

## Why Is Urban Stormwater a Problem?

When rainwater washes over farmlands or urban streets, it collects a wide variety of pollutants from the surface of the land and carries them into streams, lakes and estuaries.

**Urban Stormwater Runoff:** runoff from developed areas, construction sites, rooftops, roads and highways

Cumulative effects from increasing stormwater runoff include:

- **Public health threats**
- **Economic losses in commercial fisheries and tourism**
- **Damaged aquatic environments**

As areas become more densely developed, a larger percentage of land is covered by paved or hardened surfaces, and the severity of water pollution grows worse.

A typical family house covers about 5,000 square feet with impervious surfaces—including a roof, a driveway and maybe a deck or patio. In addition, an enormous system of roads, highways and parking lots expands to serve new facilities. Roads and parking lots contribute a far greater amount of paved surfaces; 60 to 70 percent of all impervious surfaces are related to the automobile.

## INFORMATION CLEARINGHOUSE

Additional information about stormwater runoff and other coastal environmental topics is available through Coastal Training Program at [www.NCCoastalTraining.net](http://www.NCCoastalTraining.net)

*A technical paper with more details about stormwater runoff from impervious surfaces in coastal NC is available to the public through:*

### COASTAL TRAINING PROGRAM

*Promoting informed coastal decisions through science-based education and training.*



*For more information about this and other publications, contact:*

North Carolina National Estuarine  
Research Reserve, Education Office  
135 Duke Marine Lab Road  
Beaufort, NC 28516  
**(252) 728-2170**  
[www.NCCoastalReserve.net](http://www.NCCoastalReserve.net)

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*What You Need to Know to Protect the Environment*

# Stormwater Runoff from Impervious Surfaces

## Basics for a Healthy Coastal Environment



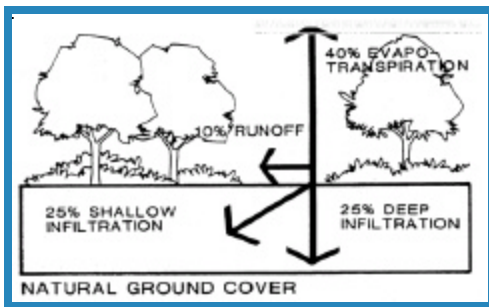
**North Carolina National Estuarine Research Reserve**

**North Carolina Division of Coastal Management**

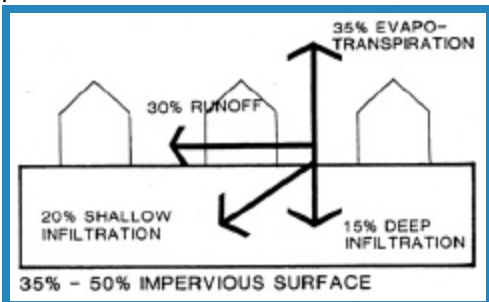
*Science for Coastal Living Series, No. 3*

## What's Wrong With Impervious Surfaces?

Paved areas and rooftops are impervious surfaces - impenetrable materials that prevent infiltration of water into soil. Increasing impervious coverage has become a significant threat to North Carolina water quality. Rain that would have been absorbed by plants or filtered into groundwater aquifers instead flows into storm drains.

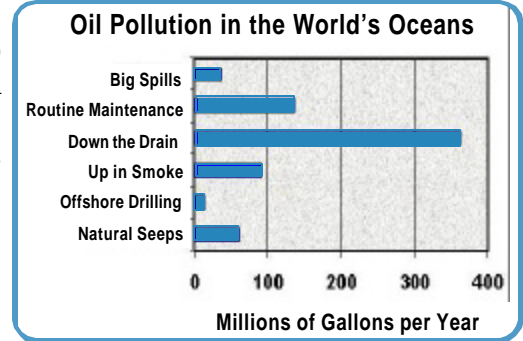


Though many people believe that storm drains carry water from streets to wastewater treatment plants, these drains usually carry runoff directly to nearby streams, rivers, lakes or coastal waters. Our extensive network of parking lots, rooftops and especially roads, creates a 'stormwater superhighway' that carries pollutants quickly into the aquatic environment.



## Contaminants Found in Stormwater Runoff

- **SEDIMENT** - (from construction, erosion, agriculture) may block light, preventing submerged plants from photosynthesizing, depleting food sources and habitat for other aquatic life
- **NUTRIENTS** - (from fertilizers, failing sewer or septic tanks) High nutrient levels stimulate algae blooms. As microbes consume the abnormally large algae population, oxygen levels in the water can drop, endangering other aquatic life.
- **ORGANIC MATERIALS** - (such as lawn clippings, leaf litter) are decayed when they are washed into water bodies by microbes, whose increased respiration decreases the water's oxygen levels
- **BACTERIA** - (from failing sewer or septic tanks, animal waste) may contaminate shellfish beds and cause harvest closures
- **OIL & GREASE** - (from cars, roads, parking areas) can cause mortalities of aquatic plants and animals, even in small concentrations
- **METALS** - (like copper, lead, chromium, cadmium, zinc, mercury) potentially toxic to aquatic life, ruin drinking water supplies, contaminate shellfish stocks
- **TOXIC & SYNTHETIC CHEMICALS** - (from pesticides, residential or industrial solvents) may be lethal to some organisms in concentrated doses



## What Can I Do?

### Ways to Reduce Runoff and Impervious Surfaces

Adapted from The Nonpoint Education for Municipals Offices Project (NEMO), <http://nemo.uconn.edu/index.htm>

- **GET INVOLVED!** Let your local government know you support development projects that channel runoff into vegetated areas, use minimal impervious surfaces and use alternative paving methods that allow water infiltration.
- **ROOFTOPS** - Turn downspouts toward vegetated areas that are not treated with chemicals, allow the water to sheet flow across and infiltrate naturally. To accomplish this, add a plastic sleeve with holes in it to the end of your downspouts. Rather than letting water runoff driveways or streets, collect water from drain pipes in containers for reuse onsite.
- **DRIVEWAYS** - Use alternative types of paving surfaces to decrease imperviousness. Porous driveway surfaces include: washed stone or gravel, paver blocks and bricks set in sand, grass pavers and grid pavers.
- **ROADS** - Since roads contribute to nearly 50% of the imperviousness of a site, they should be constructed using the minimum required pavement width to support projected traffic volumes. Remove the curb from road designs to allow water from the roadway to sheet flow to adjacent vegetated shoulder.