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Late Holocene climate variability of South America reconstructed by a multi-proxy analysis of Chilean fjord sediments

S. Bertrand (1,*), K. Hughen (1), L. Giosan (2), J. Tierney (2), J. Sepúlveda (3) and S. Pantoja (4)

(1) Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, MS#25, MA 02543, Woods Hole, USA; (2) Geology and Geophysics, Woods Hole Oceanographic Institution; (3) Research Center Ocean Margins (RCOM), University of Bremen, Germany; (4) Center for Oceanographic Research in the eastern South Pacific (COPAS), University of Concepcion, Chile; * Corresponding author: sbertrand@whoi.edu

High-resolution paleoclimate data from the Southern Hemisphere are essential to improve the understanding of the interhemispheric pattern of paleoclimate changes. Due to their intermediate location between the terrestrial and marine realms of South America, the sediments deposited in the fjords of Southern Chile contain an interesting high-resolution record of paleoclimate changes and paleoceanographic conditions. In this project, four ~2m long cores collected along a N-S transect at the outer part of the Chilean fjords between 44°S and 47°S, are studied by a multi-proxy sedimentological and geochemical approach. According to AMS radiocarbon measurements realised on remains of terrestrial organic matter, the cores span the last 1400 to 2600 years, depending on location. The multi-proxy analysis includes high resolution XRF core scanning (ITRAX core scanner) with calibration of the data by ICP-AES, grain-size, and elemental and isotopic composition of the bulk organic matter (C/N, d13C, d15N). These results allow us to estimate the proportion of terrestrial and marine constituents in the sediment and therefore to reconstruct the intensity of the terrestrial runoff which is directly linked to the amount of precipitation in the Andes. The records of the four cores are compared and allow us to discuss the variations of precipitation intensity associated with the latitudinal migration of the westerlies. It appears that precipitation in the region increased abruptly at ~1500 BP and again in two steps at ~900 and ~750 BP. Moreover, the southernmost core (46.5°S) contains several silt layers that are probably

related to melting pulses of the nearby San Rafael glacier, reflecting increased temperatures coeval with the earliest dry conditions observed in the northern (44-45°S) cores.