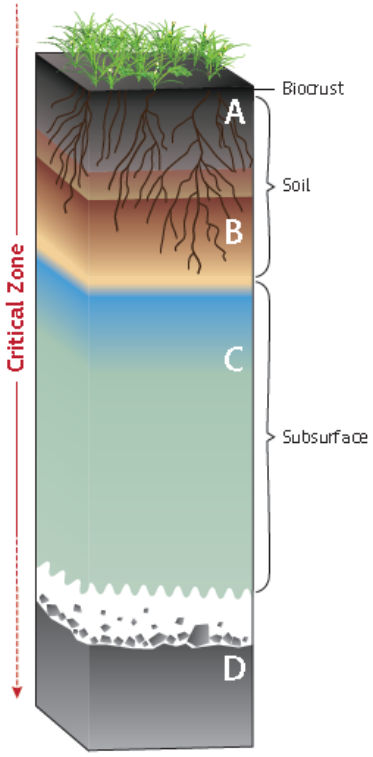
GOLD NUGGET

***Distribution Patterns – Soil Biodiversity At The Extremes Part 3***

**Impacts on the soil subsurface**

Although less is known about the subsurface, humans are beginning to exert an increasing impact on this zone, both directly through activities like heat and energy exchange, and use for waste disposal or gas storage, but also indirectly through the downward communication of changes in the atmosphere and aboveground biodiversity. Since land use is a main driver of aboveground biodiversity change, land use intensification has frequently been shown to negatively affect biodiversity. But how deep can the 'fingerprints' of vegetation or land use be traced? Does the subsurface biodiversity really care about land use intensifications, about a decline in aboveground biodiversity?

Plant diversity can significantly influence the density and diversity of soil organisms, which in turn are likely to govern essential ecosystem processes. Plant diversity effects can be even more important for the structure and functioning of soil food webs than changes in atmospheric CO2 concentrations or nitrogen depositions. Therefore, a loss of biodiversity could have at least as great an impact as other anthropogenic drivers of environmental change. Some investigations of the Earth's critical zone have been established in the past decade to improve our fundamental understanding of the biogeochemical processes in the subsurface and how they are linked to surface properties. Linear core drillings and groundwater wells grant access to the hidden subsurface compartment of the 'Critical Zone' and provide an understanding of how the provision of ecosystem services are ultimately linked with biodiversity and processes within the subsurface. The Earth's critical zone is defined as the heterogeneous, near surface environment in which complex interactions involving rock, soil, water, air and living organisms regulate the natural habitat and determine the availability of life-sustaining resources. The critical zone, where soil biodiversity is present, ranges from the outer extent of vegetation down through the lower limits of groundwater, including the soil biocrust (in drylands), soil, altered rock and the zone saturated by water. A = topsoil, B = subsoil, C = zone saturated by water and D = rock.




**Devil's Worm**

Since their discovery over two decades ago, single-cell organisms were considered the only inhabitants of the deepest layers of soil. However in 2011, a new species of nematode was recovered from 0.9-3.6 kilometre-deep fractures in the deep gold mines of South Africa. *Halicephalobus mephisto* was the name given to the new species, with mephisto, which means 'he who loves not the light', alluding to the Devil and referring to the German demon Mephistopheles. For this reason it is also commonly known as Devil's worm. According to radiocarbon dating, these worms live in groundwater that is 3000-12000 years old. *Halicephalobus mephisto* is resistant to high temperatures and feeds on subterranean bacteria.

***Farming Secrets says:*** ***How You Protect The Soil Surface Matters. Plant Diversity Drives The Soil Ecology***

***Ref:*** **A Global Atlas of Soil Biodiversity p73**