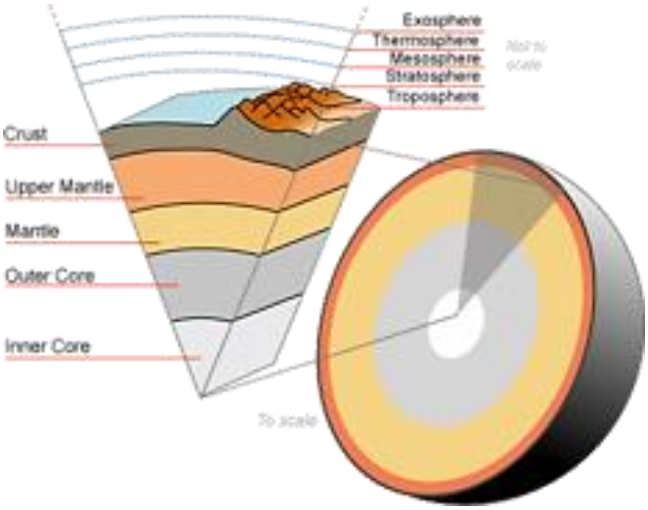
THE DALLAS WORLD AQUARIUM

Geography:

A Resource for Teachers

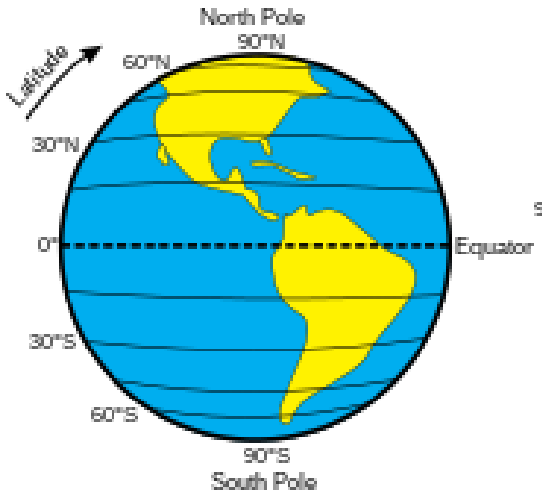
Where in the World?

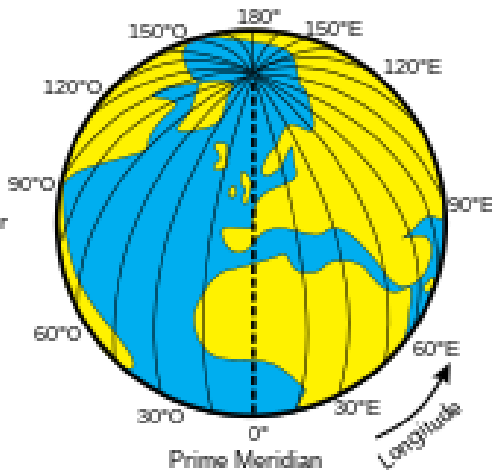
The earth is a sphere with topographical irregularities (mountain ranges, ocean trenches, etc.). Since the earth is round, a globe shows the true reduced size and shape of land and water in relation to the whole earth.



The earth is formed of three main sections - the core, the mantle, and the crust. This structure is like that of an egg. The core is the yolk, the mantle is the egg white, and the crust is the shell. Relative to the size of the planet, the crust is very thin.

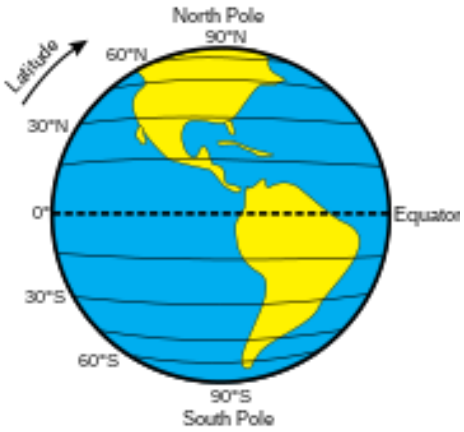
Lines are drawn to divide the earth into parts and zones. Lines make it easier to understand and locate places on maps or globes. This system of intersecting makes a grid. These dividing lines are imaginary — nothing marks the lines on the surface of the earth, just on a map or globe. Horizontal lines (latitude) go around the earth from side to side. Vertical lines (longitude) go around the earth from top to bottom.

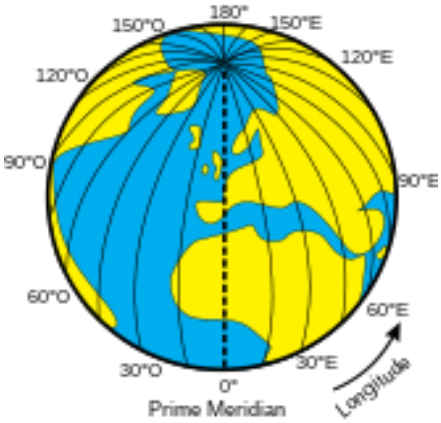




Early mariners used the location of the pole star (also called the North Star or Polaris) to measure north-south distances on the earth. The place where Polaris is directly overhead is the North Pole. The bottom of the earth is called the South Pole. The equator circles the earth horizontally, exactly halfway between the North Pole and the South Pole. Since a circle has 360^0, each distance from the equator (0^0) to a pole (north or south) is 90^0.

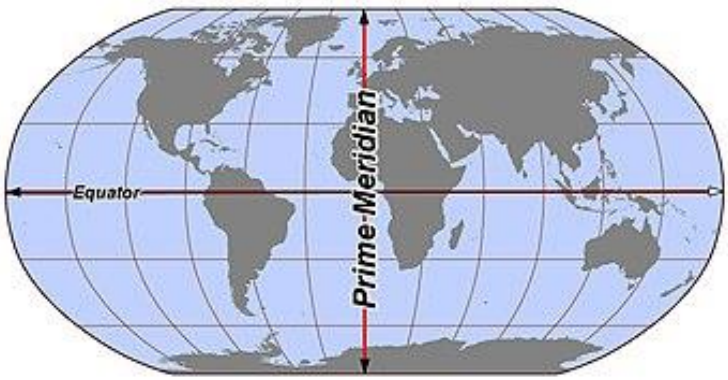
The area between the equator and the North Pole is called the Northern Hemisphere. The area between the equator and the South Pole is called the Southern Hemisphere. Horizontal lines, also known as lines of latitude, go around the earth parallel to the equator. These lines are always the same distance from the equator all around the earth and never meet with other horizontal lines. On the earth's surface, the distance between each degree of latitude is about 70 miles (113 km).



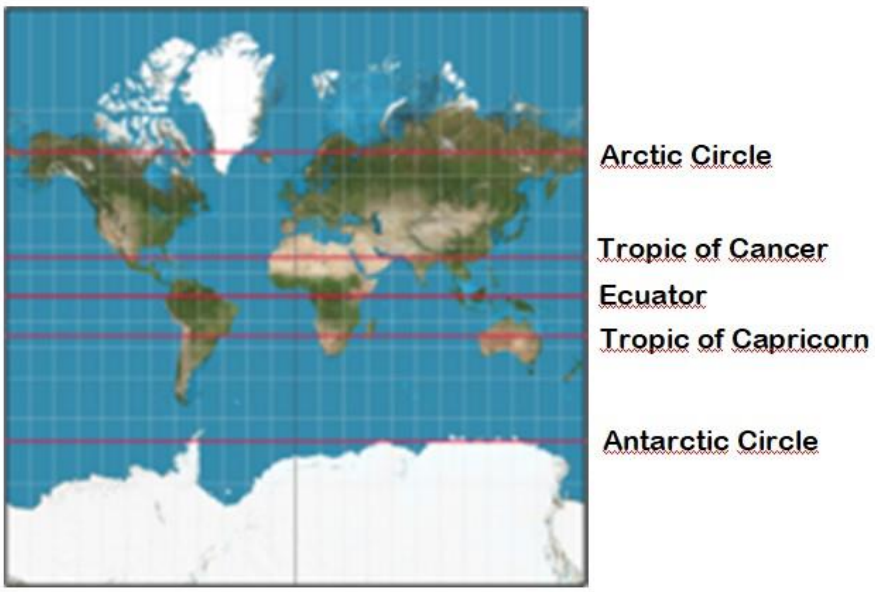


Vertical lines between the North Pole and the South Pole are called lines of longitude or meridians. These lines meet at the North or South Pole. Meridians are all the same length but are not parallel. The distance between lines of longitude is not the same along the entire length — farthest apart at the equator and closest together at the poles. One degree of longitude on the earth's surface at the equator is about 70 miles (113 km).

To use meridians for east-west measurements, the Prime Meridian was selected as the starting line. The Prime Meridian, the site most used, runs through the observatory at Greenwich, England. Meridians east of the Prime Meridian (to 180^0 E) make up the Eastern Hemisphere. Meridians west of Greenwich (to 180^0 W) make up the Western Hemisphere. The Western Hemisphere is sometimes called the New World and the Eastern Hemisphere the Old World.



The earth makes one complete revolution on its axis every 24 hours. Therefore, the earth turns 15^0 every hour. At the North Pole, summer means total sunlight for six months. At the same time, the South Pole is in total darkness for the same six-month period. As you move up or down the globe, daylight hours and temperatures change. Since most of the animal and plant life exhibited at The Dallas World Aquarium are from areas of plentiful sunlight and warm temperatures, we will divide the earth into additional areas or zones.



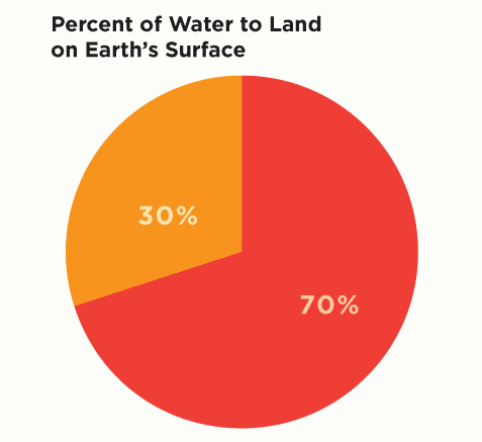
The two areas surrounding the North and South Poles are polar regions and are extremely cold. The North Pole is in the Arctic region. The South Pole is in the Antarctic region. As you move from the poles toward the equator, a line is drawn in the Northern Hemisphere and in the Southern Hemisphere where total darkness or total daylight occurs for at least one 24-hour period. (Remember, at the pole locations, total darkness or total daylight lasts for six months and reduces to 24 hours at the locations where we will place the next imaginary lines).

In the Northern Hemisphere, the line is called the Arctic Circle. In the Southern Hemisphere, the line is called the Antarctic Circle. The Arctic Circle is 66.5^0 north of the equator. The Antarctic Circle is 66.5^0 south of the equator.

Above and below the equator (23.5^0 N and 23.5^0 S) are two more lines— the Tropic of Cancer in the Northern Hemisphere and the Tropic of Capricorn in the Southern Hemisphere. These mark the tropical zone, making it the largest and hottest of all zones. The Tropic of Cancer is the line where the sun shines directly overhead on June 22nd of each year. The Tropic of Capricorn is the line where the sun shines directly overhead on December 22nd. The sun is always shining over part of the tropical zone.

The two areas between the polar regions and the tropical region are called the temperate zones - north temperate zone and south temperate zone. The temperate zones are the only areas that have all four seasons — spring, summer, winter, and fall. Seventy-five percent of the earth's population lives in the north temperate zone.

Where do you live? In the Southern or Northern Hemisphere? Do you live in a temperate or tropical zone? Where would you like to live? Why? If you were a tree, a fish, or a penguin, could you survive in all zones? The Dallas World Aquarium is in the Western Hemisphere, north of the equator in the north temperate zone. We will now learn about the original habitat of plants/animals that you will see at The Dallas World Aquarium.



The earth's surface is covered with land masses and water. Land makes up 25-30% of the earth's surface. Continents are large masses of land. They are often adjacent to islands and either completely or partially surrounded by water. The earth has seven continents. There are three continents in the Western Hemisphere and four continents in the Eastern Hemisphere.

There are more than one million miles (1,609,340 km) of shoreline around the islands and continents on Earth. The remaining surface of the earth is covered with water. This explains why the earth is called the "blue planet" when viewed from space. Heat from the sun shining on the ocean water causes the water to rise into the air as invisible vapor. After cooling, clouds form and rain, sleet, hail, or snow fall back to earth to be carried by streams or rivers back to the sea where the water cycle is repeated.

The seven continents are Africa, Antarctica, Asia, Australia, Europe, North America, and South America.

Land Masses

North America, South America, and part of Antarctica make up the **Western Hemisphere**:

Antarctica, the fifth largest continent, is surrounded by oceans. It averages 35^0 F (1.6^0 C) colder than the arctic region. The lowest temperature ever recorded was -128^0 F (-89^0 C) in Antarctica. There are no permanent residents in Antarctica. In some places, ice covers are almost three miles (4.8 km) thick. About 90% of the world's supply of fresh water is contained in this Antarctic ice cover. It is the highest continent; elevation average is 6,000 feet (1828 m) and would be even higher if it were not under so much weight from ice. The downward force of the ice compresses land and mountains alike.

North America extends north into the Arctic Circle and south almost to the equator. Temperatures can vary more than 200^0 F (93.3^0 C) from the Yukon to Death Valley, California. North America is almost completely west of South America. It is the third largest continent with the fourth largest population. North America narrows from 4,900 miles (7,886 m) wide (Alaska to Newfoundland) to 20 miles (32 km) wide at the Isthmus of Panama. It has the longest coastline of all continents.

North American countries: Belize, Canada, Costa Rica, Cuba, Dominican Republic, El Salvador, Greenland, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Puerto Rico, Tobago, Trinidad and the United States.

South America is the fourth largest continent. Much of it lies within the tropics. It is home to the world's longest and second tallest mountain range — the Andes. The upper elevations have an everlasting snow cover, even at the equator. Three major river systems are located in South America. The mighty Amazon River transports 20% of the total river water in the world. The flow is so strong that fresh water can be found 50 miles (80 km) out from the river's mouth in the Atlantic Ocean. The Orinoco (*oh re noe' koe*) River, found entirely in Venezuela, is the third longest and voluminous river in South America (after the La Plata River). The world's largest rainforest is in South America. South American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Surinam, Uruguay, Venezuela, Falkland Islands and French Guiana.

The continents in the **Eastern Hemisphere** are: Africa, Asia, Australia and Europe.

Africa is the second largest continent and the third largest in population. More than 80% of Africa lies within the tropical zone, making this the largest tropical region of any continent. The world's largest single desert, the Sahara, is in Africa. The Sahara is about the size of the continental United States. The tallest sand dunes in the world reach 1,000 feet (305 m) on the southwestern African coast. The world's highest temperature in the shade, 136^0 F (57.7^0 C), was recorded off the coast of Libya.

Asia is the largest continent. It makes up 30% of the earth's land mass. It stretches 6,000 miles (9,656 km) from Turkey to Japan. It is also home to 60% of the world's population. It has the lowest and highest points on the earth (the Dead Sea and Mt. Everest). Asia also has the most of the following: deserts, longest rivers, number of rainforests, active volcanoes and earthquakes. Asia is made up of some 39 countries split into four areas including the Middle East, Southern Asia, the Far East and the Southeast.

Australia is the smallest, flattest, driest and lowest continent. It is a large country, about the same size as the continental United States. Australia is entirely south of the equator, making it the "land down under." The Great Barrier Reef is the world's largest coral reef, running 1,250 miles (2,012 km) down the northeastern coast of Australia (about the distance from New York City to Miami, Florida). The Great Barrier Reef is made up of 2,500 individual reefs. Thousands of species of marine life are found here. Australia is separated into six states (New South Wales, Queensland, Tasmania, South Australia, Victoria and Western Australia) and two territories (Australian Capital Territory and Northern Territory).

Europe is the most densely populated continent. Over 700 million people live in Europe, which is the second smallest continent. Europe looks like a collection of peninsulas on the western border of Asia. Sometimes the two continents are considered one and called "Eurasia." Europe is made up of more than thirty independent countries, including Great Britain, France, Greece, Poland and Russia - to name a few.

The Blue Planet

The water portion of the earth is made up of five major oceans and many seas. Oceans are vast bodies of salt water. Seas are extensions from oceans that are not as deep and are partially surrounded by land. Oceans are the main regulators of our climate. They are unevenly spread over earth, with more water being in the southern hemisphere. These huge bodies of water absorb heat or energy from the sun during the day and in the summer. They slowly release the heat or energy at night and in the winter. The oceans act like a large thermostat with much control over the change of seasons. Dramatic effects of the earth's surface can occur from small changes in ocean temperature, height and/or currents. It takes five times as much heat to change water temperature as land temperature, therefore, water temperature does not fluctuate as much as land temperature.

Temperature differences between sea and land cause winds. Wind creates waves and currents on the surface of the water. Currents are large amounts of water that move in a certain direction. Most ocean currents always move in the same direction, usually clockwise in the northern hemisphere and counterclockwise in the southern hemisphere. However, in the Indian Ocean, currents driven by the monsoon winds change direction twice each year. Ocean currents can move in both horizontal and vertical directions. Besides currents created by surface winds, deep currents under the surface usually result from the density of adjacent water. Water density increases with rises in salinity; however, water density decreases as temperature drops.

There are more than one million miles (1.6 million km) of shoreline around the land masses on earth. The coastlines around the oceans are not only moving, but they are also always changing. The land that extends into the water and goes to a depth of approximately 650 feet (198 m) below the surface or sea level, is called the continental shelf. A continental shelf, around each continent, is covered by ocean water and drops into the continental slope and eventually to the deep ocean floor. The continental shelf is covered by 10% of the ocean, yet most marine life can be found in these areas. Below the continental shelf are continental slopes, mountain ranges, volcanoes, trenches, and abyssal plains. Sandy beaches, rocky formations, tide pools, lagoons, marshes, swamps, mud flats, deltas, estuaries, and reefs can be found along the coastlines. The five major oceans are: Antarctic or Southern, Arctic, Atlantic, Indian, and Pacific.

The **Antarctic** or Southern Ocean surrounds the Antarctic Circle. Most of this body of water freezes in the winter.

The **Arctic** Ocean is the smallest. It is almost completely surrounded by land. The ocean is usually covered with 10 - 12 feet (3 - 3.7 m) of ice.

The **Atlantic** Ocean is only about half the size of the Pacific Ocean and not as deep. It is often divided into the North and South Atlantic which are separated by the equator. Many large bodies of water are found in the Atlantic, such as the Caribbean Sea and the Gulf of Mexico in the western Atlantic, and the Mediterranean and North Seas in the eastern Atlantic.

The **Indian** Ocean is bordered by Arabia and Asia on the north (including the Red Sea and Persian Gulf), Africa on the west and Asia and Indonesia on the east. To the south, it reaches Antarctica. Monsoons and cyclones are frequent in this body of water, which is largely located in the tropical and subtropical region.

The **Pacific** Ocean is the largest and deepest. It covers approximately one-third of the surface of the earth. It covers more area than all the land masses put together. The Pacific has an average depth of 13,800 feet (4,206 m) but is more than seven miles (11.2 km) deep in one place. It contains thousands of tropical islands and more species of marine life than any other body of water.

Ninety-seven percent of the water on the Earth is saltwater. Salt enters the water as rocks are eroded away. The rocks contain Sodium chloride (NaCl, also known as "table salt") which is absorbed into the water as the rocks are weathered. One cubic foot (0.028 m^3) of seawater contains about two pounds (0.9 kg) of NaCl. Salt water or sea water makes up all the oceans and seas in our world. There is enough salt in the oceans to cover all the land on earth with a layer of salt more than 500 feet (152 m) deep. Rain washes salt from the soil and eventually carries the salt to the sea. Salt in sea water is called salinity. The mean ocean salinity is about 35 parts per thousand – roughly 1.3 ounces (37 gr) of salt per quart (0.9 L) of water. Some tropical areas such as the Red Sea have a salinity near 40 parts per thousand.

The sand found on the ocean floor and on beaches is formed as rocks break into smaller pieces. Sand is comprised of tiny pieces of rock and shell. The ocean floor is not totally flat. While a majority of the deep ocean floor is covered with flat plains, the deepest valleys (trenches) and the tallest mountains (islands) are under the ocean.

The sun and the moon both have a gravitational pull on the Earth. The moon's pull on the Earth is stronger than the sun's because it is much closer. This gravitational pull causes the oceans to bulge, producing the tides. The water near the shore rises during high tide and drops during low tide. The zone marked by the height of high tide and the lowest point of low tide is called the intertidal zone. Waves break on the shore because the water moving towards the shore keeps its velocity but drags on the bottom as the depth decreases.

Coral reefs are beautiful, diverse, and highly sensitive ecosystems found between the Tropics of Cancer and Capricorn. They occur in tropical waters from mid-tide level down to about 130 feet (40 m). Corals require sunlight, plenty of oxygen (O_2), a stable temperature around 82^0 F (28^0 C), salinity (27-28 parts per thousand) and a good food supply. Corals are sensitive and lack the ability to remove any buildup of sediments. The conditions necessary for coral reefs to flourish are appropriate for many species, which make these ecosystems home to a variety of marine life.

Corals are simple, carnivorous animals belonging to the group coelenterates. This large group includes jellyfish, sea anemones and sea fans. Coral polyps are surrounded by a skeleton of calcium carbonate (limestone). Single-celled plants called zooxanthellae live in the tissue cells of the polyps and provide the color of the coral — without them the coral would be white. Like other green plants, they use sunlight, carbon dioxide (CO^2) and nutrients to make food and grow. Coral reefs can grow about one inch (2.5 cm) per year.

Different types of coral are found in different areas of coral reefs. This is called zonation. Some factors affecting zonation are depth and amount of water movement. Large branching corals, like Elkhorn coral (*Agropora*) grow quickly in deeper water, with less wave action, while other massive types, like the brain corals (*Diplora*) are slow growers in the shallow areas of the reef. After corals die, their calcium carbonate skeletons become cemented together to form the reef.

Four coral reef formations occur, although intermediate forms are found. The four types of reefs (fringing, barrier, atoll, and patch) are likely related in their development. A fringing reef is attached to the shore. These form around islands or volcanoes. Barrier reefs have a channel of water between the reef and the shore. An atoll reef is a ring of coral around a sunken volcano where only a lagoon remains.

Corals occur in the Atlantic, Indian and Pacific Oceans. Since corals cannot survive in the cold-water currents which flow around the southern tips of America and Africa, they cannot pass from one ocean to the next. The Atlantic and Indo-Pacific corals have evolved into separate species due to this barrier of migration.

Three percent of the water on earth is freshwater. One percent of the freshwater is stored as groundwater or in rivers and streams. The other two percent of freshwater is frozen in glaciers. Where streams join, the river proper begins. As rivers grow in strength, they meander back and forth eroding away and building up their flood plain. A flood plain is the entire area covered in water when the river is flowing at or above full capacity. When the river meets the sea, it fans out and forms a delta where sediments (alluvium) carried down river are deposited.

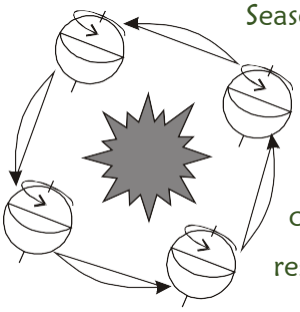
Rivers provide water storage and help keep the soil along the banks saturated. In a dense forest, a river provides a gap through which sunlight can reach the ground. Riverbanks in such regions are home to a diverse range of sun-seeking plants.

Weird Weather

El Niño, named "the child" because it usually occurs near Christmas, is the cause of strange weather patterns. An El Niño event occurs when strong easterly trade winds fail to push warm water away from the coast of South America. When the warmer water is moved away, cooler, nutrient-rich water rises near the surface and attracts many fish to the area. If these trade winds fail to arrive, warm surface water is pushed towards the South American coast and devastates the fish population which normally thrives there. El Niño triggers weather changes close to the equator and in regions far removed from tropical areas.

La Niña, "the little girl", is the opposite of El Niño. During this cold episode, also known as El Viejo (the old man) or "anti-El Niño", cooler surface temperatures occur off the coast of South America, which influence weather patterns around the world. Surface temperatures of the western coast of South America generally range from 60^0 - 70^0 F (15.5^0 - 21^0 C), with a warm pool in the central to western Pacific reaching 80^0 F (27^0 C). During an El Niño event, this warm pool covers the tropics, but during a La Niña episode, the coastal water temperature can fall as much as seven degrees below normal.

La Niña and El Niño affect areas in opposite ways. Areas that are prone to drought during El Niño may experience above average rainfall with La Niña. Winters during a La Niña episode are warmer in the southeast and colder in the northwest. These weather phenomenons occur on a three-to-five-year cycle. La Niña can, but does not always, follow an El Niño episode.



Seasons change according to the amount of solar energy reaching different parts of the Earth. As the earth revolves annually around the sun, portions of the planet are tilted toward or away from the sun. A hemisphere is tilted towards the sun in the summer months and away from the sun in the winter. The Northern and Southern Hemispheres have opposite seasons. When we are enjoying the summer, it is wintertime in Australia and the rest of the Southern Hemisphere.

At The Dallas World Aquarium, you will find exhibits from around the world. Most of the selected exhibit sites are located within or near the tropical zone.

Australia (land area: 2,965,368 square miles or 7,682,300 sq km)

Lord Howe Island, a small volcanic island, is located 480 miles (772 km) northeast of Sydney, Australia. The island is seven miles long (11 km) and two miles wide (3.2 km). Fewer than 700 residents and visitors inhabit this area surrounded by the world's southernmost coral reefs. Lord Howe Island is the most beautiful part of New South Wales.

Southern Australia is surrounded by the cool water of the Indian and Southern Oceans. It is the waters southwest of Adelaide around the southwest tip of Australia up to Perth that is home to the rare and indigenous Leafy seadragon.

Papua New Guinea (land area: 174,850 square miles or 452,860 sq km)

Papua New Guinea, an independent state, is north of Australia. The current population of Papua New Guinea is about 6.1 million people. It is the world's second largest island (excluding continents) and has an immense ecological value in terms of biodiversity, with between 5-10% of the total species on the planet. Many of the species are endemic and thousands are still unknown. It has a rich diversity of coral life and 1,200 species of fish have been found.

British Columbia, Canada (land area: 366,255 square miles or 948,597 sq km)

British Columbia is the westernmost province on Canada's pacific coast. The region is found between the northwestern states of Washington and Alaska. A line of mountains to the west of the coastline extends through Vancouver inland and north to the Queen Charlotte Islands, sheltering the water route known as the Inside Passage from the Pacific Ocean. This coastal area has cool summers and mild winters with heavy rainfall. Dense forests, picturesque mountains and a fjord-lined coastline provide beautiful landscape. Vancouver, British Columbia is the country's busiest seaport.

Fiji (land area: approximately 7,054 square miles or 18,274 sq km)
A volcanic archipelago of two large islands and over hundreds of islets in the southwest Pacific Ocean make up the Republic of Fiji. Only about 100 of these islands are inhabited. It is located approximately 2,800 miles (4,506 km) southwest of Hawaii. Numerous colorful corals make up the reefs that surround these islands. The capital is Suva (on Viti Levu). From 1874 to 1970, Fiji was a British colony.

Republic of Indonesia (land area: 699,450 square miles or 1,811,569 sq km)
Indonesia, the world's largest archipelago, is made up of a group of volcanic islands with the fourth largest population in the world. Formally known as the Dutch and East Indies, it has over 200 volcanoes, with the Krakatoa eruption in 1883 being the largest explosion in recorded history. The country is blanketed by tropical forest and mangrove swamps, leaving just 10% of the land for farming.

Republic of Palau (land area: 177 square miles or 459 sq km)
The Republic of Palau is a chain of islands located in western Micronesia. Eight of the 340 islands are populated with only 20,800 people. Palau is famous for its breathtaking coral reefs, but the scenery above ground is just as spectacular. Rock Islands, the scenic highlight of Micronesia, contain hidden saltwater lakes. Palau is a former U.S. Trust Territory but declared its independence in 1994. Palau was originally colonized by Spain, Germany, Japan and finally the U.S.

Japan (land area: 140,728 square miles or 364,485 sq km)
Located in Eastern Asia, the island chain is between the North Pacific Ocean and the Sea of Japan, east of the Korean peninsula. Slightly smaller than California in size, Japan has 18,445 miles (29,684 km) of coastline. It is one of the most seismically active regions of the world. It is calculated that the country gets around 1,000 earthquakes each year, most of them too small to notice with seismic equipment. The latitudinal spread of Japan, ranging from subtropical in the south to sub-arctic in the north, makes for a wide diversity of flora and fauna.

Solomon Islands (scattered over 289,000 square miles or 748,510 sq km)
Named for King Solomon, two parallel chains of islands, approximately 870 miles (1,400 km) east of New Guinea, comprise the Solomon Islands. These islands are often referred to as the "Happy Isles." The six largest islands (of more than 900) make up 80% of the land mass. Most of the islands are coral reefs. About one percent of the land can be cultivated. Famous for its historic role in World War II, Guadalcanal is one of the largest of the Solomon Islands.

Sri Lanka (24,955 square miles or 64,630 sq km)
Sri Lanka is in the Indian Ocean, south of the tip of India. Sri Lanka was known as Ceylon until 1972. The coastline of the small, island country is 833 miles long (1,340 km). Approximately 1,000 species of fish are found in the coastal waters and coral reefs surrounding the island. Sri Lanka is home to varied and rich marine life, including sea turtles, whales, and dolphins.

Cape of Good Hope, South Africa
South Africa is found at the southern tip of the African continent where the Indian and Atlantic Oceans meet. This country has beaches, grasslands, arid semi-deserts and mountains. It is the most industrial nation of the African countries and supplies half of the world's diamonds and gold. Eleven official languages are spoken by South Africans which come from a variety of cultural backgrounds. The Cape of Good Hope was described by Sir Francis Drake as, "the fairest cape in the whole circumference of the earth." Five hundred years ago, it was a landmark for India bound Portuguese explorers who called it the "Cape of Storms."

Venezuela, South America (area: 352,051 square miles or 912,050 sq km)

- The Capital is Caracas.
- The currency is named for Simon Bolivar who liberated the Spanish Colony in 1821
- Located on the northeast coast of South America
- Venezuela's central llanos (plains) drain into the Orinoco River
- Venezuela has the largest known oil deposits outside the Middle East
- Environmental concerns: rainforest destruction, oil pollution of Lake Maracaibo, and illegal gold mining, harming soil, and lakes

Venezuela, the most northern South American country, is unmatched for its spectacular geographic and natural diversity. It is Caribbean, Amazonian, Andean and Guayanan countries all in one! In the north, more than 1,850 miles (2,977 km) of coastline borders Venezuela.

This coastal strip has a prolific continental shelf and more than 300 islands and keys scattered nearby in the Atlantic Ocean and the Caribbean Sea. Just inland from the coast is the 300-mile (2,092 km) long mountain chain, the Cordillera de la Costa.

The central region of this northern area is the most developed part of Venezuela. It is the most densely populated area, with less than 2.5% of the territory but more than 45% of Venezuela's population. These coastal mountains seem to be an eastern curve in the structural continuation of the Andes that go south into neighboring Colombia.

The area that lies east of the Andes and south of the Cordillera de la Costa Mountain range to the Orinoco River is made up of tropical savannas or llanos. These sparsely populated, low alluvial plains are an accumulation of sand, clay and mud. A few scattered forests along the creeks and rivers can be found throughout these grassy plains. South of the Orinoco, the tropical savannas and jungles are known as Guyana. Most of Venezuela's Indian groups live in this region. The southernmost part of the territory is mainly thick tropical rainforest that is crisscrossed by rivers. This area is sparsely populated by indigenous groups, home to such tribes as the mysterious Yanomamis.

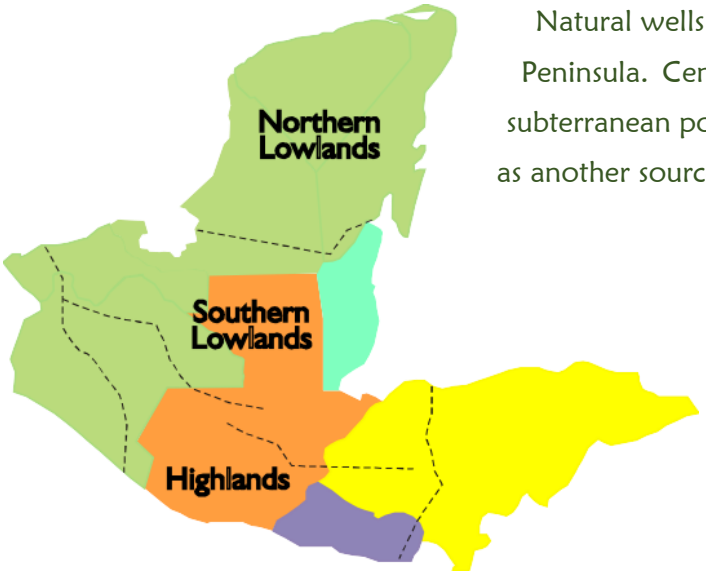
It is in this area that the 135-mile (217 km) long natural channel, Casiquiare, links the Orinoco and the Negro rivers, thus spanning the two vast river systems of the Orinoco and the Amazon. It is believed this is the only such unusual hydrological phenomenon in the world.

The interconnecting channel not only sends between 20% - 35% (varying with the seasons) of the Orinoco waters to the Amazon, it also disperses plants and animals. From the mouth of the Orinoco, through the savannas and jungles, unparalleled massive concentrations of flora and fauna abound. Venezuela has more than 1,300 species of birds; some 2,000 species of fish; over 300 species of mammals; more than 100 species of amphibians; over 500 species of reptiles; and more than 30,000 known species of insects. There are more than 25,000 species of flowering plants alone, including 2,600 species of orchids of which 25% are endemic. More than 30% of the 1,100 species of ferns are native to Venezuela. These were the reasons for choosing this relatively unspoiled and unknown part of the world as the "blueprint" for the ORINOCO - Secrets of the River rainforest exhibit.

Mundo Maya

The ancient Maya empire included the countries of modern-day Belize and Guatemala, the western parts of Honduras and El Salvador and five Mexican states (Yucatan, Quintana Roo, Tabasco, Campeche, and Chiapas). The area (approximately 154,441-193,051 square miles or 400,000-500,000 sq km) was referred to as El Mundo Maya or The Maya World.

The Maya territory can be divided into three geographical areas. The Northern Lowland or Northern zone is covered by low, dense thornbush. Hardwood trees, such as mahogany, cedar and zapote can be found in the northeastern region of this zone. It is extremely arid and has only one chain of low hills.



Natural wells (cenotes) are the main source of water on the Yucatan Peninsula. Cenotes are formed by the caving in of soil to expose subterranean pools. Chultunes (or cisterns) were invented by the Maya as another source for collecting water.

The Southern Lowland or Central zone is from 500-4,000 feet (305-1,219 m) above sea level. Vegetation ranges from tropical to highland. Two rivers, Rio San Pedro Martir and Rio Usumacinta, cross this zone. Lush vegetation is home to flourishing wildlife. The climate is hot and humid, with rain throughout most of the year (rainy season is from May to January).

In the Highland or Southern zone, mountains are mostly of volcanic origin. They reach an altitude of more than 13,790 feet (4,203 m) in Guatemala, with the lower peaks being around 3,500 feet (1,067 m). The rainy season is usually from May to November. Summers are cooler than in the lowland zones. Winters are cold and dry, with frost in the higher mountains. This area contains beautiful lakes and is home to many reptiles, birds and mammals.

Numbering seven to eight million, the Maya of today are a large, homogenous group living in Mexico, Belize, Guatemala, and Honduras. They still speak any one of the many dialects of the Mayan language, practice a mixture of the old religion with Christianity, and many still use the old methods of agriculture. Most of the Maya today live in poverty. In the past few decades, there has been a movement in Mexico, Honduras, and Guatemala to return ownership of land back to the Maya so their way of life can continue like that of their ancestors.

USEFUL VOCABULARY

accumulate	to collect or gather
adjacent	having a common border
alluvium	clay, silt, sand or gravel deposited in the bed of a stream or on its flood plain or delta
archipelago	an expanse of water with many scattered islands
atoll reef	a coral reef surrounding a lagoon
axis	a straight line about which a body or a geometric figure rotates
barrier reef	coral reefs which run parallel to the shore
bulge	to jut out or swell
calcium carbonate	a salt (CaCO3)
capacity	the sediment load that a stream can carry
carbon dioxide	a heavy, colorless gas; absorbed from the air by plants in photosynthesis (CO2)
carnivore	animal that feeds on other animals
channel	the bed where a natural stream of water runs
CO2	chemical symbol for carbon dioxide
colony	a group of people living in a new territory but retaining ties to the parent state
compress	to press or squeeze together
continent	one of the usual seven divisions of land on the globe
continental shelf	submerged part of continent between the shore and the continental slope
continental slope	the area between the continental shelf and the deep ocean floor
core	the innermost zone of the earth
creek	a natural stream of water normally smaller than and often a tributary to a river
crust	the outermost layer or shell of the Earth
currents	a fluid body moving continuously in a certain direction
cyclone	a wind system that rotates about a center of low atmospheric pressure–clockwise in the Southern Hemisphere and counterclockwise in the Northern Hemisphere
degree	an interval marked on a scale of measuring equipment
delta	a fan-shaped deposit of sediment formed at a stream's mouth
dense	compacted or crowded together
deposit	a natural accumulation of matter
depth	the perpendicular measurement downward from a surface
desert	an arid, barren tract, incapable of supporting any considerable population
destruction	the action or process of destroying something
disperse	to spread or distribute from a fixed source

diverse	having various forms or qualities
dune	a hill or ridge of sand piled up by the wind
earthquake	shaking or trembling of the earth that is tectonic or volcanic in origin
ecosystem	a biological community and its environment
endemic	belonging or native to a particular people or country
envelop	to enclose or enfold completely
equator	the longitudinal line which is equidistant between the two poles
erode	process by which earth materials are dissolved, loosened or worn away and deposited elsewhere
fauna	animals or animal life
fjord (fiord)	a long narrow inlet or arm of the sea bordered by steep cliffs
flood	condition in which stream stage is above the height of the channel bank
flood plain	a flat region or valley floor surrounding a stream channel into which the stream overflows during flooding
flora	plants or plant life
fringing reef	a coral reef which is attached to the edge of a coastline
globe	a spherical representation of the earth
gravitational pull	an attraction to or force pulling towards something
groundwater	water within the earth that supplies wells and springs
habitat	the place where a plant or animal naturally lives or grows
hemisphere	the northern or southern half of the earth divided by the equator, or the eastern or western half of the earth divided by the Prime Meridian
high tide	the tide when the water is at its highest elevation
horizontal	parallel to the horizon
hydrology	the science of the properties, distribution, or circulation of water
indigenous	produced, growing or living naturally in a particular region or environment
inhabitant	a permanent resident in a place
intermediate	occurring midway between other measures
intertidal zone	the area between high and low tide
jungle	an impenetrable thicket or tangled mass of tropical vegetation
key	small coral islet
landmark	a mark for designating the boundary of land
latitude	angular distance north or south from the Earth's equator
levee	a low ridge or embankment built by a stream along its banks in times of flood
limestone	a sedimentary rock consisting mainly of calcium carbonate
llana	wet savannas where grasses dominate and trees and shrubs are widely scattered

longitude	an angular distance measured on a great circle of reference
low tide	the tide when the water is at its lowest elevation
mantle	the zone of the earth's interior between the crust and the core
map	a representation on a flat surface of the whole or part of an area
marine	of or relating to the sea
mariner	one who navigates or assists in navigating a ship
meander	a curve, bend or loop in the course of the stream; to move about at random, especially over a wide area
meridian	a representation of such a circle or half circle numbered for longitude on a map or globe
migration	to move from one country, place or locality to another
mining	the process or business of working in mines
molten	fused or liquified by heat
monsoon	a periodic windstorm
moon	the earth's only known natural satellite revolving around the earth, east to west
mouth	the place where a stream or river enters a larger body of water
NaCl	sodium chloride (table salt)
native	an original inhabitant
nutrient	any food or element an organism must take in to live, grow or reproduce
O2	chemical symbol for oxygen
ocean	one of the large bodies of saltwater which covers three-fourths of the earth
oxygen	colorless, odorless, tasteless atmospheric gas
parallel	extending in the same direction, everywhere equidistant and never meeting
peninsula	a portion of land extending from a larger body and surrounded by water on three sides
permanent	continuing or enduring without change
phenomenon	an observable act or event
pollution	an undesirable change in air, water, soil or food that can adversely affect the health, survival or activities of other living organisms
polyp	a coelenterate with a hollow tubular body surrounded by tentacles
population	the whole number of people or inhabitants in an area or region
ppt	parts per thousand
Prime Meridian	the meridian of 0 ^{0} longitude which runs through Greenwich, England, and from which other longitudes are marked east-west
prolific	marked by abundant productivity
rainforest	lush woodland with a high annual rainfall
range	to live or occur in or be native to a specific region

reef	a chain of rocks or a ridge at or near the water level
region	an area, division, or district
remote	secluded
reptile	a cold-blooded or breathing vertebrate including crocodiles, alligators, lizards and snakes
revolution	the time it takes a celestial body to move completely through its orbit
river	a natural stream of water of considerable volume
salinity	amount of various salts dissolved in a given amount of water
saturate	to fill completely
savanna	a treeless plain
sea	extension of an ocean that is not as deep and partially surrounded by water
sediment	matter deposited by ice, water or wind
sensitive	excessively susceptible
skeleton	rigid supportive or protective framework of an organism
sodium chloride	table salt (NaCl)
sparse	few and scattered elements
species	a class of individuals having common characteristics and designated by a common name
storage	an area of excess materials; the act of storing something
stream	flowing body of surface water
subtropical	the regions bordering the tropical zone
sun	the heat and light source for the earth and other planets which revolve around it
system	an organized procedure
temperate	moderate
temperature	degree of heat
territory	a geographical area belonging to a governmental authority
tide	the alternative rising and falling of the ocean level at the shore
topographic	relating to the artistic representation of a particular area
trade winds	wind blowing almost constantly in one direction
transport	to move from one place to another
trench	a long cut in the ground or a similar depression in the ocean floor
Tropic of Cancer	the parallel of latitude north of the equator that is reached by the overhead sun
Tropic of Capricorn	the parallel of latitude south of the equator that is reached by the overhead sun
tropical	located in the tropics
velocity	a measure in quickness of motion
vertical	perpendicular to the plane of the horizon

volcano	a vent in the earth's crust through which molten rock and lava flow
water	colorless, tasteless liquid (H20) necessary to sustain life on earth
Yanomamo	indigenous tribe living in the Amazon basin
zone	a subdivision of a region or area
zooxanthellae	animal plankton