

PAUSE, REFLECT, APPLY

1. List and rank the four facts you know about the size of Canada.
2. Create a diagram to show how Canada's size, northernness, and isolation affect four circumstances of Canadian history.
3. It has been joked that "Canada has too much geography." Explain what this statement means to you.
4. Imagine what it would be like if your school were a one-room schoolhouse. Now picture your school being housed in the MTS Centre. How would each of these locations affect your ability to connect with (a) your friends and (b) your teachers? Create a chart listing the positive and negative effects that these locations would have on your school community.

Canada: Physical Geography

The physical geography of an area can be broken into landforms, soils, surface waters, climate, and vegetation. In Canada, these five components vary considerably from place to place.

KEY QUESTION

How does the physical geography of Canada vary from place to place?

LANDFORMS AND SOILS

Physically, Canada is the product of three primary **geologic** developments.

First, the Canadian Shield was formed about 2,000 million years ago when seven ancient micro-continents collided and merged together. Much of the Shield consists of rocks, mostly granite, that are 2,500 million years old.

Second, as sediment accumulated in long, narrow basins, three regions around the Shield margins developed mountains. These are (1) the Cordilleran mountain system, in Western Canada, with a history that includes volcanic and earthquake activity; (2) the Appalachian system in Eastern Canada, which is older than the Cordilleran and lowered by erosion; and (3) the Innuitian system across the high Arctic, from Alaska to Greenland.

The third geologic development was the depositing of sediments in shallow seas in the intervening areas, about 500 million years ago.

Landscape was also affected by **glaciation**. Almost all of Canada was under ice at some time during the last 1.5 million years. Only 1 percent is under ice today. The largest ice sheet in the northern hemisphere covered Canada during the last glacial period, which ended about 10,000 years ago.

Physiographic Regions of Canada

This sketch of Canada's geological history helps us to understand the physiographic regions of Canada. These regions, mapped in Figure 1.6, are defined by underlying geologic structures and **topography** (surface landforms). They are as follows.

- *Canadian Shield*. This, the largest physiographic region, includes most of Quebec and Ontario, northern Manitoba and Saskatchewan, Nunavut, and more than half of the Northwest Territories. The rugged landscape comprises rock outcrops, bogs, **muskeg**, **drumlins**, **eskers**, and lake basins. Soils are poor, thin, acidic, or non-existent. Natural resources include forest and mineral deposits, including gold, uranium, copper, and nickel.
- *Western Cordillera*. Oriented northwest to southeast, this region includes a Pacific mountain system and the interior Rocky Mountains. The landscape is deeply dissected and eroded, with

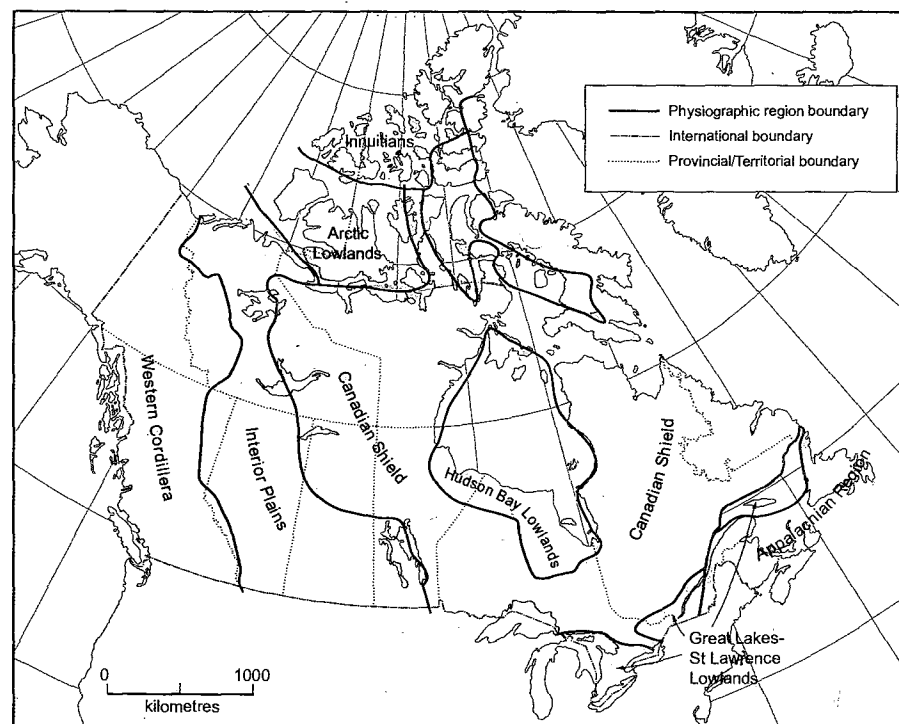


FIGURE 1.6 Physiographic regions of Canada

many peaks over 3,000 metres, and there are large valleys and other intermontane (between mountains) regions. Soils are limited to valley and intermontane regions. Natural resources include forest, minerals such as gold, and opportunities for hydroelectric power.

- *Appalachians*. These older mountains are eroded to an undulating upland about 150–1,200 metres high. Glacial landforms, such as drumlins and eskers, are common. Soils are mostly poor and sometimes swampy. There are a few areas of good soil in the lowlands, including throughout Prince Edward Island. Other natural resources include coal.
- *Innuitions*. Located in the far north, this rugged and isolated mountain area comprises glaciers and ice fields.
- *Great Lakes–St. Lawrence Lowlands*. This relatively small region rests on **sedimentary** rocks. Natural resources include fertile soils, construction materials, and opportunities for hydroelectric power.
- *Interior Plains*. Sedimentary rocks also underlie this region, extending from the Mackenzie River delta to the border with the United States. Landforms are diverse, with flat areas, rolling areas, and valleys created by glacial meltwater. In the southern area there are thick glacial lake soils. From east to west, the prairies increase in elevation. Natural resources include several minerals and oil and gas.
- *Hudson Bay Lowlands*. A level area, this region comprises muskeg and other poorly drained areas. There are few natural resources.
- *Arctic Lowlands*. This region is a series of low islands. Natural resources include fossil fuels.

THE WEB →

Explore Canada's physiographic regions and natural resources through photos, maps, satellite images, key glossary words, and more at www.emp.ca/ccw

► DID YOU KNOW ◀

Glacial Lake Agassiz was formed by the melting ice sheet about 12,000 years ago. Today, many lakes, including lakes Winnipeg, Manitoba, and Winnipegosis, are remnants of Agassiz. The rich soils of the Red River Valley formed at the bottom of the lake.

SURFACE WATERS

The geological history of Canada also helps us understand **hydrography**, the study of surface waters. The map in Figure 1.7 shows Canada's five **drainage basins**: Hudson Bay (3,681,279 km²), Arctic (3,576,501 km²), Atlantic (1,502,444 km²), Pacific (1,037,885 km²), and Gulf of Mexico (26,213 km²).

The location and size of drainage basins is important for many reasons. In particular, rivers can be main transportation routes. Both rivers and lakes also offer opportunities for power, fishing, and recreation, and provide water for domestic, agricultural, and industrial use.

CLIMATE AND NATURAL VEGETATION

Four main factors help explain why different parts of Canada have different climates:

- *Latitude.* Because the sun's rays have to travel farther through the Earth's atmosphere to reach northern parts of Canada, less solar radiation reaches these northern areas. As a result, temperatures decrease from south to north in the northern hemisphere.
- *Distance from oceans.* Close to oceans, climates are temperate, with warm summers and cool winters and high levels of precipitation. Away from oceans, climates are more continental, with hot summers, cold winters, and less precipitation.
- *Prevailing air movement.* Because air moves from west to east at Canada's latitudes, weather patterns move in an easterly direction.
- *Landforms.* The Western Cordillera prevents warm, moist Pacific air from moving east across Canada. The Interior Plains sometimes let moving air spread easily; at other times, they act like a saucer, holding bodies of cold air in winter and hot air in summer.

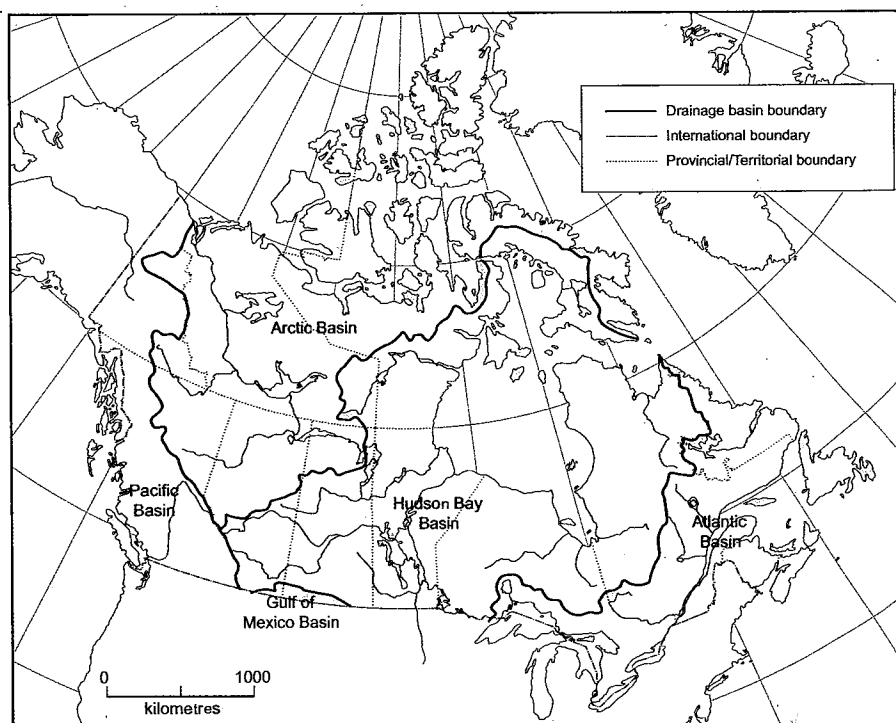


FIGURE 1.7 Drainage basins of Canada

Climate Regions of Canada

Geographers recognize climate regions. These are defined by long-term averages of temperature and precipitation. Because climate affects vegetation, each region also has characteristic natural vegetation.

The map in Figure 1.8 is divided into seven climate regions:

- The *Arctic* is characterized by light snowfall, high winds, and long periods of very low temperatures. Vegetation is limited to **tundra**.
- The *Subarctic* has very cold winters, with about six months of snow, and warm summers. Vegetation is **boreal forest** with open areas and some stunted growth. The transition zone between tundra and boreal forest is called the **tree line**.
- The *Pacific* has high rainfall, with mild winters and cool summers. Vegetation is mostly coastal rainforest.
- The *Cordillera* has temperatures that vary widely with elevation, with most precipitation in the south. It is a varied montane (mountain) and boreal forest region.

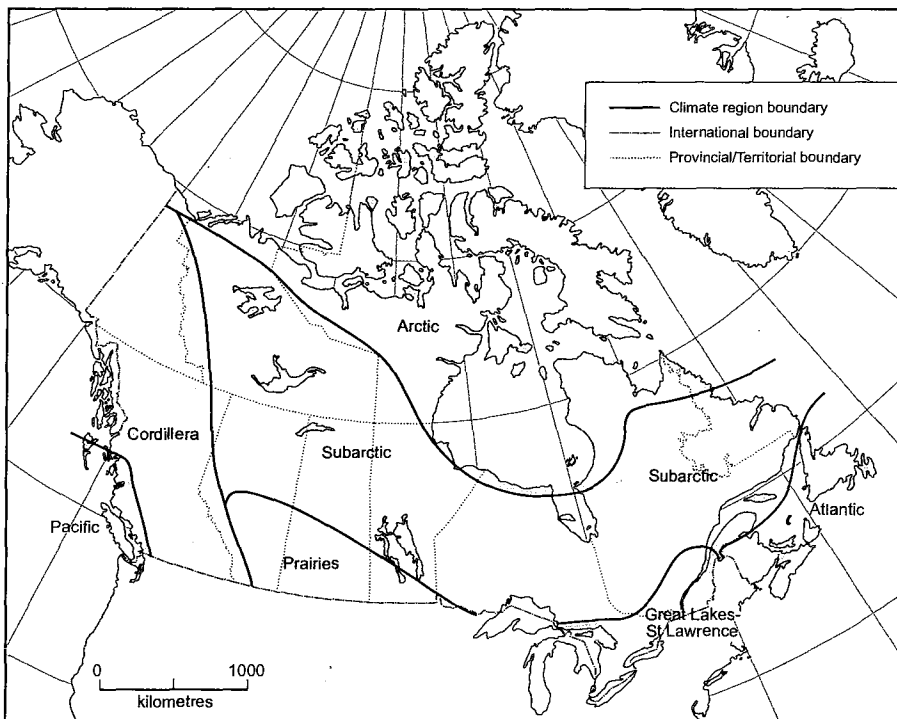


FIGURE 1.8 Climate regions of Canada

► DID YOU KNOW ◀

Much of the ground in northern Canada is permanently frozen to a great depth, as much as 400 metres at Resolute, Nunavut. Even with this **permafrost**, in some areas a surface layer thaws in summer, allowing tundra vegetation to grow.

- The *Prairies* region has light precipitation, with very cold winters and hot summers. This is a grassland and parkland zone.
- The *Great Lakes–St. Lawrence* region has high humidity, with warm summers and cold winters. The natural vegetation is broadleaf and mixed forest. Most Canadians live in this climate region.
- The *Atlantic* has high precipitation, with cool winters and warm summers. This is a region of mixed and boreal forest.

PAUSE, REFLECT, APPLY

1. List the three primary geologic developments that have affected Canada's physiography.
2. List the eight physiographic regions of Canada. Which are upland regions, and which are lowland regions?
3. a) Why is the hydrography of Canada important?
b) Why is it significant that most of Canada's rivers drain into the Arctic Ocean or into Hudson Bay?
4. List four factors that help explain why different parts of Canada have different climates.
5. List the seven climate regions of Canada.
6. How might physiography and climate relate to economic activity and settlement patterns across Canada?

► KEY QUESTION

How does the human geography of Canada vary from place to place?

Canada: Human Geography

The physical and human geographies of Canada are closely related. In particular, Canada is a northern country with little land suitable for agriculture. As a result, the area of Canada inhabited by significant numbers of people is small. The map in Figure 1.9 shows how unevenly population is distributed. Where does the map show that the vast majority of people live? This figure, and the preceding figures that map aspects of physical geography, divide Canada into regions.

Canada can also be divided into five regions based on political boundaries: Atlantic (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick); Central (Quebec and Ontario); Prairie (Manitoba, Saskatchewan, and Alberta); West Coast (British Columbia); and North (Nunavut, Northwest Territories, and Yukon Territory).