

Soil development through time I

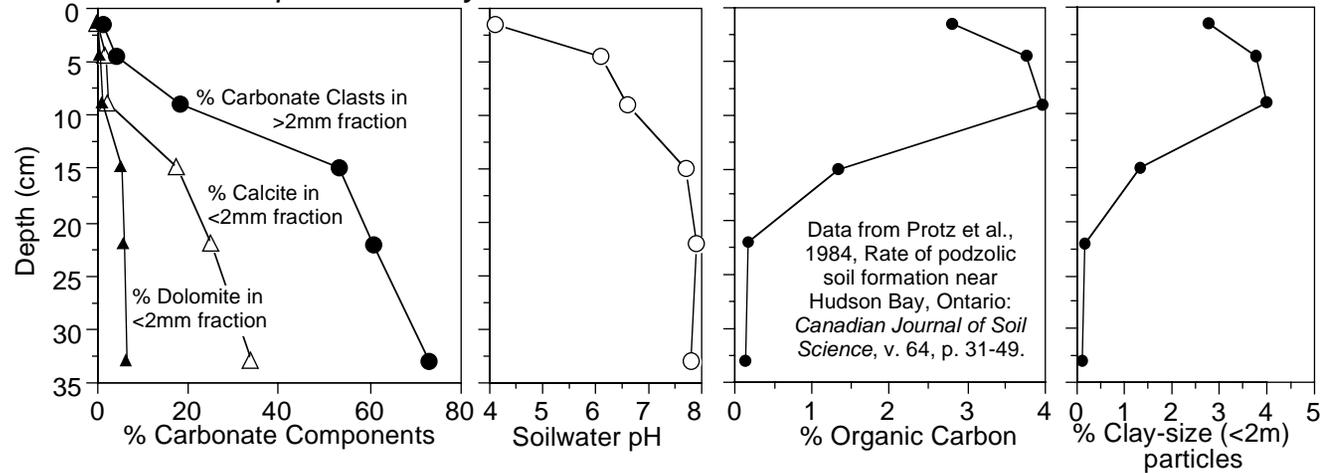
Soil development consists of a variety of processes, many of which are driven by influx of very dilute and relatively acidic water (rainwater charged with CO₂ by respiration of plant roots and/or by oxidation of soil organic matter). Those processes include

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

The progress of these processes can be seen in the two soil profiles below. They are 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. In the two profiles, note the loss of carbonate clasts from the top with leaching by the incoming water, buffering of the pH of that water with the dissolution of the carbonate, input of organic carbon from the land surface downwards, and generation and downward transfer of clay.

Note the greater depth of leaching of carbonate, buffering of pH, input of organic carbon, and generation of clay in the older soil. Another page labelled "Soil development through time II" shows more data from more soils around Hudson Bay to illustrate the change through time further.

Soil developed on 2300-year-old beach sediment:



Soil developed on 5435-year-old beach sediment:

