

Abstract

The global carbon cycle is in the focus of the scientists' interest, because understanding carbon sinks and their relationships can show the solutions of problems related with increasing CO₂ concentration in the atmosphere in the future. I focused on the role of forests ecosystems in this carbon cycle. All forests cover almost one third of the Earth's land area. By photosynthesis they bind big part of atmospheric carbon to their biomass. Sink strength of forest can differ according to the type of biome, forest stand age and actual climatic conditions.

Forest biomes can be generally divided according to the latitude to three groups: tropical forest biomes, temperate forests and boreal forests. The size of carbon stock decreases in this order. Other parameters, such as net primary production and respiration differ in dependence on the particular ecosystem. Tropical rain forests represent great carbon stock, but their deforestation causes massive C emissions back to the atmosphere. Boreal forests aren't considered as important carbon sink, but they influence local climate. Some speculations can also appear about the old forests. It is possible to find authors, who claims, that old forests are no more carbon sinks, so that their carbon balance is neutral. Many surveys prove that they bind less carbon compared to mature and young forests, but the total carbon balance is positive.

It is difficult to study forest ecosystems, because the reaction of unique plant under cultivation conditions without ambient environment contact differs from the unique plant in real ecosystem. This was one of the reasons why several methods to study these forests were developed. Using these new methods physiological processes can be investigated on the level of unique plant even on the level whole ecosystem.