

Glossary

A

Acre: A measure of land area equal to 43,560 square feet.

Acre-Foot: A measure of water volume equal to a land area of one acre with a depth of one foot.

Algae: Simple plants that grow in sunlit waters. Too much algal growth can lower water quality by reducing the oxygen necessary to support *aquatic* life. Excessive algal growth can be triggered by high amounts of *nutrients* such as *nitrogen*.

Aquatic: Growing or living in, or often found in water.

Aquatic Bench: A ten to fifteen foot wide bench around the inside perimeter of a stormwater pond that ranges in depth from zero to twelve inches. Normally planted with wetland vegetation, the bench provides safety, habitat, and additional pollutant removal.

Aquifer: A water-bearing layer of rock, sand, or gravel capable of absorbing water. An aquifer supplies *groundwater* to wells and springs.

B

Bankfull Flow: The flow at which a stream begins to overflow its banks.

Baseflow: Streamflow coming from *groundwater* seeping into a stream.

Benthic Macroinvertebrate: An *aquatic* animal with no backbone and generally visible to the unaided eye, living at the bottom of streams. The number and types of these animals is used as a measure of water quality.

Berm: A mound of earth formed to control the flow of surface water. (Also called, *earthen berm*.)

Best Management Practice (BMP): A practice designed to lessen the impacts of changes in land use on surface water and *groundwater*. Structural best management practices refer to techniques such as *stormwater ponds* designed to reduce pollutants in stormwater runoff. Nonstructural best management practices refer to land-use practices designed to reduce the impact of stormwater runoff on streams, such as the preservation of open space and stream buffers.

Biofiltration: see *Bioretention*.

Bioretention: A water quality practice that uses landscaping and soils to collect and treat urban stormwater runoff. Water is collected in shallow depressions in the ground and allowed to slowly filter through a layer of plants and soil.

Build-out: The total potential land development area based on current and future land development and zoning plans.

Buffer: An area of plant cover next to shorelines, wetlands, or streams. See also, *Resource Protection Area* and *Riparian Buffer*.

C

Catchment: The smallest *watershed* management unit, defined as the area contributing water to a stream, usually through a pipe or open channel.

Channel: A natural or manmade waterway.

Channel Evolution Model: A classification system based on a stream channel's response to human activity such as changes in land use. Channel types are categorized based on streambed and bank characteristics that represent stages in a stream channel's response to land disturbance. See section 3.1.6 for more details.

Chesapeake 2000 Agreement: A voluntary agreement that jurisdictions around the Chesapeake Bay, including the Commonwealth of Virginia, have signed to form a partnership to restore the Chesapeake Bay.

Chesapeake Bay Preservation Areas: Any land designated by Fairfax County in accordance to Part III of the Chesapeake Bay Preservation Area Designation and Management Regulations and Code of Virginia, Section 10.1-2107. A Chesapeake Bay Preservation Area consists of a *Resource Protection Area (RPA)* and a *Resource Management Area (RMA)*.

Confluence: The point where two or more streams join to create a combined, larger stream.

D

Deposition: The process in which particles (e.g., silt, sand, gravel) in the water settle to the stream bottom. Too much deposition can create a thick layer of particles on the stream bottom causing a loss of habitat and spawning areas for *aquatic* insects and fish. Stream bank erosion is a common source for the particles.

Detention: The temporary storage of stormwater runoff used to control peak runoff amounts and provide time for the gradual settling of pollutants.

Detention Basin: A stormwater management pond that temporarily holds runoff and slowly releases it to a downstream stormwater system. Since a detention basin holds runoff only temporarily, it is normally dry during periods of no rainfall. (Also called a *Dry Pond*.)

Discharge: The volume of water that passes a given location within a given period of time, usually expressed in cubic feet per second.

Dissolved Oxygen (DO): The amount of oxygen that is present in a liquid. An adequate supply of oxygen is necessary to support life in a body of water. Measuring the amount of dissolved oxygen in water provides a means of determining the water quality.

Drainage: The removal of excess surface water or *groundwater* from land.

Drainage Area: The area of land draining to a single outlet point.

Dry Pond: See *Detention Basin*.

Dwelling Unit: A residential building or part of a building intended for use as a complete, independent living facility.

E

Ecosystem: All of the organisms in an ecological community and their environment that together function as a unit.

Effluent: Water that flows from a sewage or other type of treatment plant after it has been treated.

Erodibility: The susceptibility of soil to erosion.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents. In streams, erosion is the removal of soil from the stream banks or streambed by rapid flows.

Estuary: A partially enclosed body of water where freshwater from rivers and streams flows into the ocean, mixing with the salty seawater. Although influenced by the tides, estuaries are protected from the full force of ocean waves, winds, and storms by the reefs, barrier islands, or fingers of land, mud, or sand.

Eutrophication: The process of over-enrichment of waterbodies by nutrients, often resulting in excess *algae*. Excess algae reduces the oxygen in water, required for living organisms.

Evapotranspiration: The loss of water to the atmosphere from the earth's surface by evaporation and by *transpiration* through plants.

F

Farm Pond: A still body of water found on farmland.

Fecal Coliform Bacteria: A group of organisms that live in the intestinal tracts of humans and animals. The presence of fecal coliform bacteria in water is an indicator of pollution from human and/or animal excrement.

Filter Strips: A vegetated area that treats *sheet flow* and/or *interflow* by removing sediment and other pollutants. The area may be grass-covered, forested or of mixed vegetative cover (e.g., wildflower meadow).

First Flush: The first portion of stormwater runoff usually containing the highest pollutant concentration resulting from a rainfall event.

Fish Passage: Unobstructed movement of fish within the stream system. Fish require the ability to move between various habitat types and during migration.

Flood limit: Those land areas in and adjacent to streams subject to continuous or periodic inundation from flood events. A 100-year flood limit is an area with a 1 percent chance of inundation in any given year. Also called *floodplain*.

Flooding: The inundation of land next to streams and waterbodies.

Forb: A small, non-woody plant that is not grass, commonly called weeds.

Forebay: A small storage area near the inlet of a stormwater pond to trap incoming sediment where it can be removed easily before it can accumulate in the pond.

G

Gabion: A wire basket or cage that is filled with rock, used to stabilize stream banks, change flow patterns, or prevent erosion.

Geographic Information System (GIS): A computer system for mapping and spatial analysis.

Geomorphology: A science that deals with the land and underwater relief features of the earth's surface. In streams (fluvial geomorphology), it is the study of stream and river channel physical characteristics and evolution over time.

Grassed (Grassy) Swale: An open, vegetated natural depression or wide shallow ditch used to temporarily store, route, or filter out pollutants and sediments from runoff.

Greywater: Wastewater from washing machines, showers, bathtubs, hand washing, lavatories and sinks, which does not contain sewage.

Groundwater: Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper surface of the saturated zone is called the water table.

Groundwater Discharge: The flow of water from the ground to a receiving waterbody such as a stream or lake. See also *Baseflow*.

H

Headcut: An erosional feature in which a sudden change in stream bed elevation occurs resulting in a small waterfall. Flow over the headcut results in a lowering of the stream bed elevation on the downstream side. The headcut will migrate upstream creating a deeper channel as it progresses.

Headwater: The source of a stream or *watercourse*.

Herbicides: Chemicals used to control or kill plants.

Hydraulics: The physical science and technology of the stationary and active behavior of fluids.

Hydrograph: A plot showing the rate of discharge, depth, or velocity of flow over time for a given point on a stream or drainage system.

Hydrologic Cycle: The cycling of water from the atmosphere, onto and through the landscape and eventually back into the atmosphere.

Hydrology: The science dealing with the distribution and movement of water.

Hyetograph: A graphical display of the distribution of rainfall over time.

I

Impervious Surface: A surface composed of any material that impedes or prevents *infiltration* of water into the soil. Impervious surfaces include roofs, buildings, streets, and parking areas. Also called impervious cover.

Infill: A residential development that has occurred near, or within, an already established neighborhood.

Infiltration: The process by which water drains into the ground. Some of this water will remain in the shallow soil layer, where it will gradually move through the soil and subsurface material. Eventually, it might enter a stream by seepage out of a stream bank or it may penetrate deeper, recharging *ground-water aquifers*.

Infiltration Facility: A stormwater management facility that temporarily stores runoff so it can be absorbed into the surrounding soil. Since an infiltration facility confines runoff only temporarily, it is normally dry during periods of no rainfall. Infiltration ponds, infiltration trenches, infiltration dry wells, and porous pavement are considered infiltration facilities.

Intensely Developed Area: A term related to Fairfax County's Chesapeake Bay Preservation ordinance, describing an area of existing development and *infill* sites where development is concentrated and little of the natural environment remains.

L

Land Development: A man-made change to, or construction on, the land surface.

Land Disturbing Activity: Land change including clearing, grading, excavating, permanent flooding associated with the impoundment of water, and filling of land. These land changes can result in soil erosion from water or wind and the movement of sediments into waters or onto lands.

Land Use: Describes the type of activity on the land such as commercial or residential. The county zoning requirements dictates the type of land use allowed for a given area.

Leaching: The process by which water-soluble materials in the soil, such as salts, nutrients, pesticides or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water.

Low-Impact Development (LID): A stormwater management technique that reduces the stormwater impacts from new development or redevelopment. There are many options for including low impact development in a design. For example, reducing the amount of *impervious* surfaces and designing the site to take advantage of the natural conditions can reduce the amount of runoff produced by a development area. Techniques such as *grassy swales* and *bioretention* facilities may also be included to reduce runoff rates and promote *infiltration*.

M

Marsh: A wet land area, periodically inundated with water.

Micaceous: General term for mica-rich rocks. Mica is a group of minerals with a sheet-like crystal structure that easily separate into thin, transparent leaves. Micas can be found in the rocks of the Piedmont and Blue Ridge provinces of Virginia.

Micropool: A small permanent pool in a larger stormwater pond system, usually at the pond outlet to provide additional settling of pollutants.

Mitigation: To make a development scenario less harmful than the original plan; or to provide a habitat in another more conducive, larger, or better-suited area, typically in a different location from the original.

Municipal Separate Storm Sewer (MS4) Permit: An NPDES (National Pollutant Discharge Elimination System) permit issued to municipalities requiring the reduction in pollutants contributing to the discharges from the municipality's storm sewer system outfalls.

N

National Pollutant Discharge Elimination System (NPDES): The national program for issuing, modifying, monitoring, and enforcing permits under Sections 307, 402, 318 and 405 of the Clean Water Act. The NPDES permits regulate wastewater and stormwater discharges to the waters of the United States, and are administered by the Virginia Department of Environmental Quality and Virginia Department of Conservation and Recreation.

Nitrogen: A chemical element that occurs naturally as a gas and makes up 78 percent of the atmosphere. It is required by plants for growth and is found in most fertilizers. Too much nitrogen in the water can cause *eutrophication* and result in excess algal blooms, reducing the amount of oxygen available to aquatic life.

Nonpoint Source (NPS) Pollution: Contaminants such as sediment, nitrogen, phosphorous, hydrocarbons, heavy metals, and other toxins whose origins cannot be pinpointed to a specific source. These contaminants are generally washed from the land surface by stormwater runoff.

Nutrient: A substance that provides food or nourishment. In the *aquatic* environment, nutrient refers to compounds of phosphorus, nitrogen, and potassium that contribute to *eutrophication*.

Nutrient Uptake: The biological process in which plants absorb nutrients through their roots, removing these compounds from the *aquatic* environment.

O

On-Site Stormwater Management: A stormwater management facility designed to control runoff from a small area, such as a lot, block, or subdivision.

Open Space: A portion of a development site that is permanently set aside for public or private use and will not be developed. The space may be used for recreation, or may be reserved to protect or buffer natural areas.

Outfall: Defined in the *NPDES* program as the point where discharge from a regulated system flows into waters of the United States.

Outlet: The point at which water flows from one waterbody to another, such as a stream or river to a lake or larger river.

P

Peak Discharge: The maximum flow rate at a given location during a rainfall event. Peak discharge is a primary design factor for the design of stormwater runoff facilities such as pipe systems, storm inlets and culverts, and swales.

Perennial Streams: A body of water that normally flows year-round, supporting a variety of *aquatic* life.

Pervious: Any material that allows for the passage of liquid through it. Any surface area that allows *infiltration*.

Phosphorus: An element found in fertilizers and sediment runoff that can contribute to the *eutrophication* of waterbodies. It is the keystone pollutant in determining pollutant removal efficiencies for various *best management practices* as defined by the Virginia Stormwater Management Regulations.

Point Source: Any discernible, confined conveyance, including but not limited to, any pipe, ditch, channel, tunnel, well, concentrated animal feeding operation, landfill leachate collection system, or floating craft from which pollutants are discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant: Any substance introduced to water that degrades its physical, chemical, or biological quality.

Pollutant Loading: The rate at which a pollutant enters a surface water or *groundwater* system. This is typically determined by water quality modeling and expressed in terms such as pounds per acre, per year.

Pollution Prevention: Any activity intended to reduce or eliminate pollutants from entering a waterbody (e.g., spill response, minimizing fertilizer or pesticide use, etc.)

Pool: The reach of a stream between two *riffles*; a small and relatively deep body of quiet water in a stream or river. Natural streams often consist of a succession of pools and riffles.

Post-Development: Refers to conditions that exist after completion of a land development activity on a specific site or tract of land.

Pre-Development: Refers to the conditions that exist at the time that plans for land development of a tract of land are approved by the plan approval authority.

Q

Quantity Control: *Stormwater management facilities* designed to reduce *post-development peak discharge* to the *peak discharge* that occurred in the *pre-development* conditions.

Quality Controls: *Stormwater management facilities* designed to remove *pollutants* from *runoff* and improve water quality.

R

Rain Barrel: A storage container connected to a roof downspout, typically including a hose attachment to allow for reuse of rooftop runoff.

Reach: General term used to describe a length of stream.

Recharge: The downward movement of water through the soil into *groundwater*; for example, rainfall that seeps into a *groundwater aquifer*.

Redevelopment: The substantial alteration, rehabilitation, or rebuilding of a property for residential, commercial, industrial, or other purposes.

Regional Ponds: Larger stormwater management facilities designed to treat the runoff from drainage areas of 100 to 300 acres.

Resource Management Area (RMA): An area defined in Fairfax County's Chesapeake Bay Preservation Ordinance comprised of lands that, if improperly used or developed, have a potential for causing significant water quality degradation. RMAs typically include floodplains, highly erodible or permeable soils, and other land as designated by the locality.

Resource Protection Area (RPA): As established in accordance with Chapter 118 of the Code of County of Fairfax, Virginia, that component of the Chesapeake Bay Preservation Area comprised of lands at or near the shoreline or water's edge that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts that may result in significant degradation of the quality of state waters. In their natural condition, these lands provide for the removal, reduction, or assimilation of sediments, nutrients, and potentially harmful or toxic substances from runoff entering the Bay and its tributaries, and minimize the adverse effects of human activities on state waters and aquatic resources.

Resource protection areas filter pollutants out of stormwater runoff, reduce the volume of stormwater runoff, prevent erosion, and perform other important biological and ecological functions. A resource management area is a Chesapeake Bay Preservation Area, whose land features generally include tidal wetlands, nontidal wetlands contiguous to tidal wetlands, tidal shores, tributary streams, a buffer area (of not less than 100 feet), and other lands as designated by the locality.

Retention: The permanent storage of stormwater.

Retention Basin: A stormwater management pond that permanently stores water for the purpose of improving water quality. It is normally wet, even during periods without rainfall. Stormwater runoff may be temporarily stored above this impoundment for the purpose of reducing flooding or stream channel erosion. Also called a *Wet Pond*.

Retrofit: The modification of stormwater quantity control systems through the modification of wet ponds, wetland plantings, or other *best management practices* designed to improve water quality.

Return Period: The average length of time between events having the same characteristics. For example, if a storm has a 1 percent chance of occurring in any given year, then it has a return period of 100 years.

Riparian Buffer: Strips of grass, shrubs, and/or trees along the banks of rivers and streams that filter polluted runoff. These buffers provide a transition zone between water and human land use. Buffers are also complex ecosystems that provide habitat and improve the stream communities they shelter.

Riprap: A protective layer of large stones placed on a streambank to prevent erosion.

Riffle: A reach of stream that is characterized by shallow, fast-moving water broken by the presence of rocks and boulders.

Riffle/Run: Streams that are generally characterized by a high slope (gradient), and a mixture of riffle and run habitat.

Runoff: The portion of precipitation, snowmelt, or irrigation water that flows off the land into surface waters instead of *infiltrating*.

Run: A segment of stream length that is characterized by moderate depths, smooth flowing water at a moderate pace. A run is intermediate between a *riffle* and a *pool*.

S

Scour: Removal of sediment from the streambed and banks caused by fast moving water. See also *Erosion*.

Sediment: Organic materials and/or minerals that have been moved from their original site by water or wind. Sediment accumulates in reservoirs, rivers and streams, reducing channel depth, impeding navigability, destroying wildlife habitat and clouding water so that sunlight cannot reach *aquatic* plants.

Sedimentation (Settling): The processes whereby particles of rock material accumulate to form deposits. Sedimentation also refers to a pollutant removal method to treat stormwater in which pollutants are removed by gravity as sediment settles out of the water column. An example of a *best management practice* using sedimentation is a *detention pond/wet pond*.

Sheet Flow: Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.

Site Plan: Detailed engineering drawings of the proposed uses and improvements required in the development of a given lot.

Source Controls: A group of stormwater management techniques designed to remove pollutants before they enter a downstream waterbody. They include non-structural best management practices, pollution prevention techniques, and housekeeping measures such as street sweeping, litter and trash pickup, or storm sewer cleaning.

Stakeholder: Stakeholders include groups of people within the Difficult Run watershed (e.g., residents, industry, local government, agencies, and community groups), as well as those who work in the *watershed*.

Storm Drain: See *Storm Sewer*.

Storm Sewer: A man-made drainage system that carries only surface runoff, street wash, and snow melt from the land. In a separate storm sewer system, storm sewers are completely separate from sanitary sewers that carry wastewater. In a combined sewer, a single conveyance system carries both stormwater and wastewater.

Stormwater: Surface water flow that results from rainfall.

Stormwater Management (SWM) Facility: A structure, such as a pond, that controls the quantity and quality of stormwater runoff.

Stormwater Outfall: A single location, pipe discharge, or outlet structure that releases stormwater into a stream, river, or pond.

Stormwater Ponds: A depression or dammed area with an outlet device that controls stormwater outflow. Stormwater ponds retain water from upstream areas, thereby reducing peak flows downstream. In Fairfax County, stormwater ponds are either dry (*dry pond*) or contain a permanent pool of water (*wet pond*) and are typically designed to control the peak runoff rate for selected storm events.

Stormwater Wetlands: Areas intentionally designed to emulate the water quality improvement function of wetlands for the primary purpose of removing pollutants from stormwater.

Stream Flow: Surface water flowing in a natural channel.

Stream Rehabilitation: The recovery of ecosystem functions and processes in a degraded *aquatic* habitat. Rehabilitation does not necessarily reestablish the pre-existing condition of the ecosystem, but does involve establishing geologically and hydrologically stable landscapes that support the natural ecosystem.

Stream Restoration: The reestablishment of the structure and function of a stream, as closely as possible to its pre-existing condition.

Subdivision: A new development that splits an existing tract, parcel or lot into two or more parts.

Subdivision Code: A set of local requirements that govern the dimensions of a particular zoning category and also specify the types of roads, drainage, waste disposal and other community services that must be constructed to serve the development.

Substantial Alteration: Expansion or modification of a structure or development that would result in disturbance of any land within a *Resource Protection Area*. It also refers to land exceeding an area of 2,500 square feet within a *Resource Management Area*.

Substrate: The material forming the bottom of a stream channel. Channel materials are generally broken into categories (listed smallest to largest) such as clay, silt, sand, gravel, cobble and boulder.

Subwatershed: A smaller subsection of a larger *watershed*, delineated to describe a particular tributary to a larger waterbody. A subwatershed may contain several *catchments*.

Suspended solids: Particles that are suspended in and carried by the water. The term includes sand, mud, and clay particles as well as solids in wastewater.

Swale: A natural depression or wide shallow ditch used to temporarily store, route, or filter runoff.

T

Tidal Shores or Shore: The land next to a tidal body of water between the mean low water level and the mean high water level.

Total Maximum Daily Load (TMDL): A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

Transpiration: The process by which water vapor escapes from living plants and enters the atmosphere. Studies have shown that about 10 percent of the moisture found in the atmosphere is released by plants through transpiration.

Tree Canopy Cover: The area directly beneath the crown and within the dripline of a tree.

Turbidity: The amount of solid particles that are suspended in water, making it cloudy or even opaque in extreme cases.

U

Ultra-Urban: A type of land use dominated by highly developed areas in which very little *pervious* surface exists.

Uncontrolled Stormwater: Stormwater that is not treated by *stormwater management* systems.

Urban Runoff: Stormwater from developed areas, including streets and adjacent residential or commercial/industrial properties. This runoff can carry road salt, trash, chemicals, oil, and other pollutants into local streams and waterbodies.

W

Water Body with Perennial Flow: A body of water flowing in a natural or manmade channel year-round, except during periods of drought. These include *perennial streams*, *estuaries*, and tidal bays.

Water Quality Standards: State-adopted and USEPA-approved standards for waterbodies. The standards prescribe the use of the waterbody and establish the water quality criteria that must be met to protect designated uses.

Watershed: An area of land that drains directly, or through tributary streams, into a particular river or waterbody. A watershed includes its associated groundwater. Elevated landforms, such as ridges or even roads can serve as watershed divides.

Wetlands: Areas where the soil or substrate is saturated with water during at least a part of the growing season. These saturated conditions determine the types of plants and animals that live in these areas.

Wet Pond: See *Retention Basin*.

Acronyms

ac	Acre
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
cfs	Cubic Feet per Second
CEM	Channel Evolution Model
CBPA	Chesapeake Bay Preservation Area
COD	Chemical Oxygen Demand
CMP	Corrugated Metal Pipe
CWA	Clean Water Act
DCR	Virginia Department of Conservation and Recreation
DEM	Digital Elevation Model
DEQ	Virginia Department of Environmental Quality
DO	Dissolved Oxygen
DPWES	Fairfax County Department of Public Works and Environmental Services
DPZ	Fairfax County Department of Planning and Zoning
E&SC	Erosion and Sediment Control
FEMA	Federal Emergency Management Agency
fps	Feet per Second
FBP	Future Basin Plan
GIS	Geographic Information System
GP	General Permit
IAP	Immediate Action Plan
IDA	Intensely Developed Area
IMBI	Index of Macro-Biotic Integrity
IMP	Integrated Management Practices
JPA	Joint Permit Application
LF	Linear Foot
LID	Low Impact Development
mg/l	Milligrams per Liter
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Natural Resources Conservation Service

NWP	Nationwide Permit
OSDS	Fairfax County Office of Site Development Services
PFM	Fairfax County Public Facilities Manual
ppb	Parts per Billion
ppm	Parts per Million
ppt	Parts per Thousand
PRS	Pro Rata Share
RBP	Rapid Bioassessment Protocol
RCP	Reinforced Concrete Pipe
RMA	Resource Management Area
RPA	Resource Protection Area
SCS	U.S. Soil Conservation Service
SOS	Save Our Streams
SPA	Stream Physical Assessment
SPS	Stream Protection Strategy
STATSGO	NRCS State Soil Geographic Database
SWM	Stormwater Management
TMDL	Total Maximum Daily Load
TR-55	Technical Release 55
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VDH	Virginia Department of Health
VDOT	Virginia Department of Transportation
VPDES	Virginia Pollutant Discharge Elimination System
VWPP	Virginia Water Protection Permit

References

- CDM, 2003. *Technical Memorandum No. 3, Stormwater Model and GIS Interface Guidelines*, CDM, Annandale, VA.
- Center for Watershed Protection, 2003. *Impacts of Impervious Cover on Aquatic Systems*. CWP, Ellicott City, MD.
- Fairfax County Environmental Coordinating Committee, 2003. *The Role of Regional Ponds In Fairfax County's Watershed Management*. Fairfax County, Fairfax VA.
- Fairfax County Office of Comprehensive Planning, 1978. *Difficult Run Headwaters Land Use Study*, Fairfax County, Fairfax VA.
- Fairfax County Soil Science Office, 1990. *Fairfax County Soil Survey*. Fairfax, VA.
- Fairfax County Stormwater Management Branch, 2001. *Fairfax County Stream Protection Strategy (SPS) Baseline Study*. Fairfax, VA.
- Metropolitan Washington Council of Governments, 2006. *Growth Trends to 2030: Cooperative Forecasting in the Washington Region*. MWCOG, Washington DC.
- Parsons Brinkerhoff Quade and Douglas, 1976. *Difficult Run Environmental Baseline*. PBQ&D, Fairfax, VA.
- Schueler, T.S., 2000. "Irreducible Pollutant Concentrations Discharged from Stormwater Practices." Article 65 in *The Practice of Watershed Protection*. Center for Watershed Protection, Ellicott City, MD.
- Schumm, S.A., Harvey, M.D., and Watson, C.C., 1984. *Incised Channels: Morphology, Dynamics, and Control*. Water Resources Publications, Littleton, CO.