CARING FOR OUR Watersheds™

Saskatchewan 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:_____

Club:_____

Date:_____

www.saskriverbasin.ca
www.CaringForOurWatersheds.com

Partners FOR the Saskatchewan River Basin

Nutrien™

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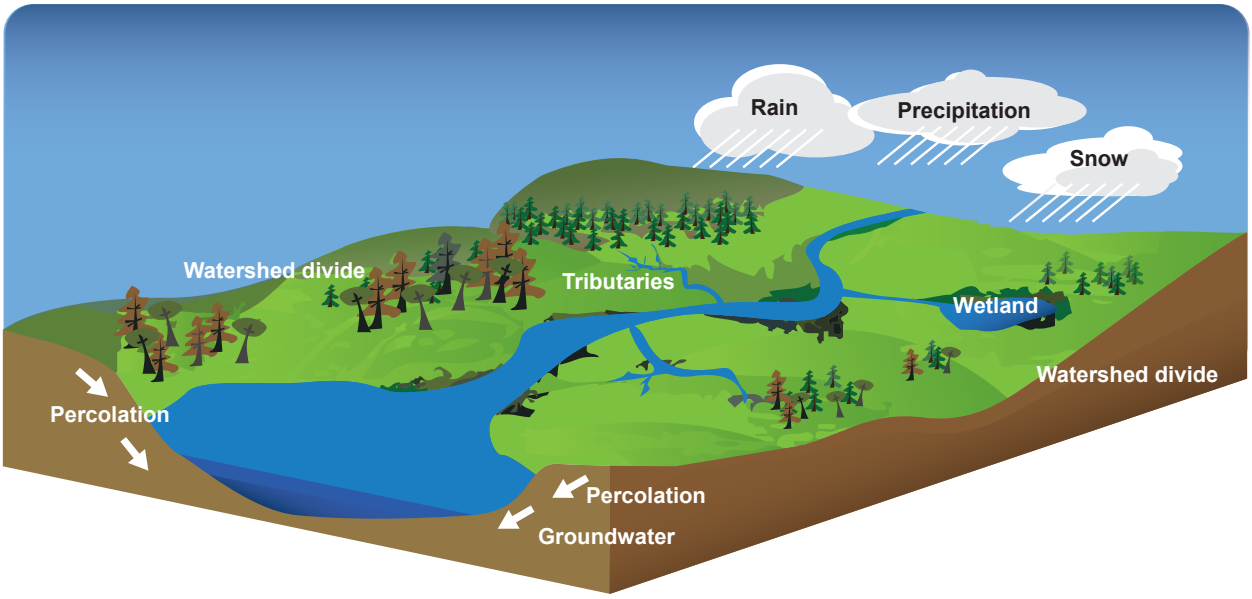
What is a watershed?

A watershed or drainage basin is a region that drains a particular body of water, such as a river, pond, lake or ocean. The area of land encompassed could be tiny or it could be immense. The size of a watershed, and the speed and direction of the flow of its rivers, is determined by land forms. High ground, such as mountain ranges and hills, form the boundaries between watersheds, and to a large degree they also direct the path and speed of rivers. Within large watersheds, there are many smaller ones; and within those smaller watersheds are even smaller ones.

Watersheds know no borders, whether provincial, national or international. In fact, rain falling on the prairie of southern Saskatchewan could eventually flow into the Mississippi River and further south to the Gulf of Mexico.

A watershed includes both water (aquatic) and land (terrestrial) components. Each watershed has a unique mix of habitats: from creeks, rivers and lakes to forests, farms and even cities. A healthy watershed is critical to ensure a healthy environment.



Overview

Taking care of our world requires more than simply talking about it. It calls for stewardship and a lighter footprint. Many of Saskatchewan's schools and stewardship organizations have a long tradition of helping youth develop environmental conservation skills and knowledge. As a result, Nutrien and Partners FOR the Saskatchewan River Basin 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 teachers or club leaders with a suite of tools designed to help incorporate concepts around local and provincial watershed health into their activities. All activities in this guide are designed to complement the Saskatchewan Program of Studies and help youth build knowledge and key life skills while learning about local environmental issues.

Students do not have to participate in the CFW contest to still complete the Caring For Our Watersheds experience.

Benefits of Caring For Our Watersheds

To Students
- 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
- Hands-on, real-life, practical projects that will enhance their local watershed
- Prize money to implement projects within their local club/area (if participating in Caring For Our Watersheds contest)
- Opportunity to travel to present action projects at regional Saskatchewan Caring For Our Watersheds finals

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

To Schools
- Can become the option program
- 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 CFW program enhance curriculum outcomes
- Offers a creative way for students to develop leadership, life skills, responsibility, decision making and a variety of other skills

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, students 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 a final report that is:
  - prepared by the student
  - presented by the student in front of a group
  - at least three minutes in length
- Be involved in a club activity that is a benefit to your community.
- Participate in the club's achievement event. This could be Caring For Our Watersheds or another community event.
- 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, students will:

- Gain knowledge about watersheds, the environment and hydrologic cycles
- 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/ public speaking skills
- Gain project management experience
- Achieve personal reward for having done something positive for the environment and your club
- Building stronger relationships with other club members and your local community
- Encouraging others to participate in the project

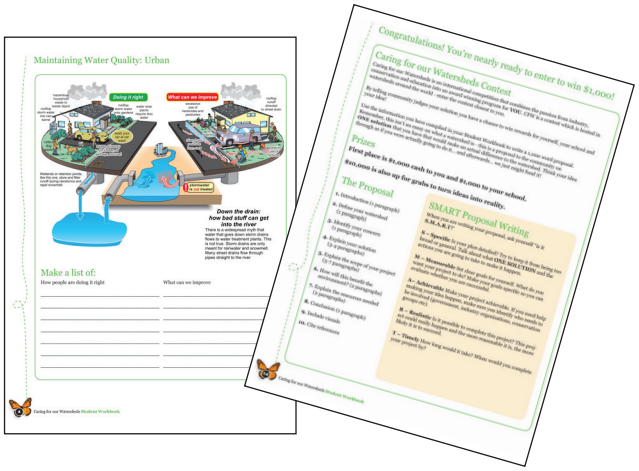
Caring For Our Watersheds Contest

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 school or 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 Saskatchewan nearly $10,000 will be awarded to students and schools or clubs who participate.

School or 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 team finishes in first place the team wins $1000 and the club wins $1000. Plus, there is still money to implement the idea!

To qualify, a school or club must register online at www.CaringForOurWatersheds.com. All individuals or team members must select their school or club when they enter the contest.

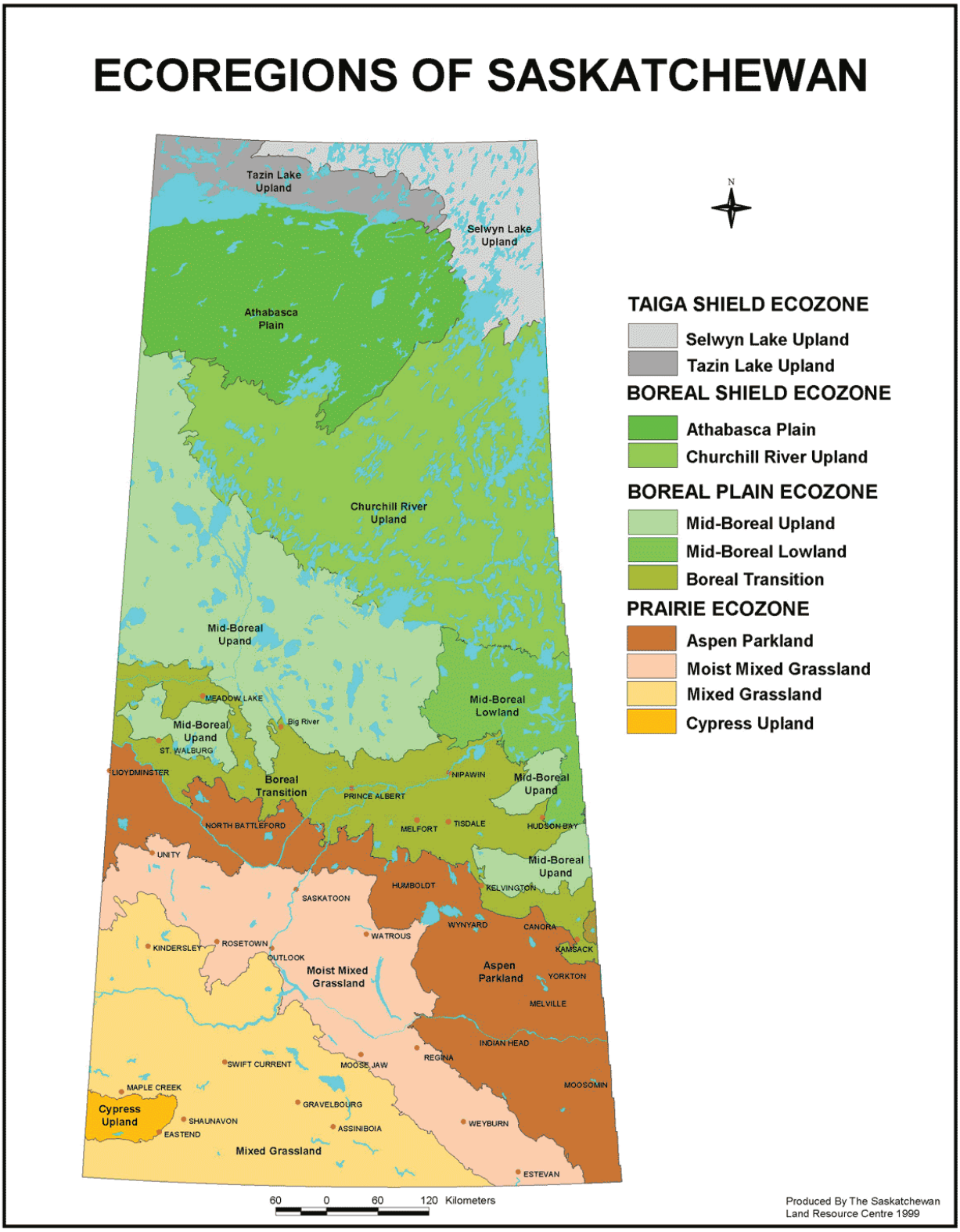


Teacher or Leader Time Commitment

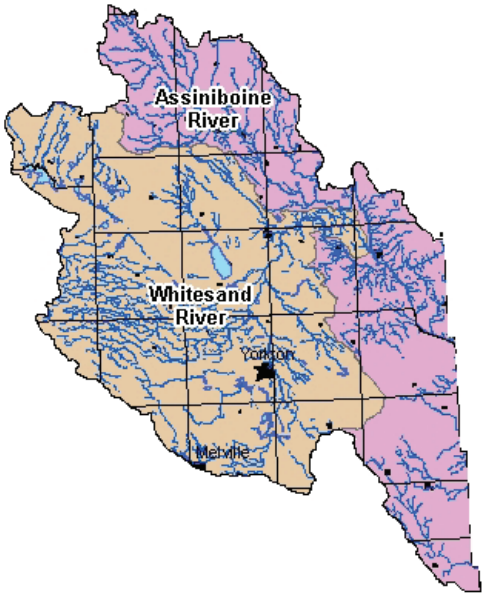
- **This contest can be a school or club activity**
  Student success directly relates to leaders assigning the contest and assisting students with their work. Giving students sufficient time to complete the contest assignment is more effective in producing quality projects.
- **Attend teacher or leader training (if applicable)**
- **Discuss and assign the contest**
  - 30 minutes
- **Assist students with ideas**
  - time commitment will vary depending on level of interest of students and leader
- **Remind students about contest entry deadline**
  - initially every other week – 10 minutes times six weeks
  - every week one month prior to deadline – 10 minutes times four weeks
- **Students may want to give a classroom presentation (optional)**
  - 5 minute time limit per presentation
- **If your student is selected as a finalist, help prepare them for their verbal presentation**
  - 2-4 hours
- **If your student is selected as a finalist, attend verbal competition and awards presentation**
  - 4 hours

Saskatchewan's Major River Basins

Saskatchewan Map



Your Watershed Facts: **Assiniboine Watershed**



How big is your watershed?

The Assiniboine Watershed covers an area of approximately 17,300 square kilometers.

How many people live in it?

Approximately 45, 500 people call the Assiniboine Watershed home.

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

Nearly 90% of water in the Assiniboine Watershed is supplied by aquifers. The remaining water comes from a combination of rainfall and snowmelt.

What are the names of the major bodies of water?

The major bodies of water are the Assiniboine River, Whitesand River, Fishing Lake, Good Spirit Lake and Lake of the Prairies.

Describe the land.

The Assiniboine Watershed is part of the Prairie Pothole Region, which is a glaciated area of mixed and tallgrass prairie stretching nearly 3,000 km across Alberta, Saskatchewan and the northern Great Plains.

What are the largest towns/cities?

The largest towns and cities in the watershed are Yorkton and Melville.

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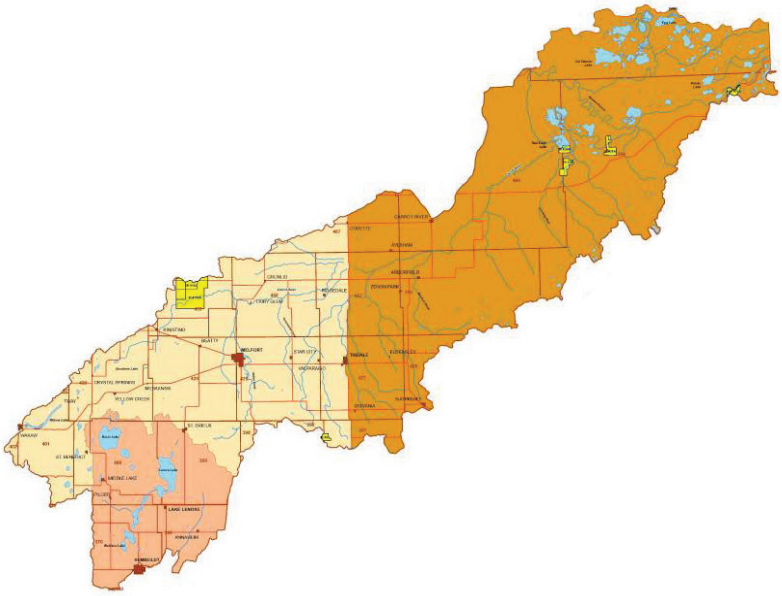
Your Watershed Facts: **Assiniboine Watershed**

Does your watershed cross provincial/ state/national borders? If so, what borders?	Yes. The Assiniboine River watershed stretches from its headwaters in eastern Saskatchewan to the City of Winnipeg at the confluence with the Red River.
Where does the water in your watershed come from? Where does it flow to?	Spring runoff and rainfall enters two major river systems, the Assiniboine and Whitesand rivers. The two rivers confluence at Kamsack and flow through Lake of the Prairies into Manitoba.
What are some of the main businesses in your watershed?	Land use in the basin is dominated by agriculture. The Assiniboine River serves as the raw water source for the cities of Brandon and Portage la Prairie once it crosses into Manitoba. Water drawn from the river is also used for irrigation and for facilities such as food processing industries.

Did you know?

About 60% of the Assiniboine Watershed is located within Manitoba.

Your Watershed Facts: **Carrot River Watershed**



How big is your watershed?

The Carrot River Watershed is located in both Saskatchewan and Manitoba, and covers an area of approximately 17,500 square kilometres. Nearly 15,570 square kilometers of the Carrot River Watershed is located in Saskatchewan.

How many people live in it?

The estimated population of the Saskatchewan portion of the Carrot River watershed is around 25, 500 people.

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

Residents in the Carrot River Watershed get their water from a variety of sources: surface water, groundwater and aquifers. Rural residents of the watershed may have their own groundwater well, use surface water from dugouts, or be connected to rural pipeline water services depending on where they live within the watershed.

What are the names of the major bodies of water?

The Carrot River is the main water body in the Carrot River watershed. Wakaw Lake is the largest recreational lake in the watershed, and is the headwaters for the Carrot River. Other lakes include Struther's Lake, Basin Lake, Lenore Lake, and Waldsea Lake on the southwest portion of the watershed, and Cut Beaver Lake, Egg Lake, Potato Lake and Red Earth Lake on the northeast side of the watershed.

Describe the land.

The watershed intersects five ecoregions: the Moist Mixed Grassland, Aspen Parkland, Boreal Transition, Mid-Boreal Lowland and Mid-Boreal Upland. These ecoregions have been dramatically altered by agriculture, and now consists of large areas of cropland.

What are the largest towns/cities?

The Carrot River Watershed includes the City of Melfort, seven towns (Tisdale, Wakaw, Lake Lenore, St. Brieux, Star City, Arborfield and Carrot River), 11 villages and 6 First Nations Reserves.

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Your Watershed Facts: **Carrot River Watershed**

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

Yes, the Carrot River crosses the Saskatchewan border into Manitoba.

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

The Carrot River is the dominant watercourse in this watershed, and its headwaters originate in the Cudworth and Tiger Hills Plains near the Town of Wakaw. The outlet of Wakaw Lake marks the start of the Carrot River, and from there the river flows northeast through Melfort and Red Earth Plains until it reaches the Saskatchewan River west of The Pas, Manitoba.

What are some of the main businesses in your watershed?

The main industry in the watershed is agriculture. In the northeast portion of the watershed, there is some forestry activity. Recreation and tourism exists throughout the area with Regional Parks at Wakaw Lake, Lenore Lake (St. Brieux), and Struther's Lake. Hunting and outfitting is also a popular tourist draw to the area thanks to its abundance of wildlife such as deer, moose, elk and waterfowl.

Did you know?

All of the lakes within the Lenore Lake Basin are saline with the exception of St. Brieux and Burton Lakes.

Your Watershed Facts: **Lower Qu'Appelle Watershed**

How big is your watershed?

The Lower Qu'Appelle Watershed is the downstream half of the Qu'Appelle River basin, and covers an area of approximately 17, 800 square kilometers.

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 in the Lower Qu'Appelle Watershed are from precipitation (rain and snowmelt), as well as some groundwater. The watershed is affected to a great extent from water diverted from Lake Diefenbaker to the Lower Qu'Appelle system via Qu'Appelle River dam. This high quality water is used to augment the natural water supply.

What are the names of the major bodies of water?

The six major lakes found within the watershed are Pasqua, Echo, Mission, Katepwa, Crooked, and Round Lakes. Main tributaries within the Lower Qu'Appelle watershed include the Loon, Jumping Deer, Pheasant, Kaposvar, Pearl, Indianhead, Redfox, Ekapo, Cutarm and Scissor creeks.

Describe the land.

The most distinctive characteristic of the Lower Qu'Appelle River Watershed is the Qu'Appelle River Valley. The valley originated as a glacial spillway and runs the entire length of the watershed. The Lower Qu'Appelle River Watershed is part of the Prairies Ecozone, which contains the majority of the country's productive agricultural cropland, rangeland, and pasture.

What are the largest towns/cities?

The Lower Qu'Appelle River Watershed includes the city of Melville, 16 towns and 29 villages (such as Esterhazy, Rocanville, Grenville), as well as 16 First Nations Reserves and resort villages along the lakes.

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Your Watershed Facts: **Lower Qu'Appelle Watershed**

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

The entire length of the Qu'Appelle Valley runs from the west, at Lake Diefenbaker, to the east into Manitoba, where it crosses the Saskatchewan-Manitoba border and meets the Assiniboine River at St. Lazare.

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

The majority of water in the Lower Qu'Appelle River watershed comes from rain and snowmelt. Flows in the Qu'Appelle are controlled, since many of the tributaries that feed the system have varying levels dependent on precipitation, and run-off events. Water from Lake Diefenbaker that is let into the system by the Qu'Appelle River dam is used to enhance the natural supply of the system.

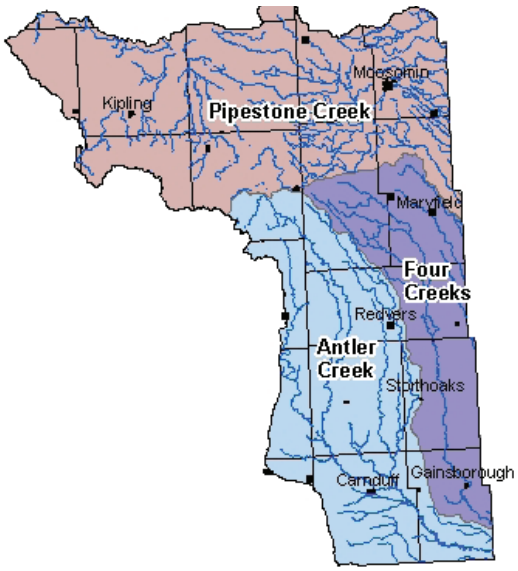
What are some of the main businesses in your watershed?

The main industry in the Lower Qu'Appelle Watershed is agriculture (crop and livestock production). Potash and oil and gas extraction are more localized, yet are also important economic drivers. Recreation-based tourism is another important support of the watershed economy, especially in the Lower Qu'Appelle Lakes region.

Did you know?

The Qu'Appelle Valley gets its name from the French word for "who calls", which was derived from the Cree name kah-tep-was which meant "river that calls".

Your Watershed Facts: **Lower Souris Watershed**



How big is your watershed?

The Lower Souris River subwatershed drains 1,900 square kilometers of land into the Souris River and is the largest subwatershed in the Central Assiniboine and Lower Souris River Watershed.

How many people live in it?

The Lower Souris River Watershed includes 20 rural municipalities (12 totally, 8 partially), 19 urban municipalities, and three First Nations' lands. The rural population accounts for 37 percent of the population while the remaining 63 percent of the population live in the watershed's urban communities.

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

Groundwater is a major source of water for private domestic use as well as for municipal, industrial, commercial and agricultural purposes within the Lower Souris River Watershed. Groundwater discharge also provides base flow to rivers and streams, and contributes water to marshes and wetlands. The principal aquifers in this watershed are sand and gravel.

What are the names of the major bodies of water?

Major bodies of water within the Lower Souris Watershed are Moosomin Reservoir, as well as Pipestone, Lightning and Gainsborough Creeks.

Describe the land.

Ecologically, the Lower Souris River Watershed is predominantly located in an area known as Aspen Parkland. Undisturbed, the Aspen Parkland ecoregion is a mix of aspen groves and fescue grasslands and represents the zone of transition between open grasslands and continuous forest. Agriculture use has altered the landscape, with 80 % of the area being cropland.

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Your Watershed Facts: **Lower Souris Watershed**

What are the largest towns/cities?	The largest population centres are Kipling, Wapella, Moosomin, Redvers and Carnduff.
Does your watershed cross provincial/ state/national borders? If so, what borders?	The Lower Souris River Watershed is located in the south-eastern corner of Saskatchewan, bounded to the east by the province of Manitoba and to the south by the State of North Dakota.
Where does the water in your watershed come from? Where does it flow to?	The Lower Souris River Watershed is a conglomeration of smaller watersheds that eventually flow into the Souris River in Manitoba. These watersheds include the Pipestone Creek Watershed, the Antler River Watershed, and the Four Creeks Watershed.
What are some of the main businesses in your watershed?	Agriculture is the main industry in the Lower Souris River subwatershed. Agricultural land uses like annual croplands, pasture and grasslands, and forage cover represent 86% of the land area within the subwatershed.

Did you know?

The mixed-grass prairie ecosystem of the Lower Souris Watershed supports increasingly threatened species such as Baird's sparrow, burrowing owl and small white lady slipper.

Your Watershed Facts: **Moose Jaw River Watershed**

How big is your watershed?

The Moose Jaw River Watershed spans an area of approximately 9, 360 square kilometres.

How many people live in it?

Approximately 40,500 people call the Moose Jaw River Watershed home.

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

The majority of water in the Moose Jaw River Watershed comes from precipitation and surface water, as well as aquifers.

What are the names of the major bodies of water?

Large bodies of water in the Moose Jaw River Watershed include Pelican Lake, Peysen, Buffalo Pound and Kettlehut Lakes, as well as Avonlea Reservoir.

Describe the land.

Much of the land in the Moose Jaw River Watershed has been modified for agricultural purposes. 70% of the landcover is in cropland while 21.6% is in grassland and forages.

What are the largest towns/cities?

The Moose Jaw River Watershed includes 22 rural municipalities, two towns, 10 villages, and the City of Moose Jaw.

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Your Watershed Facts: **Moose Jaw River Watershed**

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

The Moose Jaw River flows northwest, paralleling the edge of the Missouri Coteau in the U.S., with many small tributaries entering the river from the more rugged, higher terrain to the southwest.

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

The upper headwaters of the Moose Jaw River are located approximately 30 kilometres west of Weyburn in very flat terrain. From the City of Moose Jaw the river flows north-east joining the Qu'Appelle River approximately five kilometers downstream of Buffalo Pound Lake. The Moose Jaw River is the largest contributor to the Qu'Appelle River.

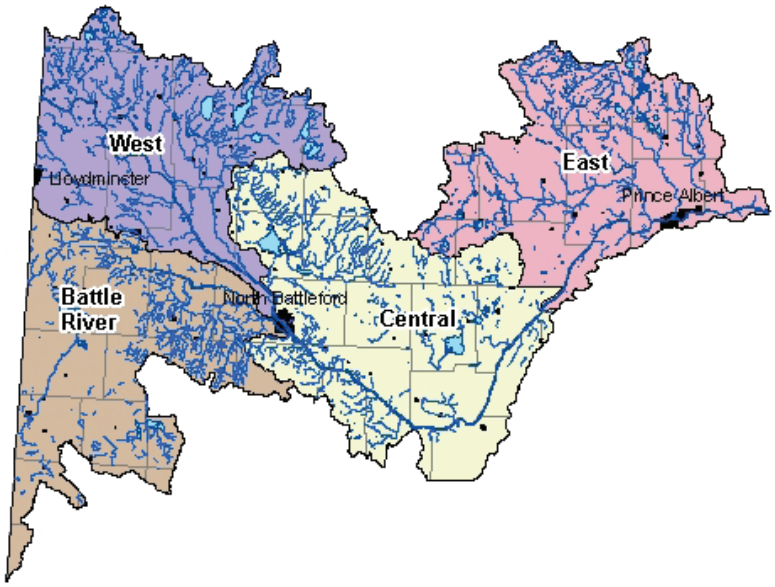
What are some of the main businesses in your watershed?

The dominant land use in the watershed is agriculture, with approximately 70 percent of the agricultural land being used for annual crop production.

Did you know?

An average of only 10% of precipitation that falls on the watershed reaches the Moose Jaw River.

Your Watershed Facts: North Saskatchewan River Watershed (Saskatchewan side)



How big is your watershed?

The North Saskatchewan River Watershed covers an area of approximately 41,500 square kilometres on the Saskatchewan side.

How many people live in it?

Nearly 113,500 people call the North Saskatchewan River Watershed home.

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

The North Saskatchewan is a glacier-fed river that originates in the Columbia Icefield in the Rocky Mountains of Alberta, with runoff water (rain and snow) contributing to the flow. In Saskatchewan, the Battle River is the largest tributary to the river.

What are the names of the major bodies of water?

Major bodies of water in the North Saskatchewan Watershed include the Battle River, and a number of large lakes including Jackfish Lake, Murray Lake, Turtle Lake, Emma Lake and Christopher Lake.

Describe the land.

The North Saskatchewan River Watershed traverses four ecoregions: Aspen Parkland and Moist Mixed Grassland (prairies, grasslands, aspen groves, sloughs/prairie potholes wetlands and farmland) in the southern and middle part of the watershed. The northern part of the watershed is made of the Boreal Transition and Mid-Boreal Upland (aspen, spruce and pine trees) ecoregions.

What are the largest towns/cities?

The North Saskatchewan River Watershed includes 51 rural municipalities, 29 First Nations with lands and 17 First Nations Reserves, 100 towns and villages, and the Cities of Lloydminster, North Battleford, and Prince Albert. It also includes a portion of Prince Albert National Park.

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Your Watershed Facts: North Saskatchewan River Watershed (Saskatchewan side)

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

The North Saskatchewan River winds its way across Alberta and Saskatchewan, until it reaches "The Forks", where the North and South Saskatchewan Rivers join east of Prince Albert. From there the Saskatchewan River flows into the Nelson River system in Manitoba and ultimately empties into Hudson Bay.

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.

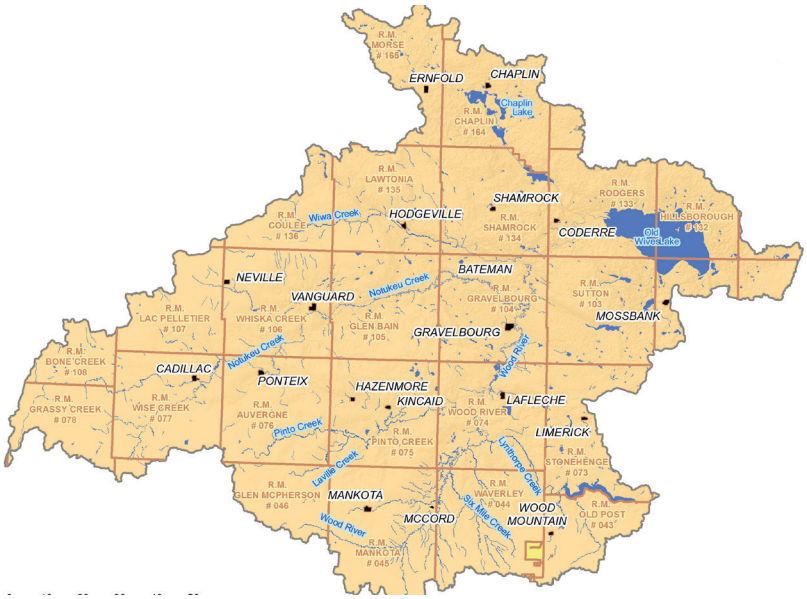
What are some of the main businesses in your watershed?

The Battle River, the largest tributary of the North Saskatchewan Watershed in Saskatchewan contributes less than 5% of the flow.

Did you know?

The Battle River, the largest tributary of the North Saskatchewan Watershed in Saskatchewan contributes less than 5% of the flow to the watershed.

Your Watershed Facts: **Old Wives Lake Watershed**



How big is your watershed?

The Old Wives Lake Watershed is located in southwestern Saskatchewan and is part of the Missouri River Basin. The watershed is approximately 16,850 square kilometres in size.

How many people live in it?

Approximately 9,300 people call the Old Wives Lake Watershed home.

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

The primary source of water in the Old Wives Lake Watershed comes from snowfall, which accounts for roughly 30–40 per cent of total precipitation. Water supply in a given year is a reflection of spring snowmelt and spring and summer rainfall.

What are the names of the major bodies of water?

The Wood River, Chaplin, and Old Wives Lakes are the dominant surface water resources in the area. The Notukeu, Pinto, Wiwa and Russell creeks are other important local water resources. There are also a number of reservoirs in the watershed. Thomson Reservoir is the most prominent, and supplies a number of communities, as well as recreational and agricultural uses.

Describe the land.

There are five primary ecoregions located within the Watershed: the Wood Mountain Plateau, the Swift Current Plateau, the Dirt Hills, the Wood River Plain, and the Chaplin Plain. The land is a mixture of prairie, prairie pothole wetlands and grasslands with intermittent tree cover.

What are the largest towns/cities?

The Old Wives Lake Watershed is home to 32 rural municipalities, 17 urban municipalities, and one First Nation. The Town of Gravelbourg is the largest urban municipality in the watershed.

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Your Watershed Facts: Old Wives Lake Watershed

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

The Old Wives Lake Watershed is bounded to the east by the Moose Jaw River Watershed and to the west by the Swift Current Creek Watershed. Eventually the water flows into the Missouri River system.

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

In addition to precipitation from snowmelt, there are a number of natural lakes, wetlands and poorly drained lowlands within the Watershed. Old Wives Lake is the largest natural water body in the Watershed with a total lakebed area of approximately 300 square kilometres. Old Wives Lake eventually outflows to the Lake of the Rivers and Willow Bunch Lakes and then into Big Muddy Lake and the Missouri River system.

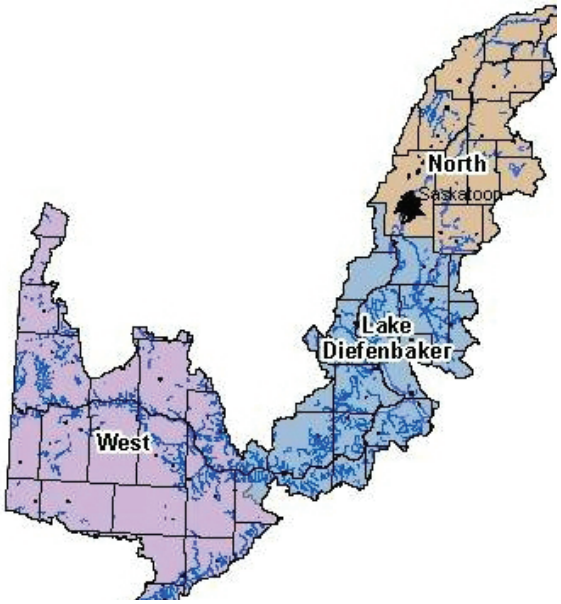
What are some of the main businesses in your watershed?

Agriculture is the dominant land use in the Old Wives Lake Watershed, with close to 95% of the land being devoted to some form of agriculture.

Did you know?

The Old Wives Lake Watershed is a unique watershed as it is closed to surface water outflow, meaning water only exits through evapotranspiration, groundwater recharge, and consumption.

Your Watershed Facts: South Saskatchewan River Watershed



How big is your watershed?

The South Saskatchewan River Watershed is one of the largest and most important rivers in Saskatchewan, spanning an area of 35,000 square kilometers.

How many people live in it?

Slightly more than 285,000 people call the South Saskatchewan Watershed home.

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

The South Saskatchewan River is fed by three major tributaries in Alberta: the Red Deer, Bow, and Oldman Rivers. In Saskatchewan, the river flows through a region of very low runoff. On average, the local runoff contributes 2% of the natural flow into the river, half of which originates from the Swift Current Creek. Precipitation from rain and snowfall, as well as water from aquifers helps to supply water to residents of the Watershed.

What are the names of the major bodies of water?

Major bodies of water in the South Saskatchewan Watershed include Lake Diefenbaker and Swift Current Creek. The Gardiner and Qu'Appelle River Dams are also significant bodies of water in the basin.

Describe the land.

The South Saskatchewan River passes through four ecoregion areas known as Mixed Grassland, Moist Mixed Grassland, Aspen Parkland and the Boreal Transition. These regions are characterized by rich soils, and thick glacial drift. Many of the features were shaped 10 000 – 14 000 years ago during the ice age that covered most of Canada.

What are the largest towns/cities?

The largest towns and cities within the watershed are the City of Saskatoon, as well as the towns of Elbow, Outlook and Leader.

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Your Watershed Facts: South Saskatchewan River Watershed

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

The South Saskatchewan River travels northeast through Alberta and Saskatchewan, becoming Lake Diefenbaker. From the northern shores of Lake Diefenbaker the river flows out of the Gardiner Dam towards the City of Saskatoon. From the confluence of the North and South Saskatchewan Rivers, the Saskatchewan River passes through the Saskatchewan Delta, into Lake Winnipeg, which eventually drains into Hudson Bay through the Nelson River.

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

The headwaters of the South Saskatchewan River begin in the Rocky Mountains of Alberta, where two mountainous tributaries join to create the South Saskatchewan River: the Oldman and Bow Rivers. Shortly downstream from their confluence they are joined by the Red Deer River, just before crossing the Saskatchewan-Alberta border, at which point the joined rivers officially become the South Saskatchewan River.

What are some of the main businesses in your watershed?

Agriculture is the dominant industry in the Watershed. Other major industries include; power production from the Gardiner Dam Hydroelectric Station and the Queen Elizabeth Power Station; fertilizer plants, potash mines, and petroleum related operations, including oil and gas extraction and exploration.

Did you know?

The South Saskatchewan River Watershed is the single largest supplier of water in Saskatchewan for drinking water, irrigation, industrial uses, and recreation, with almost 50% of the provincial population in Saskatchewan relying on the South Saskatchewan River for their daily needs.

Your Watershed Facts: **Swift Current Creek Watershed**

How big is your watershed?

The Swift Current Creek Watershed's total drainage area is 5,592 square kilometres.

How many people live in it?

Around 20,000people call the Swift Current Creek Watershed home. Swift Current is the largest population centre in the region.

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

The Swift Current Creek River is formed by spring runoff from rainwater and snowmelt, as well as from ground water springs.

What are the names of the major bodies of water?

Major water bodies in the watershed include Rock Creek, Jones Creek, Bone Creek, Duncairn Dam (Reid Lake), Lac Pelletier and the Swift Current Reservoir.

Describe the land.

The Swift Current Creek Watershed is part of the Mixed Grassland ecoregion, which represents the driest area of the province as evidenced by the absence of native trees and scarcity of wetlands and permanent water bodies. Its diverse landscapes include glacial lake plains, dune-covered sandhill areas, the hilly, Prairie Pothole country along the Missouri Coteau; and the rolling expanses of native grassland and intermittent "badlands" near the United States border.

What are the largest towns/cities?

Major urban municipalities located in the watershed are the City of Swift Current and the Town of Shaunavon, as well as the villages of Waldeck, Hebert and Morse.

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Your Watershed Facts: **Swift Current Creek Watershed**

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

The Swift Current Creek Watershed's boundaries lie primarily in Saskatchewan. Swift Current Creek eventually meets the South Saskatchewan River, which makes its way into the larger Nelson River system and eventually enters Hudson Bay.

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

The Swift Current Creek Watershed begins northeast of Eastend, Saskatchewan at the foot of the Cypress Hills, and empties into the South Saskatchewan River north of Stewart Valley.

What are some of the main businesses in your watershed?

Agriculture is the main industry within the watershed, primarily relating to livestock production. Recreation and tourism in the form of fishing, boating and resort development also make up a portion of economic activity in the region.

Did you know?

Swift Current Creek is the sole supply of municipal water for the City of Swift Current.

Your Watershed Facts: Upper Qu'Appelle and Wascana Watershed

How big is your watershed?

The Wascana Watershed is one of the smallest in Saskatchewan with a land area of 3,870 square kilometres, or about 1% of Saskatchewan's total area.

How many people live in it?

The total number of people in the watershed is 241,500. The population of urban municipalities is close to 221,300 people and 20, 121 in the Rural Municipalities.

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

The Upper Qu'Appelle Watershed consists of the Qu'Appelle River, and several major creeks that run into it. The bulk of water in the watershed comes from precipitation in the form of surface runoff from rain and snow, as well as groundwater from aquifers. The vast majority of rural residents within the Upper Qu'Appelle -Wascana watershed rely on groundwater for domestic use including those who live in hamlets, resort communities, villages and towns.

What are the names of the major bodies of water?

The Upper Qu'Appelle Watershed consists of the Qu'Appelle River, and several major creeks that run into it, including Ridge Creek, Iskwao Creek, High Hill Creek and Deer Run Creek. Major water bodies in the Wascana Watershed include Wascana Creek and Wascana Lake, Cottonwood Creek and Manybones Creek. There are two major lakes in the Upper Qu'Appelle River Watershed: Buffalo Pound Lake and Eyebrow Lake.

Describe the land.

Located in a semi-arid prairie grasslands ecosystem, the Wascana and Upper Qu'Appelle Watershed typically has low stream banks and slow water flows. These characteristics allow watercourses to meander sharply, and in some situations result in small wetlands.

What are the largest towns/cities?

Within the boundaries of the Wascana Creek and Upper Qu'Appelle River Watersheds there are 35 rural municipalities, 69 urban municipalities (cities, towns, villages and resort villages) and 17 hamlets. Regina is the largest city in the watershed, accounting for nearly 20% of the province's population.

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Your Watershed Facts: Upper Qu'Appelle and Wascana Watershed

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

The Upper Qu'appelle watershed ends just east of the Valeport Marsh, which joins Last Mountain Lake to the Qu'Appelle River.

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

Wascana Creek begins near Davin, Saskatchewan, southeast of Regina and flows southeast, then loops around to the west, through Wascana Lake in the City of Regina and then enters the Qu'Appelle River outside of Lumsden. The River then runs east through the Qu'Appelle Valley, one of southern Saskatchewan's most recognizable features, passing through Eyebrow Lake and Buffalo Pound Lake.

What are some of the main businesses in your watershed?

The watershed's economy relies heavily on agricultural crop and livestock production. The Upper Qu'Appelle also provides water to the Mosaic Potash Mine in Belle Plaine, which extracts potash using steam, and to the neighbouring Yara Fertilizer plant.

Did you know?

Buffalo Pound Lake serves as the drinking water supply for 25% of Saskatchewan's population, including the cities of Regina and Moose Jaw, as well as major industrial and recreational users.

Your Watershed Facts: **Upper Souris River Watershed**

How big is your watershed?

About 20,400 square kilometres of the Souris River basin in southeastern Saskatchewan are encompassed by the Upper Souris River Watershed, including sub-watershed areas of the Souris River main stem, Long Creek and Moose Mountain Creek.

How many people live in it?

Close to 26,000 people call the Upper Souris Watershed home. Weyburn and Estevan represent the largest population centres in the watershed.

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

Most of the water in the Upper Souris comes from a combination of surface water (runoff from precipitation) and groundwater. The runoff from the Souris basin is less than 1 per cent of the precipitation received. This low runoff makes the Souris River sensitive to precipitation, and a flow can turn from a trickle to a torrent in the span of a few days.

What are the names of the major bodies of water?

Major bodies of water include Kenosee Lake, Tatagwa Lake, Strawberry Lake and Gooseberry Lake, Long Creek and Moose Mountain Creek. McDonald Lake, formed by the Rafferty Dam near Estevan also contributes a significant amount of water.

Describe the land.

Glacial moraines and the remnants of glacial lake plains dot this region. The highest point is found in the Moose Mountain uplands, which rise about 300 meters above the Souris plain. A portion of the Missouri Coteau forms the southwestern boundary of the watershed. Natural vegetation varies in the watershed. Slightly dryer areas in the southwest are characterized by mixed grass prairie vegetation. As moisture increases to the north and east, vegetation ranges from parkland (widely spaced trees or bluffs of trees) to hardwood forest. Much of the native vegetation has been eradicated by cultivation and drainage.

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Your Watershed Facts: **Upper Souris River Watershed**

What are the largest towns/cities?	The largest towns and cities in the Upper Souris Watershed are Weyburn, Estevan and Carlyle.
Does your watershed cross provincial/ state/national borders? If so, what borders?	The Upper Souris River Watershed is part of the larger Assiniboine River basin and the major basin of the Nelson River, which eventually contributes to the Arctic Ocean via Hudson's Bay.
Where does the water in your watershed come from? Where does it flow to?	The Souris River, known as the Mouse River in the United States, has its headwaters in Saskatchewan, flows into North Dakota and then travels back north into Manitoba.
What are some of the main businesses in your watershed?	Agriculture is the main economic driver of the region. There is also some coal mining activity around Estevan. Tourism and recreation also comprises a portion of the regional economy, primarily from hunting and fishing related activities.

Did you know?

The Upper Souris Watershed has a rich First Nations heritage and is known to have been inhabited by humans for over 11,000 years.

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 students just like you!

Insect Hotels: Accommodating Biodiversity

Alana Krug-McLeod from Aden Bowman Collegiate in Saskatoon, Saskatchewan, proposed the idea of improving the South Saskatchewan River Watershed through increasing insect biodiversity. Her proposal was to build three separate Insect Hotels in Saskatoon with educational signage and an associated website that explained the benefits of insect biodiversity and the importance of habitat provision like, insect hotels, for improving nearby aquatic ecosystems. Alana explained in her proposal that "...insect hotels typically consists of a solid structure or frame filled with organic and inorganic materials, a formation that serves to provide habitat for insects." The types of material such as bricks, bamboo, drilled logs and bark will affect what varieties of insects check-in at a given hotel.

Alana worked with the community to build and install three separate insect hotels across Saskatoon; one in a private yard, one at the Varsity View Community Garden, and one at Aden Bowman's joint school and community garden.

On August 26th, Alana met with members of the community garden to construct their insect hotel. People of all ages participated with volunteers ranging from a gleeful four year old to seniors. Together, volunteers and members of the Varsity View community garden built a beautiful structure, which a smaller group of volunteers was able to fill, seal, and mount the next morning.

On August 27th, Alana met with a group of students from Aden Bowman Collegiate to harvest and weed the raised garden beds and to install and fill the insect hotel. Everyone was energetically engaged, and the insect hotel was easily secured in a south facing location beside the raised garden beds. Two students agreed to be contacts for the insect hotels and to report on what types of insects that "check-in" and to monitor the longevity of the structure. After the insect hotel was installed some of the students talked about making insect hotels for themselves and as gifts for others.

The third insect hotel was built by Alana and her mom with materials remaining from the construction of the other two insect hotels and donated materials. It was installed in her family's front yard in the Varsity View neighbourhood, where it attracts the attention of passersby who often stop to see or taste what is growing in the garden. Alana has expressed interest, capacity willing, to work with other interested groups in Saskatoon to build more insect hotels and continue to increase aquatic and insect biodiversity to improve her local watershed.

Erosion Prevention at Brightwater Creek

Liam McRorie-Wilson, **Brayden Johnson** and **Benjamin Gaskin** from Caswell Hill Community School were inspired to plant native plants to prevent erosion of a local creek bank. Brightwater Creek is an important ecological area that feeds its waters into the South Saskatchewan River Watershed. On a field trip with their Grade 8 class they learned that the creek bank was experiencing erosion. Erosion affects the water quality of the creek and impacts habitat for birds, humans and other wildlife in the area.

After doing some research, they found that erosion could be reduced by planting native shrubs and plants along the creek bank in the riparian area. The group decided to take action and proposed planting 75 native shrubs. The species they selected were the Red Osier Dogwood, Buffalo Berry, Wolf Willow, and Western Sandcherry.

These shrub species prevent erosion along the creek bank because their root systems provide structure for the soil. As the water level of the creek rises and falls, the root systems of the shrubs would keep the soil in place and it is not easily washed away by the creeks current. The shrubs also provide habitat for birds and other wildlife in the area and increase the strength of the riparian area's buffer zone. Having a strong riparian buffer zone means chemical fertilizers, pesticides and other contaminants that are washed from the soil after rain storms from surrounding land would be prevented from entering the creek. These native shrubs slow the flow of water washing towards the creek. This then allows any contaminated water to trickle through the soil and shrub root systems in the riparian area. Any contaminated water would then be filtered and cleaned by the soil and roots systems before entering the South Saskatchewan River Watershed.

In June of 2016, Liam, Brayden and Benjamin worked with their grade 8 class from Caswell Hill Community School and two classes, one from North Park Wilson School and one from Victoria School, to transplant these native plants in the creek's riparian area. The students from each class also learned about the native shrubs and the many benefits they provide for the South Saskatchewan River Watershed. Each student and teacher left this project with a greater understanding of the importance of healthy riparian areas and how native shrubs provide such important ecological services for our many water ways!

Squeaky Green

Julia Visentini and **Jasmine Thomas** from St. Edward School decided to focus their efforts on educating about the harmful effects of triclosan. Trisclosan is a preservative and anti-bacterial and anti-fungal agent found in many of the hand sanitizers, soaps, shampoos and other PCPs that we use. Studies show that triclosan can interfere with how hormones function in our bodies. It is an endocrine disrupter and can affect the reproductive systems of animals. Triclosan is also found to be very toxic to aquatic animals and can cause long term negative effects on aquatic ecosystems.

When triclosan enters our water ways it can react with other pollutants and form additional harmful compounds like dioxins which is linked to causing cancer in humans. Triclosan doesn't easily degrade so it can build up in our rivers and lakes after washing down the drain. This means that fish can accumulate this chemical in their bodies over time, potentially becoming harmful to the other animals, including humans along the food chain.

The students developed 3 triclosan-free organic consumer products: hand sanitizer, hand soap, and shampoo, and shipped out education packages and samples for teachers and students to utilize alternative products that do not include this harmful chemical. The soap contains water, castile soap, olive oil, vitamin E oil and lemon essential oil.

In order to share this information, Julia and Jasmine created a commercial that they showed to classes in their school to inform them about the problem and to share their solutions. They also developed a recipe book so that other students could create their own soaps free from chemicals.

After piloting the Squeaky Green products with their class they wanted to make a bigger impact in Saskatoon. They wanted to get more students across Saskatoon to use triclosan-free products! So, Julia and Jasmine made 40 body product sample packs. Each of these sample packs contained samples for the hand sanitizer, soap, and shampoo and a copy of the Squeaky Green recipe book that detailed how to make them. In November of 2015, these packages went to 40 schools in Saskatoon and encouraged students and teachers to become Squeaky Green and to protect our precious watershed. Students and teachers were able to see for themselves how effective Squeaky Green products are and how easy they are to make (not to mention how good they smell!).

Project Activities

The following activities are designed to meet a wide range of cross-curricular 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 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
- www.earthcache.org
- 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: https://www.wsask.ca/Water-Info/Watershed-Planning/
- 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 places 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 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 students to build nestboxes to attract wildlife to natural areas or farms, and to provide shelter and important nesting habitat for birds, bats and waterfowl. Students 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 Saskatchewan'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 Saskatchewan, 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:

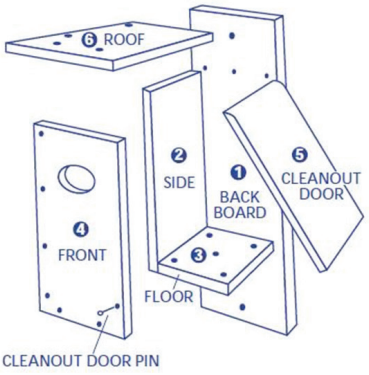
- ¼ sheet (2' x4') ½" cedar lumber or outdoor grade plywood.
- 1" x 2" (0.75" x 1.75" finished) x 8' pine lumber (this is known as a furring strip).
- 20" x 22 ½" of 1/8" plastic mesh
- 30 to 40 1 and ¼" multipurpose drywall screws
- 5/16' staples
- 1 tube of acrylic caulking, such as Mono
- 1 quart 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.

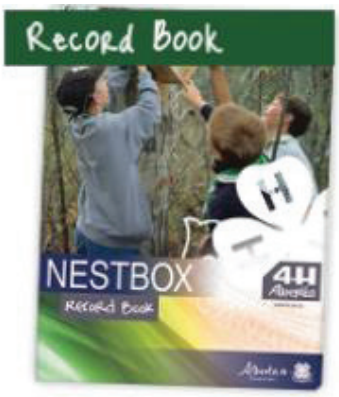
To increase the chances of your nest box being used by waterfowl, it should be located in an area that is attractive to cavity nesting ducks. You’ll see these birds using wooded wetlands that contain water year round or, at least, throughout the summer. You’ll also see them using trees along riverbanks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

Students 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 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.

a. Explain what you know about different ways that water is used by humans who live in agricultural areas.
b. Explain what you know about different ways that water is used by humans who live in urban areas.
c. Discuss ways in which urban water use is similar to agricultural water use. Discuss ways they are different.
d. 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

Students will participate in a hands-on activity designed to illustrate the value of soil to filter, clean and store water. It is recommended that students 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.aitc.oregonstate.edu

Project 6: Just Go With It!

Activity Overview

This fun and interactive water relay race will put students' skills to work, while also helping members learn about the value of water conservation. Divide the students 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 H20- Ontario Ministry of Environment

Project 7: A Lesson In Love: Give Thanks To Your Watershed

Activity Overview

Water flows over landscapes and through our lives, acting as a thread that connects us all. But often we take our water for granted, and do not recognize the irreplaceable values and benefits that a healthy watershed provides to us each and every day.

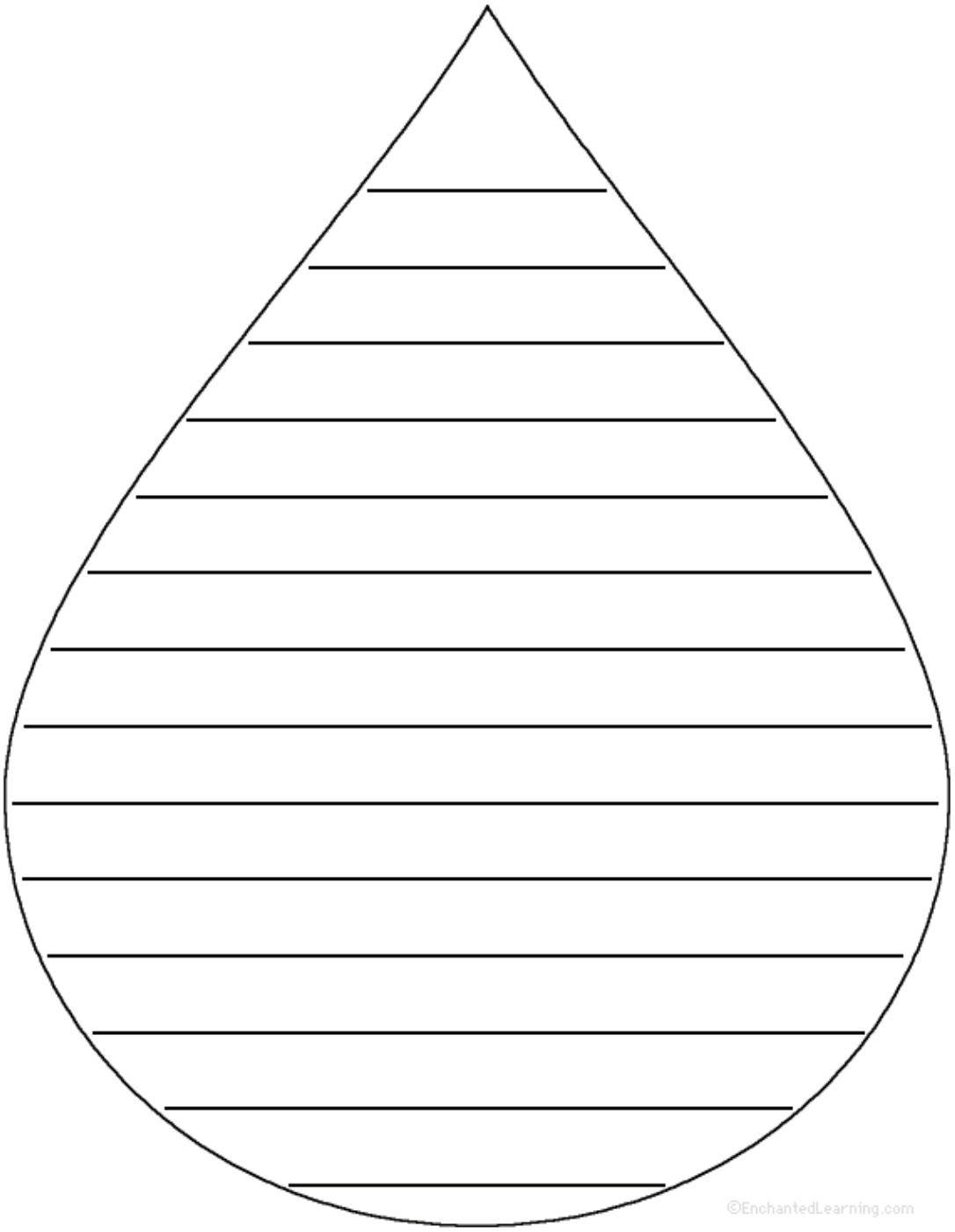
Our rivers and streams provide us with clean and safe driving water, habitat for wildlife, recreational opportunities, and just plain beautiful views! Whatever water means to you, take time to reflect and thank the waters and the lands that have shaped our individual and collective experiences.

Write a love letter to local waters and lands.

Here are some questions to get you started:

- When you think about your favourite body of water, what comes to mind?
- What is your most powerful memory of being on the water?
- How has water influenced your life so far?

Please use the template attached, or a separate piece of paper, to write a few lines about water. You can write about a local river, lake, wetland, or any place in Canada that feels important to you.



Assessment Tool

After completing the activities outlined in the Student Workbook and accompanying Leader's Guide, students 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 Saskatchewan
- ✓ Develop their understanding of ideas related to environmental stewardship and sustainability
- ✓ 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 students/youth
- ✓ 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.

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.

Ecozone
A large geographical region having a distinct biodiversity of flora and fauna. Also known as an ecoregion.

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.

Stakeholder
A person or group of people who have an interest in a company's or organization's affairs.

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

Partners FOR The Saskatchewan River Basin
Partners FOR the Saskatchewan River Basin (PFSRB) promotes stewardship and sustainability of the Saskatchewan River Basin. Use this resource to learn about watershed sustainability through awareness, linkages and stewardship.
www.saskriverbasin.ca

Meewasin Valley Authority
Meewasin Valley Authority is a conservation agency dedicated to conserving the cultural and natural resources of the South Saskatchewan River Valley. Use this resource to navigate specific projects, plans and learn more about collaborative watershed management.
https://meewasin.com

Saskatchewan Water Security Agency
The Saskatchewan Water Security Agency is a unique organization in Canada - bringing together all of government's core water management responsibilities in one place. Use this resource to learn more about Saskatchewan's watersheds, sourcewater protection and more.
www.wsask.ca

The Saskatchewan Association of Watersheds
The Saskatchewan Association of Watersheds (SAW) is the umbrella organization representing 11 watershed groups throughout the province whose mandate is the protection of both ground and surface water. Use this resource to learn more about aquatic invasive species, State of the Watersheds, and water security in Saskatchewan.
http://saskwatersheds.ca

City of Saskatoon
The City of Saskatoon is working within the South Saskatchewan River watershed to implement programs and initiatives that will protect the water resource. Use this resource to navigate specific projects, plans, and community environmental programs.
www.saskatoon.ca/community-culture-heritage/environment

Caring for our Watersheds
Features a number of resources to help engage students in preserving and improving their local watersheds.
www.caringforourwatersheds.com

Global Institute for Water Security
The University of Saskatchewan's Global Institute for Water Security (GIWS) researches sustainable use of the world's water resources and protection against natural hazards such as flood and drought. Use this resource to learn more about water policy and water security issues.
www.usask.ca/water

Trout Unlimited Canada
TUC's Yellow Fish Road™ program educates Canadians that storm drains are the doorways to our rivers, lakes and streams. Use this resource to learn more about the Yellow Fish Road™ program, events and resources.
https://tucanada.org/yellow-fish-road

Ducks Unlimited Saskatchewan
Find specific information on the Ducks Unlimited projects taking place in Saskatchewan.
www.ducks.ca/places/saskatchewan/

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

Videos

Where is your Watershed in Saskatchewan?
Do you have your facts straight about your local watershed? Use this Caring for Our Watersheds' resource to learn about a few of Saskatchewan's watersheds.
www.youtube.com/watch?v=59WaRE6uF74&t=71s

Contact Information for Members of the Saskatchewan Association for Watersheds (SAW)

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

Assiniboine Watershed Stewardship Association
www.assiniboinewatershed.com

Carrot River Valley Watershed Association
www.crwatershed.ca

Lower Qu'Appelle Watershed Stewards
www.lowerquappellewatershedstewards.ca

Lower Souris River Watershed
www.lowersourisriverwatershed.com

Moose Jaw River Watershed Stewards
www.mjriver.ca

North Saskatchewan River Basin Council
www.nsrbc.ca

Old Wives Watershed Association
www.oldwiveswatershed.com

South Saskatchewan River Watershed Stewards
www.southsaskriverstewards.ca

Swift Current Creek Watershed Stewards
www.sccws.com

Upper Souris Watershed Association
www.uppersouriswatershed.ca

Wascana Upper Qu'Appelle Watersheds Association Taking Responsibility
http://wuqwatr.ca

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Enter your local contest at: **www.CaringForOurWatersheds.com**

Partners FOR the Saskatchewan River Basin

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