



Australia, Oceania, and Antarctica

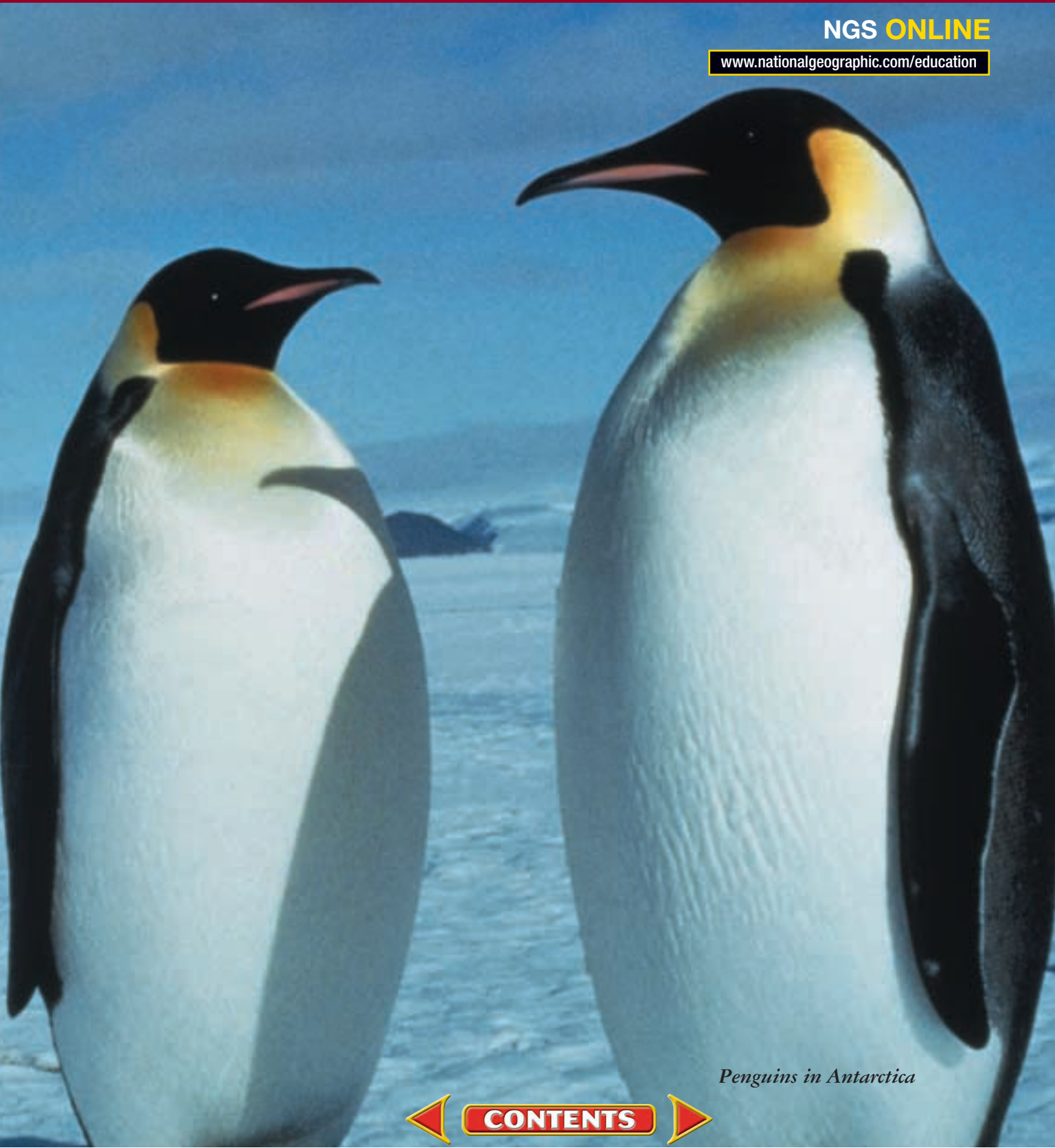
WHY IT'S IMPORTANT —

Vast and sparsely populated, the region of Australia, Oceania, and Antarctica is perhaps the most diverse of the world's regions. Parts of the region—Australia and Oceania—are developing close economic ties to other countries in the Pacific Rim, the area bordering the Pacific Ocean. Such ties to prosperous Pacific Rim nations will influence global trade and trading networks for decades to come. Cold, icy Antarctica lacks a permanent human population, but the data gathered there by scientists will broaden your understanding of the world's climates and resources in the years ahead.



World Regions Video

To learn more about Australia, Oceania, and Antarctica and their impact on your world, view the World Regions video "Australia, Oceania, and Antarctica."



Penguins in Antarctica

What Makes Australia, Oceania, and Antarctica a Region?

Both palm trees and polar ice lie within this diverse region that includes two continents—Australia and Antarctica—and some 25,000 islands scattered across vast expanses of the Pacific Ocean.

Australia is ancient and arid. Low mountains curve down its eastern coast, blocking rainfall to the flat interior where scrubland and deserts form what Australians call the “outback.” Across the Tasman Sea lies New Zealand—lush, green, and mountainous. North of New Zealand’s rugged shores lies the rest of Oceania, where groups of tropical islands dot the blue ocean waters like tiny jewels.

A different sort of jewel lies far to the south of New Zealand—Antarctica, a glittering kingdom of ice and snow that sits astride the bottom of the world.



1

1 Shouldering the day’s catch, a spear fisher in the Cook Islands watches his companion take aim. The Cook Islands spread across 850,000 square miles (2.2 million sq. km) of ocean. Like people throughout Oceania, Cook Islanders depend on the sea for food.



3



2



4

2 A loaf-shaped mass of sandstone, Uluru (also known as Ayers Rock) looms over the flat landscape of central Australia. Uluru is sacred to Aborigines, the country's native inhabitants. Aborigines share their homeland with Australia's other natives—kangaroos and other animals found nowhere else on Earth.

3 Fringed with coral reefs, the thickly forested islands of Palau seem to float on the surface of blue Pacific waters. Palau is a chain of about 200 islands a few hundred miles east of the Philippines. Its coral reefs are among the world's most biologically diverse.

4 A sea of sheep parts for two bicyclists on New Zealand's South Island. Sheep greatly outnumber people in New Zealand, where pastures thrive in a climate that is mild year-round. The nation ranks as one of the world's leading producers of lamb, mutton, and wool.

Lands Down Under

Europeans were latecomers to this region, much of which lies “down under” the Equator. Australia’s original settlers were Aborigines; the first settlers of New Zealand were the Maori. During the 1800s, the British colonized both lands. Today, Australia and the islands

of Oceania are a blend of European, traditional Pacific, and Asian cultures. Antarctica has no permanent human inhabitants.

Although huge livestock ranches spread across Australia and New Zealand, life in these two countries is largely urban, with most people living in coastal cities. For many Pacific Islanders, life is more traditional, and people support themselves mainly through fishing and subsistence farming.



1 A blend of cultures is reflected by an Aborigine wearing western-style clothing. Aborigines are thought to have arrived in Australia from Asia at least 40,000 years ago. Today, many Aborigines are striving to preserve their ancient traditions while living in a modern world.





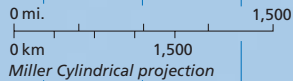
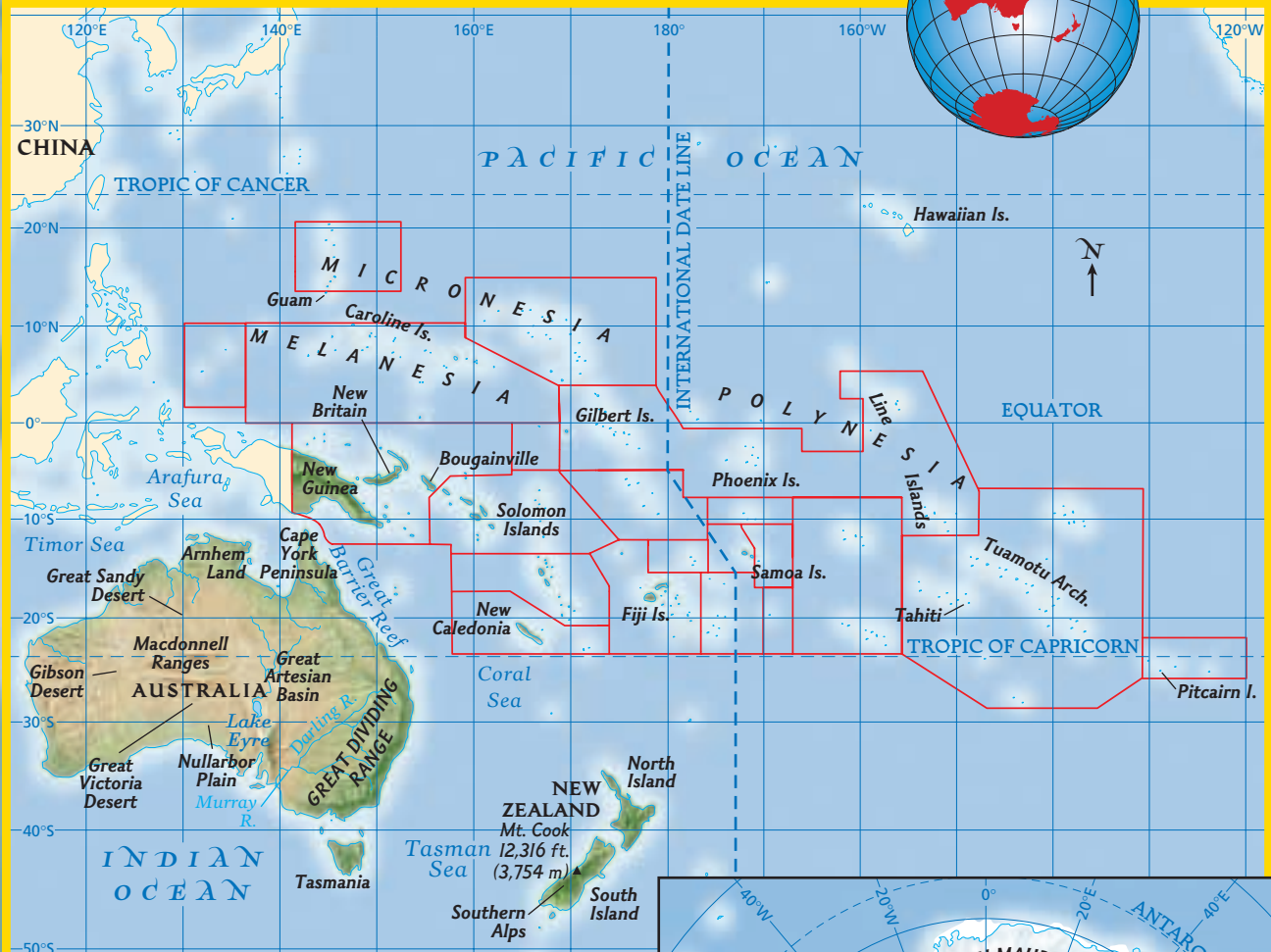
2 Thatched houses called *fale* sit beneath palm trees on an island in Samoa. Open sides allow cool ocean breezes to blow through the houses. Blinds made of palm leaves can be let down to keep out rain or glaring sun.

3 Mirrored in the waters of Sydney Harbor, the Sydney Opera House glows as evening falls. The white shells that form the building's roof resemble billowing sails—a fitting tribute to the city that is Australia's busiest seaport.

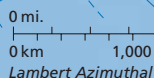
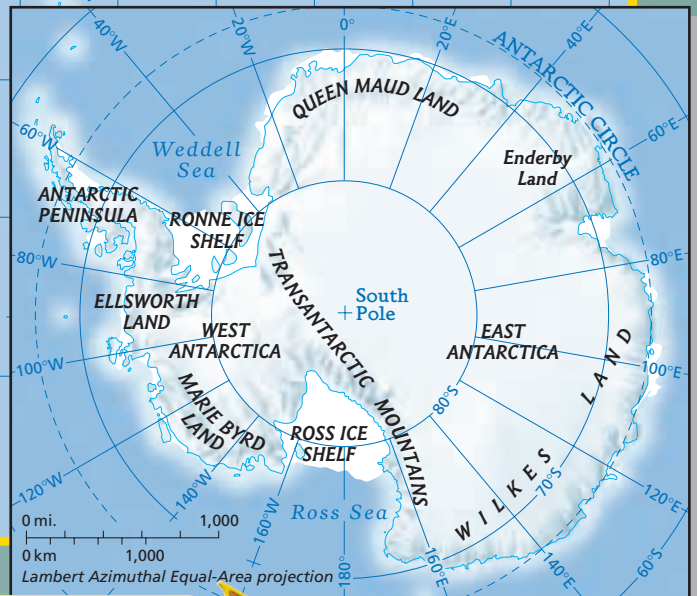
4 Bundled against the cold, scientists in Antarctica load equipment into a waiting helicopter. Antarctica is a continent reserved almost entirely for scientific research and exploration. The United States is one of many countries operating research stations here.

Australia, Oceania, and Antarctica

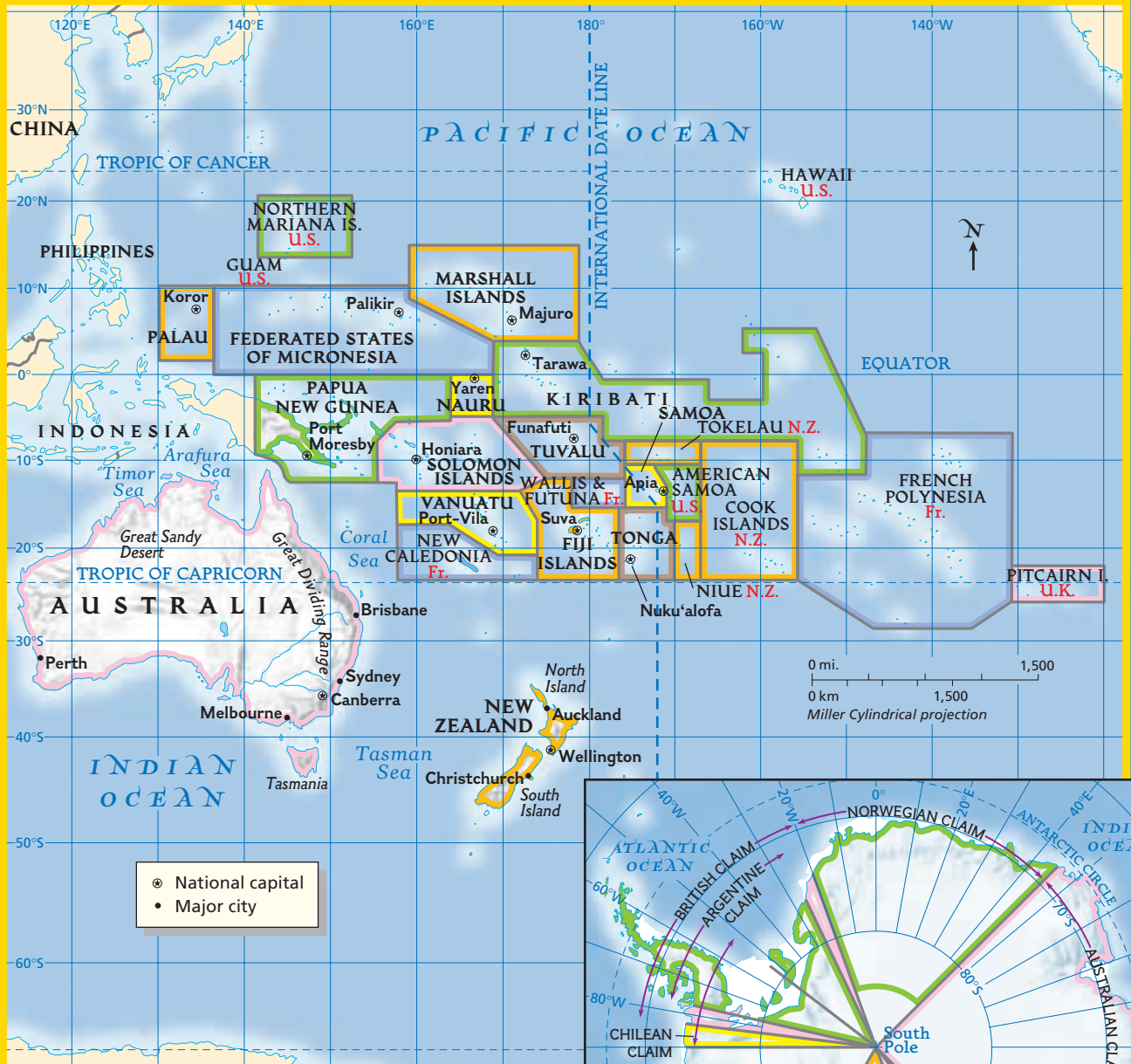
PHYSICAL



Elevation Profile



POLITICAL



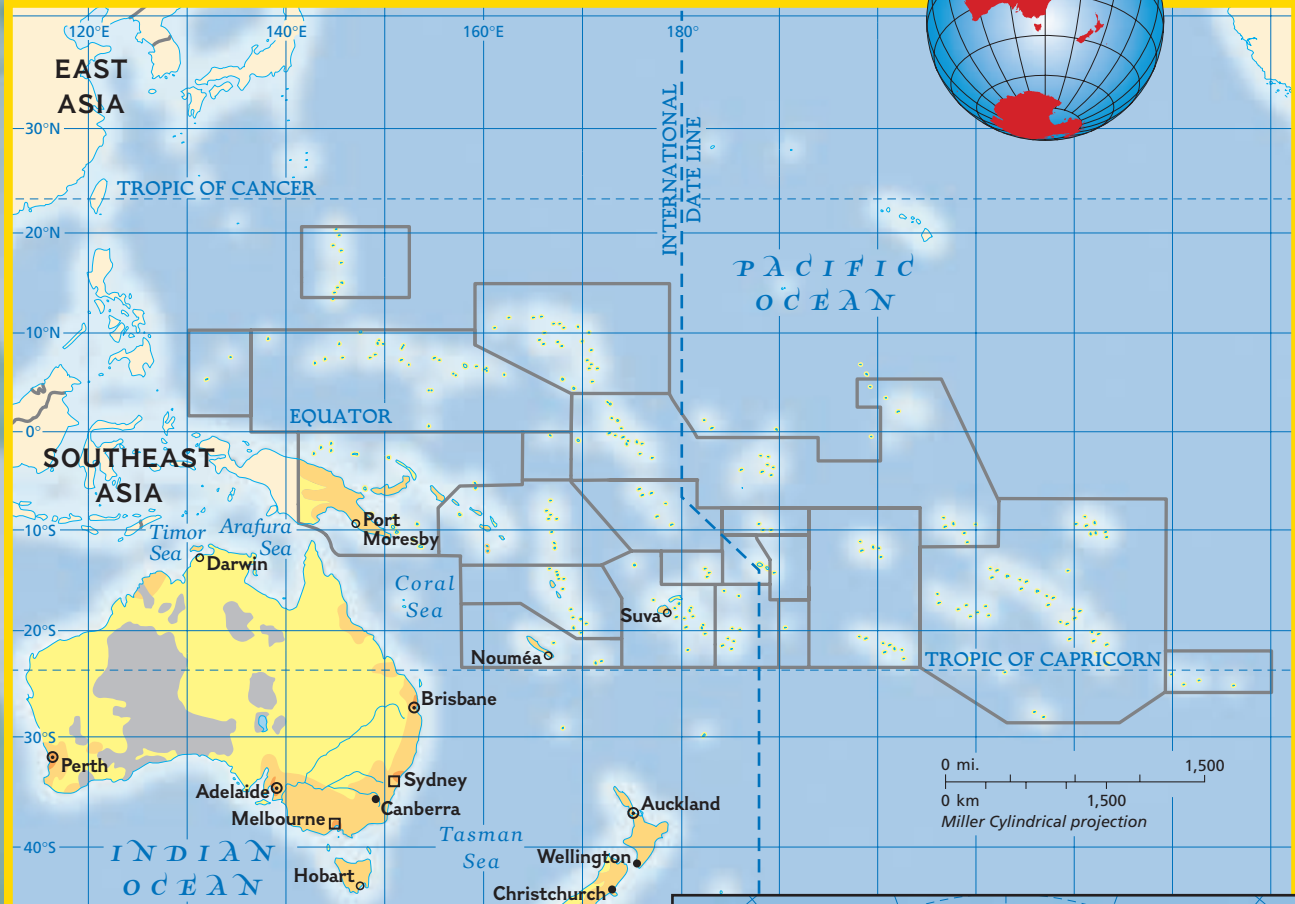
⊙ National capital
• Major city

- MAP Study**
1. Which rivers drain the eastern part of Australia?
 2. Which countries claim parts of Antarctica?



Australia, Oceania, and Antarctica

POPULATION DENSITY



Per sq. km	Per sq. mi.
Over 100	Over 250
50-100	125-250
25-50	60-125
1-25	2-60
Under 1	Under 2
Uninhabited	Uninhabited

Cities (Statistics reflect metropolitan areas.)	
■	Over 5,000,000
□	2,000,000-5,000,000
○	1,000,000-2,000,000
●	250,000-1,000,000
○	Under 250,000













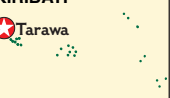





























ECONOMIC ACTIVITY



Australia, Oceania, and Antarctica

















COUNTRY PROFILES

COUNTRY * AND CAPITAL	FLAG AND LANGUAGE	POPULATION AND DENSITY	LANDMASS	MAJOR EXPORT	MAJOR IMPORT	CURRENCY	GOVERNMENT
AUSTRALIA 	 English	19,400,000 6 per sq. mi. 2 per sq. km	2,988,888 sq. mi. 7,741,220 sq. km	 Coal	 Machinery	Australian Dollar	Parliamentary Democracy
FEDERATED STATES OF MICRONESIA 	 English, Local Languages	100,000 444 per sq. mi. 111 per sq. km	270 sq. mi. 699 sq. km	 Fish	 Foods	U.S. Dollar	Republic
FIJI 	 English, Fijian, Hindi	800,000 119 per sq. mi. 46 per sq. km	7,054 sq. mi. 18,270 sq. km	 Sugar	 Machinery	Fiji Dollar	Republic
KIRIBATI 	 English, Gilbertese	100,000 337 per sq. mi. 130 per sq. km	282 sq. mi. 730 sq. km	 Coconut Products	 Foods	Australian Dollar	Republic
MARSHALL ISLANDS 	 English, Local Languages	100,000 1,007 per sq. mi. 389 per sq. km	69 sq. mi. 179 sq. km	 Coconut Products	 Foods	U.S. Dollar	Republic
NAURU 	 Nauruan, English	10,000 1,412 per sq. mi. 545 per sq. km	9 sq. mi. 23 sq. km	 Phosphates	 Foods	Australian Dollar	Republic
NEW ZEALAND 	 English	3,900,000 37 per sq. mi. 14 per sq. km	104,452 sq. mi. 270,531 sq. km	 Wool	 Machinery	New Zealand Dollar	Parliamentary Democracy
PALAU 	 English, Palauan	20,000 107 per sq. mi. 41 per sq. km	178 sq. mi. 461 sq. km	 Fish	 Machinery	U.S. Dollar	Republic
PAPUA NEW GUINEA 	 English, Local Languages	5,000,000 28 per sq. mi. 11 per sq. km	178,703 sq. mi. 462,841 sq. km	 Gold	 Machinery	Kina	Parliamentary Democracy
SAMOA 	 Samoan, English	200,000 155 per sq. mi. 60 per sq. km	1,097 sq. mi. 2,841 sq. km	 Coconut Products	 Foods	Tala	Constitutional Monarchy

* COUNTRIES AND FLAGS NOT DRAWN TO SCALE

FOR AN ONLINE UPDATE OF THIS INFORMATION, VISIT GEOGRAPHY.GLENCOE.COM AND CLICK ON "TEXTBOOK UPDATES."

[CLICK HERE](#)

COUNTRY * AND CAPITAL	FLAG AND LANGUAGE	POPULATION AND DENSITY	LANDMASS	MAJOR EXPORT	MAJOR IMPORT	CURRENCY	GOVERNMENT
SOLOMON ISLANDS  Honiara	 English, Local Languages	500,000 41 per sq.mi. 16 per sq.km	11,158 sq.mi. 28,899 sq.km	 Cocoa	 Machinery	Solomon Islands Dollar	Parliamentary Democracy
TONGA  Nuku'alofa	 Tongan, English	100,000 349 per sq.mi. 156 per sq.km	290 sq.mi. 699 sq.km	 Squash	 Foods	Pa'anga	Constitutional Monarchy
TUVALU  Funafuti	 Tuvalu, English	10,000 1,100 per sq.mi. 435 per sq.km	10 sq.mi. 26 sq.km	 Coconut Products	 Foods	Tuvaluan Dollar	Parliamentary Democracy
VANUATU  Port-Vila	 Bislama, English, French	200,000 44 per sq.mi. 17 per sq.km	4,707 sq.mi. 12,191 sq.km	 Coconut Products	 Machinery	Vatu	Republic

* COUNTRIES AND FLAGS NOT DRAWN TO SCALE



▲ Aerial view of harbor and city, Papeete, Tahiti

GLOBAL
CONNECTION

AUSTRALIA AND THE UNITED STATES

EUCALYPTUS



With their big noses, round faces, and cuddly teddy-bear appearance, koalas are among Australia's most famous native animals. If you wanted to see a koala in the wild, the best place to look would be in a eucalyptus tree. Koalas live in eucalyptus trees and eat almost nothing but eucalyptus leaves—about three pounds (1.4 kg) of leaves per day!

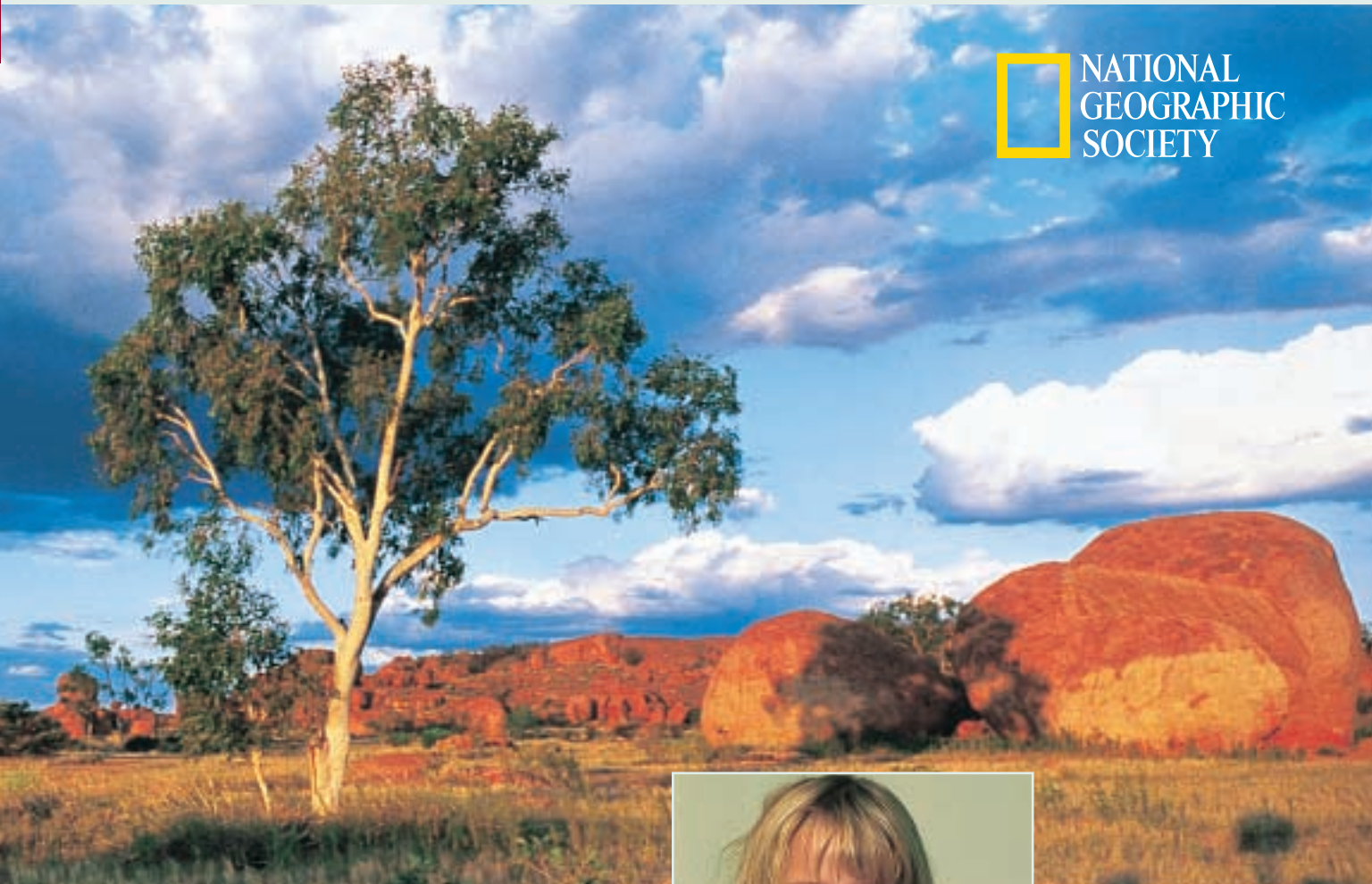
Like the koala, eucalyptus trees are native to Australia. More than 500 different kinds grow there. And for hundreds of years, they've been important not only to koalas, but to Australia's people as well.

Long before Europeans arrived in Australia, Aborigines used many different native plants to make medicines. They discovered that eucalyptus leaves contain a strong-smelling oil—eucalyptus oil—that has powerful antiseptic, or germ-fighting, properties. The Aborigines used the leaves to treat several common ailments, including infections, fevers, coughs, colds, and flu. They prepared the leaves in various ways so that the oil could be rubbed onto the skin, inhaled, or mixed with a liquid and swallowed.

When European colonists arrived in Australia, some were quick to recognize the value of Aboriginal remedies, especially those made from parts of eucalyptus trees. Eucalyptus preparations



▲ Koala nibbling eucalyptus leaf



▲ Eucalyptus tree in the Australian outback

became so popular that colonists tried them for just about every imaginable ailment, from headaches and rheumatism to hair loss and stomach ailments.

The popularity of eucalyptus quickly spread beyond Australia's shores. Eucalyptus oil was one of the first products to be exported from the young colony. By the nineteenth century, millions of the trees themselves were being shipped to the far corners of the world. You can find eucalyptus trees growing in southern California, Florida, and other parts of the southern United States.

Today, eucalyptus oil is an important ingredient in many common medicines, especially cough and cold remedies. The next time you pop a cough drop into your mouth or use a "vapor rub" to clear a stuffy nose, check the label. Chances are good the product contains eucalyptus oil.



▲ American cold sufferer who might benefit from eucalyptus oil



CHAPTER

32

The Physical Geography of Australia, Oceania, and Antarctica

GeoJournal

As you read this chapter, imagine that you are visiting interesting and beautiful locations in Australia, Oceania, and Antarctica. Write journal entries, using vivid details to explain why these places are appealing.



Chapter Overview Visit the **Glencoe World Geography** Web site at tx.geography.glencoe.com and click on Chapter Overviews—Chapter 32 to preview information about the physical geography of the region.

CLICK HERE

CONTENTS

Guide to Reading

Consider What You Know

You may have seen photographs or movies showing the dry Australian outback or Antarctica's mountainous ice cap. What animals do you associate with these areas?

Read to Find Out

- How do mountains, plateaus, and lowlands differ in Australia and New Zealand?
- How have volcanoes and continental shelves formed the islands of Oceania?
- Why does the physical geography of Antarctica attract scientists?

Terms to Know

- artesian well
- lagoon
- coral
- krill
- atoll

Places to Locate

- Australia
- Great Dividing Range
- Nullarbor Plain
- Murray River
- Darling River
- Oceania
- Melanesia
- Micronesia
- Polynesia
- New Zealand
- North Island
- South Island
- Antarctica

The Land



A Geographic View

Australian Landscape

The land breathes magic. Not . . . colored scarves and playing cards, but real magic. Weepy eucalyptus trees with [curving sword]-shaped leaves. Dazzling-white ghost gums. Termite mounds: some red and bulbous as a Henry Moore sculpture; others, black and delicate as the spires of a Gothic cathedral. A glory of birds—sulfur-crested cockatoos that lift from trees in clouds, tiny bee-eaters, iridescent as opals.

—Cathy Newman, “The Uneasy Magic of Australia’s Cape York Peninsula,” *National Geographic*, June 1996



Termite mound, Australia

On Australia's northeastern coast, the Cape York Peninsula displays a landscape of great contrasts. Rain forests, savannas, and wetlands form an exotic patchwork in this area. Australia, Oceania, and Antarctica together form the equally diverse South Pacific region, one that covers a huge portion of the globe. In this section you will explore the region's varied physical geography, including coastal lowlands bordering mountains and plateaus, islands rising from the sea, and a vast ice cap spanning a continent.

Australia: A Continent and a Country

As the only place on the earth that is both a continent and a country, **Australia** is unique. Although water surrounds Australia in the same way as an island, geographers classify it as a continent because of its tremendous size. Located in the Southern Hemisphere, its name comes from the Latin word *australis*, meaning “southern.”

Mountains and Plateaus

A chain of hills and mountains known as the **Great Dividing Range** interrupts Australia's otherwise level landscape. The peaks stretch along Australia's eastern coast from the Cape York Peninsula to the island of Tasmania, separated from the mainland long ago by the sea. Most of Australia's rivers begin in the range, and they water the most fertile land in the country.

The Western Plateau, a low expanse of flat land in central and western Australia, covers almost two-thirds of the continent. Australians call this area where few people live the "outback." Across the plateau spread the hot sands of the Great Sandy, Great Victoria, and Gibson Deserts. Near the edges of the deserts, a few low mountain ranges and huge rock formations thrust up from the earth. When explorer Jean-Michel Cousteau visited the arid Western Plateau, he spoke of the land's effect on those few who inhabit it:

“For human or nonhuman, life in the vast dry sea, as we were soon to witness, demands extraordinary survival strategies, and those who endure do so with earthy ingenuity and tenacity.”

Jean-Michel Cousteau,
Cousteau's Australia
Journey, 1993

South of the Great Victoria Desert lies the **Nullarbor Plain**. The name comes from the Latin *nullus arbor*, meaning "no tree." This dry, virtually treeless land ends abruptly in giant cliffs. Hundreds of feet below the cliffs lies the churning Great Australian Bight, a part of the Indian Ocean.

Comparing Lands



The region of Australia, Oceania, and Antarctica is about two and a half times the size of the continental United States.



Geography Skills for Life

Australian Outback The rugged Australian outback is sparsely populated.

Human-Environment Interaction Why do so few people live in the Western Plateau area?

Central Lowlands

The Great Dividing Range and Western Plateau are separated by the Central Lowlands. This arid expanse of grassland and desert stretches across the east central part of Australia. After heavy rainfall, rivers and lakes throughout the area fill with water, but because rains are infrequent, most rivers and lakes remain dry much of the year. In the southeast, however, the **Murray River** and the **Darling River** supply water that supports farming. A vast treasure of pressurized underground water, known as the Great Artesian Basin, lies underneath the lowlands. Although the water that gushes from **artesian wells**, or wells from which pressurized water flows to the surface, is too salty for humans or crops, ranchers use it to water livestock.

Great Barrier Reef

Along Australia's northeastern coast lies the Great Barrier Reef. This famous natural wonder is the world's largest coral reef, home to brilliantly

colored tropical fish and underwater creatures. Because of its unique beauty and the habitat it provides for multitudes of creatures, Australia has designated the reef a national park, and the United Nations has named it a World Heritage Site. Although its name suggests a single reef, the Great Barrier Reef is actually a string of more than 2,500 small reefs. Formed from **coral**, the limestone skeletons of a tiny sea animal, it extends 1,250 miles

(2,012 km). This span equals the length of the coastline from New York City to Miami, Florida.

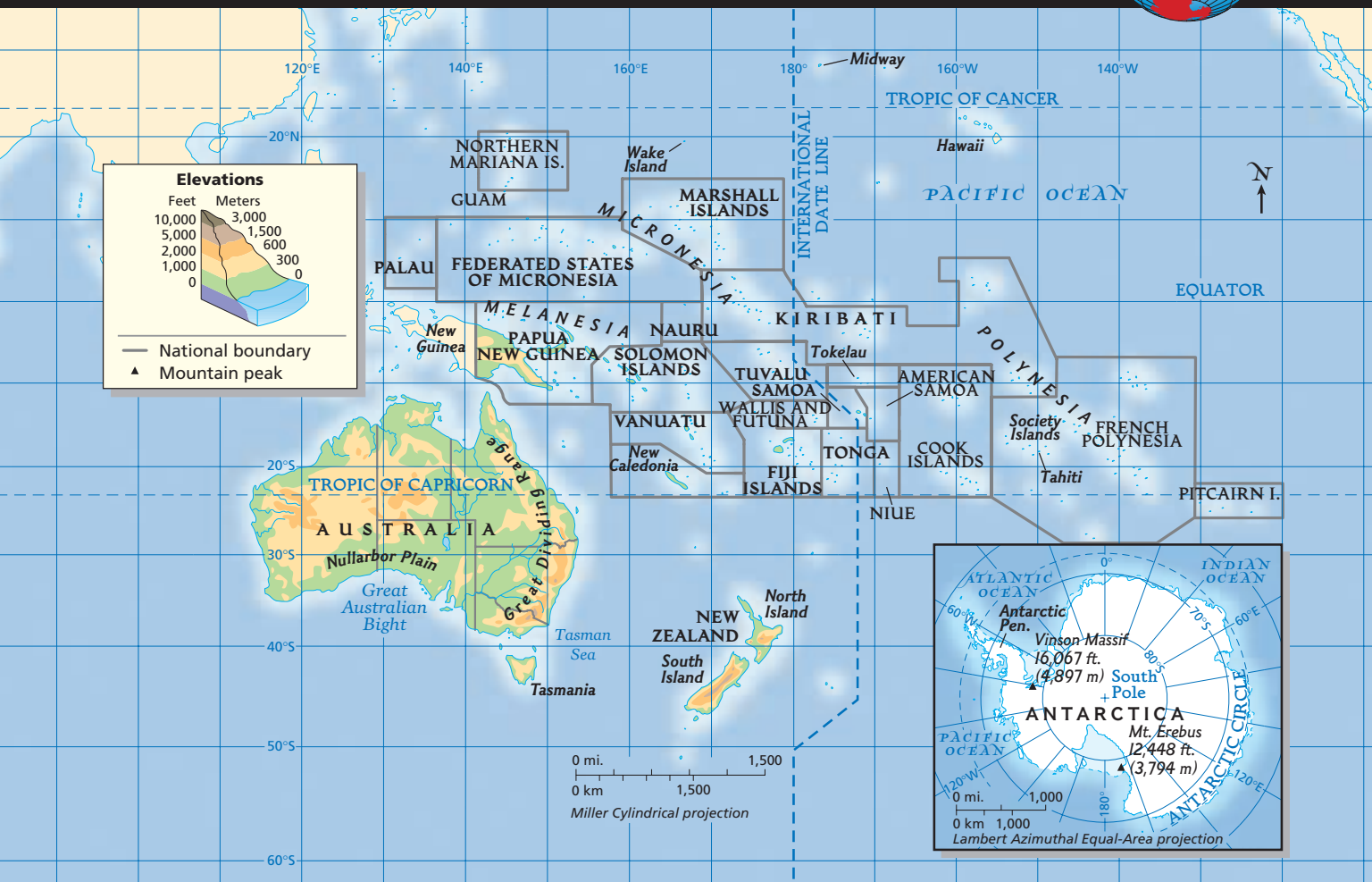
Economics

Natural Resources

Although only 10 percent of Australia's land can be farmed, agriculture is important to the country. Australian farmers make effective use of their land and water to grow wheat, barley, fruit,



Australia, Oceania, and Antarctica: Physical-Political

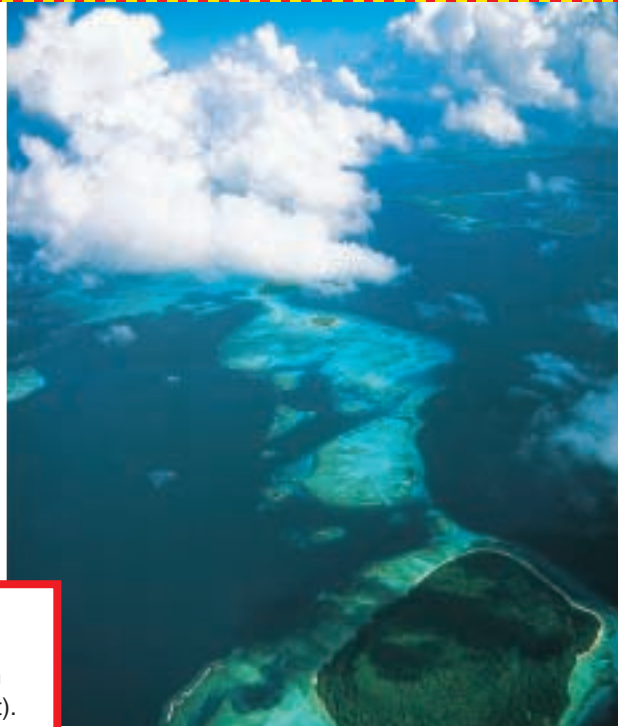


Geography Skills for Life

1. **Interpreting Maps** Which of New Zealand's two islands has higher elevations?

2. **Applying Geography Skills** In what part of Australia are most rivers found? How might their location affect population patterns?

Find NGS online map resources @ www.nationalgeographic.com/maps



Geography

Skills for Life

Pacific

Islands Volcanic peaks are found on high islands such as Tahiti (left), while low islands are known as atolls (right).

Region What is the third type of island found in the region?

and sugarcane. In arid areas, ranchers raise cattle, sheep, and chickens.

Australia also yields rich mineral resources, including one-fourth of the world’s bauxite—the raw material for aluminum production—and most of the world’s high-quality opals. Deposits of coal, iron ore, lead, zinc, gold, nickel, and petroleum also make the country one of the world’s major mining areas.

Oceania: Island Lands

Thousands of islands, differing in size and extending across millions of square miles of the Pacific Ocean, form the region called **Oceania** (OH•shee•A•nee•uh). Created by colliding tectonic plates millions of years ago, the islands are part of the Ring of Fire, named for its volcanic and earthquake activity.

Island Clusters

Oceania’s islands are classified into three clusters, based on location, how the islands formed, and the inhabitants’ cultures. **Melanesia**, meaning

“black islands,” lies north and east of Australia. The “little islands” of **Micronesia** extend north of Melanesia. **Polynesia**, or “many islands,” spans an area larger than either Melanesia or Micronesia, ranging from Midway Island in the north to **New Zealand** in the south.

Island Types

Earthquakes and volcanic eruptions still occur on many high islands, one of three island types in Oceania. The landscapes of high islands, such as Tahiti and many of the islands of Fiji, feature mountain ranges split by valleys that fan out into coastal plains. Bodies of freshwater dot the land, and the volcanic soil on high islands supports some agriculture.

Volcanoes shaped Oceania’s many low islands differently than they shaped the high islands. Low islands, such as many of the Marshall Islands in Micronesia, are ring-shaped islands, known as **atolls**, formed by the buildup of coral reefs on the rim of submerged volcanoes. Atolls encircle **lagoons**, shallow pools of clear water, and usually

rise only a few feet above sea level. Low islands have little soil and few natural resources.

Continental islands are the third type, formed by the rising and folding of ancient rock from the ocean floor. Most of Oceania's large islands, such as New Guinea and New Caledonia, fall into this category. Although volcanoes did not create these islands, many do have active volcanoes. Coastal areas consist of plains, swamps, and rivers. Beyond the coastal areas, the land rises into rugged interior mountains, plateaus, and steep valleys. Because of the variety of their rocks and soil, continental islands have most of Oceania's mineral deposits. Their mining industries produce oil, gold, nickel, and copper. Some larger forested islands support timber processing.

New Zealand: A Rugged Landscape

Located 1,200 miles (1,931 km) southeast of Australia, New Zealand's two largest islands make up 99 percent of the country's landmass. Both **North Island** and **South Island** display sandy beaches, emerald hillsides, and snow-tipped mountains.

North Island's northern region includes golden beaches, ancient forests, and rich soil that supports citrus orchards. A broad central plateau of volcanic stone features hot springs and several active volcanoes. Chief among them is Mount Ruapehu (ROO•uh•PAY•hoo), North Island's highest point. Mount Ruapehu often spews molten rock. Shining freshwater lakes—including Lake Taupo, New Zealand's largest lake—appear throughout the plateau. East of the plateau, a band of hills runs north and south. Here ranchers graze sheep and dairy cattle.

The towering, snowy peaks of the Southern Alps run along South Island's western edge. New Zealand's earliest inhabitants, the Maori, named the highest peak on South Island *Aorangi* (ow•RAHNG•ee), which means "cloud piercer." Today, Aorangi is known as Mount Cook and rises to 12,349 feet (3,764 m). This high country also features sparkling lakes, carved by glaciers, and tumbling rivers. Lowlands called the Canterbury Plains lie on the eastern coast. This land is New Zealand's flattest and most fertile area. Along the western coast, pounding surf meets rugged cliffs, deep fjords, and coastal caves.



Geography Skills for Life

Canterbury Plains In addition to producing grain, New Zealand's Canterbury Plains are economically important for the livestock they support.

Place How does the eastern coast of South Island differ from the western coast?

Natural Resources

New Zealand's fertile soil, perhaps its most important resource, greatly benefits the country's economy. About 55 percent of the land supports crops and livestock. New Zealand's sheep and wool products dominate exports, and its forests yield valuable timber. The country's rivers and dams produce abundant hydroelectric power, fulfilling about 75 percent of the country's needs. New Zealand also uses less typical means to generate power: geothermal energy is provided by water heated underground by volcanoes.

Warm and cold ocean currents meet in the waters off the New Zealand coasts, providing the country with a wide variety of fish. Tuna, marlin, and sharks are abundant in the warmer tropical currents, while cod and hake, a cod-like fish, thrive in the cold Antarctic currents.

Antarctica: A White Plateau

Antarctica, almost twice the size of Australia, lies at the southern extreme of the earth, beneath a massive ice cap. Antarctica's ice cap covers about 98 percent of the continent's landmass. The ice is as much as 2 miles (3.2 km) thick in places and holds 70 percent of the world's freshwater.

Like a jagged backbone, the Transantarctic Mountains extend northward across Antarctica and the Antarctic Peninsula to within 600 miles

(966 km) of South America's Cape Horn. The mountains and the peninsula divide the continent into two areas. East of these mountains lies a high, ice-covered plateau. Coastal mountains and valleys near the plateau's edge form pathways for glaciers. To the west the landmass is largely below sea level, including underwater volcanoes.

Research Stations

Although Antarctica contains mineral resources, international agreements limit activity on Antarctica to scientific research. In year-round research stations, scientists from many countries gather fascinating information in this cold and barren land. They investigate weather patterns, measure environmental changes, and observe the sun and stars through an unpolluted atmosphere. The coastal sea also holds valuable resources. Fishing boats from several countries harvest **krill**, a shrimplike animal eaten by some whales. This plentiful, protein-rich food may someday help lessen world hunger.



Student Web Activity Visit the **Glencoe World Geography** Web site at tx.geography.glencoe.com and click on Student Web Activities—Chapter 32 for an activity about the Ring of Fire.

TX TAKS Practice

SECTION 1 ASSESSMENT

Checking for Understanding

- 1. Define** artesian well, coral, atoll, lagoon, krill.
- 2. Main Ideas** Create a graphic organizer like the one below. List the features and resources for each region. Then choose two of the regions, and write a paragraph explaining how they differ.

Australia	Oceania	Antarctica
• • •	• • •	• • •

Critical Thinking

- 3. Predicting Consequences** What group of people would be most affected if Australia's artesian wells dried up? Why?
- 4. Comparing and Contrasting** Identify similarities and differences between New Zealand's two main islands and a high island such as Tahiti.
- 5. Decision Making** Of the three types of islands found in Oceania, which type would you choose for a home? Explain why.

Analyzing Maps

- 6. Location** Study the physical-political map on page 795. To which island region does Papua New Guinea belong?

Applying Geography

- 7. Effects of Location** Consider the location of Oceania's islands in relation to other parts of the world. Write a paragraph explaining how this location might affect the development of natural resources.

Guide to Reading

Consider What You Know

Scientists who live and work at research stations in Antarctica's harsh climate make exciting discoveries about the earth. Why might this bleak and icy land be a good location for studying ecology, biology, climatology, or astronomy?

Read to Find Out

- How do variations in rainfall affect Australia's climate and vegetation?
- How does elevation affect climate patterns in New Zealand?
- What vegetation survives in the cold, dry Antarctic climate?

Terms to Know

- wattle
- doldrums
- typhoon
- manuka
- lichen
- crevasse

Places to Locate

- Papua New Guinea
- Antarctic Peninsula

Climate and Vegetation

NATIONAL GEOGRAPHIC

A Geographic View

A Frozen Frontier

I have grown to love this cold, strange place. . . . Such a reaction may seem odd to those who have never heard the sigh of ice floes jostling on the swells. . . . Alighting here briefly, like a bird of passage, I have come to see this transient frontier not as a harsh place but as a living creature that nurtures a multitude of other lives. . . . We can't conquer it, settle it, even own it. The winter ice belongs only to itself.

—Jane Ellen Stevens, "Exploring Antarctic Ice,"
National Geographic, May 1996



Ice shelf, Antarctica

Just as there is a surprising variety of life in an area that appears to be a frozen desert, there are other startling geographic contrasts throughout Australia, Oceania, and Antarctica. In this section, you will learn about the climates and vegetation of one of the world's most geographically diverse regions.

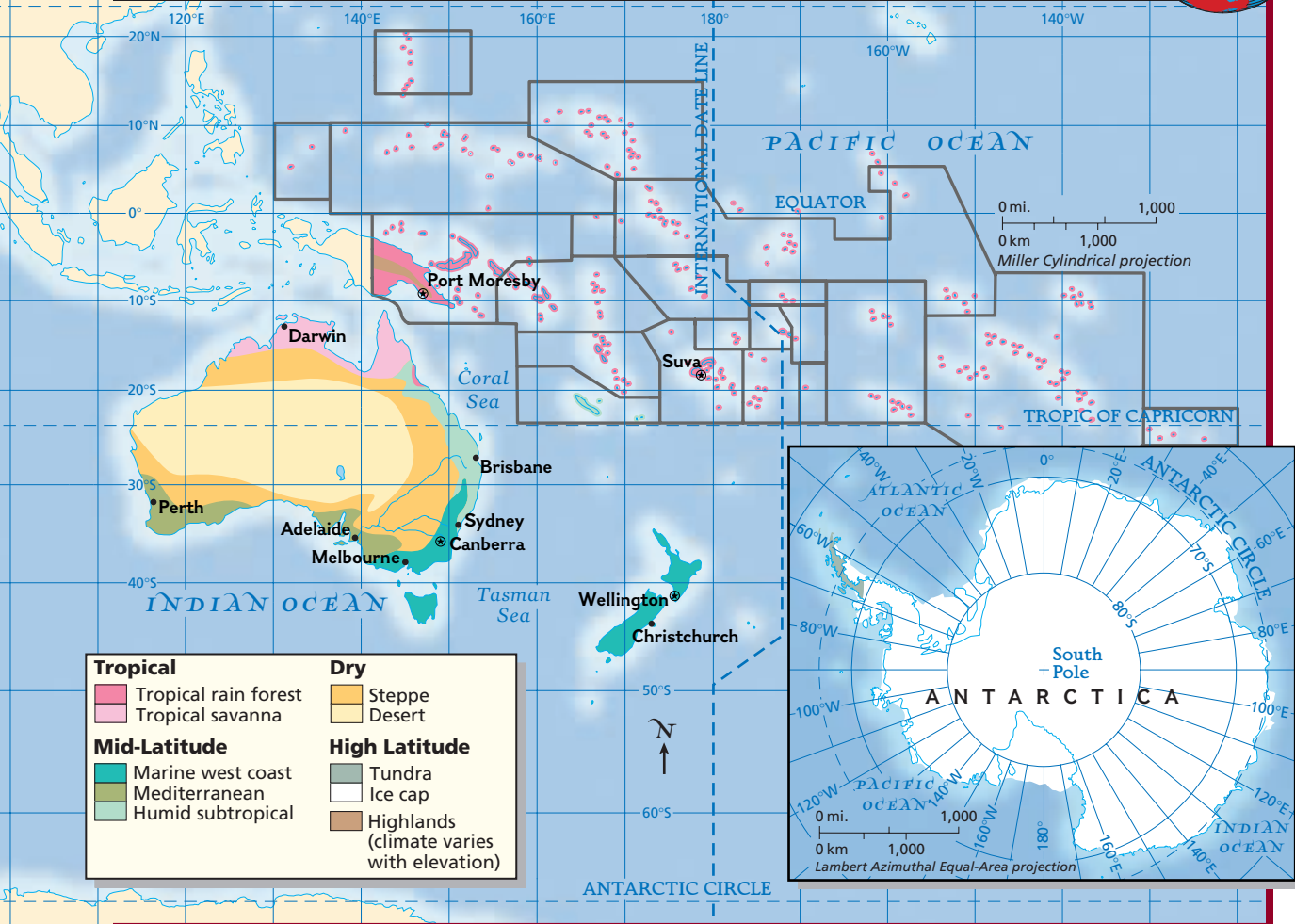
Australia

In Australia, climate and vegetation vary greatly from area to area. The country's climate and vegetation regions include tropical rain forests in the northeast, dry desert expanses in the interior, and temperate areas of grasslands, scrub, and mixed forests along the eastern, southern, and southwestern coasts. Differences in rainfall cause these significant changes in climate and vegetation throughout Australia.

Subtropical high-pressure air masses block moisture-laden Pacific Ocean winds from reaching the Western Plateau, Australia's large



Australia, Oceania, and Antarctica: Climate Regions



Geography Skills for Life

1. **Interpreting Maps** What types of climate characterize the eastern coast of Australia?

2. **Applying Geography Skills** Why does Port Moresby have a warmer climate than Wellington?

Find NGS online map resources @ www.nationalgeographic.com/maps

interior desert area. The sun scorches the land, but night temperatures drop dramatically. One traveler writes of the arid Western Plateau, as seen from a railroad car:

“... At twilight, the shrieking diesel horn scatters flights of long-beaked birds nesting in a sparse underbrush of burrs

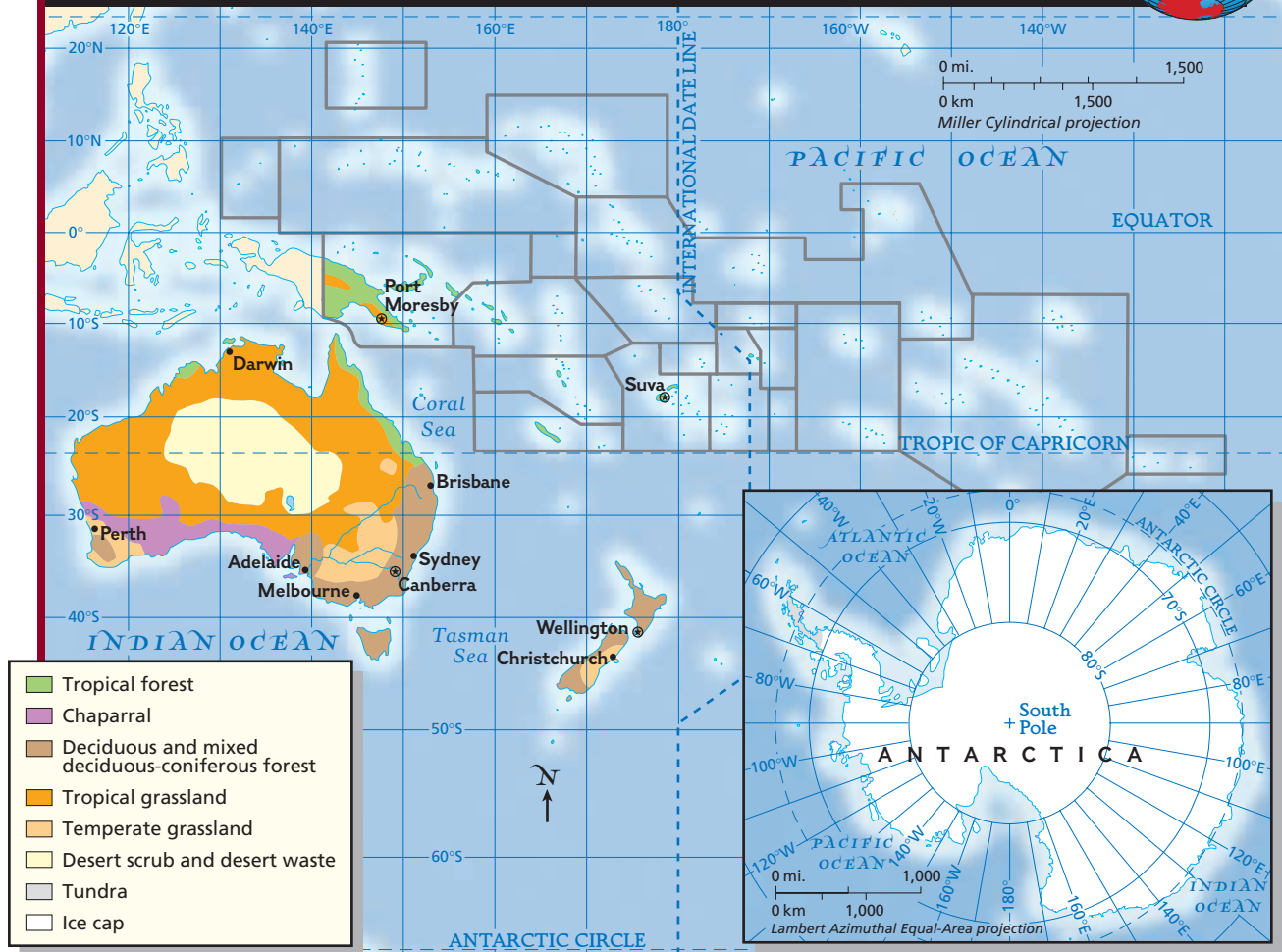
and thistles. . . . Dawn purples a line of mesa-type, flat-topped hills outlined against a cloudless blue sky.”

Hugh A. Mulligan, “The Ghan: Australia’s Notoriously Lethargic Train to the Outback,” *The Columbian*, November 11, 1999

With less than 10 inches (25 cm) of rain annually, there is not even enough vegetation for grazing.



Australia, Oceania, and Antarctica: Natural Vegetation



Geography Skills for Life

1. **Interpreting Maps** What type of vegetation is found in western Australia?

2. **Applying Geography Skills** What physical processes might affect patterns of economic conditions in southeastern Australia?

Find NGS online map resources @ www.nationalgeographic.com/maps

An area of milder steppe climate encircles Australia's desert region. Here more regular rainfall brings vegetation such as eucalyptus and acacia trees and small shrubs to life. Saplings of the acacia tree were used by early settlers to make **wattle**, a strong, interwoven wooden framework used for building homes. Rains fall only during the wet season, however, and the amount can vary greatly from year to year. Annual rainfall ranges from 10

to 20 inches (25 to 51 cm). Short grasses, ideal for grazing, also grow here, as do irrigated crops.

Australia's coastal areas have a variety of moister climates. The humid subtropical northeastern coast averages more than 20 inches (51 cm) of rain yearly. Less rain falls in the Mediterranean climate of the southern coasts and in the marine west coast climate along the southeastern coast. Coastal areas support most of Australia's agriculture.



Geography

Skills for Life

A Diverse Region

A ranching station in the Australian steppe (left), a tropical forest and island beach in Polynesia (middle), and a farm in the marine west coast climate of New Zealand (right) are just a sampling of the diverse landscapes of the region.

Place What kind of climate is found in most of New Zealand?

on islands with more rainfall. Hot, steamy rain forests thrive where heavy rains drench island interiors. A generally windless area called the **doldrums** occupies a narrow

band near the Equator where opposing ocean currents meet. The eerie calm within the doldrums can change to violent storms called **typhoons**. Their forceful winds and heavy rain devastate land and vegetation and threaten lives.

Oceania

Because much of Oceania lies between the Equator and the Tropic of Capricorn, most islands have a tropical rain forest climate. Most days are warm throughout the year, ranging from 70°F (21°C) to 80°F (27°C), though Pacific ocean winds cool atolls and the windward sides of higher islands. Some mountainous areas of **Papua New Guinea** even remain snow-covered year-round.

Seasons throughout most of Oceania alternate between wet and dry. The dry season features the cloudless blue skies often seen in travel advertisements, but the wet season brings constant rain and high humidity. The amount of rainfall varies from island to island. Low islands get little rainfall, but the larger landmasses of high islands give off warm, moisture-laden air. When this air rises and mixes with cool ocean breezes, heavy rains fall. Some high islands receive as much as 150 inches (381 cm) annually.

Only shrubs and grasses grow on dry, low islands, but coconut palms and other trees appear

New Zealand

A marine west coast climate is found in most of New Zealand. Ocean winds warm the land in winter and cool it in summer, preventing temperature extremes. Temperatures hover between 65°F (18°C) and 85°F (29°C) in summer and between 35°F (2°C) and 55°F (13°C) in winter. Abundant sunshine graces New Zealand's beaches and inland landscape, but clashing air masses may bring sudden clouds and rain.

Geographic differences also cause climatic variations. North Island's central plateau is warm and sunny during summer, but mountaintops may have snow year-round. Fierce winds or blizzards may strike these mountains at any time

of year. Mountainous areas exposed to western winds generally have more rainfall than do other areas. Although the country as a whole averages 25 to 60 inches (64 to 152 cm) of rain annually, the Southern Alps on South Island have an average annual rainfall of 315 inches (800 cm). Humidity levels in inland areas are about 10 percent lower than coastal areas. Maurice Shadbolt, a popular travel writer, describes New Zealand as a “long, lean land fated to fickle weather.” In fact, he says, “At its most temperamental, New Zealand can offer the traveller all four seasons in one day.”

New Zealand’s geographic isolation gives rise to unique plant life. Almost 90 percent of the country’s indigenous plants are native only to New Zealand. **Manuka**, a small shrub, carpets land where prehistoric volcanic eruptions destroyed ancient forests. Early settlers from Great Britain cut down almost all of the pinelike kauri trees, but some still grow among thriving evergreen forests. In an effort to repair severe erosion damage in deforested areas, New Zealand’s forest service has imported several tree species from Europe and North America. A species of pine tree native to California in the United States, for example, now grows in large areas of the volcanic plateau of North Island. Willows and poplars from Europe also help keep soil on hillsides from eroding.

Antarctica

Antarctica is the earth’s highest, driest, windiest, and coldest continent. Though very cold year-round, Antarctica’s climate exhibits some variation. Air loses moisture as it rises over Antarctica’s plateau, making the plateau drier than Australia’s deserts, but much colder. Temperatures may plunge as low as -129°F (-89°C) in winter. The Antarctic Plateau descends to coastal areas that have a milder, moister climate. Annual snowfall averages no more than 2 inches (5 cm) inland, but along the coast it often measures 24 inches (61 cm).

Despite the severe climate, some species of mosses and algae have adapted well to life on Antarctica. In rocky areas along the coasts, tiny sturdy plants called **lichens** thrive. Of the approximately 800 plant species in Antarctica, about 350 are lichens. These plants survive by remaining dormant for long periods and almost instantly beginning to photosynthesize during brief periods of milder weather. The continent’s only two flowering plants grow in a small area on the **Antarctic Peninsula** that lies in a tundra climate zone. Summer temperatures there may reach almost 60°F (16°C).

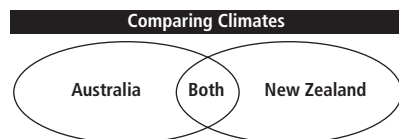
Although frozen, Antarctica’s ice is not motionless. The cap’s tremendous weight causes the frozen mass to spread toward the coasts. As it moves, the ice breaks into pieces, causing huge **crevasses**, or cracks, as much as 100 feet (30 m) wide.

TAKS Practice

SECTION 2 ASSESSMENT

Checking for Understanding

- 1. Define** wattle, doldrums, typhoon, manuka, lichen, crevasse.
- 2. Main Ideas** Create a Venn diagram like the one below. Fill in the climate factors for each location, putting those factors that both places have in common in the area where the circles overlap.



Critical Thinking

- 3. Making Inferences** What type of climate does most of New Zealand have? Why might it appeal to settlers?
- 4. Problem Solving** What problems might researchers encounter in Antarctica, and how could these conditions be overcome?
- 5. Identifying Cause and Effect** How do Pacific ocean currents and winds affect the climate of Oceania? How do they affect vegetation?

Analyzing Maps

- 6. Human-Environment Interaction** Study the vegetation map on page 801. What type of vegetation is suitable for raising livestock, and where in Australia is it found?

Applying Geography

- 7. Understanding Climate Maps** Note the climate regions on the map on page 800. Write a paragraph explaining how climate relates to the way farmers operate in New Zealand and Australia.



**TAKS
Practice**

Making Inferences

You see a police car stopped behind another car by the roadside. The emergency lights are flashing on the police car. You infer, or conclude, that the driver was speeding based on the information you already have from similar circumstances. Making an inference means using information to draw a conclusion.

Learning the Skill

When you hear about a country or an event in news reports or read about it in magazines and books, you may still have questions afterward. Most sources do not contain all the information on a subject, but they may offer enough information for you to infer, or figure out, the answers to your questions.

Different sources present information in different forms. Statistical charts, for example, often compare information from which you might infer differences, similarities, or trends over time. These steps will help you make inferences from a chart:

- **Read the title and other labels to know what information the chart presents.**
- **Determine whether the chart provides detailed information about one topic, compares two or more topics, or shows changes over time.** Some charts may give several different types of information.
- **Make a list of the information that is not given in the chart, or the questions that arise from it.**
- **Infer answers to your questions.** Make logical inferences based on the facts given.

Population	500,000
Government	Under British rule from 1893 to 1978, when it gained independence; member of the Commonwealth of Nations
Capital	Honiara
Languages	120 indigenous languages; English
Land	About 900 islands scattered over approximately 11,000 square miles (28,900 sq. km) of ocean
Geography	Mountainous volcanic islands and small atolls; coral reefs
Climate	Tropical
Rainfall	Ranges from 120 to 140 inches (305 to 356 cm) annually
Temperature	Ranges from 70° to 90°F (21° to 32°C)
Vegetation	Tropical forests on main islands
Exports	Fish, timber, cocoa
Life Expectancy	67 years

Sources: National Geographic Atlas of the World, 7th edition; 2001 World Population Data Sheet

Practicing the Skill

A tourist traveling to the Solomon Islands might use a chart to learn about the country. Answer the following questions by making inferences about the Solomon Islands from the information in the chart above.

1. Given the information in this chart, is it more likely that the form of government in the Solomon Islands is a parliamentary democracy or a communist state? Explain.
2. What can you infer about the health of the people in the Solomon Islands? Explain.
3. What can you infer about the animal life on the Solomon Islands? Explain.

4. What sorts of activities might a tourist enjoy in the Solomon Islands? Explain.

Applying the Skill

Locate a chart with information about another country in this region from a newspaper, magazine, or Web site. Use the steps to make inferences from the facts presented. Draft several questions based on your inferences. Exchange charts with another student, and complete each other's questions.



The **Glencoe Skillbuilder Interactive Workbook, Level 2** provides instruction and practice in key social studies skills.



SECTION 1

The Land (pp. 793–798)

Terms to Know

- artesian well
- coral
- atoll
- lagoon
- krill

Key Points

- Australia, both a country and a continent, encompasses mountains, central lowlands, and expansive deserts. Rich mineral deposits and productive farms and ranches contribute to the Australian economy.
- Oceania's thousands of islands extend across the southern Pacific Ocean. The islands of Oceania were formed either directly or indirectly by volcanic activity.
- New Zealand's main features are two large islands with mountain ranges, rivers, and lakes. The country boasts rich soil and timberland.
- Antarctica is an ice-covered continent. While Antarctica may have important mineral resources, its key resource is the information it offers to scientists.

Organizing Your Notes

Use a chart like the one below to help you organize information about the physical features and resources of Australia, Oceania, and Antarctica.

	Geographic Features	Natural Resources
Australia		
Oceania		
New Zealand		
Antarctica		

SECTION 2

Climate and Vegetation (pp. 799–803)

Terms to Know

- wattle
- doldrums
- typhoon
- manuka
- lichen
- crevasse

Key Points

- Australia generally has a hot, dry climate. Along the edges of the vast interior desert, the steppe receives sufficient rainfall for raising livestock. Only the coastal climates provide enough rainfall for growing crops without irrigation.
- Oceania enjoys a warm, moist tropical climate. Most islands have wet and dry seasons. The amount of rain during the wet season determines whether shrubs and grasses or dense rain forests will grow.
- New Zealand's marine west coast climate provides year-round rainfall, with temperatures that vary without being extreme.
- Antarctica's extremely cold and windy climate supports primarily lichens and mosses.

Organizing Your Notes

Use an outline like the one below to help you organize the information in this section about climate and vegetation.

Climate and Vegetation	
I.	Australia
A.	Mountains and Plateaus
B.	Central Lowlands
II.	Oceania

Reviewing Key Terms

Write the letter of the key term that best matches each definition below.

- | | |
|------------------|-------------|
| a. artesian well | f. doldrums |
| b. coral | g. typhoon |
| c. atoll | h. manuka |
| d. lagoon | i. lichen |
| e. krill | j. crevasse |

- limestone skeletons of a tiny sea animal
- windless area near the Equator
- shrimplike animal
- small, sturdy plants
- well from which pressurized water flows to the surface
- huge crack in an ice cap
- small shrub that grows in New Zealand
- pool of water inside an atoll
- violent Pacific Ocean storm
- low, ring-shaped island

Reviewing Facts

SECTION 1

- What formation lies just off Australia's northeastern coast?
- Name the three types of islands that are found in Oceania.
- What is New Zealand's main natural resource?
- List the local resources that help to meet New Zealand's energy needs.

SECTION 2

- What climate supports most of Australia's agricultural lands?
- Describe the factor that prevents temperature extremes in New Zealand.
- What causes the motion of the Antarctic ice cap?

Critical Thinking

- Making Inferences** Based on the information in Section 1, would you infer that Australia does or does not have an even distribution of population across the continent?
- Comparing and Contrasting** How are Oceania's islands similar? Different?
- Identifying Cause and Effect** Create a chart like the one below, and fill in the effects of different climates on vegetation. Then choose one effect, and write a paragraph describing its possible economic impact.

	Australia	Oceania	New Zealand	Antarctica
Climate				
Vegetation				

NATIONAL GEOGRAPHIC

Locating Places

Australia and New Zealand: Physical-Political Geography

Match the letters on the map with the places and physical features of Australia and New Zealand. Write your answers on a sheet of paper.

1. Great Barrier Reef	4. Tasmania	7. Coral Sea
2. Great Victoria Desert	5. Cape York Peninsula	8. Lake Eyre
3. Great Dividing Range	6. Great Australian Bight	9. North Island
		10. South Island

0 mi. 1,500
0 km 1,500
Miller Cylindrical projection



Self-Check Quiz Visit the **Glencoe World Geography** Web site at tx.geography.glencoe.com and click on Self-Check Quizzes—Chapter 32 to prepare for the Chapter Test.

Using the Regional Atlas

Refer to the Regional Atlas on pages 784–787.

- 1. Location** Which Australian city is located on the coast, just south of the Great Barrier Reef?
- 2. Location** In which part of Australia are most of the coal deposits found?

Thinking Like a Geographer

Think about the activities of explorers, scientists, and tourists in Antarctica. What changes to Antarctica’s physical geography might happen as a result? As a geographer, what safeguards would you suggest to preserve this unspoiled environment?

Problem-Solving Activity

Contemporary Issues Case Study Use print and nonprint resources to learn more about krill. Investigate how these tiny crustaceans fit into the food chain in the waters surrounding Antarctica. Find out about issues related to harvesting krill commercially as well as its potential for reducing world hunger. Write a brief report of your findings, and give recommendations for using krill responsibly.

GeoJournal

Travel Brochure Imagine that you are a travel writer, and draft a brochure about one location you wrote about in your GeoJournal. Include vivid details and information about the landforms, climate, and vegetation of the location you choose. Use your textbook and the Internet to make the brochure lively and interesting.



Technology Activity

Using the Internet for Research

Search the Internet for photographs and information about plants mentioned in Section 2, such as acacia and manuka. Look for details about their habitats and their uses. Create a display of the information and images, and share the finished product with your class.



TAKS Test Practice

Use the chart below to choose the best answer for each of the following multiple-choice questions. If you have trouble answering the questions, use the process of elimination to narrow your choices.

Australian City	Average Yearly Precipitation (inches)	Average Temperature Range	
		January (°F)	July (°F)
Alice Springs	10–20	75°–85°	45°–55°
Brisbane	over 30	75°–85°	55°–65°
Darwin	over 30	75°–85°	over 75°
Melbourne	20–30	65°–75°	45°–55°
Perth	over 30	75°–85°	45°–55°
Sydney	over 30	65°–75°	45°–55°

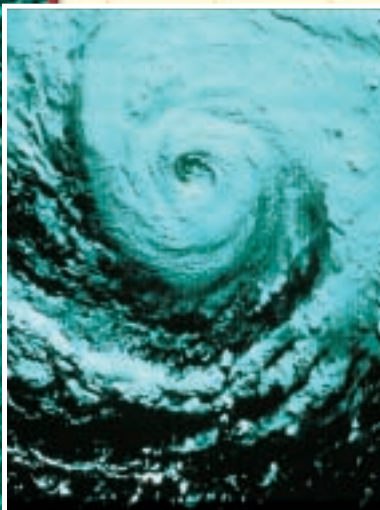
- If tourists were traveling to Australia in January and wanted to avoid both excessive heat and heavy rainfall, to which city should they travel?
 - A Melbourne
 - B Brisbane
 - C Darwin
 - D Sydney
- What information in the chart shows that the Australian cities are in the Southern Hemisphere?
 - F July’s temperatures are higher than January’s.
 - G January’s temperatures are higher than July’s.
 - H The cities have abundant rain.
 - J The cities have a dry season.



Read the chart and become familiar with the information it contains before you answer the questions. Do not, however, study the chart in depth. The quickest way to answer both question 1 and question 2 is to read through each answer choice and use the process of elimination to get rid of those that you think are wrong.

Geography Lab Activity

Air in Motion



▲ Large tropical storms can be seen from space.

Winds are horizontal air movements caused by temperature differences among air masses. Surface winds are usually strongest during the day, when the sun heats the ground. The increased ground temperature causes the air to spread out, become lighter, and rise. As thin air rises, cold air moves down to take its place. This movement of air is the wind blowing. Winds usually,

but not always, become gentler at night. Wind patterns have a significant impact on an area's climate, and they are often themselves affected by local weather patterns and conditions. People generally identify winds based on the direction from which they blow.

Tropical storms are created when an area of low atmospheric pressure is surrounded by circulating winds. Twenty to twenty-five typhoons blast across the Pacific Ocean each year. The word *typhoon* comes from the Chinese word *tai-fung*, which means "great wind." These storms, which are called tropical cyclones or hurricanes in other parts of the world, have spiraling winds that reach 100 to 150 miles per hour (161 to 241 km per hour).

1 Materials

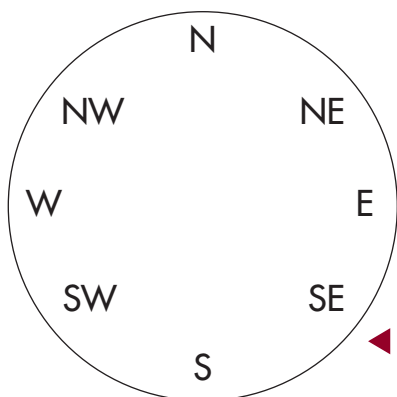
- Drinking straw
- Scissors
- Thin, stiff plastic for the arrowhead and tail, 5⁷/₈ in × 5⁷/₈ in (15 cm × 15 cm)
- Clear tape
- Straight pin
- Wood block, 2 in × 2 in × 17³/₄ in (5 cm × 5 cm × 45 cm)
- Hammer
- Metal washer
- Photocopy of Figure 1—Compass
- Photocopy of Figure 2—Data chart

2 Procedures

In this activity, you will build and use a wind vane to see how local changes in wind direction are related to local weather changes.

1. To construct the arrow, make two small slits in each end of the drinking straw. The slits at the arrow end should be 1¹/₈ inches (3 cm) long. The slits at the tail end should be 2 inches (5 cm) long. Make sure the slits align with each other.
2. Cut a small arrowhead and a large tail out of the plastic. Insert the arrowhead and the tail into the straw's slits, and secure them with a small amount of tape.
3. Balance the straw on your finger.
NOTE: The balancing point may not be in the center of the straw. When you find this point, poke the straight pin through the straw. Enlarge the hole slightly.

- Photocopy Figure 1 (the compass), and tape it to the top of the wood block. Using the hammer, gently drive the pin through the metal washer and into the center of the compass.
- Take the wind vane outside to an open area.
- Hold the wind vane so that the *N* on the block points north. The wind vane's arrow will point into the wind. Use the compass to determine the direction from which the wind is blowing. This is the wind direction.
- Photocopy or draw Figure 2 (the data chart), and record the wind direction three times a day, for five days.



◀ Figure 1

Date	Time	Wind Direction
	1. 2. 3.	
	1. 2. 3.	
	1. 2. 3.	
	1. 2. 3.	
	1. 2. 3.	

◀ Figure 2

3 Lab Report

- Why do you think the arrow of a wind vane points into the wind?
- In which direction did your arrow point most often?
- According to your results, how often does the wind direction change in your area?
- Drawing Conclusions** Weather stations take wind direction readings from the tops of tall buildings or high poles. Why do you think this is so?

4 Find Out More

In addition to measuring wind direction, you can measure wind speed. Use nylon thread to attach a table tennis ball to the center of the straight edge on a protractor. In the windiest area of the school grounds, hold the protractor with the straight edge up and level. Now face the wind. The angle made by the nylon line on the protractor will be the wind speed in degrees. The degree of wind speed converts to the following wind speeds:

- 10 degrees = 8 mph (13 km/h)
- 20 degrees = 12 mph (19.2 km/h)
- 30 degrees = 15 mph (24 km/h)
- 40 degrees = 17.9 mph (28.8 km/h)
- 50 degrees = 20.9 mph (33.6 km/h)
- 60 degrees = 25.8 mph (41.6 km/h)
- 70 degrees = 32.8 mph (52.8 km/h)

Did You Know?

Meteorologists use technology to monitor tropical storms and issue warnings that can save lives and property. Specialists scan satellite photographs for thunderstorm clusters. They reexamine cluster images hourly for signs of rotating winds. If these conditions develop, tropical storm warnings go out to people on ships, on aircraft, and along coastlines.