

## **Influence of relief and vegetation on soil properties in a disturbed chernozem soil landscape**

Thomas Raab (1), Florian Hirsch (1), Oleksandr Vasserman (1), Alexandra Raab (1), and Anne Naeth (2)

(1) Brandenburg University of Technology (BTU), Geopedology and Landscape Development, Cottbus, Germany (raab@b-tu.de), (2) University of Alberta (U of A), Edmonton, Canada

In central and southeastern Alberta, chernozems dominate the soil landscape and are divided into several groups that follow the climate gradient from Northwest to Southeast: Dark Grey Chernozems, Black Chernozems, Dark Brown Chernozems; Brown Chernozems. Principles controlling development and distribution of these chernozem subtypes along the ecotone transect are quite well known. However, intensive land use over the last century has affected soils that originally have formed under natural conditions during the Holocene in more than 10,000 years. There is a lack of knowledge regarding soil development in these landscapes on the decadal to centennial time scale. Within this time frame the most important factor of soil formation may be relief, although this has not been properly studied.

This study aims to compare soil properties in a typical chernozem landscape where soils have been highly disturbed and parent materials have been re-arranged by surface coal mining. We hypothesize that within 50 years, soils develop with significant differences based on vegetation type and slope aspect. Our study site is the former Diplomat Mine near Forestburg, Alberta where spoils form a small scale ridge and graben topography. The south facing slopes of the piles are covered by grassland, whereas on the north exposition has trees and shrubs. Samples were taken from six sites with differences in topography and vegetation type. Diplomat T1 is at the top of the ridge with grassland, Diplomat S1 is on the southern slope with grassland, Diplomat N1 is on the northern slope with trees, and Diplomat N2 is on the northern slope with shrubs. For comparison we took samples from two sites without slope aspect. One site was an undisturbed grassland (Diplomat Z1) and the other sites were reclaimed piles (Diplomat R1). At each site, five soil profiles were examined and volumetrically sampled (250 cm<sup>3</sup> steel ring) in steps of five centimeters to a depth of 30 centimeters.

We present first results of basic physical and chemical soil parameters (bulk density, water content, pH, C-stock, N-stock).