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Assessment of the thermal and dynamic reaction scenarios of different permafrost typologies in the European Alps: A PermaNET initiative

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High altitude and high latitude regions are generally recognized as being particularly sensitive to the effects of the ongoing climate change. A large part of permafrost in the European Alps for instance is at or close to melting conditions and is therefore very sensitive to degradation caused by atmospheric warming. Knowledge regarding permafrost distribution and its climatologically driven dynamics in the entire European Alps is still far from being complete. The new European Union co-funded project "PermaNET – Permafrost long-term monitoring network" (launched in July 2008) attempts to close some of these major gaps in permafrost knowledge (www.permanet-alpinespace.eu). One work package of PermaNET focuses on the assessment of the relationship between permafrost and climate change. In it, one action is concerned with the assessment of the thermal and dynamic reaction scenarios of different permafrost typologies in the European Alps. Research in this action is focussing on the relationship between measured climate data and observed permafrost reaction using available datasets collected during the last decades in the European Alps. Such datasets include ground temperature measurements (at the surface and in boreholes), rock glacier displacements or observations on mass movement events that were initiated in permafrost environments (e.g. rock falls). These established relationships in combination with calculated data from climate scenario modelling will form the basis for model simulations and estimations regarding changes in permafrost distribution (vertically and horizontally), in the active layer thickness, in the rates of rock glacier displacement, etc. Study sites for this action are located in Austria (Mt. Sonnblick, Central Schober Mountains, Dösen Valley, Mt. Hochreichart, Schrank Cirque), in Italy (Cime Bianche Pass, Matterhorn SW ridge, Valtournenche, Aosta Valley Region, Val di Genova and Val d'Amola in the Adamello-Presanella Group), in Switzerland (Murtèl/Corvatsch, Schilthorn, Matterhorn), in Germany (Zugspitze) and in France (Haute-Savoie, Rhône-Alpes, Mont Blanc massif, Combe du Laurichard, Deux-Alpes ski resort, Orelle-Plan Bouchet ski resort, Bérard valley). The study sites will be presented and some preliminary results will be discussed on the poster. (* E. Cremonese, M. Dall'Amico, P. Deline, A. Galuppo, S. Gruber, J.-M. Krysiecki, G.K. Lieb, V. Mair, M. Maukisch, U. Morra di Cella, P. Pogliotti, A. von Poschinger, L. Ravanel, C. Riedl, P. Schoeneich, R. Seppi, M. Staudinger, G. Zampedri)