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Rare earth element and Nd isotope geochemistry of an ombrotrophic peat bog at Karukinka (Chile, 53.9° S): a palaeo-record of Holocene dust deposition in Tierra del Fuego.

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The value of ombrotrophic peat bogs as past atmospheric dust records, has been increasingly recognized over the past 10 years. Their high accumulation rates provide high resolution archives of natural atmospheric dust deposition since the Late Glacial, often missing in marine, lake and ice core records. Consequently, peat deposits can be used as a proxy for atmospheric circulation patterns and thus palaeoclimate.

In the Southern Hemisphere, the climate is considered to be driven by the Southern Westerly Wind belt (SSW), as it significantly affects the Antarctic Circumpolar Current and hence atmospheric CO_2 levels. Palaeo SSW belt migrations have been observed in palaeoclimate records but, reconstructions of SSW shifts and associated climatic changes are incoherent, in particular for the Holocene. As peatlands thrive in southwest Tierra del Fuego due to its high annual precipitation, a remote ombrotrophic peat bog at Karukinka (southwest on the Isla Grande de Tierra del Fuego) was sampled, to investigate the Holocene palaeoclimate in southern South America based on dust deposition records.

A 4,5 m long Russian D-core was recovered and subsequently subsampled for elemental and isotope geochemistry in addition to density and radiocarbon dating measurements. Initial results show a number of layers enriched in scandium, indicating the presence of lithogenic material, i.e. dust. Rare earth element patterns indicate at least 2 different sources. The most significant dust peak occurs at the base of the core at $\sim$7300 Cal years B.P and has a neodymium isotopic composition of 2.2, suggesting a volcanic origin.