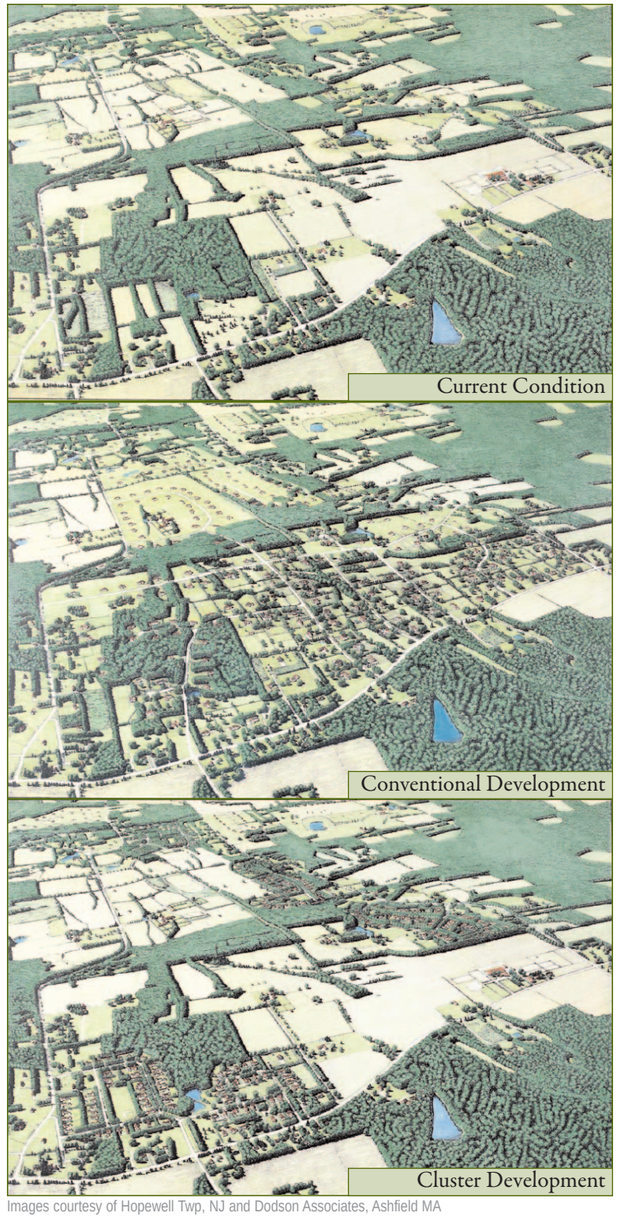
more pedestrian-friendly neighborhoods.

- Discourage new customers located beyond the public water infrastructure from connecting to the public drinking water system, unless they have an existing agreement for service or can offset the water budget increase through fees used for conservation efforts within the existing system.
- Promote the use of native, non-invasive plant species, by planting native vegetation around public facilities and along stream banks and promoting the benefits to conserving water and reducing runoff and use of fertilizers.
- Encourage good housekeeping practices, such as arranging for easy and safe disposal of automotive waste, leftover paint and pesticides at municipal facilities.

Protect Critical Land and Concentrate Development

- Purchase open space or provide landowners with tax benefits for retaining it. Develop partnerships with land trusts to protect and maintain critical natural areas such as wetlands, riparian corridors and aquifer recharge zones.
- Establish urban growth boundaries or zoning ordinances to steer development toward areas with adequate infrastructure and away from sensitive natural areas and groundwater recharge zones.
- Create a transfer of development rights (TDRs) program, in which landowners forego development in key natural areas in exchange for higher density or other exceptions in non-sensitive areas.
- Protect wetlands and other bodies of water through zoning, easements, and conservation plans.
- Offer incentives (e.g., expedited permitting) for infill development projects, such as redevelopment and re-use of existing sites.



Images courtesy of Hopewell Twp, NJ and Dodson Associates, Ashfield MA

In 2004 *The Trust for Public Land* (www.tpl.org), the *U.S. EPA* (www.epa.gov/watertrain/smartgrowth), *River Network* (www.rivernetwork.org), *The National Association of Counties* (www.naco.org), and *American Rivers* (www.americanrivers.org) convened a network of organizations to explore and promote the use of smart growth strategies for the protection and improvement of water resources. Current activities of the network include planning and hosting a one-day workshop on smart growth and clean water at the annual New Partners for Smart Growth Conference and identifying and filling information gaps for practitioners with materials such as this fact sheet.

February, 2006

Protecting Water *Through* Smart Growth

Reducing Costs and Protecting Your Water Resources Through Smart Growth

Photo: Phil Schemeister

Whether you live in a small, rural community, a highly-developed urban area, or anything in between, how you manage growth will affect the quality of life in your community, the availability and quality of your water resources and your community's long-term economic prospects. This fact sheet explains how growth impacts water quality and the costs of water infrastructure, and offers a menu of smart growth strategies to minimize the possible negative impacts of growth on water resources.

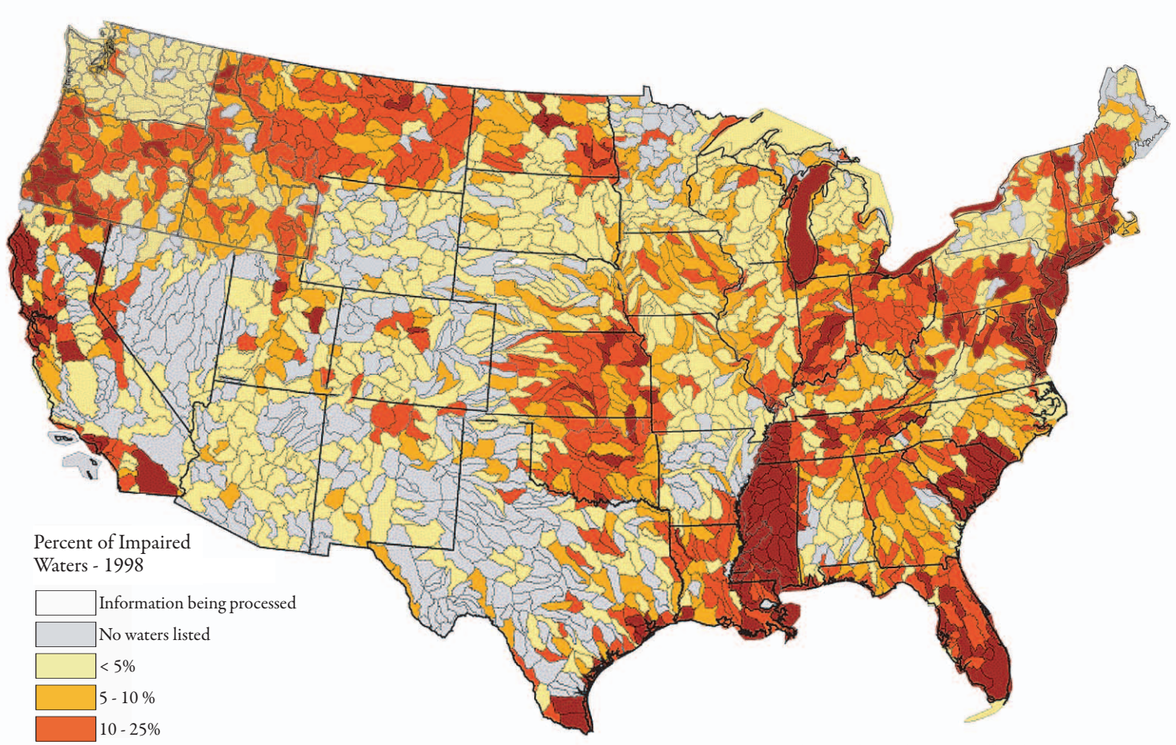
Local governments are uniquely positioned to encourage land use decisions that will help restore and protect water resources by protecting critical natural areas such as wetlands, riparian corridors (streambanks and floodplains) and aquifer recharge zones (groundwater in-take areas), concentrating development away from these natural areas and around existing infrastructure, encouraging low-impact development techniques and using other proven smart growth strategies.

Land Use Trends and Water Quality Threats

Consider this: In the 15 years between 1982 and 1987, the amount of developed land in the United States increased by over a third, while population only grew by 15 percent. During this period more land was converted to urban or suburban uses than any other period in U.S. history. These statistics suggest that the current alarming rate of land conversion is due more to modern settlement patterns than to population growth.

Changes in land use impact water resources. As residential and commercial development occurs, natural land cover, such as forests, meadows, and wetlands, is replaced by impervious surfaces, such as roads, rooftops and channelized streams, essentially turning what was a green sponge into a grey funnel. As a result, water runs off the land at a much higher volume and speed, decreasing groundwater supply, eroding streambanks and washing pollutants into waterways. Watersheds characterized by unmanaged growth have more localized flooding and polluted waterways, contaminating drinking water sources, degrading habitat, and making stormwater management and drinking water treatment more costly.

Nonpoint Source Pollution:
occurs when surface water from rainfall or snowmelt runs off the land or into the soil, picking up pollutants from lawns, farms, roads, septic systems and other land uses, depositing them in streams, wetlands and other surface and ground water sources.



The negative environmental and economic consequences of unmanaged growth are widespread. The above map reveals an alarming number of water bodies that do not currently meet state water quality standards. Almost 90% of these waterbodies are impaired by nonpoint source pollution. In the National Water Quality Inventory 2000 Report, U.S. EPA reported that the leading sources of impairments across all waterbody types (including streams, groundwater, and estuaries) are from wet-weather runoff from farms, and commercial and residential development.

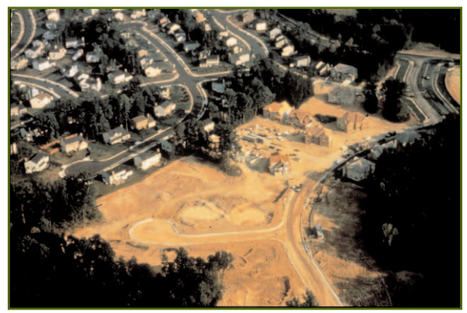

Photo: Brian Lehman

Spotlight Drinking Water Vulnerability

In addition to impacting flooding and the quality of our rivers, lakes, and other water resources, how we live on the land also affects the quality and quantity of our drinking water. Americans have come to expect consistently clean and safe drinking water when they turn on the tap. Although filtration and treatment are critical to clean drinking water, protecting our sources - the lakes, streams and aquifers that serve as our supply - is also necessary to consistently provide safe and affordable drinking water.

Poorly managed growth can directly impact drinking water supplies. The prevalence of septic systems in new developments is one major area of concern. Approximately 80 percent of drinking water systems in the U.S. rely primarily on ground water; and in 2003, state agencies reported to the U.S. EPA that septic systems constituted the third most common source of ground water contamination nationally. These systems fail because of inappropriate siting or design, or inadequate maintenance. According to the U.S. Census Bureau, about 1/3 of all new development is served by septic systems, and most septic systems are poorly maintained.

New development can also reduce the quantity of drinking water supply. Local wells may run dry because impervious surfaces have replaced natural land cover, reducing groundwater recharge. In addition, when sediment from construction and streambed scouring settle in reservoirs, water storage capacity declines over time. Increased demand may further deplete finite supplies of groundwater.



Unintended Costs of Unmanaged Growth

Dispersing small populations over large areas (low-density development) requires more infrastructure per capita, including more miles of roads, sewer lines, and water pipes per household. This forces communities to allocate scarce infrastructure funding to new development and reduces funds for existing systems. Without adequate funding, aging systems deteriorate.

The loss of forests due to development increases drinking water treatment costs. Recent data provided by 23 surface water treatment plants across the country indicate that when 10% of forest cover in a drinking watershed is lost, chemical treatment costs typically increase by about 12%.

Smart Growth Strategies

Smart growth has emerged as a way for city and county governments to address a community's economic and environmental goals in a more integrated fashion. Smart growth efforts have taken different forms around the country, and various strategies are available to protect and improve water quality, a few of which are mentioned here.

Encourage Low-impact Development Techniques and Other Best Management Practices

- Develop and enforce erosion and sedimentation control ordinances that require the use of structural and nonstructural management practices during construction, such as infiltration basins and constructed wetlands.
- Set standards for subdivision site design, such as requiring vegetated buffers to control erosion and requiring decentralized wastewater systems (small systems and septics) be located away from ground and surface drinking water supplies and be properly designed and maintained to reduce failure.
- Require golf courses, grassed campuses and recreation areas to adhere to design, vegetation, fertilization and watering standards that will minimize pesticide and fertilizer use and irrigation.
- Amend building codes to reduce minimum street widths and the number of required parking spaces for new commercial developments (allowing establishments to share spaces or convert parallel street parking spots to diagonal parking spaces). This will result in less overall impervious surface and create