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The GRASP project – a multidisciplinary study of hydrology and biogeochemistry in a periglacial catchment area

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The Arctic region is sensitive to global warming, and permafrost thaw and release of old carbon are examples of processes that may have a positive feedback effect to the global climate system. Quantification and assumptions on future change are often based on model predictions. Such models require cross-disciplinary data of high quality that often is lacking. Biogeochemical processes in the landscape are highly influenced by the hydrology, which in turn is intimately related to permafrost processes. Thus, a multidisciplinary approach is needed when collecting data and setting up field experiments aiming at increase the understanding of these processes. Here we summarize and present data collected in the GRASP, Greenland Analogue Surface Project. GRASP is a catchment-scale field study of the periglacial area in the Kangerlussuaq region, West Greenland, focusing on hydrological and biogeochemical processes in the landscape. The site investigations were initiated in 2010 and have since then resulted in three separate data sets published in ESSD (Earth system and Science Data) each one focusing on i) meteorological data and hydrology, ii) biogeochemistry and iii) geometries of sediments and the active layer. The three data-sets, which are freely available via the PANGAEA data base, enable conceptual and coupled numerical modeling of hydrological and biogeochemical processes. An important strength with the GRASP data is that all data is collected within the same, relatively small, catchment area. This implies that measurements are more easily linked to the right source area or process. Despite the small catchment area it includes the major units of the periglacial hydrological system; a lake, a talik, a supra- and subpermafrost aquifer and, consequently, biogeochemical processes in each of these units may be studied. The new data from GRASP is both used with the aim to increase the knowledge of present day periglacial hydrology and biogeochemistry but also in order to predict consequences within these subjects of future climate change.