Impervious Surfaces - Double the Damages.



Picture a thunderstorm on a hot evening in late August. It hasn't rained for a couple of weeks and strong storms are rolling into your town. The streets turn brown as rain washes dirt into storm drains. For a short time, there is minor street flooding as storm drains cannot handle all the runoff from driveways, parking lots, streets and other hard surfaces. However, the muddy water quickly drains away leaving sand and silt deposits beside catch basins. Most of the stormwater is flushed into neighborhood brooks along with concentrated sediments, fertilizers, oil and grease from roads, and other toxic materials. In addition, the storm runoff is warmed by hot streets and creates a lethal mixture for stream life.

In less built up areas, rain falls on forests and fields where it soaks into the soil and recharges ground water. When streets and buildings are constructed, forests and fields are replaced by concrete and asphalt. Lands stripped of vegetation and covered with hard surfaces lose their ability to absorb or slow runoff. Pollutants are not filtered by soil and ground water levels decrease. In the dry months, there is less ground water to replenish streams and their flows are reduced.

The combined effects of polluted runoff, warmer water and decreased flows will harm natural streams and stress aquatic ecosystems. The outcome is the death of a stream by a thousand cuts. Yet, these damages can be reversed and the stream can be brought back to health using low impact practices and stormwater controls. Several examples of these are outlined below, and additional information is provided by the Clean Water Toolkit .

Low Impact Development and Stormwater Management

Site Design - Site planning for stormwater management is the most effective approach to avoid

pollution and flooding problems. Site plans are usually reviewed by local planning boards, and by conservation commissions when a site is located in a wetland area. Careful site designs will minimize the material, construction, and maintenance costs of stormwater controls.



Conventional development often treats stormwater with “pipe-and-pond” systems that collect rainwater and discharge it off the site. In contrast, Low Impact Development (LID) treats stormwater as part of site design, not a secondary consideration. LID site design preserves natural features, places buildings and roads in less sensitive areas, and improves stormwater management. The use of non-structural stormwater controls can achieve a more attractive design that keeps construction and maintenance costs less than the conventional pipe-and-pond approaches.

LID design may be applied to both residential and nonresidential development, as well as redevelopment projects. LID techniques reduce runoff, increase ground water recharge and prevent pollution by creating less impervious surfaces, fitting development to the terrain, preserving existing vegetation, and retaining the natural drainage ways.

Low Impact Development Regulations are another great way to improve stormwater management and protect habitats, floodplains, and other vital parts of the stream ecosystem. Advice on Low Impact bylaws and regulations is available from state and federal agencies, the Massachusetts Watershed Coalition and watershed organizations, as well as many Internet websites.

Improve maintenance of roads and parking areas. How many tons of sand were used in last winter to keep community roads safer for driving? Where did all the sand go?



Federal Stormwater Policy and Your Community

The U.S. Environmental Protection Agency has established a two phase stormwater control program that is improving the nation's surface waters. Phase I required permitting of Municipal Separate Storm Sewer Systems (MS4s) in cities with populations of 100,000 persons or more, specific industrial operations, and building activities that disturb over five acres of land. Phase II of the NPDES program became effective in 2003 and requires the permitting of publicly-operated MS4s located in "urbanized areas" as defined by the Census Bureau, and construction activities that disturb between one and five acres of land. Phase II communities have prepared stormwater management plans that specify a schedule of municipal actions to prevent pollution of local waters. EPA requires each Phase II community to be in compliance with its stormwater management plan in 2008.

State Stormwater Policy and Your Community



In 1996, the Massachusetts Department of Environmental Protection established standards to increase ground water recharge and prevent pollution of surface and ground waters. MassDEP recently updated these standards to promote low impact development, removal of illicit

discharges, and better maintenance of stormwater management practices. These standards are part of the state Wetlands Protection Act Regulations, and the state Water Quality Certification Regulations.

Polluted runoff from rain and snow melt is the greatest source for impairments in the Commonwealth's rivers, lakes, ponds, and marine waters. New and existing development adds impervious surfaces that may alter natural drainage features, increase flooding, reduce ground water levels and stream flows, and increase pollution to wetlands, streams and water bodies.

The state stormwater standards require low impact design for local land development and redevelopment. It makes sense for your community to use the practices explained by the MassDEP Stormwater Handbook, including porous paving, grass swales, bioretention, and other alternatives to the "collect and convey" practices used for conventional drainage systems