

GLACIATION AND SOILS



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Abstract

Our modern soils are the product of a major “powerful” event (the last ice age) that ended about 17,000 years ago, as well as a number of climate events during the Holocene (ie. hypsithermal and neoglacial events) that also changed some of our soil characteristics to a lesser degree. Glaciations have occurred repeatedly in Canada over the past 2.6 Ma and have reset the soil forming processes each time. The last glaciation and especially the last deglaciation have provided most of the parent materials on which our modern soils have developed. These range from fertile glacial lake plains, to ground moraine, ridged and recessional moraines, dead-ice hummocky terrain, and ice and water scoured bedrock areas. Drying glacial lake plains often produced sand sheets or dunes or resulted in loessic soil properties downwind from these drying lakes. Absence of glacial deposits or thin deposits often resulted in solonchaks due to presence of salts in marine bedrock, especially in areas of high evaporation. Lime layers and carbonate concretions are seen in many parts of the southern prairie soils and have a range of origins. Buried paleosols (fossil soils) occur in a number of locations and suggest that not all interglacial periods were like today.

Biography

René was born at the Galt hospital in Lethbridge in 1950 and raised on an irrigation farm NE of Picture Butte, Alberta. He completed a B.Sc. in 1971 at the University of Lethbridge, majoring in Geography; an M.Sc. at the Institute of Aerial Surveys and Earth Sciences in Delft/Enschede, The Netherlands, majoring in Remote Sensing and Mapping, and a Ph.D. in 1977 at Queen’s University in Kingston, Ontario, majoring in Geography and Soils. His Ph.D. research dealt with the Quaternary Stratigraphy of southeastern Alberta, using magnetostratigraphy as a research tool to differentiate glacial deposits. He taught at San Francisco State University in California from 1977-1981 and then returned to Lethbridge to teach for 40 years in the Department of Geography and Environment from 1982-2022. His research has focused on paleoenvironments and climate change, in particular the glacial/ interglacial sedimentary records in Canada which provide an archive of climate change and provide proxies for permafrost and ice extent, as well as vegetation and soil conditions.