# Oceans — only a river away

## Discover Canada's Watersheds

## What's Inside?

### Teaching Activities



### Background Information



### Contacts for More Information and Resources



**CURRICULUM LINKS TABLE**

| SUBJECT AREA | APPLICABLE THEMES OR STRANDS | | | |
|---|---|---|---|---|
| **Grades** | **K – 3** | **4 – 6** | **7 – 8** | **9 – 12** |
| **Science and Technology** | Water in the environment<br><br>Needs and characteristics of living things<br><br>Exploring the world with our senses | Habitats and communities<br><br>Diversity of life | Interactions within ecosystems<br><br>Water systems on Earth | Interactions among living things<br><br>Stewardship<br><br>Human interactions with watersheds |
| **Geography** | Patterns in physical geography<br><br>Areas of fresh water on Earth | Geography of the Canadian provinces<br><br>Human environment interactions | Natural resources and sustainable development | Human environment interactions |
| **Civics and Leadership** | | Citizenship | Citizenship<br><br>Active citizenship | Citizenship<br><br>Active citizenship |
| **Arts** | Visual arts and media arts<br><br>Sketching | Visual arts and media arts<br><br>Sketching | Visual arts and media arts<br><br>Sketching | Visual arts and media arts<br><br>Sketching |
| **Language** | Oral and visual communication | Reading and writing<br><br>Oral and visual communication | Reading and writing<br><br>Oral and visual communication | Reading and writing<br><br>Oral and visual communication |
| **History** | | First Nations people and European explorers | New France, the fur trade, exploration of Northern and Western Canada | Canadian history, identity and culture |

### CONNECT WITH WILD EDUCATION

Share your students' knowledge about Canada's northern rivers, oceans and watersheds with other schools by sending their PowerPoint presentations or digital photos of their projects or hallway displays to CWF's *WILD Education* website at **www.wildeducation.org**. See the back cover for **FREE** resources.

## CELEBRATE RIVERS TO OCEANS WEEK

Starting this year, Oceans Day (June 8) and Canadian Rivers Day (second Sunday in June) will be celebrated together in one of Canada's newest celebratory "weeks" — Rivers to Oceans Week — from June 8 to 14. This special week focuses on creating an understanding of Canada's watersheds, our connection to fresh- and saltwater environments, and what we can do to protect them.

All creatures — whether people or wildlife — live in a watershed. A watershed is an area of land that water flows across or through on its way to a particular water body. You can think of a watershed as a network of springs, lakes, streams, rivers and wetlands and all of the land that they drain. Rivers flow through a watershed as fresh water makes its journey from land to the salty water of the ocean. We invite you and your students to launch Rivers to Oceans Week at your school.

# COOL WILDLIFE INTERVIEWS

## Grades four and up

**Subjects:** Language arts, science.

**Group Size:** Assemble students in pairs.

**Skills:** Interviewing, communication, writing.

**Duration:** Three hours spread over three days.

**Materials:** Internet and library access; examples of interview summaries; video-recording equipment (optional).

**Summary:** Students conduct imaginary interviews with northern wildlife species, researching and presenting answers to a set of questions in an interview format.

**Background:**
The purpose of this activity is for students to recognize the diversity of wildlife that lives in or around northern waters.

**Procedure:**

1. Work with students to establish a research, interview and reporting format. Invite them to conduct imaginary "interviews" with wildlife that lives in and around northern waters. Group students into pairs where one has the role of interviewer and the other plays the role of interviewee.
2. Have students select their animal or plant, research it (library or Internet) and present their findings through an interview. Here are links to get them started:
   - **Whales** (narwhal, bowhead and beluga whale) at **www.dfo-mpo.gc.ca** and **www.acsonline.org**.
   - **Walrus** (Atlantic walrus) and seals (ringed, hooded, bearded and harp) at **www.dfo-mpo.gc.ca** and **www.imma.org**.
   - **Polar** and **grizzly bears** at **www.hww.ca**.
   - **Fish** (such as the Bering cisco, Arctic char, lake trout, northern pike, whitefish, grayling, Arctic cod, sculpins, Greenland shark, Dolly Varden char and inconnu) at **www.dfo-mpo.gc.ca** and **www.taiga.net**.
   - **Migratory birds** and **seabirds** (such as the trumpeter swan, eider duck, harlequin duck, oldsquaw, fulmar, Canada goose, thick-billed murre, semipalmated plover, jaegar, Arctic tern, semipalmated sandpiper, black-legged kittiwake and the ivory gull) at **www.hww.ca**.
3. Here are suggested interview questions:
   a) Where do you live? What is it like there?
   b) What do you like to eat? How do you find or capture your food?
   c) Are there other animals that eat you?
   d) What special needs do you have for your survival and how are they met by your environment?
   e) What special features, adaptations or habits do you have?
   f) What changes have you noticed in your world over the past few years?
4. Have teams write summaries of their interviews. (Circulate summaries provided on page 3 as examples.) Students could compile their summaries in a newsletter format to share with classmates. Alternatively, they could prepare and publish transcripts of interviews in the newsletter.
5. Older students could video-record their interviews and expand their research to find out if their species needs action to protect its habitat. Students could create "advertisements" that encourage positive action for their species.

**Evaluation:**

1. Identify at least three northern species of wildlife.
2. Write a paragraph about one species of wildlife that lives in or around northern waters.

## DISCOVER CANADA'S NORTHERN WATERS

Celebrate Rivers to Oceans Week with one heartfelt embrace that will take in all of our northern waters during International Polar Year. Oceans Day, first declared in 1992 at the United Nations Earth Summit, is celebrated every June 8 to raise awareness about the importance of the Earth's oceans, and to inspire us to take better care of them. Canadian Rivers Day, celebrated since 2003, gives Canadians a chance to honour our rivers and the important place they occupy at the heart of our history and natural heritage. The 2007-08 edition of International Polar Year will be the third one since one was first proclaimed in 1882. Scientists from all over the world will engage in important research, striving to get a better picture of conditions in the Earth's polar regions and how they influence the planet's oceans, atmosphere, biodiversity and lands. Use this teacher's guide during Rivers to Oceans Week and throughout the year to inspire learning among your students about Canada's northern waters.

# EXAMPLES OF INTERVIEW SUMMARIES

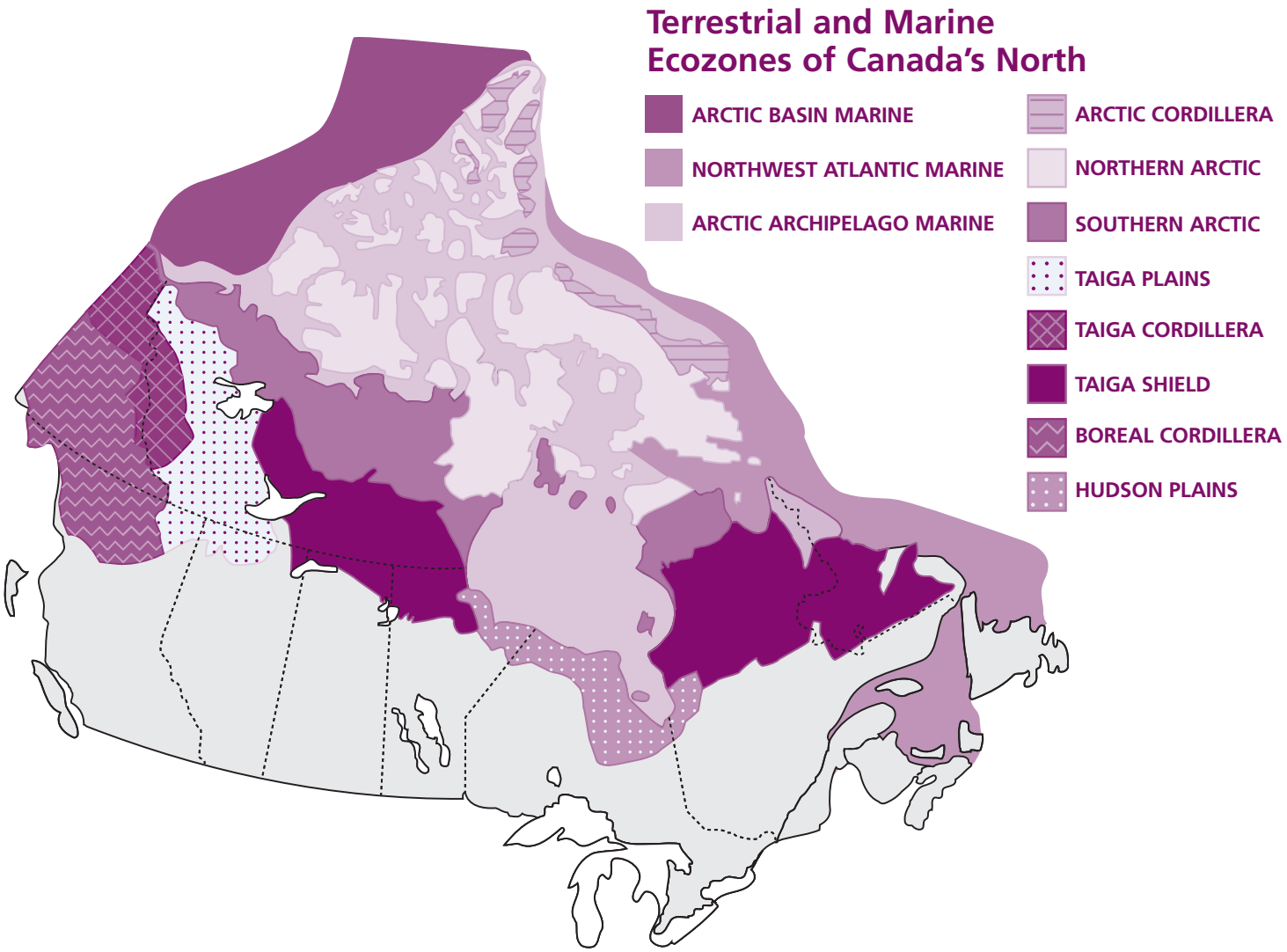
**Northern Water-Life — The Harbour Seal Lacs des Loups Marins Subspecies**
An amazing subspecies of the harbour seal, known as the Lac des Loups Marins Subspecies population, lives about 160 kilometres east of Hudson Bay on the Ungava Peninsula. While similar to their cousins, these landlocked seals spend their entire lives in fresh water! The Committee for the Status of Endangered Wildlife in Canada has rated them under the category of "Special Concern" (a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats). There are few of these seals (100 to 600 individuals) and they are susceptible to human activities. Although scientists know little about this subspecies, they believe that it eats brook trout and hauls out onto the ice in small groups to lounge.

**Northern Water-Life — The Narwhal**
This whale is found in Canada's eastern Arctic. Narwhal males grow to about five metres and sport a unicorn-like, three-metre long, spiralling ivory tusk. The tusk is a long tooth that grows through a hole in the upper lip. No one knows the purpose of the tusk, but theories abound. Does it attract a mate? Is it used to pierce ice? Regardless, this whale is adept at living in an ice-covered sea and dives to depths of 1,000 metres or more to feed on Arctic cod and squid. Narwhals breathe air and survive in winter by finding areas of open water, such as leads and polynyas.

**Northern Water-Life — The Thick-billed Murre**
A murre looks like a penguin, but this seabird is actually a member of the auk family. Apart from brief periods spent on land to mate and nest, murres spend most of their lives on the ocean, "flying" underwater to depths of 100 metres or more. They use their thick bills to capture fish, squid and krill (tiny, shrimp-like crustaceans). Murre parents usually produce a single young each season. Their young must start the annual migration to wintering areas southward at three weeks of age — well before they can fly. They will often cover 1,000 km of the journey swimming at sea, followed closely by their parents, before their wings are ready for flight.

**Northern Water-Life — The Arctic Char**
The Arctic char's colour, taste and fighting spirit have made this member of the salmon family legendary among anglers. Indeed, its name has become synonymous with fishing in Canada's North. Arctic char are widely distributed throughout Northern Canada. Most Arctic char are anadromous (sea-going) populations that return to rivers and lakes to breed. Char have been a traditional food source for northern Aboriginal peoples for thousands of years. Today, they continue to play a role in supplying food, recreation and tourism-related job opportunities to Northerners.

# GET TO KNOW NORTHERN WATERS AND MARINE ECOZONES




## MUCH OF CANADA'S WATER FLOWS NORTH

Did you know that if you sculpted a clay model of Canada's landscape and then simulated precipitation by sprinkling water on it, more than half of the water would drain toward Canada's North? In fact, two of Canada's five main watersheds drain northward — the Arctic and the Hudson Bay watersheds (see the map on page 5).

Watersheds are huge areas of land that collect precipitation, such as rain and snow, and then channel it through water systems, such as rivers and streams. Eventually most of the water ends up in our oceans. Each of these main watersheds are named for the areas into which they drain: the Pacific, Atlantic and Arctic oceans and Hudson Bay and the Gulf of Mexico.

## WHERE IS CANADA'S NORTH?

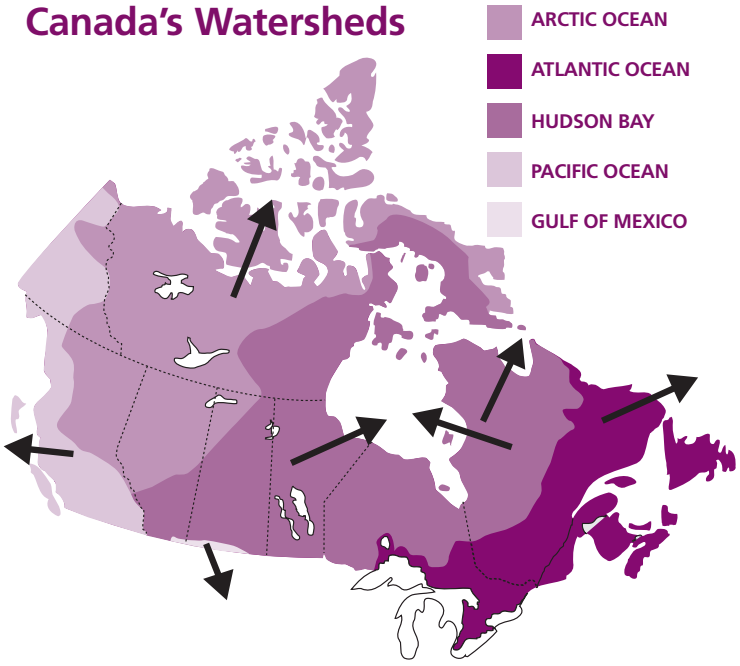
According to Environment Canada, the "North" includes our eight northernmost terrestrial ecozones: the Arctic Cordillera, the Northern Arctic, the Southern Arctic, the Hudson Plains, the Taiga Shield, the Taiga Plains, the Taiga Cordillera, and the Boreal Cordillera. In this unit, we view all the area encompassed by these ecozones as "Canada's North." Visit **www.wildeducation.org** for more information about these ecozones.

## WHERE ARE NORTHERN WATERS LOCATED?

We consider "northern waters" to include:

- the Arctic Ocean;
- freshwater systems located in and that run through the eight northern terrestrial ecozones; and
- the three northern marine ecozones (Arctic Basin, Arctic Archipelago, Northwest Atlantic).

## Canada's Watersheds




## EXPLORE NORTHERN MARINE ECOZONES

Almost all northern watersheds will eventually spill into one of our three northern marine ecozones.

**The Arctic Archipelago Marine Ecozone**: This large marine area extends from Alaska to Greenland and includes Hudson and James Bays — an area where many famous explorers sought the Northwest Passage. Bays, fjords, channels, straits, sounds and gulfs surround hundreds of islands found in this region, such as the Queen Elizabeth Islands and Baffin Island. You might see everything from high cliffs and hanging glaciers to rolling plains along the coasts. Sea ice covers nearly the entire water surface during winter although you may see "polynyas" — areas of open water created by currents and upwellings.

Cold temperatures and nearly constant ice cover limit the variety and abundance of life above the water, but where rivers meet the ocean (an area called an estuary) they share a bounty of nutrients with the ocean life gathered there and beyond. Plankton (tiny plants and animals) and small crustaceans feed fish such as the Arctic cod. This small fish, about 30 centimetres in length, is the main food for many varieties of marine mammals, such as the ringed, bearded and harp seals, beluga whales and narwhals. In fact, life in Canadian Arctic waters is amazingly abundant and diverse — home to about one quarter of Canada's freshwater and almost a third of our marine fish species. Above the water, polar bears wander the floating pack ice to hunt seals and move to the coast in summer, waiting for the next freeze-up to get back out to feed. During brief summer seasons, migrating birds breed by the millions. Tundra swans, loons, geese, ducks, shorebirds, gulls, jaegers, Arctic terns and fulmars spend summers in the coastal estuaries and mud flats.

**The Arctic Basin Marine Ecozone:** About 90 per cent of this ecozone, which includes the Beaufort Sea and extends northward to the northern edge of Ellesmere Island, is covered by a floating ice layer up to two metres thick all year round. This ice layer continually drifts and rotates around the North Pole in a counter-clockwise direction. The waters below plunge to depths of up to 3,600 metres.

Despite the extreme cold, there is life above and below the ice — it's just not very plentiful. You might see polar bears, walrus, and harp and ringed seals above the ice. Most birds are migratory, but the hardy ivory gull stays year-round near open water. Below the ice, about 130 species of fish make this area home, including the Arctic cod, ogac, Arctic char, sculpin, eelpout and the snailfish. Beluga whales and narwhals can also be found here. Bottom dwellers include anemones, clams, sea worms and sea stars. Plants are limited to algae (that can grow on ice!) and phytoplankton. Generally, life is sparse compared with warmer waters, and little is known about most of these creatures.

**The Northwest Atlantic Marine Ecozone:** Many of the rivers in eastern Quebec, Labrador and the Maritimes flow into this ecozone. This region includes part of the ocean east of Baffin Island, Hudson Strait, Ungava Bay, the Labrador Coast, and parts of the Newfoundland and Gulf of St. Lawrence coasts. While only a portion of this ecozone is in the area we consider the "North," the overall region is richer and more productive than other northern marine areas. In fact, the southern part of this ecozone includes the Grand Banks, one of the most productive biologically diverse marine areas in the world. Bottom-dwelling communities are rich with invertebrates, such as barnacles, sea stars, crabs, lobster, sponges, scallops, clams and jellyfish. Fish include redfish, herring, silver hake, turbot and the once-common northern cod. You may see such marine mammals as harbour seals, grey seals, harbour porpoises, dolphins and whales (northern bottlenose, blue, pilot, beluga, fin, minke and humpback). There are an incredible number and variety of seabirds here, too. Many only come ashore to find mates. Among them are fulmars, murres, shearwaters and the Atlantic puffin.

# JOURNEY NORTH BY RIVER INC.

## Grades Four and up

**Subjects:** Language arts, science, social studies, geography, history.

**Group Size:** Any.

**Skills:** Public speaking, writing, research.

**Materials:** Internet access, art supplies.

**Duration:** Three hours spread over three days.

**Summary:** Students play the role of tour guides who recruit others for a canoe trip down one of the Canadian Heritage Rivers located in Canada's North. The recruitment effort involves preparing a poster, a speech or a brochure.

**Background:**
Canada's northward-flowing rivers are diverse and numerous. Many begin far to the south and travel through several terrestrial *ecozones* before spilling into the ocean. For example:

- In the west, mountain glaciers feed the Athabasca and Peace rivers that wind through the rolling, forested *boreal plains* to Lake Athabasca. From there, the waters flow to Great Slave Lake and the Mackenzie River system, passing through wide valleys they've carved into the *taiga plains* on their way to the coast.
- In Central Canada, the South Saskatchewan River passes through relatively flat *prairies* and forested *boreal plains* where it joins the North Saskatchewan River. The waters eventually flow from Lake Winnipeg as the Nelson River, crossing the hills of the *boreal shield* and the low-lying *Hudson plains* before reaching Hudson Bay.
- Dozens of river systems in Ontario and Quebec cascade northward through the rocky, heavily-treed *boreal shield* to traverse the flat, open *Hudson plains* to Hudson or James Bay or to tumble across the taiga shield to Ungava Bay.

These freshwater systems have several features in common:

- They begin as springs, glaciers, wetlands, lakes and streams, gradually growing in size as they collect waters that drain from the surrounding lands.
- They create relatively fertile valleys where life can be generally more abundant and diverse. They carry dissolved nutrients from the surrounding lands, which give life to food webs in rivers and oceans.
- They attract human settlement and development, even in remote locations. Some communities are home to people who live traditional lifestyles. Most have limited resources for sewage treatment and waste disposal.
- Northern rivers are also altered by hydroelectric developments. Dams and canals change the direction and flow of large watersheds to supply hydroelectricity to the south.

Canada's northern rivers have played an important role throughout history:

- Aboriginal people used canoes, kayaks and skin boats to travel with their family groups between seasonal fishing and hunting areas, to move to new lands and to trade among neighbouring communities.
- When Europeans came, they adopted many aboriginal ways, often enlisting the help of native Canadians as guides as they explored this vast country by canoeing its rivers. Eventually, rivers became highways for the fur trade and, later, for lumber extraction.

The natural and historical values of Canada's rivers are being recognized and protected. The Canadian Heritage Rivers System (CHRS), for example, has already nominated about 40 rivers for protection, including 12 that are located in Canada's North. Learn more about heritage rivers at CHRS' website at **www.chrs.ca**.

**Procedure:**

1) In small groups, have students role-play tour guides to recruit people for a canoe trip on one of the following heritage rivers in Canada's North: the Tatshenshini, Alsek, Athabasca, Arctic Red, Bonnet Plume, Clearwater, Coppermine, Hayes, Kazan, Missinaibi, Seal, Soper, South Nahanni or Thelon Rivers. The Bloodvien, Churchill and North Saskatchewan rivers, which flow northward, may be included.
2) Students research their river by reading fact sheets and river stories at **www.chrs.ca**. Have them create a poster or brochure. It should communicate:
   - the objective of the trip (such as a hunting, exploration, recreational or historical trip).
   - a description of their river.
   - the route and what travellers might see in terms of wildlife and scenery.
   - the length of the trip and types of challenges the travellers can expect.
   - other convincing arguments for joining the expedition.
3) Provide some brief backgrounders that are located on page 7 to get your students started on their ads.
4) Ask students to display and present their recruitment materials.

**Extensions:**

1) Students describe features of the northern marine ecozone into which their river eventually drains.

2) Students describe features of northern Wetlands of International Importance, such as at Old Crow Flats, Whooping Crane Summer Range, Queen Maud Gulf Migratory Bird Sanctuary, Polar Bear Pass, Rasmussen Lowlands, Dewey Soper Migratory Bird Sanctuary, McConnell River Bird Sanctuary and Polar Bear Provincial Park, which are linked to their river.

3) Students create an account of a "first voyage" down a river from the perspective of an Aboriginal person or a northern explorer such as Samuel Hearne, Sir John Franklin, Dewy Soper, J.B. Tyrrell, John Hornby or George Douglas.

4) Students research and describe the potential impacts of climate change on the ecology and recreational aspects of their river.

**Evaluation:**
Identify and describe three Canadian Heritage Rivers in Canada's North.

# BRIEF BACKGROUNDERS

**The Sublime Thelon River**
The Thelon River flows through the spruce-lined valleys that reach into the northern barrens and the Thelon Game Sanctuary to Baker Lake, where it joins the Kazan River for the final journey to Hudson Bay. You may see muskox, white wolves, snow geese and some of the Beverly caribou herd that call it home. You can fish for lake trout, Arctic char and grayling while you contemplate the adventures of Samuel Hearne or camp at the final resting place of ill-fated explorer John Hornby. This heritage river is part of the largest remaining unaltered watershed that flows into Hudson Bay. Hopefully, its protected status will spare it the dams and diversions that have befallen so many other once-wild northern rivers.

**The Majestic Mackenzie**
Canada's longest river at over 4,200 km, the Mackenzie drains almost one-fifth of Canada's lands (over 1.8 million km$^2$). The river provides rich soil and moderates the regional climate so well that it helps the treeline extend all the way north to the Beaufort Sea. This is the traditional home of the Dene and Inuvialuit people, many of whom still rely heavily on hunting and fishing for food. The sprawling Mackenzie delta is uncommonly rich in ecological diversity, hosting about 54 mammal species, 137 kinds of birds and 55 types of fish, including the renowned Arctic char.

**The Wild South Nahanni**
The South Nahanni River, located in the Northwest Territories, is part of the Nahanni National Park Reserve and was designated a Canadian Heritage River in 1987. This spectacularly wild river features canyons up to 1.2 km deep, cave systems, hot springs and waterfalls (including Virginia Falls, which is twice the height of Niagara Falls). Rare orchids, endangered trumpeter swans, Dall sheep and Dolly Varden char live here. This is also a traditional home of the Dene people, who still use northern rivers as highways in summer and winter. Their name for this river means "flowing from Mother Earth." You can travel this protected river by raft or canoe, but make sure your whitewater paddling skills are up to speed!

## PROTECTING NORTHERN WATERS

Northern waters are a valuable part of Canada's natural and cultural heritage:

- Many northern people experience strong spiritual links to waters that connect them to the Earth, its cycles and their ancient beginnings.
- Northern rivers and lakes are home to many unique species of wildlife including the famous Arctic char. Some populations of char live entirely in fresh water and some are anadromous (seagoing but they spawn in fresh water), but both are important food sources for local people and contribute to local economies through commercial and sport fishing.
- Northern waterways are original "highways" for Aboriginal people and explorers. They continue to provide recreational and economic opportunities.
- Northern marine ecosystems support marine mammals found only in the Arctic, such as the walrus, bowhead whale, narwhal, polar bear and several species of seals.
- Many of the world's population of migratory birds use Arctic river deltas and coastlines as key habitat.
- The permanent ice covering much of the northern seas increases the *albedo* effect — the reflection of solar energy from the surface of the ice. This helps to slow warming of the Earth's climate.

## THREATS

Canada's North is one of the most sensitive regions on the planet even though it is far from the Earth's main human population centres. Ecosystems are fragile and easily damaged by our actions.

- Global climate change is causing sea ice to melt. The loss of this reflective ice surface (the albedo effect) leads to more warming of the climate and the loss of important ice habitat for polar bears, walruses and ringed seals. As ice melts, it also dilutes salt water and upsets the natural composition of marine food webs.
- Hydroelectric power developments, though considered a source of renewable energy, can create environmental impacts that include:
  - dams that block migration and travel routes for fish, often cutting them off from key spawning and feeding grounds
  - flooding of lands behind the dams with the destruction of terrestrial habitats and release of pollutants such as mercury
  - seasonal and daily changes in river water flow, leaving too little water for fish at some times and too much at other times
  - diversion of water from one drainage basin (watershed) to another that allows undesirable alien species to colonize new areas and reduces nutrients to the estuaries of diverted rivers
- Oil spills that occur through oil exploration, development and transportation pollute key habitats such as shorelines, ice floes and open water areas. Improper storage and disposal of waste oil and gasoline on smaller scales also adds up to bad news for rivers and coasts.
- Increased shipping and oil exploration can result in collisions between ships and marine mammals, or can disrupt wildlife feeding and mating.

Agricultural and industrial pollutants produced in populated areas are carried northward by air and ocean currents and dumped into rivers and lakes. Pollutants such as Persistent Organic Pollutants, heavy metals and radioactive compounds concentrate in northern food chains and are thought to cause deformities, cancers and other health issues in wildlife and people.

### LETHAL NORTHERN FOOD WEBS

Northern food chains and webs can be long and complex, often overlapping between terrestrial, freshwater and marine ecosystems. At the top are traditional northern people such as the Cree and Inuit who get much of their food through hunting and fishing. Most of us would prefer to be at the top of food chains and webs, but with toxic chemicals, heavy metals and radioactive elements accumulating in the environment, eating traditional foods is becoming a concern. Learn more about northern food webs and the problem of contaminants by visiting the Inuit of Canada's website at **www.itk.ca/environment/contaminants-wildlife-humans.php**. Also, find the activity, "Lethal Legacy," which deals with contaminants in food chains, on CWF's *WILD Education* website under Ocean Education, *Learning about Oceans Unit 7* (2001) at **www.wildeducation.org/programs/ocean_ed2001/lessons/lessons6.asp**.

## PROTECTION

Canada's North serves as an early-warning system for the planet because it's so sensitive to human-induced change. Many agencies and organizations protect northern natural areas. For example:

- Fresh- and saltwater-related legislation and strategies by the federal government provide frameworks for protection. Examples are the Fisheries and Oceans' Marine Protected Areas, Parks Canada's National Marine Conservation Areas and National Parks, Environment Canada's National Wildlife Areas, migratory bird sanctuaries and wetlands of international importance.
- Federal, provincial and territorial governments protect areas through such systems as parks and ecological reserves. Many of our northern national parks, for example, protect lakes, rivers and offshore areas.
- Organizations such as the Canadian Heritage River System (established in 1984 through a partnership between federal, provincial and territorial governments) protect examples of Canada's river heritage. As of March 2007, 40 rivers have been named. The goal is to raise awareness of natural and cultural values and to encourage enjoyment of this heritage resource.

## WHAT YOU CAN DO

These good-news stories are not enough to protect the North. We can each take action, starting from our own home, school and backyard, to protect Canada's North from threats such as climate change and pollution. Here's where to start:

- Raise awareness. Spread the word among friends, family members and the school community and families about the value and importance of northern rivers and marine areas. Plan bulletin board and information displays, articles in the local paper or festivals during Rivers to Oceans Week that focus on a local river, a Canadian Heritage River, a marine area or northern ocean.
- Shut down global climate change from your home and at school:
  - Use less electricity. Turn off lights and turn down the thermostat.
  - Plant a native tree in your backyard or in your schoolyard to absorb carbon dioxide from the atmosphere.
  - Encourage school administrators and parents at home to use energy-efficient appliances.
  - Explore the availability of "green" energy from wind or other renewable sources for use at your school.
  - Encourage teachers and parents to reduce the use of their cars. Ask them to consider an energy-efficient vehicle when replacement time comes. Burning fossil fuels (such as gasoline) puts climate-changing "greenhouse gases" directly into the air.
  - Reduce, reuse and recycle. It takes less energy to create products from recycled goods than from raw materials.
- Cut pollution off at the source. Toxic cleaners and chemical compounds that go down our drains or onto our lawns can eventually make their way into food chains and the watersheds that connect us to Canada's northern waters. And remember: people are a part of those food chains, too!
- Write to members of Parliament for action on pollution and climate change.

# CREATE HANDS-ON OR ELECTRONIC NORTHERN WATERS PRESENTATIONS

## Any grade

**Subjects:** Art, science, language arts, media.

**Group size:** Any.

**Skills:** Small group work, research, analysis, application, drawing.

**Duration:** Minimum six hours, may be spread over several days.

**Location:** Locate displays in areas such as school hallways, lockers or cafeteria walls.

**Materials:** Common art materials for hands-on displays; appropriate equipment and computer programs (e.g., video cameras, computer programs) for video, PowerPoint or website presentations.

**Summary:**
Students plan, prepare and present a hands-on or an electronic display on a northern ocean and rivers theme. They may also share their displays with other schools through CWF's *WILD Education* website and other media.

**Procedure:**
Follow these five steps to create a spectacular display (see the boxes for details).

1. Choose your theme. Match your theme to your grade level, curriculum focus and interest.
2. Select a presentation style. Have students select a style for their display.
3. Research, plan and prepare. Have small groups of students work co-operatively to research, plan and prepare parts of the display (visit CWF's *WILD Education* website at **www.wildeducation.org** for a list of resources for your display section).
4. Show the display in busy locations at school. Let students select a suitable location to show their display for maximum exposure at their school.
5. Connect, share and celebrate. Have students celebrate their display by connecting with other classes and schools in your watershed. Better yet, send us their electronic presentations for posting on CWF's *WILD Education* website at **www.wildeducation.org**.

**Evaluation tips:**
Evaluate students on their clarity (written work and presentation), creativity and the integration of their visual messages with the theme.

### CHOOSE YOUR THEME

Here are some suggested topics:

**Grades K–3**
- Me and my water connection to Canada's North.
- Water in my environment and where it flows.

**Grades 4–6**
- A shoreline community in Canada's North.
- Fresh- and saltwater wetland communities in Canada's North.

**Grades 7–8**
- Our connections to the rivers and oceans in Canada's North.
- Water systems in Canada's North.

**Grades 9–12**
- Trace "your ecological footprint" from your watershed to the Arctic Ocean.
- Issues facing our northern waters.

### RESEARCH, PLAN AND PREPARE

Research the theme that is chosen for the presentation. Be sure to communicate your ideas visually through colourful photos, artwork or crafts.

### SHOW YOUR PROJECT IN BUSY LOCATIONS AT SCHOOL

Maximize the exposure of your display and its messages by positioning it in busy locations at your school.

- Plan to take photos of the assembly process from start to finish. Create a photo journal, video or PowerPoint presentation. Send it to CWF for inclusion on the *WILD Education* website.
- Alert teachers, administrators and caretakers that there will be a display.
- Follow your school's guidelines for attaching things to walls, ceilings, lockers, etc., if you are doing a hands-on display.
- Create work teams with leaders. Brief them on the task and your expectations.

## SELECT A PRESENTATION STYLE

Here are some presentation style ideas:

- Be interactive. Create displays that motivate audience participation by including elements such as quizzes and scavenger hunts (where students search for items in a display or a website).
- State a clear theme. One key element in any display is a clearly defined theme.
- Make it 3-D. Include special crafts such as origami and mobiles in a display.
- Use visuals. Get lots of great photos from the *WILD Education* website.

**For Younger Students:**
**Story:** As a class, deliver an important message through a simple, illustrated story. A theme such as "Where Water Flows" might work well. Have different students work on different parts of the display and the titles or captions.

**Mural:** Have students create a spectacular themed mural and contribute illustrated elements.

**Collage:** Allow students to produce individual items for a collage. The theme "Canada's Northern Waters" works well in this style.

**For Older Students:**
**3-D model:** Let students make a three-dimensional model of Canada's main watersheds.

**Large wall map:** Have students show how people make different uses of land and water, and display the information on panels outside the *Discover Canada's Watersheds* map, which was provided in the 2006 *Learning About Oceans Unit 12*.

**For High-School Students:**
**PowerPoint presentations:** Encourage students to create innovative computer presentations.

**Videos:** Older students could video-record interviews with people on how they impact northern waters, watersheds, oceans and marine ecozones and what they could do to maintain their health.

**Website development:** Let students build a website about practices that help sustain people, wildlife and water in the North. Post the websites within school district systems for maximum exposure.

## CONNECT, SHARE AND CELEBRATE

Your students have done a great job. Now let's share it!

**Connect with your school**. Have older students give an "interpretive tour" of their connection to northern waters to younger students or parents.

**Contact other schools**. Link with other schools located in your watershed. Contact those that have posted their projects on the *WILD Education* website.

**Celebrate**. Plan an official "unveiling" of your display. List the event on CWF's website. Conduct a tour of the display during Rivers to Oceans Week in June or any other time of the year (such as National Wildlife Week in April, Biodiversity Day in May or Environment Week in June). Notify local media to help promote watershed and ocean awareness.

## SHARE WITH CWF

Send us a copy (or link) of your project (video, PowerPoint, website, etc.) for posting on the *WILD Education* website. Be sure to create a photo journal of your project if you developed a hands-on display. Please include:

- pictures and explanatory notes of your preparation activities, your final display, your celebrations and any related events.
- an explanation of how your activities are helping Canada's northern waters.
- permission to post your project on the *WILD Education* website.
- your location and your class contact information.
- a note indicating if you are interested in hearing from other Canadian schools.

For resources for your displays and for more information about Canada's northern waters, go to CWF's *WILD Education* website at **www.wildeducation.org**.

## PARTNERS AND SPONSORS

CWF gratefully acknowledges the following partners and sponsors for their help in preparing, distributing and/or financing the educational materials for this *Learning About Watersheds* unit. Please visit their websites for additional resources.

**Atlas of Canada**
**(Natural Resources Canada)**
Website: **atlas.gc.ca**

**Biodiversity Convention Office**
**(Environment Canada)**
Website: **www.cbin.ec.gc.ca**

**Canadian Association of Principals**
Websites: **www.cdnprincipals.org**
**www.schoolfile.com/lessonplans/oceans/oceans.htm**

**Canadian Heritage Rivers System**
Website: **www.chrs.ca**

**Canadian Museum of Nature**
Website: **www.nature.ca**

**Canadian Network for Environmental Education and Communication**
Website: **www.eecom.org**

**Coastal Zone Canada Association**
Website: **www.czca-azcc.org**

**Conservation Priorities Division**
**(Environment Canada)**
Websites: **www.npa-pan.ca**
**www.npa-pan.ca/youth**
**www.npa-pan.ca/jeunesse**

**Fisheries and Oceans Canada**
Websites: **www.dfo-mpo.gc.ca**
**www.dfo-mpo.gc.ca/oceans-habitat**
**www.dfo-mpo.gc.ca/canwaters-eauxcan/bbb-lgb (*kids' section*)**
**www.dfo-mpo.gc.ca/science**

**(DFO Regions)**
Website: **www.dfo-mpo.gc.ca/regions_e.htm**

**(Maritimes Region)**
Website: **www.mar.dfo-mpo.gc.ca**

**(Quebec Region)**
Website: **www.osl.gc.ca**

**(Pacific Region)**
Websites: **www.pac.dfo-mpo.gc.ca**
**www.streamtosea.ca**

**Government of Canada**
**RésEau — Building Canadian Water Connections**
Website: **www.environmentandresources.gc.ca/reseau**

**Parks Canada**
Website: **www.pc.gc.ca**
**www.pc.gc.ca/education**

**Scouts Canada**
Website: **www.scouts.ca**

## VISIT THE *WILD EDUCATION* WEBSITE FOR FREE RESOURCES

- Visit CWF's *WILD Education* website at **www.wildeducation.org** for a list of resources that offer general information, teaching resources about Canada's northern waters, posters and maps.
- Order your **FREE** copy of next year's *Learning About Watersheds Unit 2* online.
- Join the WILD Education Network for mailings of FREE educational resources.
- Give us feedback on how you use our materials so we can serve you better.

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**www.wildeducation.org**
**www.spaceforspecies.ca**
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*Learning About Watersheds Unit 1* Learning About Watersheds is part of the WILD Education family of conservation education programs. ISBN: 1-55029-194-7