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How Soils Reflect Biodiversity on Earth Through Geologic Time

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Biodiversity (i.e., biological diversity) refers to the number of different species in an ecosystem. Like soils, biodiversity is primarily the result of a region's precipitation and temperature, as well as disturbance that controls the length of time over which evolution occurs. Because biota is one of the five soil forming factors, soil profiles take on characteristics of the ecosystems (hence biodiversity) in which they reside. Consequently, grasslands, tropical rainforests, temperate deciduous forests, boreal spruce forests, and deserts reflect (or "remember") the biome in which they developed. Even subaqueous soils reflect aquatic ecosystems. Although complexity arises along borders that have shifted back and forth, this biome-soil association is a useful tool for understanding how paleosols provide clues to biodiversity in geologic time, including global scale event, such as the advent of photosynthesis and the enrichment of oxygen in the Earth's atmosphere, and the colonization of Paleozoic landscapes by vascular plants.

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