Landscape and climate interaction in the sub-Antarctic: Current knowledge, future impacts

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Marion Island in the southern ocean has a hyper-maritime climate and an environment where diurnal processes dominate the landscape. In a diurnal soil frost environment like Marion Island, the impact of climate change on the landscape occur at a higher resolution than for seasonal and permafrost environments and needs investigation at the synoptic time scale. Results from automated and manual surface and sub-surface measurements in a variety of habitats show that the landscape on Marion Island is dominated by the passage of synoptic scale weather systems. These systems influences the thermal characteristics of soil, intensity of rainfall, snowfall, soil frost dynamics, needle ice development, aeolian erosion and a host of other abiotic processes and its direct and indirect interactions with the ecosystem. This presentation reviews the current knowledge on the interaction between climate and the landscape current methodologies employed to investigate these interactions and specifically addresses the possible landscape responses under a future climate.