

# 4-H Alberta Leader's Guide



**What can you do  
to improve your  
watershed?**

We want to hear your realistic  
solution to a local environmental  
concern.

**You can make it happen.  
We can help.**

This workbook belongs to:

Name: \_\_\_\_\_

4-H Club: \_\_\_\_\_

Date: \_\_\_\_\_

[www.4h.ab.ca](http://www.4h.ab.ca)  
[www.CaringForOurWatersheds.com](http://www.CaringForOurWatersheds.com)

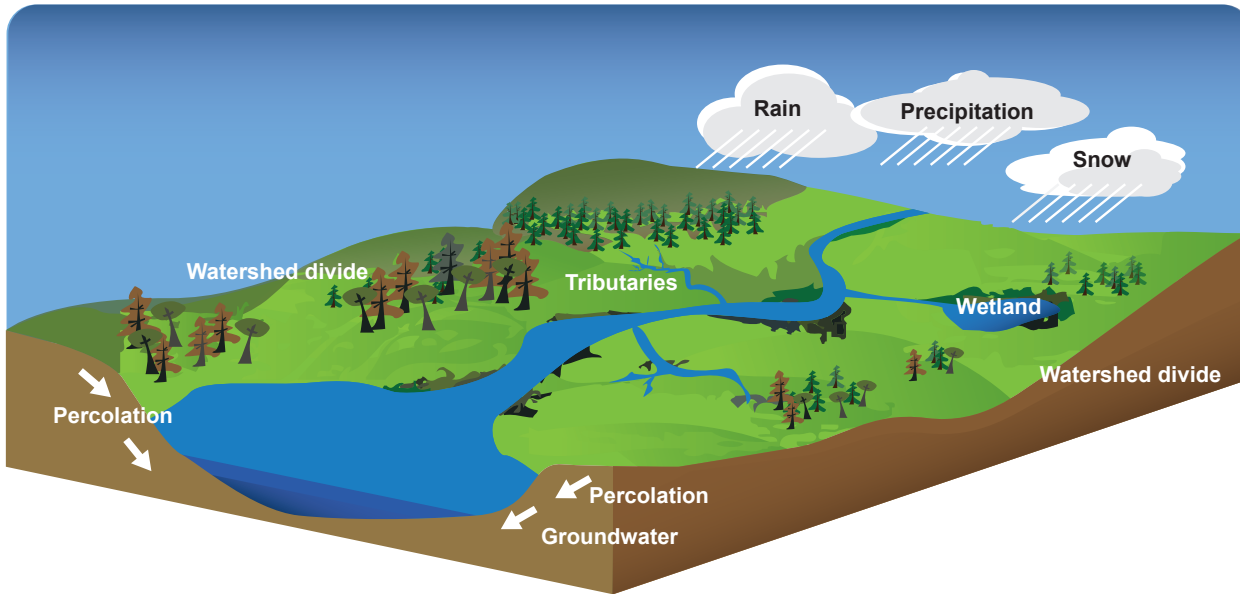
# Table of Contents

	Page
What is a watershed?	1
Overview	2
Benefits of Caring for our Watersheds to 4-H	2
Tasks and Deliverables	3
Learning Objectives	3
Contest	4
4-H Leader Time Commitment	4
Alberta's Major River Basins Map	5
Alberta Map	6
Answer Keys	
Athabasca Watershed Answer Key	7
Battle River Watershed Answer Key	9
Beaver River Watershed Answer Key	11
Bow River Watershed Answer Key	13
Hay River Watershed Answer Key	15
Milk River Answer Key	17
North Saskatchewan River Watershed Answer Key	19
Oldman River Watershed Answer Key	21
Peace/Slave River Watershed Answer Key	23
Red Deer River Watershed Answer Key	25
South Saskatchewan Watershed Answer Key	27
Project Examples	29
Need More Inspiration?	29
Project Activities	31
Assessment Tool	42
Glossary of Terms	43
Additional Resources	45

# What is a watershed?

A watershed is all of the land that drains to the same location or body of water. People tend to think only of water bodies such as rivers, lakes and wetlands as being part of their watershed. However any upland whether it be a park, field, or even a parking lot, is also included.

Watersheds know no borders and whether national or international they are key to a healthy environment.



We all live in a watershed. Our actions impact our land, air and water. Farmers and ranchers are some of the best environmentalists in the world, working hard to ensure future generations are sustainable. The key to sustainability is implementing best management practices, innovating, learning and doing the right thing.



# Overview

Taking care of our world requires more than simply talking about it. It calls for stewardship and a lighter footprint. 4-H Alberta has a long tradition of helping youth develop life skills tied to the four H's (Head, Heart, Health and Hands). As a result, Nutrien and 4-H are teaming up on an environmental contest for Grades 7-12 students called, "Caring for our Watersheds."

Caring for our Watersheds asks members to answer the question, "**What can you do to improve your watershed?**" Either individually or as a team, participants must research their local watershed, identify an environmental concern and come up with one realistic solution.

The goal of this guide is to provide 4-H leaders with a suite of tools designed to help incorporate concepts around local and provincial watershed health into their club activities. In keeping with 4-H traditions, all activities are designed to help build knowledge and key life skills while helping youth learn about local environmental issues. Members do not have to participate in the CFW contest to still complete the 4-H Caring for our Watersheds experience.

## Benefits of Caring for our Watersheds to 4-H

### To Members

- **Hands-on, real-life, practical projects** that will enhance your local watershed
- Develop independence, self-confidence, and responsibility
- Develop problem solving, decision making and goal setting skills
- Develop leadership and life skills
- Develop communication skills
- Learn the value of community service
- **Make a difference** to themselves, their school, community and world
- Possibility of gaining high school credits
- Taking ownership of their projects by incorporating their own interests and ideas
- **Prize money** to implement 4-H member projects within your local club/area (if participating in Caring For Our Watersheds contest)
- Opportunity to travel to present action projects at finals.

### To Schools

- Can be offered/scheduled in a variety of ways that suit each school
- Can be set up as a **cross-curricular** graded program
- Aspects of the 4-H program enhance curriculum outcomes
- Offers a creative way for members to **develop leadership, life skills, responsibility, decision making** and a variety of other skills

### To Staff Leaders

- **Learn more about local environmental issues**
- **Create a partnership** with members by working and learning together on projects
- Less planning time required as 4-H resources are very well developed and inclusive
- Assist with developing relationships and leadership opportunities for members especially in cross graded programs
- Opportunity to work with multi-age members
- **No formal grading or marking**
- Leadership and travel opportunities as part of CFW program

### To the Community

- **Brings school and community together**
- Develops skills in youth that will later assist in the community
- Provides **volunteer opportunities** for community members to work with youth





# Tasks and Deliverables

**To successfully complete this project, 4-H club members are required to:**

- Complete project records and have them signed by the club or project leader.
- Attend a minimum of 70% of club activities.
- Complete and submit at least one CFW proposal before the contest deadline.
- Be involved in a club activity that is a benefit to your community
  - implement at least one of the CFW ideas!
- Participate in the club's achievement event by showcasing the CFW project ideas (optional).
- Above all - have fun!

## Learning Objectives

*Instilling environmental awareness and stewardship among the next generation to improve the quality of the watersheds within our communities.*

**Through this project, members will:**

- Gain knowledge about watersheds and the local environment.
- Develop an interest and understanding of environmental sciences and sustainable practices and technologies.
- Develop research and writing skills.
- Develop leadership and team-building skills.
- Improve communication skills.
- Gain project management experience.
- Achieve personal reward for having done something positive for the environment and your club.
- Build stronger relationships with other club members and your local community.
- Encourage others to participate in the project.
- Be stewards of the environment and develop sustainable solutions.
- Take care of themselves and others.
- Learn positive ways to stay healthy and active.
- Make informed choices about their health and the health of the planet.
- Dig in and get their hands dirty! (Hands-on learning/Experiential Education/Learn to Do by Doing)



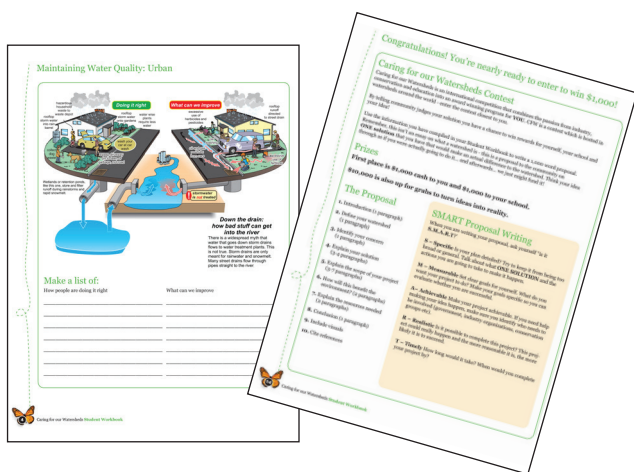
# Contest

Are you in Grades 7-12? Enter Nutrien's Caring for our Watersheds (CFW) environmental contest for a chance to win cash for your ideas and cash for your 4-H club!

CFW asks youth to submit a proposal that answers the question, "What can you do to improve your watershed?" Teams research their local watershed, identify an environmental concern and come up with one realistic solution. Across Alberta nearly \$40,000 will be awarded to students and schools or clubs who participate.

**Club Prize** - For every 10 entries win \$100 cash (based on the first 500 entries) and all finalists will win matching cash awards for their club. This means that if your 4-H team finishes in first place the team wins \$1000 and the club wins \$1,000. Plus, there is still money to implement the idea!

To qualify, a club must register online at [www.CaringForOurWatersheds.com](http://www.CaringForOurWatersheds.com). All club members must select their club when they enter the contest.

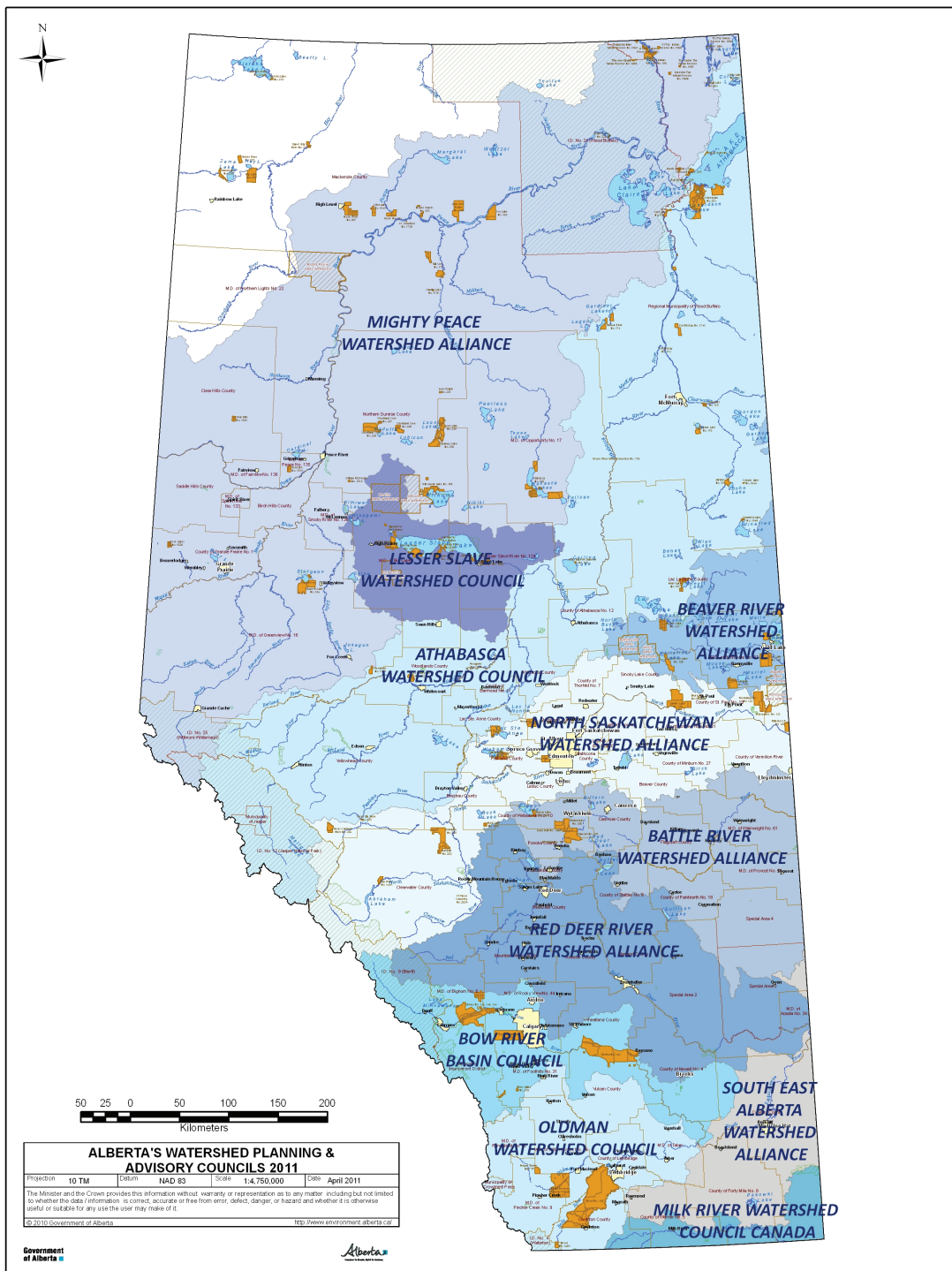


## 4-H Leader Time Commitment

- **This contest can be a 4-H club activity**  
4-H member's success directly relates to leaders assigning the contest and assisting members with their work. Giving members sufficient time to complete the contest assignment is more effective in producing quality projects.
- **Attend leader training (if applicable)**
- **Discuss the contest and overview of what a watershed is**  
60 minutes
- **Assist members with ideas - use the Student Workbook as a guide**  
Time commitment will vary depending on level of interest of members and leader
- **Remind members about contest entry deadline**  
Every week one month prior to deadline – 10 minutes times four weeks
- **If your member is selected as a finalist, help prepare them for their verbal presentation**  
2 hours
- **If your member is selected as a finalist, attend verbal competition and awards presentation**  
4 hours

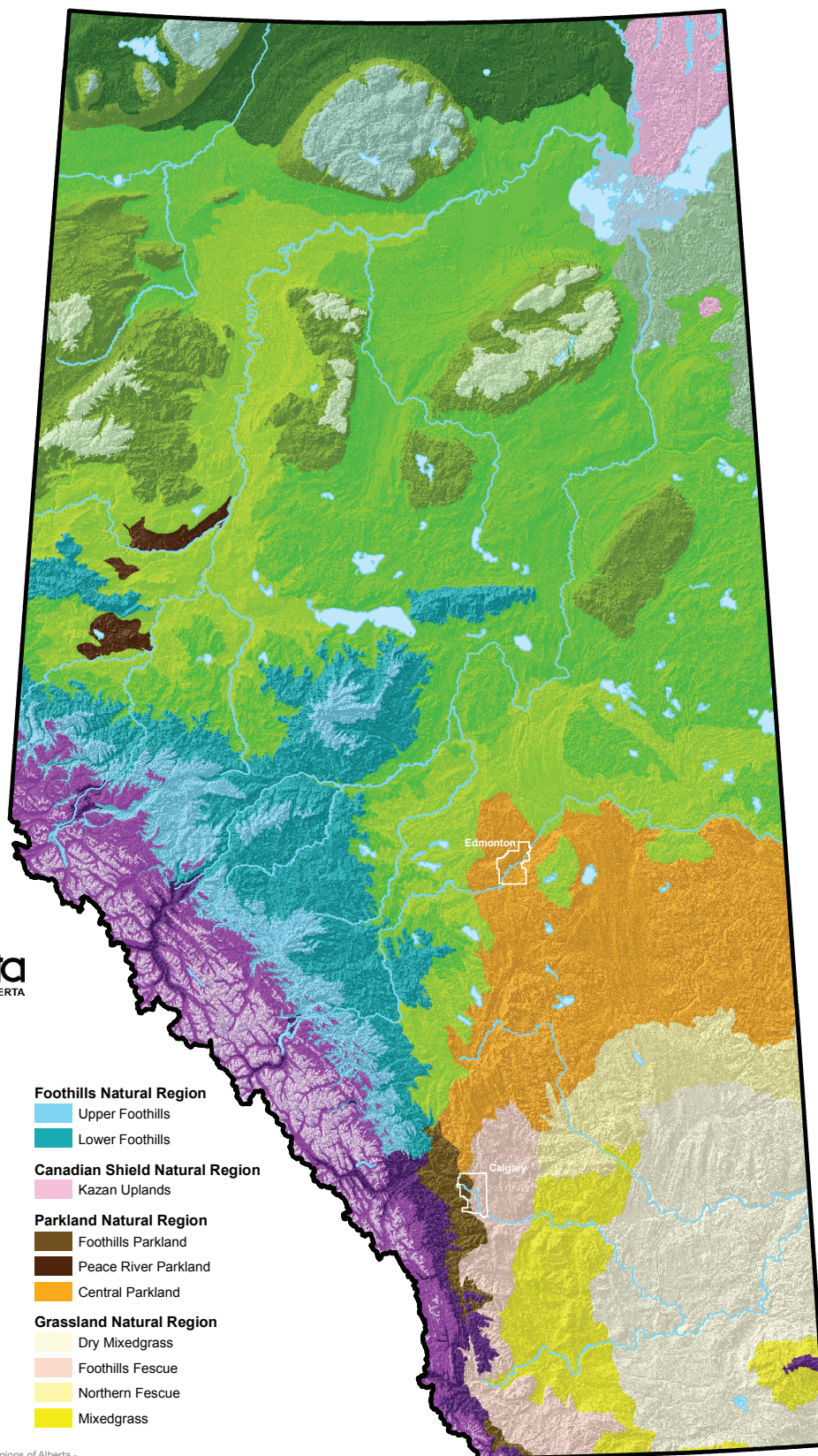


# Alberta's Major River Basins





# Alberta Map



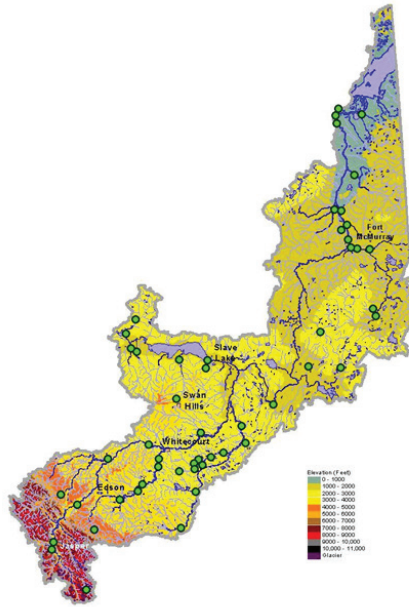
**Alberta**  
GOVERNMENT OF ALBERTA

2005 Natural Regions and Subregions of Alberta -  
Alberta Sustainable Resource Development, Alberta Environment,  
Alberta Community Development and Agriculture and Agri-Food Canada, June 2005





# Your Watershed Facts: **Athabasca Watershed**



## **How big is your watershed?**

The Athabasca Watershed covers an area of approximately 159,000 square kilometres, which is approximately 24% of Alberta's land base!

## **How many people live in it?**

Roughly 5% of Alberta's population, or around 154, 097 people, call the Athabasca Watershed home!

## **What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.**

The main sources of water in the Athabasca Watershed are snow and ice melt from the headwaters of the Columbia Glacier, as well as surface water from precipitation (rain, snow, hail) and groundwater.

## **What are the names of the major bodies of water?**

The major bodies of water in the Athabasca Watershed are Lake Athabasca, Lesser Slave Lake, and Christina Lake.

## **Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.**

There are four natural regions in the Athabasca Watershed: Rocky Mountain, Foothills, Boreal Forest and Canadian Shield. The central and lower areas of the watershed are mainly Boreal Forest while the upper areas are comprised of Foothills and Rocky Mountain natural regions. A very small area of Canadian Shield natural region is situated north of Fort Chipewyan. A large portion of the Boreal Forest region is comprised of extensive wetland and peatland areas.

## **What are the largest towns/cities?**

The largest towns and cities within the Athabasca Watershed are Jasper, Hinton, Whitecourt, Athabasca and Fort McMurray. Other sizeable towns are Barrhead, Westlock, Lac La Biche, Slave Lake, and Swan Hills.

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## Your Watershed Facts: **Athabasca Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

The Athabasca River and Lake Athabasca sub watershed together drain an area of about 269,000 square kilometres in Alberta, Saskatchewan and a small portion of the Northwest Territories.

**Where does the water in your watershed come from? Where does it flow to?**

The headwaters of the Athabasca River originate from the melting snow and ice of the Columbia Glacier in Jasper National Park and travel almost 1500 km across north central Alberta, and through the Peace-Athabasca Delta where the river drains into Lake Athabasca, and eventually into the Arctic Ocean. It is joined by several large tributaries along its course including the McLeod, Pembina, Lesser Slave and Clearwater rivers.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

The main industries within the Athabasca Watershed are forestry, agriculture and tourism, as well as coal and uranium mining. Sand, gravel and petroleum extraction also occur within the Athabasca Watershed.

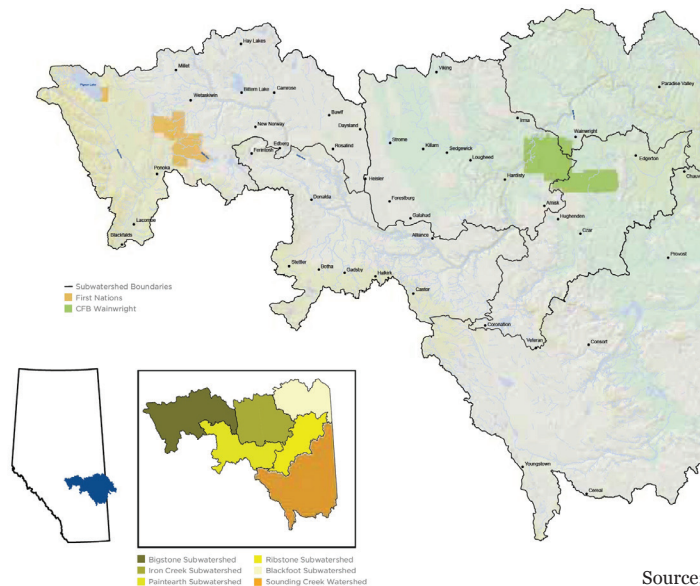


### **Did you know?**

The confluence of the Peace and Athabasca Rivers with Lake Athabasca forms a vast wetland called the Peace-Athabasca delta. It is one of the world's ecologically significant wetlands and has the designations of a Ramsar Convention wetland and a United Nations Education, Scientific and Cultural Organization (UNESCO) World Heritage Site.



# Your Watershed Facts: Battle River and Sounding Creek Watershed



Source: Battle River Watershed Alliance

## How big is your watershed?

The Battle River Watershed is a sub-basin of the North Saskatchewan Watershed, covering an area of approximately 30,000 square kilometers. 83% of this area is within Alberta; the remainder lies within Saskatchewan.

## How many people live in it?

Roughly 122,500 people live within the Battle River and adjacent Sounding Creek sub-basins.

## What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.

Unlike most of Alberta's major rivers, the Battle River lacks a continuous, glacier-and-mountain-snowpack-fed source of water. Its water supply comes entirely from local rain and snow run-off, meaning it is a 'prairie-fed' river. As a result, the Battle River's natural flow varies widely from year to year, depending on the amount of snowpack and rainfall it receives annually.

## What are the names of the major bodies of water?

Pigeon Lake and Battle Lake are the only natural deep-water lakes in the Battle River Watershed. There are many shallow prairie lakes in the watershed, such as Samson Lake and Wavy Lake. Some of these lakes are ephemeral and naturally dry up during drought years.

## Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.

The Battle River Watershed is characterized by productive agricultural communities that span the Parkland, Grassland, Boreal and Foothills Natural Regions. The natural lands, as well as an abundance of wetland and riparian areas, provide important habitat for wildlife species such as waterfowl, songbirds, ungulates and fish.

## What are the largest towns/cities?

The largest urban centres in the Battle River Watershed are Camrose, Wetaskiwin, Wainwright and Lacombe. Smaller towns include the resort community of Pigeon Lake, as well as Ponoka, Stettler, Viking, Killam, Amisk, Millet, Daysland, Provost and Coronation, just to name a few. The Maskwacis First Nation Reserve and Canadian Forces Base Wainwright also occupy sizeable areas of land within the watershed.

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# Your Watershed Facts: **Battle River and Sounding Creek Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

The Battle River starts at Battle Lake and flows east through Alberta to Saskatchewan, eventually emptying into Hudson's Bay. Over 83% of land within the watershed lies within Alberta, the remainder lies in Saskatchewan.

**Where does the water in your watershed come from? Where does it flow to?**

The Battle River starts at Battle Lake and flows over 800 kilometres eastward along the North Saskatchewan River, through Alberta to Saskatchewan, eventually emptying into Hudson's Bay. A number of creeks in the Battle River Watershed feed into the Battle River, including Pipestone, Iron, Paintearth, Ribstone, and Pigeon Lake Creek.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Approximately 70% of the landscape of the Battle River and Sounding Creek basins is used for agricultural purposes, however, the agriculture, forestry, fishing and hunting industries account for only about 6% of the watershed's GDP. The primary driver of economic activity is mining and oil and gas extraction, which account for almost half of the GDP of Alberta's watersheds. Canadian Forces Base Wainwright is also a sizeable employer within the Battle River Watershed.



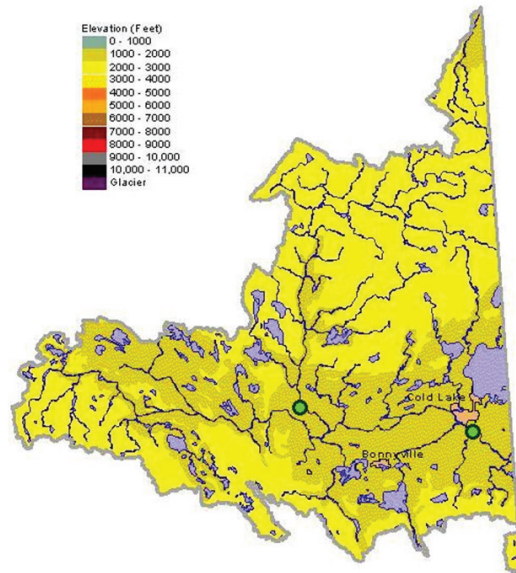
## **Did you know?**

Legally, the Province of Alberta must ensure that 50% of the Battle River's water reaches Saskatchewan!





# Your Watershed Facts: Beaver River Watershed



## How big is your watershed?

The Beaver River Watershed is one of the smaller river basins in Alberta, covering an area of approximately 22,000 square kilometers; which comprises about 3% of Alberta's land base.

## How many people live in it?

Roughly 38,300 people call the Beaver River Watershed home!

## What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.

The main sources of water within the Beaver River Watershed are groundwater and surfacewater from precipitation (rain, hail, snow). Because runoff in the watershed is not subject to the stabilizing influence of mountain snowmelt, it shows considerable variability from year to year and within the year.

## What are the names of the major bodies of water?

Major bodies of water in the Beaver River Watershed include Beaver Lake, Cold Lake, Moose Lake, Ethel Lake, and Wolf Lake.

## Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.

The Beaver River Watershed lies mainly in the Boreal Forest Natural Region. The southern portion of the watershed is characterized by productive agricultural lands, covering about one-third of the watershed, while the northern portion is mixedwood forest and wetland/peatland. The natural lands, as well as an abundance of wetland and riparian areas, provide important habitat for wildlife species such as waterfowl, songbirds, ungulates and fish.

## What are the largest towns/cities?

The largest cities and towns in the Beaver River Watershed are Bonnyville, Lac La Biche and Cold Lake.

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## Your Watershed Facts: **Beaver River Watershed**

**Does your watershed cross provincial/ state/national borders? If so, what borders?**

In addition to spanning a portion of southeastern Alberta, the Beaver River extends across Saskatchewan and Manitoba to Hudson's Bay.

**Where does the water in your watershed come from? Where does it flow to?**

Unlike many Alberta rivers, the Beaver River originates at Beaver Lake on the boreal plain rather than on the eastern slopes of the Rocky Mountains. The basin and the Beaver River extend eastward through urban centres of Bonnyville, Cold Lake, and Grand Centre and across Saskatchewan and Manitoba to Hudson's Bay.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

The primary industries within the Beaver River Watershed are agriculture, mining, oil and gas, and forestry. There is also a large Canadian Forces base located near Cold Lake, which employs a sizable number of people in the region.

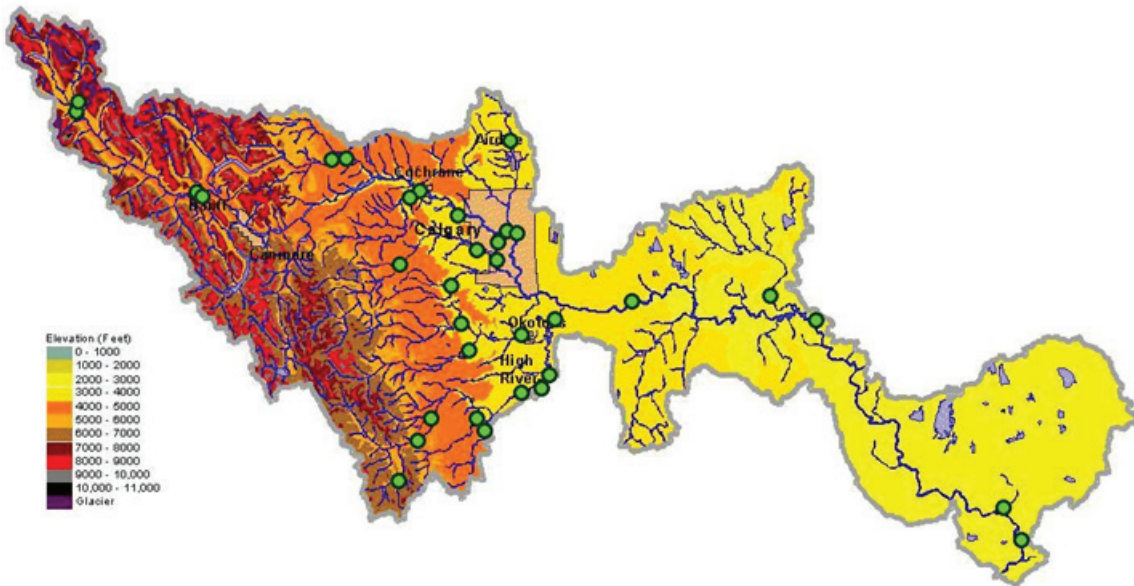


### **Did you know?**

The Beaver River Watershed is a significant recreational fishery, accounting for 25% of the annual provincial harvest.



# Your Watershed Facts: **Bow River Watershed**



## **How big is your watershed?**

Covering an area of over 25,000 square kilometres, the Bow River basin makes up more than 4% of Alberta, and about 23% of the South Saskatchewan River drainage area in Alberta. The Bow River Basin is a sub-watershed of the South Saskatchewan River Watershed.

## **How many people live in it?**

Approximately 1.2 million people (or 34% of Alberta's population) reside within the Bow River Basin. In the last ten years, the population of the basin has grown by more than a quarter million people. The current population is 95% urban, with 4% residing in 12 rural or regional municipalities, and less than 1% residing in Aboriginal settlements.

## **What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.**

Main sources of water within the Bow River Basin are supplied by precipitation that falls within the Rocky Mountains as rain and snow. Glacial meltwater (or runoff), as well as water from a number of smaller tributaries such as Nose and Fish Creek, are also important sources of water. Warm winters or winters with little snowfall in the mountains can reduce the flows of the Bow River to below average for the rest of the season. The chinook winds that the region experiences during the winter can also significantly reduce snowpack in the foothills and prairies. Low snowpack winters may mean less water available in the spring and summer when demand is typically highest.

## **What are the names of the major bodies of water?**

The Bow River Basin is blessed with an abundance of lakes. Larger lakes within the basin include Bow Lake, Lake Agnes, Lake Louise, Moraine Lake, Lake Chestermere, Eagle Lake and the Glenmore and Spray Lakes Reservoirs just to name a few!

## **Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.**

The Bow River encompasses many different landscapes and ecosystems. The headwaters of the Bow descend from alpine tundra through forests of lodgepole pine, spruce, fir and trembling aspen to prairie grasslands. Riparian areas can be found along stream banks and floodplain of the river and its tributaries, as well as along the margins of wetlands and lakes.

A variety of water bodies ranging from cold alpine lakes to shallow prairie wetlands and irrigation reservoirs are found throughout the prairies, and are primarily located in the eastern regions of the basin. These areas provide habitat for a variety of mammals, birds, aquatic plants, invertebrates, and fish.

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# Your Watershed Facts: **Bow River Watershed**

## **What are the largest towns/cities?**

The Bow River Basin is one of Alberta's most inhabited areas, and is home to the province's largest urban centre, Calgary. Other large cities and towns include Cochrane, Okotoks, Banff, Canmore, Black Diamond, Strathmore, Brooks and Vulcan.

## **Does your watershed cross provincial/state/national borders? If so, what borders?**

The Bow River Sub-Basin lies exclusively within Alberta, however, the Bow and Oldman Rivers are both part of the South Saskatchewan River Watershed, which eventually flows to the Hudson Bay and then on to the Arctic Ocean.

## **Where does the water in your watershed come from? Where does it flow to?**

The Bow River begins in Bow Lake and then flows in a southeasterly direction through a steep valley corridor in Banff National Park. The headwaters of the basin are fed by the snow and glacial ice of the Rocky Mountains along the eastern side of the Continental Divide. The Bow River winds its way across the prairies to its confluence with the Oldman River. The meeting of the Bow and Oldman Rivers creates the South Saskatchewan River, which is the southwest tributary of the Saskatchewan-Nelson River system that eventually flows to the Hudson Bay, and then on to the Arctic and Atlantic Oceans.

## **What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

The economy of the Bow River Basin is very diverse, with large numbers of Calgary's population finding employment in the oil and gas sector. Ranching and agriculture, power generation, and tourism and recreation are also significant industries in the region. Stockyards, as well large meat-processing operations in High River and Brooks employ large numbers of people locally.



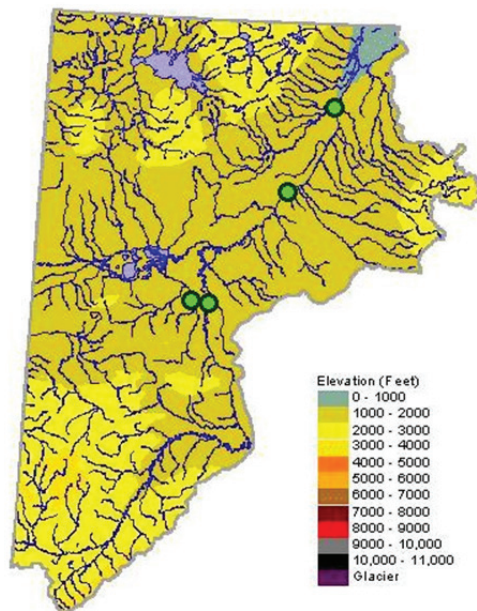
## **Did you know?**

The hydrology of the Bow River is significantly affected by 13 dams, 4 weirs, and 8 reservoirs, making it the most managed or regulated river in Alberta.





# Your Watershed Facts: **Hay River Watershed**



## **How big is your watershed?**

The Hay River Watershed covers an area of approximately 48,000 square kilometers, or about 6% of Alberta's land base.

## **How many people live in it?**

The Hay River Watershed is perhaps the most remote watershed in the province of Alberta, home to only 0.2% of Alberta's population, or about 7,500 people!

## **What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.**

The headwaters of the Hay River Watershed originate in the mountains of British Columbia. Major sources of water within the Hay River Watershed include ground and surface water, snow melt, and aquifers. A number of small creeks and tributaries also join the Hay River as it makes its way across Alberta.

## **What are the names of the major bodies of water?**

Zama Lake and Hay Lake are the two major lakes in the Hay River watershed, both of which are recognized for their importance to wildlife.

## **Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.**

The Hay River Watershed lies primarily within the Boreal Forest Natural Region. Much of the landscape is comprised of forested areas and muskeg (peatlands). There is also a small region of Parkland to the south, which is characterized by trembling aspen, mixed tall shrubs, and patches of grasslands.

## **What are the largest towns/cities?**

The town of Rainbow Lake is the sole urban settlement within the Hay River Watershed. The Dene Tha First Nation and Paddle Prairie Métis Settlements comprise two other sizable settlements within the region.

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## Your Watershed Facts: **Hay River Watershed**

**Does your watershed cross provincial/ state/national borders? If so, what borders?**

Located in the northwest corner of Alberta, the water in the Hay River begins in the Rocky Mountains of British Columbia, flows across northeastern Alberta, and up into the Northwest Territories.

**Where does the water in your watershed come from? Where does it flow to?**

The Hay River Watershed is part of the Mackenzie River System, with the Hay River originating in British Columbia's Rocky Mountains. From its headwaters, the Hay River flows through northwestern Alberta and up into the Northwest Territories, ending up in Great Slave Lake and eventually draining into the Arctic Ocean.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Due to the remote location and inaccessibility of the Hay River Watershed, much of its land base remains undeveloped. The primary industries in the Hay River Watershed are oil and gas, as well as natural gas/petrochemical plants. Agriculture also makes up a small portion of industrial activity within the watershed.

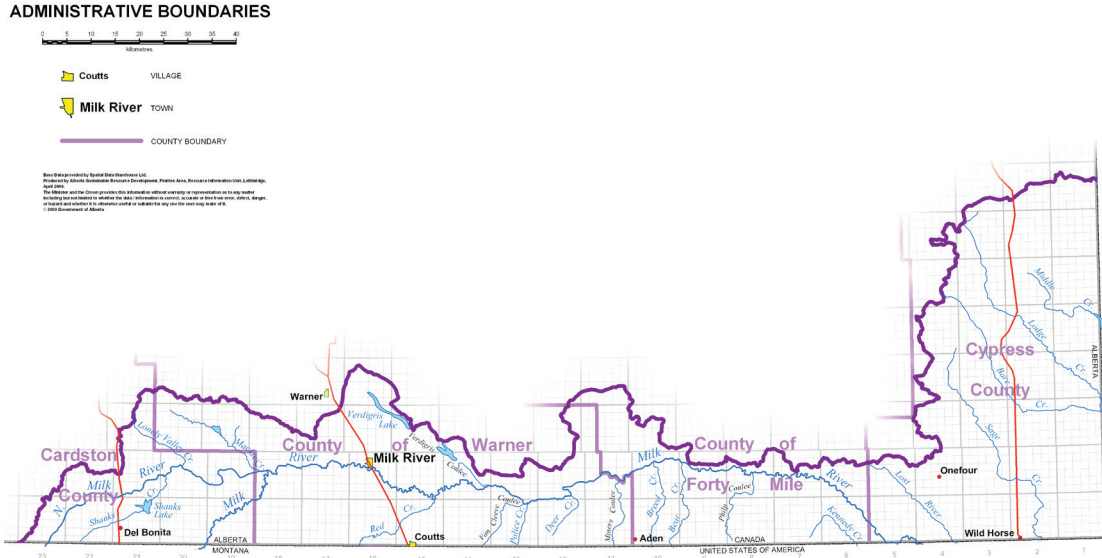


### **Did you know?**

The Hay River Watershed occupies about 6 % of Alberta by area, but only 0.2% of the provincial population lives there!



## Your Watershed Facts: **Milk River Watershed**



## How big is your watershed?

The Milk River Watershed is the smallest of Alberta's major river basins, covering an area of roughly 6,664 square kilometres.

## How many people live in it?

Approximately 2,534 people live within the Milk River Watershed.

**What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.**

The majority of water within the Milk River Watershed comes from snow-melt in the headwaters, inflows from tributaries and precipitation runoff throughout the watershed. Snow-melt in the headwaters accounts for between 50% and 80% of the water in the river. In addition to the natural flows, the water in the Milk River is augmented by an inter-basin transfer of water from the St. Mary River.

## What are the names of the major bodies of water?

Shanks Lake is the only major body of water within the Milk River Watershed.

**Describe the land.  
i.e. desert, rocky,  
mountains, prairies,  
hills, forests, swamps,  
wetlands.**

Arid (desert-like) landscapes dominate the Milk River Watershed, due to the low levels of precipitation the region receives. Most of the Milk River Watershed sits in the Dry Mixed Grass Natural Region, with the remaining land being comprised of Mixed Grass and Foothills Fescue Natural Regions. The Sweetgrass Hills, although not in Alberta, form a prominent part of the Milk River landscape. Much of the region is comprised of native rangelands, sandstone outcrops, and riparian areas; all of which are vitally important to the overall health of the watershed.

## What are the largest towns/cities?

The two urban municipalities within the Milk River Watershed are Town of Milk River and Village of Coutts.

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## Your Watershed Facts: **Milk River Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

The Milk River Watershed is the only trans-boundary basin in Alberta. The Milk River begins in the northern part of the Missouri-Mississippi River Basin in Montana and enters Alberta, flows eastward through the southern portion of the province before looping back to Montana. From here flows enter the Mississippi River system and eventually empty into the Gulf of Mexico.

**Where does the water in your watershed come from? Where does it flow to?**

The water in the Milk River begins in the northern part of the headwaters of the Missouri-Mississippi River Basin in Montana. From there, the Milk River enters Alberta, and flows eastward through the southern portion of the province before it makes its way back to Montana once again. From here flows enter the Mississippi River system and eventually empty into the Gulf of Mexico.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Approximately 93% of land in the Milk River Watershed is comprised of agricultural land, and subsequently, agriculture is the primary economic driver within the watershed. Tourism, especially to Writing-On-Stone Provincial Park is also an important economic driver within the region. Currently, there are approximately 2,856 oil and gas wells in the watershed.



### **Did you know?**

The Milk River is the only watershed in Alberta that drains south to the Gulf of Mexico.





# Your Watershed Facts: North Saskatchewan River Watershed



## How big is your watershed?

The North Saskatchewan River Basin is one of the largest and most populated major watersheds in Alberta, covering an area of approximately 55,000 square kilometers.

## How many people live in it?

Approximately 1.2 million people call the North Saskatchewan Watershed home.

## What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.

Water in the North Saskatchewan Watershed originates in the headwaters of the Banff and Jasper Icefields. Groundwater from aquifers, as well as surface water from precipitation, creeks, rivers and streams that feed into the North Saskatchewan also supply sizeable quantities of water annually.

## What are the names of the major bodies of water?

There are three major lakes in the basin: Beaverhill Lake, Wabamun Lake, and Lac Ste Anne.

## Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.

The North Saskatchewan River Watershed encompasses a wide variety of ecological regions, including Boreal Uplands, Foothills and Mixed Woods, and Aspen Parkland Natural Regions. The majority of land within the basin is covered by a mixture of forest, wetland and riparian areas.

## What are the largest towns/cities?

The North Saskatchewan Watershed is home to Alberta's capital city, Edmonton. Other sizeable cities within the watershed include Drayton Valley, Spruce Grove, St. Albert, Fort Saskatchewan, Leduc and Lloydminster.

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# Your Watershed Facts: **North Saskatchewan River Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

The North Saskatchewan River flows east through Alberta and across the border into Saskatchewan.

**Where does the water in your watershed come from? Where does it flow to?**

The North Saskatchewan River begins in the icefields of Banff and Jasper National Parks and flows east to Saskatchewan. The North Saskatchewan River Watershed is part of the larger Nelson River system, which eventually drains into Hudson Bay.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

The primary industries within the North Saskatchewan River Watershed are chemical (including petro-chemical) and fertilizer plants, manufacturing, and mining. Agriculture, forestry, hydroelectric power generation are also important industries in the region.

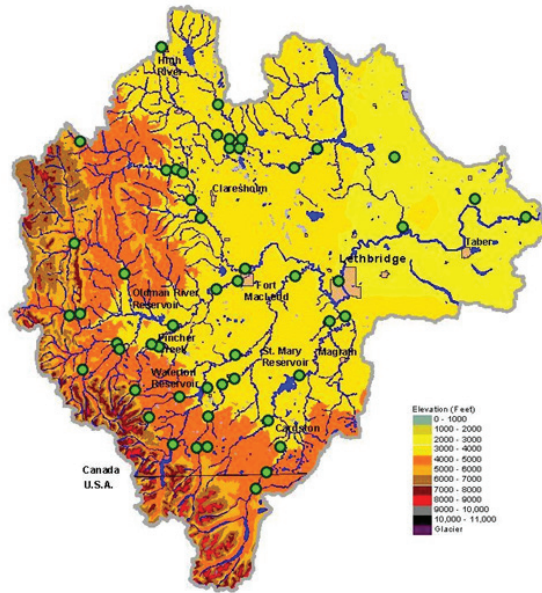


## **Did you know?**

About 95 percent of the water allocations in the North Saskatchewan watershed are for cooling purposes such as thermal power generation or air conditioning!



# Your Watershed Facts: **Oldman River Watershed**



## **How big is your watershed?**

Like the Bow and Red Deer Rivers, the Oldman River Watershed is a sub-watershed of the South Saskatchewan River Watershed, and covers an area of approximately 23,000 square kilometres.

## **How many people live in it?**

The Oldman River Watershed is home to more than 210,000 people, almost half of whom live in Lethbridge and area.

## **What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.**

Precipitation and snowmelt in the mountains on the western edge of the watershed feed the headwaters of the Oldman River and its tributaries (Crowsnest and Castle Rivers, Willow and Pincher Creeks). The headwaters of the Belly, Waterton and St. Mary rivers rise in Glacier National Park in Montana. Much of the watershed lies in the rain shadow of the Rocky Mountains, and chinooks are frequent in the winter. This causes water levels within the watershed to fluctuate seasonally.

## **What are the names of the major bodies of water?**

The Oldman River watershed contains several lakes and reservoirs including Payne Lake, Keho Lake, Beauvais Lake, Oldman Reservoir, Crowsnest Lake, St. Mary Reservoir, Chain Lakes Reservoir, McGregor Lake, Travers Reservoir, Waterton Lake, and Little Bow Lake Reservoir.

## **Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.**

The Oldman River watershed spans three natural regions: the Rocky Mountains, Parkland, and Grassland. The mountains and foothills support coniferous and deciduous forests. The Plains are characterized by grassland and prairie vegetation and comprise about 80% of the watershed. The climate is semi-arid, and temperatures vary considerably across the three natural regions.

## **What are the largest towns/cities?**

Lethbridge, Fort Macleod, High River and Taber are the largest cities in the watershed. Other sizeable population centres include Vulcan, Pincher Creek, Claresholm and Vauxhall.

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## Your Watershed Facts: **Oldman River Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

The watershed drained by the Oldman River and its tributaries covers about 23,000 square kilometres in southwestern Alberta and approximately 2,100 square kilometres in northern Montana. It extends eastward from the forested slopes of the Rocky Mountains through the foothills to the plains and prairie grasslands.

**Where does the water in your watershed come from? Where does it flow to?**

The Oldman River begins in the southern Rockies and flows out onto Alberta's foothills and then the prairies. From there, the Oldman drains into the South Saskatchewan River at the confluence of the Bow River. The South Saskatchewan River meanders through the prairies, and ultimately makes its way to Hudson Bay. The Oldman River headwaters are in the Canadian Rocky Mountains. The river flows through the communities of Fort Macleod, Lethbridge, Taber, and on to Grassy Lake, where it joins with the Bow River to form the South Saskatchewan River, which continues into Manitoba and eventually drains into the Hudson Bay.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Primary industries in the Oldman River Watershed include agriculture, forestry, mining, recreation, and oil and gas extraction. Commercial fisheries exist on McGregor Lake and Travers Reservoir with a substantial lake whitefish fishery on McGregor Lake. Commercial fisheries are also present on Kehoe Lake, Little Bow Reservoir, Milk River Ridge Reservoir, St. Mary Reservoir, and Fincastle Reservoir.

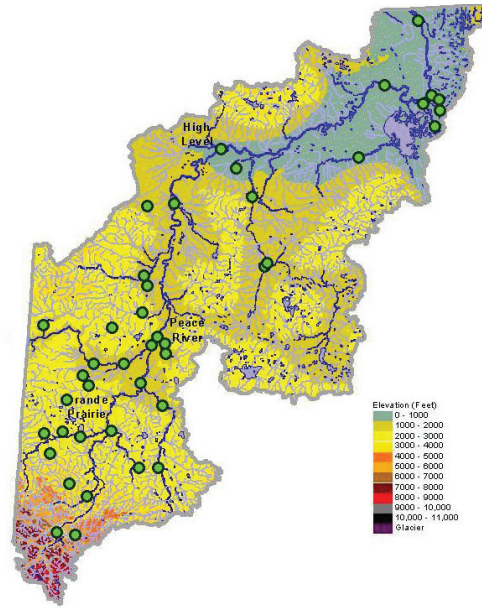


### **Did you know?**

Approximately 87% of total surface water and groundwater in the Oldman River Watershed is allocated to agriculture!



# Your Watershed Facts: **Peace/Slave River Watershed**



## **How big is your watershed?**

The Peace/Slave River Watershed is the largest watershed in Alberta, covering approximately 182, 500 square kilometres, or about 30 percent of the province!

## **How many people live in it?**

Roughly 137, 000 people, or about 4% of Alberta's population live in the Peace/Slave River Watershed. The majority of the population within the Peace/Slave River Watershed lives in the Grande Prairie area.

## **What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.**

The Peace and Slave Rivers draw their water from precipitation (rain, hail and snow), groundwater from deep bedrock aquifers, and also from inflows from the Wapiti, Smoky, Little Smoky and Wabasca rivers, which feed into the watershed.

## **What are the names of the major bodies of water?**

The largest body of water in the Peace/Slave River Watershed is Utikama Lake. Other sizeable lakes include Winagami Lake, Sturgeon Lake, Cardinal Lake, Musreau Lake, Bear Lake, and Snipe Lake.

## **Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.**

The vast majority of the Peace/Slave River Watershed is covered by boreal forest, and is characterized by a mix of coniferous and deciduous forests, mixed shrubs and wetland and riparian areas. A small part of the watershed lies within the Peace River Parkland Natural Region, which is a unique landscape featuring plants, animals and insects that are typically found much further south.

## **What are the largest towns/cities?**

Grande Prairie is the largest urban centre within the Peace/Slave River Watershed. The towns of Peace River, Fairview, Fort Vermilion and Grimshaw, as well as the Sturgeon Lake and Paddle Prairie Indian Reservations make up the remaining sizable population centres in the watershed.

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## Your Watershed Facts: **Peace/Slave River Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

The Peace River is roughly 1,923 kilometres in length and stretches from the head of the Finlay River, located in British Columbia, to Lake Athabasca. Water from the Peace/Slave River Watershed and the Athabasca River system then join to form the Slave River, which then travels almost 450 kilometres before draining into Great Slave Lake in the Northwest Territories.

**Where does the water in your watershed come from? Where does it flow to?**

The Peace River originates in the Rocky Mountains of British Columbia and flows to Alberta are influenced by the W.A.C. Bennett Dam, located on the Peace River in British Columbia. From B.C., the Peace River flows northeast across the Alberta, through the town of Peace River and empties into the Slave River. The Peace/Slave River basin is part of the Mackenzie River system (the 12th longest river system in the world!), which drains eventually into the Arctic Ocean.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Agriculture is one of the most significant industries in the Peace/Slave River Watershed, and nearly two-thirds of farms in the region raise livestock. In fact, it has been estimated that there are five times as many cows as people in the watershed! Forestry is another major economic driver, and nearly one-third of all timber harvested in Alberta comes from the Peace/Slave River Watershed. There are several pulp mills in the watershed which process raw timber into paper and other wood-related products. As in other watersheds in Alberta, oil and gas activity and seismic exploration is widespread within the region.

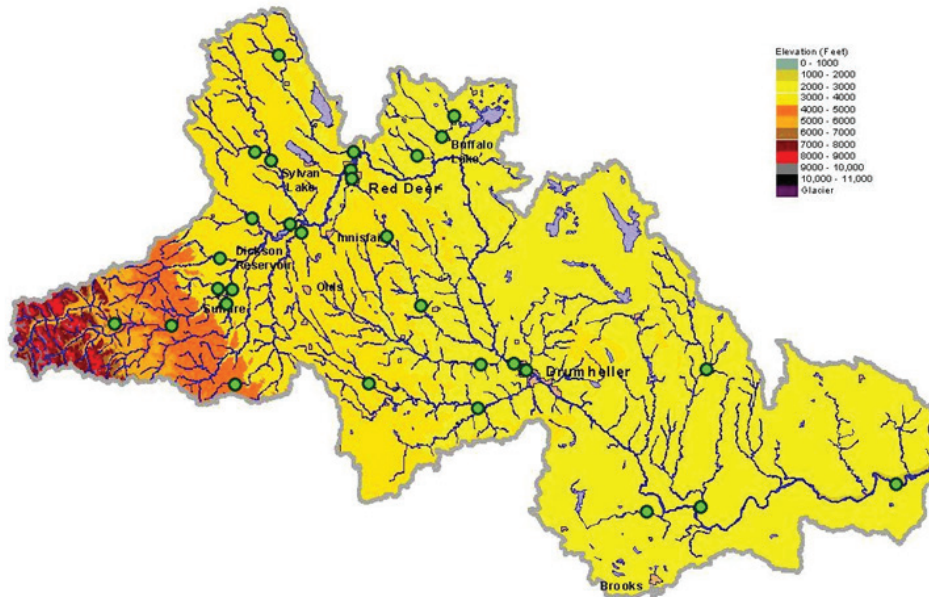


### **Did you know?**

Did You Know? The northernmost badlands in Alberta are the Kleskun Hills, which lie in the Peace/Slave River region.



# Your Watershed Facts: Red Deer River Watershed



## How big is your watershed?

The Red Deer River Watershed is the largest sub-watershed of the South Saskatchewan River Watershed, spanning approximately 49,650 square kilometres, or 8% of Alberta's land base!

## How many people live in it?

Roughly 267, 863 people call the Red Deer River Watershed home. The population of the Red Deer River Watershed is expected to increase by 40% over the next 25 years!

## What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.

The Red Deer River is fed primarily by snowmelt and precipitation and receives small amounts of seasonal glacial runoff. The Red Deer River is also fed by numerous freshwater streams and inflow from tributaries such as the Blindman and Medicine Rivers.

## What are the names of the major bodies of water?

Major bodies of water in the Red Deer River Watershed include Sylvan Lake, Gull Lake, Buffalo Lake, Sullivan Lake, Pine Lake, Gough Lake and Dowling Lake. Gleniffer Reservoir, also known as Gleniffer Lake, is also a sizeable water body within the watershed.

## Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.

The Red Deer River Watershed encompasses five natural regions including Boreal, Rocky Mountain, Foothills, Parkland and Grassland. Much of the Red Deer River watershed is dominated by wetlands, riparian areas and uplands, which are characterized by a mix of deciduous and coniferous trees, as well as grasses and shrubs. The Central Parkland Subregion is one of the most productive waterfowl areas; however, it is also the most heavily impacted natural region, with only 5% remaining in its natural state.

## What are the largest towns/cities?

The largest urban centres in the Red Deer River Watershed are the cities of Red Deer and Brooks, as well as the towns of Strathmore and Sylvan Lake. Other sizeable towns include Innisfail, Drumheller, Olds and Sundre.

[continued on next page](#)

## Your Watershed Facts: **Red Deer River Watershed**

**Does your watershed cross provincial/state/national borders? If so, what borders?**

From its headwaters in the Rocky Mountains, the Red Deer River flows east across Alberta to join the South Saskatchewan River near the Alberta-Saskatchewan border. The South Saskatchewan River forms part of the Nelson River system, which eventually drains into Hudson Bay.

**Where does the water in your watershed come from? Where does it flow to?**

The Red Deer River Watershed originates in the Canadian Rocky Mountains in Banff National Park near Lake Louise. The river flows northeast and then southeastward for 724 km, where it enters the South Saskatchewan River at a point 8 km across the Saskatchewan border.

**What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Agriculture is the primary industry within the Red Deer River Watershed, with around 43% of the land in the watershed dedicated to raising crops such as canola, barley, alfalfa, and spring wheat. Other industries and commercial ventures within the watershed include bottling and food processing plants, fertilizer plants, manufacturing facilities, mining and forestry-related facilities, golf courses, and aggregate washing facilities for the construction industry.

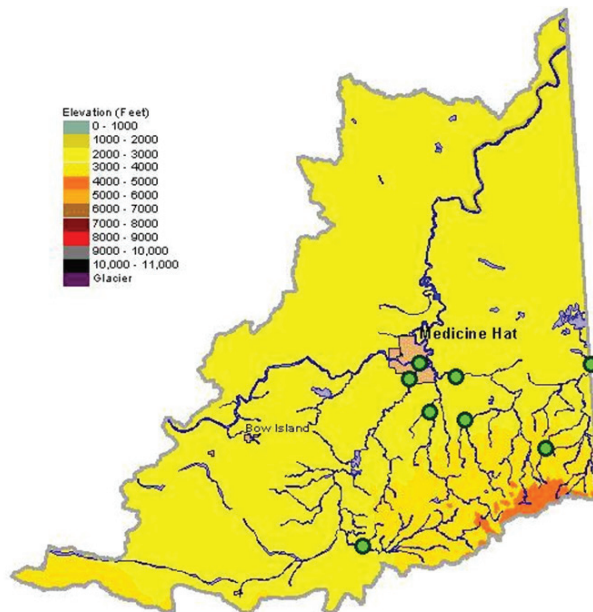


### **Did you know?**

The river got its name from the translation of Was-ka-soo which means “elk river” in Cree. Early fur traders in the region mistranslated the Cree name as “Red Deer River” and the name stuck!



# Your Watershed Facts: South Saskatchewan River Watershed



## How big is your watershed?

In Alberta, the South Saskatchewan River Watershed covers an area of approximately 121,085 square kilometers. The South Saskatchewan River Watershed also includes the sub-basins of the Bow, Red Deer, Oldman and South Saskatchewan rivers. The combined watershed of the four basins is 121,095 square kilometres, of which 41% is the Red Deer sub-basin, 22% is the Oldman, 21% is the Bow, and 16% is the South Saskatchewan. Just counting the area of the South Saskatchewan River Sub-basin, the land base is approximately 14,000 square kilometers.

## How many people live in it?

Approximately 66,000 Albertans call the South Saskatchewan River Sub-basin home. (Note: This figure does not include the population of Calgary, Red Deer or Lethbridge, which are discussed in their respective watersheds.)

## What are the main sources of water? i.e. rivers, lakes, aquifers, rainwater, glaciers.

The primary sources of water in the South Saskatchewan River Sub-basin are precipitation and inflow from small streams and tributaries rising on the slopes of the Cypress Hills.

## What are the names of the major bodies of water?

Major water bodies within the South Saskatchewan River sub-watershed include Pakowki Lake, Milk River Reservoir and Many Islands Lake. Other sizeable bodies of water include Elkwater Lake in the Cypress Hills, as well as St. Mary's Irrigation District, which is a large system of canals and pipelines that bring water to southeastern parts of the province.

## Describe the land. i.e. desert, rocky, mountains, prairies, hills, forests, swamps, wetlands.

The South Saskatchewan River sub-watershed is part of the Prairie Pothole Natural Region, which is characterized by wetlands and shallow lakes that formed in depressions left by retreating glaciers during the last Ice Age. The Prairie Pothole Region is one of the most important North American migration habitats for waterfowl breeding in the Boreal Forest and Arctic such as lesser scaup, wigeon, green-winged teal, Canada geese and snow geese.

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# Your Watershed Facts: **South Saskatchewan River Watershed**

## **What are the largest towns/cities?**

The largest urban centre in the basin is Medicine Hat, with approximately 60,000 residents calling the city home. The towns of Redcliff and Bow Island, as well as the village of Foremost and CFB Suffield comprise other sizeable population centres.

## **Does your watershed cross provincial/state/national borders? If so, what borders?**

The South Saskatchewan River sub-watershed starts below the confluence of the Bow and Oldman rivers and drains the area east to Saskatchewan. The main stem of the South Saskatchewan River ultimately makes its way to Hudson Bay.

## **Where does the water in your watershed come from? Where does it flow to?**

The South Saskatchewan River basin originates in mixed grasslands at the confluence of the Bow and Oldman rivers. The sub-basin comprises the river reach of the South Saskatchewan River and its associated drainage area. The South Saskatchewan River flows east to Medicine Hat then turns northeast to the Saskatchewan boundary.

## **What are some of the main businesses in your watershed? i.e. Agriculture, Manufacturing, Oil and Gas, Recreation and Tourism.**

Within Alberta, agricultural is the primary industry in the South Saskatchewan River sub-watershed, accounting for nearly 80% of the basin's land base. Oil and gas is also a major industry, with thousands of oil and gas wells operated within the region. Canadian Forces Base Suffield, covering some 2,700 square kilometers offers one of the largest live-fire training areas in North America for military use.



## **Did you know?**

The Cypress Hills within the South Saskatchewan River Watershed are a drainage divide – a landform around which rivers flow.





# Project Examples

Stumped about what project to tackle? Here are some suggested topics to get you started:

- Shoreline cleanup of a river or lake in your watershed
- Reducing water consumption in your watershed
- Planting trees and wetland plants to improve riparian health
- Removing invasive plants (such as purple loosestrife) in your watershed.
- Trail project highlighting the importance of water and watersheds in your community.
- Working with local farmers to prevent manure run-off or shoreline trampling by livestock.
- Composting program to reduce organic waste and improve soil health.

## Need more inspiration? Here are some real project examples submitted by 4-H members just like you!

### Green is Great

**Sierra Harty**, from Erle River High School, won first place at the 2010 Caring For Our Watersheds (CFW) Grade 7-9 Division.

Sierra had noticed the deterioration of the riverbanks leading to the water at popular canoe entry sites along the Milk River. After consulting with the County of Warner, she determined that a pathway made up of crushed gravel and highlighted by signs would direct the flow of recreational users to stay on the path.

Sierra created three trail signs, and worked with the County of Warner and Milk River Watershed Council of Canada (MRWCC) to develop key messages for each of the trail signs. Sierra also worked on the trail sign site logistics for relevant placements on the path.

The crushed gravel pathway, as well as the strategic placement of the signs that Sierra created, helped to direct the flow of traffic in and out of the river at two high traffic spots: Poverty Rock and Coffin Bridge. By keeping the recreationists stay on the path, it helps minimize the deterioration of the river banks.





## Protecting Alberta's Cottonwoods

4-H member **Jalen Hulit** from Erle River High was in the finals for the Grade 7 -9 Division of the 2010 Caring for our Watershed (CFW). Jalen had observed that cattle grazing and drinking along the banks of the Milk River were causing erosion of the riverbank. Jalen's project idea to improve the health of his local watershed was to wrap wire around the base of 50 young cottonwood seedlings to protect them from being trampled or browsed by livestock and people. This would help control erosion and improve the riparian health along the banks of the Milk River, as well as make the banks of the river stronger, thereby reducing erosion in vulnerable areas. The project was completed June 25th, 2011. About 30 cottonwood trees were wrapped. Jalen plans to continue wrapping trees and seedlings as needed to ensure the long term health of the cottonwoods and riparian areas along the river.



Construction material was donated by Alberta Conservation Association (ACA). Milk River Watershed Council of Canada (MRWCC) assisted in the implementation, as well as many volunteers to help in wrapping the cottonwood trees.

## Riffle Crossing for Cattle

Growing up on a cattle farm, situated in a valley with a creek meandering through it, **Kendra Elliott** is familiar with the idea of livestock crossing through the water. With this, also comes the knowledge of the controversy surrounding the concept of farm animals being allowed in waterways. She proposed a structure called a Riffle crossing that is "positive for the environment, the farmers, and the animals".

Riffles are naturally occurring structures that are created when various rocks, stones, and gravel are present on the bed of a short section of shallow stream. By allowing livestock to cross over it, it becomes a riffle crossing. The rocky bed creates resistance, resulting in a lower velocity water flow, helping to reduce the severity of erosion and allowing sediment to settle. The tumbling of the water over the rough surface also increases the turbulence, aerating the water, resulting in a healthier aquatic environment.



A student at Virden Collegiate, Kendra won first place at the Manitoba Caring for Watersheds Competition. Her extensive knowledge on the topic of riffle crossings, as well as her excellent presentation skills, were instrumental in helping her win the CFW contest. With funding from Nutrien, Kendra was able to start implementing her project. Working with the West Souris River Conservation District, a plan was established to install a riffle crossing near Cromer, Manitoba. The Conservation District provided the work in kind and the materials and equipment needed was provided through a generous grant of \$8,000 made possible by Nutrien.

"This riffle crossing will help improve the health of the Pipestone Creek, downstream to Oak Lake. This beautiful valley and creek is where I've grown up – it is home. Hopefully projects like these will help maintain that natural appeal for many future generations to come. Even the riffle crossing adds aesthetic value. The easiest way to explain it is that it's a happy place - watching and listening as the water tumbles over the rocks. It makes me proud to know that I was involved in making this happen."



# Project Activities

The following activities are designed to meet 4-H project learning objectives, while encouraging students to discover more about their watershed in a fun and interactive way. All activities can be modified for different age groups and can be completed individually or as part of a larger club activity.

## Project 1: Get To Know Your Watershed: A Geocaching Activity

### Activity Overview

The goal of the Get to Know Your Watershed activity is to encourage students to learn more about their local watershed and use geocaching to explore the importance of clean and safe water. Members will research their local watershed and work towards developing stories or information pamphlets about their watershed, and will also create items known as “trinkets” or “treasure” that will be used to build geocaches.

After creating their information pamphlets and items, members will then strategically hide these geocaches for the geocaching community to discover. This will allow them to share their watershed stories and help educate others about watersheds in a fun and engaging way.



### Description of Activity

Geocaching is an outdoor activity that is similar to a scavenger hunt. The goal of the activity is to find hidden containers known as caches or geocaches using a handheld satellite navigation device called a Global Positioning System (GPS) receiver. Individuals who take part in this activity (generally referred to as cachers or geocachers) place a cache in an outdoor location and post the cache’s latitudinal and longitudinal coordinates on the Internet. Other geocachers then use their GPS devices to download the coordinates and cache descriptions from the Internet in order to find the caches. Once the participant has found the cache, they may log their findings on the Internet.

There are several different types of caches. Physical caches typically consist of a sturdy, weatherproof box with a logbook, pencil, and trade items (small objects left in the caches for geocachers to trade with one another – e.g. toys, key chains, etc.) left inside the box. Another type of cache is an earth cache, which highlights an area’s unique natural features. More information regarding different types of caches and geocaching in general can be found at:

- [www.geocaching.com](http://www.geocaching.com)
- [www.earthcache.org](http://www.earthcache.org)
- [www.geocaching-qc.com](http://www.geocaching-qc.com) (Available in French Only)



## Project Checklist

This activity can be completed individually or in small groups. If working in a group, make sure that each team member has the opportunity to practice using the GPS device.



- Find out what watershed you live in. You can use the internet to do a search. A good website for this exercise is: <http://www.environment.alberta.ca/apps/basins/>
- Once you have determined what watershed you live in, spend an hour or two researching your watershed. How big is it? What are the major rivers or lakes located in it? Are there any special plants or animals found within watershed boundaries? Record your information, as you will use it to help you tell your watershed story.
- Using your research, create an educational information pamphlet that tells the story of your watershed. What would you like other people reading it to know about it? You can use drawings to help illustrate your pamphlets if you wish.
- Create a trinket that will be placed inside your geocaching box, if you plan to use them. You can also use a purchased item that you feel represents your watershed. What items you place in the cache are entirely up to you, so be creative!
- Global Positioning System (GPS) receiver such as Garmin (1 per group). If you cannot obtain a GPS, you can also download a free GPS app for a smartphone at: <http://www.viewranger.com/en-gb>
- Sturdy waterproof container to use as your geocache box. Tupperware containers with tight-fitting lids work well.
- Place your information pamphlet, trinkets, logbook and pencil, as well as any other items you feel should be included inside your cache.



## Research Questions

Here are a few questions to help guide you in your watershed research. Remember that your goal is to share your knowledge about your watershed with others. Not everyone may know what a watershed is, so you might want to start off by learning some watershed basics.

- What is a watershed? Are there any other terms used to describe watersheds? Hint: watersheds can also be referred to as river basins.
- Why are watersheds important to human health and to the health of natural ecosystems?
- What are the main uses of water in your watershed? For example: agriculture, hydroelectric power generation, recreation.
- What are some of the challenges that your watershed is facing? For example: drought or flooding.
- Draw a map or a picture of your watershed. This is a great way of helping people understand the size and scale of your watershed.

## Stashing Your Cache

There are a number of rules that you will need to follow when deciding where to place your geocaches. It is important to consider their placement very carefully, in order to ensure that all caches are placed in a location that is safe for members and the general public to access and does not disturb any sensitive wildlife habitat.

Geocaching.com offers an excellent introduction to hiding your first geocache. It is available online at: <https://www.geocaching.com/about/hiding.aspx>

Once you have placed your geocaches, you will need to record their location using your GPS device. Your next steps are to register your caches on [www.geocaching.com](http://www.geocaching.com) so that other geocachers will know where to look for them. Follow all the steps outlined on the geocaching.com website and enter all your information. Then make your geocaches “live”! Be sure to check back and see who has found your caches.

References: <http://www.pc.gc.ca/docs/pc/guide/geocache/geocache1.aspx>

*Note: Geocachers are also encouraged to visit the Leave no Trace website at <http://www.leavenotrace.ca>. This website offers helpful principles for planning safe and environmentally respectful outdoor recreation activities.*



## Project 2: Build a Nestbox

### Activity Overview

This project encourages members to build nestboxes to attract wildlife to natural areas or farms, and to provide shelter and important nesting habitat for birds, bats and waterfowl. Members are encouraged to monitor the use of their nestboxes during the breeding season and will discover how to keep accurate records on each nestbox while learning about Alberta's birds and their habitat.

Members will learn more about managing wildlife and the balance of nature by researching the biology and habits of bluebirds, then building and installing nest boxes to attract the species. Adult assistance and supervision is recommended for this project, as it does involve the use of power tools and sharp implements.

### Why nestboxes?

In the spring, some species of birds, such as robins, build an open nest, but others prefer to nest in hollow cavities in decayed trees or stumps. Cavity-dwelling birds, like wood ducks, chickadees, bluebirds and woodpeckers will substitute a nest box for a tree cavity. In many areas of Alberta, natural nest sites have disappeared as weakened or dying trees are removed from our landscape. Depending on other attributes in your landscape, providing an appropriately sized nest box may help attract some bird species to your yard. You can successfully attract birds by building an inexpensive, simple, six-sided box. Whatever the design or material used, the boxes must be strong, weatherproof, and securely fastened. Single-compartment nest boxes are the easiest to build and the most frequently used by birds. When you are building the box, be sure to allow easy access for cleaning and occasional observations. You can use the same basic box design for all species. Instructions on how to construct your nest box are listed below.



### Tips to improve the nesting of these species:

**Wood Ducks, Buffleheads and Mergansers** prefer a nest box near (or standing in) water. The young leave the nest within 48 hours of hatching by climbing up from the floor to the entrance hole and tumbling to the ground. Horizontal sawcuts or a piece of hardware cloth stapled to the inside wall between the floor and the entrance are essential for these species.

**Chickadees** prefer their nest boxes to be located close to shrubs or bushes. They are very territorial and will not tolerate any other chickadees in the vicinity of their nest.

**Mountain Bluebirds** may attempt a second nesting during the breeding season and would benefit from the chance to lay their next clutch in a second box.

### What type of wood should you use?

Cedar wood is recommended for use in this project because it is naturally resistant to insects and weather. But you can also use other materials such as pine or plywood to construct your nest boxes.



### Project Checklist

To make one nest box, you will need the following supplies:

- 1/4 sheet (2' x 4') 1/2" cedar lumber or outdoor grade plywood.
- 1" x 2" (0.75" x 1.75" finished) x 8' pine lumber (this is known as a furring strip).
- 20" x 22 1/2" of 1/8" plastic mesh
- 30 to 40 1 and 1/4" multipurpose drywall screws
- 5/16" staples
- 1 tube of acrylic caulking, such as Mono
- 1 quart of exterior latex paint

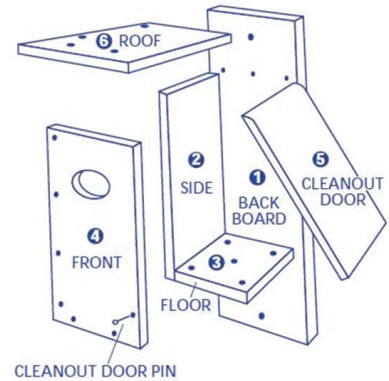
You will need the following tools to construct your nestbox:

- Table saw (should only be operated by a qualified adult)
- Caulking gun
- Power drill
- Phillips drill bit for drywall screws
- Staple gun
- Tape measure
- Paintbrush



## Construction Procedure

1. Measure and cut plywood into three pieces: 26.5" x 24" 16.5" x 24" 5" x 24"
2. Measure and cut furring strip into one 24" and two 20 1/4" pieces.
3. Screw back to furring strips, caulking first. Start with 24" piece at top.
4. Staple the netting to inside surface of back, starting at the bottom. Be sure netting lies flat and does not pucker.
5. Screw front to furring strips, top piece first (don't forget to caulk along the edges). Leave 1/2" vent space between top and bottom front pieces.
6. Caulk around outside joints if needed to seal the roosting chamber.
7. Attach a 4" x 28" board to the top for a roof if desired.
8. Paint the exterior at least twice to ensure an even finish.
9. Depending on the species of waterfowl or birds in your area, you may also need to add wood shavings to the bottom of your nest box so that the birds have someplace soft to lay their eggs.



## Where to Place Your Nestbox

Now that you've completed construction of your nest box, you need to consider where to install it. Be sure to place the box in a location that will be convenient for monitoring and annual maintenance.

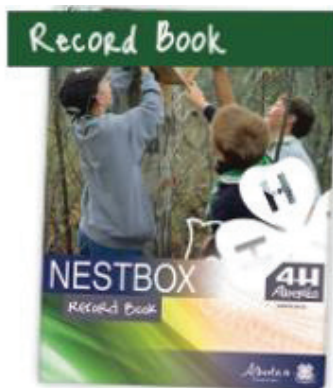
To increase the chances of your nest box being used by waterfowl, it should be located in an area that is attractive to cavity nesting ducks. You'll see these birds using wooded wetlands that contain water year round or, at least, throughout the summer. You'll also see them using trees along riverbanks and lake shorelines.

## Nest box maintenance and monitoring

Once a cavity nesting bird starts using your box, you'll likely see many young waterfowl, known as broods, raised over the years. Nesting sites for these birds are limited in number. When they find a good nesting site, there is a very good chance they'll return in following years. When you put up a nest box you are committing yourself to maintaining that box. Fall and winter are the best times to remove old nesting material, tighten any loose screws and mounts, and add new wood shavings.

If you don't have any ducks using your box over the summer, don't worry. Waterfowl biologists have seen waterfowl migrating in the fall scope out potential nesting sites for next spring. This too is a good reason to keep your boxes in top condition. You never know when somebody might be popping in!

*This information has been compiled from the Nest Box Guide for Waterfowl by Ducks Unlimited Canada (DUC) and the Canadian Wildlife Service, Environment Canada and is intended to complement the 4-H Nestbox Record Book.*



## Project 3: Make a Model Watershed

### Activity Overview

Most watersheds are massive in size and scale. This activity is designed to help members learn more about how processes in their local watershed work through the construction of their own model watershed.

4-H members can work in teams to construct a model watershed.



### Project Checklist

Each group of members will need the following items:

- A large bucket
- Different coloured felt markers.
- Food colouring (blue and green)
- Aluminum foil
- A watering can
- A spray bottle
- 4 Litres of water
- A shallow washbasin or dishpan. You can also use a disposable aluminum roasting pan.
- Small rocks (such as pea gravel), larger rocks, various sizes of wood, and/or boxes.
- Notepad and pen or pencil to record observations.



### Next Steps

1. Take the washbasin and place the different sizes of rocks, wood, or boxes to create a mountain on one side of the basin-make sure that the materials are higher on one side of the basin than the other.
2. Cover the rocks with aluminum foil and push it down to secure it and create a miniature “landscape” in your washbasin. Make sure the edges of the foil remain inside the basin or else you will have a lot of water to clean up. Your model may look a bit lumpy, but don’t worry, that’s part of the fun!
3. Once you are happy with the placement of your foil, make different folds, rivers, ridges and valleys to give your “rainwater” a place to flow down different paths.
4. Use a blue marker to draw the lines of where you believe the main rivers will flow. You can also draw features such as rocks and trees onto your model to make it more realistic.
5. When you are satisfied with how your model looks, and your 4-H leader gives you the go-ahead to proceed, fill the spray bottle with water and add a few drops of blue food colouring to tint the water to represent rain. Fill the watering can with water, and add a few drops of green food colouring to represent the regular river flow. Have one person in your group spritz the water from the spray bottle over the model to make it “rain” over the landscape of your watershed, while another person pours “river water” from the highest point of your watershed.
6. Watch what happens when it rains. Where does the water go? Write down your observations.
7. Once each member has had a chance to observe what happens to the water in your watershed, remove the foil from the rocks, remove the rocks from the washbasin and empty the “rainwater” into a bucket.





### Observations

- What happens when it begins to rain?
- How do streams form?
- Where do you notice streams forming?
- Where does the “rainwater” end up after the rainstorm?

### Discussion

- What caused the water in your watershed to flow in a particular direction?
- What happened to your main river as other streams joined it?
- If this were a real watershed, where does your group think all the water would end up after a rainstorm?
- Try to make different watershed configurations and observe how the water flows.
- What do you think would happen if there was a flood in your watershed?

*(Adapted from National Geographic water education modules)*



## Project 4: Watersheds and the Urban/Rural Interface

### Activity Overview

Human uses and impacts on water quality and quantity differ in some significant ways in urban and agricultural areas, yet both share the same watershed. Understanding the urban/rural interface is important to understand how human activities from both urban and agricultural areas can have a multiplying effect on the environment. In this activity, youth will create a simulated watershed and observe how pollution from urban and agricultural areas mix.

### Time Required

Approximately 20 minutes



### Project Checklist

- One (1) roll of aluminum foil (18-inch width)
- One spray bottle per group
- Flip chart paper and writing implements
- A variety of different coloured water-soluble markers per group (at least two per group).

### Before You Begin

- Cut a piece of aluminum foil for each group that measures approximately 18" x 18".
- Fill the spray bottles with water.
- Divide the youth into four groups of 3-4 individuals.
- Provide each group with 1-2 sheets of flip chart paper and writing implements.
- Provide each group with watercolour markers. Make sure each group has two different colours.

### Opening Questions/Prompts

Ask the youth to share their answers to these questions either verbally or by recording their responses on the flip chart paper provided.

Explain what you know about different ways that water is used by humans who live in agricultural areas.

- a. Explain what you know about different ways that water is used by humans who live in urban areas.
- b. Discuss ways in which urban water use is similar to agricultural water use. Discuss ways they are different.
- c. Discuss the types of pollutants you think might be present in urban and agricultural areas. How do you think they might be similar? How do you think they might be different?

### Procedure

1. Explain to the youth that the foil represents a large piece of land. Each square inch of the aluminum foil represents 10 square kilometers.
2. Instruct the groups to draw a line down the center of the foil using one of their markers.
3. Using one of the water color markers, draw pictures that depict an urban setting on one side of the piece of foil. Using the other water color marker, draw pictures that depict an agricultural setting on opposite side.
4. Have each group loosely crumple their piece of aluminum foil and then gently pull out all four corners of the square. This should return the foil to its approximate square shape, but still allow for the foil to have some "peaks and valleys" that represent different land forms.
5. Using a spray bottle to simulate rain, have the youth gently spray their foil. Spray water on the foil from a distance of approximately 10-12 inches above the foil. Spray the foil approximately 10 times consecutively to simulate a rain storm.
6. Instruct the youth to record their observations and make comparisons with other groups.



### Sharing and Observing

Follow the lines of thinking developed by the youth as they share and compare their thoughts, observations, and procedures; if necessary, use more targeted questions or prompts to get to particular points. Specific questions might include:

1. Ask the youth to explain what happened when they sprayed their “land” with water.
2. Discuss the significance of the flow of water through their “land” with respect to the “urban” and “agricultural” areas they identified.
3. Discuss ways you think the movement of water across your land might impact the potential mixing of pollutants from urban and agricultural areas.

The goal is to have the youth develop concepts through their own exploration and define terms using their own words.

*Adapted from 4-H There's No New Water Module 3*



## Project 5: Just Filter It: How does soil help filter water?

### Activity Overview

4-H members will participate in a hands-on activity designed to illustrate the value of soil to filter, clean and store water. It is recommended that members are paired up in groups for this activity if possible, but it can also be completed individually. This activity will take approximately 45 minutes to 1 hour to complete.



### Project Checklist

#### Per Team

- 2 funnels (cone-shaped paper cups could be used)
- Paper coffee filters (cut two 5cm squares of “fabric” from the filters)
- ½ cup each of dry, clean sand and dry soil (not potting soil)
- 4 cups in which the funnels will be placed
- 3 cups of water
- 3 cups of prepared Kool-Aid drink mix
- worksheet or notebook to record observations

### Instructions

#### Step I – Creating the Filter System

1. Place the filter paper in the base of the funnel (if using cone-shaped paper cups, cut the tip off the cup), twist the paper through the funnel opening and having the paper also extend below the funnel (will help block the sand/soil).
2. Place the funnel in the cup (the cup will collect the liquid once poured)
3. Place ¼ cup of sand in one of the funnels and ¼ cup of soil in the other.

#### Step II – Creating the Plain Water Filter

1. Using the worksheet, record assumptions as to what will happen when the water is poured through each filter.
2. Measure two ½ cups of water.
3. At the same time, pour the water into each of the funnels.
4. Observe the speed of infiltration, noting any differences between the sand and the soil.
5. Once the water has seeped through the funnel, measure how much has been collected, noting any differences between the sand and the soil.
6. Update observations on worksheet.

#### Step III – Filtering Contaminants

1. Use the same materials (funnels/cups), removing the water from the cups.
2. Record assumptions as to what will happen when the grape drink is poured through each filter.
3. Measure two ½ cups of grape Kool-Aid drink mix.
4. At the same time, pour the grape drink mix into each of the funnels.
5. Note any differences in the colour of the liquid in the cup as well as the amount of time it takes to move through each filter.



### Observations/Discussion

- Based on what you observed, can you think of some situations where a sandy soil would be ideal? Why is it not always ideal?
- What happens when the water is poured too quickly? What does this mean for a field? For a slope?
- For the Plain Water Filter: As you pour the water, which medium is faster?
- What is happening to the water initially when poured on the dry soil/sand?
- Are there any differences in the amount of water that is collected? (The sand should have more water seep through.)
- How can you tell that there is moisture in the soil? Is there any difference in the soil when it is dry?

*Adapted from: Oregon Agriculture in the Classroom Foundation, Water Filtering & Soil.*  
[www.aitsc.oregonstate.edu](http://www.aitsc.oregonstate.edu)

## Project 6: Just Go With It!

### Activity Overview

This fun and interactive water relay race will put 4-H members' skills to work, while also helping members learn about the value of water conservation. Divide the members up equally into two teams. This relay race will take about 30 to 60 minutes to complete, depending on the number of people taking part.



### Project Checklist

- Two empty plastic or metal buckets
- Water
- Three sturdy place markers such as rocks or traffic cones that will not easily blow away
- A large field, park, or other suitable open space to play the game
- Three signs that read "Spin Cycle", "Shower", and "Leaky Faucet".
- A pair of dice
- Two ceramic coffee cups
- 2 plastic water bottles. Cut the neck of the bottles off and cut a small hole in the bottom of the bottle.
- A watch with a timer function. Or you can also use a cell phone with a timer.

### Next Steps

1. Fill the two buckets with equal amounts of water. Then place the empty buckets at the far end of the playing field.
2. Take the three place markers and evenly space the markers between the two buckets and attach one of the signs to each of these stations. Place the cup with the hole at the station marked "shower". Place one of the ceramic cups inside each bucket of water.
3. Have each team roll the dice. Team members will go through the stations one at a time doing each activity the number of times they rolled on the dice. Once the player gets to the empty bucket, he or she will dump their water into the bucket and run back to hand the cup to the next person on their team.

### How to Play

The objective of the water relay race is to get as much water as possible from the full bucket to the empty bucket at the other end of the playing area. Form two teams and have them line up behind one of the buckets of water. To increase the level of difficulty, enforce the rule that players are not allowed to cover the top of the cup they are using to transport water during the game. Decide how long you would like your game to last (for example 15 minutes) and choose one person to be the timer. Before the game begins, have each team member roll the dice and remember their number – this is how many times the player will need to complete the activity at each station.

#### Station 1: The Spin Cycle

At this station, you will need to spin in a circle just like a washing machine would. The higher the number you rolled on the dice, the more laundry you will do and the more you will spin around! For example if you rolled a five on the dice, you must spin around five times.

#### Station 2: The Shower

At this station, dump the water left in your cup into the cup with the hole in the bottom and then catch the water back in your original cup. Every pour represents a 10 minute shower. So, for example, if you roll a five on the dice, switch the water between the cups five times because you took a 50 minute shower.

#### Station 3: The Leaky Faucet

At this station you must hop on one foot for every 100 drops of water that gets wasted down the drain because of a leaky tap. So if you roll a five on the dice, you must hop on one foot 5 times because you lost 500 drops of water. After completing all three stations, place the water left in your cup into the empty bucket. Then run back to the start and pass the cup to the next team member. Have them fill it up and start the relay again, running through each of the three stations.







## Observations/Discussions

At the end of the game, see which team managed to get the most water safely though the day and who managed to fill up the empty bucket. You may notice that the people who did less laundry, took shorter showers and had taps that leaked less also seemed to get more water to the end of the relay race! The same is true in real life. What other ways can your team think of to conserve water? See if you can make some small changes during your daily routine to help with water conservation at home.

*Adapted from Go with the Flow, Conserve H2O- Ontario Ministry of Environment*

Encourage members to **explore** their land and local area to **understand** the good, the bad and the ugly. If they have a **realistic idea** to make an improvement, **we can make it happen!**



# Assessment Tool

After completing the activities outlined in the Student Workbook and accompanying Leader's Guide, members will be able to:

- ✓ Describe basic concepts such as watershed, aquifer, and basin
- ✓ Develop a general understanding of the interrelationships between land and water, as well as the role human activities play in watershed health in Alberta
- ✓ Describe the known industrial activities and potential environmental impacts taking place within their local watershed
- ✓ Develop the tools to examine the condition, and the reasons for that condition, of their local watershed
- ✓ Identify, research and investigate an issue of concern in their local watershed
- ✓ Assess a variety of positions on controversial issues
- ✓ Design and implement strategies to address community/regional/provincial problems or projects
- ✓ Compare ways of solving problems with other 4-H members
- ✓ Improve research and proposal writing skills
- ✓ Improve communication and public speaking skills
- ✓ Apply creative problem solving and innovative thought and actions, both independently and as part of a larger group
- ✓ Predict possible problems associated with choosing a particular solution or courses of action around the issue being investigated
- ✓ Plan and implement a course of action that addresses the problem, issue or inquiry initially identified, either independently or as part of a larger group
- ✓ Use a variety of media styles to effectively present information



# Glossary of Terms

## **Aquatic Ecosystem**

An aquatic area where living and non-living elements of the environment interact. This includes the physical, chemical, and biological processes and characteristics of rivers, lakes, and wetlands and the plants and animals associated with them.

## **Aquifer**

An underground water-bearing formation that is capable of yielding water. Aquifers have specific rates of discharge and recharge. As a result, if groundwater is withdrawn faster than it can be recharged, the underground aquifer cannot sustain itself.

## **Basin**

A basin is an area of land where surface water from rain and melting snow or ice converges to a single point, usually the exit of the basin, where the waters join another water body, such as a river, lake, reservoir, estuary, wetland, sea, or ocean. Other terms that are used to describe a drainage basin are watershed, catchment, catchment area, catchment basin, drainage area and river basin.

## **Biodiversity**

A measure of the number and variety of different species found in an ecosystem. Biodiversity can also refer to the genetic variation within species, as well as the diversity of global ecosystems.

## **Biome**

Natural region characterized by major communities of plants and animals with similar requirements or environmental conditions. Examples include the Boreal Forest and Rocky Mountains.

## **Bog**

A wetland characterized by peat deposits, acidic water, and extensive surface mats of sphagnum moss. Bogs receive their water from precipitation rather than from runoff, groundwater, or streams, which decreases the availability of nutrients needed for plant growth. A bog is also referred to as muskeg or peatland.

## **Chinook**

A warm dry wind blowing down the eastern slopes of the Rockies.

## **Community**

A collection of all living and non-living organisms in an ecosystem, including plants, animals, fungi and bacteria.

## **Confluence**

A confluence is the meeting of two or more water bodies, and refers either to the point where a tributary joins a larger river, or where tidal or other non-riverine bodies of water meet.

## **Coniferous**

Cone-bearing trees, such as pines, spruces, firs; which are usually evergreen. Notable exceptions include tamarack and larch.

## **Deciduous**

Broad-leafed trees, such as aspen and maple, which shed their leaves every autumn.

## **Fen**

A wetland characterized by slow internal drainage from groundwater movement and seepage from upslope sources. Fens are characterized by peat accumulation, but due to the seepage of nutrient-rich water, fens are typically less acidic and more nutrient-rich than bogs.

## **Groundwater**

All water under the surface of the ground whether in liquid or solid state. It originates from rainfall or snowmelt that penetrates the layer of soil just below the surface. For groundwater to be a recoverable resource, it must exist in an aquifer. Groundwater can be found in practically every area of the province, but aquifer depths, yields, and water quality vary.

# Glossary of Terms

## **Headwaters**

The source and upper tributaries of a river or stream.

## **Hydrologic Cycle**

The process by which water evaporates from oceans and other bodies of water, accumulates as water vapor in clouds, and returns to oceans and other bodies of water as rain and snow or as runoff from this precipitation or groundwater.

## **Invertebrate**

An animal that lacks a backbone. Examples include arthropods, insects and sponges.

## **Marsh**

A type of non-stagnant, shallow wetland which usually remain covered with water year-round.

## **Natural Region**

A natural region is a large ecological unit that combines similar climate, topography, geology, vegetation and wildlife.

## **Non-native Species**

Exotic species not native to a particular region; many alien species are invasive and out-compete native wildlife or plants. Examples of alien species include purple loosestrife, zebra mussels and dandelion.

## **Peatlands**

Are wetlands with at least 40 cm of peat. Peat is made up of partially decomposed plant remains – usually from mosses and grass-like plants called sedges. Peatlands provide several ecosystem functions such as water quality improvement, water storage, runoff and stream flow regulation, and habitat for many wildlife species.

## **Riparian Zone**

Riparian zones are those areas that surround water bodies in the watershed and are characterized by moist soils, water-loving plant species and their associated ecosystems. Riparian zones act as important protective buffers for many species of animals and fish.

## **Reservoir**

A large natural or artificial lake used as a source of water supply.

## **Swamp**

A type of flooded wetland characterized by standing trees.

## **Surface Runoff**

Surface runoff is water, from rain, snowmelt, or other sources, that flows over the land surface, and is a major component of the water cycle.

## **Surface Water**

Natural water that has not penetrated much below the surface of the ground. This includes rainwater, groundwater and spring water.

## **Sub-basin**

Refers to a smaller basin, or watershed, within a larger basin.

## **Tributary**

A stream or river which feeds into a larger river or lake.

## **Watershed**

A watershed (or basin) is the area of land that catches snow and rain and drains it to a larger body of water, such as a marsh, lake, stream or river. Topography defines the entire watershed, as it shapes the course and speed of water moving through the area. Other terms used to describe a watershed are drainage basin, catchment basin or area, and river basin.



# Additional Resources

## Web Resources

### Alberta Environment:

Publishes a variety of teacher and student resources on water from Grades K-12.

[environment.gov.ab.ca/edu/homeEd.asp](http://environment.gov.ab.ca/edu/homeEd.asp)

### Athabasca Watershed Council Interactive Watershed Atlas

An excellent cartographic illustration of the Athabasca Watershed.

[www.fieragis.com/awcatlas/](http://www.fieragis.com/awcatlas/)

### Battle River Watershed Council Interactive Watershed Atlas

Find out what makes the Battle River such a unique river in Alberta.

[www.battleriverwatershed.ca/maps-data/items](http://www.battleriverwatershed.ca/maps-data/items)

### Bow River Basin Web-based State of the Watershed Tool

The WSOW tool is an online, interactive and adaptive watershed management tool.

[wsow.brbc.ab.ca](http://wsow.brbc.ab.ca)

### Caring for our Watersheds

Features a number of resources to help engage students in preserving and improving their local watersheds.

[www.caringforourwatersheds.com](http://www.caringforourwatersheds.com)

### Ducks Unlimited Canada: Take Action Booklet

This resource booklet gives you inspiring examples and step-by-step ideas on activities, from beginner to advanced, to take action.

[www.ducks.ca/assets/2012/06/TA-English-booklet-single-page-Sept-2012-for-screen-lo-res.pdf](http://www.ducks.ca/assets/2012/06/TA-English-booklet-single-page-Sept-2012-for-screen-lo-res.pdf)

### North Saskatchewan River Watershed

Download a series of fact sheets and fun facts about water in the North Saskatchewan Basin.

[www.nswa.ab.ca/content/resources?resourceType=27](http://www.nswa.ab.ca/content/resources?resourceType=27)

### Wetlands Alberta

Features a wealth of information and resources available from numerous organizations across the province to help teachers and students learn about wetlands.

[wetlandsalberta.ca/educators-students](http://wetlandsalberta.ca/educators-students)

## Print Resources

### The Living Flow: Water in Alberta: Poster

This resource was created for students grades 7-9. Topics dealt with in this resource are water sources, water usage, water conservation and management in Alberta.

### Available from Alberta Environment: Facts About Water In Alberta

An informative booklet describing Alberta's water supply, water quality, aquatic ecosystems, uses of water and water management.

[environment.gov.ab.ca/info/library/6364.pdf](http://environment.gov.ab.ca/info/library/6364.pdf)

### Maps: Alberta's Major River Basins

[www.albertawater.com/index.php/water-toolkit/water-maps/9-water-toolkit/664-maps-alberta-s-major-river-basins](http://www.albertawater.com/index.php/water-toolkit/water-maps/9-water-toolkit/664-maps-alberta-s-major-river-basins)

## Videos

### Hidden Water

An informative multimedia presentation that will introduce students to the science of groundwater in Alberta. Topics include groundwater quality, links to the hydrologic cycle, as well as the distribution and uses of groundwater in the province. Curriculum links: Grade 8, with applications in Grade 5, Grade 9 Science, Biology 20 and beyond.

[www.insideeducation.ca/Hidden\\_Water](http://www.insideeducation.ca/Hidden_Water)

### Water Stewardship in the Bow River Basin

Water is the lifeblood of southern Alberta and the Bow River is critical to the health of the Region. This educational series of vignettes, shot in spectacular High Definition, takes the viewer on a journey of Water Stewardship of the Bow River and how that stewardship affects life in the Bow Basin.

[www.youtube.com/watch?v=5e00c1IJHL8](http://www.youtube.com/watch?v=5e00c1IJHL8)

## Contact Information for Watershed Agencies

If you require additional information or assistance in completing your project, please contact the Watershed Advisory group in your region.

### Athabasca Watershed Council

[www.awc-wpac.ca](http://www.awc-wpac.ca)

### Battle River Watershed Alliance

[www.battleriverwatershed.ca](http://www.battleriverwatershed.ca)

### Beaver River Watershed Alliance

[beaverriverwatershed.ca](http://beaverriverwatershed.ca)

### Bow River Basin Council

[brbc.ab.ca](http://brbc.ab.ca)

### Lesser Slave Lake Watershed Council

[www.lesserslavewatershedcouncil.ca](http://www.lesserslavewatershedcouncil.ca)

### Mighty Peace Watershed Alliance

[www.mightypeacewatershedalliance.org](http://www.mightypeacewatershedalliance.org)

### Milk River Watershed Council

[www.milkriverwatershedcouncil.ca](http://www.milkriverwatershedcouncil.ca)

### North Saskatchewan Watershed Alliance

[www.nswa.ab.ca](http://www.nswa.ab.ca)

### Oldman Watershed Council

[oldmanbasin.org](http://oldmanbasin.org)

### Red Deer River Watershed Alliance

[www.rdrwa.ca](http://www.rdrwa.ca)

### South East Alberta Watershed Alliance

[www.seawa.ca](http://www.seawa.ca)





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Enter your local contest at: [www.CaringForOurWatersheds.com](http://www.CaringForOurWatersheds.com)

