4 Ecology

4.3 Carbon cycling

Carbon fluxes

- estimates based on ecosystems or mesocosms are done to show how much carbon is transferred from one pool to another in the carbon cycle
- global carbon fluxes are in gigatonnes ($1x10^{15}$grams)

Trends in atmospheric carbon dioxide

- data from atmospheric stations is freely available: long-term trends and annual fluctuations

4.4 Climate change

Opposition to the climate change science

- many claims that humans are not causing climate change
- many factors influence global temperature: volcanic activity and cycles in oceanic currents
- global warming continues but with varying increases each year
- not all sources in the internet are trustworthy

Coral reefs and carbon dioxide

- carbon dioxide emissions have effects on the ocean: dissolve into the ocean
- rising concentrations of atmospheric carbon dioxide cause ocean acidification
- marine animals that deposit calcium carbonate in there skeletons need to absorb carbonate ions from seawater
- dissolved carbon dioxide lowers the carbonate ion concentration: carbon dioxide reacts with water to form carbonic acid (H_2CO_3) which dissociates into hydrogen and hydrogen carbonate (HCO_3^-); hydrogen ions react with carbonate ions (CO_3^{2-}), reducing their concentration
- if carbonate ion concentrations drops, it is more difficult for corals to absorb them and existing skeletons tend to dissolve