Pollution Pipe: Street to Stream

What Is the Problem?

Urban Development

Where do rain and snow melt go? If you live in the city, runoff from your yard and driveway probably runs into the street where it drops into storm drains... then where? Many people think storm drains lead to treatment plants. In truth, these pipes take water directly from curb to stream, lake, or wetland. The problem is, this runoff carries pollution.

Fig. 1: Impervious Cover Percentages

Land Use	Impervious Cover
Business or Shopping Center	95-100%
Residential, High Density	45-60%
Residential, Medium Density	35-45%
Residential, Low Density	20-40%
Open Areas	0-10%

Impervious Cover = streets, parking lots, roofs, etc.

What land uses are most common in your watershed? Parks? Homes? Businesses? It matters to the lakes and streams. Figure 1 shows which kinds of land usage typically have the most paved surfaces overall. Then Figure 2 shows where the rain goes when there is more pavement. The greater the runoff in your watershed, the more important it is to keep pollution out of the storm sewers.

When we develop natural areas for urban land uses, drastic changes in hydrology (water flow patterns) result. Roads, buildings, and parking lots prevent rain from soaking into the soil. All this added runoff causes floods, carves gullies in hillsides, stirs up toxic chemicals in bottom sediments, and transports pollutants. Underground water storage (aquifer) decreases, which can lower water levels in lakes, streams and wetlands, and dry up wells. Figure 3 (see next page) graphs how, after development, rain water flushes quickly through streams and goes down river.

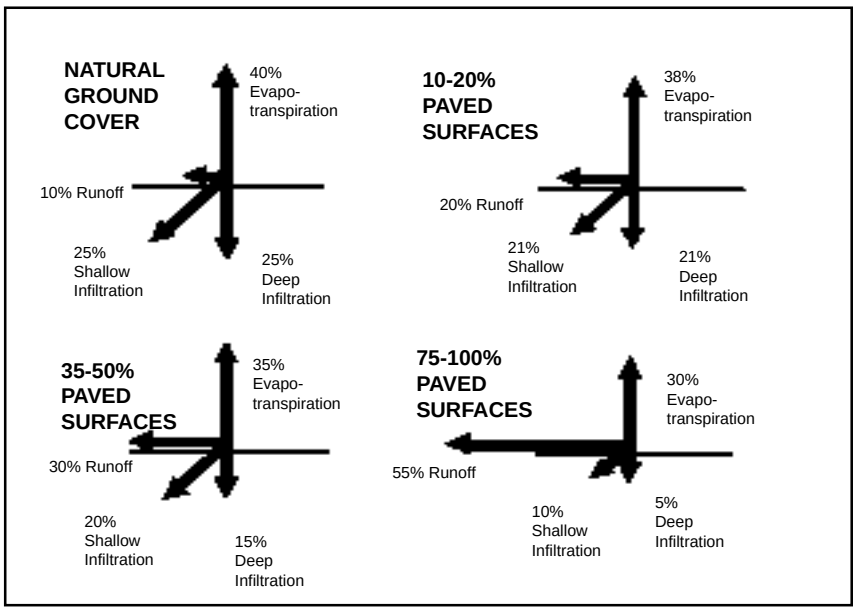
Success Story: Minneapolis

YMCA Service Treks painted signs by storm drains in Minneapolis to help home owners understand that runoff from their yards and driveways flowed straight into Lake Calhoun. Leaflets told home owners how to keep pollution out of the lake. Minnehaha Creek Watershed District and the City of Minneapolis also restored a pond and wetlands to filter runoff before it entered the lake.

Pollutants in Runoff

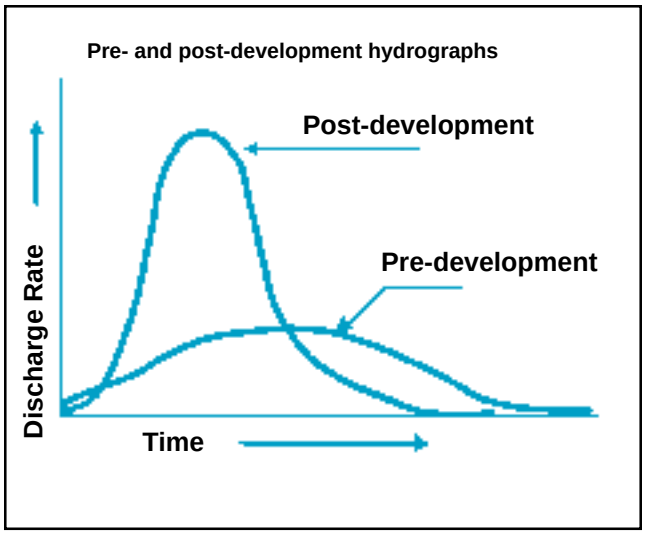
Say "pollution" and most people picture a factory pipe. Today, the federal Clean Water Act and similar state laws limit this type of pollution. Yet even neighborhoods with no factories add "nonpoint source" pollution from everybody's yard, garage, garden, or trash. See next page for a list of pollutants, where they come from, and what damage they can cause. Local water management agencies can say which pollution sources affect your watershed most.

Fig. 2: Pavement Percentages and Runoff Flow



Source for diagrams is "Protecting Water Quality in Urban Areas, Best Management Practices for Minnesota." Minnesota Pollution Control Agency. (1989)

Fig. 3: How Development Affects Runoff Peak Flow



Pollutants in Runoff (continued)

- **Sediment** - Sources: construction digging, gardening, and bare earth, especially on hills.
  Tiny soil particles fill in streams and lakes, smother habitat, block light in water, and clog drinking water intake. Sediments also carry other pollutants.

- **Nutrients** - Sources: grass clippings, leaves, spilled or excess fertilizer, and animal wastes.
  Phosphorus and nitrogen feed algal blooms (green scum) and plants that clog waterways. Microorganisms eat this organic matter, using up dissolved oxygen. This kills fish and other aquatic animals.

- **Bacteria** - Sources: animal wastes, and improper sewage disposal.
  Bacteria can sicken humans and aquatic life.

- **Toxins:**
  - **Toxic Chemicals** - Sources: improper use or disposal of toxic products, including spills and illegal dumping.
    Solvents, pesticides, paints and stains, and other toxic products can kill aquatic life.
  - **Trace Metals** - Sources: galvanizing, chrome plating, auto emissions, machine wear, and other sources.
    Lead, mercury, zinc, and copper, chromium, cadmium, and nickel are toxic to aquatic life, especially over years as they build up on the bottom of lakes.
  - **Hydrocarbons** - Sources: oil or gasoline spills, leaky crankcases, and improper disposal.
    Oil slicks, even in small amounts, kill aquatic life.
  - **Chloride** - Sources: overuse and careless storage of de-icing salts.
    De-icing salts can harm small lakes and streams.

What Can We Do About It?

There are many small steps anyone can take to prevent water pollution: bagging or composting leaves and grass, using and storing chemicals carefully, picking up pet waste and trash, planting grass or shrubs on bare soils—all these help. (See "Tip Sheet" in *Pollution Prevention Guide*, under "Mo' Info." below.)

The key is to involve lots of people. Public education service project ideas include:

- Set up a booth at a mall or school fair.
- Write articles for local newspapers.
- Make and put up posters.
- Create and hand out leaflets based on the information in this fact sheet.
- Write stories or skits and present them to young children or people in nursing homes.
- Write/draw messages on grocery bags.
- Paint "Do Not Dump, Drains to Stream!" by storm drains, and leaflet neighboring homes.

Mo' Info.

Step-by-step instructions on how to organize stenciling and other service projects: *Pollution Prevention Project Guide;* Call Minnesota Office of Environmental Assistance for a copy (651) 215-0232.
In the *Guide*, see:
- Tip Sheet: "The Solution to Pollution Is in Our Hands," p. 4; 14 easy steps to take at home
- Storm drain stenciling: pages 15-16
- Public education projects: pages 8-11

Other Resources:
Web Site: www.earthwater-stencils.com
Storm Drain Maps: Your city public works dept.
Speakers: Your city public works dept.
Video: "From Streets to Streams: Reducing Pollution from Urban Yards," St. Paul Neighborhood Energy Consortium (651) 221-4412
3-D Display: Enviroscape Runoff Model: Met Council Environmental Services, (651) 602-1805
Local Partners: www.bwsr.state.mn.us - Hit button for "Local Gov'ts," then find your county and/or watershed. Also call your city.

Watershed Resources Youth Stewardship Project
Susan or Rich Cairn, 3715 45th Ave. S., Minneapolis, MN 55406 (612) 722-5806 voice 722-6062 fax cairn@tc.umn.edu
Supported by: Environment and Natural Resources Trust Fund, Legislative Commission on Minnesota Resources