1. Soil

The James Hutton Institute

Soil

Soil is an integral part of a terrestrial ecosystem and fulfils numerous functions, including the capacity to generate biomass and the filtering or buffering activities between the atmosphere and the groundwater, in the biosphere. The word 'soil' means different things to different people but basically it may be defined as the solid material on the Earth's surface that results from the interaction of **weathering** and biological activity on the soil parent material or underlying hard rock.

Pedology, or the study of soils as naturally occurring phenomena, takes into account their characteristics, distribution and method of formation. Such studies are associated with other branches of science.

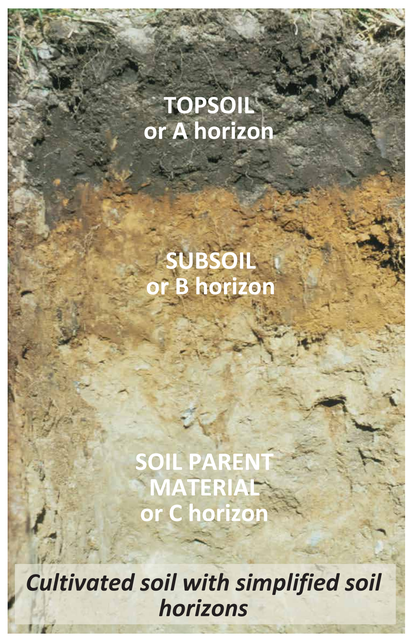
The vertical cross-section of a soil, as represented by a soil profile, is the basic unit of study. A soil profile is divided into a number of distinct layers, referred to as horizons, with either simplified names or pedological notations. The presence or absence of particular horizons allows pedologists to classify the soil.

Soil forming factors

Given the wide variety of soils known to exist in Scotland, it is necessary to understand how they are formed and subsequently classified prior to systematic mapping.

There are five classical soil forming factors:

- Soil parent material
- Climate
- Organisms, including vegetation and fauna or soil biota
- Topography
- Time



Cultivated soil with simplified soil horizons

Podzol with pedological horizons

TIME


Buried profile in Culbin Forest. Relatively recent aeolian sand

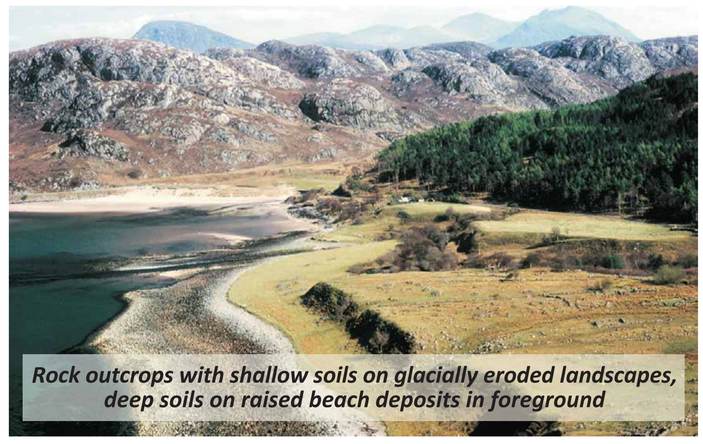
Recent soil

Buried soil

PARENT MATERIAL

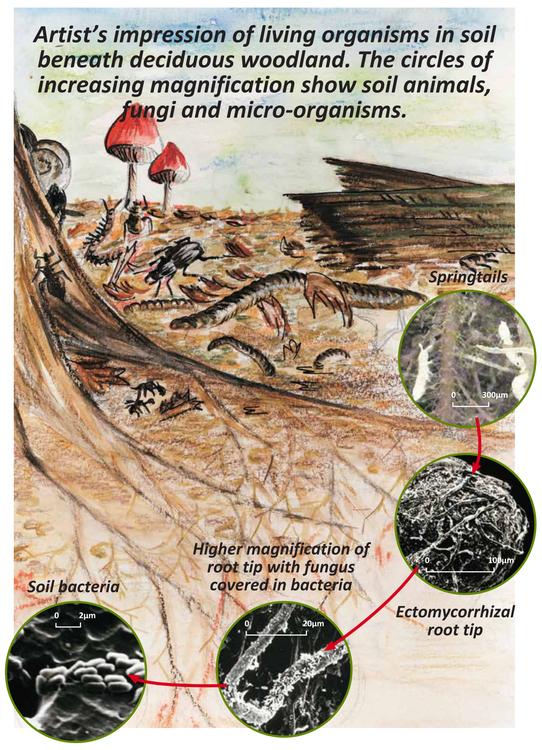
Cultivated brown earth with distinctive colour derived from Old Red Sandstone parent material

LANDFORMS/ TOPOGRAPHY


Rock outcrops with shallow soils on glacially eroded landscapes, deep soils on raised beach deposits in foreground

ORGANISMS


Scots pine woodland with distinctive heather ground flora



Artist's impression of living organisms in soil beneath deciduous woodland. The circles of increasing magnification show soil animals, fungi and micro-organisms.

ORGANISMS

Redrawn from 'The Living Mantle' (ISBN 0-908606-55-9)

Three of the most important soil types in Scotland are BROWN EARTHS, PODZOLS AND GLEYS. Their distribution has been mapped by the Soil Survey of Scotland at a variety of scales.

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