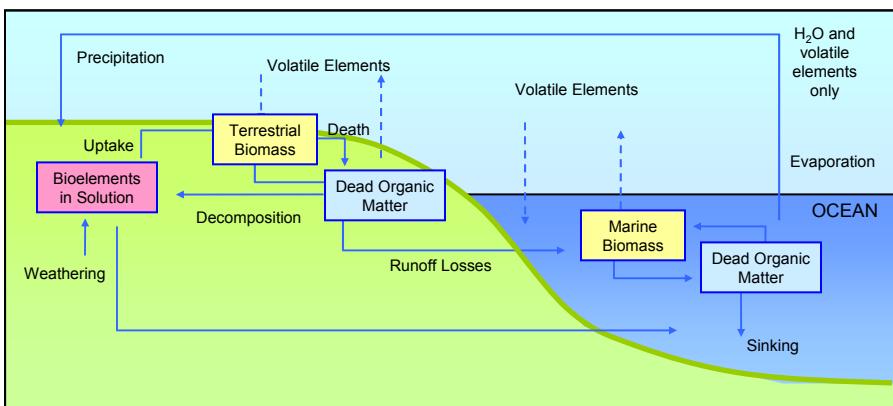


7.014

Lecture 20: Limiting Factors and Biogeochemical Cycles

March 30, 2005

Global Nutrient Cycling - Biogeochemical Cycles



Useful Conversion Factors

$$10^{12} \text{ g} = 1 \text{ teragram} = 1 \text{ Tg}$$

$$10^9 \text{ g} = 1 \text{ gigaton} = 1 \text{ gt}$$

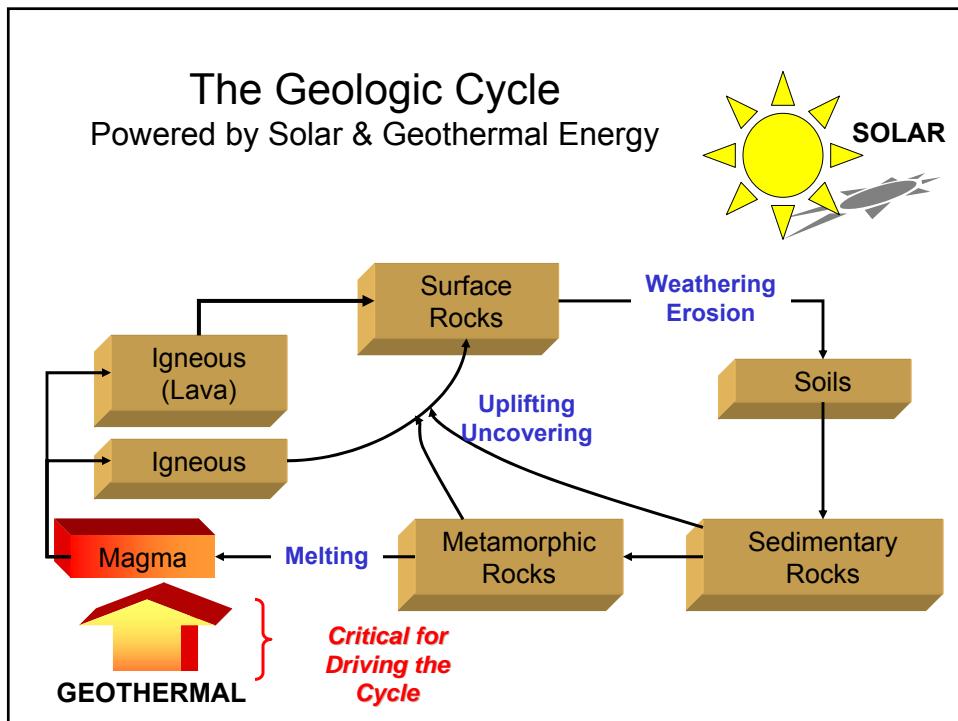
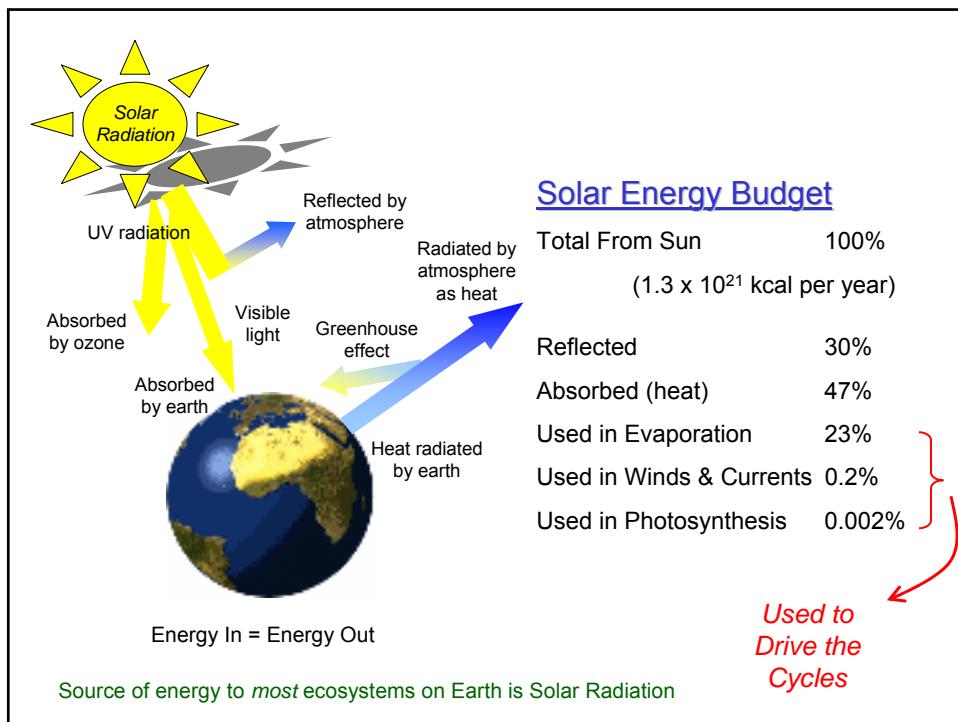
$$10^6 \text{ g} = 1 \text{ metric ton} = 1 \text{ tonne}$$

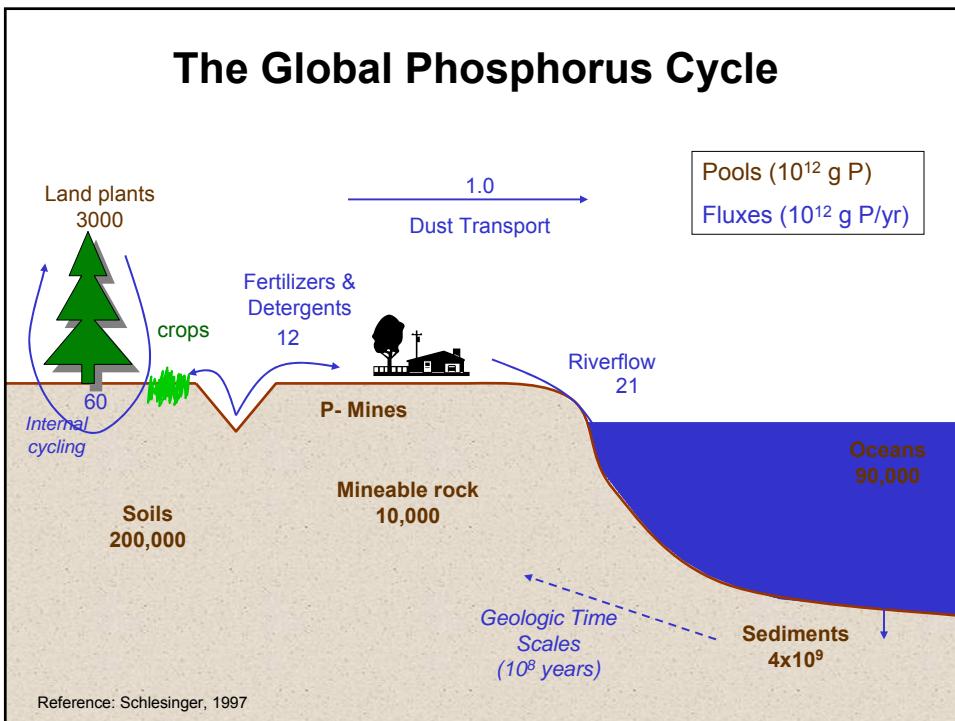
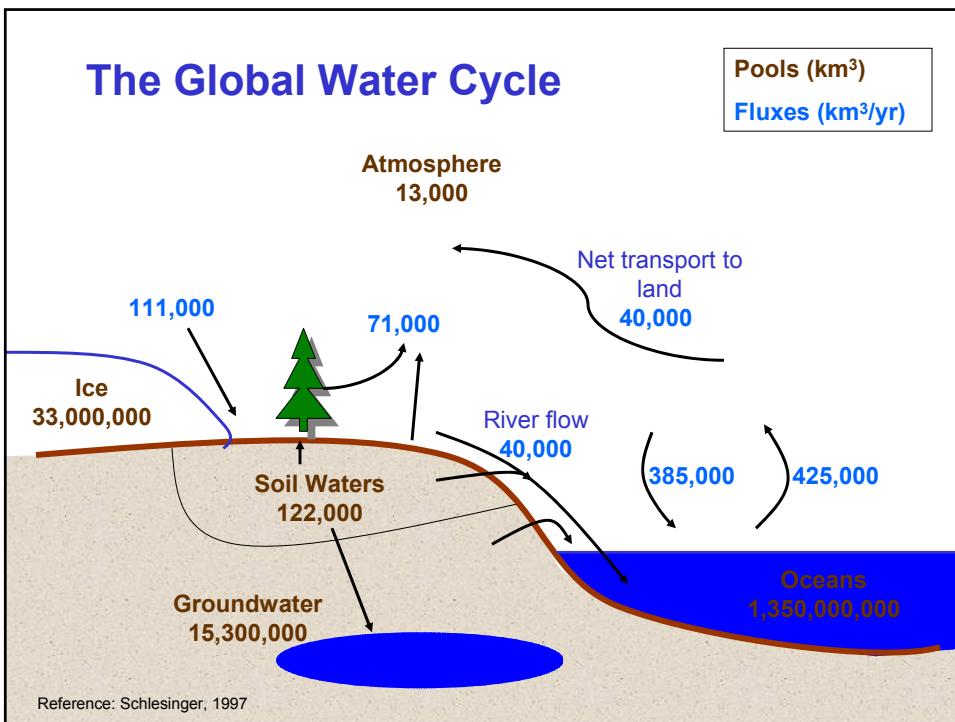
Mean Residence Time (MRT)

= pool size / mean flux in or out of pool

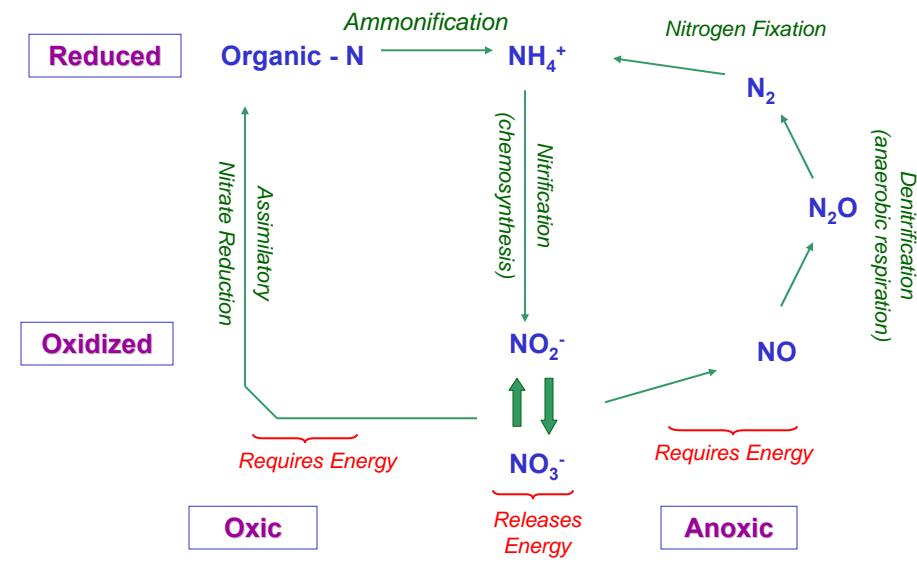
Fractional Turnover = 1 / MRT

= fraction that is removed and replaced per unit time





Global Nitrogen- Transformations



The Global Nitrogen Cycle

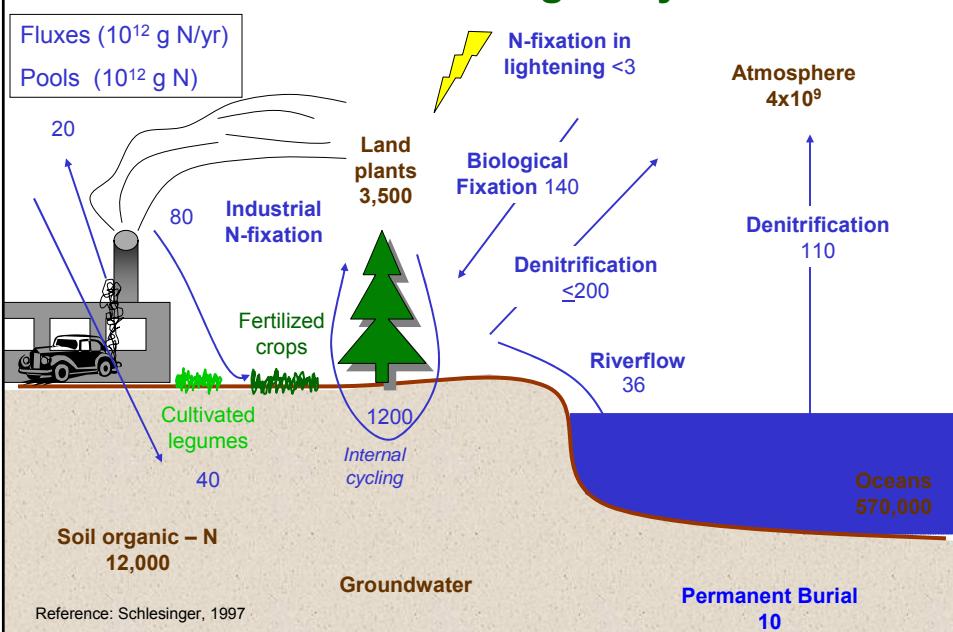


Figure 51.13b

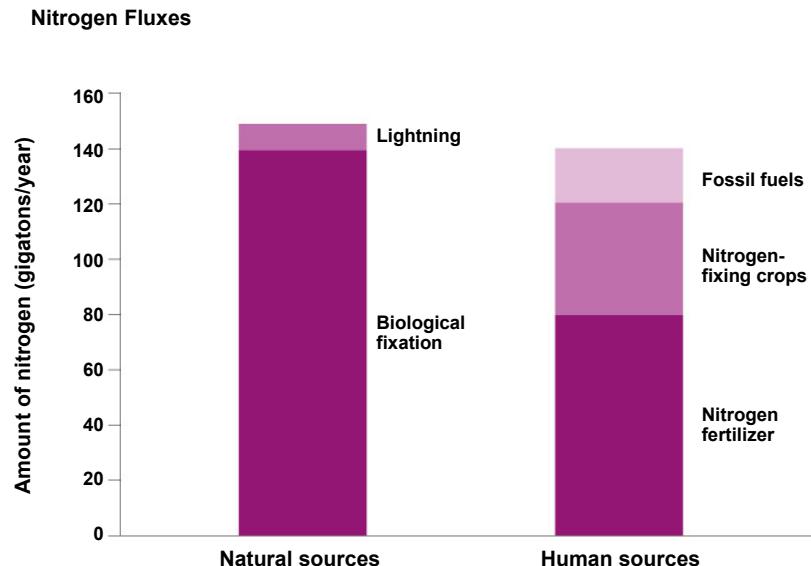


Figure 51.10a upper

Hubbard Brook Experimental Forest, New Hampshire

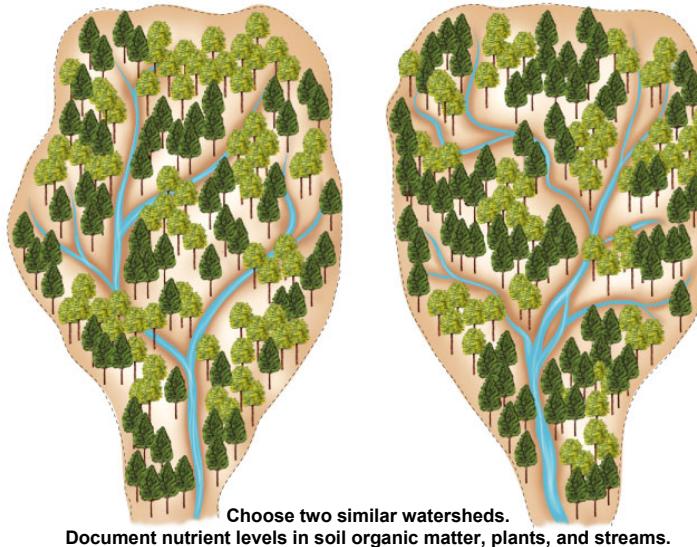


Figure 51.10a lower

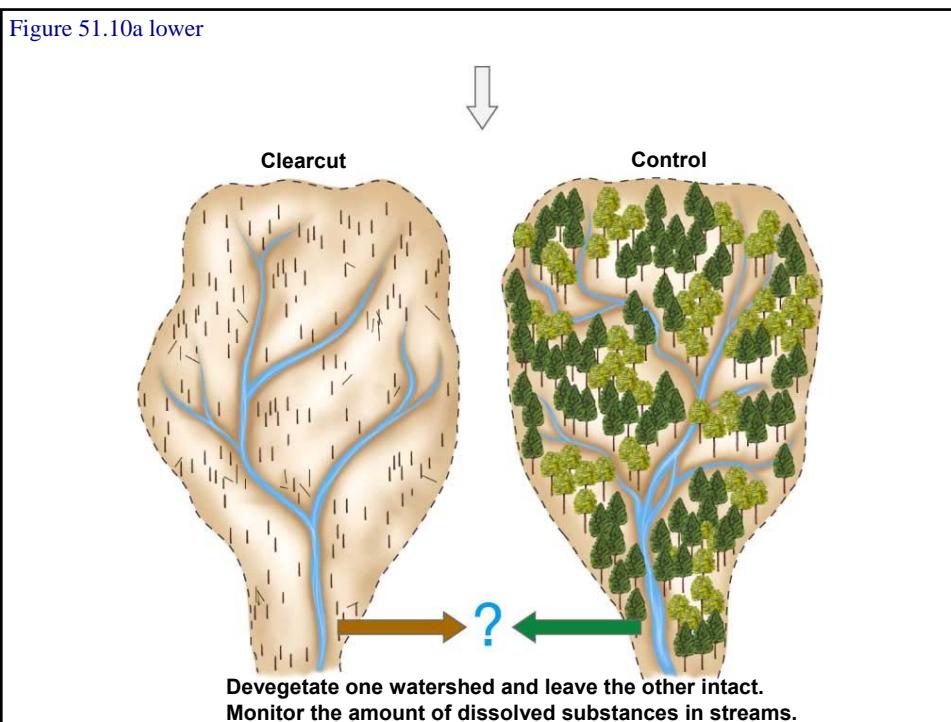
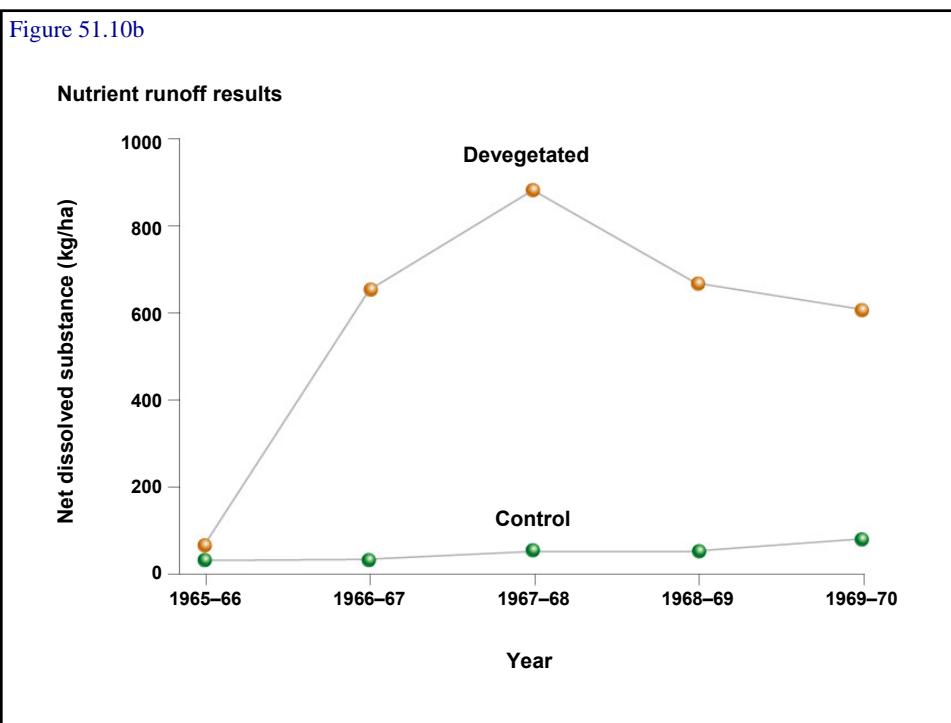
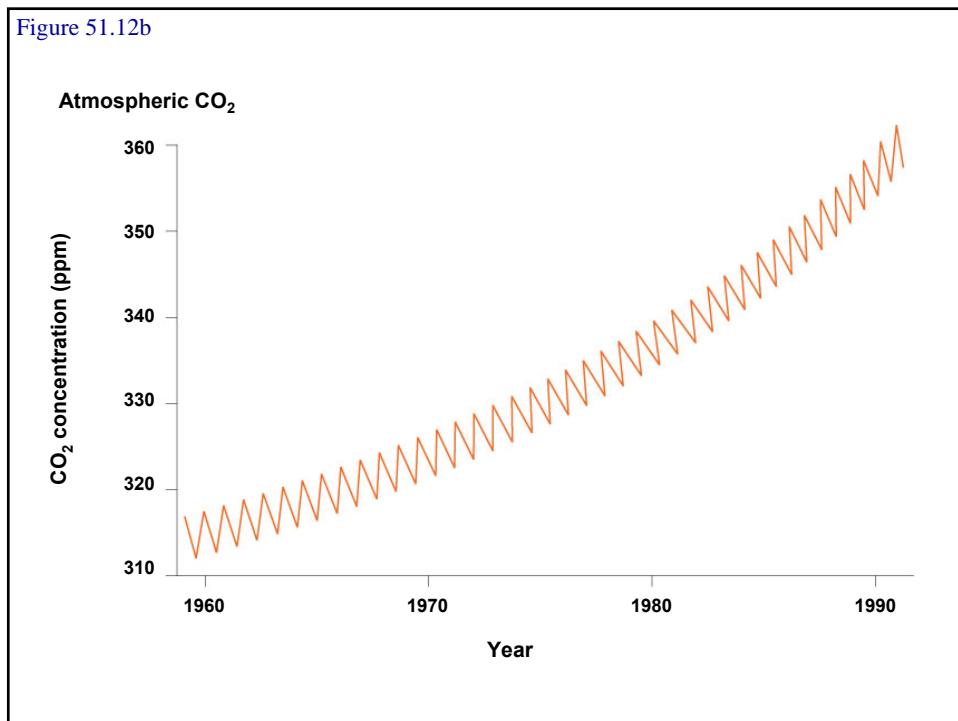
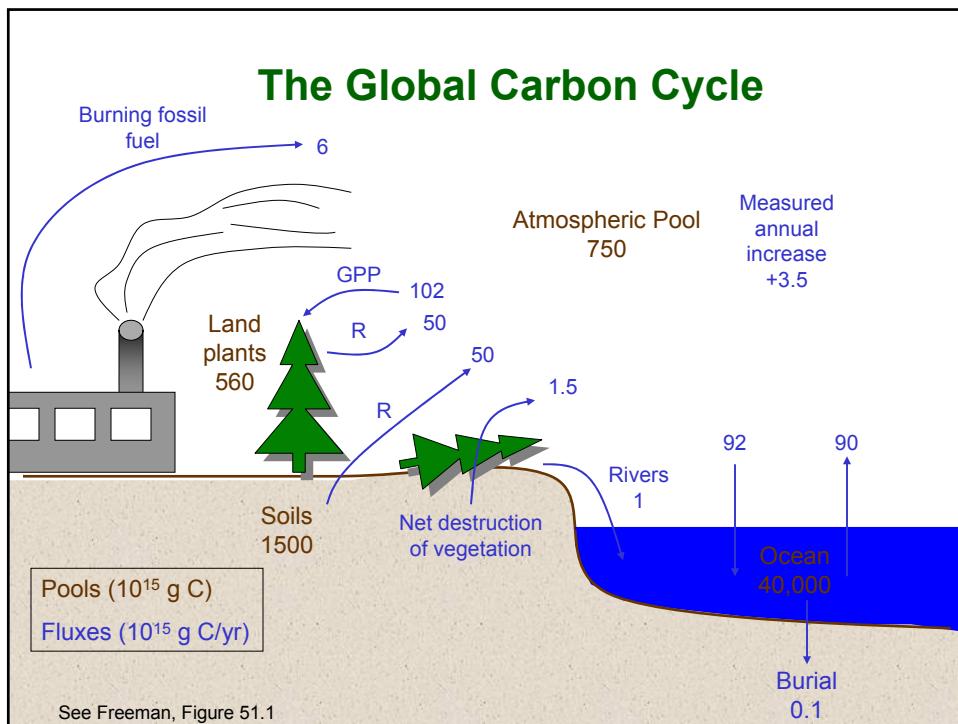
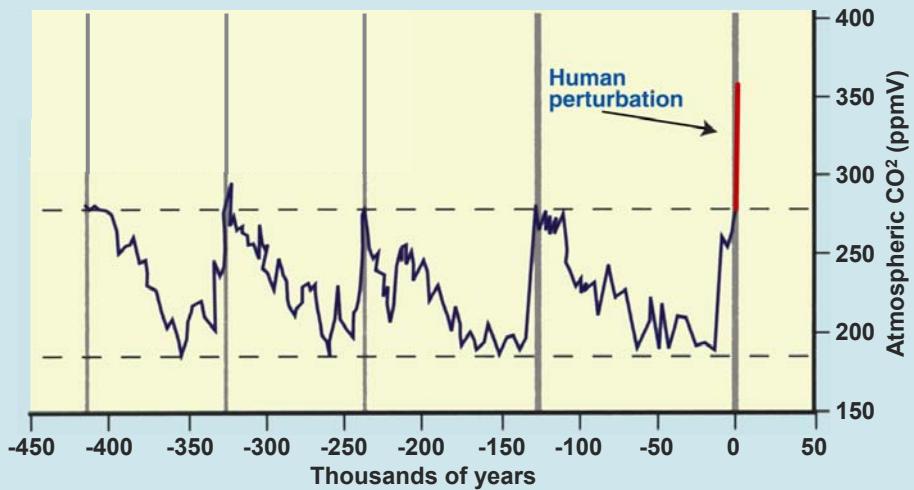


Figure 51.10b





Ice Core Data Showing Changes in Atmospheric CO₂ Concentrations



Biosphere II Experiment



