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Holocene climate of the Antarctic Peninsula from lake sediment cores

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The Antarctic Peninsula is one of the fastest-warming regions on Earth and one of the key areas for studying the effects of 'global warming'. With a rate of temperature increase of $3.7\pm1.6^{\circ}$C century^{-1}, it is warming at several times the global mean ($0.6\pm0.2^{\circ}$C century^{-1}). This has resulted in shifts in species distribution, catastrophic disintegration of ice shelves, accelerated discharge of continental glaciers, and the possibility of increased rates of global sea level rise. These processes look set to accelerate given the IPCC prediction that future anthropogenic increases in greenhouse gas emissions will lead to a 1.4-5.8°C rise in global temperatures by 2100. This project forms part of a multi-institutional/disciplinary program (GSAC-CACHE)[5] that will provide a critical natural response baseline to assess the effects of natural and anthropogenic increases in temperature across the Antarctic Peninsula. Lacustrine, marine and ice cores are currently being extracted to compare the spatial context of leads and lags in climate responses between maritime and continental regimes and along a N-S latitudinal transect of the Antarctic Peninsula. Here, we present new results from the first lakes cored: Col1 on Horseshoe Island and The Narrows Lake on Pourquoi Pas Island. The sediments contain key proxy-records that constrain Last Glacial Maxi-

mum to present-day regional deglaciation and sea level change. Results thus far indicate: (i) the Narrows Lake was isolated from the sea by at least 6420$\pm$50 ^{14}C yr B.P. (7430-7260 2σ cal yr BP) and (ii) a period of sustained warmth, which we tentatively associate with the prolonged and well-documented ‘mid-Holocene warm period’.