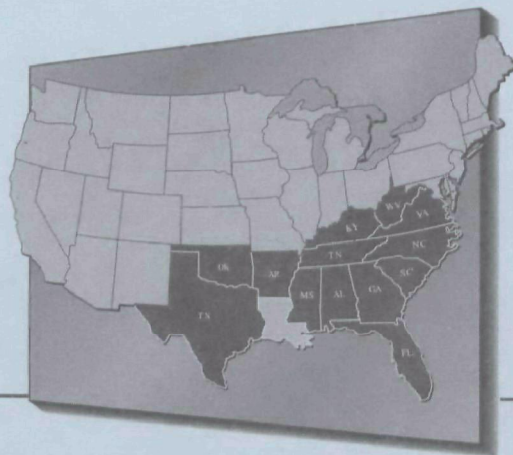

Environmental Trends

Implications for Small Communities in the South



**Produced for the
Conference of Southern County
Associations**

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March 1996

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Executive Summary

Small towns and rural areas have a difficult time addressing environmental problems that require legal, administrative, technical, and financial capacity to resolve. Although small communities may not experience many of the environmental problems faced by urban areas or, if they do, they may not be as severe, the lack of internal resources makes it difficult to address these problems. Small towns and rural areas tend to lack financial capacity due to small tax bases; they have few, if any, staff; they frequently do not have private capability to assist them; and they are generally older, incomes of their residents more limited, and infrastructure costs per capita higher than in larger communities. The dispersed nature of small communities also contributes to the difficulty in resolving environmental problems.

While small communities may have difficulty in handling environmental responsibilities, the types of responsibilities they may be asked to address are changing. Congress and the administration are currently examining federal environmental policies and programs with an eye to shifting responsibilities to state and local governments. As this devolution moves forward, three efforts are necessary to ensure environmental quality in rural areas. First, as environmental responsibilities shift from the federal government to states and their subdivisions, the capacity must exist at these levels to effectively implement them. This is particularly true for small communities. Capacity building must focus on the following:

- administrative capacity to handle paperwork and administer programs;
- financial capacity or having the fiscal resources to carry out the environmental responsibilities;
- legal authority to carry out effective environmental programs, including enforcement authority where appropriate and necessary; and
- technical capability to competently carry out environmental responsibilities.

If these capacities are not in place and cannot be provided, it may be necessary to alter environmental policies to reflect this situation.

In light of the limited resources available in small communities, the second effort for sustaining environmental quality is to focus resources on the most pressing environmental problems. A mechanism is needed to prioritize environmental, as well as other, problems and to address the most significant first. Without such an approach, limited resources can be squandered on relatively insignificant problems while severe problems go unaddressed.

The third effort for sustaining environmental quality while revising environmental policies and programs is to create an environmentally literate public. It is important to realize that the focus of environmental efforts is changing from point sources to nonpoint sources of

pollution and from industrial sources of pollution to ones that are more dispersed and related to modern lifestyle. To effectively address these sources of contamination, public information, education, and involvement become critical. People have to understand why these dispersed pollution sources can collectively create major problems; what needs to be done to prevent or correct them; and how to do so effectively. It is unrealistic to think that public support and action can be obtained without significant investments in informing and involving the public. The use of advisory committees, focus groups, and other measures to incorporate public involvement into the decision-making process will become increasingly important in the future.

The public must also be provided with good information. It is important to have sound research efforts designed to improve our understanding of complex environmental systems and alternatives to address identified problems; to develop and utilize information systems to make accurate information more readily available to all users; and to inform the public about environmental matters. DeWitt John suggests that the evolving federal role with small communities may center less on funding and more on the provision of information. He contends that federal policies toward rural areas should center on the provision of:

- information,
- expertise,
- civic capacity, and
- top-down support for bottom-up initiatives.

However the changes in federal environmental policies and programs evolve, the federal government should provide flexibility and support for local efforts to address the problems they face in a way that meets their needs.

Environmental Trends: Implications for Small Communities in the South[†]

Introduction

Rural areas, defined by the Census Bureau as open countryside and small towns (those having a population of less than 2,500 people), have a difficult time addressing environmental problems that require legal, administrative, technical, and financial capacity to resolve.^{††} Yet these small communities are faced with a variety of environmental problems and responsibilities to address them.

Although small communities may not experience many of the environmental problems faced by urban areas or, if they do, they may not be as severe, the lack of internal resources makes it difficult to address these problems. Small towns and rural areas, in which governmental affairs are generally handled by the county commission, tend to lack financial capacity due to small tax bases. They have few, if any, full-time staff, especially those trained to deal with environmental matters. The staff may be limited to a clerk and, possibly, a person who oversees the water system or wastewater system, frequently on a part-time basis. Small towns and rural areas do not generally have private capability to assist the local governments. Small communities tend to be older, incomes of their residents more limited, and infrastructure costs per capita higher than in larger communities.¹

The dispersed nature of small communities also contributes to the difficulty in resolving environmental problems. Small towns make up the overwhelming majority of communities in the United States. Of the 39,000 units of general purpose local government in the country, approximately 26,000 of them have populations of less than 2,500 people.² In Region 4, this same pattern holds true. As shown in Table 1, of the 3,214 incorporated towns and cities in the region, 2,127 have populations of less than 2,500 and 1,521 of them are rural small towns, located outside Metropolitan Statistical Areas (MSAs). Although the population is more dispersed in small towns and rural areas, the number of people involved is significant.

[†]For the purposes of this report, the South is defined as those states participating in the Conference of Southern County Associations and includes: Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. For analysis purposes, however, states have been limited to those eight in Region 4 of EPA and include: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.

^{††}For the purposes of this report, we will use the term “urban-like” area to mean all population and housing units located inside a Metropolitan Statistical Area (MSA) and outside an MSA but within an incorporated area with a population of 2,500 or more (1990 Census count). “Rural” area means all population and housing units not located in an urban-like area (i.e., located outside an MSA and not in an incorporated area with a population of 2,500 or more). The term “small community” includes small towns of under 2,500, both incorporated and unincorporated, located outside an MSA; and rural counties.

Table 1
EPA Region 4 Cities and Small Towns

Cities in Study Area							
	Outside Metro Areas		Within Metro Areas		Total "Rural"	Total "Urban"	Total
	# Cities <= 2,500	# Cities > 2,500	# Cities <= 2,500	# Cities > 2,500			
Alabama	193	61	112	73	193	246	439
Florida	76	37	91	186	76	314	390
Georgia	298	84	76	77	298	237	535
Kentucky	190	65	132	51	190	248	438
Mississippi	195	64	12	24	195	100	295
North Carolina	290	83	65	73	290	221	511
South Carolina	114	48	63	45	114	156	270
Tennessee	165	57	55	59	165	171	336
Region 4 Total	1,521	499	606	588	1,521	1,693	3,214

As presented in Table 2, of the 44,707,666 people living in Region 4 in 1990, about one-quarter (i.e., 10,292,930) lived in small towns and rural areas.

Small communities may be called on to assume a variety of environmental responsibilities including the provision of certain environmental services (i.e., drinking water supply, wastewater disposal, solid waste management) and/or addressing specific environmental problems (i.e., leaking underground storage tanks, Superfund sites). Additionally they may be called on to comply with environmental review requirements for proposed activities under the National Environmental Policy Act or state environmental assessment laws or to obtain a Section 404 permit for activities that alter wetlands. As a result, there is a schism between what small communities are asked to do and their ability to do it.

The difficulties faced by small communities in addressing environmental concerns should not be construed as a lack of interest. A study of the environmental attitudes of rural residents in the western United States concluded that rural residents hold similar pro-environment attitudes as held by other segments of the population.³ Consequently, local support for addressing environmental matters may generally be present but impediments, such as the lack of technical and financial resources, make it difficult for local officials to do so.

The purpose of this report is to look at environmental issues and trends affecting small communities in the South. Understanding these trends is important for two reasons. First, many local government officials have had a difficult time dealing with environmental matters. Faced with an increasing array of federal and state environmental requirements, they have been placed in the position of meeting sometimes expensive mandates while voters are saying “no new taxes.” Second, awareness of these trends helps local officials prepare for them.

Trends Affecting Small Communities in the South

The information in this section has been compiled to serve as a base for consideration of what the future may hold for small communities in the South.⁴ Some of the issues and challenges discussed may already be upon us while others may not appear for many years, if at all. It is important, however, to think about where we are headed, what it might mean for small communities, and to consider what steps might be taken to better enable public officials to effectively address these emerging issues.

Population Trends

Figure 1 shows MSAs and cities (i.e., over 2,500 people) in Region 4 of the U.S. Environmental Protection Agency (EPA). These “urban-like” areas, as defined here, are the ones where the bulk of the population lives and where many of the environmental problems exist. It is also these areas that have the most resources, both financial and human, to address the problems. It is the areas in white on this map that represent the small towns and rural areas of Region 4 and it is these areas that this report is focused on.

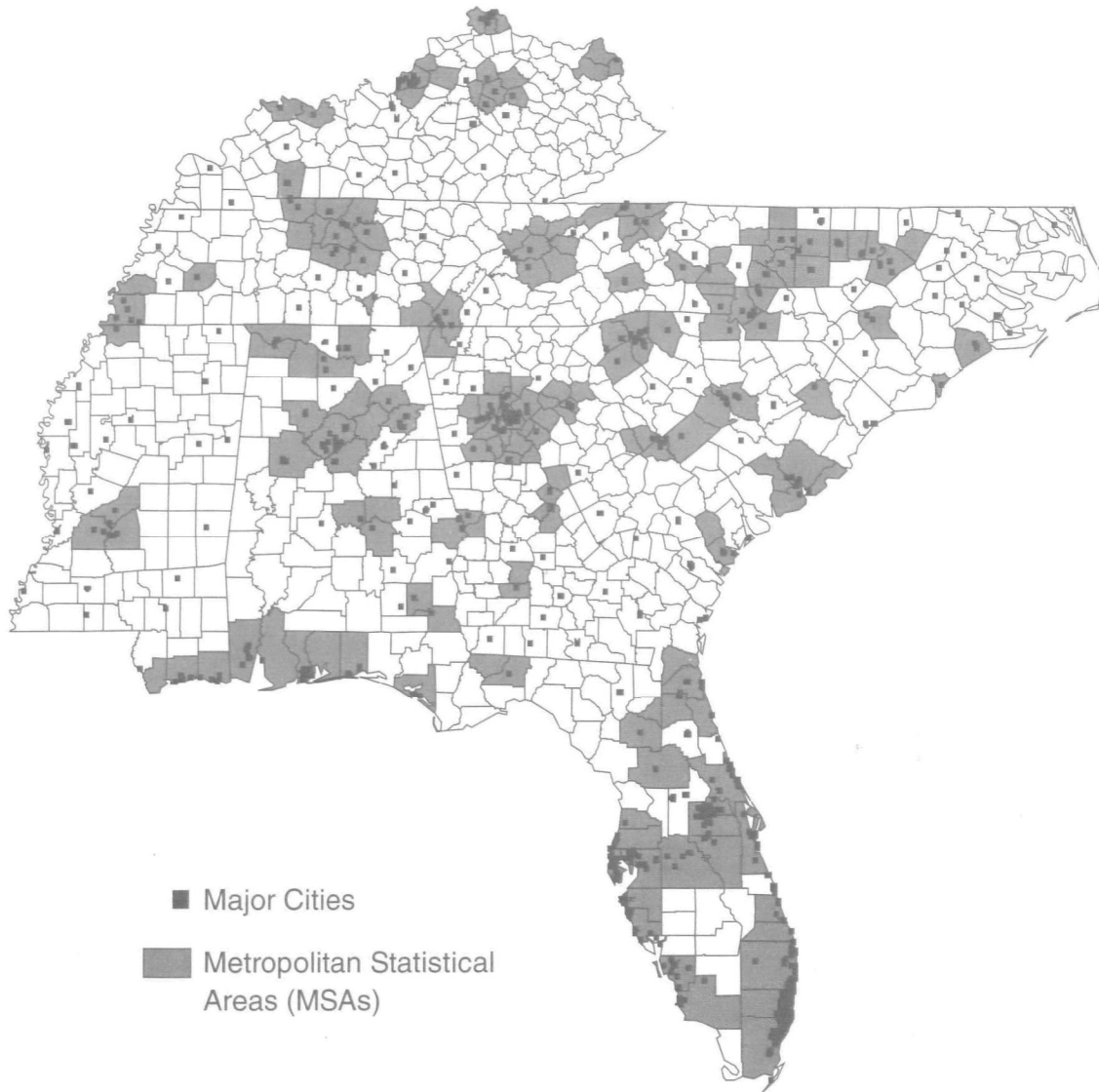
Table 2
EPA Region 4 Population

Population of Study Area									
	Outside Metro Areas			Within Metro Areas			Total "Rural"	Total "Urban"	Total
	In cities <= 2,500	In cities > 2,500	Unincorp.	In cities <= 2,500	In cities > 2,500	Unincorp.			
Alabama	134,167	477,222	702,915	104,086	1,716,150	905,947	837,082	3,203,405	4,040,487
Florida	69,214	254,062	860,560	95,317	5,985,730	5,673,043	929,774	12,008,152	12,937,926
Georgia	210,972	666,772	1,388,772	65,401	1,638,705	2,507,594	1,599,744	4,878,472	6,478,216
Kentucky	154,051	480,774	1,336,592	96,555	1,022,243	595,081	1,490,643	2,194,653	3,685,296
Mississippi	158,984	609,625	1,028,933	11,426	515,902	248,346	1,187,917	1,385,299	2,573,216
North Carolina	231,462	736,807	1,904,051	68,748	1,988,171	1,699,398	2,135,513	4,493,124	6,628,637
South Carolina	76,272	378,865	916,952	61,578	761,240	1,291,796	993,224	2,493,479	3,486,703
Tennessee	155,227	455,149	963,806	53,304	2,180,524	1,069,175	1,119,033	3,758,152	4,877,185
Region 4 Total	1,190,349	4,059,276	9,102,581	556,415	15,808,665	13,990,380	10,292,930	34,414,736	44,707,666

Source: Data are from the U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A.

Note: If a city "straddles" a county line which results in part of the city being in a metro area and part in a nonmetro area, the city and its total population have been assigned to whichever area contains the majority of its population. For this reason, these data cannot be used to calculate exact populations living in metro and nonmetro areas.

**Figure 1: Metropolitan Statistical Areas and Major Cities
in the Study Area**



Population changes over the past 40 years have had a profound impact on the South. The increased population results in increasing demands being placed on the natural resources base and increasing generation of waste products, many of which become pollutants. Table 3 presents population changes in the region between 1950 and 1990 in total numbers and percent change.

Following are some thoughts and observations relating to population changes in the South.

1. At current rates of increase, the South is experiencing a 43-year population doubling time. Today we have nearly twice as many people in the region as lived here in 1950. The population growth in the region is equivalent to that of many third world countries.
2. Overall, the population is increasing at a fairly rapid rate but it is not consistent across the region. Some areas are experiencing rapid, unsustainable growth while other areas are losing population.

Table 3
Population Change in Region 4: 1950-1990
(1,000)

State	1950 Pop.	Percent Change 1950-60	Percent Change 1960-70	Percent Change 1970-80	Percent Change 1980-90	1990 Pop.	Percent Change 1950-90
Alabama	3,062	6.7	5.4	13.1	3.8	4,041	32.0
Florida	2,771	78.7	37.1	43.5	32.8	12,938	467.1
Georgia	3,445	14.5	16.4	19.1	18.6	6,478	88.0
Kentucky	2,945	3.2	6.0	13.7	0.7	3,685	25.1
Mississippi	2,179	0.0	1.8	13.7	2.1	2,573	18.1
N.Carolina	4,062	12.2	11.6	15.7	12.7	6,629	63.2
S.Carolina	2,117	12.6	8.7	21.9	11.7	3,487	64.7
Tennessee	3,292	8.4	10.1	16.9	6.2	4,877	48.1
TOTAL	23,873					44,708	87.3

3. The population in the South is becoming more diversified and conflicts over environmental and natural resource issues will become more intense.
4. Some small communities are faced with rapid population increase and the challenges of meeting demands for urban infrastructure and services, while other small communities are faced with deteriorating infrastructure and cutbacks in services.
5. Development of growth management measures are becoming increasingly important. Even small communities will increasingly find that it is in their best interest to plan and adopt growth management policies that protect public investments and private interests in property.
6. Coastal zone management efforts and other actions designed to deal with growth as it relates to environmentally sensitive areas will increase. "Takings" conflicts will increase until the issues are clarified by Congress and/or the courts.

Local planning and growth management policies have been concentrated in urban-like areas. National demographic trends of the past 20 years, however, indicate that many rural areas are experiencing high rates of growth. One study found that in parts of the West and Northeast the greatest threat to many rural communities was not economic decline, but prosperity.⁵ Growth pressures may result in, among other things, higher demands for infrastructure, environmental destruction, diminished quality of life, and concerns over destruction of scenic quality and ecologically sensitive areas.⁶ At the same time, however, most rural areas have lower wages, have almost as much poverty as inner cities, and are losing population.⁷ For example, in 1990, rural areas in Georgia had an average household income of \$29,165 while average household income in urban-like areas was \$36,810.

Rural communities may be grouped into four categories:⁸

- poor, rural communities with little basic infrastructure, few jobs, and tight control by outside corporations or narrow oligarchies;
- centers for low-wage manufacturing (declining as firms move their operations to other countries);
- agricultural and mining towns with relatively good standards of living, but in many places their populations are dropping; and
- rapidly growing tourist towns with increasing numbers of retirees and professionals moving in.

The problems faced by these different types of small communities and their capacities to respond to them differ. Consequently, policies should be flexible to enable local efforts to be appropriate under varying circumstances.

Figure 2 presents the percentage of the rural population in the region below the poverty level in 1990. As shown on the map, between 14 and 27 percent of the rural population in the Region 4 states live below the poverty level. This suggests that the financial capacity of small communities to address environmental matters is limited.

Environmental and Natural Resource Trends

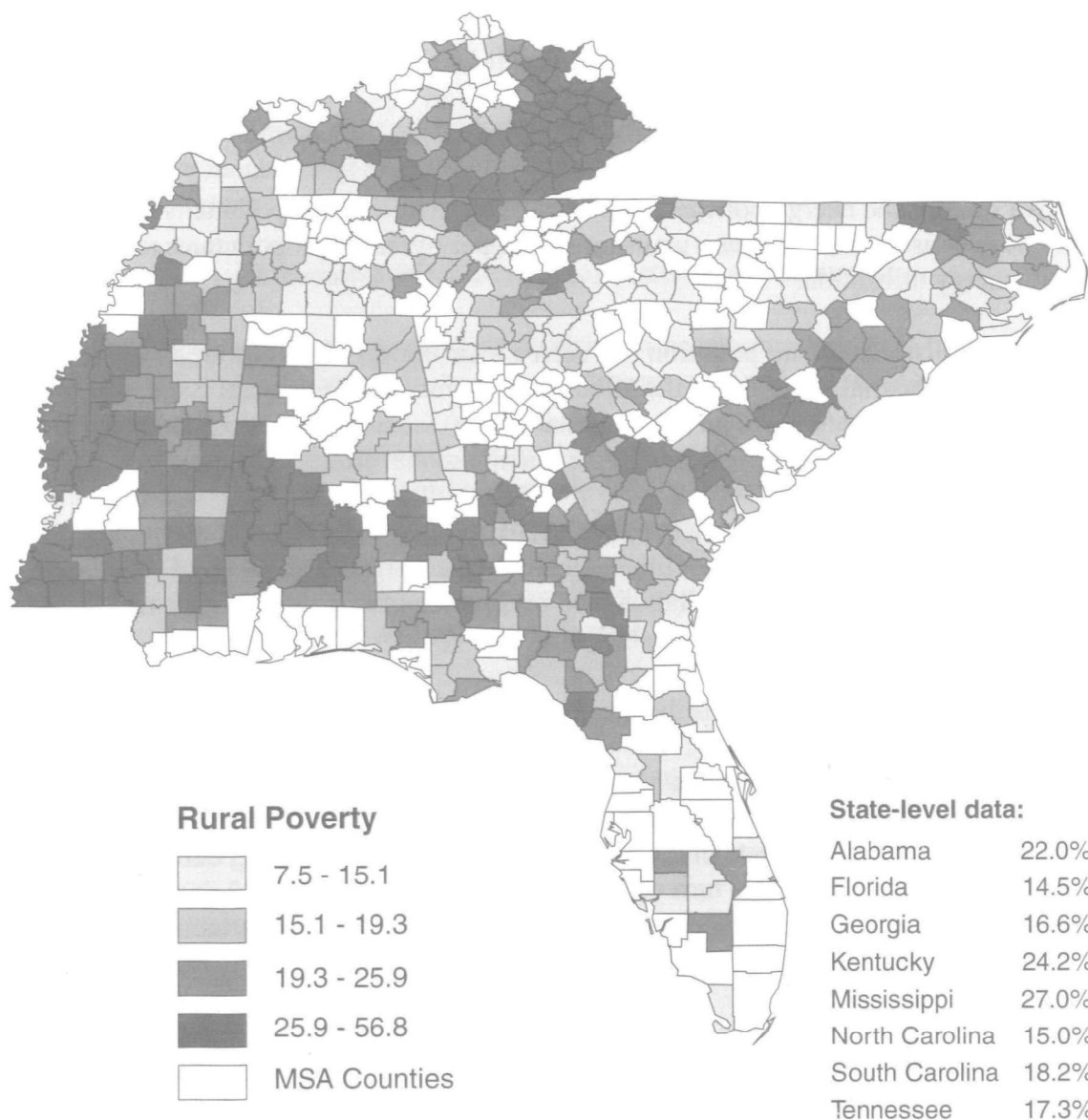
This section presents some important facts and some apparent trends relating to the environment (i.e., waste management, air quality, water quality) and natural resources (i.e., water resources, forest resources, wildlife resources, nonrenewable resources). The intent is to present a snapshot of where the region is and where it is headed in relation to the various environmental and natural resources components.

Waste Management

Waste management efforts in the region are currently going through a transition period, especially for solid waste management. When the transition is finalized, it appears that the following observations will hold true for the region.

1. Solid waste management will be regionalized with fewer but larger disposal facilities. They will increasingly be operated by the private sector or groups of local governments operating them in a businesslike manner.
2. Recycling and composting efforts will continue but plateau at a sustainable level. Sustainable levels for small communities may be considerably different from those of more urban areas. Recycling and composting will increasingly be subjected to regulations.
3. Solid waste/recyclables management will increasingly face the potential of being regulated as a utility.
4. Greater emphasis will be placed on pollution prevention and source reduction.
5. Solid waste regulatory attention will turn to:
 - industrial solid waste disposal practices;
 - construction and demolition waste disposal practices; and
 - management facilities currently permitted by rule.

Figure 2: Percentage of Rural Population in Poverty, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

6. Collection and use of methane as a fuel will increase.
7. Hazardous waste and low-level radioactive waste will continue to be managed on a regional, interstate level.
8. High-level radioactive waste will be managed at the national level.
Transportation and processing of high-level waste will be issues in the South.

Air Quality/Energy

Air quality and energy policies are inextricable. Although air pollutants may be created by activities not associated with energy usage, a number of the major pollutants are directly related to energy utilization.

1. Historically, air pollution has been a local concern in urban areas and around industrial sites. Since the 1960s, it has evolved to a national issue, due in part to the automobile, to an international issue (i.e., acid deposition), and to a global issue (stratospheric ozone depletion and global climate change).
2. The Southeast is more prone naturally to have some types of air quality problems due to its warm moist climate, naturally occurring high levels of volatile organic compounds from vegetation, and occurrence of stagnating air masses that allow pollutants to build up.
3. Ground level ozone is the most significant air pollutant in the South.
4. Ground level ozone is a human health concern but it also has major impact on forest and agricultural production, which frequently are the mainstay of rural economies. Although the focus on controlling ground level ozone has been in urban areas, it may turn out that it will have to be addressed on a multistate regional level, rather than the geographically smaller, nonattainment areas used today. As a result, small communities may have to meet similar requirements as urban areas.
5. Implementing the Clean Air Act Amendments of 1990 will provide some local governments (e.g., those in nonattainment areas) with considerable responsibility and cost.
6. All local governments will face higher energy costs.
7. Energy conservation and increased energy efficiency (i.e., pollution prevention) will become more important and will affect local actions relating to: location, design, and construction of facilities; transportation (i.e., mass transit, alternative fuels); purchasing; and work behavior (i.e., telecommuting).

8. While policies are being implemented to control air pollution resulting from automobile exhaust, the price of gasoline today in real terms is at a 50-year low. In 1940, in 1993 dollars, a gallon of gasoline cost \$1.57; in 1981 it cost \$2.02; and now it costs \$1.18.⁹ The low price of gasoline encourages the increased use of the automobile and thus increased emissions. Consequently, in our attempts to protect air quality, we are addressing the symptoms of the problem rather than the problem itself.
9. Global climate change and stratospheric ozone depletion have the potential to have monumental impacts on what we do and how we do it. Potential impacts include:
 - more erratic weather conditions (storms and droughts);
 - potential sea level rise resulting in heavy investments in protecting the built environment and loss of many wetlands and other natural areas;
 - loss of coral reefs and marine fisheries (this may or may not be related to changes in water temperature but for some reason important resources are disappearing at an alarming rate); and
 - changes in climatic regions with major impacts on agriculture and forestry production and species extinction.

Water Quality

In 1972 the Federal Water Pollution Control Act (Clean Water Act) was passed that made it a national goal to have "fishable" and "swimmable" waters in the United States by 1977. We have not reached that goal but considerable progress has been made. This progress is based on the initiatives included in the Act:

- requirements for classification of streams based on water usage and quality;
- requirements for monitoring water quality;
- establishment of the national pollution discharge elimination system (NPDES) requiring permits for point discharges to surface waters;
- establishment of the construction grants program to help finance construction of wastewater facilities; and
- requirements to study nonpoint sources of pollution.

The permit process has worked well to control point discharges of wastewater. Currently

emphasis on controlling nonpoint sources is increasing and the construction grants programs is being converted to a revolving loan program.

1. Water quality has improved over the past 30 years by focusing on control of the end-of-the-pipe measures, major public and private investments in wastewater treatment infrastructure construction, and regulatory actions.
2. Water quality is still a problem in many areas, particularly downstream from urban areas.
3. The Clean Water Act is up for reauthorization and will focus more on:
 - river basin management;
 - nonpoint pollution control;
 - pollution prevention; and
 - wetlands.
4. The least costly approaches for protecting water quality have already been used. Treating wastewater to meet higher standards is feasible but will be costly.
5. Clean technologies will reduce the amount of waste that requires treatment.¹⁰
6. Increasingly, industries will switch from a single, pass-through system to a closed-loop process so that the water within an industrial facility can be used over and over again with zero discharge of wastewater.¹¹
7. Issues relating to reliability and safe-failure of pollution control infrastructure will increase.¹²
8. States will continue to institute their revolving loan funds for water and wastewater treatment plant construction but these programs must be supported at a level that allows for timely project funding and/or be augmented by other financing mechanisms.
9. Land-use measures designed to control stormwater and erosion will become more common. Greater emphasis will be placed on:
 - river basin/watershed management,
 - protection of vegetative buffers along streams and lakes,

- use of water retention mechanisms designed to limit or eliminate off-site discharges of stormwater runoff,
 - adoption of mandatory best management practices, and
 - protection of highly erodible soils.
10. Greater emphasis will be placed on institutional arrangements to operate water systems more effectively (i.e., coordinating releases from reservoirs and discharges of treated wastewater with timing restrictions for water intakes).¹³
 11. The use of wastewater to enhance the environment will increase. For example, land application of treated wastewater can increase soil fertility and plant growth and the creation of artificial wetlands for wastewater treatment or stormwater retention can provide habitat for plant and animal species.¹⁴
 12. Stream buffer zones will become more important for plant and animal species. As land-use changes occur, populations of plants and animals are likely to become isolated. Increasingly, wildlife corridors will be necessary to enable plants and animals to interbreed with other populations of their species. Streamside buffers can serve the dual purpose of water quality protection and wildlife corridors.
 13. Wetlands protection measures will be addressed and formalized. Delineation criteria will be agreed to. States will likely move to assume implementation of the 404 permitting program (Section 404 of the Clean Water Act) and there will be an increased role for local governments in wetlands management. Greater emphasis will be placed on advanced delineation to enable local governments to "flag" wetlands in their planning process.
 14. Many species of plants and animals listed as endangered or threatened under the Endangered Species Act live in wetlands and other aquatic environments. The Endangered Species Act is up for reauthorization. Amendments to this law may have significant impacts on water-related decisions in the future.
 15. Greater emphasis will be placed on land-use activities that affect groundwater quality. Measures such as wellhead protection will become more common and greater consideration will be given to land-use activities in significant groundwater recharge areas.

Water Resources/Supply

As the human population multiplies, increasing demands in the form of offstream consumptive uses and instream flow requirements are placed on the region's water resources by competing users. Although dams have been constructed that regulate the flow of surface water,

storing water for use during dry periods, the quantity of water available has not significantly changed.

1. Even though the South is the "wettest" region in the country, water resources are not evenly distributed over the region, nor are demands for water evenly distributed.
2. Interuse water conflicts (i.e., instream v. offstream and among public supply v. industrial v. agricultural v. power production) will increase as evidenced by the call for minimum instream flows relating to Federal Energy Regulatory Commission licenses.
3. Demands for interbasin water transfers will increase, especially in the Piedmont and other "hillier" regions where population increases are occurring. Resistance to interbasin water transfers will increase at a comparable rate.
4. Interstate water conflicts will increase as evidenced by proceedings in Virginia and North Carolina; Alabama, Florida, and Georgia; and South Carolina and Georgia.
5. States will be moving to institute and tighten water rights and water allocation programs. This may include mechanisms for the transfer of water rights and greater use of water markets.
6. Attaching the true cost to water supports water conservation and the efficient use of water.
7. Demands for the protection of instream flows will increase.
8. Reservoir siting will become more difficult due to the remaining sites being less acceptable (e.g., 80 percent of Texas's potential reservoir sites have been used), the impacts on wetlands, and the costs.
9. Limitations of withdrawals from some aquifers (e.g., Edwards Aquifer in Texas, Floridan Aquifer in Florida, Georgia, and South Carolina) may be imposed.
10. Local governments are faced with major costs associated with water supply infrastructure. A federal financial assistance program will be adopted for water supply purposes.
11. Concerns with required testing under the Safe Drinking Water Act will be resolved.

Forest Resources

Throughout the history of the United States, forests have been used for economic purposes. Most of the old growth forest has been cleared for agricultural purposes, urban growth, fuel wood, and to produce lumber, paper, and other forest products.

1. Forest acreage has fluctuated over the years but increasing demands for land will result in less forested acreage in the future.
2. Softwood trees, principally pines, are generally of more economic value than hardwood trees such as oaks and hickories. Hardwood trees are of more value to wildlife than pines.
3. Managed forests tend to be less diverse (e.g., pines) and younger than natural forests.
4. Demands for forest products are increasing. Some of the increasing demands for paper and wood products can be met by increasing recycling of paper and wood.
5. Historically, demands on forests have been for consumptive and utilitarian purposes but increasingly the demands are diversifying (i.e., wilderness, endangered species habitat such as old growth trees for red-cockaded woodpeckers).¹⁵
6. Leasing of land for hunting is becoming a significant source of income for forestland owners and a means for leaving acreage in hardwoods rather than converting it to pine plantations.¹⁶
7. Mandatory best management practices (BMPs) will be adopted for forestry operations to ensure that they have less impact on water and other resources.

Wildlife Resources

The South is very likely the most biologically diverse region in the United States. It includes the complex mixed mesophytic forest of the Appalachians, mixed oak-pine forests, hardwood bottomland forests, freshwater and coastal wetlands, the subtropical region of south Florida, and the more arid grassland and desert areas of Texas.

1. Wildlife species have been heavily used in the past, resulting in the extinction of some species (i.e., passenger pigeon, ivory-billed woodpecker, and Carolina parakeet). Other species were eliminated from some areas but did not become extinct (i.e., whitetailed deer, turkey, cougar). Many of these species have been reintroduced in parts of or throughout their former range.

2. Game laws focusing on the species that can be taken, the means by which they can be taken, and the time of day and year that they can be taken first appeared in the 1700s. All states in the region have well-developed fish and wildlife laws and programs.
3. As land-use changes occur, populations of plants and animals are likely to become isolated. This fragmentation can lead to insufficient habitat to maintain the populations and insufficient numbers of plants or animals to function as a breeding population, resulting in their extirpation. Increasingly, wildlife corridors will be necessary to enable plants and animals to interbreed with other populations of their species.
4. Populations of many songbirds in the South are declining due to a variety of reasons, including the loss of suitable wintering habitat in the neotropics (i.e., Central and South America).¹⁷
5. Land-use changes associated with human activities are beneficial to some species and detrimental to others. "Edge species" or those that do well along the boundaries of different ecosystems (i.e., deer, turkey) are doing well. "Interior species," such as cougar, that need large expanses of a certain type of habitat and "specialist species," such as the gopher tortoise and indigo snake, that inhabit only sandhill areas are not doing as well and are most commonly the species listed as endangered or threatened under the Endangered Species Act.¹⁸
6. Nonconsumptive uses of wildlife such as bird-watching and photography are increasing.
7. Hunting will hold steady in terms of actual numbers of hunters but will decline as a percentage of the population that hunts.
8. Increasingly, greater emphasis is being placed on nongame and endangered species. The Endangered Species Act is up for reauthorization. The question of how to equitably address endangered species protection on private property will have to be resolved.

Nonrenewable Resources

The South has a variety of nonrenewable resources such as fossil fuels; iron, copper, and other metal ores; stone; and soil deposits. These nonrenewable resources have been used throughout our history and have contributed to the economic development of the region. On the other hand, extraction and use of some of these resources have resulted in environmental problems.

1. A wide variety of fossil fuel and mineral, stone, and soil resources exist in the South.
2. Fossil fuel resources include:
 - petroleum,
 - natural gas, and
 - coal.
3. Most coal deposits in the region have a relatively high sulfur content and are thus less valuable due to air pollution concerns. Decreased demand for high sulfur coal has major economic impacts on coal mining regions.
4. Petroleum extraction in the Gulf of Mexico contributing to land subsidence is likely advancing the demise of the highly productive marshes that support the Gulf seafood industry.
5. Mineral, stone, and soil resources include:
 - metals (i.e., iron, gold, and bauxite);
 - stone (i.e., limestone, marble, and granite); and
 - soil deposits (i.e., sands, clays, and peat).
6. The mining industry will face increasing local opposition to its activities that are perceived as being incompatible with other land uses.
7. Increasingly, policies will focus on ensuring that, as extraction of nonrenewable resources occurs, land will be brought back into biological productivity.

The trends discussed in this section in some cases are the reason that our environmental policies are in place. In other cases, they are the result of current environmental policies.

Environmental Infrastructure of Small Towns

In urban-like areas, environmental services and infrastructure (i.e., infrastructure for water supply, treatment, and distribution; wastewater collection and treatment; solid waste management) are generally in place. This is frequently not the case in small communities. As a result of the dispersed nature of the population and the lack of resources, constructing and operating environmental infrastructure and providing environmental services may be impractical.

Water Supply

Water for domestic, industrial, commercial, and agricultural uses may come from surface water sources such as lakes, reservoirs, and rivers or from groundwater sources (i.e., wells, springs). Rural populations have historically depended on individual water sources, principally wells, to meet their needs. As populations become concentrated in towns and cities, however, it becomes more feasible, and frequently necessary to ensure an uncontaminated water supply, to provide water through a public or private system. Nationally, about two-thirds of the rural cities and one-third of unincorporated rural communities have public water service.¹⁹ These, in part are the result of the Farmers Home Administration financing of public water systems,

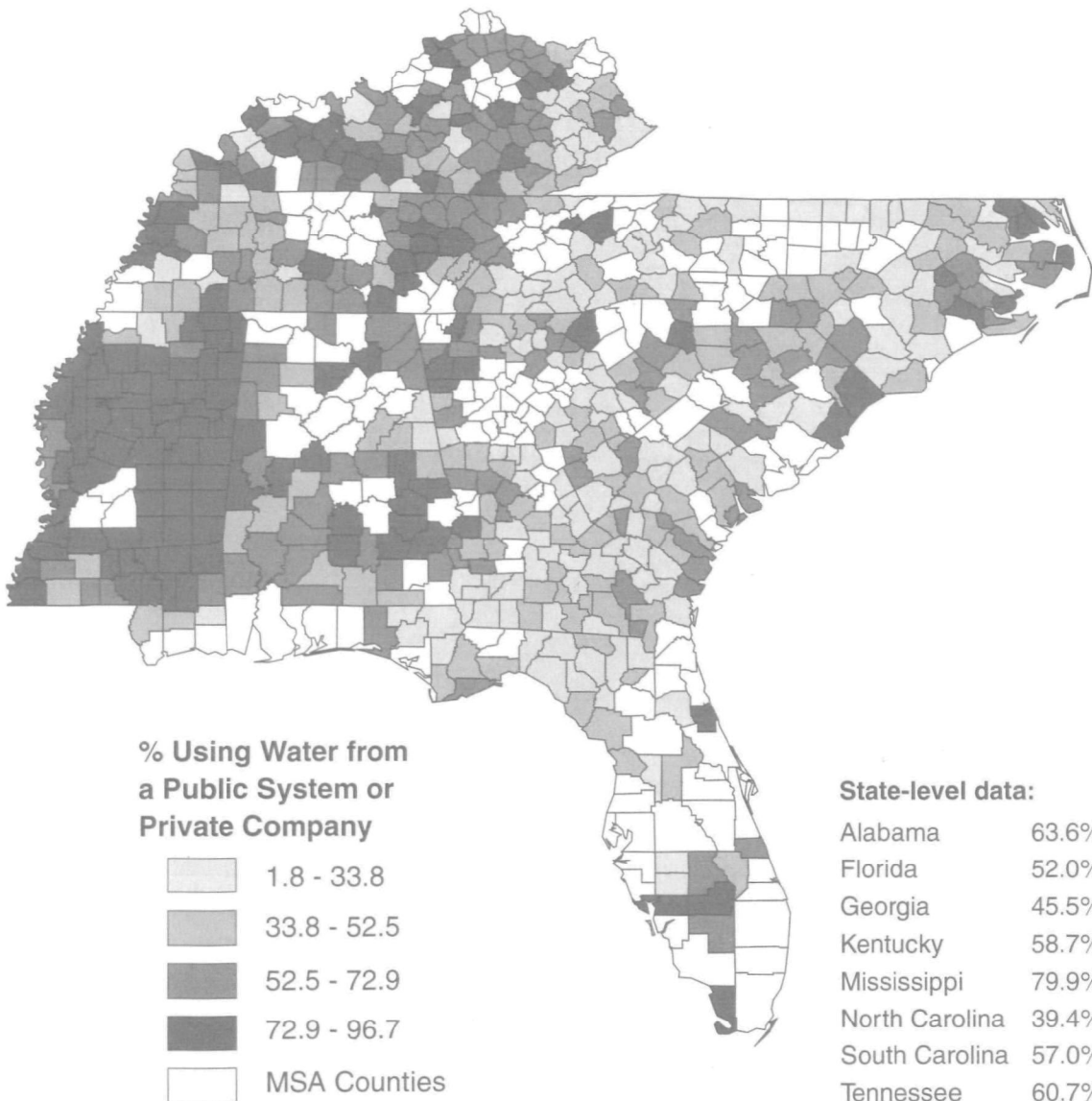
As shown on the maps on the next three pages (Figures 3, 4, and 5), the percentage of rural populations obtaining water from public or private systems ranges from 39.4 percent in North Carolina to 79.9 percent in Mississippi. The flip side of this is that those households not served by public or private systems must depend on individual sources. Most rural households, not attached to a public or private water system, utilize drilled or dug wells for their water supply. Rural households utilizing drilled or dug wells range from 19.1 percent in Mississippi to 55.3 percent in North Carolina.

A generally small percentage of the rural population, not hooked into public or private systems, obtains water from other sources such as springs, streams, and cisterns. Rural households utilizing such sources range from 0.4 percent in Florida to 10.6 percent in Kentucky. Rural households in mountainous states such as Kentucky and Tennessee are more likely to use these alternative sources. Over half (56.4 percent) of the rural households in Washington County, Kentucky, obtain their water from sources other than public or private systems or wells.

Meeting the water supply needs of small communities presents both financial and logistical problems. The economies of scale would argue for regional approaches but the dispersed nature of the population may hinder such arrangements.

The major federal law relating to rural water supply is the Safe Drinking Water Act, although this law does not apply to individual wells or other sources of water used by individual rural households. It sets requirements for public water supplies. With the 1987 amendments to the Safe Drinking Water Act, Congress directed EPA to set standards for 25 new chemicals per year. This requirement resulted in a significant increase in testing requirements for drinking water systems and the cost of providing water through public and private systems. The costs in some cases became excessive and contributed to the backlash on unfunded mandates. Changes in testing requirements will be addressed through the amendments to the Safe Drinking Water Act.

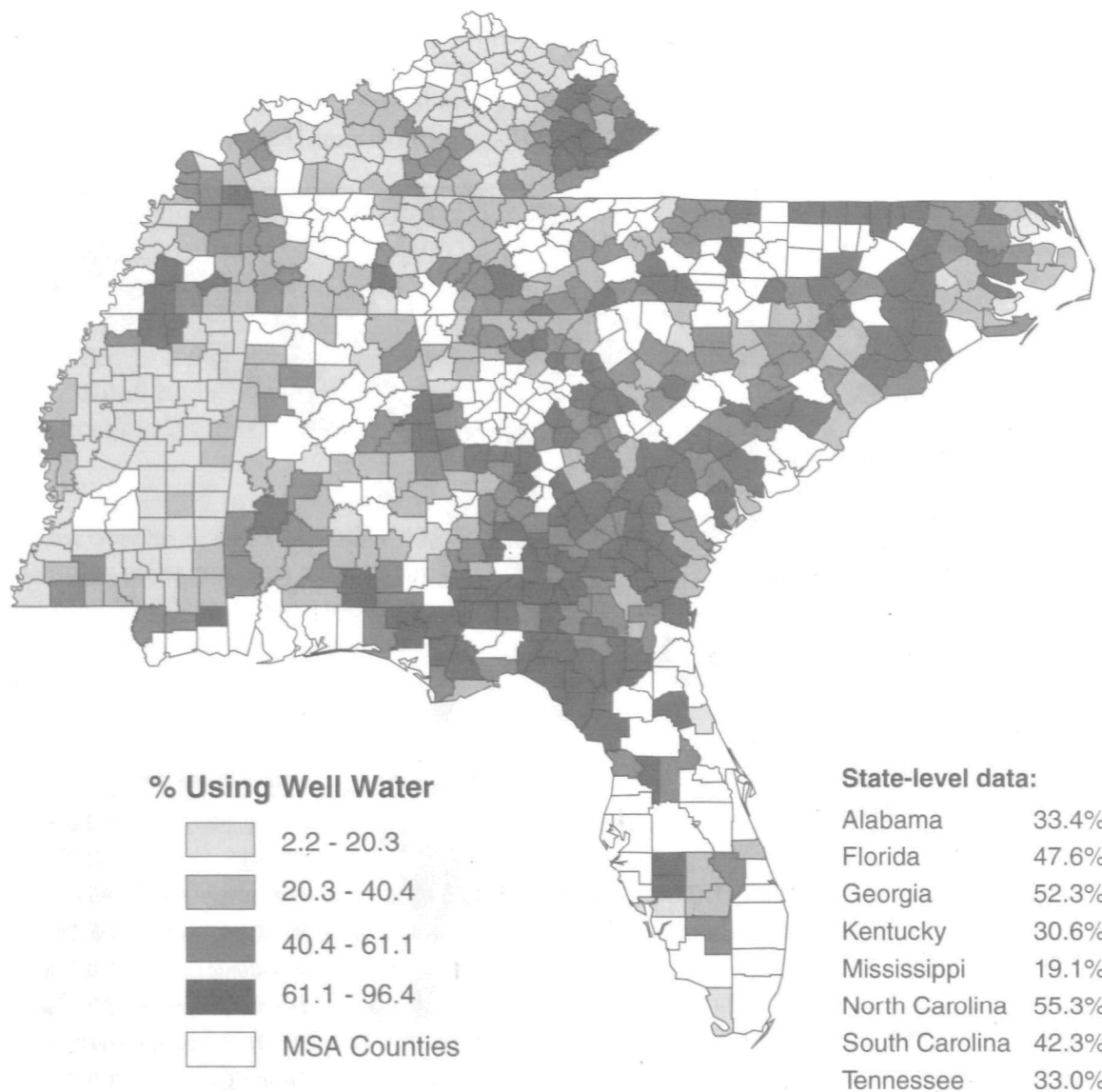
Figure 3: Percentage of Rural Housing Units Using Water from a Public System or Private Company, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

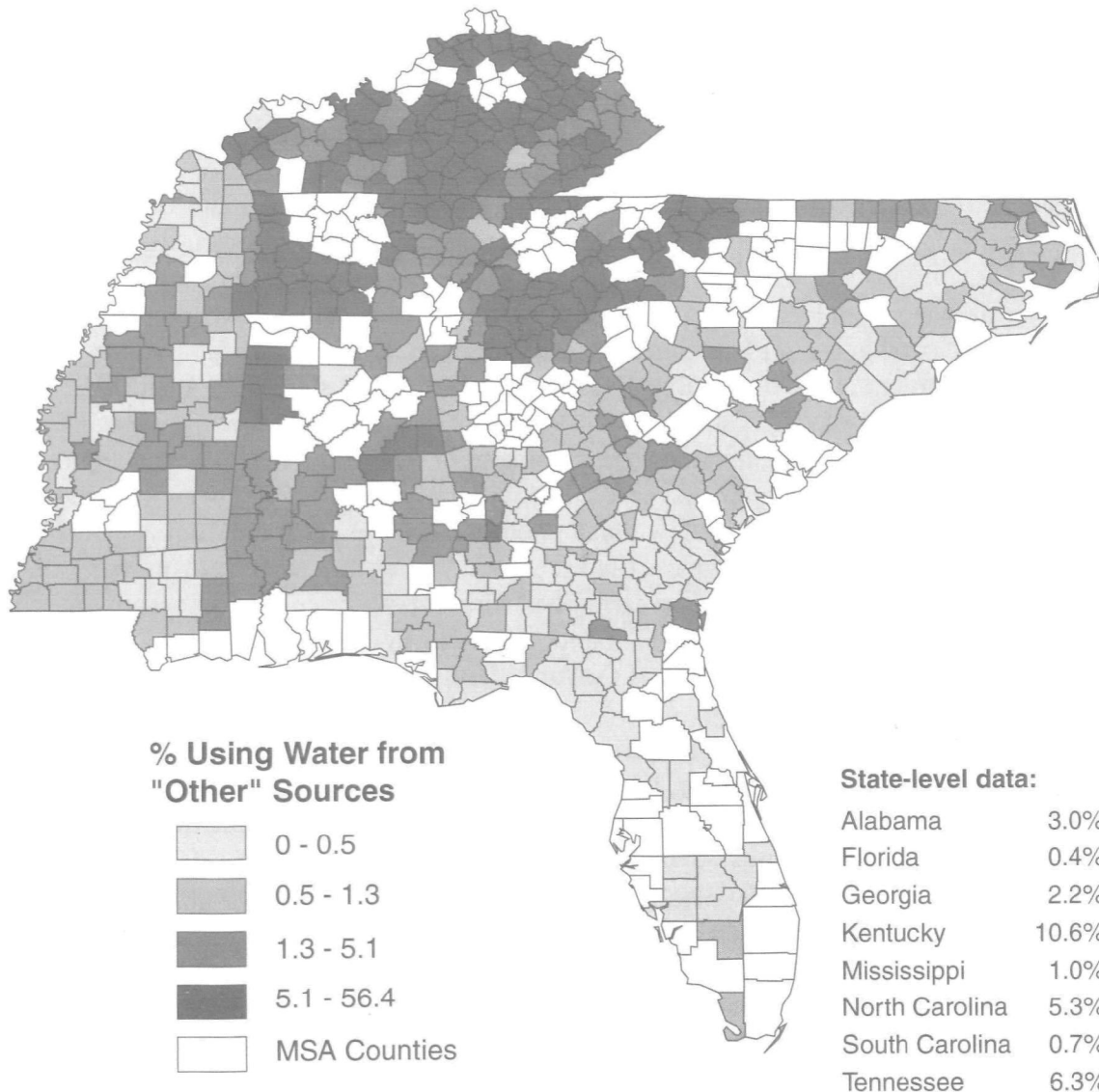
Figure 4: Percentage of Rural Housing Units Using Water from Drilled or Dug Well, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

Figure 5: Percentage of Rural Housing Units Using Water from Sources other than Public/Private Systems or Wells, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

Technical assistance is available to rural areas from EPA, state agencies, and the National Rural Water Association and its state chapters. This network of rural water operators is important in providing educational programs and technical assistance to small towns and rural areas interested in developing water supply systems. Other institutions and organizations such as the Cooperative Extension Service and local government associations may also provide technical assistance to small communities.

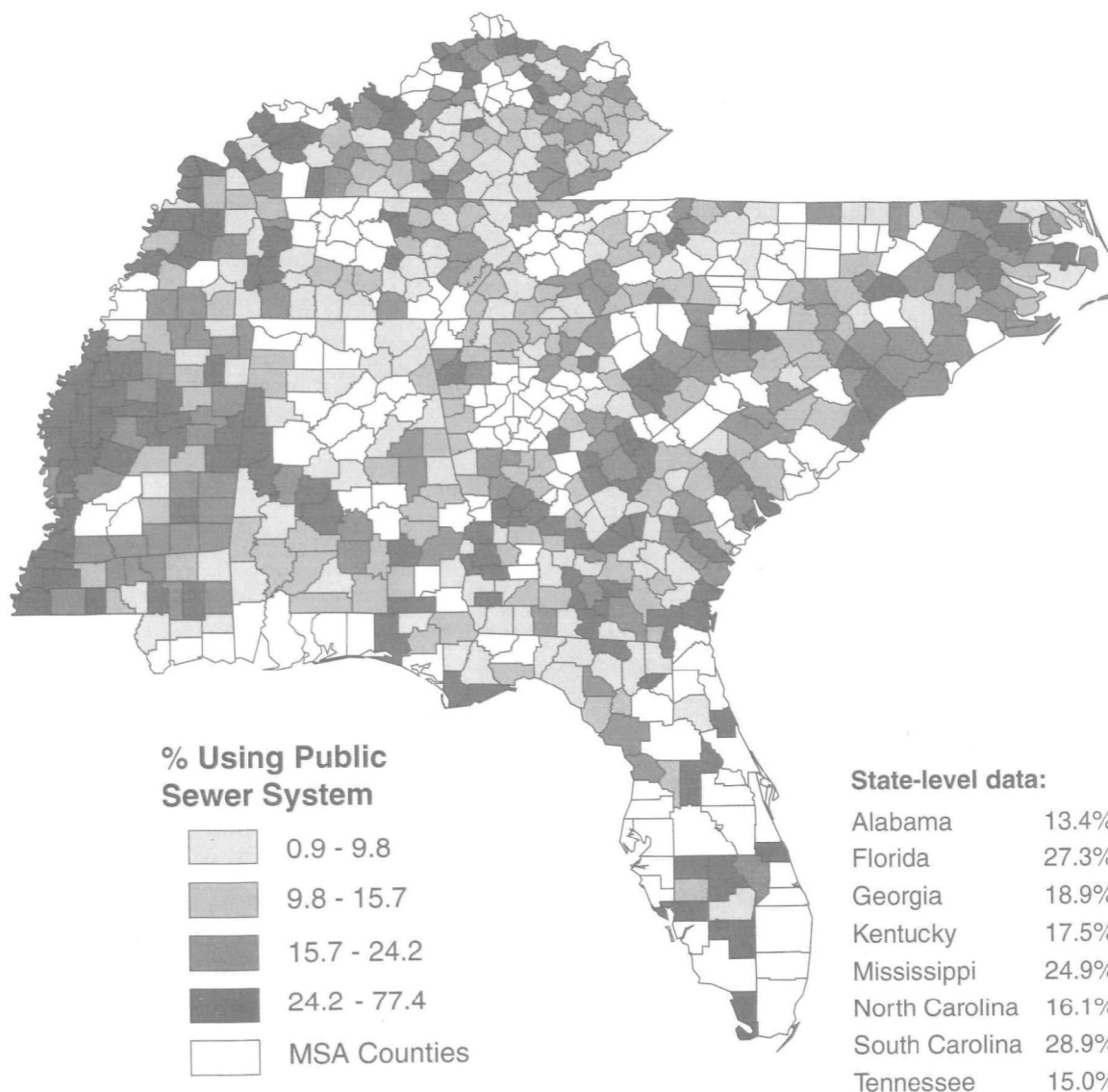
Wastewater Treatment and Disposal

Rural populations have historically used individual wastewater disposal options such as septic tanks. As populations become more concentrated, health concerns force the institution of sewer systems to more effectively treat and dispose of human waste. The maps on the next three pages (Figures 6, 7, and 8) present wastewater treatment and disposal options utilized by rural populations in the region. Whereas a relatively high percent of rural households are served by a public or private water supply system, the percentage served by a public sewer system is less. The percentage of rural households with public sewer service ranges from 13.4 percent in Alabama to 28.9 percent in South Carolina. These figures are consistent with a national study that found that about half of the rural cities and 89 percent of unincorporated rural communities were without wastewater treatment plants and 25 percent of the rural cities have inadequate plants.²⁰ This may reflect the higher cost associated with public wastewater systems over water supply systems. It may also reflect a view that a good water supply is more important for economic development and other purposes than is a good wastewater system. Although large sums of federal and state funds have been earmarked for wastewater collection, treatment, and disposal systems, relatively little of this has found its way to small communities in the South. Economies of scale have resulted in most of the funds being spent in urban-like areas.

The major wastewater treatment and disposal options in the region for rural households are the use of septic tanks and cesspools, which ranges from 67.9 percent of the rural households in Mississippi to 80.9 percent in Alabama. In most Region 4 states over three quarters of the rural households utilize septic tanks or cesspools. In Baker County, Florida, 96.7 percent of the housing units use a septic tank or cesspool. Although septic tanks can be an effective way to handle human waste, they must be installed and maintained properly. If they are not, they can result in groundwater contamination. About half of the waterborne disease outbreaks in the United States are related to contaminated groundwater and septic systems are the most frequently reported cause of the contamination. Where groundwater contamination results from septic systems, it is generally related to the density of the systems as well.²¹

A relatively small percentage of rural households in the region utilize other means for sewage treatment and disposal. These may vary from outhouses to chemical toilets. Rural households utilizing alternative sewage options range from 1.9 percent in Florida to 8.4 percent in Kentucky. In Clarke County, Alabama, 28.1 percent of the rural housing units rely on sewage disposal by methods other than septic tanks, cesspools, or public sewer systems.

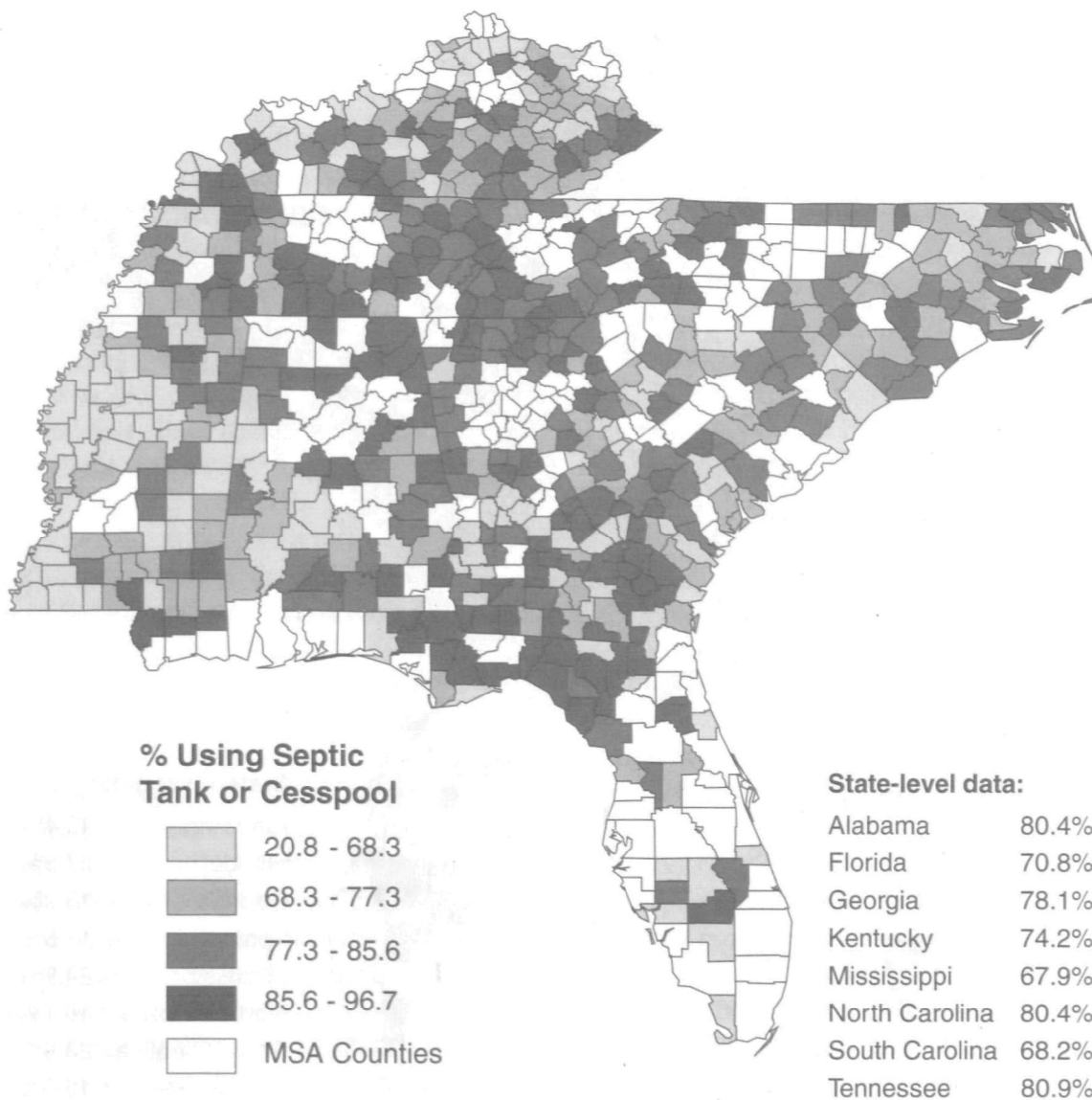
Figure 6: Percentage of Rural Housing Units Using a Public Sewer System, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

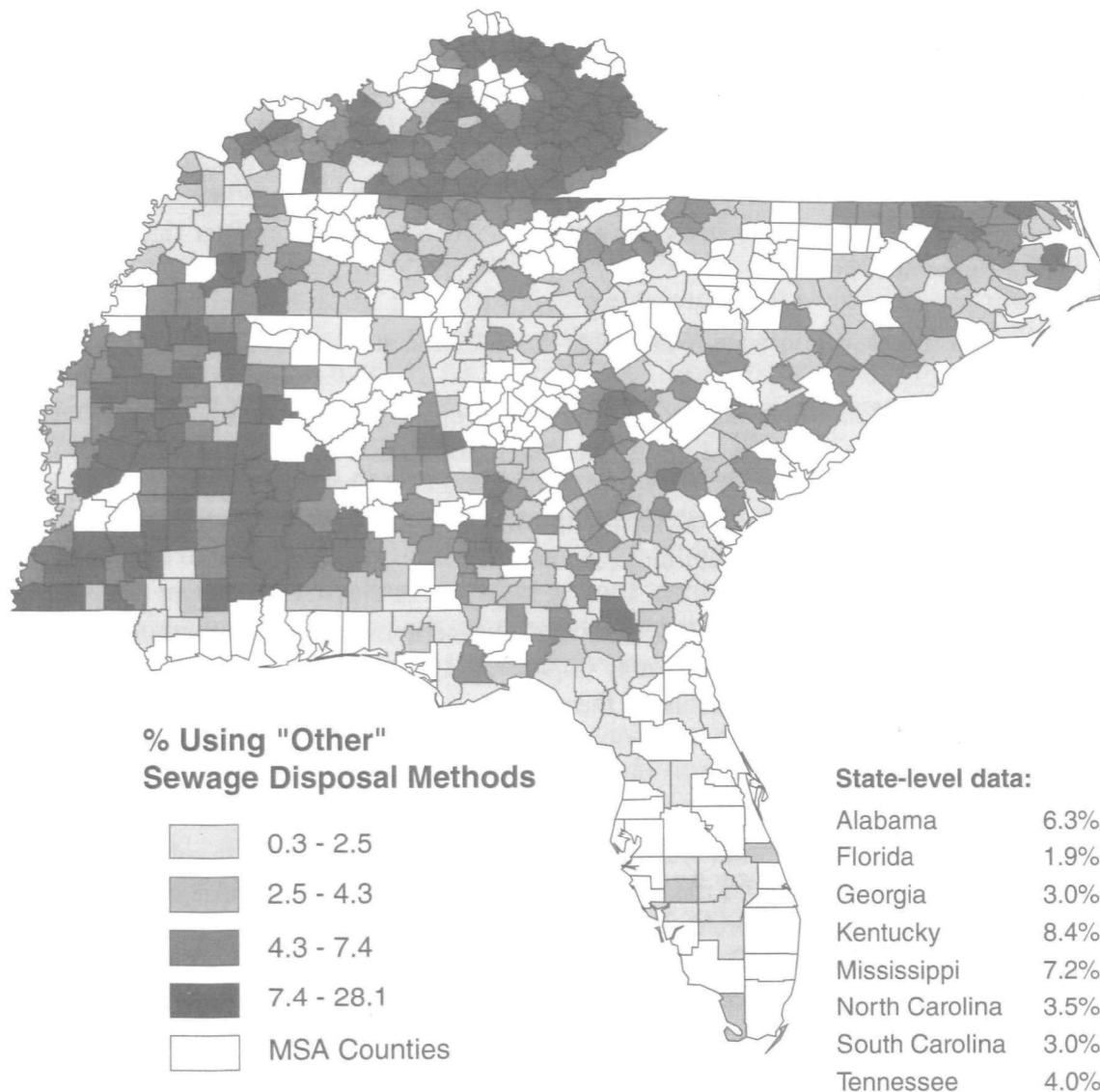
Figure 7: Percentage of Rural Housing Units Using Septic Tanks or Cesspools, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

Figure 8: Percentage of Rural Housing Units Using Sewage Disposal Methods other than Public Sewer Systems, Septic Tanks, or Cesspools, 1990



Note: "Rural Population" includes only those persons living in cities of 2,500 or less or in rural areas. Only nonmetropolitan counties are included.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1990, Summary Tape File 3A

The major federal law relating to wastewater treatment and disposal is the Clean Water Act. This law establishes water quality standards and requires permits for wastewater dischargers, including public wastewater treatment plants. Originally, a federal grant program provided funds on a matching basis for construction of wastewater treatment facilities. This is being converted to a revolving loan program.

In discussing the plight of local officials in addressing wastewater concerns, the National Association of Towns and Townships states that the initial financial assessment for facility construction is almost always a sobering experience but that small towns can capitalize on their strengths. They then present some recommendations based on the experience of small-community leaders:

- fixing or upgrading an existing system, when possible, is better than building a new one;
- cutting down on water usage cuts down on the size and cost of new facilities;
- several small systems may be better than one big one under specific circumstances, such as widely scattered population centers;
- using a homegrown workforce can substitute for overqualified or out-of-town labor on some construction tasks; and
- one hundred percent local financing is sometimes less costly than involvement with grants and loans that may impose delays, unnecessary design standards, and burdensome requirements on the project.

Solid Waste Management

Disposing of garbage or solid waste in rural America has generally involved burning it, burying it, or dumping it. Whatever method was used, it frequently took place close to the house. As populations become more concentrated, however, solid waste collection and disposal services become more common. The responsibility for disposing of municipal solid waste has, in most cases, been assumed by local governments, with or without private sector involvement, and generally depended on open dumps for waste disposal. It is probably safe to say that, historically, all counties in the region had at least one dump to handle their solid waste.

In 1965, federal legislation was passed in the form of the Solid Waste Disposal Act. The thrust of this legislation was to move from open dumps to sanitary landfills for solid waste disposal. Sanitary landfills differ from open dumps principally in having the waste compacted and covered daily. Although the federal law favored sanitary landfills, no federal permitting system was called for. In the late 1960s and early 1970s, however, the states in Region 4 enacted legislation which established permitting systems for solid waste disposal or assumed that responsibility under their general environmental protection authority.

In 1976, the federal law was amended and greatly expanded with the passage of the Resource Conservation and Recovery Act (RCRA). The thrust of this law was to remove most of the hazardous waste (i.e., industrial chemical waste) from the solid waste stream and to establish different management requirements for the hazardous waste. As with the 1965 law, the role of the federal government was widely interpreted to be advisory, leaving the states and the subdivisions with the responsibility to see that solid waste was managed properly.

By 1984, however, it was apparent that more was needed to ensure that solid waste disposal did not result in environmental degradation. With the 1984 amendments to RCRA, Congress directed EPA to develop environmentally protective landfill standards. These Subtitle D standards require the use of liners, leachate collection systems, methane monitoring, groundwater monitoring, and closure and postclosure care plans.

The impact of the Subtitle D regulations is significant. It was apparent when the draft regulations were released that the cost of solid waste management would increase dramatically. This realization coupled with the difficulty in siting new disposal facilities placed local governments in an onerous situation. As a result, they turned to their respective state capitols for help. Between 1988 and 1991 all states in Region 4, as well as most states across the country, enacted comprehensive solid waste management legislation. The laws that were enacted by states were essentially designed to accomplish two objectives. First, the laws brought the states into general compliance with the Subtitle D regulations. Second, they set in place a variety of criteria designed to reduce the amount of waste requiring disposal. Emphasis for waste reduction has focused on increasing recycling, but other options include increasing composting and mulching of organic waste, principally yard trimmings; reducing the amount of waste generated at the source; and encouraging reuse of materials to keep them out of landfills.

These developments in reducing and managing municipal solid waste have had a profound impact on the rural South. First, the days of every county having its own landfill are gone. For example, the number of landfills in Georgia decreased from 181 in 1990 to about half that many in 1995. At the same time, the disposal capacity remained at the same or higher level because the new landfills coming on line were larger. As a result, many local governments, primarily rural local governments, have gotten out of the solid waste disposal business. Larger, regional public and, increasingly, private landfills are replacing the county landfill. Coupled with this is a higher cost for solid waste disposal.

With the increased interest in reducing the solid waste stream, many local governments are instituting recycling programs. Small rural communities have found it more difficult to institute recycling programs due to the lack of infrastructure, lower volumes of materials recovered, and higher transportation costs. Some rural local governments, individually or with their neighboring jurisdictions, have adopted some creative mechanisms to allow them to recycle at higher levels.

Focus of Environmental Policies

U.S. environmental policies are in a state of flux for two reasons. One reason is the perception by some that our environmental policies are not doing what they should be doing; they are not protecting the environment as well as they should while the regulatory requirements are seen by some as being too prescriptive, costly, and inflexible. The second reason that our environmental policies are in a state of flux is that the nature of the problems they are designed to address are changing. The problems are changing from principally health to ecological risks, from point to nonpoint sources, from a limited number of major sources to a larger number of diffuse sources, and from only industrial to broader lifestyle activities. With these shifts comes the need to develop new strategies for addressing environmental concerns. As Table 4 shows, that there is a significant change in policy direction developing. By increasing awareness of these environmental trends, local officials can make decisions that support rather than hinder efforts to protect environmental quality.

Table 4
Changing Focus of Environmental Policies

1960-1990	1990-2000
Short-Term Perspective	Long-Term Perspective
Large Concentrated Pollution Sources	Small Dispersed Pollution Sources
End-Of-Pipe Management	Pollution Prevention (Source Reduction)
Command and Control Approach	Shared Responsibilities Approach
Autonomous Agencies	Consolidation and Agency Coordination
Each Local Government Provides Services	Shared Services/Regionalization
Everyone Pays	Polluter Pays
Public Information	Public Involvement

Source: James E. Kundell and Melody F. Dorfman. *Georgia's Environmental Policy: New Directions*, Carl Vinson Institute of Government, The University of Georgia, Athens, Georgia, 40 pp., 1994.

While the focus of environmental policies may be changing, governmental bodies do not have an unlimited array of options to affect these policies. Government actions will generally fall into one of the following areas.²²

- Change tax structure; (i.e., change tax rate, tax an externality, improve collection machinery);

- Alter regulations (i.e., tighten standards, close loopholes, improve enforcement);
- Provide or eliminate subsidies and grants (i.e., add or abolish a grant program, change formula for allocation);
- Adjust agency budgets (i.e., add or subtract from the budget; shift allocations from one budget item to another);
- Provide information (i.e., require disclosure, require government certification, simplify information);
- Modify the structure of private rights (i.e., contracts, property, liability, Constitutional);
- Alter the framework for economic activity (i.e., encourage or discourage competition, control prices, alter tax incentives);
- Undertake education and consultation activities (i.e., provide technical assistance, training);
- Institute financing and contracting actions (i.e., create new markets, lease public resources, redesign bidding systems, create new procurement practices);
- Adopt bureaucratic and political reforms (i.e., agency reorganizations, ethics reforms).

It is likely that changing environmental policies will result in changes in all of these options but certainly much of the focus will be on the use of incentives rather than regulatory options. Regulations will remain but they will be supplemented with incentives; technical assistance; public outreach, education, and involvement; public-private partnerships and other forms of cooperation; and other mechanisms designed to prevent and resolve problems in a cost-effective manner.²³ DeWitt John suggests that the evolving federal role with small communities may center less on funding and more on the provision of information.²⁴ He contends that federal policies toward rural areas should center on:

- information,
- expertise,
- civic capacity, and
- top-down support for bottom-up initiatives.

Thus federal policies should provide the flexibility to enable and support local efforts to address the problems they face in ways that meet their needs.

As environmental policies change, three efforts are necessary. First, as environmental responsibilities devolve from the federal government to states and their subdivisions, the capacity must exist at these levels to effectively implement sound environmental policies. This is particularly true for small communities. Capacity building must focus on the following:

- administrative capacity to handle paperwork and administer programs;
- financial capacity or having the fiscal resources to carry out the environmental responsibilities;
- legal authority to carry out effective environmental programs, including enforcement authority where appropriate and necessary; and
- technical capability to competently carry out environmental responsibilities.

If these capacities are not in place and cannot be provided, it may be necessary to alter environmental policies to reflect this situation.

In light of the limited resources available in small communities, the second effort for sustaining environmental quality is to focus resources on the most pressing environmental problems. A mechanism is needed to prioritize environmental, as well as other, problems and to address the most significant first. Without such an approach, limited resources can be squandered on relatively insignificant problems while severe problems go unaddressed. Both states and local governments in the region should consider adopting an environmental priority setting process to determine which problems are most pressing in their jurisdiction.[†]

When setting priorities, it is important to include representatives of the general public because the public perception of environmental problems tends to differ from that of scientists. Table 5 presents the most significant ecological and health risks as identified by EPA's Science Advisory Board. Table 6 presents the public's view of environmental problems by presenting the percentage of the respondents who rated each problem as very serious. Note that the problems in bold in Table 6 relate to the most significant problems identified by the Science Advisory Board. These tables suggest that there is a vast difference between what the science community and the general public perceive as the most important environmental problems.

The third component for sustaining environmental quality is an environmentally literate public. It is important to realize that the focus of environmental efforts is changing from point

[†] Alabama and Kentucky, as well as the City of Atlanta, have already undertaken priority setting efforts. Additional information on environmental priority setting can be obtained from the Northeast Center for Comparative Risk, Vermont Law School, P.O. Box 96, Chelsea Street, South Royalton, VT 05068.

Table 5
Ecological and Health Risks
(EPA Science Advisory Board)

High-Risk Ecological Problems*

- Global climate change
- Stratospheric ozone depletion
- Wildlife habitat alteration and destruction
- Species extinction and loss of biodiversity

Medium-Risk Ecological Problems

- Acid deposition
- Pesticides
- Airborne toxic chemicals
- Toxic chemicals, nutrients, and turbidity in surface water

Low-Risk Ecological Problems

- Oil spills
- Groundwater pollution
- Radioactive isotopes
- Acid runoff to surface water
- Thermal pollution

High-Risk Health Problems

- Indoor air pollution
- Outdoor air pollution
- Worker exposure to industrial or farm chemicals
- Pollutants in drinking water
- Pesticide residues on food
- Toxic chemicals in consumer products

* Items in each category are not listed in rank order.

Table 6
Public's Top Environmental Concerns

Problem	Percent
Active hazardous waste sites	67
Abandoned hazardous waste sites	65
Water pollution from industrial waste	63
Occupational exposure to toxic chemicals	63
Oil spills	60
Destruction of the ozone layer	60
Nuclear power plant accidents	60
Industrial accidents releasing pollutants	58
Radiation from radioactive wastes	58
Air pollution from factories	56
Leaking underground storage tanks	55
Coastal water contamination	54
Solid waste and litter	53
Pesticide risk to farm workers	52
Water pollution from agricultural runoff	51
Water pollution from sewage plants	50
Air pollution from vehicles	50
Pesticide residues in food	49
Greenhouse effect	48
Drinking water contamination	46
Destruction of wetlands	42
Acid rain	40
Water pollution from city runoff	35
Nonhazardous waste sites	31
Biotechnology	30
Indoor air pollution	22
Radiation from x-rays	21
Radon in homes	17
Radiation from microwave ovens	13

sources to nonpoint pollution and from industrial sources of pollution to ones that are more dispersed and related to modern lifestyle. To effectively address these sources of contamination, public information, education, and involvement are critical. People have to understand why these dispersed pollution sources can collectively create major problems; what needs to be done to prevent or correct the problems; and how to effectively address the problems. It is unrealistic to think that public support and action can be obtained without significant investments in informing and involving the public. The use of advisory committees, focus groups, and other measures to incorporate public involvement into the decision-making process will become increasingly important in the future.

The public must also be provided with good information. It is important to have sound research efforts designed to improve our understanding of problems and how to address them; to develop accurate databases on environmental conditions; to develop and utilize information systems to make accurate information more readily available to all users; and to inform the public about the environment. Better, more accessible information and an informed public will help small communities more effectively respond to changing environmental policies.

Conclusions

Small communities may not experience many of the environmental problems faced by urban areas, but the lack of internal resources and their dispersed nature makes it difficult to address the problems they do have. They frequently lack financial capacity due to small tax bases. Consequently, they have few, if any, full-time staff, especially those trained to deal with environmental matters, nor do they tend to have access to private capability to assist them. Small communities are generally older, incomes of their residents more limited, and infrastructure costs per capita higher than in larger communities.

Although their internal capacities may be limited, small communities may be called on to assume a variety of environmental responsibilities including the provision of certain environmental services (i.e., drinking water supply, wastewater disposal, solid waste management) and/or addressing specific environmental problems (i.e., leaking underground storage tanks, Superfund sites). Additionally they may be called on to comply with environmental review requirements for proposed activities under the National Environmental Policy Act or state environmental assessment laws or to obtain a Section 404 permit for activities that alter wetlands. As a result, there is a schism between what small communities are asked to do and their ability to do it.

This report presents environmental trends in the South and describes the changing nature of environmental policies. It attempts to discern those forces at work that influence a small community's ability to address environmental matters. The mission before us is to identify strategies and to create a framework for EPA and other institutions to better assist small communities in carrying out environmental responsibilities and resolving environmental problems.

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