

Soil development through time II

Soil development consists of a variety of processes, many of which are driven by influx of very dilute and relatively acidic water (rainwater charged with CO₂ by respiration of plant roots and/or by oxidation of soil organic matter). Those processes include

- a) destruction of soluble or reactive primary minerals (minerals of the substrate on which the soil develops)
- b) generation of clays, either by neoformation or by transformation of pre-existing phyllosilicates;
- c) storage of organic carbon generated by plants.

The progress of these processes can be seen in plots below. The plots show data from soils developed on beach ridges of different ages left exposed with the uplift of the Canadian Shield and resultant shrinkage of Hudson Bay. The beach ridges contained, among other components, carbonate clasts and chlorite. The data show the loss of carbonate clasts through time, complementary buffering of pH of the soil water, and neoformation or transformation to generate smectite and vermiculite at the expense of quartz, chlorite, and micas.

Another page labelled "Soil development through time I" shows data from the 2300- and 5345-year-old soils plotted against depth.

Data are from
 Protz, R., Ross, G.J., Martini, I.P., and Terasmae, J., 1984,
 Rate of podzolic soil formation near Hudson Bay, Ontario:
Canadian Journal of Soil Science, v. 64, p. 31-49.

