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The Misten peat-bog (Hautes-Fagnes): how pollen analysis allows to link interdisciplinary data

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The discrimination of human *vs.* climate impact on a sensitive ecosystem such as raised bogs requires the prior knowledge of its accumulation processes as well as its bio-physico-chemical characteristics. This joint study between several expert laboratories from the University of Liège, as well as other European ones, aims to answer three questions:
1) what are the recent vegetation changes and their causes;
2) are those changes synchronous, and how could we take advantage of them to manage the bog and
3) can we discriminate human from climatic impacts on the bog development.
In order to answer those questions, several 1m-long peat monoliths were retrieved from the Misten bog (East Belgium).

Each laboratory provided one or several parameters, guaranteeing a multiproxy and interdisciplinary approach: peat macrofossils, pollens, spores, testate amoebae, humification, nitrogen, trace metals, lead and neodymium isotopes, 210Pb and 14C dating.

The high resolution of the sampling step and the accurate age-model make this study a reference that can be compared to various data such as the history of the area, climatic parameters, human occupation and activities, forestry data, old maps (the bog having been mapped back to mid XVIII th century), but also to ongoing projects such as LIFE Hautes Fagnes.

From the base to the top of each monolith, it is possible to reconstruct and correlate ca. 2000 yrs of environmental changes linked to climate and/or human activities. The Medieval Warm Period (MWP) and the Little Ice Age (LIA) are well defined. The latter one is characterized by a recurrent dominance of aquatic Sphagnum. From the XVI th onwards, the climatic signal is progressively disturbed by peat cutting at the edges of the bog. However, our monoliths do not seem significantly affected. The geochemical data show a decrease in mining activities, compared to the previous Roman Period. However, mineral dust loads increase significantly, due to human activities (grazing, agriculture) superimposed upon climatic deterioration (LIA, more wind, more erosion).