

Elemental analysis and reconstruction of late Holocene aeolian dust fluxes from the Rio Rubens peat bog in Patagonia

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Abstract

The mechanism, timing and dynamic of paleoclimatic changes in southern Patagonia in the Holocene, still remain unclear. The main climatic driver in the study zone are the Southern Westerlies Winds (SWW), whose changes have the potential to modify dust emissions in southern South America. During the Holocene in Patagonia, the SWW in environmental paleorecords have shown changes in position and strength. In order to understand paleoclimate dynamics in southern Patagonia and correlations between dust deposition and SWW, we sampled an ombrotrophic peat bog in the locality of Rio Rubens, close to the present-day SWW core maximum position, on the east flank of the Andes Mountains. Elemental analyses from ombrotrophic peat bogs have allowed successful reconstruction of past atmospheric dust changes, providing new data for interpreting and determining variations in the atmospheric circulation through the Holocene.

Previous palynological studies carried out in this bog indicate a basal age of 13 ka, with a purely ombrotrophic section of 5 ka. In order to determine the dust fluxes, a 1,5 m long core was recovered and subsequently subsampled each 1 cm, for elemental inorganic geochemistry (major and rare earth elements) as well as for radiocarbon and Pb210 dating. Preliminary results show an increase in the magnitude of dust flux interpreted as a southward shift in the SWW position, bringing the core of the SWW closer to the Rio Rubens peat bog through the late Holocene.