

Name: _____

Date: _____ Period: _____

Review: Climate and Conservation

Climate Variables:

- Climate - the overall weather conditions over a long time span
- Latitude and Temperature:
 - Temperature is affected by latitude, the angle of insolation, intensity, and duration of sunlight
- Planetary Winds:
 - Prevailing Winds are caused by pressure differences and redistribute heat
- Latitude and Moisture:
 - Moisture content varies with latitude due to planetary winds
 - Low Pressure at the equator causes air to rise, expand, cool, and condense to form clouds and rain
 - High pressure causes air to sink and form arid regions
- Large Bodies of Water:
 - Oceans, seas, lakes, and bays modify climate regions where land masses close to a body of water will be regulated by the slow rate of heating and cooling of water
- Ocean Currents:
 - Coastal climates are modified by ocean currents when warm waters flow away from the equator and cold waters flow away from the poles
- Mountains and Elevation:
 - Higher elevations are cooler due to temperatures decreasing
 - Mountains intersect planetary winds causing the air rise, expand, cool, and condense creating a cooler and more moist region on the windward side
- Cloud Cover:
 - During the day clouds block sunlight from warming Earth's surface and at night trap in the heat

Climate Variables:

- Earth has been recycling its water supply for the past 4 billion years and has not gained or lost water since
- The Water Cycle - model to show the movement and the phase changes of water at or near Earth's surface
 - The water cycle is fueled by solar energy and gravity
- Evaporation - when the Sun warms up liquid water and turns it into water vapor
- Condensation - when water vapor turns into liquid water
- Transpiration - the process of water moving through a plant and changing to vapor
- Precipitation - the product of the condensation that falls from the sky
 - Examples: rain, snow, sleet and hail
- Runoff - when water runs downhill due to the force of gravity towards the ocean

El Niño:

- In the 1600s, South America fishermen saw the appearance of unusually warm water in the Pacific
 - They termed the event El Niño which is Spanish for "Christ Child" or "The Little Boy" and was chosen based on the time of year (December) when these warm water events occur
- El Niño - an ocean-atmosphere climate interaction linked to a periodic warming in sea surface temperatures across the central and eastern Pacific Ocean
 - El Niños occur approximately every two to seven years

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- La Niña - climate pattern when surface ocean waters cool along the tropical west coast of South America
- La Niña Conditions (Normal Conditions):
 - Wind blows from east to west at the equator in the Pacific and piles up water in the western Pacific
 - In the east, deep colder water gets pulled up to replace the warm water that is pushed away
 - Western water temperatures are warmer (30° C) Eastern water temperatures are cooler (22° C)
- El Niño Conditions:
 - Normal prevailing winds pushing that water get weaker and as a result, some warm water piled up in the west stays in the east and doesn't allow for the cold water to get pulled up
 - These tend to make the water in the eastern Pacific warmer
 - The warmer ocean causes the winds to get weaker and that cause the ocean to get warmer
 - This cycle is called positive feedback and causes El Niño to get more powerful
- Global Weather Related Effects of El Niño:
 - Peru has flooding rains and warm weather
 - Indonesia, Africa, and Australia have droughts
 - California has droughts then torrential rain with mudslides
 - Northeast United States has mild winters and fewer hurricanes
 - Southern Mexico suffers from increased wildfires
- Global Ecological Related Effects of El Niño:
 - Since El Niño reduces the upwelling of nutrient rich cold water which plankton are dependent on, fish have no food source and either die or are forced to migrate to find food
 - Lack of fish causes sea birds to die or go elsewhere
 - California has seen fish populations reduced which results in an increase in dead marine mammals and live strandings along the coast and poor survival rates

Climate Change:

- Global Warming - a gradual increase in the overall temperature of the earth's atmosphere attributed to the greenhouse effect
- Greenhouse Effect - increased levels of carbon dioxide, chlorofluorocarbons, and other pollutants in lower atmosphere that traps in heat energy
- Global Warming Contributing Factors:
 1. Fossil fuel burning power plants
 2. Burning of gasoline for transportation
 3. Deforestation of the rainforests
 4. Methane emissions from animals and agriculture
- Global Warming Potential Effects:
 1. Worldwide sea level rise from melting ice
 2. More frequent and intense storms
 3. Massive crop failures
 4. Widespread extinctions
 5. Loss of coral reefs
- With 90% of the US population lives within 100 miles of the ocean and if sea level were to rise these areas would be inundated with water