Geophysical Research Abstracts
Vol. 12, EGU2010-4097-1, 2010
EGU General Assembly 2010
© Author(s) 2010

Spatio-temporal natural and anthropogenic environmental variability during the last 1500yrs in an ombrotrophic bog (East Belgium).

François De Vleeschouwer (1), Nathalie Fagel (2), Mohammed Allan (2), Emmanuelle Javaux (3), Philippe Gerrienne (3), Maurice Streel (3), Cédric Luthers (3), Marie-Noëlle Hindrycks (4), Cécile Wastiaux (4), Louis Leclercq (4), and the MISTEN Team

(1) Department of Ecology and Environmental Science, Umeå University, Umeå, Sweden (fdevleeschouwer@gmail.com), (2) AGEs, Département de Géologie, Université de Liège, Liège, Belgium. , (3) PPM, Département de Géologie, Université de Liège, Liège, Belgium, (4) Station Scientifique des Hautes Fagnes, Robertville, Belgium

Peatlands cover ca. 3 % of the Earth's surface and provide crucial continental archives for deciphering past climatic changes and anthropogenic impacts on decadal to millennial timescales. Numerous studies have demonstrated that peat bogs are excellent archives to investigate past environmental and ecological changes during the Holocene. Studies which focus on intra-site variability at high resolution are rare however, despite their potential to provide constraints on the reliability of the palaeoenvironmental reconstruction and the influence of micro-scale variability. Such variability must be taken into account in any peatland restoration process linked with recent environmental changes, particularly human-derived impact such as peat cutting, drainage and tree cultivation.
Four 1m-long Wardenaar monoliths were retrieved from the Misten bog (Hautes-Fagnes, East Belgium). The cores were investigated using chronological (radiocarbon AMS dating of plant macrofossils, 210Pb age modelling), biological (macrofossils, pollen content, testate amoebae), organic (humification level) and geochemical proxies (major and trace geochemistry, Nd and Pb isotopes). The aims of this research were to: (1) to assess whether the bog vegetation and other environmental indicators have changed simultaneously in time and space, (2) identify the most sensitive palaeoenvironmental indicator(s) and (3) assess to what extent variation in peat accumulation rates affects the record of each proxy. Preliminary interpretations show great variability (up to 50%) in peat development on a decimetre depth-scale as assessed by the variation in peat palynological and macrofossils zones from one core to another. In addition, our recent high-resolution records of environmental change have high applied palaeoecological value since they can be used to inform conservation management ('natural' changes in the composition of the peat forming vegetation and the range of water table depth variability over a range of timescales).