1.1 STORMWATER RUNOFF BASICS

When a drop of rain falls during a storm, it may land on a tree and evaporate; it may land on a farm field and soak into the soil; or it may land on a rooftop, driveway, road or other hard, impermeable surface where it cannot be absorbed. Precipitation that does not evaporate or soak into the ground, but instead runs across the land and into the nearest waterway, is considered stormwater runoff. When stormwater travels across a surface, moving downhill towards rivers, arroyos, and bays, it picks up pollutants along the way. These pollutants can include bacteria, oil, grease, metals, organic material, or litter and all eventually end up in the receiving water body.

Stormwater runoff from parking lots, roads, and rooftops may flow to the street and into a storm drain, where it is conveyed through a pipe to a river or other body of water. Piping runoff in this way reduces the amount of water than can soak into the ground and eliminates the pollutant removal that occurs in natural systems. Over time, this can reduce the water quality in the receiving waterbody.

Given the interconnectedness of ecosystem/water quality health and coastal community economies, it is critical to understand how land development directly affects watershed functions. When development occurs in previously undeveloped areas, the resulting alterations to the land can dramatically change the conveyance and storage of stormwater runoff and can generate downstream flooding. Land development causes soil compaction and creates roadways, parking lots, buildings, and other surfaces that prevent infiltration of runoff into the ground. Any man-made surface which inhibits natural filtration of rainwater through soil and increases surface runoff is typically called impervious cover.

As illustrated in Figure 1.1, new development, and the associated increase in hard, impervious surfaces often has the unintended consequence of increasing the volume as well as decreasing the quality of stormwater runoff that makes its way into rivers and bays. However, when new developments are designed following guidance outlined in this document, it is possible to both reduce the amount of stormwater exiting a site and improve its quality.

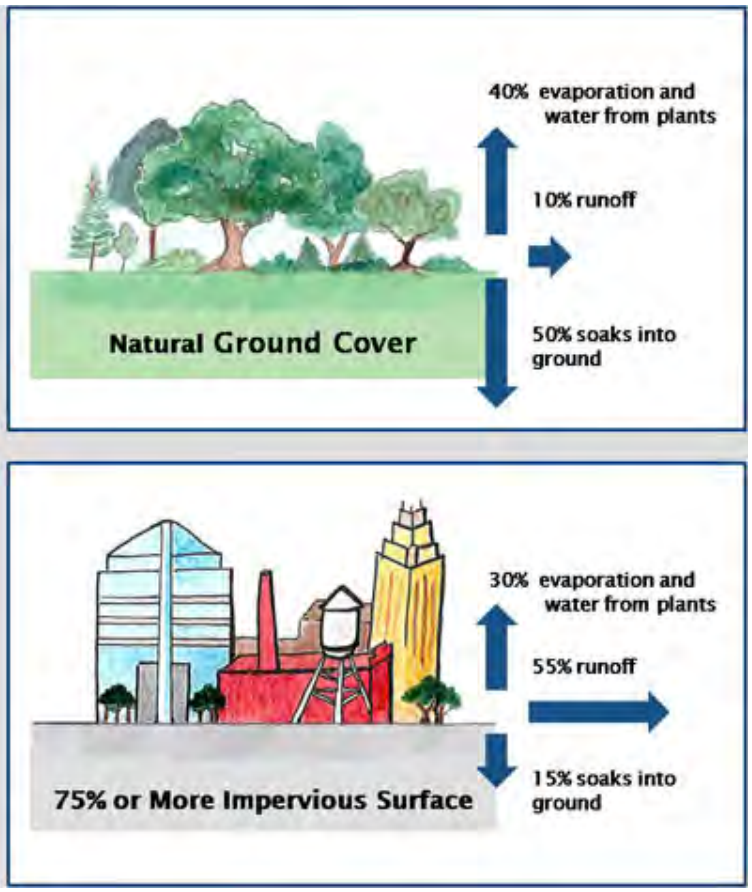

Figure 1-1: Influence of impervious cover on infiltration. (Graphic courtesy of City of Durham, North Carolina)

Sustainable and resilient development strategies are designed to reduce the impact of development on the environment, are compatible with the coastal landscape, and can be implemented at three scales: 1) the region or large watershed area, 2) the community or neighborhood, and 3) the site or block. Different stormwater approaches are used at different scales to afford the greatest degree of protection to waterbodies. At the regional or watershed scale, decisions about where and how to develop are the first, and perhaps most important, decisions related to water quality and resiliency. At the site and block scale, combining multiple strategies to address stormwater volumes can have significant beneficial effects on both water quality and flood control. These issues are discussed in more detail in Chapter 2.