230

SOIL MAPPING IN WESTERN-CENTRAL WRIGHT VALLEY, ANTARCTICA

M McLeod[1], J. G Bockheim[2], M. R Balks[3]

[1]Landcare Research, Hamillton, New Zealand, [2]University of Wisconsin, Wisconsin, United States, [3]University of Waikato, Hamilton, New Zealand

A soil map of the Wright Valley can provide a geographic framework for environmental reporting in the Ross Sea Region. During the 05/06 Austral summer we extended soil mapping into the western-central part of the Wright Valley, Antarctica. Using air photo interpretation and existing surficial geology maps we plotted preliminary soil boundaries at a scale of 1:50 000 onto a geo-referenced satellite image that was stored in a laptop GIS. In the field we made test pit observations at more than 80 sites that were described then located by GPS. Soil properties described included weathering stage, depth of visible salts, oxidation, rock ghosts and coherence. The GPS locations were uploaded into the GIS and polygon boundaries upgraded in the field. Soil properties were tabulated by major landform. Finally, 30 soil pits were excavated and samples obtained for chemical and particle-size analyses. We have identified three large rock glacier deposits, the Wright Upper III deposit and other drift and non-drift deposits. Notable features of the area examined include the large volume of material contained within the rock glaciers and large areas of pattern-ground that contain ice-cemented permafrost shallower than 70 cm. Soil development in rock glaciers and associated channels is similar, suggesting the channels are coeval rather than being formed as a result of erosion at a later date. Compared with soils of similar age in the moist eastern valley, soils in the drier west do not contain as many salts. As a consequence, weathering stage judged from surface weathering and profile oxidation is greater than that indicated by salt stage. Generally, where ice-cemented permafrost is > 1 m, soils are classified as Typic Anhyorthels or Anhyturbels where there is cryoturbation. The cryoturbation normally being fossilised. A Typic Haplorthel/Haploturbel complex of soils is mapped on pattern ground where ice-cemented permafrost occurs – often at about 40 cm depth. Glaciers from the Asgard Range and high-elevation snow patches all produce melt water, much of which moves laterally below the surface to produce extensive moist hyporheic zones that may extend hundreds of metres from source.