Geomorphology and regolith erosion rates from ice-free valleys in the Southern Transantarctic Mountains

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Geomorphological and sedimentological studies were carried out by the Brazilian Expedition at Union glacier (79°45.666’ S / 83º15.895’ W), and surrounding hills, trunk valleys and tributary glaciers: Connell Canyon (79°49.238’ S / 83º06.402’ W), Elephant Head (79°49.298’ S / 83º20.426’ W), Mount Dolence (79°49.313’ S / 83º11.811’ W) and Rossmann Cove (79°47.849’ S / 82º53.536’ W), during the 2011/2012 field season. Union Glacier basin, located at the southeastern sector of the Ellsworth Mountains, flows into the Constellation Inlet of the Ronne Ice Shelf, and has been stable in recent decades, according to glaciological research conducted in the area. Dead-glaciers, morainic ridges and subglacial deposits were surveyed with GPS and GPR equipments in order to map the main geomorphological features. Microscale (striations and sichelwannen) and mesoscale (streamlined bedrock and giant stoss and lee) landforms of glacial erosion were found mainly in Rossmann Cove area. Subglacially derived deposits with large numbers of striated and polished boulders and clasts indicate abrasion and quarrying of former beds of active wet glaciers. Ice-cored moraines predominate as continuous ridges on the ice margins, and their morphological characteristics, mechanisms of formation and glaciological significance are being investigated. To advance on the understanding of the West Antarctica Ice Sheet behavior, information about the processes of formation and distribution of surface deposits and landforms, besides the dynamics of the glaciers are being documented in a geomorphological and glaciological mapping, which covers the Union glacier area. The mapping combines multisensor and multitemporal approach based on recent ASTER, LANDSAT ETM, COSMO and QUICKBIRD satellite data.

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