



Education Program Guide

John Marshall Soil & Water Conservation District

John Marshall Soil and Water Conservation District

98 Alexandria Pike, Suite 31

Warrenton, VA 20186

540-347-3120 x3

johnmarshall.swcd@vaswcd.org

Mission

Our Mission is to provide leadership, technical assistance, information, and education to the citizens of Fauquier County in proper soil stewardship, agricultural conservation methods, and water quality protection so as to ensure the wise use of the county's natural resources.

Who We Provide Education Programs For

All Schools: Kindergarten – 12th Grade (Public and Private)

Nature Clubs and Conservation Organizations

Boy Scouts and Girl Scouts

Senior Citizens

4-H

Church Groups

Youth Groups

Community and Municipal Groups

Libraries

All Fauquier County Residents

How to Schedule a Program

Call or email the John Marshall SWCD Conservation Education Specialist:

Michael Trop at 540-316-6639 or michael.trop@fauquiercounty.gov

Select the program, time, and date desired. Please have alternative dates in mind in case your first choice is not available. Customized programs can be created for your group, but a minimum of 1-month notice is required for these programs. Please note that April and October are typically very busy, so if you would like a program scheduled for these months, the request should be made early in order to ensure you receive a date. Please inform us of any special requirements that your class or group may have and notify us immediately if you have to postpone or cancel.

Introduction

The John Marshall Soil and Water Conservation District (SWCD) is a political subdivision of the Commonwealth of Virginia. The District is governed by a Board of Directors consisting of five elected and appointed members of the local community. District staff partners with state and federal agencies to provide technical assistance to local landowners to assist with the conservation of Fauquier County's natural resources. Part of the District's mission is to educate the public and this is done through a variety of programs including classroom programs, field days, workshops, and community meetings. This document has been developed for you to become familiar with some of the educational programs offered by the John Marshall SWCD. The District's Conservation Education Specialist is available to help support your educational needs.

Please note that the programs listed here are not inclusive of all the programs that are available through the John Marshall SWCD. Classroom programs are geared toward helping teachers address the Virginia Standards of Learning. Please note that while time lengths and grade levels are given for each program, presentations are flexible and are able to be adapted to different grade levels. Most programs work best for individual classes, but if classes need to be combined, that can be arranged.

School Water Programs

Kindergarten

A Drop in the Bucket

VA SOL: K.1, K.11

20 minutes

In this Project WET activity, students learn how much fresh water is available for human use and why we need to conserve our valuable water resources for future use.

1st Grade

Who Polluted The River?

VA SOL: 1.1, 1.8

30 minutes

For this activity, students take turns pouring different pollutants into a waterbody. Students then discuss all the different factors and ways that they can both harm and improve water quality and why it's important to conserve natural resources.

3rd Grade

The Incredible Journey

VA SOL: 3.1, 3.9

40 minutes

In this activity adapted from Project WET, students imagine they are water droplets as they move throughout the water cycle. Each student will make a bead bracelet that shows their individual movements throughout the water cycle.

4th Grade

Your Watershed Address

VA SOL: 4.1, 4.7, 4.9

40 minutes

For this activity, students will receive a lesson on watersheds: what watershed students are in, where water from each Virginia watershed goes, and what impacts humans can have on their watershed. The Augmented Reality Sandbox is used for this program.

5th Grade

Leaf Pack Project

VA SOL: 5.1, 5.5

Two 50-minute periods

In this activity, students classify stream insects and understand how these organisms affect water quality. During the first classroom visit, students will fill bags of leaves. A staff member from John Marshall Soil and Water Conservation District will then take the bags and place them in a stream. After about a month, the bags will be brought back to the classroom and students will pick through them to find, sort, and identify benthic macroinvertebrates (stream insects) based on their characteristics.

6th Grade

Where Does Your Water Shed?

VA SOL: 6.1, 6.5, 6.7, 6.9

50 minutes

Students will use the Enviroscape® table top model to learn about Virginia's watersheds, the health of ecosystems, and the importance of protecting our water resources. The Enviroscape® model allows students to create a storm event to see the effects of pollution on a watershed.

Life Science

Leaf Pack Project

VA SOL: LS.1, LS.6, LS.8, LS.9, LS.11

Two 50-minute periods

In this activity, students examine stream insects to understand their interactions as part of the food web, their adaptations for survival, and what outside influences can affect them. During the first classroom visit, students will fill bags of leaves. A staff member from John Marshall Soil and Water Conservation District will then take the bags and place them in a stream. After about a month, the bags will be brought back to the classroom and students will pick through them to find, sort, and identify benthic macroinvertebrates (stream insects) based on their characteristics.

Earth Science

Introduction to Topography

VA SOL: ES.1

30 minutes

Using the District's Augmented Reality Sandbox, students will learn about topographic maps, contour lines, and landforms. The Sandbox allows for students to create 3-D models of topographic maps to help further understand these concepts and their use in watershed and land use planning.

An Overview of Freshwater Resources

ES.1, ES.8

30 minutes

Water is vital to life on Earth. In this lesson, students will learn about freshwater resources including watersheds, groundwater, and aquifers, as well as how these resources can become polluted.

Biology

Water Monitoring

VA SOL: BIO.1, BIO.2, BIO.8

One or more 90-minute class periods

Depending on time and available resources, students will be able to either:

A: Take one (or multiple) field trips to a local stream to test water quality measuring physical (temperature, width, depth, velocity), chemical (pH, dissolved oxygen, nutrients), and biological (benthic macroinvertebrates) factors of a stream.

B: Have buckets of water from different streams brought into the classroom to test for temperature, pH, dissolved oxygen, and nutrients. The Leaf Pack Project (see 5th Grade or Life Science) can also be completed as part of the water monitoring experience.

The District has all the equipment needed to conduct these activities.

Chemistry

The Chemistry of Water Quality

VA SOL: CH.1, CH.3, CH.4

60 minutes

Students use chemical kits (provided by the District) to test water quality. Discussions are held on the chemical makeup of the water. Also discussed are the reactions which take place during the tests and how they allow us to measure water quality.

AP Environmental Science/Ecology

Water Monitoring

AP Topics – II: The Living World, VI: Pollution

One or more 90-minute class periods

Depending on time and available resources, students will be able to either:

A: Take one (or multiple) field trips to a local stream to test water quality measuring physical (temperature, width, depth, velocity), chemical (pH, dissolved oxygen, nutrients), *E. coli* bacteria and biological (benthic macroinvertebrates) factors of a stream.

B: Have buckets of water from different streams brought into the classroom to test for temperature, pH, dissolved oxygen, and nutrients. The Leaf Pack Project (see 5th Grade or Life Science) can also be completed as part of the water monitoring experience.

The District has all the equipment needed to conduct these activities.

Wetland Resources

AP Topics – II: The Living World, IV: Land and Water Use

60 minutes

Students will learn about the importance of wetlands and the services they provide. Students will then go outside to test a couple of areas on their school property for the presence or absence of wetlands.

Meaningful Watershed Educational Experiences (MWEEs)

In Virginia, students are required per the 2014 Chesapeake Bay Agreement (CBA) to participate in a Meaningful Watershed Educational Experience (MWEE) in Elementary School, Middle School, and in High School. A MWEE is an investigative or experimental project which engages students to think critically about the Chesapeake Bay and its watershed. A MWEE must include four phases: a preparation phase, an outdoor action phase, an action project, and a reflection phase. The goal of the MWEE program as stated in the 2014 CBA is to “Enable every student in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed.” The MWEE should be related to a specific issue associated with the Chesapeake Bay. Students will focus their investigation on this locally relevant issue. Topics should also be grade-level appropriate.

The John Marshall Soil and Water Conservation District can help you plan and conduct your Meaningful Watershed Educational Experience (MWEE). A copy of “An Educator’s Guide to the Meaningful Watershed Educational Experience” can be provided to teachers upon request. The District also has PowerPoint presentations which may be correlated to your MWEE topic. PowerPoints include: An Introduction to Watersheds, A Virtual Tour of Your School’s Watershed, Biological Monitoring, Chemical Monitoring, and Visual Stream Assessment.

MWEEs can be done at any grade level; however, they fit well with the science SOLs for 4th Grade (4.1, 4.5, and 4.9), 6th Grade (6.1, 6.5, 6.7, and 6.9), and 9th Grade (ES.1, ES.6, ES.8, and ES.10). MWEEs are intended to be multidisciplinary and investigations can easily cross into civics, language arts, mathematics, and other disciplines.

School Soils Programs

2nd Grade

Eroding Away

VA SOL: 2.1, 2.7

30 minutes

For this activity, the Enviroscope® model is used to demonstrate the effects of wind and water erosion on land surfaces. The Enviroscope® model allows students to create a storm event to see the effects on a landscape.

3rd Grade

Soil Tubes

VA SOL: 3.1, 3.7

30 minutes

In this activity, students learn the layers, components, uses, and overall importance of soils. As part of this program, students will get to make and take home a Soil Tube which will help remind them of the soil layers (topsoil, subsoil, and bedrock).

5th Grade

Enviroscope® Weathering

VA SOL: 5.1, 5.7

30 minutes

Students will use the Enviroscope® model to discuss erosion, sediment deposition, and the impact that humans have on the Earth's surface through various activities. The Enviroscope® model allows students to create a storm event to see the effects on a landscape. A discussion of weathering and soil formation will also take place.

Earth Science

Sinkhole in a Cup

ES.1, ES.8

30 minutes

This is a Project Underground activity in which students will use commonly found items to create their own sinkhole. Students will learn about karst topography in Virginia: where it occurs and what that means for the people that live there. Also available as a kit which can be loaned out to teachers.

AP Environmental Science/Ecology

Soil Exploration 101

AP Topic – I: Earth Systems and Resources

90 minutes

Students will learn the basics about soils: particle size, soil color, and classifying soils by texture. Students will then use a variety of soil equipment such as pH meters, moisture meters, soil augers, etc. to characterize the soils around their school. The District has all the necessary equipment and can also loan it out to teachers.

Agriculture

Soil Exploration 101

90 minutes

Students will learn the basics about soils: particle size, soil color, and classifying soils by texture. Students will then use a variety of soil equipment such as pH meters, moisture meters, soil augers, etc. to characterize the soils around their school. The District has all the necessary equipment and can also loan it out to teachers.

School Conservation District Programs

High School

Conservation Districts

30 minutes

What exactly is a conservation district? Where did they come from and what do they do? This presentation gives students an inside look into a unique branch of government and how conservation districts work to help conserve important natural resources.

Conservation District Careers

20 minutes

A member or members of the John Marshall Soil and Water Conservation District is able to come to your school or classroom to discuss career options with students who may have an interest in natural resources.

Adult Programs

Conservation Around Your Yard

45 minutes

Learn about ways that you can help conserve natural resources around your home. From landscaping, to watering, to ways to fix erosion and wet areas, this program will help you address your outdoor conservation needs.

Conservation Districts

30 minutes

What exactly is a conservation district? Where did they come from and what do they do? This presentation gives an inside look into a unique branch of government and how Conservation Districts work to help conserve important natural resources.

Other Services and Programs

The John Marshall Soil & Water Conservation District offers a wide variety of programs that address Fauquier County's diverse natural resources. The following services and programs are available to county residents.

Water Quality Monitoring

The District conducts monitoring on a number of sites in Fauquier County. The District also hosts water monitoring workshops as well as individual training on setting up and implementing a water quality monitoring program. For more information about the District's monitoring efforts in Fauquier County, go to: <http://www.fauquiercounty.gov/government/departments-h-z/john-marshall-soil-water-conservation-district/water-quality-monitoring>.

Envirothon

9th-12th Grade Students

Envirothon is a natural resources competition for high school students. Students compete by demonstrating their knowledge of environmental science and natural resource management. In preparation for the competition, the teams spend the year studying soils, forestry, aquatics, wildlife, and a current environmental issue. Students also apply their knowledge of these topics and problem solving skills through an oral presentation in which they solve real-life environmental problems. For more information: <http://vaswcd.org/envirothon> or <http://www.fauquiercounty.gov/government/departments-h-z/john-marshall-soil-water-conservation-district/conservation-education-programs/envirothon>.

Youth Conservation Camp

Currently Enrolled in Grades 9-12

Held in Early-Mid July at Virginia Tech

Youth Conservation Camp is a 7-day long camp for students who have an interest in natural resources. During the week, students participate in a variety of activities including electrofishing, forestry hikes, hiking to the cascades waterfall, touring the forest products center, sampling benthic macroinvertebrates, touring the dairy science center and swine facilities, touring the vet hospital, and canoeing on the New River. The John Marshall SWCD offers two full scholarships to applicants from Fauquier County. Camp applications can be found at the following website and are typically due in early May:

<http://www.fauquiercounty.gov/home/showdocument?id=5207>.

Holiday Lake Forestry Camp

Ages 13-16

Held in Late June at Holiday Lake 4-H Education Center

Holiday Lake Forestry Camp is a 6-day long camp for students who would like to explore and experience activities in forestry and wildlife related careers. Some of the learning experiences include a field trip to a local paper mill; urban forestry demonstrations; exploratory classes in topics such as forest fire equipment and tactics, wilderness survival, canoeing, archery, skeet marksmanship, and wood turning; and presentations by Conservation Police Officers, arson investigators, and wildlife researchers. The cost for students to attend is \$85. Students must be nominated to attend by an adult not related to them. Nominations are accepted from January 1 to April 1 each year. More information can be found here:

<http://www.dof.virginia.gov/forestry/camp/index.htm>.

VASWCD Scholarship

The Virginia Association of Soil and Water Conservation Districts offers four \$1,000 statewide scholarships annually through their educational foundation. Applicants must be full-time students enrolled in or who have applied to a college freshman level curriculum. Applicants also need to be in the top 20% of his or her graduating class or a 3.0 or greater GPA and must also demonstrate active interest in conservation. Applications are typically due to the John Marshall SWCD in early March. More information and an application can be found here:

<http://vaswcd.org/student-scholarships>.

Conservation Poster Contest

Kindergarten – 12th Grade

The annual Conservation Poster Contest provides kindergarten through twelfth grade students with an opportunity to convey their thoughts about soil, water, and other natural resource issues through art. The poster contest theme follows the annual National Association of Conservation Districts Stewardship theme. Previous themes include: Where Does Your Water Shed?, Dig Deeper: Mysteries in the Soil, and Local Heroes: Your Hardworking Pollinators. First place posters for each grade category are then submitted for judging to the Virginia Association of Soil and Water Conservation Districts poster contest. Cash prizes are given to winning posters at the State and National level. To assist in making this activity more meaningful, District staff can give a short program to your class on the current contest theme. Rules and information on the contest are available here:

<http://vaswcd.org/poster-contest>.

Conservation Field Days

Conservation field days have been held for Fauquier County schools since the 1990s. At these field days, students visit a local farm and groups rotate through 8 or 9 stations. They are typically geared toward 3rd and 7th grade students, but can be done for almost any grade level. Typical stations may include farm management, livestock (typically cattle or horses depending on the farm), crops, water quality, soils, insects, forestry, wildlife, composting, and wetlands.

Trout in the Classroom

Virginia's state fish is the Brook Trout and the Trout in the Classroom (TIC) program gives students an opportunity to study the lifecycle of this fish. This is a program sponsored by the Virginia Department of Game and Inland Fisheries where a classroom will raise Brook Trout from eggs to adults. The program starts in the fall when eggs are delivered to schools and ends in the spring when the schools release their fish into streams. The District can help connect schools with the equipment and resources necessary to undertake this project.

Outdoor Classrooms

The John Marshall SWCD can assist teachers or schools in the development of an on-site outdoor classroom area.

Earth Day Projects

District staff is available to help set up Earth Day projects in area schools or around the community.

Tree Plantings/Stream Restoration

The John Marshall SWCD typically conducts tree plantings in the spring on local farms and can help classes or members of the general public become a part of these meaningful restoration activities.

Grant Writing Assistance

The District can assist teachers with preparing grants and finding funding sources for any great ideas that they have for school or community programs.

Boy Scouts/Girl Scouts

The District offers opportunities for Boy Scout troops in receiving merit badges such as Environmental Science and Soil and Water Conservation. The District offers a patch program for Girl Scouts for Soil, Water, and for participation in the Poster Contest.

Contractors/Landscapers

The District occasionally hosts workshops for contractors and landscapers to provide information on District program requirements and policies.

Festivals and Special Events

The District supports a variety of activities, fairs, festivals, and other events. We have a couple of different displays and activities which can be set up at these events.

Special Program Requests

If you have a request for a program that is not listed in this booklet, let us know and we can work with you to develop a program customized to your request.

Miscellaneous Materials

The District has a large collection of fact sheets, brochures, DVDs, and other material available to all residents of Fauquier County.

Teacher Training/Professional Development Opportunities

The following six items are curricula sponsored by different groups. Each curriculum comes with an activity book with hundreds of activities correlated to various grade levels and cross-curricular academic standards. To receive the materials for Project WET, Project Learning Tree, Project WILD, Flying WILD, and Project Aquatic WILD, teachers must attend a workshop in order to learn the activities and be trained on using the various guides. The John Marshall Soil & Water Conservation District's Education Specialist is certified to teach workshops for Project WET, Project Learning Tree (pre-K – 8th Grade), three of the Project Learning Tree (9th – 12th Grade) modules, and Project Flying WILD; however, all workshops can be arranged by contacting the JMSWCD Education Specialist.

Project WET

<http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/ProjectWET.aspx>

Project WET (which stands for “Water Education for Teachers”) is a nationally developed water education program for educators (public and private school teachers, youth club leaders, museum staff, and other community educators). The “Project WET Curriculum and Activity Guide”, for kindergarten through twelfth grades, is a collection of hands-on water-related activities. Project WET addresses water’s chemical and physical properties, quantity and quality issues, aquatic wildlife, ecosystems, and management strategies. The activities promote critical thinking and problem-solving skills by teaching students how to think about water resources rather than *what* to think.

Project Learning Tree (Pre-K – 8th Grade)

<https://www.plt.org/virginia>

Project Learning Tree (PLT) advances environmental literacy and promotes stewardship through environmental education, professional development, and curriculum resources that use trees and forests as windows on the world. PLT’s curriculum is about the entire environment – not just trees – and focusing on local, national, and global scopes. The Project Learning Tree Activity Guide focuses on activities for pre-K through 8th grade students. The activities cover environment, resource management and technology, and society and culture while integrating these themes through science, language arts, social studies, art, music, and physical education disciplines. Like Project WET, it teaches students how to think rather than *what* to think.

Project Learning Tree (9th – 12th Grade)

<https://www.plt.org/virginia>

PLT also offers a variety of modules for high school students. These modules are:
Green Schools – Engages students in STEM as they investigate their school site, energy use, water, waste, and recycling practices.

Focus on Forests – Designed to foster student understanding of the forested lands throughout North America.

Forests of the World – Provide students with opportunities to apply scientific processes and higher order thinking skills while investigating world forestry issues.

Places We Live – Help students explore current and future community environmental issues, enabling them to make informed decisions.

Southeastern Forests and Climate Change – Students learn the impacts of climate change on forest ecosystems and forest roles for sequestering carbon.

Biodiversity – Students learn that decisions about growth, development, energy use, and water quality all rest to some extent on perspectives about biodiversity.

Biotechnology – Designed as a supplement for the *Focus on Risk* curriculum for biology, environmental science, social studies, and agriculture students.

Focus on Risk – Students analyze, explore, discover, and learn about risk assessment, risk communication, risk perception, and risk management.

Municipal Solid Waste – This activity book guides students through waste management strategies and solutions.

Project WILD

<http://www.dgif.virginia.gov/education/project-wild/>

Project WILD's goal is to assist students in developing awareness, knowledge, skills, and commitment to result in informed decisions, responsible behavior, and constructive actions concerning wildlife and the environment upon which all life depends. Wildlife is emphasized because of its intrinsic, ecological value as well as its role in teaching how ecosystems function. Project WILD activities are suitable for kindergarten through high school students. Project WILD addresses the need for human beings to develop as responsible citizens of our planet. It is based on the premise that young people and educators have a vital interest in learning about our natural world.

Flying WILD

<http://www.flyingwild.org/>

Flying WILD offers practical hands-on classroom and outdoor field investigation experiences connecting real-world experiences in bird biology, conservation and natural history. Project-based classroom applications, service learning and community involvement are encouraged through sections of the guide dedicated to the planning and implementation of birding festivals.

Project WILD Aquatic

<http://www.projectwild.org/%5C/aquatic/index.htm>

Project Aquatic WILD has the same emphasis on wildlife as Project WILD; however, Project Aquatic WILD focuses on aquatic wildlife and ecology.

To receive the materials for Project WET, Project Learning Tree, Project WILD, and Project WILD Aquatic, teachers must attend a workshop to be trained on using the various guides.

Agriculture in the Classroom

<https://www.agintheclass.org/>

The mission of Ag in the Classroom is to educate Virginia's children about the importance of agriculture. This is done by offering professional development workshops for Virginia teachers. They offer Virginia SOL-based lesson plans, maps, and information on how to incorporate agriculture into the classroom. They also provide mini-grants to teachers so that their students can have hands-on experiential learning about agriculture.

WOW! The Wonders of Wetlands

http://www.wetland.org/education_wow.htm

WOW! The Wonders of Wetlands is an instructional guide for educators that provides a resourceful and creative collection of wetland activities, information, and ideas. This book includes hands-on multidisciplinary activities, background information, ideas for student action projects, and a wetlands resource guide. You are not required to attend a workshop to obtain a copy of the book. The John Marshall SWCD has two copies that can be lent out to teachers.

John Marshall SWCD Teacher Conservation Newsletter

This is a free newsletter for teachers in Fauquier County which is published four times per year (August, October, January, and March). The newsletter describes current District programs, useful resources for teachers, information on grants, and professional development opportunities. To receive it, please email the Conservation Education Specialist to have your name added to the mailing list.

Internship/Volunteer Opportunities

Overview

Internships and volunteer opportunities can offer valuable real-world experiences to students wishing to discover or break into a career in natural resources. Depending on the time of year and the need, the John Marshall Soil and Water Conservation District may be able to offer volunteer opportunities, internships, or career shadow days for local high school and college students. **Please note that all opportunities are unpaid.**

Opportunities

The John Marshall Soil and Water Conservation District focuses on agriculture-related conservation. Activities that the intern or volunteer might undertake include surveying conservation practices, designing engineered practices, mapping practices, conducting stream monitoring, or assisting with educational programs.

The District works closely with other state and federal natural resource agencies such as the USDA Natural Resource Conservation Service, Virginia Department of Conservation and Recreation, Virginia Department of Environmental Quality, and Virginia Department of Forestry. These partnerships can give students exposure to future curriculum needs or potential career opportunities.

Procedure

Contact the John Marshall Soil and Water Conservation District (540-347-3120 x3) to inquire about current opportunities. If opportunities are available, you may be asked to visit the office to discuss your specific interests and our potential projects or activities that you would undertake during your internship.

Library References

The Fauquier County Public Library System has numerous books and other resources on conservation topics. The library allows patrons with Fauquier County Public Library cards to borrow materials from the following library systems: Alexandria Library, Arlington County Public Library, Central Rappahannock Regional Library, Culpeper County Library, Fairfax County Public Library, Handley Regional Library, Loudoun County Public Library, Prince William Public Library, Mary Riley Styles Public Library, Rappahannock County Library, and Samuels Public Library. Below is just a partial list of the Fauquier County Public Library resources that are available. **This list is not meant to be exhaustive, nor does the listing of these resources constitute an endorsement by the John Marshall Soil and Water Conservation District.**

Reference	Author	Type	Audience
A Field Guide to Eastern Trees	George A. Petrides	Book	Adult
A Sand County Almanac	Aldo Leopold	Book	Adult
All About Natural Resources	Schlessinger Media	DVD	Youth
All About Soil	Schlessinger Media	DVD	Youth
All About the Water Cycle	Schlessinger Media	DVD	Youth
All About Water Ecosystems	Schlessinger Media	DVD	Youth
The American Family Farm	George Ancona	Book	Youth
Attracting Native Pollinators	Eric Mader	Book	Adult
The Complete Guide to Organic Livestock Farming	Terri Paajanen	Book	Adult
Country and Cottage Water Systems	Max Burns	Book	Adult
Environmental Conservation	James H. M. Marshall	Book	Adult
Farming	Bill Nye	DVD	Youth
Farming	Gail Gibbons	Book	Youth
Farming the Land	Jerry Bushey	Book	Youth
Fauquier County Water and Sanitation Authority	John T. Toler	Book	Adult
From Raindrop to Tap	Michael Bright	Book	Youth
Gardening in Clay Soil	Sara Pitzer	E-Book	Adult
Gardening With Less Water	David A. Bainbridge	Book	Adult
How the Earth Works	Teaching Co.	DVD	Adult
How We Use Soil	Carol Ballard	Book	Youth
Hydrology: The Study of Water	Christine Taylor-Butler	Book	Youth
If You Were A Farmer	Virginia Schomp	Book	Youth
Improving Your Soil	Keith Reid	Book	Adult
The Invention of Nature	Andrea Wulf	Book	Adult

Let There Be Water	Seth M. Siegel	Book	Adult
Life In A Bucket of Soil	Alvin Silverstein	Book	Youth
The Living Landscape	Rick Darke	Book	Adult
Microlife That Lives in Soil	Steve Parker	Book	Youth
Miss Lady Bird's Wildflowers	Kathi Appelt	Book	Youth
Pollinator Friendly Gardening	Rhonda Fleming Hayes	Book	Adult
Pond and River	DK Publishing	DVD	Youth
Rachel Carson's Silent Spring	WGBH Boston	DVD	Adult
Rock 'n Learn	Big Kid Productions	DVD	Youth
Rocks and Soil	Bill Nye	DVD	Youth
Sand and Soil	Beth Gurney	Book	Youth
School House Rock! Earth	ABC Studios	DVD	Youth
Small-scale Livestock Farming	Carol Ekarius	Book	Adult
Soil	Elaine Pascoe	Book	Youth
Soil	Rebecca Faulkner	Book	Youth
Soil: A Resource Our World Depends On	Ian Graham	Book	Youth
Soil Erosion and Pollution	Darlene R. Stille	Book	Youth
U-X-L Sustainable Living	Jason M. Everett	E-Book	Adult
Watching Water Birds	Jim Arnosky	Book	Youth
The Water Wise Home	Laura Allen	Book	Adult
Water	Melissa Stewart	E-Book	Youth
Water Can Be...	Laura Purdie Salas	Book	Youth
Water Cycle	Disney Educational	DVD	Youth
Water is Water	Miranda Paul	Book	Youth
Water, Peace, and War	Brahma Chellaney	Book	Adult
Water Pollution	Darlene R. Stille	Book	Youth
Water Storage	Art Ludwig	Book	Adult
Water Up, Water Down	Sally M. Walker	Book	Youth
Water, Water Everywhere	Mark J. Rauzon	Book	Youth
Watersheds	Gregor Gilpin Beck	Book	Youth
Wetlands	Bill Nye	DVD	Youth
The Woodlot Management Handbook	Stewart Hilts	Book	Adult
World of Water	Rona Arato	Book	Youth
Xeriscape Gardening	Connie Lockhart Ellefson	Book	Adult

Online Video List

There are countless videos available online which can be fantastic resources for soil and water conservation-related information. Below is a very small sampling of some worthwhile educational videos available online. **The listing of these resources does not constitute an endorsement by the John Marshall Soil and Water Conservation District.**

“Livestock Exclusion and Rotational Grazing” – 8 minutes

James River Association and Altria

<https://www.youtube.com/watch?v=dYL8qrVp7jg>

“Potomac: The River Runs Through Us” – 27 minutes

American University Center for Environmental Filmmaking

<https://www.youtube.com/watch?v=4qnRDefVXvE>

“Riparian Forest Buffers: The Link Between Land and Water” – 21 minutes

University of Maryland Cooperative Extension

<http://extension.umd.edu/riparianbuffers/riparian-forest-buffers-link-between-land-and-water>

“The Science of Soil Health: Going Deeper” – 2 Parts: 4 minutes and 3 minutes

USDA Natural Resource Conservation Service

Part 1: <https://www.youtube.com/watch?v=XzffFNG5mnQ>

Part 2: <https://www.youtube.com/watch?v=Qo6zvBBROL0>

“WaterLogged” – 35 minutes

Great Lakes Restoration Initiative

<https://www.youtube.com/watch?v=hQDgHiR3ILc>

“Wetlands: The Drain Game” – 27 minutes

Prairie Public Broadcasting

<https://www.youtube.com/watch?v=J96MHt7J3X0>

“What is a TMDL” – 2 minutes

Save It Lancaster

<https://www.youtube.com/watch?v=ixdxleSCII4>

Cooperating Agencies

Fauquier County

10 Hotel Street, Warrenton, VA 20186; 540-422-8001

Natural Resource Conservation Service

98 Alexandria Pike, Suite 32, Warrenton, VA 20186; 540-347-3120 x3

Virginia Cooperative Extension

24 Pelham Street, Warrenton, VA 20186; 540-341-7950

Virginia Department of Conservation and Recreation

600 East Main Street, Richmond, VA 23219; 804-786-6124

Virginia Department of Environmental Quality

P.O. Box 1105, Richmond, VA 23218; 804-698-4000

Virginia Department of Forestry

675 Frost Avenue, Warrenton, VA 20186; 540-347-6358

Non-Profit Partners

Fauquier Education Farm

8428 Meetze Road, Warrenton, VA 20187; 540-341-7950 x7

Friends of the Rappahannock

3219 Fall Hill Avenue, Fredericksburg, VA 22401; 540-373-3448

Goose Creek Association

P.O. Box 1178, Middleburg, VA 20118; 540-687-3073

Piedmont Environmental Council

45 Horner Street, Warrenton, VA 20186; 540-347-2334