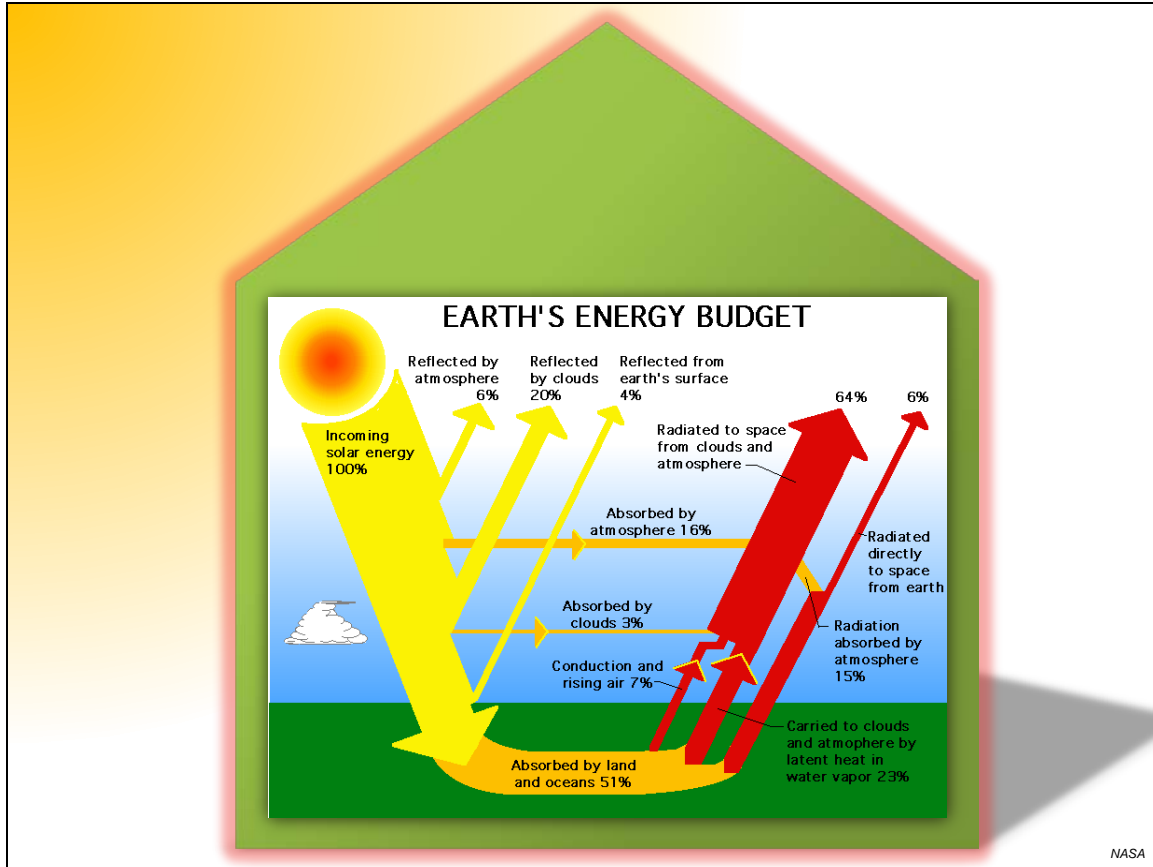


# Module 10: Environmental Oceanography

## Topic 2 Content: Global Warming Notes



Think about Earth like a greenhouse. The sun's rays come in through the atmosphere as ultraviolet radiation and is absorbed. Water and land are the biggest absorbers. Then, at night, the water and land give back the energy as infrared radiation. The atmosphere acts like a greenhouse and traps this heat, keeping the temperature stable. Without the atmosphere, Earth and its inhabitants would be very cold at night due to loss of atmospheric heat.

**Module 10: Environmental Oceanography**  
**Topic 2 Content: Global Warming Notes**



What happens if humans generate too many of the heat-trapping gases called greenhouse gases? Many scientists call this global warming. Scientists all agree that the temperature of the Earth fluctuates, but scientists do not know for sure that the greenhouse effect is increasing the temperature of Earth. It is clear, though, that measures taken to reduce greenhouse gases have other positive effects in preserving the environment.

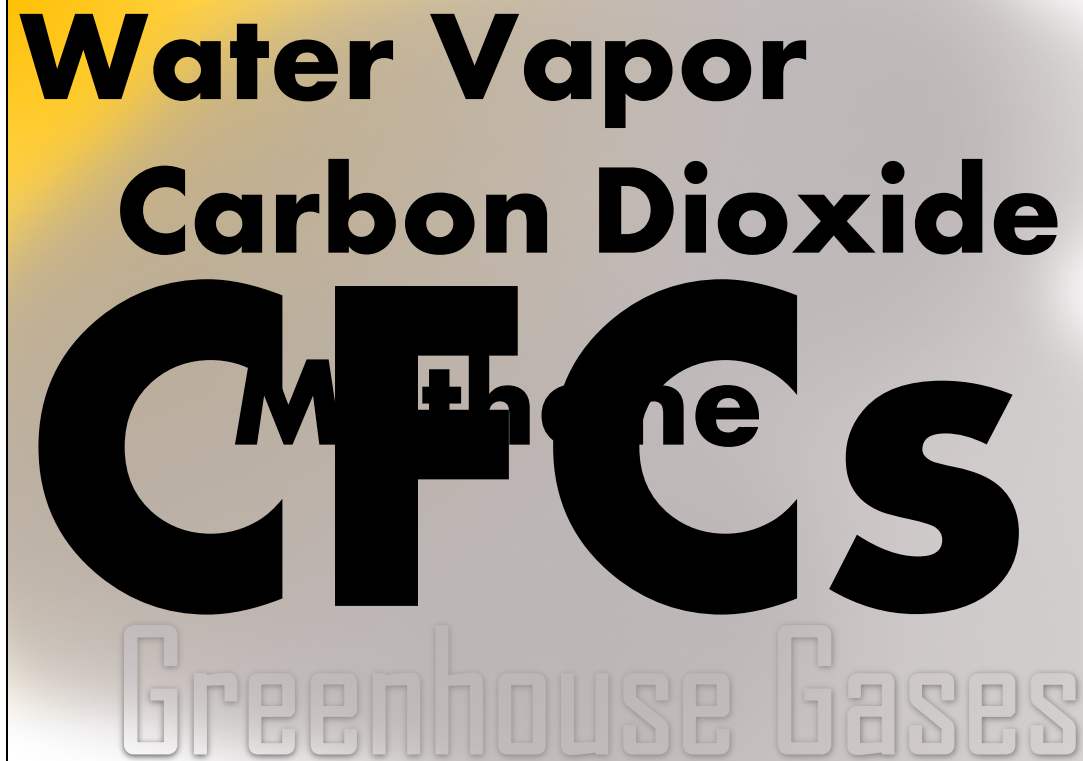
**Module 10: Environmental Oceanography**  
**Topic 2 Content: Global Warming Notes**

Water vapor  
Carbon dioxide  
Methane  
Nitrous oxide  
Tropospheric ozone  
Chloroflourocarbons

Greenhouse Gases

Greenhouse Gases include:

Water vapor  
Carbon dioxide  
Methane  
Nitrous oxide  
Tropospheric ozone  
Chloroflourocarbons



**Water Vapor**  
**Carbon Dioxide**  
**Methane**  
**CFCs**  
Greenhouse Gases

Greenhouse gases all occur naturally and are released naturally except one type -- CFCs or chlorofluorocarbons. These gases used to come from aerosols and other manmade materials. The natural release of greenhouse gases like water vapor, carbon dioxide, and methane is not believed to cause overheating. Actually, water vapor has more of an influence on the greenhouse effect than any other gas, and humans have no control over the amount of water vapor present in the atmosphere.

## Module 10: Environmental Oceanography

### Topic 2 Content: Global Warming Notes



The burning of fossil fuels, particularly coal, oil, and natural gas, contributes the greatest influence on the greenhouse effect than the other gases produced by human activity. The burning of fossil fuels began in large scale with the Industrial Revolution. Burning fossil fuels releases carbon dioxide that helps the Earth trap heat, thus warming the planet. Some scientists estimate that a thirty-percent increase has occurred over the past two hundred years. Oceanographers know that the oceans will absorb and store thirty to fifty percent of all the carbon from the atmosphere, through such natural occurrences as photosynthesis and depositing of marine sediment and fossil fuels. The ocean, because of its size, has the ability to absorb a lot of heat without changing its own temperature much.

**Module 10: Environmental Oceanography**  
**Topic 2 Content: Global Warming Notes**



This storage of carbon dioxide by the ocean, however, is believed to lead to negative effects for the oceans. If the temperature of Earth continues to climb, so may sea levels. The amount of polar ice controls the height of sea level. As the Earth's temperature rises, the ice in the polar regions melts. Some computer models have the oceans' sea levels rising one to five feet by 2050.

## Module 10: Environmental Oceanography

### Topic 2 Content: Global Warming Notes



Coral reefs are the most diverse marine community. If the ice melts, this marine community may not adapt to deeper water and basically not obtain the sunlight required for survival. Also, as salinity decreases and temperature increases, the coral may undergo coral bleaching.

Some oceanographers feel there will be more hurricanes and storms as a result of global warming. Others feel that there will be great habitat destruction from changing climate, but only time will tell what will happen for sure.