



Global Nutrient Limitation In Terrestrial Vegetation

NASA has determined the limits to vegetation growth from soil nutrients availability

Using 19 years of remote sensing data, a research team led by Dr. Josh Fisher (JPL) calculated maximum possible vegetation productivity— as determined by available water and light— then cross-compared that theoretical maximum with observed vegetation productivity. Where actual vegetation productivity was less than the theoretical maximum, the researchers found vegetation was nutrient limited, after accounting for disturbance.

Globally, nutrient limitation reduces plant growth by 16-28%, on average.

The nutrient limitation maps significantly advance global carbon cycle and climate models, which struggle to characterize the role of nutrient cycling in limiting the ability of the terrestrial biosphere to take up CO₂.

The global study detected large scale nutrient gradients— an East - West gradient across Amazonia, fertilization differences between 'developed' and 'developing' countries, tree line migration boundaries in boreal North America, and distinctions between biomes such as forests, savannas, and grasslands.



Plant growth is enhanced or limited by the amounts of nutrients in the soil.