



High mountain soils and periglacial features at the Torres del Paine, National Park Torres del Paine, Chile.

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The Torres del Paine National Park (TPNP) is located on the southern limit of the Andean Southern Ice Field, part of the Magallanes and Antarctica Chilena region, in the province of Ultima Esperanza. The TPNP has a very heterogeneous climate due to orographic influence and wet air masses from the Pacific. The geology is basically Cretaceous metasedimentary rocks and Miocene granitic plutons and batholiths. We studied the main soils and geoenvironments of Mt Ferrier mountain and its surroundings, based on soils, landforms and vegetation aspects. The geoenvironmental stratification was based on the combined variation and integration of pedo-litho-geomorphological features with the vegetation. We used detailed geological maps, a DEM and slope maps and WorlView II satellite images. Fifteen soils profiles were sampled and classified according to Soil Taxonomy (2010) at all genovironments, ranging from 50 m a.s.l to the at high plateau just below the permanent snowline, under periglacial conditions (~1004m asl). Three soil temperature and moisture monitoring sites were set, allowing for 24 consecutive months (2011 to 2013). Seven geoenvironments were identified with distinct soil and landform characteristics, all with a similar geological substrate. The landform and vegetation have a strong connection with the landscape dynamic, controlling erosional and depositional processes, resulting from glacier advances and retreats in the Late Quaternary. Wind blown materials is widespread, in the form of loess material, accumulating in the higher parts of the landscape. On the other hand, accumulation of organic matter in the water-saturated depressions is common in all altitudes. Generally the soils are acidic and dystrophic, with little exceptions. The following geoenvironments were identified: Periglacial Tundra, Loess slopes, Talus and scarpmentd, Fluvio-glacial terraces, Fluvio-lacustrine plains, Moraines and Paleodunes. The regional pedology show the occurrence of five soil orders (Soil Taxonomy, 2010): Histosols, Mollisols, Inceptisols, Entisols and Andisols.