

# Growth & Water Resources



All photos courtesy of Stephen Delaney

## The Link Between Land Use and Water Resources

Thoughtful community land use planning and development are critical components in maintaining and restoring water quality in America's streams, lakes, wetlands, estuaries and aquifers. If not carefully planned, land development projects can adversely impact water quality and supply.

- Impervious surfaces created by the construction of roads, parking lots, rooftops and driveways can decrease groundwater infiltration of runoff and increase runoff volumes and rates. Reduced recharge of ground waters can negatively affect drinking water supplies and stream baseflows. Changes in runoff volumes and rates can increase flooding, streambed erosion and sedimentation.
- Development activities typically increase pollutant loadings, e.g., pathogens, household chemicals, metals, fertilizers, pesticides, oil and grease. These increases in pollutant concentrations may impair surface and ground waters.
- Construction activities disturb soil and may release sediment and other pollutants to local streams. EPA estimates that conversion of land produces 40 million tons per year of new sediment during construction. States have identified sediment as the leading cause of impairment to America's rivers.
- Increases in surface runoff, loss of vegetative buffers along streams, and physical alteration of waterways due to development activities can change the natural form and function of a stream. Runoff from unshaded impervious surfaces can increase stream temperatures, often crossing the threshold at which sensitive biota can survive and reproduce.

## Role of the EPA

EPA recognizes that land use decisions occur at the state and local level, and that inter-jurisdictional coordination at the watershed or regional level results in more effective protection of water resources. EPA is a resource for state and local decision makers — our role is to provide tools to help identify and assess risks to water quality, and to maintain, protect or restore watershed health.

## A FEW GUIDELINES for Building Communities that Protect Water Resources

- ★ Establish community goals for water resources in the watershed
- ★ Direct development where most appropriate for watershed health
- ★ Minimize adverse impacts of development on watershed health
- ★ Promote opportunities for restoration
- ★ Assess and prevent unintended consequences of federal, state or local decisions affecting watershed health
- ★ Plan for safe, adequate and affordable water supplies as an integral part of growth
- ★ Consider the cumulative impacts of growth management decisions on the watershed
- ★ Monitor and evaluate success of initiatives

For additional principles see <http://www.smartgrowth.org/about/principles/default.asp>



## Resources & Tools

EPA 842-F-02-008  
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### EPA Websites

**Development, Community, and Environment Division's Smart Growth Site**  
<http://www.epa.gov/smartgrowth>

**Nonpoint Sources (NPS) of Pollution**  
<http://www.epa.gov/owow/nps>

**Low Impact Development**  
<http://www.epa.gov/nps/lidlit.html>

**National Pollutant Discharge Elimination System (NPDES) Storm Water Program**  
<http://www.epa.gov/npdes/menuofbmps>

**Eight Tools of Watershed Protection in Developing Areas**  
[www.epa.gov/watertrain/protection](http://www.epa.gov/watertrain/protection)

### Partner Websites

**Center for Watershed Protection**  
<http://www.cwp.org>

**Local Government Environmental Assistance Network (LGEAN)**  
<http://www.lgean.org>

**Nonpoint Education for Municipal Officials (NEMO)**  
<http://nemo.uconn.edu>

**Smart Growth Network**  
<http://www.smartgrowth.org>

Information on “smart growth” policies, funding sources, networking opportunities, technical tools and resources. Included are case studies that demonstrate how such approaches can have clear environmental benefits.

Details on funding opportunities, partnerships, model ordinances, outreach and education, Clean Water Act Section 319 and Coastal Zone Act Reauthorization Amendments Section 6217 programs, and other tools to manage NPS pollution.

Literature review and fact sheets that discuss technologies that use the natural landscape of a development site to detain, absorb and treat surface runoff.

Guidance on developing a Phase II storm water program along with a list of best management practices to mitigate pollution from storm water runoff.

Training module that describes various tools to protect and restore aquatic resources in an urbanized or developing watershed.

The Center provides scientifically sound information and techniques to protect and restore watersheds. It also conducts training seminars and workshops for planners, engineers, landscape architects and municipal officials across the country.

LGEAN provides environmental management, planning, and federal and state regulatory information for local government officials, managers and staff.

NEMO is an educational program for local land use officials that addresses the relationship between land use and natural resource protection.

A growing coalition of developers, planners, government officials, lending institutions, community groups, architects and other stakeholders. The website contains a large library of documents on “smart growth” and offers many other links.

### Highlights from the National Estuary Program

The **Puget Sound Water Quality Action Team** is exploring how low impact development and smart growth concepts can be used to improve water quality in Puget Sound. Visit their website, [www.wa.gov/puget\\_sound/Programs/LID.htm](http://www.wa.gov/puget_sound/Programs/LID.htm), to learn more.

The **Maryland Coastal Bays Program** published a guide, *Envisioning the Future: A New Tool For Coastal Managers*, that describes techniques coastal managers can utilize to explore growth management options. Visit [www.mdcoastalbays.org](http://www.mdcoastalbays.org) for more information.

### In Print

*Our Built and Natural Environments: A Technical Review of the Interactions between Land Use, Transportation, and Environmental Quality.* US EPA, Development, Community and Environment Division. January 2001. Call EPA's National Center for Environmental Publications at (513) 891-6561 and ask for EPA 231-R-01-002 or visit [www.epa.gov/smartgrowth/publications.htm](http://www.epa.gov/smartgrowth/publications.htm).

*Smart Growth Strategies: Protecting Water Resources. Local Government Roles and Options for the Rocky Mountains and Northern Great Plains.* National Association of Counties. December 2001. Call NACo (202)393-6226 or visit [www.naco.org](http://www.naco.org) to request copies.

*Getting to Smart Growth: 100 Policies for Implementation.* Smart Growth Network and International City/County Management Organization. January 2002. Visit [smartgrowth.org](http://smartgrowth.org) for ordering information.

*Coastal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States.* Pew Oceans Commission. April 2002. Available on the internet at [www.pewoceans.org/reports/water\\_pollution\\_sprawl.pdf](http://www.pewoceans.org/reports/water_pollution_sprawl.pdf).