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Multi-proxy palaeoclimate reconstructions from peatlands in southern South America

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There is a relative paucity of palaeoclimatic archives in South America relative to many other regions of the world. This paucity must be addressed in order to validate climate models and improve our understanding of the global climate system. The southern westerlies represent an important component of climatic variability in the region and, in turn, their migration and changes in their intensity can play a key role in determining whether the Southern Ocean functions as a sink or source of atmospheric carbon dioxide. Increased ventilation of deep waters with elevated concentrations of dissolved inorganic carbon, driven by enhanced Ekman transport, leads to increased outgassing of carbon dioxide. However, as instrumental records are limited to the latter half of the twentieth century, little is known about the long-term variability of the southern Westerlies and their subsequent effects.

The Peninsula Brunswick and Isla Grande de Tierra del Fuego are directly situated in the core path of the southern westerlies during the Austral summer and they are ideally suited for studies of past variability in westerly intensity and position. The region's abundant peatlands are capable of recording these long-term changes, as wind intensity and westerly position affects precipitation and temperature, two key drivers (i.e. P-E) of water-table dynamics in ombrotrophic peatlands. Currently, the peatlands of southern Patagonia represent a relatively unexploited resource in terms of palaeoclimate reconstruction. As a result, we have developed a new regional network of multi-proxy (testate amoebae, plant macrofossils, stable isotopes) archives, supported by high-resolution radiocarbon chronologies, to develop quantitative climate reconstructions for southern South America spanning the last $\sim$2000 years using Sphagnum magellanicum-dominated peat deposits.