

World Geography

Chapter 2

Climates and Ecosystems

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Chapter 2: Climates and Ecosystems

Section 1: Weather and Climate

Section 2: Ecosystems



Weather and Climate



- **How are weather and climate affected by the relative positions of the earth and the sun?**
- **How do wind and ocean currents redistribute the sun's heat?**
- **What factors influence the world's climate regions?**
- **Why is climatic change a cause for concern?**



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The Sun and the Earth



- **Weather** is the condition of the bottom layer of the earth's atmosphere in one place over a short period of time.
- **Climate** is the term for weather patterns that an area typically experiences over a n extended period of time.
- The sun is the ultimate source of the earth's climates.
- The greenhouse effect traps solar radiation as heat within the atmosphere.
- The movement of the earth on its axis is called **rotation**.
- The earth moves in an almost circular orbit around the sun, and one complete orbit around the sun, which takes one year, is called a **revolution**.
- The earth is tilted on its axis, and this tilt means that sunlight strikes different parts of the earth more directly at certain times of the year.
- Because sunlight falls most directly near the Equator, most places near the equator have warm climates, while areas farthest from the equator are cold.



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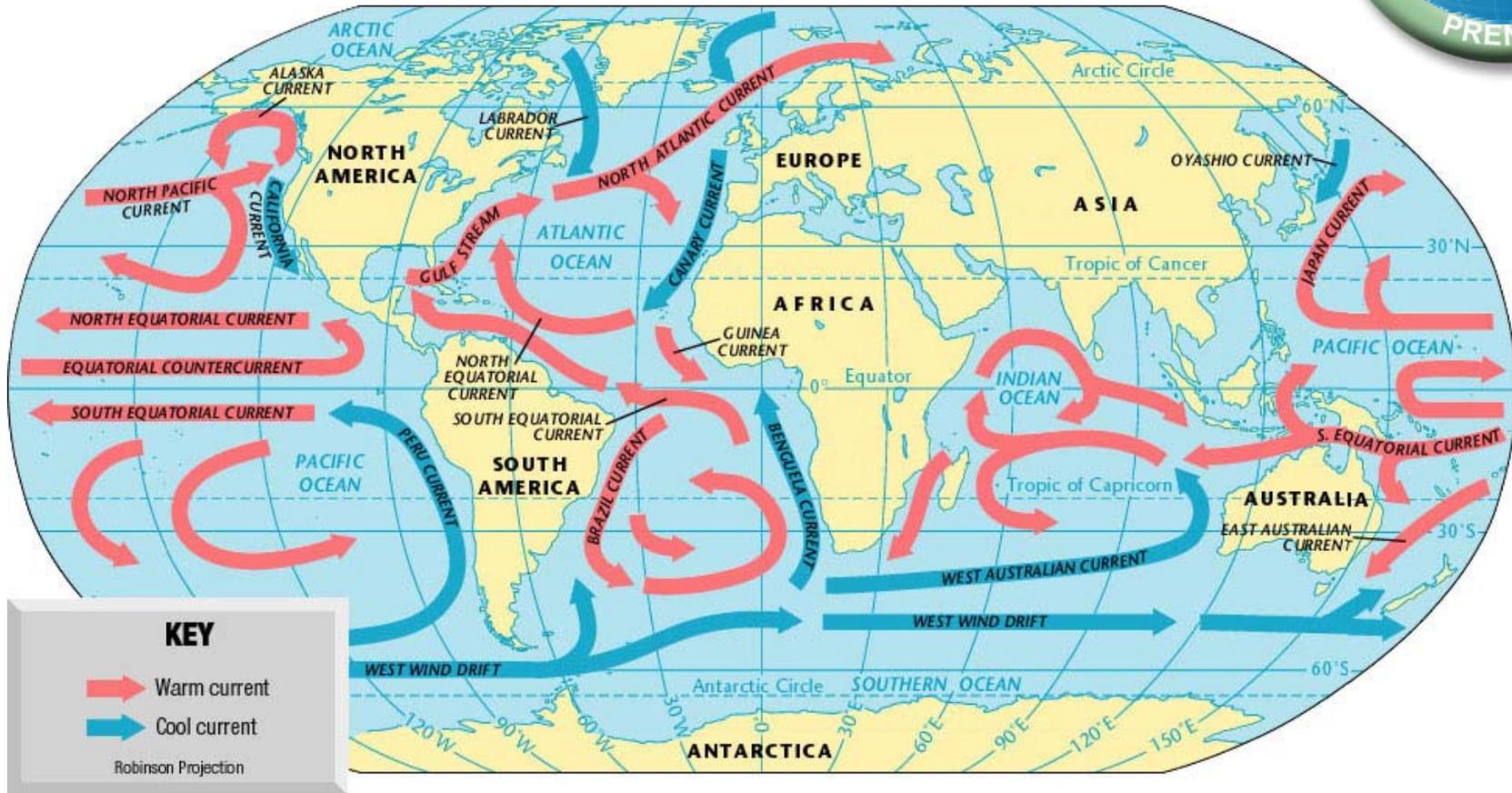
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Distributing the Sun's Heat



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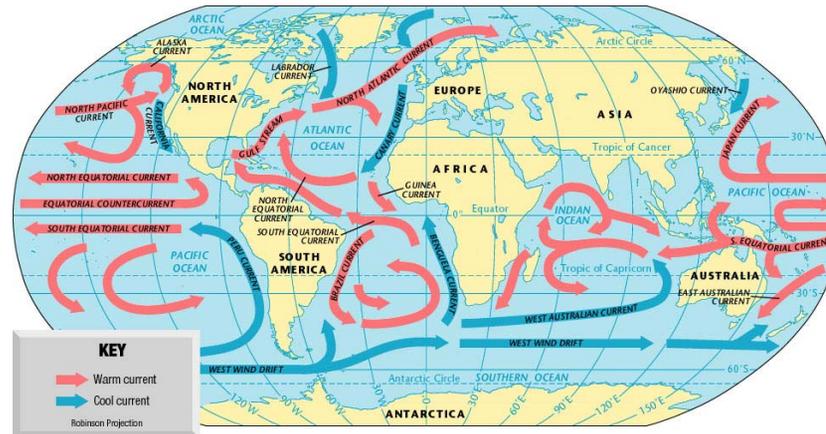
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Distributing the Sun's Heat



- Heat is distributed through a process called convection.
- Convection occurs because warm gases and liquids are lighter or less dense than cool gases and liquids, causing the lighter material to rise and the cooler material to sink.
- Convection affects both air and water, producing winds and currents.
- Warm air and water both flow from the Equator to the poles, while cold air and water tend to move from the poles to the Equator.



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Influences on Climate



- **Precipitation**, which includes all the forms of water that fall from the atmosphere to the earth's surface, affects climate.
- Large bodies of water affect surrounding climates because water temperatures change much more slowly than land temperatures.
- Coastal areas tend to have milder climates, while the great central areas of continents in the Northern Hemisphere have **continental climates**, with cold winters and hot summers.
- Higher elevations can have colder climates than lower elevations.
- Nearby landforms, such as large desert areas, inland mountains, and forests, can influence climate.
- Large cities tend to have higher temperatures than the surrounding areas, creating what are called microclimates.



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Changing Climates



- **Many climate changes result from changes in nature, but more may now be caused by human action.**
- **Increasing amounts of carbon dioxide and other substances in the atmosphere may lead to global warming.**
- **Global warming may partially melt polar ice caps, resulting in higher ocean levels, flooding of low-lying areas, and changes in precipitation.**
- **Some scientists theorize that global warming may be largely due to natural cyclical changes.**



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Section 1 Review



What process distributes heat through the air and the water?

- a) convection
- b) rotation
- c) revolution
- d) precipitation

How does a large body of water affect nearby climates?

- a) It makes the climate warmer.
- b) It makes the climate cooler.
- c) It makes the climate milder.
- d) It makes the climate harsher.

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Section 1 Review



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Ecosystems



- **What conditions affect life in an ecosystem?**
- **Why are there different kinds of forests?**
- **Where are grasslands located?**
- **How does life survive in harsh deserts and tundras?**



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Ecosystems



- An **ecosystem** is formed by the interaction of plant life, animal life, and the physical environment where they live.
- The survival and growth of life in an ecosystem is affected by various physical conditions, such as climate, sunlight, temperature, precipitation, elevation, soil, and landforms.
- A change in one aspect of an ecosystem leads to other changes.
- The growth of human populations has led to dramatic changes in ecosystems.
- A **biome** is a type of ecosystem that can be found in various regions of the world.



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Forest Regions



Tropical Rain Forest

Tropical rain forests exist in warm areas near the Equator with heavy rainfall.

Tropical rain forests support an immense diversity of plant and animal life.

Mid-Latitude Forest

Most trees in the middle latitudes are deciduous, shedding their leaves during one season.

This forest type once covered much of Europe, eastern Asia, and eastern North America, but was largely cleared away for agriculture.

Coniferous Forest

Coniferous forests, named for the cones that carry their seeds, exist in the colder parts of the middle latitudes.

The needles of these trees expose only a small surface to the cold, and so can remain on the tree in winter.

Other Forest Types

In most places, forest regions overlap; a mixed region has both coniferous and deciduous trees.

Chaparral has small evergreen trees and low bushes, adapted to a climate with wet winters and dry summers.



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Grasslands



Tropical Grasslands

- Huge tropical grasslands, called **savannas**, grow in warm areas near the equator.
- During the wet season, grasses grow tall and green, which then die above ground in the dry season.
- A third season is a time of natural wildfires, which encourage new grasses to grow.
- **Herbivores**, or plant-eating animals, graze on the grasses.
- **Carnivores**, are meat-eating animals whose survival depends on thriving herbivore populations.

Temperate Grasslands

- Grasslands in cooler parts of the world are called by several names.
- The temperate grasslands in North America are called **prairies**.
- Much of the original prairie grasses have been plowed under to provide farmland.
- Cool, dry, temperate grasslands in Northern Eurasia and central Asia are called steppes and are similar to the Great Plains in North America.
- The pampas of Argentina and veld of South Africa are also temperate grasslands.



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Deserts and Tundras



- **Deserts** have many plants and animals adapted to survive with almost no water.
- Many desert animals get all the water they need from seeds, plants, or eating other animals.
- **Tundra** regions are where temperatures are always cool or cold; only specialized plants and animals can survive there.
- Alpine tundra exists in high mountains, where no trees grow.
- In arctic tundra, plants must be able to survive cold temperatures and go without sunlight for most of the winter.
- Some parts of the tundra contain **permafrost**, a layer of soil just below the surface that stays permanently frozen.



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What kind of forest grows the the areas near the Equator?

- a) deciduous forest
- b) coniferous forest
- c) tropical rain forest
- d) chaparral

To what kind of conditions must plants adapt in the arctic tundra?

- a) warm temperatures and heavy rainfall
- b) cool temperatures and seasonal rainfall
- c) cold temperatures and little sunlight in the winter
- d) arid climate and hot temperatures

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