CHAPTER 4

NATURAL RESOURCES AND ENVIRONMENTAL QUALITY

One goal of smart growth policies is to protect natural resources and improve environmental quality by conserving undeveloped land and improving air quality and water quality. The connection between statewide smart growth programs and land conservation is direct: states with smart growth policies are able to mandate preservation of some types of land, such as farmland, open space, and environmentally sensitive land. But the connection to improvements in air quality is more indirect: advocates believe smart growth policies will reduce vehicle miles traveled, which should result in decreased air pollution from automobile emissions, other things being equal. And the connection to improvements in water quality is even more indirect: advocates believe smart growth policies encourage land use patterns that reduce impermeable surfaces and the amount of runoff for a given amount of built space, thereby protecting environmentally sensitive riparian areas.

The research in this project does not strongly support or refute the hypothesis that smart growth states generally do better at protecting natural areas or improving environmental quality. The available evidence does suggest, however, a connection between smart growth policies and conservation of resource land and farmland. The case study states that mandate protection of these types of land lost fewer acres over the last two decades.

THE VALUE OF NATURAL RESOURCES AND ENVIRONMENTAL QUALITY

Protecting natural resources and improving environmental quality are different but related concepts. Natural resources are physical assets—air and water, land and minerals, plants and animals—that contribute to environmental quality, among other things. Protecting natural resources entails either preventing or mitigating development of, or extraction from, these natural

assets. Such protections arguably lead to better environmental quality than if the natural resources were developed or extracted.

Thus, improved environmental quality can be viewed as a likely result of protecting natural resources. While it may be argued that it is possible to improve environmental quality in other ways (for example, by better treatment of effluent), the counterargument is that such treatment is precisely a means of protecting an air or water resource.

Implicit in these definitions is the idea that resources left in a natural state can provide ecological services (such as water quality) and social services (such as recreation) that are at least as valuable as the services they provide when developed. Indeed, there is a growing recognition that natural features such as forests, rivers, riparian areas, grasslands, and other natural resources provide multiple benefits collectively known as ecosystem services. These resources help maintain the biophysical functions that affect our climate, the air we breath, the water we drink, and the food we eat.

A widely cited reference in the field of environmental science describes ecosystem services and the related benefits to society as:

> . . . the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. They maintain biodiversity and the production of ecosystem goods, such as seafood, forage, timber, biomass fuels, natural fiber, and many pharmaceuticals, industrial products, and their precursors. The harvest and trade of these goods represent an important and familiar part of the human economy. In addition to the production of goods, ecosystem services are the actual life-supporting functions, such as cleansing, recycling, and renewal, and they confer many intangible aesthetic and cultural benefits as well. (Daily 1997, 3)

If properly managed and protected, natural resources provide these valuable ecosystem services. If they are degraded, society loses these services and either does without or attempts to replicate them as best it can—often at great expense. For example, well-functioning riparian areas can help mitigate flooding and prevent soil erosion. By sharp contrast, the loss of wetlands and mangrove habitat along the Gulf Coast contributed to the severity of damages during Hurricane Katrina in 2005. The high cost of bringing back salmon runs in the Northwest is another example of the expense involved in trying to restore a natural resource once it has declined significantly. References throughout the economic literature describe the importance of ecosystem services provided by riparian areas, upland forests, and other natural resources (Costanza et al. 1997; King and Mazzotta 2003).

STATE LAND CONSERVATION POLICIES

In planning for urban land uses, natural features both constrain the supply of buildable land (i.e., wetlands and steep slopes make land less suitable for development) and influence the demand for land. Regional and urban planning often includes an analysis of buildable land that tries to: (1) identify lands that need protection of those lands based in large part on the value of the natural materials and ecosystem services they provide; (2) ensure protection of those lands with policy; and (3) subtract lands protected from the inventory of buildable land that can accommodate population and employment growth. These types of analyses are conducted on a semi-regular basis in Oregon and Washington as part of their smart growth programs.

All of the states evaluated in this study—and almost certainly all states in the country—have policies, programs, and agencies that address various aspects of environmental quality. Some of these efforts are federally mandated and therefore are similar across states. Others differ. For example, some states focus on conservation of land through private trusts or easements, primarily for open space, recreational uses, or environmental protection. Others put a priority on regulating agricultural lands for economic uses. The approaches of the four smart growth states included in this analysis are described below.

- *Florida*. The Florida Forever program was established to protect environmentally sensitive lands and to promote potable water supplies. The program has used $6 billion in state funds and placed more than 2.5 million acres in the hands of

state and local governments through fee-simple purchases. Florida also passed the Rural and Family Lands Protection Act in 2001 to protect agricultural land. Although this legislation identifies agricultural lands as a priority for preservation, the state has not authorized funding for the purchase of development rights and the establishment of easements. Because of this differential treatment, Florida has become a national leader in the purchase of conservation lands, but does not provide substantial protection for agricultural lands.

- *Maryland*. State policies protecting open space, conserving environmentally sensitive land, and preserving agricultural land date back to the late 1960s and early 1970s. Maryland provides funding for preservation of open space and rural lands, as well as for development of parks and conservation areas. The Maryland Agricultural Land Preservation Program purchases easements that permanently restrict development on prime farmland and woodland. More recently, Maryland has developed programs to identify and protect lands critical to long-term ecological health.

- *New Jersey*. New Jersey protects agricultural land under its Statewide Goals and Strategies, primarily for the economic benefits of farming. State policies include protecting farmland, funding agricultural facilities, streamlining regulations about agriculture, educating the public about the benefits of agriculture, and creating economic development strategies such as marketing agricultural products outside of New Jersey and promoting economic activities that support agriculture.

- *Oregon*. The statewide planning program provides for the preservation of agricultural and forestry lands, environmentally sensitive lands, and open spaces. Oregon's planning system has been most successful at preserving agricultural and forestry land for economic use. A key requirement is that each city must maintain an urban growth boundary, thus limiting development in rural areas. Oregon also preserves environmentally sensitive areas, such as riparian zones, within urban areas by limiting development on these lands. The system also requires cities and counties to plan for the recreational needs of residents, primarily through provision of parks and open spaces.

In the four states without statewide smart growth programs, the approaches to environmental protection are voluntary and focus on land conservation programs. Each of these states has policies to encourage land conservation through private, and in some cases, public efforts.

- *Colorado*. Colorado uses three principal methods for protecting conservation land: private land trusts, public acquisition of property, and state investment in parks and recreation land. The state offers conservation tax credits to private land trusts. In 1994 the state established the Great Outdoors Colorado Program, a lottery-funded program to purchase land for conservation and parks.

- *Indiana*. Large areas of Indiana remain in agricultural and forestry use, but state efforts to protect that land are limited. The principal tool used by the state is the Indiana Heritage Trust, which is funded largely from purchases of environmental affinity license plates. The program, operated by the Department of Natural Resources, has partnered with dozens of individual landowners and organizations, including nonprofit land trusts, The Nature Conservancy, private companies (some in the forestry business), public utilities, and other governmental agencies.

- *Texas*. Texas has several state laws and programs aimed at conservation of agricultural and forestry lands. The Texas Forest Service operates three conservation programs. The Forest Heritage Program encourages private forest owners to gift their properties to the state to serve as "demonstration forests." The proceeds of sustainable forestry practices fund an endowment to manage the heritage forests or support forestry excellence funds. The Forest Stewardship Program offers technical assistance to private landowners in developing sustainable forestry plans for their properties. The Forest

Legacy Program allows the state to purchase conservation easements on forestland from willing sellers to keep the land in forestry use.

- *Virginia*. While Virginia does not have a uniform statewide program for land conservation, it does have state laws that enable jurisdictions to adopt conservation policies. Jurisdictions can tax farmland and open space on their use rather than on fair market value, and they are allowed to establish agricultural and forestry districts where development is limited and landowners receive tax incentives for participating. Virginia also allows conservation easements and the transfer of development rights.

PERFORMANCE MEASURES

To analyze the impacts of smart growth policies on natural resource protection and environmental quality, data sources had to meet two basic criteria: (1) be relatively simple measures that are related to planning policy; and (2) be based on data that are available in all eight states, consistently measured over time (roughly 1990 to 2000), and disaggregated to the county level where possible.

Despite extensive research and consultation with government and nonprofit officials, the following data constraints made it difficult to specify good performance measures, particularly for air and water quality and for fauna and flora.

- *Connection with planning policy*. The connections between environmental quality indicators and planning policy are difficult to establish. For example, air quality is directly affected by regulation of industrial pollution, which is not directly influenced by urban planning. Air quality is also directly affected by transportation policies, such as those that influences vehicle miles traveled or federal regulation of gasoline consumption.

- *Complexity of environmental systems*. Numerous aspects of human activity and natural systems affect environmental quality, especially water quality. It is often impossible to isolate the change in environmental quality resulting from a particular activity or a change in planning policy.

- *Complexity of the data*. The knowledge needed to interpret some of the environmental data is beyond the level of most planning professionals, especially the analyses of water quality. The U.S. Environmental Protection Agency maintains a number of databases on water quality, but does not necessarily produce county-level reports that interpret this information.

- *Time period*. Some data, such as those collected in the decennial census, are available for 1990 and 2000. But in many cases, information is available for a slightly different period. For example, the Census of Agriculture is conducted every five years, with data available for 1992 through 2002. Where possible, however, percent change or growth rates can be used to standardize the data.

- *Time series*. Data may not be available in a time series. For example, the National Wetlands Inventory (NWI) does not provide longitudinal data about changes in the amount of wetlands by state, much less by county. For some states, the NWI has only partial data about existing wetlands.

- *Geography*. Standardized data regarding environmental quality and natural resource protection at the county level are scarce. Datasets focus on geographies that range from the county to the watershed to the state level. For this reason, the performance measures in this chapter generally use state-level data.

Given these limitations, the list of performance indicators was necessarily limited to five, all relating to land—resource land, farmland, farmland under conservation, land in trust, and state parkland.

RESOURCE LAND

The Natural Resources Conservation Service (NRCS) tracks changes in land use in the National Resource Inventory (NRI).

The NRI is a statistical survey of natural resource conditions and trends on nonfederal land in the United States, including privately owned lands, tribal and trust lands, and lands controlled by state and local governments. The NRI is a longitudinal survey that uses scientific statistical principles and procedures. The survey was conducted every five years from 1982 to 1997 and is now done annually, although 1997 is the last year for which data are available.

This analysis combines five of the nine categories from the NRI into a single measure of productive lands, referred to here as resource land.

1. *Cropland.* Areas are used for the production of adapted crops for harvest.

2. *Pastureland.* Land is managed primarily for production of introduced forage plants for livestock grazing, regardless of whether it is being grazed.

3. *Rangeland.* Land has potential plant cover composed principally of native grasses, grass-like plants, or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland.

4. *Forestland.* Areas are at least 10 percent stocked by single-stemmed woody species of any size that will be at least 4 meters (13 feet) tall at maturity, as well as land bearing evidence of natural regeneration of tree cover (cut-over forest or abandoned farmland).

5. *Conservation Reserve Program (CRP) land.* Land is covered by a CRP contract.

The other four categories in the NRI are developed land, water areas, federal land, and other rural land. The "other" category was excluded because it includes nonproductive lands.

It is important to note that, in the aggregate, federal land accounts for about 30 percent of land in the four smart growth states and 10 percent in the other selected states. Unlike all other designations, federal land is one of jurisdiction/ownership rather than of land cover. Although federal lands may be disproportionately resource lands, there is no independent way to estimate the share. Thus, the method used here likely underestimates—perhaps substantially in some states—the total amount of resource land.

FARMLAND

The National Agricultural Statistics Service (NASS) of the U.S. Department of Agriculture (USDA) conducts the Census of Agriculture every five years. The USDA reports the amount of land in acres for all individual, partnership, or corporate farms. The census defines a farm as any place from which $1,000 or more of agricultural products are produced and sold, or normally would have been sold, during the year the census is conducted. This analysis uses data from the 1987 and 2002 censuses.

Under the USDA definition, farmland is any land used to produce crops, livestock, specialty livestock, or grazing, including woodland and wasteland not under cultivation or used for pasture or grazing, as well as land enrolled in conservation programs. The USDA includes some but not all pasture and rangeland in its definition.[1]

FARMLAND ENROLLED IN CONSERVATION PROGRAMS

The Census of Agriculture tracks the amount of farmland enrolled in the Conservation Reserve Program (CRP) and the Wetlands Reserve Program (WRP), which provide incentives to conserve environmentally sensitive land. The CRP is designed to help farmers convert highly erodible or environmentally sensitive farmland to nonproductive vegetative cover, such as grasses, trees, or riparian buffers. The program provides annual rental payments and cost-share assistance to farmers who sign contracts lasting 10 to 15 years. To be eligible, a site must be cropland (or former cropland) that is highly susceptible to erosion, suitable for use as a riparian buffer, or located in a conservation priority area as determined by the CRP.

The WRP helps landowners protect, restore, and enhance wetlands on their properties. Land enrolled in this program is placed under 30-year or permanent easements.

Landowners are reimbursed for the easement and the costs of restoring the wetland. Landowners can also choose to receive assistance from the U.S. Department of Agriculture to restore wetlands without placing an easement on the property. Lands eligible for the WRP are wetlands, farmed wetlands, flooded wetlands, degraded range or pasture lands, riparian areas, lands adjacent to protected wetlands, and previously restored wetlands.

LAND IN PRIVATE LAND TRUSTS

The Land Trust Alliance (LTA) is a nonprofit organization that accredits land trusts throughout the country for maintaining nationally agreed-upon best practices. Land trusts are nonprofit, tax-exempt organizations that work to conserve land for its natural, recreational, scenic, historical, and productive values. Land trusts either enact or facilitate the creation of conservation easements, permanently limiting the type and scope of development on the land, or they purchase the land outright.

The LTA has conducted a census of land in private land trusts in every state since the early 1980s. This census measures the pace, volume, and type of private land conservation occurring throughout the country (LTA 2005). It also documents trends in land trust management, including number of acres privately conserved both at the state and national levels; types of conservation tools employed by local land trusts and landowners; types of land conserved or targeted for conservation; regional growth patterns in private land conservation; and human and fiscal resources of land trusts operating in the United States.

STATE PARKLAND

The National Association of State Park Directors (NASPD) conducts regular surveys of the amount of land in state park systems. NASPD membership is made up of the administrative heads of the nation's 50 state park agencies. The organization, founded in 1962, collects information about state park systems, provides leadership development opportunities for state park directors, and encourages collaborative relationships with other federal and state agencies.

NASPD's surveys of state parkland are self-reported by the states about every 10 years. The most recent data available are from 2006 and include the number of acres within each of the 50 state park systems. Totals do not account for natural areas, historic areas, trails, or recreation areas, which have been counted separately since 1980.

SMART GROWTH PROGRAMS AND LAND CONSERVATION

Two primary goals of state smart growth policies are denser urban development and more conservation of open space. The link between these outcomes and smart growth programs is thus measured through changes in the amount of land in each category. States with smart growth programs protect natural resources by mandating preservation of some types of land. As a result, they generally had comparatively smaller losses in resource land and farmland (relative to population growth) than the other selected states. Another way to protect natural resources is through private and public land conservation programs, which all case study states have in one form or another.

CHANGE IN RESOURCE LAND

If state smart growth programs are having an effect on natural resources and the environment, preservation of resource land should be greater in states with these programs than in states without them. This is a simple, fundamental, and overarching measure of the impacts of smart growth policies on natural resources and environmental quality. Using percent change in the amount of resource land allows comparisons across states with very different endowments of such land.

As figure 4.1 shows, all states experienced losses in resource land and gains in developed land between 1982 and 1997. The majority of losses were in cropland, although the number of acres in pastureland, rangeland, or forestland in most states declined as well.

Table 4.1 indicates that resource land in the eight case study states accounted for between 45 percent (Oregon) and 90 percent (Texas) of total land in 1997. New Jersey had the smallest amount of resource land (2,399,000 acres) and Texas had the largest (153,319,000 acres). The absolute declines in resource land from 1982 to 1997 ranged between 311,000 acres in

Maryland and 3,092,000 acres in Texas. More relevant to the comparisons here, the loss of resource land varied from 2 percent in Oregon, Colorado, Indiana, and Texas to 18 percent in New Jersey.

Table 4.1 comparisons also suggest that the other selected states perform better on this particular measure. As a group they lost only 2 percent of their resource lands, while smart growth states lost 6 percent. One possible explanation for this outcome is that the selected states without smart growth programs have four times the acreage of resource land. As a result, they may have lost more acres, but from such a large base that the percentage loss is smaller.

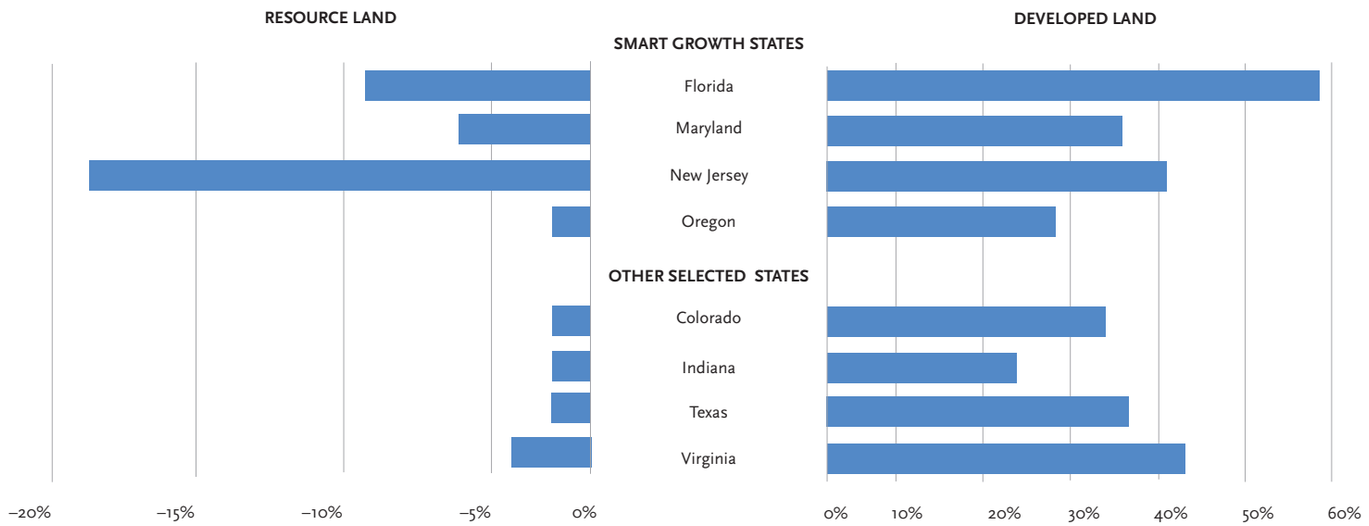
Assuming that population gains are a proxy for growth, it may be that losses of resource land are a function of growth. The data in table 4.2 support this hypothesis. States with strong population growth relative to those with weak growth would be expected to lose more resource land. But if the population is growing more quickly than the loss of resource land, this would suggest that the states are using less additional land to accommodate new residents.

Table 4.2 divides the loss of resource land by the growth in population to calculate the percent change in acres per additional resident. The four smart growth states lost less resource land per additional person (0.59 acres) than the other selected states (0.76 acres). Even here, however, the results are mixed and the outliers are important. Oregon, touted as having one of the strongest statewide programs for preserving resource lands, lost more acreage per additional person than any other case study state except Indiana. One explanation may be that the large and growing urban areas in Oregon are surrounded by more resource land than the urban areas in the other states.

CHANGE IN FARMLAND

Table 4.3 shows the change in farmland relative to population growth from 1987 to 2002. To standardize for population growth, the table divides the acres of farmland lost by the growth in population to calculate the change in acres of farmland per added person. States with strong population growth relative to those with weak growth would be expected to lose more farmland. If the population of a state is growing at a faster pace than the rate at which farmland is decreasing, then the state is using less additional farmland to accommodate new residents.

Figure 4.1 **Percent Change in Resource and Developed Land, 1982–1997**



Source: U.S. Department of Agriculture (2000).

Table 4.1 **Change in Acres of Resource Land, 1982–1997**

	Acres in 1982 (000s)	Acres in 1997 (000s)	Percent of Total Land in 1997	Change 1982–1997	
				Acres (000s)	Percent
SMART GROWTH STATES					
Florida	25,219	22,868	61	-2,351	-9
Maryland	4,798	4,487	57	-311	-6
New Jersey	2,925	2,399	46	-527	-18
Oregon	28,646	28,134	45	-512	-2
All Four States	**61,587**	**57,887**	**51**	**-3,700**	**-6**
OTHER SELECTED STATES					
Colorado	40,579	39,886	60	-693	-2
Indiana	19,759	19,395	84	-364	-2
Texas	156,411	153,319	90	-3,092	-2
Virginia	20,103	19,299	71	-804	-4
All Four States	**236,852**	**231,899**	**81**	**-4,953**	**-2**

Source: U.S. Department of Agriculture (2000).

Table 4.2 **Change in Resource Land per Additional Person, 1982–1997**

	Change in Resource Land (000s of acres)	Change in Population (000s)	Change in Acres of Resource Land per Added Person
SMART GROWTH STATES			
Florida	-2,351	4,212	-0.56
Maryland	-311	810	-0.38
New Jersey	-527	623	-0.85
Oregon	-512	578	-0.88
All Four States	**-3,700**	**6,223**	**-0.59**
OTHER SELECTED STATES			
Colorado	-693	830	-0.83
Indiana	-364	404	-0.90
Texas	-3,092	4,024	-0.77
Virginia	-804	1,240	-0.65
All Four States	**-4,953**	**6,498**	**-0.76**

Source: U.S. Department of Agriculture (2000).

Suburbanization has been the trend over the last 100 years, especially outside the developed cities of the eastern seaboard. The density of urban areas has declined at the same time that the number and percent of people living in urban areas have increased. Thus, a decline in the rate of farmland lost relative to the rate of population growth would be some evidence of a change in that trend.

Acres of farmland decreased more slowly relative to population growth in the smart growth states than in the other selected states. The loss rate averaged 0.26 acres of farmland per added person in the smart growth states and 0.56 acres in the other selected states.

All states had less farmland by 2002, with the other selected states reporting the largest (Colorado) and smallest decreases (Virginia). Although the smart growth states lost less farmland both in absolute terms and on a per person basis, they did lose a larger share of their farmland—similar to the pattern of change in resource land. States with smart growth programs generally have less farmland than states without such programs,

Table 4.3 **Change in Farmland per Additional Person, 1987–2002**

	Change in Farmland (000s of acres)	Change in Population (000s)	Change in Acres of Farmland per Added Person
SMART GROWTH STATES			
Florida	-779	4,685	-0.17
Maryland	-319	876	-0.36
New Jersey	-89	907	-0.10
Oregon	-729	823	-0.89
All Four States	**-1,916**	**7,290**	**-0.26**
OTHER SELECTED STATES			
Colorado	-2,955	1,240	-2.38
Indiana	-1,112	682	-1.63
Texas	-625	5,141	-0.12
Virginia	-52	1,353	-0.04
All Four States	**-4,744**	**8,415**	**-0.56**
United States	**-26,192**	**45,837**	**-0.57**

Source: U.S. Department of Agriculture (1987b; 2002).

both in absolute terms and as a share of total land. Indeed, one reason that these states adopted smart growth policies was to protect farmland. It may be that the programs in some states are more effective at preserving farmland than in others.

Surprisingly, Oregon saw the largest percent loss of farmland per person among smart growth states despite policies that protect farmland—especially prime farmland. Further analysis shows that the majority of farmland losses occurred in the sparsely populated eastern region, where only 5 percent of the state's population lives. By comparison, the Willamette Valley, Oregon's most urbanized area with about 70 percent of the state's population, gained a small amount of farmland (0.05 acres per new person). This area also has the highest concentration of prime farmland in the state. Given Oregon's highly regulated and restrictive process for expanding urban growth boundaries, it seems unlikely that the bulk of Oregon's farmland loss in the largely unpopulated part of the state is directly related to population growth and urbanization.

While Colorado experienced the largest decrease in farmland, it also posted one of the largest increases in farmland enrolled in conservation programs and land privately conserved. Given that Colorado has several statewide policies that emphasize land conservation, some of the farmland losses may be a result of public and private conservation programs (see next section).

Because farmland is a potentially large subset of resource land, some correlation might be expected between changes in resource land and changes in farmland. There are in fact some consistencies: on average, smart growth states lost fewer acres (per new person) of resource land and farmland. Oregon, Colorado, and Indiana were the poorest performers and lost the most farmland per person. Virginia did the best among the other selected states on both measures, and lost the least farmland per person of all eight states. New Jersey had relatively high losses of resource land, but relatively low losses of farmland.

CHANGE IN FARMLAND ENROLLED IN CONSERVATION PROGRAMS

Table 4.4 shows the change in land enrolled in the Conservation Reserve and Wetlands Reserve programs. Over the 15-year period, land enrolled in these programs increased in each of the

Table 4.4 **Change in Farmland Enrolled in Conservation Programs, 1987–2002**

	Acres under Conservation		Percent of Total Farmland in 2002	Change 1987–2002	
	1987	2002		Acres	Percent
SMART GROWTH STATES					
Florida	25,835	97,267	1	71,432	276
Maryland	5,101	57,397	3	52,296	1,025
New Jersey	–	2,605	0	2,605	100
Oregon	292,043	483,237	3	191,194	65
All Four States	**322,979**	**640,506**	**2**	**317,527**	**98**
OTHER SELECTED STATES					
Colorado	811,790	1,735,353	6	923,563	114
Indiana	79,945	291,664	2	211,719	265
Texas	1,085,184	3,302,766	3	2,217,582	204
Virginia	14,340	107,610	1	93,270	650
All Four States	**1,991,259**	**5,437,393**	**3**	**3,446,134**	**173**
United States	**9,870,669**	**32,723,967**	**3**	**22,853,298**	**232**

Note: Includes farmland enrolled in Conservation Reserve and Wetlands Reserve programs.

Source: U.S. Department of Agriculture (1987b; 2002).

Table 4.5 **Change in Share of Farmland Enrolled in Conservation Programs, 1987–2002**

	1987 Share	2002 Share	Change in Share 1987–2002
SMART GROWTH STATES			
Florida	0.2	0.9	0.7
Maryland	0.2	2.8	2.5
New Jersey	0.0	0.3	0.3
Oregon	1.6	2.8	1.2
All Four States	**1.0**	**2.1**	**1.1**
OTHER SELECTED STATES			
Colorado	2.4	5.6	3.2
Indiana	0.5	1.9	1.4
Texas	0.8	2.5	1.7
Virginia	0.2	1.2	1.1
All Four States	**1.1**	**2.9**	**1.9**
United States	**1.0**	**3.5**	**2.5**

Note: Includes farmland enrolled in Conservation Reserve and Wetlands Reserve programs.

Source: U.S. Department of Agriculture (1987b; 2002).

eight states—more than doubling in some cases. Texas and Colorado, the states with the largest increases in CRP and WRP land, also have the most farmland. Overall, the other selected states outperformed the smart growth states on this measure, 173 percent compared to 98 percent. The states with the largest percentage increases were Maryland and Virginia.

Table 4.5 indicates that the share of farmland enrolled in CRP and WRP programs in states without smart growth programs increased from about 1.1 percent in 1987 to 2.9 percent in 2002, a gain of about 1.9 percent of farmland. Smart growth states experienced smaller changes in the share of farmland enrolled in conservation programs, increasing from 1.0 percent to 2.1 percent. The share of farmland enrolled in these programs increased the most in Colorado followed by Maryland and Texas.

In summary, the smart growth states had 3 percent of the nation's farmland and 2 percent of land enrolled in CRP and WRP programs in 2002. In contrast, the other selected states had 20 percent of the nation's farmland and 17 percent of land enrolled in CRP and WRP programs. The share of farmland enrolled in these programs thus grew faster in the other selected states than in smart growth states.

Table 4.6 **Change in Acres Held in Private Land Trusts, 1990–2005**

	Acres in Land Trusts		Percent of Land Area in 2005	Change 1990–2005		
	1990	2005		Acres	Percent Change	Annual Average
SMART GROWTH STATES						
Florida	23,193	79,097	0.2	55,904	241	3,727
Maryland	41,340	200,143	2.5	158,803	384	10,587
New Jersey	62,347	201,014	3.6	138,667	222	9,244
Oregon	1,694	43,164	0.1	41,470	2,448	2,765
All Four States	**128,574**	**523,418**	**0.4**	**394,844**	**307**	**26,323**
OTHER SELECTED STATES						
Colorado	24,724	714,010	1.1	689,286	2,788	45,952
Indiana	136	15,498	0.1	15,362	11,296	1,024
Texas	8,841	194,508	0.1	185,667	2,100	12,378
Virginia	68,613	500,316	1.8	431,703	629	28,780
All Four States	**102,314**	**1,424,332**	**0.5**	**1,322,018**	**1,292**	**88,135**

Note: Excludes land owned by The Nature Conservancy.

Source: Land Trust Alliance (n.d.; 2005).

CHANGE IN LAND IN PRIVATE LAND TRUSTS

As table 4.6 shows, the amount of land in private land trusts more than doubled in each state between 1990 and 2005. Colorado and Virginia, both without smart growth programs, top the list of states with the most growth in private conservation land.

Small smart growth states such as Maryland and New Jersey had the largest shares in private land trusts, with about 200,000 acres (2.5 and 3.6 percent of their total land areas). Colorado and Virginia also had comparatively large amounts of land in private land trusts (more than 500,000 acres, or 1.1 and 1.8 percent of total land).

The other selected states saw larger increases in land protected by private land trusts, in part because they had relatively less land in private land trusts in 1990. During the 15-year period, these states added a combined average of about 88,000 acres of land to private land trusts, compared with 26,000 acres in smart growth states.

Growth in land protected by private land trusts does not appear to be directly related to state smart growth programs. Two smart growth states (Maryland and New Jersey) and two of the other selected states (Colorado and Virginia) had the most acres of land in private land trusts in 2005.

The amount of land in private land trusts may reflect either state-specific policies about land trusts or the effectiveness of specific private trusts independent of state policy as a whole. An indirect connection may exist, however, in states where residents value open space (in land trusts) and those where policy makers also value open space (by enacting smart growth programs). States that promote conservation and open space may encourage the development of private nonprofit organizations such as land trusts that share the same goals. Colorado, for example, has several programs that result in conservation of land through both private land trusts and publicly owned land. Colorado's policies seem to stem less from systematic plans for growth management and more from the value that residents place on open space.

Using this measure as an indicator of the impacts of smart growth programs has fundamental problems. Consider

Table 4.7 **Change in State Parkland, 1990–2006**

	Parkland as a Percent of Total State Land Area			Number of Parkland Acres per 1,000 People		
	1990	2006	Change 1990–2006	1990	2006	Change 1990–2006
SMART GROWTH STATES						
Florida	0.4	0.6	0.2	13.4	13.5	0.1
Maryland	0.7	1.2	0.5	11.4	16.4	5.0
New Jersey	1.2	6.0	4.8	8.7	38.5	29.8
Oregon	0.1	0.2	0.0	31.6	27.3	-4.3
All Four States	**0.3**	**0.6**	**0.3**	**13.6**	**20.0**	**6.4**
OTHER SELECTED STATES						
Colorado	0.2	0.3	0.1	31.3	42.5	11.2
Indiana	0.2	0.3	0.0	10.2	10.3	0.1
Texas	0.1	0.3	0.2	10.3	22.2	11.9
Virginia	0.2	0.2	0.1	6.7	8.1	1.3
All Four States	**0.1**	**0.3**	**0.2**	**11.8**	**20.2**	**8.4**

Note: Acres of parkland per 1,000 people is the level of service measure used by the National Recreation and Park Association.

Source: National Association of State Park Directors (n.d.).

two hypotheses. In the first, smart growth policies somehow encourage the use of land trusts. For instance, New Jersey's experience with transferable development rights in the Pinelands area perhaps created a familiarity with the issues, benefits, and implementation problems of conservation easements and land trusts, thus making land trusts a more accepted approach in the state. In other words, smart growth policies encourage land protection. In the second, states without smart growth programs realize that land trusts are a good way to provide the protection that regulation does not. In other words, the absence of smart growth policies encourages land protection. Yet another hypothesis is that the use of land trusts depends on a large number of other factors, including idiosyncratic donations and the agendas of major organizations working on protecting national areas.

CHANGE IN STATE PARKLAND

Table 4.7 shows that state parkland accounted for 0.6 percent of total land in the smart growth states in 2006, compared with 0.3 percent in the other selected states. New Jersey had the largest share (6.0 percent), followed by Maryland (1.2 percent). Increases in parkland service levels from 1990 to 2006 are similar in both sets of states, reaching 20 acres per 1,000 people.

State parkland has multiple purposes that include conservation and recreation. In the past, federal policy greatly influenced the designation of state parks. The federal government ceded Yosemite Valley to the State of California in 1864 for the nation's first state park, and the federally created Civilian Conservation Corps of the 1930s established many of the nation's state park systems. Today, however, state park designation often relies on the availability of land for purchase or donation, limiting its connection with smart growth programs.

Smart growth states had greater increases in state parkland relative to their total land area, possibly because of federal policies in place when many large state parks were established. The fact that the smart growth and other selected states had similar state park service levels in 2006 suggests that they had similar policies for providing state parkland for recreational purposes, although there are wide variations among the eight states.

CONCLUSIONS

Unlike measures of transportation, land area, and population that are relatively consistent over time and across geography, environmental quality measures are sparse and poor. This problem makes it necessary to draw conclusions about state performance from data that are generally not up to the task. Readers should keep this caveat in mind when considering the generalizations that follow.

The available evidence neither supports the hypothesis that smart growth states do a better job of preserving environmental quality and natural areas, nor does it support the opposite hypothesis. Two measures suggest that states with smart growth programs performed slightly better than those without such programs.

- *Change in resource land.* One of the best and most relevant measures of what smart growth states agree they want to achieve is the change in resource lands. Data from the Natural Resources Inventory, however, is open to interpretation. When losses of resource land are standardized to popu-

lation growth (acres lost per new person), smart growth states performed slightly better than the other selected states—although not uniformly so. Indeed, Oregon has a strong state program for preserving resource lands, but lost more resource land per person of growth than any other state except Indiana. The fact that Oregon's large and growing urban areas are surrounded by resource land may partially explain this result.

- *Change in farmland*. Change in farmland is also one of the best and most relevant measures of what smart growth states are trying to achieve. When losses of farmland are standardized to population growth (acres lost per new person), smart growth states outperformed the other selected states, but again not uniformly. New Jersey and Florida lost the smallest amounts of farmland per new person in this group. While Oregon's loss was comparatively large, it may not be the result of a uniformly high average conversion of farmland. Indeed, the densely populated Willamette Valley had a small *gain* in farmland. In contrast, the majority of farmland losses occurred in the lightly populated eastern part of the state.

  While the other selected states lost about two-and-a-half times more farmland than the smart growth states, the *share* of farmland lost was only half that in the smart growth states. Colorado had the largest decreases in farmland, which may be explained by state policies that promote land conservation through both private and public means.

Three other measures suggest that states without smart growth programs performed slightly better.

- *Change in farmland enrolled in conservation programs*. The four states without smart growth programs had more farmland enrolled in the Conservation Reserve and Wetlands Reserve programs, both as a share of farmland and as an absolute amount of land. These states have more than six times as much farmland as their smart growth counterparts to begin with. Texas, Colorado, and Indiana had the largest acreage increases from 1987 to 2002, in that order.

- *Change in land in private land trusts*. The other selected states also had greater growth in acres held by private land trusts, both in absolute and in growth terms. The share of all land in private land trusts, however, was only slightly higher in the other selected states than in the smart growth states in 2005. Colorado saw the largest increase in acreage protected, followed by Virginia and Texas.

- *Change in state parkland*. States without smart growth programs had larger increases in parkland relative to population growth than the smart growth states between 1990 and 2006. By that year, all eight case study states had similar average state park service levels—about 20 acres per 1,000 people. This suggests similar policies for providing state parkland for recreational purposes.

In summary, the available data do not show large or consistent differences between the four smart growth states and the four other selected states in protecting the environment or natural resources, and do not support a conclusion that states with smart growth programs perform much better overall. This is not to say that smart growth states do not deliver better protection—they may, but the available measures do not make a strong case for that claim. In addition, it is not necessarily the case that some states are doing a better quality job on some aspects of environmental and natural resource protection than others, which some of the measures presented here may suggest.

Note

1. The USDA's estimate of land in farms differs from the measure of resource land shown in table 4.1 because it does not cover some types of land, such as forestland, or some types of pastureland or rangeland.