

All About Carbon

Active Carbon Pool

The active carbon layer in soil is central to the carbon cycle, housing essential nutrients and aggregate glues. This layer supports the interaction between plants and microorganisms, facilitating vital ecological processes. Changes in land management — whether positive or negative — primarily influence the active carbon pool, impacting soil health and biological activity.

Stable Carbon (Humus)

Humus, composed of molecules bound to soil minerals, plays a crucial role in nutrient provision. It enhances soil aggregation and cation exchange capacity, both of which are vital for soil fertility. While short-term land management practices typically have minimal effects on this stable carbon layer, their long-term implications can be significant. Depletion of the active carbon layer may lead to degradation of humus, resulting in a net loss of previously stored carbon and compromising soil health over time.

Living Carbon Fraction

Living carbon in the soil comprises a diverse array of microorganisms, including fungi, bacteria, nematodes, amoebas, and others, along with plant components, primarily roots. These organisms continuously create, exchange, and cycle carbon within their structures, playing a vital role in maintaining soil health and supporting ecosystem dynamics. In a closed (input-free) system, the living carbon fraction, along with above-ground plant and animal materials, contributes significantly to the active carbon pool. This dynamic interaction supports soil health and fosters the cycling of nutrients essential for ecosystem stability.

