GeoCache Your Watershed

GUIDE FOR HIGH SCHOOLS

Environment Canada Environnement Canada

Canada

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A GUIDE FOR HIGH SCHOOLS

Edition 1.1

Geocache Your Watershed
A Guide for High Schools

by

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INTRODUCTION

“Geocache Your Watershed” is an innovative pilot project from Environment Canada (EC) that involves the use of an existing adventure game for Global Positioning System (GPS) users known as “Geocaching” as a tool for promoting the discovery of local watersheds and exploring the importance of fresh, clean, safe water.

With this project, high school students and teachers and the public in general are encouraged to research their local watersheds and develop information pamphlets that will be made available through existing or new caches registered with www.geocaching.com.

Groundspeak Inc. is the company that runs the geocaching.com web site. For more information about “Geocaching” please visit www.geocaching.com. Also note that while EC encourages the use of the “Geocaching” activity in connection with its pilot project and the registration of caches on the geocaching.com web site, EC is not affiliated, in any manner, with Groundspeak Inc. or their web site.

Therefore, please visit www.ec.gc.ca/geocache-water for more information about “Geocache Your Watershed”, part of EC's “Know Your Watershed” website (www.map.ns.ec.gc.ca/kyw) established in 2006. The “Know Your Watershed” site allows users to dynamically locate their watershed in Canada and visualize how it intersects with the rest of the network. It also enables visitors to access a constantly evolving database that illustrates many of the activities happening in and impacting on each watershed.

Or please contact:

Environment Canada
45 Alderney Drive, Dartmouth, Nova Scotia, B2Y 2N6
(902) 426-2132

“Geocache Your Watershed” began as a pilot project in the fall of 2006 with four schools across Canada participating. Since then, the project has expanded to include one high school in every province in Canada. Our ultimate goal would be to have a participating high school in every watershed in Canada.

The objective is to have high schools pass on information on their particular watershed to others that use that watershed. The students will research their local watershed and write information pamphlets about what they have learned.

Using GPS devices, they will create geocaches in their area and include the information pamphlets they have created. What most people refer to as a GPS is actually a GPS receiver, an electronic gadget that allows you to find your approximate location on the planet and navigate from one location to another. This knowledge will then be transferred, by way of geocaching, to the public who visit this watershed location.

To do list...

- [ ] find out which watershed you are in
- [ ] research your watershed
- [ ] make educational brochures
- [ ] create and place geocaches
- [ ] make geocaches live on geocaching.com
- [ ] send all information to Environment Canada

WHAT IS A WATERSHED?

You might be surprised to know that watersheds are more than just water. A watershed is an area of land that water flows across or through on its way to a particular water body, such as a stream, river, wetland or coast. Think of it as the land upon which precipitation (such as rain) falls and flows to a common, watery place. No matter where you live, work or play, you are in a watershed!

Watersheds come in all shapes and sizes. They can be very large, spanning several provinces, or so small that they only encompass a small stream or wetland area. They cross counties, provinces and national boundaries. They can be "open systems" -- those that eventually drain into an ocean or "closed systems" -- ones where water can only escape through evaporation or by seeping into the earth.

Canada has five main watersheds: the Arctic, the Atlantic (which includes the Great Lakes and the St. Lawrence River), Hudson Bay, the Pacific and the Gulf of Mexico. Each of these massive landscapes contains a network of sub-watersheds, most of which are connected through configurations of tributaries (streams and rivers) that channel water to an ocean. Canada is subdivided into 594 sub-watersheds and these can be discovered through the “Know Your Watershed” website.

We have included copies of the poster below in your “Geocache Your Watershed” kit. It shows the most comprehensive watershed outlines available. You can order additional free copies of the "Discover Canada's Watersheds" map from www.wildeducation.org/.

What is GPS?

GPS stands for Global Positioning System. What most people refer to as a GPS is actually a GPS receiver, an electronic gadget that allows you to find your approximate location on the planet and navigate from one location to another. Locations are given in coordinates, usually in latitudes and longitudes or in UTM (Universal Transect Mercator grid). With these coordinate systems, each place on earth has a unique address. A system of waypoints and routes can be used to plan trips, find points of interest, or go geocaching. Some units have their own maps, built-in electronic compasses and/or voice navigation, depending on the complexity of the device.

How does a GPS work?

The Global Positioning System uses 24 satellites (21 in use and three spares) which were put into orbit by the United States military. These satellites are located 12,000 miles (˜19,300 km) above the earth's surface and interact with GPS receivers to determine the distance between the satellite and the receiver using the travel time of radio signals.

Simply put, each satellite broadcasts its number and the current time over and over. Your GPS receiver knows where each satellite is at all times because the satellites' orbits have been programmed into the receiver's internal computer. The receiver determines how long the satellite's signal took to reach it, and uses this information to "work backwards" to determine your location on the planet. The receiver must have signals from at least three satellites to determine a position, which is known as triangulation.

GPS units have some degree of error. Why?

Originally, GPS was created for United States military purposes and there was an error placed on the signal coming from the satellites. This error, known as selective availability (SA) could vary randomly anywhere from 30 to 100m. Only United States military GPS receivers could get their current position because they were the only receivers that could decode the SA.

SA has since been removed, but there is still some degree of error. This is because there are a number of factors that cause small errors, which can add up. For example, satellite's internal clocks can be slightly inaccurate, and the satellites themselves can be off their predicted path or orbit. The atmosphere causes some timing errors because it slows the radio signals of the satellite. Errors also occur due to signals bouncing off buildings and mountains; this is called multipath error. GPS receivers themselves have some error, usually caused by their internal clocks. However, even with all these sources of error, GPS can determine your location fairly accurately (between 5 and 25m).

Can I be tracked if I have a GPS device?

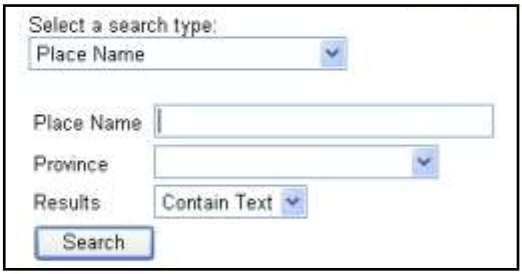
No. GPS devices do not broadcast your location. The satellites use radio frequencies to broadcast their own position. Your GPS unit takes that information to figure out where you are (triangulation).

"Know Your Watershed" is an excellent resource to access while researching your watershed. Its number one function will be to enable you to determine in which watershed you are located. Using the website will also give you a map of your watershed that you can use in your educational materials.

"Know Your Watershed" website:
map.ns.ec.gc.ca/kyw

Find Your Watershed

Begin by using the "Place Name" search to search for the community that your high school is in. Remember that local names and the names of nearby waterbodies may not be included in the database and you may have to change your search name. Keep playing around until you find what you are looking for.



Results for search "melvern square, Nova Scotia":

	Place	Province	Place Type	Watershed	Place Latitude	Place Longitude
View	Melvern Square	NS	UNP/LNO	Fundy Shore (01D02)	44.9832	-64.9825

Sometimes your search may give you a list instead of a single entry. This is either because your search matched several things within your province that have a similar name or because your town may have more than one watershed or sub-watershed. By clicking on “View” at the beginning of each line, you will be able to narrow down which entry matches your school.

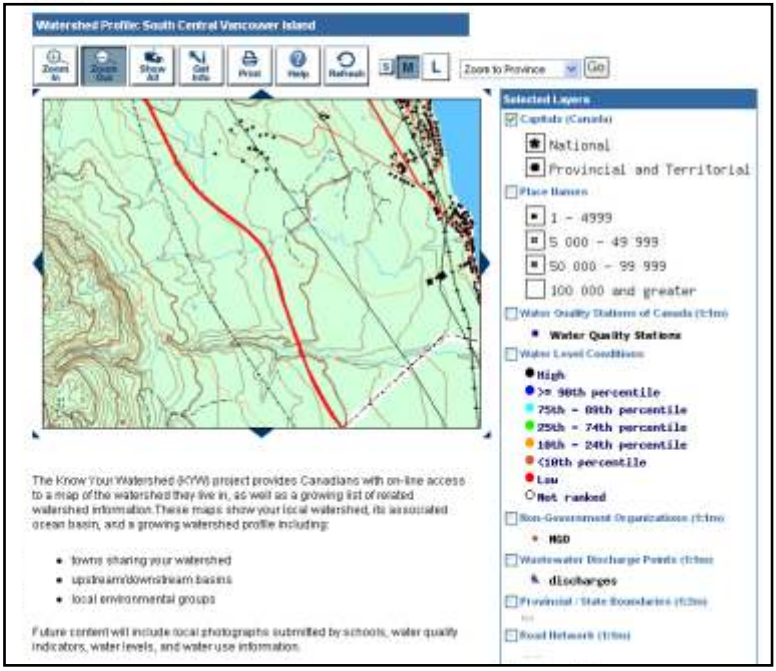
Results for search "comox, British Columbia":

	Place	Province	Place Type	Watershed	Place Latitude	Place Longitude
View	Comox	BC	TOWN/VIL2	South Central Vancouver Island (08H02)	49.676	-124.9352
View	Comox 1	BC	IR/RI	South Central Vancouver Island (08H02)	49.6832	-124.9509
View	Comox, Base des Forces canadiennes	BC	MIL/MIL	South Central Vancouver Island (08H02)	49.7166	-124.9009
View	Comox, Canadian Forces Base	BC	MIL/MIL	South Central Vancouver Island (08H02)	49.7166	-124.9009
View	Comox-Strathcona	BC	MUN1/AZM1	East Central Vancouver Island (08H07)	50.3332	-125.3343

The next screen you come to is the profile page for the sub-watershed you have selected. You will see three maps at different levels of zoom. These maps all show the same thing but allow you to visualize how that sub-watershed is connected to the network of watersheds. At this stage you may be able to determine if you are in the right watershed and whether you should continue or go back and try again.

On the “watershed profile” pages you will also find valuable links and images for each watershed which may be a good starting point for your research. This information comes from a constantly evolving database housed at Environment Canada. If you see links that are missing or wrong, or if you have pictures for us to upload, please email reseau@ec.gc.ca.

To explore the full capabilities of “Know Your Watershed”, click on the “Local” Map. This will open a dynamic mapping page which will allow you to zoom, pan and turn layers off and on. As you zoom in closer, more details will appear such as lakes, roads and buildings. It is interesting to see which areas you share water with and how events within your area could affect so many other areas. If you make a layer change and you don't see your map update, press the refresh button which will redraw your map and apply any changes you might have made.



When you have made a map of your watershed that you are happy with in the map window, click the “print” button. This will open another window which will give you the option of printing or downloading your image. This image can then be used in your research material.

Here are some possible things to research and include in your educational materials for your caches.

General

- What is a watershed?
- Why are watersheds important?
- What can we do to protect watersheds?
- Why is water important?

Local

History

- What is the history of the area as it relates to water?
- Are there any interesting settlements? Were they settled because water was nearby?
- Information about local industry such as fishing, boat building, transportation, gold mining, logging – transport and sawmills.

Present

- What are the present issues with water in your area?
- What is the water quality like in your area?
- Are there any environmental projects such as river rehabilitation being done in your area? What is being done?
- What is water being used for in your area? (hydroelectric, recreation, transportation)

Maps / Pictures

Can you make a map of your watershed? (Use “Know Your Watershed” site at map.ns.ec.gc.ca/kyw)

Maps and pictures are a great way to give people a sense of how large an area is and what goes on in an area.

Helpful links…

- Environment Canada
  www.ec.gc.ca
- Geocache Your Watershed
  www.ec.gc.ca/geocache-water
- Know Your Watershed
  map.ns.ec.gc.ca/kyw
- Local municipal and provincial government sites
- Local environment groups' sites

Other things to remember

You should not place the Environment Canada logo on your literature because it can only be used by authorized Environment Canada employees.

WHAT IS GEOCACHING?

Geocaching is an adventure game for GPS users (like high-tech hide and seek or treasure hunting). The basic idea is that individuals and organizations all over the world have set up caches and share their locations on the Internet. GPS users then use these location coordinates to find the caches.

A cache is usually made of a waterproof container with a logbook and 'prizes' inside. Once the cache is found, the logbook is signed, and the visitor gets to take a prize as long as they leave something new. Geocaches can be set up in the wilderness, or in urban areas, and can provide geocachers with a number of different experiences.

The international popularity of geocaching can be linked to its appeal to different types of people. Computer people like it because of its high-tech nature. Backpackers like it because of the outdoor aspect. Parents enjoy the opportunity to entertain their children with an inexpensive activity that involves exercise. Children like it because, well, there are prizes!

Geocaching has become an increasingly popular tool for education. It has been used by such organizations as National Geographic as a fun way to present a topic.

Did you know?

The first geocache in Canada was placed on June 28, 2000 in Atlantic Canada. It is simply known as “Geocache (GCBBA). It is located near East River in Nova Scotia. This was a little over a month after the first geocache ever was placed in Oregon on May 3, 2000.

Getting Started

Getting started is easy, you will need the following:

- A GPS receiver
- Access to the internet

From there, you'll need to select a cache that is near to you.

- Log on to geocaching.com and create a user account. Then select "Seek or hide a cache". Enter a postal code.
- From the list of caches available, select the one you want to search for.
- Enter the coordinates of the cache into your GPS receiver.
- Perform a GOTO to the waypoint you entered (tell your GPS device to take you to your saved point)

Once you find the cache, enter a log entry and take or place an item.

The Rules

The rules of the game are very simple:

- Find the cache
- Make a logbook entry
- Trade a cache item. Take something/leave something (optional)
- Leave the cache in the same spot that you found it.
- Go to geocaching.com and enter your find on the cache page.

What shouldn't be in a cache?

Respect local laws; no food, restricted or illegal items.

The first thing you should do, if you haven't already, is to join the geocaching.com website. Membership is free and you won't be able to make new geocaches until you are a member. You do this by clicking "log in" and then "Create a new account".

Once you become a member, log on and take a look around the website and get a feel for just how widespread geocaching is. By clicking on "Hide and Seek a Cache" you can search and get a feel for all the geocaches in your area. As you can see, there are many ways to search for geocaches and you don't have to be a geography major to use the website. Try typing in the postal code of your school. This will give you a list of all caches within a certain radius of your postal code.

The geocaching website has excellent resources to teach you about the phenomenon of geocaching, how to find your first geocache, and also some tips for creating one. Check out the "Getting Started" section.

You will notice that caches have different symbols beside them. This symbol signifies what type of cache it is. For the purposes of this project, we envision most of our caches being traditional, multi or puzzle.

Traditional Cache

This is the original cache type consisting, at a bare minimum, a container and a log book. Normally you'll find a plastic container, metal box, or bucket filled with goodies, or smaller container ("micro cache") too small to contain items except for a log book. The coordinates listed on the traditional cache page is the exact location for the cache.

Multi-Cache (offset Cache)

A multi-cache ("multiple") involves two or more locations, the final location being a physical container. There are many variations, but most multi-caches have a hint to find the second cache, and the second cache has hints to the third, and so on. An offset cache (where you go to a location and get hints to the actual cache) is considered a multi-cache.

Mystery or Puzzle Caches

The “catch-all” of cache types, this form of cache can involve complicated puzzles you will first need to solve to determine the coordinates. The only commonality of this cache type is that the coordinates listed are not of the actual cache location but a general reference point, such as a nearby parking location. Due to the increasing creativity of geocaching, this becomes the staging ground for new and unique challenges.

Google Earth is a wonderful resource for people searching for geocaches. It is a dynamic mapping program that connects to live data through the Internet to ensure the user is seeing the most up-to-date information available.

Google Earth can be downloaded free at:
earth.google.com/

When you use Google Earth to visualize geocaches you don't need to do a search. You simply zoom to the area that you are interested in and the geocaches will be automatically shown (assuming you have an active Internet connection)

In order to get the current geocaches from geocaching.com to show on Google Earth you have to download the geocaching layer from the geocaching.com web site. You do this by first logging onto the geocaching.com web site. You then choose "My Account" from the side menu. When in "My Account", you will see a heading entitled "Google Mapping Features" in the right hand column. Click on the "Google Earth" button and follow the instructions (either save or open will work). The next time you open Google Earth, the geocaching layer will be there.

SOME GEOCACHING TERMS

Geocaching has its own language. Below is a guide to some of the more common phrases.

- **Travel Bug** - A travel bug is a trackable item that moves from place to place picking up stories along the way. People purchase travel bugs from “Groundspeak” - the official geocaching merchandiser. These bugs are “dog tags” that are imprinted with a unique number. This number is registered on the geocaching web site. People who place travel bugs usually give them a little story or mission which is accessible when you search for the number on the web site. They also are generally attached to a mascot (something small enough to fit in most cache boxes). People will take a travel bug from one cache and deposit it in another in order to aid it in accomplishing its ultimate mission. The geocacher who moves the bug will log the move on the travel bug’s webpage on the geocaching web site. There is also the opportunity to upload pictures of the bug on its travels.

- **Geocoin -** A geocoin is a special coin created by individuals or groups of geocachers as a kind of signature item or calling card. Like travel bugs, each geocoin is assigned a unique tracking ID which allows them to travel from geocache to geocache or to be passed amongst friends, picking up stories along the way. They come in all shapes and sizes and are quite the collector’s item. They do not tend to stay in caches for very long.

- Some logbook acronyms:
  FTF - first to find
  TFTC - thanks for the cache
  TFTH - thanks for the hunt
  TNLN - took nothing / left nothing
  TNLNSL / TNSL - took nothing / left nothing / signed log

- **Geocache Size** - When developing a geocache you have to identify a cache size. This gives the geocacher a rough idea of what they are looking for. There are five standard geocache size classifications.

  - micro (ex. 35mm film canister)
  - small (holds logbook and small items)
  - regular (plastic container, metal box)
  - large (five gallon bucket)
  - other (this is the catch-all choice for everything else, details for it are placed in the cache description)

- **Difficulty and Terrain** - Difficulty and terrain are two attributes that apply to every cache. They are displayed as a ranking from one for easiest to five for hardest. They are entered by the geocache owner. There is a short online questionnaire that you fill out when entering a new geocache that calculates the rank for you. They are used by the geocacher to determine the suitability of the geocache for them. They also help to decide what gear may be required.

- **Muggles** - A muggle is a non-geocacher. If a geocache has been muggled, that generally means that it has been stolen or vandalized. Geocaches are usually well labeled to identify them in case a non-geocacher stumbles upon them. It is also encouraged to hide geocaches in a location where they are less likely to get spotted. Some geocachers like to place geocaches in very public spots to make them more challenging.

Below is a listing and description of the items you received in your “Geocache Your Watershed” kit.

- This book - Guide for High Schools
- Metal box - geocache container that you can use for one of your geocaches.
- Travel Bugs - these have not been activated and need to be activated before placing in the cache. To do this, follow the instructions on the bag that the bug comes in.
- Logbook, pencil and sharpener
- Official geocaching sticker - to put on outside of geocache container
- “Discover Your Watershed” poster
- CITO containers - CITO is an acronym for “Cache In Trash Out” and it is an activity that encourages geocachers to collect litter along the trails while they are searching for caches and properly dispose of it.
- A GPS receiver
- Environment Canada water bottle holders (carabiner)
- Laminated Geocache identification card - to put in your caches to explain its purpose to muggles (non-geocachers)
- Limited edition “Geocache your Watershed” collectors geocoin

CUSTOMIZE THE PROJECT

We want you to have fun with the project and customize it to fit your educational outcomes. It is not meant to be a cookie cutter process.

The project offers the opportunity to involve many classes. Below are some suggestions and examples but please feel free to come up with your own ideas (in fact we encourage it!):

- Geography Class to do maps and research
- Multimedia Class to develop promotional items
- Photography Class to make a movie or take photos
- French Class to do any translation
- Computer Class to make website
- Orienteering Class to find geocache locations
- Leadership Class to teach elementary grades about watersheds or geocaching

The possibilities are endless and we can’t wait to hear your ideas.

A few key points to keep in mind in making a geocache:

- Make sure you choose a location that is easily accessible by you. You will be the geocache owner and that means that periodically you may want to check on it to see if replenishing is needed and to make sure it hasn't been damaged.

- Always ask the owner's permission before placing a geocache. If you place it on private land, you must ask permission before putting it there! If you place the cache on public lands you need to contact the managing agency to find out about their rules.

- Geocaching is welcomed in national historic sites, national parks, and national marine conservation areas managed by Parks Canada. New guidelines have been developed that will encourage wide and meaningful participation in this activity.

  These guidelines are available at http://www.pc.gc.ca/docs/pc/guide/geocache/index_e.asp or by emailing geocache@pc.gc.ca. For information on placing or seeking a cache at a particular Parks Canada national historic site, national park or national marine conservation area, geocachers can contact the location directly.

- Be sure to include "GYW" within your official geocache name when you create your geocache on the geocaching.com web site. This will ensure that people can search the web site if they wish to find only "Geocache Your Watershed" caches. (ex. GYW Exploring Round Rock Cove)

- When you are writing your geocache description on the geocaching web site make sure to include all your watershed research information. This will ensure that people browsing the geocaching.com web site will learn something about your watershed and the project even if they decide not to do the geocache.

- Don't forget to activate your travel bugs and give them a story or theme. Make sure to change their name and attach a mascot to them. Explore geocaching.com to see many examples of how people have customized their travel bugs. This is a separate process from entering your geocaches. It is also good practice to attach your travel bugs story directly to him (ex. laminated card) so people don't take him if they can't further his mission.

GEOCACHE CHECKLIST

Here is a list of some of the things to include in your geocaches:

- [ ] Geocache container with official geocache sticker
- [ ] Laminated geocache identification card
- [ ] Logbook, pencil and sharpener in plastic baggie
- [ ] Activated travel bug with mascot and laminated" story card" attached
- [ ] CITO container with plastic bag inside
- [ ] Prizes (some examples - school pins, town keychains)
- [ ] Multiple copies of your research brochure
- [ ] Any promotional items that you have developed such as pins or bookmarks

WHAT WE NEED FROM YOU

To make the project a success we need a couple things from every school. Please don't hesitate to contact us if you need any more details on our requirements. Our ultimate goal is to make the program better and allow your hard work to shine.

- [ ] Submit project report including, for example:
  - what classes were involved and how
  - how many students were involved
  - where did they find their information
  - what things did they research (industry, environment, quality, etc)
- [ ] Develop educational materials to include in caches and provide them electronically to Environment Canada.
- [ ] Enter all caches on geocaching.com website with full descriptions including research information from educational materials (this way people will learn about your watershed from reading the geocache description even if they don't visit your geocache).
- [ ] Provide Environment Canada with a list of your geocaches, travel bugs and coins including the name, tracking number and web address on the geocaching.com website.
- [ ] Send Environment Canada a short description of your school to be posted on your school's profile page on the "Geocaching Your Watershed" website.
- [ ] Provide Environment Canada with a link to the website that your school did for the project (if applicable).

GEOCACHE DESCRIPTION EXAMPLE

Below you will find a description of the contents of a hypothetical Geocache Your Watershed cache in Nova Scotia . It is provided here as an example of the level of detail we encourage you to put in your description.

This cache will take you through the heart of our watershed, along the West River. Cache is an ammunition box.

This geocache is part of the "Geocache Your Watershed" project.

EC.GC.CA/GEOCACHE/WATER

Through this initiative, high school students will learn about their watershed and experience their own outdoor discovery of its unique features.

Initial Contents

Logbook, two pencils, sharpener
information brochure about Eastern Shore Watershed
CITO container
Eastern Shore Watershed bookmark
keychain
carabiner
Nova Scotia pin
fish toy

Please help us out.

When logging this geocache please provide some feedback on what you thought of this watershed information sheet. Was it useful/useless, interesting/boring, etc? Your feedback would be greatly appreciated.

Eastern Shore Watershed

The Eastern Shore watershed is relatively small and is located along Nova Scotia's Marine Drive.

Settlement within this watershed area began in 1784 when Loyalist refugees and British veterans of the American Revolution settled here. The large forested areas fostered a lumber industry that allowed the settlers to prosper.

The Eastern Shore watershed is home to a number of industries, most notably forestry, fishing, and the Nova Scotia Power Sheet Harbour Hydro System.

Some traditional industrial activities within this watershed were coal and gold

mining, lumber, sawmills, fishing, shipping, shipbuilding, and pulp and paper. The Port of Sheet Harbour and the Sheet Harbour Industrial Park are located within this watershed.

Recreational activities within this watershed include angling, canoeing, hiking and snowmobiling. A number of restaurants, campgrounds, and accommodations are located within the watershed. The Liscomb Game Sanctuary, which is the second-largest sanctuary in the province, is located nearby.

The West River is home to Atlantic salmon. Unfortunately the population of Atlantic salmon has been decreasing for some time. Scientists believe that fewer than 100 adult salmon return to this area each year. A major reason for this is acid rain. Acid rain lowers the pH in the water, and many aquatic species, salmon included, cannot adjust to this change in water quality.

Efforts to reverse the effects of acid rain are ongoing in the Eastern Shore watershed through a liming project. Liming may not return the local environment to the condition it was once in, but it may allow it to sustain the species that are currently being threatened by acid rain.

The West River/Sheet Harbour liming project uses a lime doser, which monitors the pH level of the water and adds powdered lime as needed. This lime doser is the first of its kind in use in North America, but it is not unproven technology. These lime dosers have been used in Norway for a number of years.

A number of clear cut areas are located within the Eastern Shore Watershed. Clear cutting removes valuable buffer zones near watercourses (lakes, streams, and rivers). Buffer zones protect watercourses from industrial accidents, erosion and sedimentation, and they help control the water temperature, thereby providing a thermal refuge for fish and other wildlife.

What is a watershed?

Did you know that we all live in a watershed? No matter where you live, work or play, you are in a watershed! You might be surprised to know that watersheds are more than just water. A watershed is an area of land that water flows across or through on its way to a particular water body, such as a stream, river, wetland or coast. Think of it as the land upon which precipitation (such as rain) falls and flows to a common, watery place.

Watersheds come in all shapes and sizes. They can be very large, spanning several provinces, or so small that they only encompass a small stream or wetland area. They cross counties, provinces and national boundaries. They can be “open systems” — those that eventually drain into an ocean or “closed systems” — ones where water can only escape through evaporation or by seeping into the earth.

Canada has five main watersheds: the Arctic, the Atlantic (which includes the Great Lakes and the St. Lawrence River), Hudson Bay, the Pacific and the Gulf of Mexico. Each of these massive landscapes contains a network of sub-watersheds, most of which are connected through configurations of tributaries (streams and rivers) that channel water to an ocean.

Why are watersheds important?

Watersheds not only allow an area for water to drain and seep into the ground, they provide important habitat for both aquatic and terrestrial wildlife and watersheds provide people and animals with fresh drinking water. Watersheds contain industries, which can put stress on a watershed, and have a number of recreational uses.

Anything that occurs on land can directly affect streams, rivers, lakes and the groundwater. Motor oil, road salt, pesticides and fertilizers can all reach watercourses though sewers, runoff, and infiltration. Industrial pollution, agricultural runoff, erosion and devegetation from logging, untreated municipal sewage and faulty septic systems can all affect watersheds. Trees and other vegetation are important to watersheds because they slow runoff, protect land from erosion, reduce water temperatures, and can even clean water.

Pollutants within your watershed can harm the environment, wildlife and habitat. They can also impact the economy and jobs, and degrade the health and wellness of humans.

What can I do to help protect watersheds?

- Never pour any chemicals down the drain
- Clean up garbage on the ground
- Clean up after your pets
- Properly dispose of household hazardous wastes
- Use alternative pest control methods
- Practice waste reduction and pollution prevention
- Plant native species of plants – they grow better without the aid of fertilizers and pesticides.