

Soil – The Living Skin of Planet Earth



The soil forms the outer skin of the land masses of Planet Earth. This thin veneer of living material is sometimes only a few centimetres thick and rarely thicker than two or three metres, but it has critical influence on what happens on the surface of the Earth. Soil is our life-support system. It provides anchorage for roots; holds water long enough for plants to make use of it; and holds nutrients, making them accessible to support life. It's home to myriad micro-organisms, that accomplish suites of biochemical transformations from fixing atmospheric nitrogen to the decomposition of organic matter, and to armies of microscopic animals - as well as earthworms, ants and termites that graze upon roots, other organisms and organic matter. Most biodiversity is in the soil, not above ground.

Different places – different soils

Soils vary from place to place – not randomly but in a systematic way: soils of the tundras are very different from those in the tropics, those of steplands are very different from those of the plain, and they vary over short distances. As you move from hill crest to valley bottom you will often find soils which look different and, also, behave differently, for instance when we try to grow crops or build a road or house. This variability reflects the soil's unique position in relation to the other components of planet earth – at the interface between the atmosphere, lithosphere, hydrosphere, and biosphere.

- **Different places – different soils**
- **Soil – a vulnerable resource**
- **Soil – the need for reliable information**

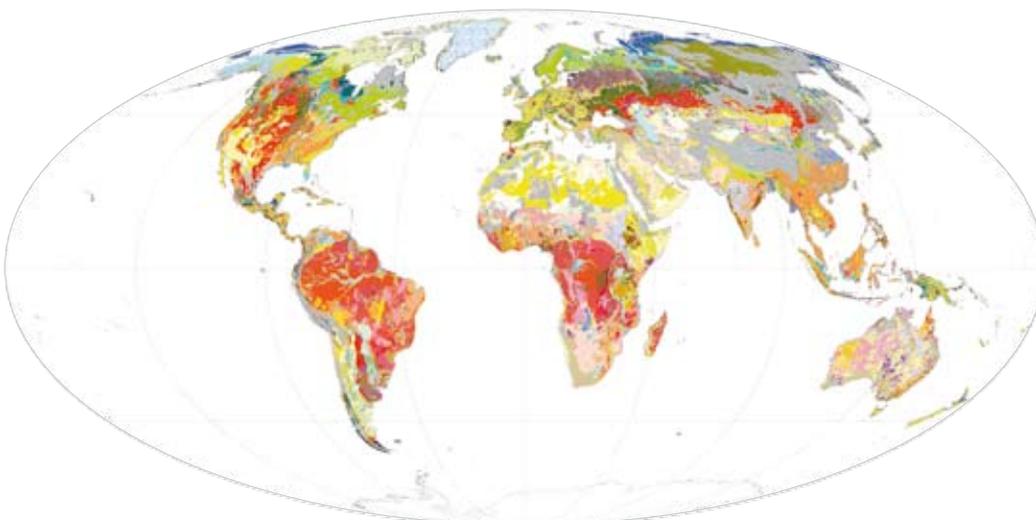
Soil – a vulnerable resource

Soils are vulnerable. The largest disruption and destruction is caused by humans. It is not a new phenomenon as soil degradation took place in the early civilisations in the basin of the Tigris and Euphrates. A major threat is soil erosion by which the soil is removed often exposing unweathered rock. Soil erosion arises from poor land management activities, for example cultivating steeply sloping land. The soil is an amazingly robust system within which many materials are broken down and made less harmful. This ability to 'clean up' materials has resulted in applications of waste organic and inorganic materials in to the soil system. If the amounts applied exceed the soil's capacity to break them down the soil will be degraded and its biological activity reduced. The most serious disruption of the soil is the sealing by buildings and infrastructure. This is common in many industrialised countries. Once sealed by tarmac or buildings the soil is essentially lost and unable to perform the functions we expect of it.

Soil – the need for reliable information

We are now able to access data about the surface of Planet Earth on a day to day basis with the increased availability of information from airborne or space-borne sensors together with the increased availability of software and computing power. There is no longer need to rely entirely upon information collected in the past and available in the form of printed maps and reports. This new information linked to developments in climate and land surface models are enabling soil scientists to make decisions about land use changes and their impacts, and to monitor and predict impacts of human actions. Soil scientists provide field calibration and testing of model outcomes and these new tools are able to guide land development and prevent soil degradation.

Soil Map of the World



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