SOILS for SALMON

Building the Soil for Healthier Landscapes and Healthier Streams

2005 Update

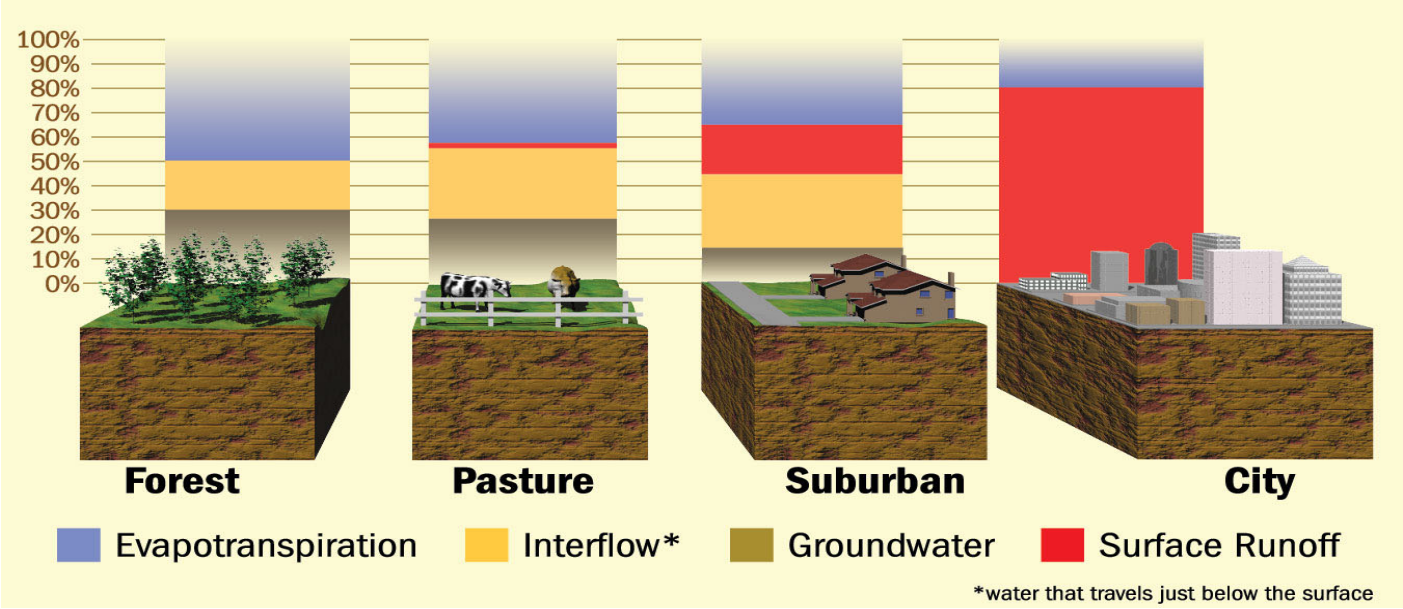
www.soilsforsalmon.org

Growing Recognition of the Benefits of Healthy Soil

The "*Soils for Salmon*" initiative, begun by the Washington Organic Recycling Council (WORC) in March 1999, has become recognized both regionally and nationally as a practical approach to link the benefits of healthy functioning soils with clean, healthy water resources. The Pacific Northwest is engaged in significant debate and action around saving salmon, whose decline is an indicator of degraded aquatic resources. A widely supported direction for the protection of salmon and other species is the adoption of "Low Impact Development" practices, in order to restore more natural stream flows and protect water quality. The important function that soil quality plays in water issues had not been adequately recognized prior to the *Soils for Salmon* initiative.

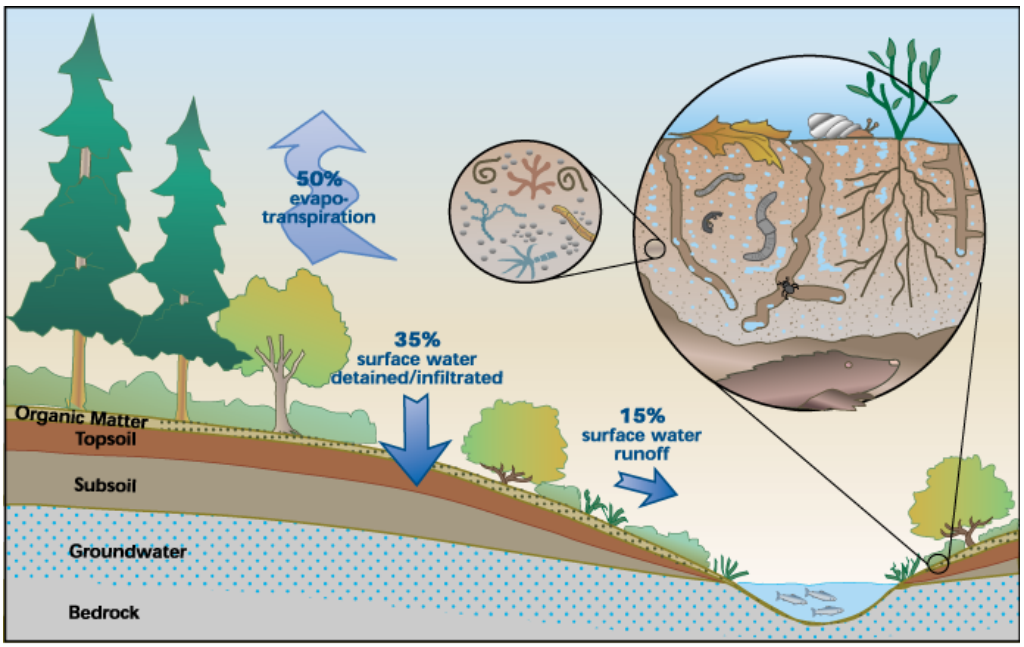
Many local government and industry initiatives are underway in Washington and Oregon. A soil quality movement has developed, resulting in many successful projects using soil best practices. *Widespread recognition of the environmental functions of soils, and adoption of soil "best management practices" (BMPs) will have multiple benefits, including expanding recycling of organic waste and reducing irrigation water demand, as well as managing stormwater quantity and quality. For builders and homeowners the benefits include easier planting and better plant survival, as well as lower maintenance requirements for water, fertilizer, pesticides.*

What happens to rainwater as we develop land?
Surface runoff increases, impacting water quality. The soil is not performing its functions.



What is the value of native soil?

Numerous environmental functions:



Native Soil

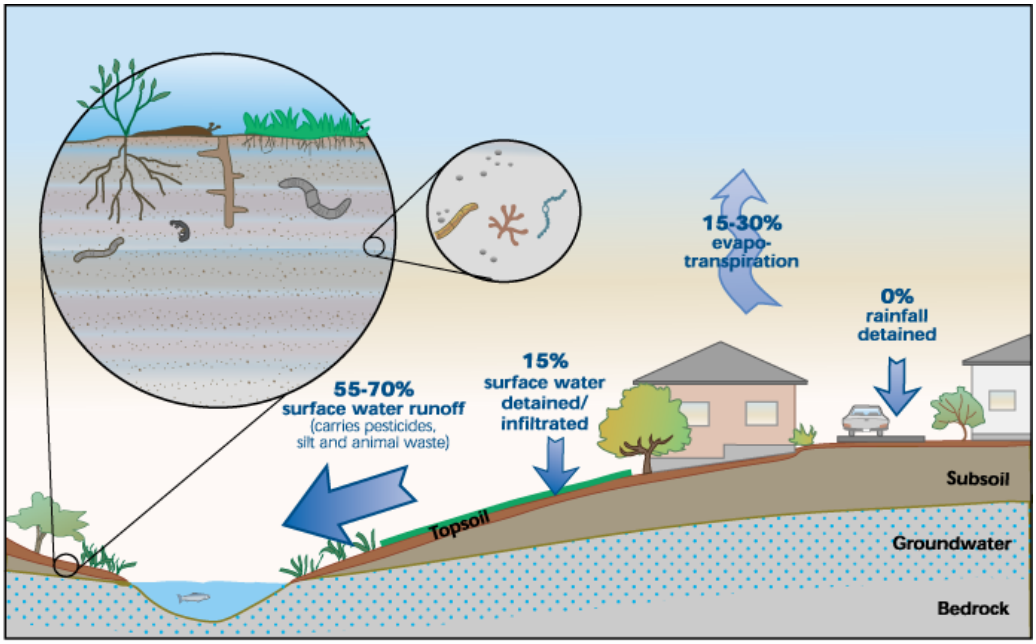
A healthy, vigorous soil and vegetation structure provides valuable plant nutrients, holds and retains water and oxygen, and binds and breaks down pollutants.

***Characteristics of healthy soils**:*

- *Many air and water spaces*
- *Numerous micro and macro organisms*
- *Deep plant root growth*
- *High evapotranspiration, surface water infiltration, and stormwater detention*
- *Low water runoff, minimal erosion*

What is the human impact on soils?

Development limits soils' ability to provide environmental functions:



Disturbed Soil

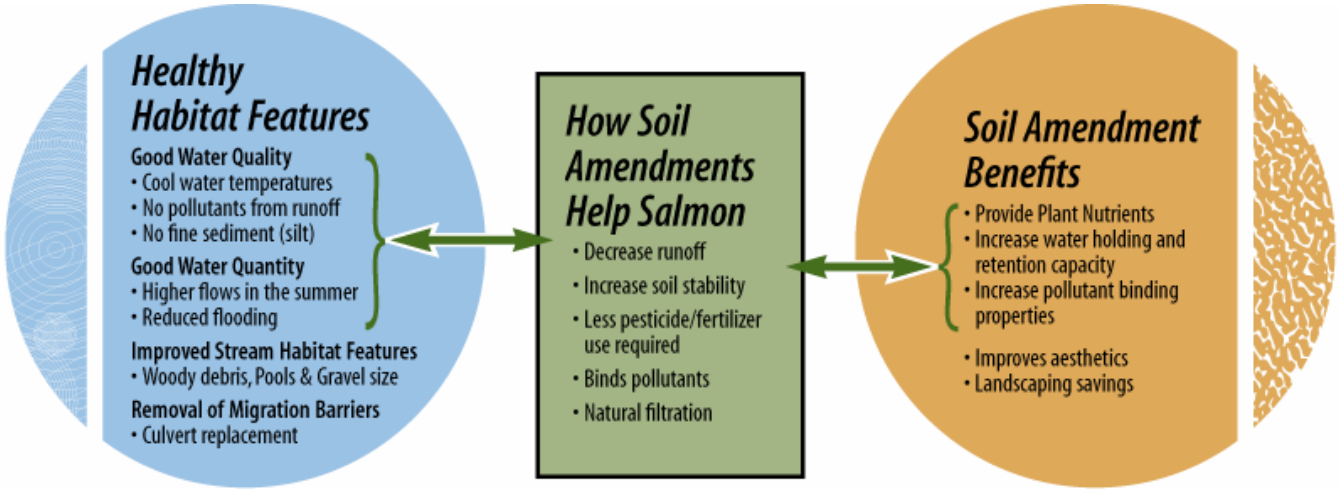
A soil structure impacted by human activity, compaction and development, has limited organic life. This soil cannot perform its natural functions, resulting in negative impacts throughout the watershed.

***Characteristics of disturbed soils**:*

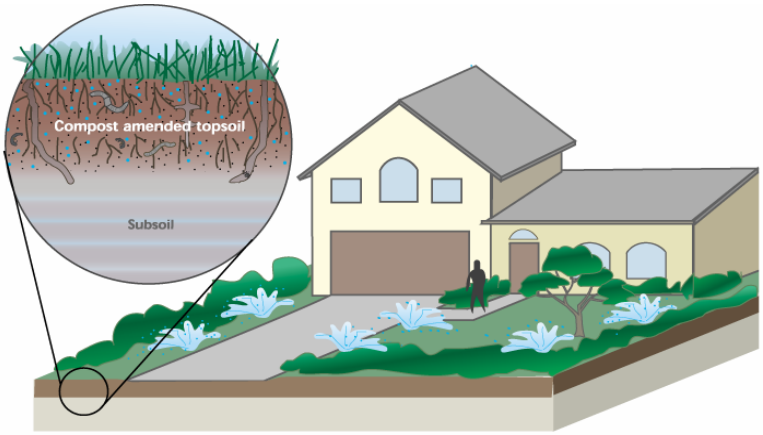
- *Few air and water pockets*
- *Limited beneficial soil organisms – more pests*
- *Shallow root growth*
- *Low evapotranspiration; low surface water detention and infiltration*
- *High runoff and erosion*

Soil Amendment improves water, aquatic habitat, and landscape success:

Soil and water are linked. Soil amendment has a role in salmon recovery.



Compost and other organics can improve soil health and environmental functions:



Utilization of best management practices for soils

Amending soils with compost or other decomposed organics will help restore many of the native soil functions.

***Characteristics of amended soils**:*

- *Increased evapotranspiration, natural stormwater detention and infiltration*
- *Decreased surface water runoff, erosion and pollutants*
- *Improvements in plant nutrient availability, plant appearance, and savings in water, fertilizer and pesticide usage*

Soil Best Management Practices – for healthy streams and healthy landscapes

New Construction BMP's (best management practices)

- Retain and protect native topsoil & vegetation (especially trees) where practical
- Minimize construction footprint and unnecessary soil compaction
- Store and reuse topsoil from site
- Retain "buffer" vegetation along waterways
- Restore disturbed soils by tilling 2-4" of compost into upper 8-12" of soil (or deeper) before planting. (Use a tractor-mounted ripper to loosen compacted layers within 12" of surface.)

Existing Landscape BMP's

- Retrofit soils by tilling in compost when re-landscaping
- Mulch beds with organic mulches (leaves, wood chips, compost), and topdress turf with compost
- Avoid over-use of soluble chemical fertilizers and pesticides, which may damage soil life

Resources: Soil Best Practices in Development

Background Science

University of Washington Center for Watershed Studies http://depts.washington.edu/cwws/ Download proceedings of 1998 *Salmon in the City* conference, and *Soils for Salmon* paper at http://depts.washington.edu/cwws/Outreach/Publications/articles.html This site also includes research on the effects of urbanization, stream restoration techniques, permeable paving , etc.

Soil Biology and Soil Functions: Why Soil Life Matters

US Dept. of Agriculture, NRCS Soil Quality Institute http://soils.usda.gov/sqi/ Download the excellent *Soil Biology Primer*, and other soil quality and erosion prevention resources, or order print copies from 1-800-THE SOIL

Washington State University's Soil Management research site http://www.puyallup.wsu.edu/soilmgmt/

Soil Restoration and Compost Use

Washington Organic Recycling Council / Soils for Salmon **www.SoilsforSalmon.org** Background and up to date information on Soils for Salmon initiative, a soil BMP manual, and useful links on compost use and soil restoration.

U.S. Composting Council http://compostingcouncil.org/ The most authoritative source for information on compost specifications. Particularly useful to landscape professionals is the recently updated *Field Guide to Compost Use*.

USCC's "Seal of Testing Assurance" (STA) program is the state-of-the-art for verifying compost quality and specifications for a variety of uses. See http://tmecc.org/tmecc/ and follow the "STA" link for complete information.

Penn State Turfgrass Extension http://turfgrassmanagement.psu.edu/default.htm
Download Dr. Peter Landschoot's practical guide, *Using Composts to Improve Turfgrass Performance*

Stormwater Management with Soil and Low Impact Development BMPs

Washington State Department of Ecology *Stormwater Management Manual*, used by local jurisdictions for stormwater design, contains soil improvement as a Best Management Practice (Volume V, Chapter 5, BMP T5.13) at www.ecy.wa.gov/programs/wq/stormwater/manual.html, and see the Soils for Salmon website above for a useful manual for implementing that BMP.

Puget Sound Action Team (PSAT) plan update includes a soil improvement policy as a water quality tool. PSAT's Low Impact Development website contains a wide array of useful site planning tools, including a soil BMP in the new *Low Impact Development Manual* http://www.psat.wa.gov/Programs/LID.htm

Master Builders Association's "Built Green" sustainable building program, developed with King and Snohomish Counties, includes soil strategies for home building. www.builtgreen.net

Soil BMP Specifications and Design Guidelines

WA Dept. of Transportation soil bio-engineering page http://www.wsdot.wa.gov/eesc/design/roadside/sb.htm

See also the EPA's "Model Compost Spec for Highways" http://www.epa.gov/epaoswer/non-hw/compost/highway/

Seattle Public Utilities, SEA Street project soil specifications and other Natural Drainage design information at http://www.seattle.gov/util/NaturalSystems/default.htm ; best landscape practices (including soil) information at http://www.seattle.gov/util/rescons/plantNaturally

Puget Sound Action Team, LID Technical Manual http://www.psat.wa.gov/Programs/LID.htm

Texas DOT specs http://www.dot.state.tx.us/DES/landscape/compost/topsoil.htm

Iowa State University research & Iowa DNR specs www.eng.iastate.edu/compost/ and www.iowadnr.com/waste/pubs/files/compostbrochure.pdf

Low Impact Development Center http://www.lowimpactdevelopment.org/

For More Information Contact:

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www.compostwashington.org/ or **www.soilsforsalmon.org**

Illustrations created by the King County Department of Natural Resources & Parks

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