

Stormwater Runoff Education Resource Guide (Secondary)

This guide was created by King County with assistance from Nature Vision to provide unincorporated King County school districts with programs and resources applicable to the Stormwater Management Waiver Program.

This guide was created by King County to aid teachers in finding environmental programs that show the relation of ecology, clean water, runoff water and stormwater. We hope these resources will help students connect science and engineering with natural processes. Related topics include the hydrologic cycle; wetlands, streams, rivers, lakes, and their ecological systems; the effects of urbanization and human impacts on surface water quality and quantity; water pollution; land use effects on runoff and stormwater; the causes and effects of flooding; salmonids; wetland and native plants and their benefits to our waterways; watershed studies; and water and carbon sequestration. Programs will be updated as frequently as possible.

This guide is organized by grade and then “type” of program – the types of programs include teacher resources, classroom visitors, field trips, and projects. Teacher resources include lesson plans, kits, and online resources. Classroom visitors are informal educators that will travel to your classroom to present a lesson or investigation. Field trips include day trips and overnight programs. Projects are culminating restoration projects your class can sign up for.

For more information on programs offered by King County, please see the [environmental education programs](#), [solid waste education](#) page and the [wastewater education](#) page. To access reports and projects happening within your school’s watershed, please see this [interactive watershed](#) website.

Created by:

Mary Rabourn, King County; Mary.Rabourn@kingcounty.gov
Susan Tallarico, King County; Susan.Tallarico@kingcounty.gov
Ginny Ballard, Nature Vision; gsanchez@naturevision.org
Haley Rutherford, Nature Vision; info@naturevision.org

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All Grades

King County Green Schools Program – Level Three: Water conservation and pollution prevention

The King County Green Schools Program provides assistance, tools and recognition to schools and school districts to help them improve conservation practices. Level Three of the program is focused on water conservation and pollution prevention best practices for schools. In addition to a Best Practices Guide on water conservation and pollution prevention, the program provides tailored recommendations to help with school-wide education and outreach on stormwater pollution prevention. If a King County Green School participant takes advantage of the resources in this guide, those actions can count toward meeting Level Three recognition criteria.

Link: <http://www.kingcounty.gov/depts/dnrp/solid-waste/programs/greenschools/water-conservation.aspx>

Time: Variable

Cost: No cost

6th Grade

Teacher Resources

King County: Protecting Our Liquid Assets

This Vashon Island course provides students with the first steps along the path of ecological understanding, with the hope that their future steps will be considered and measured, serving the interests of all life.

Link: www.kingcounty.gov/environment/waterandland/groundwater/management-areas/vashon-maury-island-gwma/liquid-assets.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: Online Publications

This web page is a useful resource for students doing research on local environmental issues. Online publications, including reports, newsletters, and brochures.

Link: www.kingcounty.gov/depts/dnrp/publications.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: GIS Custom Map Products

King County GIS can prepare custom map products for curriculum support. For example, Sustainability Ambassadors, a non-profit organization empowering youth in community sustainability, engaged the King County GIS Center to help create a themed atlas of stormwater indicator maps for the Tahoma School District in suburban King County. The “Stormwater Neighborhood Atlas” serves as a community outreach tool to show students and the broader community the environmental conditions of their neighborhoods, highlighting unique project opportunities, such as pervious pavement installation and rainwater harvesting at the district’s own schools. Local student Sustainability Ambassadors worked with the school district, the Chamber of Commerce, the Rotary Club and the City of Maple Valley to distribute the “Stormwater Neighborhood Atlas” in classrooms throughout the district, in the public library, and for casual viewing in doctor and dentist waiting rooms and in the lobbies of public spaces such as coffee shops and city buildings. The King County GIS Center’s unique cartographic and design capabilities, and its direct access to King County’s extensive

Contact: Dennis Higgins at dennis.higgins@kingcounty.gov or 206-477-4415

Link: <http://kingcounty.gov/services/gis/ClientServices/Services.aspx>

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

Department of Ecology: Discover Wetlands

A curriculum guide for grades K-12 which focuses on what wetlands are, why they are important, and how human actions affect them.

Unit I: Washington’s Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816a.pdf>)

Unit II: Amazing Wetlands: Functions and Values

(<https://fortress.wa.gov/ecy/publications/documents/8816b.pdf>)

Unit III: People and Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816c.pdf>)

Unit IV: A Walk on the Wild Side

(<https://fortress.wa.gov/ecy/publications/documents/8816d.pdf>)

Time: Variable

Cost: No Cost

Earth Echo: Going Blue: A Teen Guide to Saving Our Oceans, Lakes, Rivers, and Wetlands

Provides a close look at our oceans and waterways and our role in protecting this water planet. This Leader's Guide provides a lesson sequence that expands on the critical information in Going Blue! so young people can actively reflect on the global water crisis via detailed discussion and writing assignments. Appropriate for both traditional classroom teachers and facilitators for out of school time, the Leader's Guide is an

excellent resource to move teens toward action for positive change in their classroom, their community, and the wider world!

Link: <http://earthecho.org/educator-resources/a-leaders-guide-to-going-blue>

Time: Variable

Cost: Variable (Leaders Guide Free- Student Guide online)

FOR SEA Institute Marine Sciences: A Salmon in the Sound – Puget Sound Project Curriculum
Salmon serves as a vehicle to focus on Puget Sound as an ecosystem that includes rivers and watersheds as well as saltwater environments. Diverse activities which integrate material from many disciplines are united through a student text tracing the return of a Chinook salmon from the open ocean to its spawning ground in the Skykomish River watershed. From food chains and fishing to genetics and wild salmon, the activities highlight the difficult and complex choices Puget Sound residents must make concerning the management of our natural resources.

Contact: <http://www.forsea.org/pspguide.html>

Order Form: <http://www.forsea.org/ORDER.HTML>

Time: Variable

Cost: No Cost

Leaping Frog: Illahee: Saving Puget Sound One Watershed at a Time Video

[Illlahee] is an inspirational story of a community's effort to preserve and restore a forest, a salmon stream, and Puget Sound. Bordering on Washington State's Puget Sound is a little gem of a community known as Illahee. What makes it so unique is that while surrounded by development, much of Illahee's natural beauty has been preserved. Started modestly by forward-looking residents of the past, and carried on by succeeding generations, this extraordinary and sustained effort insures that Illahee's natural treasures will be its legacy to the future of Puget Sound.

Contact: shellysol@olympen.com

Link: <http://www.leapingfrogfilms.com/>

Time: 30 minutes or less

Cost: No Cost (other videos available on sliding scale)

Nature Conservancy: Nature Works Everywhere: Garden Lesson: Water

By filtering rainwater and slowing the movement of water to rivers, lakes and oceans, your garden works as a mini-watershed. In this lesson, students calculate the permeable surface area of their garden and periodically measure rainfall amounts, acting as junior hydrologists. Using the collected data, students determine how much water their garden filters and explore the relationship between their garden and water quality in the surrounding watershed.

Link: <https://www.natureworkseverywhere.org/resources/activity-guide-water/>

Time: Variable

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: How Dirt Works

Soil sustains plant and animal life, regulates water, filters pollutants, cycles nutrients, and supports structures. In this lesson, students learn the value of soil and its role as a natural resource. Students investigate how humans and many other organisms rely on soil and explore why it is important to monitor and maintain the health of soil. They also learn how agriculture, home building, and road construction change the land in ways different from how nature changes the land.

Link: <https://www.natureworkseverywhere.org/resources/how-dirt-works/>

Time: 3 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: How Natural Areas Filter Water

Nature works to filter water and to release water over time, thereby reducing the amount of artificial treatment needed to filter water and helping to prevent flooding. In this lesson, students learn about the importance of water quality for human health and agriculture. They relate their own consumption activities to the water supply and also brainstorm various threats to the water supply. By contrasting natural filters with impervious (paved) areas, students compare the impact of development on the ability of nature to provide clean freshwater.

Link:

<https://www.natureworkseverywhere.org/resources/how-natural-areas-filter-water/>

Time: 3-4 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Washington Nature Stormwater Information

Link: <http://www.washingtonnature.org/cities/solvingstormwater>

Nature Conservancy: Nature Works Everywhere: City Habitats

Teacher resource

Link: <http://www.cityhabitats.org/>

PBS Frontline: Poisoned Waters

More than three decades after the Clean Water Act, iconic American waterways like the Chesapeake Bay and Puget Sound are in perilous condition and facing new sources of contamination. Watch the video chapter from *Poisoned Waters* and discuss.

Link: <http://www.pbs.org/wgbh/pages/frontline/teach/poisonedwaters/>

Time: Variable

Cost: No Cost

Puget Sound Starts Here: Engineering Solutions

Polluted stormwater runoff is the number one threat to the water quality of the Puget Sound. The purpose of the *Drain Rangers!* and *Engineering Solutions* curricula and materials is to develop and cultivate an understanding of the serious issues facing our community from stormwater runoff and to share specific actions we can take to improve the quality of our water. In these units, students will utilize problem solving models to replicate the thinking process of engineers addressing polluted stormwater runoff.

Link: <http://www.pugetsoundstartshere.org/drain-rangers>

Time: Variable

Cost: No Cost

Seattle Public Utilities: Lost and (Puget) Sound

This film follows three teens who lose a key down a storm drain. Must email Beth for CD with lessons.

Contact: Beth Miller at beth.miller@seattle.gov

Time: 29 minute video plus lesson

Cost: No Cost

Washington Stormwater Center: Supplemental Videos

Link:

https://www.youtube.com/user/StormwaterChannel/playlists?view=1&sort=dd&shelf_id=0

Classroom Visitors

These programs are taught by an informal educator from various organizations in your classroom.

King County: Biodiversity in Our World

What is biodiversity and why is it important for survival on Earth? How do our shopping and waste disposal choices affect biodiversity? Students actively engage in a discussion of real-world issues such as habitat protection, population growth, and climate change. Through challenging and fun, hands-on activities, students gain a clearer understanding of our everyday effects on the planet and how our personal choices can make a difference for the better. The high school version of this workshop includes a focus on ecosystem services.

Link: <https://your.kingcounty.gov/solidwaste/secondaryschool/workshops.asp>

Time: 50 minutes

Cost: No Cost

Note: King County also offers teacher resources, field trips, and projects.

King County: Wastewater and Stormwater in Schools

King County Wastewater Treatment Division will come into your classroom and provide a free 1-2 hour program that tells the story of water that runs over our landscapes and down the drain! These programs connects students to their local waters and includes interactive, hands-on experiments, and real-world knowledge on topics such as the water systems, wastewater and stormwater processes, and water pollution solutions.

Link:

<http://kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1-2 hours

Cost: No Cost

Note: King County also offers teacher resources, field trips, and projects.

King County: Noxious Weeds

The King County Noxious Weed Control Program can provide presentations and other programs upon request for teachers and students of all levels customized to their curriculum needs. Contact the program for more information or to set up a presentation or field trip.

Link: <http://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/school.aspx>

Note: This program can be a presentation or a field trip. King County also offers teacher resources and projects.

King County: In-Classroom Programs

Educators from King County will come into your classroom to provide hands-on presentations surrounding wastewater and/or stormwater topics. Students will be encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1 hour

Cost: No Cost

City of Duvall: Surface Water Management Classroom Visitor

Boyd Benson is the Public Works Director/City Engineer and Sara Ruhland is in the Engineering Department. Both can adapt their discussion to what you are teaching in the classroom.

Contact: Boyd E. Benson at boyd.benson@duvallwa.gov and 425-939-8042 or Sara Ruhland at sara.ruhland@duvallwa.gov and 425-788-3434x8042

Link: <http://www.duvallwa.gov/305/sewer-water-stormwater>

Time: Variable

Cost: No Cost

City of Newcastle: Surface Water Management Classroom Visitor

Audrie Starsy is the Surface Water Program Manager and can speak to your class with emphasis on what you are currently talking about in the classroom.

Contact: Audrie Starsy at audries@ci.newcastle.wa.us or 425-649-4143x111

Link: http://newcastlewa.gov/departments/public_works/surface_water_management/

Time: Variable

Cost: No Cost

Eastside Audubon: Migration

This lesson plan focuses on the migration of birds between summer and winter habitats. Students will learn the benefits and challenges of migration and play a game to reinforce their knowledge.

Contact: youthprograms@eastsideaudubon.org

Link: <http://eastsideaudubon.org/education/youth-education-1/youth-workshops>

Time: 45-60 minutes

Cost: No cost

Note: Can be adapted by the volunteer to address stormwater runoff effects on bird migration specifically. Programs are offered in communities from Bellevue to Woodinville/Bothell and from East Lake Washington to North Bend.

Friends of the Issaquah Salmon Hatchery (FISH): Those Amazing Salmon

This popular presentation consists of a slide show discussing the definition and importance of watersheds, hatchery operations, salmon lifecycle, habitat requirements, and predators of Pacific salmonids and the challenges they face. After the slide show, teachers have the option of a watershed or Native American legend activity for their class.

Contact: Rachel Martin at education@issaquahfish.org or 425-393-1118

Link: www.issaquahfish.org

Time: 45-90 minutes

Cost: \$50 per class request

Note: Ideally, a class receives the presentation prior to a visit to the hatchery. The program is available September-June. FISH also offers field trips.

Friends of the Issaquah Salmon Hatchery (FISH): Enviroscape- a Watershed Model

Using a table-top watershed model, students “pollute” the land, make it “rain,” and watch how pollution can affect the watershed. They then come up with solutions to pollution problems and identify things they can do to keep our watersheds (and salmon!) healthy. The whole activity takes approximately one hour per class.

Contact: Rachel Martin at education@issaquahfish.org or 425-393-1118

Link: www.issaquahfish.org

Time: 60 minutes

Cost: \$50 per class requested

Note: Offered December-June. FISH also offers field trips.

King Conservation District: Water on Wheels

The Water on Wheels (WOW) Program offers free lessons for K-6th grade, public and private schools, and informal presentations throughout King County. WOW lessons include lively, hands-on demonstrations, educational games, and grade-level appropriate materials to give students a better understanding of water and soil conservation as well as stormwater protection.

Contact: Kristen Reichardt at kristen.reichardt@kingcd.org or 425-282-1927

Link: <http://kingcd.org/programs-education-stormwater.htm>

Time: Variable

Cost: \$250 per lesson (KCD partners with city jurisdictions to help cover the cost of the lessons so there is no cost to teachers- ask when registering)

Mercer Slough Environmental Education Center: Water Testing

Don gloves and goggles as you determine the pH and dissolved oxygen levels of water samples from Mercer Slough. What do these tests tell about the health of the ecosystem?

Contact: Elley Vanderline at evanderline@pacsci.org or 425-450-0207

Link: <https://www.pacificsciencecenter.org/mercser-slough/teachers-school-groups/>

Time: 45 minutes

Cost: \$180 for one classroom lesson, \$110 for each additional lesson on the same day; plus mileage fee

Note: Also included in the Wetland Ecologists field study program offered on-site at Mercer Slough. Can be used as an extension to chemistry content FOSS Kits.

Nature Vision: Watershed Connections

A Nature Vision educator will visit your classroom to facilitate hands-on lessons that highlight the challenges our local watershed faces with stormwater runoff. Each hour long lesson focuses on specific concepts related to stormwater. Lessons can stand alone or be combined into units that offer a more complete picture of stormwater. Units can be for one grade level or used to scaffold throughout multiple grade levels at a school.

Every lesson is designed to support WA State K-12 Learning Standards and help students understand what they can do to reduce the effects of stormwater runoff.

Link: <https://naturevision.org/school-programs/>

Time: 1 hour lessons

Cost: \$100 per lesson

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers field trips and projects.

Salish Sea Expeditions: SOURCE Program

Salish Sea Expeditions invites students to become scientists, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways. This land-based program is focused on supporting students in investigation of their local watershed, building awareness about water quality and stormwater issues in the Puget Sound region. Salish staff visit school campuses, leading classroom-based activities and instruction, and water quality sampling and analysis on school grounds to help students learn how human activity can impact the health of the Puget Sound ecosystem.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/source/>

Time: 8-10 hours

Cost: \$1200/initial classroom (additional classes \$250 each) - email for complete pricing and scheduling options. Scholarship opportunities are often available.

Note: Offered October-February. Class size up to 30 students. Salish Sea Expeditions also offers single and multi-day boat-based field trips.

Sound Salmon Solutions: Hooks and Ladders

Students become spawning salmon in this fun, interactive game that teaches students about all of the obstacles salmon face throughout their life cycle.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45 minutes

Note: Can be done as a field trip. Sound Salmon Solutions also offers projects.

Sound Salmon Solutions: Erosion Modeling

Understand the scientific method by conducting an investigation that explores the factors that increase or decrease erosion using a model they build.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 120 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Sound Salmon Solutions: The 5 C's of Salmon Habitat

Learn about the critical habitat components necessary for salmon survival!

Link: <http://www.soundsalmonsolutions.org/education>

Time: 25 minutes

Note: This lesson can also be added on to a field trip. Sound Salmon Solutions also offers projects.

Vashon Nature Center: Nature Presentations

Trained naturalists and scientists offer short in-class or outdoor programs designed to foster student awareness and understanding of environmental science topics by pinning these topics to real-life local examples on Vashon and Maury Islands. Students become engaged and excited about science through these programs because they see how science is tied to their own backyards and personal lives.

Contact: info@vashonnaturecenter.org or 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 30-90 minutes

Cost: \$50-\$150

Note: Vashon NC works with teachers to highlight topics of their choice (stormwater, surface water mgmt). Example: Salmon See-son-the life cycle of salmon and a discussion of how salmon populations are faring in our local streams and where to see them.

Vashon Nature Center: Invertebrates in School

Sixth-grade science classes participate in monitoring the health of Shinglemill Creek, a major watershed on Vashon Island. Vashon Nature Center scientists collect aquatic invertebrate samples in the field and bring them into the classroom, where students spend three days shoulder-to-shoulder with scientists learning about watershed health, biological indicators, and sorting and identifying invertebrates. In past years, students discovered possible indications of storm-water runoff issues from a tributary of Shinglemill Creek that drains Vashon town. The students' presentation for the Vashon Maury Island Groundwater Protection Committee spurred several subsequent independent research projects to look into possible solutions for runoff issues. In addition, students are monitoring study sites for yearly changes.

Contact: info@vashonnaturecenter.org and 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 3 weeks

Field Trips

King County: Brightwater Center Field Trips

IslandWood and King County provide educational field trips for students in grades 3-8 utilizing the many resources at the Brightwater Center. Field trips can accommodate up

to 60 students per day, last 3-4 hours, and are free of charge. Teachers can choose from the following program options: Freshwater Ecosystem Investigation, Landforms Investigation, and Humans and the Water Cycle.

Contact: Derek Jones at dereki@islandwood.org or 206-263-8866

Link: <https://islandwood.org/educational-programming/brightwater-center/brightwater-school-day-programs>

Time: 3-4 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and projects.

King County: South Plant Field Trips

King County's South Plant provides educational field trips for students. Tours and programs focus on the following topics: water cycle and nutrient cycle, wastewater treatment and human health, human impacts to water systems, pollution prevention and water conservation, stormwater problems and solutions.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/locations/south-plant/school.aspx>

Time: 2-4 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and projects.

King County: Salmon SEEson

During the fall, salmon return to streams and rivers around the Puget Sound. Spot the spawners in the Lake Washington/Cedar/Sammamish and Green/Duwamish and Central Puget Sound watersheds from September to mid-December. Salmon SEEson provides information to help you spy these natural beauties at various times and locations as they make their seasonal journey home each year. Many locations have staff or volunteer naturalists on hand to point out salmon; some are self-guided locations.

Contact: Linda Grob at linda.grob@kingcounty.gov or 206-477-4704

Link: www.govlink.org/watersheds/8/action/salmon-seeson/default.aspx

Time: 15-60 minutes

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Flyers, poster, and a website are available to help you find the best time and location for you and your class to see spawning salmon. King County also offers teacher resources, in-class lessons, and projects.

King County: Noxious Weeds

The King County Noxious Weed Control Program can provide presentations and other programs upon request for teachers and students of all levels customized to their curriculum needs. Contact the program for more information or to set up a presentation or field trip.

Link: <http://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/school.aspx>

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: This program can be a presentation or a field trip. King County also offers teacher resources and projects.

Camp Solomon Schechter: Osprey Camp – 3, 4, or 5 day Full Experience

The social development aspects of OSPREY Camp set it apart from similar programs. Students unplug and take a break from cell phones, computers and electronic games to focus on relationships with peers, mentors, teachers and even themselves. Outside of class, students enjoy structured down-time, including skits, songs and team-building activities. The theme of “respect for the environment and youth” is woven throughout all aspects of camp, encouraging students to be their best selves. OSPREY Camp began over 40 years ago when environmental education became a focus in elementary schools in the Pacific Northwest. The program is designed to provide students a powerful application of science concepts as they live and learn in the outdoors. It continues to evolve and improve, adjusting to reflect changes in scientific understanding and school requirements. Our lessons are aligned with the Common Core and Next Generation Science Standards. At OSPREY Camp, students learn hands-on science in an outdoor school!

The best environmental education experience Camp Solomon Schechter has to offer! From academics aligned with Common Core and Next Generation Science Standards to an emphasis on social development, OSPREY Camp helps teach the whole child. Selectively chosen and thoroughly trained high school mentors allow teachers to break their classes into small groups for hands-on instruction. Mentor pairs provide leadership in cabin activities to ensure “down time” is productive, positive and as enriching as class time. Your students will have the time of their lives! Teachers select the environmental lessons that fit their class’ developmental level and learning needs. All meals are provided.

Contact: Sue Wattier, Osprey Camp Director, at swattier@campschechter.org or 206-447-2629

Link: http://www.campschechter.org/ospreycamp/osprey_home/

Cost: \$50 per day

Transportation: Please contact.

Environmental Science Center: Salmon Heroes

Classroom Lessons & Field Study Investigation: During the 1-hour classroom lesson, students will engage in hands-on, NGSS-correlated activities that explore the habitat needs of salmon – as well as the challenges to survival that salmon face – during each stage of the salmon life cycle. During the 3-hour field study, students review the salmon life cycle, learn external and internal anatomy, collect water quality data, learn about the changes that the local community made to their behaviors in order to make the Creek better habitat for salmon, and then play a large-group game that mimics the challenges salmon face in making it back to their spawning grounds. During the post-visit, students analyze the water quality data they collected in the field and compare it to previous year's data, and to data collected from a different local creek. Students will then evaluate different actions that people can take in order to lessen their impact on salmon population health.

Contact: Joanna Stodden at Joanna@EnvScienceCenter.org or (206) 248-4266

Link:

<https://docs.google.com/forms/d/e/1FAIpQLSd4aBr9E8gH3NWTDhm5EZ41UdixbYEnc eiHpeuFCWSZ5Bodw/viewform>

Time: 2 hours (in classroom) + 3 hours (field trip to Normandy Park Cove)

Cost: \$350 per class of 30 students (If your school has 50% or greater free/reduced lunch rate, you will pay a reduced program fee of \$70 per class of 30 students. If your school has 80% or greater free/reduced lunch rate, your program fees will be waived.

Transportation: Partial transportation reimbursements are available for schools with >50% Free and Reduced Lunch Rate.

Note: Offered September-November. Includes 1-hour classroom lesson, a 3-hour guided field study investigation, and a 1-hour post-field study classroom lesson. You need to arrange and pay for transportation for this field trip. Registering multiple classes within a grade level is strongly encouraged. There is an opportunity for bus reimbursement for schools that have a 50% or greater free/reduced lunch rate. Please contact Programs Manager Joanna Stodden for more information regarding bus subsidies. You will need to provide 4 chaperons for each class' field study.

Friends of the Issaquah Salmon Hatchery (FISH): Those Amazing Salmon - Hatchery Tours

Come see the salmon at Issaquah Creek! Watch spawning salmon, see the hatchery in action, and learn about challenges salmon face and what we can do to help them. Scheduled groups of students and adults are led through the hatchery by trained volunteer docents.

Contact: Contact Rachel Martin, Program Coordinator, FISH at education@issaquahfish.org or 425-392-1118

Time: Tours last 45 minutes to one hour and are available primarily mid-September though early November, though winter and spring/summer tours may also be scheduled.

Cost: FISH requests a fee of \$2 per student when possible.

Transportation: Please contact.

Note: The tour, ideally in conjunction with the Those Amazing Salmon classroom presentation, helps fulfill the state mandate to provide environmental education experiences to students and is aligned to Washington State standards in science and social studies.

Friends of Soos Creek (Kent): Interpretive Walk

Friends of Soos Creek Park is a non-profit organization comprised of volunteer members who take a pro-active role in preserving and extending the Soos Creek Trail Park and who sponsor and lead park clean-ups and interpretive walks for public education about the importance of wetlands specifically and undisturbed nature generally. Soos Creek Park is one of south King County's prized wetland habitats. An 8.5 mile trail follows the creek through cattail marshes, forested swamps, wet meadows and willow thickets. This trail is suited to all levels of fitness and is wheelchair accessible. Take any or all of these interpretive walks to learn more about this fascinating area and its wildlife residents. Volunteers from The Friends of Soos Creek Park lead these interpretive walks.

Contact: Kent Parks and Recreation at 253-856-5000

Time: Variable

Transportation: Please contact.

Note: All of these walks take place out of doors, so be sure to dress for the weather.

IslandWood (at Brightwater): Humans and the Water Cycle

In this field experience, students explore how humans are connected to the water cycle. They observe what happens to the water used in their homes once it arrives at Brightwater and discover how their daily actions influence the Puget Sound watershed. This program includes hands-on lab activities, a guided study of the Brightwater treatment plant, and time to explore the engaging exhibit hall.

Contact: Derek Jones at derekj@islandwood.org or 206-263-8866

Link: www.islandwood.org/brightwater

Time: 4 hours

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Can accommodate up to 60 students per day, run from 10am to 2pm.

Mercer Slough Environmental Education Center: Wetland Ecologists

Become a wetland ecologist as you learn to delineate wetland habitats, identify plants using a dichotomous key, and compare soils using a soil probe. In the lab, collect pond samples and identify aquatic macroinvertebrates to determine their pollution tolerance

levels. Compare biological and chemical tests as you assess pond water for pH and dissolved oxygen.

Contact: Elley Vanderline at evanderline@pacsci.org

Link: <https://www.pacificsciencecenter.org/mercer-slough/teachers-school-groups/>

Time: 5 hours

Cost: \$204 for up to 15 students, \$353 for 16-30 students. Mercer Slough EEC also offers in-class lessons.

Transportation: Please contact.

Mountains to Sound Greenway Trust: Earth Underfoot

Inspects the impact of invasive plants on the landscape. Students identify native and invasive plants found in Pacific Northwest forests in preparation for a stewardship event. At the stewardship event students may remove invasive plant species, plant native and shrubs, or work in our native plant nursery.

Contact: Becca Kedenburg at becca.kedenburg@mtsgreenway.org

Link: www.mtsgreenway.org/education

Time: Variable

Transportation: King County Metro provides a limited number of [Wheels to Water](#) buses to transport students on their field trip.

Note: Each curriculum includes an introductory lesson (taught by the classroom teacher), an in-class lesson, a field study trip to a nearby forest, and an optional stewardship event. Depending on the season, a stewardship event might involve removing blackberry, planting native trees and shrubs, or working in our native plant nursery. Eligible schools have a free and reduced lunch percentage of at least 25 percent. Financial assistance is available for a limited number of buses to the stewardship event.

Mountains to Sound Greenway Trust: Forests and Fins

Focuses on stream/forest ecology and the life cycle of salmon. Students complete a mock stream survey in the classroom in preparation to do a real stream survey on the field study trip. Participants analyze the riparian zone, look for macro-invertebrates, test water quality, and evaluate the stream channel. Teams of students present their results.

Contact: Becca Kedenburg at becca.kedenburg@mtsgreenway.org

Link: www.mtsgreenway.org/education

Time: Variable

Cost: No Cost

Transportation: King County Metro provides a limited number of [Wheels to Water](#) buses to transport students on their field trip.

Note: Each curriculum includes an introductory lesson (taught by the classroom teacher), an in-class lesson, a field study trip to a nearby forest, and an optional stewardship event. Depending on the season, a stewardship event might involve

removing blackberry, planting native trees and shrubs, or working in our native plant nursery. Eligible schools have a free and reduced lunch percentage of at least 25 percent. Financial assistance is available for a limited number of buses to the stewardship event.

Nature Bridge: Environmental Science Program

NatureBridge environmental science programs in Olympic National Park offer students in grades K-12 the opportunity to learn hands-on science in an International Biosphere Reserve. The three to five-day residential outdoor science programs are led by experienced educators and customized to enhance your school's curriculum. A classroom without walls: located on the shore of glacially carved Lake Crescent, students can investigate old growth forests, wilderness coasts, and alpine peaks. Inquiry-based learning: motivated by their own curiosity, students monitor the dynamic Elwha River system, collect and identify macroinvertebrates in Barnes Creek, and study the adaptations of local mammals in the skins and skulls lab. Responsible actions: students are inspired to make informed decisions about what constitutes a healthy relationship between natural and human communities, their role in that relationship and appropriate actions they can take to sustain it.

Request Information: <https://naturebridge.org/request-information-olympic> or contact Eva Foster at efoster@naturebridge.org and 206-382-6212x14 or call 206-300-6291

Link: <https://naturebridge.org/olympic/school-group>

Time: 3 or 5 days

Cost: Price range for programs can be found here:

<https://naturebridge.org/olympic/school-group/rates>

Rates are for 3 day/2 night program starting at \$234 per student, 3 day/3 night program starting at \$294 per student, 5 day/4 night program starting at \$340 per student, and 5 day/5 night program starting at \$400 per student. Need-based scholarships available and additional optional services available. Tuition includes quality customized environmental science education; on-site lodging in heated, dormitory cabins on the shores of Lake Crescent; and home-style all-you-can-eat buffet meals.

Transportation information:

<https://naturebridge.org/sites/default/files/Transportation%20-%20OLYM.pdf>

Nature Vision: Stream Connections

A Nature Vision educator will meet your class at your local stream and facilitate a variety of activities related to salmon and the effects of stormwater. All activities support WA State K-12 Learning Standards and are customized to the watershed in which the stream is located. This allows students to make connections to their local environment and learn how they can become stewards where it matters to them most.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Nature Vision: Wetland Connections

A Nature Vision educator will meet your class at your local wetland, retention pond, or location of your choice to facilitate activities that show the importance of these unique ecosystems in helping manage the effects of stormwater runoff. All activities support WA State K-12 Learning Standards and are customized to be site specific. This allows students to observe real-world solutions to stormwater management and learn about ways they can have a positive impact on their local watershed.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Pacific Marine Research: Marine Science Afloat

Students learn to love and appreciate Puget Sound on our scientific expedition aboard the *Spirit of 76* floating classroom. Haul in the plankton nets! Spy into the invisible watery world in the microscope lab! Meet your slimy and squishy underwater neighbors! Follow along with a team of scientific divers as they explore the depths beneath the boat and introduce students to the animals below with a LIVE underwater video system. And most importantly, learn how your daily actions can help protect this magnificent, but delicate ecosystem that we all share.

Contact: fieldtrips@marinescienceafloat.org or 206-361-1919

Link: <https://marine-science-afloat.myshopify.com/>

Time: 5 ½ hour

Cost: \$40 per person for the first 15 people; plus one complimentary chaperone per every 10 additional students. (scholarships available)

Transportation: Must provide own transportation.

Note: Trips take place from mid-March to mid-June but occasionally fall trips are run.

Salish Sea Expeditions: SOUND Program

Salish Sea Expeditions invites students to become scientists and mariners, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways aboard the 61' research sailing vessel, Carlyn.

1-2 day programs: One-day and two-day (overnight) boat-based expeditions that engage students in exploring water quality issues, deploying oceanographic research tools, and

practicing applied STEM skills used in maritime trades.

Cost: \$400/hour for 5+-hour sail; \$4800 for two-day overnight, which includes food and equipment (scholarships may be available)

3-5 day programs: This boat-based program provides 3-5 day expeditions of oceanographic research, nautical science and seamanship aboard the 61-foot sailing research vessel, Carlyn. Students lead and conduct marine science research under the careful guidance of Salish educators.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/sound/>

Cost: \$2800/day (scholarships may be available)

Transportation: Please contact.

Note: Dates: Spring season March-June; fall season September-October. All programs include four phases: 1) pre-trip classroom instruction to develop a student science question 2) the 3-5 day boat program 3) a post-trip into the classroom to synthesize information from the trip into a student presentation 4) Student Science Symposium (optional). All science equipment, safety gear, food, and camping equipment included. Class size up to 28 students and 2 chaperones, although we're willing to explore alternative arrangements for larger groups. Salish Sea Expeditions also offers customized classroom-based watershed lessons.

Seattle Aquarium: Salmon Exploration

Learn about the life cycle of Seattle's most iconic animal, the salmon. With the use of storyboards and interactive activities, students will explore salmon from egg to adult and discuss the many different factors that affect these amazing fish.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Aquarium: Oysters and Ocean Chemistry Research

Ocean chemistry is rapidly changing as excess carbon dioxide from burning fossil fuels is absorbed into the water. Students will discover how this affects larval oysters and oyster farmers in Puget Sound, and how Simone Alin, oceanographer at NOAA, helps the farmers monitor ocean chemistry to maintain healthy hatchery conditions. Video clips integrated throughout the class allow students to hear Simone's story directly from the source. Students will conduct two different pH tests to understand the relationship between CO₂ and pH in the ocean; analyze graphs of real data from local ocean moorings to identify patterns in ocean chemistry; discuss solutions to the oyster farmers' challenges; and get hands-on with live oysters.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Parks and Recreation: Camp Long

Bringing science, environmental education, and experiential learning to your parks. Seattle Parks and Recreation's Environmental Education and Outdoor Learning staff provide opportunities for grades K-12 and organized groups, such as scouts and camps, to experience age-appropriate, hands-on adventures in learning about natural communities in an urban setting. Programs align with WA State Essential Academic Learning Requirements for core content areas and support science kits.

Ponds (spring and summer only): Experience the freshwater habitats of a city park at Camp Long or Discovery Park. Waddling ducks, wriggling tadpoles, and dancing dragonflies are some of the creatures they may see as they explore what makes these places so special.

Forest: Camp Long and Discovery Park have lots of forest habitat to explore. Venture through the trees looking for clues to animal habits, hiding places, and seasonal happenings. Forest programs empower participants to feel comfortable in the outdoors.

Link: <https://www.seattle.gov/parks/find/centers/camp-long/camps>

Transportation: Please contact.

Sound Experience: Sound Studies Program

The goal of a Sound Studies program, as with all programs offered by Sound Experience, can be summarized in a single word: awareness. We believe that people will protect what they learn to value. The most effective way to have a lasting impact is to meet the following goals for every program. Our goals for participants: Leave with a heightened awareness of Puget Sound as a fragile ecosystem, understand the concept of a whole system, and understand how *Adventuress* and the earth both illustrate this concept. Recognize the interrelationships that exist between all life. Identify the positive and negative impacts that they as individuals have on the Puget Sound ecosystem. Recognize their ability to take action by raising others' awareness and by making responsible choices. Understand the necessity of cooperation as a course to action. Learn that Puget Sound is an incredible, diverse, and productive ecosystem and that the waterways we all share are fragile and need our care. Most importantly, students learn that they can make a difference. Experience working together to raise sails and learn about all the factors that help make a traditional sailing vessel function.

When you join us for a day trip, your group will take part in an active learning and working voyage. On board our vessel, participants are able to experience how community, nature, culture, and infrastructure all interact and shape each other.

Contact: Amy Kovacs at amy@soundexp.org or 360-379-0438

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/day-program-sound-studies/>

Time: 3 or 5 hours

Cost: Off Peak Rates (October 1-April 30): \$1150 for 3 hours, \$1675 for 5 hours. Peak Rates (May 1-September 30): \$1210 for 3 hours, \$1760 for 5 hours

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

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Contact: Amy Kovacs at amy@soundexp.org and 360-379-0439

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/overnight-programs-sound-explorations/>

Time: 2-7 days

Cost: Off Peak Rates (October 1- April 30): \$2780 per day, groups between 14-18 people can come for \$149/person/day and includes adults. Peak Rates (May 1-September 30): \$2900 per day, groups between 14-18 people can come aboard for \$159/person/day and includes adults

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

Sound Salmon Solutions: Ecosystems

Learn about a food chain and why it is important in an engaging and hands-on way.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Water Quality Testing

Students become scientists by collecting water samples and using testing kits to measure and collect data on the health of a local stream. They will understand the value of clean water and how that is defined.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Macroinvertebrates

Identify and categorize aquatic benthic macroinvertebrates as a biological indicator of water quality.

Time: 45-120 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Tacoma Nature Center: Water Sleuths

Discover how systems connect as students investigate a wetland habitat, then search out the links between human activity and watershed quality. Students use technology to gather data on the watershed and draw conclusions about its quality.

Contact: tnc@tacomaparks.com or 253-591-6439

Link: <http://www.metroparkstacoma.org/school-groups-nature-center/>

Time: 2- 2 ½ hours

Cost: \$6 per student

Transportation: Please contact.

Waskowitz Outdoor School: 4-day or 5-day program

Waskowitz Outdoor School Programs are a magical journey of discovery exploring the diversity of people and nature! For over 59 years Waskowitz has been welcoming classes from throughout the Puget Sound region to investigate the beauty of the Pacific Northwest through classes in forest and river ecology as well as forming bonds with new friends from different school.

Contact: Meredith von Trapp at (425) 277-7195 and meredith.vontrapp@highlineschools.org or 425-277-7195

Link: <https://www.highlineschools.org/waskowitz>

Cost: \$175 for 4 days per student, \$195 for 5 days per students

Transportation: Please contact.

*** If your 6th grade students go to outdoor camp, please see the 5th grade section of the Elementary Education Guide*

Projects

King County: Native Plant Salvage Program

This unique volunteer program involves digging up plants from natural sites before they are cleared for development. Later, salvaged plants are replanted at habitat restoration sites. It's a great opportunity for middle and high school students to learn about native plants and their role in protecting the aquatic ecosystem.

Contact: Cindy Young at cindy.young@kingcounty.gov or 206-477-4859

Link: www.kingcounty.gov/environment/stewardship/volunteer/plant-salvage-program.aspx

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and field trips.

Nature Vision: Blue Teams

Nature Vision offers Blue Teams, a student stewardship project funded by our water sponsors. Blue Teams are groups of kindergarden-12th grade students who commit to taking on and completing a watershed stewardship project. Students complete projects such as invasive plant removal, native plant restoration, planting water wise gardens, finding and fixing leaks, and much more.

The Blue Team program was developed to educate local youth about water resources and related ecosystems, foster sustainable stewardship values and practices in the community through hands-on youth projects, and to empower youth to take positive steps to improve their local environment.

Blue Teams receive Nature Vision's help in planning, preparing for, and executing their projects at school or at an off-campus project site, as well as regular teacher consultations via phone or email. Teachers/Instructors may register their class or youth group to become a team, and Nature Vision staff will help each team to design a watershed stewardship project. Staff will visit the students multiple times to teach inquiry-based programs, giving the students the knowledge and help they will need to successfully complete and understand the value of their project.

Link: <https://naturevision.org/blue-teams>

Time: Variable

Cost: Free Blue Teams may be available, please email info@naturevision.org for more information. Nature Vision also offer in-class lessons and field trips.

Transportation: Must provide own transportation.

Sound Salmon Solutions: Tree Planting

Students are given an opportunity to plant native trees and shrubs on an active habitat restoration site.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 60-90 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and field trips.

7th Grade

Teacher Resources

King County: Protecting Our Liquid Assets

This Vashon Island course provides students with the first steps along the path of ecological understanding, with the hope that their future steps will be considered and measured, serving the interests of all life.

Link: www.kingcounty.gov/environment/waterandland/groundwater/management-areas/vashon-maury-island-gwma/liquid-assets.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: Online Publications

This web page is a useful resource for students doing research on local environmental issues. Online publications, including reports, newsletters, and brochures.

Link: www.kingcounty.gov/depts/dnrp/publications.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: GIS Custom Map Products

King County GIS can prepare custom map products for curriculum support. For example, Sustainability Ambassadors, a non-profit organization empowering youth in community sustainability, engaged the King County GIS Center to help create a themed atlas of stormwater indicator maps for the Tahoma School District in suburban King County. The “Stormwater Neighborhood Atlas” serves as a community outreach tool to show students and the broader community the environmental conditions of their neighborhoods, highlighting unique project opportunities, such as pervious pavement installation and rainwater harvesting at the district’s own schools. Local student Sustainability Ambassadors worked with the school district, the Chamber of Commerce, the Rotary Club and the City of Maple Valley to distribute the “Stormwater Neighborhood Atlas” in classrooms throughout the district, in the public library, and for casual viewing in doctor and dentist waiting rooms and in the lobbies of public spaces such as coffee shops and city buildings. The King County GIS Center’s unique cartographic and design capabilities, and its direct access to King County’s extensive

Contact: Dennis Higgins at dennis.higgins@kingcounty.gov or 206-477-4415

Link: <http://kingcounty.gov/services/gis/ClientServices/Services.aspx>

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

Department of Ecology: Discover Wetlands

A curriculum guide for grades K-12 which focuses on what wetlands are, why they are important, and how human actions affect them.

Unit I: Washington’s Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816a.pdf>)

Unit II: Amazing Wetlands: Functions and Values

(<https://fortress.wa.gov/ecy/publications/documents/8816b.pdf>)

Unit III: People and Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816c.pdf>)

Unit IV: A Walk on the Wild Side

(<https://fortress.wa.gov/ecy/publications/documents/8816d.pdf>)

Time: Variable

Cost: No Cost

Earth Echo: Going Blue: A Teen Guide to Saving Our Oceans, Lakes, Rivers, and Wetlands

King County Stormwater Secondary Education Resource Guide

Created April 2017 – Last Updated Jan 2018

Provides a close look at our oceans and waterways and our role in protecting this water planet. This Leader's Guide provides a lesson sequence that expands on the critical information in Going Blue! so young people can actively reflect on the global water crisis via detailed discussion and writing assignments. Appropriate for both traditional classroom teachers and facilitators for out of school time, the Leader's Guide is an excellent resource to move teens toward action for positive change in their classroom, their community, and the wider world!

Link: <http://earthecho.org/educator-resources/a-leaders-guide-to-going-blue>

Time: Variable

Cost: Variable (Leaders Guide Free- Student Guide online)

FOR SEA Institute Marine Sciences: A Salmon in the Sound – Puget Sound Project Curriculum

Salmon serves as a vehicle to focus on Puget Sound as an ecosystem that includes rivers and watersheds as well as saltwater environments. Diverse activities which integrate material from many disciplines are united through a student text tracing the return of a Chinook salmon from the open ocean to its spawning ground in the Skykomish River watershed. From food chains and fishing to genetics and wild salmon, the activities highlight the difficult and complex choices Puget Sound residents must make concerning the management of our natural resources.

Contact: <http://www.forsea.org/pspguide.html>

Order Form: <http://www.forsea.org/ORDER.HTML>

Time: Variable

Cost: No Cost

FOSS Kits: Populations and Ecosystems

Look around . . . you're in an ecosystem. How do you know? Because there are organisms everywhere. An ecosystem is an organizational unit of life on Earth, defined by a physical environment and the organisms that live there. Organisms depend on their ecosystem for survival. Energy and matter, in the form of food, flow through an ecosystem. The critical role of photosynthetic organisms in creating food is what allows the rest of the organisms in the ecosystem to exist. Disruption to one element of the ecosystem produces waves and ripples that touch every member of the system. Changes may produce pressures in the ecosystem. When change is precipitous, a population may be exterminated. One powerful change agent in just about every ecosystem on Earth is humans. Human mobility, technology, and institutions place pressures on many ecosystems. The first step toward placing less disruptive pressure on natural systems is understanding how they work and what they need to remain healthy.

Link: <https://www.fossweb.com/foss-modules>

Time: Variable

Cost: No Cost

Leaping Frog: Illahee: Saving Puget Sound One Watershed at a Time Video

[Illahee] is an inspirational story of a community's effort to preserve and restore a forest, a salmon stream, and Puget Sound. Bordering on Washington State's Puget Sound is a little gem of a community known as Illahee. What makes it so unique is that while surrounded by development, much of Illahee's natural beauty has been preserved. Started modestly by forward-looking residents of the past, and carried on by succeeding generations, this extraordinary and sustained effort insures that Illahee's natural treasures will be its legacy to the future of Puget Sound.

Contact: shellysol@olympen.com

Link: <http://www.leapingfrogfilms.com/>

Time: 30 minutes or less

Cost: No Cost (other videos available on sliding scale)

Nature Conservancy: Nature Works Everywhere: Garden Lesson: Water

By filtering rainwater and slowing the movement of water to rivers, lakes and oceans, your garden works as a mini-watershed. In this lesson, students calculate the permeable surface area of their garden and periodically measure rainfall amounts, acting as junior hydrologists. Using the collected data, students determine how much water their garden filters and explore the relationship between their garden and water quality in the surrounding watershed.

Link: <https://www.natureworkseverywhere.org/resources/activity-guide-water/>

Time: Variable

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: How Dirt Works

Soil sustains plant and animal life, regulates water, filters pollutants, cycles nutrients and supports structures. In this lesson, students learn the value of soil and its role as a natural resource. Students investigate how humans and many other organisms rely on soil and explore why it is important to monitor and maintain the health of soil. They also learn how agriculture, home building and road construction change the land in ways different from how nature changes the land.

Link: <https://www.natureworkseverywhere.org/resources/how-dirt-works/>

Time: 3 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: How Natural Areas Filter Water

Nature works to filter water and to release water over time, thereby reducing the amount of artificial treatment needed to filter water and helping to prevent flooding. In this lesson, students learn about the importance of water quality for human health and agriculture. They relate their own consumption activities to the water supply and also brainstorm various threats to the water supply. By contrasting natural filters with

impervious (paved) areas, students compare the impact of development on the ability of nature to provide clean freshwater.

Link: <https://www.natureworkseverywhere.org/resources/how-natural-areas-filter-water/>

Time: 3-4 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Washington Nature Stormwater Information

Link: <http://www.washingtonnature.org/cities/solvingstormwater>

Nature Conservancy: Nature Works Everywhere: City Habitats

Link: <http://www.cityhabitats.org/>

PBS Frontline: Poisoned Waters

More than three decades after the Clean Water Act, iconic American waterways like the Chesapeake Bay and Puget Sound are in perilous condition and facing new sources of contamination. Watch the video chapter from *Poisoned Waters* and discuss.

Link: <http://www.pbs.org/wgbh/pages/frontline/teach/poisonedwaters/>

Time: Variable

Cost: No Cost

Puget Sound Starts Here: Engineering Solutions

Polluted stormwater runoff is the number one threat to the water quality of the Puget Sound. The purpose of the *Drain Rangers!* and *Engineering Solutions* curricula and materials is to develop and cultivate an understanding of the serious issues facing our community from stormwater runoff and to share specific actions we can take to improve the quality of our water. In these units, students will utilize problem solving models to replicate the thinking process of engineers addressing polluted stormwater runoff.

Link: <http://www.pugetsoundstartshere.org/drain-rangers>

Time: Variable

Cost: No Cost

Seattle Public Utilities: Lost and (Puget) Sound

This film follows three teens who lose a key down a storm drain. Must email Beth for CD with lessons.

Contact: Beth Miller at beth.miller@seattle.gov

Time: 29 minute video plus lesson

Cost: No Cost

Washington Stormwater Center: Supplemental Videos

Link:

https://www.youtube.com/user/StormwaterChannel/playlists?view=1&sort=dd&shelf_id=0

Classroom Visitors

These programs are taught by an informal educator from various organizations in your classroom.

King County: Biodiversity in Our World

What is biodiversity and why is it important for survival on Earth? How do our shopping and waste disposal choices affect biodiversity? Students actively engage in a discussion of real-world issues such as habitat protection, population growth, and climate change. Through challenging and fun, hands-on activities, students gain a clearer understanding of our everyday effects on the planet and how our personal choices can make a difference for the better. The high school version of this workshop includes a focus on ecosystem services.

Link: <https://your.kingcounty.gov/solidwaste/secondaryschool/workshops.asp>

Time: 50 minutes

Cost: No Cost

Note: King County also offers teacher resources, field trips, and projects.

King County: Wastewater and Stormwater in Schools

King County Wastewater Treatment Division will come into your classroom and provide a free 1-2 hour program that tells the story of water that runs over our landscapes and down the drain! These programs connects students to their local waters and includes interactive, hands-on experiments and real-world knowledge on topics such as the water systems, wastewater and stormwater processes, and water pollution solutions.

Link:

<http://kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1-2 hours

Cost: No Cost

Note: King County also offers teacher resources, field trips, and projects.

King County: In-Classroom Programs

Educators from King County will come into your classroom to provide hands-on presentations surrounding wastewater and/or stormwater topics. Students will be

encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1 hour

Cost: No Cost

City of Duvall: Surface Water Management Classroom Visitor

Boyd Benson is the Public Works Director/City Engineer and Sara Ruhland is in the Engineering Department. Both can adapt their discussion to what you are teaching in the classroom.

Contact: Boyd E. Benson at boyd.benson@duvallwa.gov and 425-939-8042 or Sara Ruhland at sara.ruhland@duvallwa.gov and 425-788-3434x8042

Link: <http://www.duvallwa.gov/305/sewer-water-stormwater>

Time: Variable

Cost: No Cost

City of Newcastle: Surface Water Management Classroom Visitor

Audrie Starsy is the Surface Water Program Manager and can speak to your class with emphasis on what you are currently talking about in the classroom.

Contact: Audrie Starsy at audries@ci.newcastle.wa.us or 425-649-4143x111

Link: http://newcastlewa.gov/departments/public_works/surface_water_management/

Time: Variable

Cost: No Cost

Eastside Audubon: Migration

This lesson plan focuses on the migration of birds between summer and winter habitats. Students will learn the benefits and challenges of migration and play a game to reinforce their knowledge.

Contact: youthprograms@eastsideaudubon.org

Link: <http://eastsideaudubon.org/education/youth-education-1/youth-workshops>

Time: 45-60 minutes

Cost: No cost

Note: Can be adapted by the volunteer to address stormwater runoff effects on bird migration specifically. Programs are offered in communities from Bellevue to Woodinville/Bothell and from East Lake Washington to North Bend.

Friends of the Issaquah Salmon Hatchery (FISH): Enviroscape- a Watershed Model

Using a table-top watershed model, students “pollute” the land, make it “rain,” and watch how pollution can affect the watershed. They then come up with solutions to pollution problems and identify things they can do to keep our watersheds (and salmon!) healthy. The whole activity takes approximately one hour per class.

Contact: Rachel Martin at education@issaquahfish.org or 425-393-1118

Link: www.issaquahfish.org

Time: 60 minutes

Cost: \$50 per class requested

Note: Offered December-June. FISH also offers field trips.

Mercer Slough Environmental Education Center: Water Testing

Don gloves and goggles as you determine the pH and dissolved oxygen levels of water samples from Mercer Slough. What do these tests tell about the health of the ecosystem?

Contact: Elley Vanderline at evanderline@pacsci.org or 425-450-0207

Link: <https://www.pacificsciencecenter.org/mercero-slough/teachers-school-groups/>

Time: 45 minutes

Cost: \$180 for one classroom lesson, \$110 for each additional lesson on the same day; plus mileage fee

Note: Also included in the Wetland Ecologists field study program offered on-site at Mercer Slough. Can be used as an extension to chemistry content FOSS Kits.

Nature Vision: Watershed Connections

A Nature Vision educator will visit your classroom to facilitate hands-on lessons that highlight the challenges our local watershed faces with stormwater runoff. Each hour long lesson focuses on specific concepts related to stormwater. Lessons can stand alone or be combined into units that offer a more complete picture of stormwater. Units can be for one grade level or used to scaffold throughout multiple grade levels at a school. Every lesson is designed to support WA State K-12 Learning Standards and help students understand what they can do to reduce the effects of stormwater runoff.

Link: <https://naturevision.org/school-programs/>

Time: 1 hour lessons

Cost: \$100 per lesson

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers field trips and projects.

Salish Sea Expeditions: SOURCE Program

Salish Sea Expeditions invites students to become scientists, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways. This land-based program is focused on supporting students in investigation of their local watershed, building awareness about water quality and stormwater issues in the Puget

Sound region. Salish staff visit school campuses, leading classroom-based activities and instruction, and water quality sampling and analysis on school grounds to help students learn how human activity can impact the health of the Puget Sound ecosystem.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/source/>

Time: 8-10 hours

Cost: \$1200/initial classroom (additional classes \$250 each) - email for complete pricing and scheduling options. Scholarship opportunities are often available.

Note: Offered October-February. Class size up to 30 students. Salish Sea Expeditions also offers single and multi-day boat-based field trips.

Sound Salmon Solutions: Erosion Modeling

Understand the scientific method by conducting an investigation that explores the factors that increase or decrease erosion using a model they build.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 120 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Sound Salmon Solutions: The 5 C's of Salmon Habitat

Learn about the critical habitat components necessary for salmon survival!

Link: <http://www.soundsalmonsolutions.org/education>

Time: 25 minutes

Note: This lesson can also be added on to a field trip. Sound Salmon Solutions also offers projects.

Vashon Nature Center: Nature Presentations

Trained naturalists and scientists offer short in-class or outdoor programs designed to foster student awareness and understanding of environmental science topics by pinning these topics to real-life local examples on Vashon and Maury Islands. Students become engaged and excited about science through these programs because they see how science is tied to their own backyards and personal lives.

Contact: info@vashonnaturecenter.org or 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 30-90 minutes

Cost: \$50-\$150

Note: Vashon NC works with teachers to highlight topics of their choice (stormwater, surface water mgmt). Example: Salmon See-son-the life cycle of salmon and a discussion of how salmon populations are faring in our local streams and where to see them.

Vashon Nature Center: Invertebrates in School

Seventh-grade science classes participate in monitoring the health of Shinglemill Creek, a major watershed on Vashon Island. Vashon Nature Center scientists collect aquatic invertebrate samples in the field and bring them into the classroom, where students spend three days shoulder-to-shoulder with scientists learning about watershed health, biological indicators, and sorting and identifying invertebrates. In past years, students discovered possible indications of storm-water runoff issues from a tributary of Shinglemill Creek that drains Vashon town. The students' presentation for the Vashon Maury Island Groundwater Protection Committee spurred several subsequent independent research projects to look into possible solutions for runoff issues. In addition, students are monitoring study sites for yearly changes.

Contact: info@vashonnaturecenter.org and 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 3 weeks

Field Trips

King County: Brightwater Center Field Trips

IslandWood and King County provide educational field trips for students in grades 3-8 utilizing the many resources at the Brightwater Center. Field trips can accommodate up to 60 students per day, last 3-4 hours, and are free of charge. Teachers can choose from the following program options: Freshwater Ecosystem Investigation, Landforms Investigation, and Humans and the Water Cycle.

Contact: Derek Jones at derekj@islandwood.org or 206-263-8866

Link: <https://islandwood.org/educational-programming/brightwater-center/brightwater-school-day-programs>

Time: 3-4 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and projects.

King County: South Plant Field Trips

King County's South Plant provides educational field trips for students. Tours and programs focus on the following topics: water cycle and nutrient cycle, wastewater treatment and human health, human impacts to water systems, pollution prevention and water conservation, stormwater problems and solutions.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/locations/south-plant/school.aspx>

Time: 2-4 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and projects.

King County: Salmon SEEson

During the fall, salmon return to streams and rivers around the Puget Sound. Spot the spawners in the Lake Washington/Cedar/Sammamish and Green/Duwamish and Central Puget Sound watersheds from September to mid-December. Salmon SEEson provides information to help you spy these natural beauties at various times and locations as they make their seasonal journey home each year. Many locations have staff or volunteer naturalists on hand to point out salmon; some are self-guided locations.

Contact: Linda Grob at linda.grob@kingcounty.gov or 206-477-4704

Link: www.govlink.org/watersheds/8/action/salmon-seeson/default.aspx

Time: 15-60 minutes

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Flyers, poster, and a website are available to help you find the best time and location for you and your class to see spawning salmon. King County also offers teacher resources, in-class lessons, and projects.

Environmental Science Center: Salmon Heroes

Classroom Lessons & Field Study Investigation: During the 1-hour classroom lesson, students will engage in hands-on, NGSS-correlated activities that explore the habitat needs of salmon – as well as the challenges to survival that salmon face – during each stage of the salmon life cycle. During the 3-hour field study, students review the salmon life cycle, learn external and internal anatomy, collect water quality data, learn about the changes that the local community made to their behaviors in order to make the Creek better habitat for salmon, and then play a large-group game that mimics the challenges salmon face in making it back to their spawning grounds. During the post-visit, students analyze the water quality data they collected in the field and compare it to previous year's data, and to data collected from a different local creek. Students will then evaluate different actions that people can take in order to lessen their impact on salmon population health.

Contact: Joanna Stodden at Joanna@EnvScienceCenter.org or (206) 248-4266

Link:

<https://docs.google.com/forms/d/e/1FAIpQLSd4aBr9E8gH3NWTdHm5EZ41UdixbYEnc eiHpeuFCWSZ5Bodw/viewform>

Time: 2 hours (in classroom) + 3 hours (field trip to Normandy Park Cove)

Cost: \$350 per class of 30 students (If your school has 50% or greater free/reduced lunch rate, you will pay a reduced program fee of \$70 per class of 30 students. If your school has 80% or greater free/reduced lunch rate, your program fees will be waived.

Transportation: Partial transportation reimbursements are available for schools with >50% Free and Reduced Lunch Rate.

Note: Offered September-November. Includes 1-hour classroom lesson, a 3-hour guided field study investigation, and a 1-hour post-field study classroom lesson. You need to arrange and pay for transportation for this field trip. Registering multiple classes within a grade level is strongly encouraged. There is an opportunity for bus reimbursement for schools that have a 50% or greater free/reduced lunch rate. Please contact Programs Manager Joanna Stodden for more information regarding bus subsidies. You will need to provide 4 chaperons for each class' field study.

Friends of the Issaquah Salmon Hatchery (FISH): Those Amazing Salmon - Hatchery Tours
Come see the salmon at Issaquah Creek! Watch spawning salmon, see the hatchery in action, and learn about challenges salmon face and what we can do to help them. Scheduled groups of students and adults are led through the hatchery by trained volunteer docents.

Contact: Contact Rachel Martin, Program Coordinator, FISH at education@issaquahfish.org or 425-392-1118

Time: Tours last 45 minutes to one hour and are available primarily mid-September through early November, though winter and spring/summer tours may also be scheduled.

Cost: FISH requests a fee of \$2 per student when possible.

Transportation: Please contact.

Note: The tour, ideally in conjunction with the Those Amazing Salmon classroom presentation, helps fulfill the state mandate to provide environmental education experiences to students and is aligned to Washington State standards in science and social studies.

Friends of Soos Creek (Kent): Interpretive Walk

Friends of Soos Creek Park is a non-profit organization comprised of volunteer members who take a pro-active role in preserving and extending the Soos Creek Trail Park and who sponsor and lead park clean-ups and interpretive walks for public education about the importance of wetlands specifically and undisturbed nature generally. Soos Creek Park is one of south King County's prized wetland habitats. An 8.5 mile trail follows the creek through cattail marshes, forested swamps, wet meadows and willow thickets. This trail is suited to all levels of fitness and is wheelchair accessible. Take any or all of these interpretive walks to learn more about this fascinating area and its wildlife residents. Volunteers from The Friends of Soos Creek Park lead these interpretive walks.

Contact: Kent Parks and Recreation at 253-856-5000

Time: Variable

Transportation: Please contact.

Note: All of these walks take place out of doors, so be sure to dress for the weather.

IslandWood (at Brightwater): Humans and the Water Cycle

In this field experience, students explore how humans are connected to the water cycle. They observe what happens to the water used in their homes once it arrives at Brightwater and discover how their daily actions influence the Puget Sound watershed. This program includes hands-on lab activities, a guided study of the Brightwater treatment plant, and time to explore the engaging exhibit hall.

Contact: Derek Jones at dereki@islandwood.org or 206-263-8866

Link: www.islandwood.org/brightwater

Time: 4 hours

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Can accommodate up to 60 students per day, run from 10am to 2pm.

Mercer Slough Environmental Education Center: Wetland Ecologists

Become a wetland ecologist as you learn to delineate wetland habitats, identify plants using a dichotomous key, and compare soils using a soil probe. In the lab, collect pond samples and identify aquatic macroinvertebrates to determine their pollution tolerance levels. Compare biological and chemical tests as you assess pond water for pH and dissolved oxygen.

Contact: Elley Vanderline at evanderline@pacsci.org

Link: <https://www.pacificsciencecenter.org/mercero-slough/teachers-school-groups/>

Time: 5 hours

Cost: \$204 for up to 15 students, \$353 for 16-30 students. Mercer Slough EEC also offers in-class lessons.

Transportation: Please contact.

Mountains to Sound Greenway Trust: Earth Underfoot

Inspects the impact of invasive plants on the landscape. Students identify native and invasive plants found in Pacific Northwest forests in preparation for a stewardship event. At the stewardship event students may remove invasive plant species, plant native and shrubs, or work in our native plant nursery.

Contact: Becca Kedenburg at becca.kedenburg@mtsgreenway.org

Link: www.mtsgreenway.org/education

Time: Variable

Transportation: King County Metro provides a limited number of [Wheels to Water](#) buses to transport students on their field trip.

Note: Each curriculum includes an introductory lesson (taught by the classroom teacher), an in-class lesson, a field study trip to a nearby forest, and an optional stewardship event. Depending on the season, a stewardship event might involve removing blackberry, planting native trees and shrubs, or working in our native plant nursery. Eligible schools have a free and reduced lunch percentage of at least 25 percent. Financial assistance is available for a limited number of buses to the stewardship event.

Mountains to Sound Greenway Trust: Forests and Fins

Focuses on stream/forest ecology and the life cycle of salmon. Students complete a mock stream survey in the classroom in preparation to do a real stream survey on the field study trip. Participants analyze the riparian zone, look for macro-invertebrates, test water quality, and evaluate the stream channel. Teams of students present their results.

Contact: Becca Kedenburg at becca.kedenburg@mtsgreenway.org

Link: www.mtsgreenway.org/education

Time: Variable

Cost: No Cost

Transportation: King County Metro provides a limited number of Wheels to Water buses to transport students on their field trip.

Note: Each curriculum includes an introductory lesson (taught by the classroom teacher), an in-class lesson, a field study trip to a nearby forest, and an optional stewardship event. Depending on the season, a stewardship event might involve removing blackberry, planting native trees and shrubs, or working in our native plant nursery. Eligible schools have a free and reduced lunch percentage of at least 25 percent. Financial assistance is available for a limited number of buses to the stewardship event.

Nature Bridge: Environmental Science Program

NatureBridge environmental science programs in Olympic National Park offer students in grades K-12 the opportunity to learn hands-on science in an International Biosphere Reserve. The three to five-day residential outdoor science programs are led by experienced educators and customized to enhance your school's curriculum. A classroom without walls: located on the shore of glacially carved Lake Crescent, students can investigate old growth forests, wilderness coasts, and alpine peaks. Inquiry-based learning: motivated by their own curiosity, students monitor the dynamic Elwha River system, collect and identify macroinvertebrates in Barnes Creek, and study the adaptations of local mammals in the skins and skulls lab. Responsible actions: students are inspired to make informed decisions about what constitutes a healthy relationship between natural and human communities, their role in that relationship and appropriate actions they can take to sustain it.

Request Information: <https://naturebridge.org/request-information-olympic> or contact Eva Foster at efoster@naturebridge.org and 206-382-6212x14 or call 206-300-6291

Link: <https://naturebridge.org/olympic/school-group>

Time: 3 or 5 days

Cost: Price range for programs can be found here:

<https://naturebridge.org/olympic/school-group/rates>

Rates are for 3 day/2 night program starting at \$234 per student, 3 day/3 night program starting at \$294 per student, 5 day/4 night program starting at \$340 per student, and 5 day/5 night program starting at \$400 per student. Need-based scholarships available and additional optional services available. Tuition includes quality customized environmental science education; on-site lodging in heated, dormitory cabins on the shores of Lake Crescent; and home-style all-you-can-eat buffet meals.

Transportation information:

<https://naturebridge.org/sites/default/files/Transportation%20-%20OLYM.pdf>

Nature Vision: Stream Connections

A Nature Vision educator will meet your class at your local stream and facilitate a variety of activities related to salmon and the effects of stormwater. All activities support WA State K-12 Learning Standards and are customized to the watershed in which the stream is located. This allows students to make connections to their local environment and learn how they can become stewards where it matters to them most.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Nature Vision: Wetland Connections

A Nature Vision educator will meet your class at your local wetland, retention pond, or location of your choice to facilitate activities that show the importance of these unique ecosystems in helping manage the effects of stormwater runoff. All activities support WA State K-12 Learning Standards and are customized to be site specific. This allows students to observe real-world solutions to stormwater management and learn about ways they can have a positive impact on their local watershed.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Pacific Marine Research: Marine Science Afloat

Students learn to love and appreciate Puget Sound on our scientific expedition aboard the *Spirit of 76* floating classroom. Haul in the plankton nets! Spy into the invisible watery world in the microscope lab! Meet your slimy and squishy underwater neighbors! Follow along with a team of scientific divers as they explore the depths beneath the boat and introduce students to the animals below with a LIVE underwater video system. And most importantly, learn how your daily actions can help protect this magnificent, but delicate ecosystem that we all share.

Contact: fieldtrips@marinescienceafloat.org or 206-361-1919

Link: <https://marine-science-afloat.myshopify.com/>

Time: 5 ½ hour

Cost: \$40 per person for the first 15 people; plus one complimentary chaperone per every 10 additional students. (scholarships available)

Transportation: Must provide own transportation.

Note: Trips take place from mid-March to mid-June but occasionally fall trips are run.

Salish Sea Expeditions: SOUND Program

Salish Sea Expeditions invites students to become scientists and mariners, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways aboard the 61' research sailing vessel, Carlyn.

1-2 day programs: One-day and two-day (overnight) boat-based expeditions that engage students in exploring water quality issues, deploying oceanographic research tools, and practicing applied STEM skills used in maritime trades.

Cost: \$400/hour for 5+-hour sail; \$4800 for two-day overnight, which includes food and equipment (scholarships may be available)

3-5 day programs: This boat-based program provides 3-5 day expeditions of oceanographic research, nautical science and seamanship aboard the 61-foot sailing research vessel, Carlyn. Students lead and conduct marine science research under the careful guidance of Salish educators.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/sound/>

Cost: \$2800/day (scholarships may be available)

Transportation: Please contact.

Note: Dates: Spring season March-June; fall season September-October. All programs include four phases: 1) pre-trip classroom instruction to develop a student science question 2) the 3-5 day boat program 3) a post-trip into the classroom to synthesize information from the trip into a student presentation 4) Student Science Symposium (optional). All science equipment, safety gear, food, and camping equipment included. Class size up to 28 students and 2 chaperones, although we're willing to explore

alternative arrangements for larger groups. Salish Sea Expeditions also offers customized classroom-based watershed lessons.

Seattle Aquarium: Salmon Exploration

Learn about the life cycle of Seattle's most iconic animal, the salmon. With the use of storyboards and interactive activities, students will explore salmon from egg to adult and discuss the many different factors that affect these amazing fish.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Aquarium: Oysters and Ocean Chemistry Research

Ocean chemistry is rapidly changing as excess carbon dioxide from burning fossil fuels is absorbed into the water. Students will discover how this affects larval oysters and oyster farmers in Puget Sound, and how Simone Alin, oceanographer at NOAA, helps the farmers monitor ocean chemistry to maintain healthy hatchery conditions. Video clips integrated throughout the class allow students to hear Simone's story directly from the source. Students will conduct two different pH tests to understand the relationship between CO₂ and pH in the ocean; analyze graphs of real data from local ocean moorings to identify patterns in ocean chemistry; discuss solutions to the oyster farmers' challenges; and get hands-on with live oysters.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Parks and Recreation: Camp Long

Bringing science, environmental education, and experiential learning to your parks. Seattle Parks and Recreation's Environmental Education and Outdoor Learning staff provide opportunities for grades K-12 and organized groups, such as scouts and camps, to experience age-appropriate, hands-on adventures in learning about natural communities in an urban setting. Programs align with WA State Essential Academic Learning Requirements for core content areas and support science kits.

Ponds (spring and summer only): Experience the freshwater habitats of a city park at Camp Long or Discovery Park. Waddling ducks, wriggling tadpoles, and dancing dragonflies are some of the creatures they may see as they explore what makes these places so special.

Forest: Camp Long and Discovery Park have lots of forest habitat to explore.

Venture through the trees looking for clues to animal habits, hiding places, and

seasonal happenings. Forest programs empower participants to feel comfortable in the outdoors.

Link: <https://www.seattle.gov/parks/find/centers/camp-long/camps>

Transportation: Please contact.

Sound Experience: Sound Studies Program

The goal of a Sound Studies program, as with all programs offered by Sound Experience, can be summarized in a single word: awareness. We believe that people will protect what they learn to value. The most effective way to have a lasting impact is to meet the following goals for every program. Our goals for participants: Leave with a heightened awareness of Puget Sound as a fragile ecosystem, understand the concept of a whole system, and understand how *Adventuress* and the earth both illustrate this concept. Recognize the interrelationships that exist between all life. Identify the positive and negative impacts that they as individuals have on the Puget Sound ecosystem. Recognize their ability to take action by raising others' awareness and by making responsible choices. Understand the necessity of cooperation as a course to action. Learn that Puget Sound is an incredible, diverse, and productive ecosystem and that the waterways we all share are fragile and need our care. Most importantly, students learn that they can make a difference. Experience working together to raise sails and learn about all the factors that help make a traditional sailing vessel function.

When you join us for a day trip, your group will take part in an active learning and working voyage. On board our vessel, participants are able to experience how community, nature, culture, and infrastructure all interact and shape each other.

Contact: Amy Kovacs at amy@soundexp.org or 360-379-0438

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/day-program-sound-studies/>

Time: 3 or 5 hours

Cost: Off Peak Rates (October 1-April 30): \$1150 for 3 hours, \$1675 for 5 hours. Peak Rates (May 1-September 30): \$1210 for 3 hours, \$1760 for 5 hours

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

Sound Experience: Sound Experience Program

The goal of a Sound Experience program, as with all programs offered by Sound Experience, can be summarized in a single word: awareness. We believe that people will protect what they learn to value. The most effective way to have a lasting impact is to meet the following goals for every program. Our goals for participants: Leave with a heightened awareness of Puget Sound as a fragile ecosystem, understand the concept of a whole system, and understand how *Adventuress* and the earth both illustrate this concept; recognize the interrelationships that exist between all lives. Identify the positive and negative impacts that they as individuals have on the Puget Sound

ecosystem. Recognize their ability to take action by raising others' awareness and by making responsible choices. Understand the necessity of cooperation as a course to action; Learn that Puget Sound is an incredible, diverse, and productive ecosystem and that the waterways we all share are fragile and need our care. Most importantly, students learn that they can make a difference; Experience working together to raise sails and learn about all the factors that help make a traditional sailing vessel function. When you join us for a day trip, your group will take part in an active learning and working voyage. On board our vessel, participants are able to experience how community, nature, culture, and infrastructure all interact and shape each other.

Contact: Amy Kovacs at amy@soundexp.org and 360-379-0439

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/overnight-programs-sound-explorations/>

Time: 2-7 days

Cost: Off Peak Rates (October 1- April 30): \$2780 per day, groups between 14-18 people can come for \$149/person/day and includes adults. Peak Rates (May 1-September 30): \$2900 per day, groups between 14-18 people can come aboard for \$159/person/day and includes adults

Transportation: Please contact.

Note: The Adventuress sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

Sound Salmon Solutions: Ecosystems

Learn about a food chain and why it is important in an engaging and hands-on way.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Water Quality Testing

Students become scientists by collecting water samples and using testing kits to measure and collect data on the health of a local stream. They will understand the value of clean water and how that is defined.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Macroinvertebrates

Identify and categorize aquatic benthic macroinvertebrates as a biological indicator of water quality.

Time: 45-120 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Tacoma Nature Center: Water Sleuths

Discover how systems connect as students investigate a wetland habitat, then search out the links between human activity and watershed quality. Students use technology to gather data on the watershed and draw conclusions about its quality.

Contact: tnc@tacomaparks.com or 253-591-6439

Link: <http://www.metroparkstacoma.org/school-groups-nature-center/>

Time: 2- 2 ½ hours

Cost: \$6 per student

Transportation: Please contact.

Projects

King County: Native Plant Salvage Program

This unique volunteer program involves digging up plants from natural sites before they are cleared for development. Later, salvaged plants are replanted at habitat restoration sites. It's a great opportunity for middle and high school students to learn about native plants and their role in protecting the aquatic ecosystem.

Contact: Cindy Young at cindy.young@kingcounty.gov or 206-477-4859

Link: www.kingcounty.gov/environment/stewardship/volunteer/plant-salvage-program.aspx

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and field trips.

Nature Vision: Blue Teams

Nature Vision offers Blue Teams, a student stewardship project funded by our water sponsors. Blue Teams are groups of kindergarden-12th grade students who commit to taking on and completing a watershed stewardship project. Students complete projects such as invasive plant removal, native plant restoration, planting water wise gardens, finding and fixing leaks, and much more.

The Blue Team program was developed to educate local youth about water resources and related ecosystems, foster sustainable stewardship values and practices in the community through hands-on youth projects, and to empower youth to take positive steps to improve their local environment.

Blue Teams receive Nature Vision's help in planning, preparing for, and executing their projects at school or at an off-campus project site, as well as regular teacher consultations via phone or email. Teachers/Instructors may register their class or youth

group to become a team, and Nature Vision staff will help each team to design a watershed stewardship project. Staff will visit the students multiple times to teach inquiry-based programs, giving the students the knowledge and help they will need to successfully complete and understand the value of their project.

Link: <https://naturevision.org/blue-teams>

Time: Variable

Cost: Free Blue Teams may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and field trips.

Transportation: Please contact.

Sound Salmon Solutions: Tree Planting

Students are given an opportunity to plant native trees and shrubs on an active habitat restoration site.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 60-90 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and field trips.

8th Grade

Teacher Resources

King County: Protecting Our Liquid Assets

This Vashon Island course provides students with the first steps along the path of ecological understanding, with the hope that their future steps will be considered and measured, serving the interests of all life.

Link: www.kingcounty.gov/environment/waterandland/groundwater/management-areas/vashon-maury-island-gwma/liquid-assets.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: Online Publications

This web page is a useful resource for students doing research on local environmental issues. Online publications, including reports, newsletters, and brochures.

Link: www.kingcounty.gov/depts/dnrp/publications.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: GIS Custom Map Products

King County GIS can prepare custom map products for curriculum support. For example, Sustainability Ambassadors, a non-profit organization empowering youth in community sustainability, engaged the King County GIS Center to help create a themed atlas of stormwater indicator maps for the Tahoma School District in suburban King County. The “Stormwater Neighborhood Atlas” serves as a community outreach tool to show students and the broader community the environmental conditions of their neighborhoods, highlighting unique project opportunities, such as pervious pavement installation and rainwater harvesting at the district’s own schools. Local student Sustainability Ambassadors worked with the school district, the Chamber of Commerce, the Rotary Club and the City of Maple Valley to distribute the “Stormwater Neighborhood Atlas” in classrooms throughout the district, in the public library, and for casual viewing in doctor and dentist waiting rooms and in the lobbies of public spaces such as coffee shops and city buildings. The King County GIS Center’s unique cartographic and design capabilities, and its direct access to King County’s extensive

Contact: Dennis Higgins at dennis.higgins@kingcounty.gov or 206-477-4415

Link: <http://kingcounty.gov/services/gis/ClientServices/Services.aspx>

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

Department of Ecology: Discover Wetlands

A curriculum guide for grades K-12 which focuses on what wetlands are, why they are important, and how human actions affect them.

Unit I: Washington’s Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816a.pdf>)

Unit II: Amazing Wetlands: Functions and Values

(<https://fortress.wa.gov/ecy/publications/documents/8816b.pdf>)

Unit III: People and Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816c.pdf>)

Unit IV: A Walk on the Wild Side

(<https://fortress.wa.gov/ecy/publications/documents/8816d.pdf>)

Time: Variable

Cost: No Cost

Earth Echo: Going Blue: A Teen Guide to Saving Our Oceans, Lakes, Rivers, and Wetlands

Provides a close look at our oceans and waterways and our role in protecting this water planet. This Leader's Guide provides a lesson sequence that expands on the critical information in Going Blue! so young people can actively reflect on the global water crisis via detailed discussion and writing assignments. Appropriate for both traditional classroom teachers and facilitators for out of school time, the Leader's Guide is an excellent resource to move teens toward action for positive change in their classroom, their community, and the wider world!

Link: <http://earthecho.org/educator-resources/a-leaders-guide-to-going-blue>

Time: Variable

Cost: Variable (Leaders Guide Free- Student Guide online)

FOR SEA Institute Marine Sciences: A Salmon in the Sound – Puget Sound Project Curriculum

Salmon serves as a vehicle to focus on Puget Sound as an ecosystem that includes rivers and watersheds as well as saltwater environments. Diverse activities which integrate material from many disciplines are united through a student text tracing the return of a Chinook salmon from the open ocean to its spawning ground in the Skykomish River watershed. From food chains and fishing to genetics and wild salmon, the activities highlight the difficult and complex choices Puget Sound residents must make concerning the management of our natural resources.

Contact: <http://www.forsea.org/pspguide.html>

Time: Variable

Cost: No Cost

Order Form: <http://www.forsea.org/ORDER.HTML>

Leaping Frog: Illahee: Saving Puget Sound One Watershed at a Time Video

[Illaahee] is an inspirational story of a community's effort to preserve and restore a forest, a salmon stream, and Puget Sound. Bordering on Washington State's Puget Sound is a little gem of a community known as Illahee. What makes it so unique is that while surrounded by development, much of Illahee's natural beauty has been preserved. Started modestly by forward-looking residents of the past, and carried on by succeeding generations, this extraordinary and sustained effort insures that Illahee's natural treasures will be its legacy to the future of Puget Sound.

Contact: shellysol@olympen.com

Link: <http://www.leapingfrogfilms.com/>

Time: 30 minutes or less

Cost: No Cost (other videos available on sliding scale)

Nature Conservancy: Nature Works Everywhere: Garden Lesson: Water

By filtering rainwater and slowing the movement of water to rivers, lakes and oceans, your garden works as a mini-watershed. In this lesson, students calculate the permeable surface area of their garden and periodically measure rainfall amounts, acting as junior hydrologists. Using the collected data, students determine how much water their garden filters and explore the relationship between their garden and water quality in the surrounding watershed.

Link: <https://www.natureworkseverywhere.org/resources/activity-guide-water/>

Time: Variable

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: How Dirt Works

Soil sustains plant and animal life, regulates water, filters pollutants, cycles nutrients and supports structures. In this lesson, students learn the value of soil and its role as a natural resource. Students investigate how humans and many other organisms rely on soil and explore why it is important to monitor and maintain the health of soil. They also learn how agriculture, home building and road construction change the land in ways different from how nature changes the land.

Link: <https://www.natureworkseverywhere.org/resources/how-dirt-works/>

Time: 3 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: How Natural Areas Filter Water

Nature works to filter water and to release water over time, thereby reducing the amount of artificial treatment needed to filter water and helping to prevent flooding. In this lesson, students learn about the importance of water quality for human health and agriculture. They relate their own consumption activities to the water supply and also brainstorm various threats to the water supply. By contrasting natural filters with impervious (paved) areas, students compare the impact of development on the ability of nature to provide clean freshwater.

Link:

<https://www.natureworkseverywhere.org/resources/how-natural-areas-filter-water/>

Time: 3-4 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Washington Nature Stormwater Information

Link: <http://www.washingtonnature.org/cities/solvingstormwater>

Nature Conservancy: Nature Works Everywhere: City Habitats

Link: <http://www.cityhabitats.org/>

PBS Frontline: Poisoned Waters

More than three decades after the Clean Water Act, iconic American waterways like the Chesapeake Bay and Puget Sound are in perilous condition and facing new sources of contamination. Watch the video chapter from *Poisoned Waters* and discuss.

Link: <http://www.pbs.org/wgbh/pages/frontline/teach/poisonedwaters/>

Time: Variable

Cost: No Cost

Puget Sound Starts Here: Engineering Solutions

Polluted stormwater runoff is the number one threat to the water quality of the Puget Sound. The purpose of the *Drain Rangers!* and *Engineering Solutions* curricula and materials is to develop and cultivate an understanding of the serious issues facing our community from stormwater runoff and to share specific actions we can take to improve the quality of our water. In these units, students will utilize problem solving models to replicate the thinking process of engineers addressing polluted stormwater runoff.

Link: <http://www.pugetsoundstartshere.org/drain-rangers>

Time: Variable

Cost: No Cost

Seattle Public Utilities: Lost and (Puget) Sound

This film follows three teens who lose a key down a storm drain. Must email Beth for CD with lessons.

Contact: Beth Miller at beth.miller@seattle.gov

Time: 29 minute video plus lesson

Cost: No Cost

Washington Stormwater Center: Supplemental Videos

Link:

https://www.youtube.com/user/StormwaterChannel/playlists?view=1&sort=dd&shelf_id=0

Classroom Visitors

These programs are taught by an informal educator from various organizations in your classroom.

King County: Biodiversity in Our World

What is biodiversity and why is it important for survival on Earth? How do our shopping and waste disposal choices affect biodiversity? Students actively engage in a discussion of real-world issues such as habitat protection, population growth, and climate change. Through challenging and fun, hands-on activities, students gain a clearer understanding of our everyday effects on the planet and how our personal choices can make a difference for the better. The high school version of this workshop includes a focus on ecosystem services.

Link: <https://your.kingcounty.gov/solidwaste/secondaryschool/workshops.asp>

Time: 50 minutes

Cost: No Cost

Note: King County also offers teacher resources, field trips, and projects.

King County: Wastewater and Stormwater in Schools

King County Wastewater Treatment Division will come into your classroom and provide a free 1-2 hour program that tells the story of water that runs over our landscapes and down the drain! These programs connects students to their local waters and includes interactive, hands-on experiments and real-world knowledge on topics such as the water systems, wastewater and stormwater processes, and water pollution solutions.

Link:

<http://kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1-2 hours

Cost: No Cost

Note: King County also offers teacher resources, field trips, and projects.

King County: In-Classroom Programs

Educators from King County will come into your classroom to provide hands-on presentations surrounding wastewater and/or stormwater topics. Students will be encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1 hour

Cost: No Cost

City of Duvall: Surface Water Management Classroom Visitor

Boyd Benson is the Public Works Director/City Engineer and Sara Ruhland is in the Engineering Department. Both can adapt their discussion to what you are teaching in the classroom.

Contact: Boyd E. Benson at boyd.benson@duvallwa.gov and 425-939-8042 or Sara Ruhland at sara.ruhland@duvallwa.gov and 425-788-3434x8042

Link: <http://www.duvallwa.gov/305/sewer-water-stormwater>

Time: Variable

Cost: No Cost

City of Newcastle: Surface Water Management Classroom Visitor

Audrie Starsy is the Surface Water Program Manager and can speak to your class with emphasis on what you are currently talking about in the classroom.

Contact: Audrie Starsy at audries@ci.newcastle.wa.us or 425-649-4143x111

Link: http://newcastlewa.gov/departments/public_works/surface_water_management/

Time: Variable

Cost: No Cost

Eastside Audubon: Migration

This lesson plan focuses on the migration of birds between summer and winter habitats. Students will learn the benefits and challenges of migration and play a game to reinforce their knowledge.

Contact: youthprograms@eastsideaudubon.org

Link: <http://eastsideaudubon.org/education/youth-education-1/youth-workshops>

Time: 45-60 minutes

Cost: No cost

Note: Can be adapted by the volunteer to address stormwater runoff effects on bird migration specifically. Programs are offered in communities from Bellevue to Woodinville/Bothell and from East Lake Washington to North Bend.

Friends of the Issaquah Salmon Hatchery (FISH): Enviroscape- a Watershed Model

Using a table-top watershed model, students “pollute” the land, make it “rain,” and watch how pollution can affect the watershed. They then come up with solutions to pollution problems and identify things they can do to keep our watersheds (and salmon!) healthy. The whole activity takes approximately one hour per class.

Contact: Rachel Martin at education@issaquahfish.org or 425-393-1118

Link: www.issaquahfish.org

Time: 60 minutes

Cost: \$50 per class requested

Note: Offered December-June. FISH also offers field trips.

Mercer Slough Environmental Education Center: Water Testing

Don gloves and goggles as you determine the pH and dissolved oxygen levels of water samples from Mercer Slough. What do these tests tell about the health of the ecosystem?

Contact: Elley Vanderline at evanderline@pacsci.org or 425-450-0207

Link: <https://www.pacificsciencecenter.org/mercer-slough/teachers-school-groups/>

Time: 45 minutes

Cost: \$180 for one classroom lesson, \$110 for each additional lesson on the same day; plus mileage fee

Note: Also included in the Wetland Ecologists field study program offered on-site at Mercer Slough. Can be used as an extension to chemistry content FOSS Kits.

Nature Vision: Watershed Connections

A Nature Vision educator will visit your classroom to facilitate hands-on lessons that highlight the challenges our local watershed faces with stormwater runoff. Each hour long lesson focuses on specific concepts related to stormwater. Lessons can stand alone or be combined into units that offer a more complete picture of stormwater. Units can be for one grade level or used to scaffold throughout multiple grade levels at a school. Every lesson is designed to support WA State K-12 Learning Standards and help students understand what they can do to reduce the effects of stormwater runoff.

Link: <https://naturevision.org/school-programs/>

Time: 1 hour lessons

Cost: \$100 per lesson

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers field trips and projects.

Salish Sea Expeditions: SOURCE Program

Salish Sea Expeditions invites students to become scientists, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways. This land-based program is focused on supporting students in investigation of their local watershed, building awareness about water quality and stormwater issues in the Puget Sound region. Salish staff visit school campuses, leading classroom-based activities and instruction, and water quality sampling and analysis on school grounds to help students learn how human activity can impact the health of the Puget Sound ecosystem.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/source/>

Time: 8-10 hours

Cost: \$1200/initial classroom (additional classes \$250 each) - email for complete pricing and scheduling options. Scholarship opportunities are often available.

Note: Offered October-February. Class size up to 30 students. Salish Sea Expeditions also offers single and multi-day boat-based field trips.

Vashon Nature Center: Nature Presentations

Trained naturalists and scientists offer short in-class or outdoor programs designed to foster student awareness and understanding of environmental science topics by pinning

these topics to real-life local examples on Vashon and Maury Islands. Students become engaged and excited about science through these programs because they see how science is tied to their own backyards and personal lives.

Contact: info@vashonnaturecenter.org or 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 30-90 minutes

Cost: \$50-\$150

Note: Vashon NC works with teachers to highlight topics of their choice (stormwater, surface water mgmt). Example: Salmon See-son-the life cycle of salmon and a discussion of how salmon populations are faring in our local streams and where to see them.

Vashon Nature Center: Invertebrates in School

Eighth-grade science classes participate in monitoring the health of Shinglemill Creek, a major watershed on Vashon Island. Vashon Nature Center scientists collect aquatic invertebrate samples in the field and bring them into the classroom, where students spend three days shoulder-to-shoulder with scientists learning about watershed health, biological indicators, and sorting and identifying invertebrates. In past years, students discovered possible indications of storm-water runoff issues from a tributary of Shinglemill Creek that drains Vashon town. The students' presentation for the Vashon Maury Island Groundwater Protection Committee spurred several subsequent independent research projects to look into possible solutions for runoff issues. In addition, students are monitoring study sites for yearly changes.

Contact: info@vashonnaturecenter.org and 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 3 weeks

Sound Salmon Solutions: Erosion Modeling

Understand the scientific method by conducting an investigation that explores the factors that increase or decrease erosion using a model they build.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 120 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Sound Salmon Solutions: The 5 C's of Salmon Habitat

Learn about the critical habitat components necessary for salmon survival!

Link: <http://www.soundsalmonsolutions.org/education>

Time: 25 minutes

Note: This lesson can also be added on to a field trip. Sound Salmon Solutions also offers projects.

Field Trips

King County: Brightwater Center Field Trips

IslandWood and King County provide educational field trips for students in grades 3-8 utilizing the many resources at the Brightwater Center. Field trips can accommodate up to 60 students per day, last 3-4 hours, and are free of charge. Teachers can choose from the following program options: Freshwater Ecosystem Investigation, Landforms Investigation, and Humans and the Water Cycle.

Contact: Derek Jones at derekj@islandwood.org or 206-263-8866

Link: <https://islandwood.org/educational-programming/brightwater-center/brightwater-school-day-programs>

Time: 3-4 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and projects.

King County: South Plant Field Trips

King County's South Plant provides educational field trips for students. Tours and programs focus on the following topics: water cycle and nutrient cycle, wastewater treatment and human health, human impacts to water systems, pollution prevention and water conservation, stormwater problems and solutions.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/locations/south-plant/school.aspx>

Time: 2-4 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and projects.

King County: Salmon SEEson

During the fall, salmon return to streams and rivers around the Puget Sound. Spot the spawners in the Lake Washington/Cedar/Sammamish and Green/Duwamish and Central Puget Sound watersheds from September to mid-December. Salmon SEEson provides information to help you spy these natural beauties at various times and locations as they make their seasonal journey home each year. Many locations have staff or volunteer naturalists on hand to point out salmon; some are self-guided locations.

Contact: Linda Grob at linda.grob@kingcounty.gov or 206-477-4704

Link: www.govlink.org/watersheds/8/action/salmon-seeson/default.aspx

Time: 15-60 minutes

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Flyers, poster, and a website are available to help you find the best time and location for you and your class to see spawning salmon. King County also offers teacher resources, in-class lessons, and projects.

Environmental Science Center: Salmon Heroes

Classroom Lessons & Field Study Investigation: During the 1-hour classroom lesson, students will engage in hands-on, NGSS-correlated activities that explore the habitat needs of salmon – as well as the challenges to survival that salmon face – during each stage of the salmon life cycle. During the 3-hour field study, students review the salmon life cycle, learn external and internal anatomy, collect water quality data, learn about the changes that the local community made to their behaviors in order to make the Creek better habitat for salmon, and then play a large-group game that mimics the challenges salmon face in making it back to their spawning grounds. During the post-visit, students analyze the water quality data they collected in the field and compare it to previous year's data, and to data collected from a different local creek. Students will then evaluate different actions that people can take in order to lessen their impact on salmon population health.

Contact: Joanna Stodden at Joanna@EnvScienceCenter.org or (206) 248-4266

Link:

<https://docs.google.com/forms/d/e/1FAIpQLSd4aBr9E8gH3NWTdHm5EZ41UdixbYEnc eiHpeuFCWSZ5Bodw/viewform>

Time: 2 hours (in classroom) + 3 hours (field trip to Normandy Park Cove)

Cost: \$350 per class of 30 students (If your school has 50% or greater free/reduced lunch rate, you will pay a reduced program fee of \$70 per class of 30 students. If your school has 80% or greater free/reduced lunch rate, your program fees will be waived.

Transportation: Partial transportation reimbursements are available for schools with >50% Free and Reduced Lunch Rate.

Note: Offered September-November. Includes 1-hour classroom lesson, a 3-hour guided field study investigation, and a 1-hour post-field study classroom lesson. You need to arrange and pay for transportation for this field trip. Registering multiple classes within a grade level is strongly encouraged. There is an opportunity for bus reimbursement for schools that have a 50% or greater free/reduced lunch rate. Please contact Programs Manager Joanna Stodden for more information regarding bus subsidies. You will need to provide 4 chaperons for each class' field study.

Friends of the Issaquah Salmon Hatchery (FISH): Those Amazing Salmon - Hatchery Tours

Come see the salmon at Issaquah Creek! Watch spawning salmon, see the hatchery in action, and learn about challenges salmon face and what we can do to help them.

Scheduled groups of students and adults are led through the hatchery by trained volunteer docents.

Contact: Contact Rachel Martin, Program Coordinator, FISH at education@issaquahfish.org or 425-392-1118

Time: Tours last 45 minutes to one hour and are available primarily mid-September through early November, though winter and spring/summer tours may also be scheduled.

Cost: FISH requests a fee of \$2 per student when possible.

Transportation: Please contact.

Note: The tour, ideally in conjunction with the Those Amazing Salmon classroom presentation, helps fulfill the state mandate to provide environmental education experiences to students and is aligned to Washington State standards in science and social studies.

Friends of Soos Creek (Kent): Interpretive Walk

Friends of Soos Creek Park is a non-profit organization comprised of volunteer members who take a pro-active role in preserving and extending the Soos Creek Trail Park and who sponsor and lead park clean-ups and interpretive walks for public education about the importance of wetlands specifically and undisturbed nature generally. Soos Creek Park is one of south King County's prized wetland habitats. An 8.5 mile trail follows the creek through cattail marshes, forested swamps, wet meadows and willow thickets. This trail is suited to all levels of fitness and is wheelchair accessible. Take any or all of these interpretive walks to learn more about this fascinating area and its wildlife residents. Volunteers from The Friends of Soos Creek Park lead these interpretive walks.

Contact: Kent Parks and Recreation at 253-856-5000

Time: Variable

Transportation: Please contact.

Note: All of these walks take place out of doors, so be sure to dress for the weather.

IslandWood (at Brightwater): Humans and the Water Cycle

In this field experience, students explore how humans are connected to the water cycle. They observe what happens to the water used in their homes once it arrives at Brightwater and discover how their daily actions influence the Puget Sound watershed. This program includes hands-on lab activities, a guided study of the Brightwater treatment plant, and time to explore the engaging exhibit hall.

Contact: Derek Jones at derekj@islandwood.org or 206-263-8866

Link: www.islandwood.org/brightwater

Time: 4 hours

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Can accommodate up to 60 students per day, run from 10am to 2pm.

King Conservation District: Environmental Detectives

Environmental Detectives leads students through research and discussion stations as they gather clues in an attempt to solve the Mystery of the Dying Fish. This Program places science learning in a real-world context with scenarios people may encounter daily. Along the way, students conduct scientific tests and analyze or create statistical and other data. They are empowered to seek the best solutions to complex environmental problems.

Contact: Kristen Reichardt at kristen.reichardt@kingcd.org or 425-282-1927

Link: <http://kingcd.org/programs-education-stormwater.htm>

Time: 3-4 hours

Cost: \$1500-\$2000 (KCD partners with city jurisdictions to help cover the cost of the lessons so there is no cost to teachers - ask when registering)

Transportation: Please contact.

Mercer Slough Environmental Education Center: Wetland Ecologists

Become a wetland ecologist as you learn to delineate wetland habitats, identify plants using a dichotomous key, and compare soils using a soil probe. In the lab, collect pond samples and identify aquatic macroinvertebrates to determine their pollution tolerance levels. Compare biological and chemical tests as you assess pond water for pH and dissolved oxygen.

Contact: Elley Vanderline at evanderline@pacsci.org

Link: <https://www.pacificsciencecenter.org/mercero-slough/teachers-school-groups/>

Time: 5 hours

Cost: \$204 for up to 15 students, \$353 for 16-30 students. Mercer Slough EEC also offers in-class lessons.

Transportation: Please contact.

Mountains to Sound Greenway Trust: Earth Underfoot

Inspects the impact of invasive plants on the landscape. Students identify native and invasive plants found in Pacific Northwest forests in preparation for a stewardship event. At the stewardship event students may remove invasive plant species, plant native and shrubs, or work in our native plant nursery.

Contact: Becca Kedenburg at becca.kedenburg@mtsgreenway.org

Link: www.mtsgreenway.org/education

Time: Variable

Transportation: King County Metro provides a limited number of [Wheels to Water](#) buses to transport students on their field trip.

Note: Each curriculum includes an introductory lesson (taught by the classroom teacher), an in-class lesson, a field study trip to a nearby forest, and an optional

stewardship event. Depending on the season, a stewardship event might involve removing blackberry, planting native trees and shrubs, or working in our native plant nursery. Eligible schools have a free and reduced lunch percentage of at least 25 percent. Financial assistance is available for a limited number of buses to the stewardship event.

Mountains to Sound Greenway Trust: Forests and Fins

Focuses on stream/forest ecology and the life cycle of salmon. Students complete a mock stream survey in the classroom in preparation to do a real stream survey on the field study trip. Participants analyze the riparian zone, look for macro-invertebrates, test water quality, and evaluate the stream channel. Teams of students present their results.

Contact: Becca Kedenburg at becca.kedenburg@mtsgreenway.org

Link: www.mtsgreenway.org/education

Time: Variable

Cost: No Cost

Transportation: King County Metro provides a limited number of Wheels to Water buses to transport students on their field trip.

Note: Each curriculum includes an introductory lesson (taught by the classroom teacher), an in-class lesson, a field study trip to a nearby forest, and an optional stewardship event. Depending on the season, a stewardship event might involve removing blackberry, planting native trees and shrubs, or working in our native plant nursery. Eligible schools have a free and reduced lunch percentage of at least 25 percent. Financial assistance is available for a limited number of buses to the stewardship event.

Nature Bridge: Environmental Science Program

NatureBridge environmental science programs in Olympic National Park offer students in grades K-12 the opportunity to learn hands-on science in an International Biosphere Reserve. The three to five-day residential outdoor science programs are led by experienced educators and customized to enhance your school's curriculum. A classroom without walls: located on the shore of glacially carved Lake Crescent, students can investigate old growth forests, wilderness coasts, and alpine peaks. Inquiry-based learning: motivated by their own curiosity, students monitor the dynamic Elwha River system, collect and identify macroinvertebrates in Barnes Creek, and study the adaptations of local mammals in the skins and skulls lab. Responsible actions: students are inspired to make informed decisions about what constitutes a healthy relationship between natural and human communities, their role in that relationship and appropriate actions they can take to sustain it.

Request Information: <https://naturebridge.org/request-information-olympic> or contact Eva Foster at efoster@naturebridge.org and 206-382-6212x14 or call 206-300-6291

Link: <https://naturebridge.org/olympic/school-group>

Time: 3 or 5 days

Cost: Price range for programs can be found here:

<https://naturebridge.org/olympic/school-group/rates>

Rates are for 3 day/2 night program starting at \$234 per student, 3 day/3 night program starting at \$294 per student, 5 day/4 night program starting at \$340 per student, and 5 day/5 night program starting at \$400 per student. Need-based scholarships available and additional optional services available. Tuition includes quality customized environmental science education; on-site lodging in heated, dormitory cabins on the shores of Lake Crescent; and home-style all-you-can-eat buffet meals.

Transportation information:

<https://naturebridge.org/sites/default/files/Transportation%20-%20OLYM.pdf>

Nature Vision: Stream Connections

A Nature Vision educator will meet your class at your local stream and facilitate a variety of activities related to salmon and the effects of stormwater. All activities support WA State K-12 Learning Standards and are customized to the watershed in which the stream is located. This allows students to make connections to their local environment and learn how they can become stewards where it matters to them most.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Nature Vision: Wetland Connections

A Nature Vision educator will meet your class at your local wetland, retention pond, or location of your choice to facilitate activities that show the importance of these unique ecosystems in helping manage the effects of stormwater runoff. All activities support WA State K-12 Learning Standards and are customized to be site specific. This allows students to observe real-world solutions to stormwater management and learn about ways they can have a positive impact on their local watershed.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Pacific Marine Research: Marine Science Afloat

Students learn to love and appreciate Puget Sound on our scientific expedition aboard the *Spirit of 76* floating classroom. Haul in the plankton nets! Spy into the invisible

watery world in the microscope lab! Meet your slimy and squishy underwater neighbors! Follow along with a team of scientific divers as they explore the depths beneath the boat and introduce students to the animals below with a LIVE underwater video system. And most importantly, learn how your daily actions can help protect this magnificent, but delicate ecosystem that we all share.

Contact: fieldtrips@marinescienceafloat.org or 206-361-1919

Link: <https://marine-science-afloat.myshopify.com/>

Time: 5 ½ hour

Cost: \$40 per person for the first 15 people; plus one complimentary chaperone per every 10 additional students. (scholarships available)

Transportation: Must provide own transportation.

Note: Trips take place from mid-March to mid-June but occasionally fall trips are run.

Salish Sea Expeditions: SOUND Program

Salish Sea Expeditions invites students to become scientists and mariners, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways aboard the 61' research sailing vessel, Carlyn.

1-2 day programs: One-day and two-day (overnight) boat-based expeditions that engage students in exploring water quality issues, deploying oceanographic research tools, and practicing applied STEM skills used in maritime trades.

Cost: \$400/hour for 5+-hour sail; \$4800 for two-day overnight, which includes food and equipment (scholarships may be available)

3-5 day programs: This boat-based program provides 3-5 day expeditions of oceanographic research, nautical science and seamanship aboard the 61-foot sailing research vessel, Carlyn. Students lead and conduct marine science research under the careful guidance of Salish educators.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/sound/>

Cost: \$2800/day (scholarships may be available)

Transportation: Please contact.

Note: Dates: Spring season March-June; fall season September-October. All programs include four phases: 1) pre-trip classroom instruction to develop a student science question 2) the 3-5 day boat program 3) a post-trip into the classroom to synthesize information from the trip into a student presentation 4) Student Science Symposium (optional). All science equipment, safety gear, food, and camping equipment included. Class size up to 28 students and 2 chaperones, although we're willing to explore alternative arrangements for larger groups. Salish Sea Expeditions also offers customized classroom-based watershed lessons.

Seattle Aquarium: Salmon Exploration

Learn about the life cycle of Seattle's most iconic animal, the salmon. With the use of storyboards and interactive activities, students will explore salmon from egg to adult and discuss the many different factors that affect these amazing fish.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Aquarium: Oysters and Ocean Chemistry Research

Ocean chemistry is rapidly changing as excess carbon dioxide from burning fossil fuels is absorbed into the water. Students will discover how this affects larval oysters and oyster farmers in Puget Sound, and how Simone Alin, oceanographer at NOAA, helps the farmers monitor ocean chemistry to maintain healthy hatchery conditions. Video clips integrated throughout the class allow students to hear Simone's story directly from the source. Students will conduct two different pH tests to understand the relationship between CO₂ and pH in the ocean; analyze graphs of real data from local ocean moorings to identify patterns in ocean chemistry; discuss solutions to the oyster farmers' challenges; and get hands-on with live oysters.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Parks and Recreation: Camp Long

Bringing science, environmental education, and experiential learning to your parks. Seattle Parks and Recreation's Environmental Education and Outdoor Learning staff provide opportunities for grades K-12 and organized groups, such as scouts and camps, to experience age-appropriate, hands-on adventures in learning about natural communities in an urban setting. Programs align with WA State Essential Academic Learning Requirements for core content areas and support science kits.

Ponds (spring and summer only): Experience the freshwater habitats of a city park at Camp Long or Discovery Park. Waddling ducks, wriggling tadpoles, and dancing dragonflies are some of the creatures they may see as they explore what makes these places so special.

Forest: Camp Long and Discovery Park have lots of forest habitat to explore. Venture through the trees looking for clues to animal habits, hiding places, and seasonal happenings. Forest programs empower participants to feel comfortable in the outdoors.

Link: <https://www.seattle.gov/parks/find/centers/camp-long/camps>

Transportation: Please contact.

Sound Experience: Sound Studies Program

The goal of a Sound Studies program, as with all programs offered by Sound Experience, can be summarized in a single word: awareness. We believe that people will protect what they learn to value. The most effective way to have a lasting impact is to meet the following goals for every program. Our goals for participants: Leave with a heightened awareness of Puget Sound as a fragile ecosystem, understand the concept of a whole system, and understand how *Adventuress* and the earth both illustrate this concept. Recognize the interrelationships that exist between all life. Identify the positive and negative impacts that they as individuals have on the Puget Sound ecosystem. Recognize their ability to take action by raising others' awareness and by making responsible choices. Understand the necessity of cooperation as a course to action. Learn that Puget Sound is an incredible, diverse, and productive ecosystem and that the waterways we all share are fragile and need our care. Most importantly, students learn that they can make a difference. Experience working together to raise sails and learn about all the factors that help make a traditional sailing vessel function. When you join us for a day trip, your group will take part in an active learning and working voyage. On board our vessel, participants are able to experience how community, nature, culture, and infrastructure all interact and shape each other.

Contact: Amy Kovacs at amy@soundexp.org or 360-379-0438

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/day-program-sound-studies/>

Time: 3 or 5 hours

Cost: Off Peak Rates (October 1-April 30): \$1150 for 3 hours, \$1675 for 5 hours. Peak Rates (May 1-September 30): \$1210 for 3 hours, \$1760 for 5 hours

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

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Contact: Amy Kovacs at amy@soundexp.org and 360-379-0439

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/overnight-programs-sound-explorations/>

Time: 2-7 days

Cost: Off Peak Rates (October 1- April 30): \$2780 per day, groups between 14-18 people can come for \$149/person/day and includes adults. Peak Rates (May 1-September 30): \$2900 per day, groups between 14-18 people can come aboard for \$159/person/day and includes adults

Transportation: Please contact.

Note: The Adventuress sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

Sound Salmon Solutions: Water Quality Testing

Students become scientists by collecting water samples and using testing kits to measure and collect data on the health of a local stream. They will understand the value of clean water and how that is defined.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Macroinvertebrates

Identify and categorize aquatic benthic macroinvertebrates as a biological indicator of water quality.

Time: 45-120 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Tacoma Nature Center: Water Sleuths

Discover how systems connect as students investigate a wetland habitat, then search out the links between human activity and watershed quality. Students use technology to gather data on the watershed and draw conclusions about its quality.

Contact: tnc@tacomaparks.com or 253-591-6439

Link: <http://www.metroparkstacoma.org/school-groups-nature-center/>

Time: 2- 2 ½ hours

Cost: \$6 per student

Transportation: Please contact.

Projects

King County: Native Plant Salvage Program

This unique volunteer program involves digging up plants from natural sites before they are cleared for development. Later, salvaged plants are replanted at habitat restoration sites. It's a great opportunity for middle and high school students to learn about native plants and their role in protecting the aquatic ecosystem.

Contact: Cindy Young at cindy.young@kingcounty.gov or 206-477-4859

Link: www.kingcounty.gov/environment/stewardship/volunteer/plant-salvage-program.aspx

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and field trips.

Nature Vision: Blue Teams

Nature Vision offers Blue Teams, a student stewardship project funded by our water sponsors. Blue Teams are groups of kindergarden-12th grade students who commit to taking on and completing a watershed stewardship project. Students complete projects such as invasive plant removal, native plant restoration, planting water wise gardens, finding and fixing leaks, and much more.

The Blue Team program was developed to educate local youth about water resources and related ecosystems, foster sustainable stewardship values and practices in the community through hands-on youth projects, and to empower youth to take positive steps to improve their local environment.

Blue Teams receive Nature Vision's help in planning, preparing for, and executing their projects at school or at an off-campus project site, as well as regular teacher consultations via phone or email. Teachers/Instructors may register their class or youth group to become a team, and Nature Vision staff will help each team to design a watershed stewardship project. Staff will visit the students multiple times to teach inquiry-based programs, giving the students the knowledge and help they will need to successfully complete and understand the value of their project.

Link: <https://naturevision.org/blue-teams>

Time: Variable

Cost: Free Blue Teams may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and field trips.

Transportation: Please contact.

Sound Salmon Solutions: Tree Planting

Students are given an opportunity to plant native trees and shrubs on an active habitat restoration site.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 60-90 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and field trips.

9th Grade

Teacher Resources

King County: Protecting Our Liquid Assets

This course provides students with the first steps along the path of ecological understanding, with the hope that their future steps will be considered and measured, serving the interests of all life.

Link: www.kingcounty.gov/environment/waterandland/groundwater/management-areas/vashon-maury-island-gwma/liquid-assets.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: Online Publications

This web page is a useful resource for students doing research on local environmental issues. Online publications, including reports, newsletters, and brochures.

Link: www.kingcounty.gov/depts/dnrp/publications.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: GIS Custom Map Products

King County GIS can prepare custom map products for curriculum support. For example, Sustainability Ambassadors, a non-profit organization empowering youth in community sustainability, engaged the King County GIS Center to help create a themed atlas of stormwater indicator maps for the Tahoma School District in suburban King County. The “Stormwater Neighborhood Atlas” serves as a community outreach tool to show students and the broader community the environmental conditions of their neighborhoods, highlighting unique project opportunities, such as pervious pavement installation and rainwater harvesting at the district’s own schools. Local student Sustainability Ambassadors worked with the school district, the Chamber of Commerce, the Rotary Club and the City of Maple Valley to distribute the “Stormwater Neighborhood Atlas” in classrooms throughout the district, in the public library, and for casual viewing in doctor and dentist waiting rooms and in the lobbies of public spaces such as coffee shops and city buildings. The King County GIS Center’s unique cartographic and design capabilities, and its direct access to King County’s extensive

Contact: Dennis Higgins at dennis.higgins@kingcounty.gov or 206-477-4415

Link: <http://kingcounty.gov/services/gis/ClientServices/Services.aspx>

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

Department of Ecology: Discover Wetlands

A curriculum guide for grades K-12 which focuses on what wetlands are, why they are important, and how human actions affect them.

Unit I: Washington’s Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816a.pdf>)

Unit II: Amazing Wetlands: Functions and Values

(<https://fortress.wa.gov/ecy/publications/documents/8816b.pdf>)

Unit III: People and Wetlands

<https://fortress.wa.gov/ecy/publications/documents/8816c.pdf>)

Unit IV: A Walk on the Wild Side

<https://fortress.wa.gov/ecy/publications/documents/8816d.pdf>)

Time: Variable

Cost: No Cost

Earth Echo: Going Blue: A Teen Guide to Saving Our Oceans, Lakes, Rivers, and Wetlands

Provides a close look at our oceans and waterways and our role in protecting this water planet. This Leader's Guide provides a lesson sequence that expands on the critical information in Going Blue! so young people can actively reflect on the global water crisis via detailed discussion and writing assignments. Appropriate for both traditional classroom teachers and facilitators for out of school time, the Leader's Guide is an excellent resource to move teens toward action for positive change in their classroom, their community, and the wider world!

Link: <http://earthecho.org/educator-resources/a-leaders-guide-to-going-blue>

Time: Variable

Cost: Variable (Leaders Guide Free- Student Guide online)

FOR SEA Institute Marine Sciences: The Changing Sound

An investigation of the decline of the once abundant native Olympia oyster engages students in a wide variety of hands-on/minds-on science activities from experimentally determining the size of Puget Sound to oyster anatomy and ecology to water quality testing. Integrating material from geography, history, writing, and problem solving as well, the activities focus on human interaction with oyster populations and lead students to a consideration of actions they might take for maintaining the health of Puget Sound.

Contact: <http://www.forsea.org/pspguide.html>

Link: Order Form: <http://www.forsea.org/ORDER.HTML>

Time: Variable

Cost: No Cost

Leaping Frog: Illahee: Saving Puget Sound One Watershed at a Time Video

[Illaahee] is an inspirational story of a community's effort to preserve and restore a forest, a salmon stream, and Puget Sound. Bordering on Washington State's Puget Sound is a little gem of a community known as Illahee. What makes it so unique is that while surrounded by development, much of Illahee's natural beauty has been preserved. Started modestly by forward-looking residents of the past, and carried on by succeeding generations, this extraordinary and sustained effort insures that Illahee's natural treasures will be its legacy to the future of Puget Sound.

Contact: shellysol@olypen.com

Link: <http://www.leapingfrogfilms.com/>

Time: 30 minutes or less

Cost: No Cost (other videos available on sliding scale)

Nature Conservancy: Nature Works Everywhere:

Urban Runoff: Design a School Stormwater Management Plan

Whether a city is rebuilding after a devastating storm or simply looking to revitalize and improve, working with nature rather than against it is a key part of the process of redesigning our cities to be more resilient and sustainable. This lesson introduces students to the problem of urban runoff and a variety of nature-based design ideas and solutions. Through a school mapping activity, students determine which solutions would be best suited to dealing with urban runoff on their school grounds.

Link: <https://www.natureworkseverywhere.org/resources/urban-runoff/>

Time: 3-4 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere:

Sustainable Cities: Nature-Based Solutions in Urban Design

In this set of activities, students are introduced to sustainability in the urban context. They will describe their vision of a sustainable city, identify the challenges facing cities, and discover the ecosystem services provided by nature. Sustainable cities are much more than places where humans and nature coexist productively: they are cities in which all people—regardless of race, color, income, and so on—have equal access to a healthy environment in which they can flourish. In designing sustainable cities, planners must incorporate environmental justice ideals, and more broadly, social justice. The lesson guides students into taking an active role in their cities by using technology to map their communities and plan, design, and propose an urban design project that incorporates nature-based solutions.

Link: <https://www.natureworkseverywhere.org/resources/sustainable-cities/>

Time: 2-5 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Garden Lesson: Water

By filtering rainwater and slowing the movement of water to rivers, lakes and oceans, your garden works as a mini-watershed. In this lesson, students calculate the permeable surface area of their garden and periodically measure rainfall amounts, acting as junior hydrologists. Using the collected data, students determine how much water their garden filters and explore the relationship between their garden and water quality in the surrounding watershed.

Link: <https://www.natureworkseverywhere.org/resources/activity-guide-water/>

Time: Variable

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Washington Nature Stormwater Information

Link: <http://www.washingtonnature.org/cities/solvingstormwater>

Nature Conservancy: Nature Works Everywhere: City Habitats

Link: <http://www.cityhabitats.org/>

PBS Frontline: Poisoned Waters

More than three decades after the Clean Water Act, iconic American waterways like the Chesapeake Bay and Puget Sound are in perilous condition and facing new sources of contamination. Watch the video chapter from *Poisoned Waters* and discuss.

Link: <http://www.pbs.org/wgbh/pages/frontline/teach/poisonedwaters/>

Time: Variable

Cost: No Cost

Puget Sound Starts Here: Engineering Solutions

Polluted stormwater runoff is the number one threat to the water quality of the Puget Sound. The purpose of the *Drain Rangers!* and *Engineering Solutions* curricula and materials is to develop and cultivate an understanding of the serious issues facing our community from stormwater runoff and to share specific actions we can take to improve the quality of our water. In these units, students will utilize problem solving models to replicate the thinking process of engineers addressing polluted stormwater runoff.

Link: <http://www.pugetsoundstartshere.org/drain-rangers>

Time: Variable

Cost: No Cost

Sustainability Ambassadors: Reading Resources

Videos, Library Links, and Low Impact Design Manual for Schools

Links: Video Links: <http://www.sustainabilityambassadors.org/stormwater-videos>

Library Links: <http://www.sustainabilityambassadors.org/stormwater-library-links>

Low Impact Design Manual: <http://www.sustainabilityambassadors.org/lid-manual-for-schools>

Cost: No Cost

Sustainability Ambassadors: Stormwater Pollution Solution Project Ideas

Link: <http://www.sustainabilityambassadors.org/20-action-projects>

Cost: No Cost

Washington Stormwater Center: Supplemental Videos

Link:

https://www.youtube.com/user/StormwaterChannel/playlists?view=1&sort=dd&shelf_id=0

Classroom Visitors

These programs are taught by an informal educator from various organizations in your classroom.

King County: Biodiversity in Our World

What is biodiversity and why is it important for survival on Earth? How do our shopping and waste disposal choices affect biodiversity? Students actively engage in a discussion of real-world issues such as habitat protection, population growth, and climate change. Through challenging and fun, hands-on activities, students gain a clearer understanding of our everyday effects on the planet and how our personal choices can make a difference for the better. The high school version of this workshop includes a focus on ecosystem services.

Link: <https://your.kingcounty.gov/solidwaste/secondaryschool/workshops.asp>

Time: 50 minutes

Note: King County also offers teacher resources, field trips, and projects.

King County: In-Classroom Programs

Educators from King County will come into your classroom to provide hands-on presentations surrounding wastewater and/or stormwater topics. Students will be encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1 hour

Cost: No Cost

City of Duvall: Surface Water Management Classroom Visitor

Boyd Benson is the Public Works Director/City Engineer and Sara Ruhland is in the Engineering Department. Both can adapt their discussion to what you are teaching in the classroom.

Contact: Boyd E. Benson at boyd.benson@duvallwa.gov and 425-939-8042 or Sara Ruhland at sara.ruhland@duvallwa.gov and 425-788-3434x8042

Link: <http://www.duvallwa.gov/305/sewer-water-stormwater>

Time: Variable

Cost: No Cost

City of Newcastle: Surface Water Management Classroom Visitor

Audrie Starsy is the Surface Water Program Manager and can speak to your class with emphasis on what you are currently talking about in the classroom.

Contact: Audrie Starsy at audries@ci.newcastle.wa.us or 425-649-4143x111

Link: http://newcastlewa.gov/departments/public_works/surface_water_management/

Time: Variable

Cost: No Cost

Nature Vision: Watershed Connections

A Nature Vision educator will visit your classroom to facilitate hands-on lessons that highlight the challenges our local watershed faces with stormwater runoff. Each hour long lesson focuses on specific concepts related to stormwater. Lessons can stand alone or be combined into units that offer a more complete picture of stormwater. Units can be for one grade level or used to scaffold throughout multiple grade levels at a school. Every lesson is designed to support WA State K-12 Learning Standards and help students understand what they can do to reduce the effects of stormwater runoff.

Link: <https://naturevision.org/school-programs/>

Time: 1 hour lessons

Cost: \$100 per lesson

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers field trips and projects.

Salish Sea Expeditions: SOURCE Program

Salish Sea Expeditions invites students to become scientists, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways. This land-based program is focused on supporting students in investigation of their local watershed, building awareness about water quality and stormwater issues in the Puget Sound region. Salish staff visit school campuses, leading classroom-based activities and instruction, and water quality sampling and analysis on school grounds to help students learn how human activity can impact the health of the Puget Sound ecosystem.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/source/>

Time: 8-10 hours

Cost: \$1200/initial classroom (additional classes \$250 each) - email for complete pricing and scheduling options. Scholarship opportunities are often available.

Note: Offered October-February. Class size up to 30 students. Salish Sea Expeditions also offers single and multi-day boat-based field trips.

Sound Salmon Solutions: Erosion Modeling

Understand the scientific method by conducting an investigation that explores the factors that increase or decrease erosion using a model they build.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 120 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Sound Salmon Solutions: The 5 C's of Salmon Habitat

Learn about the critical habitat components necessary for salmon survival!

Link: <http://www.soundsalmonsolutions.org/education>

Time: 25 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Vashon Nature Center: Nature Presentations

Trained naturalists and scientists offer short in-class or outdoor programs designed to foster student awareness and understanding of environmental science topics by pinning these topics to real-life local examples on Vashon and Maury Islands. Students become engaged and excited about science through these programs because they see how science is tied to their own backyards and personal lives.

Contact: info@vashonnaturecenter.org or 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 30-90 minutes

Cost: \$50-\$150

Note: Vashon NC works with teachers to highlight topics of their choice (stormwater, surface water mgmt). Example: Salmon See-son-the life cycle of salmon and a discussion of how salmon populations are faring in our local streams and where to see them.

Field Trips

King County: Brightwater and South Wastewater Treatment Plant Tours

Where does the water go when you brush and flush? Field trip programs focus on connecting students with water systems that they are a part of every day, but just don't know it! Programs facilitate STEM education experiences on topics such as engineered water systems, human and environmental health, and nutrient recycling. Students will be encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Brightwater - Kristin Covey at kristin.covey@kingcounty.gov or 206-263-8856

South Plant - Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 2 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: Programs offered at South Plant in Renton or Brightwater in Woodinville. King County also offers teacher resources, in-class lessons, and projects.

King County: Salmon SEEson

During the fall, salmon return to streams and rivers around the Puget Sound. Spot the spawners in the Lake Washington/Cedar/Sammamish and Green/Duwamish and Central Puget Sound watersheds from September to mid-December. Salmon SEEson provides information to help you spy these natural beauties at various times and locations as they make their seasonal journey home each year. Many locations have staff or volunteer naturalists on hand to point out salmon; some are self-guided locations.

Contact: Linda Grob at linda.grob@kingcounty.gov or 206-477-4704

Link: www.govlink.org/watersheds/8/action/salmon-seeson/default.aspx

Time: 15-60 minutes

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Flyers, poster, and a website are available to help you find the best time and location for you and your class to see spawning salmon. King County also offers teacher resources, in-class lessons, and projects.

Environmental Science Center: Salmon Heroes

Classroom Lessons & Field Study Investigation: During the 1-hour classroom lesson, students will engage in hands-on, NGSS-correlated activities that explore the habitat needs of salmon – as well as the challenges to survival that salmon face – during each stage of the salmon life cycle. During the 3-hour field study, students review the salmon life cycle, learn external and internal anatomy, collect water quality data, learn about the changes that the local community made to their behaviors in order to make the Creek better habitat for salmon, and then play a large-group game that mimics the challenges salmon face in making it back to their spawning grounds. During the post-visit, students analyze the water quality data they collected in the field and compare it to previous year's data, and to data collected from a different local creek. Students will then evaluate different actions that people can take in order to lessen their impact on salmon population health.

Contact: Joanna Stodden at Joanna@EnvScienceCenter.org or (206) 248-4266

Link:

<https://docs.google.com/forms/d/e/1FAIpQLSd4aBr9E8gH3NWTdHm5EZ41UdixbYEnocEiHpeuFCWSZ5Bodw/viewform>

Time: 2 hours (in classroom) + 3 hours (field trip to Normandy Park Cove)

Cost: \$350 per class of 30 students (If your school has 50% or greater free/reduced lunch rate, you will pay a reduced program fee of \$70 per class of 30 students. If your school has 80% or greater free/reduced lunch rate, your program fees will be waived.

Transportation: Partial transportation reimbursements are available for schools with >50% Free and Reduced Lunch Rate.

Note: Offered September-November. Includes 1-hour classroom lesson, a 3-hour guided field study investigation, and a 1-hour post-field study classroom lesson. You need to arrange and pay for transportation for this field trip. Registering multiple classes within a grade level is strongly encouraged. There is an opportunity for bus reimbursement for schools that have a 50% or greater free/reduced lunch rate. Please contact Programs Manager Joanna Stodden for more information regarding bus subsidies. You will need to provide 4 chaperons for each class' field study.

Friends of the Issaquah Salmon Hatchery (FISH): Those Amazing Salmon - Hatchery Tours
Come see the salmon at Issaquah Creek! Watch spawning salmon, see the hatchery in action, and learn about challenges salmon face and what we can do to help them. Scheduled groups of students and adults are led through the hatchery by trained volunteer docents.

Contact: Contact Rachel Martin, Program Coordinator, FISH at education@issaquahfish.org or 425-392-1118

Time: Tours last 45 minutes to one hour and are available primarily mid-September through early November, though winter and spring/summer tours may also be scheduled.

Cost: FISH requests a fee of \$2 per student when possible.

Transportation: Please contact.

Note: The tour, ideally in conjunction with the Those Amazing Salmon classroom presentation, helps fulfill the state mandate to provide environmental education experiences to students and is aligned to Washington State standards in science and social studies.

Friends of Soos Creek (Kent): Interpretive Walk

Friends of Soos Creek Park is a non-profit organization comprised of volunteer members who take a pro-active role in preserving and extending the Soos Creek Trail Park and who sponsor and lead park clean-ups and interpretive walks for public education about the importance of wetlands specifically and undisturbed nature generally. Soos Creek Park is one of south King County's prized wetland habitats. An 8.5 mile trail follows the creek through cattail marshes, forested swamps, wet meadows and willow thickets. This trail is suited to all levels of fitness and is wheelchair accessible. Take any or all of these interpretive walks to learn more about this fascinating area and its wildlife residents.

Volunteers from The Friends of Soos Creek Park lead these interpretive walks.

Contact: Kent Parks and Recreation at 253-856-5000

Time: Variable

Transportation: Please contact.

Note: All of these walks take place out of doors, so be sure to dress for the weather.

Nature Bridge: Environmental Science Program

NatureBridge environmental science programs in Olympic National Park offer students in grades K-12 the opportunity to learn hands-on science in an International Biosphere Reserve. The three to five-day residential outdoor science programs are led by experienced educators and customized to enhance your school's curriculum. A classroom without walls: located on the shore of glacially carved Lake Crescent, students can investigate old growth forests, wilderness coasts, and alpine peaks. Inquiry-based learning: motivated by their own curiosity, students monitor the dynamic Elwha River system, collect and identify macroinvertebrates in Barnes Creek, and study the adaptations of local mammals in the skins and skulls lab. Responsible actions: students are inspired to make informed decisions about what constitutes a healthy relationship between natural and human communities, their role in that relationship and appropriate actions they can take to sustain it.

Request Information: <https://naturebridge.org/request-information-olympic> or contact Eva Foster at efoster@naturebridge.org and 206-382-6212x14 or call 206-300-6291

Link: <https://naturebridge.org/olympic/school-group>

Time: 3 or 5 days

Cost: Price range for programs can be found here:

<https://naturebridge.org/olympic/school-group/rates>

Rates are for 3 day/2 night program starting at \$234 per student, 3 day/3 night program starting at \$294 per student, 5 day/4 night program starting at \$340 per student, and 5 day/5 night program starting at \$400 per student. Need-based scholarships available and additional optional services available. Tuition includes quality customized environmental science education; on-site lodging in heated, dormitory cabins on the shores of Lake Crescent; and home-style all-you-can-eat buffet meals.

Transportation information:

<https://naturebridge.org/sites/default/files/Transportation%20-%20OLYM.pdf>

Nature Vision: Stream Connections

A Nature Vision educator will meet your class at your local stream and facilitate a variety of activities related to salmon and the effects of stormwater. All activities support WA State K-12 Learning Standards and are customized to the watershed in which the stream is located. This allows students to make connections to their local environment and learn how they can become stewards where it matters to them most.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Nature Vision: Wetland Connections

A Nature Vision educator will meet your class at your local wetland, retention pond, or location of your choice to facilitate activities that show the importance of these unique ecosystems in helping manage the effects of stormwater runoff. All activities support WA State K-12 Learning Standards and are customized to be site specific. This allows students to observe real-world solutions to stormwater management and learn about ways they can have a positive impact on their local watershed.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Pacific Marine Research: Marine Science Afloat

Students learn to love and appreciate Puget Sound on our scientific expedition aboard the *Spirit of 76* floating classroom. Haul in the plankton nets! Spy into the invisible watery world in the microscope lab! Meet your slimy and squishy underwater neighbors! Follow along with a team of scientific divers as they explore the depths beneath the boat and introduce students to the animals below with a LIVE underwater video system. And most importantly, learn how your daily actions can help protect this magnificent, but delicate ecosystem that we all share.

Contact: fieldtrips@marinescienceafloat.org or 206-361-1919

Link: <https://marine-science-afloat.myshopify.com/>

Time: 5 ½ hour

Cost: \$40 per person for the first 15 people; plus one complimentary chaperone per every 10 additional students. (scholarships available)

Transportation: Must provide own transportation.

Note: Trips take place from mid-March to mid-June but occasionally fall trips are run.

Salish Sea Expeditions: SOUND Program

Salish Sea Expeditions invites students to become scientists and mariners, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways aboard the 61' research sailing vessel, Carlyn.

1-2 day programs: One-day and two-day (overnight) boat-based expeditions that engage students in exploring water quality issues, deploying oceanographic research tools, and practicing applied STEM skills used in maritime trades.

Cost: \$400/hour for 5+-hour sail; \$4800 for two-day overnight, which includes food and equipment (scholarships may be available)

3-5 day programs: This boat-based program provides 3-5 day expeditions of oceanographic research, nautical science and seamanship aboard the 61-foot sailing research vessel, Carlyn. Students lead and conduct marine science research under the careful guidance of Salish educators.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/sound/>

Cost: \$2800/day (scholarships may be available)

Transportation: Please contact.

Note: Dates: Spring season March-June; fall season September-October. All programs include four phases: 1) pre-trip classroom instruction to develop a student science question 2) the 3-5 day boat program 3) a post-trip into the classroom to synthesize information from the trip into a student presentation 4) Student Science Symposium (optional). All science equipment, safety gear, food, and camping equipment included. Class size up to 28 students and 2 chaperones, although we're willing to explore alternative arrangements for larger groups. Salish Sea Expeditions also offers customized classroom-based watershed lessons.

Seattle Aquarium: Salmon Exploration

Learn about the life cycle of Seattle's most iconic animal, the salmon. With the use of storyboards and interactive activities, students will explore salmon from egg to adult and discuss the many different factors that affect these amazing fish.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Aquarium: Oysters and Ocean Chemistry Research

Ocean chemistry is rapidly changing as excess carbon dioxide from burning fossil fuels is absorbed into the water. Students will discover how this affects larval oysters and oyster farmers in Puget Sound, and how Simone Alin, oceanographer at NOAA, helps the farmers monitor ocean chemistry to maintain healthy hatchery conditions. Video clips integrated throughout the class allow students to hear Simone's story directly from the source. Students will conduct two different pH tests to understand the relationship between CO₂ and pH in the ocean; analyze graphs of real data from local ocean moorings to identify patterns in ocean chemistry; discuss solutions to the oyster farmers' challenges; and get hands-on with live oysters.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Parks and Recreation: Camp Long

Bringing science, environmental education, and experiential learning to your parks. Seattle Parks and Recreation's Environmental Education and Outdoor Learning staff provide opportunities for grades K-12 and organized groups, such as scouts and camps, to experience age-appropriate, hands-on adventures in learning about natural communities in an urban setting. Programs align with WA State Essential Academic Learning Requirements for core content areas and support science kits.

Ponds (spring and summer only): Experience the freshwater habitats of a city park at Camp Long or Discovery Park. Waddling ducks, wriggling tadpoles, and dancing dragonflies are some of the creatures they may see as they explore what makes these places so special.

Forest: Camp Long and Discovery Park have lots of forest habitat to explore. Venture through the trees looking for clues to animal habits, hiding places, and seasonal happenings. Forest programs empower participants to feel comfortable in the outdoors.

Link: <https://www.seattle.gov/parks/find/centers/camp-long/camps>

Transportation: Please contact.

Sound Experience: Sound Studies Program

The goal of a Sound Studies program, as with all programs offered by Sound Experience, can be summarized in a single word: awareness. We believe that people will protect what they learn to value. The most effective way to have a lasting impact is to meet the following goals for every program. Our goals for participants: Leave with a heightened awareness of Puget Sound as a fragile ecosystem, understand the concept of a whole system, and understand how *Adventuress* and the earth both illustrate this concept. Recognize the interrelationships that exist between all life. Identify the positive and negative impacts that they as individuals have on the Puget Sound ecosystem.

Recognize their ability to take action by raising others' awareness and by making responsible choices. Understand the necessity of cooperation as a course to action. Learn that Puget Sound is an incredible, diverse, and productive ecosystem and that the waterways we all share are fragile and need our care. Most importantly, students learn that they can make a difference. Experience working together to raise sails and learn about all the factors that help make a traditional sailing vessel function.

When you join us for a day trip, your group will take part in an active learning and working voyage. On board our vessel, participants are able to experience how community, nature, culture, and infrastructure all interact and shape each other.

Contact: Amy Kovacs at amy@soundexp.org or 360-379-0438

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/day-program-sound-studies/>

Time: 3 or 5 hours

Cost: Off Peak Rates (October 1-April 30): \$1150 for 3 hours, \$1675 for 5 hours. Peak Rates (May 1-September 30): \$1210 for 3 hours, \$1760 for 5 hours

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

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Contact: Amy Kovacs at amy@soundexp.org and 360-379-0439

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/overnight-programs-sound-explorations/>

Time: 2-7 days

Cost: Off Peak Rates (October 1- April 30): \$2780 per day, groups between 14-18 people can come for \$149/person/day and includes adults. Peak Rates (May 1-September 30): \$2900 per day, groups between 14-18 people can come aboard for \$159/person/day and includes adults

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

Sound Salmon Solutions: Water Quality Testing

Students become scientists by collecting water samples and using testing kits to measure and collect data on the health of a local stream. They will understand the value of clean water and how that is defined.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Macroinvertebrates

Identify and categorize aquatic benthic macroinvertebrates as a biological indicator of water quality.

Time: 45-120 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Tacoma Nature Center: Water Sleuths

Discover how systems connect as students investigate a wetland habitat, then search out the links between human activity and watershed quality. Students use technology to gather data on the watershed and draw conclusions about its quality.

Contact: tnc@tacomaparks.com or 253-591-6439

Link: <http://www.metroparkstacoma.org/school-groups-nature-center/>

Time: 2- 2 ½ hours

Cost: \$6 per student

Transportation: Please contact.

Projects

King County: Native Plant Salvage Program

This unique volunteer program involves digging up plants from natural sites before they are cleared for development. Later, salvaged plants are replanted at habitat restoration sites. It's a great opportunity for middle and high school students to learn about native plants and their role in protecting the aquatic ecosystem.

Contact: Cindy Young at cindy.young@kingcounty.gov or 206-477-4859

Link: www.kingcounty.gov/environment/stewardship/volunteer/plant-salvage-program.aspx

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and field trips.

King Conservation District: Envirothon

The annual Envirothon is an excellent opportunity for students to cultivate new skills and learn about resource conservation career opportunities. High school teams participating in Envirothon explore ecology, natural resource management, and current

environmental issues through an overarching special topic/environmental theme. The special topic for the 2017 Envirothon is “Agricultural Soil and Water Conservation Stewardship” and the King Conservation District is currently recruiting teams for next year’s competition.

Contact: Stacie Powers at educationip@kingcd.org or 425-282-1930

Time: Variable

Cost: \$1500-\$2000 (KCD partners with city jurisdictions to help cover the cost of the lessons so there is no cost to teachers, just ask when registering)

Transportation: Please contact.

Nature Vision: Blue Teams

Nature Vision offers Blue Teams, a student stewardship project funded by our water sponsors. Blue Teams are groups of kindergarden-12th grade students who commit to taking on and completing a watershed stewardship project. Students complete projects such as invasive plant removal, native plant restoration, planting waterwise gardens, finding and fixing leaks, and much more.

The Blue Team program was developed to educate local youth about water resources and related ecosystems, foster sustainable stewardship values and practices in the community through hands-on youth projects, and to empower youth to take positive steps to improve their local environment.

Blue Teams receive Nature Vision’s help in planning, preparing for, and executing their projects at school or at an off-campus project site, as well as regular teacher consultations via phone or email. Teachers/Instructors may register their class or youth group to become a team, and Nature Vision staff will help each team to design a watershed stewardship project. Staff will visit the students multiple times to teach inquiry-based programs, giving the students the knowledge and help they will need to successfully complete and understand the value of their project.

Link: <https://naturevision.org/blue-teams>

Time: Variable

Cost: Free Blue Teams may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and field trips.

Transportation: Must provide own transportation.

Sound Salmon Solutions: Tree Planting

Students are given an opportunity to plant native trees and shrubs on an active habitat restoration site.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 60-90 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and field trips.

Vashon Nature Center: Hands-on Field Research

Vashon Nature Center scientists work with teams of Vashon High School students to tackle applied research and environmental management questions relevant to local land management agencies (including King County Parks, King County Department of Natural Resources, Vashon Maury Island Groundwater Protection Committee, and Vashon Maury Island Land Trust). Examples of projects include amphibian surveys of local ponds, effects of deer exclusion from forested plots, cutthroat trout and salmon surveys, sea star wasting syndrome surveys, notable tree identification and measurement, and research on storm-water runoff in the town of Vashon. We mentor students throughout the entire scientific process including analyzing data and communicating results. Students present their research findings to the community in an annual symposium event called ED Talks: Nature and Environment on the Rock. During this symposium students present alongside professional scientists and resource managers.

Contact: info@vashonnaturecenter.org or 206-755-5798

Time: Variable

Cost: Variable

Transportation: Please contact.

Note: Vashon Nature Center also offers in-class lessons.

10th-12th Grade

Teacher Resources

King County: Protecting Our Liquid Assets

This Vashon Island course provides students with the first steps along the path of ecological understanding, with the hope that their future steps will be considered and measured, serving the interests of all life.

Link: www.kingcounty.gov/environment/waterandland/groundwater/management-areas/vashon-maury-island-gwma/liquid-assets.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: Online Publications

This web page is a useful resource for students doing research on local environmental issues. Online publications, including reports, newsletters, and brochures.

Link: www.kingcounty.gov/depts/dnrp/publications.aspx

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

King County: GIS Custom Map Products

King County GIS can prepare custom map products for curriculum support. For example, Sustainability Ambassadors, a non-profit organization empowering youth in community sustainability, engaged the King County GIS Center to help create a themed atlas of stormwater indicator maps for the Tahoma School District in suburban King County. The “Stormwater Neighborhood Atlas” serves as a community outreach tool to show students and the broader community the environmental conditions of their neighborhoods, highlighting unique project opportunities, such as pervious pavement installation and rainwater harvesting at the district’s own schools. Local student Sustainability Ambassadors worked with the school district, the Chamber of Commerce, the Rotary Club and the City of Maple Valley to distribute the “Stormwater Neighborhood Atlas” in classrooms throughout the district, in the public library, and for casual viewing in doctor and dentist waiting rooms and in the lobbies of public spaces such as coffee shops and city buildings. The King County GIS Center’s unique cartographic and design capabilities, and its direct access to King County’s extensive

Contact: Dennis Higgins at dennis.higgins@kingcounty.gov or 206-477-4415

Link: <http://kingcounty.gov/services/gis/ClientServices/Services.aspx>

Time: Variable

Cost: No Cost

Note: King County also offers in-class lessons, field trips, and projects.

Department of Ecology: Discover Wetlands

A curriculum guide for grades K-12 which focuses on what wetlands are, why they are important, and how human actions affect them.

Unit I: Washington’s Wetlands

(<https://fortress.wa.gov/ecy/publications/documents/8816a.pdf>)

Unit II: Amazing Wetlands: Functions and Values

(<https://fortress.wa.gov/ecy/publications/documents/8816b.pdf>)

Unit III: People and Wetlands

<https://fortress.wa.gov/ecy/publications/documents/8816c.pdf>

Unit IV: A Walk on the Wild Side

<https://fortress.wa.gov/ecy/publications/documents/8816d.pdf>

Time: Variable

Cost: No Cost

Earth Echo: Going Blue: A Teen Guide to Saving Our Oceans, Lakes, Rivers, and Wetlands

Provides a close look at our oceans and waterways and our role in protecting this water planet. This Leader's Guide provides a lesson sequence that expands on the critical information in Going Blue! so young people can actively reflect on the global water crisis via detailed discussion and writing assignments. Appropriate for both traditional classroom teachers and facilitators for out of school time, the Leader's Guide is an excellent resource to move teens toward action for positive change in their classroom, their community, and the wider world!

Link: <http://earthecho.org/educator-resources/a-leaders-guide-to-going-blue>

Time: Variable

Cost: Variable (Leaders Guide Free- Student Guide online)

FOR SEA Institute Marine Sciences: The Changing Sound

An investigation of the decline of the once abundant native Olympia oyster engages students in a wide variety of hands-on/minds-on science activities from experimentally determining the size of Puget Sound to oyster anatomy and ecology to water quality testing. Integrating material from geography, history, writing, and problem solving as well, the activities focus on human interaction with oyster populations and lead students to a consideration of actions they might take for maintaining the health of Puget Sound.

Contact: <http://www.forsea.org/pspguide.html>

Link: Order Form: <http://www.forsea.org/ORDER.HTML>

Time: Variable

Cost: No Cost

Leaping Frog: Illahee: Saving Puget Sound One Watershed at a Time Video

[Illaahee] is an inspirational story of a community's effort to preserve and restore a forest, a salmon stream, and Puget Sound. Bordering on Washington State's Puget Sound is a little gem of a community known as Illahee. What makes it so unique is that while surrounded by development, much of Illahee's natural beauty has been preserved. Started modestly by forward-looking residents of the past, and carried on by succeeding generations, this extraordinary and sustained effort insures that Illahee's natural treasures will be its legacy to the future of Puget Sound.

Contact: shellysol@olypen.com

Link: <http://www.leapingfrogfilms.com/>

Time: 30 minutes or less

Cost: No Cost (other videos available on sliding scale)

Nature Conservancy: Nature Works Everywhere:

Urban Runoff: Design a School Stormwater Management Plan

Whether a city is rebuilding after a devastating storm or simply looking to revitalize and improve, working with nature rather than against it is a key part of the process of redesigning our cities to be more resilient and sustainable. This lesson introduces students to the problem of urban runoff and a variety of nature-based design ideas and solutions. Through a school mapping activity, students determine which solutions would be best suited to dealing with urban runoff on their school grounds.

Link: <https://www.natureworkseverywhere.org/resources/urban-runoff/>

Time: 3-4 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere

Sustainable Cities: Nature-Based Solutions in Urban Design

In this set of activities, students are introduced to sustainability in the urban context. They will describe their vision of a sustainable city, identify the challenges facing cities, and discover the ecosystem services provided by nature. Sustainable cities are much more than places where humans and nature coexist productively: they are cities in which all people—regardless of race, color, income, and so on—have equal access to a healthy environment in which they can flourish. In designing sustainable cities, planners must incorporate environmental justice ideals, and more broadly, social justice. The lesson guides students into taking an active role in their cities by using technology to map their communities and plan, design, and propose an urban design project that incorporates nature-based solutions.

Link: <https://www.natureworkseverywhere.org/resources/sustainable-cities/>

Time: 2-5 45-minute lessons

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Garden Lesson: Water

By filtering rainwater and slowing the movement of water to rivers, lakes and oceans, your garden works as a mini-watershed. In this lesson, students calculate the permeable surface area of their garden and periodically measure rainfall amounts, acting as junior hydrologists. Using the collected data, students determine how much water their garden filters and explore the relationship between their garden and water quality in the surrounding watershed.

Link: <https://www.natureworkseverywhere.org/resources/activity-guide-water/>

Time: Variable

Cost: No Cost

Nature Conservancy: Nature Works Everywhere: Washington Nature Stormwater Information

Link: <http://www.washingtonnature.org/cities/solvingstormwater>

Nature Conservancy: Nature Works Everywhere: City Habitats

Link: <http://www.cityhabitats.org/>

PBS Frontline: Poisoned Waters

More than three decades after the Clean Water Act, iconic American waterways like the Chesapeake Bay and Puget Sound are in perilous condition and facing new sources of contamination. Watch the video chapter from *Poisoned Waters* and discuss.

Link: <http://www.pbs.org/wgbh/pages/frontline/teach/poisonedwaters/>

Time: Variable

Cost: No Cost

Puget Sound Starts Here: Engineering Solutions

Polluted stormwater runoff is the number one threat to the water quality of the Puget Sound. The purpose of the *Drain Rangers!* and *Engineering Solutions* curricula and materials is to develop and cultivate an understanding of the serious issues facing our community from stormwater runoff and to share specific actions we can take to improve the quality of our water. In these units, students will utilize problem solving models to replicate the thinking process of engineers addressing polluted stormwater runoff.

Link: <http://www.pugetsoundstartshere.org/drain-rangers>

Time: Variable

Cost: No Cost

Seattle Public Utilities: Lost and (Puget) Sound

This film follows three teens who lose a key down a storm drain. Must email Beth for CD with lessons.

Contact: Beth Miller at beth.miller@seattle.gov

Time: 29 minute video plus lesson

Cost: No Cost

Sustainability Ambassadors: Reading Resources

Videos, Library Links, and Low Impact Design Manual for Schools

Links: Video Links: <http://www.sustainabilityambassadors.org/stormwater-videos>

Library Links: <http://www.sustainabilityambassadors.org/stormwater-library-links>

Low Impact Design Manual: <http://www.sustainabilityambassadors.org/lid-manual-for-schools>

Cost: No Cost

Sustainability Ambassadors: Stormwater Pollution Solution Project Ideas

Link: <http://www.sustainabilityambassadors.org/20-action-projects>

Cost: No Cost

Washington Stormwater Center: Supplemental Videos

Link:

https://www.youtube.com/user/StormwaterChannel/playlists?view=1&sort=dd&shelf_id=0

Classroom Visitors

These programs are taught by an informal educator from various organizations in your classroom.

King County: Biodiversity in Our World

What is biodiversity and why is it important for survival on Earth? How do our shopping and waste disposal choices affect biodiversity? Students actively engage in a discussion of real-world issues such as habitat protection, population growth, and climate change. Through challenging and fun, hands-on activities, students gain a clearer understanding of our everyday effects on the planet and how our personal choices can make a difference for the better. The high school version of this workshop includes a focus on ecosystem services.

Link: <https://your.kingcounty.gov/solidwaste/secondaryschool/workshops.asp>

Time: 50 minutes

Note: King County also offers teacher resources, field trips, and projects.

King County: In-Classroom Programs

Educators from King County will come into your classroom to provide hands-on presentations surrounding wastewater and/or stormwater topics. Students will be encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 1 hour

Cost: No Cost

City of Duvall: Surface Water Management Classroom Visitor

Boyd Benson is the Public Works Director/City Engineer and Sara Ruhland is in the Engineering Department. Both can adapt their discussion to what you are teaching in the classroom.

Contact: Boyd E. Benson at boyd.benson@duvallwa.gov and 425-939-8042 or Sara Ruhland at sara.ruhland@duvallwa.gov and 425-788-3434x8042

Link: <http://www.duvallwa.gov/305/sewer-water-stormwater>

Time: Variable

Cost: No Cost

City of Newcastle: Surface Water Management Classroom Visitor

Audrie Starsy is the Surface Water Program Manager and can speak to your class with emphasis on what you are currently talking about in the classroom.

Contact: Audrie Starsy at audries@ci.newcastle.wa.us or 425-649-4143x111

Link: http://newcastlewa.gov/departments/public_works/surface_water_management/

Time: Variable

Cost: No Cost

Nature Vision: Watershed Connections

A Nature Vision educator will visit your classroom to facilitate hands-on lessons that highlight the challenges our local watershed faces with stormwater runoff. Each hour long lesson focuses on specific concepts related to stormwater. Lessons can stand alone or be combined into units that offer a more complete picture of stormwater. Units can be for one grade level or used to scaffold throughout multiple grade levels at a school. Every lesson is designed to support WA State K-12 Learning Standards and help students understand what they can do to reduce the effects of stormwater runoff.

Link: <https://naturevision.org/school-programs/>

Time: 1 hour lessons

Cost: \$100 per lesson

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers field trips and projects.

Salish Sea Expeditions: SOURCE Program

Salish Sea Expeditions invites students to become scientists, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways. This land-based program is focused on supporting students in investigation of their local watershed, building awareness about water quality and stormwater issues in the Puget Sound region. Salish staff visit school campuses, leading classroom-based activities and instruction, and water quality sampling and analysis on school grounds to help students learn how human activity can impact the health of the Puget Sound ecosystem.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/source/>

Time: 8-10 hours

Cost: \$1200/initial classroom (additional classes \$250 each) - email for complete pricing and scheduling options. Scholarship opportunities are often available.

Note: Offered October-February. Class size up to 30 students. Salish Sea Expeditions also offers single and multi-day boat-based field trips.

Sound Salmon Solutions: Erosion Modeling

Understand the scientific method by conducting an investigation that explores the factors that increase or decrease erosion using a model they build.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 120 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Sound Salmon Solutions: The 5 C's of Salmon Habitat

Learn about the critical habitat components necessary for salmon survival!

Link: <http://www.soundsalmonsolutions.org/education>

Time: 25 minutes

Note: Sound Salmon Solutions also offers field trips and projects.

Vashon Nature Center: Nature Presentations

Trained naturalists and scientists offer short in-class or outdoor programs designed to foster student awareness and understanding of environmental science topics by pinning these topics to real-life local examples on Vashon and Maury Islands. Students become engaged and excited about science through these programs because they see how science is tied to their own backyards and personal lives.

Contact: info@vashonnaturecenter.org or 206-755-5798

Link: <http://vashonnaturecenter.org/what-we-do/scientists-in-schools/>

Time: 30-90 minutes

Cost: \$50-\$150

Note: Vashon NC works with teachers to highlight topics of their choice (stormwater, surface water mgmt). Example: Salmon See-son-the life cycle of salmon and a discussion of how salmon populations are faring in our local streams and where to see them.

Field Trips

King County: Brightwater and South Wastewater Treatment Plant Tours

Where does the water go when you brush and flush? Field trip programs focus on connecting students with water systems that they are a part of every day, but just don't

know it! Programs facilitate STEM education experiences on topics such as engineered water systems, human and environmental health, and nutrient recycling. Students will be encouraged to think about responsible water use and how everyday choices can help protect Puget Sound.

Contact: Brightwater - Kristin Covey at kristin.covey@kingcounty.gov or 206-263-8856
South Plant - Katelyn Hunt at katelyn.hunt@kingcounty.gov or 206-263-1008

Link:

<http://www.kingcounty.gov/services/environment/wastewater/education/programs/school.aspx>

Time: 2 hours

Cost: No Cost

Transportation: Free bus transportation through the [Wheels to Water program](#).

Note: Programs offered at South Plant in Renton or Brightwater in Woodinville. King County also offers teacher resources, in-class lessons, and projects.

King County: Salmon SEEson

During the fall, salmon return to streams and rivers around the Puget Sound. Spot the spawners in the Lake Washington/Cedar/Sammamish and Green/Duwamish and Central Puget Sound watersheds from September to mid-December. Salmon SEEson provides information to help you spy these natural beauties at various times and locations as they make their seasonal journey home each year. Many locations have staff or volunteer naturalists on hand to point out salmon; some are self-guided locations.

Contact: Linda Grob at linda.grob@kingcounty.gov or 206-477-4704

Link: www.govlink.org/watersheds/8/action/salmon-seeson/default.aspx

Time: 15-60 minutes

Cost: No Cost

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: Flyers, poster, and a website are available to help you find the best time and location for you and your class to see spawning salmon. King County also offers teacher resources, in-class lessons, and projects.

Environmental Science Center: Salmon Heroes

Classroom Lessons & Field Study Investigation: During the 1-hour classroom lesson, students will engage in hands-on, NGSS-correlated activities that explore the habitat needs of salmon – as well as the challenges to survival that salmon face – during each stage of the salmon life cycle. During the 3-hour field study, students review the salmon life cycle, learn external and internal anatomy, collect water quality data, learn about the changes that the local community made to their behaviors in order to make the Creek better habitat for salmon, and then play a large-group game that mimics the challenges salmon face in making it back to their spawning grounds. During the post-

visit, students analyze the water quality data they collected in the field and compare it to previous year's data, and to data collected from a different local creek. Students will then evaluate different actions that people can take in order to lessen their impact on salmon population health.

Contact: Joanna Stodden at Joanna@EnvScienceCenter.org or (206) 248-4266

Link:

<https://docs.google.com/forms/d/e/1FAIpQLSd4aBr9E8gH3NWTdHm5EZ41UdixbYEnocEiHpeuFCWSZ5Bodw/viewform>

Time: 2 hours (in classroom) + 3 hours (field trip to Normandy Park Cove)

Cost: \$350 per class of 30 students (If your school has 50% or greater free/reduced lunch rate, you will pay a reduced program fee of \$70 per class of 30 students. If your school has 80% or greater free/reduced lunch rate, your program fees will be waived.

Transportation: Partial transportation reimbursements are available for schools with >50% Free and Reduced Lunch Rate.

Note: Offered September-November. Includes 1-hour classroom lesson, a 3-hour guided field study investigation, and a 1-hour post-field study classroom lesson. You need to arrange and pay for transportation for this field trip. Registering multiple classes within a grade level is strongly encouraged. There is an opportunity for bus reimbursement for schools that have a 50% or greater free/reduced lunch rate. Please contact Programs Manager Joanna Stodden for more information regarding bus subsidies. You will need to provide 4 chaperons for each class' field study.

Friends of the Issaquah Salmon Hatchery (FISH): Those Amazing Salmon - Hatchery Tours

Come see the salmon at Issaquah Creek! Watch spawning salmon, see the hatchery in action, and learn about challenges salmon face and what we can do to help them. Scheduled groups of students and adults are led through the hatchery by trained volunteer docents.

Contact: Contact Rachel Martin, Program Coordinator, FISH at education@issaquahfish.org or 425-392-1118

Time: Tours last 45 minutes to one hour and are available primarily mid-September though early November, though winter and spring/summer tours may also be scheduled.

Cost: FISH requests a fee of \$2 per student when possible.

Transportation: Please contact.

Note: The tour, ideally in conjunction with the Those Amazing Salmon classroom presentation, helps fulfill the state mandate to provide environmental education experiences to students and is aligned to Washington State standards in science and social studies.

Friends of Soos Creek (Kent): Interpretive Walk

Friends of Soos Creek Park is a non-profit organization comprised of volunteer members who take a pro-active role in preserving and extending the Soos Creek Trail Park and

who sponsor and lead park clean-ups and interpretive walks for public education about the importance of wetlands specifically and undisturbed nature generally. Soos Creek Park is one of south King County's prized wetland habitats. An 8.5 mile trail follows the creek through cattail marshes, forested swamps, wet meadows and willow thickets. This trail is suited to all levels of fitness and is wheelchair accessible. Take any or all of these interpretive walks to learn more about this fascinating area and its wildlife residents. Volunteers from The Friends of Soos Creek Park lead these interpretive walks.

Contact: Kent Parks and Recreation at 253-856-5000

Time: Variable

Transportation: Please contact.

Note: All of these walks take place out of doors, so be sure to dress for the weather.

Nature Vision: Stream Connections

A Nature Vision educator will meet your class at your local stream and facilitate a variety of activities related to salmon and the effects of stormwater. All activities support WA State K-12 Learning Standards and are customized to the watershed in which the stream is located. This allows students to make connections to their local environment and learn how they can become stewards where it matters to them most.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Nature Vision: Wetland Connections

A Nature Vision educator will meet your class at your local wetland, retention pond, or location of your choice to facilitate activities that show the importance of these unique ecosystems in helping manage the effects of stormwater runoff. All activities support WA State K-12 Learning Standards and are customized to be site specific. This allows students to observe real-world solutions to stormwater management and learn about ways they can have a positive impact on their local watershed.

Link: <https://naturevision.org/school-programs/>

Time: Variable

Cost: \$100 per hour

Transportation: Must provide own transportation.

Note: Free programs may be available, please email info@naturevision.org for more information. Nature Vision also offers in-class lessons and projects.

Pacific Marine Research: Marine Science Afloat

Students learn to love and appreciate Puget Sound on our scientific expedition aboard the *Spirit of 76* floating classroom. Haul in the plankton nets! Spy into the invisible

watery world in the microscope lab! Meet your slimy and squishy underwater neighbors! Follow along with a team of scientific divers as they explore the depths beneath the boat and introduce students to the animals below with a LIVE underwater video system. And most importantly, learn how your daily actions can help protect this magnificent, but delicate ecosystem that we all share.

Contact: fieldtrips@marinescienceafloat.org or 206-361-1919

Link: <https://marine-science-afloat.myshopify.com/>

Time: 5 ½ hour

Cost: \$40 per person for the first 15 people; plus one complimentary chaperone per every 10 additional students. (scholarships available)

Transportation: Must provide own transportation.

Note: Trips take place from mid-March to mid-June but occasionally fall trips are run.

Salish Sea Expeditions: SOUND Program

Salish Sea Expeditions invites students to become scientists and mariners, facilitating student-led research and applied STEM (Science Technology Engineering and Math) skill development that focuses on the health of Puget Sound and its connected waterways aboard the 61' research sailing vessel, Carlyn.

1-2 day programs: One-day and two-day (overnight) boat-based expeditions that engage students in exploring water quality issues, deploying oceanographic research tools, and practicing applied STEM skills used in maritime trades.

Cost: \$400/hour for 5+-hour sail; \$4800 for two-day overnight, which includes food and equipment (scholarships may be available)

3-5 day programs: This boat-based program provides 3-5 day expeditions of oceanographic research, nautical science and seamanship aboard the 61-foot sailing research vessel, Carlyn. Students lead and conduct marine science research under the careful guidance of Salish educators.

Contact: educationdirector@salish.org

Link: <https://www.salish.org/programs/sound/>

Cost: \$2800/day (scholarships may be available)

Transportation: Please contact.

Note: Dates: Spring season March-June; fall season September-October. All programs include four phases: 1) pre-trip classroom instruction to develop a student science question 2) the 3-5 day boat program 3) a post-trip into the classroom to synthesize information from the trip into a student presentation 4) Student Science Symposium (optional). All science equipment, safety gear, food, and camping equipment included. Class size up to 28 students and 2 chaperones, although we're willing to explore alternative arrangements for larger groups. Salish Sea Expeditions also offers customized classroom-based watershed lessons.

Seattle Aquarium: Salmon Exploration

Learn about the life cycle of Seattle's most iconic animal, the salmon. With the use of storyboards and interactive activities, students will explore salmon from egg to adult and discuss the many different factors that affect these amazing fish.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Aquarium: Oysters and Ocean Chemistry Research

Ocean chemistry is rapidly changing as excess carbon dioxide from burning fossil fuels is absorbed into the water. Students will discover how this affects larval oysters and oyster farmers in Puget Sound, and how Simone Alin, oceanographer at NOAA, helps the farmers monitor ocean chemistry to maintain healthy hatchery conditions. Video clips integrated throughout the class allow students to hear Simone's story directly from the source. Students will conduct two different pH tests to understand the relationship between CO₂ and pH in the ocean; analyze graphs of real data from local ocean moorings to identify patterns in ocean chemistry; discuss solutions to the oyster farmers' challenges; and get hands-on with live oysters.

Link: <http://www.seattleaquarium.org/education-programs/plan-a-visit>

Time: 60 minutes

Cost: \$10 each (This is the price of aquarium admission for adults and youth 4 and up)

Transportation: Please contact.

Seattle Parks and Recreation: Camp Long

Bringing science, environmental education, and experiential learning to your parks. Seattle Parks and Recreation's Environmental Education and Outdoor Learning staff provide opportunities for grades K-12 and organized groups, such as scouts and camps, to experience age-appropriate, hands-on adventures in learning about natural communities in an urban setting. Programs align with WA State Essential Academic Learning Requirements for core content areas and support science kits.

Ponds (spring and summer only): Experience the freshwater habitats of a city park at Camp Long or Discovery Park. Waddling ducks, wriggling tadpoles, and dancing dragonflies are some of the creatures they may see as they explore what makes these places so special.

Forest: Camp Long and Discovery Park have lots of forest habitat to explore. Venture through the trees looking for clues to animal habits, hiding places, and seasonal happenings. Forest programs empower participants to feel comfortable in the outdoors.

Link: <https://www.seattle.gov/parks/find/centers/camp-long/camps>

Transportation: Please contact.

Sound Experience: Sound Studies Program

The goal of a Sound Studies program, as with all programs offered by Sound Experience, can be summarized in a single word: awareness. We believe that people will protect what they learn to value. The most effective way to have a lasting impact is to meet the following goals for every program. Our goals for participants: Leave with a heightened awareness of Puget Sound as a fragile ecosystem, understand the concept of a whole system, and understand how *Adventuress* and the earth both illustrate this concept. Recognize the interrelationships that exist between all life. Identify the positive and negative impacts that they as individuals have on the Puget Sound ecosystem. Recognize their ability to take action by raising others' awareness and by making responsible choices. Understand the necessity of cooperation as a course to action. Learn that Puget Sound is an incredible, diverse, and productive ecosystem and that the waterways we all share are fragile and need our care. Most importantly, students learn that they can make a difference. Experience working together to raise sails and learn about all the factors that help make a traditional sailing vessel function. When you join us for a day trip, your group will take part in an active learning and working voyage. On board our vessel, participants are able to experience how community, nature, culture, and infrastructure all interact and shape each other.

Contact: Amy Kovacs at amy@soundexp.org or 360-379-0438

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/day-program-sound-studies/>

Time: 3 or 5 hours

Cost: Off Peak Rates (October 1-April 30): \$1150 for 3 hours, \$1675 for 5 hours. Peak Rates (May 1-September 30): \$1210 for 3 hours, \$1760 for 5 hours

Transportation: Please contact.

Note: The *Adventuress* sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

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Contact: Amy Kovacs at amy@soundexp.org and 360-379-0439

Link: <https://www.soundexp.org/sail-with-us/schoolsyouth-groups/overnight-programs-sound-explorations/>

Time: 2-7 days

Cost: Off Peak Rates (October 1- April 30): \$2780 per day, groups between 14-18 people can come for \$149/person/day and includes adults. Peak Rates (May 1-September 30): \$2900 per day, groups between 14-18 people can come aboard for \$159/person/day and includes adults

Transportation: Please contact.

Note: The Adventuress sails out of many ports, including: Everett, Olympia, Seattle, and Tacoma.

Sound Salmon Solutions: Water Quality Testing

Students become scientists by collecting water samples and using testing kits to measure and collect data on the health of a local stream. They will understand the value of clean water and how that is defined.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 45-60 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Sound Salmon Solutions: Macroinvertebrates

Identify and categorize aquatic benthic macroinvertebrates as a biological indicator of water quality.

Time: 45-120 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and projects.

Tacoma Nature Center: Water Sleuths

Discover how systems connect as students investigate a wetland habitat, then search out the links between human activity and watershed quality. Students use technology to gather data on the watershed and draw conclusions about its quality.

Contact: tnc@tacomaparks.com or 253-591-6439

Link: <http://www.metroparkstacoma.org/school-groups-nature-center/>

Time: 2- 2 ½ hours

Cost: \$6 per student

Transportation: Please contact.

Projects

King County: Native Plant Salvage Program

This unique volunteer program involves digging up plants from natural sites before they are cleared for development. Later, salvaged plants are replanted at habitat restoration sites. It's a great opportunity for middle and high school students to learn about native plants and their role in protecting the aquatic ecosystem.

Contact: Cindy Young at cindy.young@kingcounty.gov or 206-477-4859

Link: www.kingcounty.gov/environment/stewardship/volunteer/plant-salvage-program.aspx

Transportation: Qualifying schools can also access free bus transportation through the [Wheels to Water program](#).

Note: King County also offers teacher resources, in-class lessons, and field trips.

King Conservation District: Envirothon

The annual Envirothon is an excellent opportunity for students to cultivate new skills and learn about resource conservation career opportunities. High school teams participating in Envirothon explore ecology, natural resource management, and current environmental issues through an overarching special topic/environmental theme. The special topic for the 2017 Envirothon is "Agricultural Soil and Water Conservation Stewardship" and the King Conservation District is currently recruiting teams for next year's competition.

Contact: Stacie Powers at educationip@kingcd.org or 425-282-1930

Time: Variable

Cost: \$1500-\$2000 (KCD partners with city jurisdictions to help cover the cost of the lessons so there is no cost to teachers, just ask when registering)

Transportation: Please contact.

Nature Vision: Blue Teams

Nature Vision offers Blue Teams, a student stewardship project funded by our water sponsors. Blue Teams are groups of kindergarden-12th grade students who commit to taking on and completing a watershed stewardship project. Students complete projects such as invasive plant removal, native plant restoration, planting water wise gardens, finding and fixing leaks, and much more.

The Blue Team program was developed to educate local youth about water resources and related ecosystems, foster sustainable stewardship values and practices in the

community through hands-on youth projects, and to empower youth to take positive steps to improve their local environment.

Blue Teams receive Nature Vision's help in planning, preparing for, and executing their projects at school or at an off-campus project site, as well as regular teacher consultations via phone or email. Teachers/Instructors may register their class or youth group to become a team, and Nature Vision staff will help each team to design a watershed stewardship project. Staff will visit the students multiple times to teach inquiry-based programs, giving the students the knowledge and help they will need to successfully complete and understand the value of their project.

Link: <https://naturevision.org/blue-teams>

Time: Variable

Cost: Free Blue Teams may be available, please email info@naturevision.org for more information.

Transportation: Must provide own transportation.

Note: Nature Vision also offers in-class lessons and field trips.

Sound Salmon Solutions: Tree Planting

Students are given an opportunity to plant native trees and shrubs on an active habitat restoration site.

Link: <http://www.soundsalmonsolutions.org/education>

Time: 60-90 minutes

Transportation: Please contact.

Note: Sound Salmon Solutions also offers in-class lessons and field trips.

Vashon Nature Center: Hands-on Field Research

Vashon Nature Center scientists work with teams of Vashon High School students to tackle applied research and environmental management questions relevant to local land management agencies (including King County Parks, King County Department of Natural Resources, Vashon Maury Island Groundwater Protection Committee, and Vashon Maury Island Land Trust). Examples of projects include amphibian surveys of local ponds, effects of deer exclusion from forested plots, cutthroat trout and salmon surveys, sea star wasting syndrome surveys, notable tree identification and measurement, and research on storm-water runoff in the town of Vashon. We mentor students throughout the entire scientific process including analyzing data and communicating results. Students present their research findings to the community in an annual symposium event called ED Talks: Nature and Environment on the Rock. During this symposium students present alongside professional scientists and resource managers.

Contact: info@vashonnaturecenter.org or 206-755-5798

Time: Variable

Cost: Variable

Transportation: Please contact.

Note: Vashon Nature Center also offers in-class lessons.

Grant Opportunities for Teachers

Private & Corporate Foundation Grants

3M Community Giving Program/3M Foundation

http://solutions.3m.com/wps/portal/3M/en_US/CommunityAffairs/CommunityGiving/

The foundation gives in areas of company operations. In WA: Bainbridge Island

Address: 600 Ericksen Avenue N.E., Suite 200, Bainbridge Island, WA 98110

Check website above for current guidelines and application procedures.

Paul G. Allen Family Foundation

<http://www.pgafoundations.com/>

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Does not accept unsolicited proposals. Beginning in 2012, the foundation will partner with public schools and districts in Washington State and Oregon to implement sustainable, research-based improvements that lead to measurable improvements in student achievement. The foundation supports projects at the school and district level that integrate rigorous academics, real-world learning, direct impact on student achievement, and community engagement. Check with your school or district for existing partnerships. For more information, go to:

<http://www.pgafoundations.com/TemplateMain.aspx?contentId=13>

Bank of America Charitable Foundation, Inc.

<http://www.bankofamerica.com/foundation/>

Funds Washington State University Foundation, nonprofit education foundations. Funds in Seattle: <http://about.bankofamerica.com/en-us/partnering-locally/seattle-wa.html?sort=FEATURED&page=3#fbid=-aSXdtiDGkx>

Bezos Family Foundation

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

Located on Mercer Island, the foundation supports private colleges, universities, and nonprofit education organizations nationally. The foundation's purpose is to support children and youth as well as sports and recreation. Supports reading programs, capital, programs, general operating, and scholarships.

Boeing Company

Northwest guidelines:

<http://www.boeing.com/principles/community-engagement.page#/seeking-support>

Community investments for the region.

Cathay Bank Foundation

<https://www.cathaybank.com/Cathay-Foundation/Home/>

Focus on low to moderate income individuals. Nonprofits may submit letters of inquiry (as directed on website) for review, pending request for full proposal.

Dimmer Family Foundation

<http://dimmerfoundation.org/>

Funds some schools and universities in Tacoma, Seattle and Lakewood, WA; mostly small grants (under \$5,000).

Bill & Melinda Gates Foundation

<http://www.gatesfoundation.org>

Funds education extensively. A current focus is college-ready education

<http://www.gatesfoundation.org/college-ready-education/Pages/default.aspx>. Check website for current funding opportunities.

GenCorp Foundation

<http://www.gencorp.com/pages/gcfound.html>

The Foundation's primarily focus is education, with emphasis on Science, Technology, Engineering and Mathematics (STEM) education. Funds in areas of company operations: Redmond, WA.

Lowe's

<http://toolboxforeducation.com/>

Funds school technology upgrades, tools for STEM programs, facility renovations and safety improvements.

Elizabeth A Lynn Foundation

<http://elizabethalynnfoundation.org/>

Funds Catholic schools, and higher education. Interested in helping the disabled.

Charlotte Y. Martin Charitable Foundation

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

Funds educational programs in and out of the classroom, aims to help underserved populations achieve success. Funds public and private schools, focus on rural schools.

The Medina Foundation

<http://www.medinafoundation.org>

The foundation's purpose is to aid in improving the human condition in the greater Puget Sound community by fostering positive change, growth, and the improvement of people. Funds many private schools and nonprofit education organizations.

JPMorgan Chase Foundation

<http://www.jpmorganchase.com/corporate/Corporate-Responsibility/corporate-philanthropy.htm>

(Scroll down page to find education focus area). Only funds 501(c) (3) organizations; no private schools or higher education. Funds public schools working in partnership with a 501(c) (3) organization. Funds statewide in Washington. Submit online application at:

http://www.cybergrants.com/pls/cybergrants/ao_login.login?x_gm_id=2608&x_proposal_type_id=10400

Nesholm Family Foundation

http://www.nesholmfamilyfoundation.org/Nesholm_Foundation/Home.html

Funds human services, education, and the performing arts in the city of Seattle, and occasionally, in other parts of King's County. Its aim is to develop human potential, enhance quality of life, deal with important community issues and problems, affect significant numbers of people, encourage the involvement of others and leverage foundation assets to increase a project's long-term impact. Request an application by emailing:

grants@nesholmfoundation.org. Strong supporter of the Alliance for Education (\$250,000 in 2011 for the Middle School initiative). Funds Seattle public schools, and individual schools.

The Norcliffe Foundation

<http://www.thenorcliffefoundation.com>

Funds K-12 and higher education. Primarily supports capital projects. Some new project and scholarship support also available.

Stuart Foundation

<http://www.stuartfoundation.org>

Funds colleges and universities, school districts, and nonprofit organizations in California and Washington State. Focus on system-wide change:

<http://www.stuartfoundation.org/BecomeOurPartner.aspx>

Subaru of America Foundation

<http://www.subaru.com/csr/soa-foundation.html>

Makes partnership grants to Seattle nonprofit organizations. Interested in youth development and education.

Target

<https://corporate.target.com/corporate-responsibility/grants>

Funds educational field trips for K-12 schools.

Washington STEM

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

Funds innovative education programs across Washington State.

Community Foundations

King County

<http://www.kingcounty.gov/services/environment/grants-and-awards/waterworks.aspx>

WaterWorks provides funding for projects that improve water quality in the [service area](#) for King County's regional wastewater system. This grant program complements the water quality mission of the Wastewater Treatment Division. In addition to the WaterWorks competitive grants, water quality project funding is available through King County [Council allocated funding](#). Approximately \$2 million are awarded every two years for organizations carrying out a variety of projects. Non-profits, schools and educational institutions, cities, counties, tribes, and special purpose districts are eligible to apply, and partnerships are encouraged.

Renton Community Foundation

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

Serves the greater Renton area. All grants are donor advised. Scholarships are available.

The Seattle Foundation

<http://www.seattlefoundation.org>

Serves King County. Provides a variety of community-based grants.

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The Nature Conservancy

<https://www.natureworkseverywhere.org/grants/>

The Nature Conservancy are awarding grants to support projects that implement green infrastructure to address local environmental challenges. These include: access to healthy food, air quality, heat island effect, climate change, and storm water collection. Young people will work as social innovators to help their communities through project design and implementation. Grants of \$2,000 will be awarded to 60 public or charter schools across the United States. See the [detailed grant description](#) linked on this page for full requirements, guidelines, important dates, and online application information. Samples of an [application](#), an [applicant commitment letter](#), and an [administration letter of support](#) are also available.

Highline Schools Foundation

<http://www.highlineschoolsfoundation.org/grants/>

For 15 years, Highline Schools Foundation has awarded grants directly to pre-K through 12th grade educators (including teachers, counselors, librarians, and other staff) throughout all Highline Public Schools to support innovative teaching and learning. The foundation acts as a bridge between need and opportunity in many ways – through college scholarships, college campus field trips, sports participation fees, band and orchestra instruments, and backpacks and school supplies; but one of the most impactful ways the foundation supports students is with grants.

The goal of the Excel Grant program is to fund innovative ideas and programs that school budgets can't provide. We strive to support activities and experiences that expand the learning process and actively engage students.

The foundation's Impact Grant awards \$10,000 to one school or program in the district for an opportunity that aligns with the Highline Public Schools strategic plan in a way that impacts a large number of students.

The Issaquah Schools Foundation

<http://isfdn.org/our-purpose/advancing-academic-achievement/classroom-enrichment-grants/>

The Issaquah Schools Foundation recognizes that school budgets are limited and classroom demands are high. Each year, the foundation awards Classroom Enrichment Grants to enhance the learning environment of individual classrooms, libraries, computer labs, resource centers and schools. Grants in this program are funded up to \$1,000.

Youth Garden Grant

https://kidsgardening.org/2018-youth-garden-grant/?utm_source=KidsGardening+Friends&utm_campaign=1dd68ba043-EMAIL_CAMPAIGN_2017_10_03&utm_medium=email&utm_term=0_0a82c9a42d-1dd68ba043-366393945&mc_cid=1dd68ba043&mc_eid=35b83a2731

The 2018 Youth Garden Grant is an award designed to support school and youth educational garden projects that enhance the quality of life for students and their communities. Any nonprofit organization, public or private school, or youth program in the United States planning

a new garden program or expanding an established one that serves at least 15 youth between the ages of 3 and 18 is eligible to apply. The selection of winners is based on demonstrated program impact and sustainability.

Kent Community Foundation

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

Provides community group and school grants.

Snoqualmie Valley Schools Foundation

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

Provides community support for schools to fund meaningful and essential programs in the Snoqualmie Valley.

Professional Development for Teachers

Click the links below for a list of fluctuating professional development and adult courses available for teachers.

IslandWood:

NGSS In Action: A Professional Development Series

Next Generation Science Standards (NGSS) have rolled out across the state, and classroom teachers and informal educators alike are exploring the implications for curriculum and approaches to teaching. The Standards call for using local phenomena that are relevant to students, but national curricula can be hard to adapt to local communities. Join the IslandWood education team and King County for a professional development series aimed at exploring ways to use all the dimensions of the new Standards and incorporate culturally responsive approaches as we help students understand and solve real world problems. The content of these workshops is appropriate for any K-8 teacher (or 4-12 for our "Understanding Local Water Systems" session).

Each session dives more deeply into a different dimension of the standards and, while the sessions can stand alone, each one is designed to build upon the ones that come before. Participants who attend multiple sessions will benefit from the progression and have opportunities to discuss successes and challenges with the group. Registering for and attending all sessions is not required.

<https://islandwood.org/brightwater-center/teacher-professional-development>

Pacific Education Institute:

PEI welcomes participation in their expert-designed, NGSS aligned, experiential workshops and institutes. They aim to increase educators' knowledge, skills, and confidence in taking students

outdoors to learn locally relevant, real-world science that is connected to careers in environmental science, natural resources, and agriculture sectors.

<https://pacifieducationinstitute.org/work/#catalog>

Project WET:

Workshops to understand the Project WET Curriculum.

<http://www.projectwet.org/teach-and-learn>

Seattle Aquarium:

Field guides, resources, and general information.

<http://www.seattleaquarium.org/teacher-resources>

Seattle Public Schools:

The School and Community Partnerships Department is committed to offering supports that build the capacity of community based organizations and schools to align their work and effectively and authentically partner.

Guided by our Professional Development Advisory Committee, which includes community based organizations, the City of Seattle, Seattle Public Schools (SPS), and feedback from partners and 2016-2017 attendees, we are excited to unveil our 2017-18 professional learning opportunities. Some opportunities are designed only for community-based organization staff and volunteers, while others are open to both to school staff and partners.

The first two pages provide an overview, and the subsequent pages have full details, including location, timing, and registration links.

<http://www.seattleschools.org/cms/one.aspx?pageId=1709268>

Snohomish County Public Utility District PUD:

Teacher workshops are offered throughout the year for educators in the PUD's service area. All classes are offered with clock hours (some offer college credit) and are aligned with Washington State's *Grade Level Expectations*.

<http://www.snopud.com/Education/educators/educwkshp.ashx?p=1398>

University of Washington:

Deepen your instructional expertise, develop your leadership skills and rekindle your educational passion in one of our expert-led programs.

<https://www.pce.uw.edu/areas-of-study/education>

Woodland Park Zoo:

Courses are open to all educators and other professionals. These courses are presented as part of the Advanced Inquiry Program Master's degree (AIP). Students enrolled in AIP or other students taking the courses for credit will be given priority enrollment. If there is space in the course, Washington state-approved clock hours will be available to those participants not

taking the course for credit. The courses are held at Woodland Park Zoo (unless otherwise noted) and include presentations by guest speakers, tours of zoo grounds, group discussions and hands-on activities.

https://www.zoo.org/aip/courses#.We_mSDBrzIU