

Peat bog records of dust deposition over the last 2000 years in the Dolomites (NE Italian Alps)

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The reconstruction of dust composition and fluxes is crucial to help to understand climate variability and climate changes. Dust fluctuations, linked to changes in dry and wet depositions, can indicate more humid or arid conditions, changes in temperature, vegetation cover and wind regimes.

Peatlands are unique terrestrial archives that can capture changes in atmospheric deposition over time. Among them, ombrotrophic environments are hydrologically isolated from the surrounding landscapes receiving all the nutrients from precipitation and wind, with no influence from streams and groundwater. In recent decades biological and chemical proxies from peat bogs were extensively used to trace past climate changes, and rare earth elements (REE) in particular have been developed as inorganic geochemical proxies of mineral dust input in the atmosphere that plays an important role in the marine and terrestrial biogeochemical cycle as source for both major and trace elements.

Dust deposition in the Italian Alps during the last 2000 years is estimated from the geochemical signature of two ombrotrophic peatlands. The first bog is located in Danta di Cadore (Belluno province, 1400 m a.s.l.), the second one in Coltrondo (Belluno province, 1800 m a.s.l.): they both allow us to have new insights into climate variability in the Eastern sector of the Italian Alps.

The REE and the lithogenic elements concentration, as well as the lead isotopic composition were determined by CRC-ICP-QMS along the first meter of each core. For both the archives chronology is based upon independent ^{14}C and ^{210}Pb measurements.

Changes in REE concentration through the bogs were related with those of lithogenic elements in order to test the immobility of the REE. Moreover peat humification degree was used to evaluate the hydroclimatic conditions of the bogs and Pb isotopic signature were used to trace dust deposited at Danta di Cadore and Coltrondo bogs and to discriminate natural from anthropogenic source of dust.