Geophysical Research Abstracts
Vol. 15, EGU2013-8668-1, 2013
EGU General Assembly 2013

Deciphering human-climate interactions in ombrotrophic peat record : REE, Nd and Pb isotope signatures of dust supplies over the last 2500 years (Misten bog, Belgium)

Nathalie Fagel (1), Mohamed Allan (1), Gael Le Roux (2), Nadine Mattielli (3), Natalia Piotrowska (4), and Jarek Sikorski (4)

(1) University of Liege, Sart Tilman, B18, AGEs Geology, Liege, Belgium (nathalie.fagel@ulg.ac.be, +32.4.3662029), (2) . EcoLab, ENSAT, Avenue de l'Agrobiopole, 31326 Castanet Tolosan, France, gael.leroux@ensat.fr, (3) G-Time, Dept. Earth and Environmental Sciences, Université Libre Bruxelles ULB, Belgium, nmattiel@ulb.ac.be, (4) Department of Radioisotopes, GADAM Centre of Excellence, Institute of Physics, Silesian University of Technology, Gliwice, Poland, natalia.piotrowska@polsl.pl

A core of 173 cm of ombrotrophic Misten peat bog from the Hautes-Fagnes Plateau in Eastern Belgium provides a record of Rare Earth Elements (REE) deposition allowing to trace dust fluxes in West Europe during the historical record (last 2500 years). REE and lithogenic element analyses, as well as the Nd isotopes, were performed by HR-ICP-MS and MC-ICP-MS, respectively in peat layers dated by 210Pb and 14C. The parallel variations of REE concentration with lithogenic conservative elements confirms that REE are immobile in the studied peat bog and can be used as tracers of dust deposition. Dust fluxes show pronounced increase at BC300, AD600, 1000AD, 1200AD and from 1700AD, recording either influence of human activities (regional erosion due to forest clearing and soil cultivation activities) or local and regional climate changes. Using Nd isotope allows to decipher between local and distal causes. The ENd variability (-13 to -9) is interpreted by a mixing between dust sources from local soils and desert particles. Three periods characterised by dominant-distal sources (at 320AD, 1000 AD and 1700AD) are consistent with local wetter intervals as indicated by lower humi [U+FB01] cation degree. Local erosion prevails durier drier (higher humification) intervals (-100AD, 600AD). On a global scale more distal supplies are driven during colder periods, in particular Oort and Maunder minima. Combining geochemical elementary content and isotope data in ombrotrophic peat allows to decipher between dust flux changes related to human and climate forcing.