

Ecology

The interaction of living things in the environment

What is Ecology

- Ecology is the study of the interactions between organisms and their environment.
- Organism → Population → Community → Ecosystem → Biosphere.
- Population
 - Study how an individual interacts with it's immediate environment.

What is Ecology

- Community
 - All organisms in a particular area and how they interact
- Ecosystem
 - Adds the non-living (abiotic) factors
- Biosphere is the total of all earth's ecosystems.
- Ecology: the study of relationships between living organisms and between organisms in the environment.

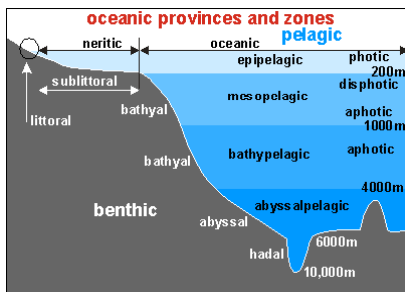
Various Types of Ecosystems / Biomes

- **Aquatic**
 - **Marine**
 - Photic/aphotic
 - Pelagic, Intertidal, Estuaries, Benthic
 - **Freshwater**
 - Lotic (running), Lentic (standing)

What type of aquatic?



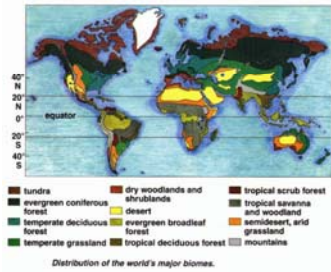
zones



Biomes

- Terrestrial are called Biomes
 - Named for the vegetation they have.
- Tropical Forest
 - Deciduous
 - Rain
- Savannas
- Deserts
- Chaparral
- Grasslands
- Temperate Forest
- Coniferous Forest
- Tundra

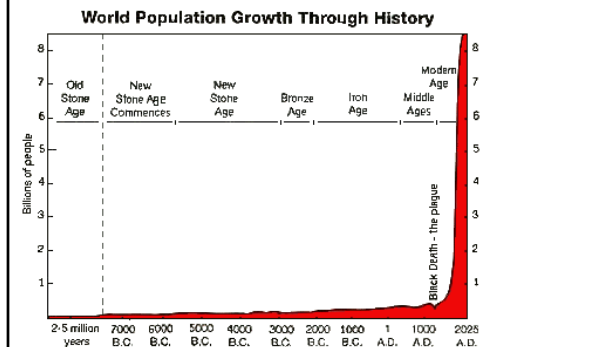
Biomes



Population Growth

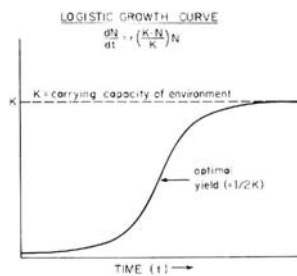
- $G = rN$
- $G =$ Growth Rate
- $r =$ Intrinsic Rate
 - Birth minus death
- $N =$ Number of individuals in the population at the time the growth rate is studied.

Exponential Growth • 6,705,651,277 as of June 2008



Population Growth

- Natality
- Immigration
- Mortality
- Emigration



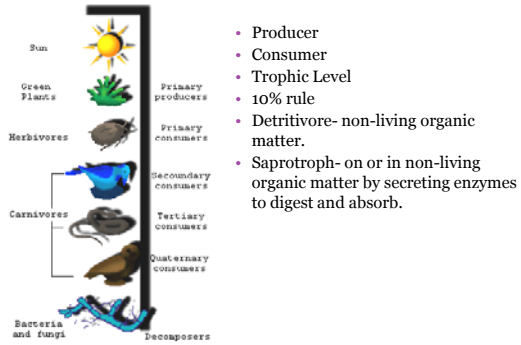
Factors Effecting Growth

- Density Dependent
 - Food
- Density Independent
 - Fires, floods, storms, seasonal changes

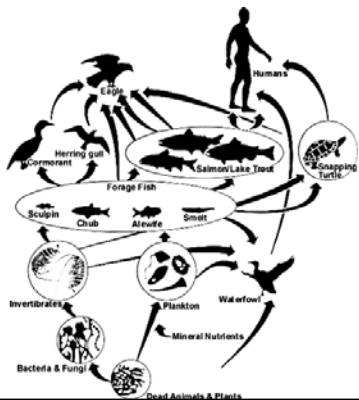
Communities and Ecosystems

- Communities are groups of populations inhabiting a particular environment.
 - Competition
 - Intraspecific, Interspecific
 - Niche – Role in the community

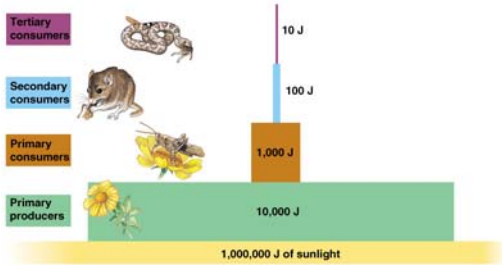
Trophic Levels



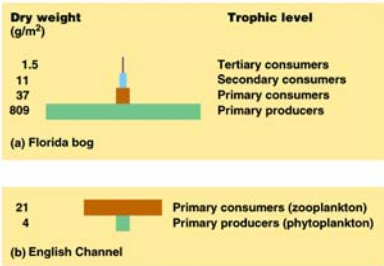
Food Web vs Chains



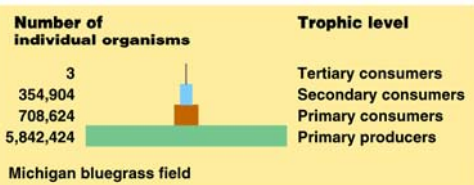
Pyramids and Energy Trans...

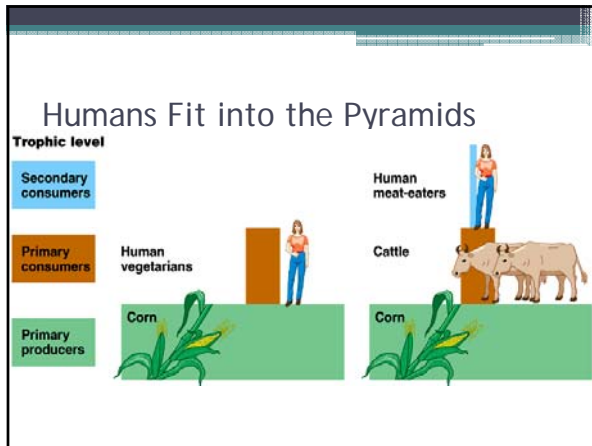


Dry Biomass Per Trophic Level



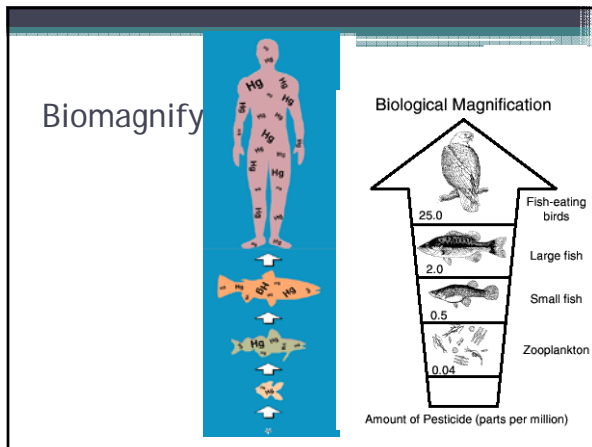
Pyramid of Numbers

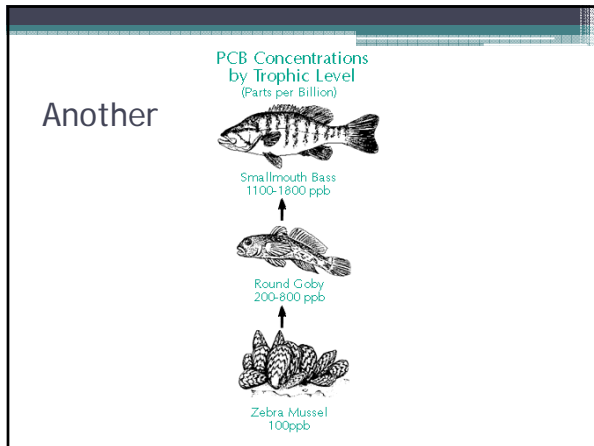


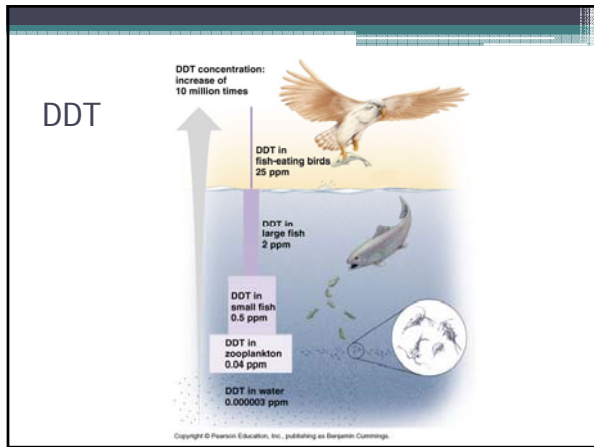


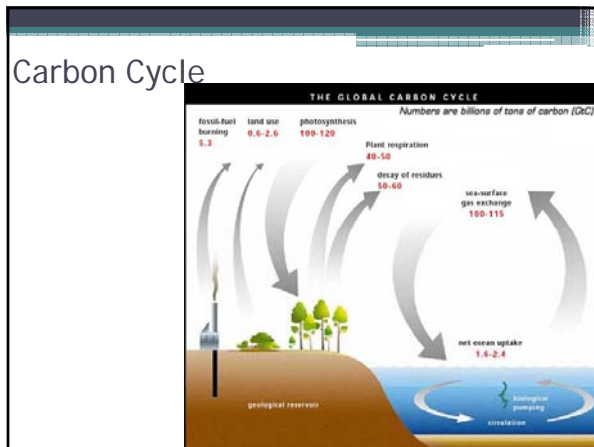
Biomagnification or Bioaccumulation

- Since the higher you are on the foodchain the more individuals you have to eat in order to maintain yourself

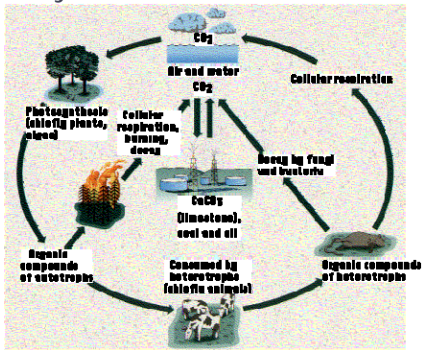






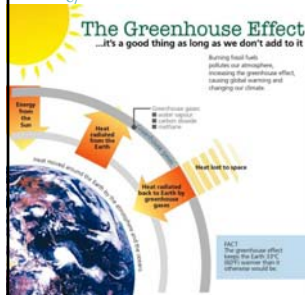


Carbon Cycle



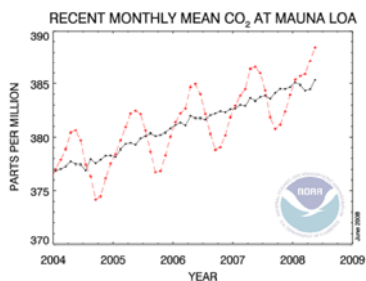
Greenhouse Effect

• <http://earthguide.ucsd.edu/earthguide/diagrams/greenhouse/>



- Visible and UV go into atmosphere
- Radiate as IR
- Trapped by Methane, CO₂, water, Nitrous oxide
- Global warming is the effect.

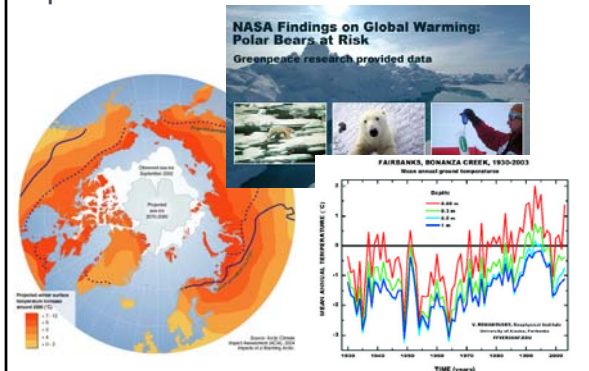
Changes in Concentration of Carbon Dioxide



Precautionary Principle

- Def. If the impact of human induced change would be possibly catastrophic then it is up to the parties to prove it will do no harm.
- This is reverse of normal. Normally the concerned parties have to show it is doing harm.
- Can the Precautionary Principle help with the enhanced greenhouse effect and the recommendation for strong action?
- What is the balance between those in the world that are contributing to the problem and those other countries that are impacted?

Impact to Artic Environments



Impacts to Arctic Environment

- Increased decomposition
 - More greenhouse gases
- Expansion of temperate species
- Loss of Ice Habitat
- Change in Prey distribution
- Increased Pathogen success.

