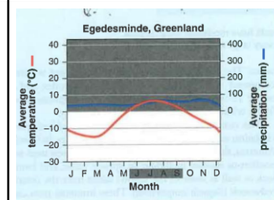
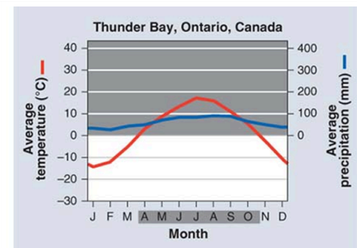
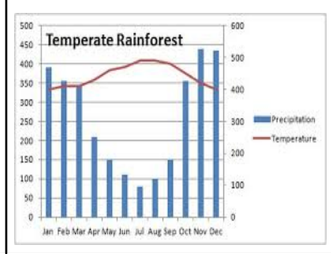
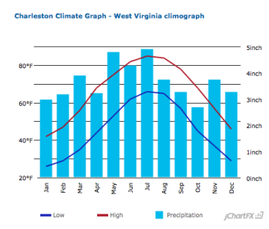
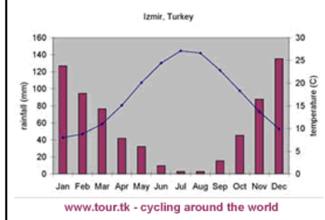
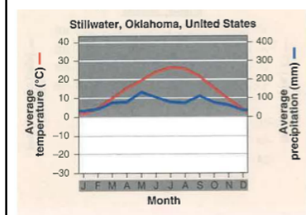
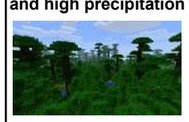
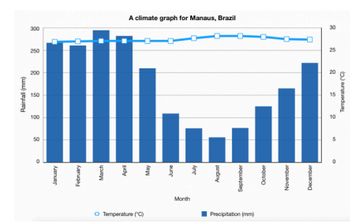
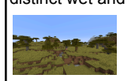
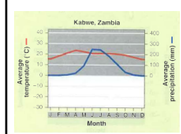
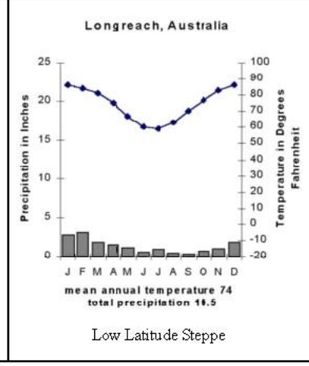
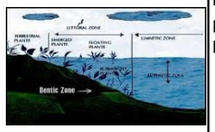
Terrestrial Biomes								
Biome- definition	AKA	Location	Describe Temps	Describe Precipitation	Climate Diagram	Plant and or animals and adaptation(s)	Soil fertility/decomposition	Other items of interest or threats
Tundra- cold and treeless biome with low growing vegetation		Artic, Northern Hemi,(russia, scandinavia, alaska) antarctica in southern hemi	Very Cold, short growing season in summer when longer light	Very little	 IGURE 12.5 **Tundra biome.** The tundra is cold and tree-ess, with low-growing vegetation. *(Panther Media GmbH/Alamy)*	No deep rooted plants frozen subsoil, small woody plants, mosses that can grown in shallow waterlogged soil.	Underlying subSoil frozen (permafrost), in summer top melts makes makes pools water	Warming temp, melting permafrost, release greenhouse grasses
Boreal Forest: largest land biome covering 11.5% of Earth's land area; terrestrial subarctic, humid	Taiga	North America	1-3 months of summer; 50˚F Very cold; averages from 21 to -50˚F	Low, averaging from 7.5-29.5 in per year	 **Figure 12.6** *Environmental Science for AP®*, Second Edition Bill Brooks/Alamy	Pines, spruces, larches, 85 species of mammals, 130 species of fish, about 32,000 species of insects	The soil in these forests is very fertile. The forest floor in temperate deciduous forests supports mosses, ferns and wildflowers and the understory supports a variety of shrubs and ferns.	Human activities, climate change, insects, pollution,
Temperate rainforest: coniferous or broadleaf forests that occur in the temperate zone and receive heavy rainfall	Broadleaf Forest	Pacific Coast of North AMerica	The average annual temperature for temperate rainforests is about 0°C because temperate rainforests are usually located close to the ocean, but for the warmer parts of the temperate rainforests the average annual temperature is around 20°C.	The average annual precipitation of a temperate rainforest biome is 200cm. In much warmer areas, the average precipitation goes up to about 350 cm annually.		Animals in temperate deciduous forests have to adapt to changing seasons. They must be able to cope with cold winters and hot summers. Some animals hibernate or migrate during the winter to escape the cold.	Temperate rainforests have fertile soil. Decomposing matter releases nutrients back into the soil and is good for growing thick stands of fast growing trees.	There are many threats to rainforests in general, most of which are human. Some of these threats consist of mining, introduction of new animals to the ecosystem, global warming, acid rain and most importantly, deforestation.
Temperate Seasonal Forest- a biome with warm summers and cold winters		Found in areas with warm moist summers and cool winters. The six major areas of this forest type occur in the Northern Hemisphere.	Average is 50°F (10°C). Summers are mild, and average about 70°F (21°C), while winter temperatures are often well below freezing.	Winters are cold and summers are warm. Temperate deciduous forests get between 30 and 60 inches of precipitation a year. Precipitation in this biome happens year round.		Lichen, moss, ferns, wildflowers and other small plants can be found on the forest floor. As well as shrubs, hardwood trees; like maple, oak, birch, magnolia, sweet gum and beech can also be found. Some animals hibernate or migrate during the winter to escape the cold.	The soil in these forests is very fertile. The forest floor in temperate deciduous forests supports mosses, ferns and wildflowers and the understory supports a variety of shrubs and ferns.	Trees and plants in deciduous forests have special adaptations to survive in this biome, specifically in really hot or cold temperatures.

Woodland/Shrubland A biome characterized by hot, dry summers and mild, rainy winters 	Chaparral	Found in southern California, southern South America, southwestern Australia, southern Africa, and in large region surrounding Mediterranean Sea.	Hot, dry summers and mild, rainy winters.	Low precipitation in summer, higher precipitation in the winter.		Plants of this biome include drought-resistant shrubs, like yucca, scrub oak, and sagebrush. Animals include the California quail, black-tailed jackrabbits, and the San Joaquin kit fox.	Soils in this biome are low in nutrients because of leaching by the winter rains.	Major threat by humans is increase in human development and an increased frequency of fire that is making it hard for native species to survive.
Temperate Grassland/Cold Desert- <u>Def:</u> cold, harsh winters and hot, dry summers 	Prairies	North American Prairie, The Pampas,	about 18 degrees celsius during the winter, and during the summer it can reach up to 100 degrees Fahrenheit	Precipitation is extremely limited and can become a problem during drought seasons.		Grasses dominate the grassland, ha ha,, rarely ever any trees or shrubs, purple needlegrass, ryegrass and buffalo grasses are common. Ungulates dominate the land, they just eat plants not that scary to be honest.	These soils are some of the darkest and most rich soils in the world, the decomposition is great here, lots of dry dead grass to decompose	Greedy and evil corporations want the grassland for farming, we are losing many of our natural grasslands.
Tropical Rainforest- A warm and wet biome found between 20 N and 20 S of the equator with little seasonal temp variation and high precipitation 	fruitloops	Southern America, West Africa, Central America, Southeast Asia	Humid, warm, lots of rain, temperatures between 70 to 85 degrees F	Lots of rain and precipitation year round	 Source	Dense vegetations - leaves have “drip tips” for rain to slide off easily to avoid fungi growth. Animals such as chameleons and jaguars camouflage for stealth.	Prime for growth, lots of animal and plant life prosper in the environment because of the mass intake of water	Responsible for 28% of the world’s oxygen, 70,000 fires have occurred in Brazil’s Amazon rainforest since January 2019 and the deforestation is being encouraged by President of Brazil Jair Bolsonaro
Tropical Seasonal Forest- a biome marked by warm temps and distinct wet and dry seasons 	Savanna	Central America, Atlantic coast of South America, southern Asia, northwestern Australia, sub-saharan Africa	Warm temperatures, distinct wet/dry seasons	Precipitation only during the summer; very distinct wet and dry seasons		Animals that live in the Savanna are buffalo, wildebeest, zebra, rhinos, giraffes, elephants, and war hogs. Some plants in the Savanna are many grasses such as lemon grass, star grass, and Bermuda grass and many trees like the acacia tree, the baobab tree and the jackalberry tree.	The soil is porous, with rapid drainage of water. Thin layer of hummus which provides vegetation with nutrients.	Unsustainable water usage and irrigation methods cause a threat to the savanna.
Subtropical Desert- a Biome Prevailing at 30N and 30 S with hot temps and extremely dry conditions and sparse vegetation 	Desert	Major Desert, the Sahara in Africa, the Arabian Desert of the Middle East, and the Great Victoria Desert of Australia	Hot temperatures and dry conditions with sparse vegetation	Low precipitation; usually much less than 100 cm per year		Plants and animals in subtropical deserts must be able to withstand the hot temperatures and the lack of moisture.	Low fertility soils. In some cases plants can look wilted and incapable of growth; however, when water is available after rainfall they perk back up.	Climate change, lack of predictability in rainfall, low diversity in species

Biome- definition	Freshwater or Marine	Description, zones?, productivies?	Ecosystem services	Other items of interest
Stream and River- large or small bodies of flowing water that lead into larger bodies of water like lakes or the oceans	Freshwater	Flowing water, moving in one direction, and can get murky toward the “head” of the stream due to slower water and picked up sediments. Will end up depositing water into the ocean.	Streams and rivers serve as an important life-giving source for many plants and animals.	Streams and rivers can range from tiny, to the size of The Nile River which is 4132 miles long.
Lake and Pond- large communities of plants and animals centered around waters with less than 1% of salt concentration.	Freshwater 	The lake and pond biome is actually divided into 3 different zones. These regions vary in size from just a few square meters to thousands of square kilometers. The productivity is not as much as an ocean but more than a river. More organisms live in a lake and pond.	Freshwater Ecosystem, such as a lake has 2% of the earth's total land surface.They provide a wide range of habitats for a good portion of animal species and plants. This is good because we all benefit from a healthy and productive ecosystems.	The freshwater biome covers almost 20% of earth. And .8% of the total water on the earth.
Freshwater Wetlands- type of water biomes that is submerged and soaked by water	Freshwater	Shallow enough for certain species to plants to survive. Some types of wetlands are swamps, marshes and bogs. Swamps have emerged tree in them. Marshes have non woody vegetation and Bogs are very acidic than the rest.	They can take in large amount of rainwater and release it slowly into groundwater.Wetland is able to filter pollutants in water. One third of the species of birds that are about to die out spend their time in wetlands.	More than 5% of wetland has been wiped for farming purposes.
Salt marshes - coastal wetlands that often are flooded with salt water and then drained	Marine	Salt marshes are found worldwide, but they are more abundant in high latitudes. They can be found along any coast in the US. They are marshy as they are made up of mud and decomposing plants. These are very important for healthy fisheries and are home to a very large number of fish.	Salt marshes provide an integral source of food, refuge, and a habitat for a large majority of fisheries species. They also disrupt wave action which protects shorelines from erosion. They also reduce flooding by absorbing rainwater.	Salt marshes make up only about 0.3% of the total surface area of the planet. The US and Australia have more salt marshes than any other counries.
Mangroves- **Mangrove swamps are coastal wetlands found in tropical and subtropical regions**	Freshwater	They are usually found in tropical areas across coastlines, rivers and creeks, meaning that they mainly support water-based flora and fauna like fish, crabs and salt water tolerant plants. They are mostly located close to the Earth's equator, meaning that the climate is usually humid and hot.	The dense root systems of mangrove forests trap sediments flowing down rivers and off the land. This helps stabilizes the coastline and prevents erosion from waves and storms.	About 42 percent of the world's mangroves are found in Asia, with 21percent in Africa, 15 percent in North and Central America, 12 percent in Australia and the islands of Oceania, and 11 percent in South America.
Intertidal ZOnes - The intertidal zone is the area of the marine shoreline that is exposed to air at low tide, and covered with seawater when the tide is high.	Marine	The Intertidal Zone is where the land meets the sea. It is the area between high tide and low tide.Organisms that live in this zone have to deal with difficult environmental conditions, being both submerged in sea water and exposed to the air.	The tidal shoreline is important habitat for a wide variety of organisms, some living primarily on land, others that live in water and a few that are found only in the intertidal zone between land and water.	Life is more abundant there because of the protection provided by the water.
Coral Reef: an underwater ecosystem characterized by reef-building corals	Marine	Coral reefs are actually the hard shells of soft animals called coral polyps. They can be found in tropical oceans close to the equator, such as in Australia, Central America, and Hawaii. They occur around the world, but mostly in warm waters.	Deliver ecosystem services for tourism, shoreline protection, and fisheries. Coral reefs serve as habitats for many species of fish urchins, and other ocean life by providing hiding places for prey fish.	Though these reefs used to be a major ecosystem, ocean acidification has caused over 50 percent of the world’s coral reefs to die--and 90 percent will be dead within the next century.
Open Ocean- the largest of all the biomes and consists of many different ecosystems	Marine	The areas that are away from the coastal boundaries and above the seabed. It extends from the tropics to the polar regions and from the sea surface to the abyssal depths.	provides goods and services that influence health, economy, and weather. In addition provides a place for recreation	Ninety percent of marine life lives in the upper zone of the **ocean** that receives sunlight.