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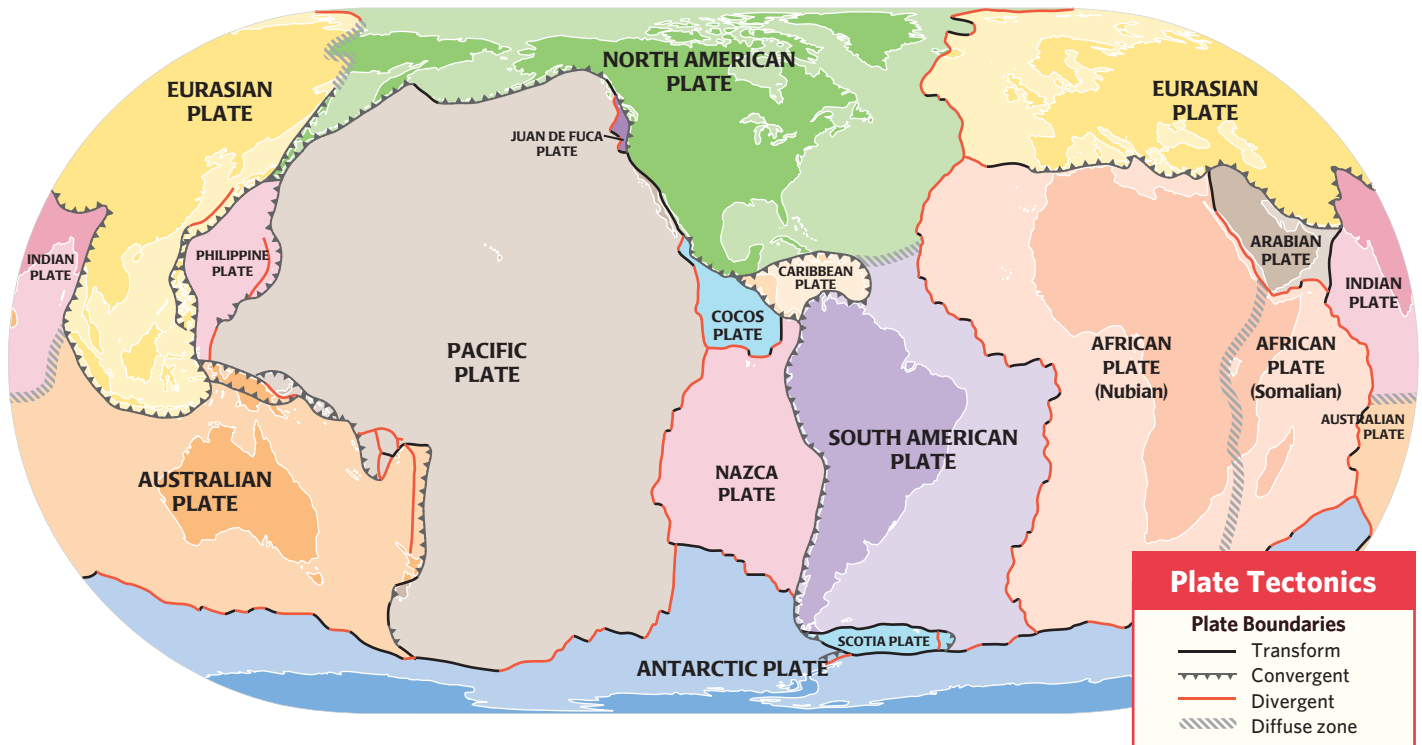
The Moving Earth

The land and water features of the earth appear stable, but actually they move between 2.5 to 15 centimetres each year.

- The earth's crust is made up of about 30 **plates** that float above the molten interior of the planet. Lighter, thicker areas of the plates form the continents. Denser, thinner areas form the ocean floors.
- Plates slide along, bump into, and move away from each other.
- **Earthquakes** and **volcanoes** are common near the boundaries between plates. When an earthquake takes place beneath the ocean, a massive, destructive wave called a **tsunami** may result.

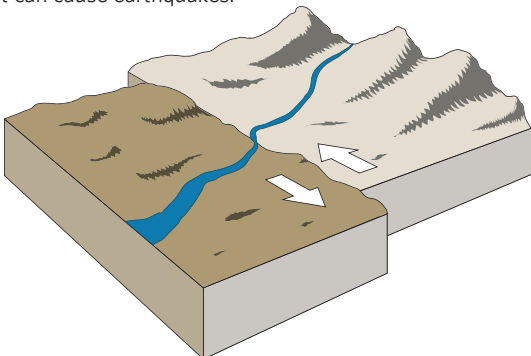


In December 2004, a massive earthquake hit off the coast of Sumatra, Indonesia. The coastal village Aceh was destroyed by the tsunami that followed the 9.1-9.3 quake.



Transform Plate Boundaries

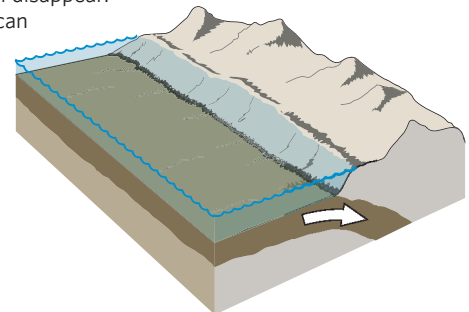
These plates move side-by-side—sometimes in opposite directions, sometimes in the same direction. This type of plate movement can cause earthquakes.

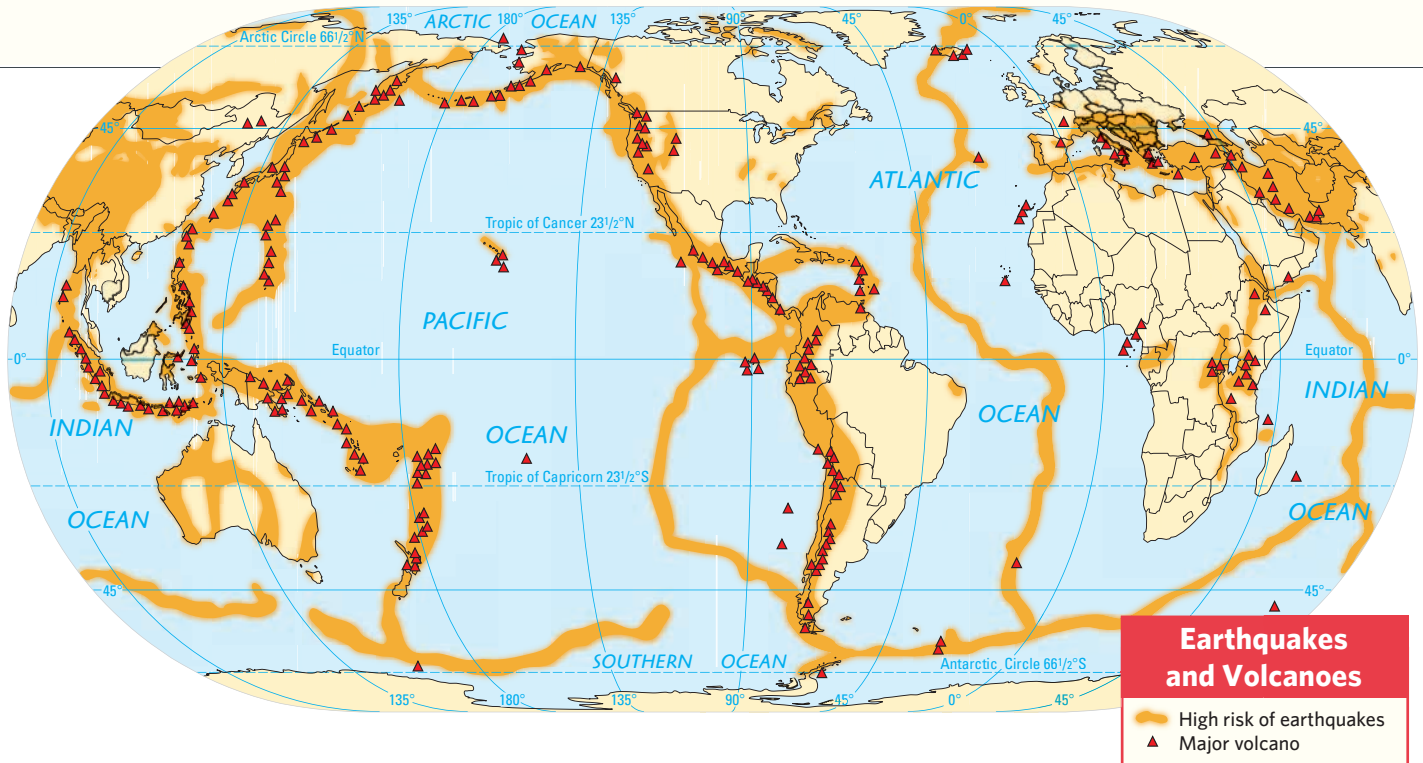


Convergent Plate Boundaries

When one plate moves under another plate—**subduction**—earthquakes and volcanoes can occur. In the long run, the subducted plate will disappear.

Convergent plates can be found near South America and the coasts of Asia, and in the western Pacific.



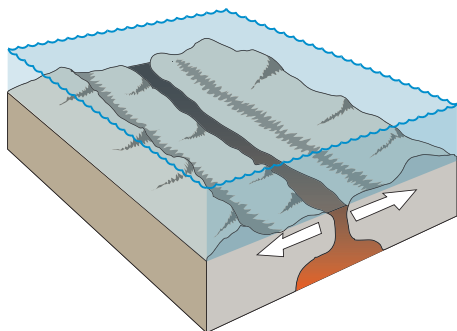


Location, Location

Why does one earthquake with a magnitude of 9.0 cause over 283 000 deaths, while another quake of the same magnitude results in none? It's all in the location. When a quake strikes near a populous area without earthquake-resistant buildings, death rates are high. Depth of the quake and stability of the overlying rock also can affect the death rate.

Divergent Plate Boundaries

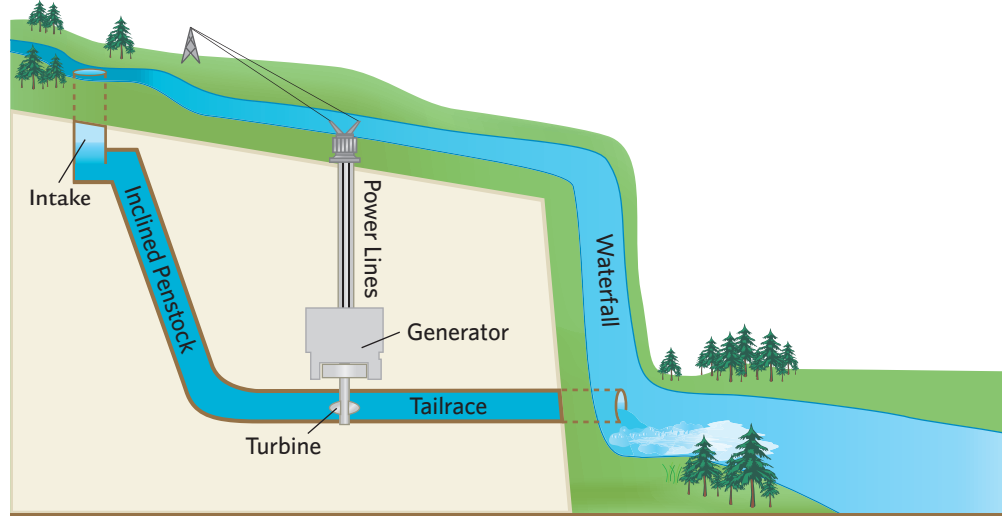
These plates move away from each other in opposite directions. The Mid-Atlantic Ridge is on a divergent plate boundary. This movement causes the Atlantic Ocean to widen by about 2.5 kilometres every 100 000 years.



The 2011 volcanic eruption at Puyehue-Cordon Caulle in Chile sent a column of ash more than 13 kilometres into the air. The drifting cloud of ash disrupted air travel across South America, Australia, and New Zealand for several days.

Hydroelectricity

As elevation changes at a **fall line**, river water is diverted through the intake and penstock to a turbine. The rapidly moving water turns the turbine and generates electricity. The *run-of-the-river* design is used for smaller stations. Larger stations dam the river downstream of the intake to raise the water level and guarantee a constant supply of water.



Canada is third in world hydroelectric production. Hydroelectricity is Canada's main renewable energy source. Provincially owned electric utilities have built massive stations along Canada's rivers. British Columbia, Québec, and the Atlantic Provinces rely heavily on hydroelectricity as a source of electrical energy. (For more information, see page 67.)



On the Rebound

A glacier covered Hudson Bay about 70 000 years ago. The crushing weight of the glacier caused the land to sink, much like a ship sinks when it is loaded with cargo. As the ice melted, the land gradually sprang back—a phenomenon known as **isostatic rebound**. The land in the region has rebounded about 250 metres since the glacier started to retreat about 12 000 years ago. (See page 50 for information about continental glaciation.)



The Canadian Rockies stretch across British Columbia and Alberta. The Rockies are part of a chain of mountain ranges that extends the length of the Americas.

Elevation Map Canada

Metres above Sea Level



Scale

1:24 000 000

0 150 300 450 600 kilometres
1 cm to 240 km

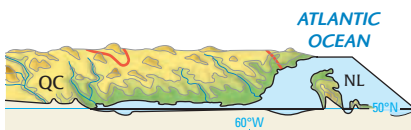
Detailed legend on page 5

Lambert Equal Area Projection



Cross Section

Vertical exaggeration 47 to 1
Scale at 50° N: 1 cm to 219 km



Ecozones

Canada has 15 different **ecozones**, which contain unique plants and animals. An ecozone's biology is determined by its land and water, called **physiographic**, features as well as by its climate. The plants and animals found in each ecozone are distinctly suited to survive in that region.

Ecozones and Physiographic Regions

Cordilleran Region

- Taiga Cordillera
- Boreal Cordillera
- Pacific Maritime
- Montane Cordillera

Interior Plains

- Taiga Plains
- Boreal Plains
- Prairies

Canadian Shield

- Southern Arctic
- Taiga Shield
- Boreal Shield

Hudson Bay Lowlands

- Hudson Plains

St. Lawrence Lowlands

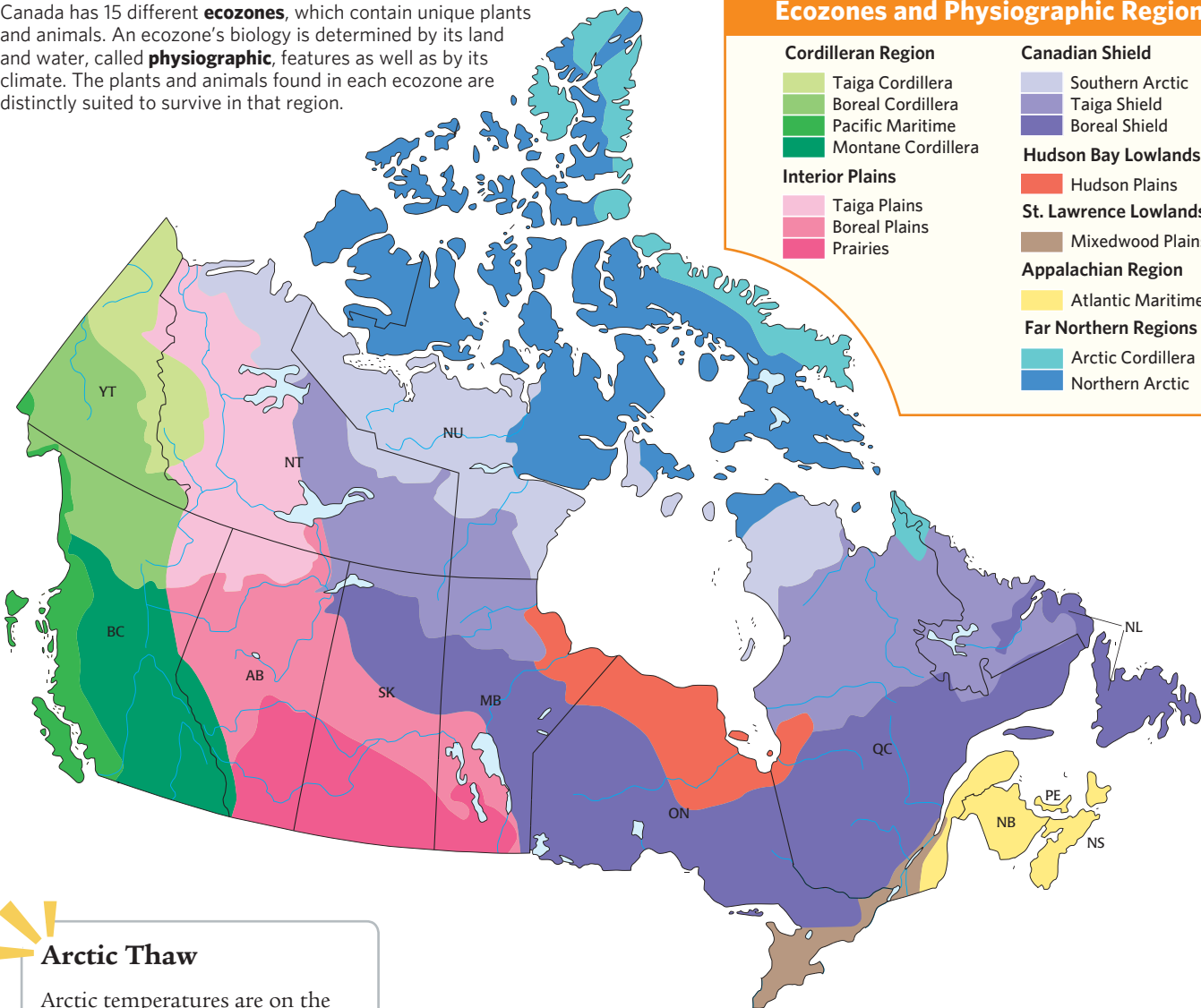
- Mixedwood Plains

Appalachian Region

- Atlantic Maritime

Far Northern Regions

- Arctic Cordillera
- Northern Arctic



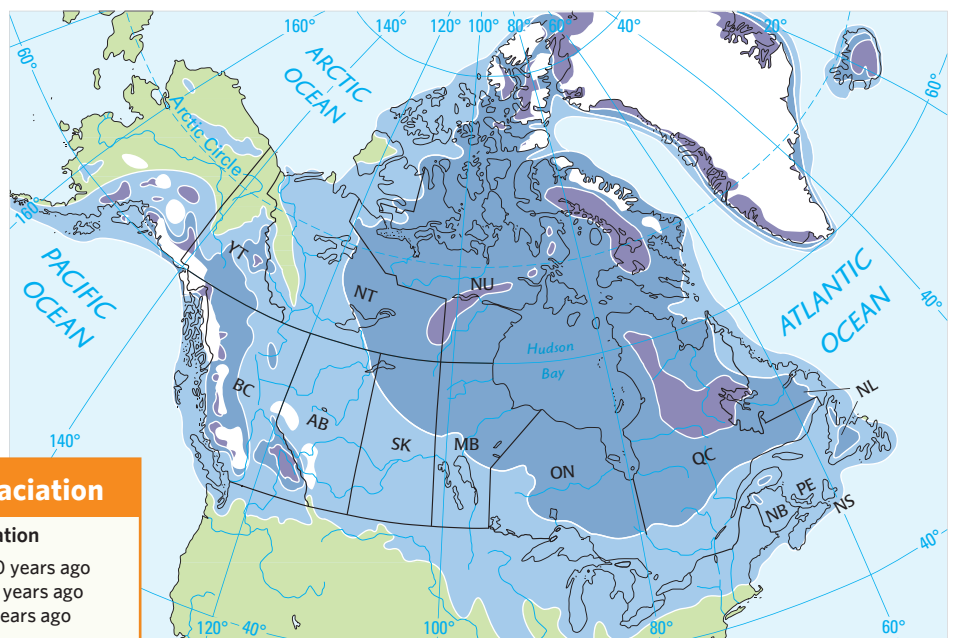
Arctic Thaw

Arctic temperatures are on the rise and affect everyday life in Canada's northern region. Arctic summers have seen average temperature increases of 1.2°C per decade. As the polar ice caps melt at a rate of 9 percent per decade, animals lose their habitat and some Inuit die hunting on thin ice. (For more information, see pages 26–27.)

Continental Glaciation

Extent of Glaciation

- 10 000 to 15 000 years ago
- 7 000 to 10 000 years ago
- 1 000 to 7 000 years ago
- Present glaciers



After millennia of melting and retreating, glaciers that once covered 97 percent of Canada now cover only 2 percent of the country. Abrasive ice sheets scraped the bedrock of the Canadian Shield, formed vast lakes, and created Hudson Bay.