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Palaeolimnological reconstructions of mid-late Holocene climate change from South Georgia

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South Georgia's position within the Polar Frontal Zone, the core belt of the Southern Hemisphere Westerly Winds, and between Antarctica and the mid-latitudes makes it a key location for studying the main drivers of past and present-day climate variability. We undertook multi-proxy analyses, including fossil diatom, pigment and μ-XRF analysis, of lake and peat cores from two sites: Annenkov Island, on the southern side of South Georgia, and Prince Olav Harbour on the northern coast of South Georgia to determine: 1) which proxies were most suitable for reconstructing Holocene palaeoclimatic change; 2) whether the climate change signals from these proxies were related to natural lake development, local catchment processes such as changes in ice extent, or regional-global scale climatic change. Deglaciation at both sites was completed by c. 7800 cal. yr. B.P. Low nutrient/low productivity environments, which persisted within lakes at both locations until c. 3500 cal. yr. B.P., are indicative of the relatively slow development of lake ecosystems following deglaciation, and suggest high altitude glaciers or persistent ice-cover remained in both catchments well into the mid Holocene. In contrast, the late Holocene (c. 3500 yr to present) was characterized by initially higher, and then highly variable within-lake biological productivity. On Annenkov Island, the late Holocene diatom composition in Fan Lake was dominated by a single species (*Cyclotella stelligera*), and we have identified four major phases of increased catchment disturbance (represented by *Fragilaria capucina* peaks in diatom data), some of which coincide with more numerous meltwater input events (identified from Ti and Sr peaks in μ-XRF data). In this poster we examine the links between these meltwater events, results from other proxies, and changes in the climate of the sub-Antarctic region.