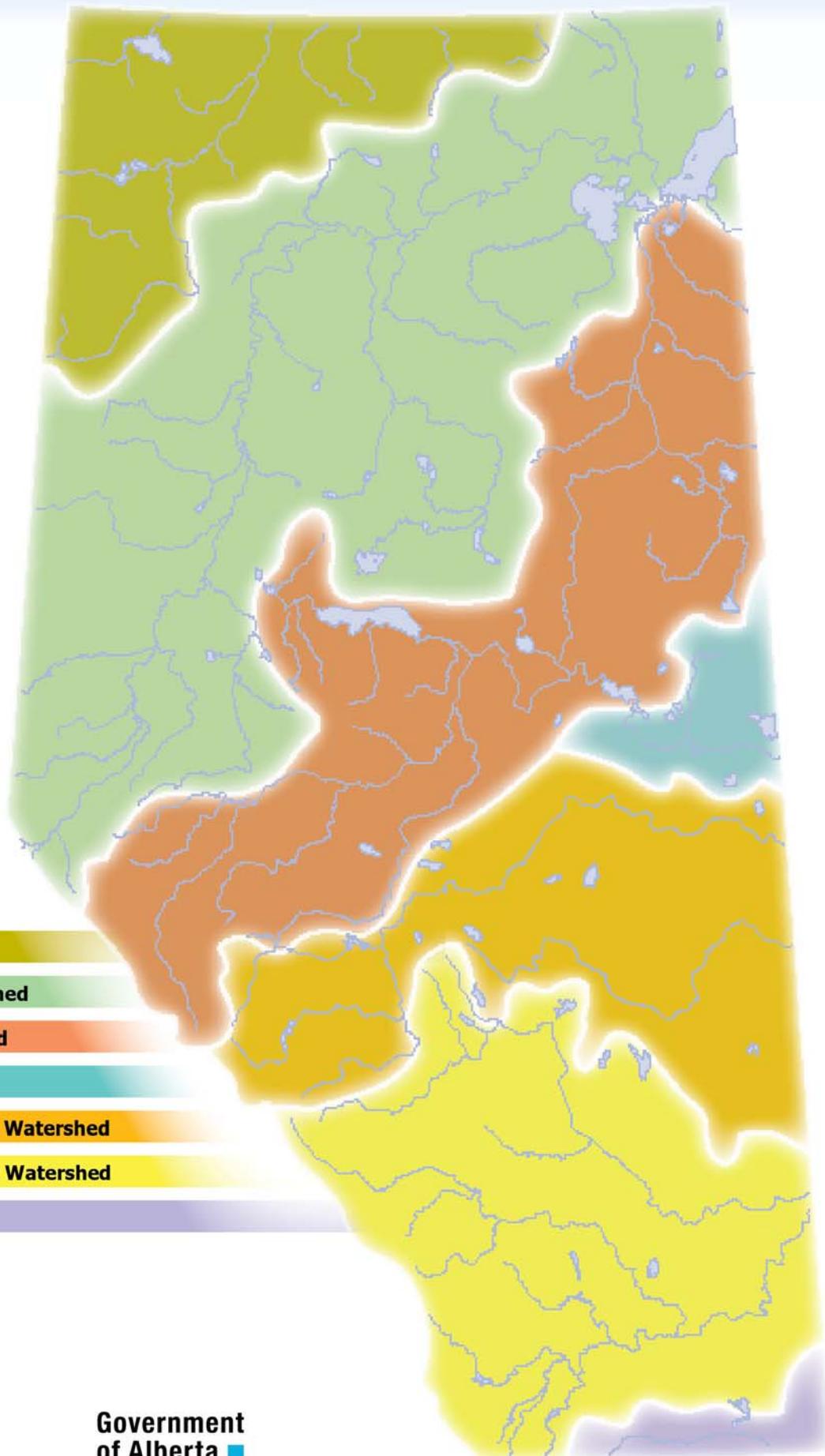


# Alberta's Major Watersheds or River Basins



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## Demonstration # 2

### Formation of Prairie Wetlands

## Teacher Background



When the continental ice sheets began to retreat from the face of what is now Alberta, chunks of ice were left behind, covered with till and other sediment. As the ice slowly melted, a depression was formed on the surface of the earth. These depressions became the hummocky terrain (old moraines and knob and kettle topography) often observed in central Alberta (e.g., Elk Island National Park, Cooking Lake or Rumsey).

As meltwater or precipitation collected in these newly formed depressions, they became the shallow, water-filled depressions now seen in Alberta and known as prairie potholes and sloughs.

### Prairie Pothole Region of North America

(Image Credit: U.S. Geological Survey, Northern Prairie Wildlife Research Center)

The **Prairie Pothole Region** is an area of the northern Great Plains and midgrass and tallgrass prairies that contains thousands of shallow wetlands known as *potholes*. These potholes are the result of glacier activity in the Wisconsin glaciation, which ended approximately 10-12,000 years ago. The decaying ice sheet left behind depressions formed by the uneven deposition of till in ground moraines, and melting ice blocks which created kettle lakes. These depressions filled with water, creating the potholes and sloughs.

More than half of the potholes have been drained and converted to agriculture. Pothole loss is 90 per cent or more in places. Those potholes that remain are important habitats for migratory waterfowl and other wildlife, supporting more than 50 per cent of North America's migratory waterfowl. (Source: Wikipedia)

The prairie pothole region of North America covers approximately 715,000 km<sup>2</sup>, extending from north-central Iowa to central Alberta. This landscape is largely the result of glaciation events during the Pleistocene Epoch.

The last glaciers retreated from this region approximately 12,000 years ago, leaving behind a landscape dotted with many small wetland depressions called *potholes* or *sloughs*.

# Demonstration # 1

## Wetlands and Watersheds

## Teacher Background

Healthy wetlands and healthy watersheds go hand in hand. To fully comprehend the benefits of wetlands, it is important to understand a watershed.

### What is a watershed?

**A watershed is an area of land that catches precipitation and drains it to a common point such as a river, lake, stream or wetland.** Watersheds can range in size from a few hectares to thousands of square kilometres. Sometimes, watersheds are called basins, drainage basins or river basins. Large watersheds, or river basins, are usually made up of smaller sub-basins. For example, in Alberta the South Saskatchewan River Basin includes the Bow, Red Deer, Oldman and South Saskatchewan River sub-basins.

### Watersheds: three main functions

Watersheds perform three main functions: *capture* water, *store* water and slowly *release* water. The main factors that play a role in the amount of water in a watershed are: soil conditions, vegetative cover, the length and slope of the drainage landscape, climate of the area and the time of year. Wetlands and vegetative buffers are a vital part of a healthy watershed. The plants that separate land from water bodies work as natural water filters. They also help to regulate water flow and reduce sediments from accumulating in the wetland.

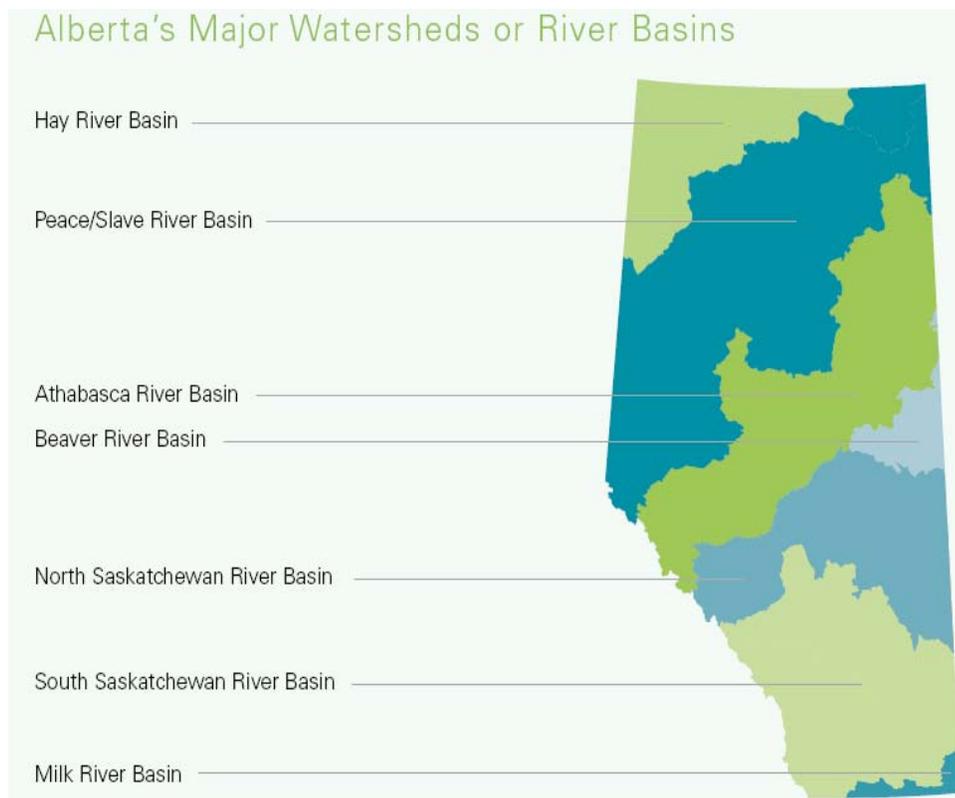


Image Credit: Alberta Environment

## Watersheds in Alberta

There are seven major watersheds, or basins, in Alberta: the Hay, Peace/Slave, Athabasca, Beaver, North Saskatchewan, South Saskatchewan and Milk.

**Hay River Basin** – the Hay River Basin is located in northwest Alberta, covering approximately 47,900 square kilometers (km<sup>2</sup>). The Hay River originates in British Columbia's Rocky Mountains, and water in the basin flows to the Arctic Ocean via the Mackenzie River. Sub-basins within the Hay River Basin include the Chinchaga and the Little Hay river systems. This basin also includes two lakes, Zama and Hay Lake, recognized for their importance to wildlife.

**Peace/Slave River Basin** – the Peace River, which begins in the mountains of British Columbia, is Alberta's largest river with the highest flow volume. The river flows northeast across the province, through the town of Peace River, empties into the Slave River, and eventually flows into the Arctic Ocean through the Mackenzie River. The Peace/Slave River Basin covers an area of 293,000 km<sup>2</sup>, and drains more water than any other major river basin in the province. It includes the Wapiti, Smoky, Little Smoky and Wabasca Rivers. Major centres within the basin include Grande Prairie, Peace River, High Level and Grand Cache.

**Athabasca River Basin** – the Athabasca River originates in Alberta's Rocky Mountains. The river flows northeast through the province, past the urban centres of Jasper, Hinton, Whitecourt, Athabasca and Fort McMurray before emptying into Lake Athabasca. Flows from the basin eventually make their way to the Arctic Ocean. The Athabasca River Basin covers an area of approximately 159,000 km<sup>2</sup>, and includes the McLeod, Pembina and Clearwater Rivers. The Peace River and Athabasca River merge to form the Peace Athabasca Delta. This delta is one of the world's largest inland fresh-water deltas and is a wetland of international significance. It includes some of the largest undisturbed grass and sedge meadows in North America, providing habitat for large populations of waterfowl, muskrat, beaver and wood bison.

**Beaver River Basin** – the Beaver River Basin is a small basin covering only 14,500 km<sup>2</sup>. The river extends east into Saskatchewan, and empties into the Hudson Bay via the Churchill River. The Beaver River begins at Beaver Lake northeast of Edmonton, flowing north of Bonnyville and then south of Cold Lake. The basin is characterized by its many winding streams and rivers, which drain into lakes within the basin.

**North Saskatchewan River Basin** – the North Saskatchewan River Basin covers approximately 80,000 km<sup>2</sup>. The basin begins in the ice fields of Banff and Jasper National Parks and generally flows eastward towards the Alberta-Saskatchewan border. The Brazeau, Nordegg, Ram, Clearwater, Sturgeon and Vermilion rivers all flow into the North Saskatchewan River. The Battle River also forms part of the basin and joins with the North Saskatchewan River in Saskatchewan. Major centres within the basin include Rocky Mountain House, Drayton Valley, Edmonton, Fort Saskatchewan, Camrose and Lloydminster.

**South Saskatchewan River Basin** –the South Saskatchewan River Basin includes the sub-basins of the Bow, Red Deer, Oldman and South Saskatchewan River systems. The total area of the South Saskatchewan Basin is approximately 121,095 km<sup>2</sup>. Major urban centres in the basin include Calgary, Lethbridge, Red Deer and Medicine Hat. The province’s 13 irrigation districts are in the South Saskatchewan River Basin. The North and South Saskatchewan Rivers meet in the province of Saskatchewan and eventually drain into the Hudson Bay via the Nelson River.

**Milk River Basin** –the Milk River is the smallest major river basin in Alberta. It encompasses an area of about 6,500 km<sup>2</sup>. The Milk River, a northern part of the Missouri-Mississippi River Basin, enters Alberta from Montana. It then flows eastward through Alberta before looping back southwards to Montana. The town of Milk River is one of the few towns in the basin.