Biomass Encyclopedia Article

Biomass

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Biomass

Biomass consists of living organisms, or parts of living organisms, as well as waste products and incompletely decomposed remains of living organisms. The term is quite encompassing and includes plants, referred to as phytomass, microbes, and animal material, or zoomass. Biomass density is a distinguishing feature of ecological systems and is usually presented as the amount of dry biomass per unit area. To insure a uniform basis for comparison, biomass samples are dried at 221°F (105°C) until they reach a constant weight.

In most settings, phytomass is by far the most important component. A square yard (0.84 m^2) of the planet's land area has, on average, about 18-22 pounds (8.4-10 kg) of phytomass, although values may vary widely depending on the type of biome. Tropical rain forests contain four or five times the average while desert biomes may have a value near zero. The global average for non-plant biomass is approximately 1% of the total. Organic compounds typically constitute about 95% by weight of biomass, and inorganic compounds account for the remaining 5%. An exception occurs in species that incorporate large amounts of inorganic elements such as silicon or calcium, in which case the inorganic portion may be several times higher.

Photosynthesis is the principle agent for biomass production. Light energy is used by chlorophyll containing green plants to remove (or fix) carbon dioxide from the atmosphere and convert it to energy rich organic compounds or biomass. It has been estimated that on the face of the earth approximately 200 billion tons of carbon dioxide are converted to biomass each year. Carbohydrates are usually the primary constituent of biomass, and cellulose is the single most important component. Starches are also important and predominate in storage organs such as tubers and rhizomes. Sugars reach high levels in fruits and in plants such as sugar cane and sugar beet. Lignin is a very significant non-carbohydrate constituent of woody plant biomass.