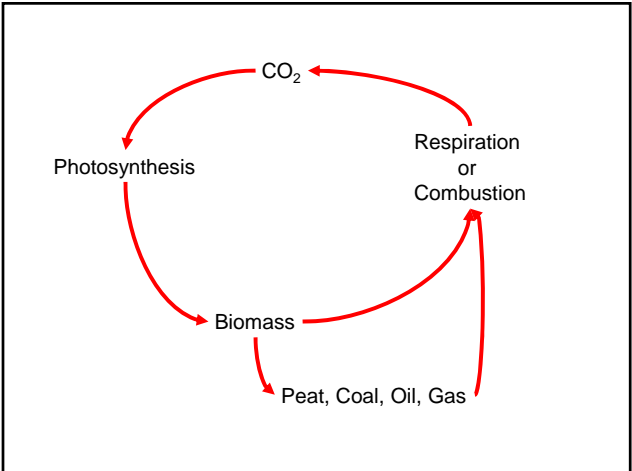
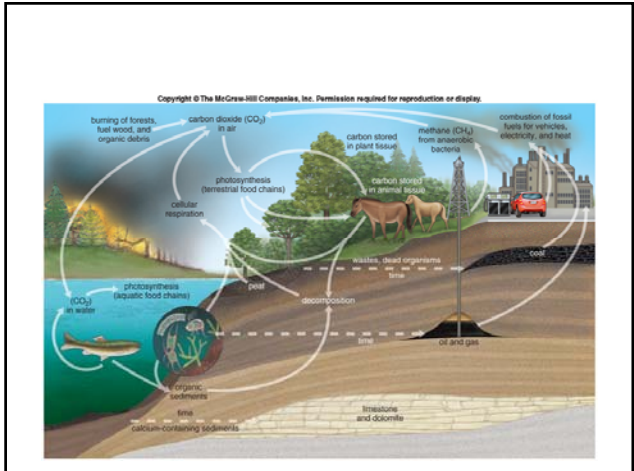
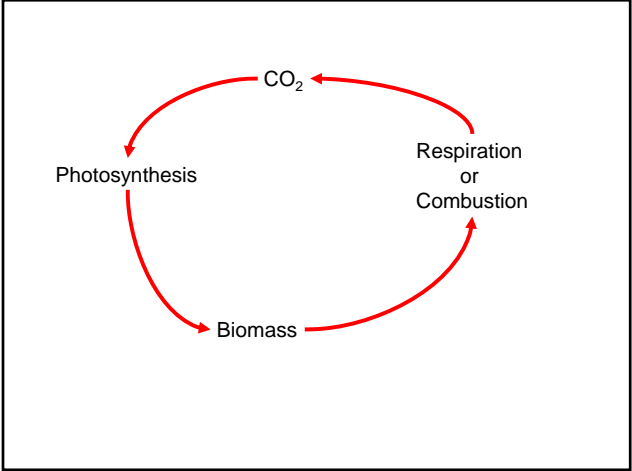



V. Photosynthesis & The Environment
A. Carbon Cycle (pp. 486-487)

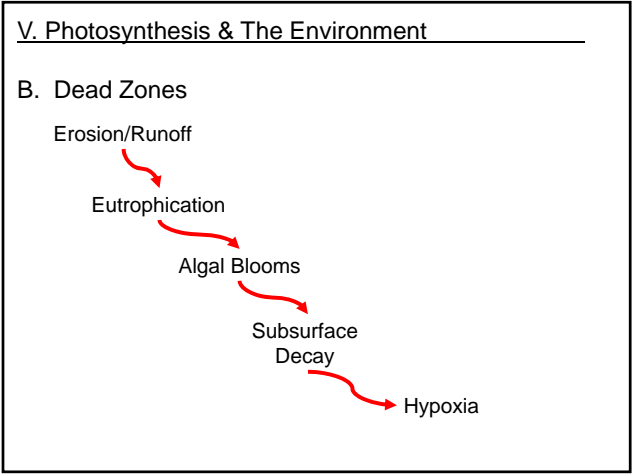


V. Photosynthesis & The Environment

B. Dead Zones



The image shows a world map with several red-shaded areas representing dead zones, primarily in the Gulf of Mexico, the Baltic Sea, and the Black Sea. Below the map is a screenshot of an AOL News article titled "Report: Ocean 'Dead Zones' Increasing in US". The article snippet includes the text: "Dead Zones: The nation's waterways are fast becoming a wasteland." and "Released Friday, a report issued by the Environmental Protection Agency, the U.S. Department of Agriculture, the U.S. Geological Survey and the Virginia Institute of Marine Science finds that the number of so-called 'dead zones' in U.S. waters is up from seven in 1995 to 14 in 2007."

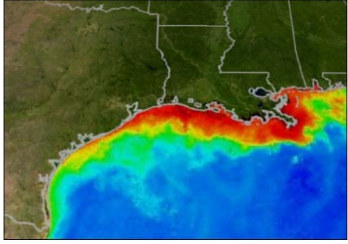


One Dead Zone in Gulf is size of New Jersey (8,600 mi²) – prior to 2010 BP Spill

Irony

The Dead Zone - How Farming is Killing the Fishing Industry

by ADAM STRALEC - 6 COMMENTS



Alexandra Cousteau, has created Expedition: Blue Planet. In this

The image shows a satellite-style map of the Gulf of Mexico coastline. A large area of the Gulf is shaded in red and orange, indicating a dead zone. The surrounding land is green, and the open ocean is blue.

V. Photosynthesis & The Environment

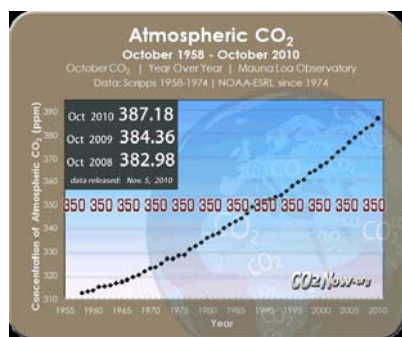
C. The Greenhouse Effect (pp. 493-495)

1. Greenhouse Gases

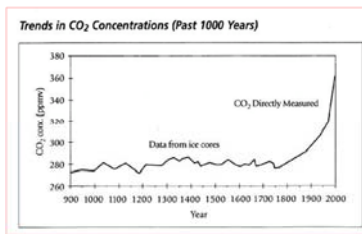
-absorb infrared radiation heat.

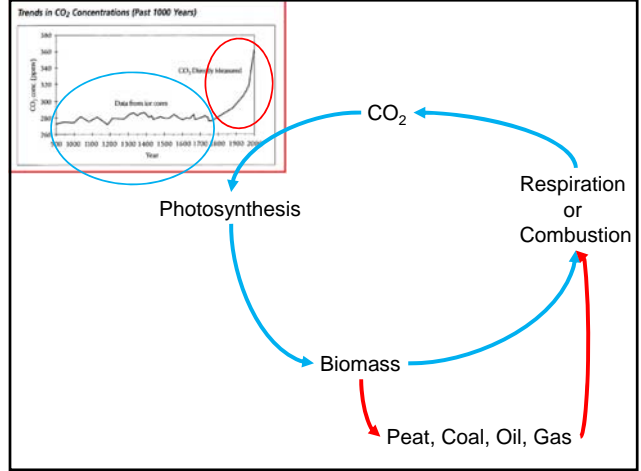
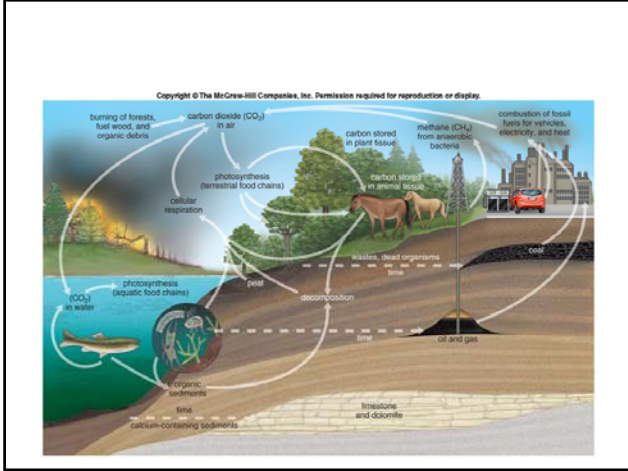
Gas	Formula	Contribution (%)
Water Vapor	H ₂ O	36 - 72 %
Carbon Dioxide	CO ₂	9 - 26 %
Methane	CH ₄	4 - 9 %
Ozone	O ₃	3 - 7 %

2. CO₂ data



(Mauna Loa Observatory)





Trends in CO₂ Concentrations (Past 1000 Years)

CO₂ Directly Measured

Data from ice cores

Year

Trivia: Where was the first oil well (in 1859)?

3. Global Warming

- Predictions:
 - CO₂ increase: 760 ppm by 2050

Trends in CO₂ Concentrations (Past 1000 Years)

CO₂ Directly Measured

Data from ice cores

Year

3. Global Warming

1. Climate & Geographic Predictions:

- b. Temp. increases:
 - 2050: 1.5 C.
 - 2100: 6.0 C.

Context (20 Ka, T was 4 C colder)

3. Global Warming

1. Climate & Geographic Predictions:

- c. Rain/Temp Patterns altered =
altered agriculture, disease biogeography

3. Global Warming

1. Climate & Geographic Predictions:

- d. Sea level rise due to...

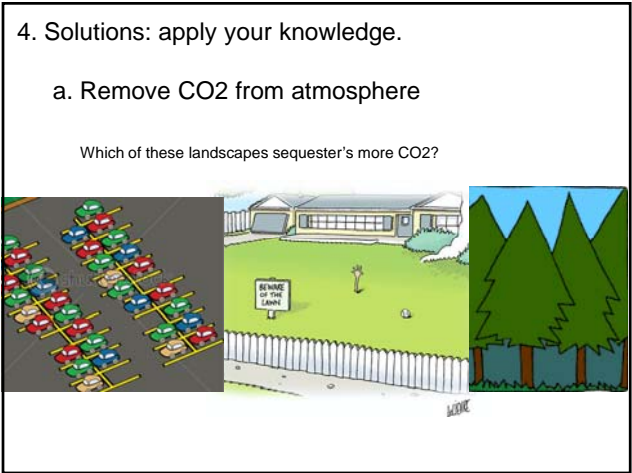
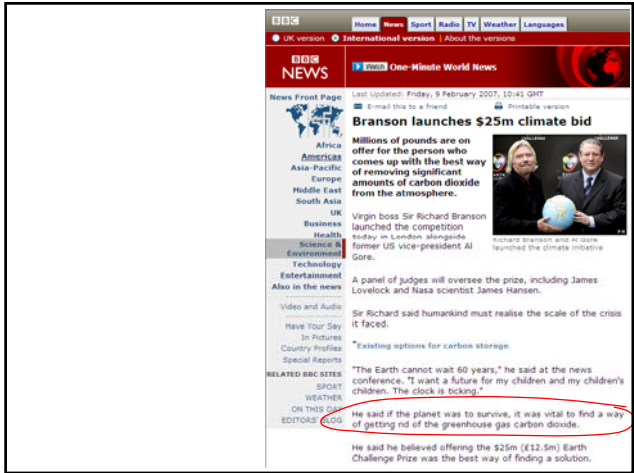
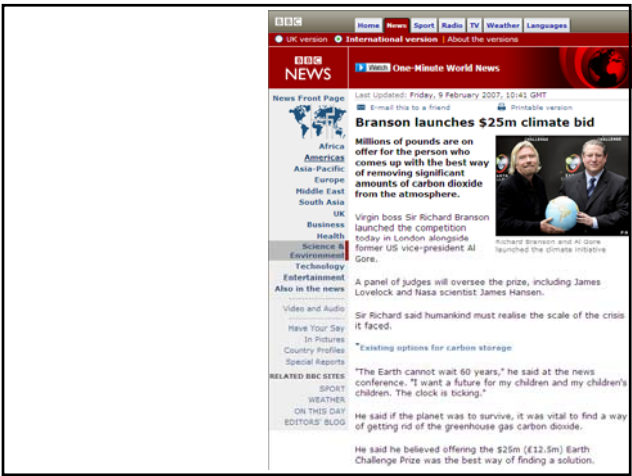
3. Global Warming

2. Sociopolitical Predictions:

- Centers of commerce change?
- Climate refuges?

4. Solutions: apply your knowledge.

a. Remove CO2 from atmosphere



4. Solutions: apply your knowledge.

a. Remove CO₂ from atmosphere

b. Lower consumption of fossil fuels

-conservation

-More C-neutral alternatives
(biomass fuels, biofuels)

Willow Bioenergy Crop Outreach

Project: Development of Willow Bioenergy Crop Outreach and Educational Materials

There is great potential for expanded cultivation of shrub willow bioenergy crops on marginal and underutilized land in New York State, but this is an unconventional crop which is unfamiliar to growers, landowners, county legislators, regulators, educators, and ag professionals. This intern will work with Larry Smart to develop new extension materials and update existing publications that describe willow cultivation and harvesting systems, commercial varieties, pest and disease management, and conversion technologies. There is also a need to develop planting guides for living willow snowfence or privacy hedges. These materials will be published in print media and online on a new web site being developed in CA called "Willowpedia" in collaboration with Tim Cameron, George Hudler and Greg Loeb. There are several focal p willow outreach in NY, including variety yield and selection trials at the NYS Agricultural Experiment Station (NYSAES) Geneva, a 2 acre demonstration trial at Vernon-Verona-Sherill High School, a small variety yield trial at the USDA-NR Plant Material Center, trials and commercial nursery plots at Double A Willow in Fredonia, and a variety yield trial at SUNY Potsdam. Each of these could be enhanced by installation of an informational poster mounted on a display board. It is also a tremendous opportunity to develop renewable energy and plant biology educational modules and 4-H/4-H science projects based on growing willow cuttings either in soil or in hydroponic culture.

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