The options that were proposed ranged from being very detailed and prescriptive to being very flexible and less prescriptive in terms of the actions that States should take to mitigate the impact of an exceptional event on the public. While EPA does not believe that section 319(b)(3)(A) explicitly requires, in and of itself, that States must develop mitigating measures or plans, EPA solicited comment in the proposed rule on whether this subparagraph supports the use of other legal authority to require mitigating actions or plans when an exceptional event occurs, and solicited comment on issues regarding its legal authority to require mitigation measures and plans, and the legal basis for not requiring mitigation measures or plans.

Option 1 in the proposed rule provided that in cases where exceedances of a NAAQS are caused by an exceptional event, once a State becomes aware that an exceptional event is occurring, is predicted to occur, or has occurred, the State must take reasonable and appropriate actions to:

- Provide notice to the public of the event. This may include, but is not limited to, using the media to alert the public of the event.
- Provide public education concerning the potential health risks associated with being exposed to high ambient concentrations of pollutant(s) related to the event. This may include, but is not limited to, providing information to sensitive populations related to the health risks associated with the event.
- Take appropriate and reasonable measures to abate or minimize the exposure of the public to high

concentrations of air pollution associated with the exceptional event. This may include, but is not limited to, taking reasonable and appropriate actions to implement control measures on significant contributing anthropogenic sources to reduce potential exposure of the public to emissions associated with natural events. States must review the need to implement controls on contributing anthropogenic sources on a case-by-case basis. For example, in the case of volcanic or seismic activity, this may include, but is not limited to, providing for prompt clean-up of the ash deposits related to the event to prevent re-entrainment.

Under option 1, EPA also proposed that, where a State is requesting that air quality data be excluded as an exceptional event, the State must submit, as a part of its demonstration, appropriate documentation to show that the State provided public notice and public education concerning the event in question, and that the State took reasonable and appropriate measures to abate or minimize the exposure of the public to the emissions from the event, where appropriate.

Option 2 in the proposed rule provided that, States are required to adopt a general mitigation plan to address exceptional events before the occurrence of an event as a part of the State's SIP required under section 110(a)(1) of the CAA. Section 110(a)(1) requires States to adopt and submit to EPA, within 3 years following the promulgation of a new or revised NAAQS, a plan which provides for the implementation, maintenance, and enforcement of the standard in each air quality region within the State. Under this option, States would be required to develop and adopt the general requirements and procedures necessary for the implementation of a mitigation plan to address exceptional events as a part of its section 110(a)(1) SIP to address a new or revised NAAQS. The general plan related to exceptional events would include provisions providing for public notice, public education related to an event, and provide a requirement for a State to take reasonable and appropriate measures to mitigate the public health impacts of an exceptional event. Under this option, in cases where control measures are required to address the impacts associated with an exceptional event, the State would be required to implement appropriate measures on an episodic basis, meaning in response to a specific event that affects the air quality of a particular area.

Option 3 in the proposed rule required that, where appropriate, EPA would require a State to develop and implement a mitigation plan for an area following the occurrence of an exceptional event. This is in contrast to option 2 above, which would require each State to adopt a plan under section 110(a)(1) of the CAA which would contain the general provisions of a mitigation plan in advance of the occurrence of any exceptional event. Under option 3, the mitigation plan would only be developed by the State following the occurrence of an exceptional event for which the State requested exclusion of the air quality data, and would not be submitted as a part of the SIP. The mitigation plan would be required to address the actions that would be taken by the State related to future similar events. The mitigation plan under this option would have the same provisions as required of plans developed under Option 2 above, including the requirements to notify the public that an event is expected to occur, or is occurring, or has occurred, to provide for public education related to the health effects associated with the event, and to identify the actions that would be taken by the State to mitigate the impact of any recurrence of the event on public health.

Option 4 provided that EPA would not require a State to develop and implement a mitigation plan for exceptional events, or to take specific mitigation measures as described in options 1–3 in order for EPA to exclude data from regulatory consideration. This approach proposed to allow States to have the maximum degree of flexibility in determining what actions should be taken to mitigate the impacts of exceptional events, e.g., public notification, public education, efforts to reduce exposures, or other necessary measures to safeguard public health. Thus, under this proposed option States would not be obligated to take any particular actions to mitigate exposures such as those contained in Option 1, to develop and implement a formal mitigation plan as part of the SIP such as those contained in Option 2, or to develop a more formal plan with requirements not a part of the SIP such as those contained in Option 3.

2. Final Rule

The EPA is adopting a modified version of Option 1 from the proposed rule, as described above. This option does not require States to submit formal mitigation plans; however, States must provide public notice, public education, and must provide for implementation of reasonable measures to protect public health when an event occurs.

3. Comments and Responses

Comment: Several commenters supported option 1 because they stated that it provides more flexibility for States to determine the appropriate measures to be implemented related to the occurrence of an exceptional event. Other commenters supported option 1 for well defined, well understood events that are non-recurring or unlikely to recur. The majority of the commenters who commented on option 2 strongly opposed that option. The commenters indicated that option 2 would waste scarce local resources in developing a mitigation plan. Other commenters stated that issues concerning exceptional events should be dealt with outside the SIP process and section 110 of the CAA. With regard to Option 3, one commenter indicated that a preemptive plan similar to a Natural Events Action Plan (NEAP) (which includes Reasonably Available Control Measures (RACM)/Best Available Control Measures (BACM) is necessary to mitigate the poor air quality impacts associated with exceptional events. The commenter stated that BACM, not RACM, must be implemented on all contributing anthropogenic sources related to an exceptional event. Several commenters supported option 3 for addressing public health impacts related to recurring natural events. The commenters stated that mitigation plans should include BACM for contributing anthropogenic sources, not RACM. The majority of commenters who commented on option 4 stated that they supported the implementation of option 4 because it allows States the most flexibility for developing and tailoring programs for public notification of exceptional events, the implementation of education programs on exceptional events, and implementation of reasonable measures to protect public health.

Response: States have an inherent responsibility to protect its citizens and as such to provide appropriate and reasonable actions to mitigate the impact of exceptional events on the public health. This includes alerting the public when such events occur, providing public education concerning the health effects of such events, and implementing reasonable measures to mitigate the impact of such events on public health. Consistent with this inherent responsibility, it is EPA's belief that States are in a better position to make decisions concerning what actions should be taken to protect the public when an exceptional event occurs. This

being the case, States should have the necessary flexibility to take appropriate actions when exceptional events occur. The EPA is adopting a modified version of its proposed preferred option 1, which requires States to provide public notification, public education, and provides that States should take "reasonable and appropriate measures" to protect public health related to the occurrence of an event. Because States are inherently responsible for the public health of its citizens, and are capable of making the determinations of what actions should be taken to mitigate the impact of such events on the public when they occur. The EPA has modified option 1 from the proposed rule and will not be requiring States to submit documentation concerning the actions that it took to mitigate the impact of exceptional events, in order for EPA to exclude data from regulatory consideration. As proposed in option 1, States may still make determinations regarding reasonable measures in a particular instance, which may or may not include the implementation of control measures on contributing anthropogenic sources related to an event, and are not limited to any particular measure. Therefore, under this option the implementation of RACM or BACM is not required, but a State has the necessary flexibility to determine if, and what, controls should be implemented following an event, as well as the level of control that is required. The EPA believes that this modified option 1 provides suitable flexibility to allow States to take those actions that it deems necessary and appropriate to protect public health. While section 319, as revised by SAFE–TEA–LU, does not specifically provide that States must implement mitigation plans, in developing the exceptional events rule, EPA is required to consider the enumerated principles including the principle that States must take necessary measures to protect public health regardless of the source of air pollution. Therefore, under the modified version of option 1 adopted in this final rule, States must take reasonable and appropriate actions to protect public health.

Comment: Several commenters stated that the exceptional events rule should be consistent with the current requirements under existing policies with respect to the need for a NEAP to address recurring natural events such as high wind events.

Response: The EPA believes that it is advantageous for States to keep NEAPs in place that are currently being implemented in order to address the public health impacts associated with recurring natural events such as high wind events. However, following the promulgation of this rule, States will no longer be required to keep NEAPs in place that were not approved as a part of a SIP for an area. Where a NEAP, as well as BACM, has been approved as a part of a nonattainment SIP for an area, the NEAP, as well as the associated BACM, must remain in place. States may, however, submit a request to EPA to remove the NEAP and BACM from the SIP. The request must contain an approvable demonstration, as required by section 110(l), which shows that the removal of the NEAP and BACM will not interfere with any applicable requirement concerning attainment or maintenance of the NAAQS for an area, reasonable further progress, or any other applicable requirement for the area.

VII. Special Treatment of Certain Exceptional Events Under This Final Rule

As stated in section IV.D above, this final rule applies to data affected by natural events (which are a subset of exceptional events) at air quality monitoring sites where it has been determined that concentrations due to these events have caused, or substantially contributed to, exceedances of the NAAQS in an affected area. This final rule applies to several types of natural events, including, but not limited to, volcanic and seismic activities, natural disasters, high wind events, certain fires, and stratospheric ozone intrusions. It also applies to transported pollution originating from national and international sources that otherwise meets the criteria and requirements for exceptional events. Some types of exceptional events have unusual characteristics that require special consideration in the context of this final rulemaking. We discuss each of these special issues, and the necessary accommodations, below.

A. Volcanic and Seismic Activities

1. Background

Volcanic and seismic activities may affect air quality for an extended period of time after the initial occurrence of the event in question. Therefore, EPA believes that it is appropriate to consider an extended timeframe for flagging and exclusion of data associated with such events. Specifically, EPA believes that emissions attributed to anthropogenic activities associated with clean-up that re-entrain volcanic ash and dust from seismic activity during the first year (12 months) following an event will be treated as due to the natural event.

2. Final Rule

The EPA is finalizing its proposal with regards to volcanic and seismic activities. The EPA will allow up to 12 months for the clean-up of ash deposits due to volcanic/seismic events. During that time period, emissions of re-entrained dust due to anthropogenic activities associated with cleanup may be treated as exceptional events. In cases where the damage caused by the event is so substantial that a 12-month period is inadequate to address the clean-up that is necessary, a State may submit a request for an extension of the 12-month time period to EPA. As stated elsewhere in this rule, EPA will grant requests for extensions of the time period related to such events on a case-by-case basis. States are encouraged to submit supporting information concerning the reason for the extension and the length of time being requested for the extension.

B. High Wind Events

1. Background

Where high wind events result in exceedances or violations of the particulate matter standards, EPA proposed that they be treated as natural events if there is a clear causal relationship demonstrated between the exceedances measured at the air quality monitoring site and the high wind event in question, and if anthropogenic activities which contribute to particulate matter emissions in conjunction with the high wind event are reasonably well-controlled.

2. Final Rule

The EPA's final rule concerning high wind events states that ambient particulate matter concentrations due to dust being raised by unusually high winds will be treated as due to uncontrollable natural events where (1) the dust originated from nonanthropogenic sources, or (2) the dust originated from anthropogenic sources within the State, that are determined to have been reasonably well-controlled at the time that the event occurred, or from anthropogenic sources outside the State. These events are also discussed in section IV.E.5.c above. In cases where anthropogenic sources are determined to have contributed to exceedances or violations due to high wind events at air quality monitoring sites, per our decision in this rulemaking concerning the action that States must take to mitigate the impact of exceptional events on public

health (See section VI above), States must take reasonable and appropriate measures to mitigate the impact associated with the event on public health. As stated in section VI of this rule, States have the flexibility to implement reasonable measures to protect public health when an exceptional event occurs. These actions may or may not include the implementation of controls on contributing anthropogenic sources related to an event. However, where anthropogenic sources have contributed to the exceedances of the PM NAAQS at an air quality monitoring site due to a high wind event, a State must take reasonable and appropriate measures to protect public health.

Since the conditions that cause or contribute to high wind events vary from area to area with soil type, precipitation, and the speed of wind gusts, States should provide appropriate documentation which indicates what types of circumstances contributed to the exceedances or violations at the monitoring site in question.[15] In this rule, EPA is not identifying a specific wind speed which should be considered when making a determination concerning whether an event should qualify as exceptional. Instead, EPA is requiring that States submit appropriate documentation which demonstrates why a particular event should be considered exceptional for the affected area. The EPA will review the documentation submitted by States concerning high wind events and will make decisions concerning whether to exclude the data as being influenced by an exceptional event on a case-by-case basis.

C. Stratospheric Ozone Intrusion

1. Background

Consideration of stratospheric ozone intrusions applies only to the 8-hour ozone standard. The occurrence of such intrusions are extremely difficult to measure or document given currently measured meteorological parameters and the locations of these measurements. The infrequency, short durations, and localized nature of such events makes it difficult to use currently available, general meteorological data, which are usually collected at isolated locations such as airports, to determine whether a stratospheric ozone intrusion has occurred. The EPA believes that it is important to differentiate between stratospheric ozone intrusion, which is an exceptional event for the purpose of flagging data, and other non-exceptional meteorological events. Although data have been identified in the past showing the result of stratospheric ozone intrusion, no standard definition or criteria have been established for concrete identification. Therefore, EPA's determination of whether a stratospheric ozone intrusion has occurred is a case-by-case decision based on reasonable judgment considering the season of the year, time of day, persistence, duration, type and severity of accompanying meteorological conditions associated with the ozone measurement in question, and other data showing that conditions were not conducive to local high ozone production but for this intrusion.

2. Final Rule

The EPA is finalizing its rule as proposed. The EPA's determination of whether a stratospheric ozone intrusion has occurred will be made on a case-by-case basis based on reasonable judgment considering the criteria as noted above. It is our intention to review this type of exceptional event during the next review of the NAAQS for ozone. A review of historical data related to the flagging of stratospheric ozone intrusion as an exceptional event shows that the event has only been flagged on a few isolated occasions.

VIII. Treatment of Fireworks Displays

A. Background

The EPA proposed to treat emissions due to fireworks displays in a manner similar to exceptional events. Some national and/or cultural traditions, such as July 4th Independence Day and the Chinese New Year, have long included fireworks displays as important elements of their observances. While this issue is not specifically covered in CAA section 319, EPA believes that Congress did not intend to require EPA to consider air quality violations associated with such cultural traditions in regulatory determinations.

We are not aware of any information showing adverse air quality impacts caused by individual use of fireworks in relatively small quantities. However, analyses of monitoring data collected on July 4th and July 5th indicates that large fireworks displays, in combination with other sources, can in some circumstances be potentially significant sources of air pollutant emissions. For this reason, States are encouraged to take reasonable precautions to minimize exposures to emissions from fireworks displays, to explore the use of lower emitting fireworks, as well as to manage associated activities that may also have significant air quality impacts in the areas where these events are held. Such precautions may include alerting the public to the potential for short-term air quality impacts that may result from the discharge of fireworks at large displays, monitoring prevailing winds, and locating displays downwind of concentrations of people. For these reasons, where States can show that the use of fireworks displays was integral to significant traditional national, ethnic, or other cultural events, we proposed that air quality data associated with such events could be excluded similar to exceptional events under this rule.

B. Final Rule

The EPA is finalizing the approach as stated in the proposed rule to treat emissions from fireworks similar to the treatment of exceptional events in the final rule provided that the event meets the other criteria as stated in this rulemaking. For example, the event must be determined to have affected air quality. Where a State can show that the use of fireworks is significantly integral to traditional national, ethnic, or other cultural events (e.g., July Fourth celebrations, Chinese New Year celebrations, Diwali, etc.), EPA will exclude data from regulatory determinations for monitoring stations whose exceedances or violations has been determined to be caused by emissions from fireworks displays on a case-by-case basis. As stated in other parts of the rule, States must assure that reasonable measures were taken to protect the public from the emissions created by the fireworks display. Under this rule, States are also strongly encouraged to institute educational programs that alert the public to the

[15] Section 319(b)(1)(B) states: "In this subsection, the term 'exceptional event' does not include (i) stagnation of air masses or meteorological inversions; (ii) a meteorological events involving high temperatures or a lack of precipitation; or (iii) air pollution relating to source noncompliance." In terms of the exclusion related to "a meteorological event involving high temperatures or a lack of precipitation" EPA believes that this statutory language prohibits EPA from treating a typical dry day(s) or a dry season for an area as an exceptional event. However, EPA believes that Congress did not intend that the above quoted language to prevent a State from submitting compelling documentation which shows that severe drought conditions may have contributed to an exceptional event, but instead was designed to prevent the indiscriminate exclusion of data on days characterized by "high temperature and a lack of precipitation." Therefore, EPA is permitting States to submit documentation which shows that "severe drought" conditions may have contributed to the occurrence of a high wind event. The documentation must, however, be compelling enough to show that the conditions present at the time of the event were more substantial than a typical dry day(s) or dry season for the area in question, but were related to severe drought conditions. The EPA will review this information and make decisions concerning the exclusion of the data related to the event on a case-by-case basis.

health effects associated with exposure to emissions from fireworks displays.

C. Comments and Responses

Comment: The majority of commenters who commented on this issue agreed that emissions from fireworks should be treated as an exceptional event. However, some commenters disagreed with EPA's proposal to treat fireworks as an exceptional event. Several commenters believed that fireworks are neither an exceptional event nor a natural event and that EPA should not make provisions for fireworks to be excluded as an exceptional event.

Response: In considering the intent of the SAFETEA–LU legislation, it is EPA's belief that Congress did not intend to prohibit the exclusion of data affected by emissions from fireworks related to celebrations of national or cultural traditions. It is EPA's belief that data influenced by fireworks displays should be subject to the same provisions as other exceptional events identified under this rule. Therefore, the mitigation actions described in section VI.A above would also apply to emissions related to fireworks displays.

IX. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a significant regulatory action because it raises novel legal or policy issues arising out of legal mandates. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Order 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

This action does not impose an information collection burden. The information being requested under this rule is consistent with current requirements related to information needed to verify the authenticity of monitoring data submitted to EPA's AQS database, and to justify data that has been flagged as being affected by exceptional or natural events. However, the OMB has previously approved the information collection requirements regulations for ambient air monitoring contained in 40 CFR part 58, subparts A through E, under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and assigned OMB control number 2060–0084, EPA ICR number 940.17. A copy of the OMB approved Information Collection Request (ICR) may be obtained from Susan Auby, Collection Strategies Division; U.S. Environmental Protection Agency (2822T); 1200 Pennsylvania Ave., NW., Washington, DC 20460 or by calling (202) 566–1672.

Burden means that total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in the CFR are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedures Act or any other statute unless the EPA certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions. For the purpose of assessing the impacts of this final rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominate in its field.

Courts have interpreted the RFA to require a regulatory flexibility analysis only when small entities will be subject to the requirements of the rule. See, *Michigan* v. *EPA*, 213 F.3d 663, 668–69 (DC Cir., 2000), *cert. den.*, 532 U.S. 903 (2001). This rule would not establish requirements applicable to small entities. Instead, this rule provides the criteria necessary for State, local, or Tribal air quality agencies to meet in order to properly flag data as being influenced by an exceptional or natural event. The rule also provides information concerning what action should be taken by a State, local, or Tribal air quality agency to protect public health during and following an exceptional or natural event. Because affected States would have discretion to implement controls on sources that may need to be regulated due to anthropogenic contribution in the area determined to be influenced by an exceptional or natural event, EPA could not predict the effect of the rule on small entities.

After considering the economic impacts of this final rule on small entities, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal Agencies to assess the effects of their regulatory actions on State, local and Tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State governments, in the aggregate, or to the private sector, of $100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation of why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments to have meaningful and timely input in the

development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small government on compliance with regulatory requirements.

We have determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any 1 year. This action simply provides the criteria for State, local, or Tribal air quality agencies to flag data to be discounted for regulatory purposes that is being influenced by exceptional or natural events. Thus, this rule is not subject to the requirements of sections 202, 203, and 205 of the UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, or the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The CAA establishes the scheme whereby States take the lead in developing plans to meet the NAAQS. Thus, Executive Order 13132 does not apply to this rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications." This final rule does not have "Tribal implications" as specified in Executive Order 13175. The rule provides information concerning what action should be taken by a State, local, or Tribal air quality agency implementing relevant air quality programs to protect public health once EPA has provided a concurrence on data that has been flagged as being influenced by an exceptional or natural event. The CAA and the Tribal Authority Rule (TAR) give Tribes the opportunity to develop and implement CAA programs, but it leaves to the discretion of the Tribe whether to develop these programs and which programs, or appropriate elements of a program, the Tribe will adopt through the Tribal Implementation Plan (TIP).

This rule does not have Tribal implications as defined by Executive Order 13175. It does not have a substantial direct effect on one or more Indian Tribes, because no Tribe has implemented a TIP related to the PM or the 8-hour ozone NAAQS at this time. Furthermore, this rule does not affect the relationship or distribution of power and responsibilities between the Federal government and Indian Tribes. The CAA and the TAR establish the relationship of the Federal government and Tribes in developing plans to attain the NAAQS, and this rule does nothing to modify that relationship. Because this rule does not have Tribal implications, Executive Order 13175 does not apply. However, even though we found that this rule does not have Tribal implications, we nevertheless were aware of Tribes that had an interest in this rule. Therefore, we conducted communications and outreach related to the rule with the Tribes through discussions via conference calls with the Tribal Association. We also provided information to the Tribes on the rule via the Quarterly Tribal Air Newsletter.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045: "Protection of Children From Environmental Health and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health and safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, EPA must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by EPA.

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because EPA does not have reason to believe that the environmental health risks or safety risks addressed by this rule present a disproportionate risk or safety risk to children. The rule provides information concerning what action should be taken by a State, local, or Tribal air quality agency to protect public health once EPA has provided a concurrence on data that has been flagged as being influenced by an exceptional or natural event.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This rule is not a "significant energy action" as defined in Executive Order 13211, "Actions That Significantly Affect Energy Supply, Distribution, or Use," (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we have concluded that this rule is not likely to have any adverse energy effects.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer Advancement Act of 1995 (NTTAA), Public Law No. 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impracticable. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by VCS bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when EPA decides not to use available and applicable VCS.

This action does not involve technical standards. Therefore, EPA did not consider the use of any VCS.

J. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal**

Register. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective May 21, 2007.

K. Petitions for Judicial Review

Under section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the District of Columbia Circuit by May 21, 2007. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review must be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. See CAA Section 307(b)(2).

List of Subjects

40 CFR Part 50

Environmental protection, Air pollution control, National parks, Wilderness areas.

40 CFR Part 51

Environmental protection, Air pollution control, Administrative practice and procedure, Reporting and recordkeeping requirements.

Dated: March 14, 2007.

Stephen L. Johnson,

Administrator.

■ In consideration of the foregoing, the Environmental Protection Agency amends 40 CFR parts 50 and 51 as follows:

PART 50—NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS

■ 1. The authority citation for part 50 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 2. Amend § 50.1 to add paragraphs (j) and (k) to read as follows:

§ 50.1 Definitions.

* * * * *

(j) *Exceptional event* means an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event. It does not include stagnation of air masses or meteorological inversions, a meteorological event involving high temperatures or lack of precipitation, or air pollution relating to source noncompliance.

(k) *Natural event* means an event in which human activity plays little or no direct causal role.

(l) *Exceedance with respect to a national ambient air quality standard* means one occurrence of a measured or modeled concentration that exceeds the specified concentration level of such standard for the averaging period specified by the standard.

■ 3. Add § 50.14 to read as follows:

§ 50.14 Treatment of air quality monitoring data influenced by exceptional events.

(a) *Requirements.* (1) A State may request EPA to exclude data showing exceedances or violations of the national ambient air quality standard that are directly due to an exceptional event from use in determinations by demonstrating to EPA's satisfaction that such event caused a specific air pollution concentration at a particular air quality monitoring location.

(2) Demonstration to justify data exclusion may include any reliable and accurate data, but must demonstrate a clear causal relationship between the measured exceedance or violation of such standard and the event in accordance with paragraph (c)(3)(iii) of this section.

(b) *Determinations by EPA.* (1) EPA shall exclude data from use in determinations of exceedances and NAAQS violations where a State demonstrates to EPA's satisfaction that an exceptional event caused a specific air pollution concentration in excess of one or more national ambient air quality standards at a particular air quality monitoring location and otherwise satisfies the requirements of this section.

(2) EPA shall exclude data from use in determinations of exceedances and NAAQS violations where a State demonstrates to EPA's satisfaction that emissions from fireworks displays caused a specific air pollution concentration in excess of one or more national ambient air quality standards at a particular air quality monitoring location and otherwise satisfies the requirements of this section. Such data will be treated in the same manner as exceptional events under this rule, provided a State demonstrates that such use of fireworks is significantly integral to traditional national, ethnic, or other cultural events including, but not limited to July Fourth celebrations which satisfy the requirements of this section.

(3) EPA shall exclude data from use in determinations of exceedances and NAAQS violations, where a State demonstrates to EPA's satisfaction that emissions from prescribed fires caused a specific air pollution concentration in excess of one or more national ambient air quality standards at a particular air quality monitoring location and otherwise satisfies the requirements of this section provided that such emissions are from prescribed fires that EPA determines meets the definition in § 50.1(j), and provided that the State has certified to EPA that it has adopted and is implementing a Smoke Management Program or the State has ensured that the burner employed basic smoke management practices. If an exceptional event occurs using the basic smoke management practices approach, the State must undertake a review of its approach to ensure public health is being protected and must include consideration of development of a SMP.

(4) [Reserved]

(c) *Schedules and Procedures.* (1) Public notification.

(i) All States and, where applicable, their political subdivisions must notify the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard.

(ii) [Reserved.]

(2) Flagging of data.

(i) A State shall notify EPA of its intent to exclude one or more measured exceedances of an applicable ambient air quality standard as being due to an exceptional event by placing a flag in the appropriate field for the data record of concern in accordance with the schedules for submission of data to the AQS database in 40 CFR 58.16.

(ii) Flags placed on data in accordance with this section shall be deemed informational only, and the data shall not be excluded from determinations with respect to exceedances or violations of the national ambient air quality standards unless and until, following the State's submittal of its demonstration pursuant to paragraph (c)(3) of this section and EPA review, EPA notifies the State of its concurrence by placing a concurrence flag in the appropriate field for the data record in the AQS database.

(iii) Flags placed on data as being due to an exceptional event together with an initial description of the event shall be submitted to EPA not later than July 1st of the calendar year following the year in which the flagged measurement occurred, except as allowed under paragraph (c)(2)(iv) of this section.

(iv) For $PM_{2.5}$ data collected during calendar years 2004–2006, that the State identifies as resulting from an

exceptional event, the State must notify EPA of the flag and submit an initial description of the event no later than October 1, 2007. EPA may grant an extension, if a State requests an extension, and permit the State to submit the notification of the flag and initial description by no later than December 1, 2007.

(v) When EPA sets a NAAQS for a new pollutant, or revises the NAAQS for an existing pollutant, it may revise or set a new schedule for flagging data for the initial designation of areas for those NAAQS.

(3) *Submission of demonstrations.*

(i) A State that has flagged data as being due to an exceptional event and is requesting exclusion of the affected measurement data shall, after notice and opportunity for public comment, submit a demonstration to justify data exclusion to EPA not later than the lesser of, 3 years following the end of the calendar quarter in which the flagged concentration was recorded or, 12 months prior to the date that a regulatory decision must be made by EPA. A State must submit the public comments it received along with its demonstration to EPA.

(ii) A State that flags data collected during calendar years 2004–2006, pursuant to paragraph (c)(2)(iv) of this section, must adopt the procedures and requirements specified in paragraph (c)(3)(i) of this section and must include a demonstration to justify the exclusion of the data not later than the submittal of the Governor's recommendation letter on nonattainment areas.

(iii) The demonstration to justify data exclusion shall provide evidence that:

(A) The event satisfies the criteria set forth in 40 CFR 50.1(j);

(B) There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area;

(C) The event is associated with a measured concentration in excess of normal historical fluctuations, including background; and

(D) There would have been no exceedance or violation but for the event.

(iv) With the submission of the demonstration, the State must document that the public comment process was followed.

(v) [Reserved.]

(A) [Reserved]

PART 51—NATIONAL PRIMARY AND SECONDARY NATIONAL AMBIENT AIR QUALITY STANDARDS

■ 4. The authority citation for part 51 continues to read as follows:

Authority: 23 U.S.C. 101; 42 U.S.C. 7401–7671q.

■ 5. Adding Subpart Y consisting of § 51.930 to read as follows:

Subpart Y—Mitigation Requirements

§ 51.930 Mitigation of Exceptional Events.

(a) A State requesting to exclude air quality data due to exceptional events must take appropriate and reasonable actions to protect public health from exceedances or violations of the national ambient air quality standards. At a minimum, the State must:

(1) Provide for prompt public notification whenever air quality concentrations exceed or are expected to exceed an applicable ambient air quality standard;

(2) Provide for public education concerning actions that individuals may take to reduce exposures to unhealthy levels of air quality during and following an exceptional event; and

(3) Provide for the implementation of appropriate measures to protect public health from exceedances or violations of ambient air quality standards caused by exceptional events.

(b) [Reserved]

[FR Doc. E7–5156 Filed 3–21–07; 8:45 am]
BILLING CODE 6560–50–P

Amy P. Wang - 5516

From: Rhodes, James [jfrhodes@pittcountync.gov]
Sent: Wednesday, February 04, 2009 9:01 AM
To: Amy P. Wang - 5516; Frank H. Sheffield Jr. - 5507
Cc: Gallagher, Janis
Subject: FW: Emailing: DailyHistory

Amy & Frank -

Weather info for April 18, 2008. Would appear to have caused the smoke from the warehouse fire to drift towards the monitoring station.

JR

From: Dickerson, Phil
Sent: Wednesday, February 04, 2009 8:26 AM
To: Rhodes, James; Gallagher, Janis; Elliott, Scott
Subject: FW: Emailing: DailyHistory

Please note high temps, and light winds from WSW, the general direction of the fire.

From: Dickerson, Phil
Sent: Wednesday, February 04, 2009 8:23 AM
To: Rhodes, James; Gallagher, Janis; Elliott, Scott
Subject: Emailing: DailyHistory

History for Greenville, NC

Friday, April 18, 2008

Daily Summary

	Actual:	Average :	Record :
Temperature:			
Mean Temperature	**65** °F	-	
Max Temperature	**86** °F	**72** °F	**93** °F (2002)
Min Temperature	**44** °F	**48** °F	**33** °F (1983)
Growing Degree Days	15 (Base 50)		
Moisture:			
Dew Point	**46** °F		
Average Humidity	56		
Maximum Humidity	100		
Minimum Humidity	14		
Precipitation:			
Precipitation	**0.00** in	-	- ()
Sea Level Pressure:			

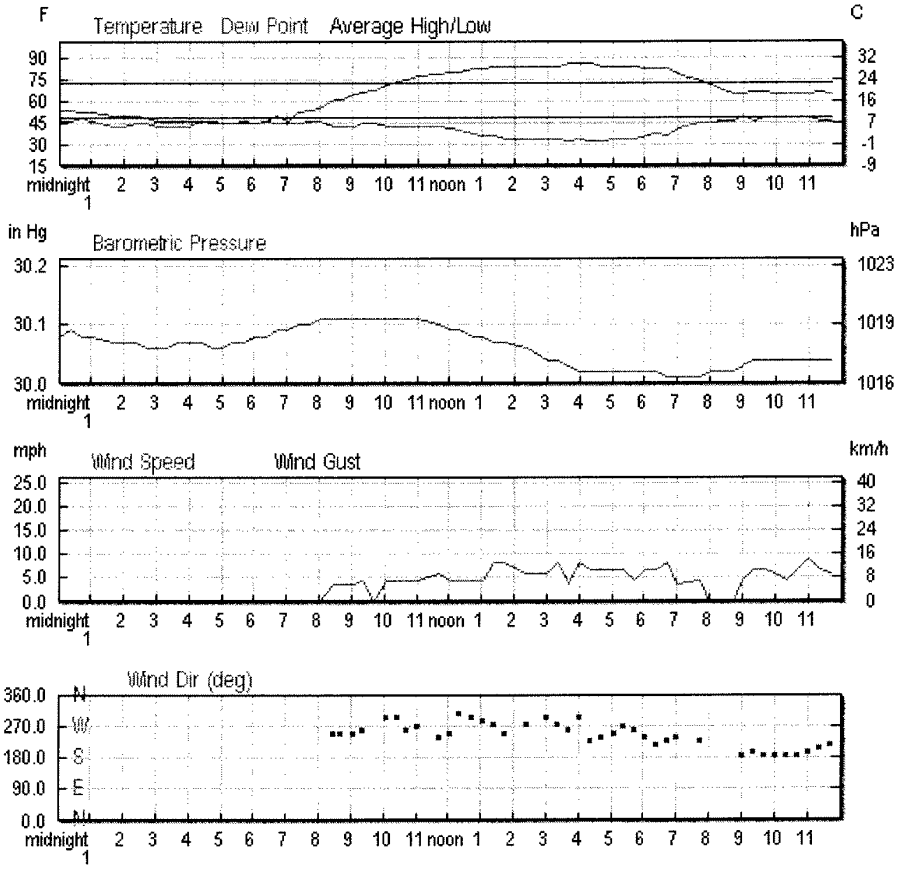
2/6/2009

Sea Level Pressure	**30.09** in
Wind:	
Wind Speed	**0** mph (West)
Max Wind Speed	**8** mph
Max Gust Speed	**16** mph
Visibility	**10** miles
Events	

Averages and records for this station are not official NWS values.

T = Trace of Precipitation, **MM** = Missing Value **Source:** NWS Daily Summa

Seasonal Weather Averages



Hourly Observations

Time (EDT):	Temp.:	Dew Point:	Humidity:	Sea Level Pressure:	Visibility:	Wind Dir:	Wind Speed:	Gust Speed:	Precip:	Events:	Conditior
12:01 AM	**53.6** °F	**46.4** °F	77%	**30.08** in	**10.0** miles	Calm	Calm	-	N/A		Clear
12:22 AM	**53.6** °F	**46.4** °F	77%	**30.09** in	**10.0** miles	Calm	Calm	-	N/A		Clear
12:41 AM	**51.8** °F	**48.2** °F	88%	**30.08** in	**10.0** miles	Calm	Calm	-	N/A		Clear
1:00 AM	**51.8** °F	**46.4** °F	82%	**30.08** in	**10.0** miles	Calm	Calm	-	N/A		Clear

2/6/2009

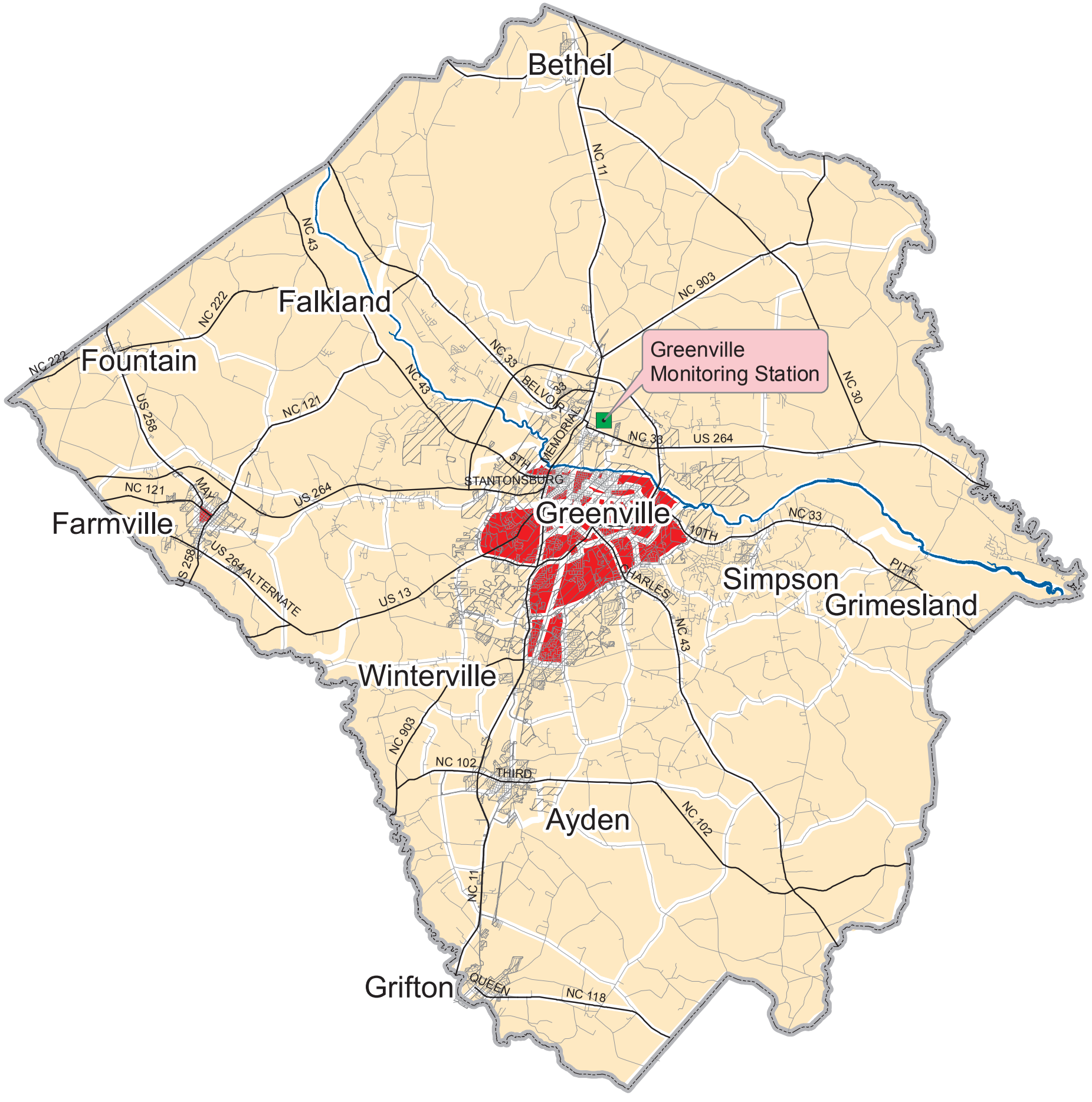
1:41 AM	**50.0** °F	**42.8** °F	76%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
2:01 AM	**50.0** °F	**42.8** °F	76%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
2:24 AM	**50.0** °F	**44.6** °F	82%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
2:41 AM	**48.2** °F	**44.6** °F	87%	**30.06** in	**10.0** miles	Calm	Calm	-	N/A	Clear
3:01 AM	**46.4** °F	**42.8** °F	87%	**30.06** in	**10.0** miles	Calm	Calm	-	N/A	Clear
3:21 AM	**46.4** °F	**42.8** °F	87%	**30.06** in	**10.0** miles	Calm	Calm	-	N/A	Clear
3:41 AM	**46.4** °F	**42.8** °F	87%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
4:01 AM	**46.4** °F	**42.8** °F	87%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
4:21 AM	**46.4** °F	**46.4** °F	100%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
4:43 AM	**46.4** °F	**44.6** °F	93%	**30.06** in	**10.0** miles	Calm	Calm	-	N/A	Clear
5:01 AM	**44.6** °F	**44.6** °F	100%	**30.06** in	**10.0** miles	Calm	Calm	-	N/A	Clear
5:21 AM	**44.6** °F	**44.6** °F	100%	**30.07** in	**7.0** miles	Calm	Calm	-	N/A	Clear
5:41 AM	**46.4** °F	**44.6** °F	93%	**30.07** in	**10.0** miles	Calm	Calm	-	N/A	Clear
6:01 AM	**44.6** °F	**44.6** °F	100%	**30.08** in	**10.0** miles	Calm	Calm	-	N/A	Clear
6:22 AM	**46.4** °F	**46.4** °F	100%	**30.08** in	**10.0** miles	Calm	Calm	-	N/A	Clear
6:41 AM	**50.0** °F	**44.6** °F	82%	**30.09** in	**10.0** miles	Calm	Calm	-	N/A	Clear
7:03 AM	**46.4** °F	**44.6** °F	93%	**30.09** in	**10.0** miles	Calm	Calm	-	N/A	Clear
7:20 AM	**51.8** °F	**44.6** °F	76%	**30.10** in	**10.0** miles	Calm	Calm	-	N/A	Clear
7:41 AM	**53.6** °F	**46.4** °F	77%	**30.10** in	**10.0** miles	Calm	Calm	-	N/A	Clear
8:01 AM	**55.4** °F	**46.4** °F	72%	**30.11** in	**10.0** miles	Calm	Calm	-	N/A	Clear
8:25 AM	**60.8** °F	**42.8** °F	52%	**30.11** in	**10.0** miles	WSW	**3.5** mph	-	N/A	Clear
8:41 AM	**60.8** °F	**42.8** °F	52%	**30.11** in	**10.0** miles	WSW	**3.5** mph	-	N/A	Clear
9:02 AM	**64.4** °F	**42.8** °F	45%	**30.11** in	**10.0** miles	WSW	**3.5** mph	-	N/A	Clear
9:21 AM	**66.2** °F	**44.6** °F	46%	**30.11** in	**10.0** miles	West	**4.6** mph	-	N/A	Clear
9:42 AM	**68.0** °F	**44.6** °F	43%	**30.11** in	**10.0** miles	Calm	Calm	-	N/A	Clear
10:04 AM	**71.6** °F	**42.8** °F	35%	**30.11** in	**10.0** miles	WNW	**4.6** mph	-	N/A	Clear
10:23	**73.4** °F	**42.8** °F	33%	**30.11** in	**10.0** miles	WNW	**4.6** mph	-	N/A	Clear

2/6/2009

AM									
10:42 AM	**75.2** °F	**42.8** °F	31%	**30.11** in	**10.0** miles	West	**4.6** mph	-	N/A	Clear
11:02 AM	**77.0** °F	**42.8** °F	29%	**30.11** in	**10.0** miles	West	**4.6** mph	-	N/A	Clear
11:43 AM	**78.8** °F	**42.8** °F	28%	**30.10** in	**10.0** miles	WSW	**5.8** mph	-	N/A	Clear
12:01 PM	**80.6** °F	**41.0** °F	24%	**30.09** in	**10.0** miles	WSW	**4.6** mph	-	N/A	Clear
12:20 PM	**80.6** °F	**39.2** °F	23%	**30.09** in	**10.0** miles	NW	**4.6** mph	-	N/A	Clear
12:41 PM	**82.4** °F	**37.4** °F	20%	**30.08** in	**10.0** miles	WNW	**4.6** mph	-	N/A	Clear
1:01 PM	**82.4** °F	**35.6** °F	19%	**30.08** in	**10.0** miles	WNW	**4.6** mph	-	N/A	Clear
1:22 PM	**84.2** °F	**35.6** °F	18%	**30.07** in	**10.0** miles	West	**8.1** mph	-	N/A	Clear
1:44 PM	**84.2** °F	**33.8** °F	16%	**30.07** in	**10.0** miles	WSW	**8.1** mph	**16.1** mph	N/A	Clear
2:23 PM	**84.2** °F	**33.8** °F	16%	**30.06** in	**10.0** miles	West	**5.8** mph	-	N/A	Clear
3:00 PM	**84.2** °F	**33.8** °F	16%	**30.04** in	**10.0** miles	WNW	**5.8** mph	-	N/A	Clear
3:21 PM	**84.2** °F	**33.8** °F	16%	**30.04** in	**10.0** miles	West	**8.1** mph	-	N/A	Clear
3:41 PM	**86.0** °F	**32.0** °F	14%	**30.03** in	**10.0** miles	West	**3.5** mph	-	N/A	Clear
4:01 PM	**86.0** °F	**33.8** °F	15%	**30.02** in	**10.0** miles	WNW	**8.1** mph	-	N/A	Clear
4:21 PM	**86.0** °F	**32.0** °F	14%	**30.02** in	**10.0** miles	SW	**6.9** mph	-	N/A	Clear
4:40 PM	**84.2** °F	**32.0** °F	15%	**30.02** in	**10.0** miles	WSW	**6.9** mph	-	N/A	Clear
5:05 PM	**84.2** °F	**33.8** °F	16%	**30.02** in	**10.0** miles	WSW	**6.9** mph	-	N/A	Clear
5:22 PM	**84.2** °F	**33.8** °F	16%	**30.02** in	**10.0** miles	West	**6.9** mph	-	N/A	Clear
5:41 PM	**84.2** °F	**33.8** °F	16%	**30.02** in	**10.0** miles	West	**4.6** mph	-	N/A	Clear
6:03 PM	**82.4** °F	**35.6** °F	19%	**30.02** in	**10.0** miles	WSW	**6.9** mph	-	N/A	Clear
6:21 PM	**82.4** °F	**37.4** °F	20%	**30.02** in	**10.0** miles	SW	**6.9** mph	-	N/A	Clear
6:41 PM	**82.4** °F	**35.6** °F	19%	**30.01** in	**10.0** miles	SW	**8.1** mph	-	N/A	Clear
7:00 PM	**78.8** °F	**41.0** °F	26%	**30.01** in	**10.0** miles	WSW	**3.5** mph	-	N/A	Clear
7:42 PM	**73.4** °F	**44.6** °F	36%	**30.01** in	**10.0** miles	SW	**4.6** mph	-	N/A	Clear
8:00 PM	**71.6** °F	**44.6** °F	38%	**30.02** in	**10.0** miles	Calm	Calm	-	N/A	Clear
8:22 PM	**68.0** °F	**46.4** °F	46%	**30.02** in	**10.0** miles	Calm	Calm	-	N/A	Clear

8:42 PM	**64.4** °F	**46.4** °F	52%	**30.02** in	**10.0** miles	Calm	Calm	-	N/A	Clear
9:00 PM	**64.4** °F	**50.0** °F	59%	**30.03** in	**10.0** miles	South	**4.6** mph	-	N/A	Clear
9:21 PM	**66.2** °F	**46.4** °F	49%	**30.04** in	**10.0** miles	SSW	**6.9** mph	-	N/A	Clear
9:42 PM	**66.2** °F	**48.2** °F	52%	**30.04** in	**10.0** miles	South	**6.9** mph	-	N/A	Clear
10:01 PM	**64.4** °F	**48.2** °F	56%	**30.04** in	**10.0** miles	South	**5.8** mph	-	N/A	Clear
10:22 PM	**64.4** °F	**48.2** °F	56%	**30.04** in	**10.0** miles	South	**4.6** mph	-	N/A	Clear
10:41 PM	**64.4** °F	**48.2** °F	56%	**30.04** in	**10.0** miles	South	**6.9** mph	-	N/A	Clear
11:01 PM	**64.4** °F	**48.2** °F	56%	**30.04** in	**10.0** miles	SSW	**9.2** mph	-	N/A	Clear
11:21 PM	**66.2** °F	**46.4** °F	49%	**30.04** in	**10.0** miles	SSW	**6.9** mph	-	N/A	Clear
11:41 PM	**64.4** °F	**46.4** °F	52%	**30.04** in	**10.0** miles	SW	**5.8** mph	-	N/A	Clear

2/6/2009



Pitt County
Population Density

Persons Per Square Mile

- 0-999
- 1000+
- City Limits
- Major Roads
- Roads
- Tar River
- County Boundary

Population Density Source: Census 2000
Summary File 1 (SF 1) 100 - Percent Data.

Map Produced By:
Pitt County Planning Department

February 3, 2009

N

0 3.5 7 10.5 Miles

1 Inch = 3.5 Mile

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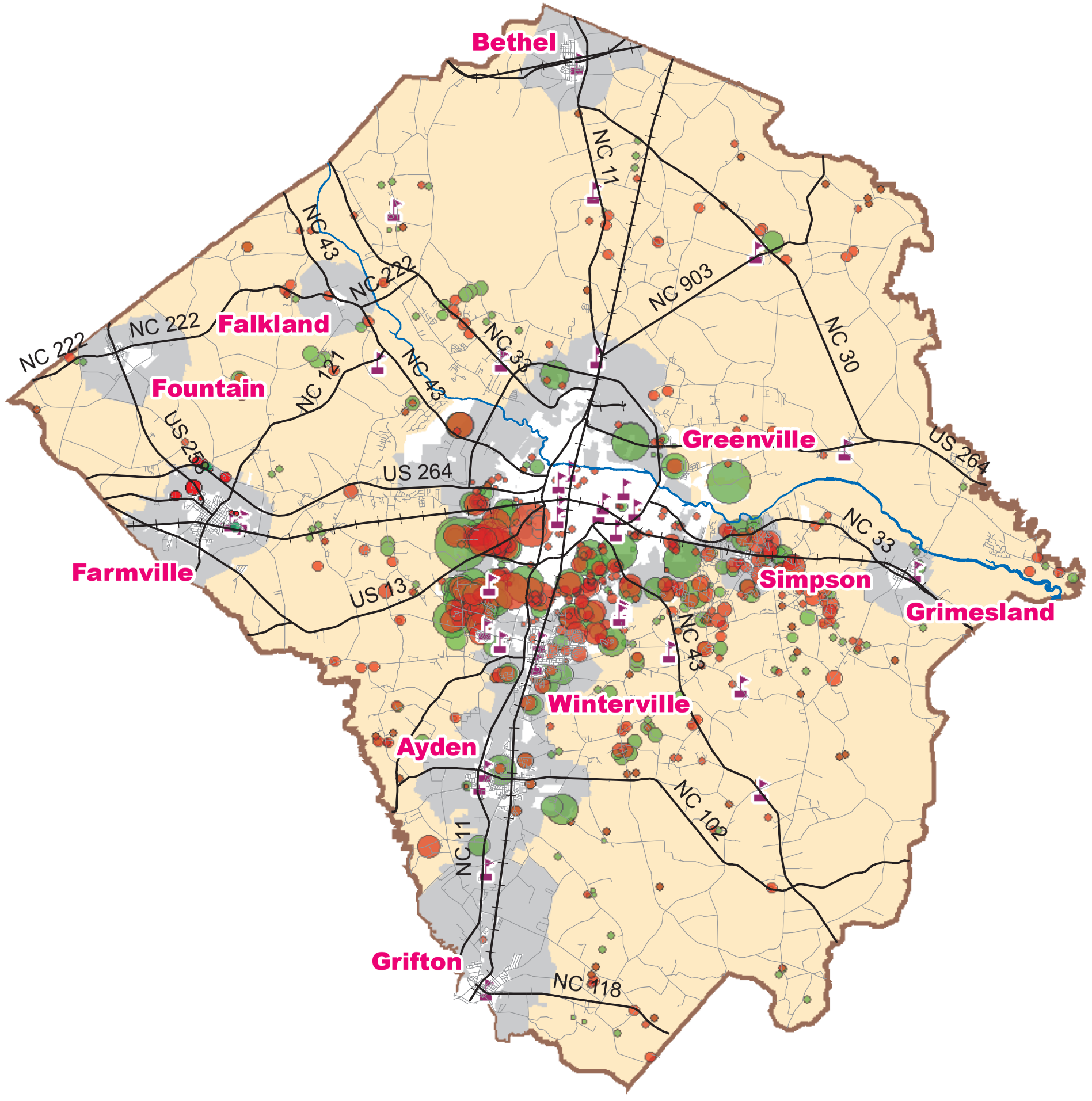


Pitt County
Proposed Development
January 2004 through
July 2008

Legend

Subdivision Activity
(Ranked by Number of Lots)

Preliminary Plats	Final Plats
1 - 10	1 - 10
11 - 30	11 - 30
31 - 60	31 - 60
61 - 100	61 - 100
101 - 150	101 - 150
151 - 200	151 - 200
201 - 416	201 - 416

- Major Roads
- Rail
- Secondary Roads
- Tar River
- Pitt County Schools
- City Limits
- ETJ
- County Boundary

Note: Development Activity is inclusive to all municipalities. It is possible some developments were not included due to incomplete data sets or outdated information.

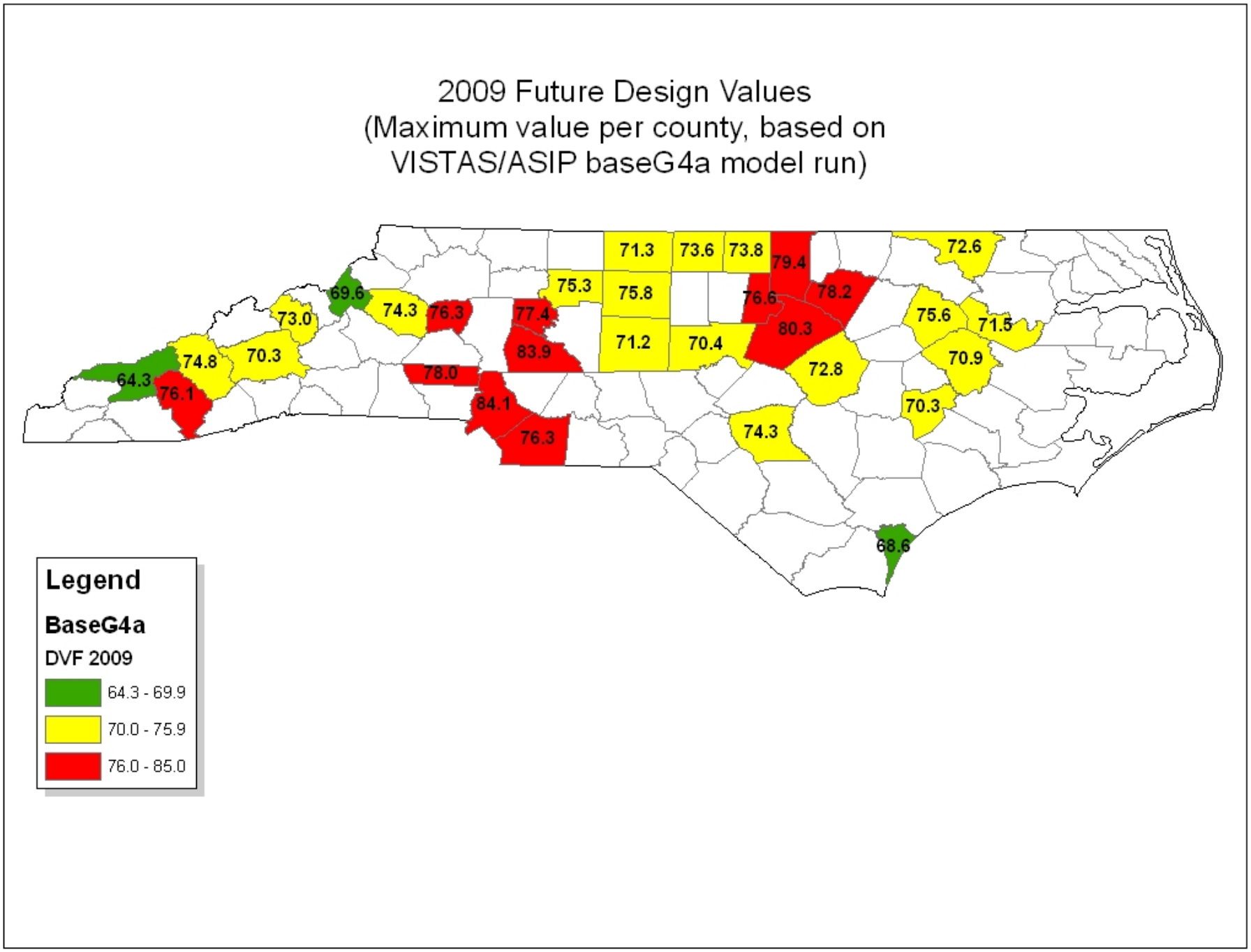
0 1.75 3.5 7 Miles

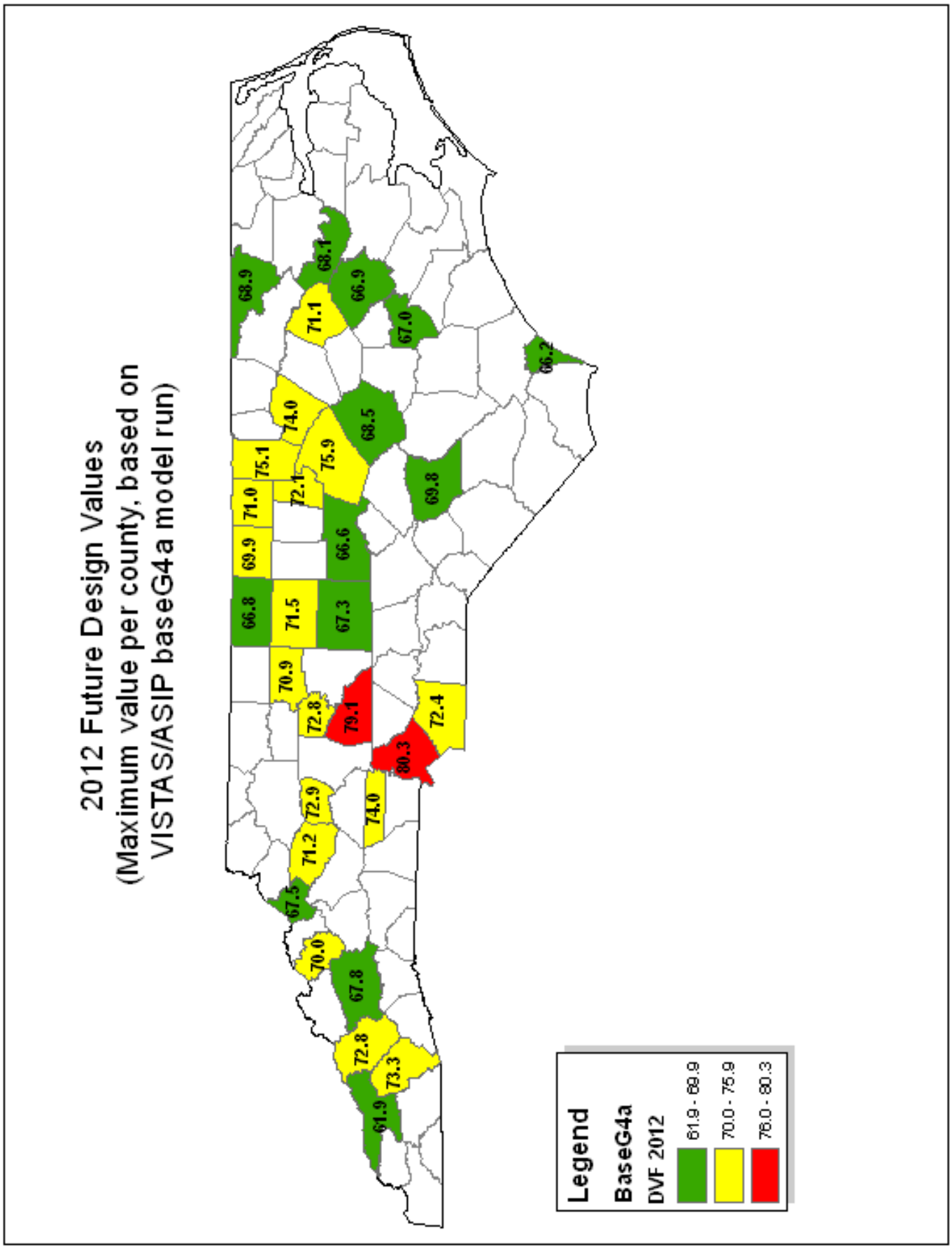
February 2009
Map Scale: 1 Inch Represents 3.5 Miles
Map Produced By:
The Pitt County Planning Department

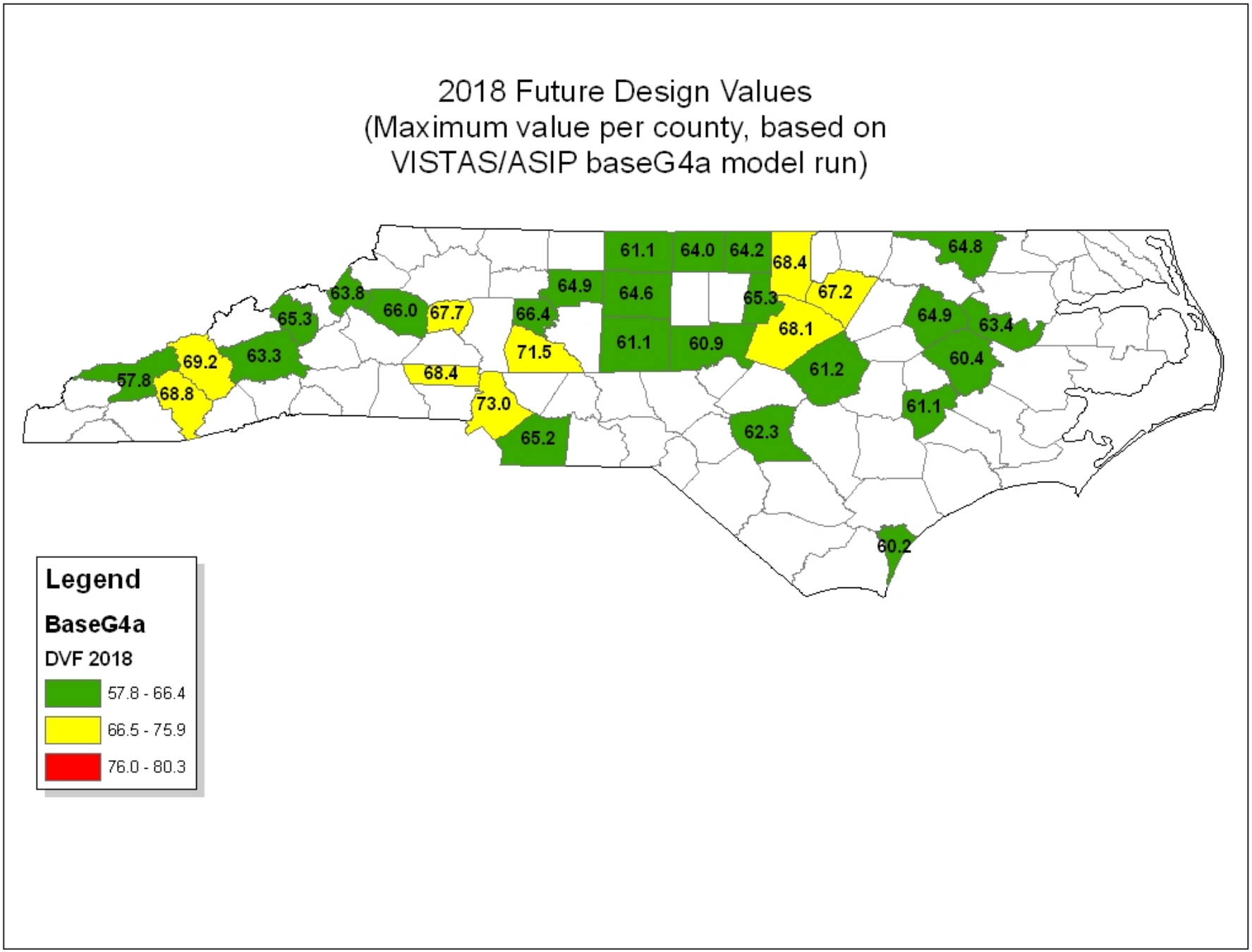
N W E S

AIRS ID	CO Name	Area	Site Name	DV Base (00-04)	DVF 2009	DVF 2012	DVF 2018
370990005	Jackson	Asheville	Barnet Knob	**86.0**	**76.1**	73.3	68.8
370210030	Buncombe	Asheville	Bent Creek	**80.0**	70.3	67.8	63.3
371730002	Swain	Asheville	Bryson	72.7	64.3	61.9	57.8
370870035	Haywood	Asheville	Frying Pan	**83.0**	74.8	72.8	69.2
371990003	Yancey	Asheville	Mt Mitchell	**83.0**	73.0	70.0	65.3
370870036	Haywood	Asheville	Purchase Knob	**84.7**	74.9	72.5	68.3
370870004	Haywood	Asheville	Waynesville	**78.3**	70.5	68.5	64.8
370270003	Caldwell	Hickory	Lenoir / Caldwell Co.	**83.3**	74.3	71.2	66.0
370030004	Alexander	Hickory	Waggin Trail	**86.7**	**76.3**	72.9	67.7
371191005	Mecklenburg	Charlotte	Arrowood	**84.7**	74.4	71.0	64.5
371191009	Mecklenburg	Charlotte	County Line	**97.3**	**84.6**	**80.0**	72.0
371090004	Lincoln	Charlotte	Crouse	**90.7**	**78.0**	74.0	68.4
371590022	Rowan	Charlotte	Enochville	**97.0**	**83.9**	**79.1**	71.5
371190041	Mecklenburg	Charlotte	Garinger (Plaza)	**95.3**	**84.1**	**80.3**	73.0
371790003	Union	Charlotte	Monroe	**87.0**	**76.3**	72.4	65.2
371590021	Rowan	Charlotte	Rockwell	**97.3**	**83.4**	**78.6**	71.6
371570099	Rockingham	Triad	Bethany	**88.3**	71.3	66.8	61.1
370330001	Caswell	Triad	Cherry Grove	**87.7**	73.6	69.9	64.0
370590002	Davie	Triad	Cooleemee	**91.3**	**77.4**	72.8	66.4
370670022	Forsyth	Triad	Hattie Ave.	**91.3**	75.3	70.9	64.9
370810011	Guilford	Triad	McLeansville	**88.7**	75.8	71.5	64.6
370670027	Forsyth	Triad	Pollirosa	**81.7**	68.3	64.6	59.7
370670028	Forsyth	Triad	Shiloh Church	**86.3**	71.1	67.2	61.8
371510004	Randolph	Triad	Sophia	**83.5**	71.2	67.3	61.1
370671008	Forsyth	Triad	Union Cross	**88.3**	74.5	70.3	64.1

AIRS ID	CO Name	Area	Site Name	DV Base (00-04)	DVF 2009	DVF 2012	DVF 2018
371450003	Person	Triangle	Bushy Fork	**89.3**	73.8	71.0	64.2
370770001	Granville	Triangle	Butner	**92.3**	**79.4**	75.1	68.4
370630013	Durham	Triangle	Duke St	**88.3**	**76.6**	72.1	65.3
370690001	Franklin	Triangle	Franklinton	**89.7**	**78.2**	74.0	67.2
371830016	Wake	Triangle	Fuquay-Varina	**87.0**	75.7	71.7	64.6
371830014	Wake	Triangle	Millbrook	**90.7**	**78.7**	74.4	66.8
370370004	Chatham	Triangle	Pittsboro	**81.3**	70.4	66.6	60.9
371830015	Wake	Triangle	St. Augustine	**92.5**	**80.3**	75.9	68.1
371830017	Wake	Triangle	Tower	**85.3**	74.5	70.5	63.5
371010002	Johnston	Triangle	W. Johnston	**84.3**	72.8	68.5	61.2
370511003	Cumberland	Fayetteville	Golfview (Hope Mills)	**86.0**	74.3	69.8	62.3
370510008	Cumberland	Fayetteville	Wade	**85.3**	73.2	69.1	62.1
370650099	Edgecombe	Rocky Mount	Leggett	**87.3**	75.6	71.1	64.9
370750001	Graham	Western NC	Joanna Bald	-7.0	-9.0	-9.0	-9.0
370110002	Avery	Western NC	Linville (Linville)	**77.7**	69.6	67.5	63.8
370290099	Camden	Central NC	Camden	-7.0	-9.0	-9.0	-9.0
371290002	New Hanover	Eastern NC	Castle Hayne	**77.3**	68.6	66.2	60.2
371470099	Pitt	Eastern NC	Farmville	**82.0**	70.9	66.9	60.4
371310002	Northampton	Eastern NC	Gaston	**84.0**	72.6	68.9	64.8
371170001	Martin	Eastern NC	Jamesville	**80.3**	71.5	68.1	63.4
370610002	Duplin	Eastern NC	Kenansville	**80.0**	-9.0	-9.0	-9.0
371070004	Lenoir	Eastern NC	L. College / Lenoir Co.	**80.0**	70.3	67.0	61.1


2009 Future Design Values
(Maximum value per county, based on
VISTAS/ASIP baseG4a model run)
71.3
73.6
73.8
79.4
72.6
75.3
75.8
76.6
78.2
69.6
74.3
76.3
77.4
73.0
75.6
71.5
80.3
74.8
70.3
71.2
70.4
83.9
70.9
64.3
72.8
78.0
76.1
84.1
70.3
74.3
76.3
68.6
Legend
BaseG4a
DVF 2009
64.3 - 69.9
70.0 - 75.9
76.0 - 85.0


2012 Future Design Values
(Maximum value per county, based on
VISTAS/ASIP baseG4a model run)
68.9
68.1
66.9
71.1
67.0
66.2
74.0
68.5
75.1
75.9
72.1
71.0
69.8
69.9
66.6
66.8
71.5
67.3
70.9
72.8
79.1
72.4
80.3
74.0
72.9
71.2
67.5
70.0
67.8
72.8
73.3
61.9
Legend
BaseG4a
DVF 2012
61.9 - 69.9
70.0 - 75.9
76.0 - 80.3


2018 Future Design Values
(Maximum value per county, based on
VISTAS/ASIP baseG4a model run)
61.1
64.0
64.2
68.4
64.8
64.9
64.6
65.3
67.2
63.8
66.0
67.7
66.4
65.3
64.9
63.4
68.1
61.1
60.9
71.5
69.2
63.3
61.2
60.4
57.8
68.4
68.8
73.0
61.1
65.2
62.3
60.2
Legend
BaseG4a
DVF 2018
57.8 - 66.4
66.5 - 75.9
76.0 - 80.3

Donnie - Joelle - George

Ulrich Alsentzer, M.D.
103 Cabana Rd.
Belhaven, NC 27810
252 964 4624
ualsentzer@gotricounty.com

B. Keith Overcash, Director
N.C. Division of Air Quality
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear Mr. Overcash
January, 16th 2009

February, 2nd 2009

I applaud DAQ holding hearings on air quality and non-attainment areas in Greenville. Although I no longer live in Greenville, clean air concerns all of us, living in the non-attainment area or downwind. Depending on where we live, the degree of air-pollution may be acutely different, but if we do not attend to the task of reducing air pollution everywhere, we will eventually have ever larger geographical areas of poor air quality and its related ill effects on people and the economy. I could have driven to Greenville to attend the meeting, but this would have meant a 110 mile round trip, and although I get 40mpg in my little car, I would still consume gas and produce emissions which is counter-productive to maintaining clean air and directly contrary to the intend and purpose of my profession, I am a physician, to do everything in my power to reduce human suffering. If we all would use alternative communication technologies to physical meetings involving travel, it would lead us a long way to reducing emissions and achieving cleaner air.

Air quality is no longer just an aesthetic issue correlated to either good visibility or bad; it is however closely associated with human health, educational level and achievement.

More school children then ever suffer form asthma, a lot of which is triggered by air pollution, especially ground level ozone which is formed by combining nitrous oxide (NOX) from vehicle emissions with sunlight. It is formed whether there is wind or not. Wind just disperses the ozone, it dilutes its concentration locally, but the process still contributes to overall ozone increase in the lower air masses that we breathe in. These children spend an average of three to four days more in emergency rooms and doctor's offices during each school year then others without asthma. Those days are lost to their formal education and that loss does, in at least in some, adversely effect their performance in school, let alone the suffering and decrease in life's enjoyment and early set-up for later health problems. That residences and schools where people of low economic achievement live and educate their children are often in close proximity to main highways with increased exposure to vehicle exhaust further aggravates the

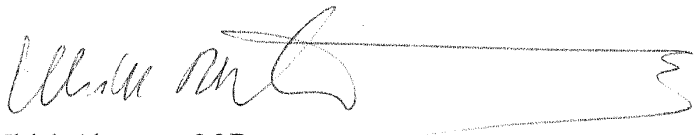
children's asthma-related health problems. Their underachievement in school leads to lower achievement and lower productivity later in life, which negatively impacts not only their personal economy but also the economic welfare of the entire country.

On the other end of the range of human life are older people who suffer acute and chronic respiratory and cardio-vascular problems from inhaling polluted air. The fine particles, ten microns and less in diameter, which unfiltered or poorly filtered diesel engines emit in large quantities, not only penetrate easily indoors but also into the finest recesses of the lungs and even the coronary arteries where they create inflammation, resulting in angina, heart attacks and death. Again, let alone the dimension of human suffering and the empathy that should generate, the associated health-care cost by far outweigh any investment cost that need to be made to reduce the harmful emission from combustion engines, especially diesel engines, both mobile and stationary.

Monitoring air quality not only helps alert the population to situations of "bad" air quality, but hopefully will help in establishing better regulations on permitted amount of noxious substance in the exhaust from all combustion processes and promote the development of cleaner technologies in power generation and vehicular traffic.

In summary, acute and chronic human suffering is related to the quality of the air humans breathe. The economics of striving for good air quality air are such that creating cleaner air benefits individuals and society at large.

Sincerely,



Ulrich Alsentzer, M.D.

Former chair of Greenville's
Environmental Advisory Commission
Member of North Carolina Eastern Region
Environmental Advisory Committee

Land-of-Sky Regional Council
Buncombe • Henderson • Madison • Transylvania Counties

February 26, 2009

Ms. Laura Boothe
Attainment Planning Branch Chief
NC Division of Air Quality
NC DENR
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear Ms. Boothe:

The Land of Sky Rural Planning Organization (LOS RPO) wants to go on record as supporting the NC Division of Air Quality's proposed recommendation regarding Ozone Non-Attainment Area Boundaries in our region. The RPO supports the designation of the Great Smoky Mountains National Park as a Non-Attainment Area for Ground Level Ozone as requesed by the National Park Service. We also support the NC Division of Air Quality's recommendation to the US EPA that the areas above 4,000 feet elevation and surrounding the violating high elevation monitors be designated as Non-Attainment Areas. We see no need to designate the valley areas in our region since all the low elevation monitors (e.g., Bent Creek, Waynesville, etc.) are in compliance with federal standards.

If you have any questions, feel free to contact me at 828-251-6622.

Bill Eaker
Environmental Programs Manager
Land-of-Sky Regional Council

Lending Our Support to the Region's Communities
339 New Leicester Hwy., Suite 140 Asheville, NC 28806-2046
Telephone: 828-251-6622 Fax:828-251-6353

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Appendix C

U.S. National Park Service and U.S. Forest Service Comments Received

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Subject: Re: 2008 8-Hour Ozone Nonattainment Boundary Recommendations
From: Jim_Renfro@nps.gov
Date: Mon, 2 Feb 2009 11:36:53 -0500
To: "George.Bridgers" <George.Bridgers@ncmail.net>
CC: "Donnie.Redmond" <Donnie.Redmond@ncmail.net>, "Joelle.Burleson" <Joelle.Burleson@ncmail.net>, Nancy_Finley@nps.gov, Denesia_Cheek@nps.gov, Bob_Carson@nps.gov, Patricia_F_Brewer@nps.gov, Russell_Paulk@nps.gov, bjackson02@fs.fed.us

George: thanks for sending this to review and the opportunity for input. We agree here at the Park with your non-attainment boundary recommendation of the new 8-hour ozone NAAQS for Great Smoky Mountains National Park (GRSM). Data from our only ozone monitor on the NC-side of the park at Purchase Knob (Clingmans Dome straddles the NC/TN line adjacent to Swain Co, NC and is also over the standard) exceed the standard and should be designated non-attainment. Not sure what EPA will go with for the rest of the exceeding ridgetop monitors in western NC and near USFS Class I areas, but your recommendation and approach for GRSM is technically sound and consistent with the previous approach under the 85 ppb ozone standard (which was supported by us and approved by EPA). Please keep me informed of upcoming key milestones related to this standard and the park. As always, thanks for all your efforts in helping to protect the air resources of the park.

Jim Renfro, Air Quality Specialist
Great Smoky Mountains NP
1316 Cherokee Orchard Rd
Gatlinburg, TN 37738
865.436.1708
http://www.nature.nps.gov/air/WebCams/parks/grsmcam/grsmcam.cfm

"George.Bridgers" <George.Bridgers@ncmail.net>
01/27/2009 02:16 PM

To: Jim_Renfro@nps.gov
cc: "Joelle.Burleson" <Joelle.Burleson@ncmail.net>, "Donnie.Redmond" <Donnie.Redmond@ncmail.net>
Subject: 2008 8-Hour Ozone Nonattainment Boundary Recommendations

Jim,

We're in the process of working up our recommendations for the revised 8-hour ozone nonattainment boundaries around North Carolina. We've done a number of elected officials meetings and are almost done with a round of Public Meetings on this topic. At these various meetings, we are showing our initial thoughts for boundaries and asking for comments / recommendations from the various groups to support or alter our initial boundaries. To this end, the areas of Western NC are the most unique with regards to our approach for nonattainment boundaries.

First... all of the 8-hour violations are at the "ridge top" monitoring sites. There are no violations of the 2008 ozone NAAQS at any "valley" site. Additionally, all of these exceedences making up the ridge top violations occurred during the nighttime hours.... actually all of the exceedences recorded at the ridge tops were at night. I imagine that this isn't a big surprise.

Taking this background info... our initial recommendations on boundaries in Western NC are elevations above 4000ft around the violating monitoring sites and all of the NC portion of the GSMNP. There has been

discussion from the local governments in Western NC of changing the 4000ft elevation cut point to 4500ft. Additionally, Bill Jackson has chimed in asking for 4000ft plus all of the area bounding the Class 1 areas. In all cases, we were taking the approach of the entire NC portion of the GSMNP following the current nonattainment boundaries under the 1997 ozone NAAQS.

You can reference the maps / slide that we've been presenting by pasting the following link in any web browser:

ftp://ftp.ncdenr.org/aq/planning/attain/Public_Meetings/Boundary_Recommendations-Public_Meetings.pdf

The last time that NCDAQ put together an 8-hour ozone nonattainment boundary recommendation package, you provided a letter of support for the GSMNP boundary. I'm hope that you can do something similar for this current boundary package. Of course, we welcome other comments on our potential boundary recommendations. Is this something that you could pull together in the next couple of weeks... by Feb 9th?

Please take some time to review the information in our presentation (link above) and feel free to ask for further clarification and or information. I'm also very open to chatting on the phone about the presentation / boundary package if you would like.

I really appreciate any assistance that you can provide and you input on our 8-hour ozone nonattainment boundary recommendations!

George

--

George M. Bridgers, Meteorologist II
NC DENR, Division of Air Quality
Planning Section, Attainment Planning Branch
1641 Mail Service Center
Raleigh, NC 27699-1641
Phone: 919-715-6287
Fax : 919-715-7476
Email: George.Bridgers@ncmail.net
Web : http://www.ncair.org

United States Department of the Interior

NATIONAL PARK SERVICE
Southeast Regional Office
Atlanta Federal Center
1924 Building
100 Alabama St., S.W.
Atlanta, Georgia 30303

IN REPLY REFER TO:

May 25, 2000

Mr. Brock Nicholson
North Carolina Department of Environment and Natural Resources
Air Quality Division
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

Dear Mr. Nicholson:

This is in follow up to the recent conference call between our agencies concerning the State's upcoming designation of ozone nonattainment areas in North Carolina. As you know, the National Park Service (NPS) is concerned about the restoration and protection of air resources in Great Smoky Mountains National Park (NP), which includes the park's attainment of the ozone national ambient air quality standard (NAAQS). Therefore, we are very interested in how ozone nonattainment area boundaries can be defined for the park. We desire nonattainment boundaries that will result in emission control measures and programs that will be effective in putting the park on the path to cleaner air and compliance with ozone NAAQS. We have similar concerns for other park areas in North Carolina and the surrounding region, such as the Blue Ridge Parkway and Shenandoah NP. In addition, if ozone nonattainment designations for park units in North Carolina will not achieve our clean air objectives, we then believe other possible state regulatory approaches may be necessary.

As discussed, Great Smoky Mountains NP is a mandatory federal Class I area administered by the NPS and lies in western North Carolina and eastern Tennessee. The park experiences impacts from emission sources in both States, as well as from transported emissions from outside these states. Although Class I areas are afforded special protection under the Clean Air Act, Great Smoky Mountains NP and other park units in the region (e.g., Blue Ridge Parkway, Shenandoah NP, and Mammoth Cave NP) still experience significant air pollution problems. Ambient ozone monitoring data from Great Smoky Mountains NP demonstrate that air quality continues to deteriorate due to the cumulative effects of existing and new emissions of ozone precursors (i.e., nitrogen oxides (NO_x) and volatile organic compounds (VOCs)). Recent monitoring in the park indicates an increasing frequency and magnitude of violations of the 8-hour ozone NAAQS in the park on both sides of state lines, despite ongoing state, regional, and national pollution reduction efforts. In fact, with the exception of one national park in California, Great Smoky Mountains NP has the worst monitored ozone air quality in the National Park System.

During the 1997-1999 period, Tennessee ambient ozone monitoring data show that Great Smoky Mountains NP was exposed to ozone levels among the highest in the state. In 1998 and 1999, the park recorded 44 and 52 days, respectively, when the maximum daily 8-hour ozone average exceeded 85 parts per billion. Because these high ozone levels pose substantial health and safety threats to park visitors and staff, the park now issues ozone advisories to alert visitors and staff of these unhealthy ozone conditions. High ozone levels are also adversely impacting park vegetation by causing visible foliar injury and growth loss. There are 60 species of plants showing foliar symptoms consistent with ozone exposure, with an additional 30 species of plants in the park showing visible leaf damage at levels substantially lower than the 8-hour ozone NAAQS. There is also evidence of growth reductions on black cherry and yellow poplar, which are species also found at Blue Ridge Parkway, Shenandoah NP, and other federal, state and private forest areas in the region.

A summary of ozone data from sites in the park and in western North Carolina near the park for the 1997-1999 period is enclosed. These data show seven monitoring sites in the area of the park (including Haywood County, North Carolina) and the Blue Ridge Parkway that are in violation of the 8-hour ozone standard and four other sites with values between 80 and 85 parts per billion (ppb), just under the NAAQS, but higher than the level of the State's ambient standard of 80 ppb. To date, the park's monitoring sites exhibit among the highest levels of ambient ozone in either North Carolina or Tennessee, but there have been violations of the standard at the monitoring station in Lenoir (and Morganton, not shown on the enclosed chart) east of the park. Other low elevation sites in western North Carolina indicate ozone concentrations approaching the national standard as well.

It is apparent that the ozone problem appears to be widespread in the two-state area encompassing the park. The extensive violations in the seven county area associated with the Knoxville, TN metropolitan statistical area, which is adjacent to the park's western boundary, and the data from western North Carolina (including park data) support this view. For this reason, NPS believes any nonattainment designation for the park should be as large as necessary to include existing emission sources (and potential emissions growth areas) that contribute to violations of the ozone NAAQS at any receptor.

The use of other appropriate regulatory tools may be necessary when dealing with ozone impacts in rural areas, such as Great Smoky Mountains NP and the Blue Ridge Parkway, due to the transboundary nature of the ozone problem. Rural areas often do not contain the major emission sources that are largely responsible for the violations of the ozone ambient standard. As such, we concur with North Carolina's concern for mobile source emissions growth in several counties near Asheville, just outside the park, and are encouraged by the possibility that inspection and maintenance programs may be established in the near future to mitigate mobile emissions. Also, the application of regulatory tools to existing and new stationary sources of ozone precursor emissions in potential growth areas could also be used as part of a comprehensive control strategy to help mitigate additional excess emissions that contribute to this regional problem. For example, we recommend that the State consider requiring new major sources to use Lowest Achievable Emissions Rate technology and to obtain emissions offsets to help mitigate potential impacts. Or alternatively, if North Carolina defines ozone

nonattainment areas which do not include existing source and growth areas adjacent to the affected park units, the NPS would be interested in reaching an agreement with the State on how new source review and other regulatory mechanism can be used to address this issue.

We appreciate your efforts to offer the NPS this opportunity to provide relevant information and express our concerns about the protection of the air resources in Great Smoky Mountains NP and the Blue Ridge Parkway. The NPS is supportive of a designation of ozone nonattainment for all park units in North Carolina, if it will result in control strategies and compliance measures locally and in the broader region. We encourage the State to assure that the designation of nonattainment boundaries, which include parklands, results in effective and equitable implementation of control requirements to all contributing sources. The NPS does not want to be unfairly burdened with more stringent nonattainment area compliance requirements inside park units than would apply to other more emission-intensive activities outside the park units.

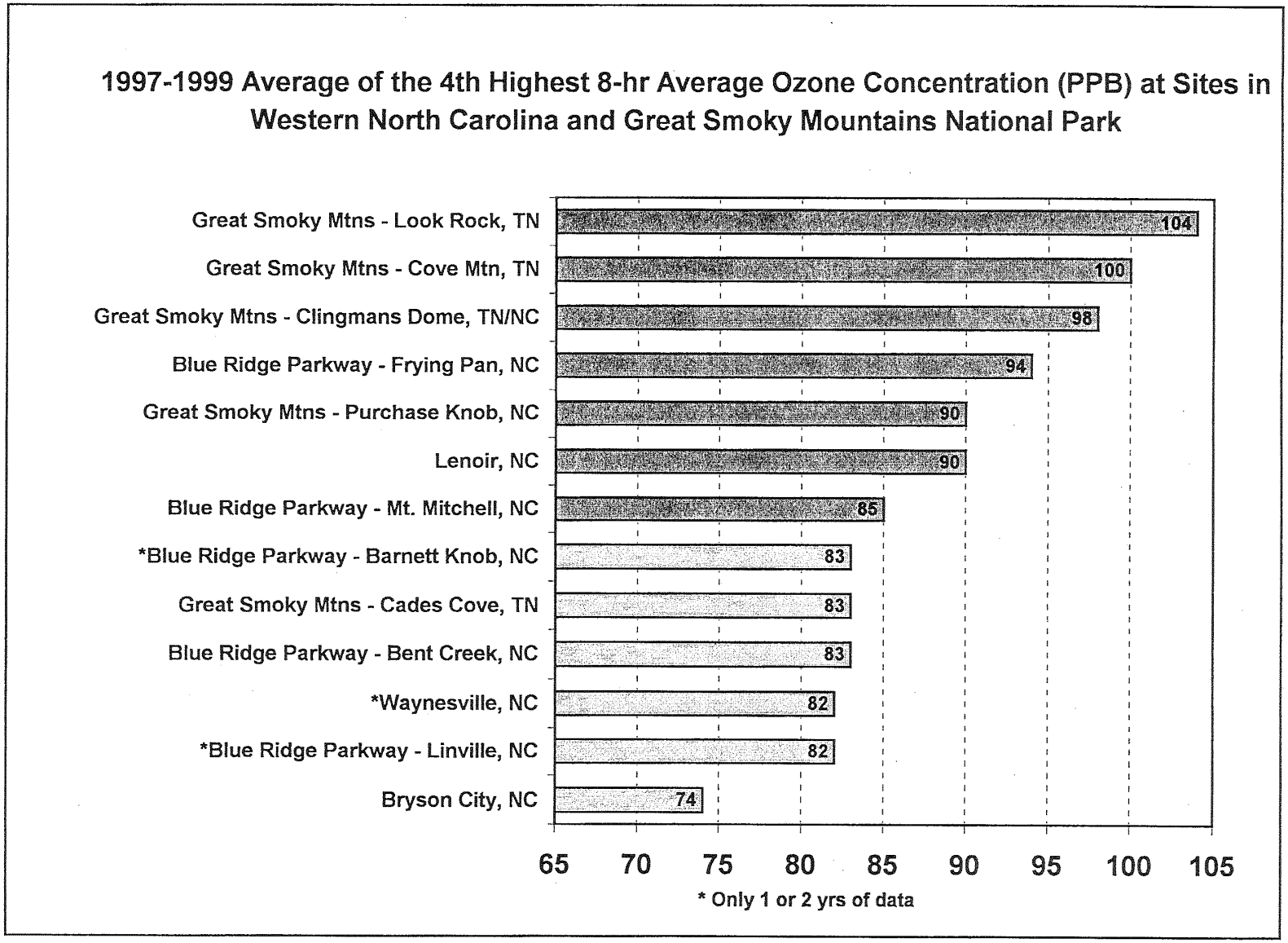
We look forward to working with your office on this matter. If you have any questions, please contact Jim Renfro of Great Smoky Mountains NP at 865-436-1708, Bambi Teague of Blue Ridge Parkway at 704-271-4779, or Brian Mitchell of the NPS Air Resources Division in Denver at 303-969-2819.

Sincerely,

for Regional Director,
Southeast Regional Office

Enclosure

Bcc:
Environmental Protection Agency – Region 4
SERO: O'Neal
GRSM: Supt., JRenfro
BLRI: Supt., BTeague
SHEN: Supt., CGordon
ARD-DEN: Mitchell, Ray, Bunyak, Scruggs, Shaver
Project & Reading File:Bmitchell:x2819:5/22/00:NC-OZONEnonattainment.doc


1997-1999 Average of the 4th Highest 8-hr Average Ozone Concentration (PPB) at Sites in Western North Carolina and Great Smoky Mountains National Park
Great Smoky Mtns - Look Rock, TN
104
Great Smoky Mtns - Cove Mtn, TN
100
Great Smoky Mtns - Clingmans Dome, TN/NC
98
Blue Ridge Parkway - Frying Pan, NC
94
Great Smoky Mtns - Purchase Knob, NC
90
Lenoir, NC
90
Blue Ridge Parkway - Mt. Mitchell, NC
85
*Blue Ridge Parkway - Barnett Knob, NC
83
Great Smoky Mtns - Cades Cove, TN
83
Blue Ridge Parkway - Bent Creek, NC
83
*Waynesville, NC
82
*Blue Ridge Parkway - Linville, NC
82
Bryson City, NC
74
65
70
75
80
85
90
95
100
105
* Only 1 or 2 yrs of data

USDA Forest Service Recommendations
For Ozone Nonattainment Areas in Western North Carolina

The recommended areas of ozone nonattainment designation (shown with the brown line in Figures 1 and 2) include all lands above 4000 feet elevation in the Black Mountains, Great Balsam Mountains (including all of Shining Rock Wilderness), and the Snowbird and Unicoi Mountains (including all of Joyce Kilmer/Slickrock Wilderness).

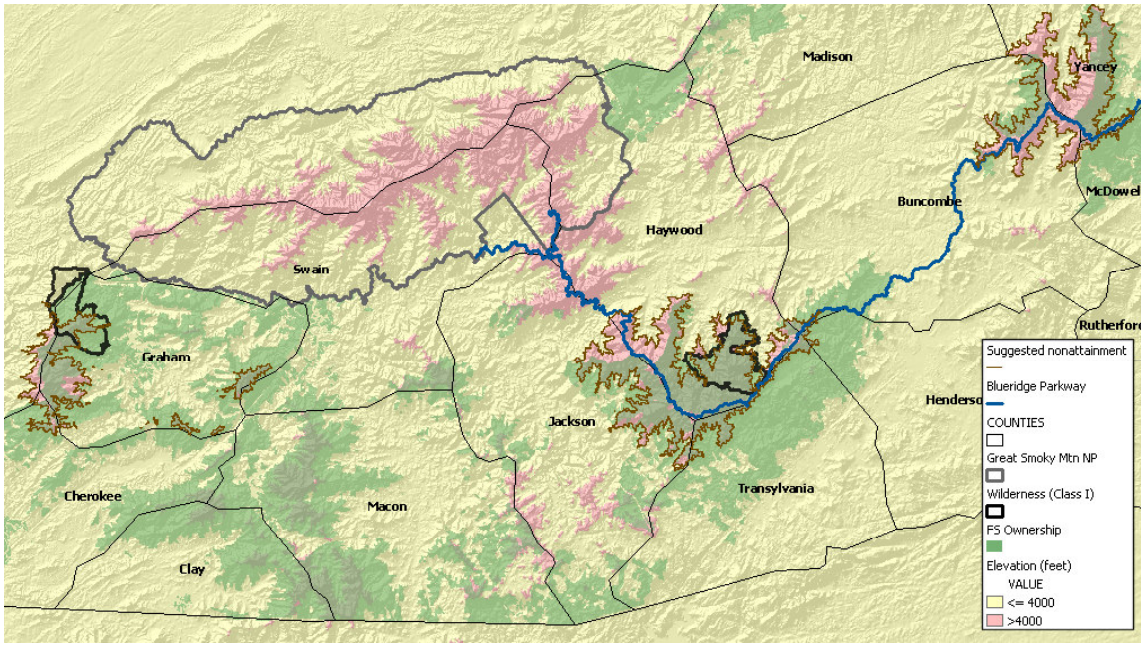


Figure 1. Recommended ozone nonattainment areas and the USDA Forest Service ownership and the Class I areas.

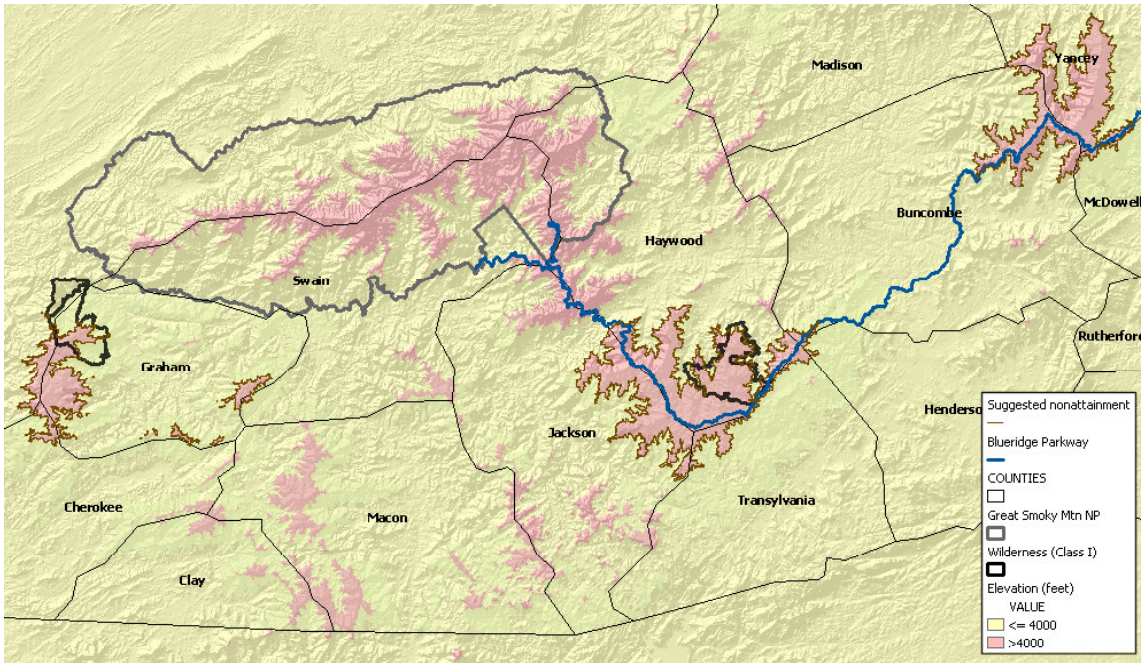


Figure 2. Recommended ozone nonattainment areas and the Class I areas.

Appendix D

Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards – December 2008 U.S. EPA Memorandum

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC - 4 2008

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards

FROM: Robert J. Meyers
Principal Deputy Assistant Administrator

TO: Regional Administrators, Regions I-X

This memorandum provides information on the timeline for designating areas for the purpose of implementing the 2008 revised primary and secondary ozone National Ambient Air Quality Standards (NAAQS). In addition, this memorandum identifies important factors states and tribes should consider in making recommendations for area designations. Please share this information with the state and tribal agencies in your Region.

The U.S. Environmental Protection Agency (EPA) revised the ozone NAAQS on March 12, 2008 (73 FR 16436; March 27, 2008). The new primary ozone standard was lowered from 0.08 parts per million (ppm) to a level of 0.075 ppm based on numerous epidemiological studies conducted during the past decade in which many of the health effects associated with ozone exposure were identified. These studies showed health effects at and below the level of the 0.08 ppm standard, which was promulgated in 1997. Prolonged (i.e., 8-hour) exposure to ozone is associated with increased mortality and a range of serious morbidity health effects, including aggravation of a variety of respiratory symptoms and lung impairment, asthma attacks, respiratory hospital admissions and emergency department visits, and cardiovascular problems. In March 2008, EPA also strengthened the secondary ozone standard to provide increased protection against adverse public welfare effects including impacts on vegetation and forested ecosystems. EPA made the secondary standard identical in all respects to the revised primary standard.

Section 107(d) of the Clean Air Act (CAA) governs the process for area designations following the establishment of new or revised NAAQS. Under section 107(d), states are required to submit recommendations on designations for their areas to EPA not later than one year after the promulgation of a new or revised standard. If, after careful consideration of the recommendations, EPA intends to promulgate a designation that deviates from a state recommendation, EPA must notify the state at least 120 days prior to promulgating the final designation, and EPA must provide the state an opportunity to demonstrate why the potential

modification is inappropriate. The CAA requires EPA to complete the designation process within two years of promulgation of a new or revised NAAQS unless the Administrator has insufficient information to make these decisions. In such a case, EPA may take up to an additional year to make the designations. While the language of section 107 specifically addresses states, EPA intends to follow the same process for tribes to the extent practicable, pursuant to section 301(d) of the CAA and the Tribal Authority Rule, or TAR (see 63 FR 7254).

Accordingly, state designation recommendations for the 2008 revised ozone standards should be submitted to the Administrator no later than March 12, 2009. Areas should be identified as attainment, nonattainment, or unclassifiable on the basis of available information. We will notify states by letter no later than November 12, 2009 if we plan to modify a state's recommendation. In order to consider public input in the designation process, we plan to provide a 30-day public comment period immediately following issuance of EPA's response letters to the states and tribes; we anticipate the comment period would conclude in mid-December 2009. If a state or tribe has additional information that they want EPA to consider with respect to a designation recommendation EPA plans to modify, we would request such information be submitted by January 12, 2010. This will ensure that EPA can fully consider any such information as we move forward to issue designations by March 12, 2010. Because the 2008 revised primary and secondary ozone NAAQS are identical, EPA expects that each area will have the same designation and boundary for both standards.

We recommend that states and tribes identify violating areas using the most recent three consecutive years of quality-assured, certified air quality data. In most cases, we expect these to be data from 2005-2007 or 2006-2008 (if these 2006-2008 data have been certified more quickly than is required) that are stored in the EPA Air Quality System (AQS).1 In general, violations are identified using data from Federal reference method (FRM) and Federal equivalent method (FEM) monitors that are sited and operated in accordance with 40 CFR Part 58. Special Purpose Monitors (SPM) using an FRM or FEM which have operated for more than 24 months are eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). Procedures for using the air quality data to determine whether a violation has occurred are given in 40 CFR Part 50 Appendix P, as revised on March 27, 2008 (73 FR 16511). We expect to base the final designations in March 2010 on the most recent quality-assured data which would be from 2006-2008 or 2007-2009.

Air quality monitoring data affected by exceptional events may be excluded from use in identifying a violation if they meet the criteria for exclusion, as specified in the Final Rule on the Treatment of Data Influenced by Exceptional Events (72 FR 13560; March 22, 2007). We recently issued a direct final rule to provide schedules for flagging exceptional event data and submitting documentation specifically for ozone data collected from 2005 through 2009 that are used in the designations process for the 2008 ozone NAAQS. (See 73 FR 58042; October 6, 2008). These schedules reflect our interest in assuring that the exceptional events claims can be fully considered by EPA in the final designations.

[1] This information is available on EPA's website at www.epa.gov/ttn/airs/airsaqs/.

Section 107(d)(1) of the CAA defines an area as nonattainment if it is violating the NAAQS or if it is contributing to a violation in a nearby area. Ground-level ozone and ozone precursor emissions are pervasive and readily transported. Therefore, EPA believes it is important to examine ozone-contributing emissions across a relatively broad geographic area. Accordingly, we recommend that the Core Based Statistical Area (CBSA) or Combined Statistical Area (which includes 2 or more adjacent CBSA's) associated with the violating monitor(s) serve as the starting point or "presumptive" boundary for evaluating the geographic boundaries of an ozone nonattainment area. CBSA is a collective term that refers to both metropolitan and micropolitan statistical areas, which are distinguished based on population size.[2] Each CBSA consists of a county or counties containing at least one urban core plus adjacent counties that have a high degree of social and economic integration with the urban core as measured by commuting ties.[3] EPA recommends starting with this presumption because the factors used to establish the CBSAs and CSAs are similar to the factors EPA plans to consider in determining whether a nearby area is contributing to the violation(s) of the standard. EPA used this same conceptual approach in the designations process for the 1997 ozone NAAQS.[4,5] Where a violating monitor is not located in a CBSA or CSA, we recommend that the boundary of the county containing the monitor serve as the starting point for considering the extent of the nonattainment area.

EPA believes that each potential nonattainment area should be evaluated on a case-by-case basis and recognizes that these area-specific analyses conducted by states, tribes, and/or EPA may support nonattainment area boundaries that are larger or smaller than the presumptive area starting point. As a framework for area-specific analyses, we recommend that states and tribes base their boundary recommendations on an evaluation of the 9 factors listed in attachment 2. These factors are consistent with those used in the designations process for the 1997 ozone standard and are factors EPA plans to consider in evaluating and making decisions on the nonattainment area boundaries for the 2008 ozone standards. Additionally, states and tribes may

---

[2] The Office of Management and Budget (OMB) delineates CBSAs (metropolitan and micropolitan statistical areas) and CSAs. OMB adopted new standards for defining metropolitan and micropolitan statistical areas on December 27, 2000 (65 FR 82229). A micropolitan statistical area has a population of at least 10,000 but less than 50,000. A metropolitan statistical area has a population of at least 50,000.

[3] For lists of the CBSAs and CSAs and their geographic components see www.census.gov/population/www/metroareas/metrodef.html. EPA recommends using the most recent available updated lists of the statistical areas. The lists are updated annually to reflect the most recent Census Bureau population estimates.

[4] Memorandum from John S. Seitz, Director of Office of Air Quality Planning and Standards to Air Directors, Regions I-X, "Boundary Guidance on Air Quality Designations for the 8-Hour Ozone National Ambient Air Quality Standards," March 23, 2000.

[5] In addition, CAA section 107(d)(4) established the consolidated metropolitan statistical area or metropolitan statistical area as the presumptive boundary for the most polluted areas that were designated nonattainment by operation of law in 1991 for the 1-hour ozone NAAQS.

identify and evaluate other relevant factors or circumstances specific to a particular area.

In addition to nearby areas with sources contributing to nonattainment, ozone concentrations in a local area may be affected by long-range transport of ozone and its precursors (notably nitrogen oxides). In certain parts of the country, such as the eastern United States, ozone is a widespread problem. Where this is the case, the CAA does not require that all contributing areas be designated nonattainment, only the nearby areas. Regional strategies, such as those employed in the Ozone Transport Region and EPA's NO_x SIP Call are needed to address the long-range transport component of ozone nonattainment, while the local component must be addressed through local planning in and around the designated nonattainment area.

This memorandum provides EPA's current views on how boundaries should be determined for ozone designations. The guidance is not binding on states, tribes, the public, or EPA. Issues concerning nonattainment area boundaries will be addressed in EPA's action to designate areas under the 2008 ozone standard. When EPA promulgates designations, those determinations will be binding on states, tribes, the public, and EPA as a matter of law. Ozone nonattainment areas will be classified at the time of designation. The approach EPA will use to classify nonattainment areas under the 2008 revised ozone NAAQS will be established through a separate notice-and-comment rulemaking. Information related to the designations for the 2008 revised ozone NAAQS will be provided on EPA's website at www.epa.gov/ozonedesignations.

Attachment 1 is a timeline of important dates in the designation process for the revised 2008 ozone NAAQS designation process. Attachment 2 provides the list of nine factors that EPA plans to consider in evaluating and making decisions on nonattainment area boundaries.

Staff in EPA's Office of Air Quality Planning and Standards are available for assistance and consultation throughout the designation process. Questions on this guidance may be directed to Carla Oldham at 919-541-3347.

Attachments (2)

cc: Air Division Directors, Regions I-X
Greg Green, OAQPS
Bill Harnett, OAQPS
Brian McLean, OAP
Margo Oge, OTAQ
Stephen D. Page, OAQPS
Peter Tsirigotis, OAQPS
Richard Wayland, OAQPS
Lydia Wegman, OAQPS

ATTACHMENT 1

TIMELINE FOR REVISED 2008 OZONE NAAQS DESIGNATION PROCESS*	
Milestone	**Date**
EPA promulgated revised ozone NAAQS	March 12, 2008
State and tribal recommendations due for ozone designations	No later than March 12, 2009
EPA notifies states and tribes concerning any modifications to their recommendations (120-day letters).	No later than November 12, 2009 (120 days prior to final designations)
EPA publishes public notice of state recommendations and EPA's proposed modifications and initiates 30-day public comment period.	Mid-November 2009
End of 30-day public comment period.	Mid-December 2009
States and Tribes submit additional information to demonstrate why an EPA modification is inappropriate.	No later than January 12, 2010
EPA promulgates final ozone designations.	No later than March 12, 2010

* This schedule assumes EPA has sufficient information to promulgate designations within 2 years. In the event EPA determines that insufficient information is available to do so, the designation process could be extended up to one year, but no later than March 12, 2011.

ATTACHMENT 2

Factors EPA Plans to Consider in Determining Nonattainment Area Boundaries in Designations for the 2008 Ozone NAAQS

EPA recommends that the Core Based Statistical Area (CBSA) or Combined Statistical Area (CSA) (which includes 2 or more adjacent CBSA's) serve as the starting point or "presumptive" boundary for considering what should be the geographic boundaries of an ozone nonattainment area.[6] Where a violating monitor is not located in a CBSA or CSA, we recommend that the boundary of the county containing the monitor serve as the presumptive boundary for the nonattainment area. As a framework for area-specific analyses to support nonattainment area boundary recommendations and final boundary determinations, we recommend an evaluation of the 9 factors listed below:

- Air quality data
- Emissions data (location of sources and contribution to ozone concentrations)
- Population density and degree of urbanization (including commercial development)
- Traffic and commuting patterns
- Growth rates and patterns
- Meteorology (weather/transport patterns)
- Geography/topography (mountain ranges or other air basin boundaries)
- Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Reservations, metropolitan planning organizations (MPOs))
- Level of control of emission sources

Analysis of these factors may support nonattainment boundaries that are either larger or smaller than the presumptive boundary. EPA plans to consider these factors, along with any other relevant information, in determining whether to make modifications to the boundary recommendations from states and tribes. The factors listed above, while generally comprehensive, are not intended to be exhaustive. States and tribes may submit additional information they believe is relevant for EPA to consider. In general, a state's or tribe's demonstration supporting their boundary recommendation for an area should show that: 1) violations are not occurring in nearby portions that are excluded from the recommended area, and 2) the excluded nearby portions do not contain emission sources that contribute meaningfully to the observed violations. While states are not bound to use the approach outlined here, EPA plans to evaluate a state recommendation and determine whether to modify such recommendation based on the above factors and any other information the Agency determines is relevant.

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[6] For lists of the CBSAs and CSAs and their geographic components see www.census.gov/population/www/metroareas/metrodef.html.

Appendix E

North Carolina's Existing and Previous Nonattainment Areas Boundaries Map

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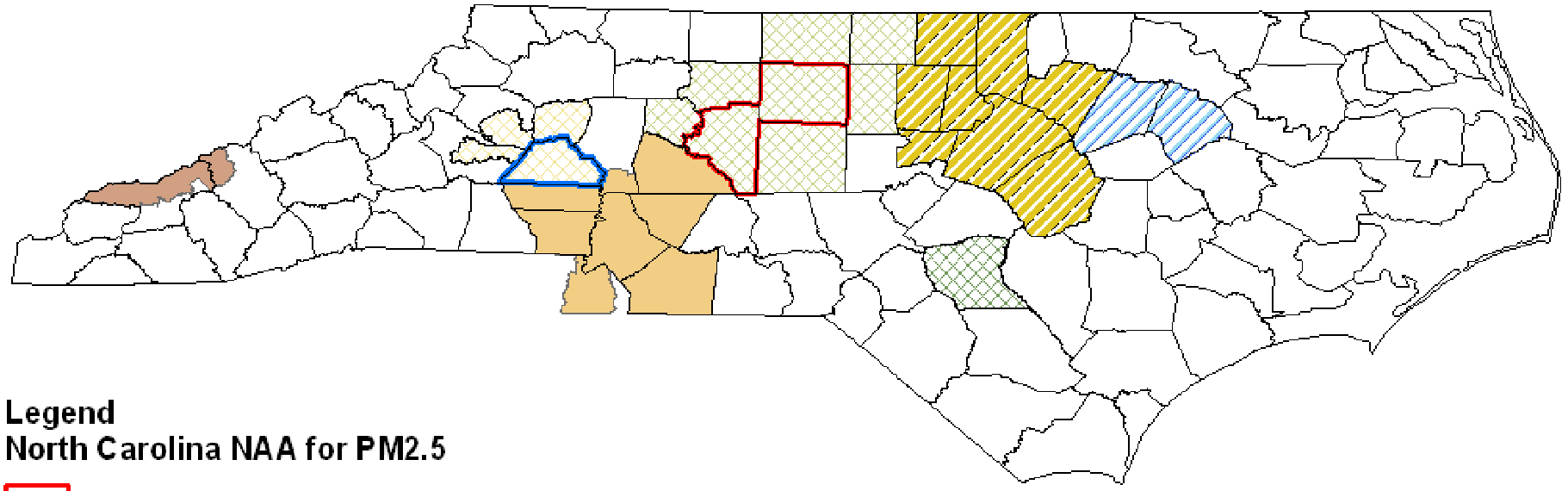
North Carolina's
Existing And Previous Nonattainment Area Boundaries



Legend

North Carolina NAA for PM2.5

- Greensboro-Winston Salem-High Point, Nonattainement
- Hickory, Nonattainment

North Carolina NAA For Ozone

AREA NAME; STATUS

- Fayetteville, NC; EAC, Designated as Attainment April 15, 2008
- Greensboro-Winston Salem-High Point, NC; EAC, Designated as Attainment April 15, 2008
- Hickory-Morgantown-Lenoir, NC; EAC, Designated as Attainment April 15, 2008
- Charlotte-Gastonia-Rock Hill, NC-SC; Nonattainment, Moderate
- Haywood and Swain Counties (Great Smoky Mountain NP); Currently Attaining the Standard, Redesignation in Process
- Raleigh-Durham-Chapel Hill, NC; Attainment/Maintenance, Redesignated as Attainment December 28, 2007
- Rocky Mount, NC; Attainment/Maintenance, Redesignated as Attainment January 5, 2007

Appendix F

North Carolina's Vehicle Emissions Testing (OBD) and Safety Inspection Map

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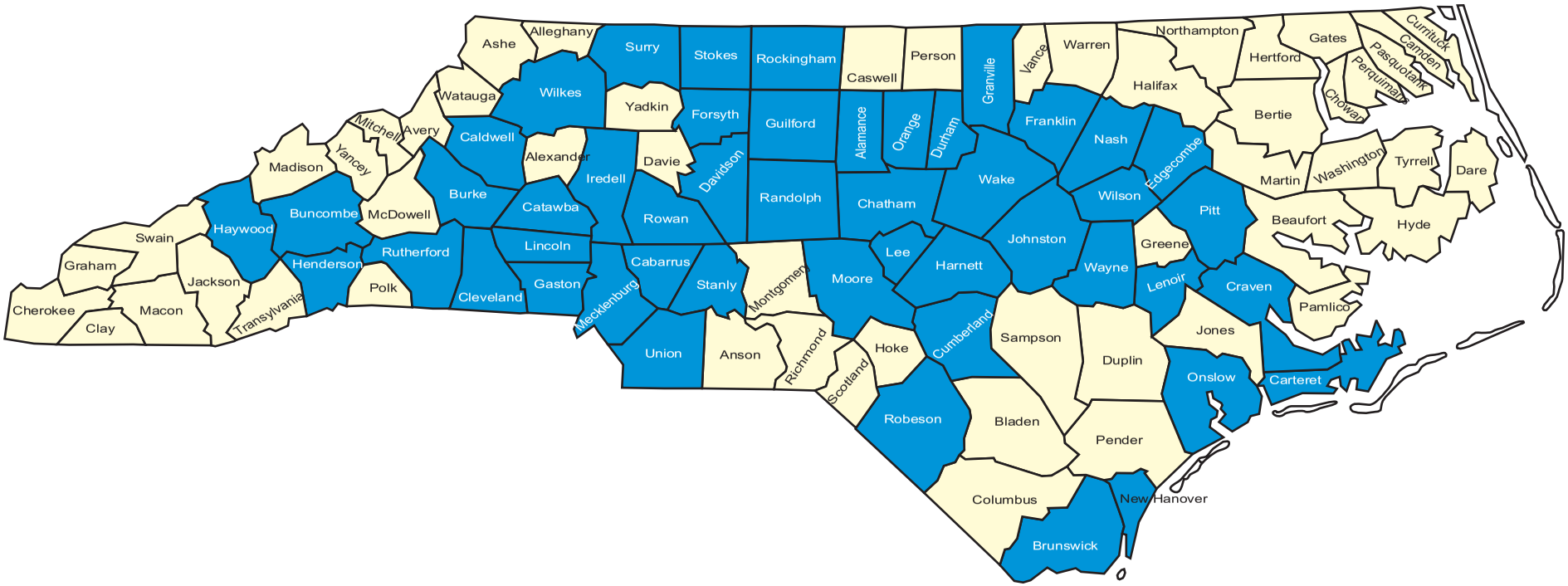
Emissions Testing and Safety Inspections for Motor Vehicles



Emissions testing (OBD) and safety inspections required for cars and light-duty trucks

Safety inspections only required for cars and trucks

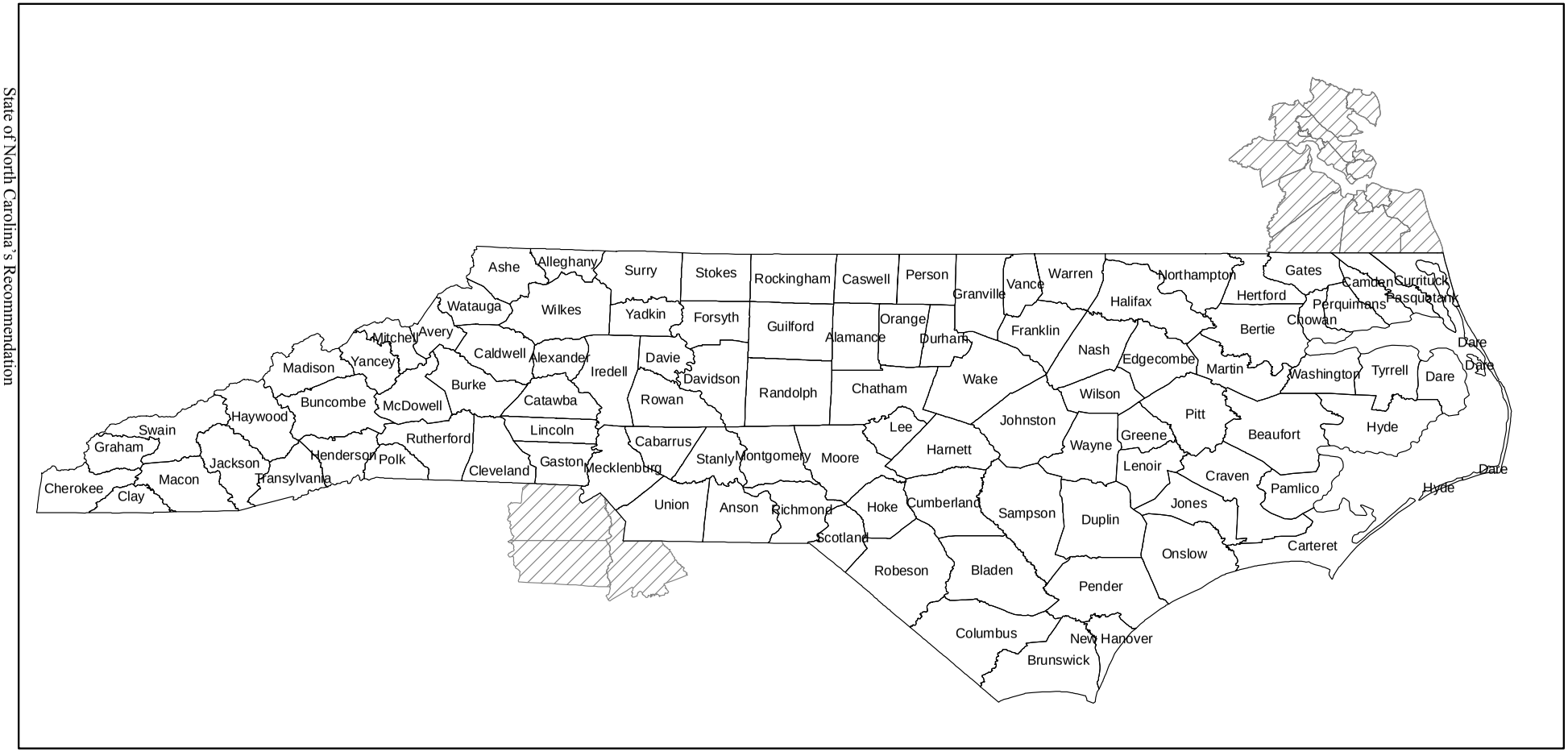
*In all 100 counties, cars and light-duty trucks are required to get an annual safety inspection if they are less than 35 years old. In the blue-shaded counties, 1996 and newer cars and light-duty trucks also are required to get an annual emissions inspection (OBD).

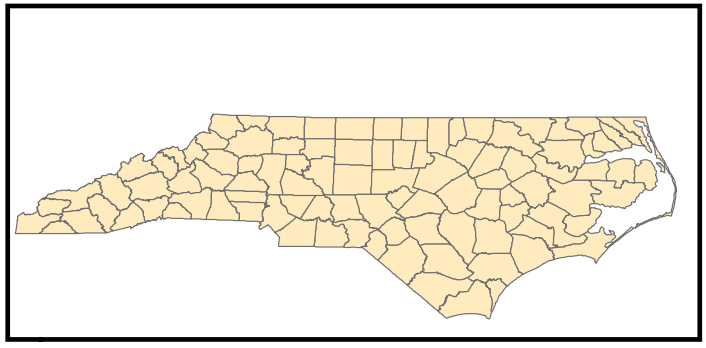
Note: Not to scale
October 2008

Appendix G

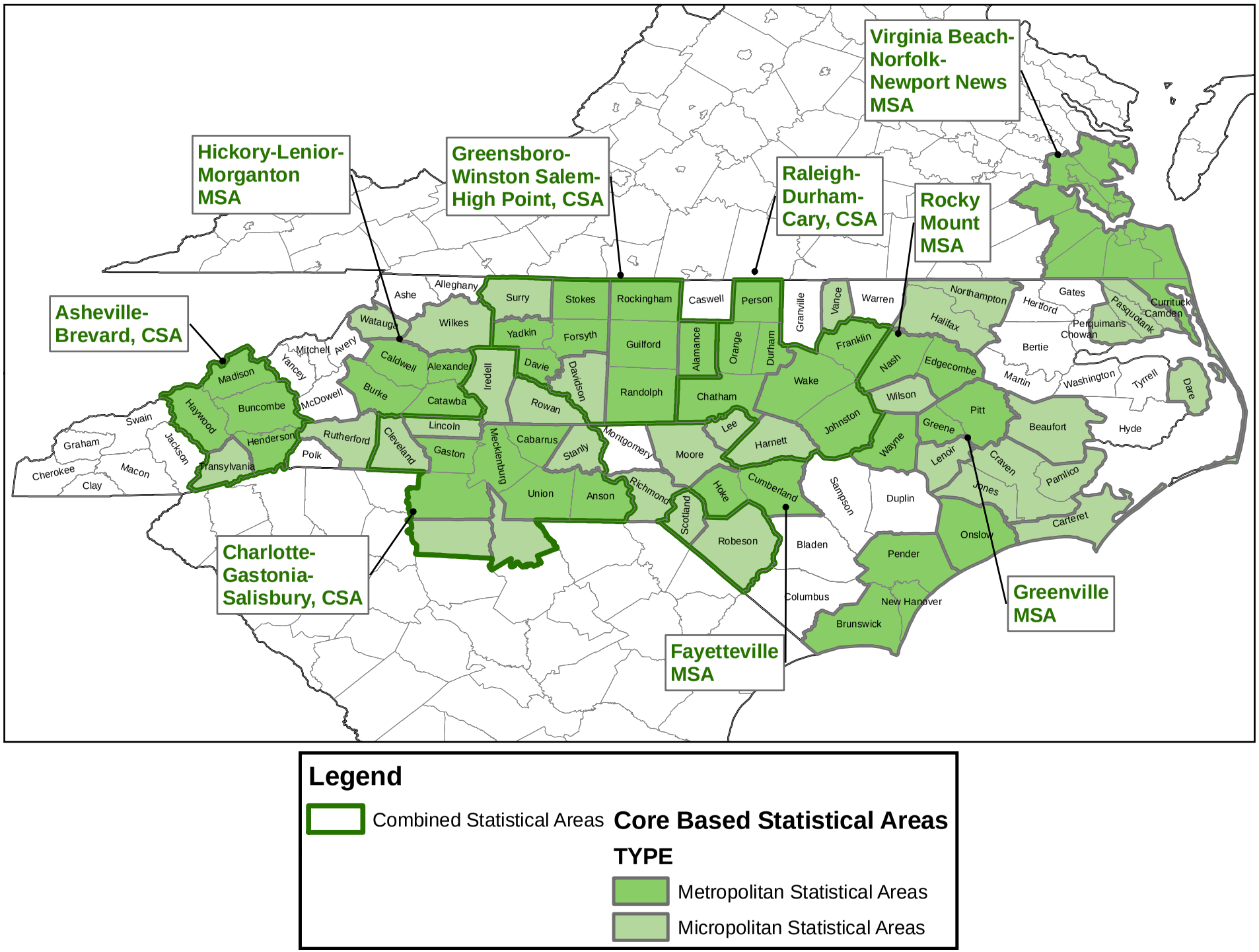
North Carolina’s Jurisdictional Information

TABLE OF CONTENTS

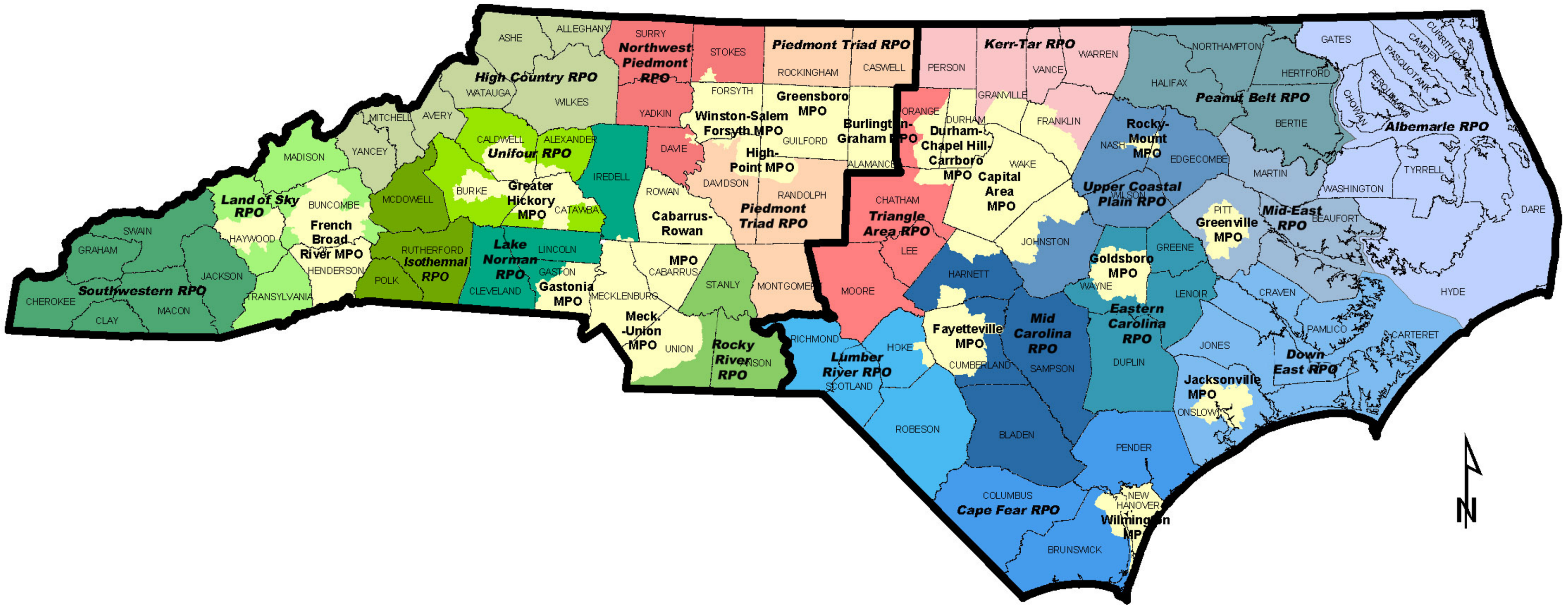




State of North Carolina
County Identification


Virginia Beach-Norfolk-Newport News MSA
Hickory-Lenior-Morganton MSA
Greensboro-Winston Salem-High Point, CSA
Raleigh-Durham-Cary, CSA
Rocky Mount MSA
Asheville-Brevard, CSA
Charlotte-Gastonia-Salisbury, CSA
Fayetteville MSA
Greenville MSA
Ashe
Alleghany
Surry
Stokes
Rockingham
Caswell
Person
Granville
Vance
Warren
Northampton
Gates
Hertford
Currituck
Camden
Pasquotank
Perquimans
Chowan
Halifax
Wataugs
Wilkes
Yadkin
Forsyth
Guilford
Alamance
Orange
Durham
Franklin
Nash
Edgecombe
Bertie
Martin
Washington
Tyrrell
Dare
Hyde
Mitchell
Avery
Yancey
Madison
Caldwell
Alexander
Iredell
Davie
Davidson
Wake
Wilson
Pitt
Beaufort
Buncombe
Burke
Catawba
Rowan
Randolph
Chatham
Johnston
Greene
Swain
McDowell
Haywood
Lincoln
Mecklenburg
Cabarrus
Montgomery
Lee
Harnett
Wayne
Lenoir
Craven
Pamlico
Graham
Henderson
Rutherford
Cleveland
Gaston
Stanly
Moore
Jones
Jackson
Polk
Transylvania
Union
Anson
Richmond
Hoke
Cumberland
Sampson
Duplin
Onslow
Carteret
Cherokee
Macon
Clay
Scotland
Robeson
Bladen
Pender
Columbus
New Hanover
Brunswick
Legend
Combined Statistical Areas
Core Based Statistical Areas
TYPE
Metropolitan Statistical Areas
Micropolitan Statistical Areas

North Carolina
Rural Planning Organizations and
Metropolitan Planning Organizations



Legend

MPO_Boundaries

0 20 40 80 120 Miles

Map Created by
North Carolina
Department of Transportation
Transportation Planning Branch
December 13, 2005

2000 Census Population Data By Township And County

County Name	Federal ID Code	Township Names	Township Population	County Population
Alamance County				**130800**
	3700193444	Township 4, Morton	5084	
	3700193476	Township 5, Faucette	3241	
	3700193520	Township 6, Graham	22827	
	3700193292	Township 1, Patterson	4001	
	3700193368	Township 3, Boone Station	18926	
	3700193328	Township 2, Coble	3390	
	3700193704	Township 11, Pleasant Grove	3732	
	3700193684	Township 10, Melville	13244	
	3700193712	Township 12, Burlington	35143	
	3700193556	Township 7, Albright	3400	
	3700193608	Township 8, Newlin	5192	
	3700193656	Township 9, Thompson	7125	
	3700193732	Township 13, Haw River	5495	
Alexander County				**33603**
	3700393168	Sugar Loaf township	1426	
	3700391364	Gwaltneys township	2130	
	3700393228	Taylorsville township	9461	
	3700391848	Little River township	1373	
	3700392068	Millers township	1924	
	3700392908	Sharpes township	4988	
	3700391020	Ellendale township	3482	
	3700394086	Wittenburg township	8819	
Alleghany County				**10677**
	3700592564	Prathers Creek township	774	
	3700593960	Whitehead township	930	
	3700590640	Cherry Lane township	1625	
	3700591232	Glade Creek township	1935	
	3700590808	Cranberry township	429	
	3700592508	Piney Creek township	807	
	3700591204	Gap Civil township	4177	
Anson County				**25275**
	3700790452	Burnsville township	1604	
	3700791356	Gulledge township	2580	
	3700790064	Ansonville township	1617	
	3700793996	White Store township	422	
	3700791808	Lilesville township	3426	
	3700793876	Wadesboro township	9039	
	3700791732	Lanesboro township	4540	
	3700792140	Morven township	2047	
Ashe County				**24384**
	3700991448	Helton township	710	
	3700991540	Horse Creek township	661	
	3700990648	Chestnut Hill township	624	
	3700991568	Hurricane township	526	
	3700990696	Clifton township	1635	
	3700990820	Creston township	786	
	3700991004	Elk township	616	
	3700991282	Grassy Creek township	444	
	3700992316	North Fork township	823	
	3700991740	Laurel township	418	
	3700992364	Obids township	1400	
	3700992512	Piney Creek township	906	
	3700992544	Pond Mountain township	258	
	3700991652	Jefferson township	4107	
	3700992376	Old Fields township	1816	
	3700993892	Walnut Hill township	1497	
	3700992456	Peak Creek township	1168	
	3700993956	West Jefferson township	4098	
	3700992504	Pine Swamp township	1891	

Avery County				**17167**
	3701190052	Altamont township	1223	
	3701190212	Beech Mountain township	689	
	3701190510	Carey's Flat township	177	
	3701190148	Banner Elk township	2654	
	3701191442	Heaton township	427	
	3701191154	Frank township	307	
	3701192263	Newland No. 2 township	1079	
	3701191558	Hughes township	446	
	3701191582	Ingalls township	2388	
	3701192502	Pineola township	1407	
	3701191826	Linville township	605	
	3701190812	Cranberry township	550	
	3701191018	Elk Park township	1146	
	3701192090	Minneapolis township	429	
	3701192110	Montezuma township	629	
	3701192538	Plumtree township	729	
	3701192262	Newland No. 1 township	1226	
	3701192586	Pyatte township	498	
	3701192708	Roaring Creek township	558	
Beaufort County				**44958**
	3701390168	Bath township	4366	
	3701390664	Chocowinity township	7664	
	3701393904	Washington township	14132	
	3701392664	Richland township	3381	
	3701392436	Pantego township	6894	
	3701391896	Long Acre township	8521	
Bertie County				**19773**
	3701593008	Snake Bite township	1277	
	3701594104	Woodville township	1454	
	3701591580	Indian Woods township	583	
	3701593988	Whites township	1395	
	3701592044	Merry Hill township	965	
	3701594064	Windsor township	6558	
	3701592096	Mitchells township	2441	
	3701592768	Roxobel township	1780	
	3701590712	Colerain township	3320	
Bladen County				**32278**
	3701790004	Abbotts township	1047	
	3701790528	Carvers Creek township	2071	
	3701790296	Bladenboro township	5704	
	3701790860	Cypress Creek township	894	
	3701791180	Frenches Creek township	784	
	3701791000	Elizabethtown township	6778	
	3701790604	Central township	1124	
	3701790244	Bethel township	3423	
	3701790392	Brown Marsh township	1942	
	3701790724	Colly township	1870	
	3701793992	Whites Creek township	1575	
	3701791720	Lake Creek township	663	
	3701793784	Turnbull township	736	
	3701793964	White Oak township	1765	
	3701791508	Hollow township	1902	
Brunswick County				**73143**
	3701991884	Lockwoods Folly township	16100	
	3701992324	Northwest township	9319	
	3701992992	Smithville township	12019	
	3701992900	Shallotte township	18420	
	3701993252	Town Creek township	14426	
	3701993868	Waccamaw township	2859	

Buncombe County				**206330**
	3702192832	Sandy Mush township	1351	
	3702193922	Weaverville town	2416	
	3702194094	Woodfin town	3162	
	3702192648	Reems Creek township	8706	
	3702193180	Swannanoa township	13547	
	3702193840	Upper Hominy township	14782	
	3702190086	Asheville city	68889	
	3702190088	Asheville township	11881	
	3702190266	Biltmore Forest town	1440	
	3702190282	Black Mountain town	7511	
	3702190108	Avery Creek township	5507	
	3702190284	Black Mountain township	4163	
	3702191604	Ivy township	3669	
	3702191816	Limestone township	13874	
	3702192114	Montreat town	630	
	3702191116	Flat Creek township	4601	
	3702190380	Broad River township	1542	
	3702191776	Leicester township	15702	
	3702191176	French Broad township	5597	
	3702191056	Fairview township	9593	
	3702191932	Lower Hominy township	7767	
Burke County				**89148**
	3702390912	Drexel township	6790	
	3702391676	Jonas Ridge township	739	
	3702392136	Morganton township	28365	
	3702391832	Linville township	1442	
	3702391912	Lovelady township	8917	
	3702391920	Lower Creek township	3019	
	3702391928	Lower Fork township	3250	
	3702391572	Icard township	16753	
	3702393836	Upper Fork township	1006	
	3702392952	Silver Creek township	10002	
	3702392996	Smoky Creek township	847	
	3702392592	Quaker Meadows township	6664	
	3702393832	Upper Creek township	1354	
Cabarrus County				**131063**
	3702593356	Township 2, Poplar Tent	20447	
	3702593284	Township 1, Harrisburg	13709	
	3702593572	Township 7, Gold Hill	1270	
	3702593436	Township 4, Kannapolis	36694	
	3702593604	Township 8, Mount Pleasant	5110	
	3702593488	Township 5, New Gilead	3463	
	3702593532	Township 6, Rimertown	2232	
	3702593380	Township 3, Odell	4203	
	3702593696	Township 11, Central Cabarrus	16633	
	3702593716	Township 12, Concord	19360	
	3702593644	Township 9, Georgeville	2860	
	3702593688	Township 10, Midland	5082	
Caldwell County				**77415**
	3702791244	Globe township	460	
	3702791672	Johns River township	1436	
	3702791556	Hudson township	10701	
	3702791852	Little River township	4186	
	3702791916	Lovelady township	15359	
	3702791924	Lower Creek township	12490	
	3702791700	Kings Creek township	1792	
	3702791780	Lenoir township	19477	
	3702792304	North Catawba township	6699	
	3702792452	Patterson township	2461	
	3702794052	Wilson Creek township	96	
	3702794116	Yadkin Valley township	1301	
	3702792180	Mulberry township	957	
Camden County				**6885**
	3702992920	Shiloh township	1941	
	3702993044	South Mills township	2318	
	3702990784	Courthouse township	2626	

Carteret County				**59383**
	3703191400	Harlowe township	1272	
	3703192000	Marshallberg township	528	
	3703192040	Merrimon township	657	
	3703190588	Cedar Island township	324	
	3703190092	Atlantic township	817	
	3703190888	Davis township	412	
	3703190180	Beaufort township	7665	
	3703191396	Harkers Island township	1525	
	3703193968	White Oak township	10073	
	3703192120	Morehead township	23748	
	3703192560	Portsmouth township	4	
	3703192884	Sea Level township	461	
	3703193000	Smyrna township	679	
	3703193088	Stacy township	206	
	3703193156	Straits township	2686	
	3703192272	Newport township	8326	
Caswell County				**23501**
	3703392468	Pelham township	3470	
	3703391492	Hightowers township	1557	
	3703393140	Stoney Creek township	3725	
	3703391756	Leasburg township	1256	
	3703394120	Yanceyville township	3874	
	3703391888	Locust Hill township	2419	
	3703390056	Anderson township	2258	
	3703392080	Milton township	2298	
	3703390880	Dan River township	2644	
Catawba County				**141685**
	3703590140	Bandy's township	4358	
	3703590476	Caldwell township	7214	
	3703590700	Clines township	21780	
	3703590556	Catawba township	7724	
	3703591468	Hickory township	59448	
	3703591636	Jacobs Fork township	4682	
	3703592284	Newton township	29563	
	3703592152	Mountain Creek township	6916	
Chatham County				**49329**
	3703790024	Albright township	2553	
	3703790504	Cape Fear township	1170	
	3703790136	Baldwin township	6133	
	3703790172	Bear Creek township	3419	
	3703794016	Williams township	7186	
	3703791428	Haw River township	1215	
	3703791352	Gulf township	3232	
	3703791472	Hickory Mountain township	1928	
	3703790592	Center township	5927	
	3703792012	Matthews township	11965	
	3703792240	New Hope township	2074	
	3703791368	Hadley township	1460	
	3703792352	Oakland township	1067	
Cherokee County				**24298**
	3703990188	Beaverdam township	850	
	3703992192	Murphy township	9620	
	3703992932	Shoal Creek township	2025	
	3703991544	Hothouse township	1271	
	3703993852	Valleytown township	6964	
	3703992336	Notla township	3568	
Chowan County				**14526**
	3704193348	Township 2, Middle	3404	
	3704193276	Township 1, Edenton	7792	
	3704193400	Township 3, Upper	1324	
	3704193456	Township 4, Yeopim	2006	

Clay County				**8775**
	3704391436	Hayesville township	3258	
	3704393192	Sweetwater township	723	
	3704391500	Hiawassee township	1358	
	3704390360	Brasstown township	1552	
	3704392944	Shooting Creek township	1291	
	3704393792	Tusquittee township	593	
Cleveland County				**96287**
	3704593504	Township 5, Warlick	9269	
	3704593384	Township 3, Rippys	8770	
	3704593296	Township 1, River	1027	
	3704593540	Township 6, Shelby	29225	
	3704593324	Township 2, Boiling Springs	7816	
	3704593440	Township 4, Kings Mountain	20942	
	3704593584	Township 7, Sandy Run	5773	
	3704593612	Township 8, Polkville	3275	
	3704593640	Township 9, Double Shoals	5887	
	3704593692	Township 11, Casar	1822	
	3704593664	Township 10, Knob Creek	2481	
Columbus County				**54749**
	3704790320	Bolton township	1726	
	3704790608	Cerro Gordo township	2180	
	3704791044	Fair Bluff township	2002	
	3704790316	Bogue township	3094	
	3704790612	Chadbourn township	6279	
	3704790436	Bug Hill township	2604	
	3704793928	Welch Creek township	1731	
	3704792624	Ransom township	4114	
	3704793944	Western Prong township	1265	
	3704794000	Whiteville township	11010	
	3704793216	Tatums township	3614	
	3704791764	Lees township	3415	
	3704793872	Waccamaw township	2177	
	3704793072	South Williams township	5507	
	3704794020	Williams township	4031	
Craven County				**91436**
	3704993508	Township 6	26148	
	3704993552	Township 7	9066	
	3704993360	Township 3	3516	
	3704993308	Township 2	7002	
	3704993460	Township 5	3359	
	3704993256	Township 1	7402	
	3704993592	Township 8	31824	
	3704993628	Township 9	3119	
Cumberland County				**302963**
	3705190192	Beaver Dam township	1750	
	3705190288	Black River township	2343	
	3705190532	Carvers Creek township	21379	
	3705190572	Cedar Creek township	11384	
	3705190832	Cross Creek township	66861	
	3705191296	Grays Creek township	7866	
	3705190968	Eastover township	10943	
	3705192460	Pearces Mill township	14756	
	3705191964	Manchester township	31170	
	3705192724	Rockfish township	44816	
	3705192892	Seventy-First township	89695	
Currituck County				**18190**
	3705392552	Poplar Branch township	6338	
	3705390816	Crawford township	5662	
	3705391188	Fruitville township	1543	
	3705392176	Moyock township	4647	

Dare County				**29967**
	3705590096	Atlantic township	15342	
	3705591424	Hatteras township	2642	
	3705591702	Kinnakeet township	1359	
	3705590964	East Lake township	147	
	3705592196	Nags Head township	9442	
	3705590824	Croatan township	1035	
Davidson County				**147246**
	3705790008	Abbotts Creek township	7666	
	3705790756	Conrad Hill township	8918	
	3705791392	Hampton township	698	
	3705791440	Healing Spring township	2484	
	3705791028	Emmons township	6846	
	3705791628	Jackson Hill township	1029	
	3705790032	Alleghany township	655	
	3705791796	Lexington township	31175	
	3705790076	Arcadia township	8521	
	3705790780	Cotton Grove township	7945	
	3705790328	Boone township	4483	
	3705793232	Thomasville township	36071	
	3705792064	Midway township	11606	
	3705792644	Reedy Creek township	4659	
	3705792956	Silver Hill township	5917	
	3705793796	Tyro township	7852	
	3705794112	Yadkin College township	721	
Davie County				**34835**
	3705991660	Jerusalem township	5826	
	3705990472	Calahaln township	2435	
	3705990668	Clarksville township	3247	
	3705992100	Mocksville township	8434	
	3705991080	Farmington township	8573	
	3705991192	Fulton township	1992	
	3705992896	Shady Grove township	4328	
Duplin County				**49063**
	3706190020	Albertson township	2513	
	3706192752	Rose Hill township	2818	
	3706191240	Glisson township	1643	
	3706191600	Island Creek township	8542	
	3706191960	Magnolia township	3058	
	3706190864	Cypress Creek township	3069	
	3706191688	Kenansville township	4807	
	3706191060	Faison township	3803	
	3706191820	Limestone township	6566	
	3706192728	Rockfish township	1491	
	3706194092	Wolfscrape township	2923	
	3706192972	Smith township	2203	
	3706193900	Warsaw township	5627	
Durham County				**223314**
	3706393764	Triangle township	67870	
	3706390932	Durham township	103863	
	3706390516	Carr township	1776	
	3706391972	Mangum township	5821	
	3706391760	Lebanon township	16415	
	3706392344	Oak Grove township	27569	

Edgecombe County				**55606**
	3706593620	Township 8, Sparta	2168	
	3706593484	Township 5, Lower Fishing Creek	1294	
	3706593652	Township 9, Otter Creek	1702	
	3706593300	Township 1, Tarboro	13962	
	3706593544	Township 6, Upper Fishing Creek	1540	
	3706593680	Township 10, Lower Town Creek	2925	
	3706593344	Township 2, Lower Conetoe	1949	
	3706593588	Township 7, Swift Creek	3944	
	3706593404	Township 3, Upper Conetoe	828	
	3706593424	Township 4, Deep Creek	848	
	3706593728	Township 13, Cokey	1854	
	3706593744	Township 14, Upper Town Creek	1390	
	3706593708	Township 11, Walnut Creek	1858	
	3706593724	Township 12, Rocky Mount	19344	
Forsyth County				**306067**
	3706790216	Belews Creek township	5631	
	3706790012	Abbotts Creek township	12869	
	3706790236	Bethania township	9543	
	3706792388	Old Richmond township	5165	
	3706791696	Kernersville township	26372	
	3706792060	Middle Fork township	6779	
	3706790376	Broadbay township	2904	
	3706790684	Clemmonsville township	13123	
	3706791792	Lewisville township	15431	
	3706794068	Winston township	185776	
	3706793036	South Fork township	3213	
	3706792396	Old Town township	176	
	3706792808	Salem Chapel township	7069	
	3706793864	Vienna township	12016	
Franklin County				**47260**
	3706990590	Cedar Rock township	2254	
	3706991258	Gold Mine township	1629	
	3706991414	Harris township	5893	
	3706992822	Sandy Creek township	2614	
	3706991170	Franklinton township	7778	
	3706990866	Cypress Creek township	2486	
	3706994150	Youngsville township	7913	
	3706991438	Hayesville township	1776	
	3706991906	Louisburg township	7865	
	3706990926	Dunn township	7052	
Gaston County				**190365**
	3707190644	Cherryville township	15724	
	3707190844	Crowders Mountain township	14426	
	3707190872	Dallas township	19542	
	3707191216	Gastonia township	82530	
	3707192692	Riverbend township	22872	
	3707193048	South Point township	35271	
Gates County				**10516**
	3707391376	Hall township	1434	
	3707391420	Haslett township	1530	
	3707391520	Holly Grove township	1855	
	3707391560	Hunters Mill township	1301	
	3707391220	Gatesville township	1765	
	3707392092	Mintonsville township	1021	
	3707392660	Reynoldson township	1610	
Graham County				**7993**
	3707593108	Stecoah township	1174	
	3707594124	Yellow Creek township	688	
	3707590636	Cheoah township	6131	

Granville County				**48498**
	3707791108	Fishing Creek township	7787	
	3707790936	Dutchville township	13801	
	3707790356	Brassfield township	7299	
	3707792844	Sassafras Fork township	2565	
	3707792424	Oxford township	7065	
	3707793212	Tally Ho township	4568	
	3707792800	Salem township	1411	
	3707793884	Walnut Grove township	2296	
	3707792348	Oak Hill township	1706	
Greene County				**18974**
	3707992416	Ormonds township	2040	
	3707990440	Bull Head township	1346	
	3707992928	Shine township	1469	
	3707990520	Carrs township	871	
	3707993020	Snow Hill township	2567	
	3707991532	Hookerton township	4049	
	3707991648	Jason township	1689	
	3707992392	Olds township	2846	
	3707993076	Speights Bridge township	2097	
Guilford County				**421048**
	3708191096	Fentress township	10459	
	3708190600	Center Grove township	5096	
	3708190896	Deep River township	10938	
	3708191184	Friendship township	13327	
	3708190672	Clay township	6782	
	3708190396	Bruce township	9332	
	3708191228	Gilmer township	58761	
	3708191304	Greene township	2936	
	3708191484	High Point township	73422	
	3708191640	Jamestown township	12995	
	3708192104	Monroe township	10078	
	3708192124	Morehead township	165130	
	3708191656	Jefferson township	9903	
	3708191952	Madison township	4836	
	3708193908	Washington township	2491	
	3708192360	Oak Ridge township	7529	
	3708193176	Sumner township	10183	
	3708192716	Rock Creek township	6850	
Halifax County				**57370**
	3708391088	Faucett township	1848	
	3708390468	Butterwood township	547	
	3708392704	Roanoke Rapids township	23837	
	3708390752	Conoconnara township	663	
	3708391372	Halifax township	2838	
	3708391036	Enfield township	6266	
	3708391876	Littleton township	4227	
	3708390368	Brinkleyville township	5270	
	3708392432	Palmyra township	1310	
	3708393932	Weldon township	5656	
	3708392756	Roseneath township	641	
	3708392864	Scotland Neck township	4267	
Harnett County				**91025**
	3708590152	Barbecue township	9174	
	3708590104	Averasboro township	12965	
	3708590060	Anderson Creek township	11216	
	3708593124	Stewarts Creek township	3482	
	3708590416	Buckhorn township	1905	
	3708591812	Lillington township	4573	
	3708590920	Duke township	5965	
	3708590292	Black River township	8085	
	3708592220	Neills Creek township	5921	
	3708591444	Hectors Creek township	3629	
	3708591668	Johnsonville township	6927	
	3708591348	Grove township	9475	
	3708593844	Upper Little River township	7708	

Haywood County				**54033**
	3708790800	Crabtree township	1393	
	3708790552	Cataloochee township	34	
	3708791592	Iron Duff township	974	
	3708790568	Cecil township	442	
	3708790956	East Fork township	1646	
	3708790704	Clyde township	6075	
	3708791104	Fines Creek township	1005	
	3708790196	Beaverdam township	11274	
	3708792488	Pigeon township	5288	
	3708791608	Ivy Hill township	4722	
	3708791680	Jonathan Creek township	2514	
	3708793920	Waynesville township	18353	
	3708793972	White Oak township	313	
Henderson County				**89173**
	3708991316	Green River township	3948	
	3708990680	Clear Creek township	4616	
	3708990972	Edneyville township	3454	
	3708990304	Blue Ridge township	8487	
	3708990796	Crab Creek township	4109	
	3708991456	Hendersonville township	43697	
	3708992076	Mills River township	10868	
	3708991536	Hoopers Creek township	9994	
Hertford County				**22601**
	3709191412	Harrellsville township	1524	
	3709191968	Maneys Neck township	1421	
	3709190016	Ahoskie township	8561	
	3709194076	Winton township	3083	
	3709192188	Murfreesboro township	5580	
	3709192784	St. Johns township	2432	
Hoke County				**33646**
	3709392600	Quewhiffle township	4156	
	3709390312	Blue Springs township	1741	
	3709390036	Allendale township	675	
	3709391148	Fort Bragg Military Reservation township	0	
	3709391948	McLauchlin township	11198	
	3709392604	Raeford township	10419	
	3709390068	Antioch township	3728	
	3709393136	Stonewall township	1729	
Hyde County				**5826**
	3709592372	Ocracoke township	769	
	3709593184	Swan Quarter township	958	
	3709591724	Lake Landing township	1852	
	3709590856	Currituck township	1195	
	3709591048	Fairfield township	1030	
	3709591728	Lake Mattamuskeet UT	22	
Iredell County				**122660**
	3709790616	Chambersburg township	10235	
	3709790160	Barringer township	5193	
	3709790240	Bethany township	5633	
	3709790744	Concord township	6077	
	3709790770	Cool Springs township	3500	
	3709790708	Coddle Creek township	22488	
	3709790884	Davidson township	17397	
	3709792924	Shiloh township	7793	
	3709792244	New Hope township	1460	
	3709790944	Eagle Mills township	1856	
	3709793104	Statesville township	25083	
	3709792400	Olin township	1574	
	3709791076	Fallstown township	6295	
	3709792912	Sharpesburg township	2449	
	3709793788	Turnersburg township	3558	
	3709793824	Union Grove township	2069	

Jackson County				**33121**
	3709992684	River township	1107	
	3709993924	Webster township	2381	
	3709992856	Savannah township	1162	
	3709993204	Sylva township	6076	
	3709992868	Scott Creek township	1930	
	3709992596	Qualla township	5288	
	3709991320	Greens Creek township	1009	
	3709990156	Barkers Creek township	1539	
	3709991384	Hamburg township	1572	
	3709990848	Cullowhee township	6411	
	3709990484	Canada township	552	
	3709990500	Caney Fork township	712	
	3709992148	Mountain township	433	
	3709990900	Dillsboro township	1271	
	3709990540	Cashiers township	1678	
Johnston County				**121965**
	3710190144	Banner township	6346	
	3710190688	Cleveland township	10125	
	3710190676	Clayton township	21182	
	3710190992	Elevation township	5055	
	3710190336	Boon Hill township	6203	
	3710190232	Bentonville township	1768	
	3710191584	Ingrams township	5922	
	3710190256	Beulah township	4298	
	3710192528	Pleasant Grove township	8937	
	3710192408	O'Neals township	7187	
	3710192980	Smithfield township	14828	
	3710192888	Selma township	9855	
	3710192024	Meadow township	3021	
	3710192500	Pine Level township	3747	
	3710192048	Micro township	2503	
	3710194008	Wilders township	8119	
	3710194056	Wilson Mills township	2869	
Jones County				**10381**
	3710393304	Township 1, White Oak	2071	
	3710393420	Township 4, Cypress Creek	907	
	3710393496	Township 5, Tuckahoe	916	
	3710393352	Township 2, Pollocksville	2709	
	3710393512	Township 6, Chinquapin	681	
	3710393560	Township 7, Beaver Creek	968	
	3710393396	Township 3, Trenton	2129	
Lee County				**49040**
	3710593372	Township 3, Cape Fear	3527	
	3710593336	Township 2, Jonesboro	10984	
	3710593428	Township 4, Deep River	2118	
	3710593280	Township 1, Greenwood	7055	
	3710593548	Township 6, West Sanford	14178	
	3710593580	Township 7, Pocket	4404	
	3710593472	Township 5, East Sanford	6774	
Lenoir County				**59648**
	3710791588	Institute township	2398	
	3710791704	Kinston township	23445	
	3710790760	Contentnea Neck township	3143	
	3710791072	Falling Creek township	5896	
	3710794096	Woodington township	1850	
	3710792520	Pink Hill township	2781	
	3710792144	Moseley Hall township	5618	
	3710792820	Sand Hill township	1124	
	3710793060	Southwest township	1531	
	3710792224	Neuse township	5237	
	3710793760	Trent township	2972	
	3710793856	Vance township	3653	

Lincoln County				**63780**
	3710991552	Howards Creek township	7675	
	3710990560	Catawba Springs township	14852	
	3710991824	Lincolnton township	18702	
	3710991596	Ironton township	17376	
	3710992300	North Brook township	5175	
Macon County				**29811**
	3711390448	Burningtown township	1005	
	3711391024	Ellijay township	2429	
	3711390524	Cartoogechaye township	1989	
	3711390792	Cowee township	1884	
	3711392974	Smithbridge township	2952	
	3711391480	Highlands township	2620	
	3711392072	Millshoal township	2395	
	3711391124	Flats township	534	
	3711391156	Franklin township	12568	
	3711392204	Nantahala township	848	
	3711393164	Sugarfork township	587	
Madison County				**19635**
	3711593568	Township 7, Ebbs Chapel	1233	
	3711593290	Township 1, North Marshall	2755	
	3711593500	Township 5, Walnut	1762	
	3711593376	Township 3, Mars Hill	4101	
	3711593624	Township 8, Spring Creek	1012	
	3711593528	Township 6, Hot Springs	1365	
	3711593298	Township 1, South Marshall	1078	
	3711593416	Township 4, Beech Glenn	2793	
	3711593340	Township 2, Laurel	1255	
	3711593706	Township 11, Revere Rice Cove	392	
	3711593654	Township 9, Sandy Mush	576	
	3711593660	Township 10, Grapevine	1313	
Martin County				**25593**
	3711791388	Hamilton township	1812	
	3711790176	Beargrass township	1884	
	3711794024	Williams township	1174	
	3711790836	Cross Roads township	1451	
	3711791644	Jamesville township	2619	
	3711794040	Williamston township	9713	
	3711791268	Goose Nest township	1322	
	3711792556	Poplar Point township	490	
	3711792712	Robersonville township	3941	
	3711791332	Griffins township	1187	
McDowell County				**42151**
	3711191984	Marion township	18637	
	3711190348	Brackett township	502	
	3711190828	Crooked Creek township	3470	
	3711190940	Dysartsville township	2901	
	3711191236	Glenwood township	2591	
	3711191476	Higgins township	1778	
	3711192384	Old Fort township	4111	
	3711192112	Montford Cove township	2178	
	3711192216	Nebo township	3704	
	3711192312	North Cove township	2279	
Mecklenburg County				**695454**
	3711993268	Township 1, Charlotte	540828	
	3711993320	Township 2, Berryhill	3435	
	3711993392	Township 3, Steel Creek	9323	
	3711993700	Township 11, Long Creek	12650	
	3711993516	Township 6, Clear Creek	20861	
	3711993600	Township 8, Mallard Creek	8871	
	3711993668	Township 10, Lemley	15660	
	3711993636	Township 9, Deweese	11159	
	3711993564	Township 7, Crab Orchard	12003	
	3711993492	Township 5, Providence	10939	
	3711993748	Township 15, Huntersville	16371	
	3711993736	Township 13, Morning Star	22063	
	3711993740	Township 14, Pineville	6031	
	3711993720	Township 12, Paw Creek	5260	

Mitchell County				**15687**
	3712190128	Bakersville township	1724	
	3712191408	Harrell township	1241	
	3712191285	Grassy Creek township	8282	
	3712192548	Poplar township	339	
	3712192632	Red Hill township	390	
	3712193012	Snow Creek township	1679	
	3712190352	Bradshaw township	530	
	3712190488	Cane Creek township	757	
	3712191140	Fork Mountain-Little Rock Creek township	745	
Montgomery County				**26822**
	3712391856	Little River township	814	
	3712392160	Mount Gilead township	3597	
	3712390628	Cheek Creek township	615	
	3712390988	Eldorado township	1544	
	3712390272	Biscoe township	5566	
	3712392748	Rocky Springs township	2104	
	3712393100	Star township	2770	
	3712392412	Ophir township	691	
	3712393848	Uwharrie township	1572	
	3712392464	Pee Dee township	1268	
	3712393772	Troy township	6281	
Moore County				**74769**
	3712593264	Township 1, Carthage	6351	
	3712593316	Township 2, Bensalem	3543	
	3712593578	Township 7, McNeill	16397	
	3712593448	Township 4, Ritter	2790	
	3712593388	Township 3, Sheffield	5514	
	3712593468	Township 5, Deep River	379	
	3712593524	Township 6, Greenwood	3513	
	3712593648	Township 9, Mineral Springs	19437	
	3712593616	Township 8, Sandhill	13760	
	3712593672	Township 10, Little River	3085	
Nash County				**87420**
	3712790776	Coopers township	3105	
	3712791616	Jackson township	2644	
	3712791976	Mannings township	5237	
	3712790916	Dry Wells township	3125	
	3712790124	Bailey township	3737	
	3712791100	Ferrells township	2558	
	3712791336	Griffins township	2676	
	3712790544	Castalia township	1926	
	3712793144	Stony Creek township	23570	
	3712792636	Red Oak township	2814	
	3712792740	Rocky Mount township	17411	
	3712792328	North Whitakers township	2537	
	3712793068	South Whitakers township	3147	
	3712792212	Nashville township	8431	
	3712792356	Oak Level township	4502	
New Hanover County				**160307**
	3712991092	Federal Point township	17291	
	3712990508	Cape Fear township	15711	
	3712991404	Harnett township	30869	
	3712992008	Masonboro township	20873	
	3712994044	Wilmington township	75563	
Northampton County				**22086**
	3713192536	Pleasant Hill township	600	
	3713191708	Kirby township	3552	
	3713192676	Rich Square township	3566	
	3713191212	Gaston township	5605	
	3713192368	Oconeechee township	2218	
	3713191620	Jackson township	1043	
	3713194004	Wiccacanee township	1879	
	3713192696	Roanoke township	2018	
	3713192880	Seaboard township	1605	

Onslow County				**150355**
	3713390482	Camp Lejeune UT	34452	
	3713391502	Hofmann Forest UT	81	
	3713391632	Jacksonville township	59053	
	3713392672	Richlands township	12497	
	3713393160	Stump Sound township	12025	
	3713393976	White Oak township	17144	
	3713393188	Swansboro township	15103	
Orange County				**118227**
	3713590268	Bingham township	6181	
	3713590580	Cedar Grove township	4930	
	3713590632	Cheeks township	7064	
	3713591496	Hillsborough township	11639	
	3713590620	Chapel Hill township	79274	
	3713591040	Eno township	6092	
	3713591860	Little River township	3047	
Pamlico County				**12934**
	3713793464	Township 5	2483	
	3713793260	Township 1	3434	
	3713793364	Township 3	2924	
	3713793312	Township 2	2819	
	3713793412	Township 4	1274	
Pasquotank County				**34897**
	3713990996	Elizabeth City township	12220	
	3713992260	Newland township	2301	
	3713992292	Nixonton township	7035	
	3713992576	Providence township	6864	
	3713992164	Mount Hermon township	5080	
	3713992804	Salem township	1397	
Pender County				**41082**
	3714190444	Burgaw township	7474	
	3714190728	Columbia township	2179	
	3714191900	Long Creek township	1854	
	3714192744	Rocky Point township	5786	
	3714191272	Grady township	2192	
	3714190496	Canetuck township	361	
	3714191516	Holly township	2263	
	3714190548	Caswell township	1172	
	3714193248	Topsail township	13806	
	3714193804	Union township	3995	
Perquimans County				**11368**
	3714392248	New Hope township	2502	
	3714390220	Belvidere township	1268	
	3714392448	Parkville township	2227	
	3714390248	Bethel township	3054	
	3714391464	Hertford township	2317	
Person County				**35623**
	3714592168	Mount Tirzah township	2935	
	3714591120	Flat River township	4885	
	3714592404	Olive Hill township	2357	
	3714592764	Roxboro township	15255	
	3714591512	Holloway township	1919	
	3714594100	Woodsdale township	1345	
	3714590852	Cunningham township	1790	
	3714590040	Allensville township	2706	
	3714590464	Bushy Fork township	2431	

Pitt County				**133798**
	3714790224	Belvoir township	8389	
	3714790512	Carolina township	1854	
	3714790080	Arthur township	4951	
	3714792428	Pactolus township	5661	
	3714790652	Chicod township	5300	
	3714791340	Grifton township	4355	
	3714790112	Ayden township	6785	
	3714791152	Fountain township	1411	
	3714790252	Bethel township	2854	
	3714791064	Falkland township	2503	
	3714791344	Grimesland township	9232	
	3714791328	Greenville township	41436	
	3714793196	Swift Creek township	1402	
	3714791084	Farmville township	6432	
	3714794072	Winterville township	31233	
Polk County				**18324**
	3714993776	Tryon township	3811	
	3714993980	White Oak township	2049	
	3714990772	Cooper Gap township	1882	
	3714991324	Green Creek township	2994	
	3714992816	Saluda township	1869	
	3714990740	Columbus township	5719	
Randolph County				**130454**
	3715190084	Asheboro township	23251	
	3715191800	Liberty township	5711	
	3715190584	Cedar Grove township	8656	
	3715192532	Pleasant Grove township	551	
	3715192668	Richland township	3667	
	3715192580	Providence township	5679	
	3715193808	Union township	2797	
	3715192620	Randleman township	7482	
	3715193208	Tabernacle township	5958	
	3715191276	Grant township	5189	
	3715190116	Back Creek township	4550	
	3715192252	New Hope township	1122	
	3715190716	Coleridge township	2222	
	3715190748	Concord township	2371	
	3715192268	New Market township	6867	
	3715190388	Brower township	1375	
	3715191784	Level Cross township	3888	
	3715193768	Trinity township	23838	
	3715190732	Columbia township	6723	
	3715191172	Franklinville township	8557	
Richmond County				**46564**
	3715392084	Mineral Springs township	3730	
	3715393116	Steeles township	564	
	3715394088	Wolf Pit township	8403	
	3715390200	Beaverdam township	3951	
	3715392736	Rockingham township	15630	
	3715390280	Black Jack township	449	
	3715391988	Marks Creek township	13837	

Robeson County				**123339**
	3715592420	Orrum township	1934	
	3715592780	Saddletree township	4198	
	3715592904	Shannon township	1107	
	3715592984	Smiths township	5141	
	3715594080	Wishart township	5395	
	3715592444	Parkton township	3800	
	3715593236	Thompson township	1238	
	3715592016	Maxton township	6139	
	3715592484	Philadelphus township	2803	
	3715592656	Rennert township	2975	
	3715590372	Britts township	2883	
	3715592796	St. Pauls township	7977	
	3715593812	Union township	2870	
	3715591200	Gaddy township	1363	
	3715592760	Rowland township	2421	
	3715590460	Burnt Swamp township	2229	
	3715591936	Lumber Bridge township	2145	
	3715592608	Raft Swamp township	3544	
	3715592472	Pembroke township	10794	
	3715590960	East Howellsville township	2355	
	3715590028	Alfordsville township	1977	
	3715592640	Red Springs township	5958	
	3715593952	West Howellsville township	2313	
	3715591940	Lumberton township	24268	
	3715593004	Smyrna township	2038	
	3715591052	Fairmont township	6055	
	3715590120	Back Swamp township	5202	
	3715593120	Sterlings township	1017	
	3715593962	Whitehouse township	1200	
Rockingham County				**91928**
	3715791752	Leaksville township	21511	
	3715792020	Mayo township	7308	
	3715791956	Madison township	8138	
	3715791564	Huntsville township	5364	
	3715792232	New Bethel township	5755	
	3715792568	Price township	1591	
	3715792652	Reidsville township	19783	
	3715793936	Wentworth township	8534	
	3715792772	Ruffin township	5669	
	3715794032	Williamsburg township	4547	
	3715792960	Simpsonville township	3728	
Rowan County				**130340**
	3715992172	Mount Ulla township	1397	
	3715991880	Locke township	12401	
	3715991160	Franklin township	12301	
	3715992584	Providence township	8892	
	3715990100	Atwell township	11226	
	3715992860	Scotch Irish township	1751	
	3715993112	Steele township	1687	
	3715991840	Litaker township	10299	
	3715993828	Unity township	2290	
	3715992128	Morgan township	3439	
	3715992812	Salisbury township	28594	
	3715991256	Gold Hill township	10015	
	3715990660	China Grove township	23348	
	3715990692	Cleveland township	2700	

Rutherford County				**62899**
	3716190720	Colfax township	7680	
	3716190656	Chimney Rock township	2246	
	3716190768	Cool Spring township	14815	
	3716190480	Camp Creek township	1247	
	3716190924	Duncans Creek township	617	
	3716192776	Rutherfordton township	12080	
	3716191224	Gilkey township	1773	
	3716191252	Golden Valley township	896	
	3716193172	Sulphur Springs township	4660	
	3716191308	Green Hill township	2466	
	3716191892	Logan Store township	3791	
	3716193816	Union township	1588	
	3716191488	High Shoals township	7550	
	3716192132	Morgan township	1490	
Sampson County				**60161**
	3716391944	McDaniels township	1217	
	3716390904	Dismal township	3650	
	3716392088	Mingo township	2480	
	3716391836	Lisbon township	1833	
	3716391164	Franklin township	2450	
	3716392288	Newton Grove township	2044	
	3716393052	South River township	1990	
	3716391844	Little Coharie township	6061	
	3716392516	Piney Grove township	2707	
	3716391380	Halls township	2265	
	3716392308	North Clinton township	10863	
	3716392524	Plain View township	4537	
	3716393224	Taylors Bridge township	1344	
	3716391460	Herring township	1834	
	3716393780	Turkey township	2115	
	3716393032	South Clinton township	6540	
	3716391528	Honeycutt township	2910	
	3716390228	Belvoir township	1754	
	3716393939	Westbrook township	1567	
Scotland County				**35998**
	3716593132	Stewartsville township	19707	
	3716594036	Williamson township	7922	
	3716591748	Laurel Hill township	3411	
	3716593080	Spring Hill township	4958	
Stanly County				**58100**
	3716790048	Almond township	2997	
	3716790264	Big Lick township	4686	
	3716791032	Endy township	1931	
	3716793028	South Albemarle township	8358	
	3716791196	Furr township	9046	
	3716790596	Center township	5954	
	3716792296	North Albemarle township	13941	
	3716791416	Harris township	6330	
	3716792680	Ridenhour township	2468	
	3716793800	Tyson township	2389	
Stokes County				**44711**
	3716993016	Snow Creek township	2653	
	3716992480	Peters Creek township	2053	
	3716990208	Beaver Island township	3565	
	3716994108	Yadkin township	19592	
	3716992588	Quaker Gap township	2796	
	3716990260	Big Creek township	1984	
	3716992852	Sauratown township	5560	
	3716990876	Danbury township	1229	
	3716992028	Meadows township	5279	

Surry County				**71219**
	3717192936	Shoals township	1872	
	3717191168	Franklin township	2155	
	3717192948	Siloam township	1071	
	3717193064	South Westfield township	2058	
	3717190984	Eldora township	3541	
	3717193128	Stewarts Creek township	6690	
	3717190412	Bryan township	2617	
	3717191904	Long Hill township	1495	
	3717192496	Pilot township	3537	
	3717191016	Elkin township	6524	
	3717191996	Marsh township	2499	
	3717192156	Mount Airy township	24828	
	3717190908	Dobson township	8088	
	3717193948	Westfield township	2464	
	3717192732	Rockford township	1780	
Swain County				**12968**
	3717390624	Charleston township	11234	
	3717391144	Forneys Creek UT	23	
	3717392208	Nantahala township	1711	
Transylvania County				**29334**
	3717590928	Dunns Rock township	4106	
	3717591248	Gloucester township	1124	
	3717590364	Brevard township	10354	
	3717591504	Hogback township	2000	
	3717590564	Catheys Creek township	3606	
	3717590948	Eastatoe township	2589	
	3717591864	Little River township	2206	
	3717590344	Boyd township	3349	
Tyrrell County				**4149**
	3717792872	Scuppernong township	673	
	3717790044	Alligator township	381	
	3717793040	South Fork township	43	
	3717790736	Columbia township	2590	
	3717791360	Gum Neck township	462	
Union County				**123677**
	3717991264	Goose Creek township	11321	
	3717992280	New Salem township	2925	
	3717991736	Lanes Creek township	2260	
	3717992108	Monroe township	40806	
	3717990432	Buford township	9102	
	3717992836	Sandy Ridge township	16427	
	3717992004	Marshville township	7490	
	3717993860	Vance township	25260	
	3717991624	Jackson township	8086	
Vance County				**42954**
	3718190868	Dabney township	2438	
	3718191452	Henderson township	22067	
	3718192824	Sandy Creek township	5896	
	3718191712	Kittrell township	4667	
	3718193752	Townsville township	1065	
	3718193916	Watkins township	639	
	3718192050	Middleburg township	3390	
	3718194028	Williamsboro township	2792	

Wake County				**627846**
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	3718392788	St. Marys township	38272	
	3718393880	Wake Forest township	29845	
	3718392612	Raleigh township	110644	
	3718393984	White Oak township	38710	
	3718392792	St. Matthews township	44631	
	3718391772	Leesville township	29998	
	3718392056	Middle Creek township	25151	
	3718392228	Neuse township	48256	
	3718390576	Cedar Fork township	10911	
	3718392036	Meredith township	11498	
	3718390420	Buckhorn township	2160	
	3718392264	New Light township	4708	
	3718391548	House Creek township	51727	
	3718391992	Marks Creek township	16278	
	3718390536	Cary township	69044	
	3718391524	Holly Springs township	16304	
	3718391868	Little River township	10985	
	3718392440	Panther Branch township	14844	
	3718390164	Bartons Creek township	18408	
Warren County				**19972**
	3718591112	Fishing Creek township	1692	
	3718591432	Hawtree township	1858	
	3718592940	Shocco township	1270	
	3718592964	Sixpound township	926	
	3718591132	Fork township	526	
	3718591684	Judkins township	905	
	3718592340	Nutbush township	1582	
	3718592688	River township	1199	
	3718592700	Roanoke township	1031	
	3718592828	Sandy Creek township	1670	
	3718592976	Smith Creek township	2198	
	3718593896	Warrenton township	5115	
Washington County				**13723**
	3718792876	Scuppernong township	1481	
	3718792968	Skinnersville township	1757	
	3718792540	Plymouth township	7569	
	3718791768	Lees Mill township	2916	
Watauga County				**42695**
	3718990332	Boone township	8690	
	3718991008	Elk township	462	
	3718990300	Blowing Rock township	2858	
	3718992276	New River township	8848	
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	3718991744	Laurel Creek township	1756	
	3718990404	Brushy Fork township	3205	
	3718993912	Watauga township	2914	
	3718990308	Blue Ridge township	3628	
	3718990788	Cove Creek township	2935	
	3718992032	Meat Camp township	2673	
	3718990132	Bald Mountain township	485	
	3718990204	Beaverdam township	1283	
	3718992320	North Fork township	222	
	3718992916	Shawneehaw township	675	
Wayne County				**113329**
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	3719191260	Goldsboro township	23938	
	3719191280	Grantham township	3959	
	3719192492	Pikeville township	2715	
	3719191300	Great Swamp township	1820	
	3719190428	Buck Swamp township	4398	
	3719192256	New Hope township	18106	
	3719192848	Saulston township	6071	
	3719191576	Indian Springs township	5858	
	3719191136	Fork township	9805	
	3719193138	Stoney Creek township	12221	
	3719190384	Brogden township	20753	

Wilkes County				**65632**
	3719390408	Brushy Mountain township	524	
	3719390072	Antioch township	1104	
	3719390184	Beaver Creek township	517	
	3719390324	Boomer township	2132	
	3719392720	Rock Creek township	5875	
	3719391664	Jobs Cabin township	457	
	3719390976	Edwards township	6959	
	3719393024	Somers township	989	
	3719393888	Walnut Grove township	1258	
	3719391788	Lewis Fork township	1416	
	3719392628	Reddies River township	10047	
	3719393092	Stanton township	477	
	3719392236	New Castle township	1689	
	3719391908	Lovelace township	689	
	3719393756	Traphill township	3083	
	3719394012	Wilkesboro township	9891	
	3719391012	Elk township	997	
	3719392116	Moravian Falls township	2800	
	3719392332	North Wilkesboro township	7241	
	3719393820	Union township	1178	
	3719392184	Mulberry township	6309	
Wilson County				**73814**
	3719593084	Springhill township	2739	
	3719591208	Gardners township	3376	
	3719592380	Old Fields township	3669	
	3719593096	Stantonsburg township	1891	
	3719590276	Black Creek township	3590	
	3719594048	Wilson township	43169	
	3719593220	Taylors township	4615	
	3719590840	Cross Roads township	3553	
	3719592840	Saratoga township	1773	
	3719593244	Toisnot township	5439	
Yadkin County				**36348**
	3719791128	Forbush township	3695	
	3719792302	North Buck Shoals township	2330	
	3719793030	South Buck Shoals township	1293	
	3719790340	Boonville township	3883	
	3719793034	South Fall Creek township	2442	
	3719792314	North Fall Creek township	1433	
	3719792321	North Knobs township	4461	
	3719793041	South Knobs township	1729	
	3719790892	Deep Creek township	2838	
	3719793042	South Liberty township	3091	
	3719790952	East Bend township	3383	
	3719792322	North Liberty township	5770	
Yancey County				**17774**
	3719990492	Cane River township	1670	
	3719990804	Crabtree township	3148	
	3719990400	Brush Creek township	531	
	3719990456	Burnsville township	4408	
	3719990980	Egypt township	677	
	3719991312	Green Mountain township	637	
	3719993056	South Toe township	2419	
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	3719992572	Price Creek township	1334	
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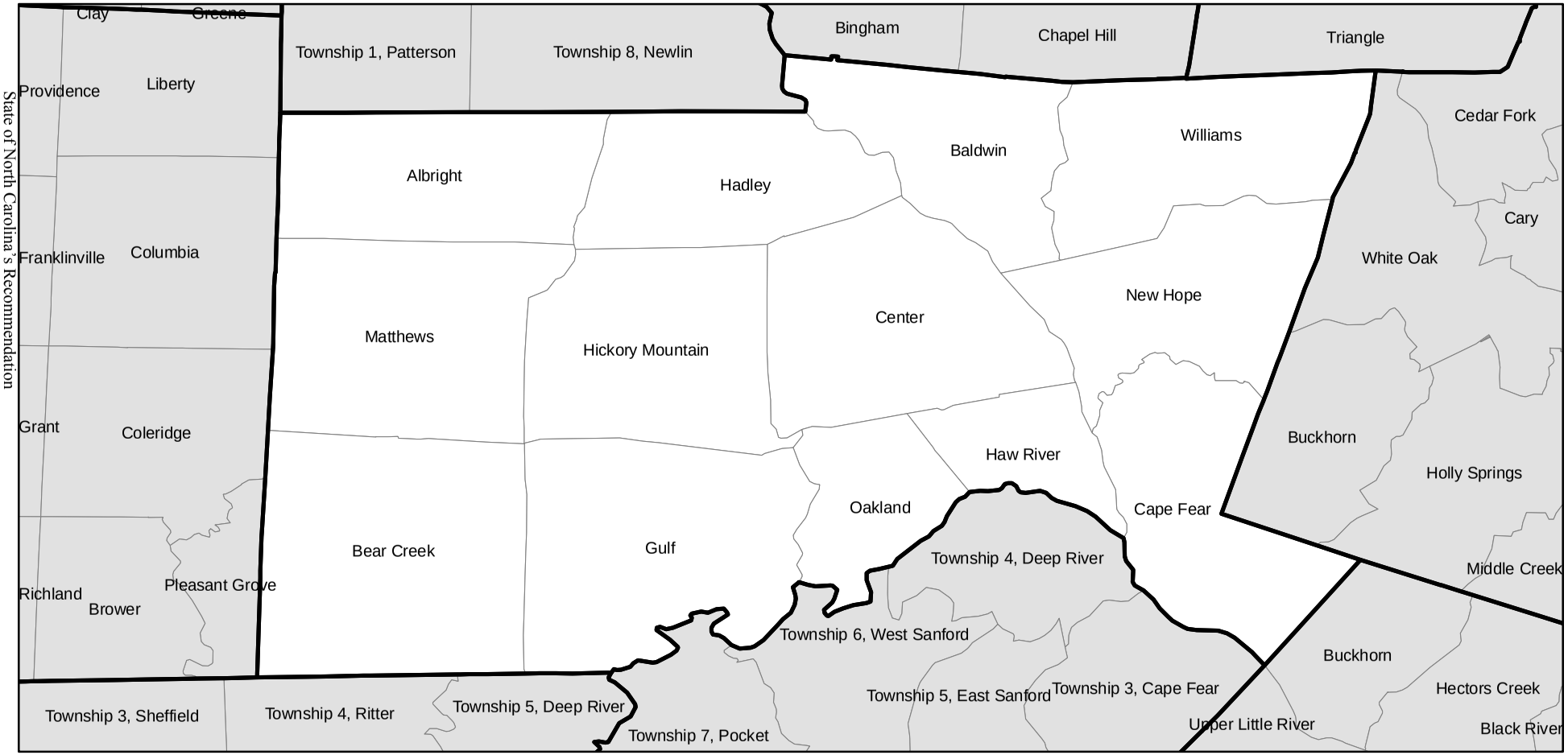
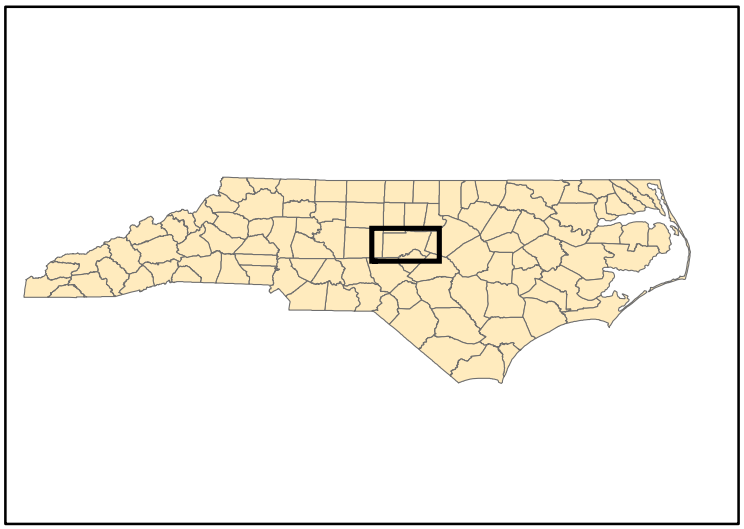
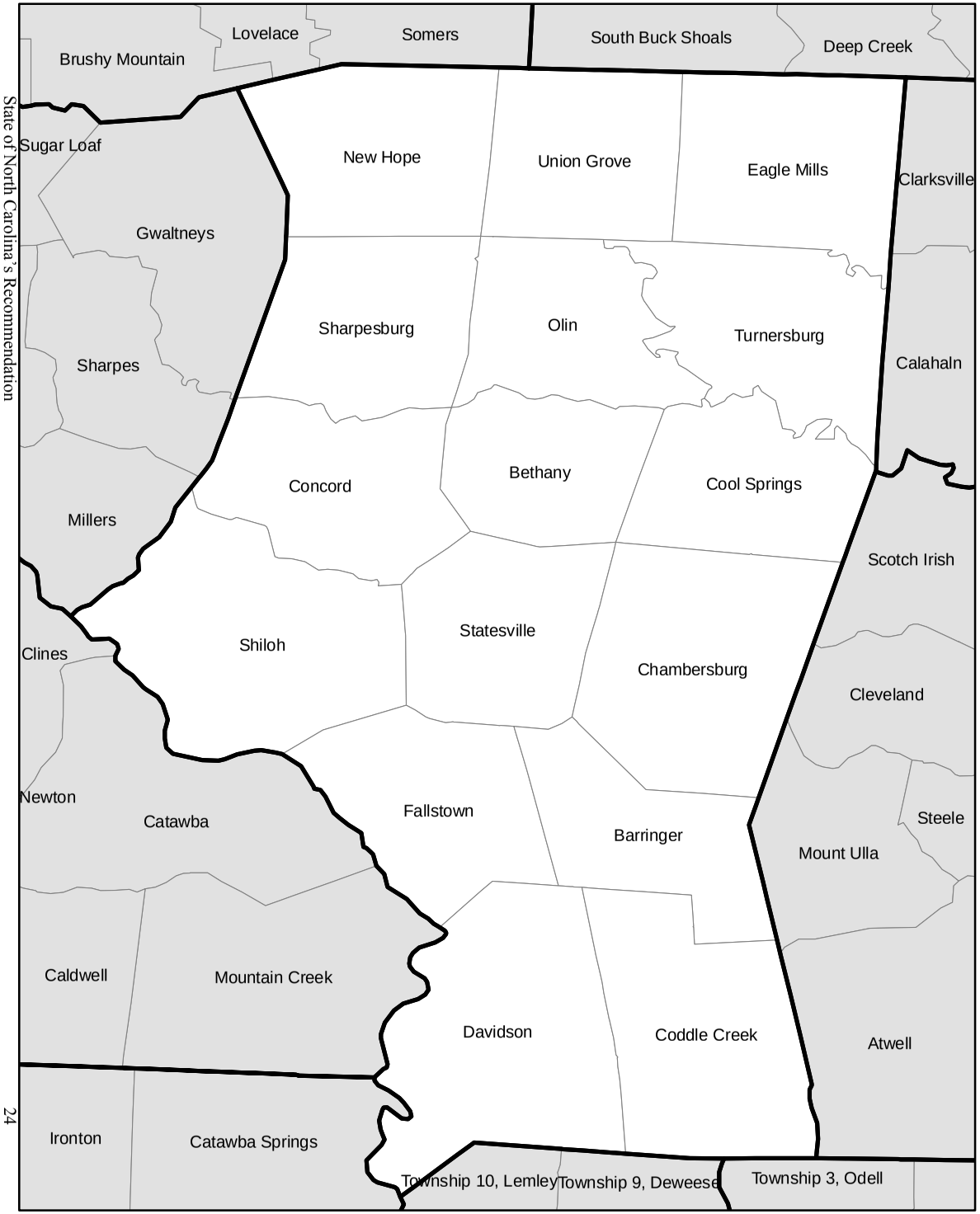




Chatham County Townships

Legend

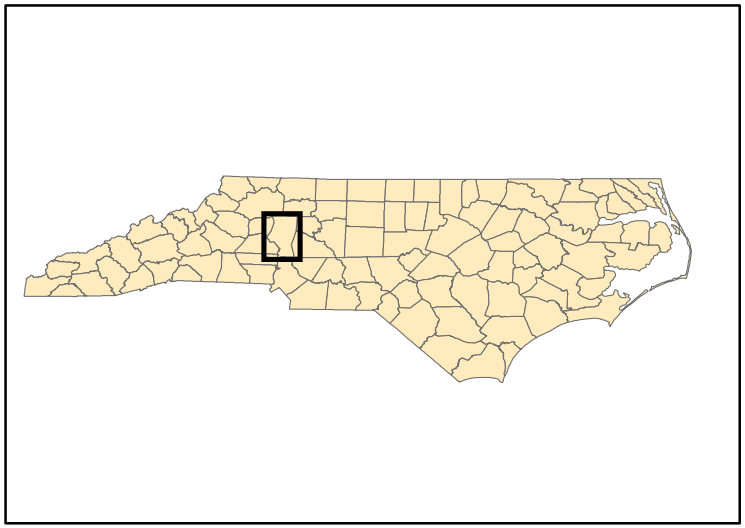
- Chatham County Townships
- North Carolina Townships

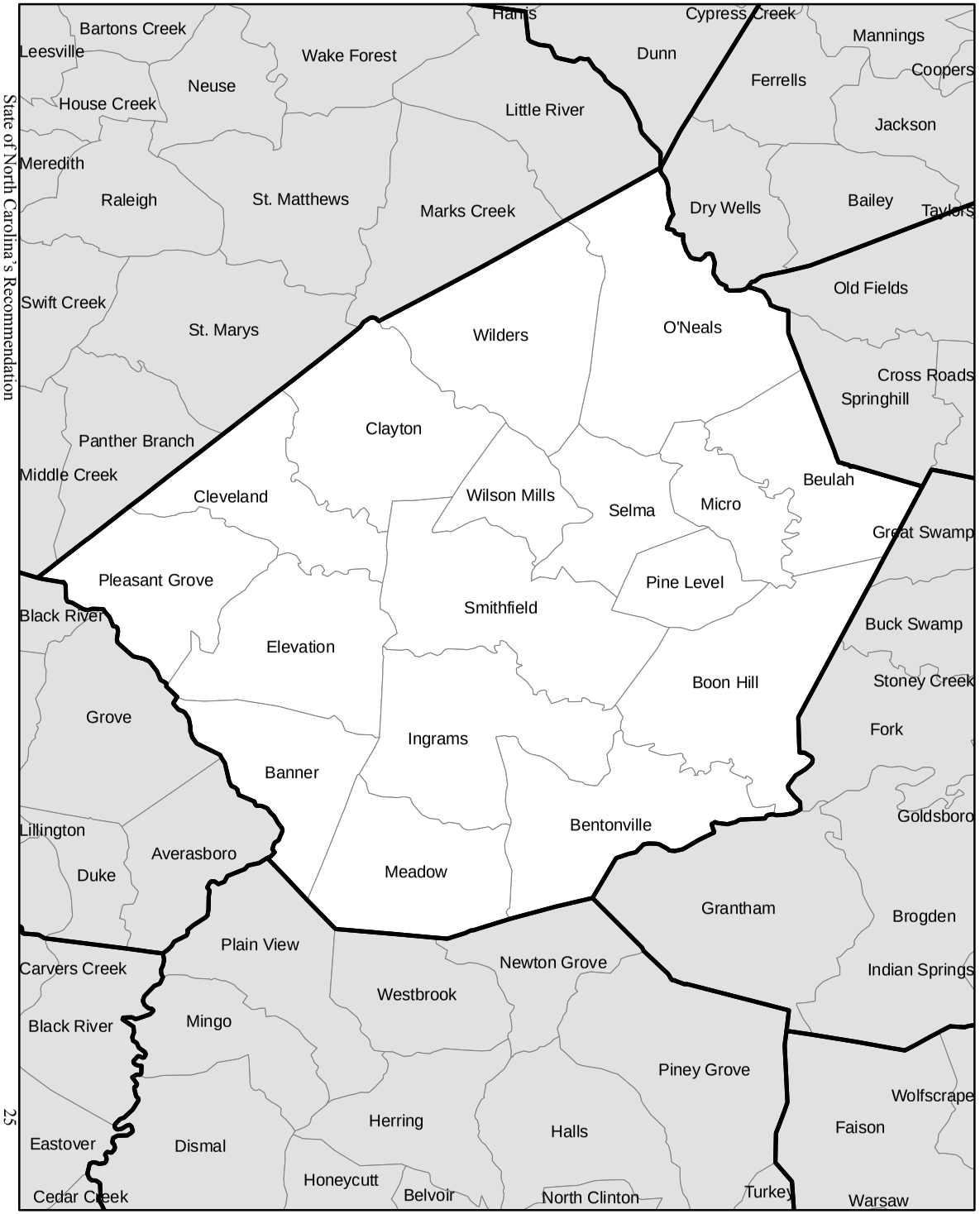


Iredell County Townships

Legend

- Iredell County Townships
- North Carolina Townships

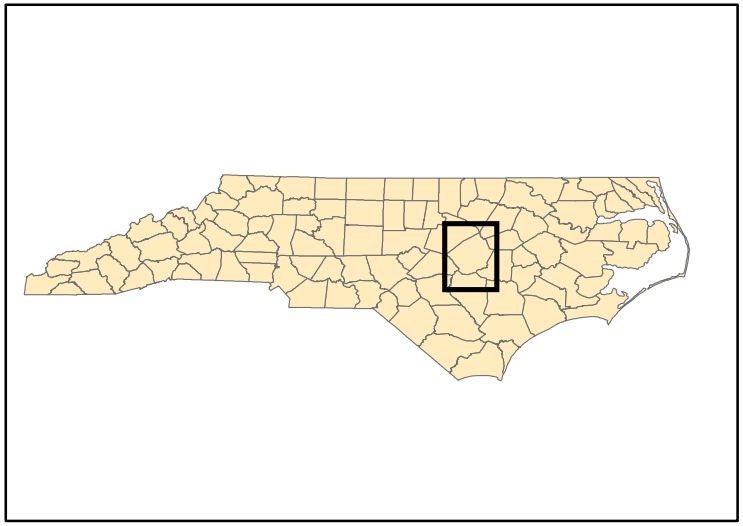




Johnston County Townships

Legend

- Johnston County Townships
- North Carolina Townships



Appendix H

North Carolina's 2006 NOx and VOC Emissions Data Maps and Tables

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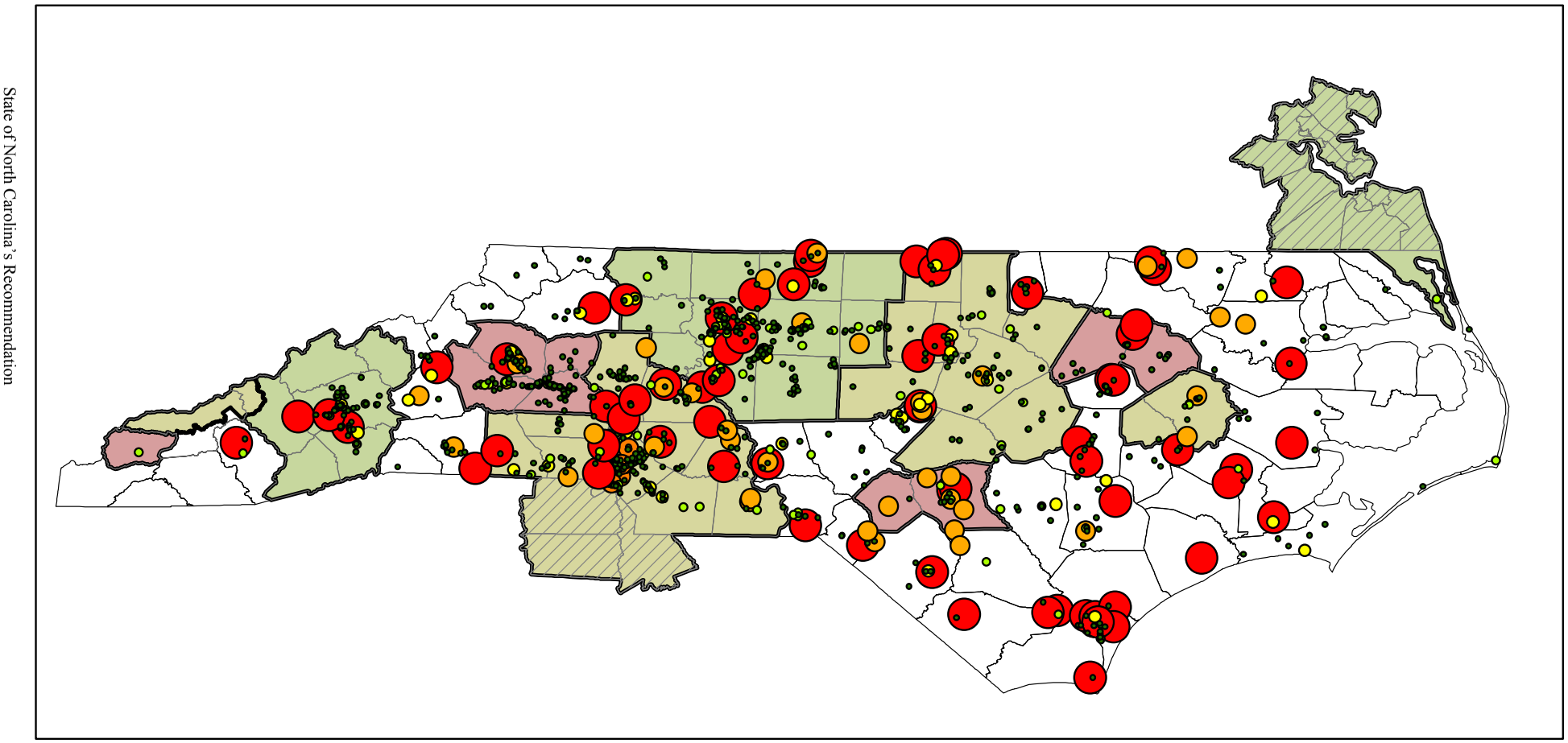
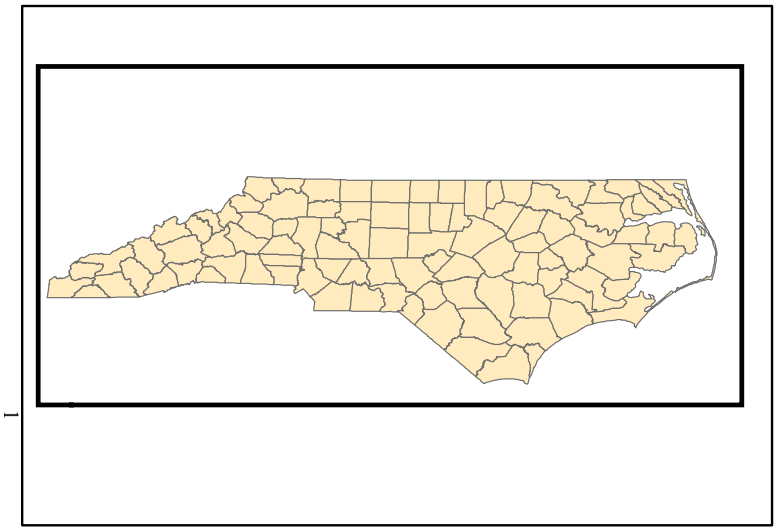
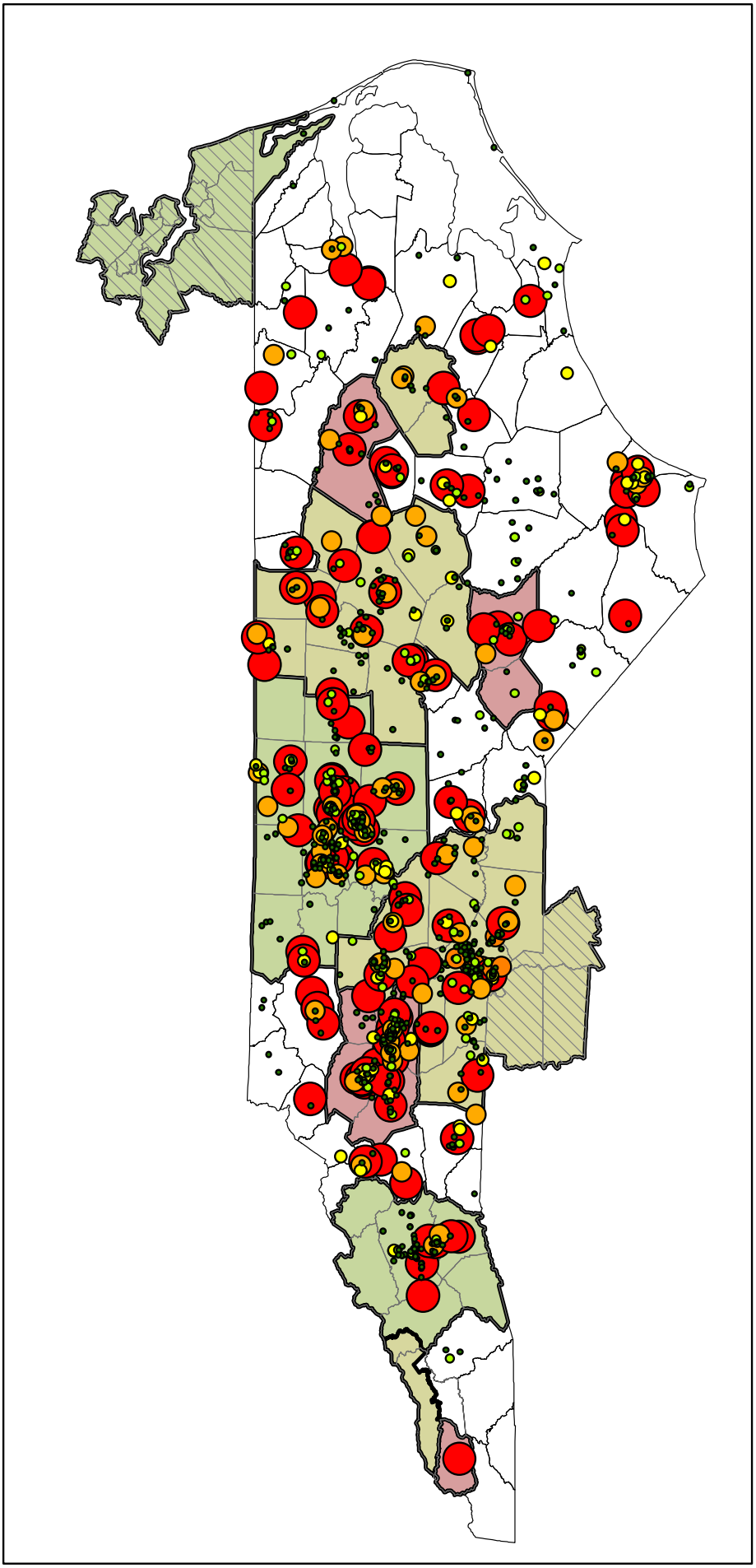




Point Source Emissions

NOx Emissions (Tons Per Year)

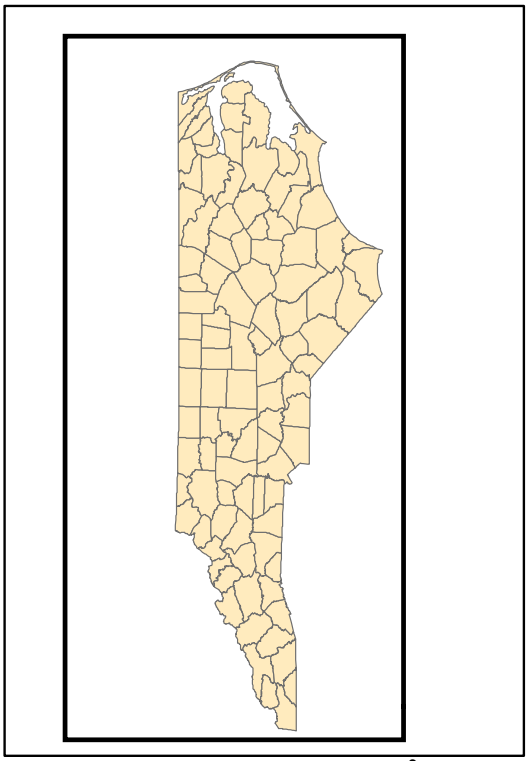
- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+

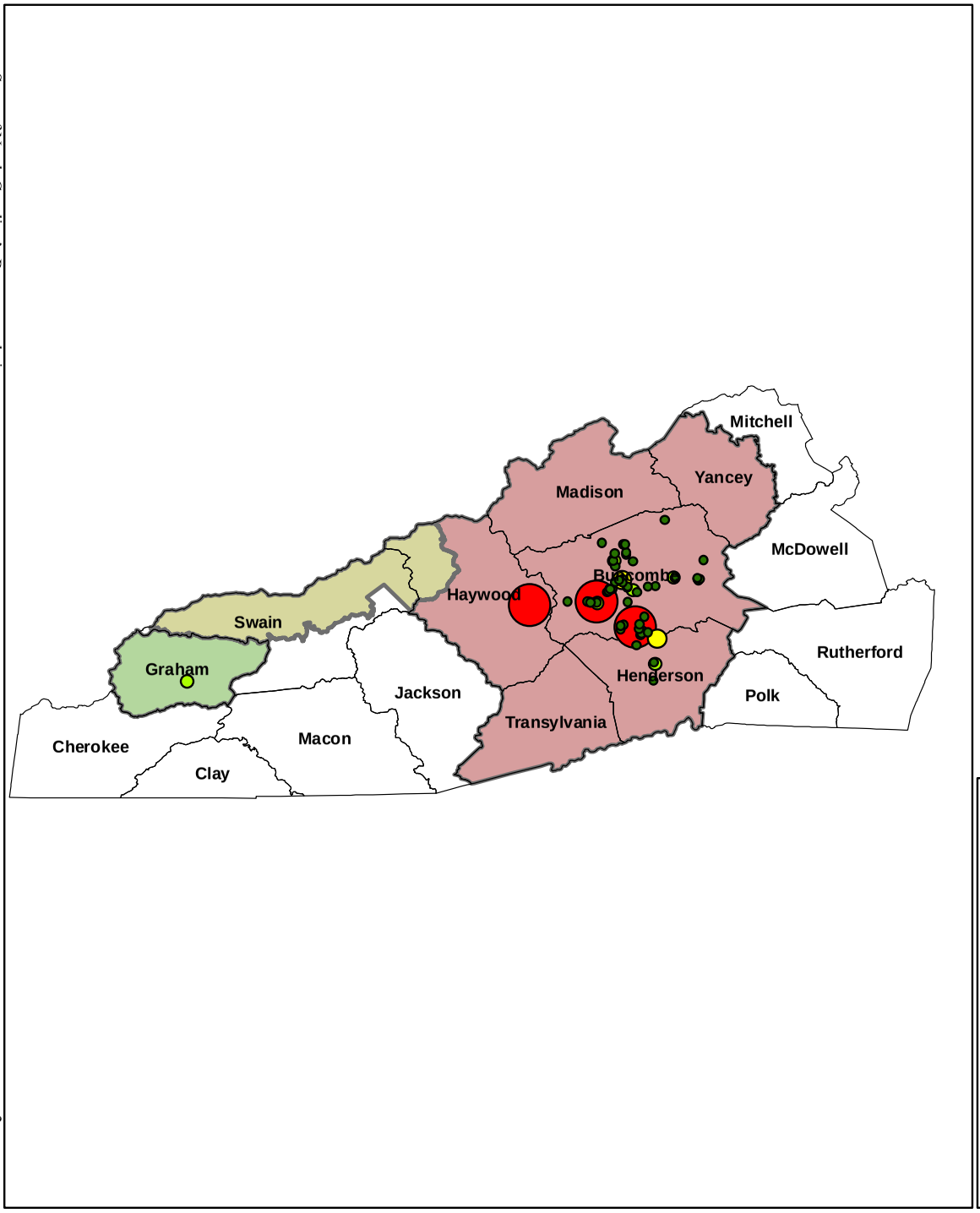


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+



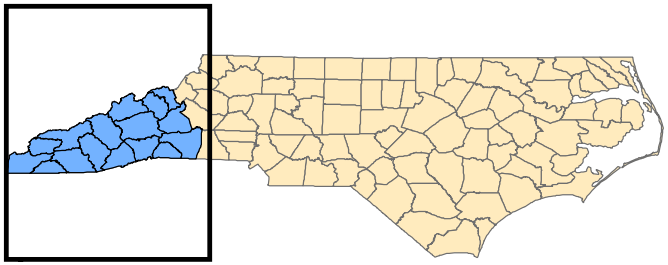


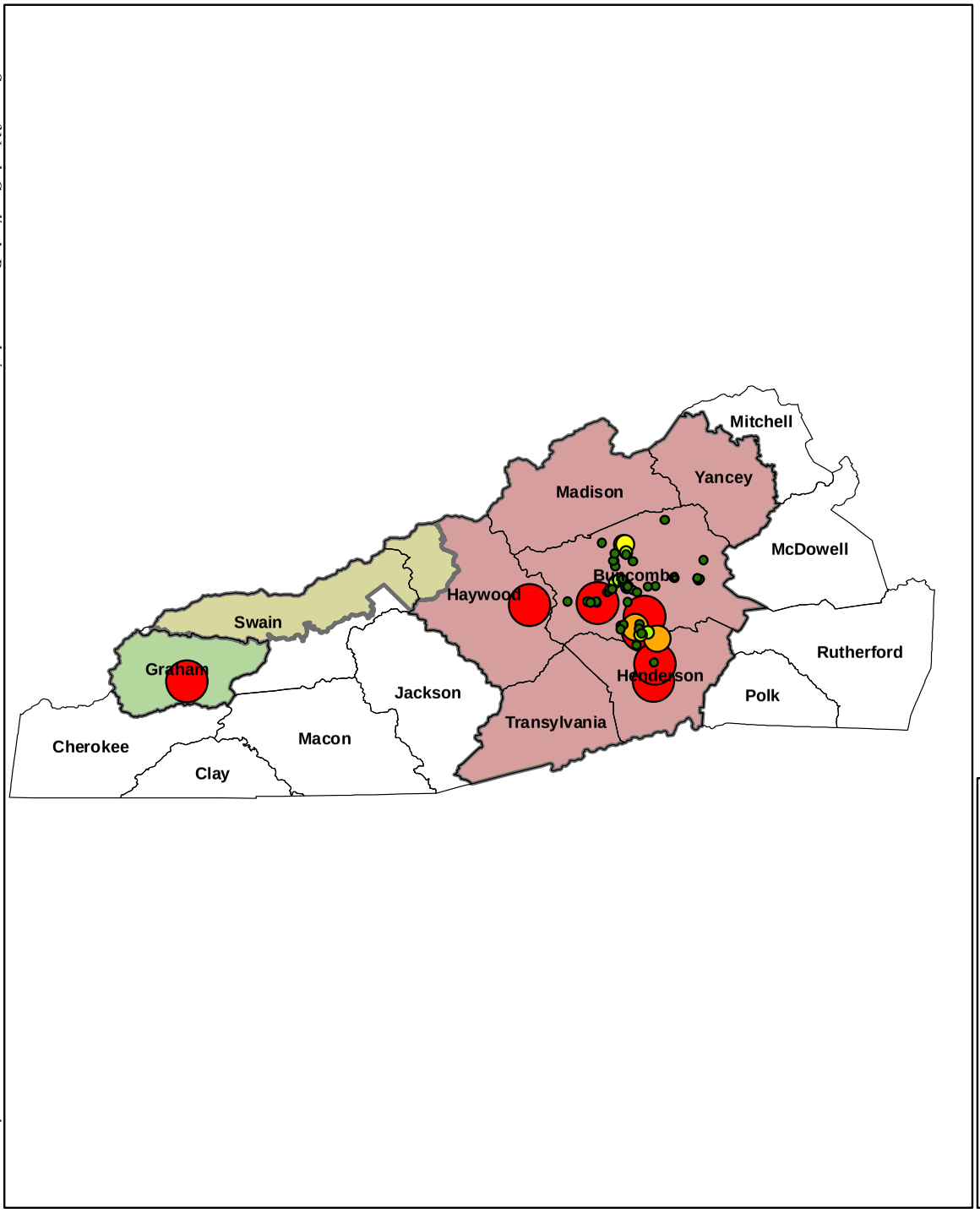
Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+

- Great Smoky Mountain National Park
- Asheville - Brevard CSA
- Graham County



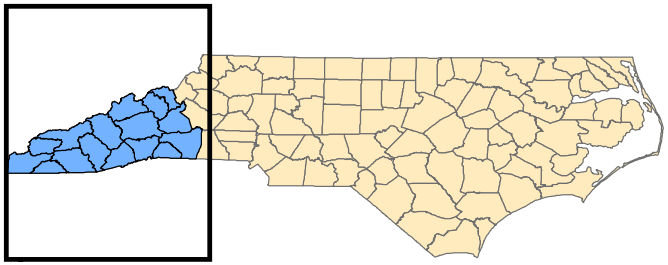


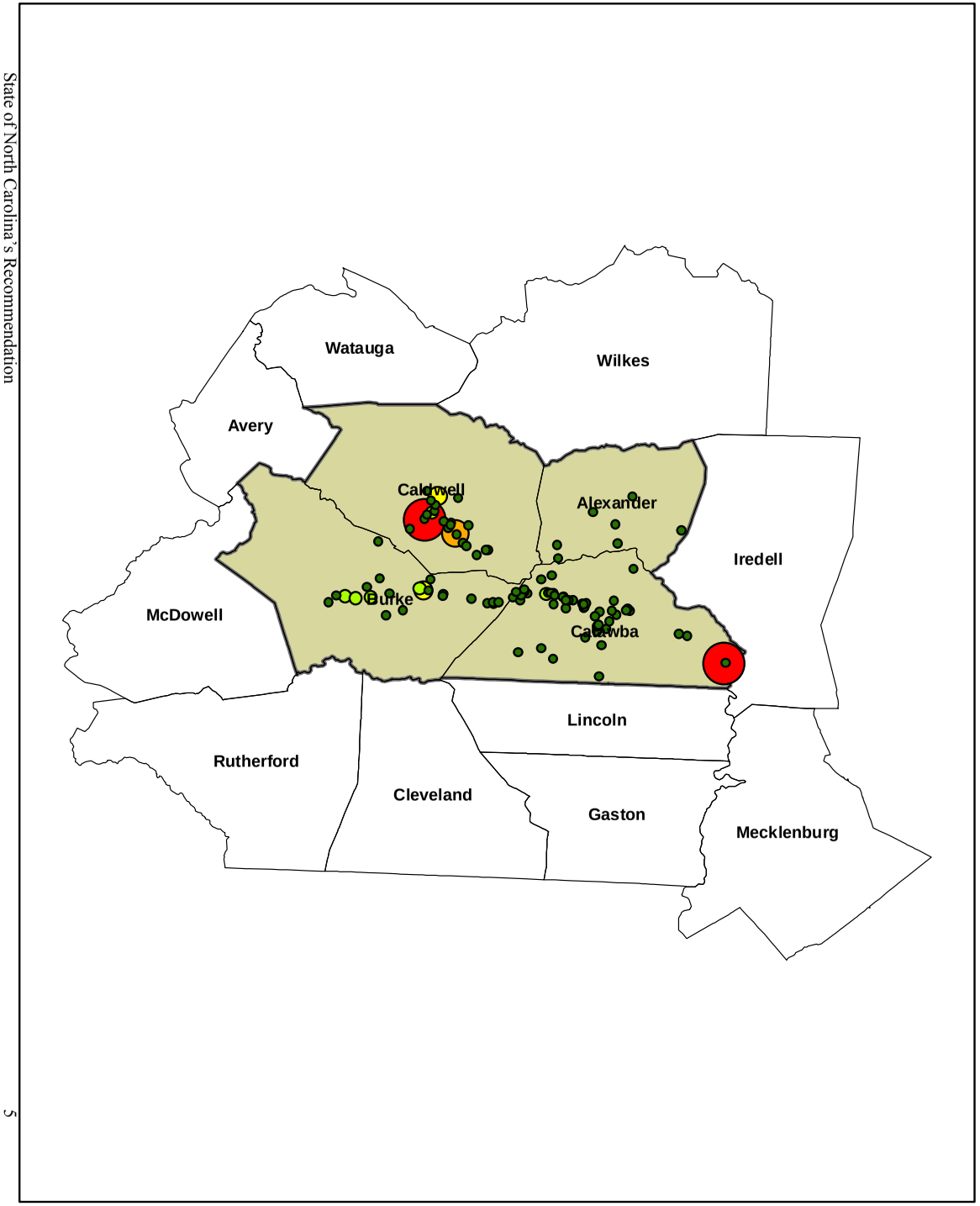
Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+

- Great Smoky Mountain National Park
- Asheville - Brevard CSA
- Graham County

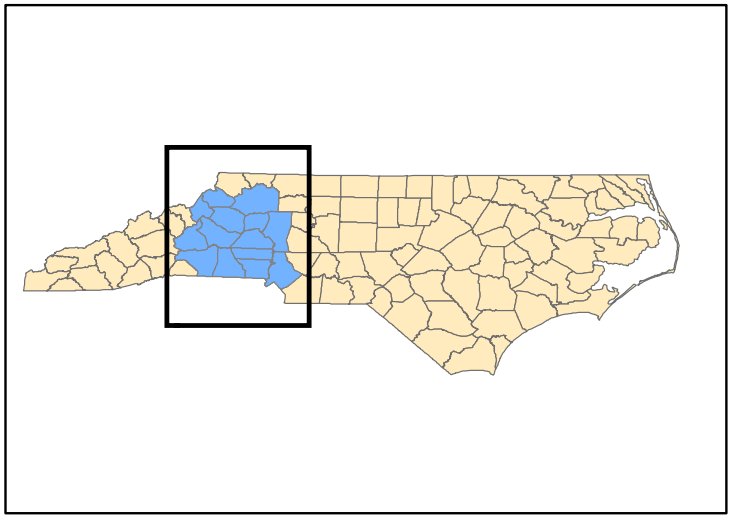


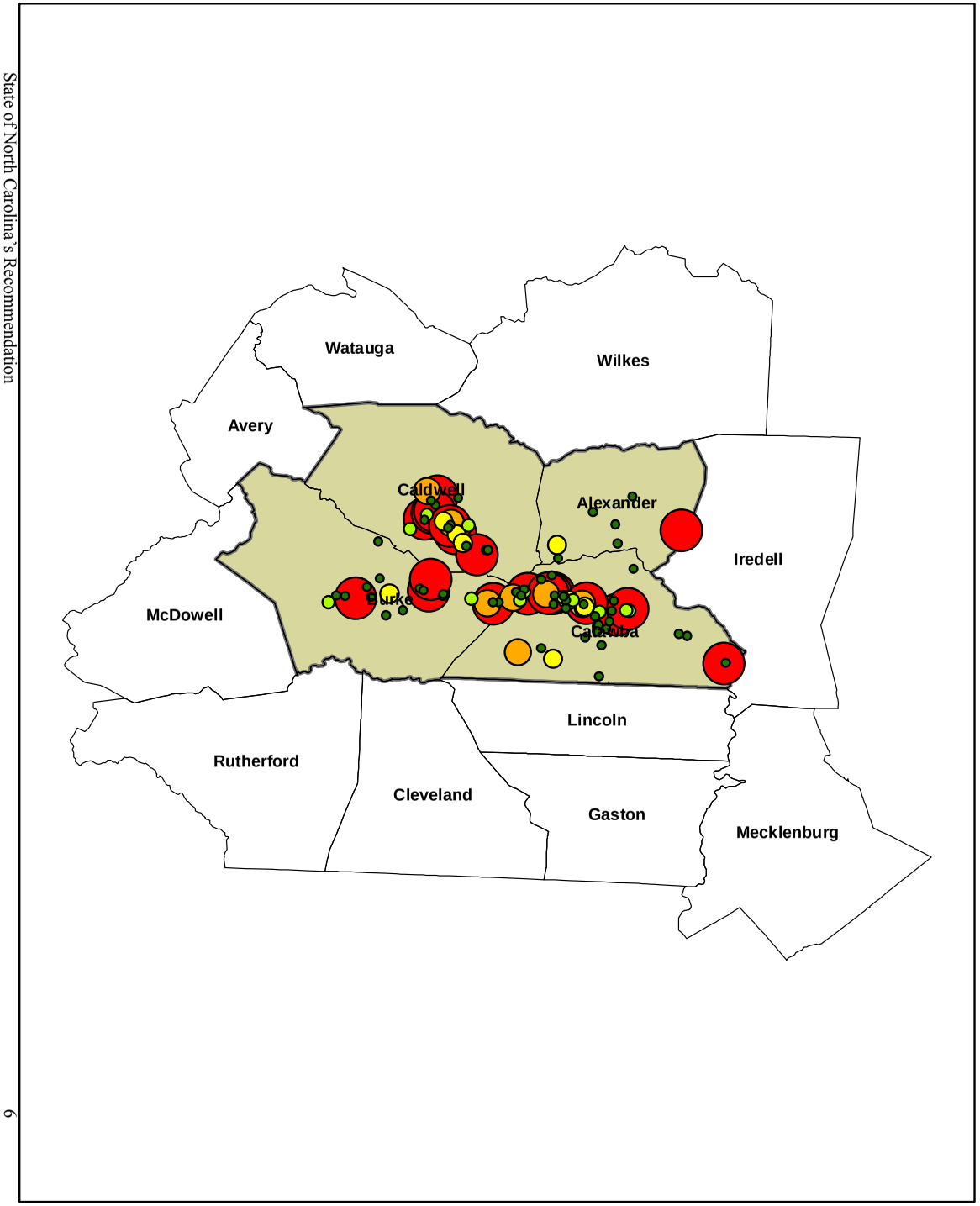


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Hickory MSA

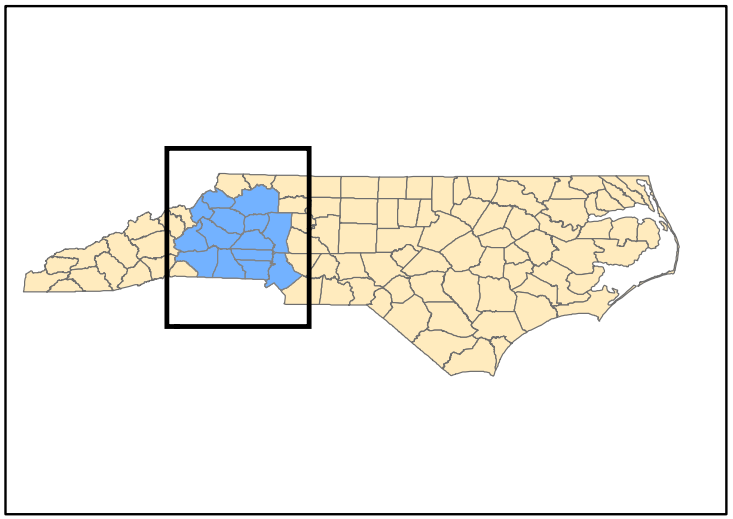


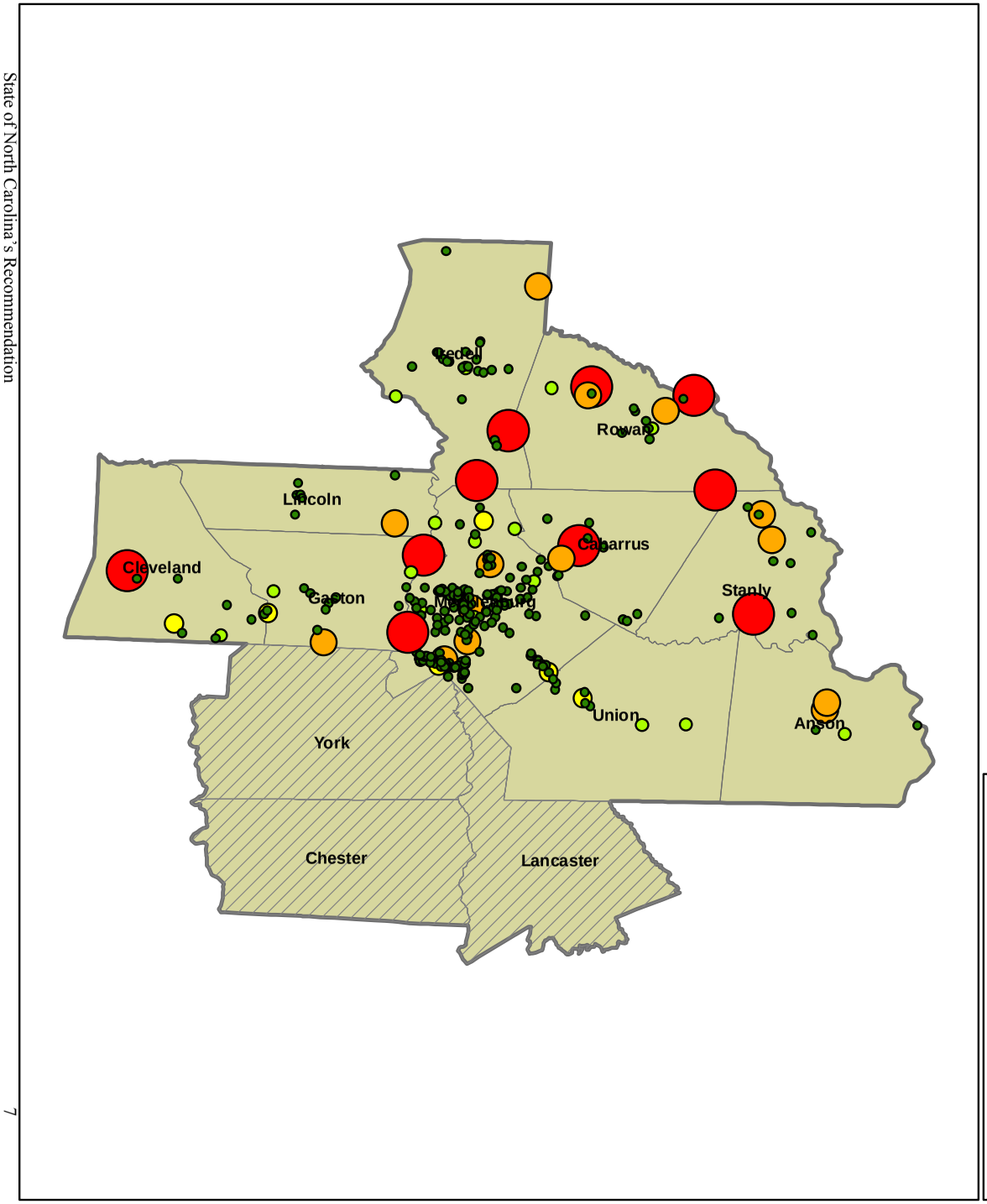


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Hickory MSA

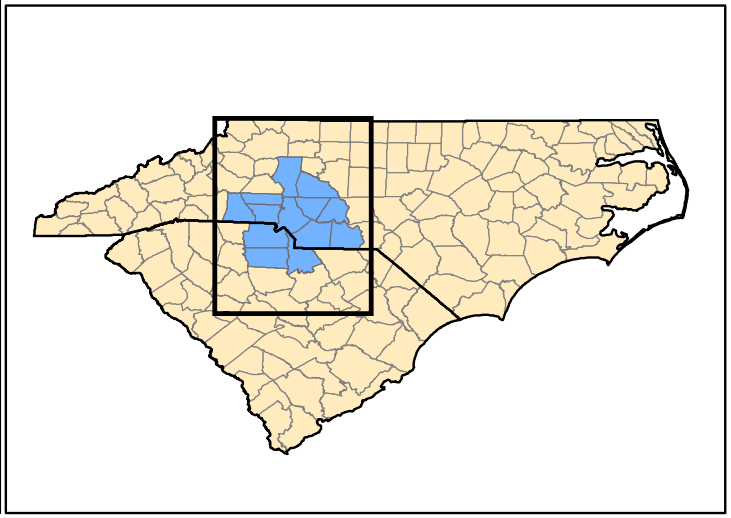


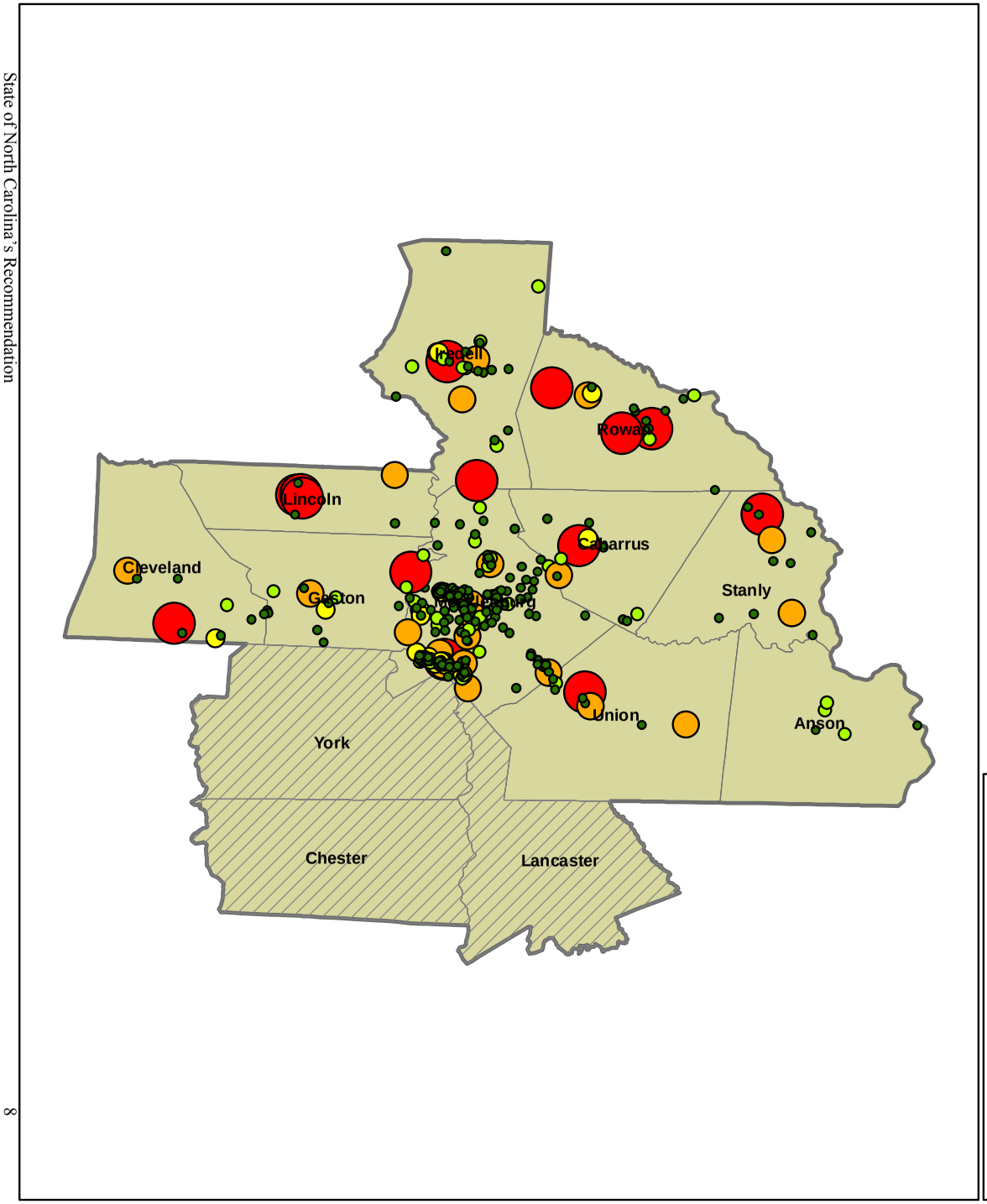


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Charlotte-Gastonia-Salisbury CSA

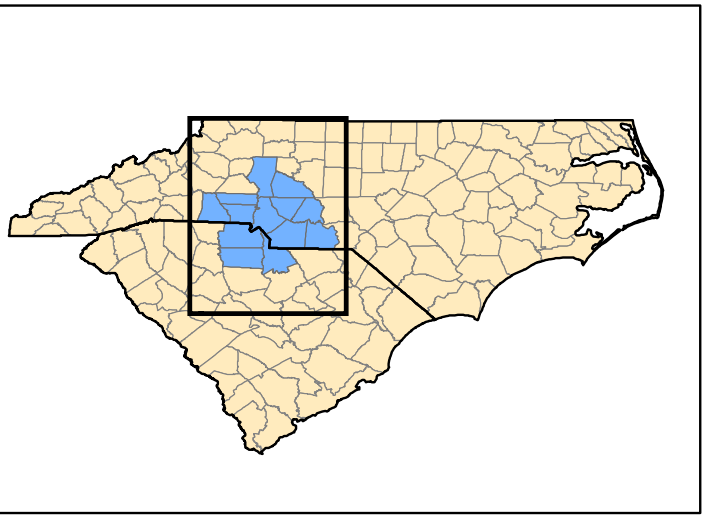


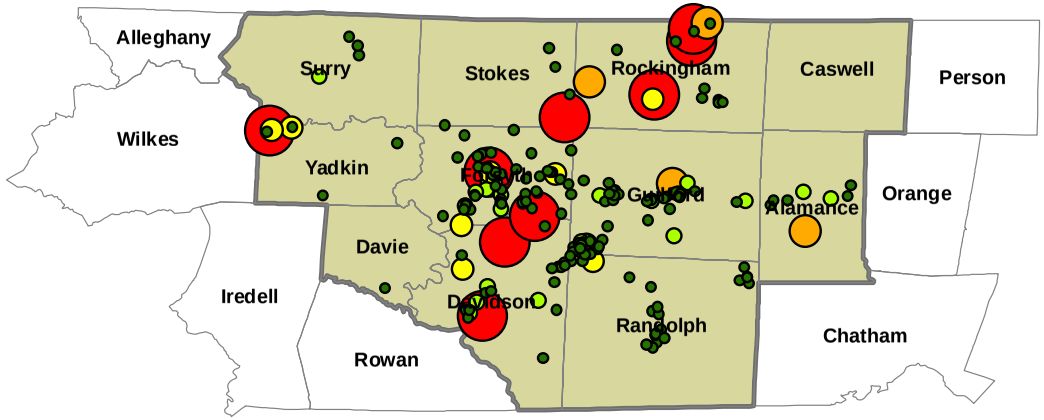


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Charlotte-Gastonia-Salisbury CSA

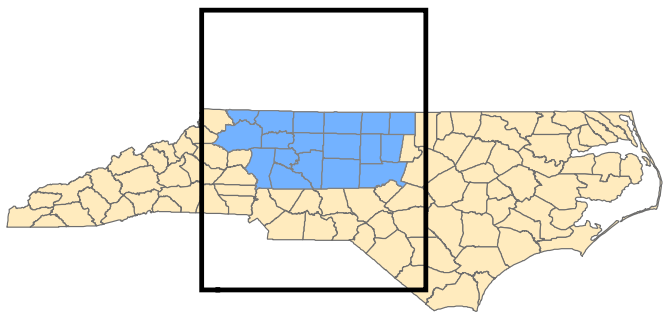


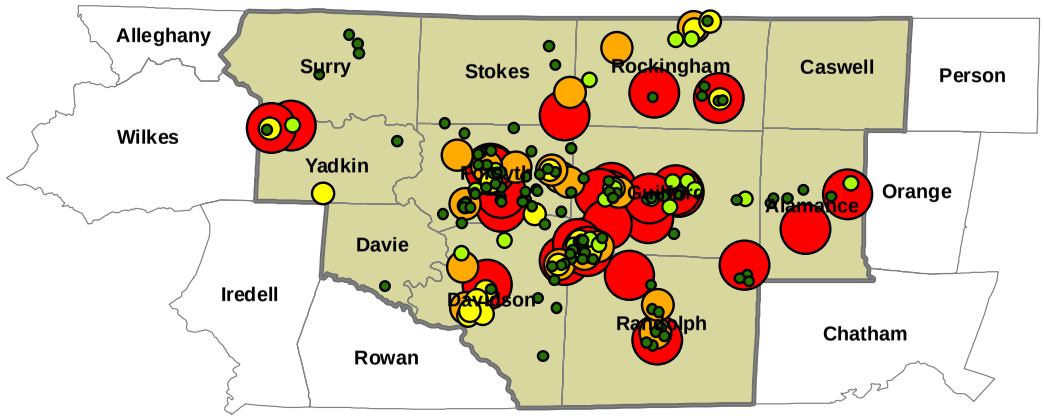


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Greensboro-High Point-Winston Salem CSA

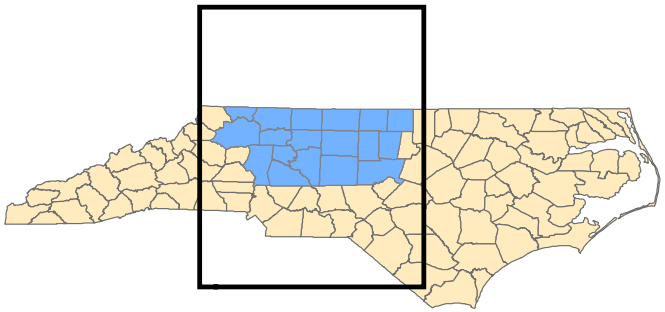


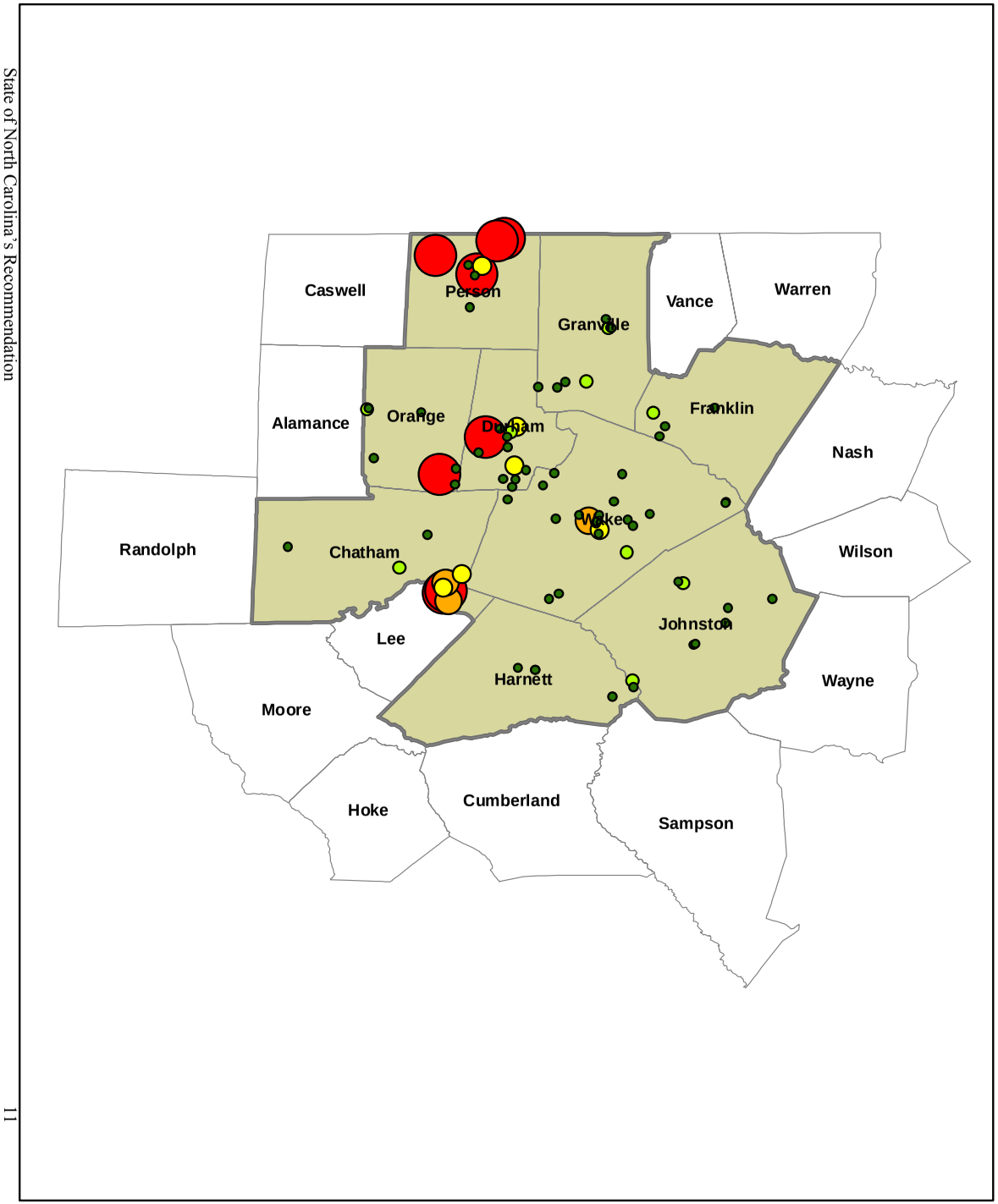


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Greensboro-High Point-Winston Salem CSA

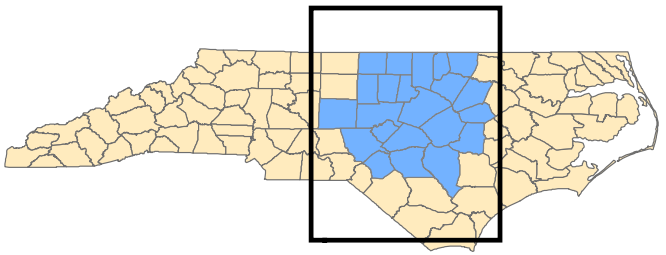


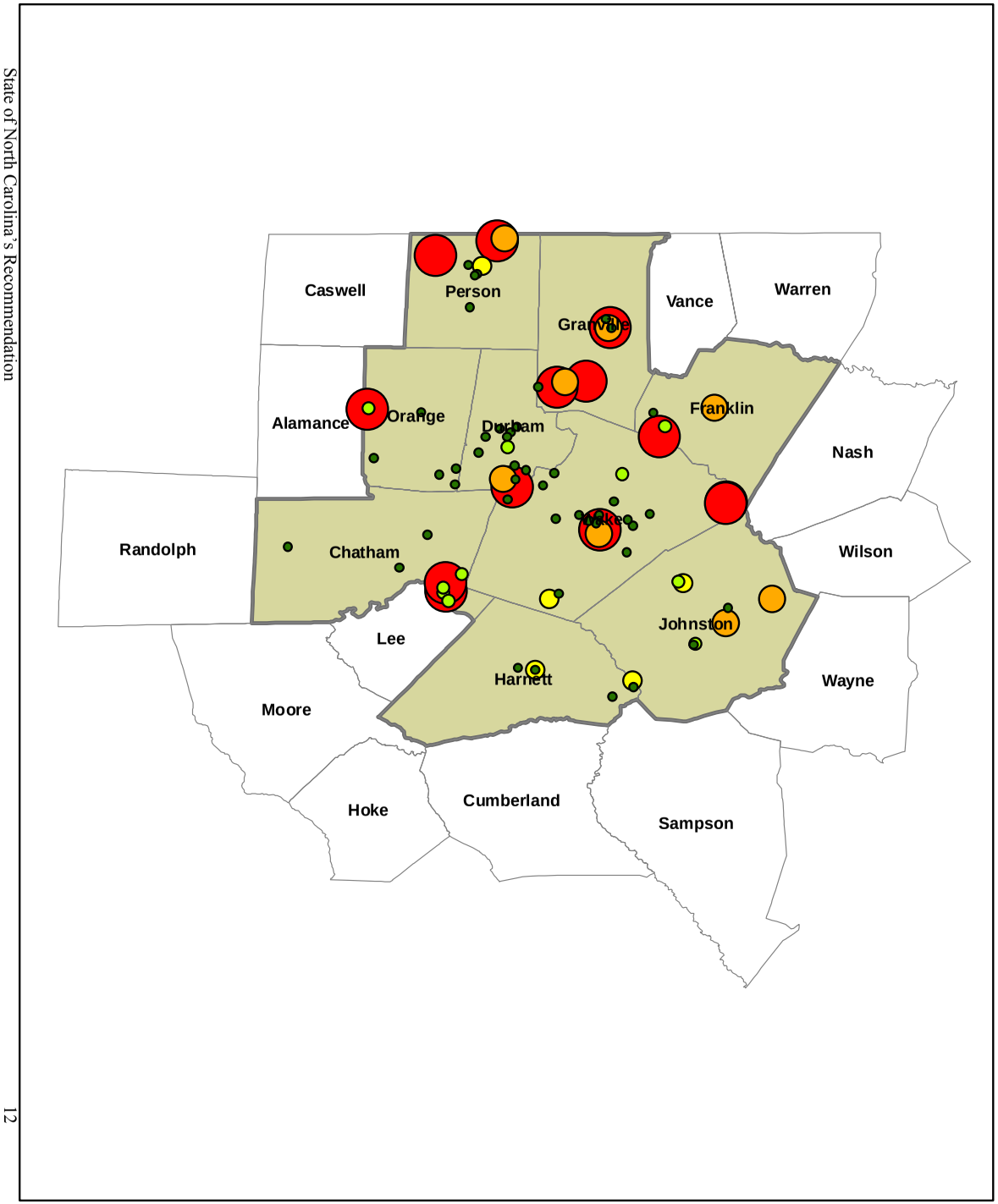


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Raleigh-Durham-Cary CSA

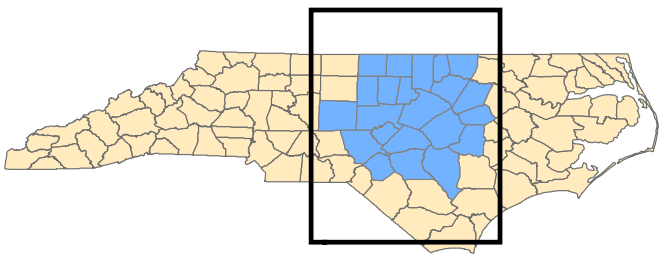


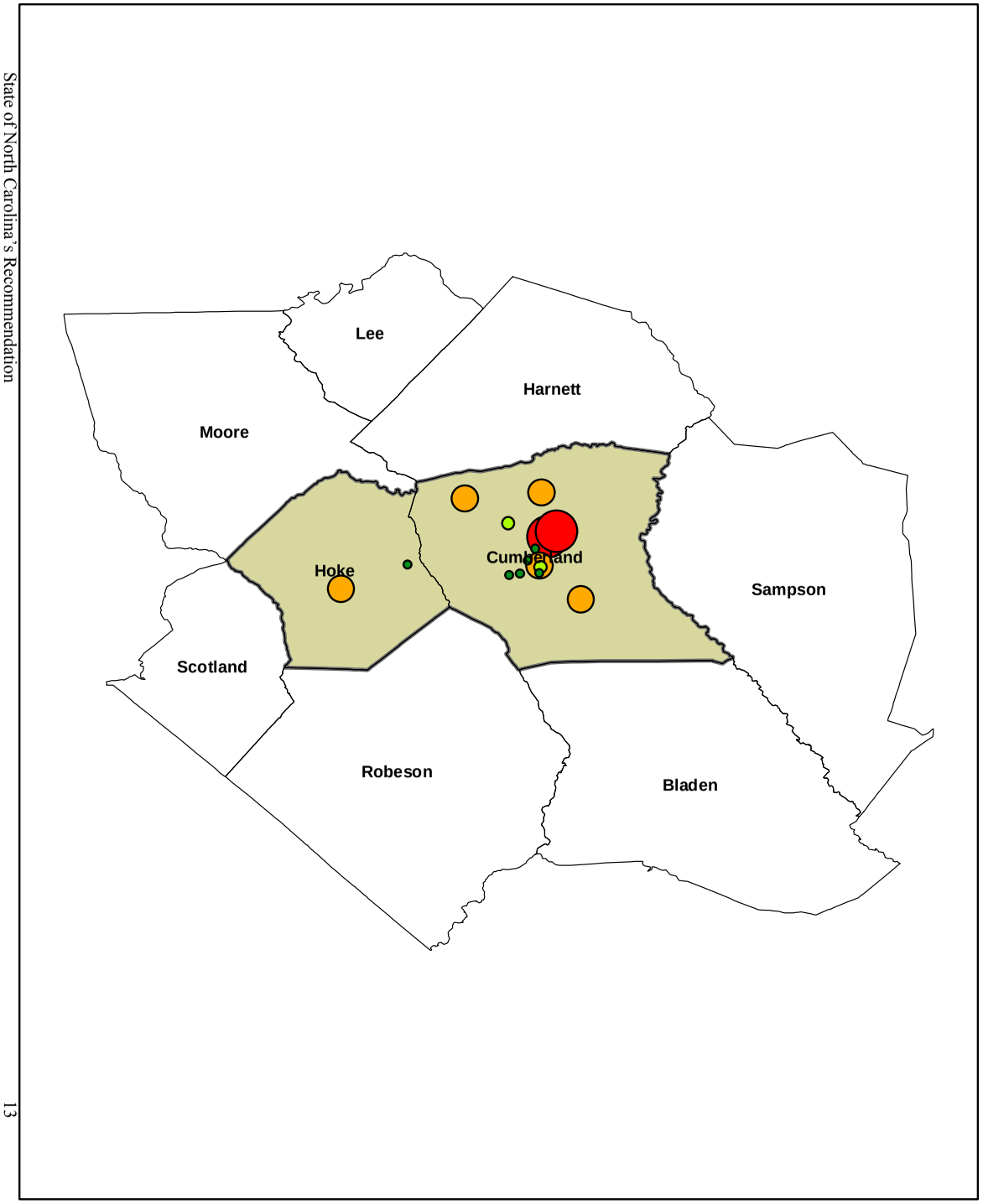


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Raleigh-Durham-Cary CSA

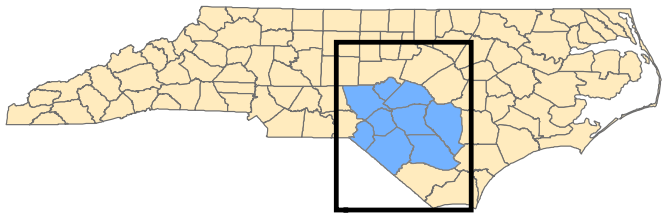


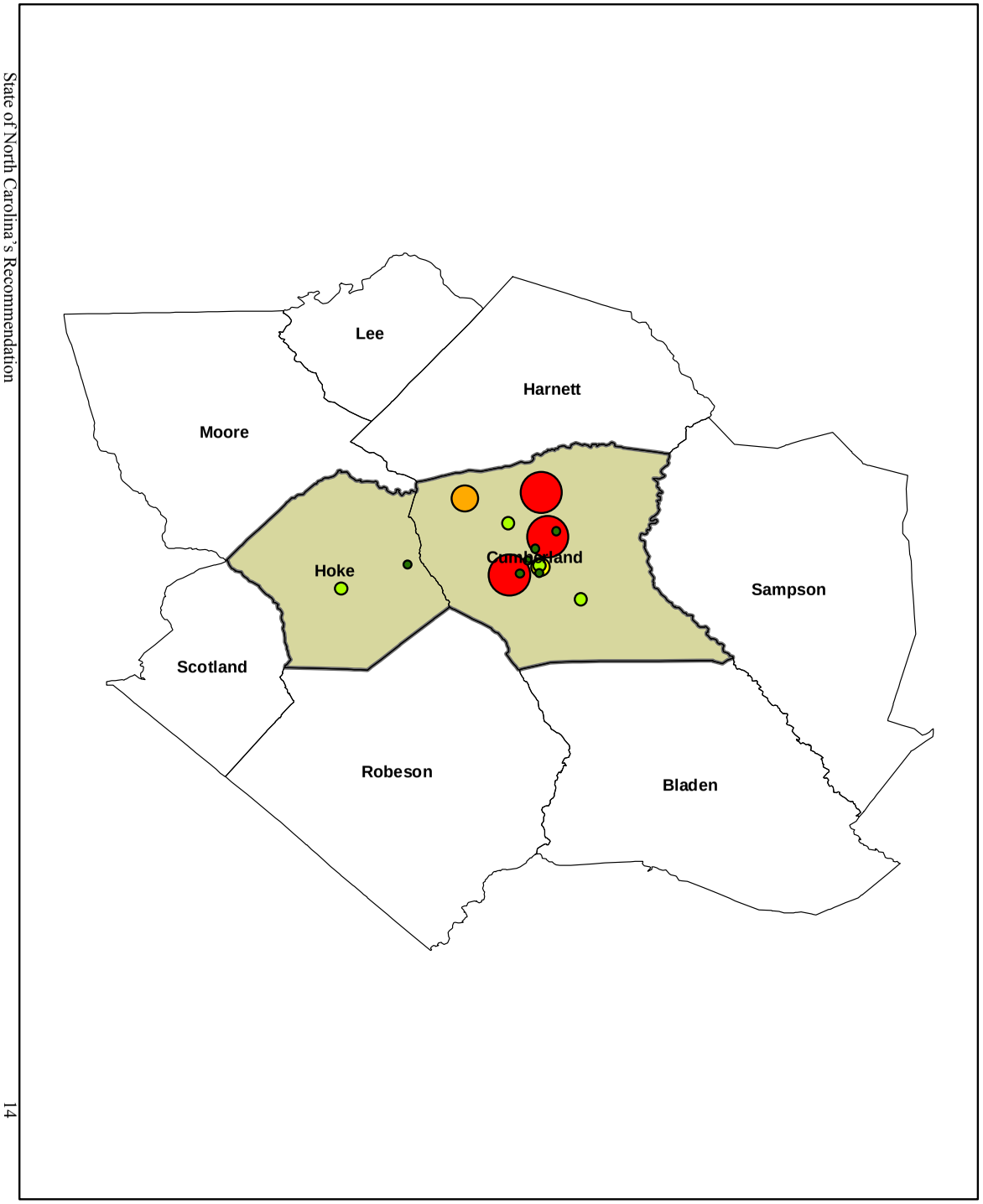


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Fayetteville MSA

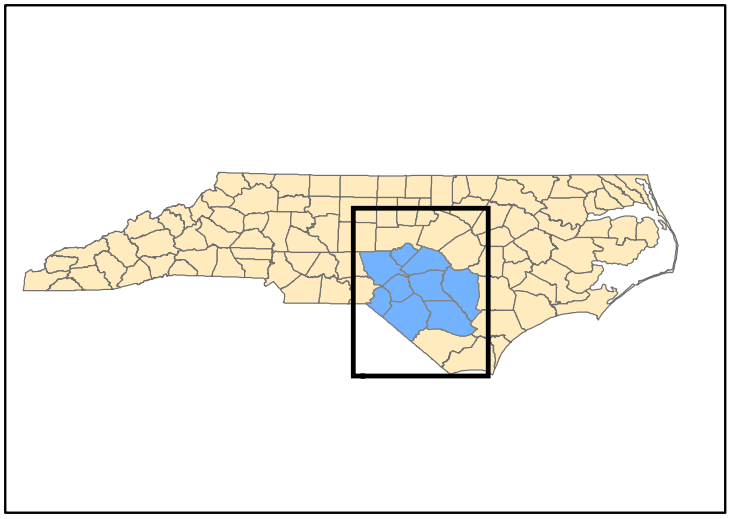


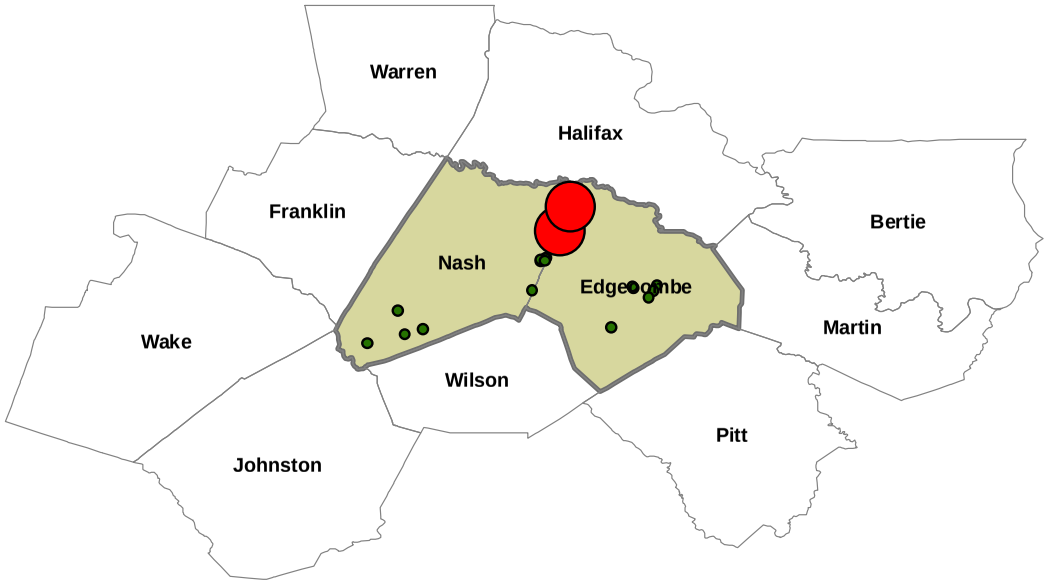


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Fayetteville MSA

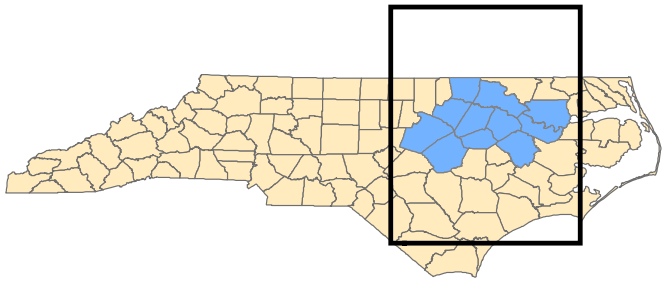


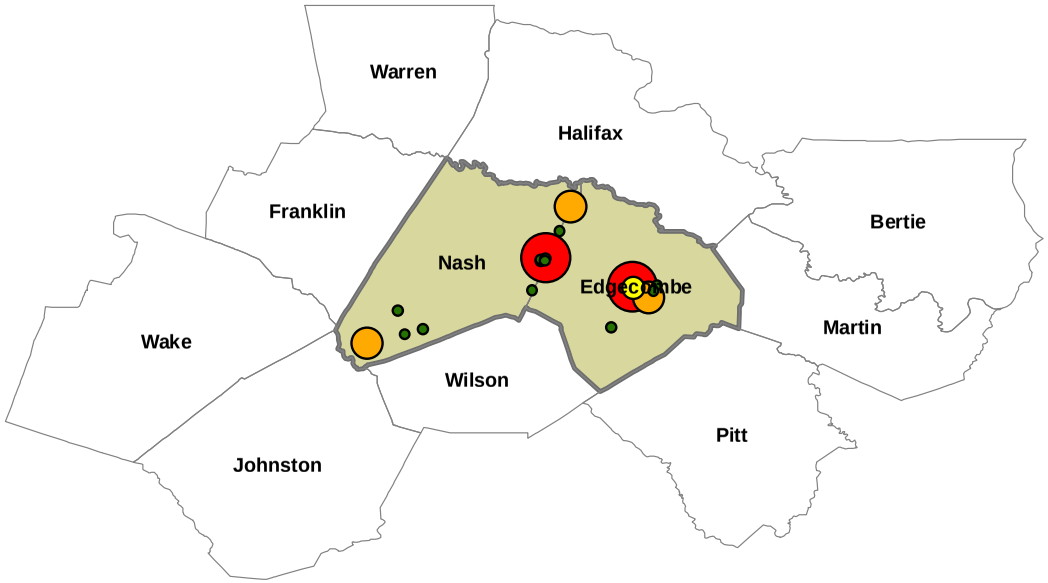


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Rocky Mount MSA

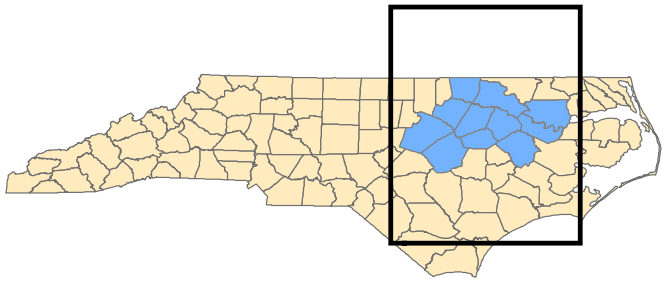


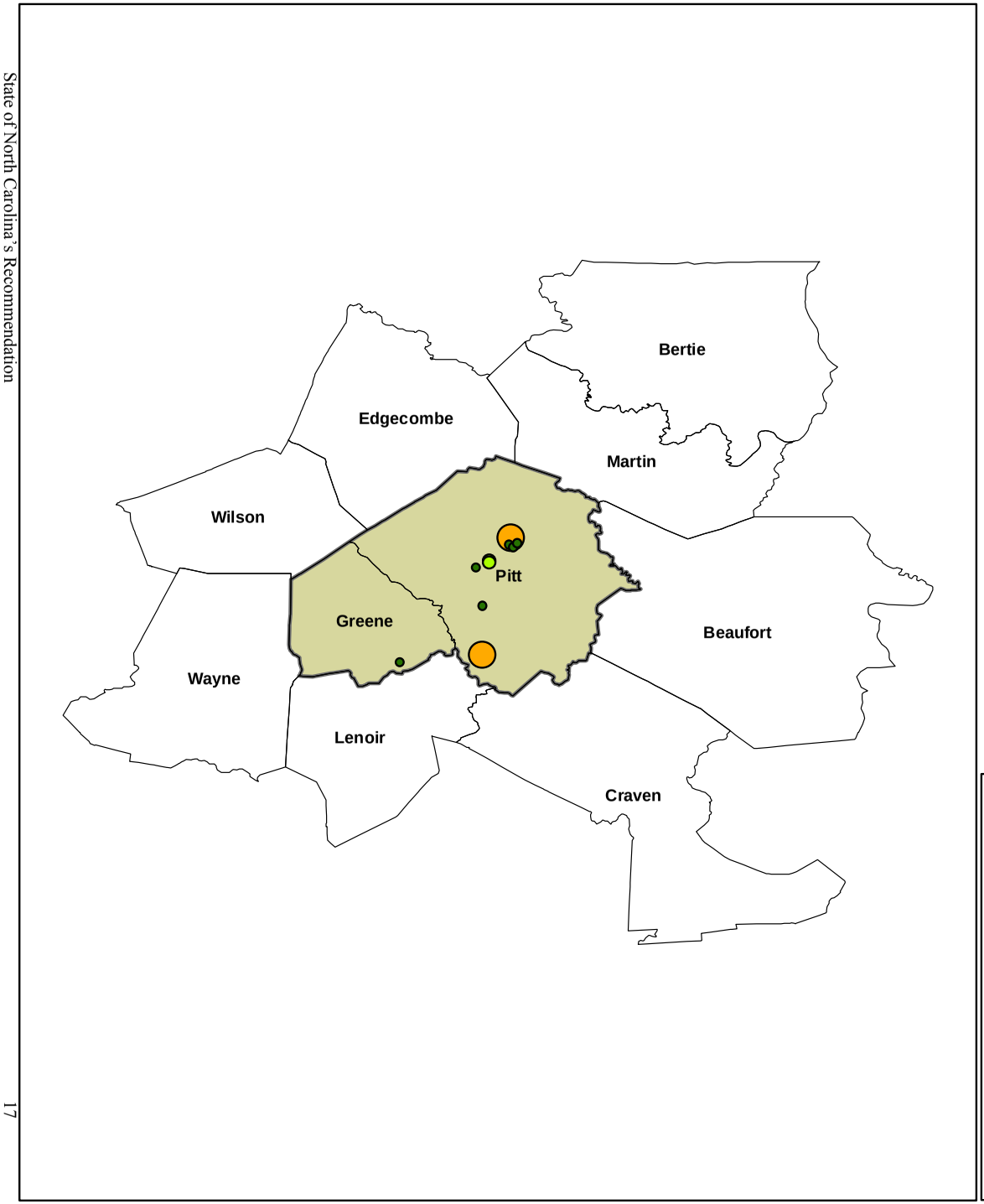


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Rocky Mount MSA

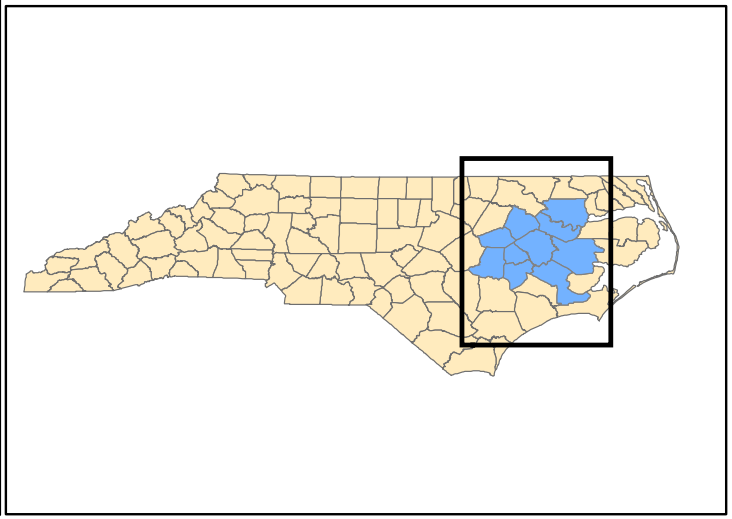


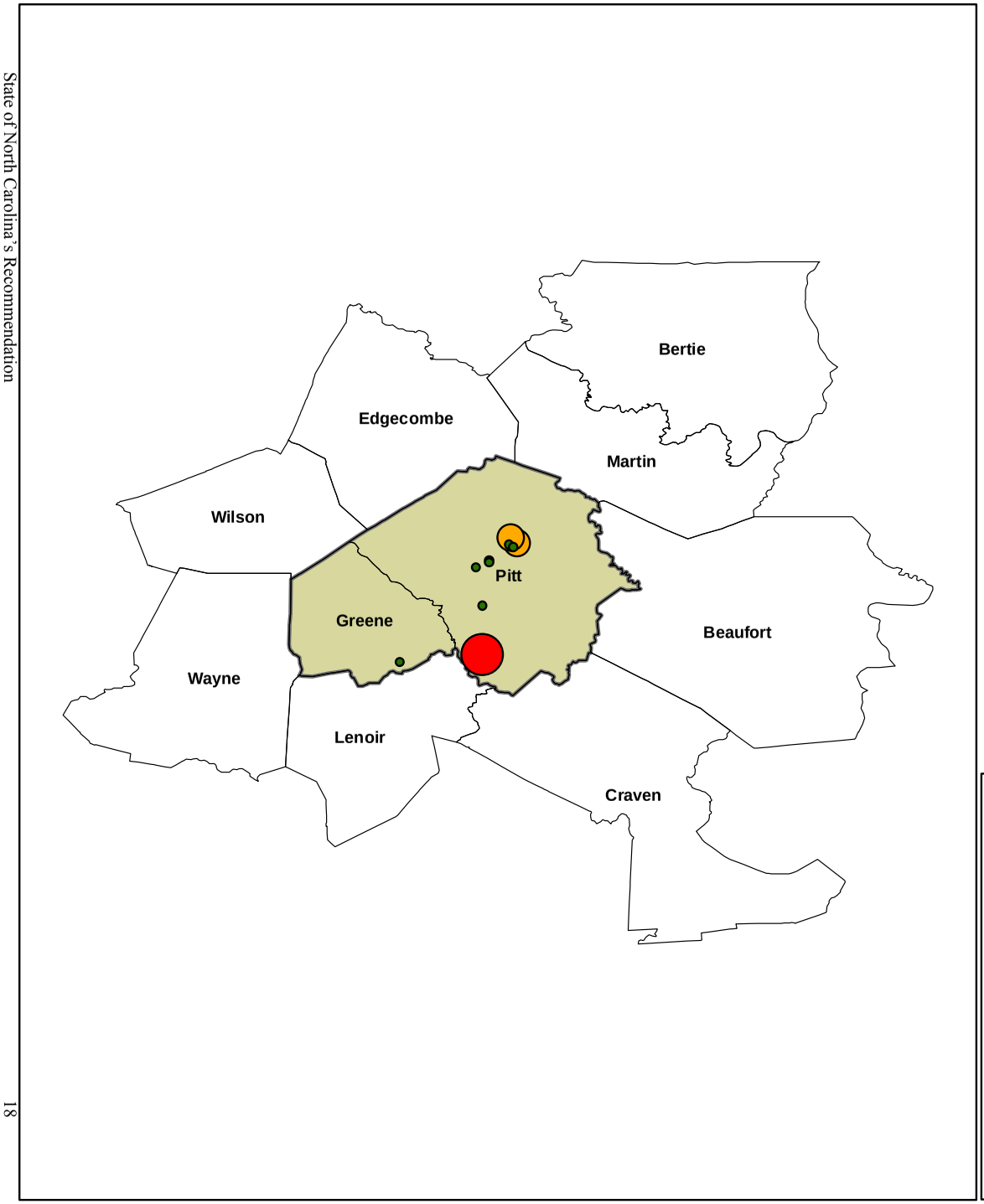


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Greenville MSA

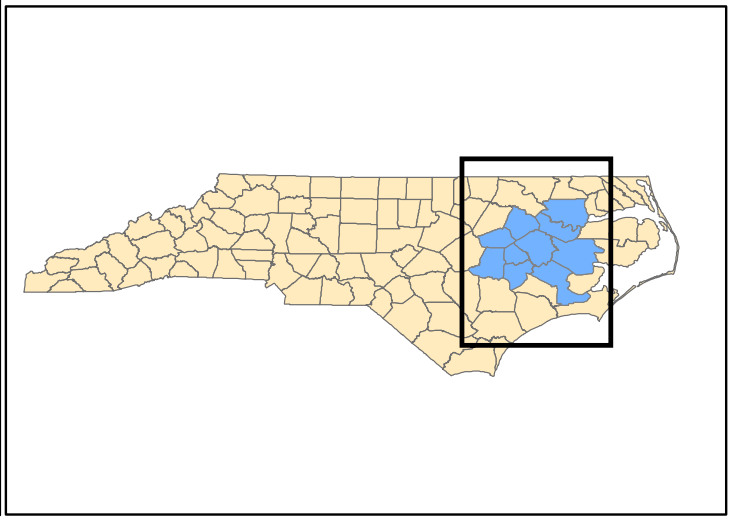


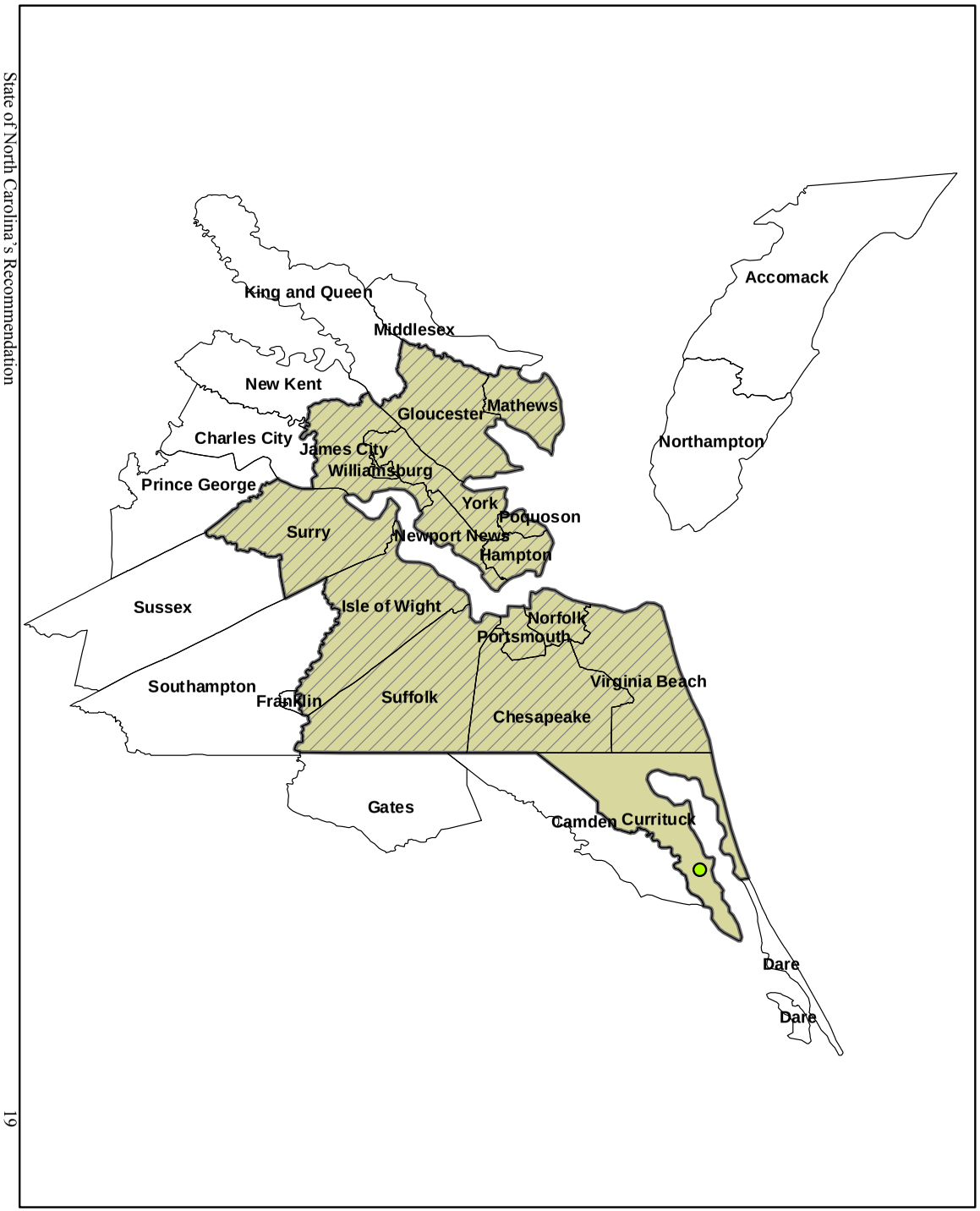


Point Source Emissions

VOC Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Greenville MSA

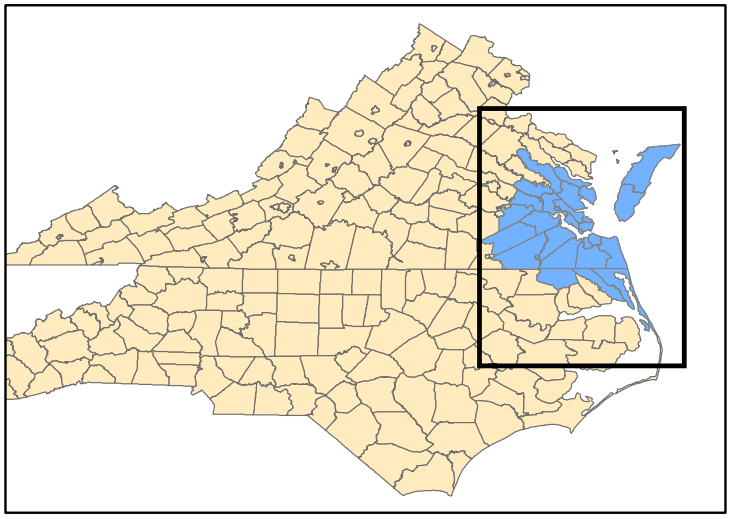


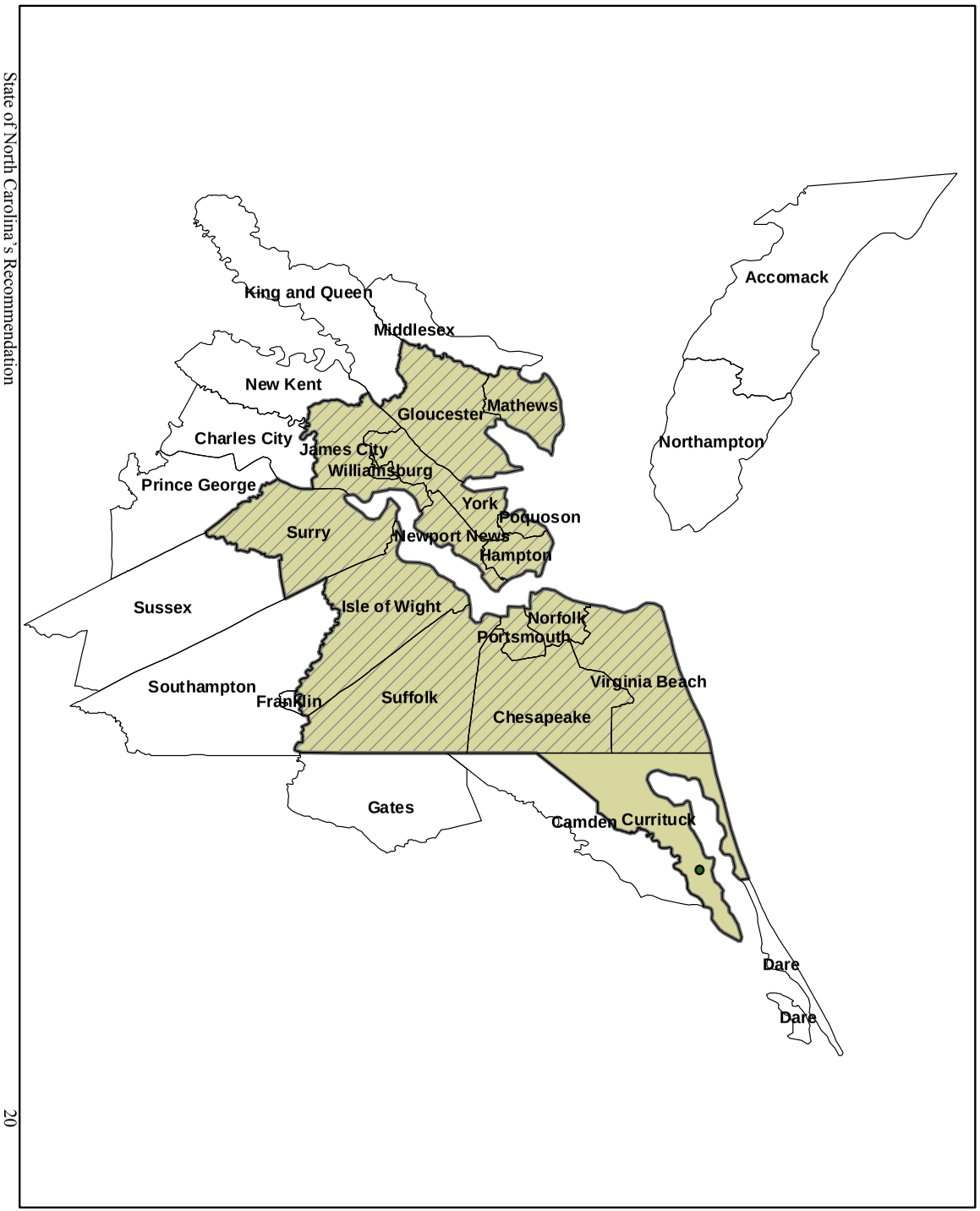


Point Source Emissions

NOx Emissions (Tons Per Year)

- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Virginia Beach-Norfolk-Newport News MSA

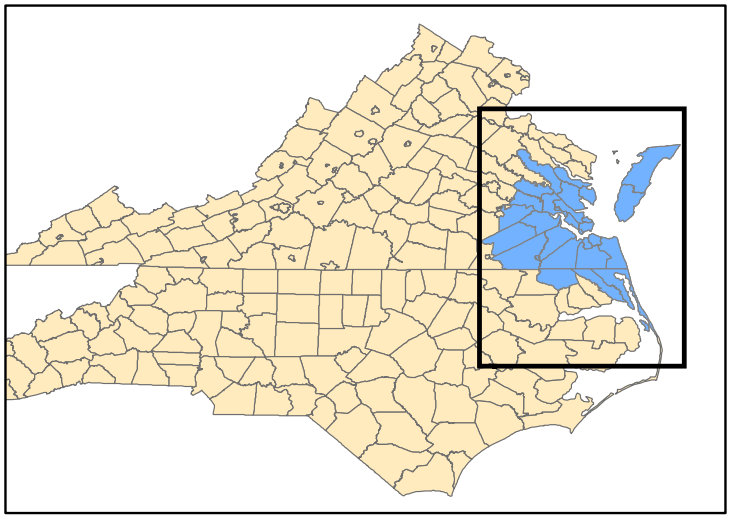




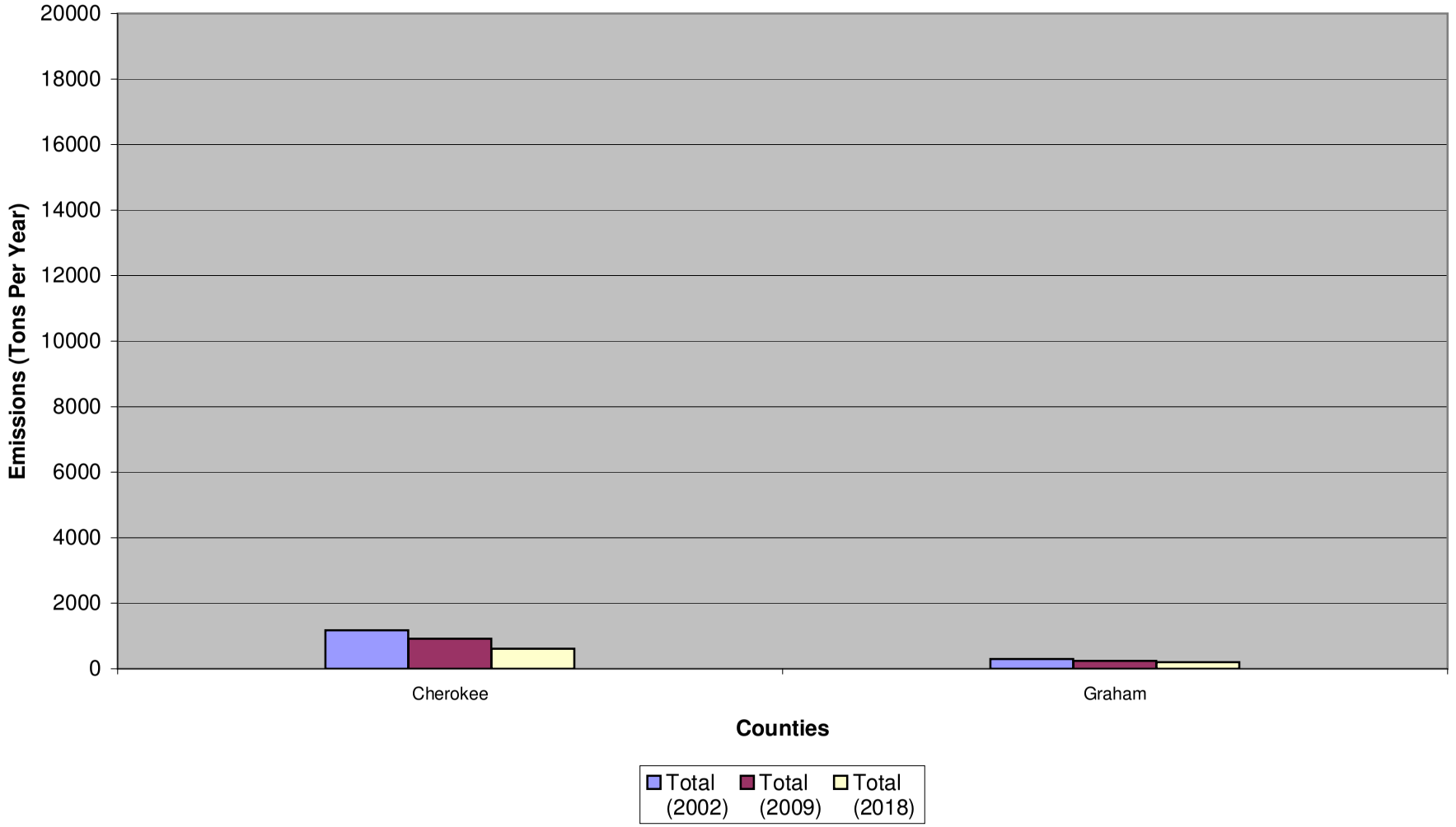
Point Source Emissions

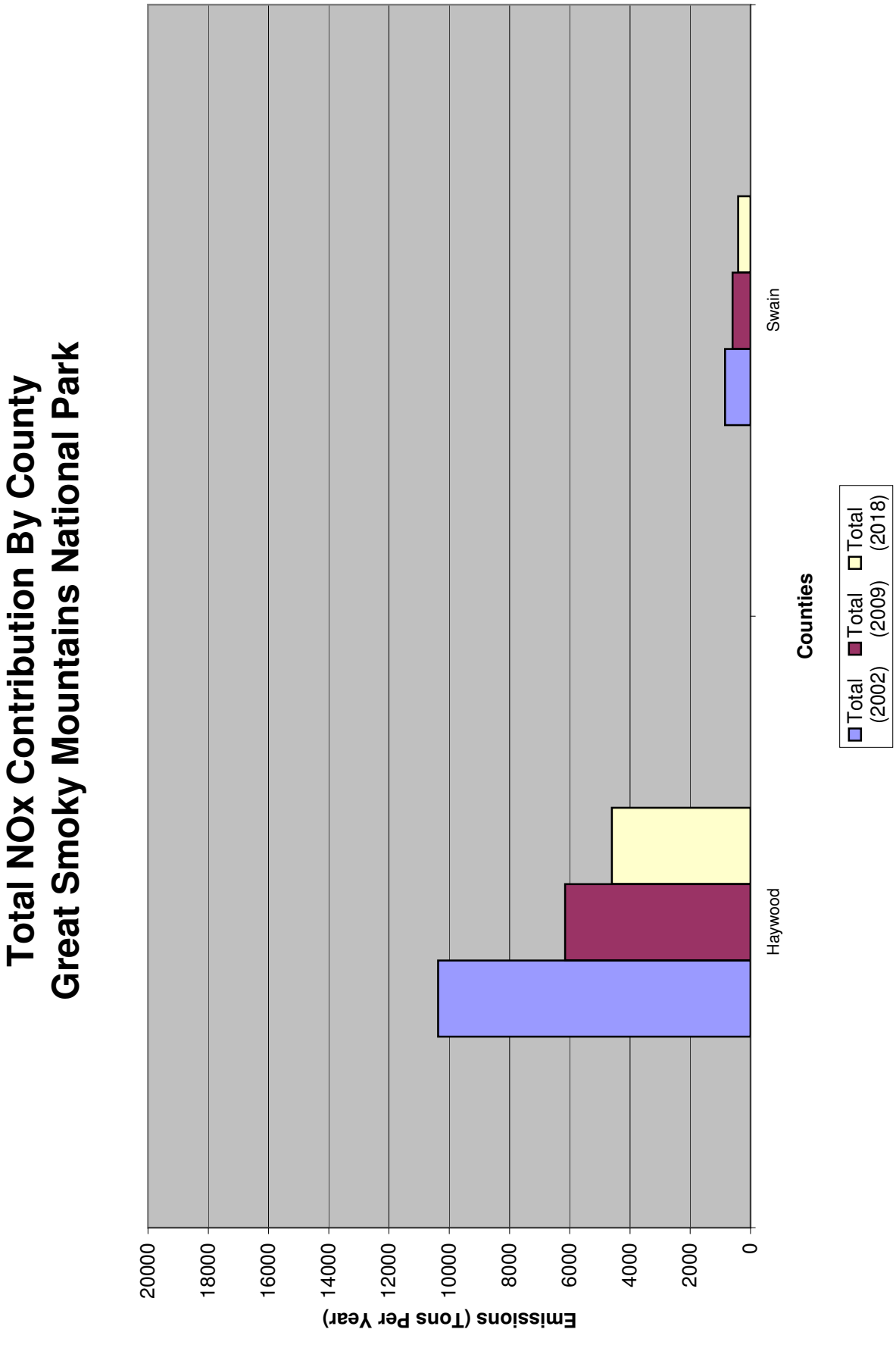
VOC Emissions (Ton Per Year)

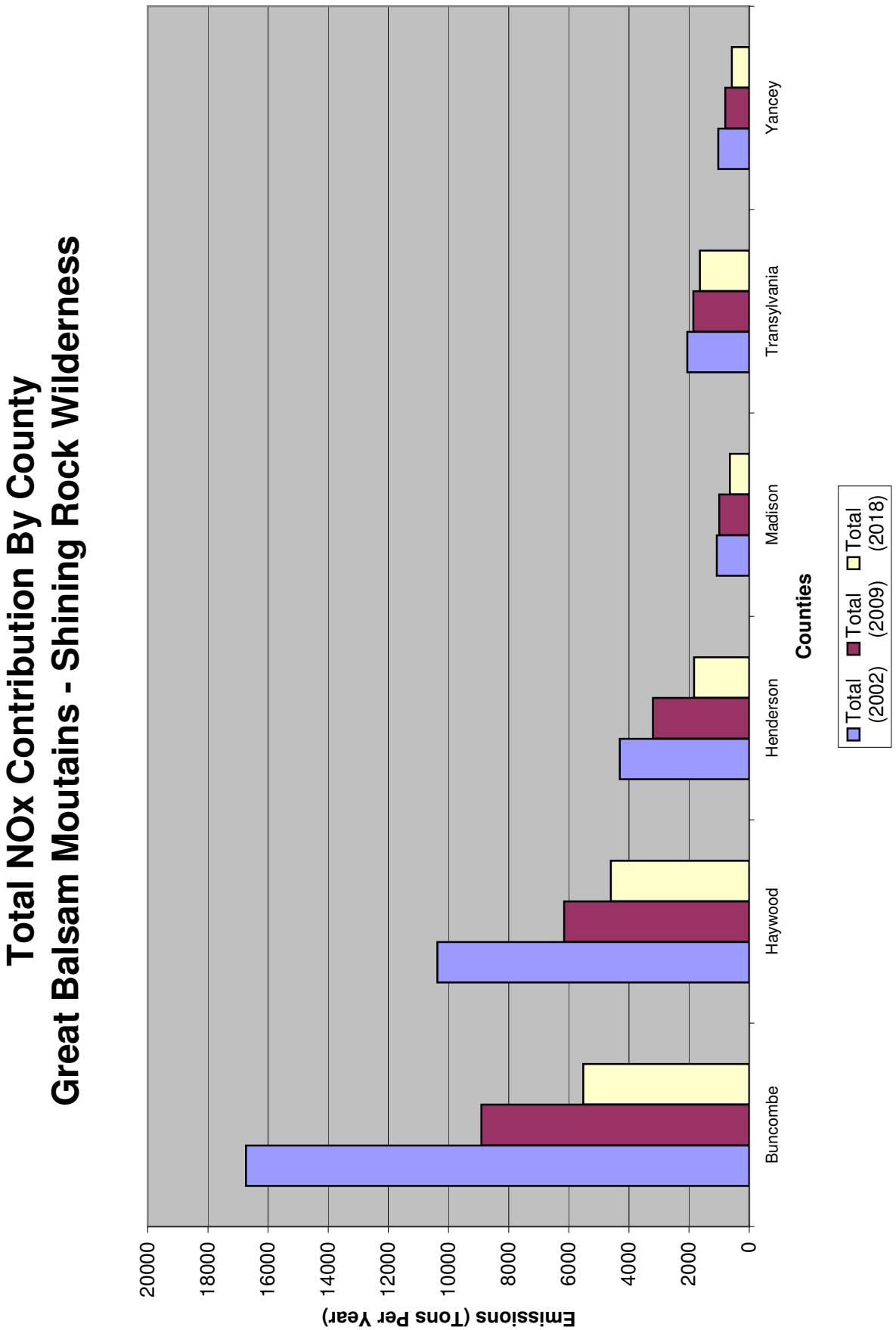
- 0 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100+
- Virginia Beach-Norfolk-Newport News MSA

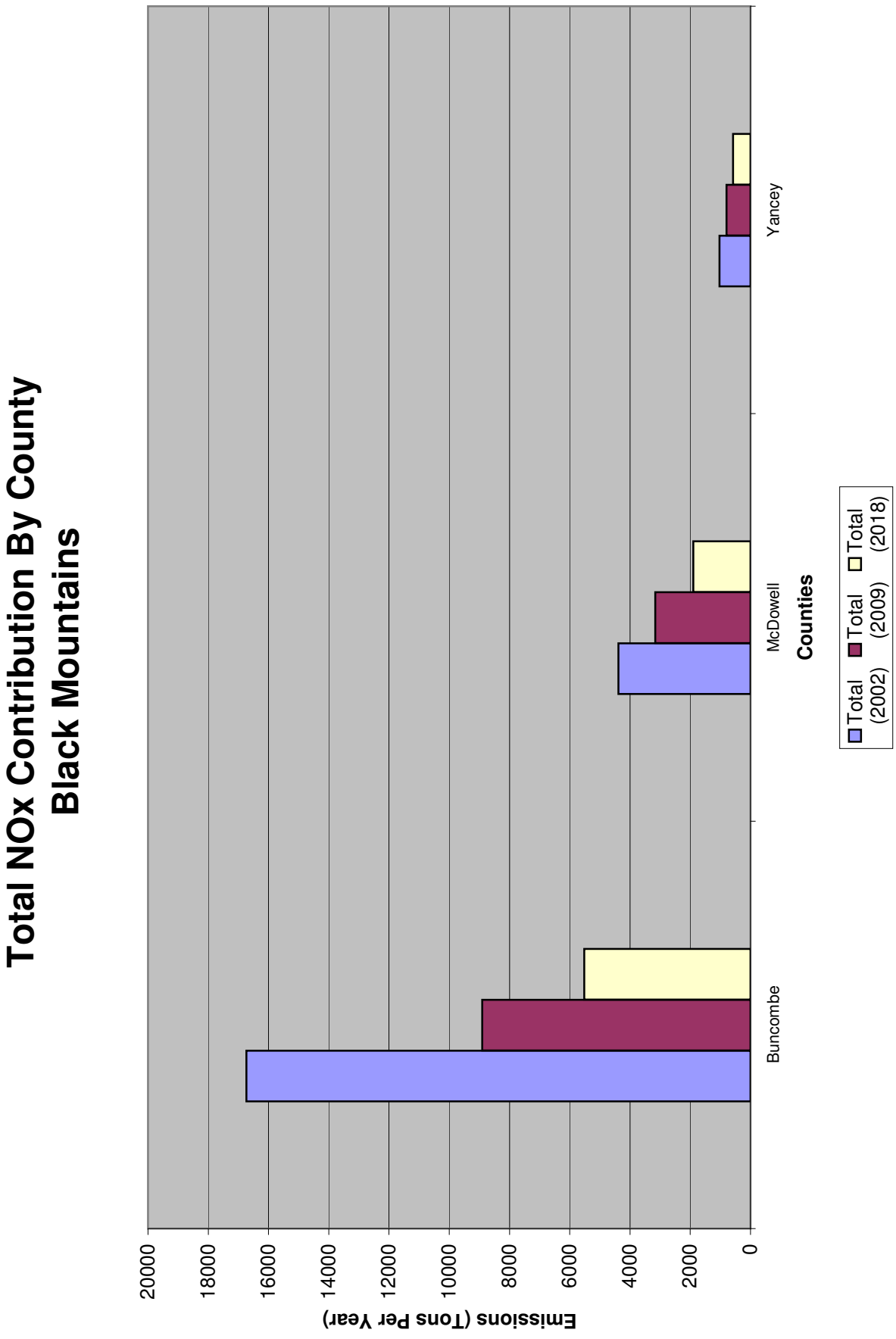


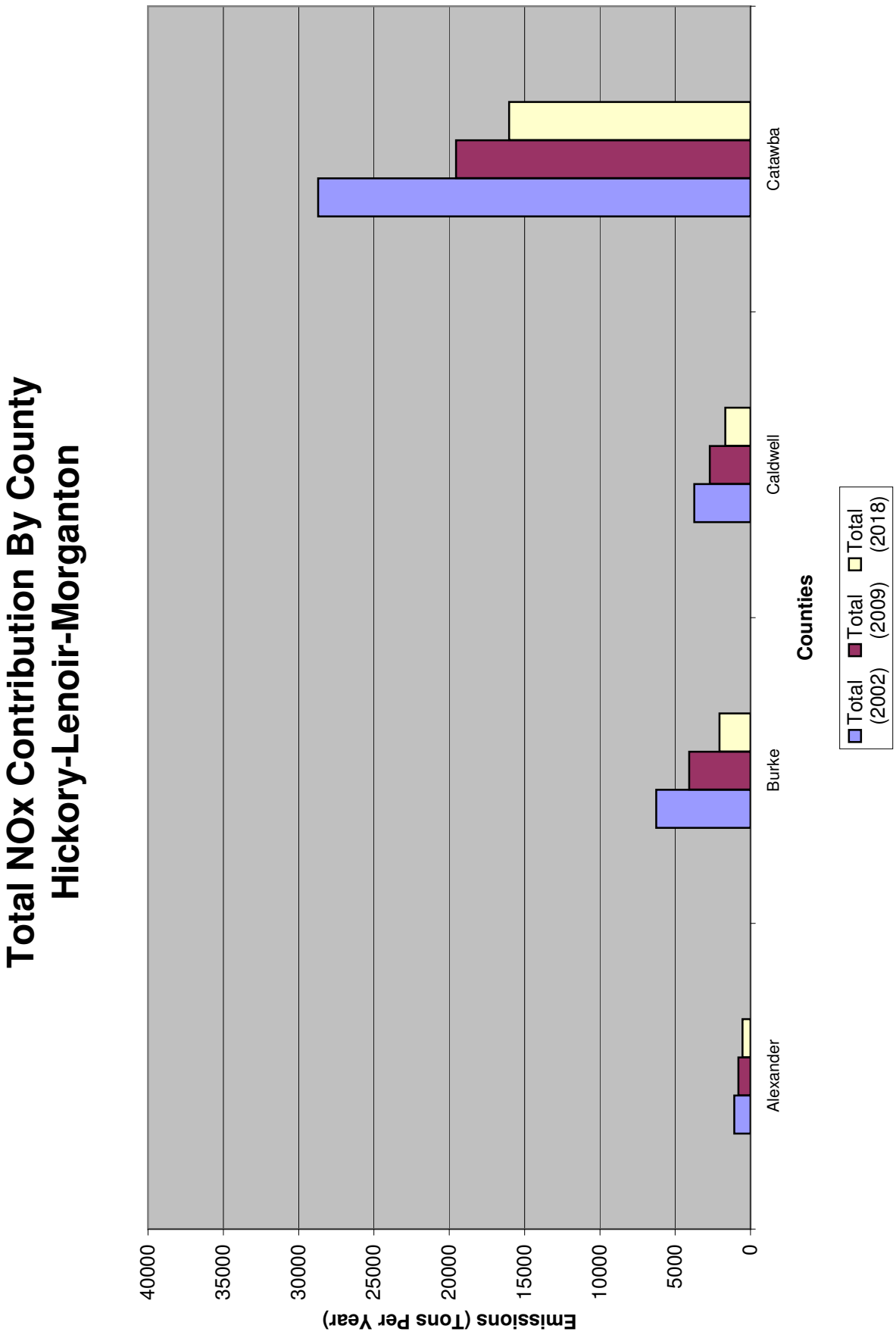
Total NOx Contribution By County
Snow Bird Mountains - Joyce Kilmer-Slickrock Wilderness

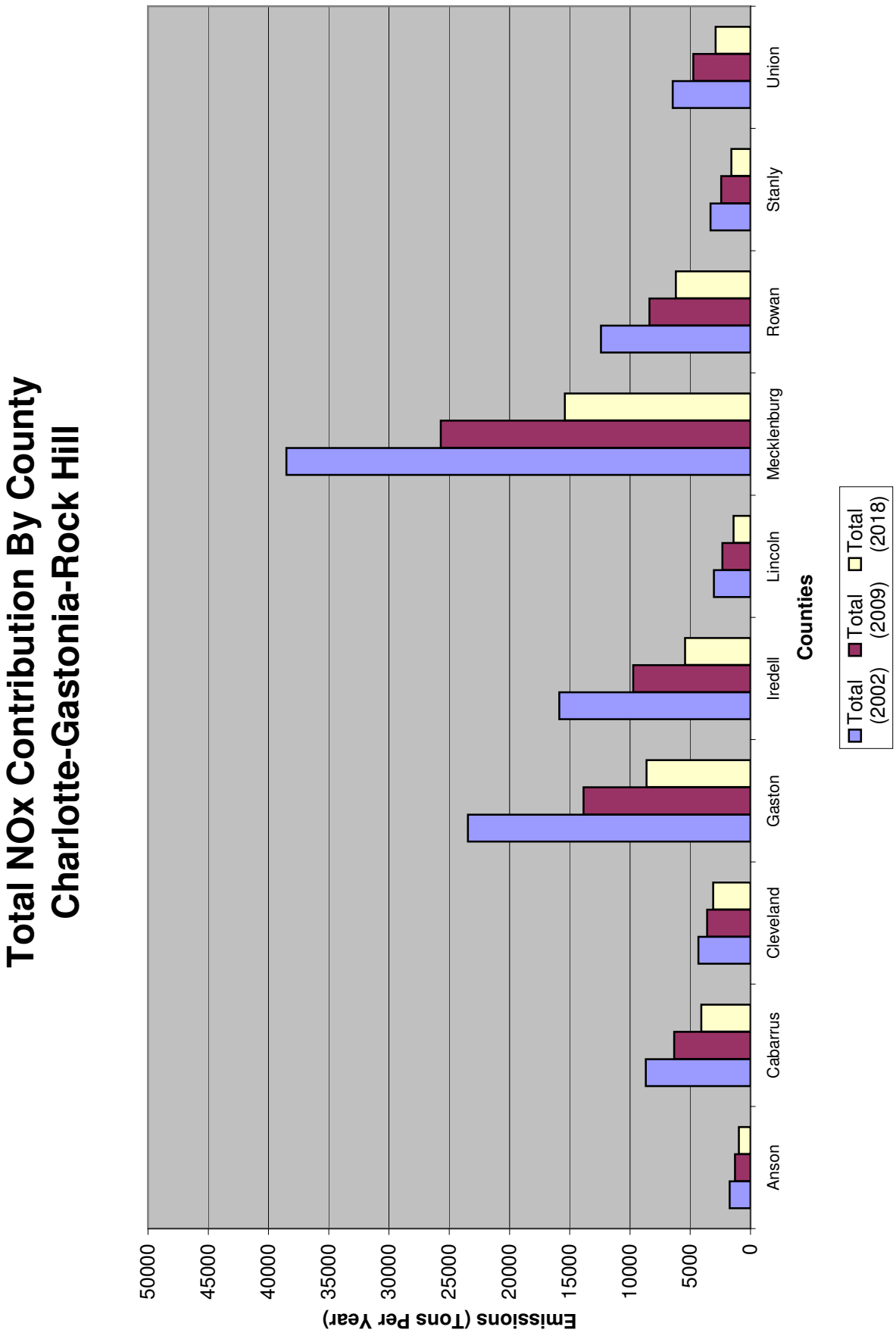


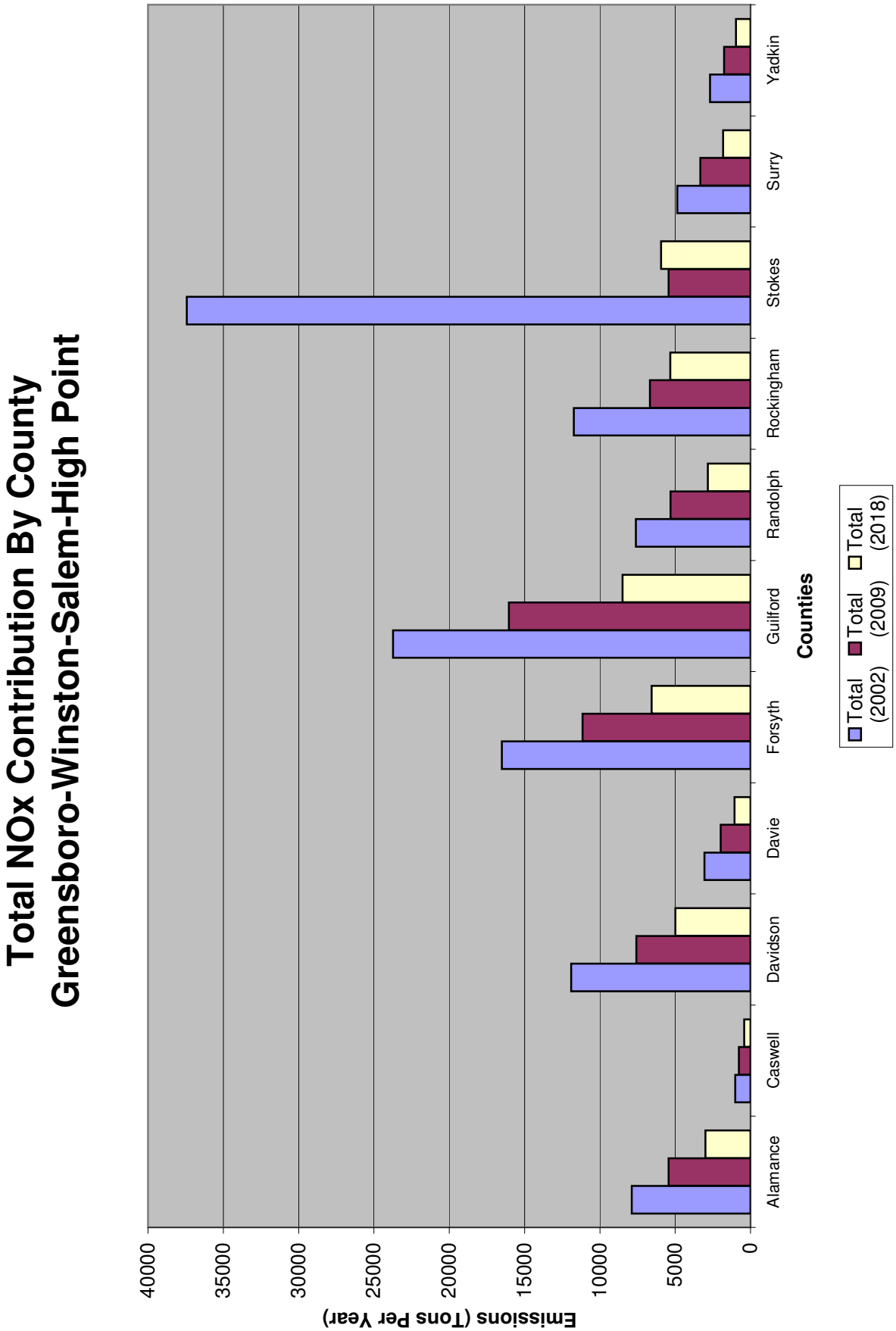

Total NOx Contribution By County
Great Smoky Mountains National Park
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Haywood
Swain
Counties
Total (2002)
Total (2009)
Total (2018)

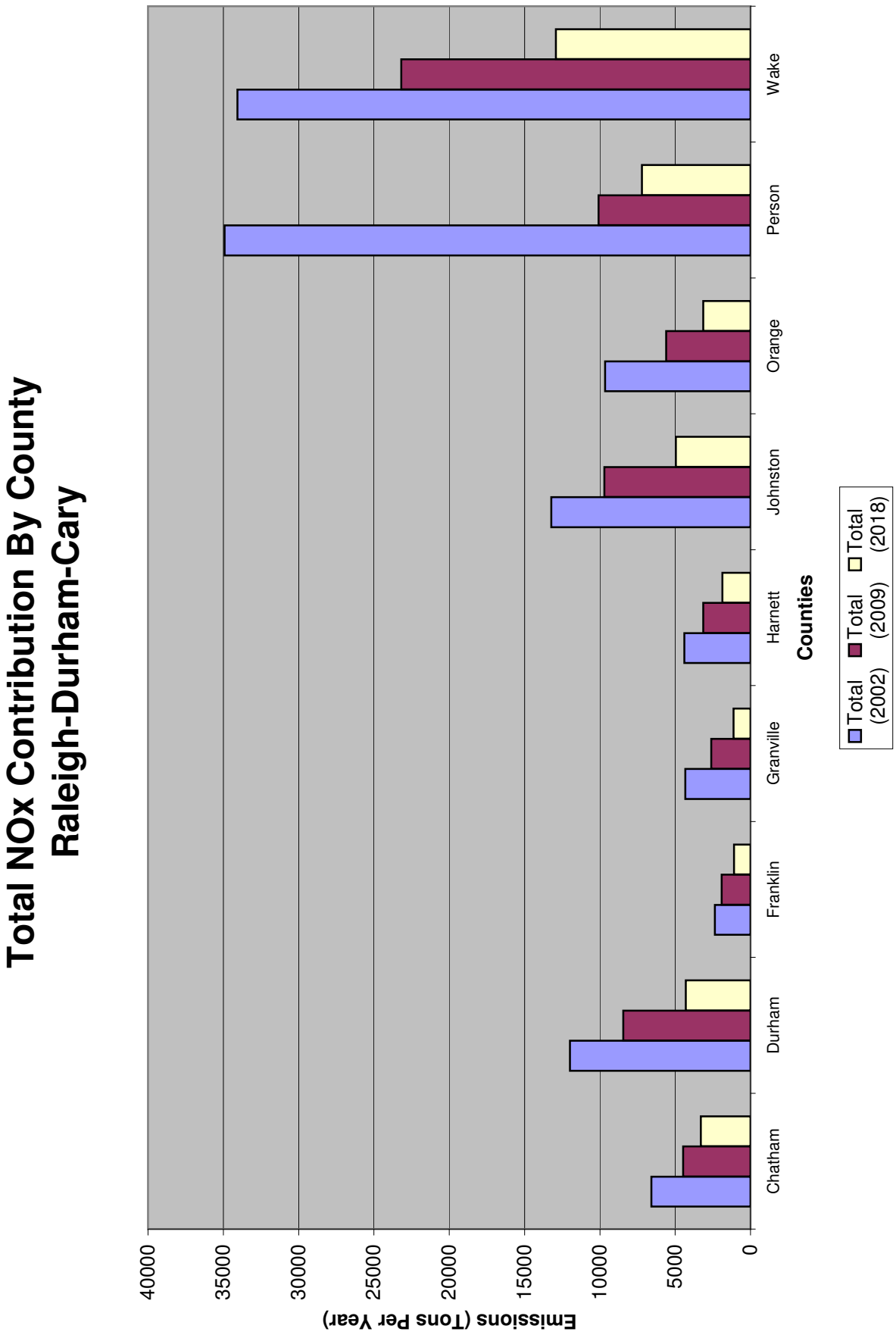

Total NOx Contribution By County
Great Balsam Moutains - Shining Rock Wilderness
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Buncombe
Haywood
Henderson
Madison
Transylvania
Yancey
Counties
Total (2002)
Total (2009)
Total (2018)

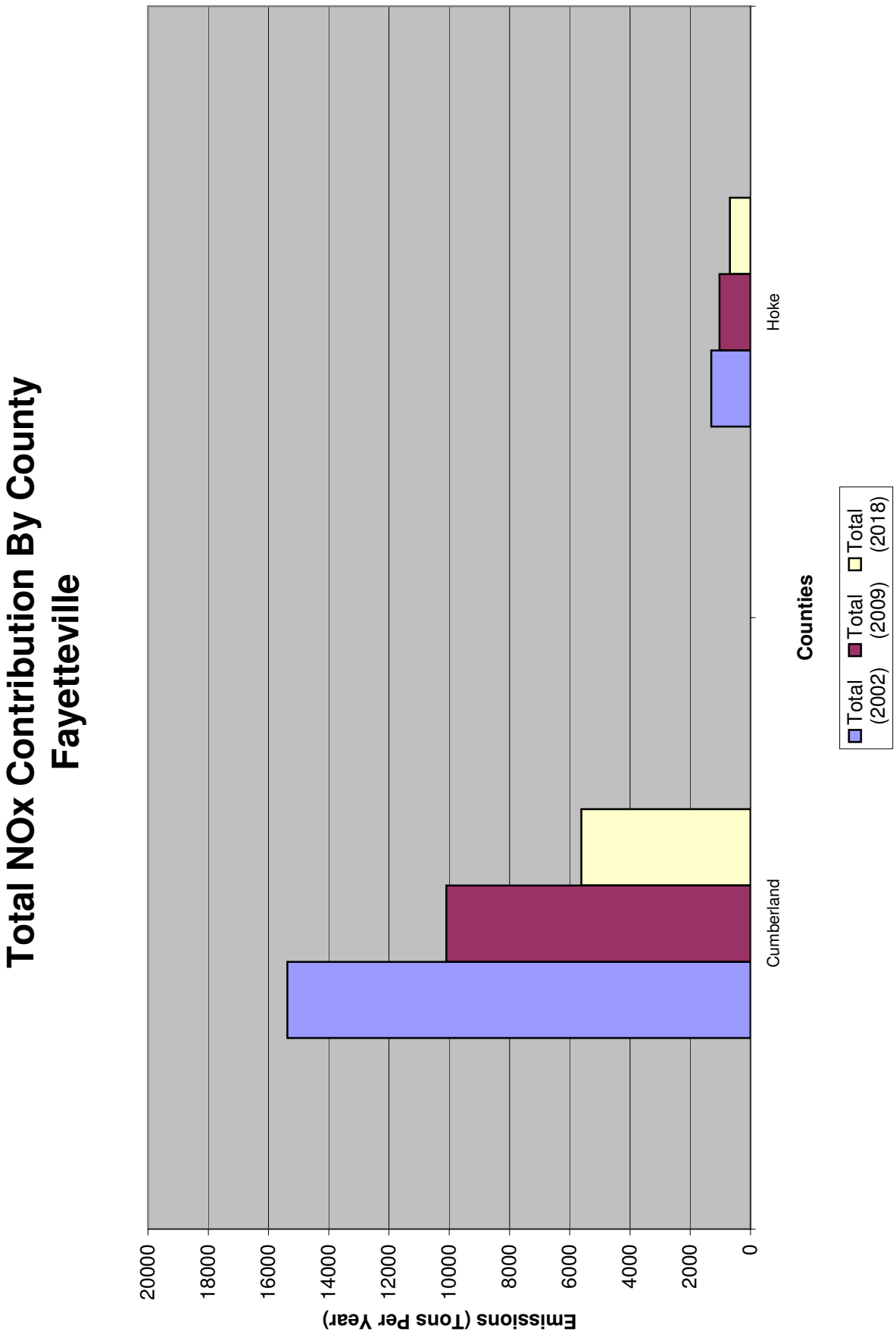

Total NOx Contribution By County
Black Mountains
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Buncombe
McDowell
Yancey
Counties
Total (2002)
Total (2009)
Total (2018)

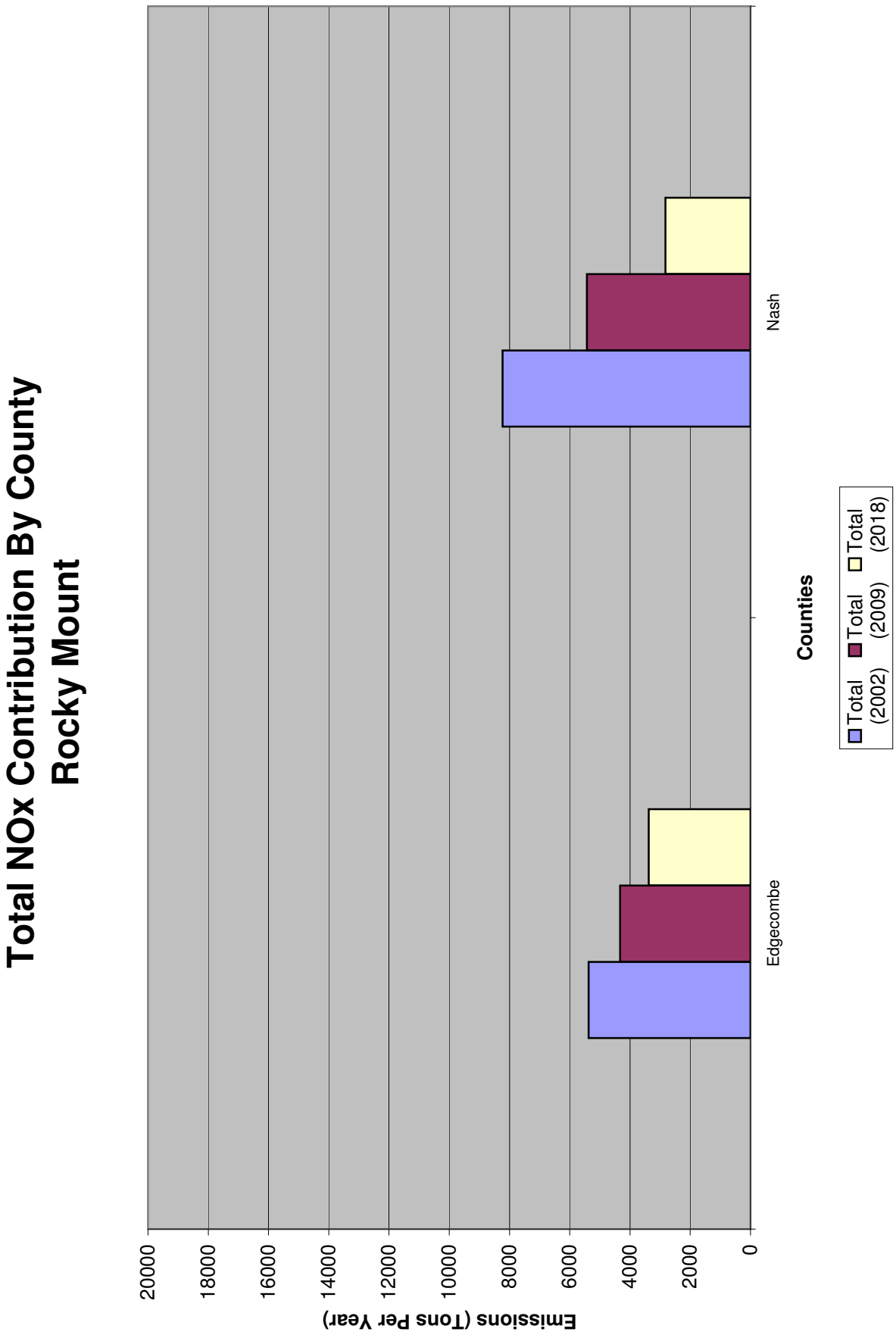

Total NOx Contribution By County
Hickory-Lenoir-Morganton
Emissions (Tons Per Year)
40000
35000
30000
25000
20000
15000
10000
5000
0
Alexander
Burke
Caldwell
Catawba
Counties
Total (2002)
Total (2009)
Total (2018)

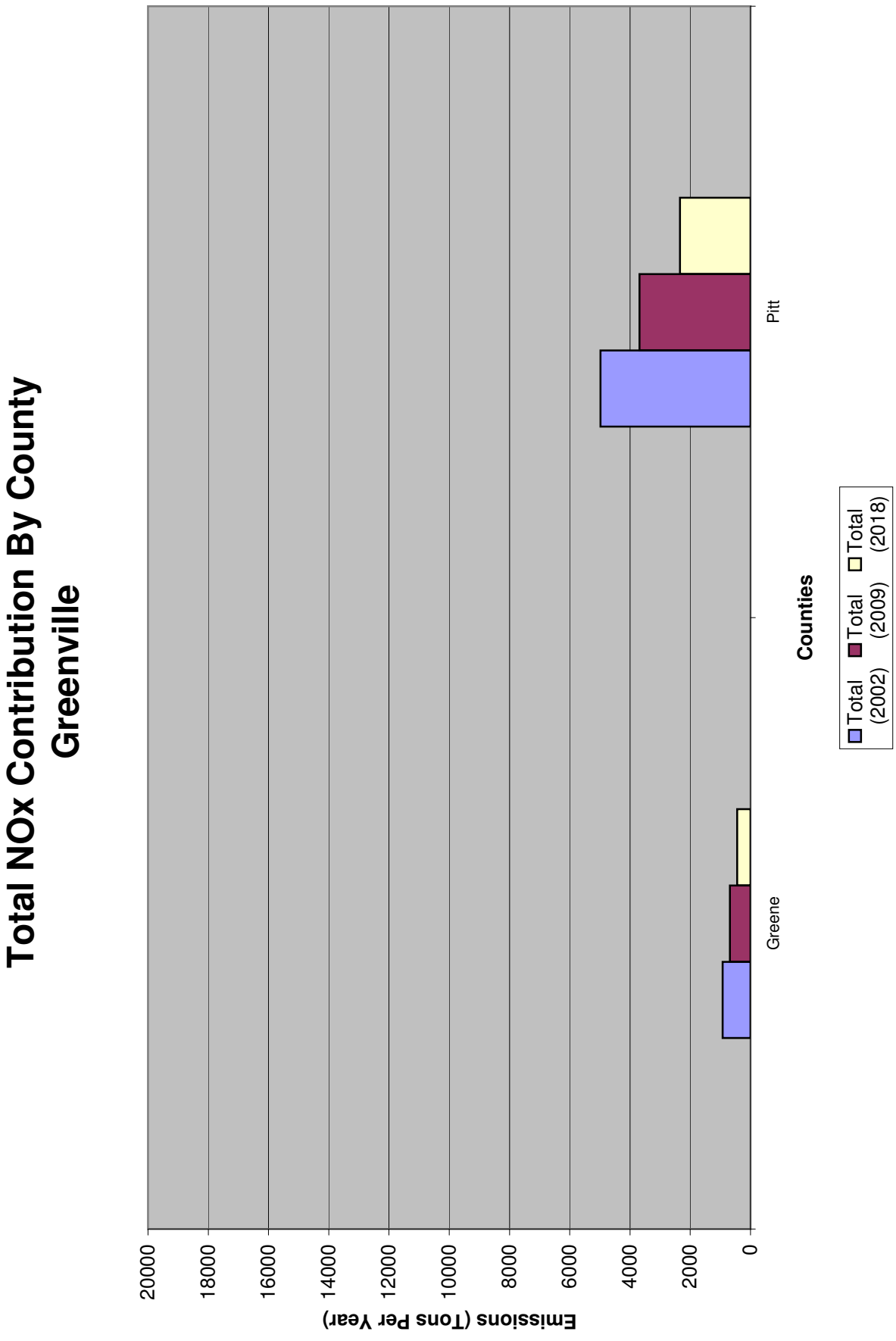

Total NOx Contribution By County
Charlotte-Gastonia-Rock Hill
Emissions (Tons Per Year)
0
5000
10000
15000
20000
25000
30000
35000
40000
45000
50000
Anson
Cabarrus
Cleveland
Gaston
Iredell
Lincoln
Mecklenburg
Rowan
Stanly
Union
Counties
Total (2002)
Total (2009)
Total (2018)

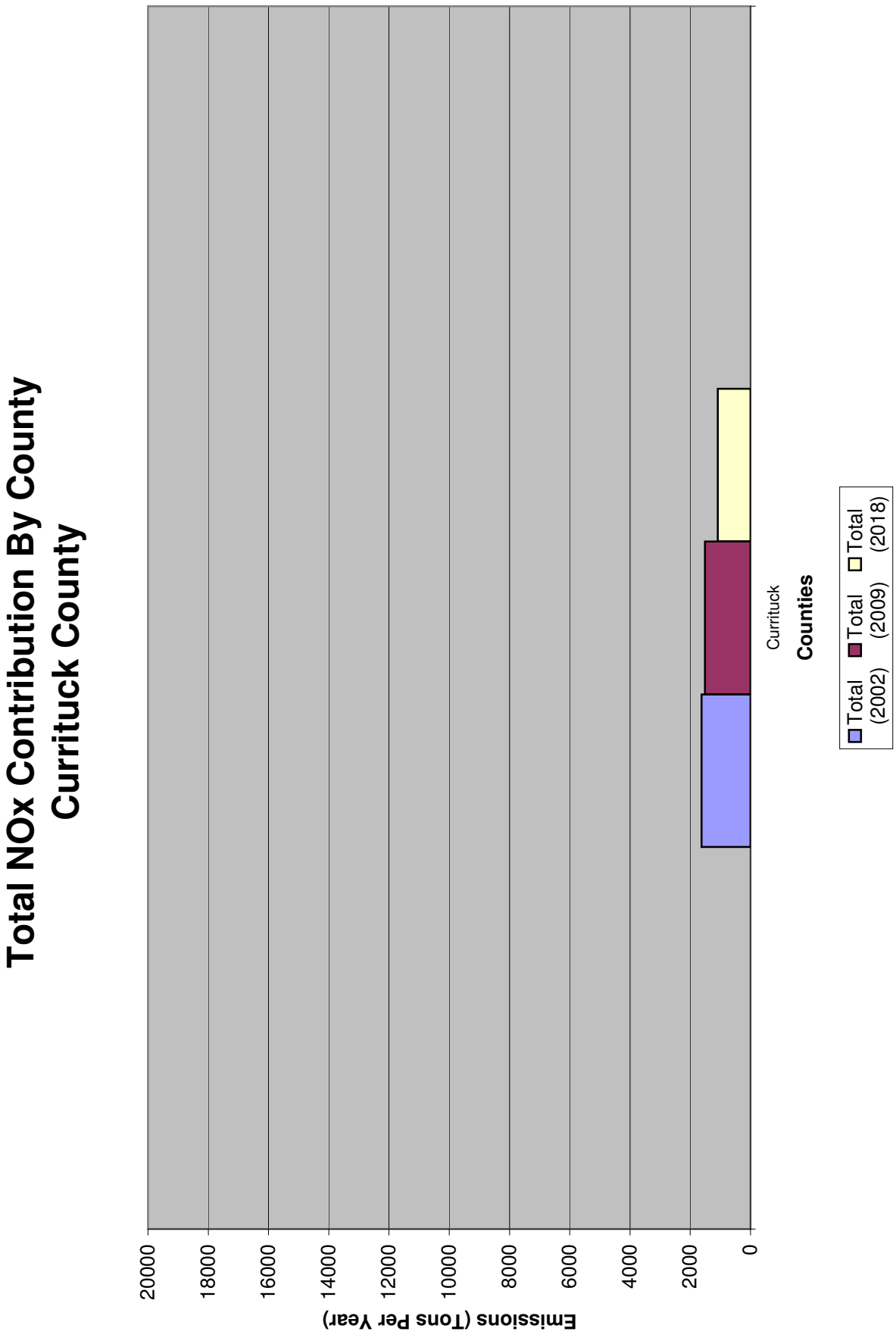

Total NOx Contribution By County
Greensboro-Winston-Salem-High Point
Emissions (Tons Per Year)
0
5000
10000
15000
20000
25000
30000
35000
40000
Alamance
Caswell
Davidson
Davie
Forsyth
Guilford
Randolph
Rockingham
Stokes
Surry
Yadkin
Counties
Total (2002)
Total (2009)
Total (2018)

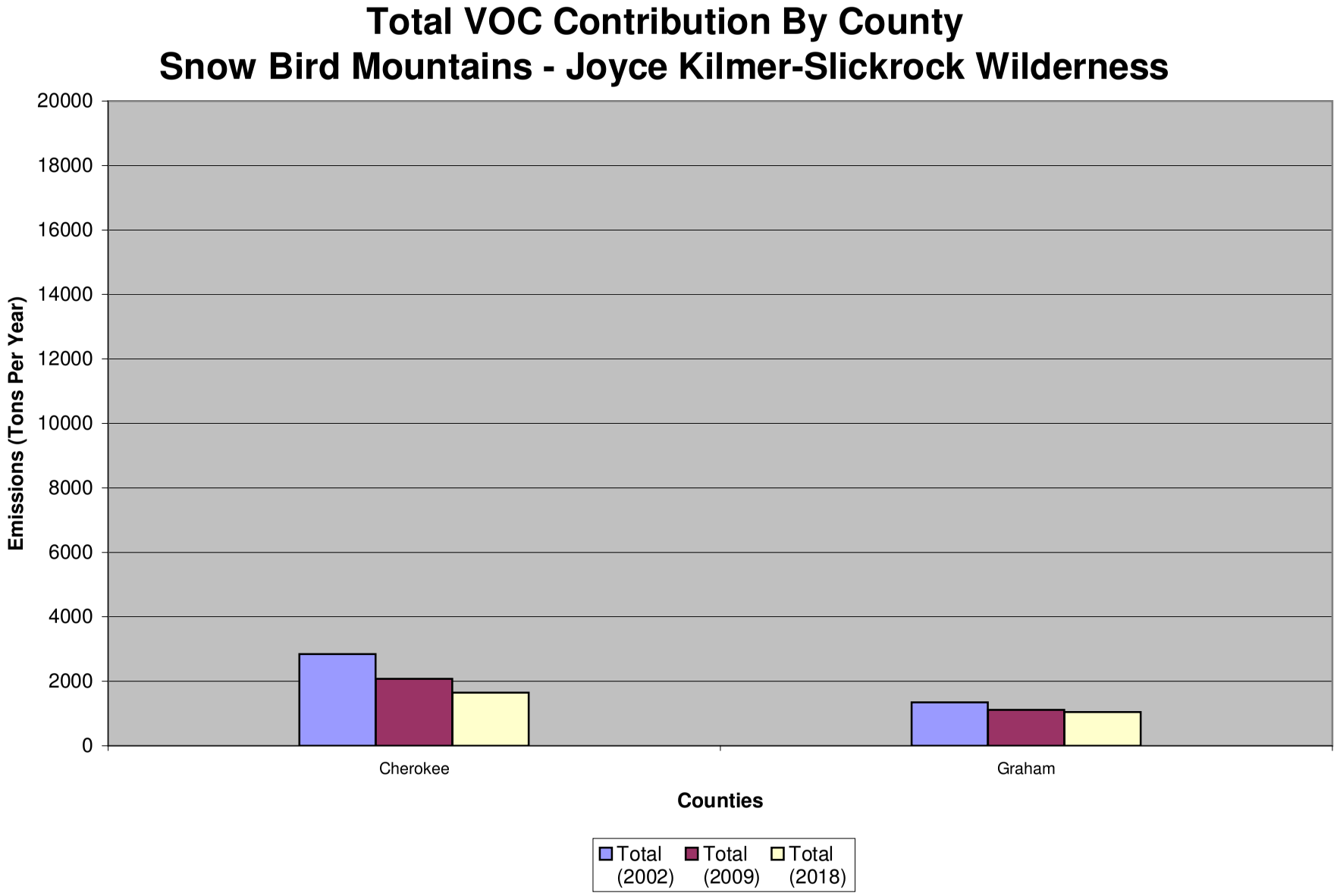

Total NOx Contribution By County
Raleigh-Durham-Cary
Emissions (Tons Per Year)
0
5000
10000
15000
20000
25000
30000
35000
40000
Chatham
Durham
Franklin
Granville
Harnett
Johnston
Orange
Person
Wake
Counties
Total (2002)
Total (2009)
Total (2018)

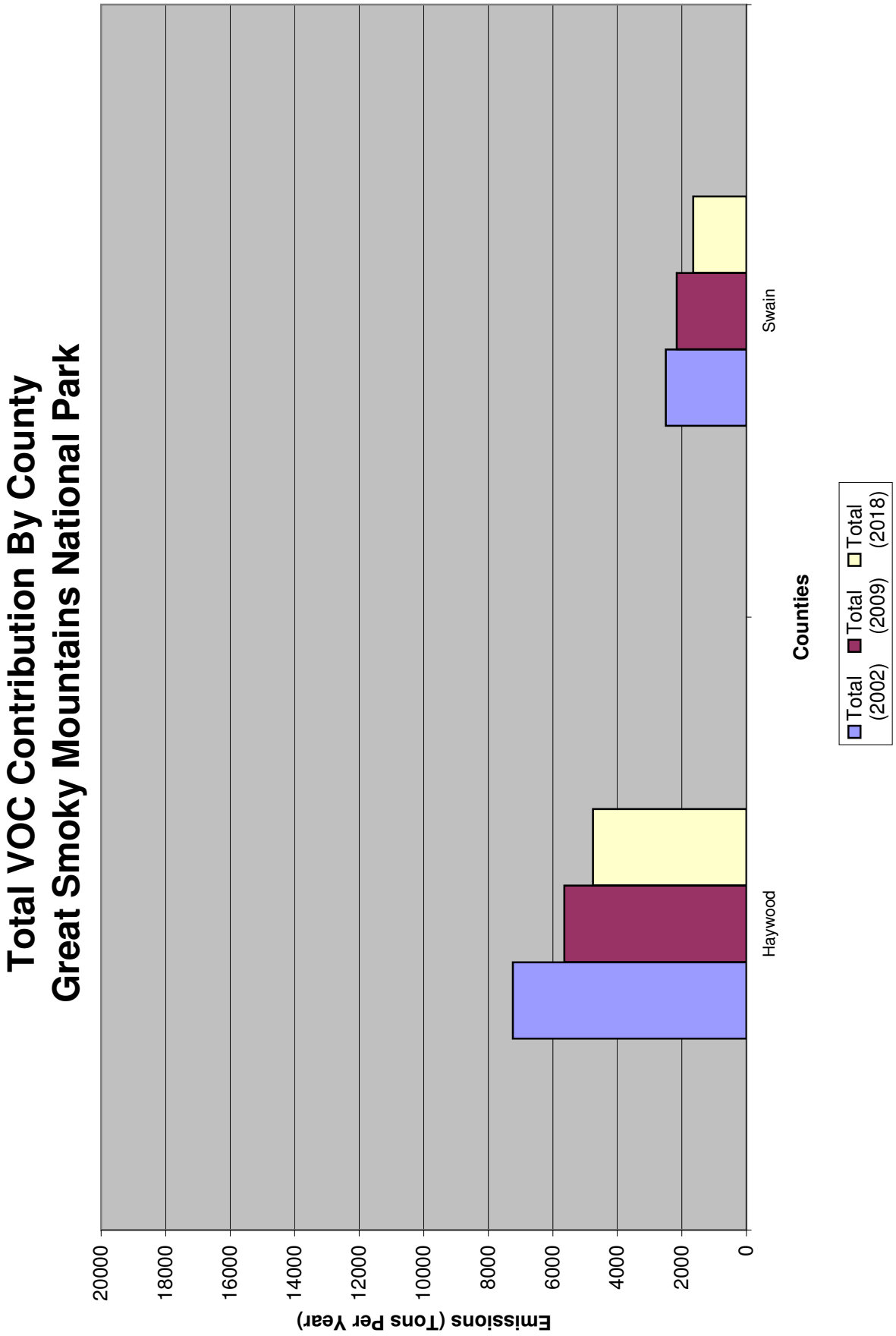

Total NOx Contribution By County
Fayetteville
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Cumberland
Hoke
Counties
Total (2002)
Total (2009)
Total (2018)

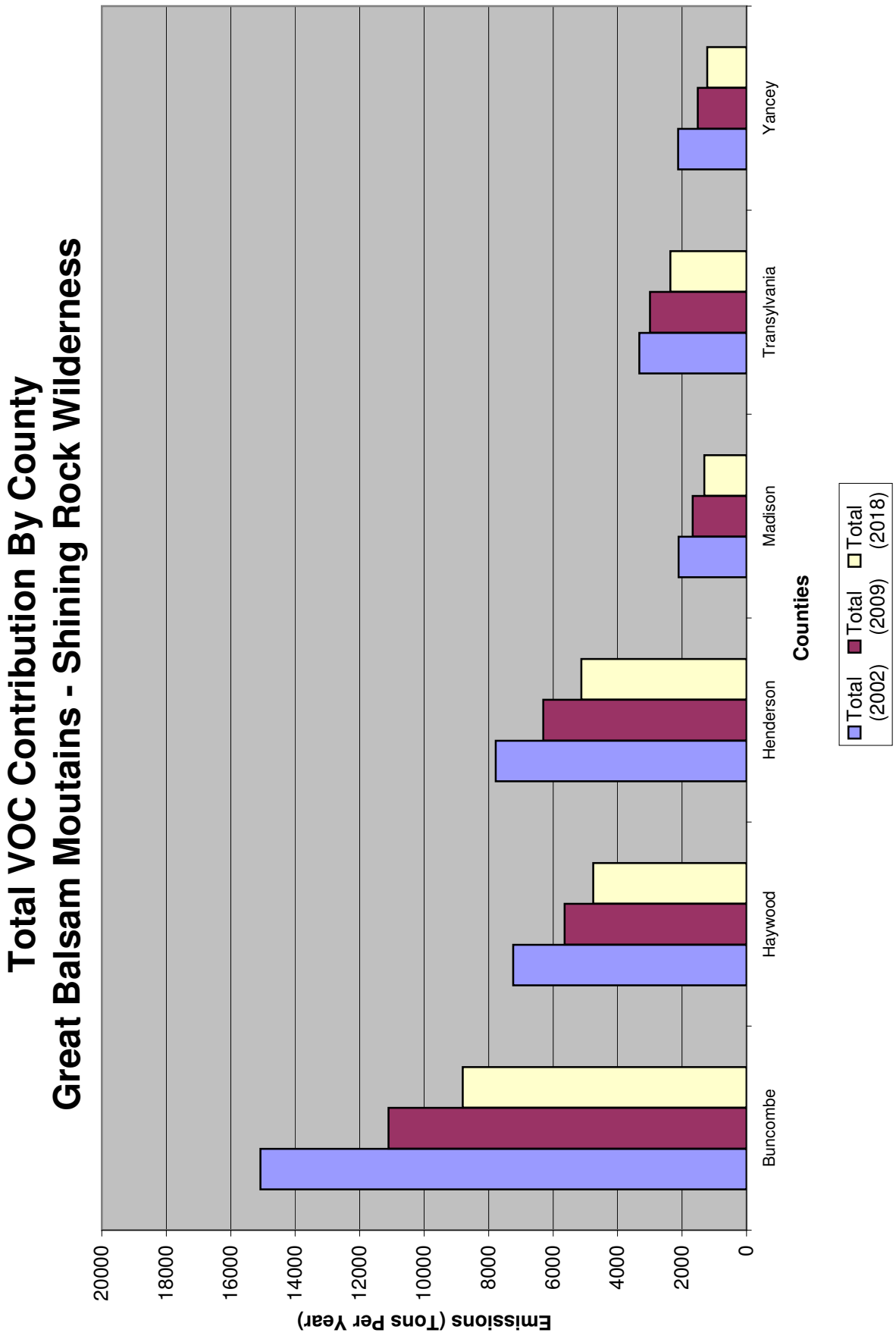

Total NOx Contribution By County
Rocky Mount
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Edgecombe
Nash
Counties
Total (2002)
Total (2009)
Total (2018)

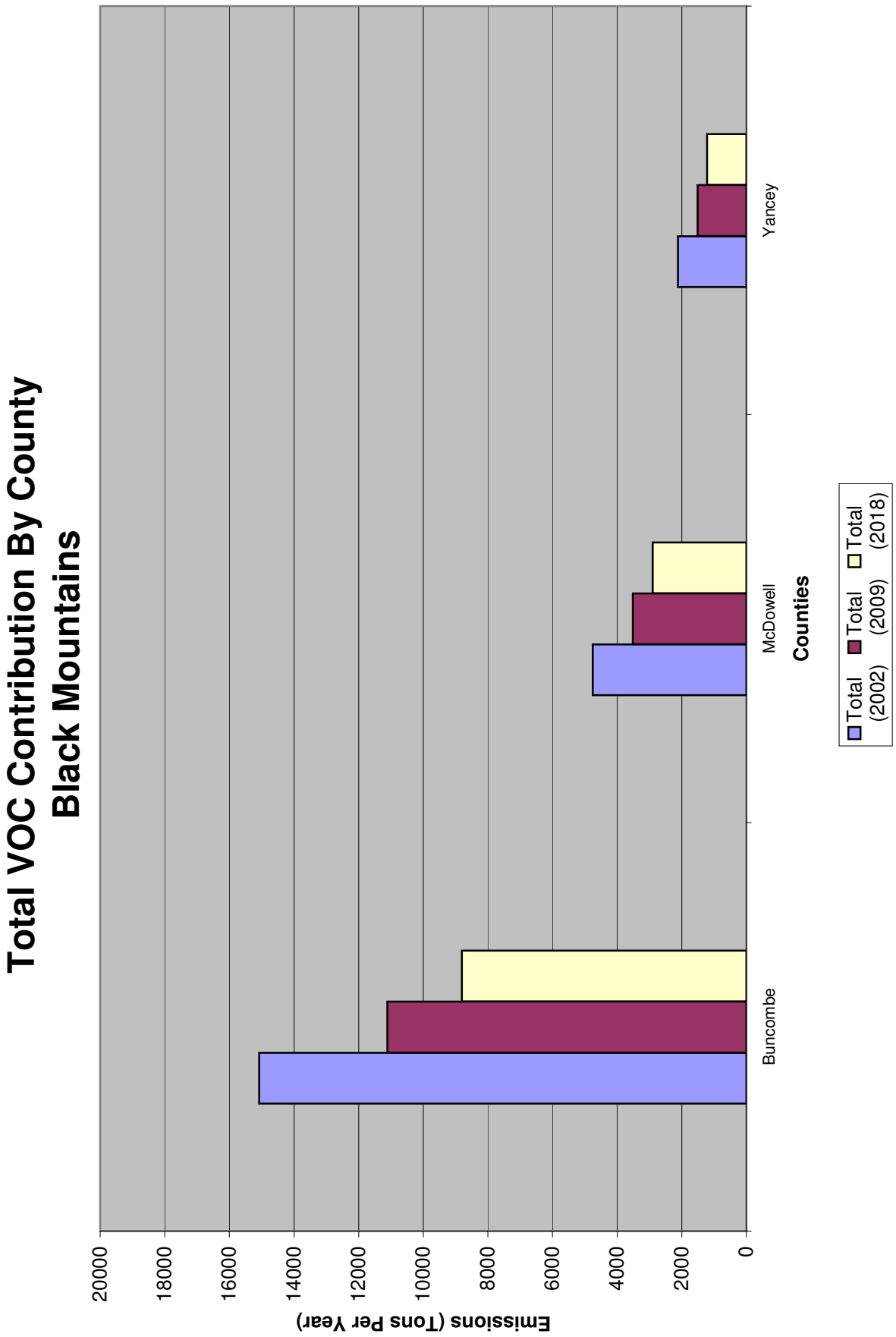

Total NOx Contribution By County
Greenville
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Greene
Pitt
Counties
Total (2002)
Total (2009)
Total (2018)

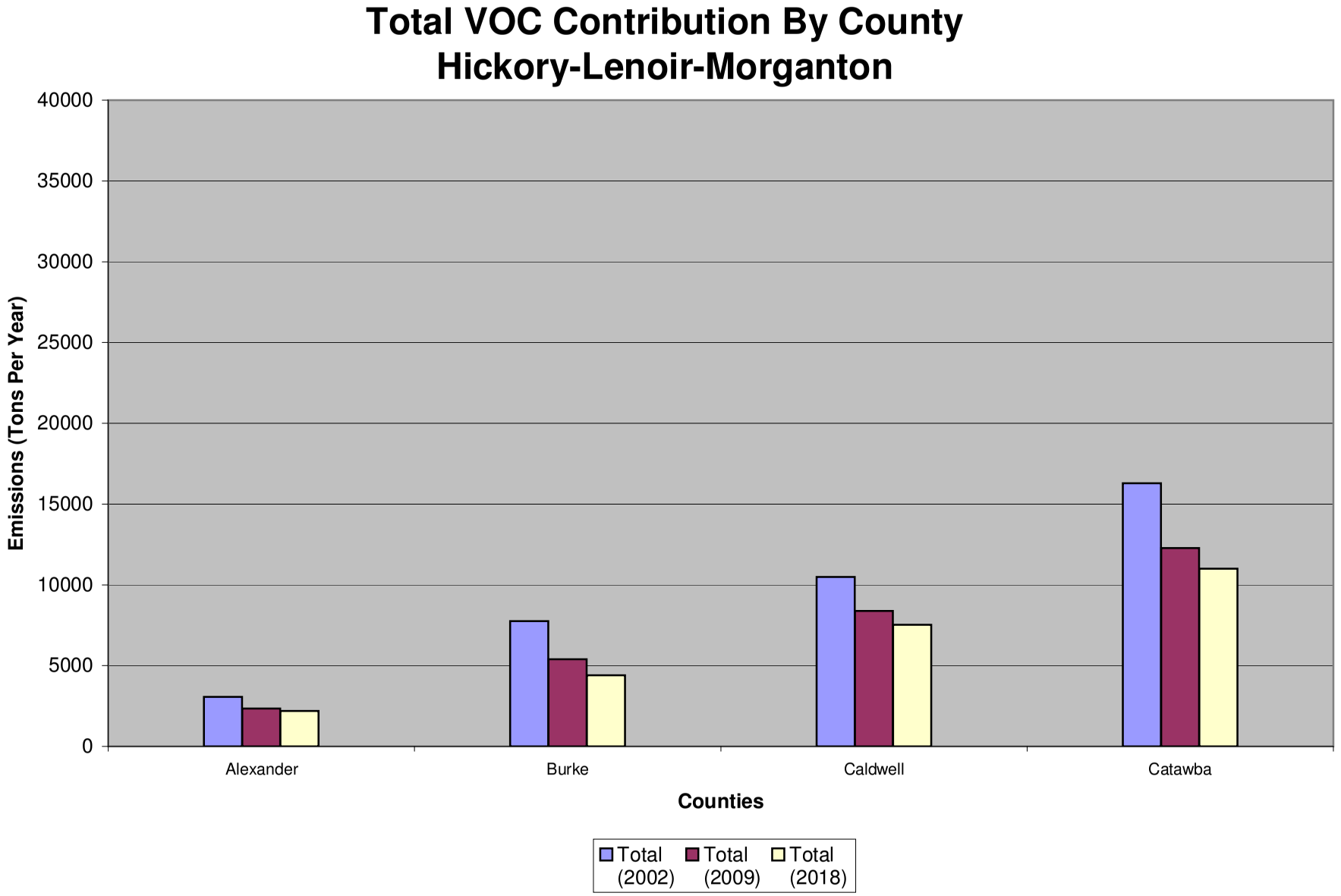

Total NOx Contribution By County
Currituck County
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Currituck
Counties
Total (2002)
Total (2009)
Total (2018)

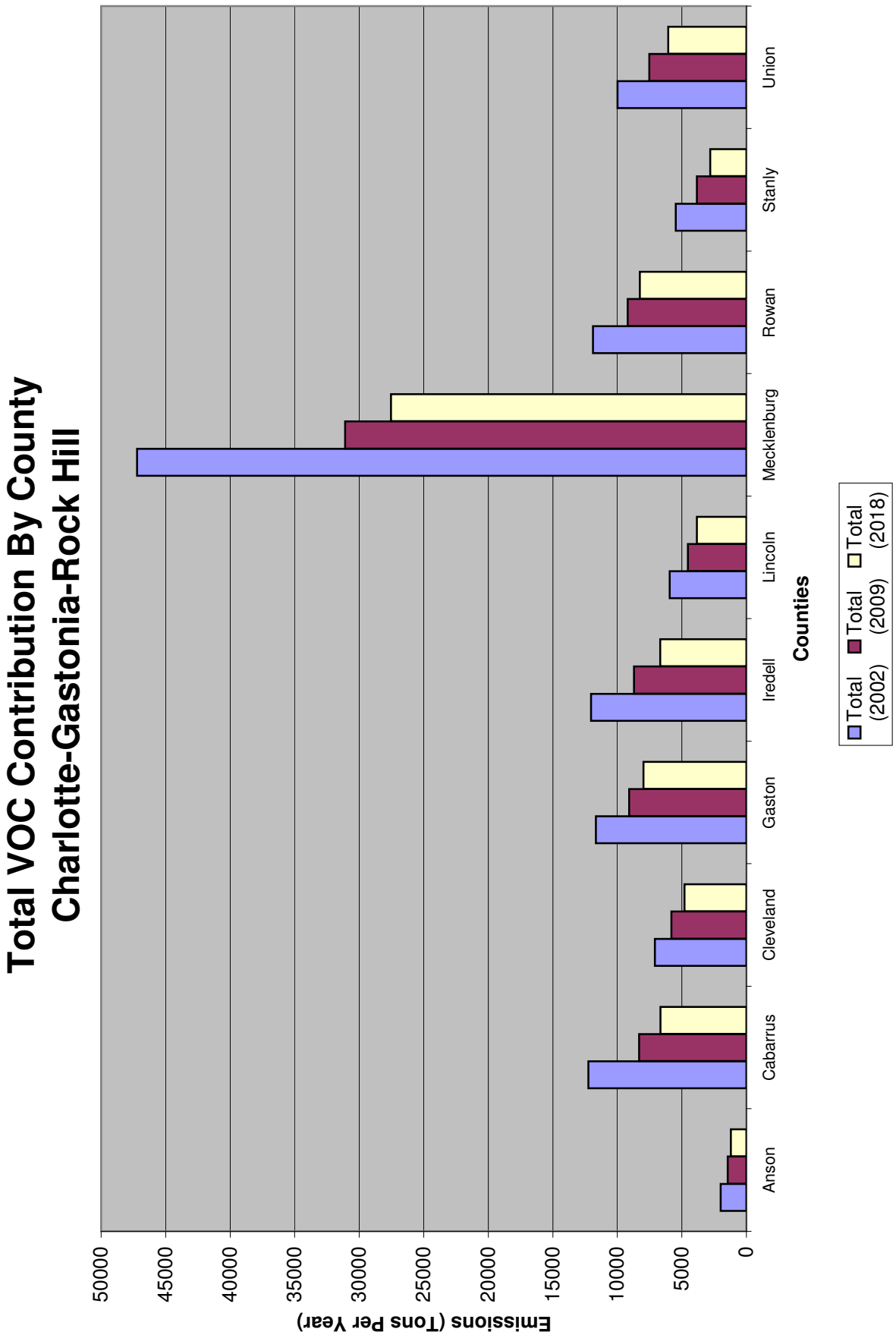

Total VOC Contribution By County
Snow Bird Mountains - Joyce Kilmer-Slickrock Wilderness
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Cherokee
Graham
Counties
Total (2002)
Total (2009)
Total (2018)

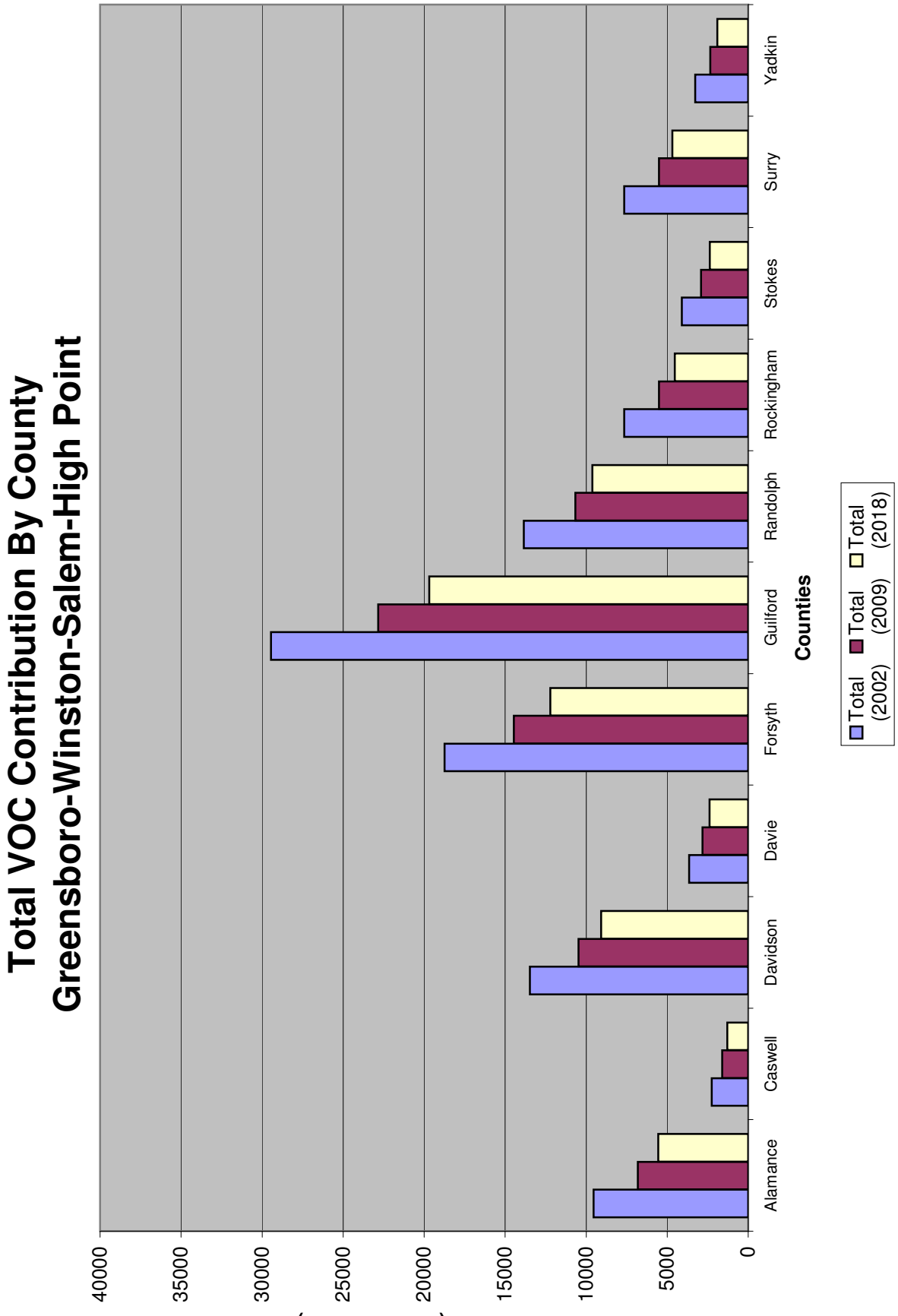

Total VOC Contribution By County
Great Smoky Mountains National Park
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Haywood
Swain
Counties
Total (2002)
Total (2009)
Total (2018)

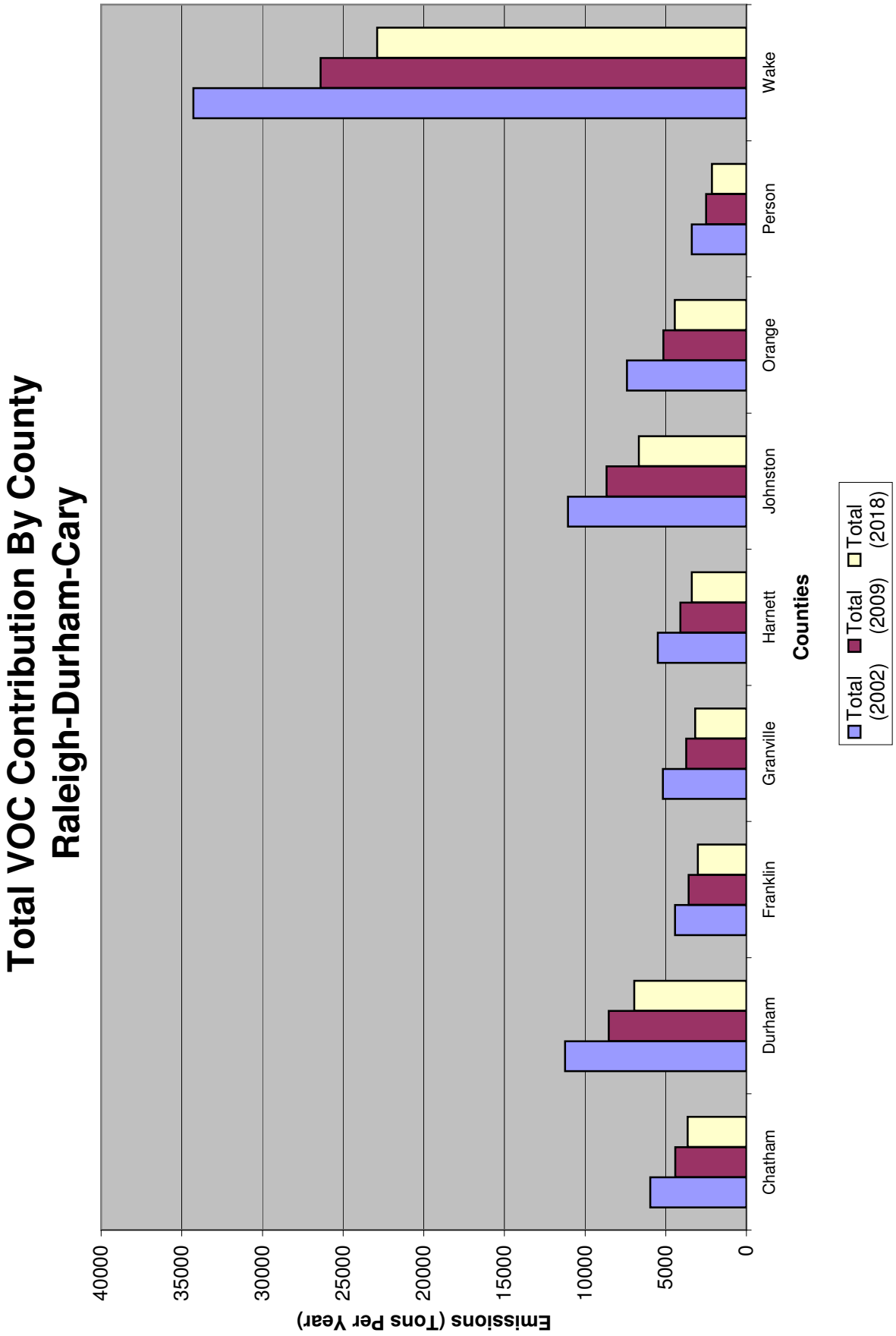

Total VOC Contribution By County
Great Balsam Moutains - Shining Rock Wilderness
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Buncombe
Haywood
Henderson
Madison
Transylvania
Yancey
Counties
Total (2002)
Total (2009)
Total (2018)

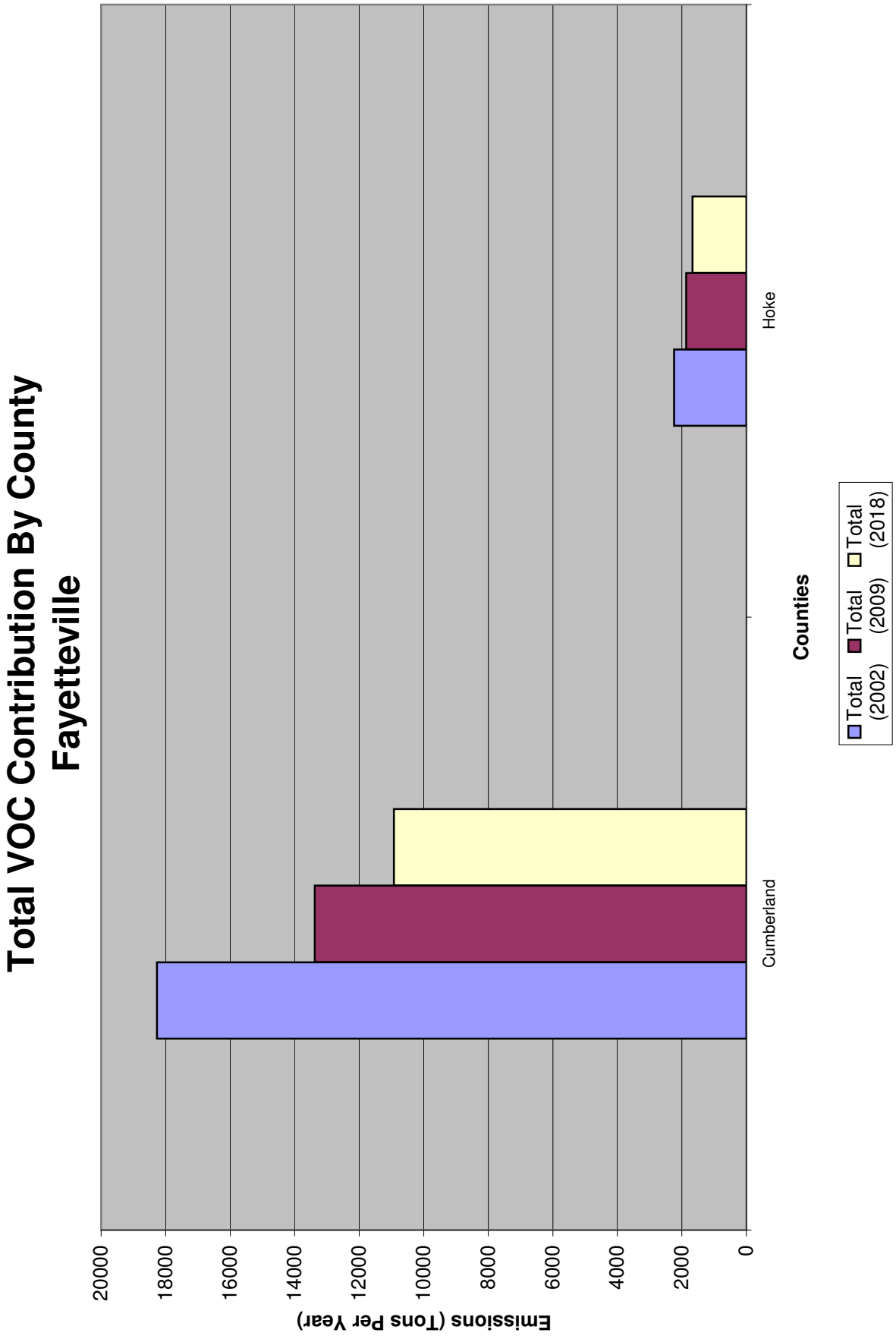

Total VOC Contribution By County
Black Mountains
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Buncombe
McDowell
Yancey
Counties
Total (2002)
Total (2009)
Total (2018)

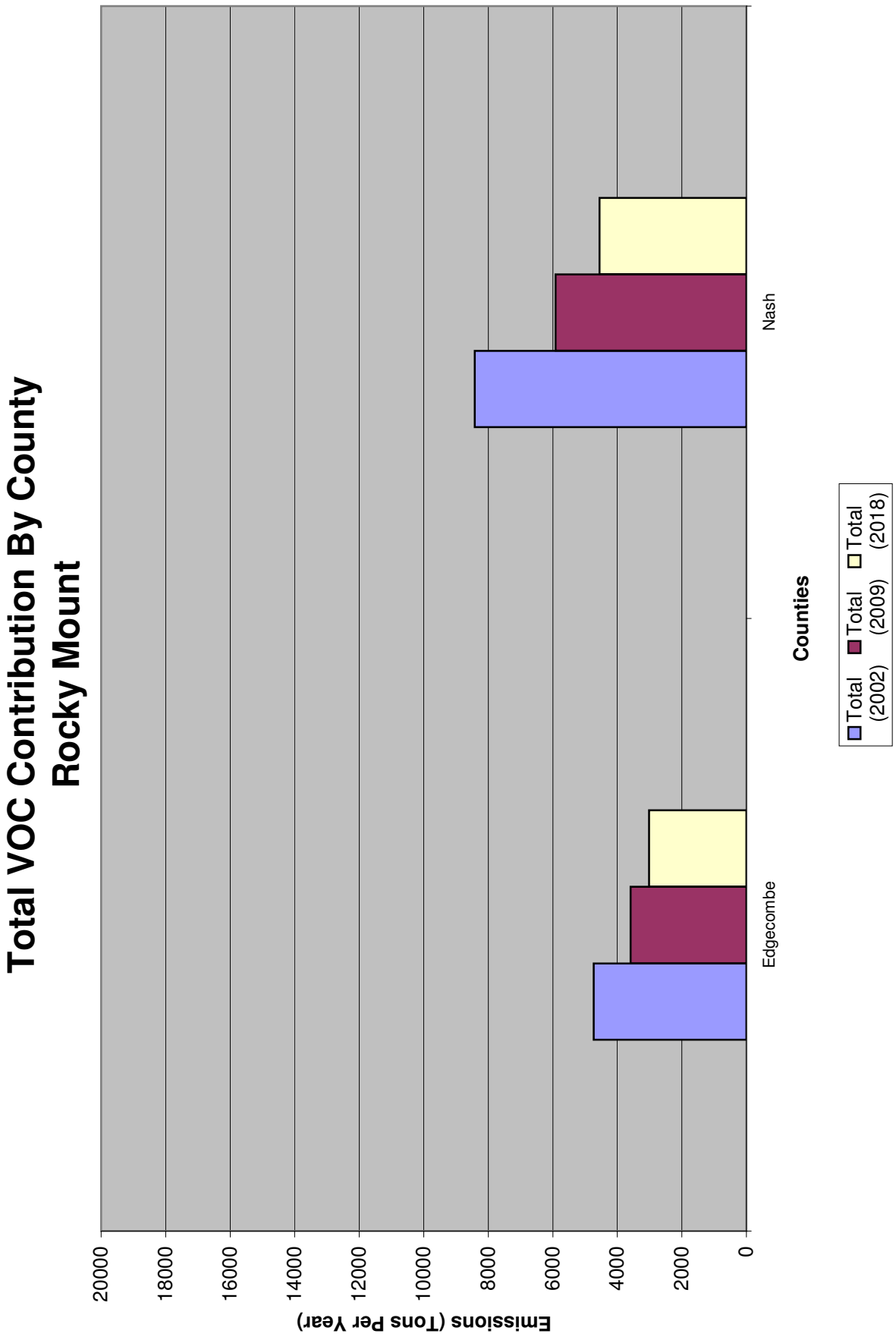

Total VOC Contribution By County
Hickory-Lenoir-Morganton
Emissions (Tons Per Year)
40000
35000
30000
25000
20000
15000
10000
5000
0
Alexander
Burke
Caldwell
Catawba
Counties
Total (2002)
Total (2009)
Total (2018)

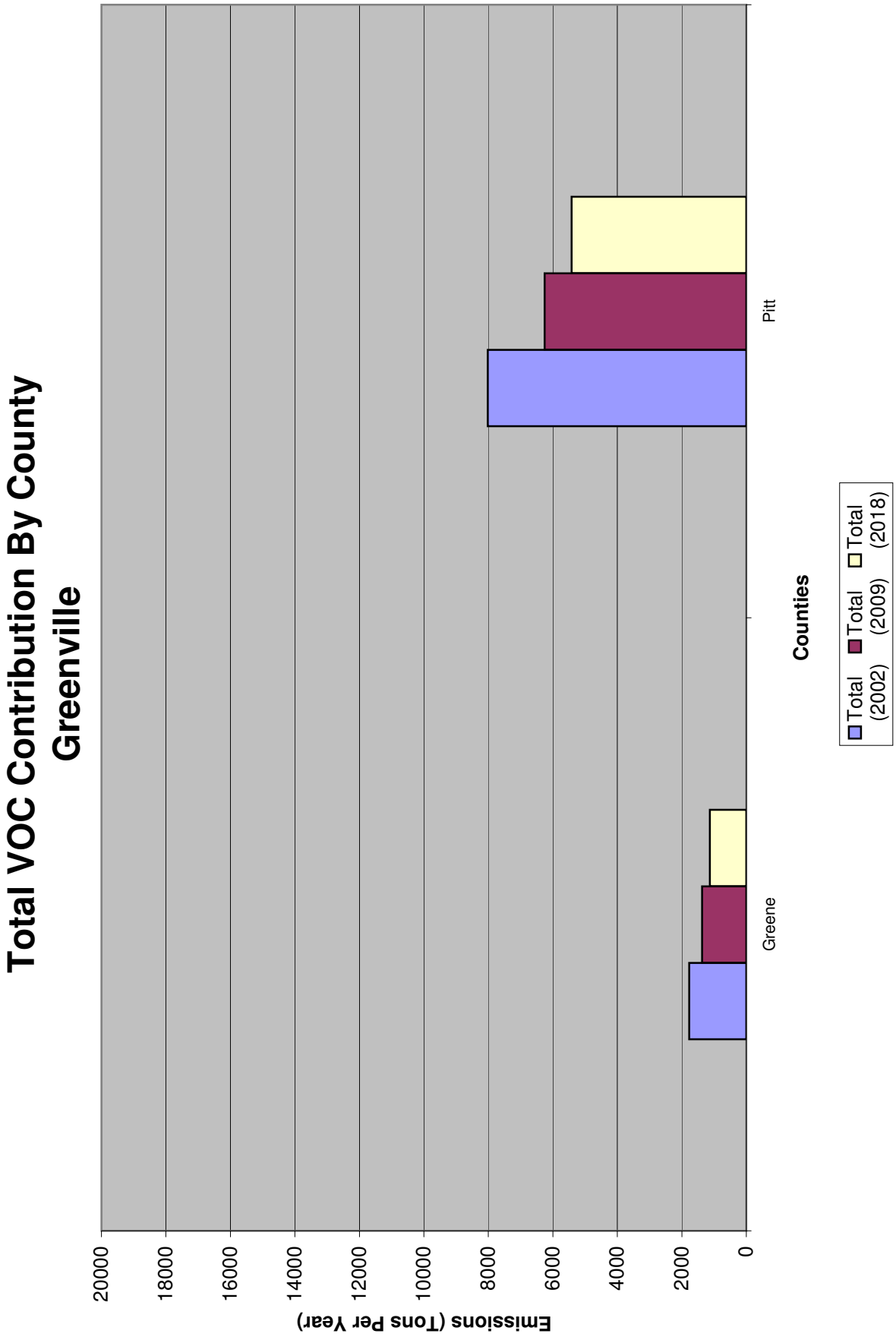

Total VOC Contribution By County
Charlotte-Gastonia-Rock Hill
Emissions (Tons Per Year)
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Anson
Cabarrus
Cleveland
Gaston
Iredell
Lincoln
Mecklenburg
Rowan
Stanly
Union
Counties
Total (2002)
Total (2009)
Total (2018)

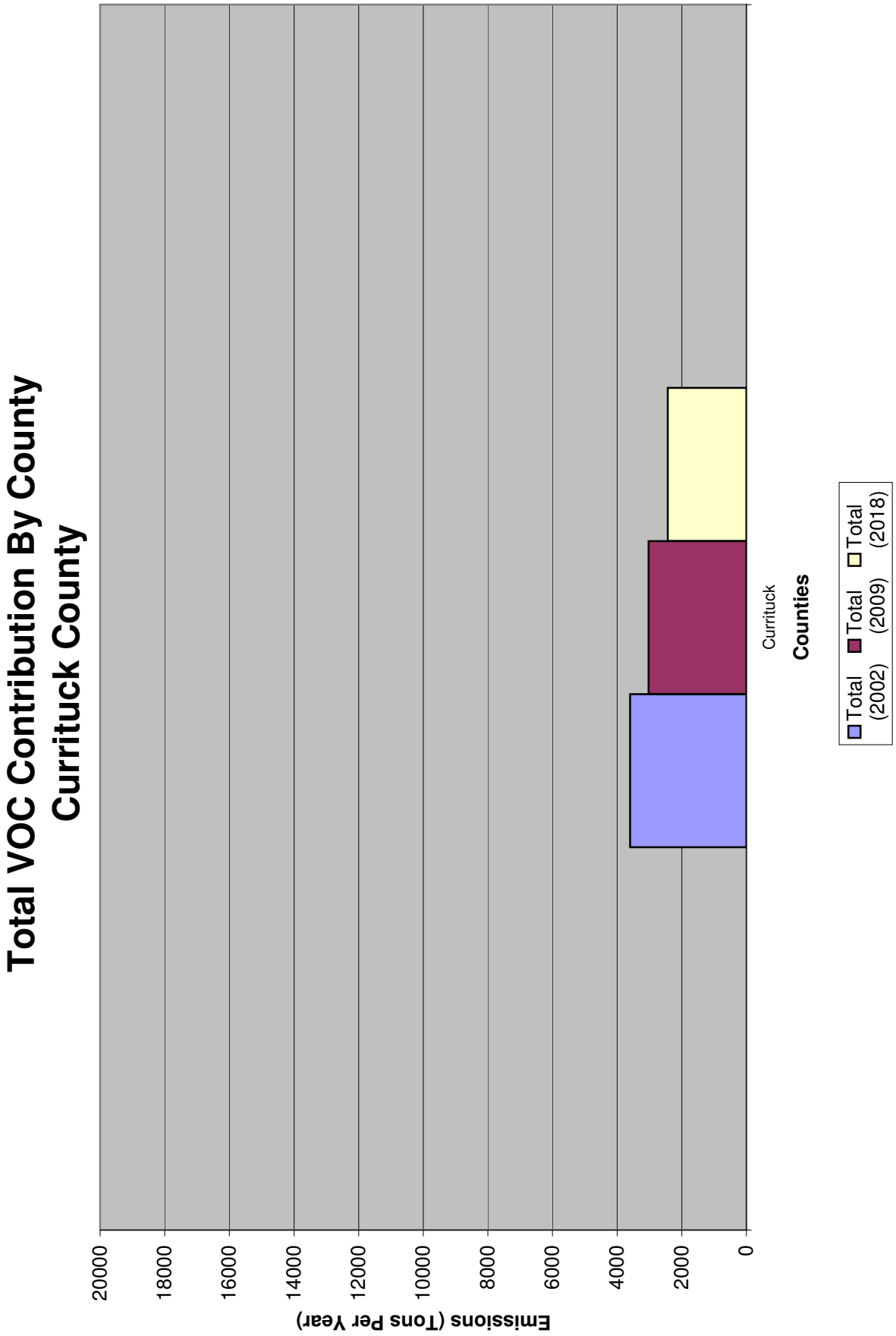

Total VOC Contribution By County
Greensboro-Winston-Salem-High Point
Emissions (Tons Per Year)
40000
35000
30000
25000
20000
15000
10000
5000
0
Alamance
Caswell
Davidson
Davie
Forsyth
Guilford
Randolph
Rockingham
Stokes
Surry
Yadkin
Counties
Total (2002)
Total (2009)
Total (2018)


Total VOC Contribution By County
Raleigh-Durham-Cary
Emissions (Tons Per Year)
0
5000
10000
15000
20000
25000
30000
35000
40000
Chatham
Durham
Franklin
Granville
Harnett
Johnston
Orange
Person
Wake
Counties
Total (2002)
Total (2009)
Total (2018)

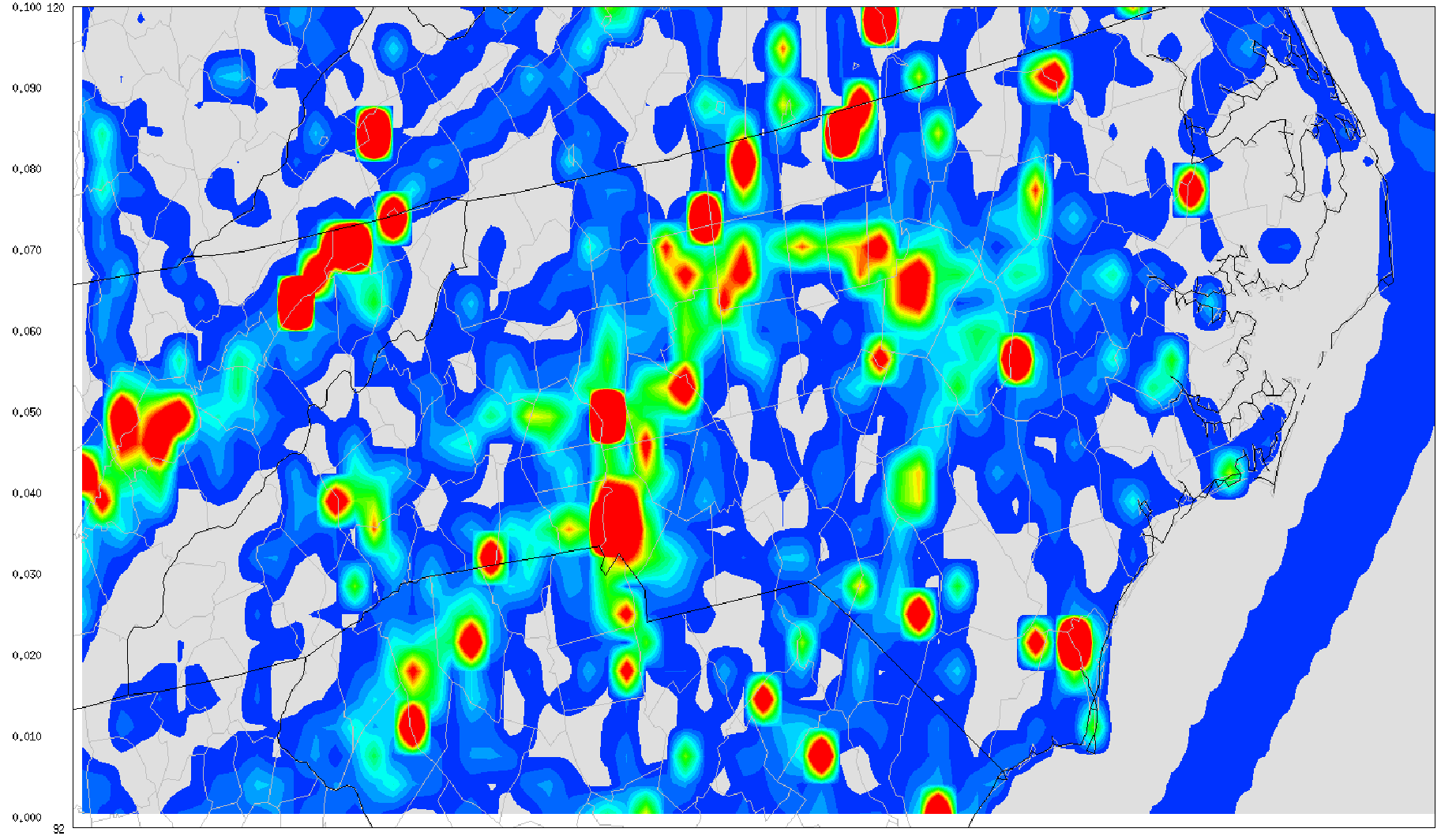

Total VOC Contribution By County
Fayetteville
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Cumberland
Hoke
Counties
Total (2002)
Total (2009)
Total (2018)


Total VOC Contribution By County
Rocky Mount
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Edgecombe
Nash
Counties
Total (2002)
Total (2009)
Total (2018)


Total VOC Contribution By County
Greenville
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Greene
Pitt
Counties
Total (2002)
Total (2009)
Total (2018)


Total VOC Contribution By County
Currituck County
Emissions (Tons Per Year)
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Currituck
Counties
Total (2002)
Total (2009)
Total (2018)

Typical Summertime Daily Average NOx Emissions From All Source



July 12, 2009 - Projected Emissions For SIP Modeling

Appendix I

North Carolina's 2000 Population and Population Density Maps

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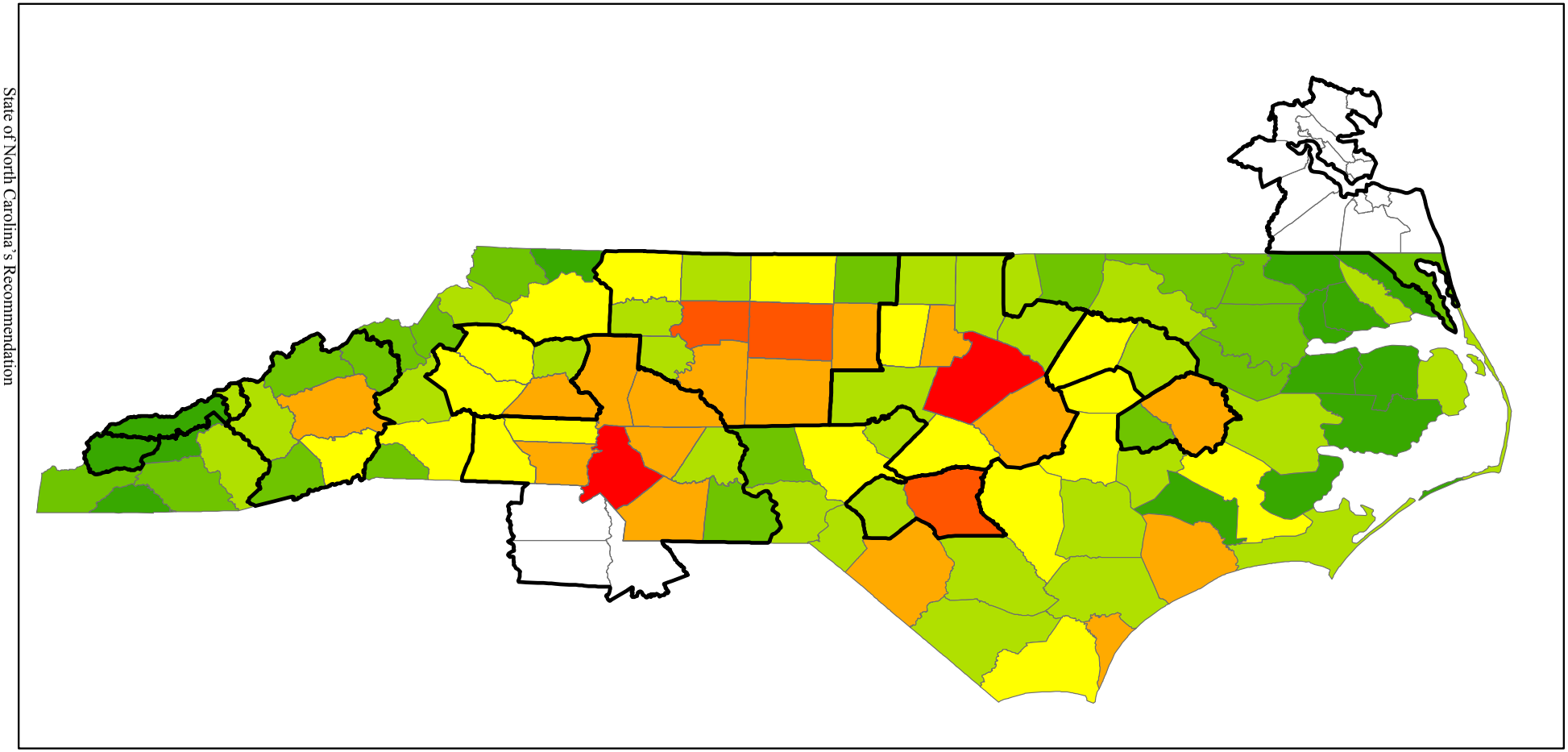
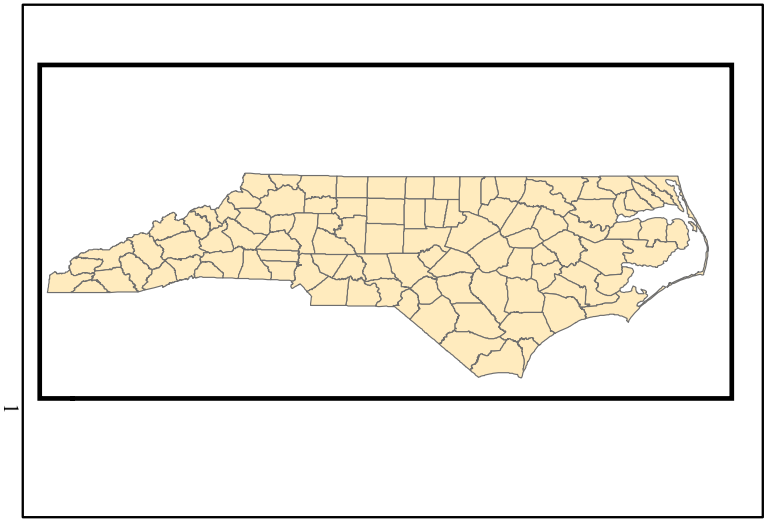
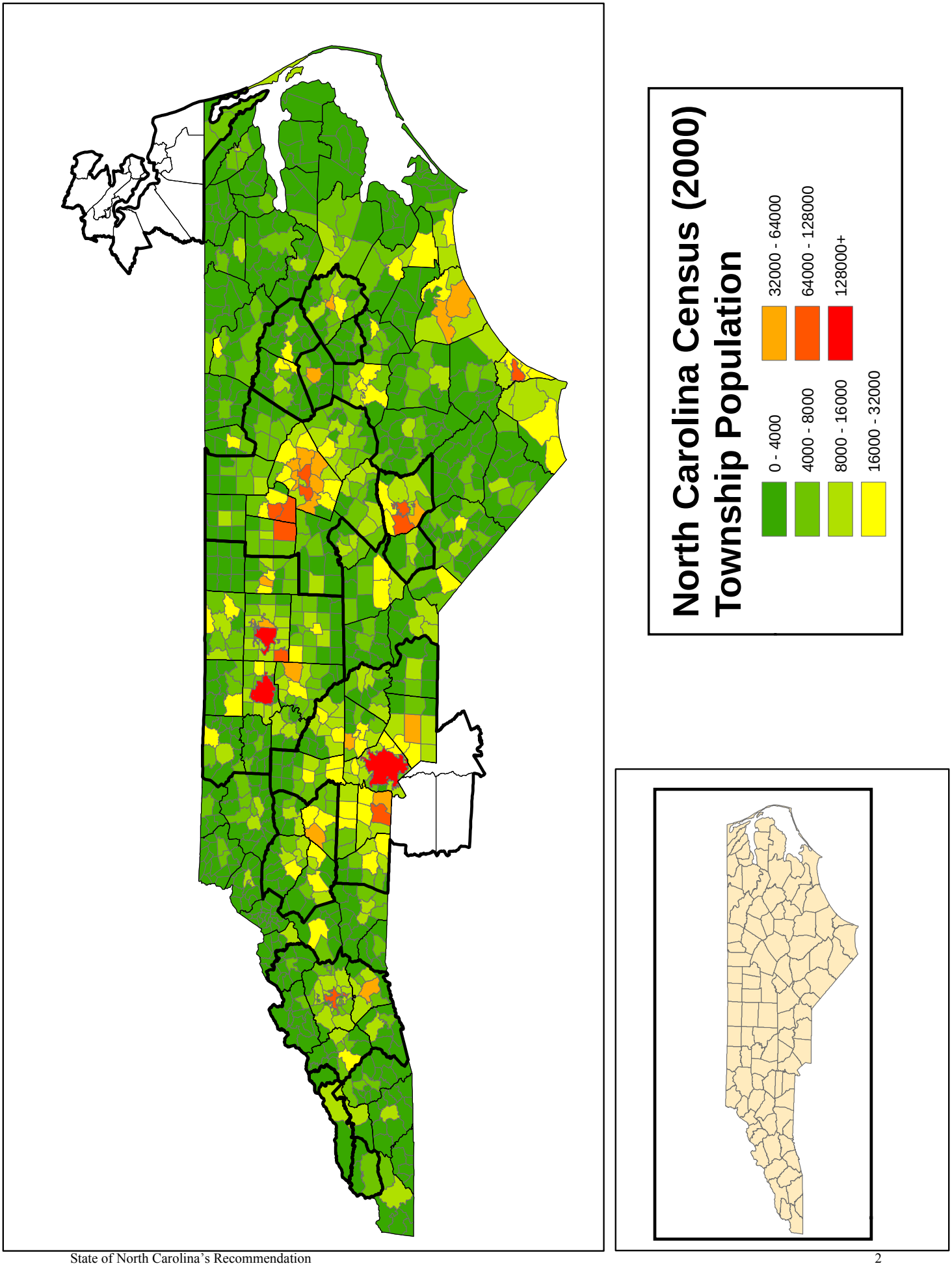


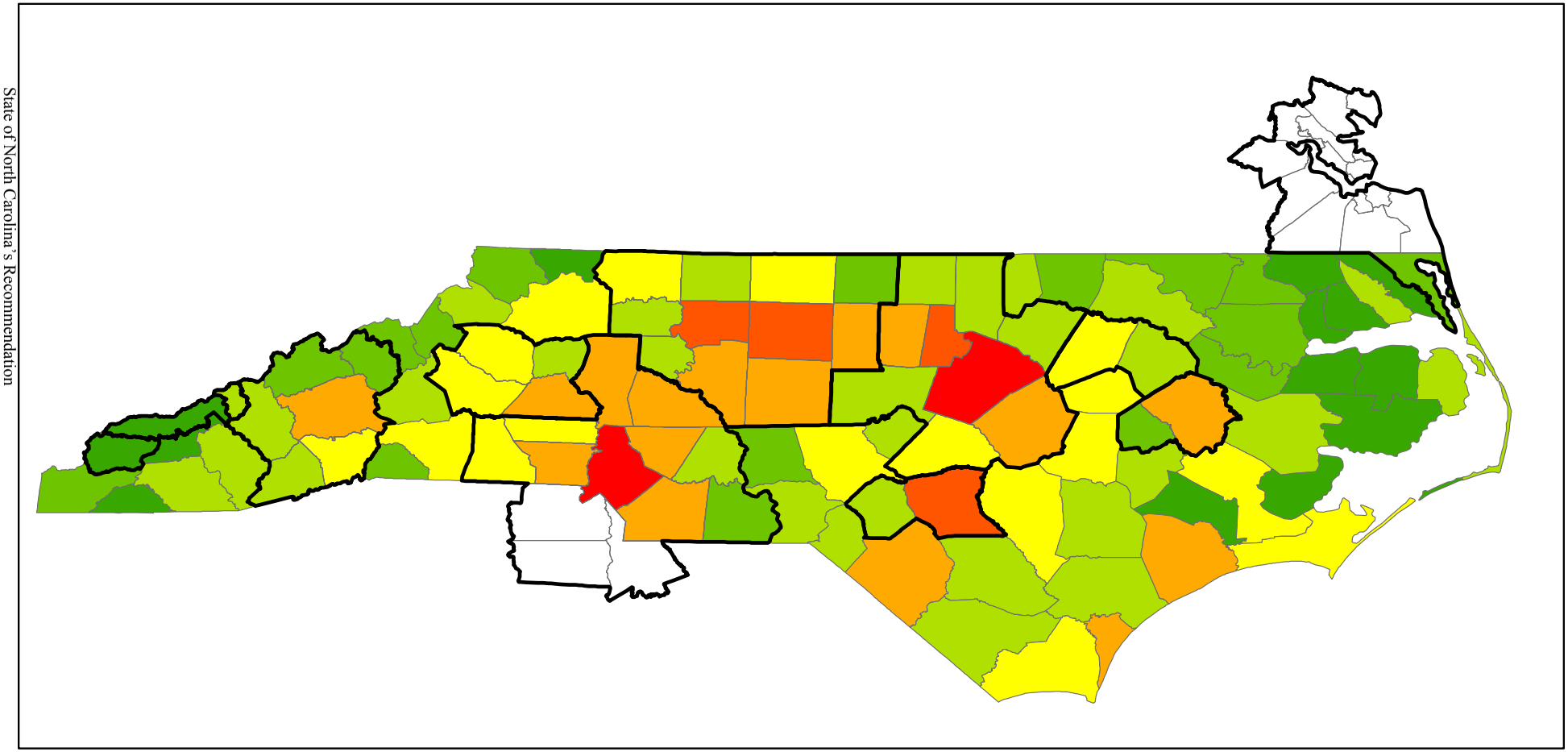


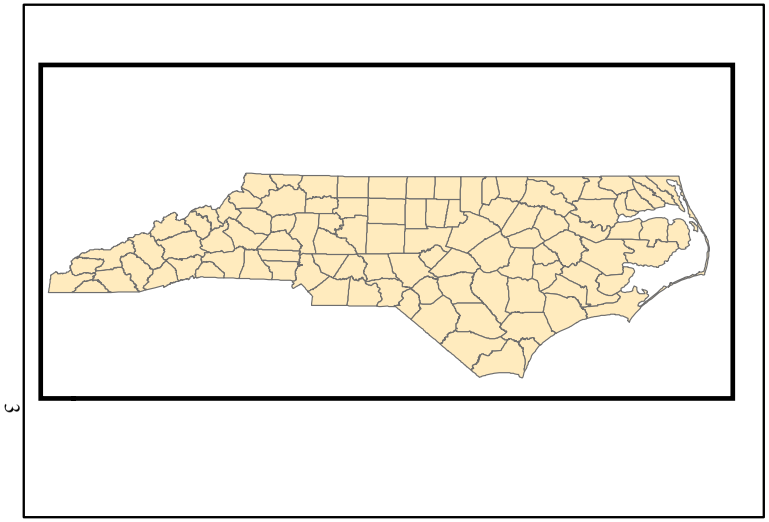
North Carolina Census (2000) County Popluation

Actual 2000 Population

- 0 - 15000
- 15001 - 30000
- 30001 - 60000
- 60001 - 120000
- 120001 - 240000
- 240001 - 480000
- 480001 or greater


North Carolina Census (2000)
Township Population
0 - 4000
4000 - 8000
8000 - 16000
16000 - 32000
32000 - 64000
64000 - 128000
128000+

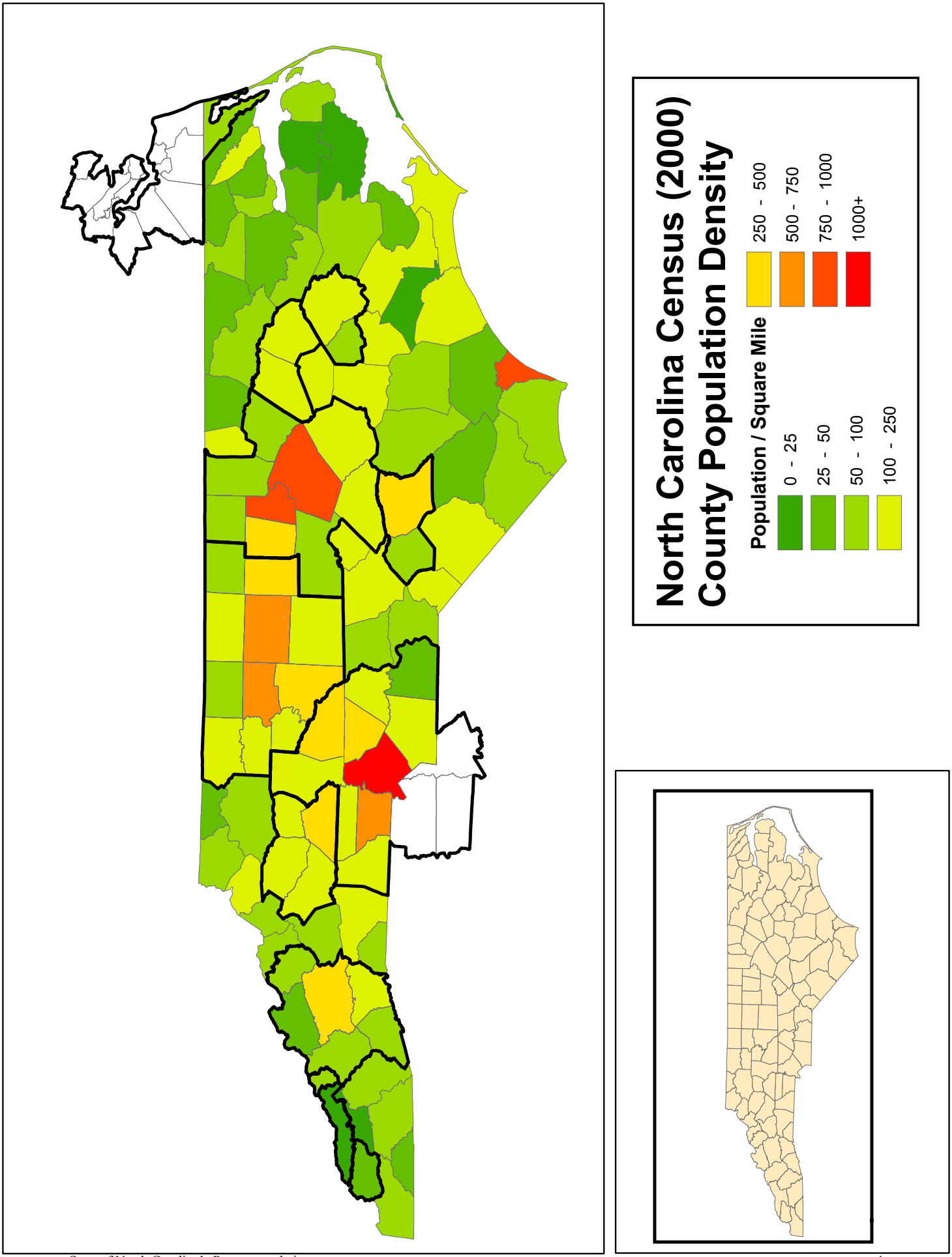


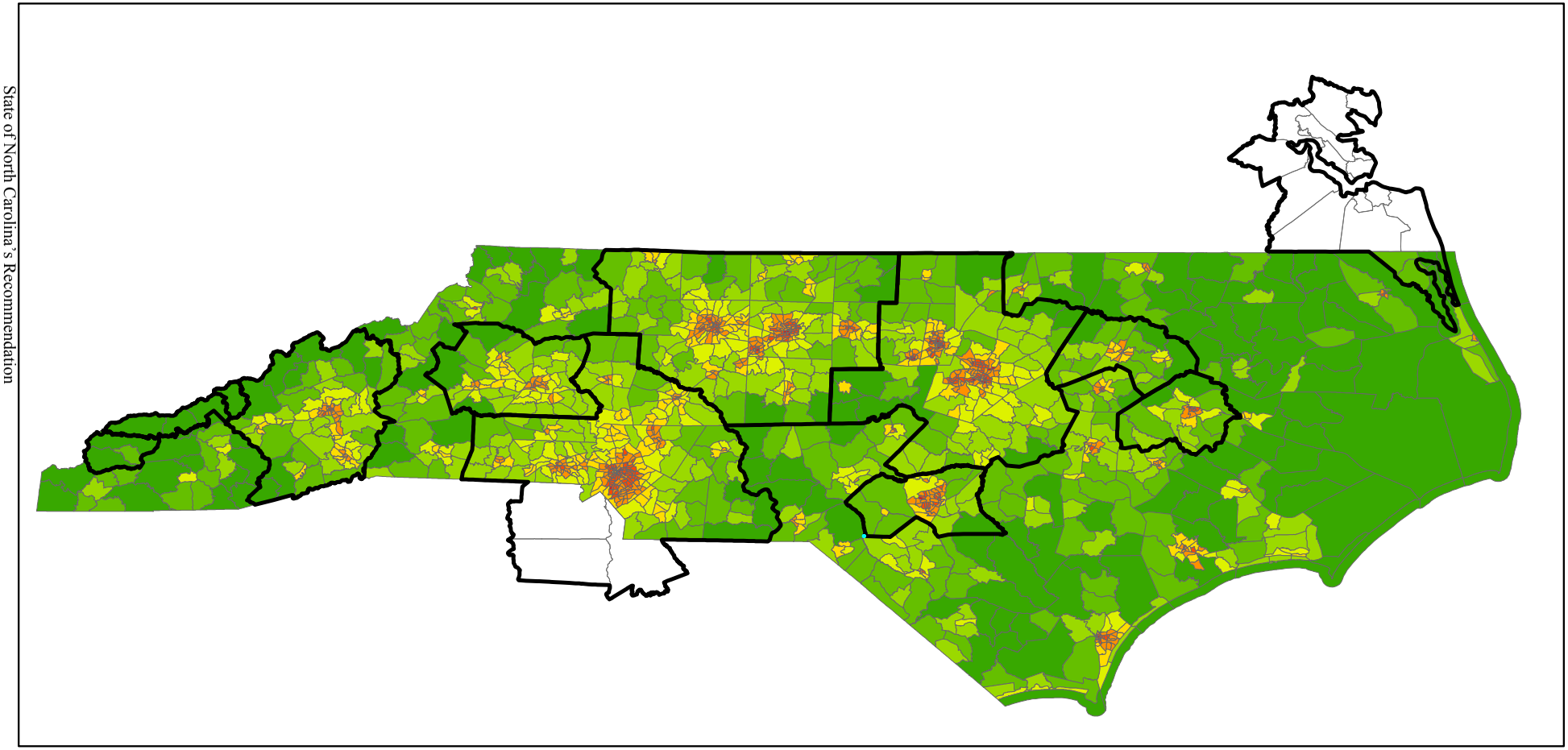


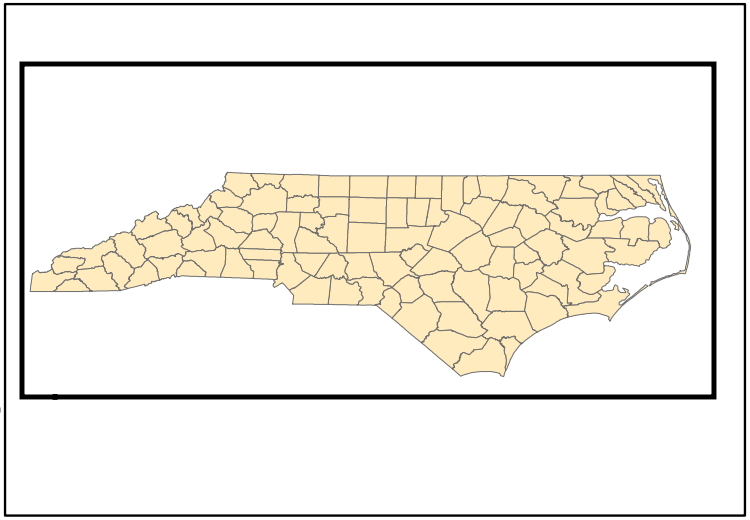
North Carolina Estimated (2007) County Popluation

Estimated 2007 Population

- 0 - 15000
- 15001 - 30000
- 30001 - 60000
- 60001 - 120000
- 120001 - 240000
- 240001 - 480000
- 480001 or greater


North Carolina Census (2000)
County Population Density
Population / Square Mile
0 - 25
25 - 50
50 - 100
100 - 250
250 - 500
500 - 750
750 - 1000
1000+

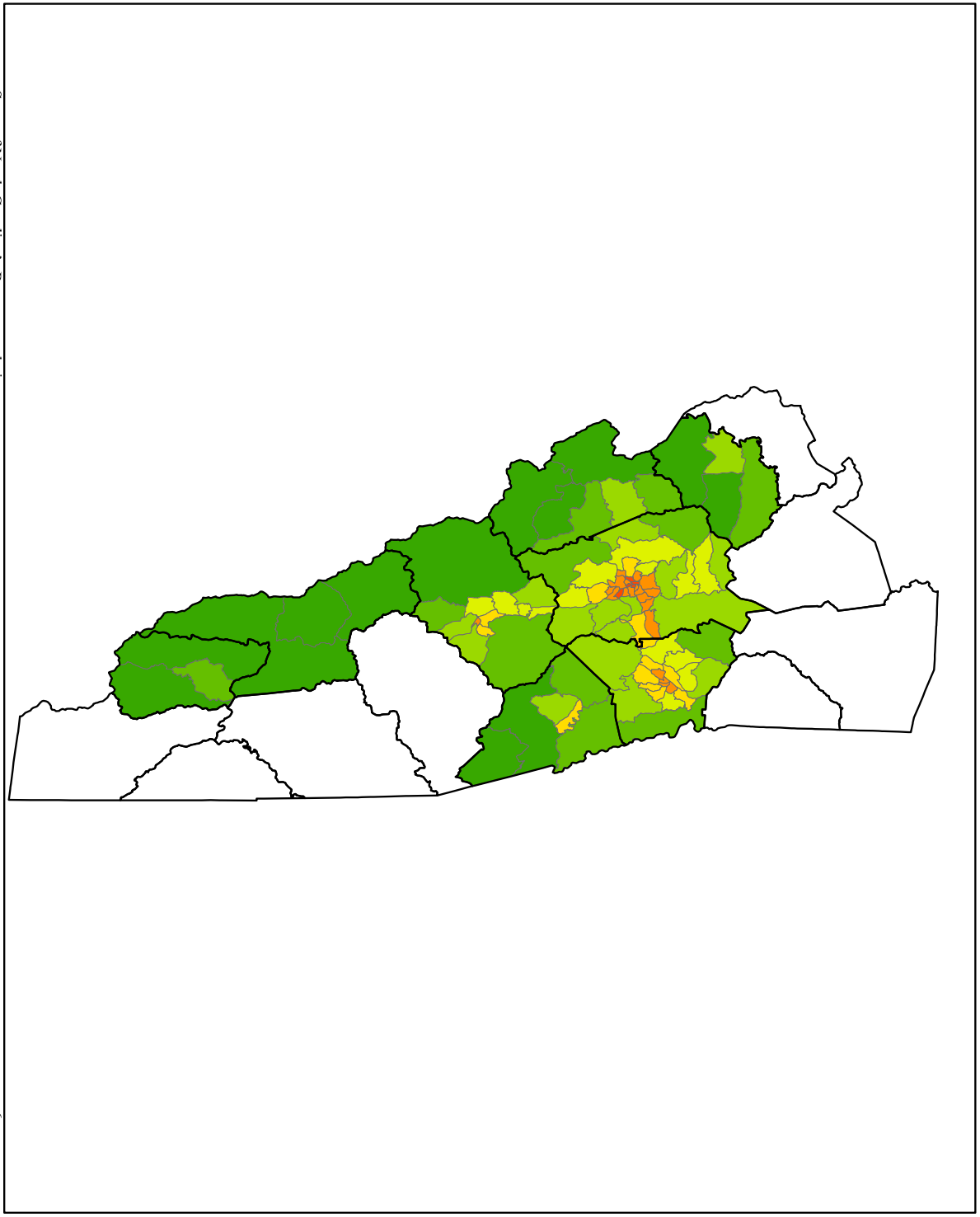




North Carolina Census (2000) Tract Population Density

Population / Square Mile

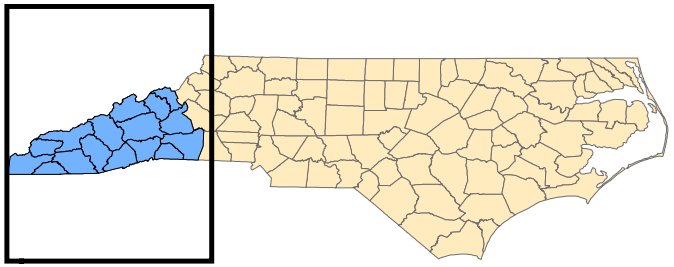
- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

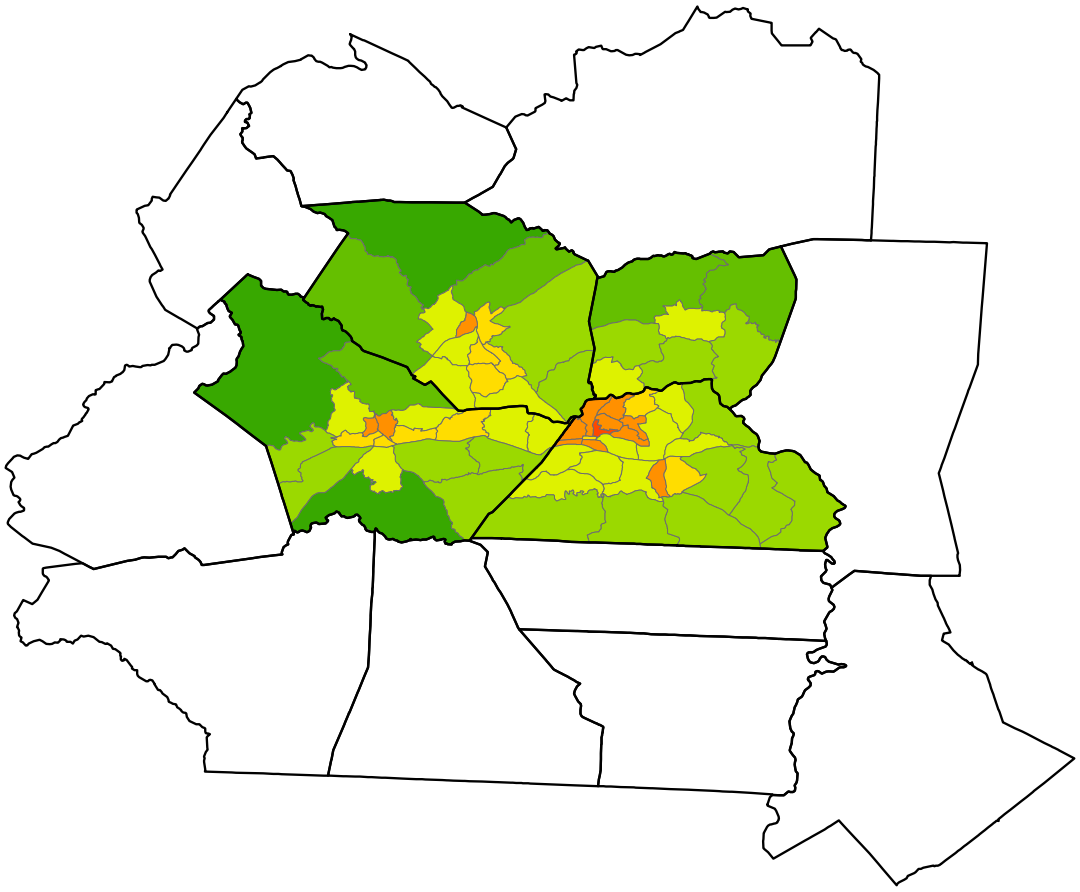


Western NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

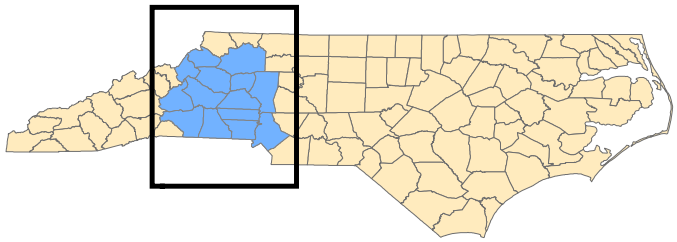


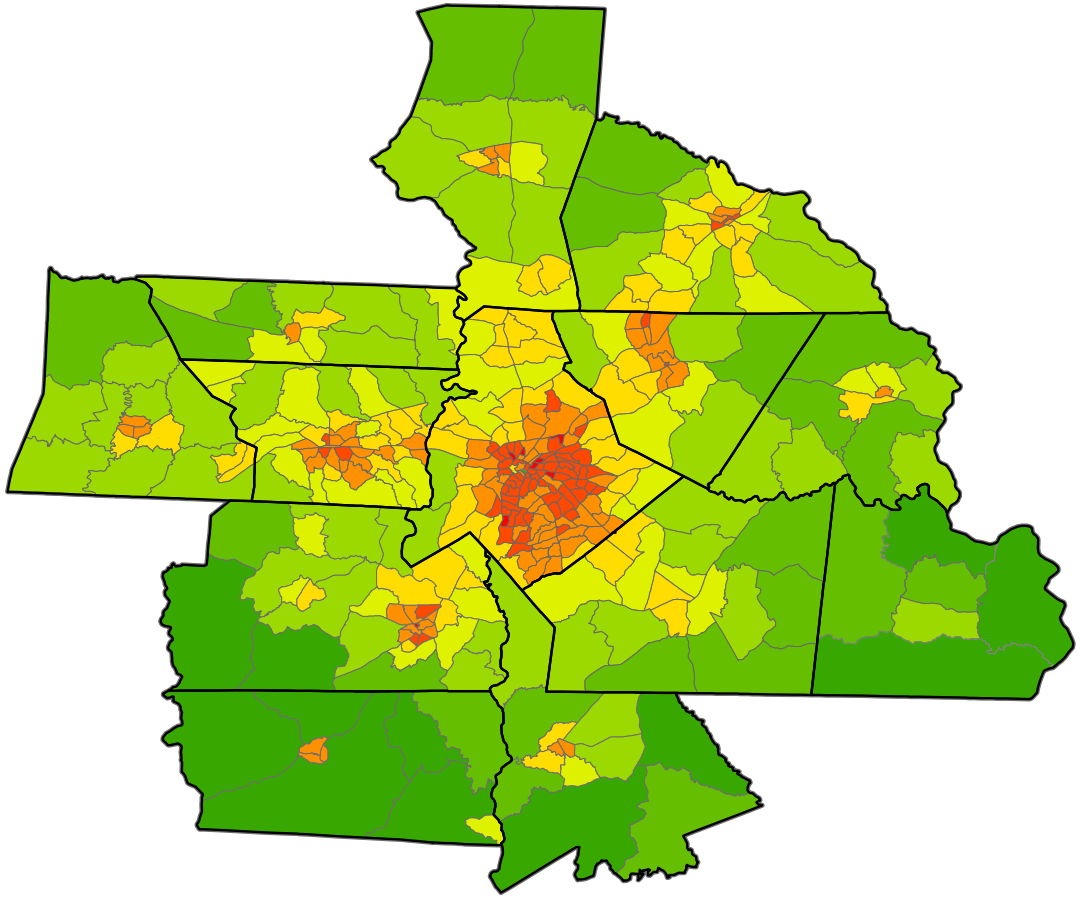


Unifour NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

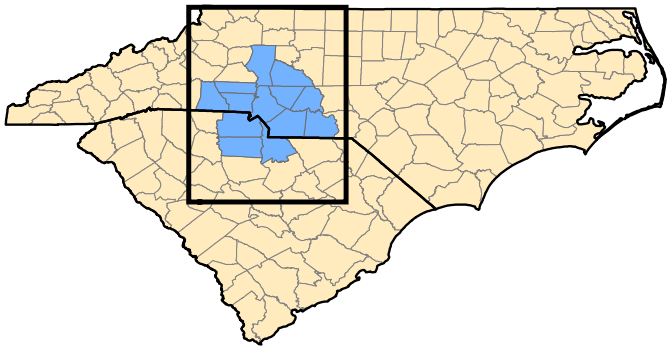


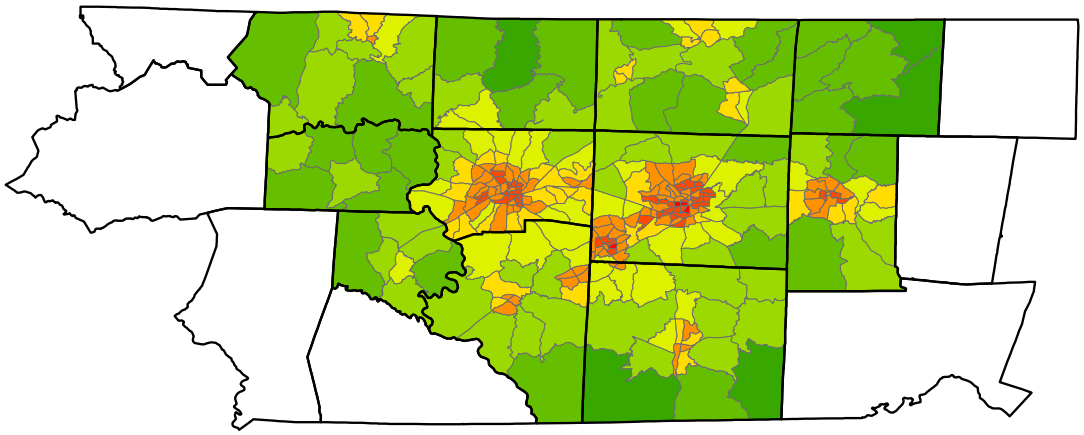


Metrolina NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

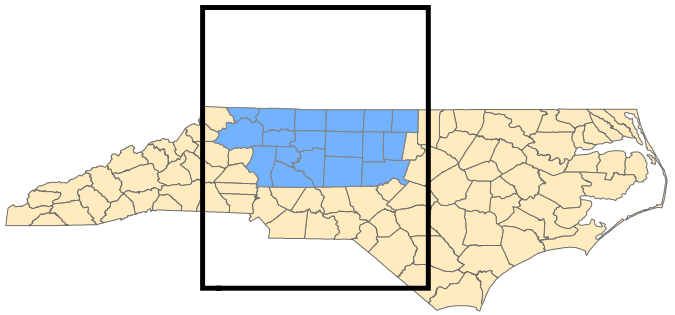


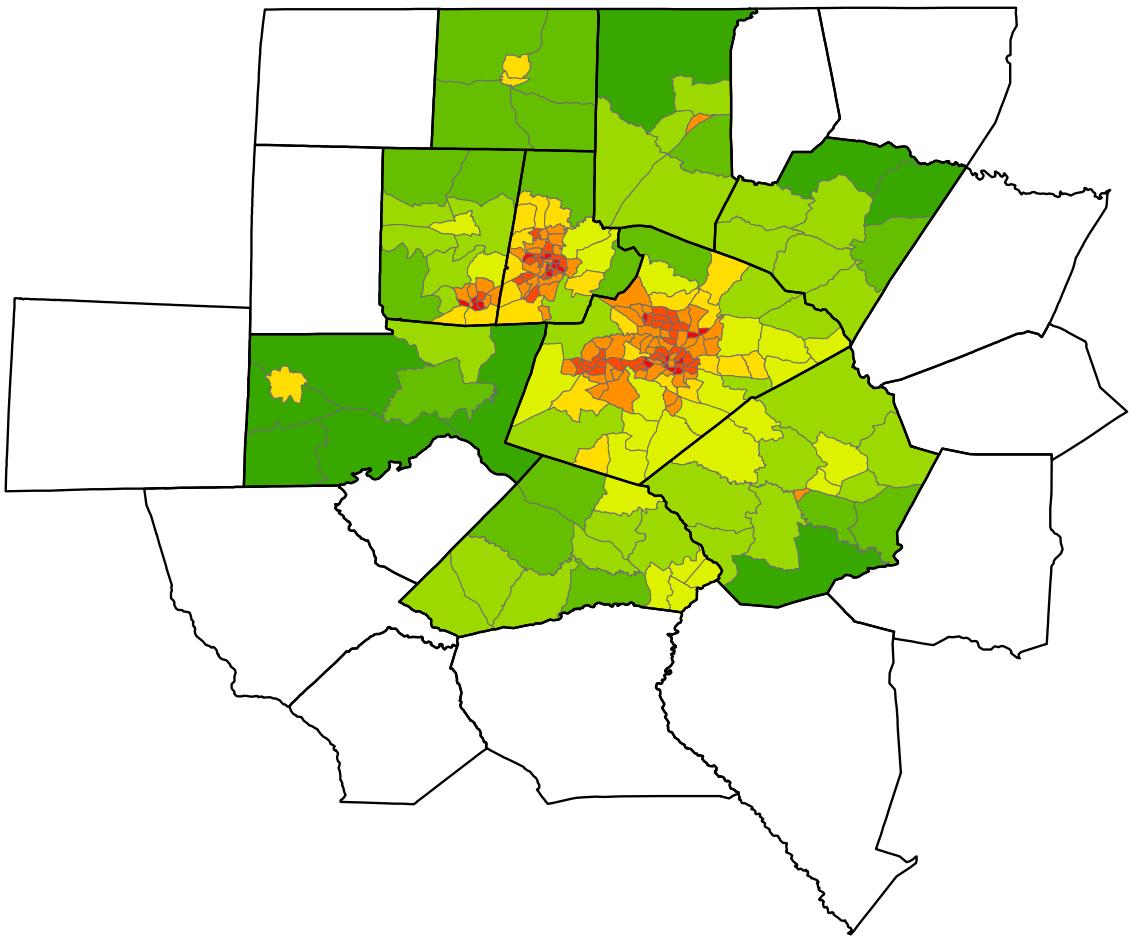


Triad NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

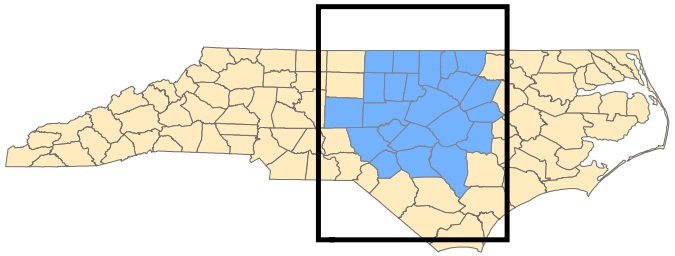


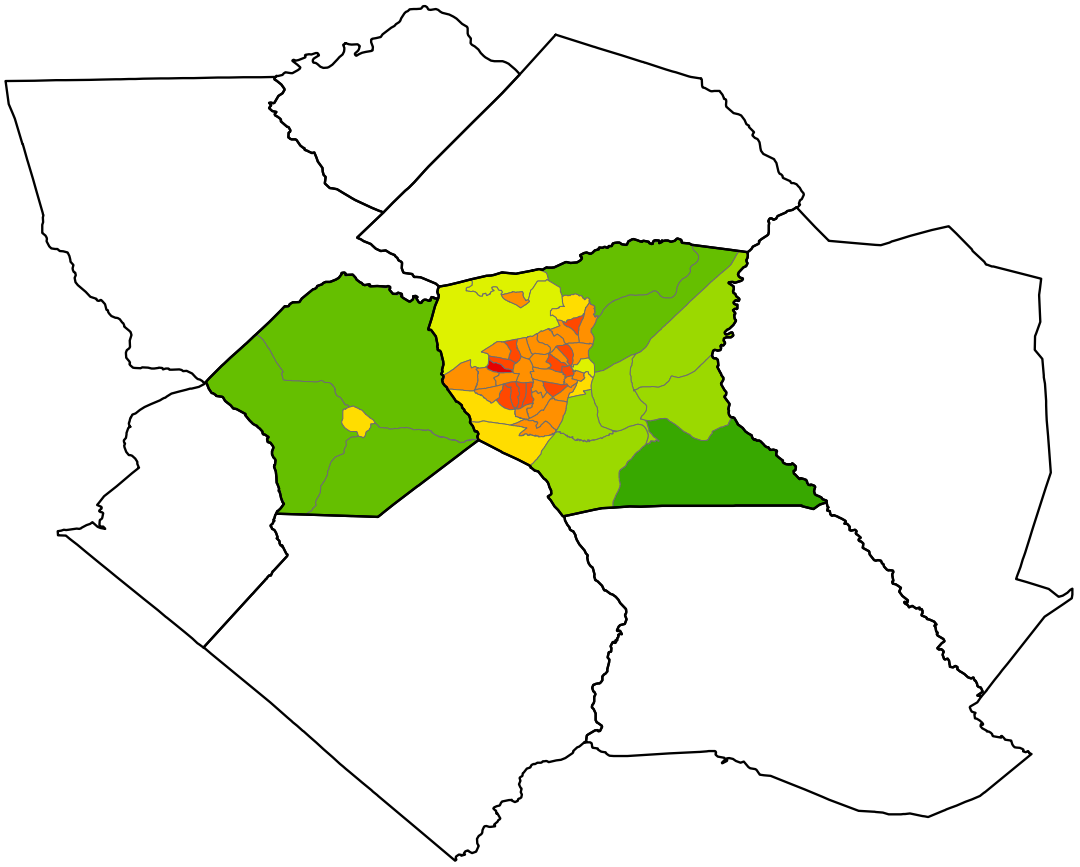


Triangle NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

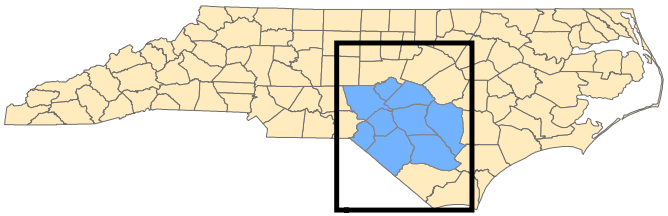


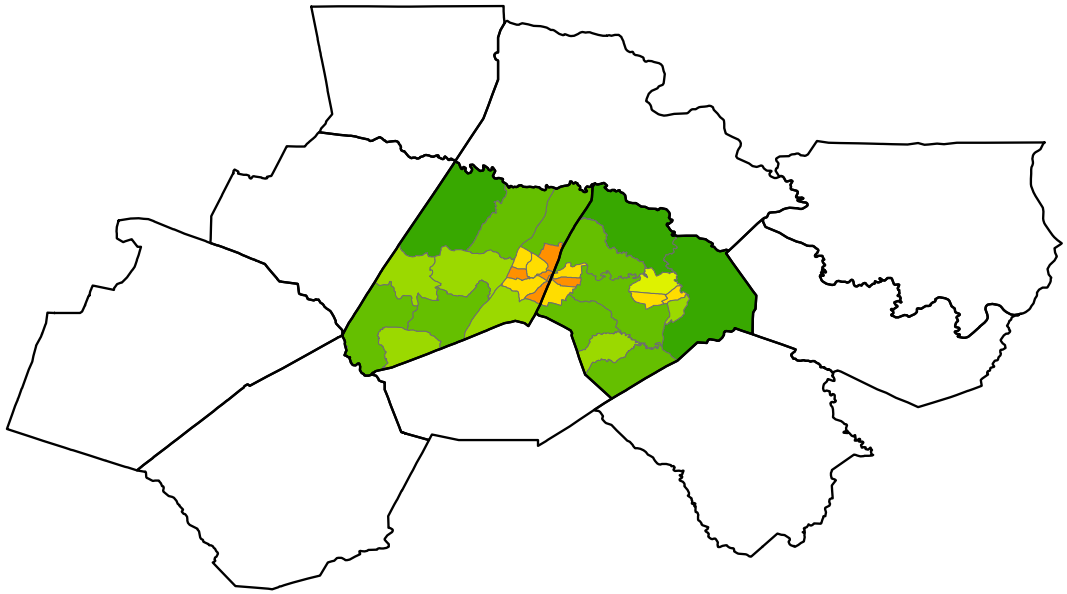


Fayetteville NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

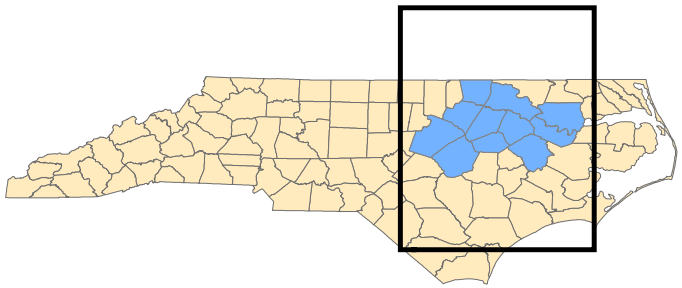




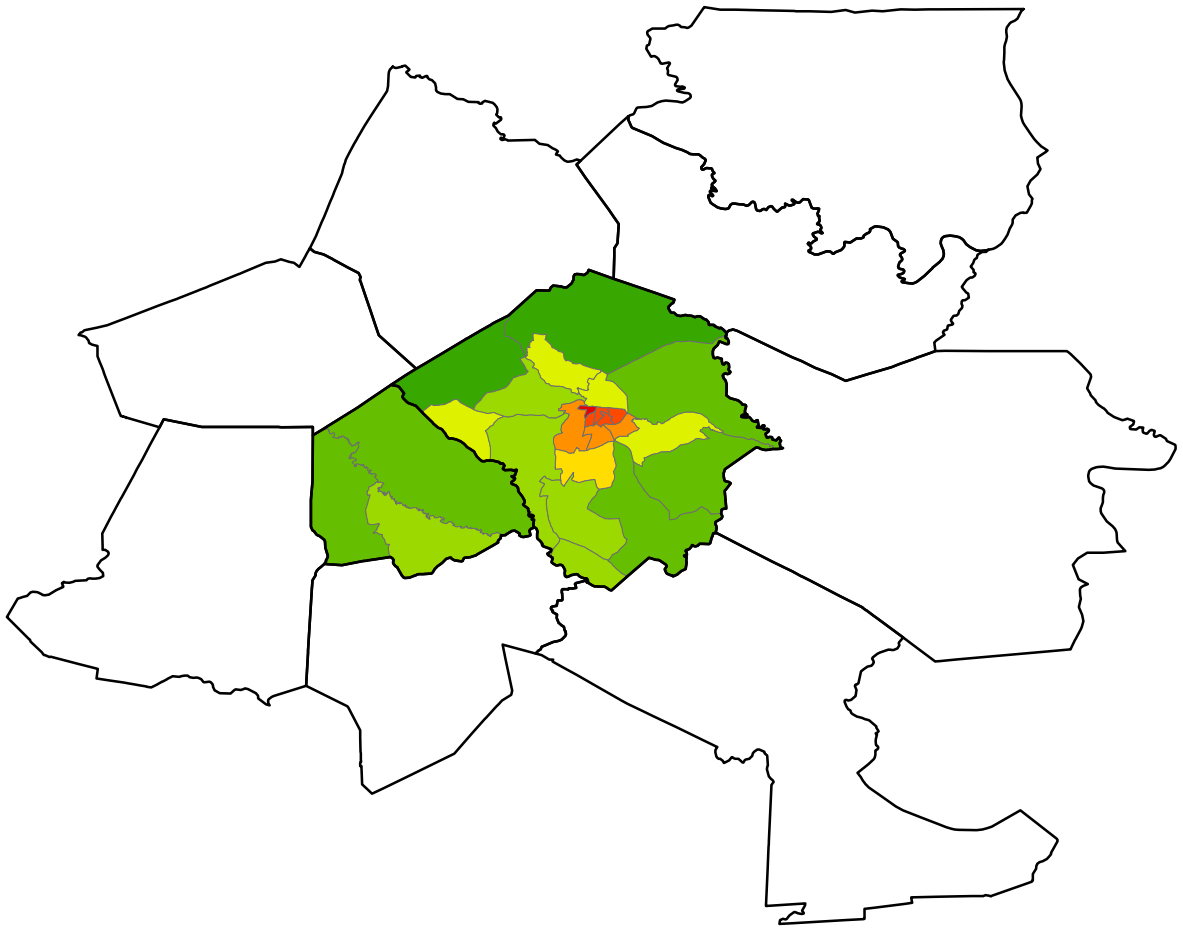
Rocky Mount NC Regional Census (2000) Tract Population Density

Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

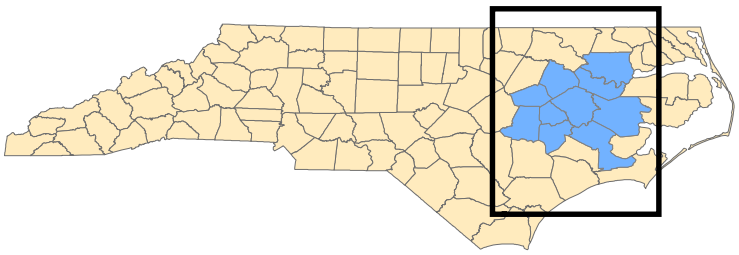


Greenville NC Regional Census (2000) Tract Population Density

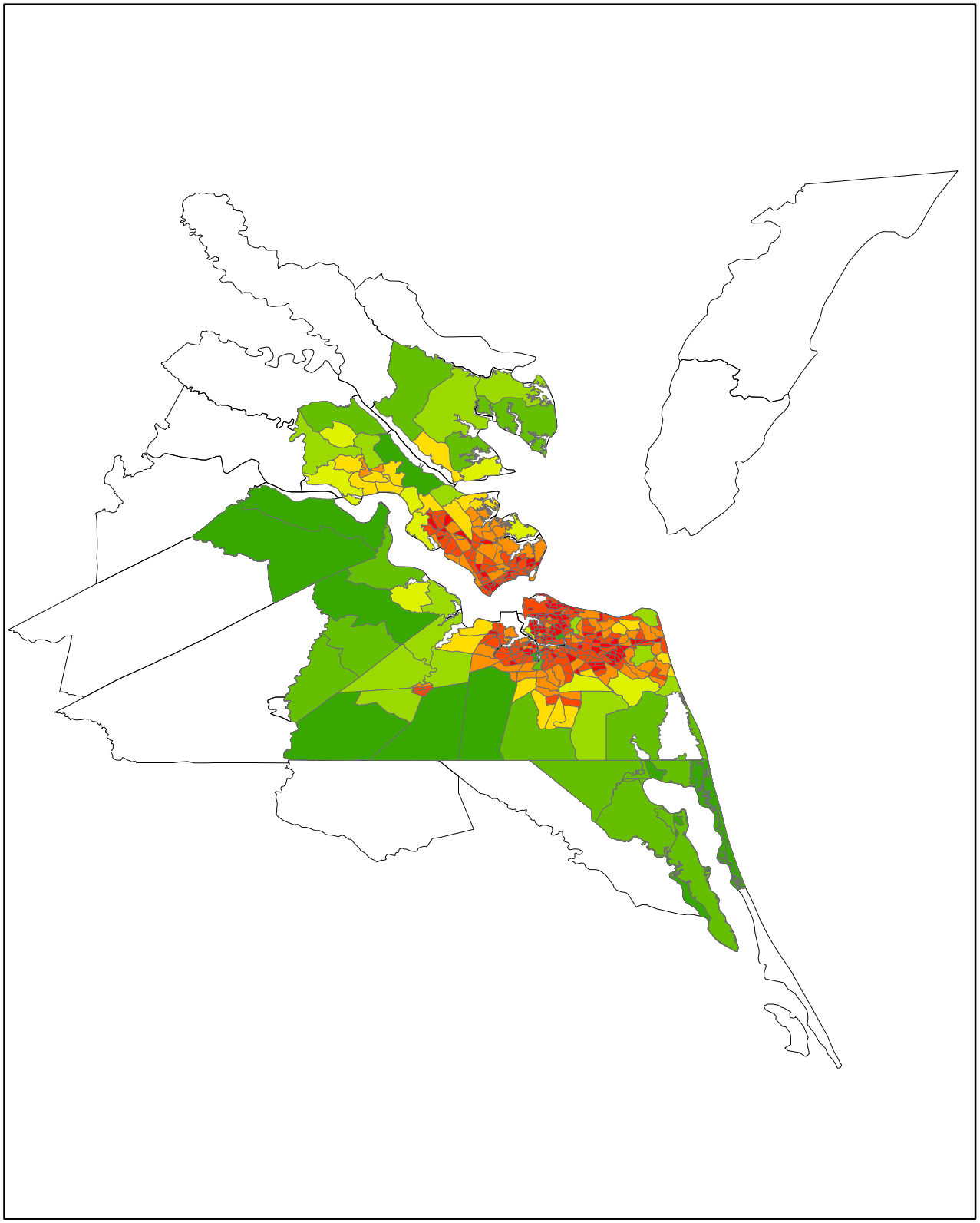


Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+

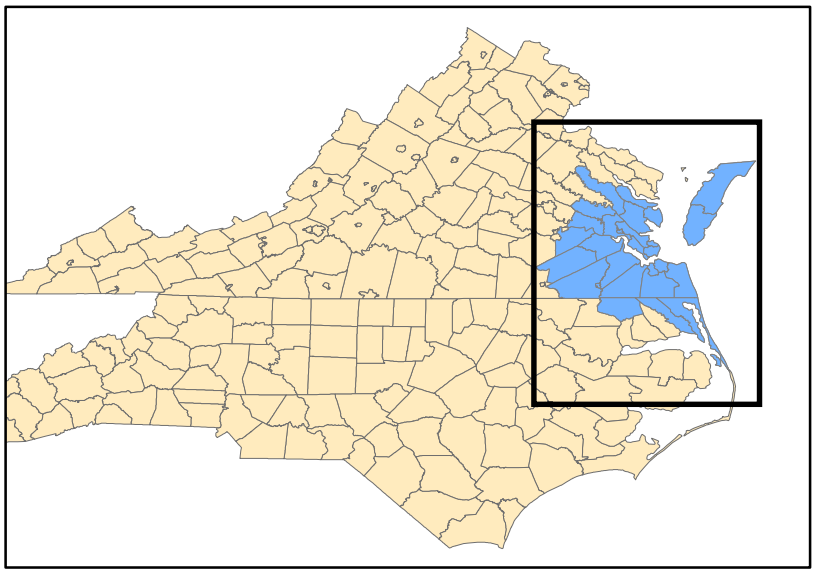


Currituck NC Regional Census (2000) Tract Population Density



Population / Square Mile

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000+



Appendix J

North Carolina's 2007 & 2020 Daily Vehicle Miles Traveled Maps and Table

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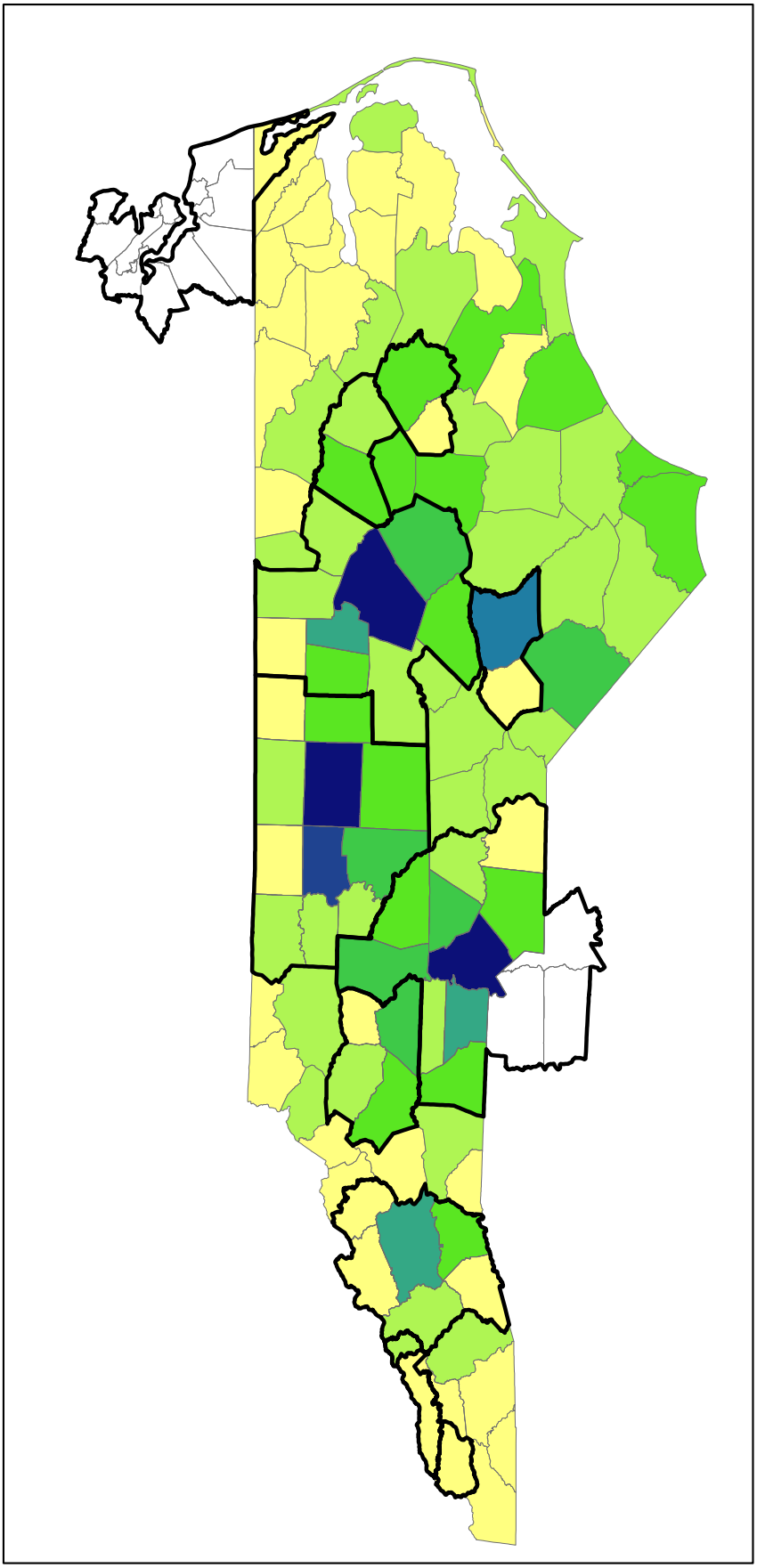
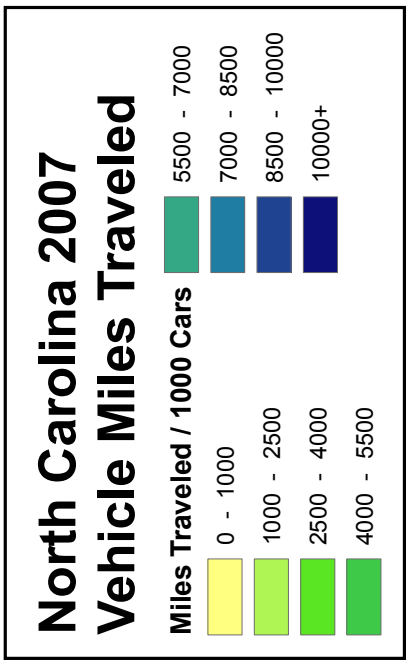
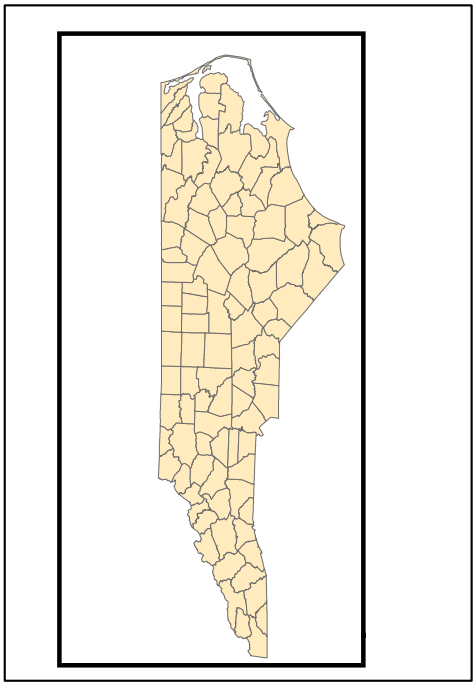
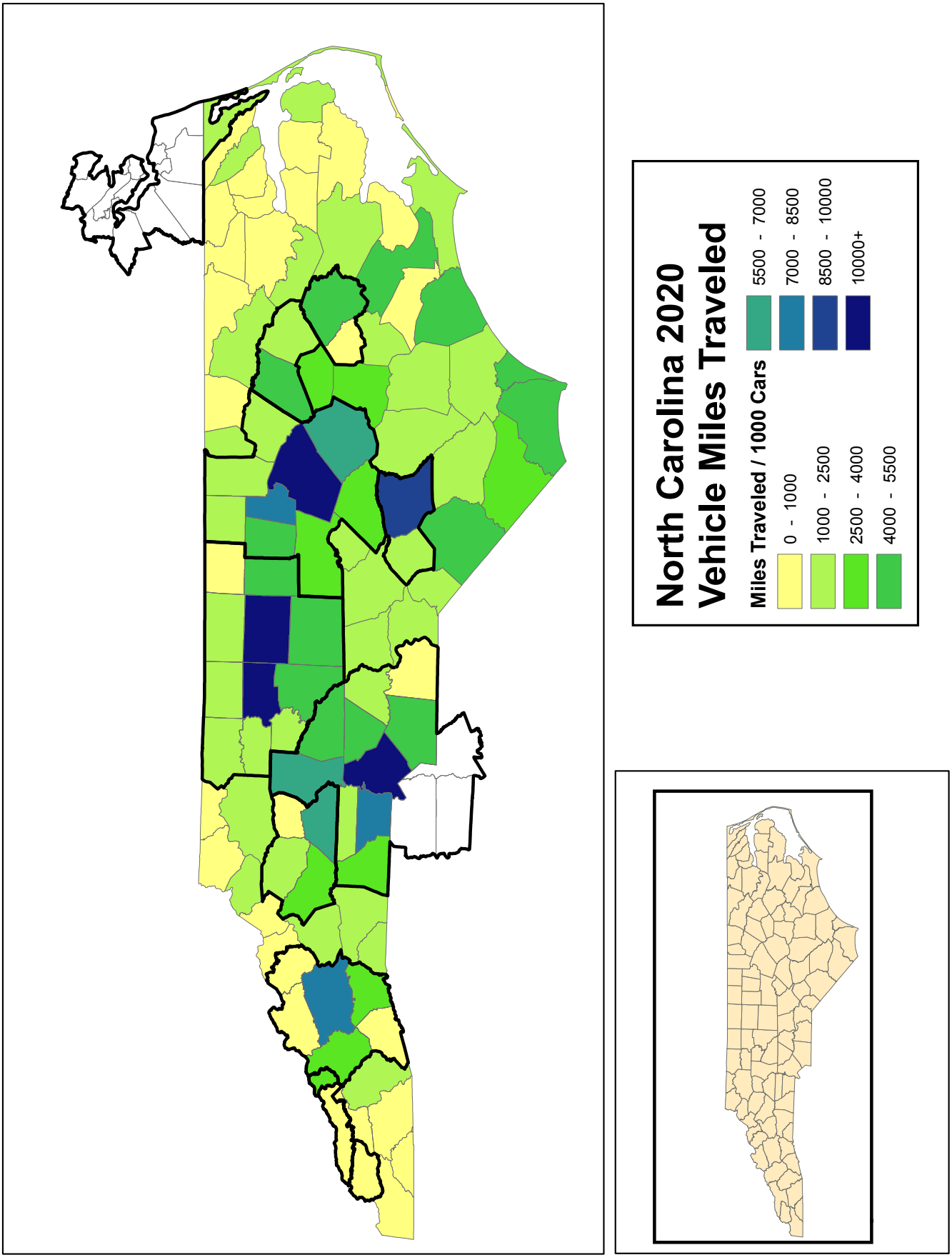



North Carolina 2007
Vehicle Miles Traveled
Miles Traveled / 1000 Cars
0 - 1000
1000 - 2500
2500 - 4000
4000 - 5500
5500 - 7000
7000 - 8500
8500 - 10000
10000+




North Carolina 2020
Vehicle Miles Traveled
Miles Traveled / 1000 Cars
0 - 1000
1000 - 2500
2500 - 4000
4000 - 5500
5500 - 7000
7000 - 8500
8500 - 10000
10000+

County	2007 Estimated Vehicle Miles Traveled	2020 Projected Vehicle Miles Traveled
Alamance	3810.1	4228.0
Alexander	632.8	750.8
Alleghany	261.0	276.5
Anson	829.9	944.1
Ashe	662.6	807.6
Avery	557.9	561.9
Beaufort	1181.2	1127.8
Bertie	760.0	886.2
Bladen	1128.9	1363.8
Brunswick	3642.3	5411.1
Buncombe	6685.8	7920.5
Burke	2685.2	2939.0
Cabarrus	4381.2	5120.2
Caldwell	1699.9	1904.0
Camden	338.5	457.2
Carteret	1720.3	2059.6
Caswell	616.7	699.4
Catawba	4911.0	5830.0
Chatham	1906.2	2502.8
Cherokee	795.8	834.7
Chowan	362.9	462.3
Clay	255.4	348.4
Cleveland	2727.7	3087.9
Columbus	1915.5	2741.5
Craven	2929.1	4385.0
Cumberland	7774.5	8817.9
Currituck	971.8	1571.8
Dare	1449.0	1771.0
Davidson	4245.1	4676.0
Davie	1397.5	1714.4
Duplin	2033.7	2215.8
Durham	6945.5	8267.6
Edgecombe	1626.7	1789.2
Forsyth	8900.9	10550.7

County	2007 Estimated Vehicle Miles Traveled	2020 Projected Vehicle Miles Traveled
Franklin	1310.4	1462.6
Gaston	5614.1	7004.9
Gates	319.3	333.9
Graham	193.3	162.3
Granville	1782.0	1977.5
Greene	585.3	731.0
Guilford	11814.3	13633.5
Halifax	1867.2	1987.9
Harnett	2541.2	2946.7
Haywood	2479.3	2782.8
Henderson	2547.2	3056.2
Hertford	533.9	536.7
Hoke	807.7	1140.1
Hyde	167.4	216.7
Iredell	5208.4	6236.9
Jackson	1358.2	1542.2
Johnston	5225.4	6131.3
Jones	528.6	569.8
Lee	1715.5	2018.5
Lenoir	1631.0	1796.3
Lincoln	1823.9	2372.0
Macon	613.4	767.8
Madison	906.6	868.7
Martin	1749.5	1965.9
McDowell	914.8	1030.4
Mecklenburg	21759.8	29485.2
Mitchell	379.8	396.5
Montgomery	1029.3	1125.3
Moore	2178.2	2497.0
Nash	3894.5	4391.9
New Hanover	3786.0	4927.1
Northampton	868.8	936.5
Onslow	3737.9	5317.4

County	2007 Estimated Vehicle Miles Traveled	2020 Projected Vehicle Miles Traveled
Orange	3921.4	4653.2
Pamlico	433.7	489.9
Pasquotank	787.4	1033.4
Pender	1879.9	2318.8
Perquimans	417.1	572.9
Person	857.5	1065.7
Pitt	3377.8	4065.7
Polk	904.8	1148.7
Randolph	3742.4	4253.5
Richmond	1367.3	1452.1
Robeson	4360.8	4909.5
Rockingham	2334.8	2200.5
Rowan	3712.5	4105.8
Rutherford	1611.6	1894.4
Sampson	1972.6	2249.4
Scotland	1072.3	1097.7
Stanly	1418.4	1495.6
Stokes	889.0	1040.0
Surry	2396.3	2359.7
Swain	575.2	624.0
Transylvania	819.1	830.8
Tyrrell	165.5	210.2
Union	3601.6	4389.9
Vance	1374.1	1627.7
Wake	19808.9	26513.8
Warren	628.9	726.7
Washington	381.0	411.7
Watauga	1134.5	1359.6
Wayne	2700.0	3349.2
Wilkes	1926.4	2137.3
Wilson	2675.6	2872.1
Yadkin	1381.3	1635.2
Yancey	454.6	484.7

Appendix K

Commuting Patterns for Larger Urbanized Counties in North Carolina

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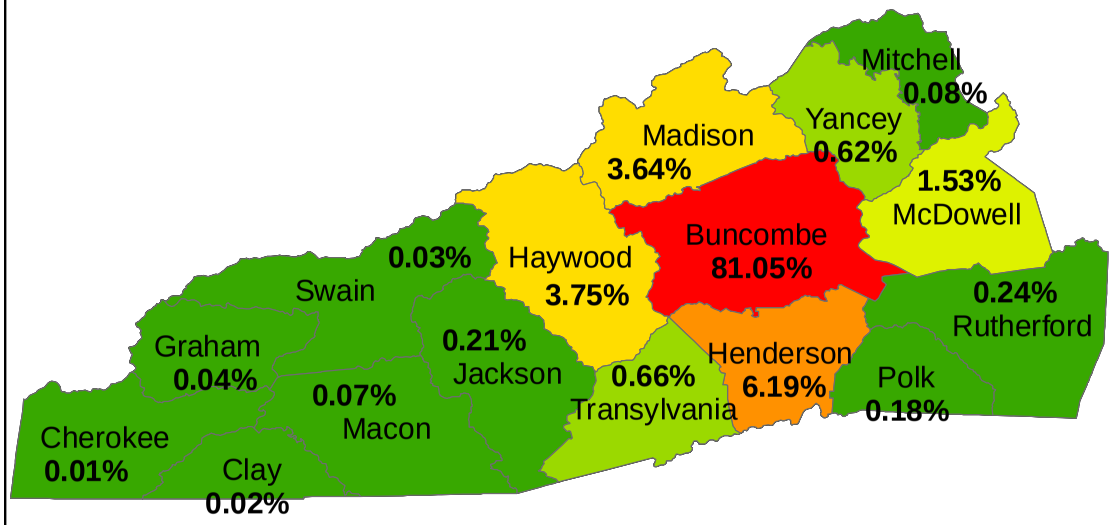
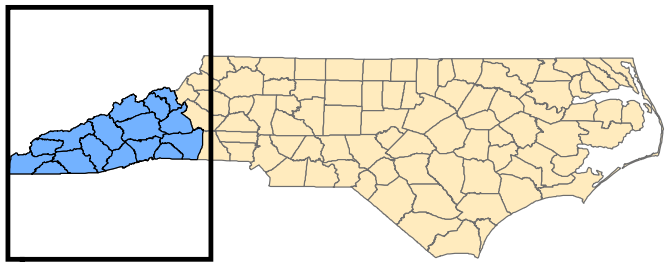
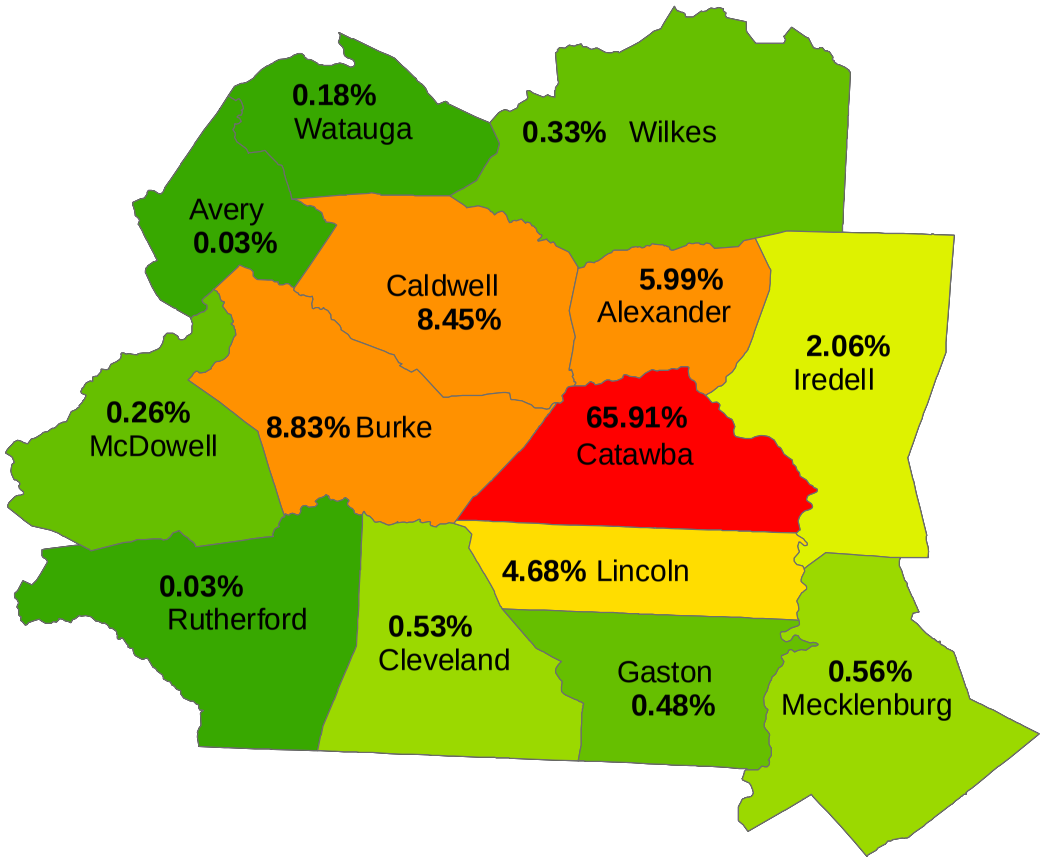


Commuting Pattern Into Core Urbanized Counties

Buncombe County Commuting Percentage

- 0.01 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

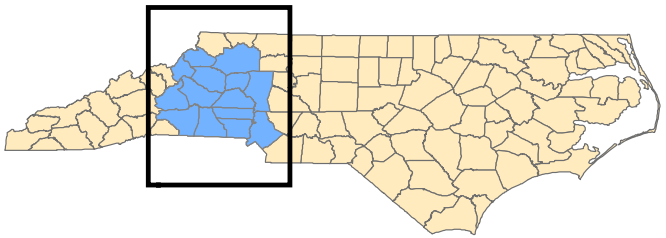


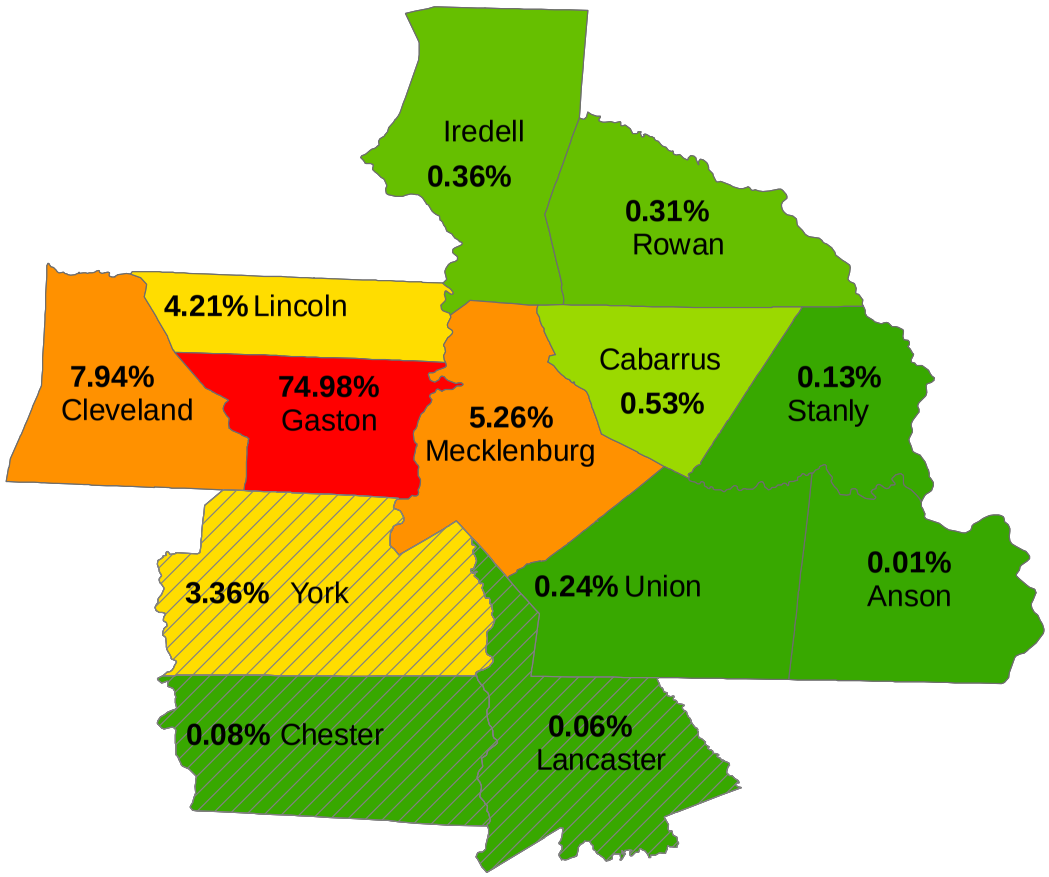


Commuting Pattern Into Core Urbanized Counties

Catawba County Commuting Percentage

- 0.03 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

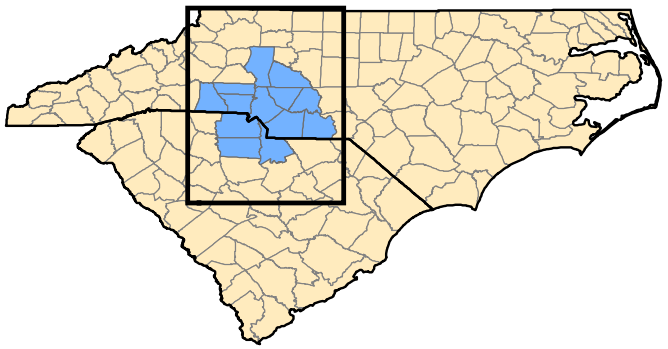


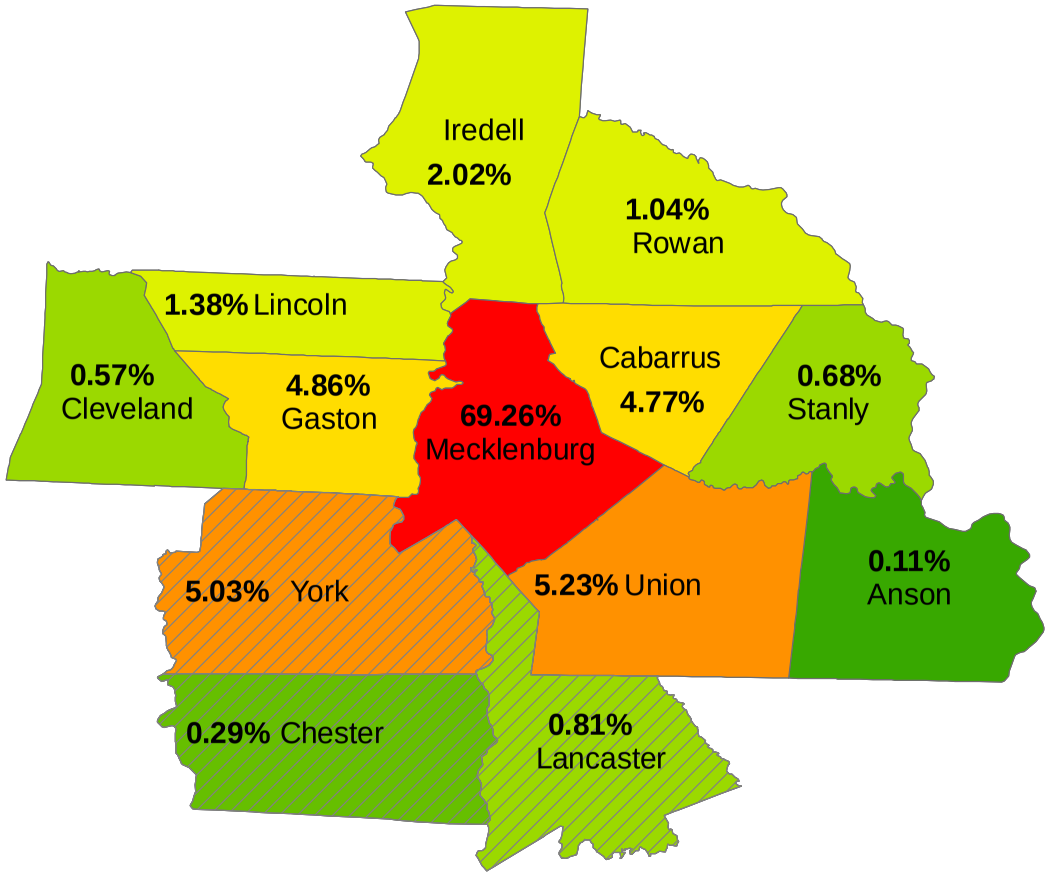


Commuting Pattern Into Core Urbanized Counties

Gaston County Commuting Percentage

- 0.01 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

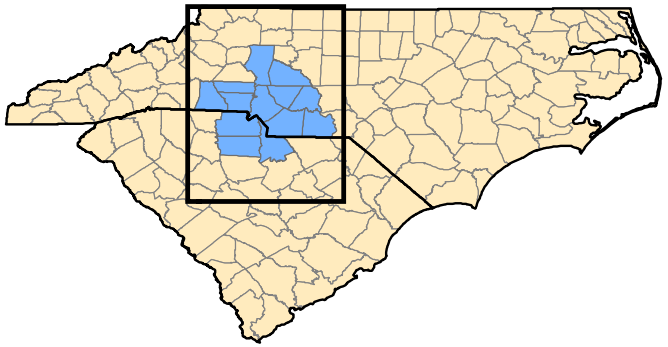


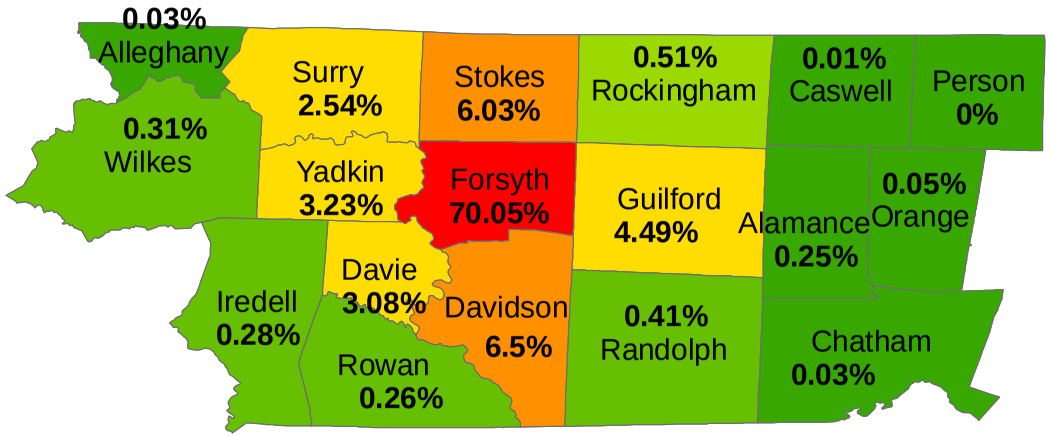


Commuting Pattern Into Core Urbanized Counties

Mecklenburg County Commuting Percentage

- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

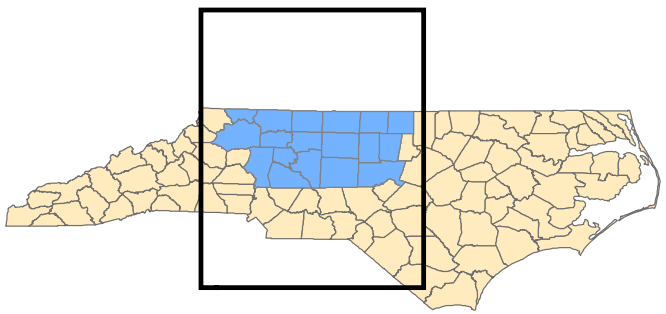


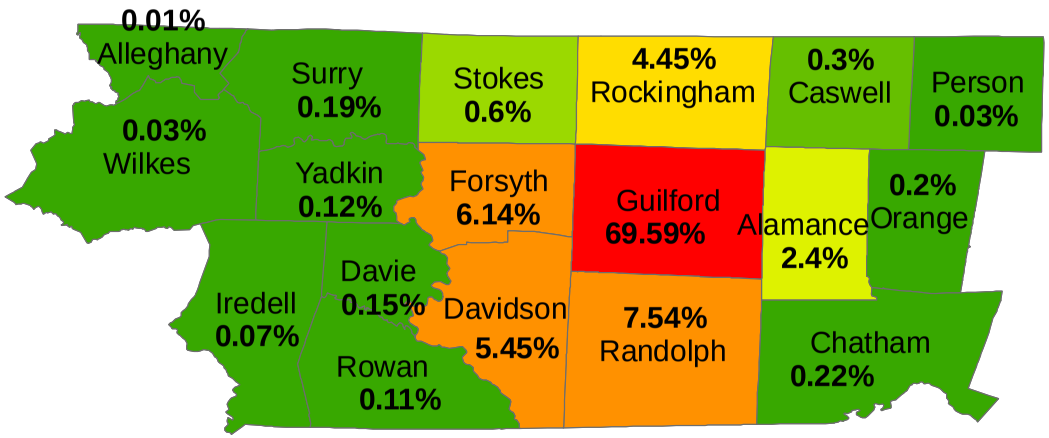


Commuting Pattern Into Core Urbanized Counties

Forsyth County Commuting Percentage

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

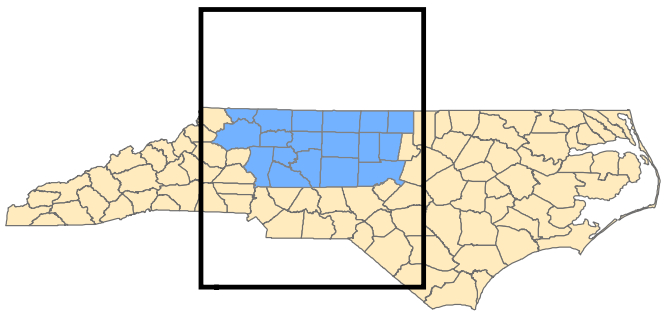


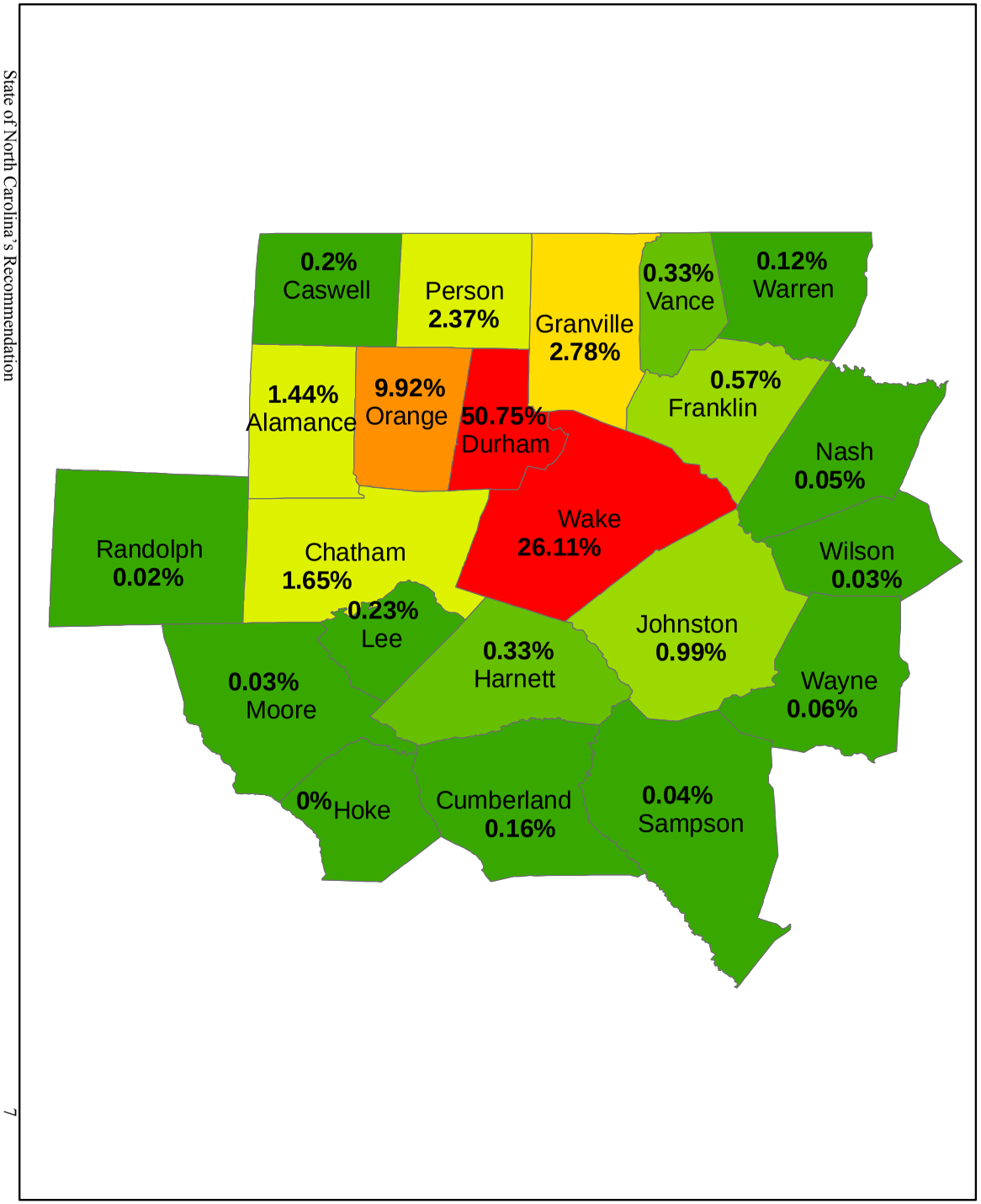


Commuting Pattern Into Core Urbanized Counties

Guilford County Commuting Percentage

- 0.01 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

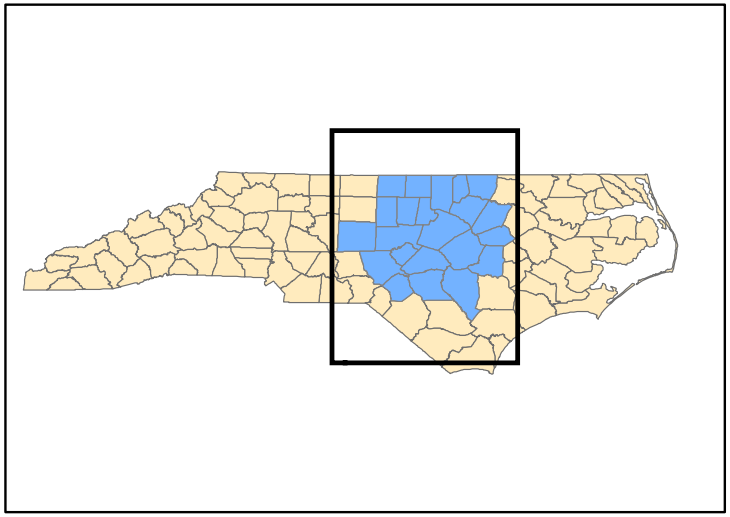


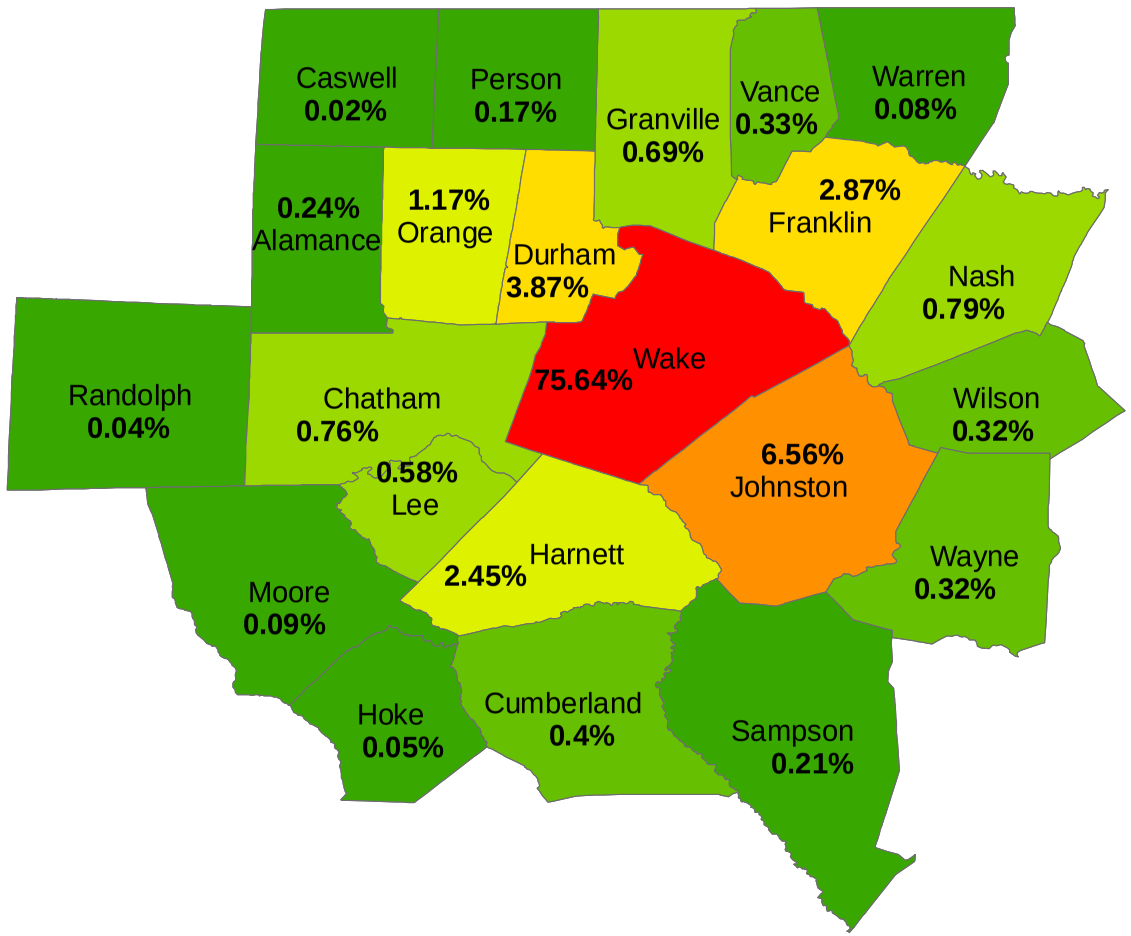


Commuting Pattern Into Core Urbanized Counties

Durham County Commuting Percentage

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

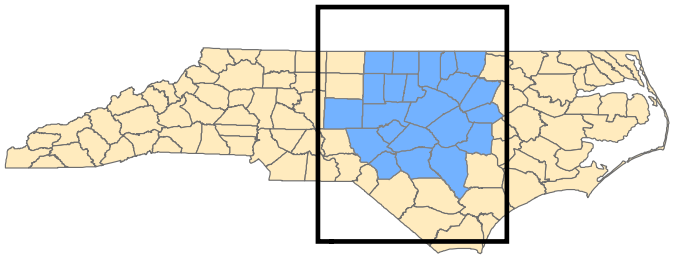


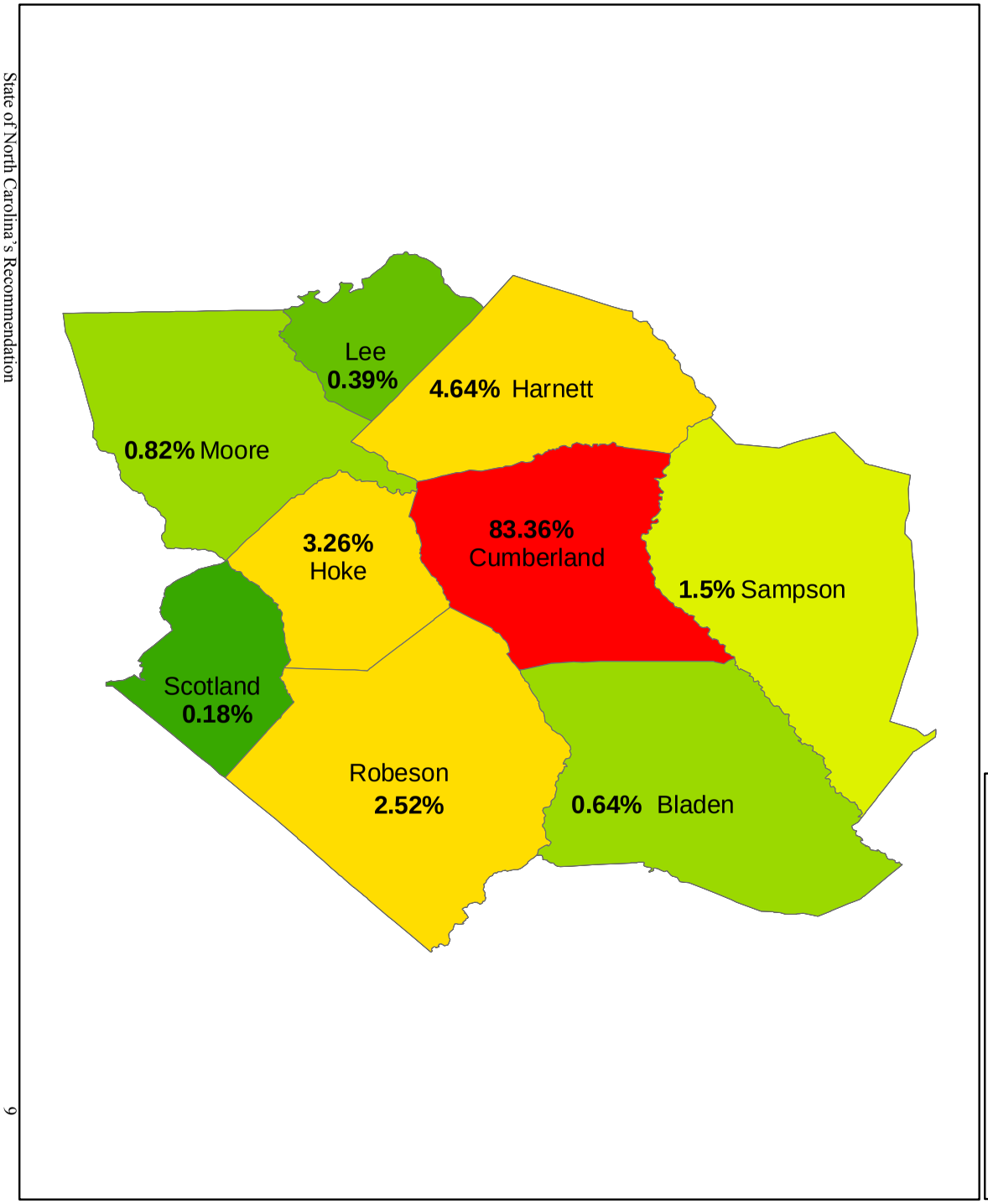


Commuting Pattern Into Core Urbanized Counties

Wake County Commuting Percentage

- 0.02 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

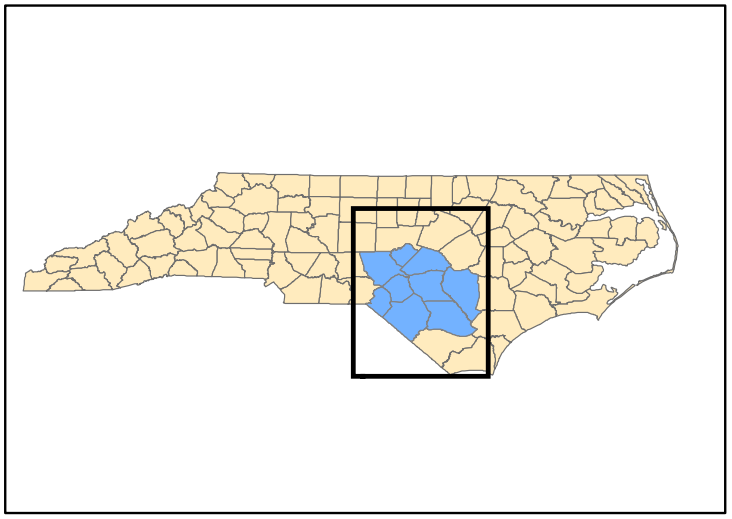


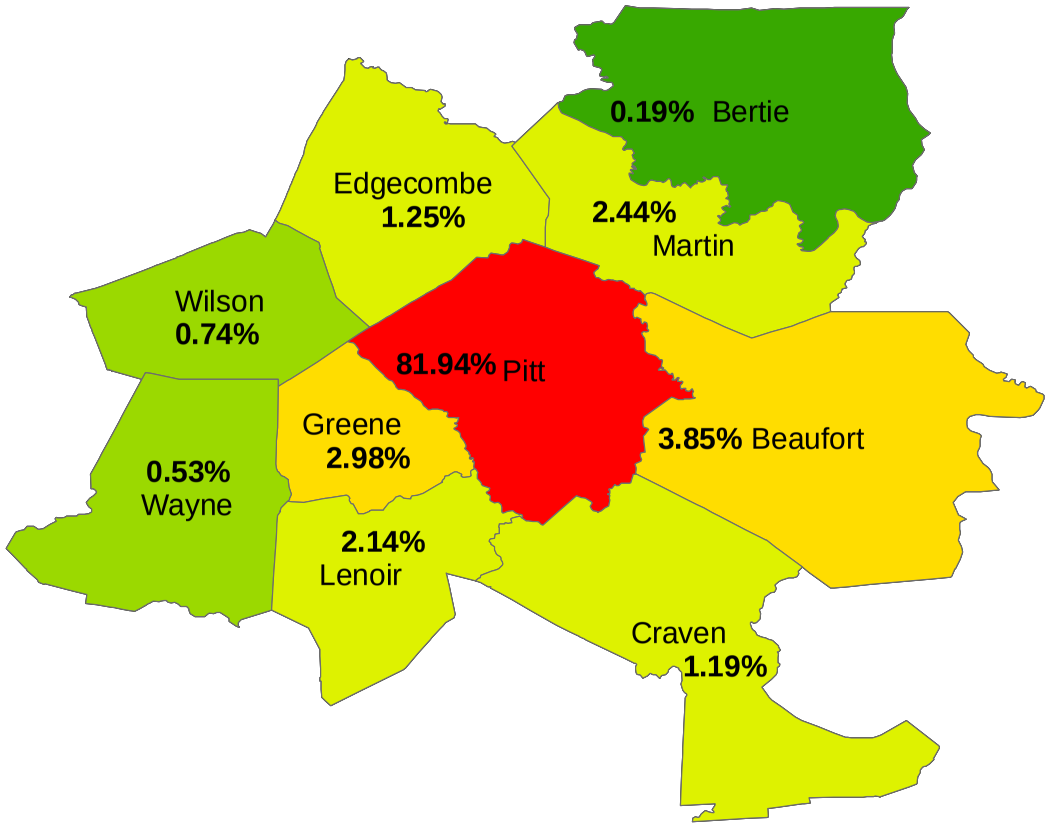


Commuting Pattern Into Core Urbanized Counties

Cumberland County Commuting Percentage

- 0.18 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00

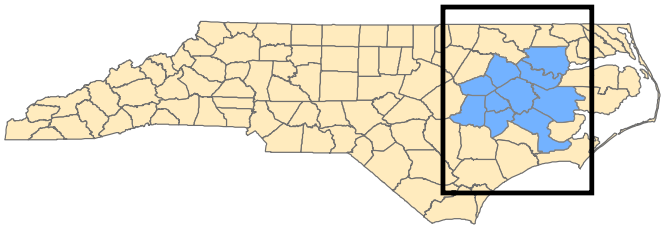




Commuting Pattern Into Core Urbanized Counties

Pitt County Commuting Percentage

- 0.19 - 0.25
- 0.26 - 0.50
- 0.51 - 1.00
- 1.01 - 2.50
- 2.51 - 5.00
- 5.01 - 10.00
- 10.01 - 25.00
- 25.01 - 100.00



Appendix L

North Carolina's Population Growth Rates and Projections Description

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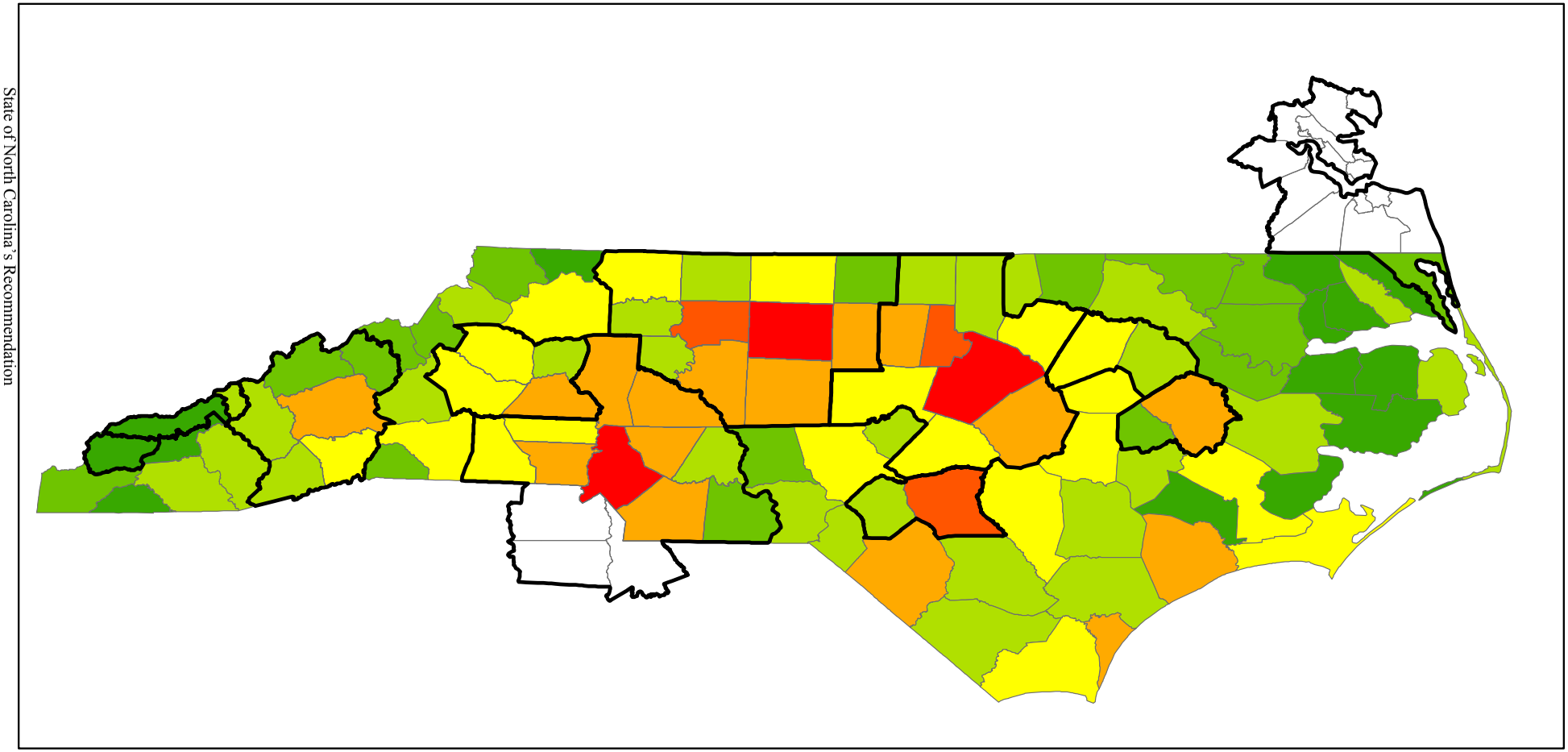
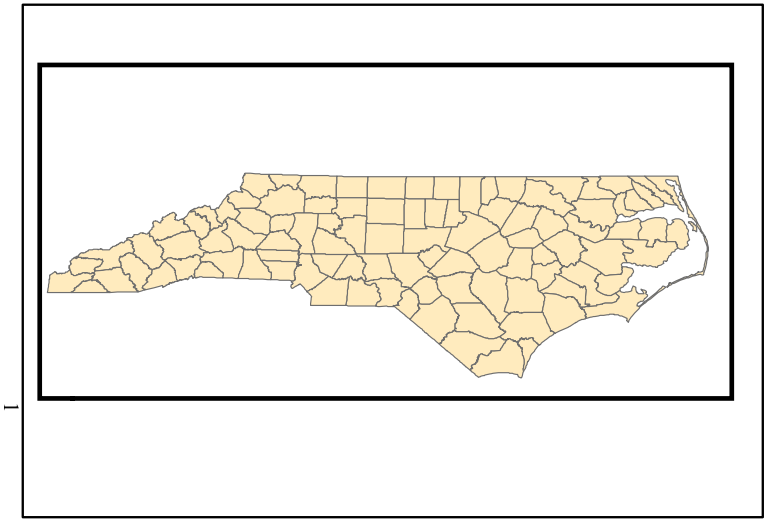
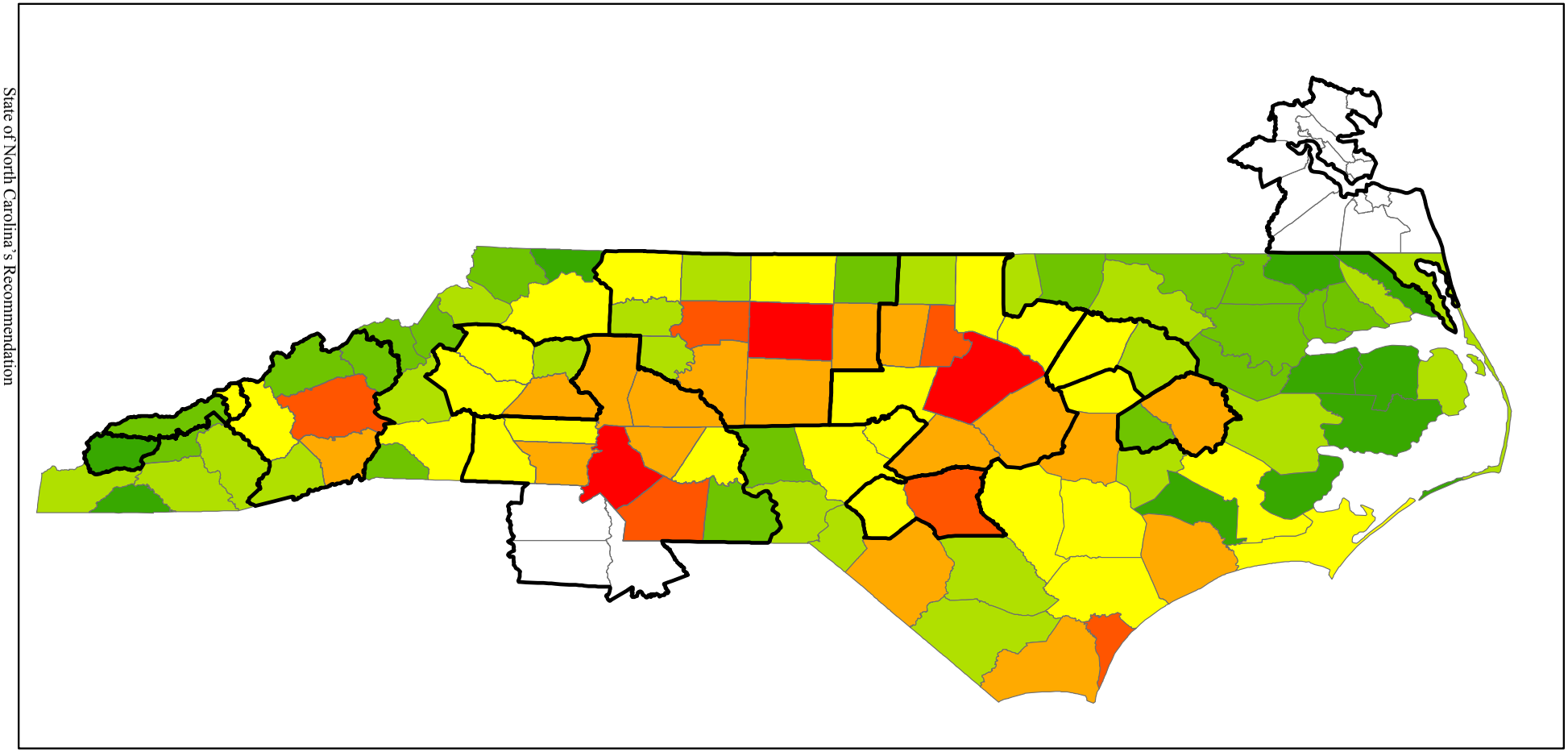


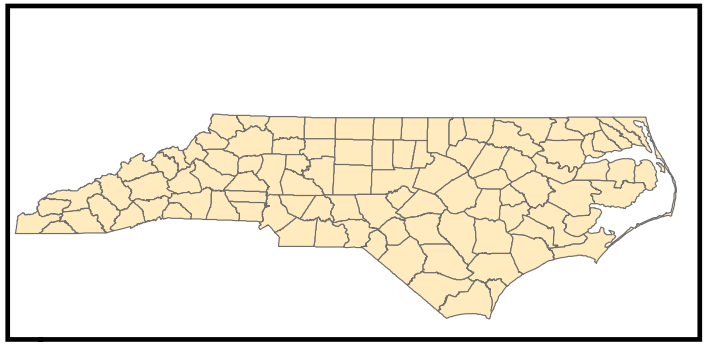


North Carolina Projected (2010) County Popluation

Projected 2010 Population

- 0 - 15000
- 15001 - 30000
- 30001 - 60000
- 60001 - 120000
- 120001 - 240000
- 240001 - 480000
- 480001 or greater

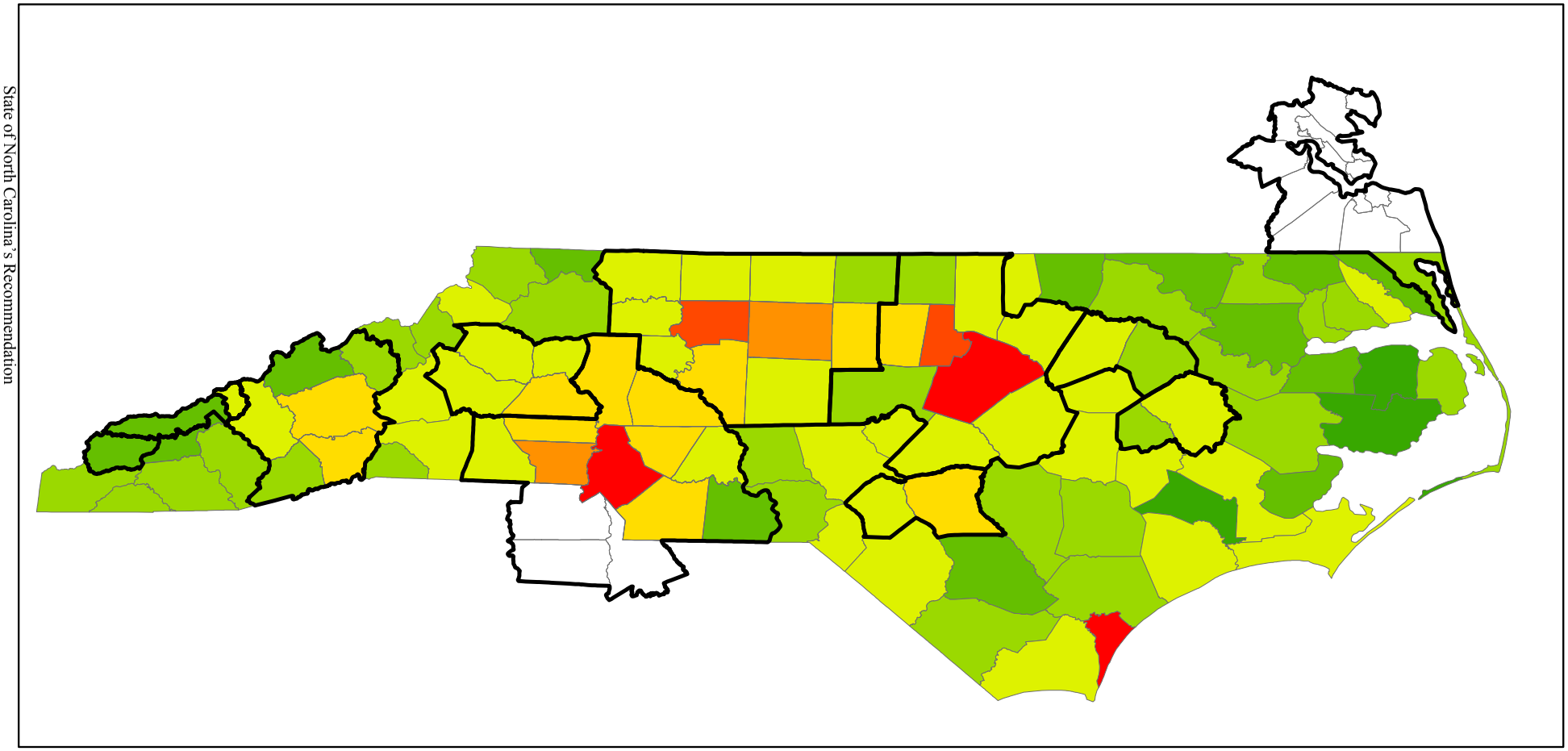


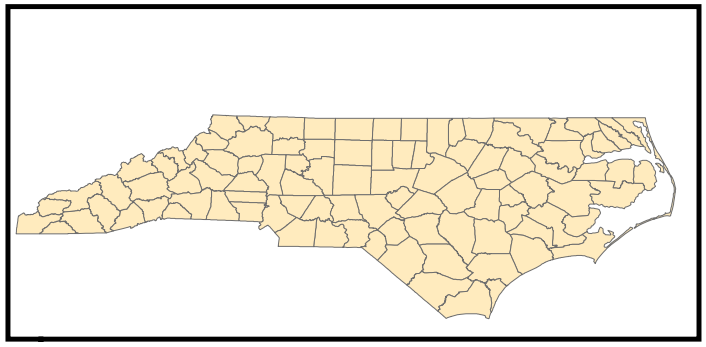


North Carolina Projected (2020) County Popluation

Projected 2020 Population

- 0 - 15000
- 15001 - 30000
- 30001 - 60000
- 60001 - 120000
- 120001 - 240000
- 240001 - 480000
- 480001 or greater

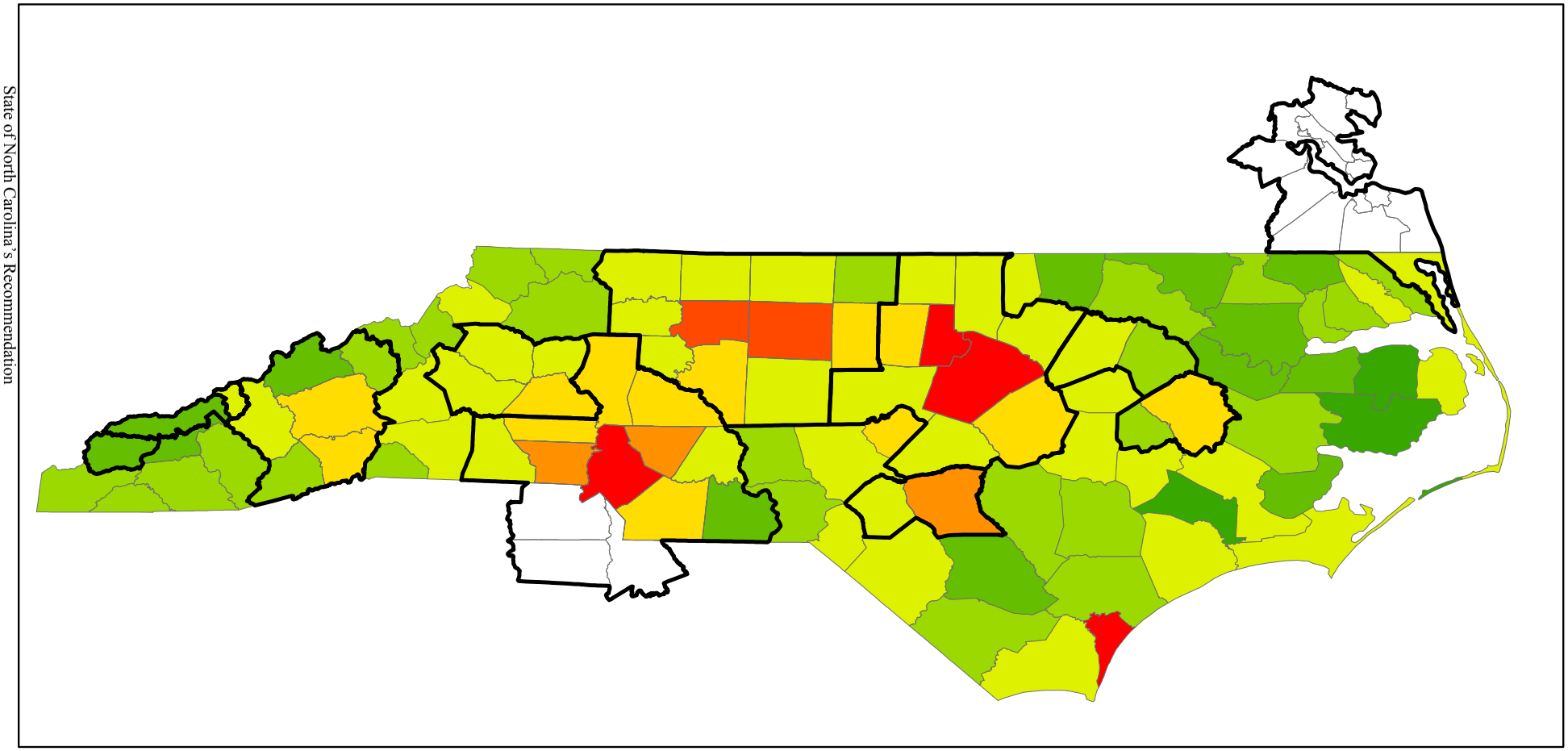


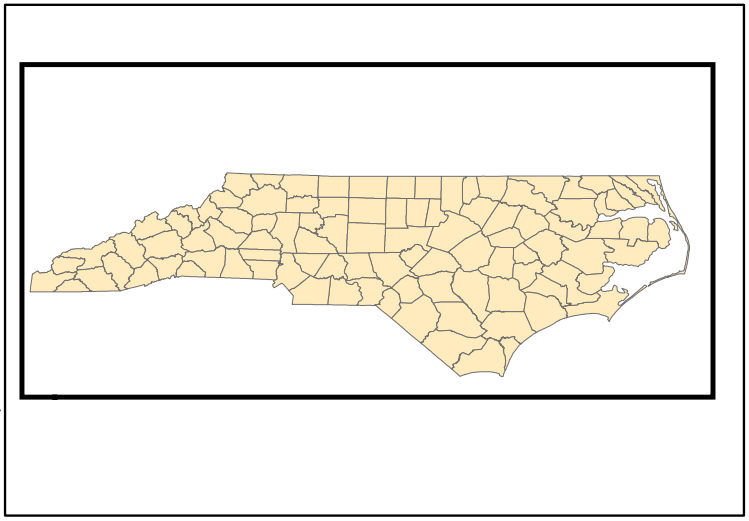


North Carolina County Projected Population Density - 2010

Population / Square Mile

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 750
- 750 - 1000
- 1000+

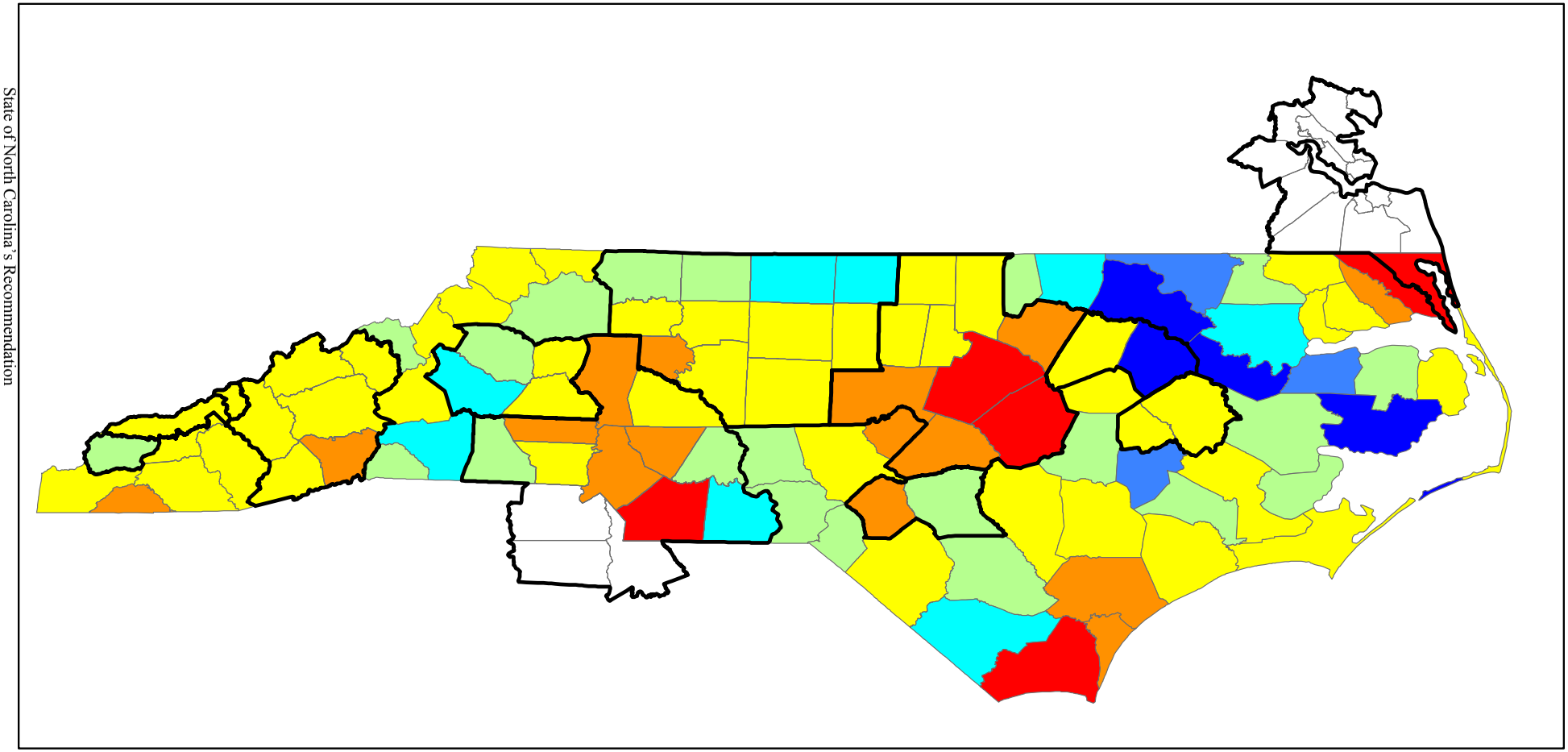


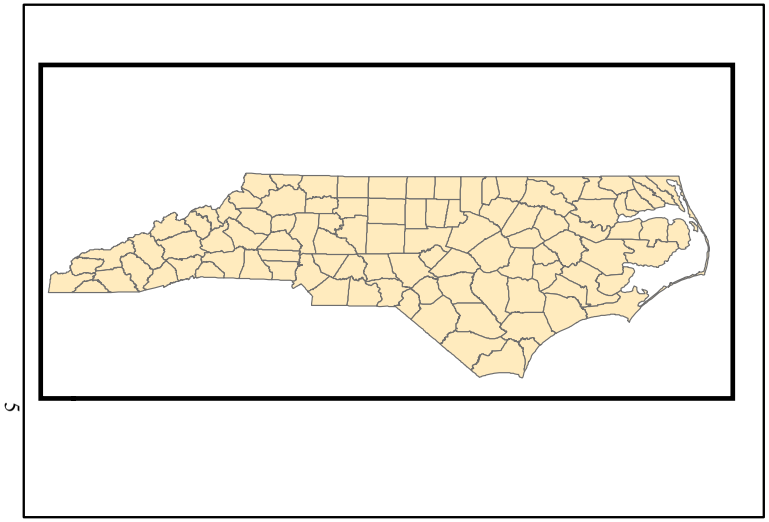


North Carolina County Projected Population Density - 2020

Population / Square Mile

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 750
- 750 - 1000
- 1000+

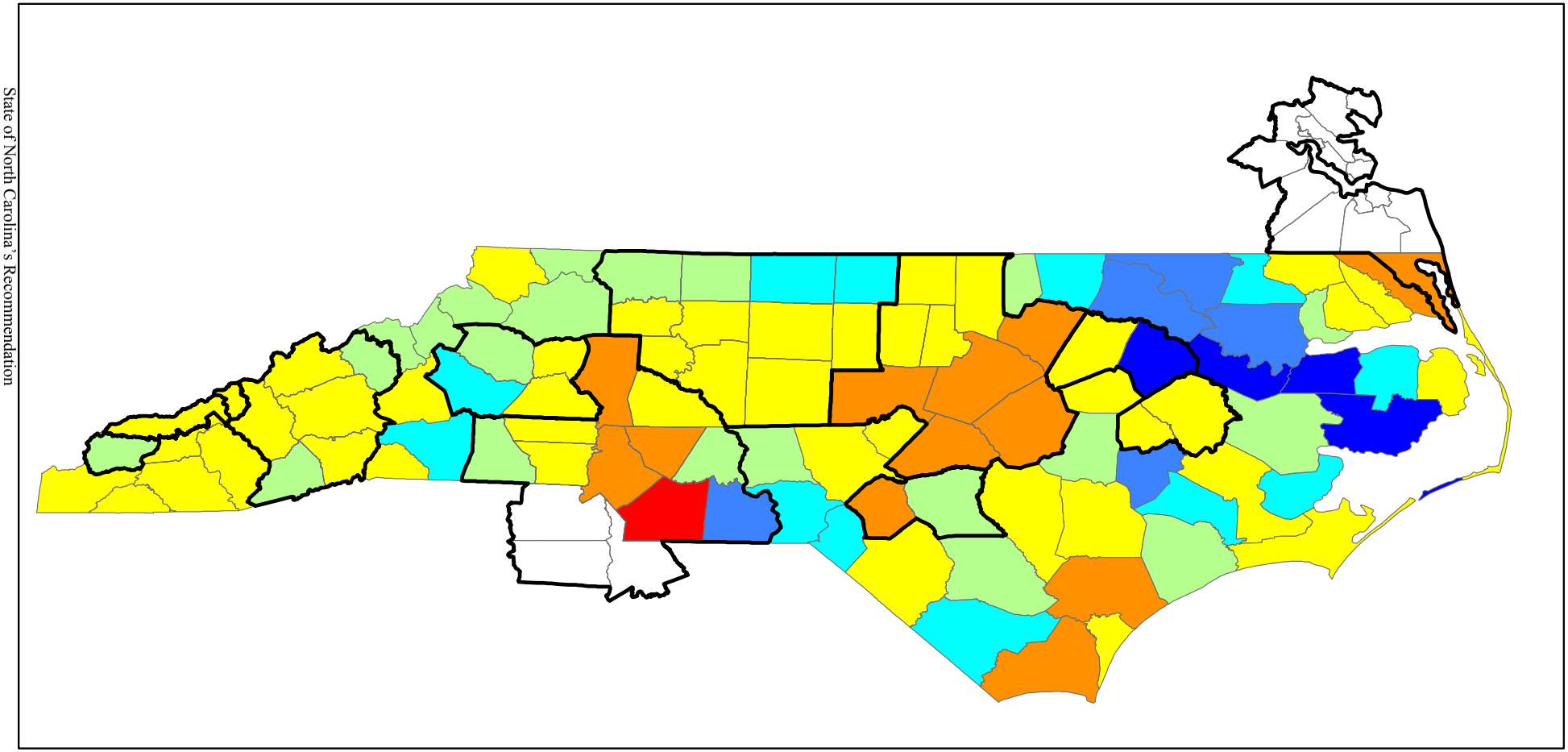


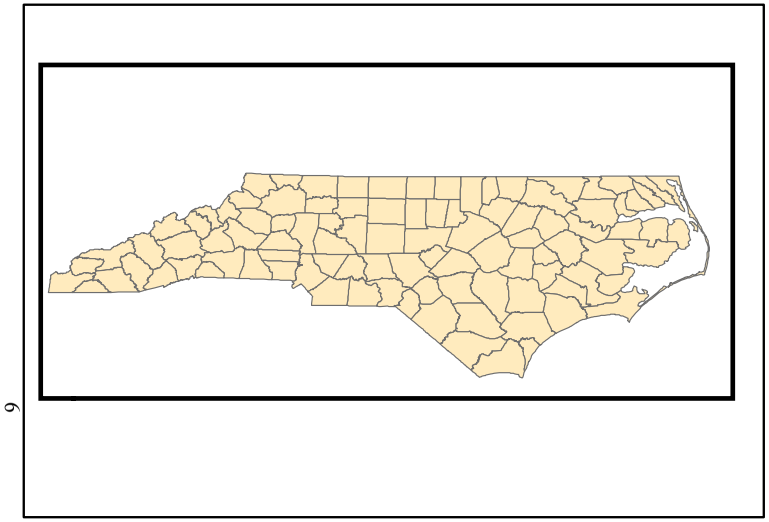


North Carolina Projected Popluation Growth (2000-2010)

Percentage Change

- 40.1% or greater
- 20.1% to 40.0%
- 5.1% to 20.0%
- 0.1% to 5.0%
- -2.4% to 0.0%
- -4.9% to -2.5%
- -5.0% or less





North Carolina Projected Popluation Growth (2010-2020)

Percentage Growth

- 40.1% or greater
- 20.1% to 40.0%
- 5.1% to 20.0%
- 0.1% to 5.0%
- -2.4% to 0.0%
- -4.9% to -2.5%
- -5.0% or less

County	2000 Census Population	State Rank (1-100)	2007 Estimated Population	State Rank (1-100)	2010 Projected Population	State Rank (1-100)	2020 Projected Population	State Rank (1-100)	2000 Census Population Density	2010 Projected Population Density	2020 Projected Population Density	2000-2010 Projected Population Growth	2010-2020 Projected Population Growth
Alamance	131407	15	143154	18	148659	18	167872	18	304.2	344.6	389.2	13.1	12.9
Alexander	33688	65	36656	66	37695	65	40705	66	129.2	144.6	156.2	11.9	8.0
Alleghany	10699	93	11088	94	11312	94	11756	96	45.5	48.2	50.1	5.7	3.9
Anson	25321	73	25332	74	24892	75	23814	75	47.5	46.9	44.9	-1.7	-4.3
Ashe	24472	74	26003	73	26776	73	28595	74	57.2	62.7	67.0	9.4	6.8
Avery	17332	86	18292	86	18468	86	18916	85	69.5	74.7	76.6	6.6	2.4
Beaufort	45030	53	46070	55	46575	56	47558	57	54.3	56.2	57.4	3.4	2.1
Bertie	19756	80	19971	82	19660	83	18819	86	28.3	28.1	26.9	-0.5	-4.3
Bladen	32315	67	32500	69	32559	69	32581	71	36.9	37.2	37.2	0.8	0.1
Brunswick	73856	34	99440	26	112038	25	147065	21	85.6	130.0	171.1	51.7	31.3
Buncombe	206812	7	225609	7	235520	7	264368	8	314.5	357.9	401.9	13.9	12.2
Burke	89220	29	88439	31	88397	31	87782	33	175.9	174.5	173.3	-0.9	-0.7
Cabarrus	132178	14	164384	12	180631	11	232599	10	359.7	492.2	634.5	36.7	28.8
Caldwell	77810	31	79376	33	80270	33	81913	35	164.8	170.1	173.6	3.2	2.0
Camden	6918	98	9519	97	10612	96	14362	92	28.6	43.7	59.3	53.4	35.3
Carteret	59443	41	63294	39	64942	39	69235	41	114.2	124.7	133.0	9.3	6.6
Caswell	23558	76	23508	78	23453	77	23413	77	55.3	55.2	55.1	-0.4	-0.2
Catawba	142481	12	153404	15	158842	17	175603	16	354.2	396.1	438.0	11.5	10.6
Chatham	49687	47	59168	41	63236	40	77367	36	72.2	92.1	112.8	27.3	22.3
Cherokee	24374	75	27026	72	28330	71	31569	72	53.4	62.1	69.2	16.2	11.4
Chowan	14160	88	14660	88	14926	88	15542	89	82.0	86.4	90.0	5.4	4.1
Clay	8823	96	10326	95	11009	95	12867	94	40.9	51.1	59.7	24.8	16.9
Cleveland	96408	24	97144	27	97218	28	98416	30	207.2	209.2	211.7	0.8	1.2
Columbus	54749	45	54460	49	54207	51	53347	51	58.4	57.9	57.0	-1.0	-1.6
Craven	91693	26	96406	28	98965	27	105938	27	129.2	139.4	149.3	7.9	7.0
Cumberland	303060	5	313616	5	317509	5	333540	5	464.2	485.8	510.4	4.8	5.0
Currituck	18297	84	23731	76	25929	74	33800	69	69.5	98.3	128.4	41.7	30.4
Dare	30211	68	34272	67	35410	67	41235	64	78.1	91.9	107.2	17.2	16.5
Davidson	147648	11	156400	14	160114	16	172686	17	266.7	289.4	312.2	8.4	7.9
Davie	35103	62	40447	61	42951	61	50815	54	131.4	161.2	190.9	22.4	18.3
Duplin	49253	49	53133	50	54943	49	61284	48	60.0	67.0	74.7	11.6	11.5
Durham	224651	6	254740	6	268139	6	310739	6	769.2	920.0	1066.6	19.4	15.9
Edgecombe	55522	44	51813	51	50223	52	45190	60	110.1	99.7	89.7	-9.5	-10.0
Forsyth	307129	4	338679	4	353998	4	402269	4	747.2	861.4	979.1	15.3	13.6
Franklin	47583	51	56456	45	60120	42	73444	38	96.1	121.5	148.6	26.3	22.2
Gaston	190580	8	200972	8	208070	9	222830	12	534.3	583.1	624.6	9.2	7.1
Gates	10526	94	11819	93	12538	93	14412	91	30.9	36.7	42.2	19.1	14.9
Graham	8006	97	8144	98	8226	98	8358	98	27.4	28.2	28.6	2.7	1.6
Granville	48851	50	55667	47	57933	46	66143	44	91.3	108.7	124.2	18.6	14.2
Greene	18976	82	21110	80	21539	79	23430	76	71.5	81.0	88.1	13.5	8.8
Guilford	422179	3	460780	3	481488	3	540860	3	648.3	739.2	830.5	14.0	12.3
Halifax	57316	43	55352	48	54411	50	51822	52	79.1	75.1	71.5	-5.1	-4.8
Harnett	91584	27	106506	24	113071	24	135827	24	153.1	189.1	227.3	23.5	20.1
Haywood	54192	46	57031	44	58072	45	61963	47	97.6	104.7	111.8	7.2	6.7
Henderson	89672	28	102142	25	108036	26	126430	25	238.5	287.7	336.8	20.5	17.0
Hertford	22895	77	23730	77	23721	76	23219	78	65.0	67.2	65.8	3.6	-2.1
Hoke	33897	64	42932	59	47456	53	62290	46	86.0	120.4	158.2	40.0	31.3
Hyde	5840	99	5447	99	5269	99	4783	99	9.5	8.6	7.8	-9.8	-9.2
Iredell	123754	19	150421	17	163367	14	204777	13	213.1	282.1	353.9	32.0	25.3
Jackson	33247	66	36815	65	38142	64	41495	62	67.5	77.6	84.4	14.7	8.8

County	2000 Census Population	State Rank (1-100)	2007 Estimated Population	State Rank (1-100)	2010 Projected Population	State Rank (1-100)	2020 Projected Population	State Rank (1-100)	2000 Census Population Density	2010 Projected Population Density	2020 Projected Population Density	2000-2010 Projected Population Growth	2010-2020 Projected Population Growth
Johnston	123082	21	157296	13	172857	13	226622	11	153.9	216.6	284.4	40.4	31.1
Jones	10375	95	10315	96	10404	97	10360	97	22.0	22.1	22.0	0.3	-0.4
Lee	49436	48	56376	46	59623	43	70385	40	191.1	230.7	272.5	20.6	18.1
Lenoir	59570	40	57642	43	57007	47	54360	50	149.1	142.7	136.1	-4.3	-4.6
Lincoln	64146	37	72776	36	77056	35	89930	32	213.5	256.8	299.9	20.1	16.7
Macon	29935	69	33626	68	35340	68	40649	67	57.7	68.2	78.5	18.1	15.0
Madison	19659	81	20495	81	20896	81	21973	79	43.7	46.4	48.8	6.3	5.2
Martin	25493	72	23906	75	23298	78	21259	80	55.4	50.6	46.2	-8.6	-8.8
McDowell	42336	57	44064	57	44973	58	47449	58	95.4	101.7	107.3	6.2	5.5
Mecklenburg	699892	1	863147	1	943079	1	1195883	2	1321.3	1780.2	2259.8	34.7	26.8
Mitchell	15733	87	15950	87	15982	87	16253	87	70.8	72.1	73.4	1.6	1.7
Montgomery	26879	71	27588	71	27972	72	29223	73	54.6	56.8	59.4	4.1	4.5
Moore	75039	32	83932	32	88236	32	101195	29	107.2	126.0	144.6	17.6	14.7
Nash	87573	30	92915	29	95501	29	103312	28	161.7	176.4	190.9	9.1	8.2
New Hanover	161118	9	189922	9	203417	10	243431	9	805.9	1017.5	1218.8	26.3	19.7
Northampton	22076	78	21235	79	21025	80	20176	82	41.2	39.2	37.6	-4.8	-4.0
Onslow	149720	10	169302	11	174953	12	183653	15	196.1	227.9	239.3	16.9	5.0
Orange	116215	22	127344	22	132134	22	145424	22	288.9	329.6	362.9	13.7	10.1
Pamlico	12915	91	12947	91	12964	92	12929	93	38.4	38.5	38.4	0.4	-0.3
Pasquotank	34940	63	40880	60	43509	60	51072	53	153.8	190.9	224.3	24.5	17.4
Pender	41280	58	50430	52	55091	48	68209	43	47.2	62.9	78.0	33.5	23.8
Perquimans	11407	92	12722	92	13491	90	15292	90	46.0	54.4	61.7	18.3	13.3
Person	35722	61	37640	63	38428	63	41258	63	90.8	97.8	105.0	7.6	7.4
Pitt	134107	13	151970	16	160783	15	186925	14	205.2	245.8	285.9	19.9	16.3
Polk	18410	83	19040	84	19195	84	20303	81	77.0	80.6	85.2	4.3	5.8
Randolph	130913	16	139422	19	142924	19	155373	19	165.7	181.1	196.9	9.2	8.7
Richmond	46566	52	46672	53	46926	54	46770	59	98.2	99.0	98.7	0.8	-0.3
Robeson	123450	20	129425	21	132139	21	139419	23	129.9	139.1	146.8	7.0	5.5
Rockingham	91954	25	91646	30	91471	30	90812	31	162.3	161.5	160.4	-0.5	-0.7
Rowan	130666	17	136486	20	139421	20	149545	20	254.9	272.2	292.0	6.7	7.3
Rutherford	63014	38	62926	40	62840	41	62690	45	111.5	111.4	111.1	-0.3	-0.2
Sampson	60357	39	64522	38	66486	38	73263	39	63.6	70.1	77.3	10.2	10.2
Scotland	35936	60	36830	64	37044	66	36908	68	112.8	116.1	115.7	3.1	-0.4
Stanly	58277	42	59158	42	59608	44	61111	49	147.1	150.8	154.6	2.3	2.5
Stokes	44810	54	46257	54	46804	55	48580	55	99.0	103.5	107.4	4.4	3.8
Surry	71304	35	73150	35	74150	36	76823	37	132.7	138.1	143.0	4.0	3.6
Swain	13016	90	13889	89	14426	89	15968	88	24.6	27.2	30.2	10.8	10.7
Transylvania	29340	70	30758	70	31614	70	33158	70	77.5	83.4	87.6	7.8	4.9
Tyrrell	4124	100	4290	100	4326	100	4290	100	10.6	11.1	11.0	4.9	-0.8
Union	125395	18	182344	10	209874	8	297510	7	194.2	325.9	463.1	67.4	41.8
Vance	43129	55	43583	58	43730	59	44684	61	169.4	172.4	176.2	1.4	2.2
Wake	634798	2	832590	2	927909	2	1238499	1	754.7	1106.2	1479.0	46.2	33.5
Warren	20030	79	19919	83	19830	82	19747	84	46.6	46.3	46.1	-1.0	-0.4
Washington	13695	89	13214	90	13038	91	12286	95	39.4	37.5	35.3	-4.8	-5.8
Watauga	42758	56	44696	56	45742	57	47834	56	136.6	146.2	152.9	7.0	4.6
Wayne	113365	23	115225	23	116481	23	120138	26	205.1	210.6	217.3	2.7	3.1
Wilkes	65778	36	67182	37	67708	37	69183	42	86.7	89.4	91.3	2.9	2.2
Wilson	73963	33	77970	34	79861	34	85585	34	198.9	214.8	230.2	8.0	7.2
Yadkin	36415	59	37850	62	38633	62	40992	65	108.3	115.0	122.0	6.1	6.1
Yancey	17832	85	18550	85	19029	85	19967	83	56.9	60.8	63.8	6.7	4.9

Population Projections Description

(go to County/State Projections)

INTRODUCTION

The current set of population projections for the state and its counties was released by the North Carolina Office of State Budget and Management in **June of 2008**. The greatest difference between these projections and the previous ones (released in 2007) is the difference in assumed growth trends for the three decades from 2000 to 2030.

The basic assumption is almost the same for both series. For the previous set of projections, the assumption was that migration (and, hence, growth) for July 1, 2006 through April 1, 2030 was a **function of two sets of growth**. The first set was the "trend" growth based on the 1990-2000 base decade, The second was the average annual non-institutional growth from April 1, 2000 through July 1, 2006 derived from the set of July 2006 Provisional County Estimates which was released by the State Demographer in May of 2007. For the current set of projections, the assumption is that migration (and, hence, growth) for July 1, 2007 through April 1, 2030 is also a **function of two sets of growth**. The first set is the "trend" growth based on the 1990-2000 base decade, The second is the average annual non-institutional growth from April 1, 2000 through July 1, 2007 derived from the set of July 2007 Provisional County Estimates which was released by the State Demographer in May of 2008.

The basic growth functions were somewhat different. For the previous set of projections, the first three years after the estimate date, 2006-2009, were considered "transition" years between the provisional estimates and the long range projections. For subsequent years, until April 1, 2010, the growth was assumed to approximate a weighted average of the "trend" growth and the "estimate" growth. For this set of projections, the "trend" growth was weighted at **40%** (and, hence, the "estimate" growth was weighted at **60%**). For the current set of projections, the first two years after the estimate date, 2007-2009, were considered "transition" years. The "trend" growth was weighted at **30%** (and, hence, the "estimate" growth was weighted at **70%**). The county totals for April 1, 2020 were adjusted for both sets of projections to try to maintain migration for April 2010 to April 2020 at close to the same levels as those of the last years (the previous set). or 3/4 of a year (the current set), of the 2000s.

The "transition" years were also treated somewhat differently. For the previous set of estimates, both the "estimate" growth weight, as well as the growth itself, were different for the "transition" years. For 2006-07, the "estimate" growth was that of July 1, 2005 to July 1, 2006 and was weighted at 90%. For 2007-08, the "estimate" growth was one half of the July 1, 2004 to July 1, 2006 growth and was weighted at 80%. For 2008-09, the "estimate" growth was one third of the July 1, 2003 to July 1, 2006 growth and was weighted at 70%. For the current set of estimates, both the "estimate" growth weight, as well as the growth itself, were different for the "transition" years. For 2007-08, the "estimate" growth was one third that of July 1, 2004 to July 1, 2007 and was weighted at 90%. For 2008-09, the "estimate" growth was one fourth of the July 1, 2003 to July 1, 2007 growth and was weighted at 80%.

BASIC DATA.... Return to Index

The most fundamental basis for these projections are population values for North Carolina and its counties from the Census Bureau's **2000 Census of Population**. Since the last projection series, there have been a few minor corrections based on Census Bureau boundary changes.

These projections use single year of age totals (0-94) and one composite age group (95+) by male and female from the 2000 Census for the data for the 2nd year of the base decade. An estimate of the "White" fraction of each age group for each gender was made to create the detailed population for April 2000. An estimate of "White" is necessary because the **2000 Census data does not define races in the same way as the 1990 Census data** does. It does not define a single racial value for "White". The goal of the estimation procedure was to create a "White"/"Other" split which would match that of the 1990 Census. The "White" and "Other" values used for projected years are based on these estimates for April 2000 and corresponding values from the 1990 Census. For more details about the estimation procedure, click here.

The "aging forward" of this 2000 population base strongly affects these age, race, and sex specific projections. This effect

causes projected births to rise more slowly than projected population, in spite of fertility rates which are assumed to remain constant. It causes projected deaths to increase more rapidly, in spite of improving mortality.

Population values for North Carolina and its counties from the Census Bureau's 1990 Census of Population are very important as well. The actual data came from the Census Bureau's **MARS** (**M**odified **A**ge, **R**ace, and **S**ex) file. The original 1990 Census files included errors nationwide in the age tabulations which made as many as 20 percent of the population in a given age group one year older on April 1, 1990 than they really were. The age error correction technique used in the preparation of the **MARS** file incorporated national birth data by quarter of the year from 1920 through 1990. For the **MARS** file, the unclassified "other" race group in the original 1990 Census data was distributed to the four basic race groups ("white", "black", "Indian", and "Asian"). The most critical use of these values is in the determination of detailed migration trends for the 1990-2000 time period. The values in the 1990 population base include adjustments to the original **MARS** file values based on postcensus corrections received from the Census Bureau.

BIRTH ASSUMPTIONS.... Return to Index

Since the early 1990s, North Carolina's fertility rates have changed significantly. North Carolina fertility rates for white mothers leveled out during the first half of the 1990s, increased rapidly during the second half of the 1990s, and are currently leveling out or increasing slightly. The fertility rate for nonwhite mothers dropped in the first half of the 1990s, rose somewhat in the second half of the 1990s, and has recently (beginning in 2001-02) dropped again. From 2002-2006, it has been below that of white mothers for the first time in decades. It was assumed that **fertility rates** for all age and race groups would be **constant from 2006 through 2030**. To obtain a more stable set of future rates, the fertility rates for **2003-2004**, the fertility rates for **2004-2005**, and the fertility rates for **2005-2006** were **averaged**.

The distribution of births into male and female for each race group was also assumed to be **constant from 2006 through the year 2030**. The fraction of the projected births for each age group which was male (or female) was assumed to be the **average** of the corresponding fractions for the calendar years **1996 through 2005**.

DEATH ASSUMPTIONS.... Return to Index

As in the previous set of estimates, unabridged life tables for 1990 from the National Center for Health Statistics were available for these estimates. North Carolina's **death rates** based on these tables were fairly **close to those of the nation** as a whole, with rates for some age groups within each race/sex group higher for the state and rates for some groups lower. Over the next several decades, North Carolina's death rates are expected to **converge toward national rates**, reaching full equality **by the year 2050**. This assumption was used to develop projected survival rates for North Carolina for 2000, 2010, 2010, and 2030 from 1990 North Carolina survival rates and projected United States survival rates (Population Projections Branch, Population Division, U. S. Bureau of the Census). Since the North Carolina nonwhite population is **overwhelmingly black** (91.6 % in 1990) and the national nonwhite population is much less so (76.2 %), North Carolina **nonwhite** rates were converged to **national black** rates.

In calculating the deaths for each race-sex group for the **1990**s, the survival rates for 2000 were adjusted to yield the **actual number** of state deaths, assuming that the average survival rate for the decade was the simple **geometric average** of the rate for 1990 and the adjusted rate for 2000. Then, the adjusted rates were **converged toward national rates**. For the **2000**s, the **2010**s and the **2020**s, the average survival rate for the decade was assumed to be the simple **geometric average** of the rate at the beginning of the decade and the corresponding rate at the end of the decade.

METHODOLOGY.... Return to Index

BASIC TREND PROJECTIONS BY COUNTY

The basic technique used to develop county trend projections by age, race, and sex for this series is the **Adjusted Migration** technique. The first step in this procedure is to obtain **survived net migration for the base decade**. First, county/state survival rate factors for each county for each race are developed using actual county deaths by race for the 1990-2000 decade. These factors are assumed to be reasonably valid throughout the projection period. Then, one obtains a "Cohort Survived" population (assumes no net migration during the base decade) for the end of the base decade by applying these factors and state survival rates to the population at the beginning of the base decade. Finally, one subtracts this "Cohort Survived" population from the population at the end of the base decade to get the desired survived net migration.

The next step is to adjust this survived net migration for the base decade to yield a **survived net migration for the projection decade**. The adjustment procedure has two branches. If the survived net migration for a given age, race, and sex group is in-migration, then it is adjusted only for differences in mortality between decades. If it is out-migration, then it is adjusted both

for mortality differences and for the change in population between the beginning and end of the base decade.

There are two final steps. First, a "Cohort Survived" population is calculated for the projection date in a manner similar to that used to calculate the "Cohort Survived" population for the end of the base decade. Then, the survived net migration for the projection decade is added to this "Cohort Survived" population to yield the final projected population.

A slightly different technique is used to project the populations of the youngest 10 age groups (0, 1, 2,..., 9). First, births by race for each year of the decade are obtained by applying projected age and race specific birth rates for each year to previously projected numbers of women of child-bearing ages. Deviations in individual county birth rates from the corresponding state birth rates are set for future years based on averages over several (usually 5, occasionally 4 or 3) prior years for which actual birth counts are available. Second, sex-at-birth and survival rates are applied to the projected births to obtain projection date populations for those who were born within the county. Third, a special survived migration is added to these populations to account for children who moved to or from the county since they were born. This survived migration is calculated in a similar manner to that for the older age groups, except that the time period varies from 0.5 to 9.5 years, depending on the age group being projected, always beginning at birth and ending at the end of the decade.

INSTITUTIONAL EFFECTS

The basic county trend projections produced for this series were modified for the growth of certain institutions. Institutions such as colleges, universities, military installations, and, to a lesser extent, prisons and some state hospitals, house persons of particular age groups. These populations will substantially grow or decline only by administrative action. There are thirteen counties in North Carolina the age structure of which is significantly affected by institutions. These counties (with major institution type) are Avery (prisons and college), Craven (military), Cumberland (military), Durham (university), Jackson (university), Madison (university), New Hanover (university), Onslow (military), Orange (university), Pasquotank (university and prisons), Pitt (university), Wake (university and prisons), and Watauga (university).

Many counties, as well as the state as a whole, experienced some growth in institutional populations between 2000 and 2007. Roughly 55% of the increase was in Onslow County, one of the two counties with large military bases. The other county with a large military base, Cumberland, showed a large increase from 2000 to 2003, followed by a much larger decrease from 2003 to 2006, and then a rebound in 2007. It was assumed that **all institutional populations would remain constant** after 2007.

PROJECTION CONTROLS

Three types of Projection controls were used. The first set was based totally on county estimates. Projected values for July 2000, July 2001, July 2002, July 2003, July 2004, July 2005, and July 2006 were controlled to revised county estimates for the corresponding dates. Projected values for 2007 were controlled to the set of July 2007 Provisional County Estimates released in May of 2008 by the State Demographer.

The second set were county population controls for July 1st of each year from 2008 through 2009 and for April 1, 2010. They were calculated in several steps. First, the "trend" growth from one projection date to the next was calculated by making a projection for the first projection decade without using any population controls. Second, the average annual non group quarters population growth for 2000-07, for 2004-07, and for 2003-07 were calculated from the July 2007 Provisional County Estimates, the July 2004 Revised County Estimates, the July 2003 Revised County Estimates, and the 2000 Census counts. Third, the "trend" growth and the "estimate" growth for each period (for July 2007-July 2008, the average annual non-institutional July 2004-July 2007 growth; for July 2008-July 2009, the average annual non-institutional July 2003-July 2007 growth; for July 2009-April 2010, 75% of the average annual non-institutional April 2000-July 2007 growth) were averaged using the appropriate weights (10%/90% for 2007-2008, 20%/80% for 2008-2009, and 30%/70% for 2009-2010). Finally, the population at each date was created by adding the growth for the period ending with that date to the population at the beginning of the period (begin by adding the 2007-08 growth to the 2007 county estimate to produce the July 1, 2008 control, then add the 2008-09 growth to the 2008 control to produce the 2009 control,...).

The third set was a set of county population controls applied to the projection date values for the second projection decade (2010-2020) to roughly approximate using 30% of the "trend" growth and 70% of the "estimate" growth for the entire decade. Several steps were required. First, the 2000-07 non group quarters "estimate" growth was linearly extrapolated to April 2010. Then, these values were averaged with values for April 2010 projected using no population controls. These averages used weights of 70% for the extrapolated (or "estimate") values and 30% for the uncontrolled (or "trend") values. The difference between each of these "70%/30%" averages and the corresponding county population control for April 2010 was used to adjust the projected value for that county for April 2020. The adjustment was added to the population projected from April 2010 (using the controlled value) to April 2020 without any population controls to yield a controlled value for April 2020. Since the growth for the 3rd projection decade is based on the projected 2nd decade growth, this adjustment changed the growth for that decade as well.

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Information contained herein is current as of June 20, 2008

Please direct questions and comments **about this data** to: Bill Tillman (Bill.Tillman@osbm.nc.gov)

Appendix M

Backward Wind Trajectories and Wind Roses On 8-Hour Ozone Exceedance Days

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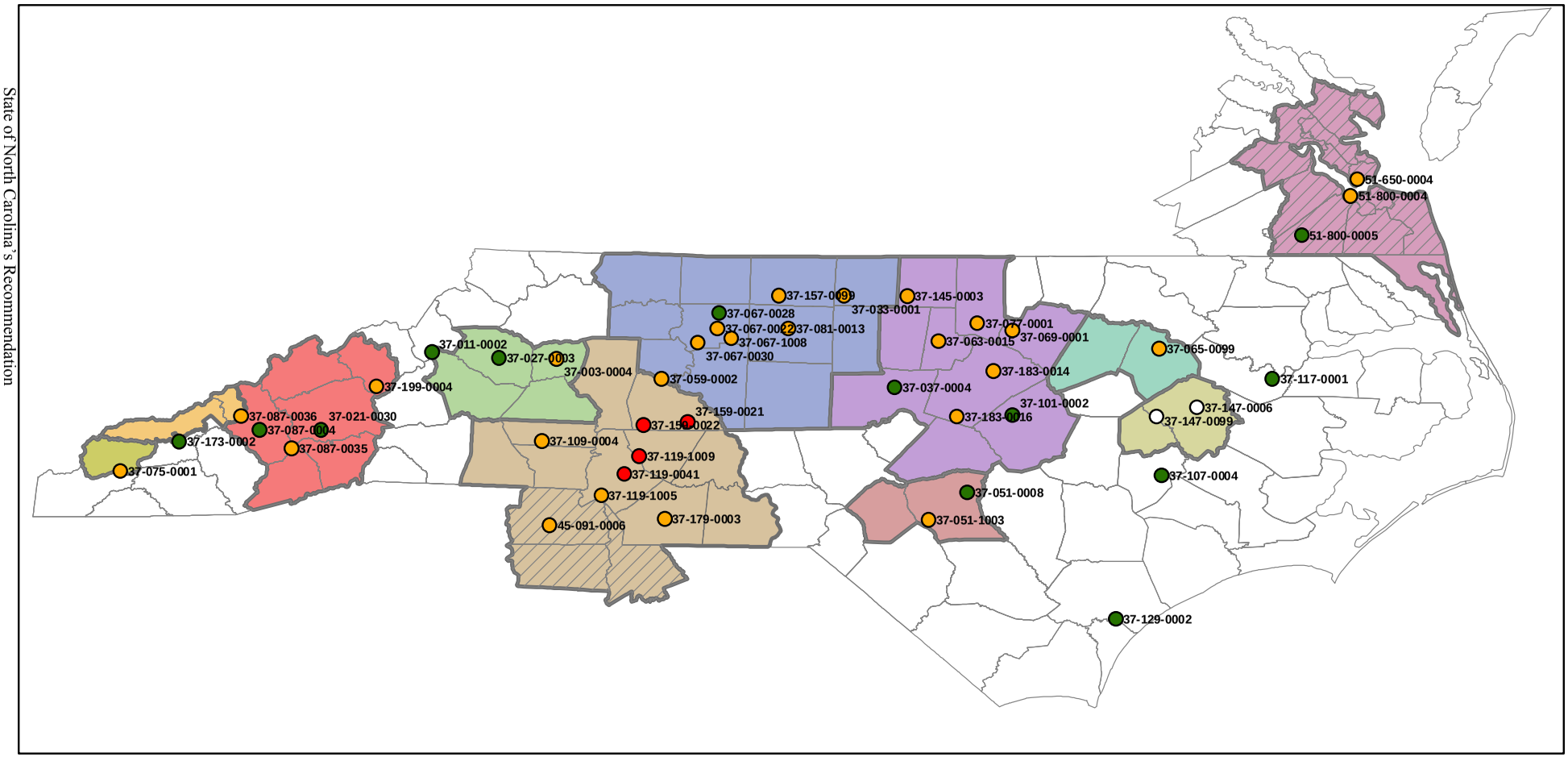
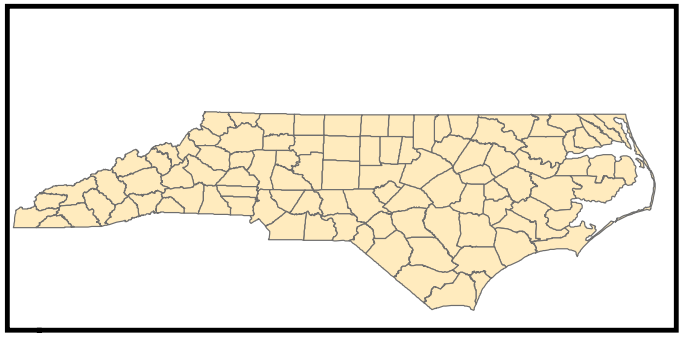
Backward Trajectories for Nonattainment Boundary Designations

- Due to the 4-dimensional nature of the transport of an air parcel by the wind in the lower troposphere, a 2-dimensional (x,y) array displaying the wind field to determine the origin or source of an air parcel is insufficient. To more accurately assess the source region of an air parcel, both the spatial (x,y,z) and time components of an air parcel's transport must be considered. Trajectories incorporate both the spatial and temporal (time changing) characteristics of an air parcel's movement.
- Backward trajectories (or back trajectories) begin at a known end point (i.e. an air quality monitor location) and are run backwards in time to determine the origin of the air parcel that is at the desired end point. The time length of the backwards tracking can vary according to one's interest, and the initial source or origin of the parcel is linked to the length of time the air parcel is tracked backwards.
- For NCDAQ's ozone nonattainment boundary studies, trajectories were run backward to assess the path an air parcel took in arriving at the monitored end point for all monitors and all days at and above the .076 ppb standard. The NOAA Air Resources Laboratories (ARL) Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) Model was used to calculate the back trajectories.
- Trajectories are run with the ARL HYSPLIT model using the Eta archived data (EDAS), available in the native ARL format from the ARL HYSPLIT site. THE EDAS data has a grid resolution of 40 km, the greatest horizontal and vertical resolution of any data available for download on the HYSPLIT site. Over highly complex terrain (e.g. mountains) the data used in the model may not be sufficient to capture the actual elevation of the trajectory end point. Also, the longer the trajectory run, the greater the uncertainty the air parcel is being adequately represented in the model becomes. Atmospheric processes that take place in the 'real' atmosphere but are ignored or approximated in the model will increase uncertainty for long trajectory runs.
- Back trajectory heights originate at 10m, 500m, and 1000m. The duration of trajectories is 36 hours, which allows enough time to sufficiently determine the

most significant source regions to the air parcel while limiting the amount of uncertainty that comes with longer duration trajectories.

- The end time of the back trajectories for non-Ridge Top monitors is 2000 UTC (1600 EDT) on the day of the exceedance. Due to the highly variable nature of exceedance times at the Ridge Top locations, the end time of the trajectories is set to be the fourth hour following the start time of the 8-hour average making up the exceedance. For example, if an exceedance at a Ridge Top location was 1200UTC (0800EDT), the end time for the trajectory would be 1500UTC (1100EDT). Similarly, if the start time of the exceedance was 2200UTC (1800EDT), the end time of the trajectory would be 0100UTC (2200EDT) on the following day. The majority of exceedances at the Ridge Tops encompass the midnight hour and do in fact span 2 calendar days.

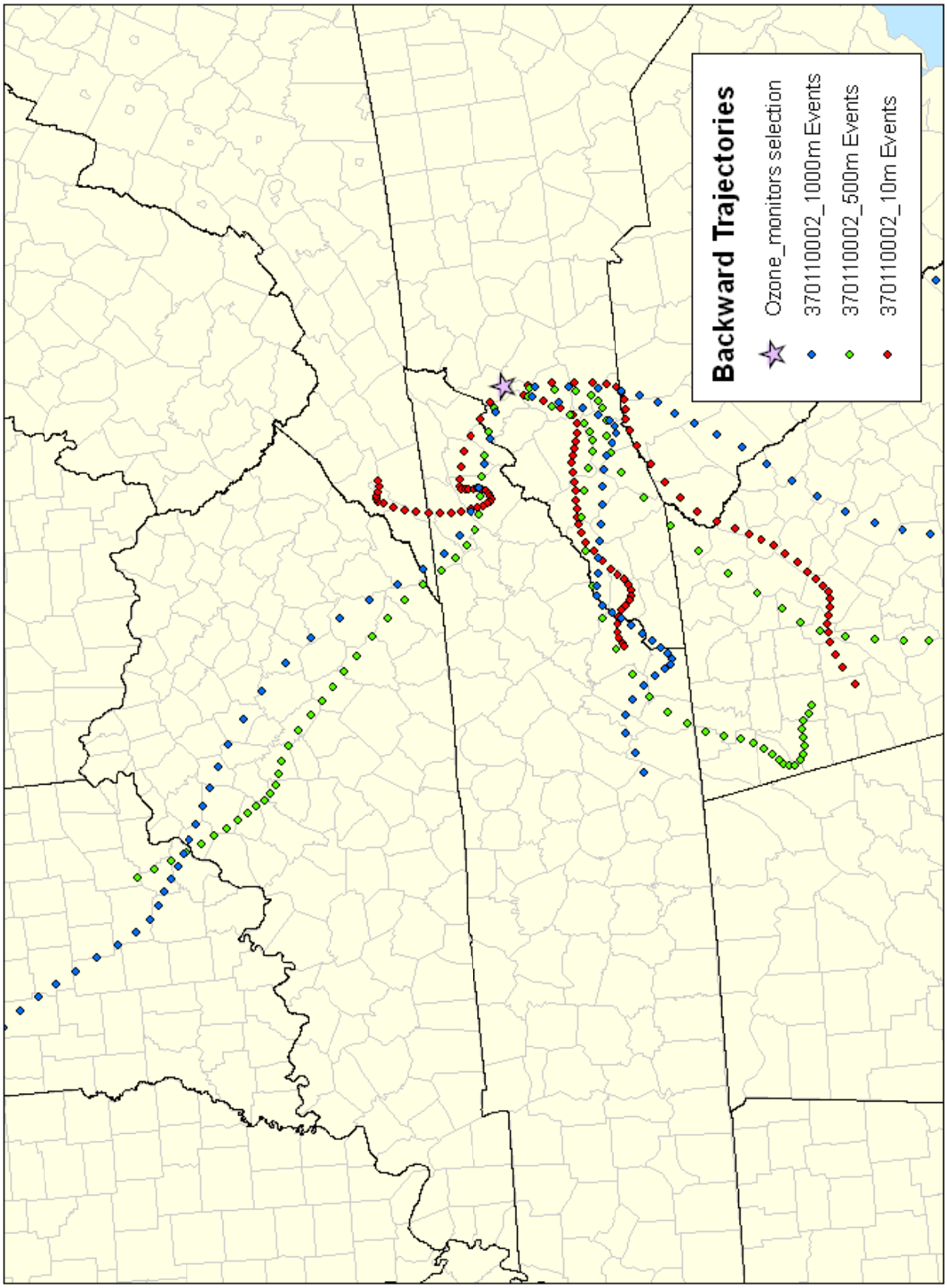




Statewide 8-Hour Ozone Design Values

2006-2008 8-Hour Ozone Design Values

- Incalculable (-999)
- Attaining (75ppb and below)
- Nonattaining (76ppb to 84ppb)
- Nonattaining (85ppb and above)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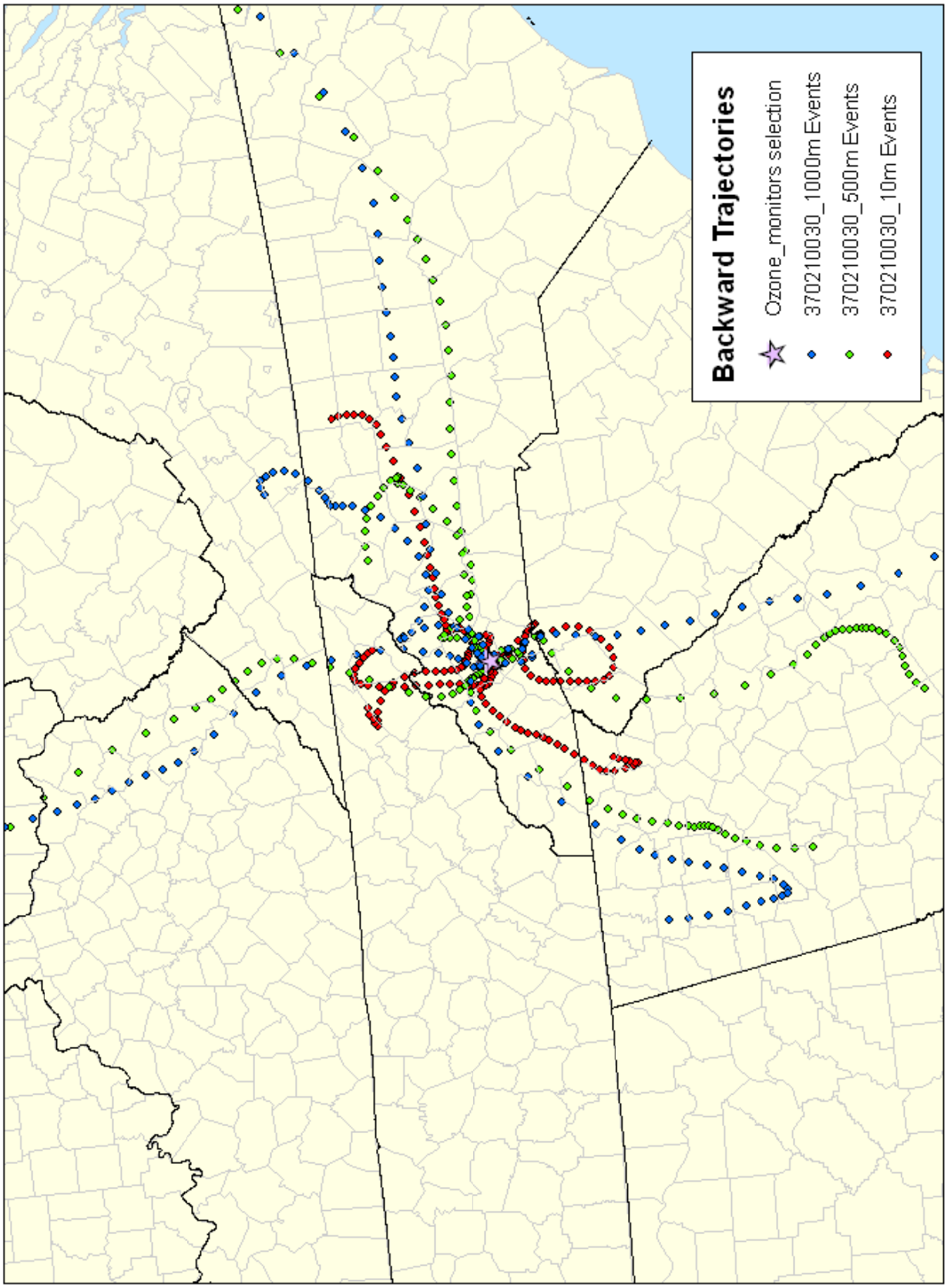
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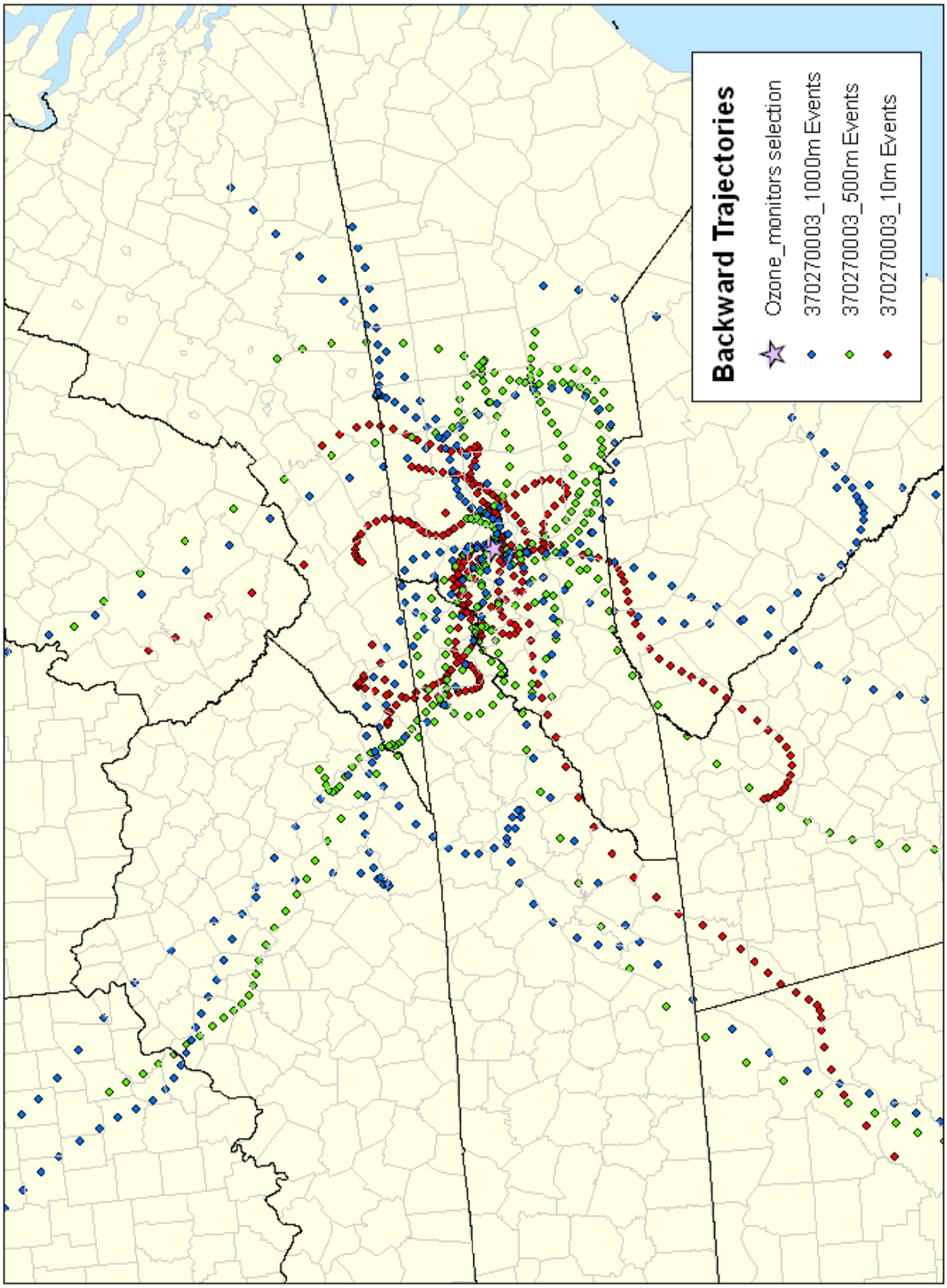
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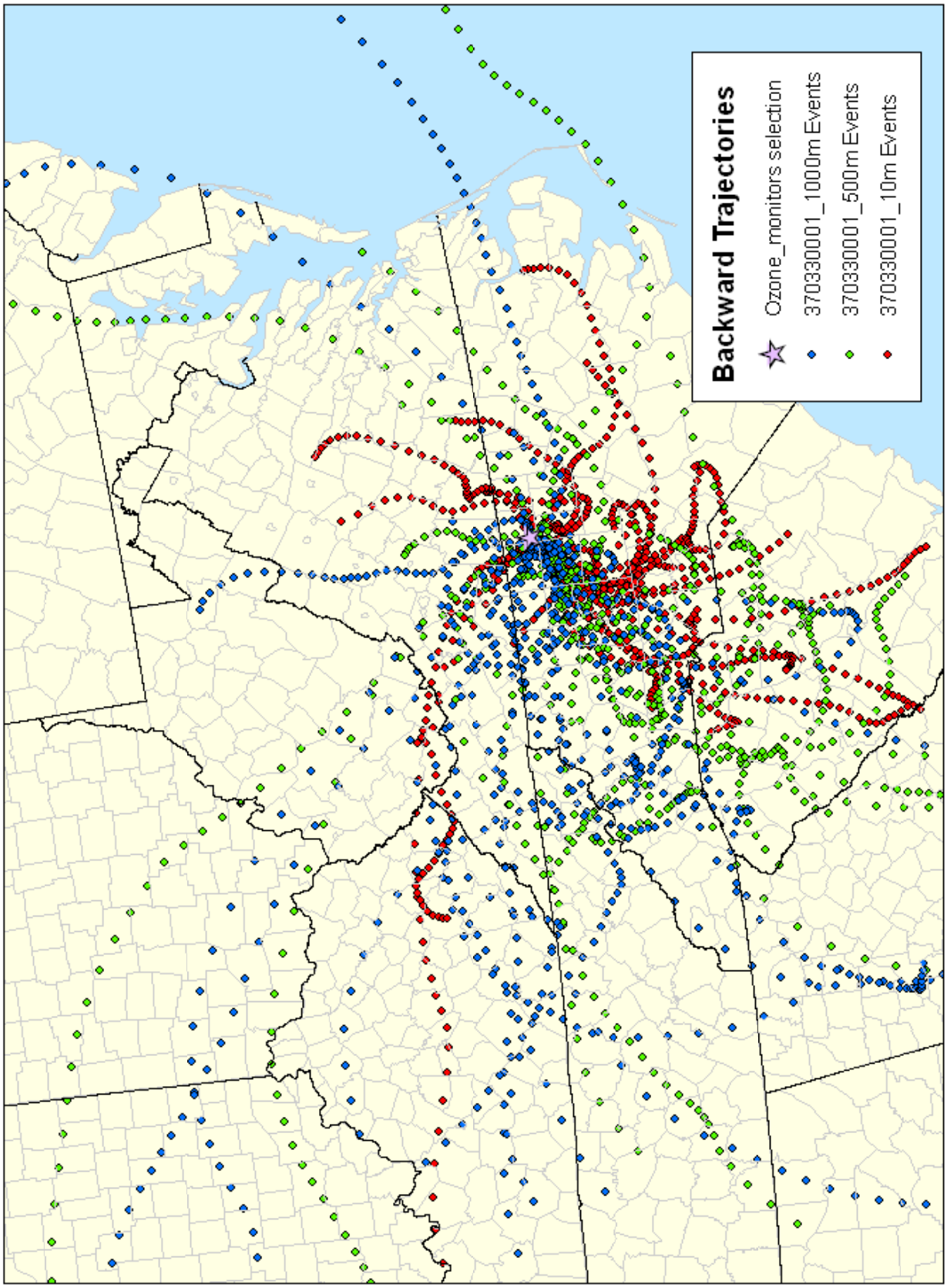
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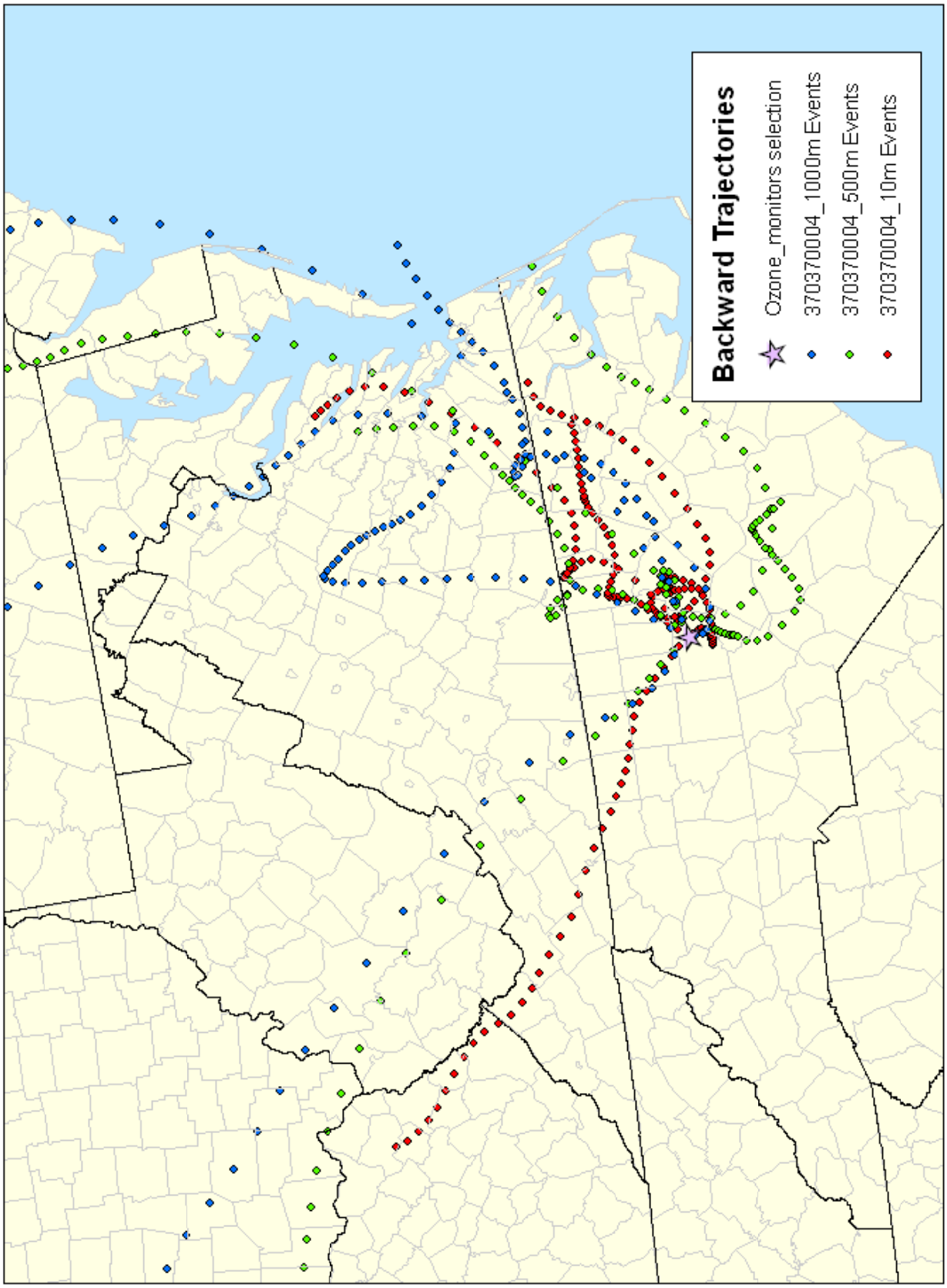
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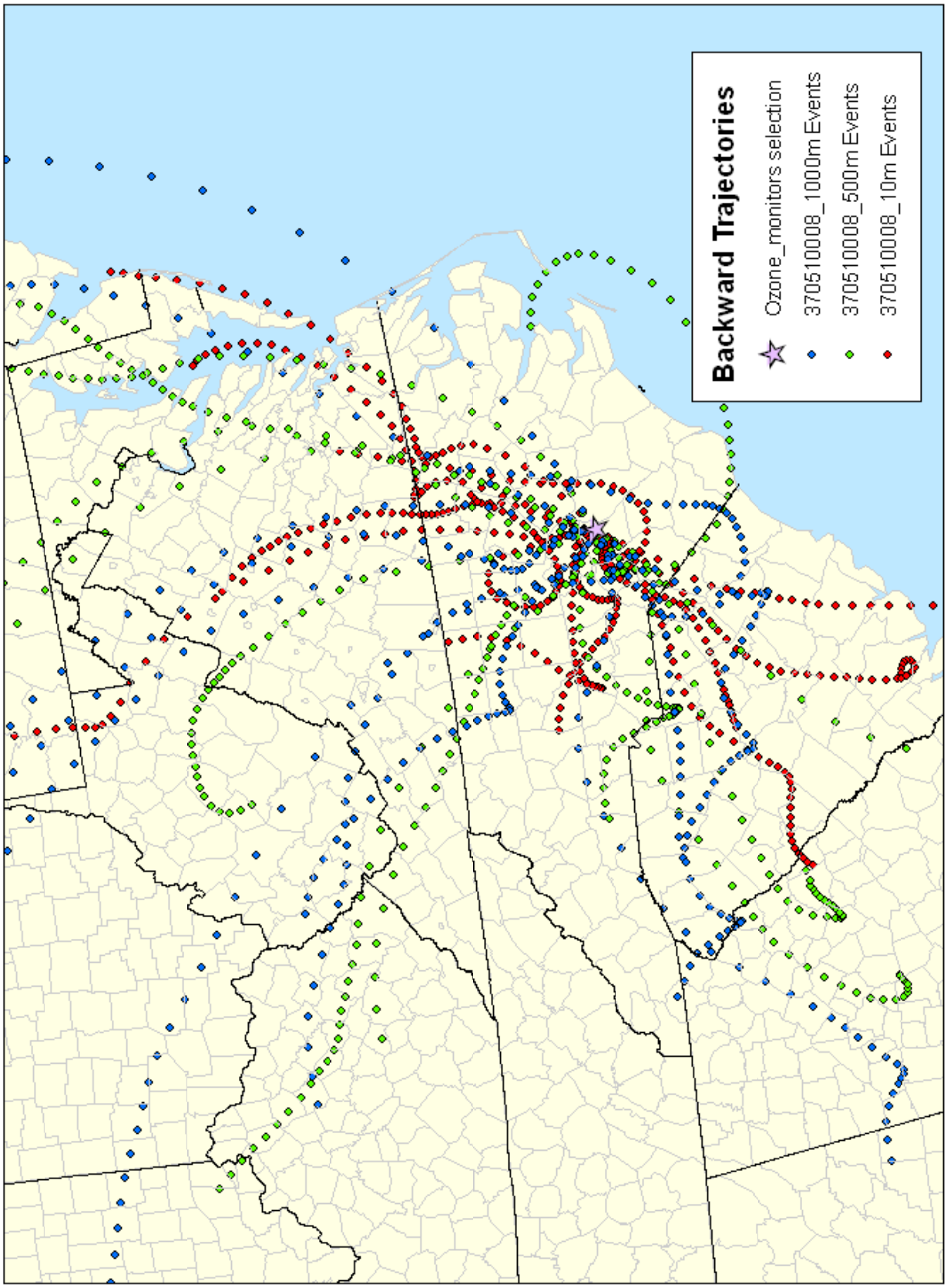
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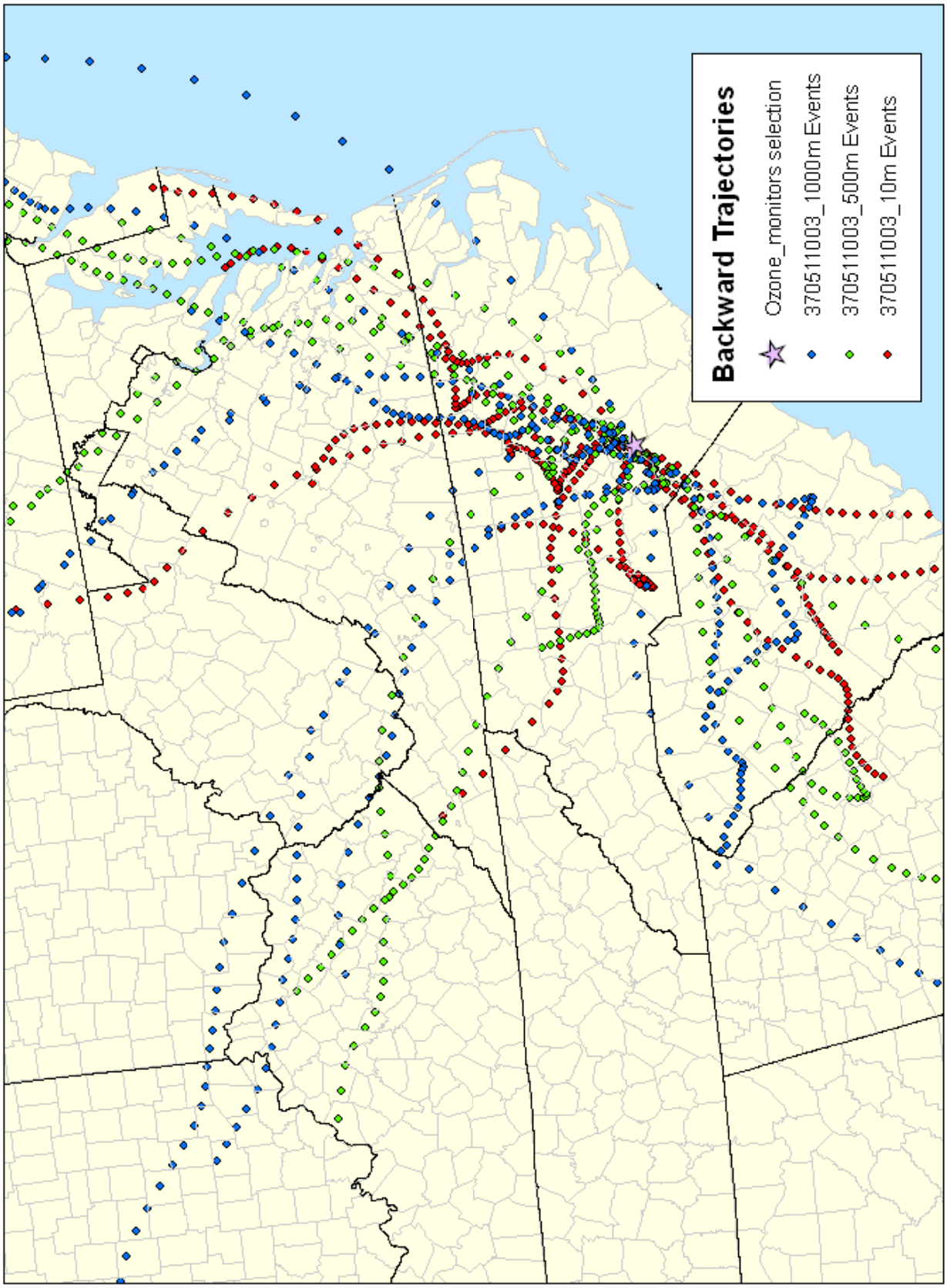
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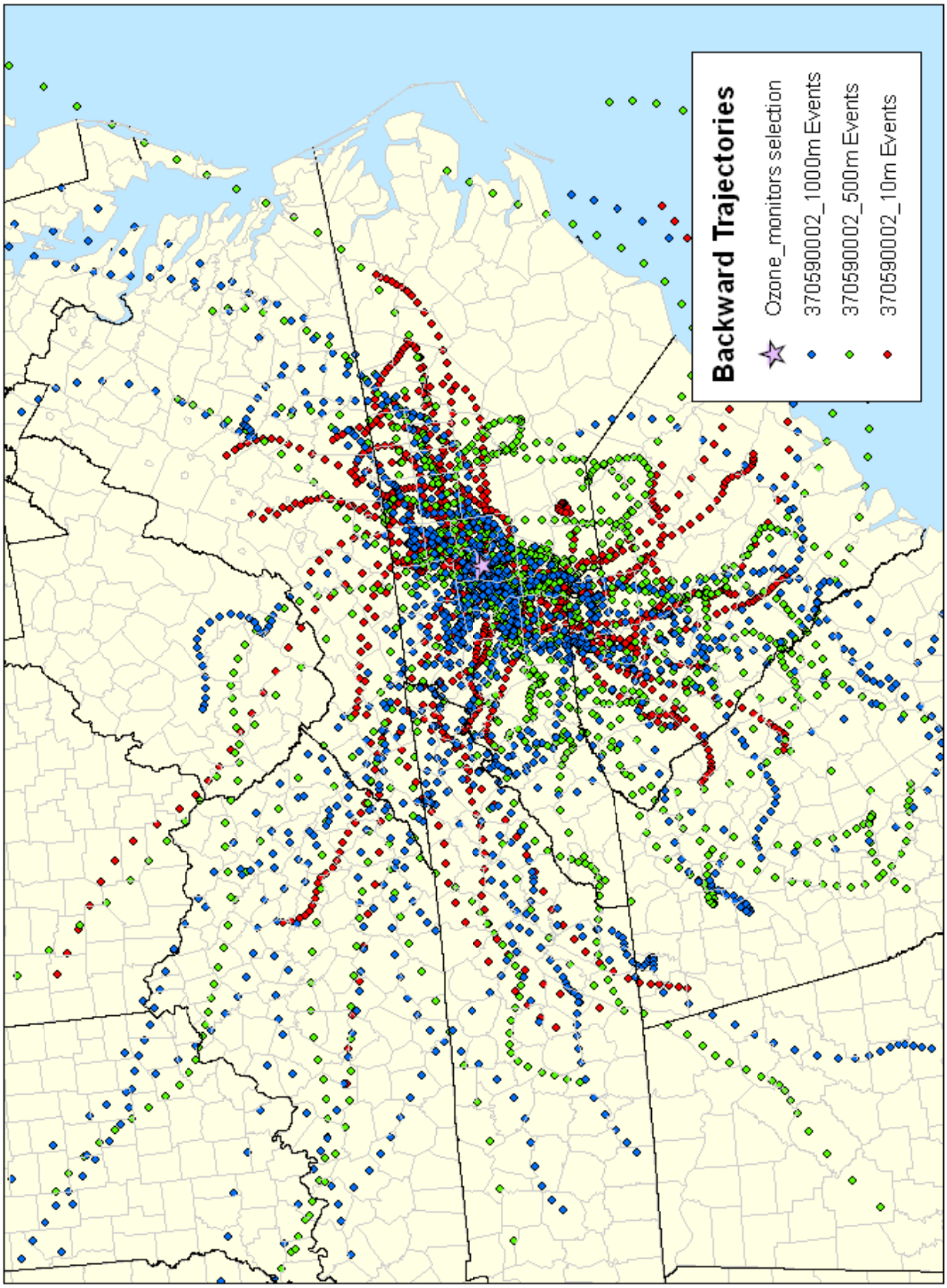
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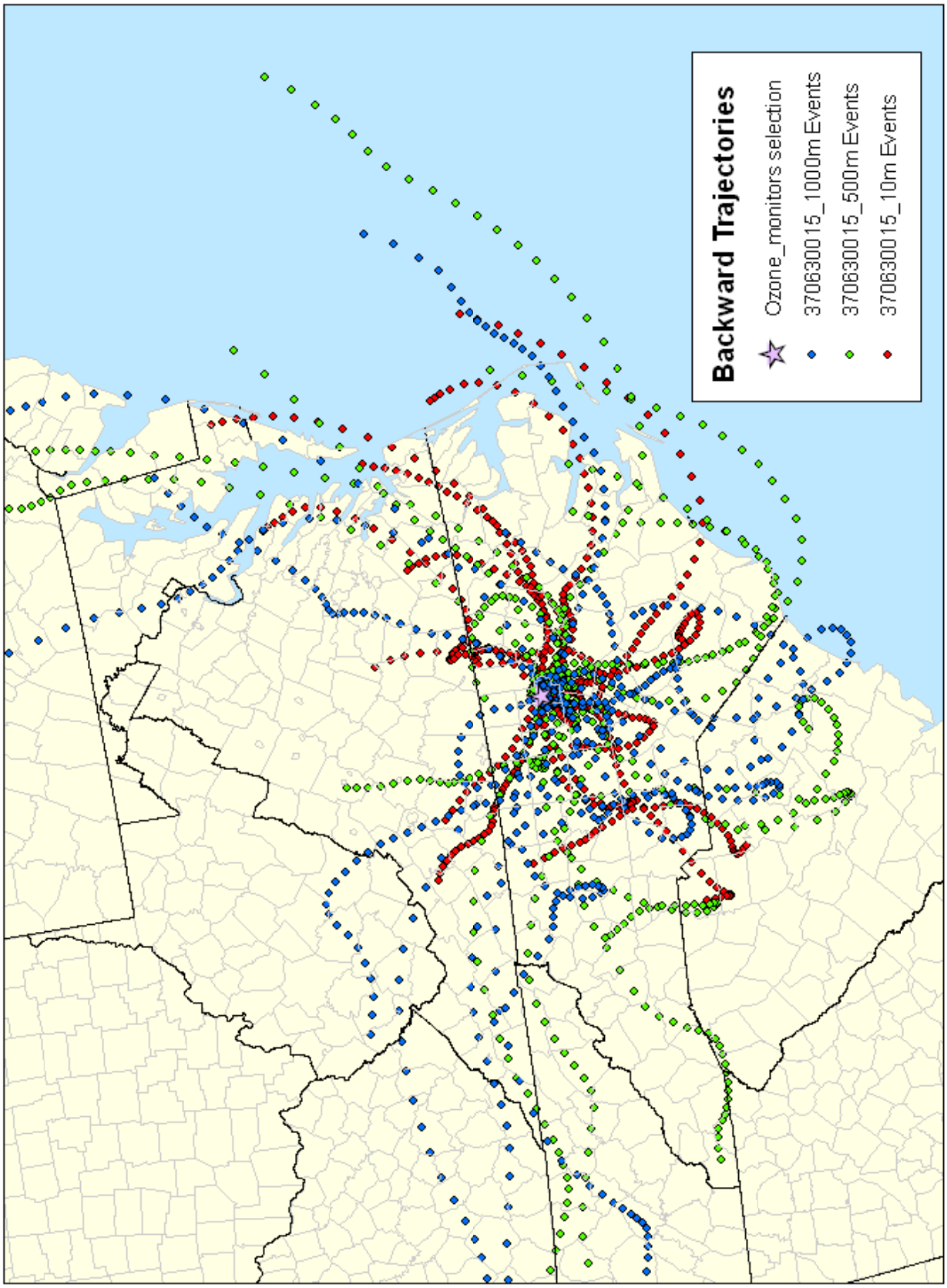
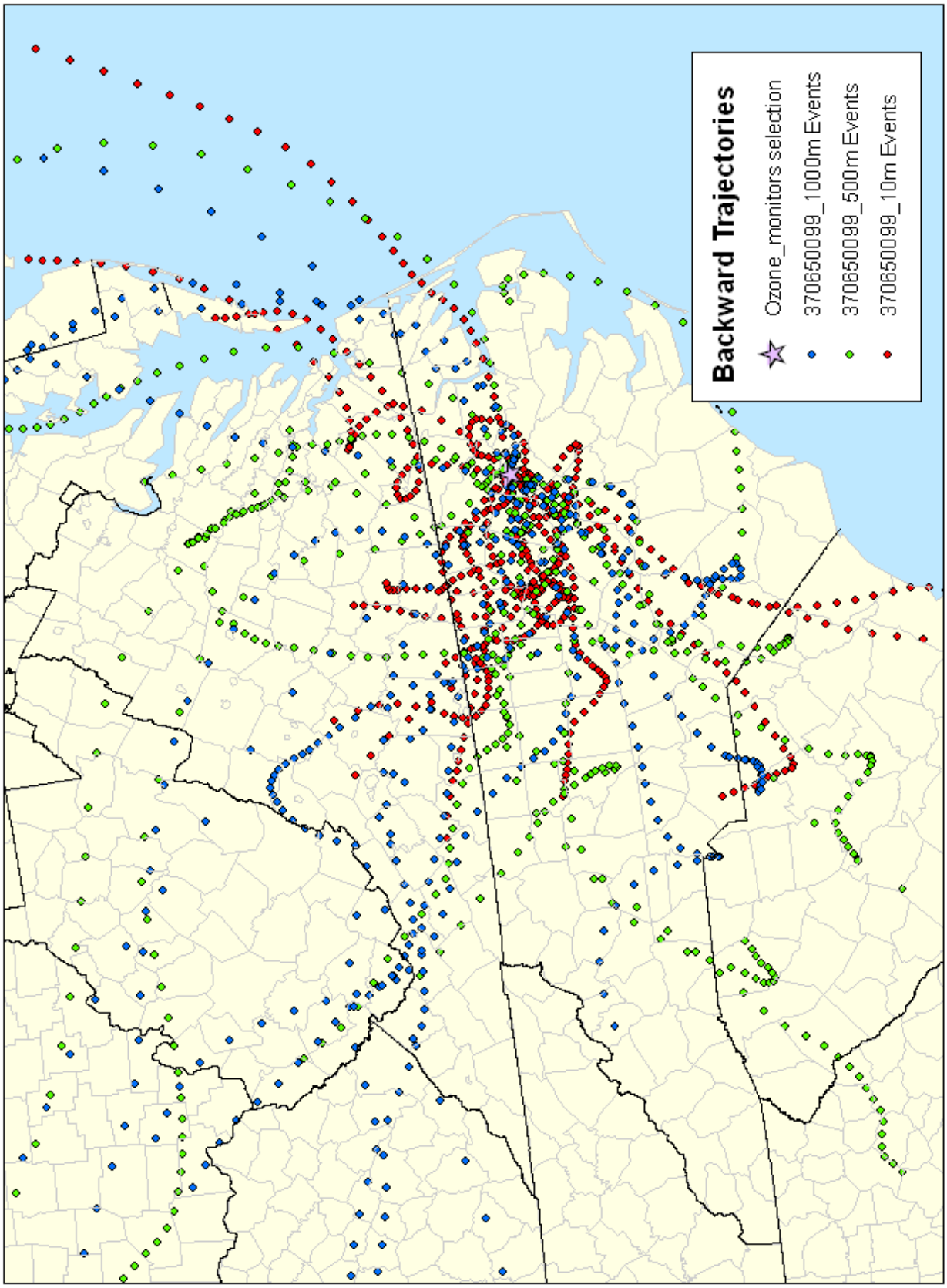
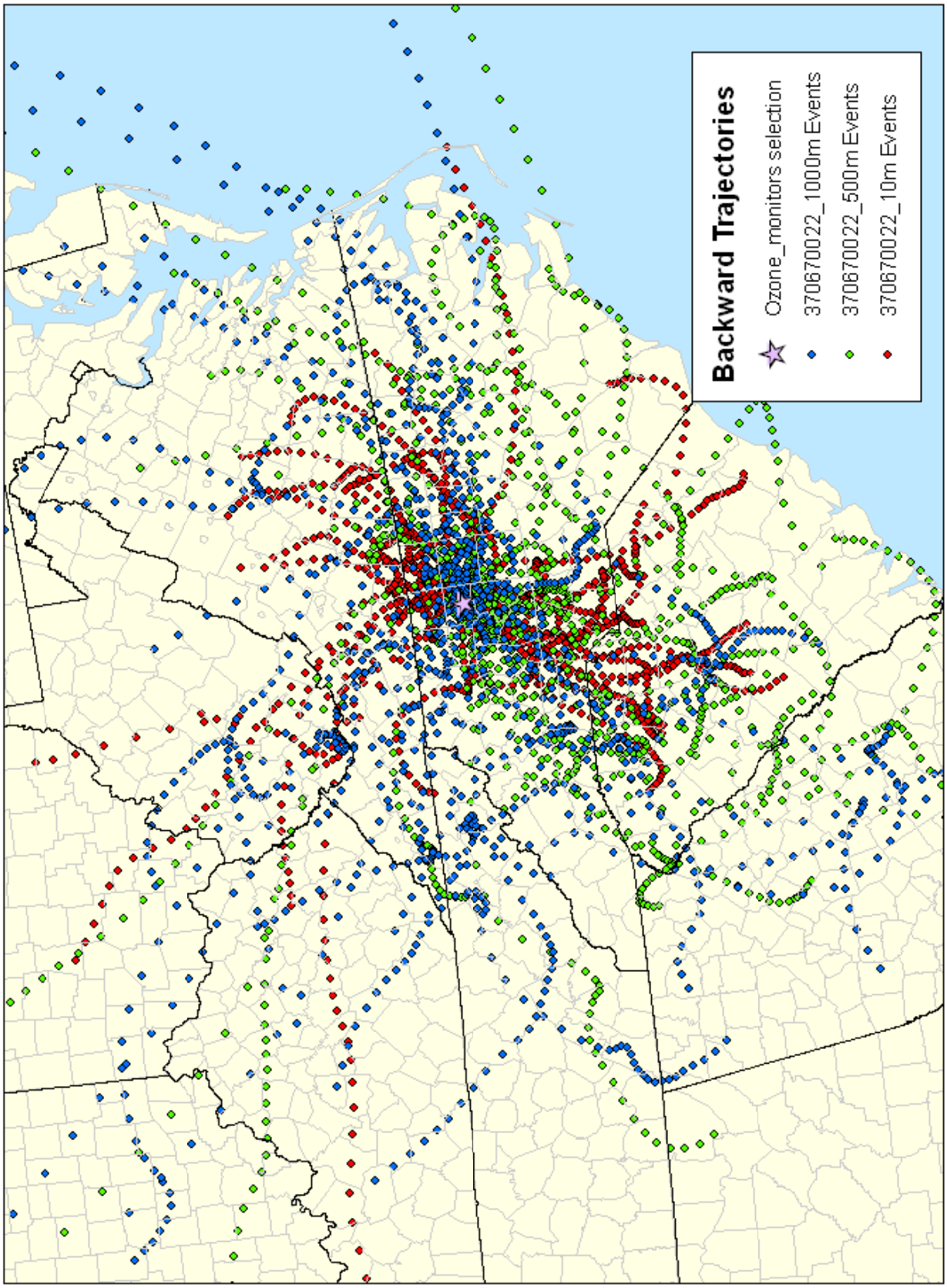
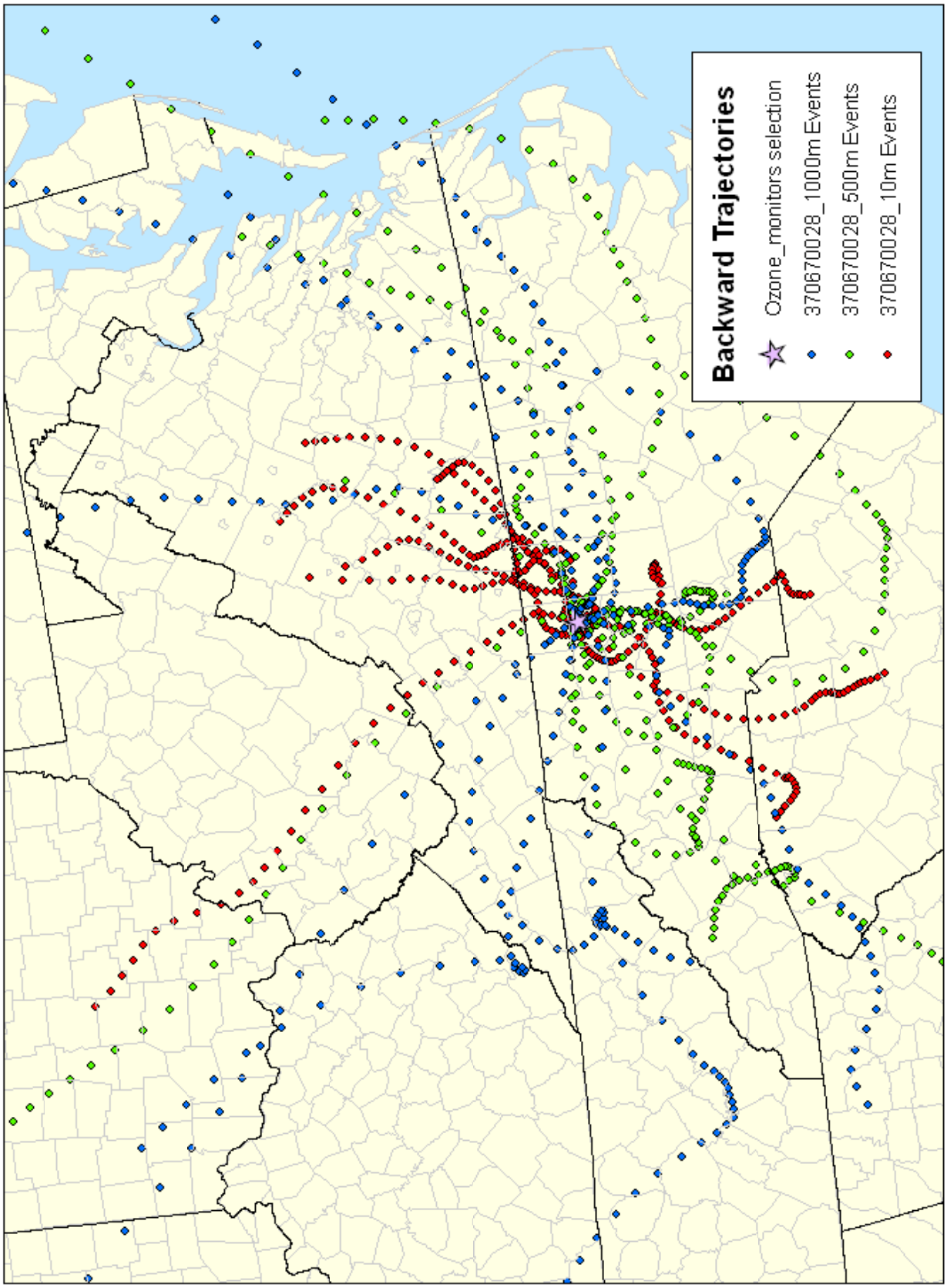
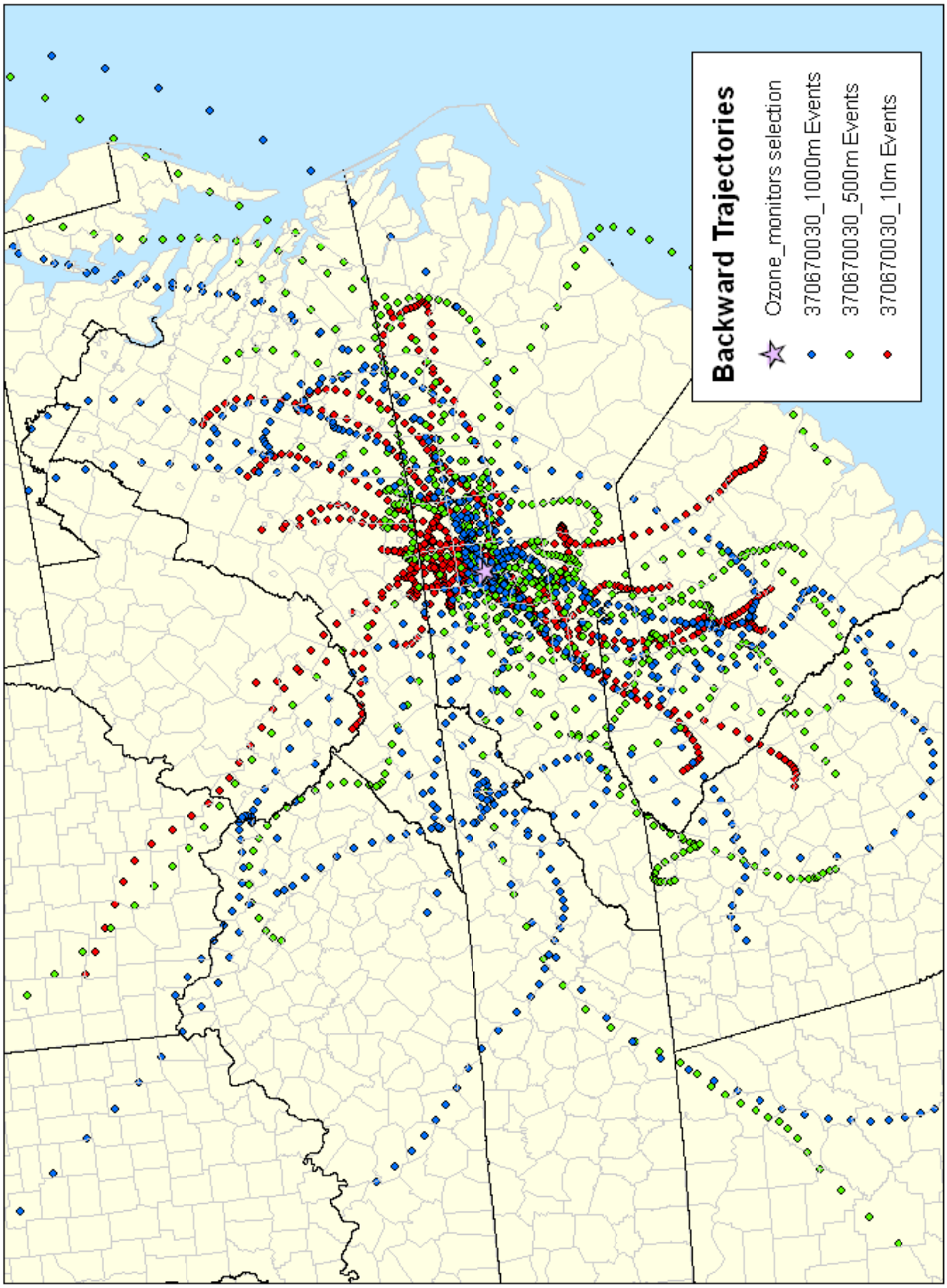
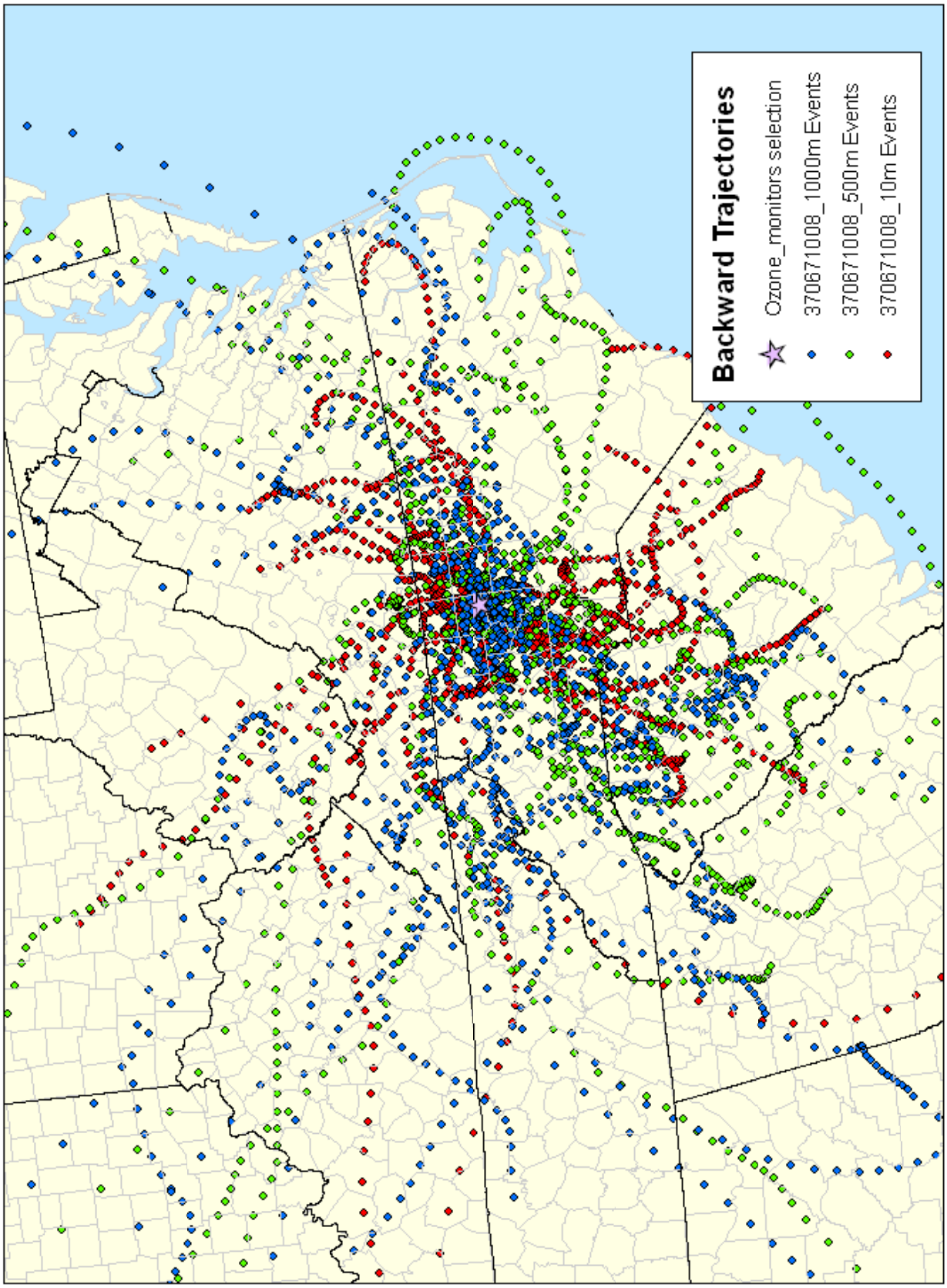

Backward Trajectories
Ozone_monitors selection
370630015_1000m Events
370630015_500m Events
370630015_10m Events

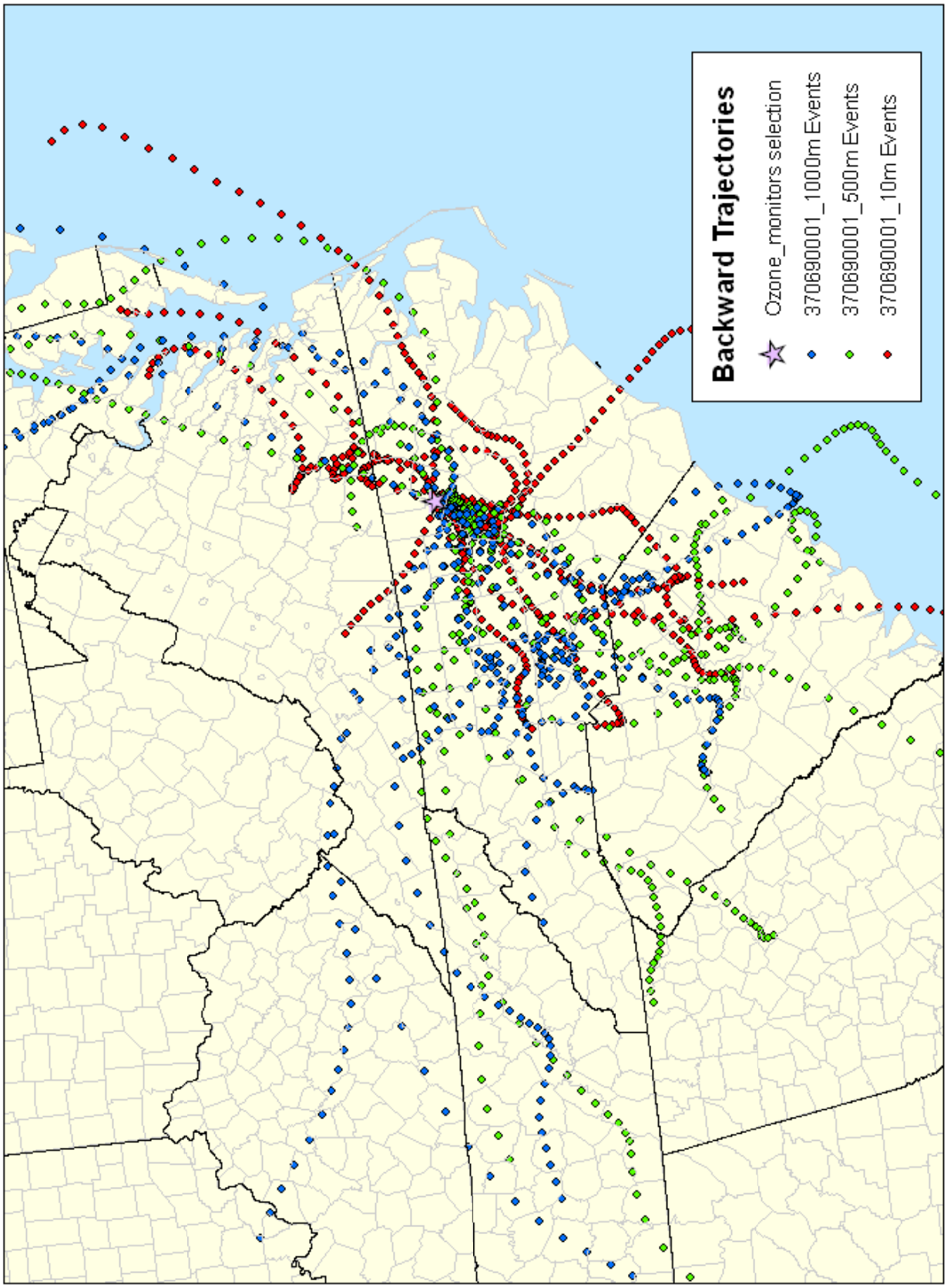

Backward Trajectories
Ozone_monitors selection
370650099_1000m Events
370650099_500m Events
370650099_10m Events

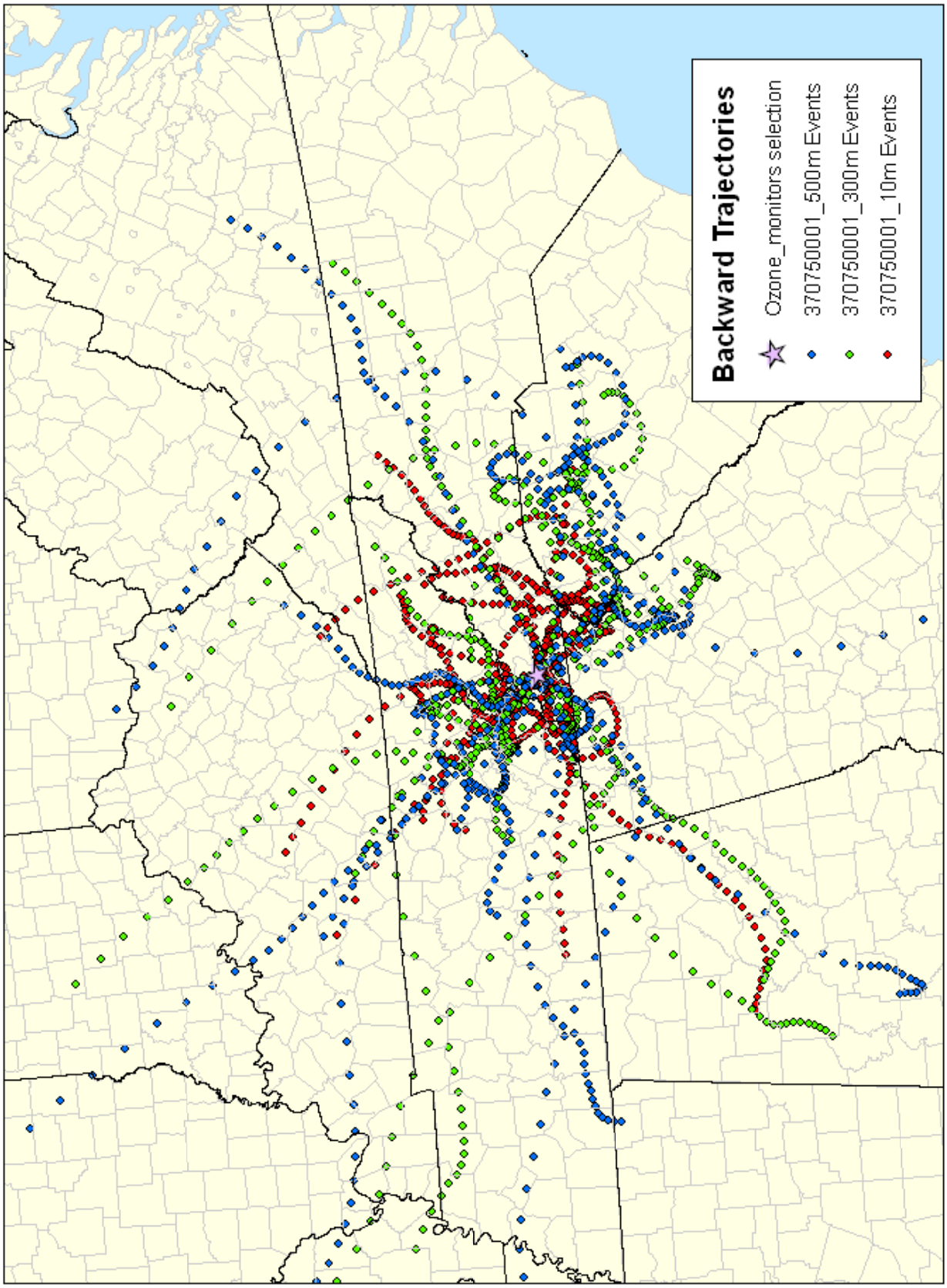

Backward Trajectories
Ozone_monitors selection
3706700022_1000m Events
3706700022_500m Events
3706700022_10m Events

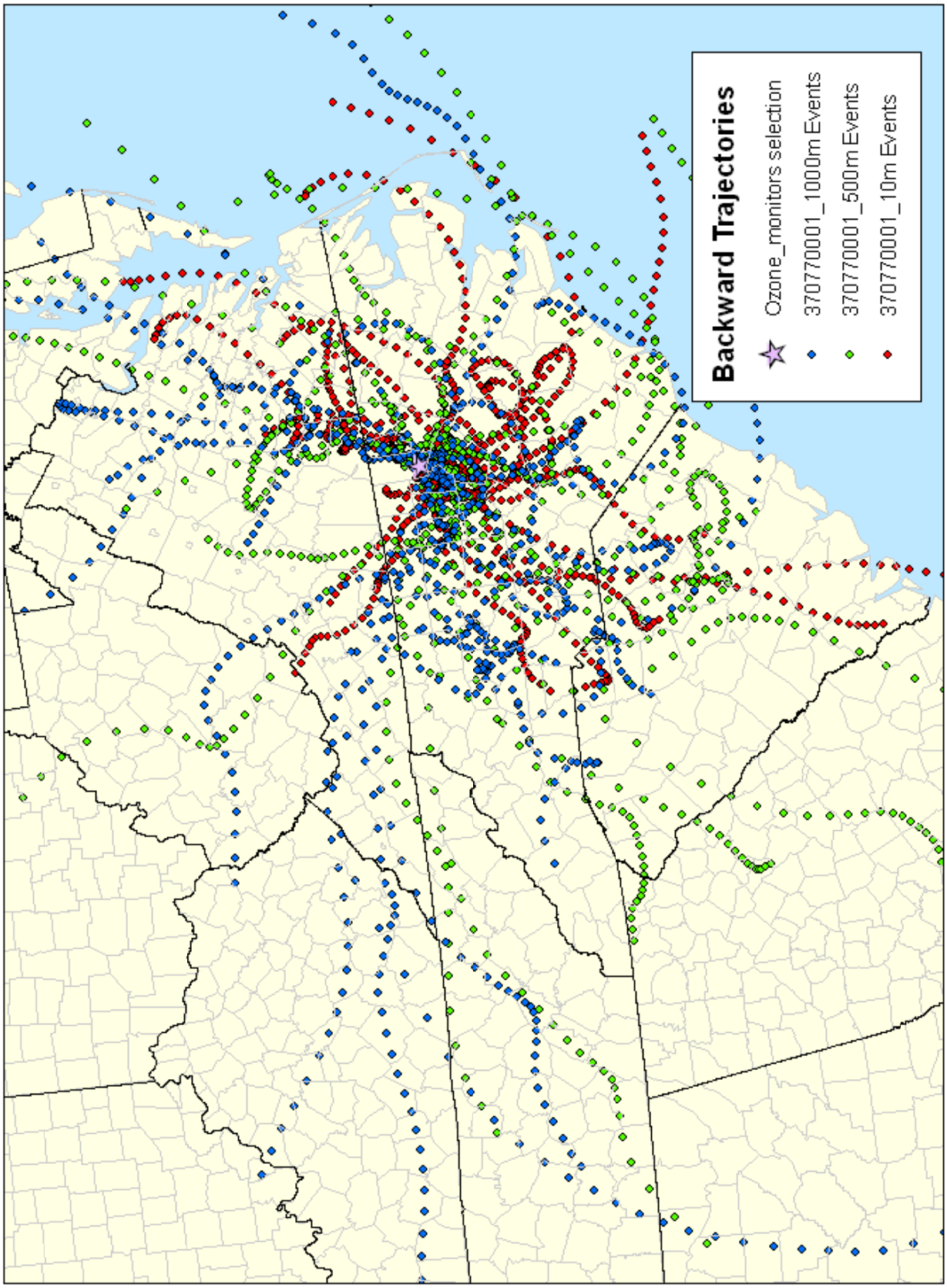

Backward Trajectories
Ozone_monitors selection
3706700028_1000m Events
3706700028_500m Events
3706700028_10m Events

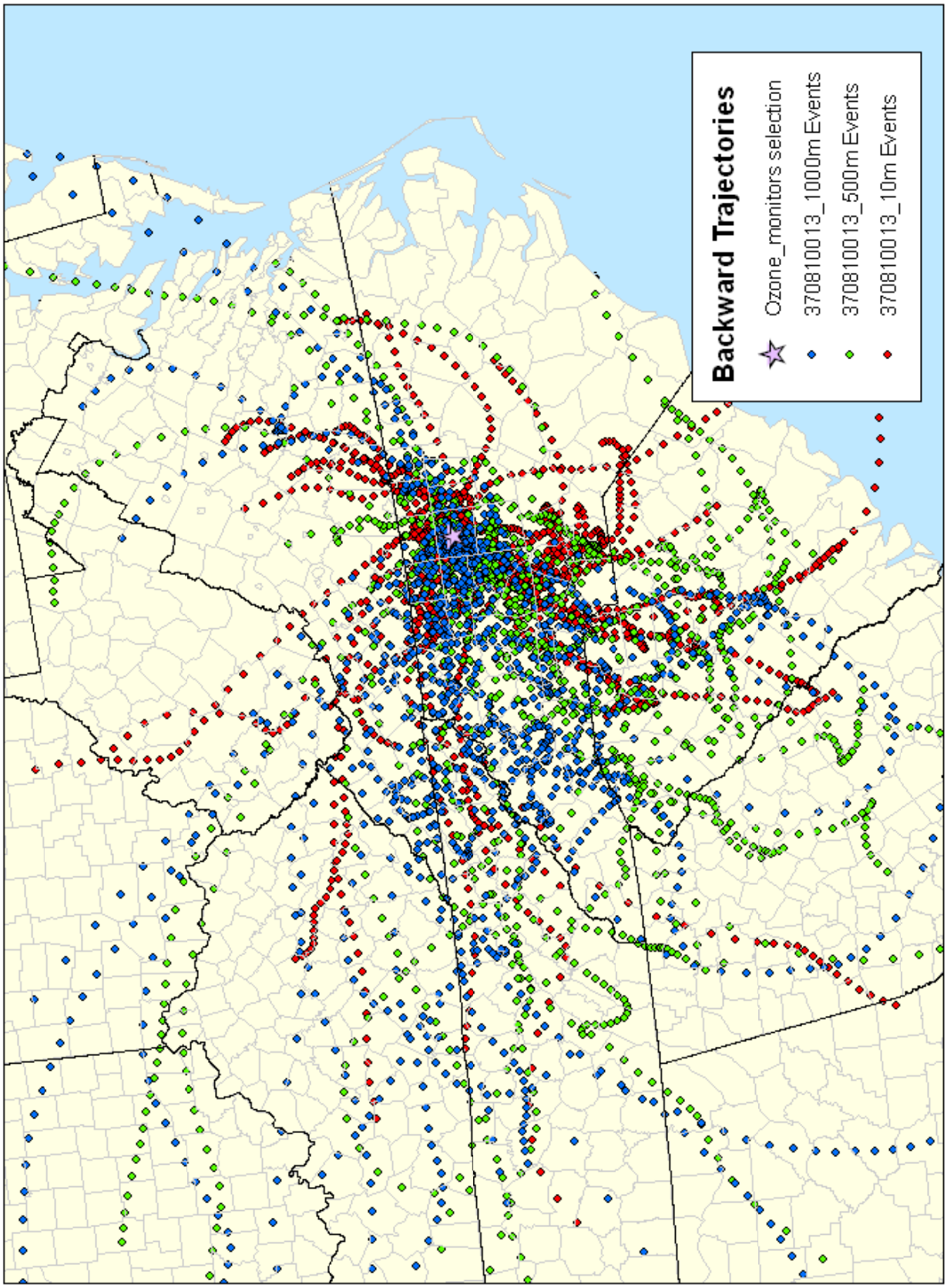

Backward Trajectories
Ozone_monitors selection
370670030_1000m Events
370670030_500m Events
370670030_10m Events

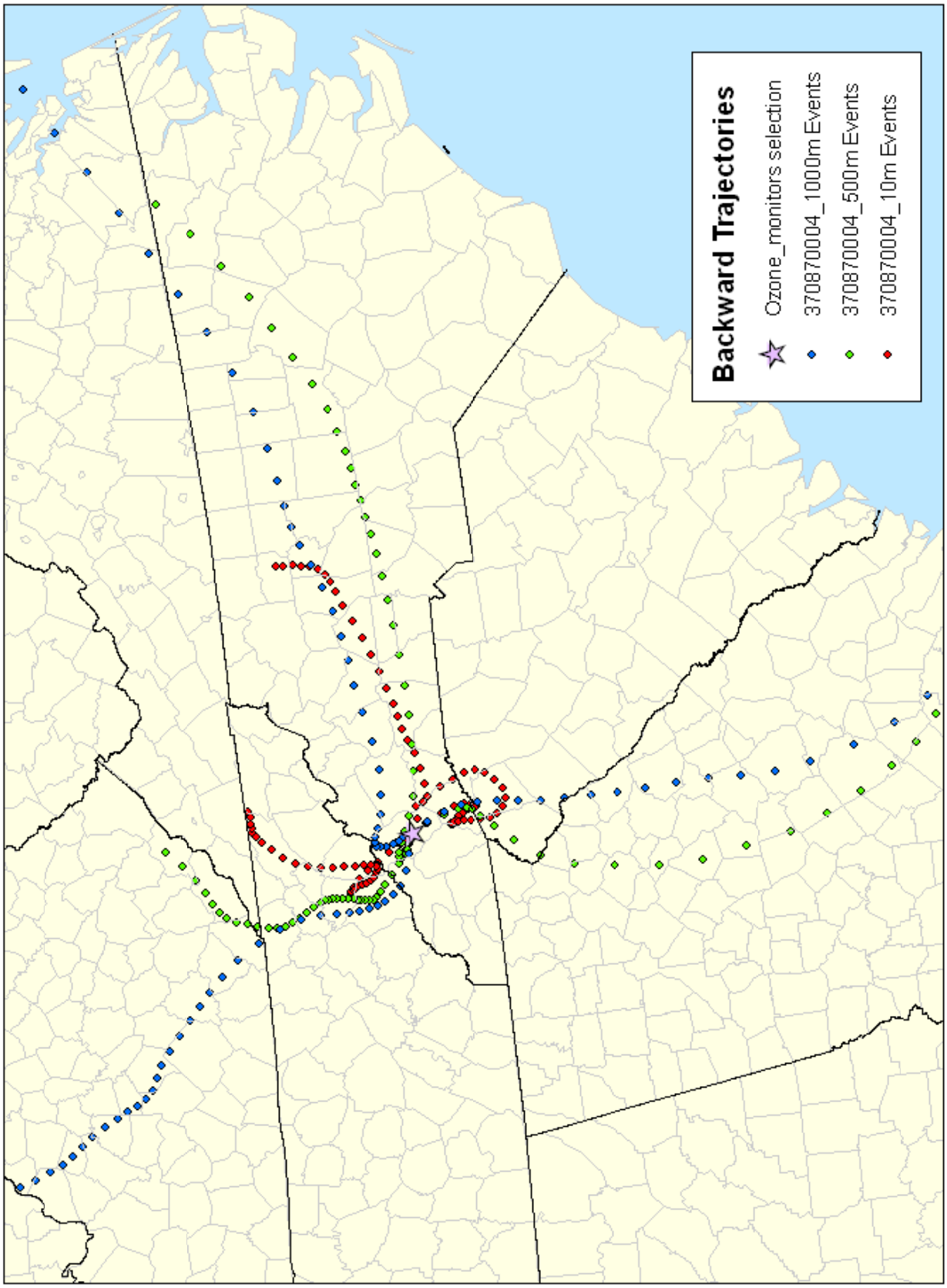

Backward Trajectories
Ozone_monitors selection
370671008_1000m Events
370671008_500m Events
370671008_10m Events

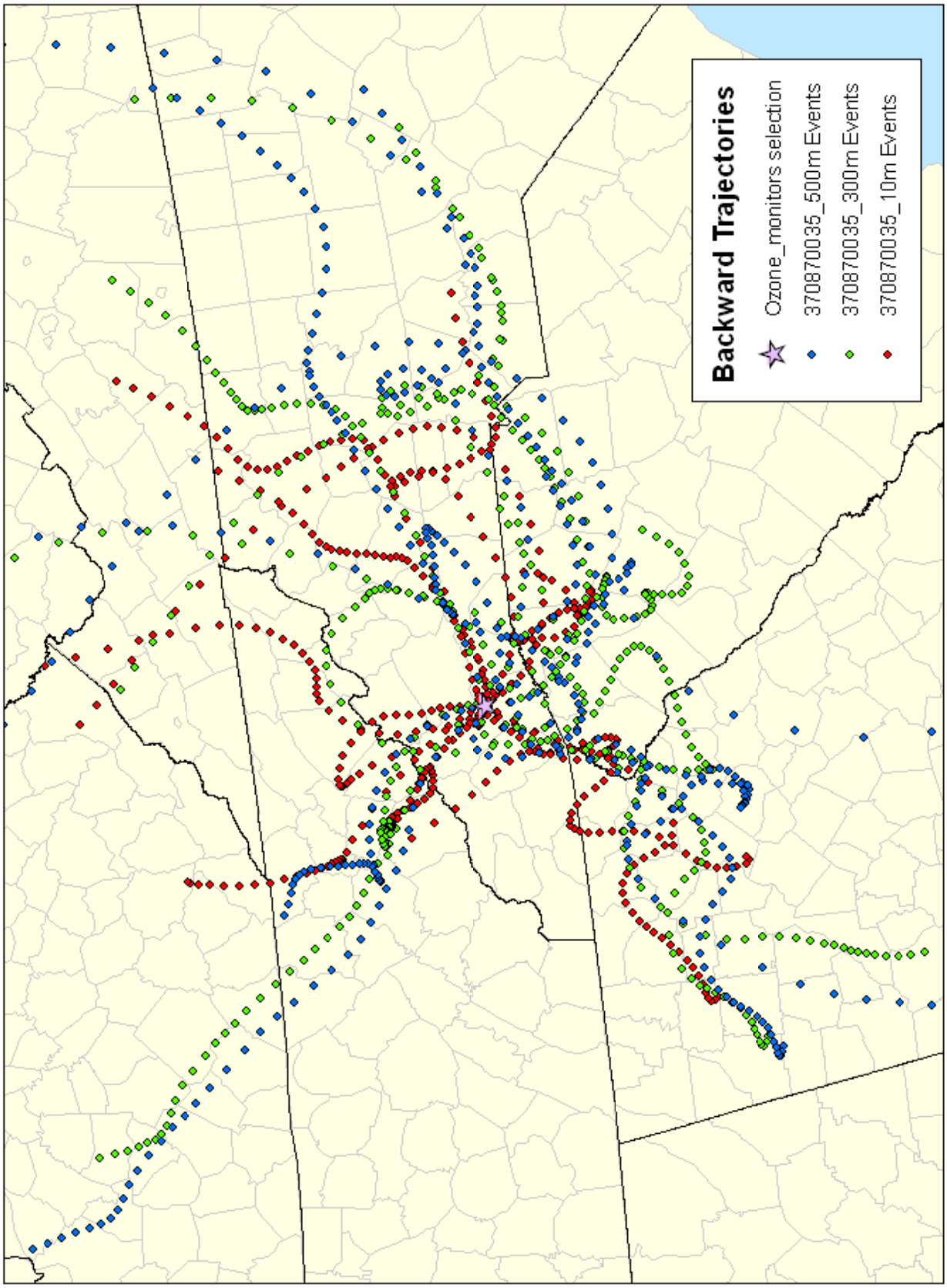

Backward Trajectories
Ozone_monitors selection
3706900001_1000m Events
3706900001_500m Events
3706900001_10m Events

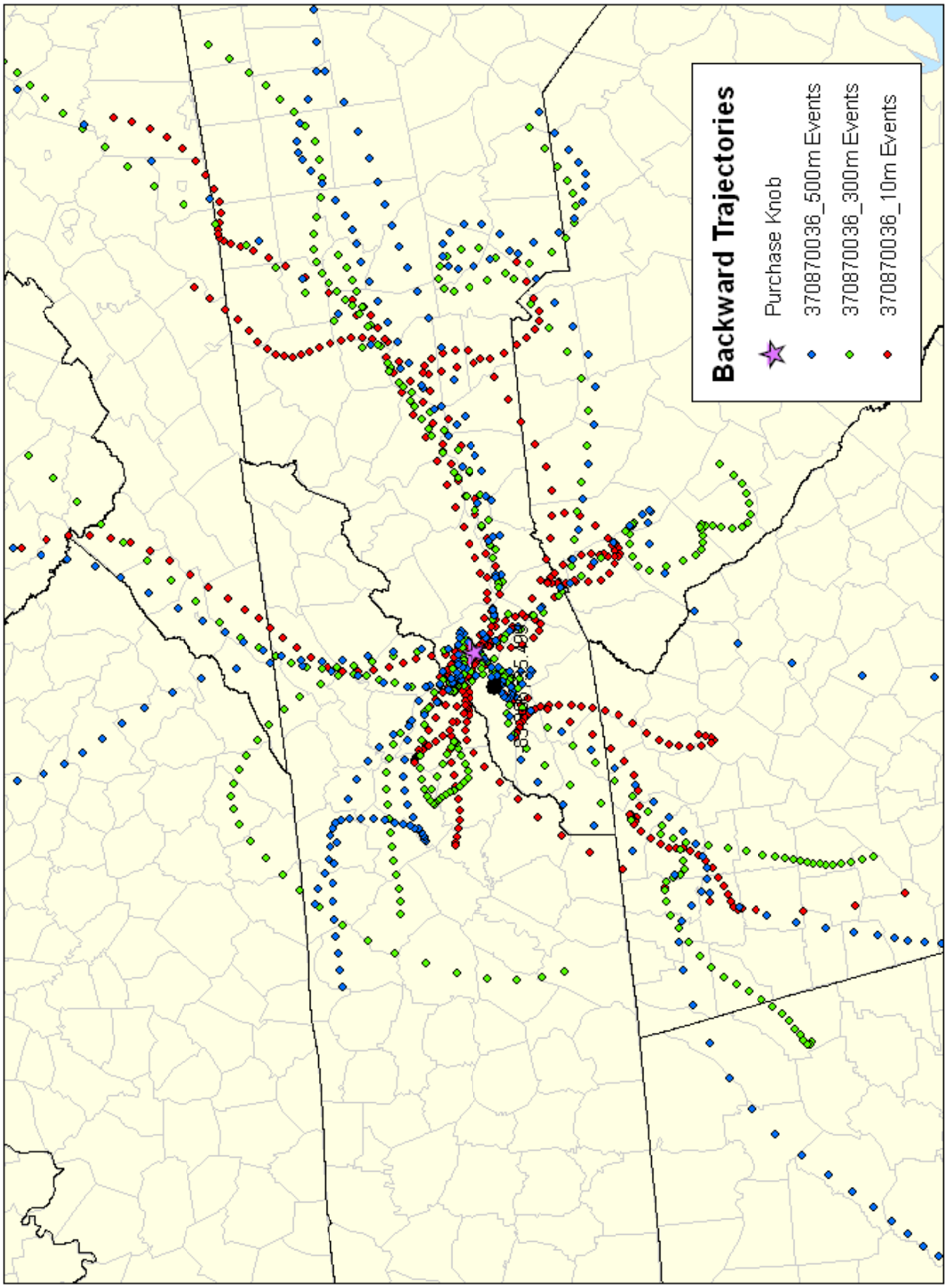

Backward Trajectories
Ozone_monitors selection
3707500001_500m Events
3707500001_300m Events
3707500001_10m Events

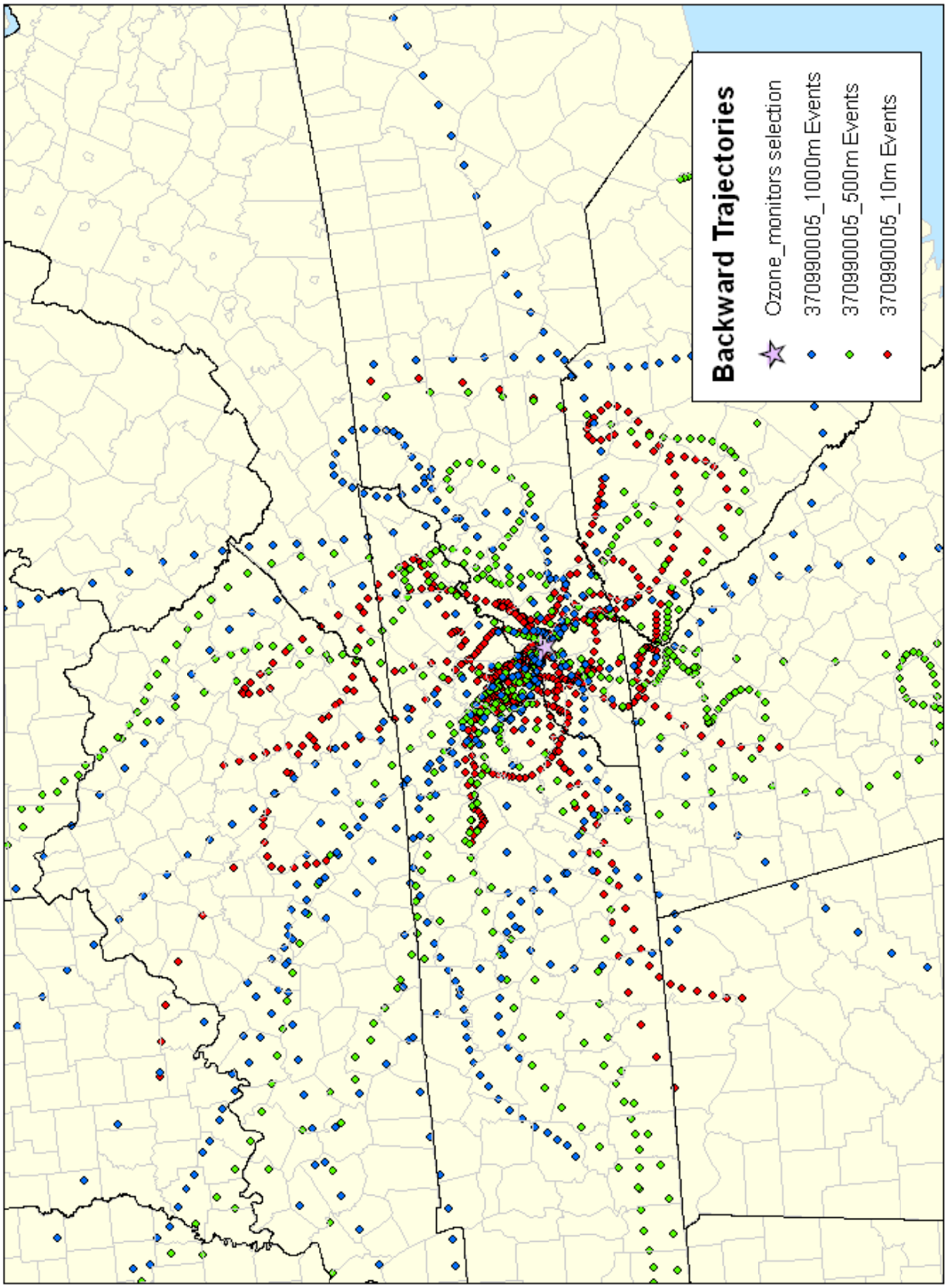

Backward Trajectories
Ozone_monitors selection
370770001_1000m Events
370770001_500m Events
370770001_10m Events

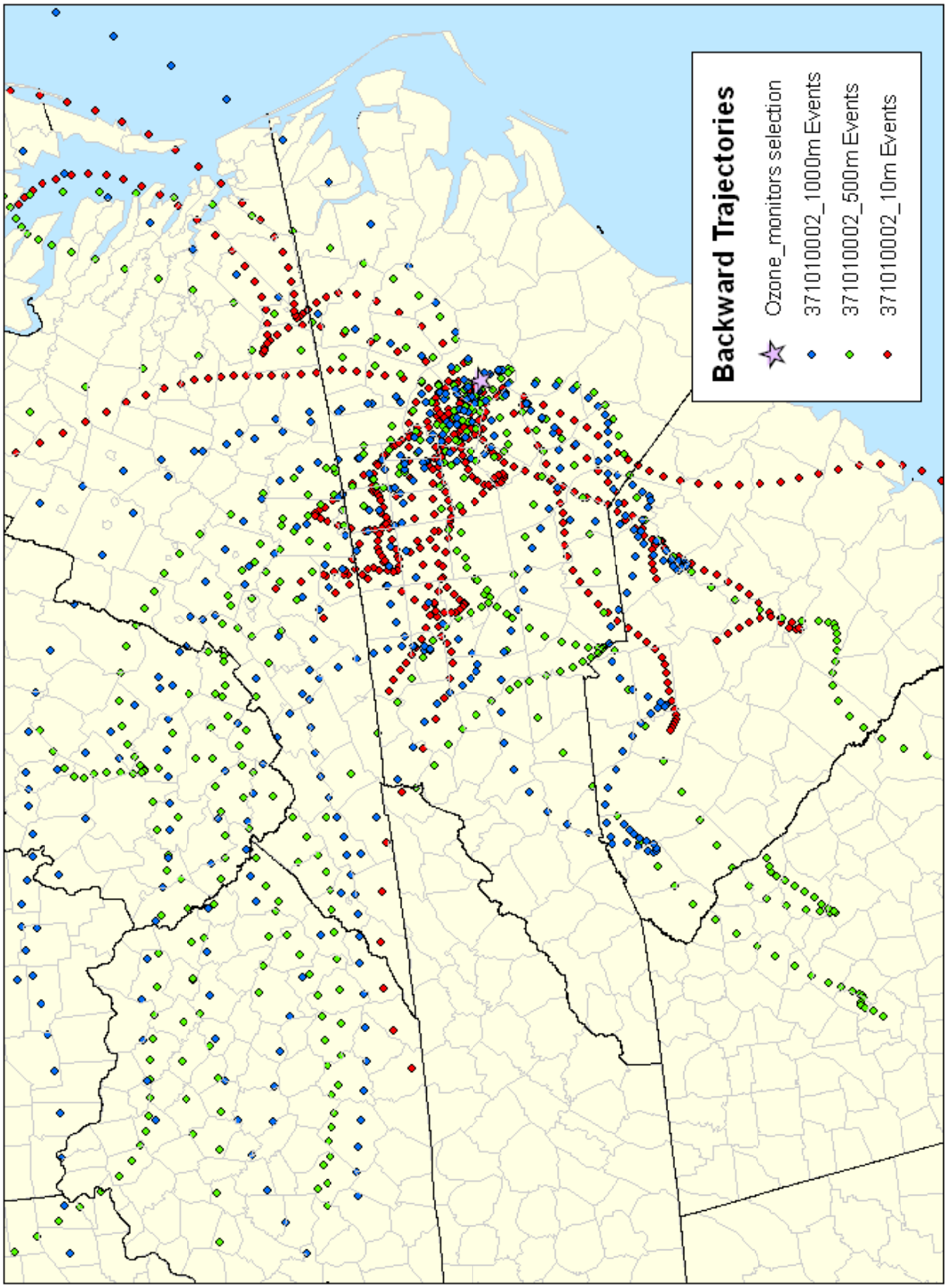

Backward Trajectories
Ozone_monitors selection
370810013_1000m Events
370810013_500m Events
370810013_10m Events

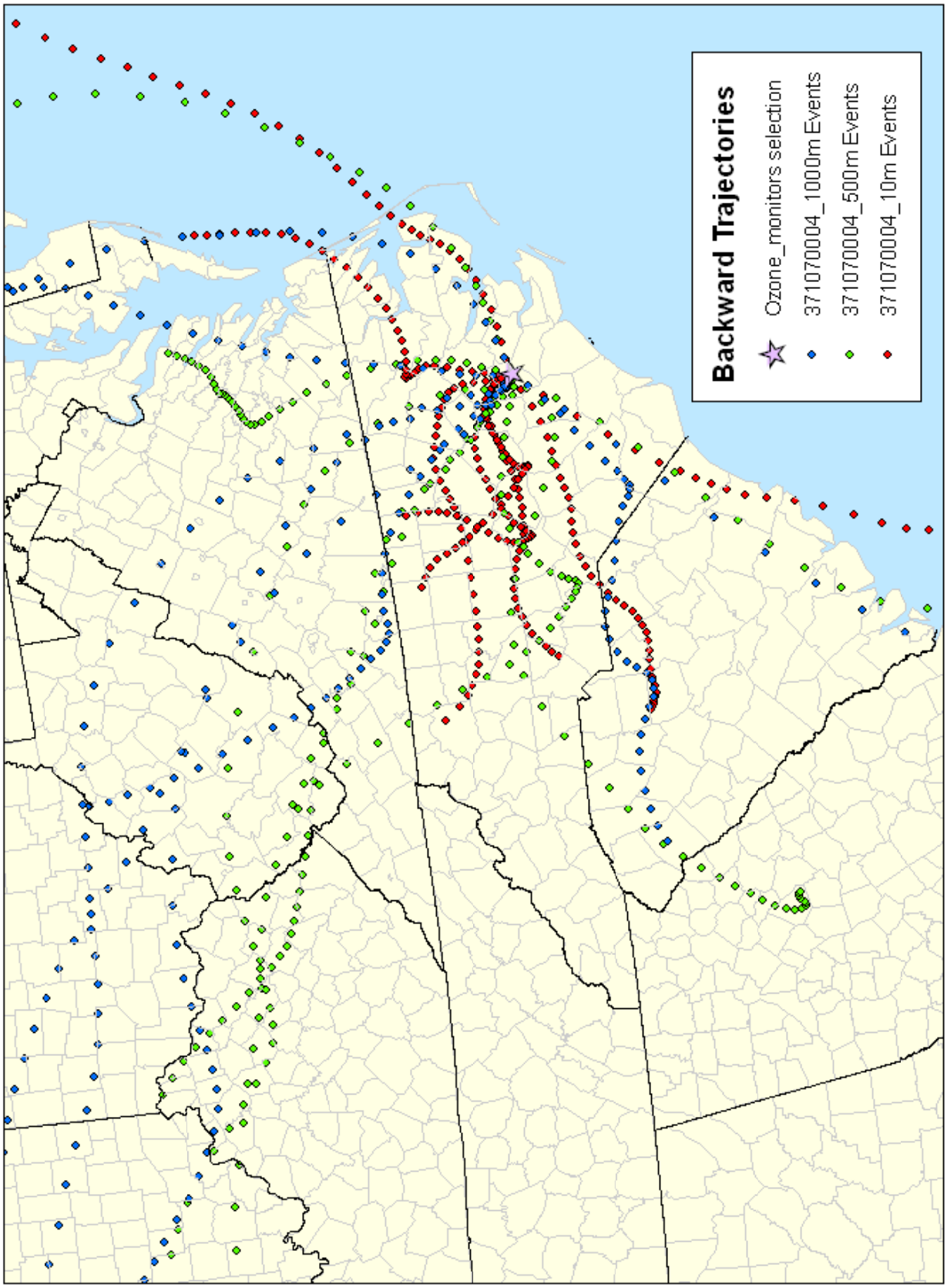

Backward Trajectories
Ozone_monitors selection
370870004_1000m Events
370870004_500m Events
370870004_10m Events

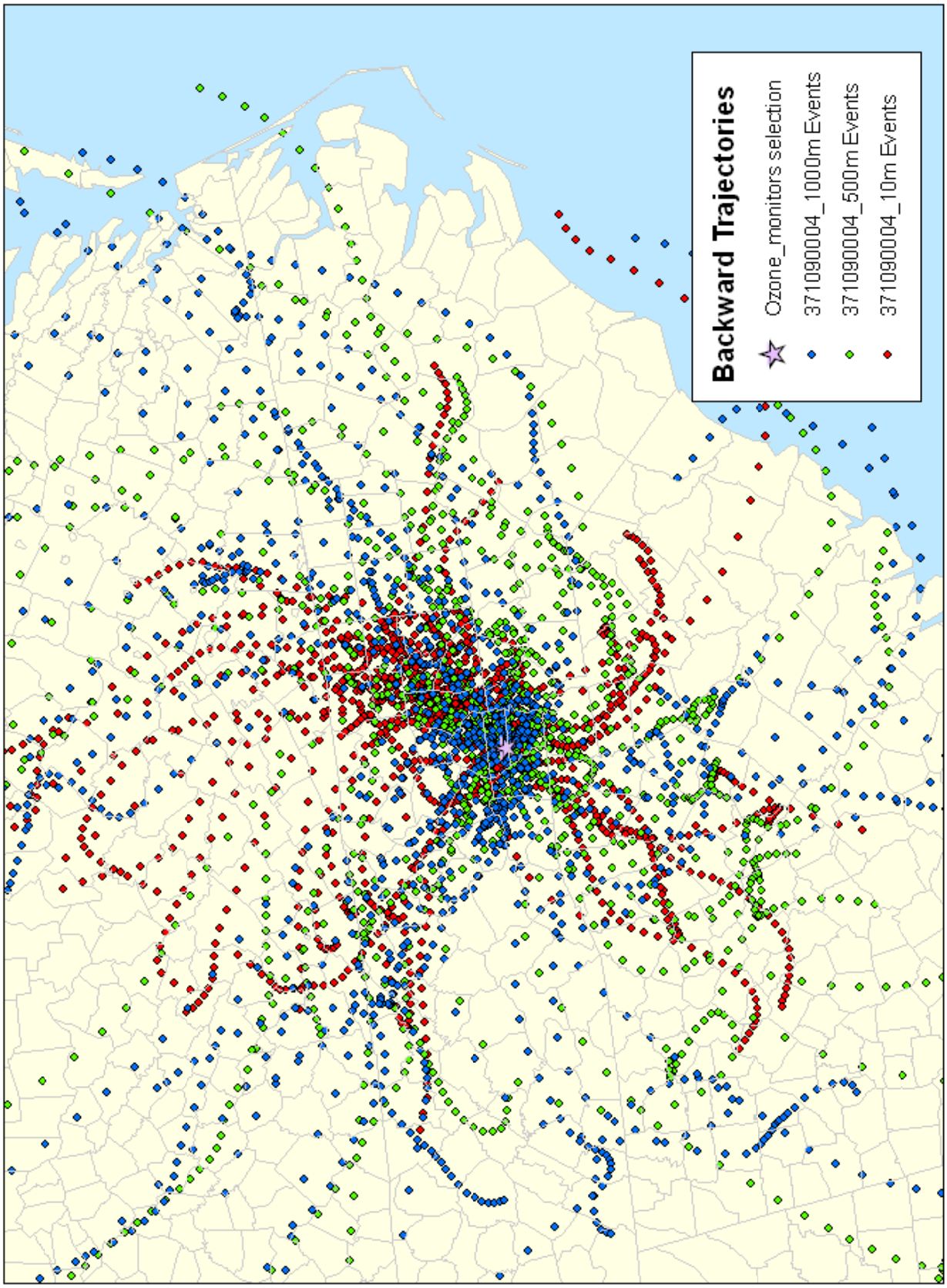

Backward Trajectories
Ozone_monitors selection
370870035_500m Events
370870035_300m Events
370870035_10m Events

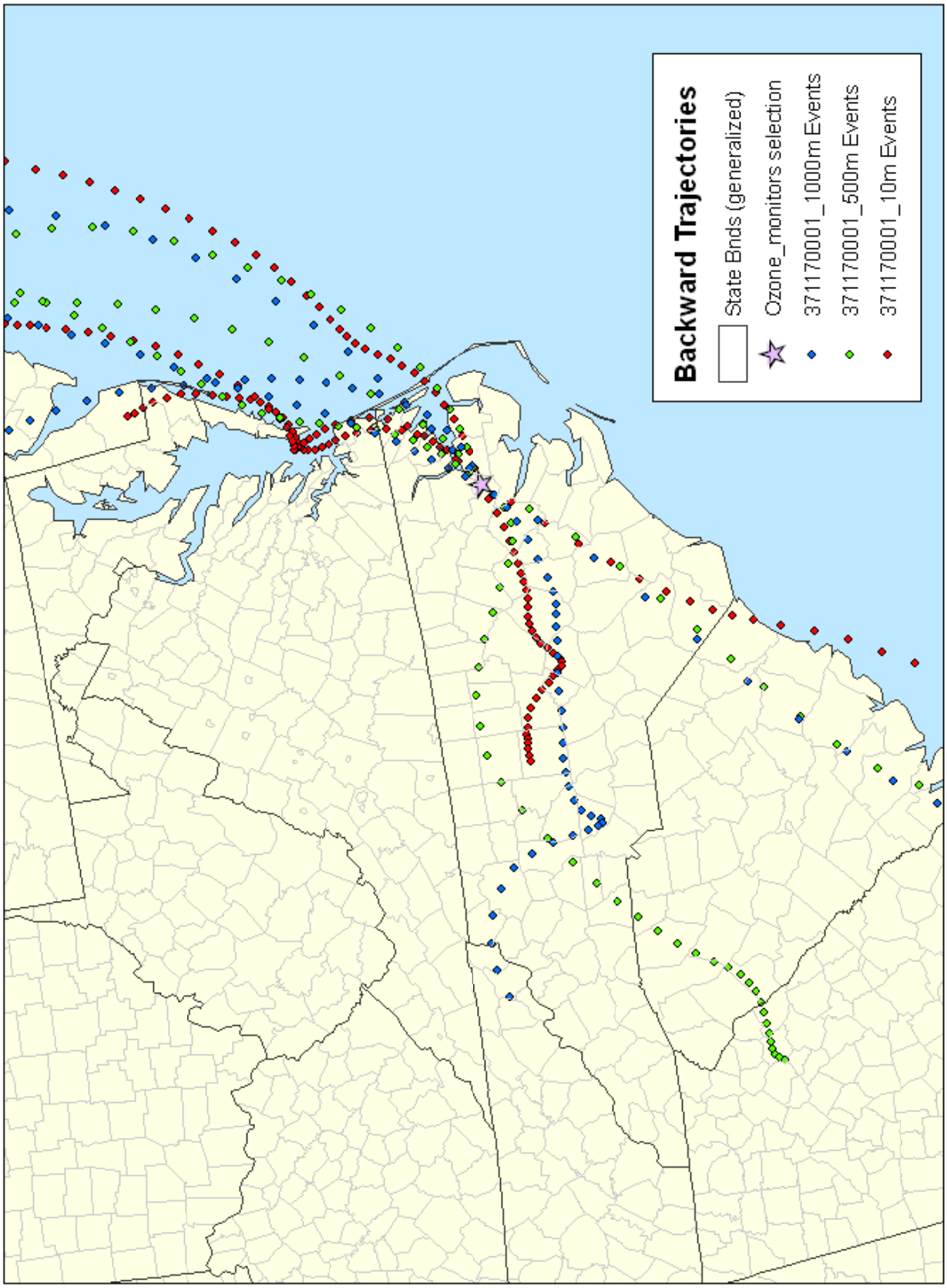

Backward Trajectories
Purchase Knob
370870036_500m Events
370870036_300m Events
370870036_10m Events

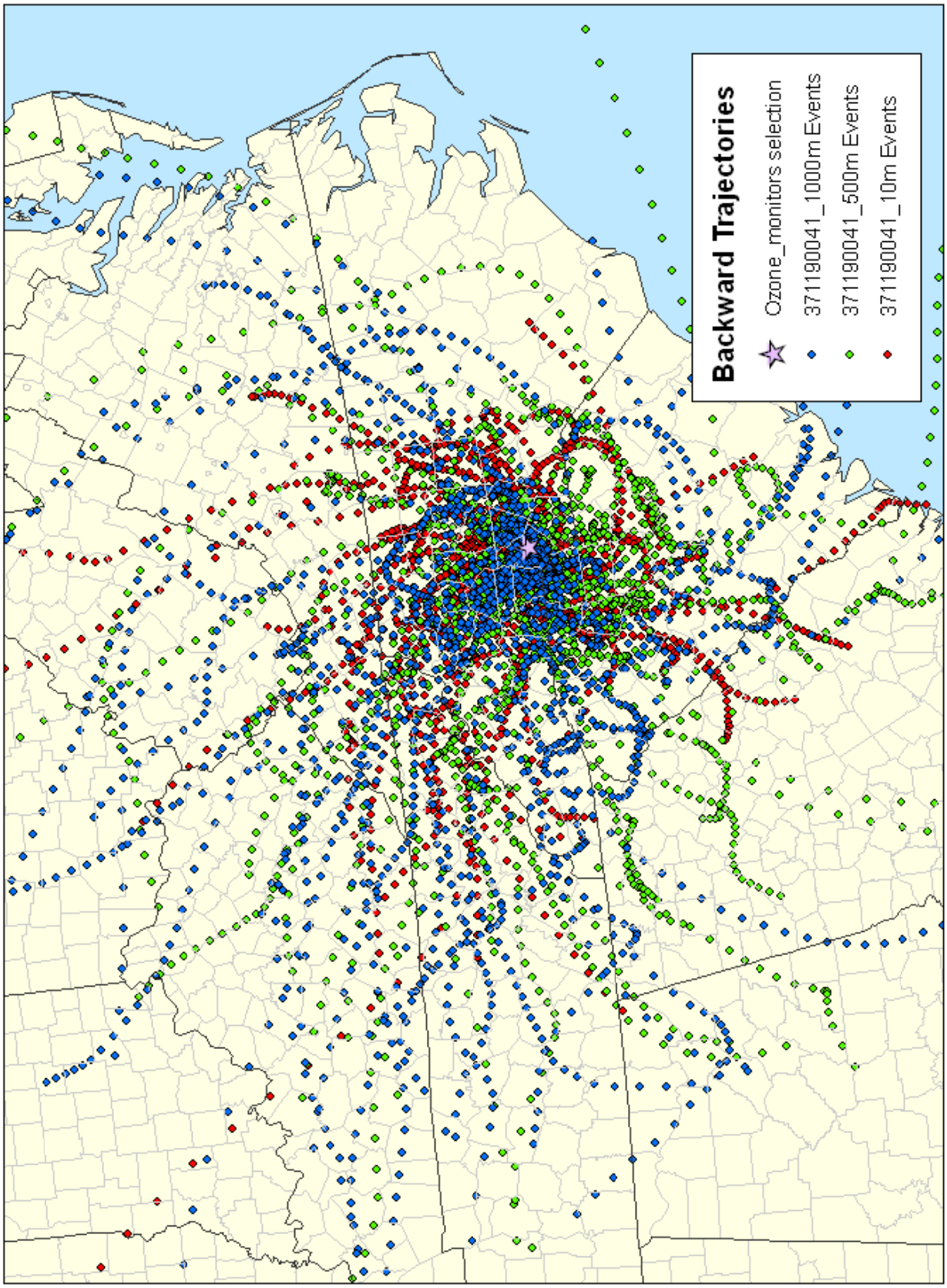

Backward Trajectories
Ozone_monitors selection
370990005_1000m Events
370990005_500m Events
370990005_10m Events

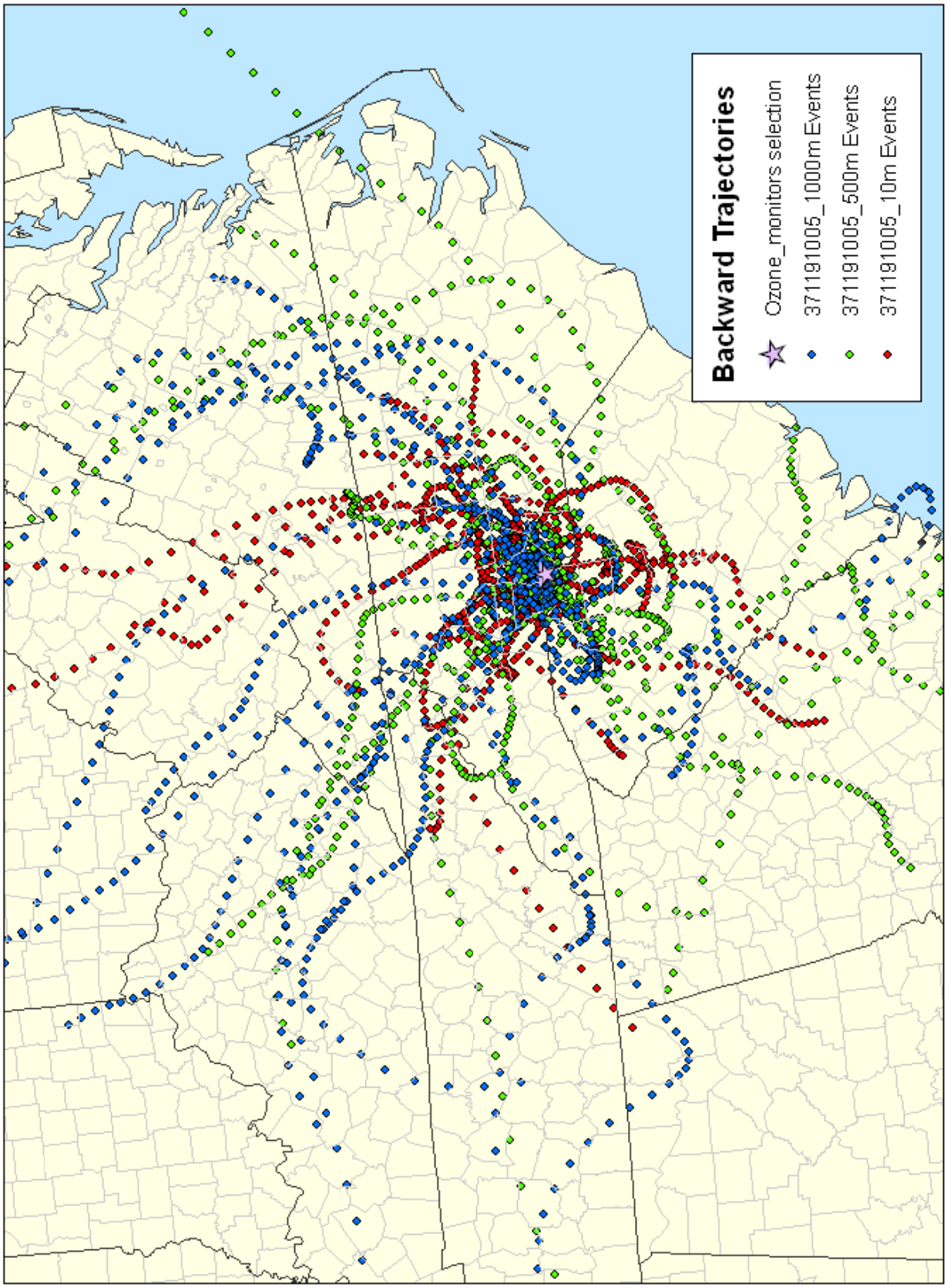

Backward Trajectories
Ozone_monitors selection
3710100002_1000m Events
3710100002_500m Events
3710100002_10m Events

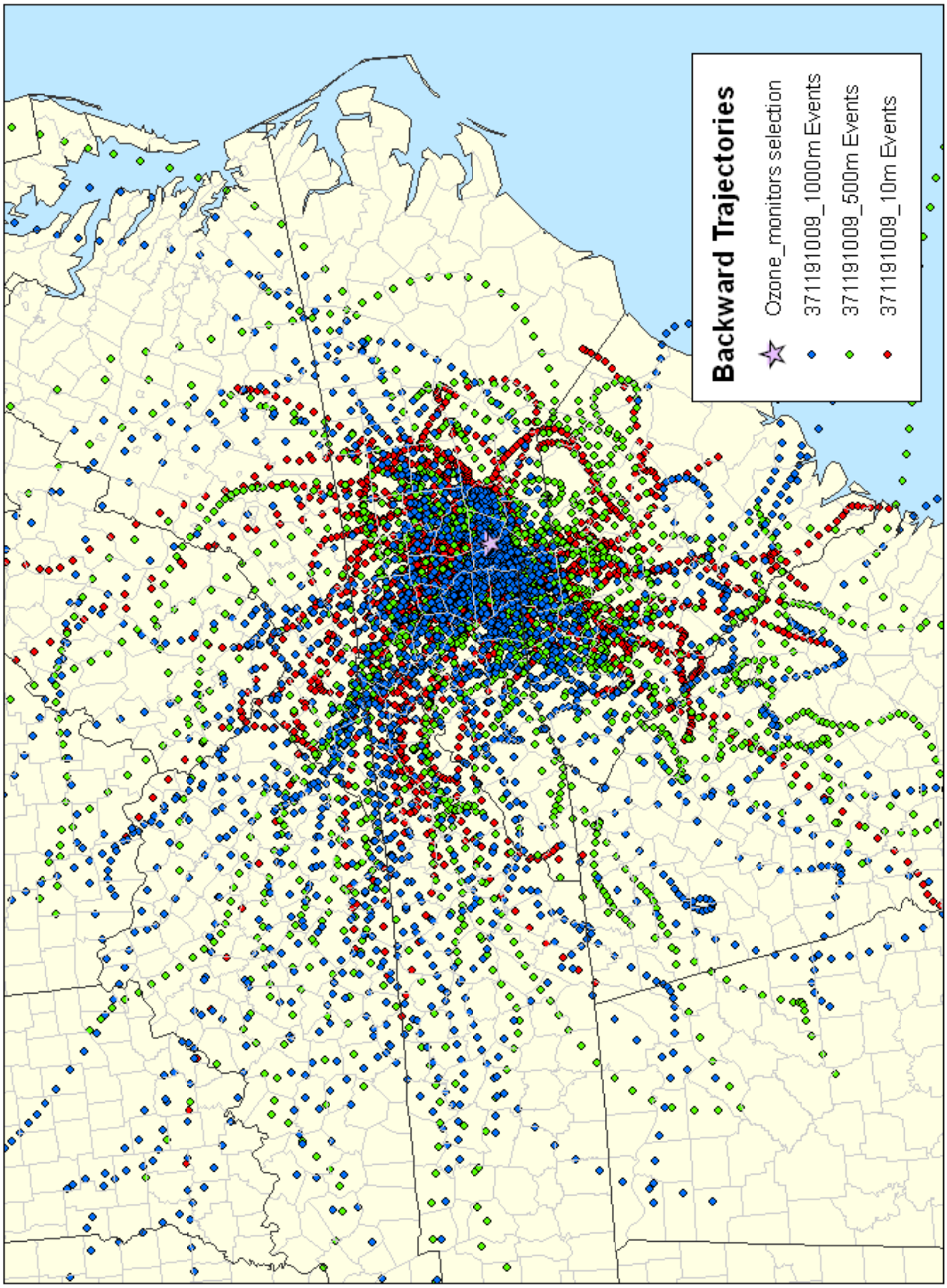

Backward Trajectories
Ozone_monitors selection
3710700004_1000m Events
3710700004_500m Events
3710700004_10m Events

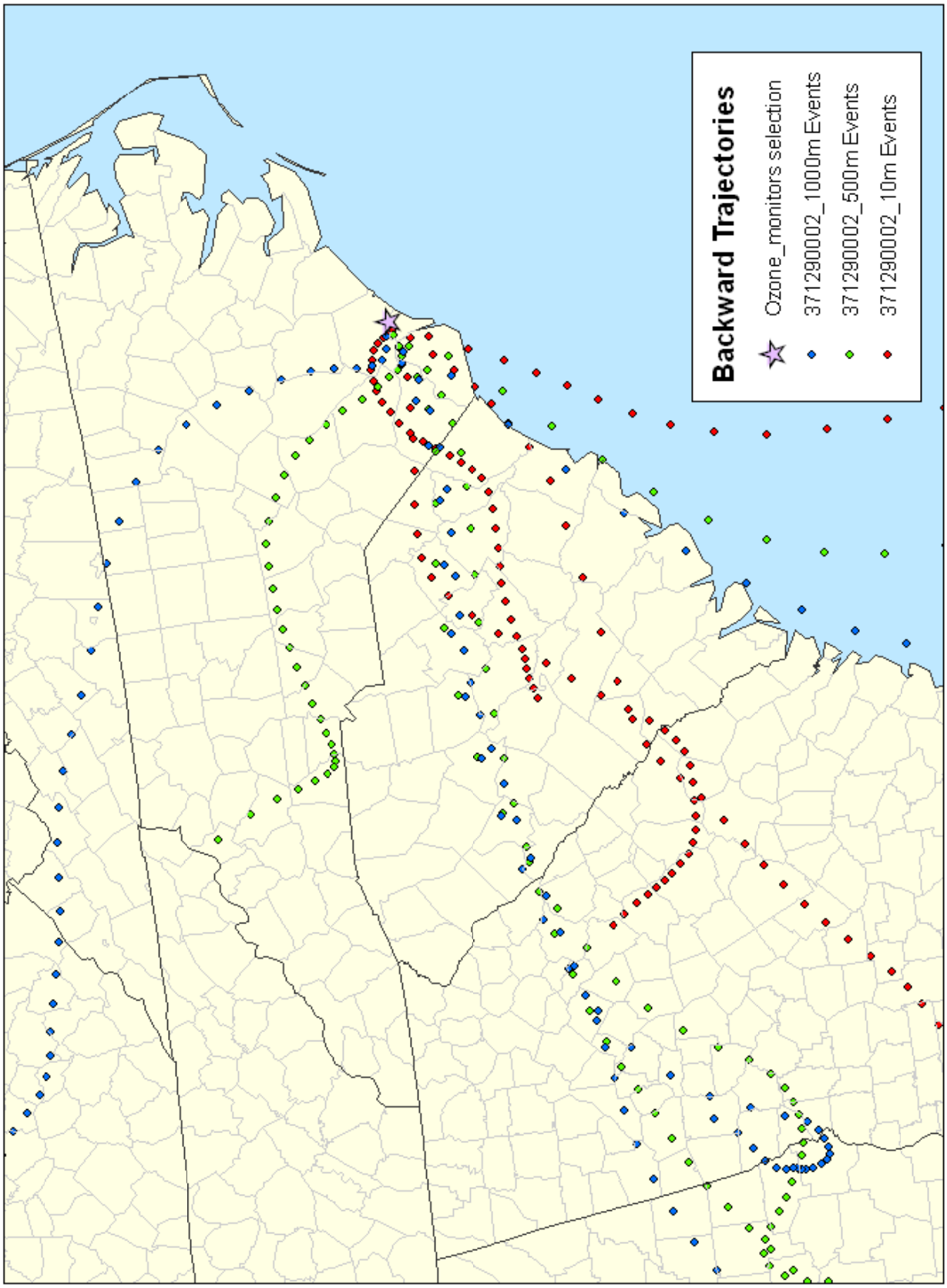

Backward Trajectories
Ozone_monitors selection
3710900004_1000m Events
3710900004_500m Events
3710900004_10m Events

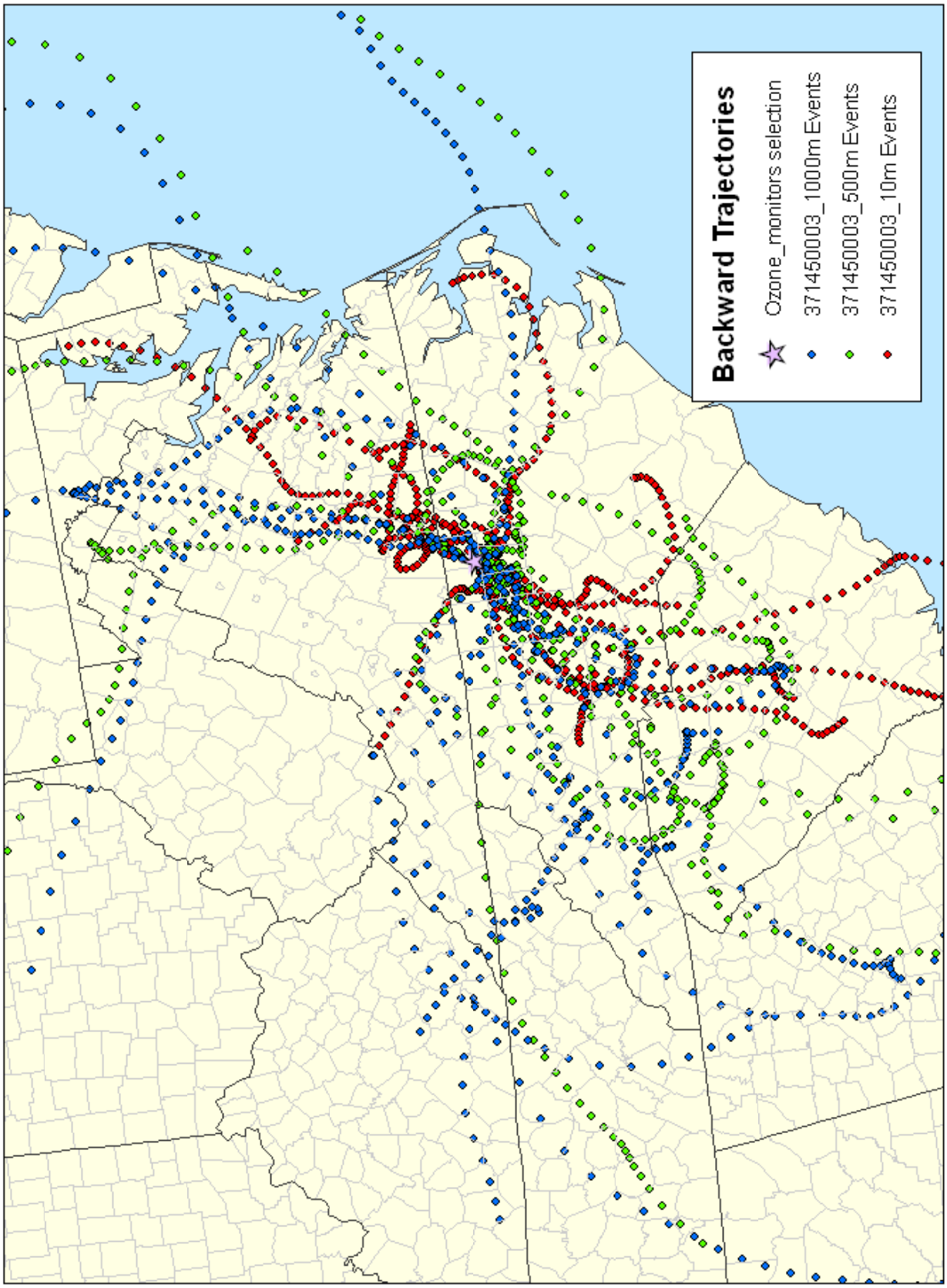

Backward Trajectories
State Bnds (generalized)
Ozone_monitors selection
3711700001_1000m Events
3711700001_500m Events
3711700001_10m Events

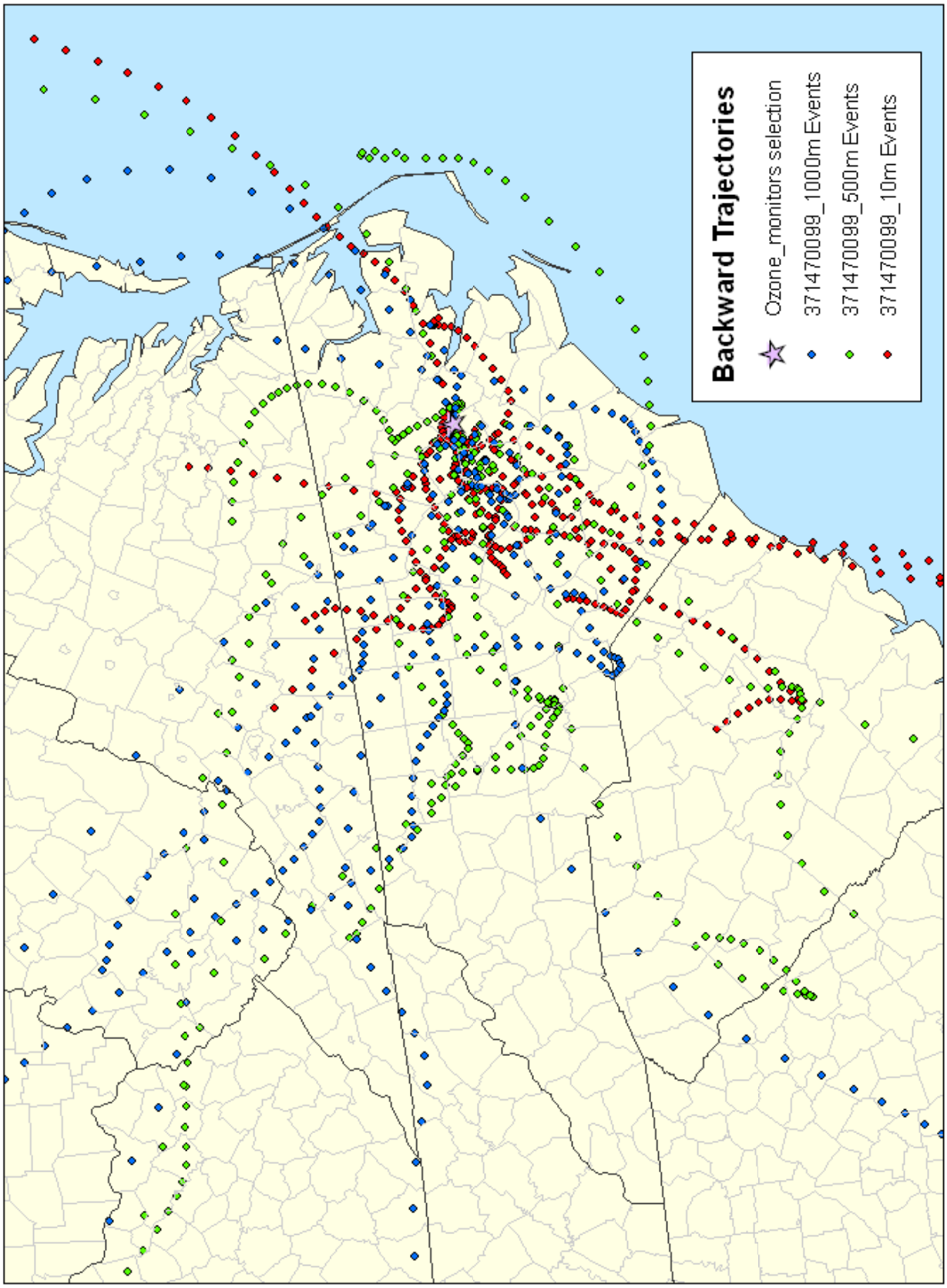

Backward Trajectories
Ozone_monitors selection
371190041_1000m Events
371190041_500m Events
371190041_10m Events

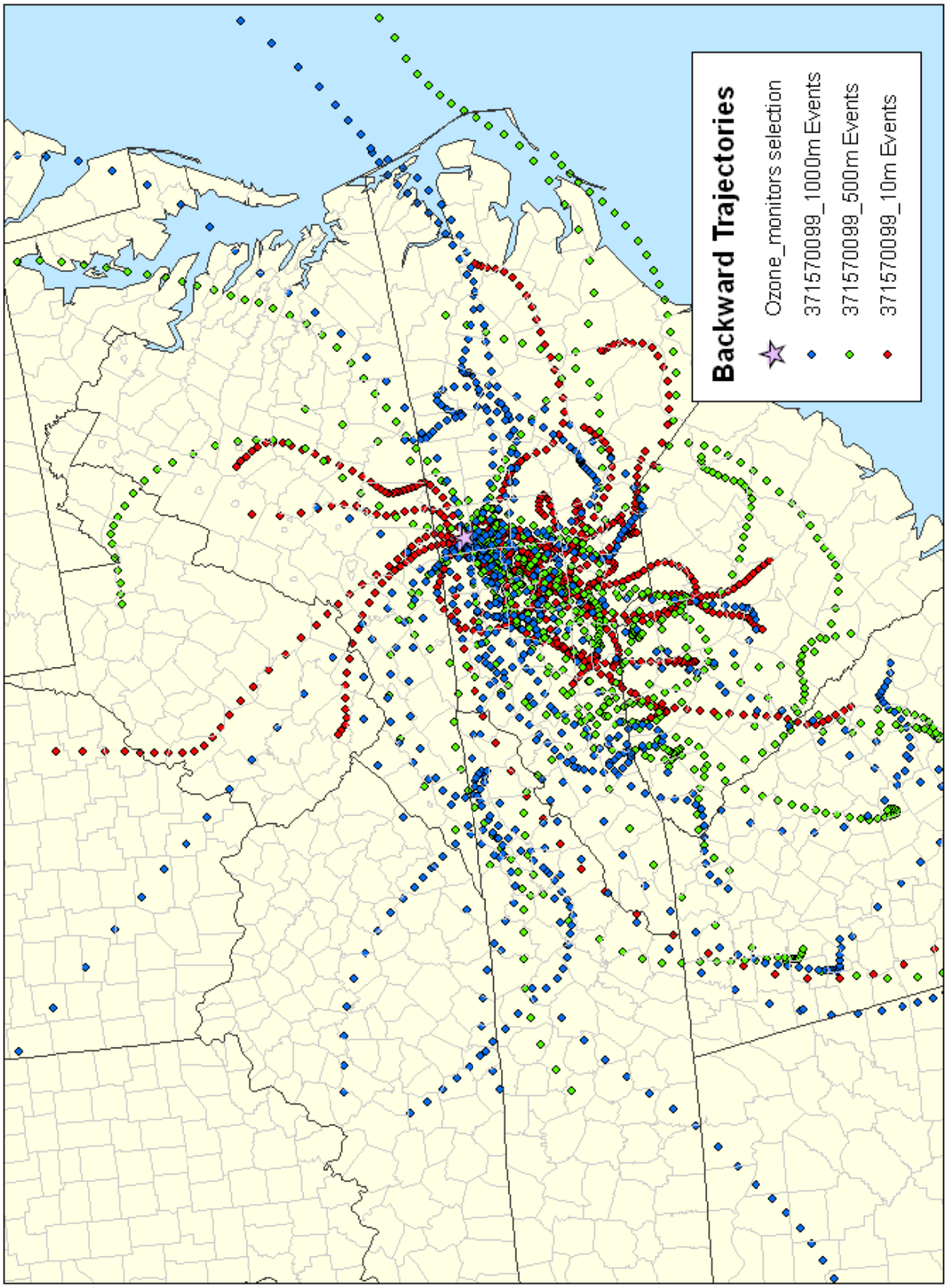

Backward Trajectories
Ozone_monitors selection
371191005_1000m Events
371191005_500m Events
371191005_10m Events

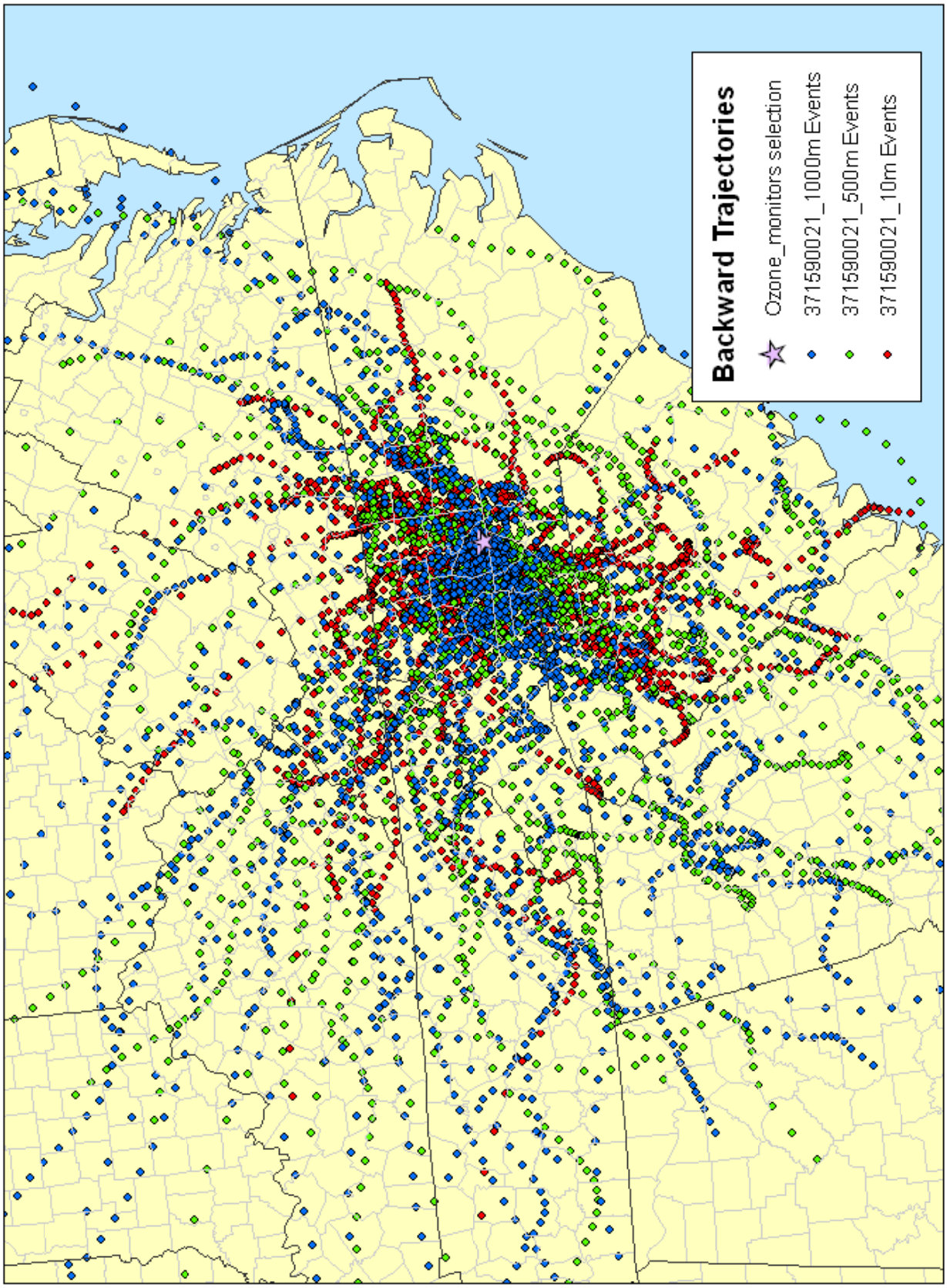

Backward Trajectories
Ozone_monitors selection
371191009_1000m Events
371191009_500m Events
371191009_10m Events

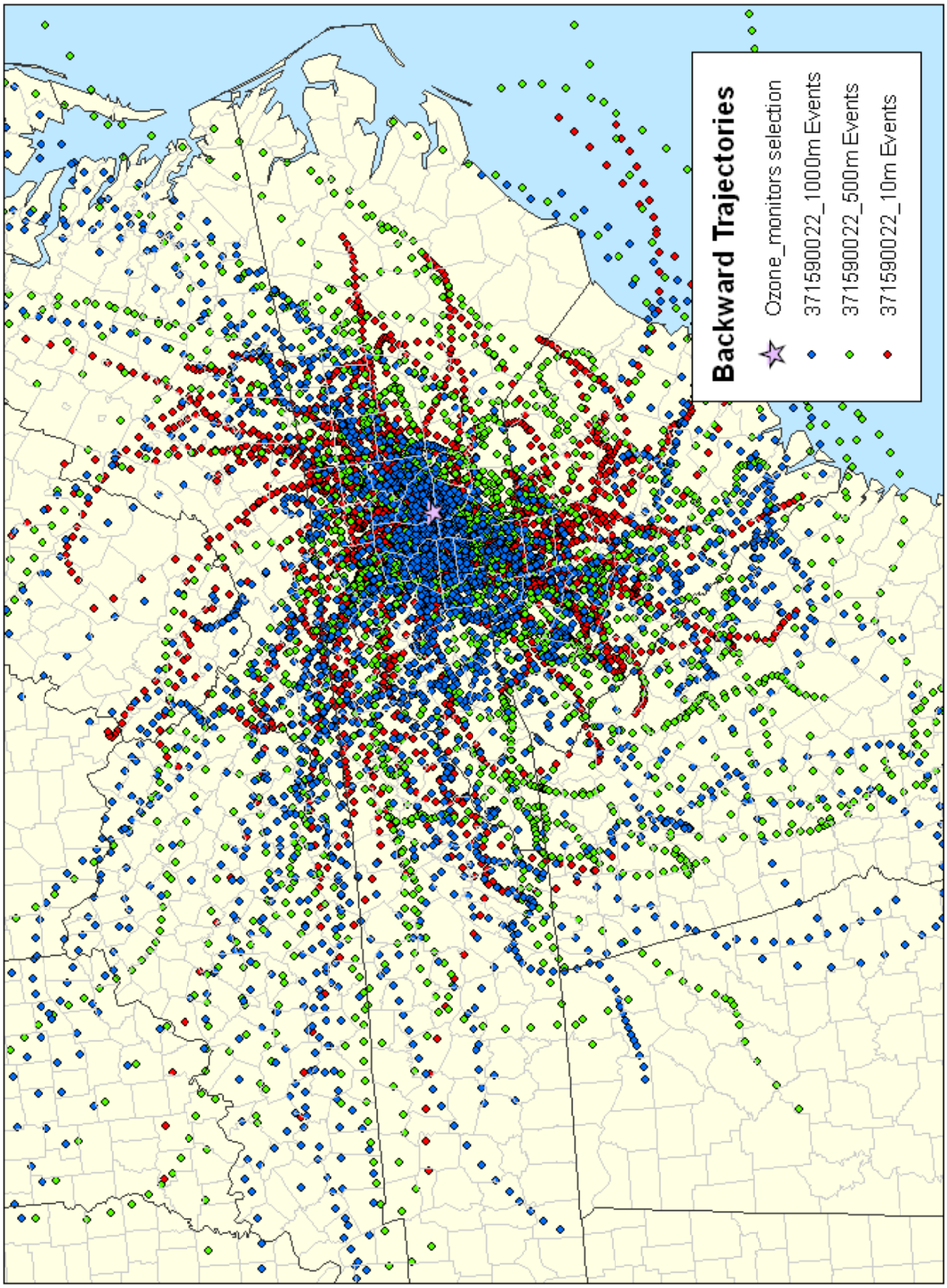

Backward Trajectories
Ozone_monitors selection
371290002_1000m Events
371290002_500m Events
371290002_10m Events

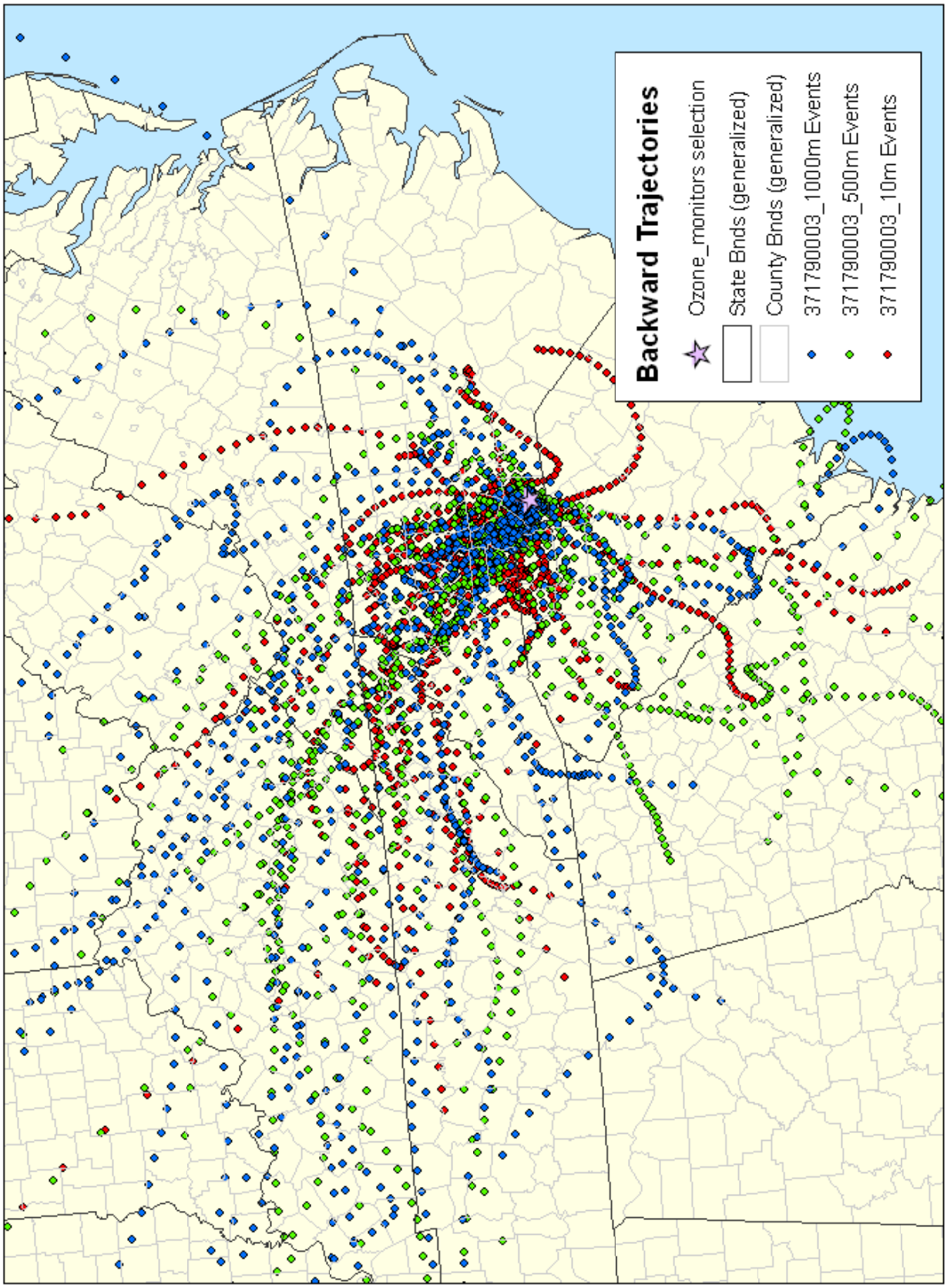

Backward Trajectories
Ozone_monitors selection
371450003_1000m Events
371450003_500m Events
371450003_10m Events

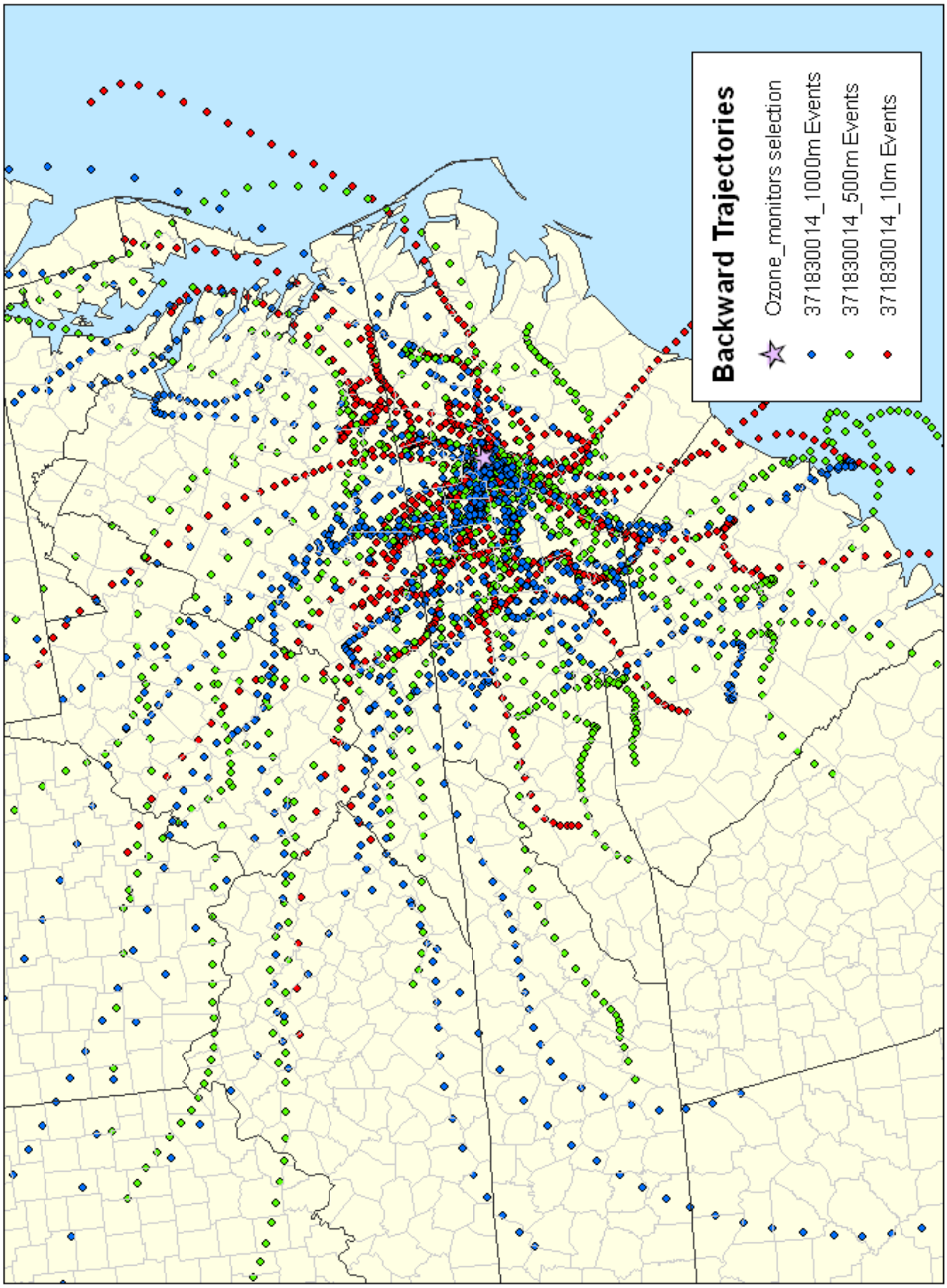

Backward Trajectories
Ozone_monitors selection
371470099_1000m Events
371470099_500m Events
371470099_10m Events

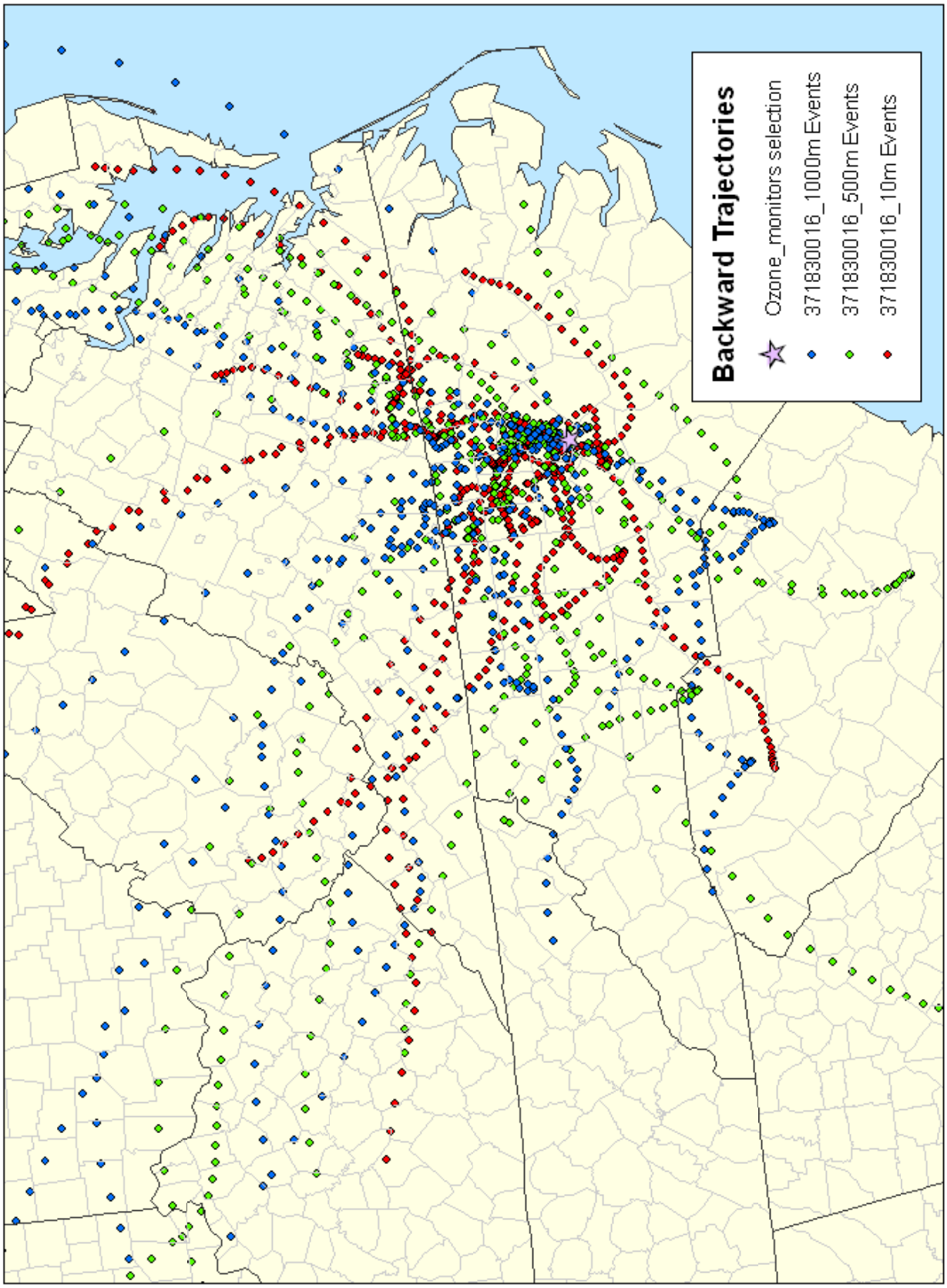

Backward Trajectories
Ozone_monitors selection
371570099_1000m Events
371570099_500m Events
371570099_10m Events

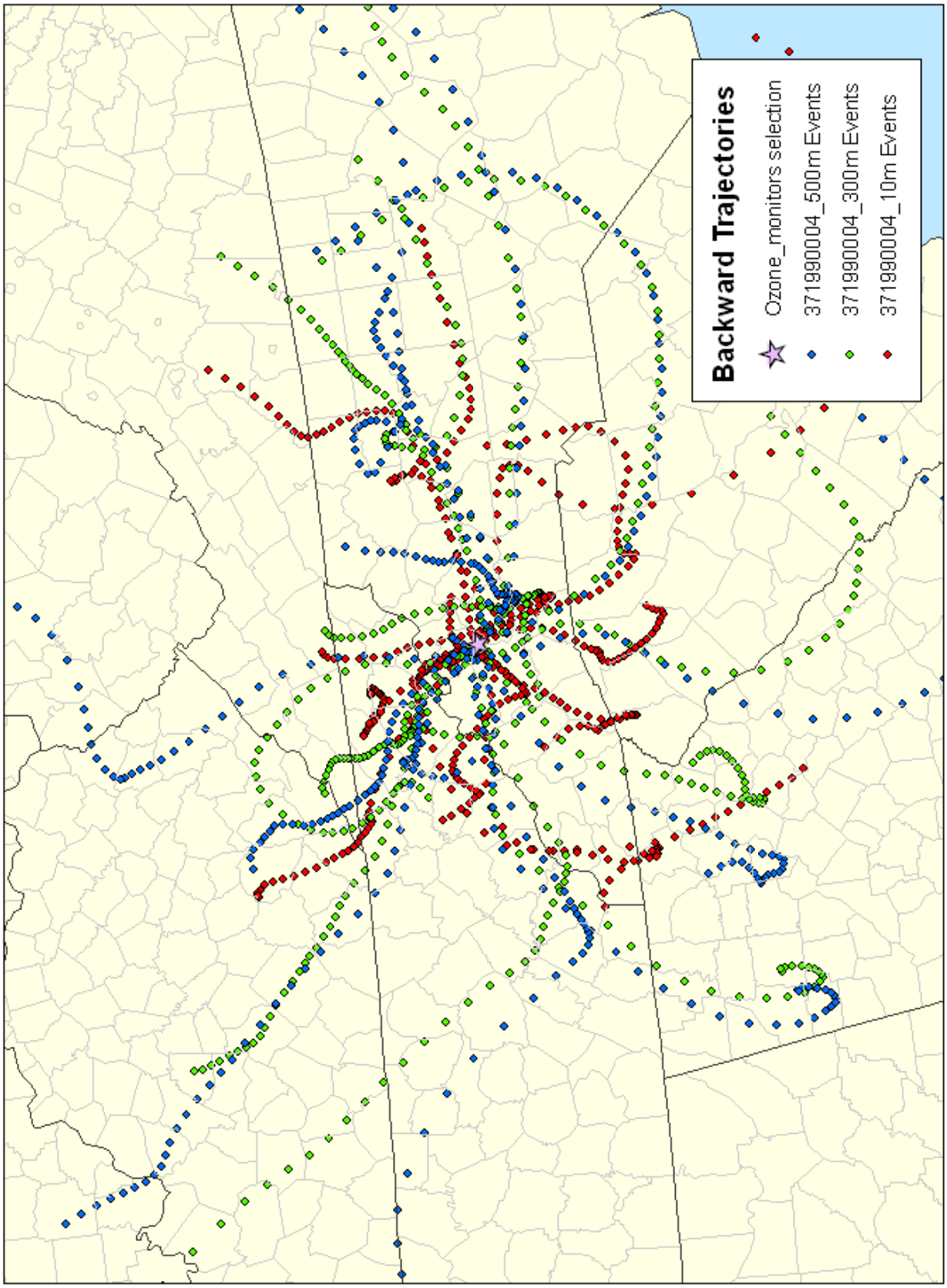

Backward Trajectories
Ozone_monitors selection
3715900021_1000m Events
3715900021_500m Events
3715900021_10m Events


Backward Trajectories
Ozone_monitors selection
371590022_1000m Events
371590022_500m Events
371590022_10m Events


Backward Trajectories
Ozone_monitors selection
State Bnds (generalized)
County Bnds (generalized)
371790003_1000m Events
371790003_500m Events
371790003_10m Events

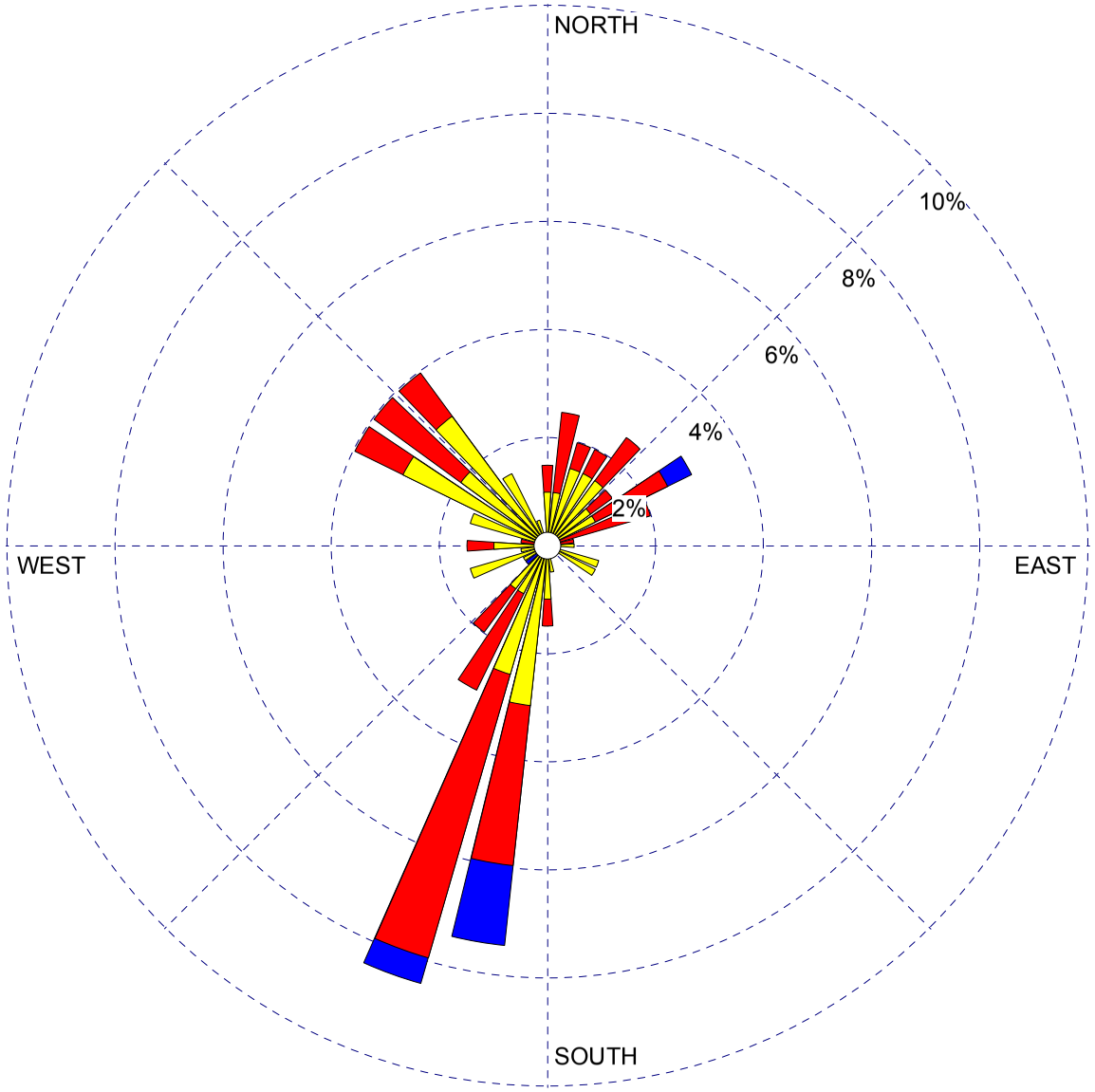

Backward Trajectories
Ozone_monitors selection
371830014_1000m Events
371830014_500m Events
371830014_10m Events


Backward Trajectories
Ozone_monitors selection
371830016_1000m Events
371830016_500m Events
371830016_10m Events


Backward Trajectories
Ozone_monitors selection
371990004_500m Events
371990004_300m Events
371990004_10m Events

WIND ROSE PLOT:
Waggin
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KHKY
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
202 hrs.

CALM WINDS:
37.13%

AVG. WIND SPEED:
3.35 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

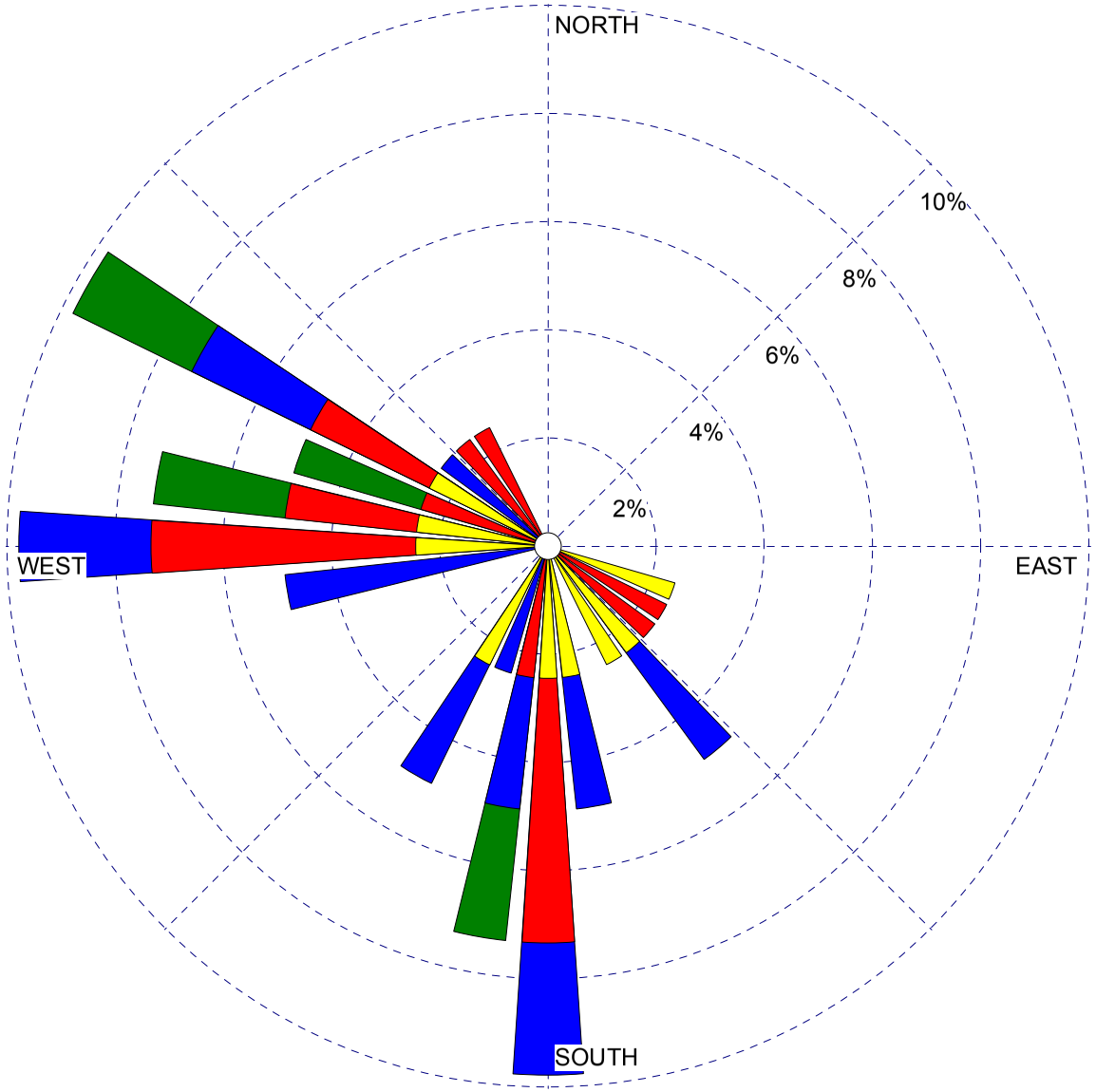
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
LINVF2
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KTNB
600-1900 EST
No Variable winds

DATA PERIOD:
2007-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
41 hrs.

CALM WINDS:
12.20%

AVG. WIND SPEED:
6.76 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

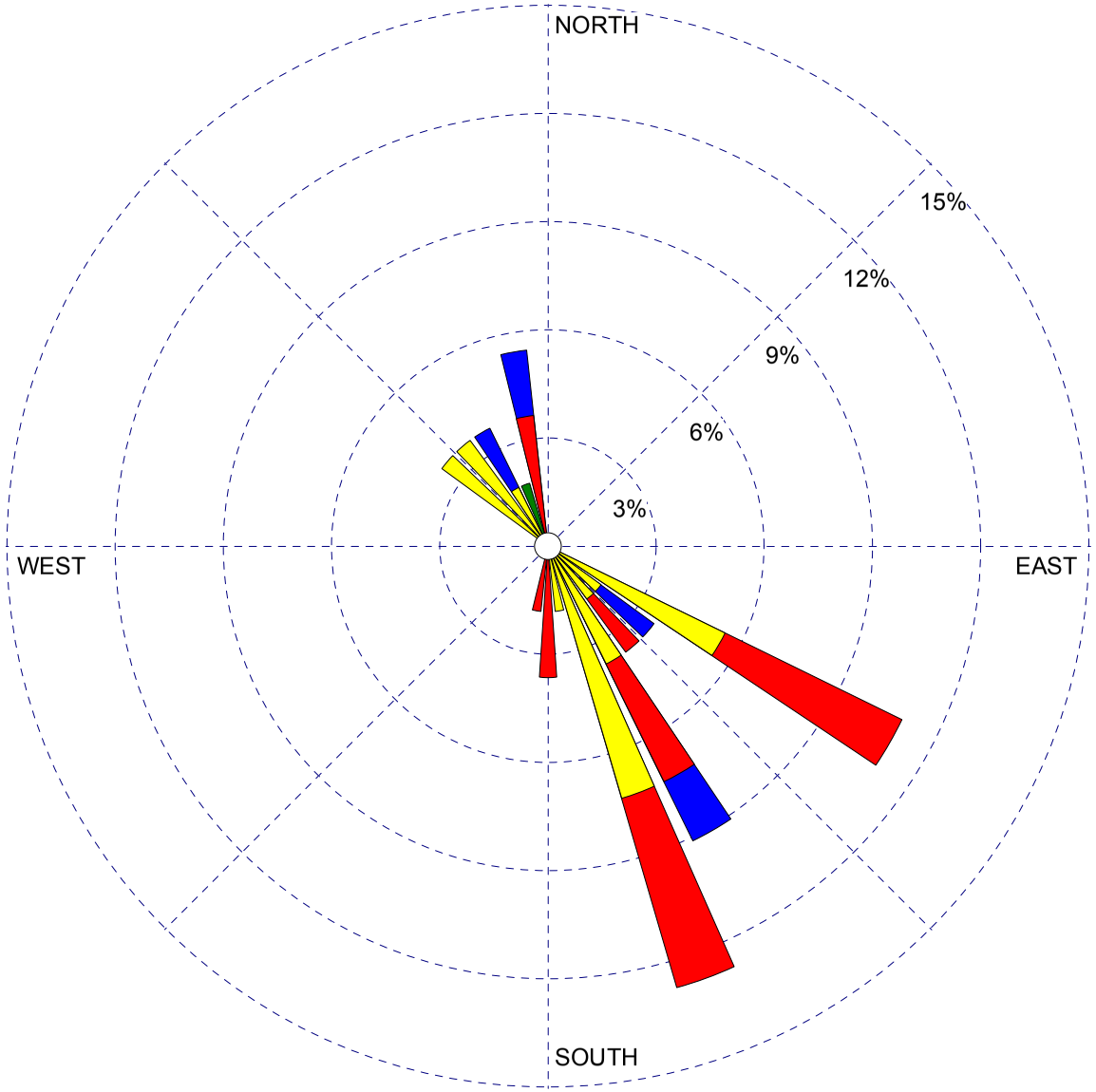
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Bent Creek
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KAVL
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
55 hrs.

CALM WINDS:
34.55%

AVG. WIND SPEED:
4.16 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

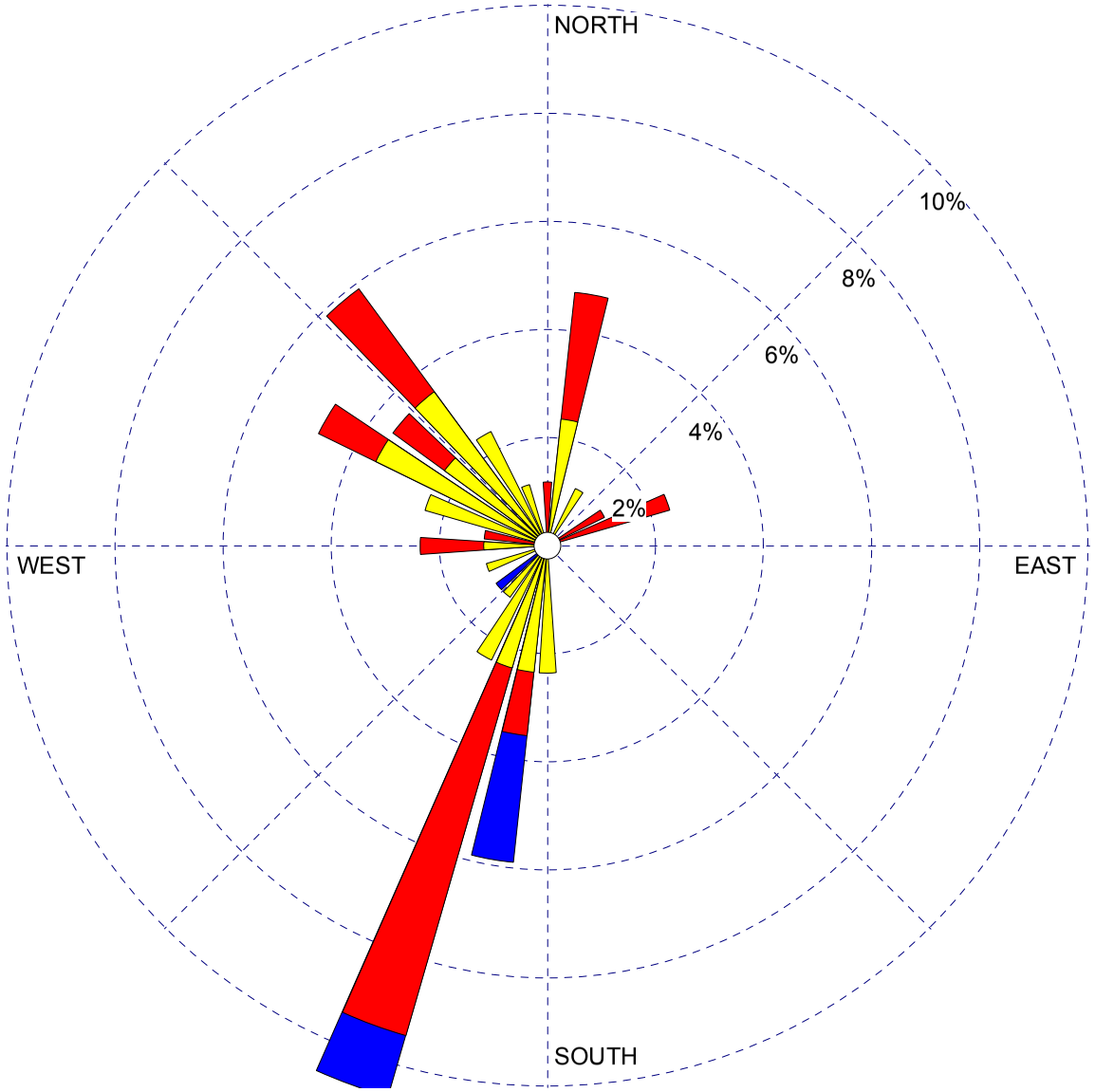
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Lenoir
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KHKY
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
85 hrs.

CALM WINDS:
41.18%

AVG. WIND SPEED:
3.32 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

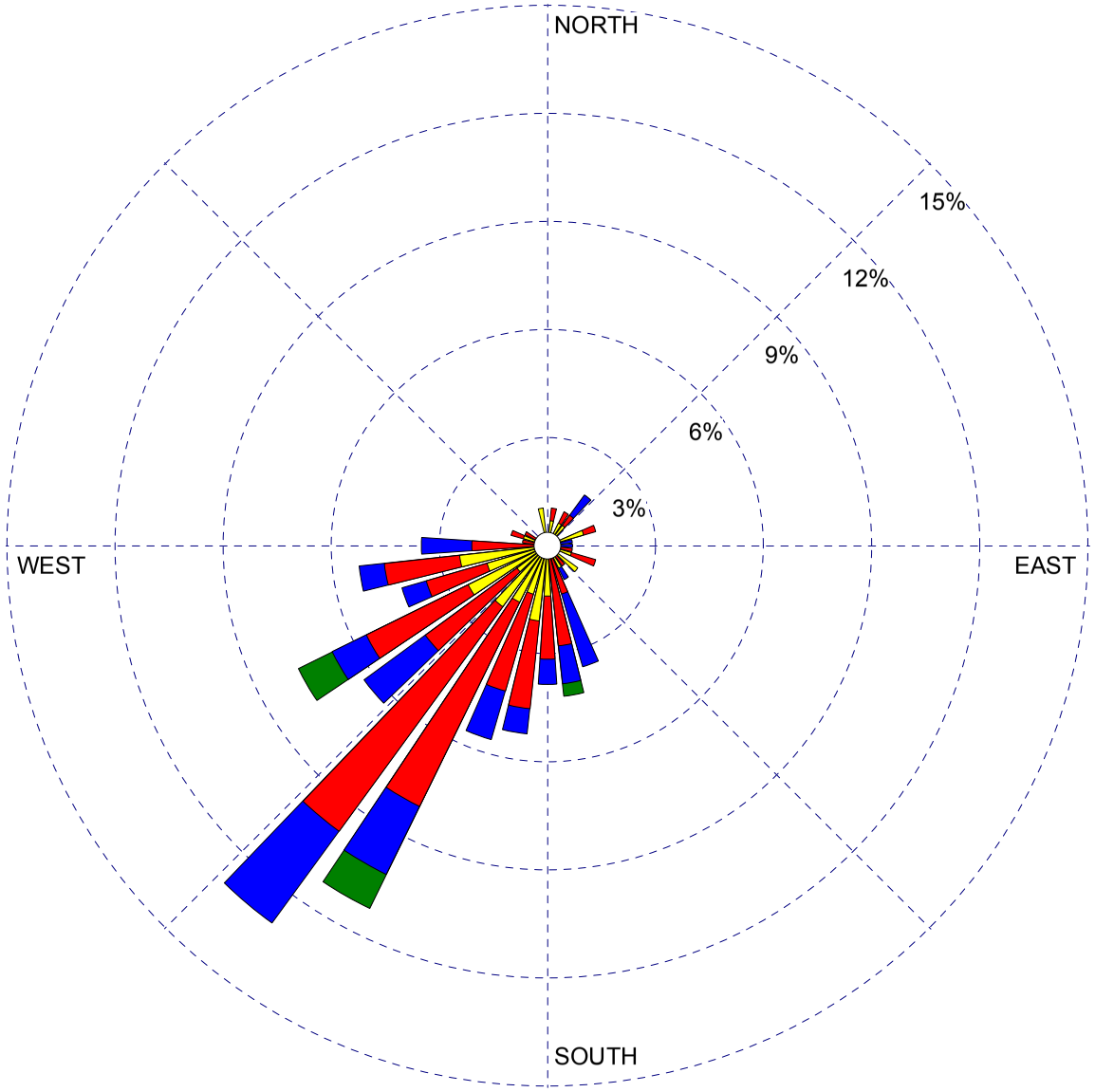
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Cherry Grove
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KGSO
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
286 hrs.

CALM WINDS:
8.39%

AVG. WIND SPEED:
6.36 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

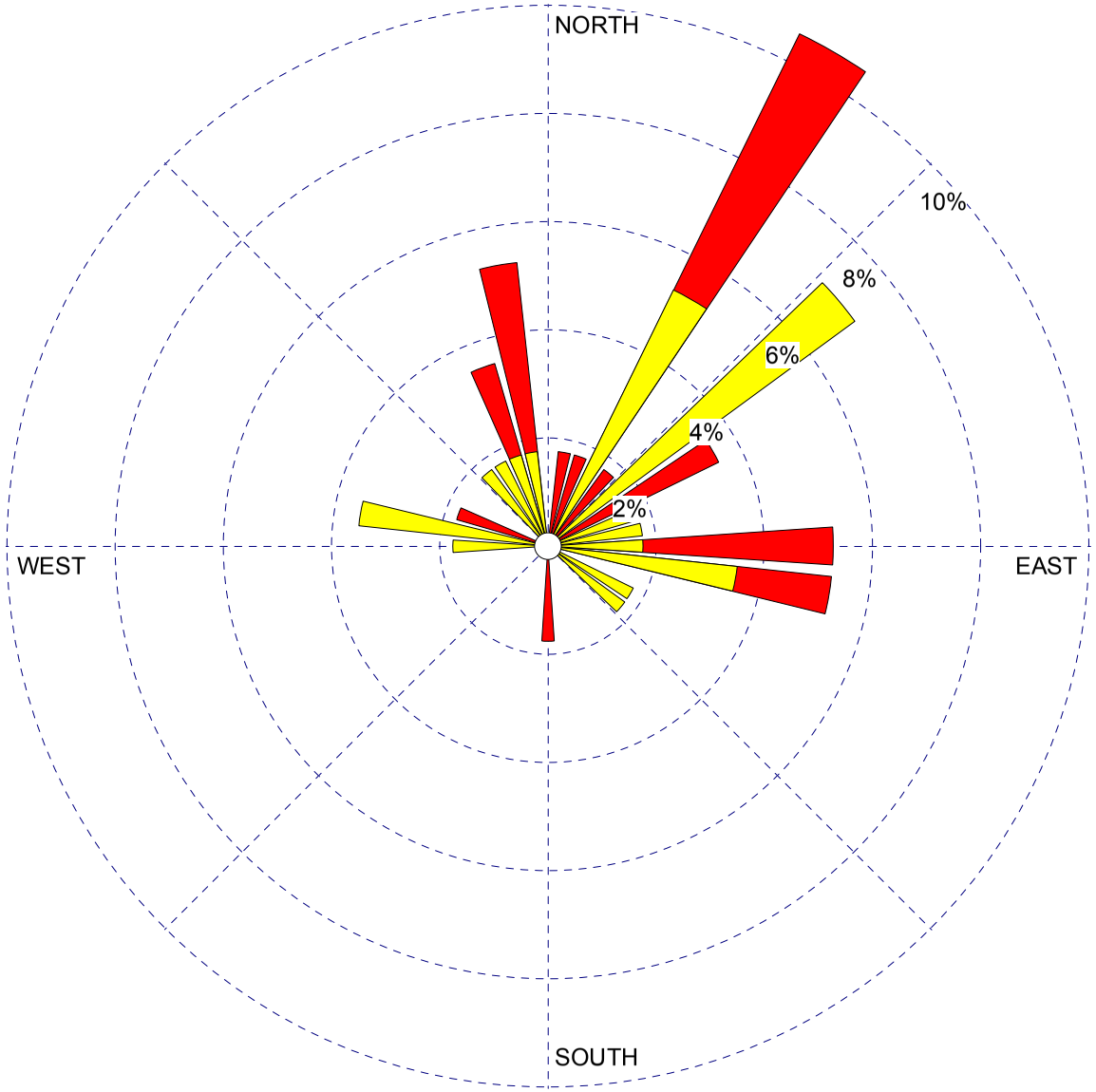
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Pittsboro
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KIGX
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
57 hrs.

CALM WINDS:
35.09%

AVG. WIND SPEED:
3.40 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

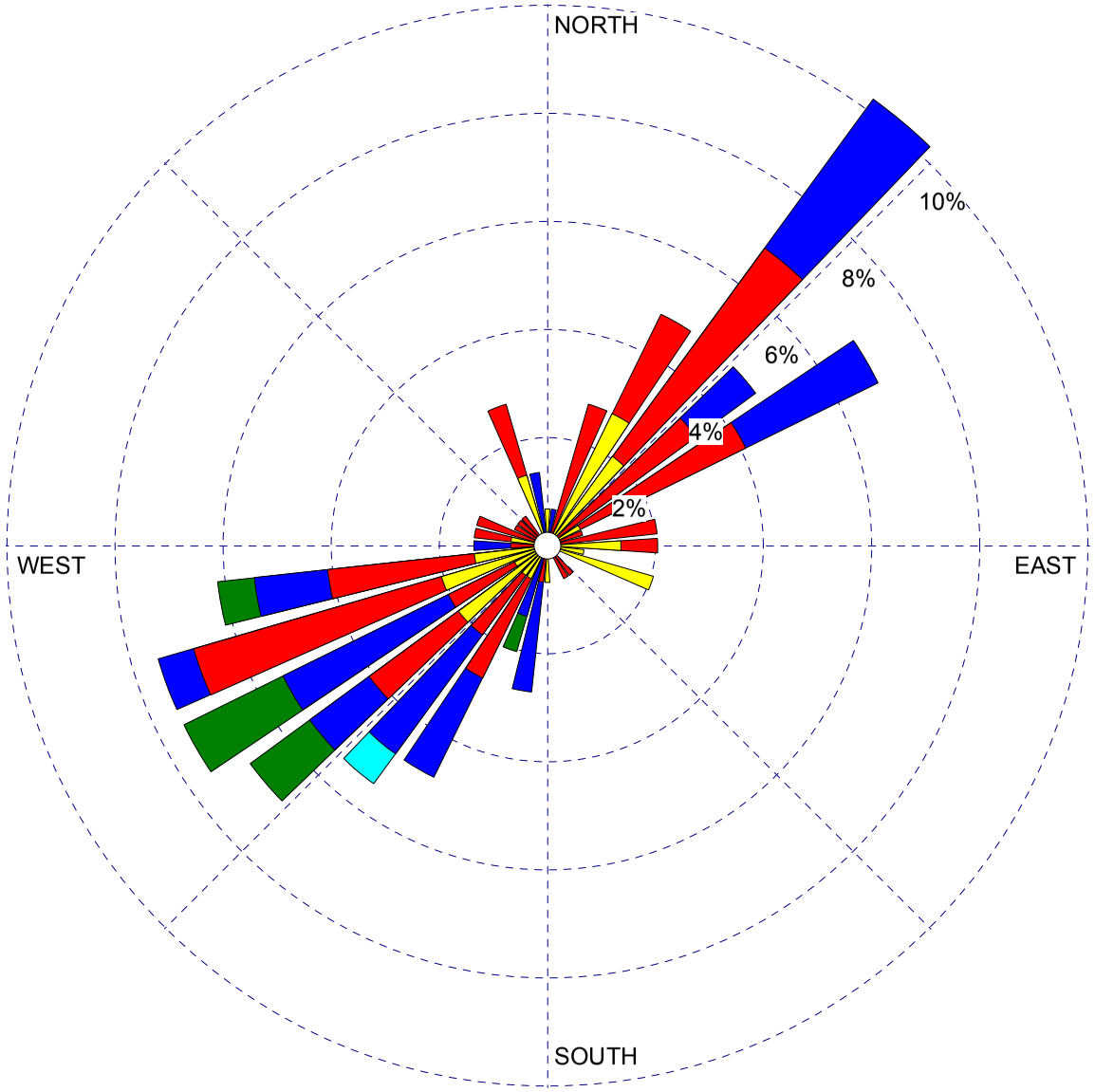
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Wade Ave
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KFAY
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
147 hrs.

CALM WINDS:
6.80%

AVG. WIND SPEED:
7.08 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

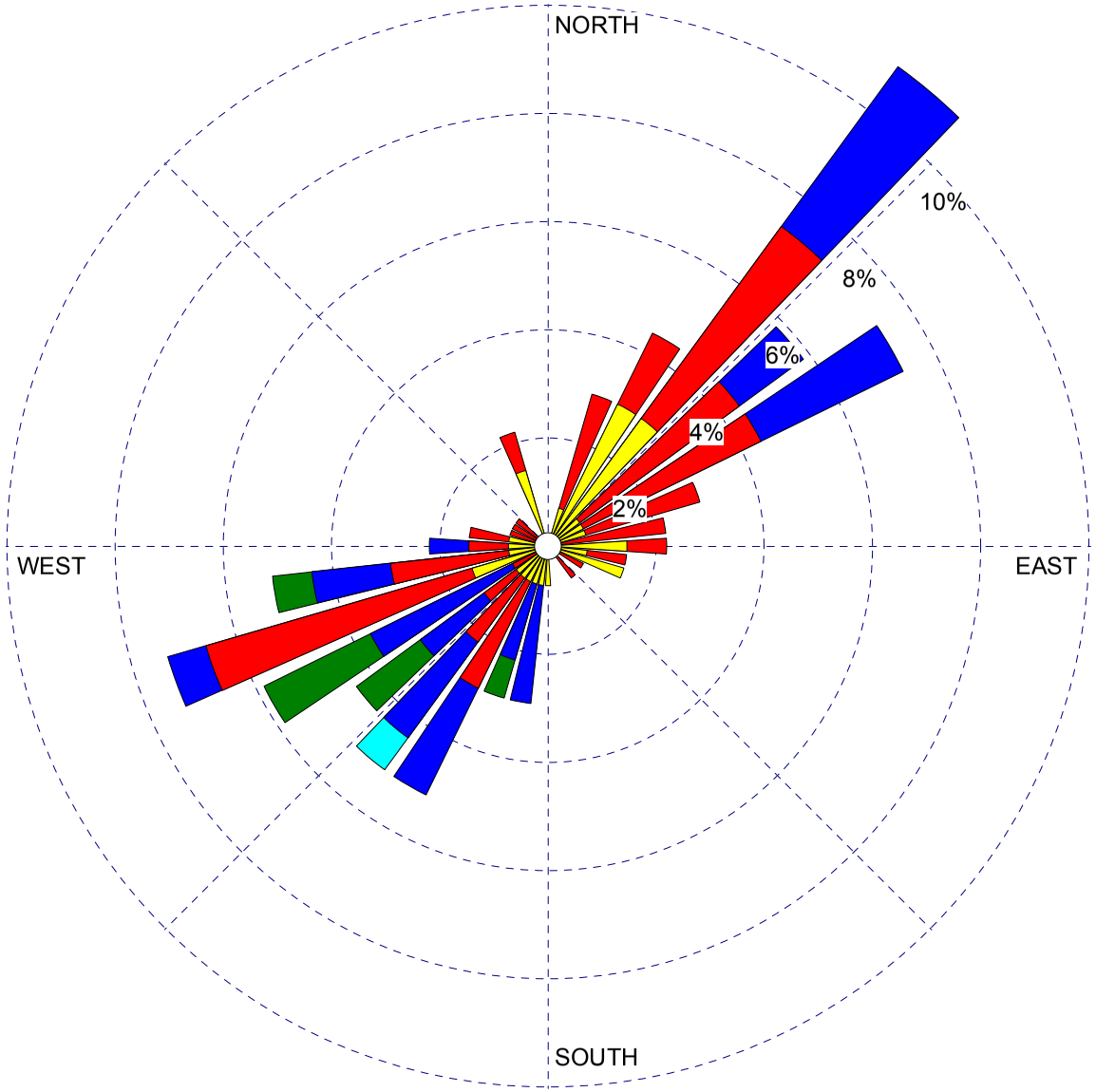
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Golfview
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KFAY
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
137 hrs.

CALM WINDS:
9.49%

AVG. WIND SPEED:
6.80 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

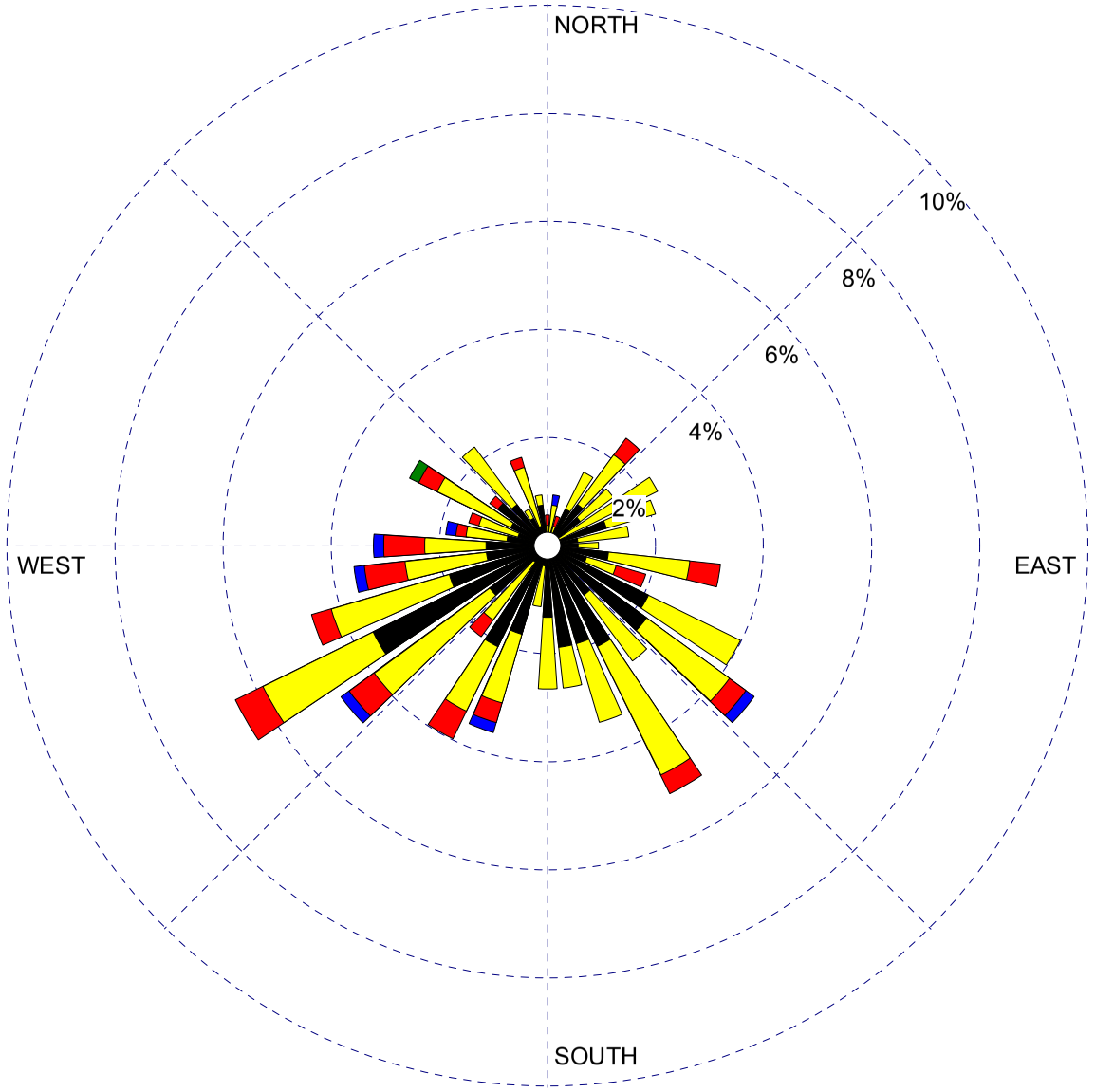
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Cooleeme
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:SALI
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT: **529 hrs.**

CALM WINDS: **8.88%**

AVG. WIND SPEED: **2.89 Knots**

COMPANY NAME: **NCDENR**

MODELER: **NCW**

DATE: **10/17/2008**

PROJECT NO.:

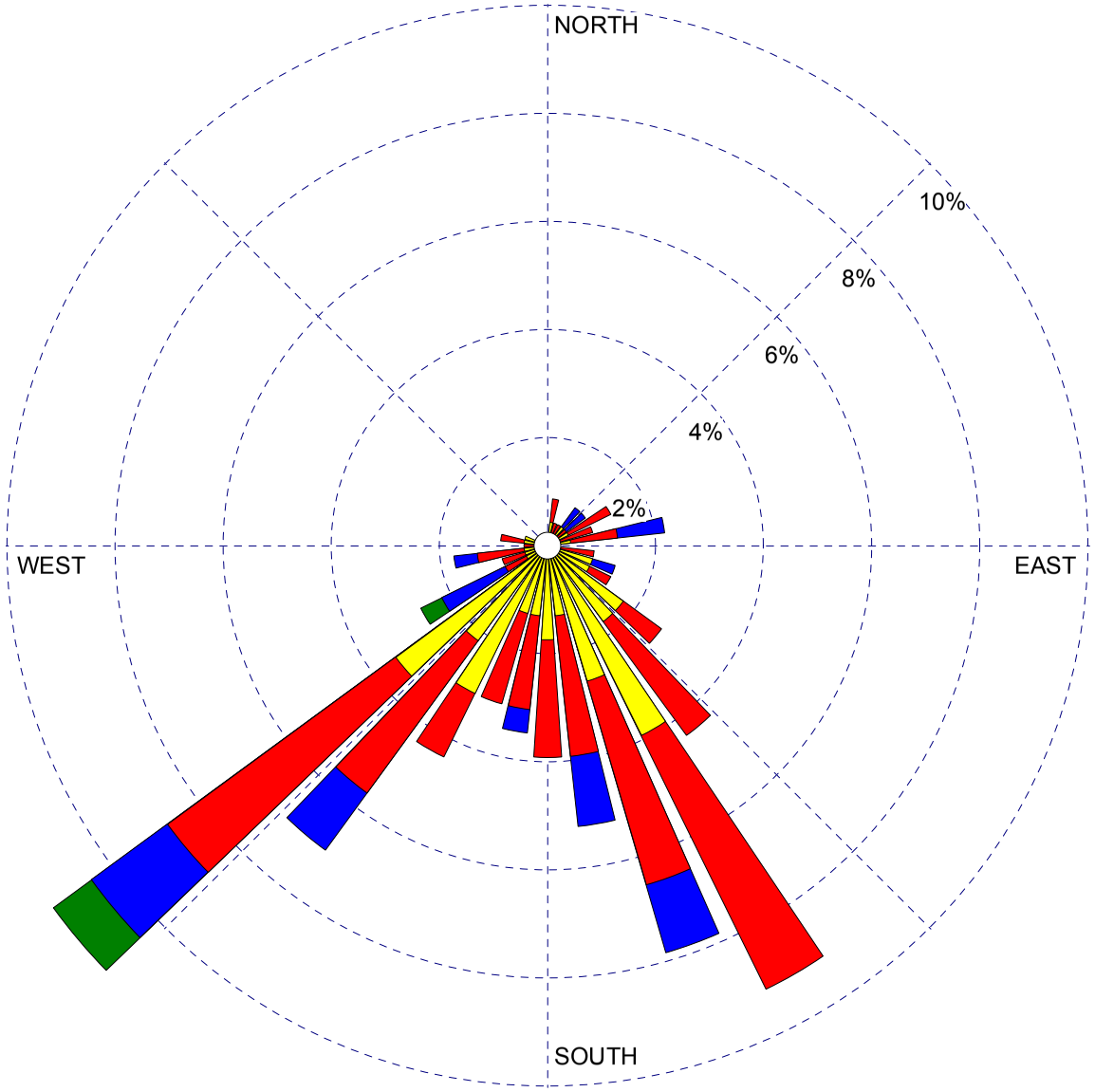
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Duke St / Durham Armory
Ozone >=76 ppb

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Met Station:KRDU
600-1900 EST
No Variable winds

DATA PERIOD:

2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
230 hrs.	**19.57%**

AVG. WIND SPEED:

5.12 Knots

COMPANY NAME:

NCDENR

MODELER:

NCW

DATE:

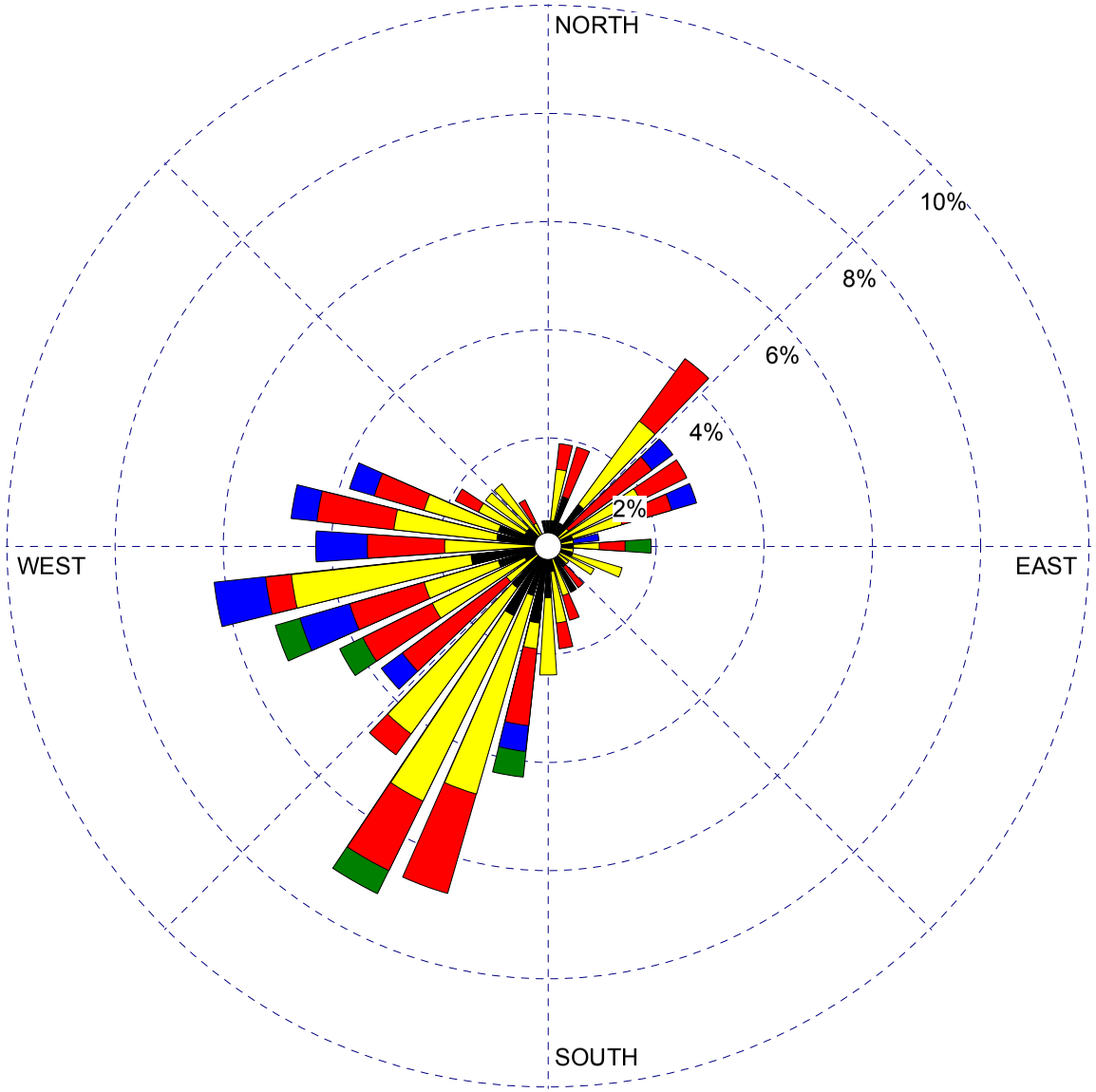
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Leggett
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:ROCK
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
210 hrs.

CALM WINDS:
7.14%

AVG. WIND SPEED:
4.60 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

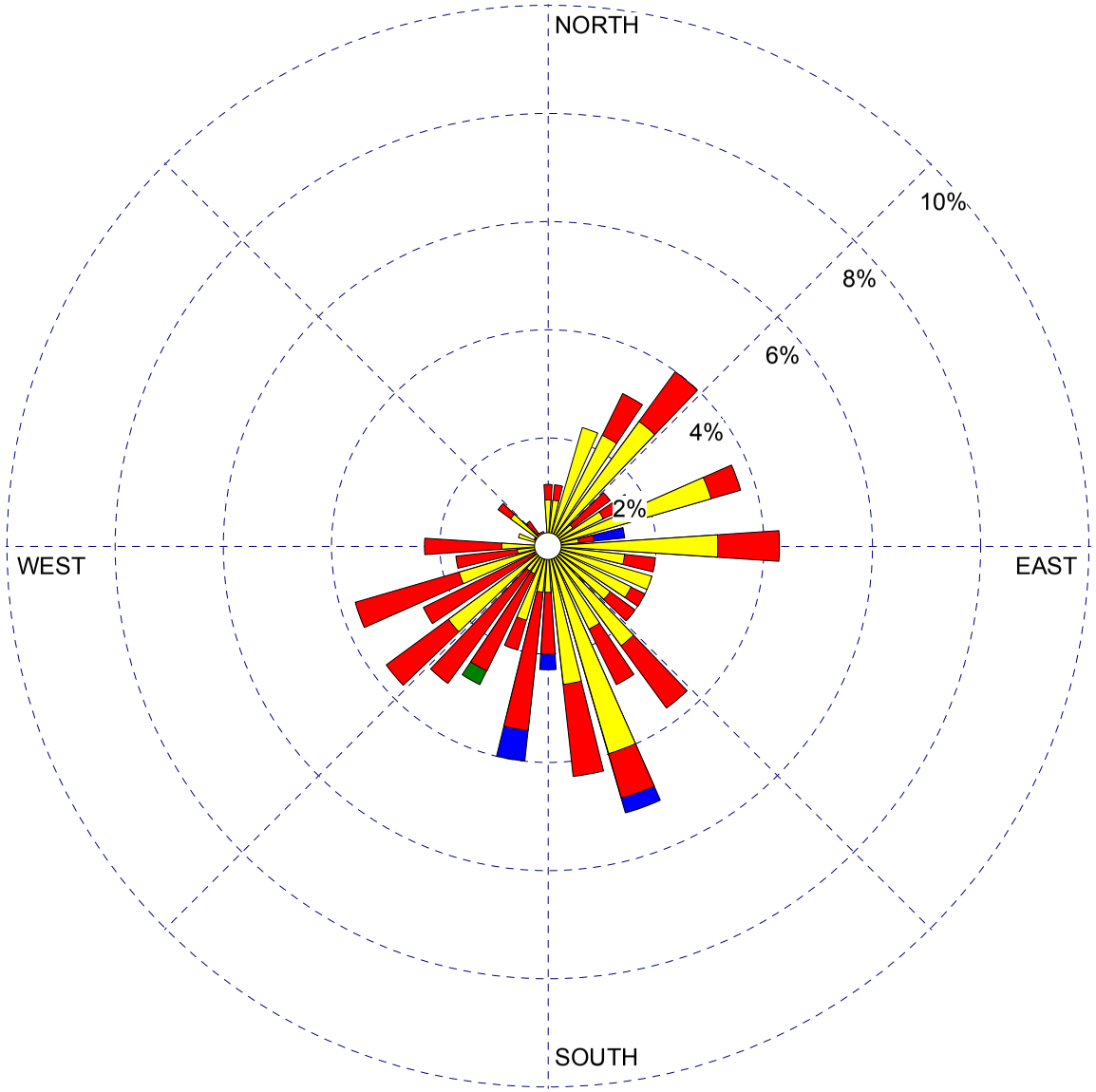
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Hattie Ave
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:Kint
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
351 hrs.

CALM WINDS:
20.51%

AVG. WIND SPEED:
4.23 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

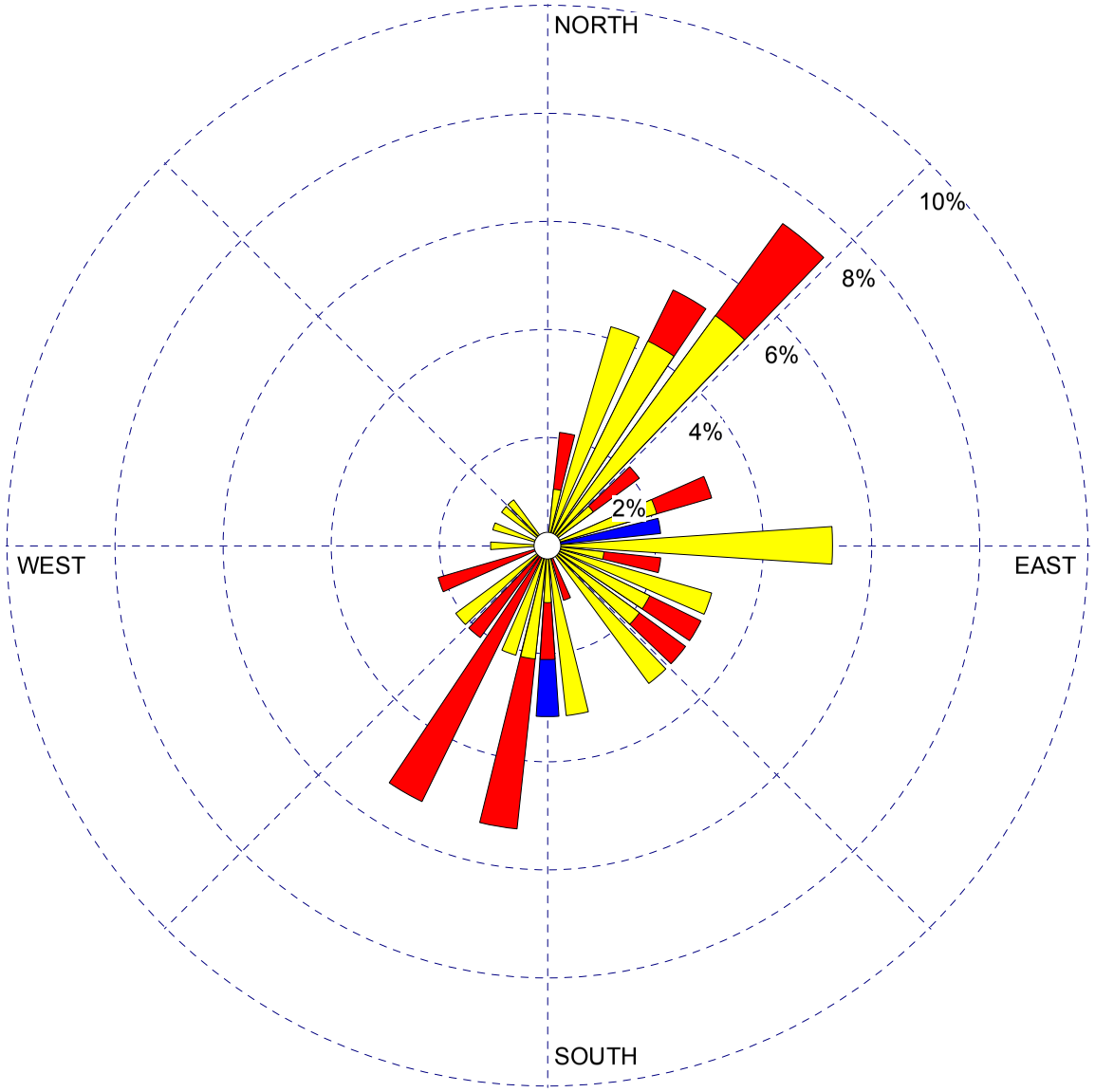
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Shiloh Church
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:Kint
600-1900 EST
No Variable winds
No 2006 data

DATA PERIOD:
2007-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
95 hrs.

CALM WINDS:
23.16%

AVG. WIND SPEED:
3.99 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

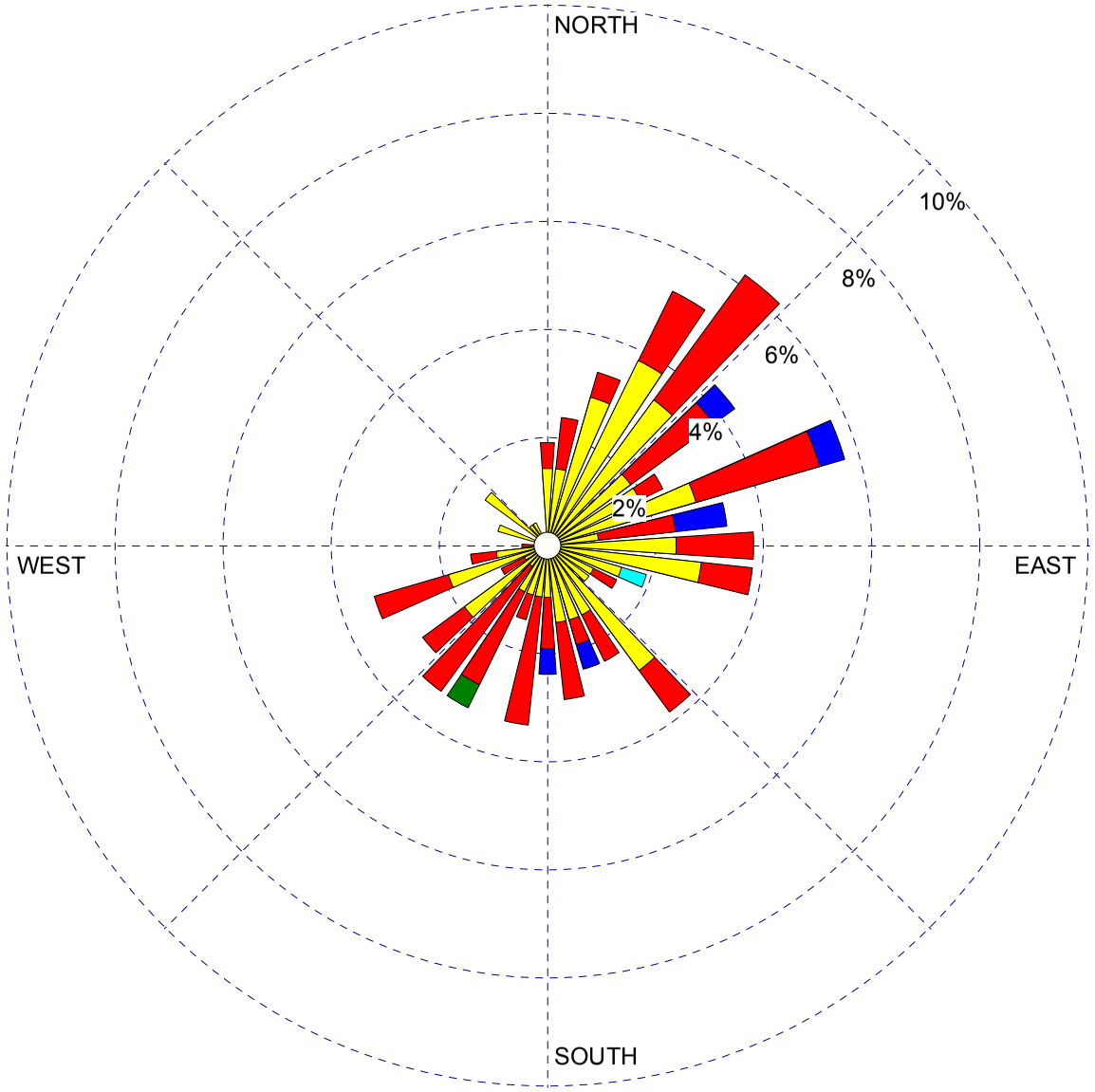
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Clemmons Middle
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KINT
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
210 hrs.

CALM WINDS:
15.71%

AVG. WIND SPEED:
4.69 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

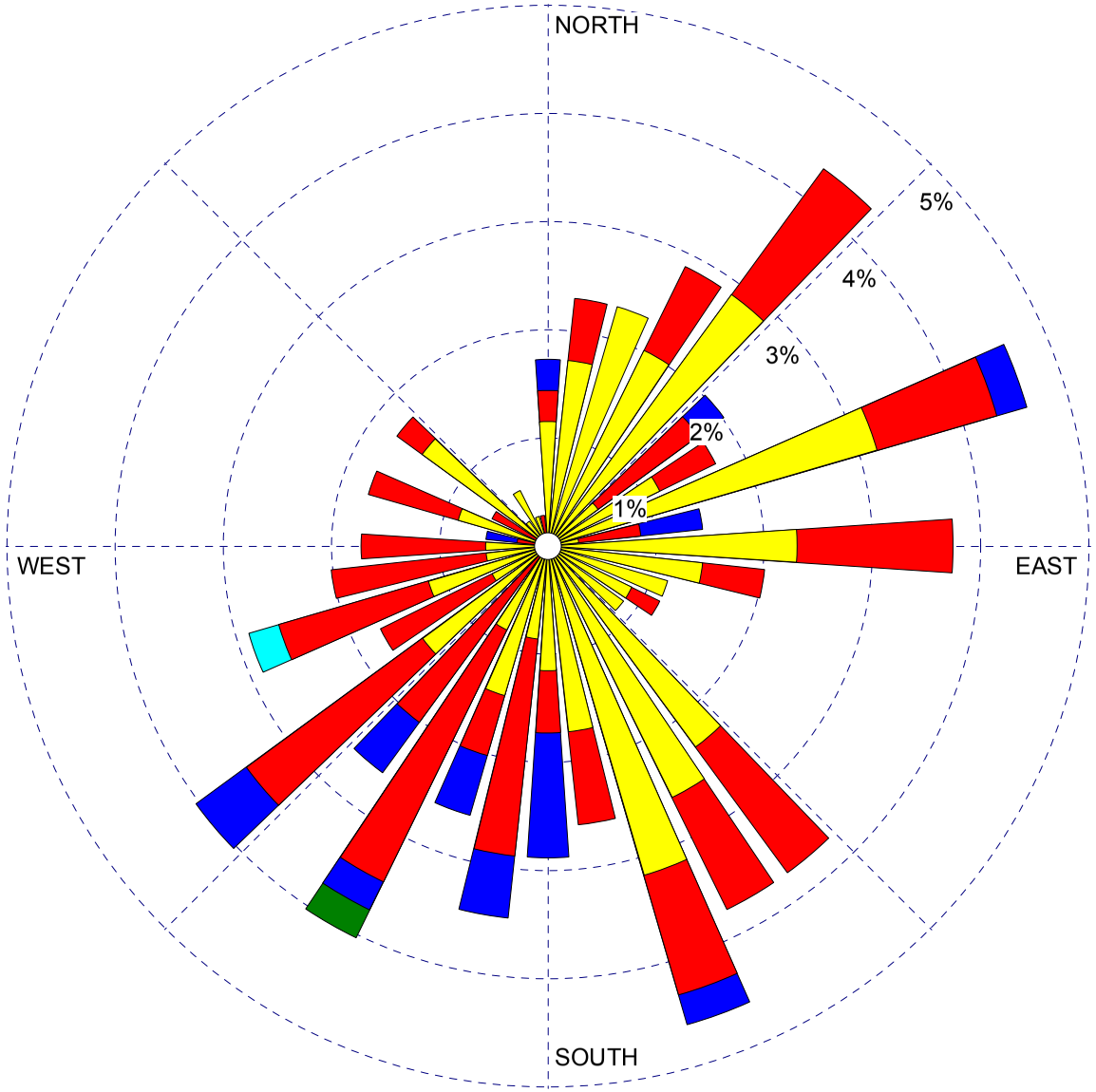
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Union Cross
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KINT
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
348 hrs.

CALM WINDS:
19.25%

AVG. WIND SPEED:
4.58 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

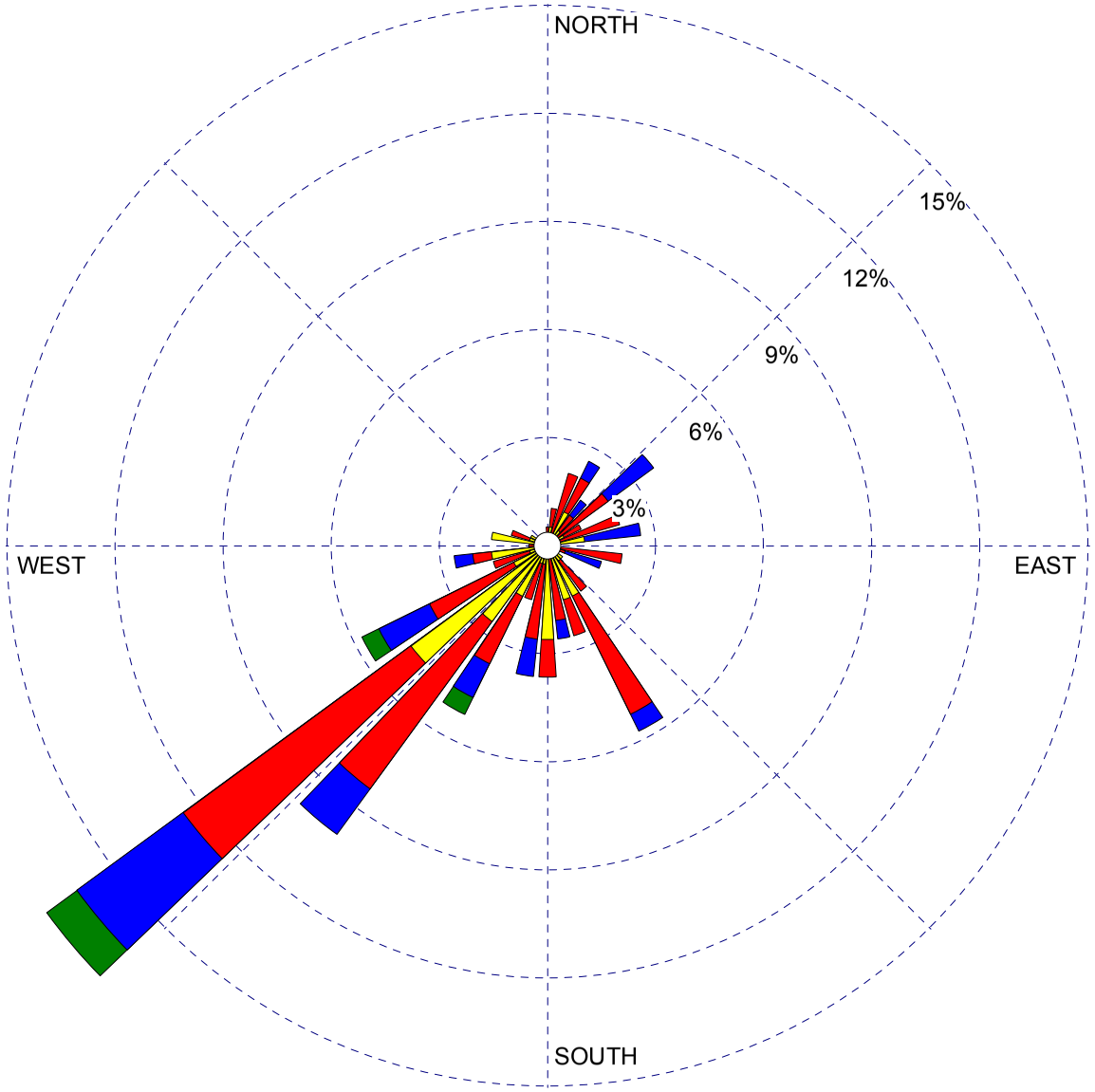
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Franklinton
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KRDU
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
192 hrs.	**11.46%**

AVG. WIND SPEED:
6.02 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

DATE:
10/20/2008

PROJECT NO.:

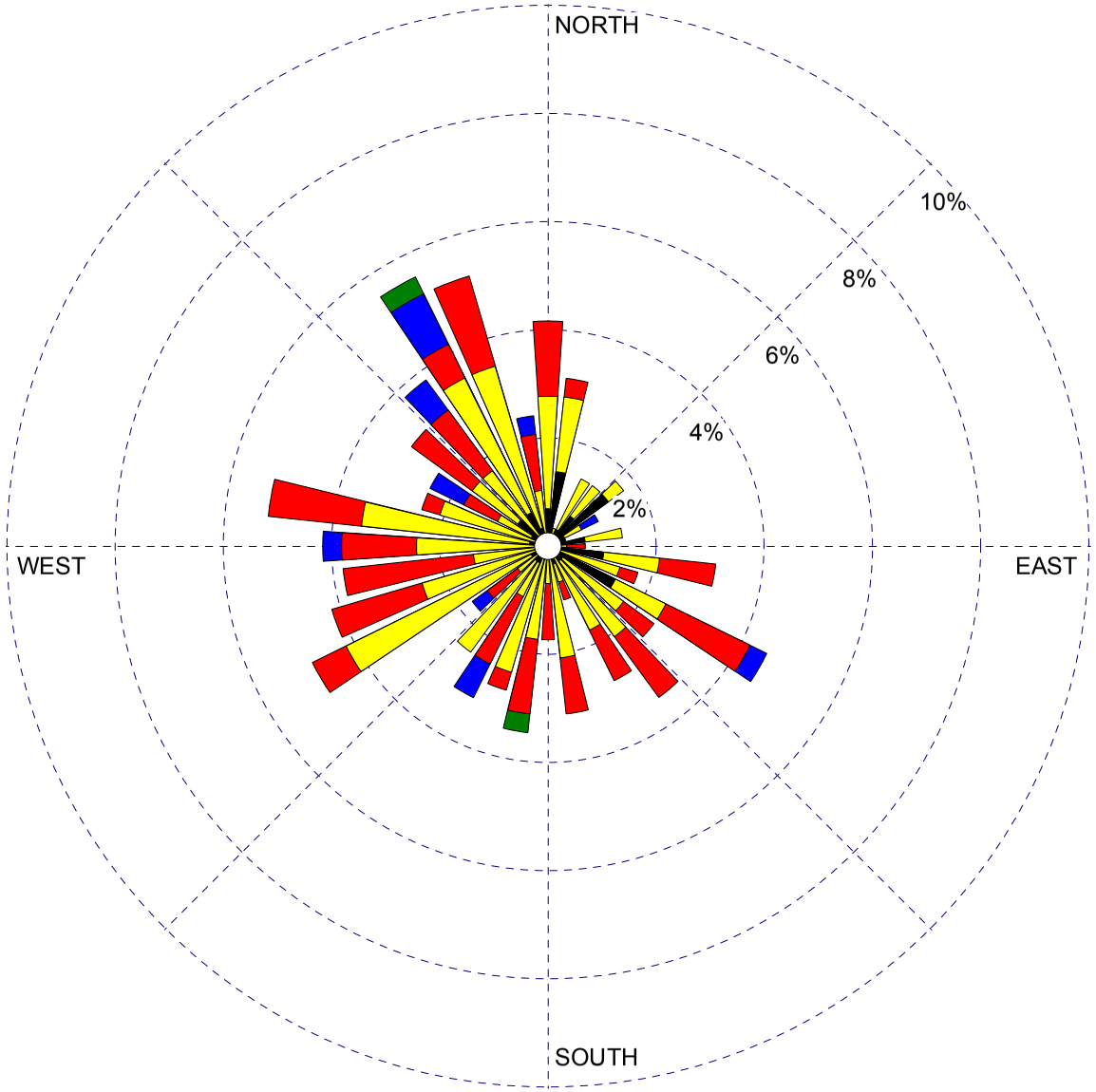
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Joanna Bald
Ozone >=76 ppb

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Met Station:WINE
1600-0800 EST
No Variable winds

DATA PERIOD:

2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
289 hrs.	**0.00%**

AVG. WIND SPEED:

4.96 Knots

COMPANY NAME:

NCDENR

MODELER:

NCW

DATE:

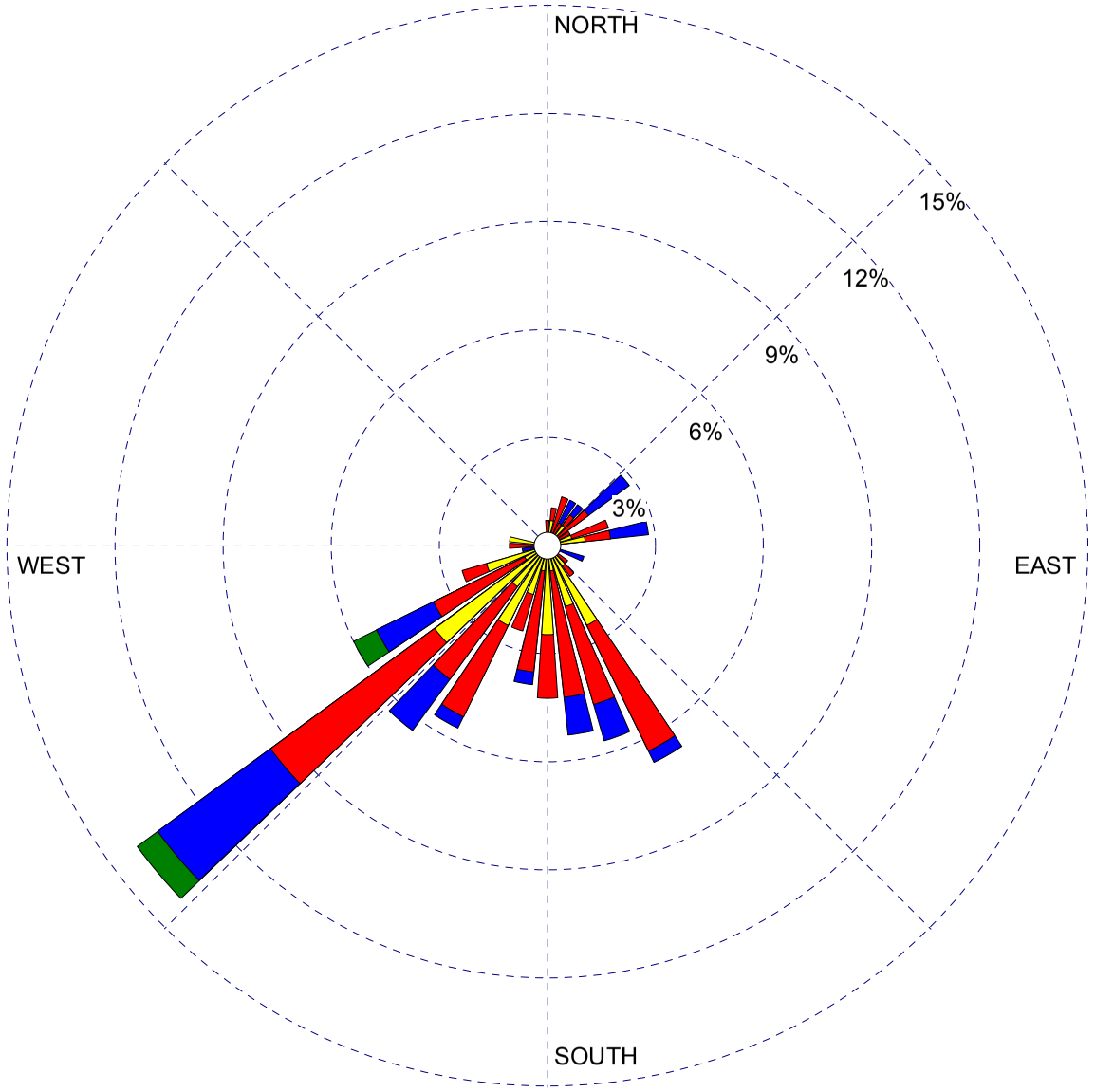
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Butner
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KRDU
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
284 hrs.

CALM WINDS:
16.20%

AVG. WIND SPEED:
5.57 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

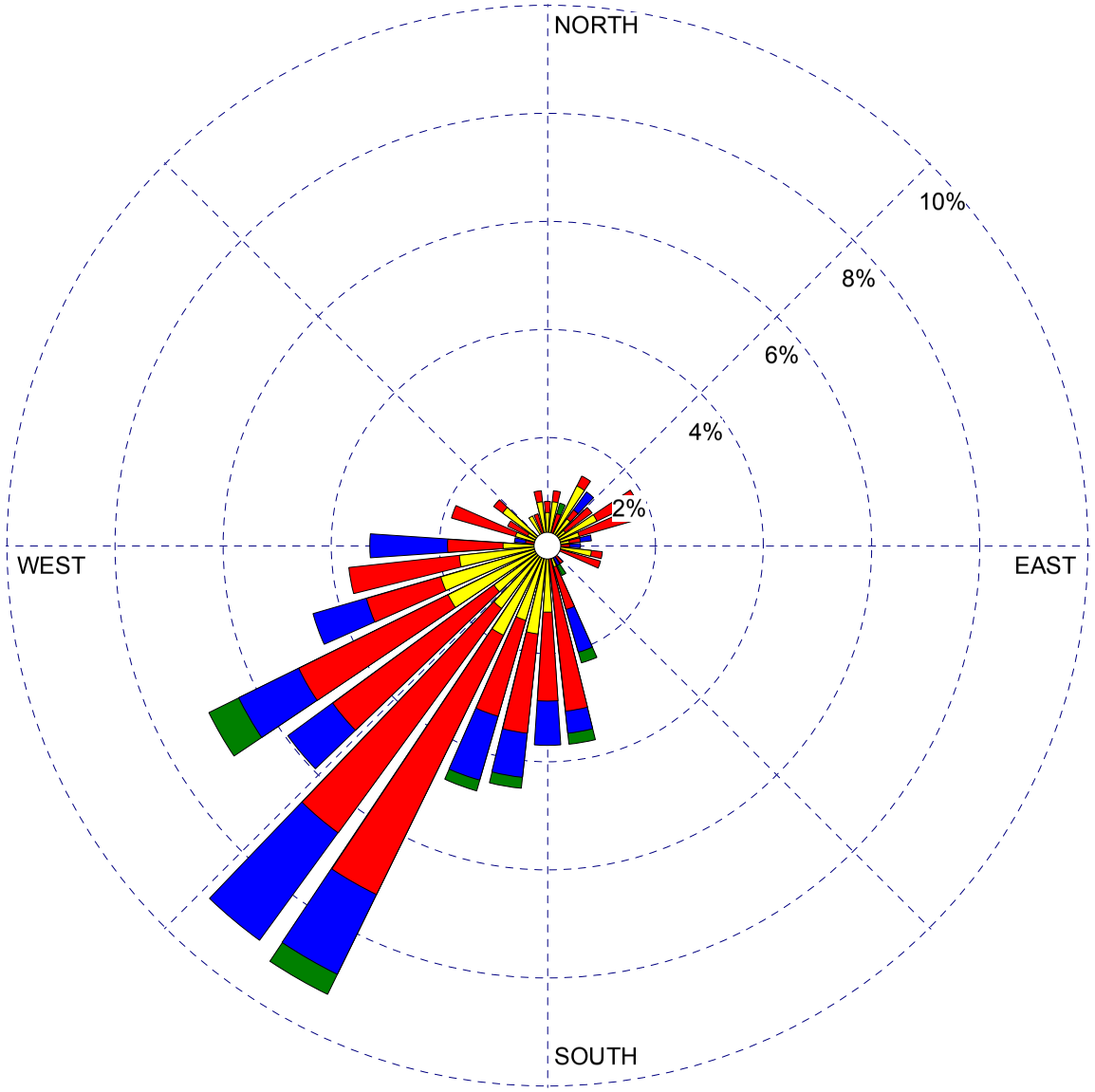
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Mendenhall
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KGSO
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT: **488 hrs.**

CALM WINDS: **16.80%**

AVG. WIND SPEED:
5.57 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

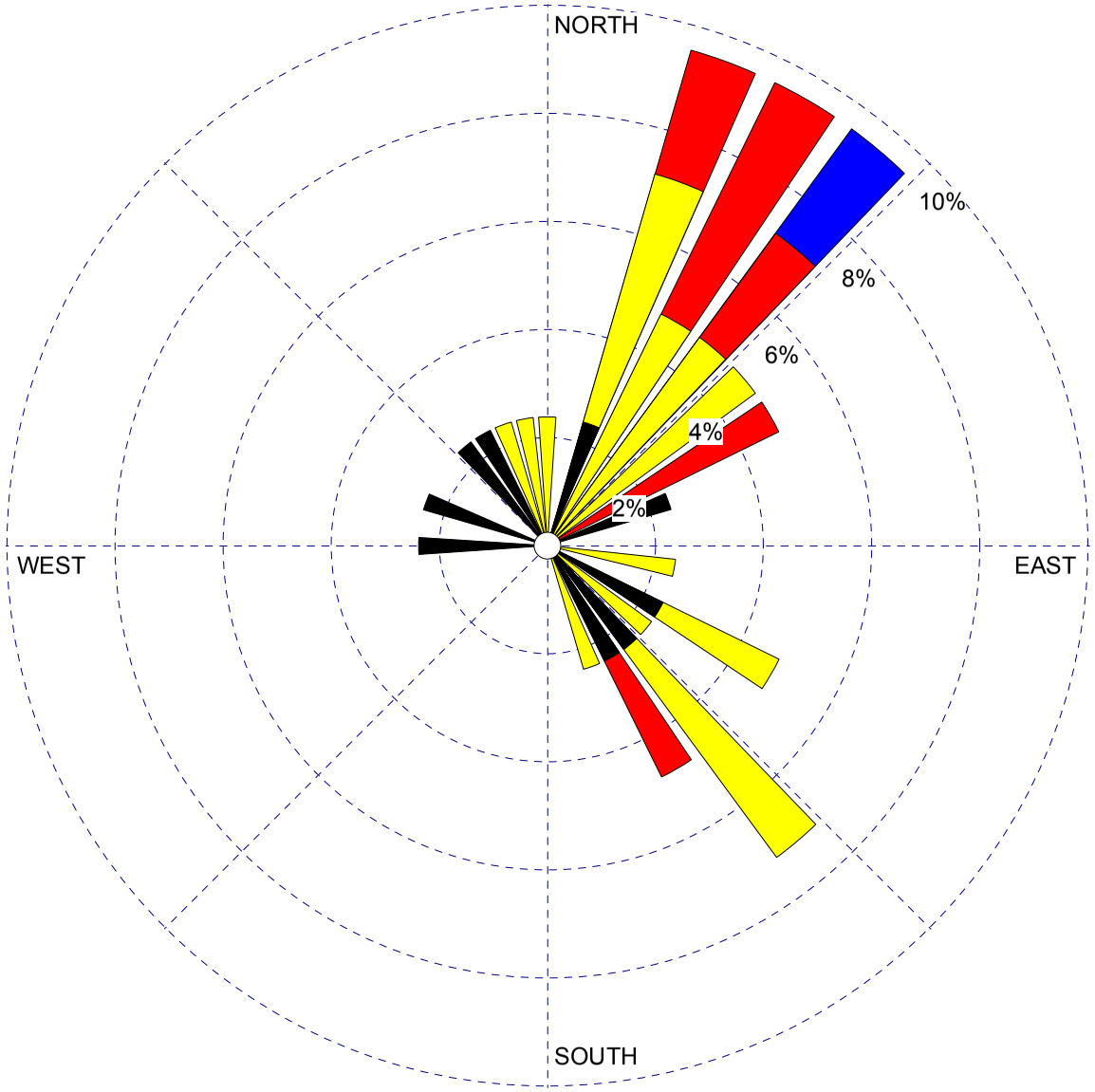
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Waynesville
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:WAYN
600-1900 EST
No Variable winds

DATA PERIOD:
2007-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
42 hrs.	**19.05%**

AVG. WIND SPEED:
3.29 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

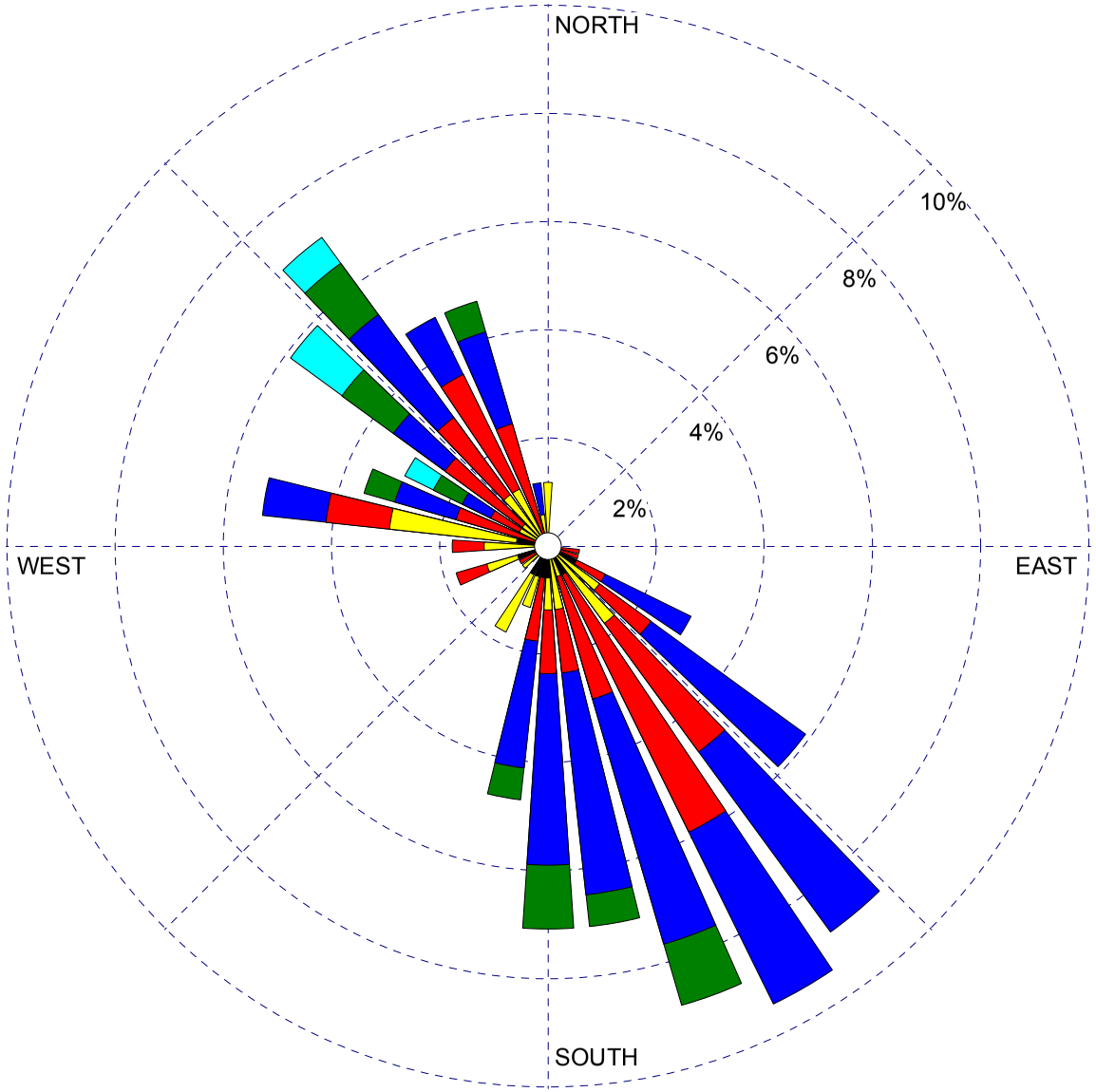
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Frying Pan
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:FRYI
1600-0800 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
170 hrs.

CALM WINDS:
0.00%

AVG. WIND SPEED:
7.97 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

DATE:
10/20/2008

PROJECT NO.:

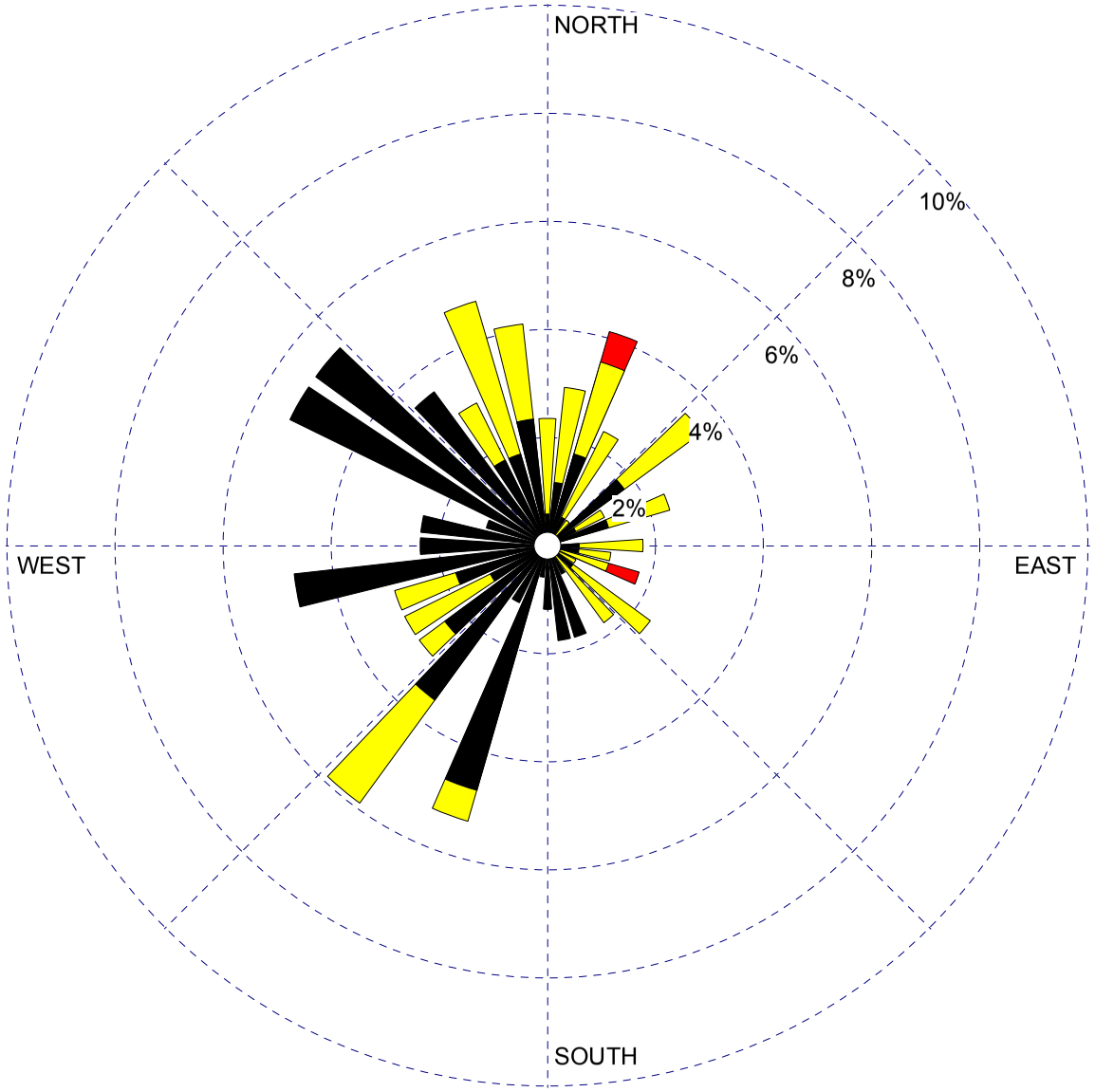
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Purchase Knob
Ozone >=76 ppb

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Met Station:Purchase Knob
(NOAA ATDD)
1600-0800 EST
No Variable winds

DATA PERIOD:

2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
170 hrs.	**7.65%**

AVG. WIND SPEED:

2.08 Knots

COMPANY NAME:

NCDENR

MODELER:

NCW

DATE:

10/29/2008

PROJECT NO.:

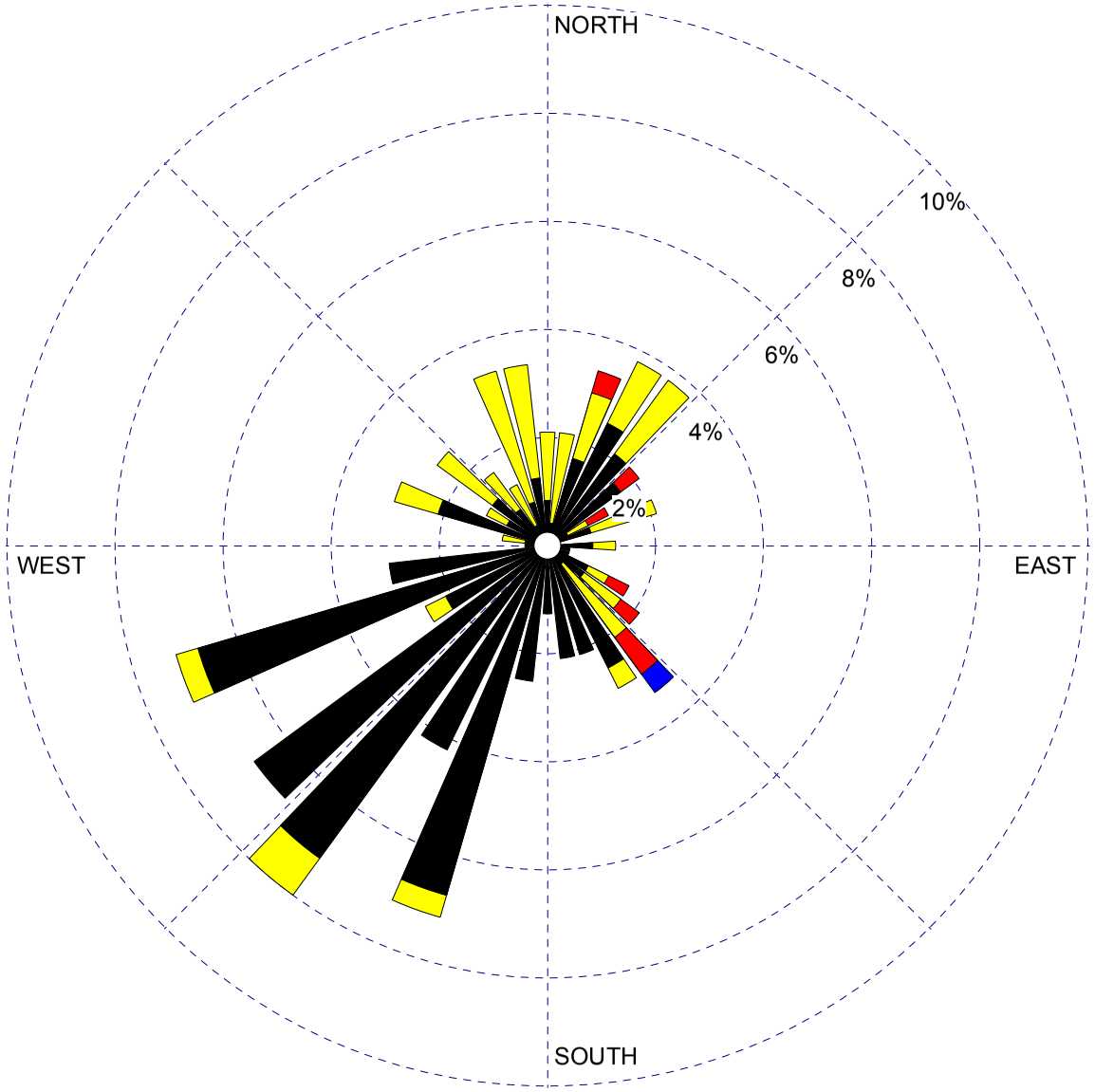
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Barnet Knob
Ozone >=76 ppb

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Met Station:Purchase Knob
(NOAA ATDD)
1600-0800 EST
No Variable winds

DATA PERIOD:

2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
238 hrs.	**2.94%**

AVG. WIND SPEED:

2.12 Knots

COMPANY NAME:

NCDENR

MODELER:

NCW

DATE:

10/29/2008

PROJECT NO.:

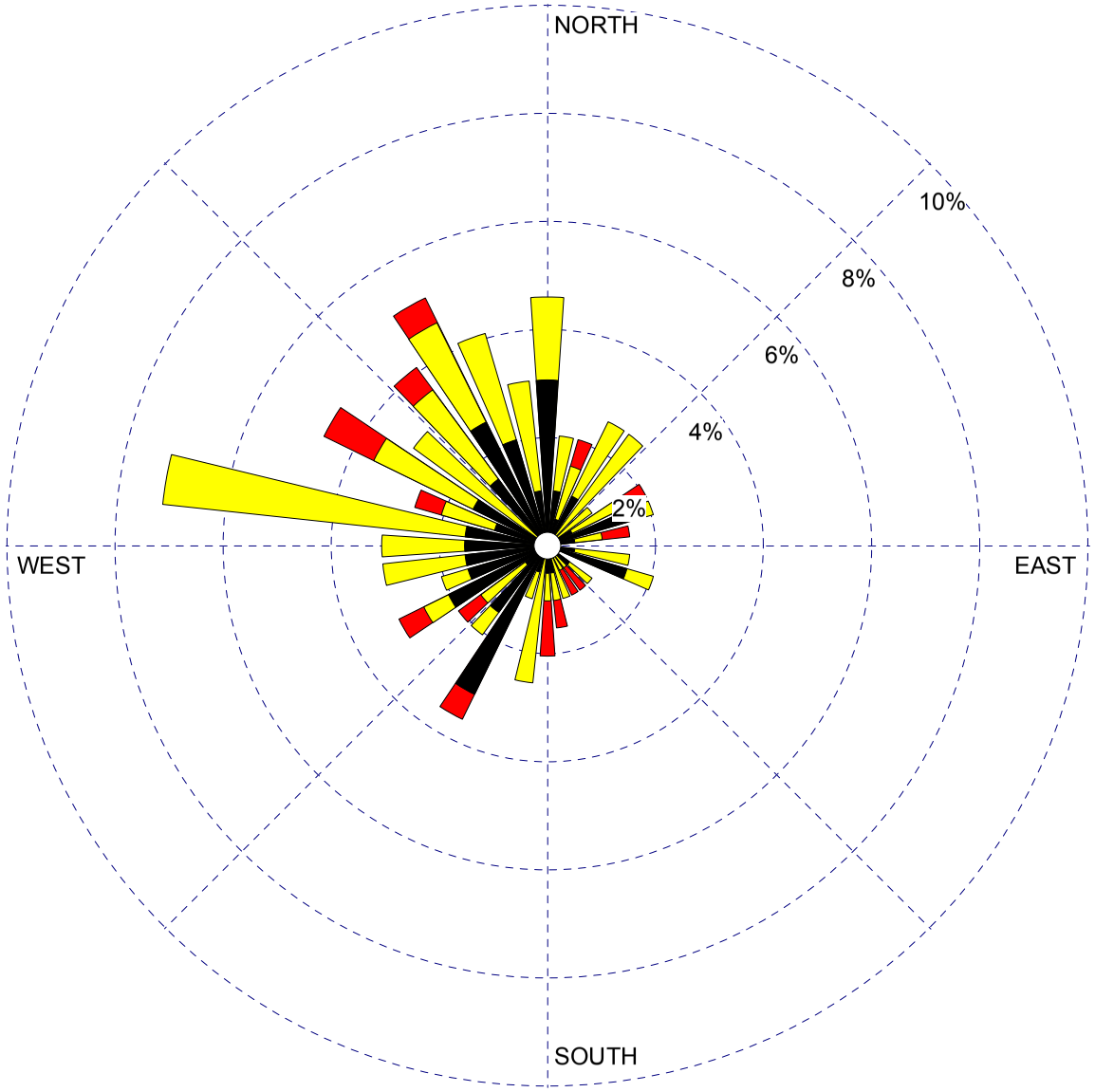
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Johnston County
Ozone >=76 ppb

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Met Station:CLA2
600-1900 EST
No Variable winds

DATA PERIOD:

2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
196 hrs.	**12.24%**

AVG. WIND SPEED:

2.72 Knots

COMPANY NAME:

NCDENR

MODELER:

NCW

DATE:

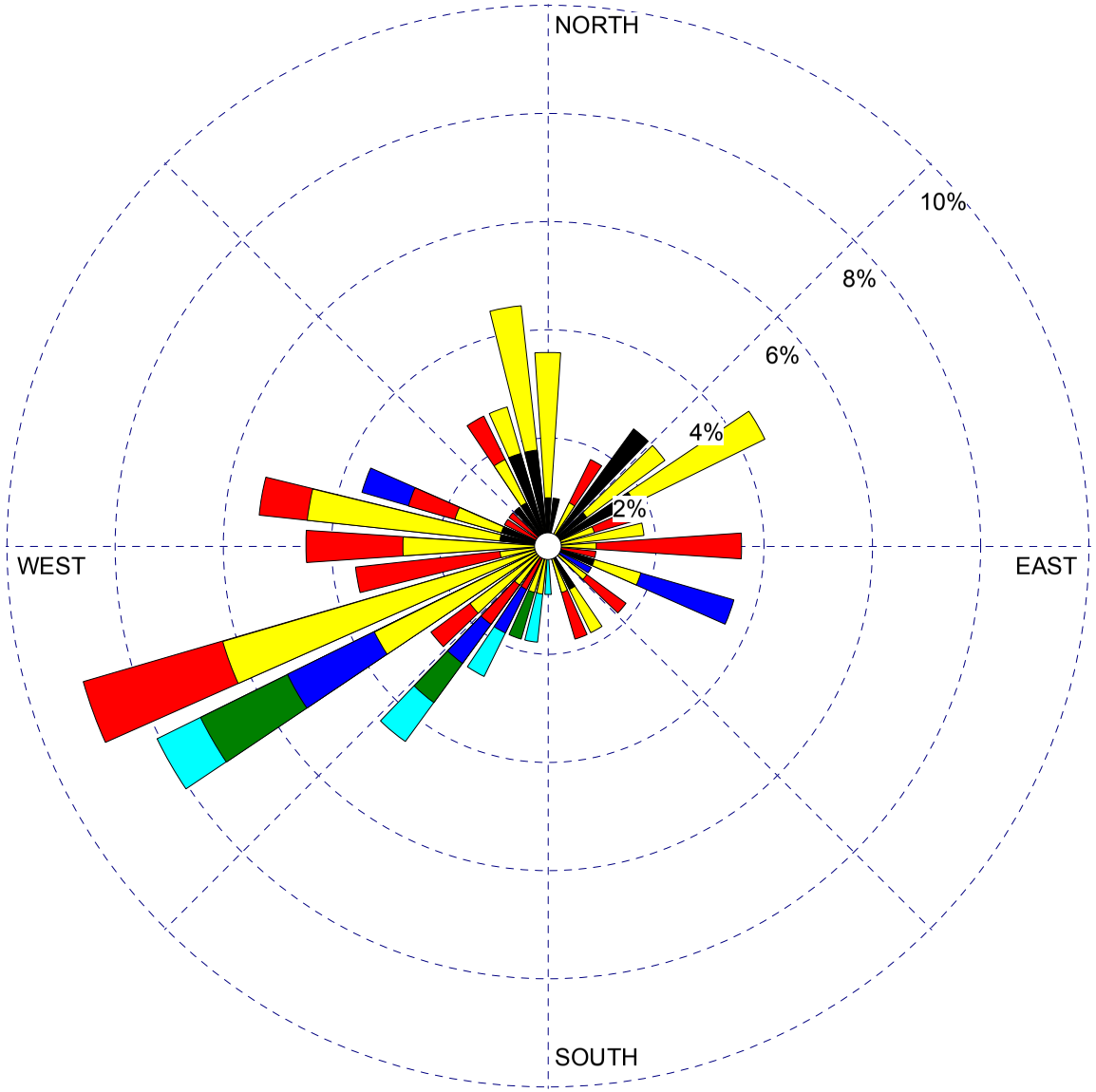
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
LENOIRCOLL
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KINS
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
112 hrs.

CALM WINDS:
5.36%

AVG. WIND SPEED:
5.19 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

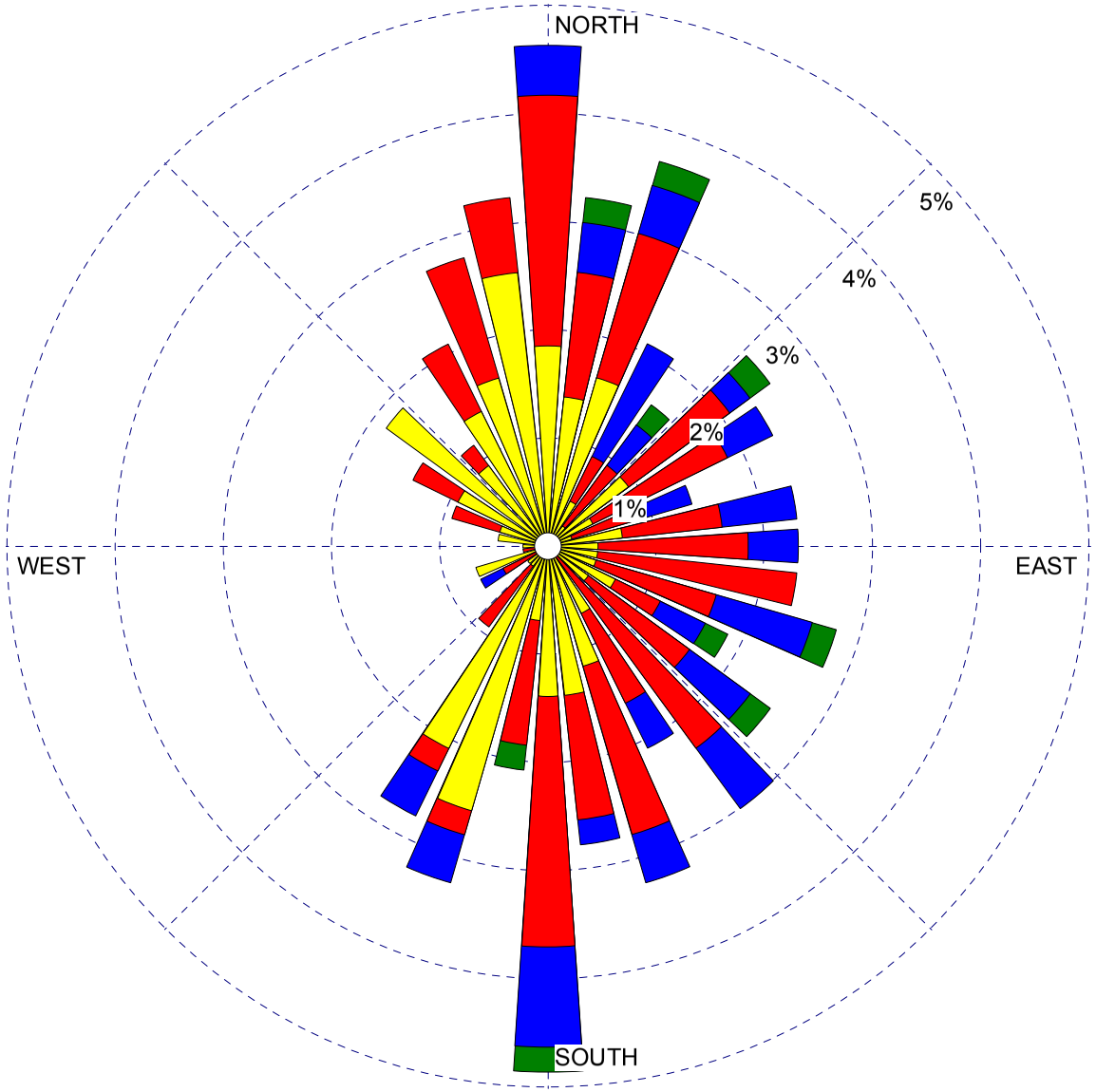
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Crouse
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KCLT
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
433 hrs.

CALM WINDS:
23.56%

AVG. WIND SPEED:
4.84 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

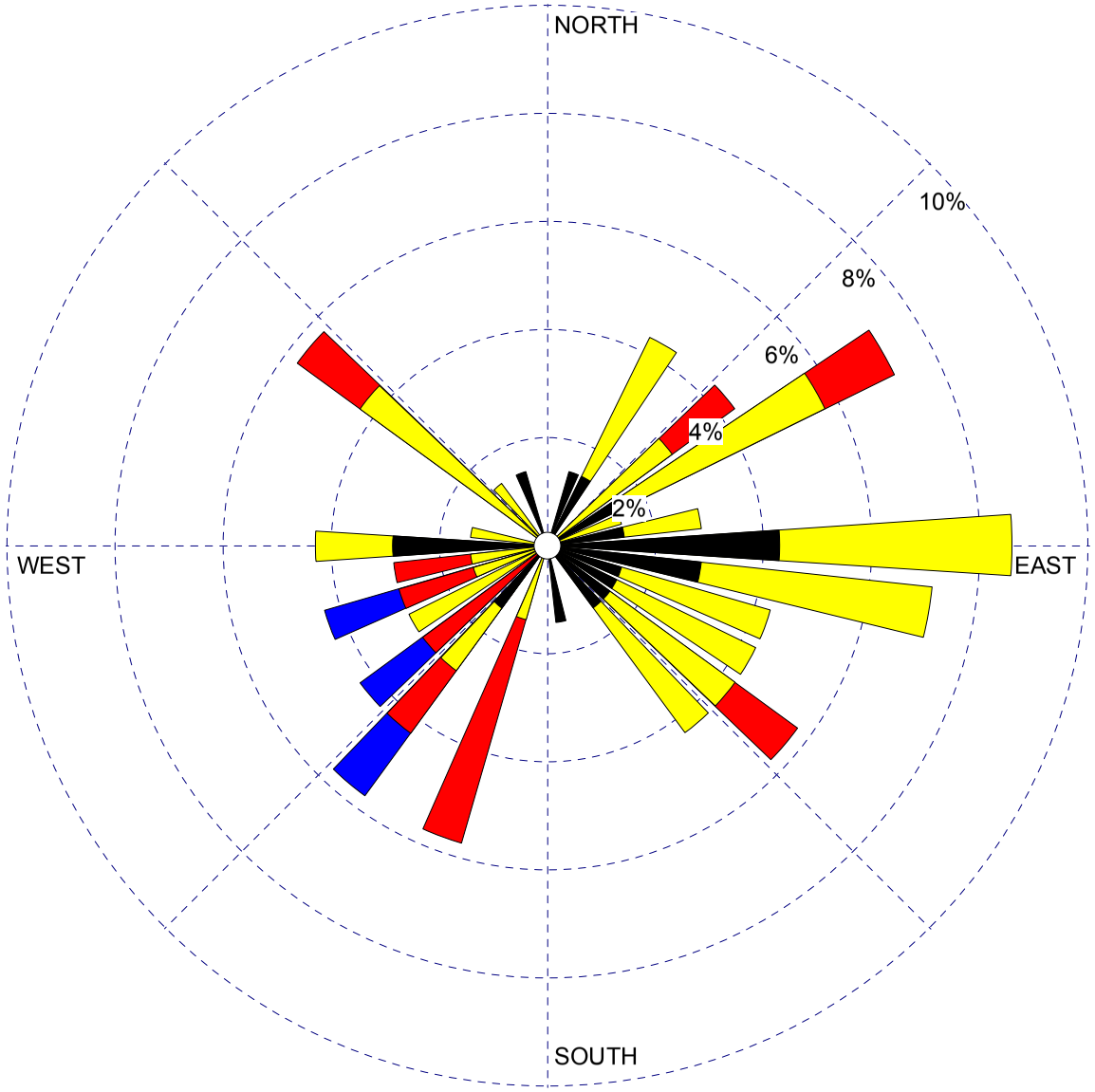
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Jamesville
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:WILL
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
70 hrs.

CALM WINDS:
2.86%

AVG. WIND SPEED:
3.96 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

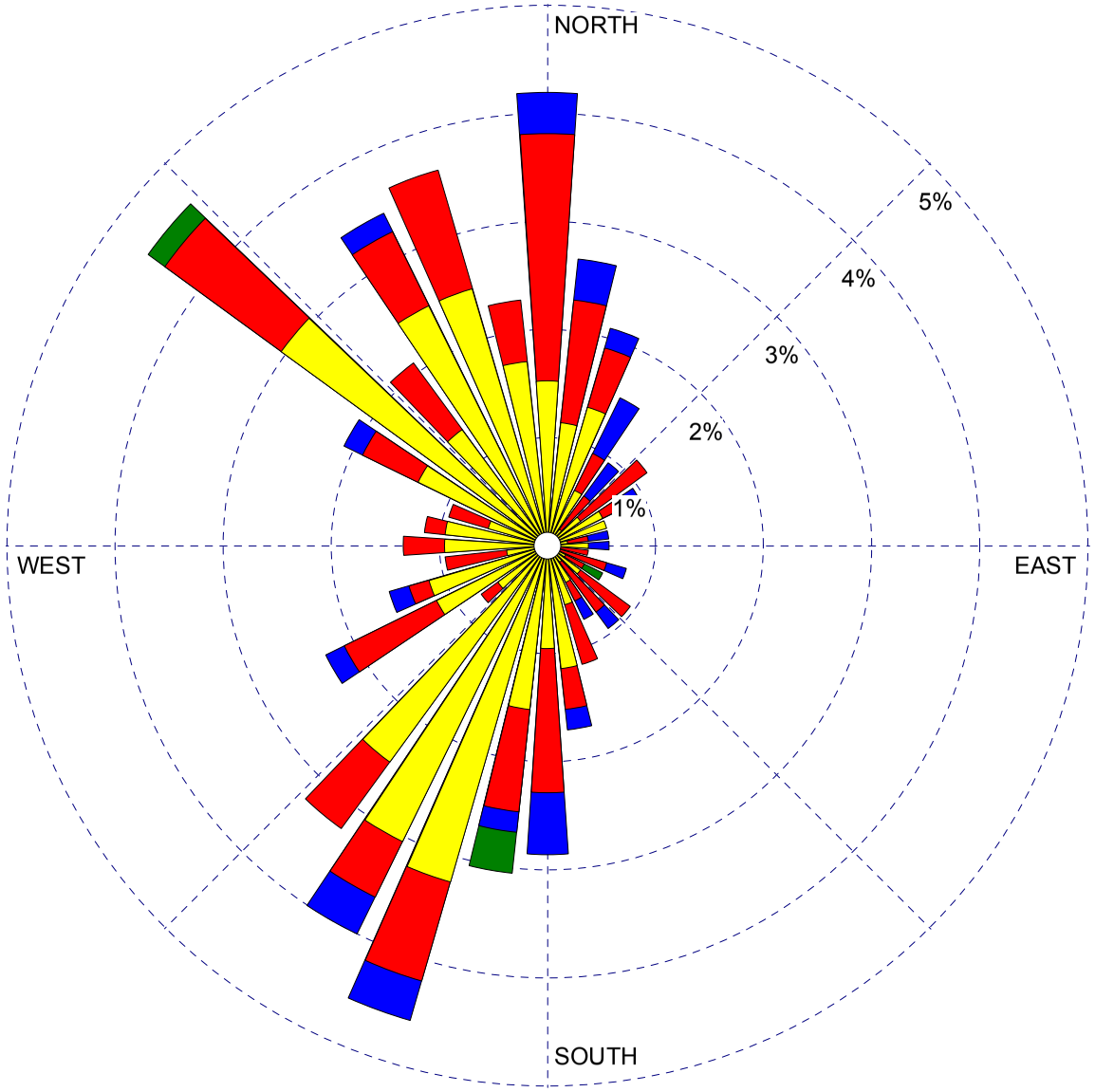
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Garinger
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KCLT
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
526 hrs.

CALM WINDS:
32.89%

AVG. WIND SPEED:
3.70 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

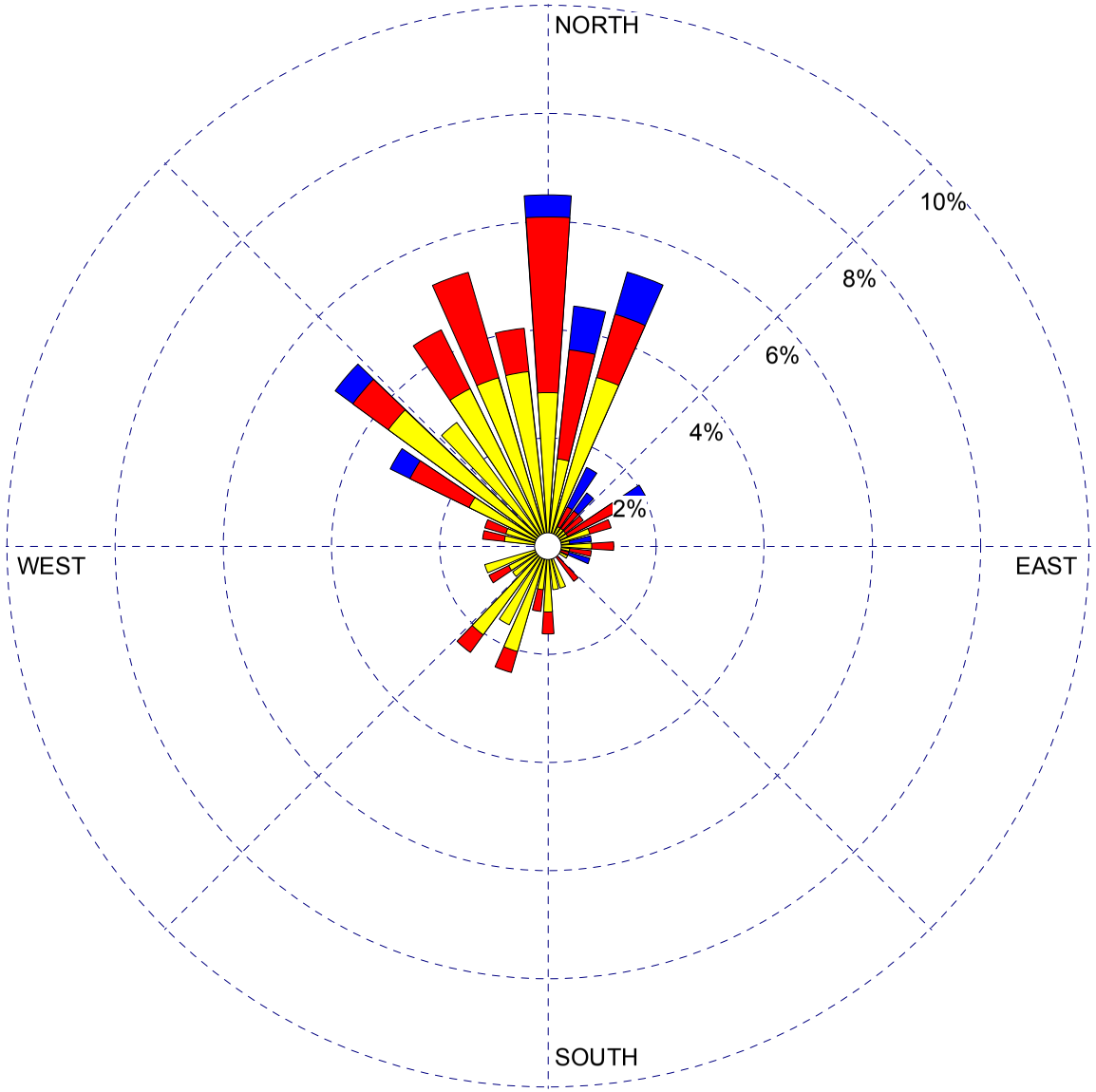
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Arrowood
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
247 hrs.

CALM WINDS:
30.77%

AVG. WIND SPEED:
3.68 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

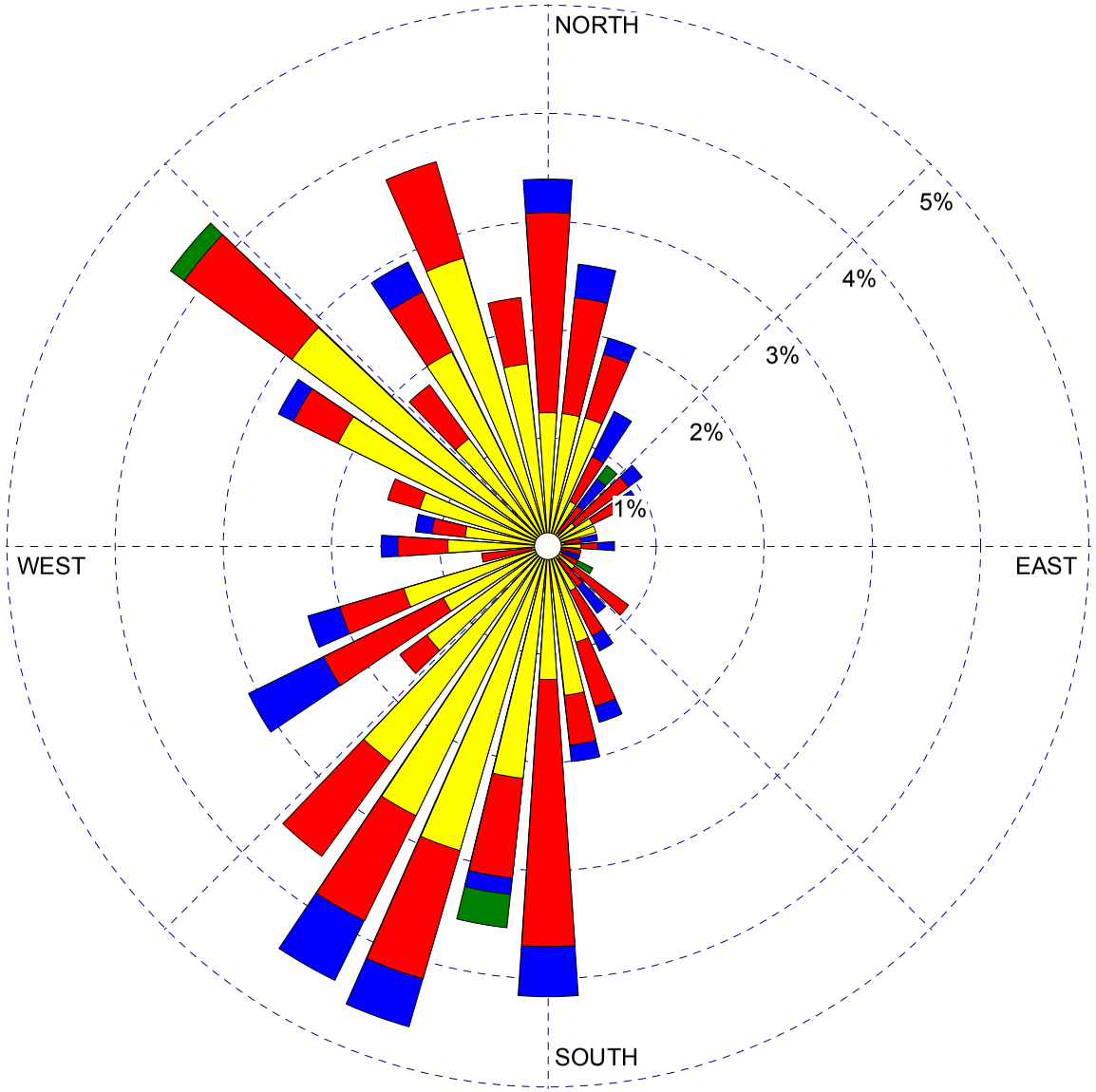
DATE:
10/16/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
County Line
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KCLT
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
650 hrs.

CALM WINDS:
28.46%

AVG. WIND SPEED:
4.00 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

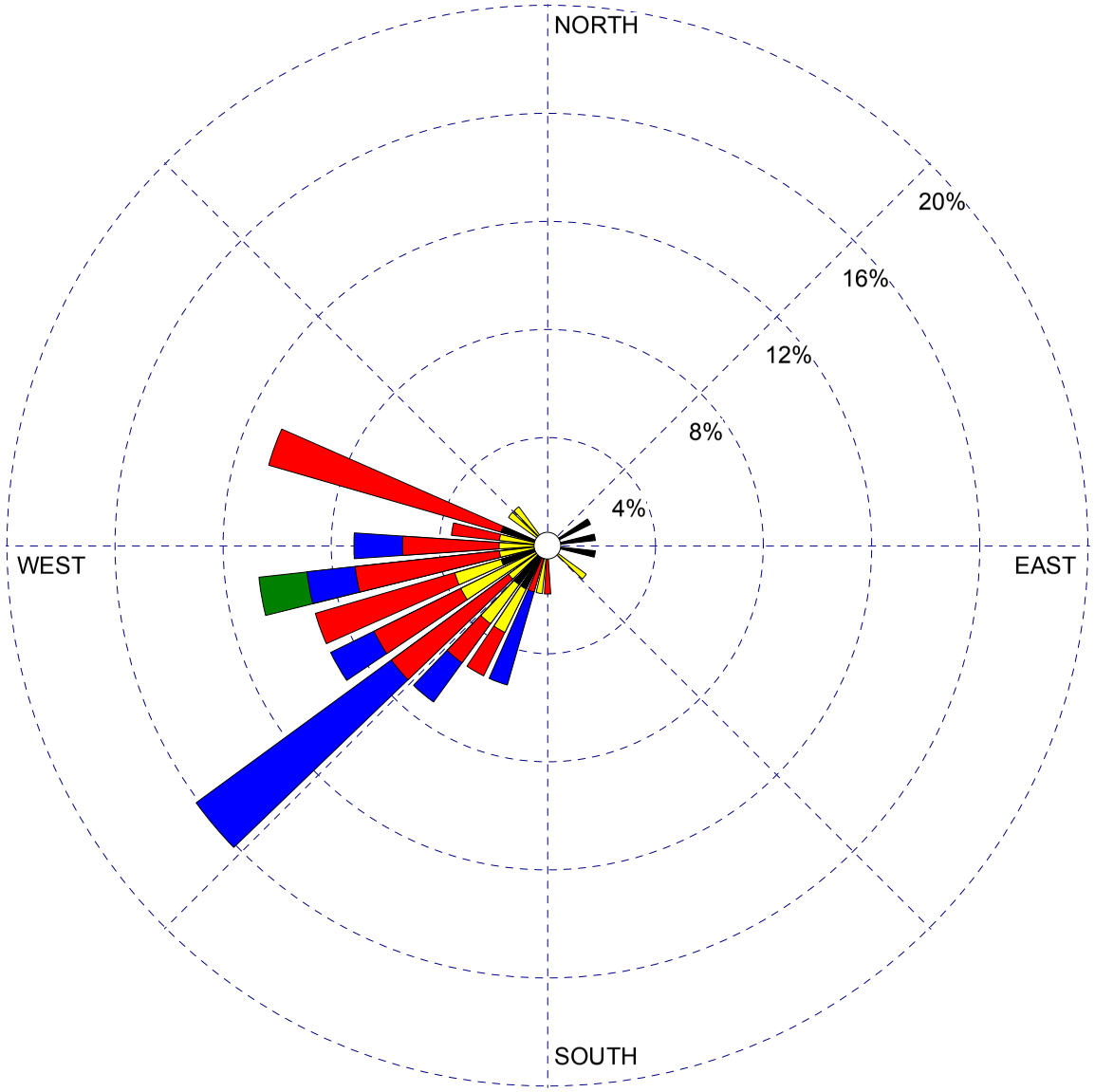
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Castle Hayne
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:CAST
1600-0800 EST
No Variable winds

DATA PERIOD:
2006-2007
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
56 hrs.

CALM WINDS:
1.79%

AVG. WIND SPEED:
6.16 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

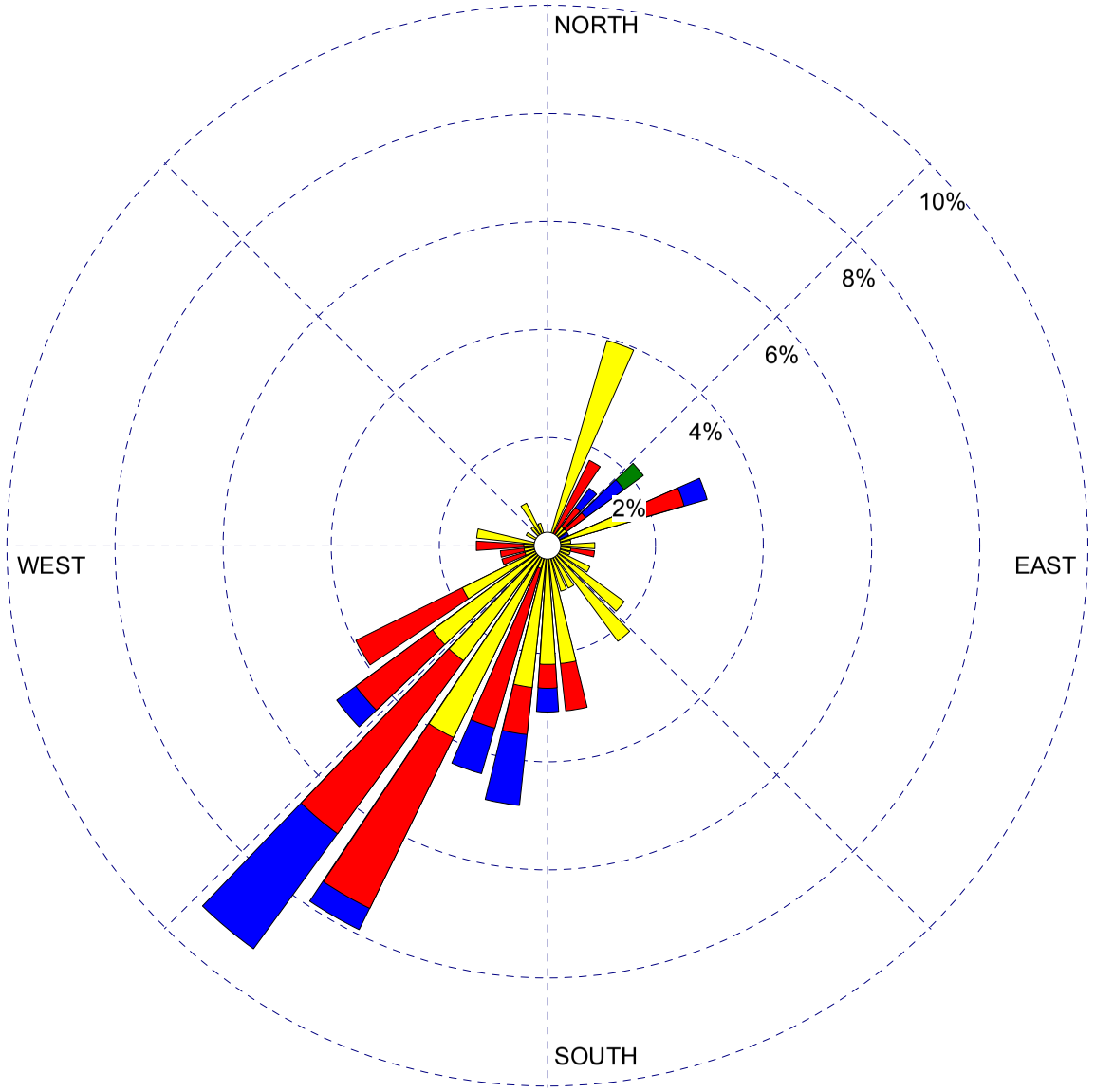
DATE:
10/23/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Bushy Fork
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KTDF
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
228 hrs.

CALM WINDS:
30.26%

AVG. WIND SPEED:
3.95 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

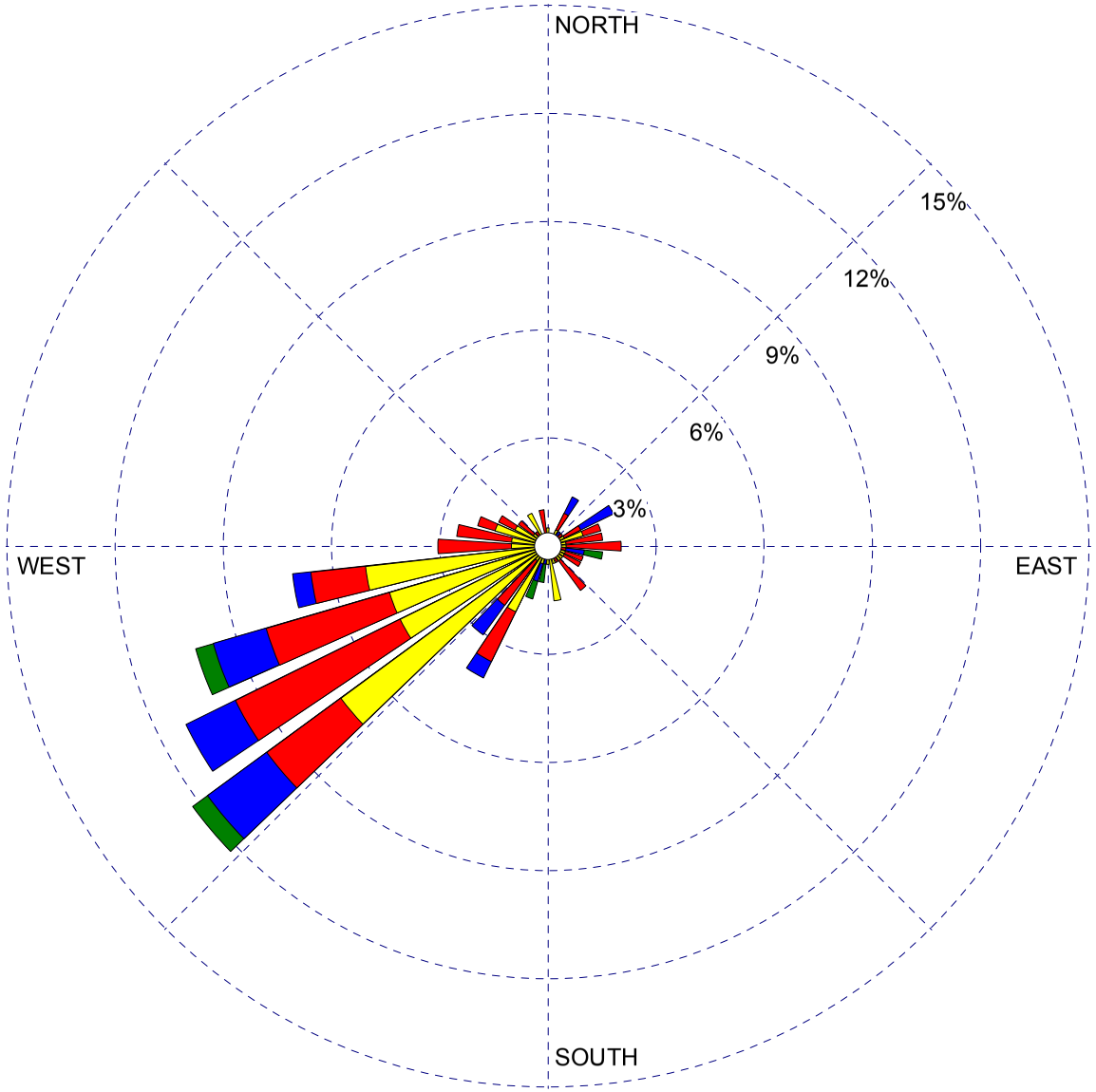
DATE:
10/20/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Pitt Ag / Farmville
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KPGV
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT: **197 hrs.**

CALM WINDS: **18.27%**

AVG. WIND SPEED:
5.00 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

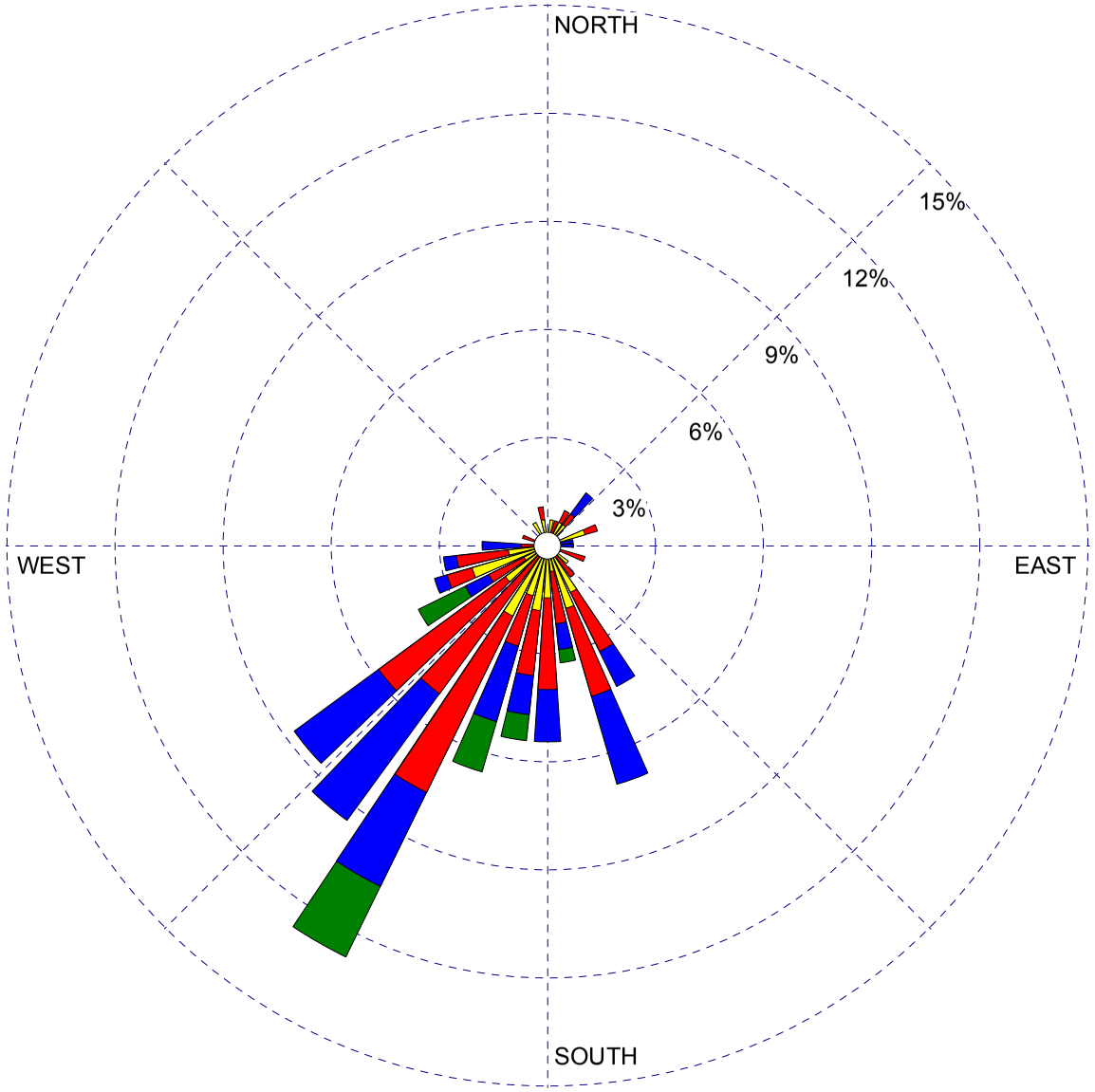
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Bethany
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KGSO
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT: **276 hrs.**

CALM WINDS: **10.87%**

AVG. WIND SPEED: **6.60 Knots**

COMPANY NAME: **NCDENR**

MODELER: **NCW**

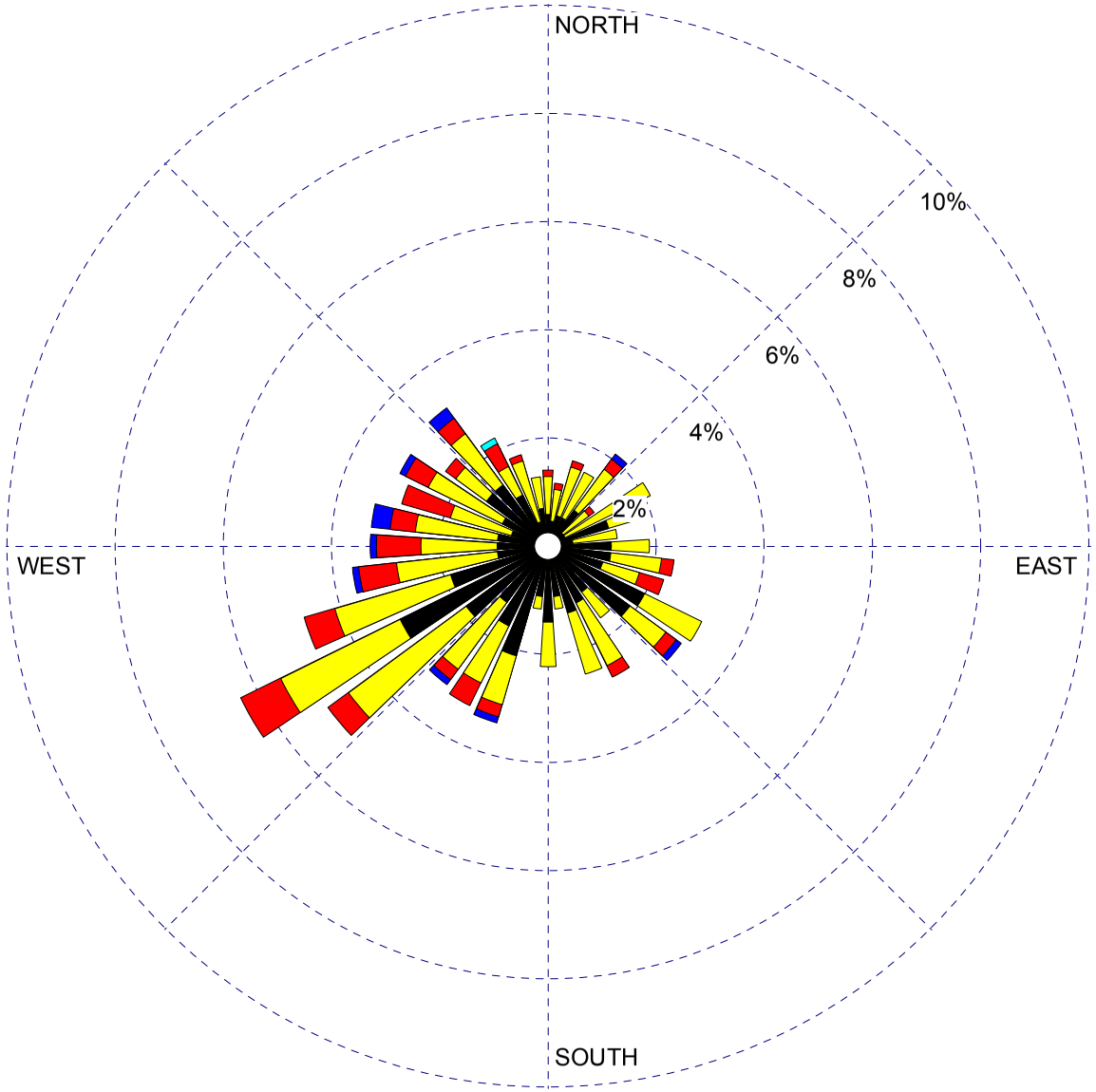
DATE: **10/17/2008**

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Enochville
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:SALI
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT: **854 hrs.**

CALM WINDS: **9.25%**

AVG. WIND SPEED: **2.89 Knots**

COMPANY NAME: **NCDENR**

MODELER: **NCW**

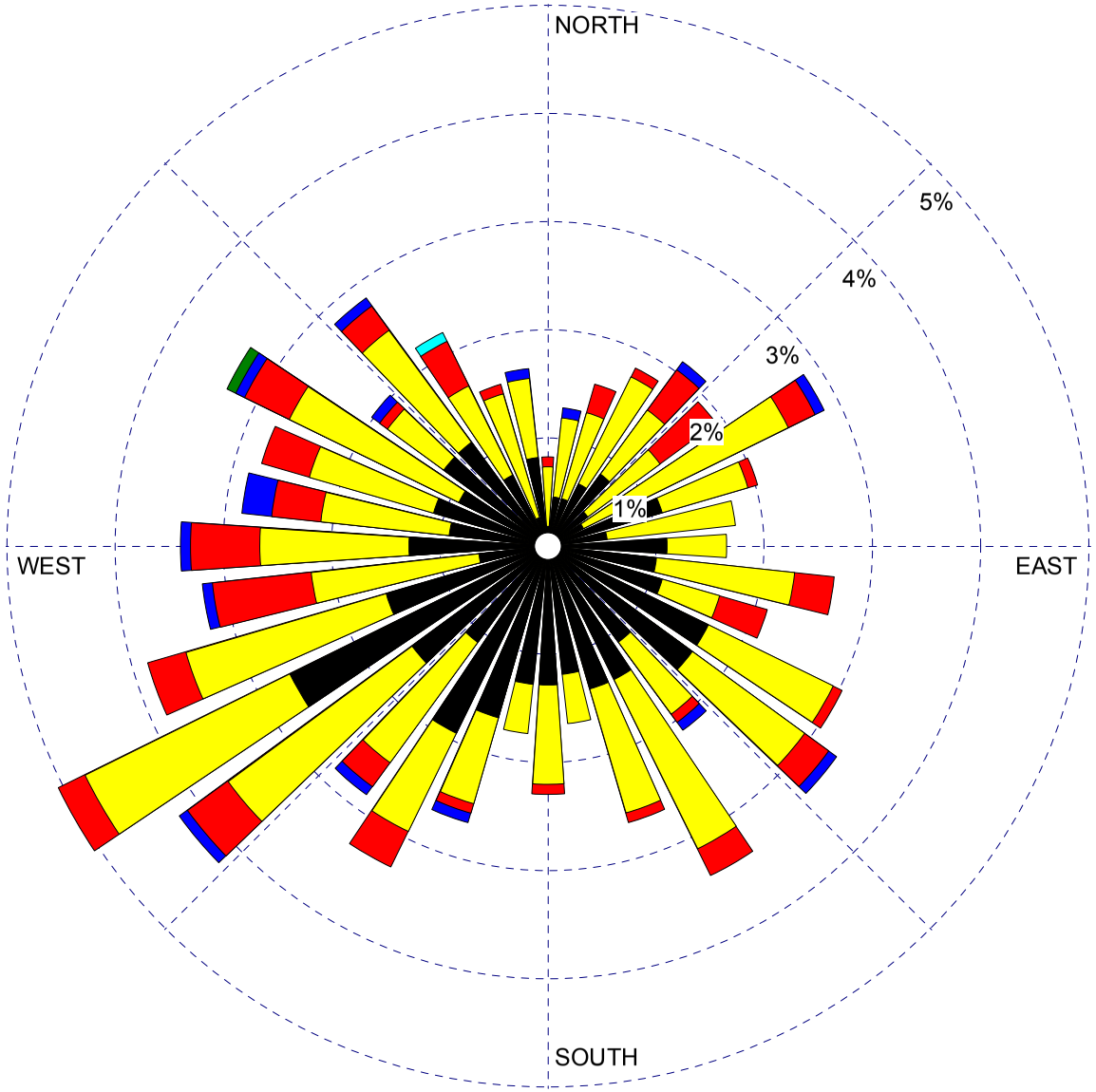
DATE: **10/17/2008**

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Enochville
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:SALI
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
1092 hrs.

CALM WINDS:
9.71%

AVG. WIND SPEED:
2.94 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

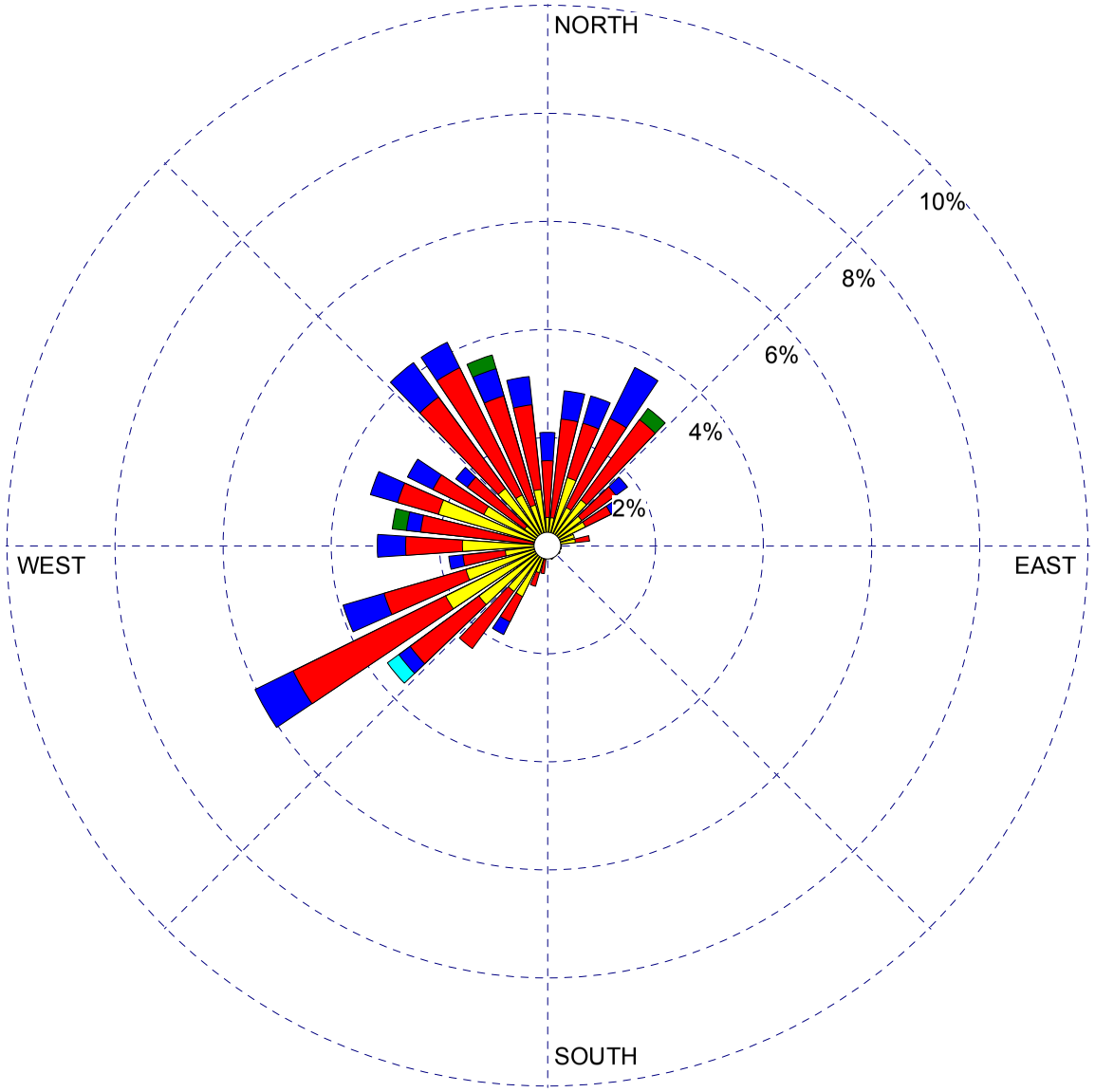
DATE:
10/17/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Monroe
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KEQY
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
382 hrs.

CALM WINDS:
29.06%

AVG. WIND SPEED:
4.48 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

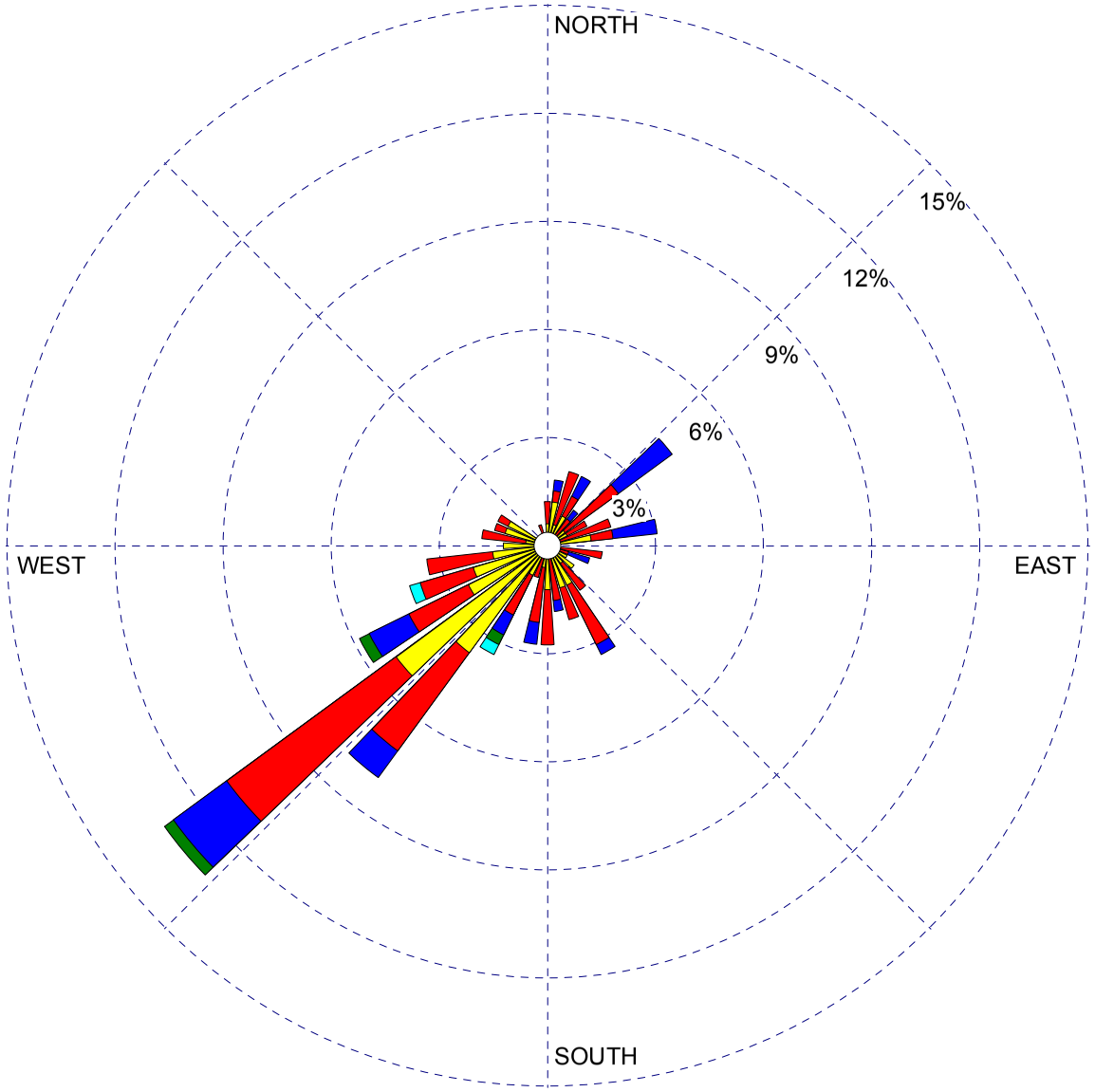
DATE:
10/16/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Milbrook
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:KRDU
600-1900 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
327 hrs.	**15.90%**

AVG. WIND SPEED:
5.23 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

DATE:
10/16/2008

PROJECT NO.:

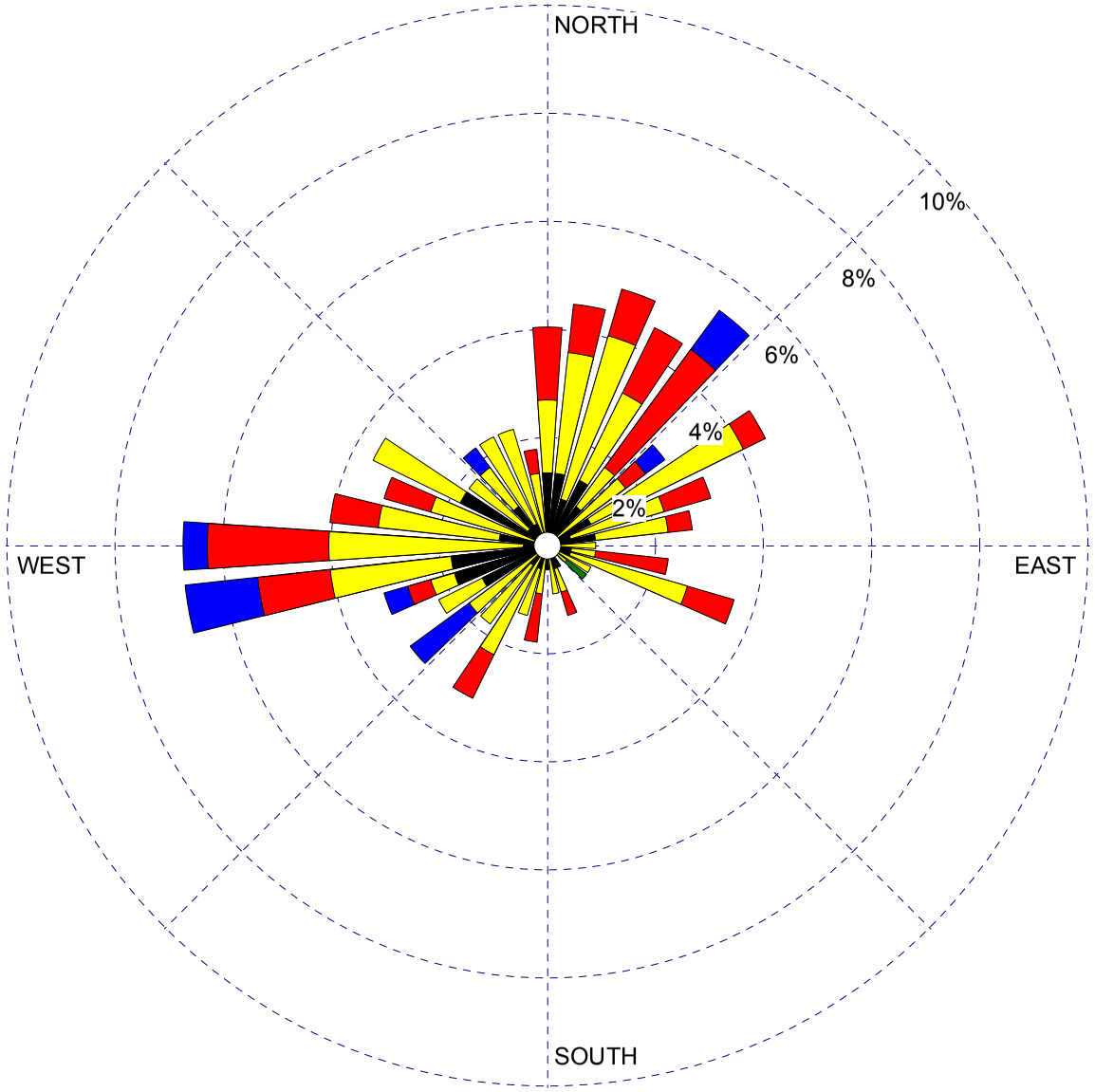
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Fuquay
Ozone >=76 ppb

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Met Station: LAKE
600-1900 EST
No Variable winds

DATA PERIOD:

2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:	CALM WINDS:
223 hrs.	**0.90%**

AVG. WIND SPEED:

4.26 Knots

COMPANY NAME:

NCDENR

MODELER:

NCW

DATE:

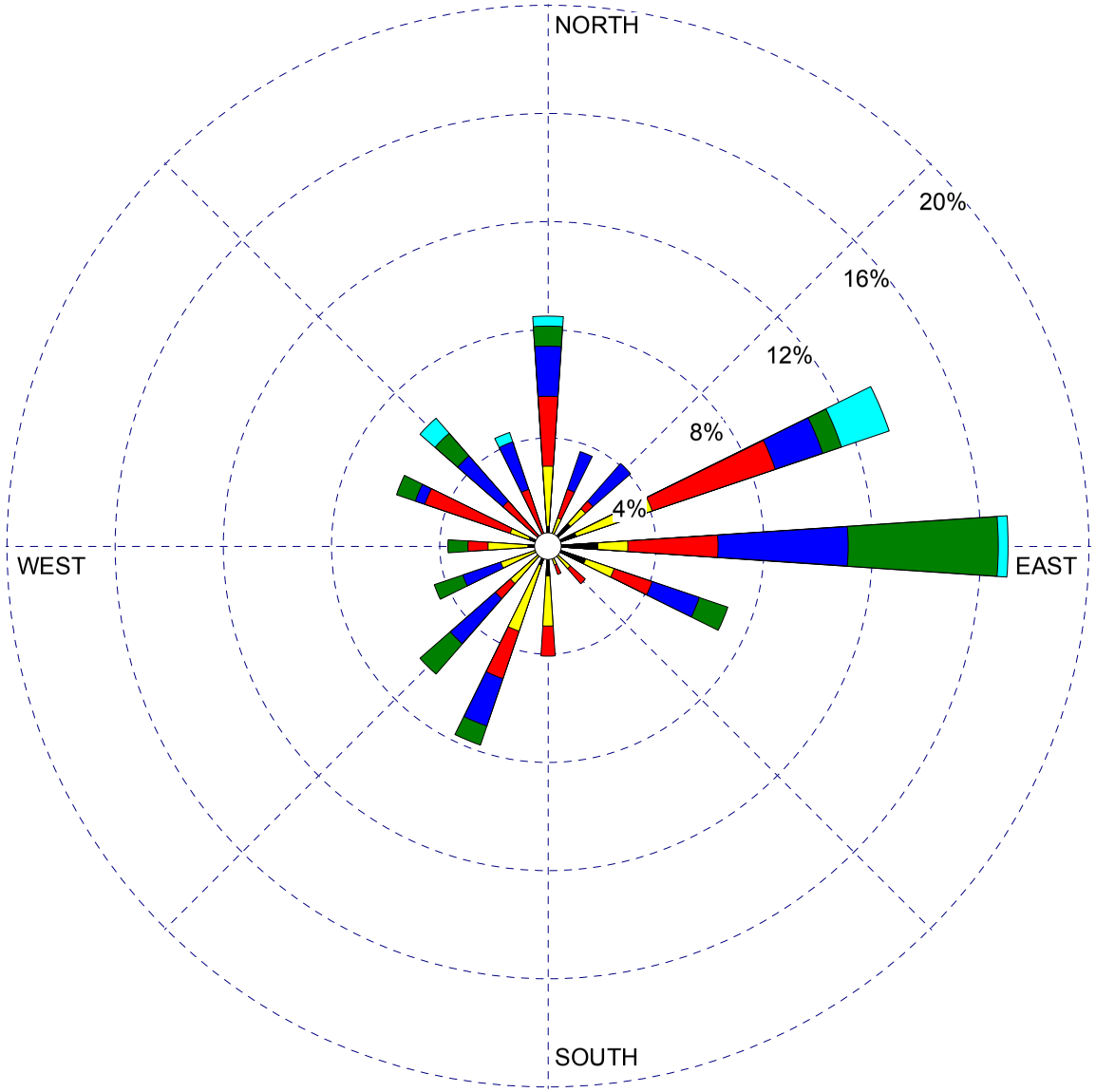
10/16/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:
Mt Mitchell
Ozone >=76 ppb

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:
Met Station:BEAR
1600-0800 EST
No Variable winds

DATA PERIOD:
2006-2008
Jan 1 - Dec 31
00:00 - 23:00

TOTAL COUNT:
271 hrs.

CALM WINDS:
0.74%

AVG. WIND SPEED:
7.46 Knots

COMPANY NAME:
NCDENR

MODELER:
NCW

DATE:
10/29/2008

PROJECT NO.:

WRPLOT View - Lakes Environmental Software