



Atmospheric mercury deposition during the last 1500 years in Western Europe: The Misten peat bog record (Hautes Fagnes - Belgium)

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The current rate of global atmospheric Hg deposition is approximately three times higher than the preindustrial record and it even increased by a factor of 2-10 in the industrialized regions.....(Hylander and Meili 2003). To determine the extent of such increase, it is necessary to quantify the atmospheric mercury concentration and its temporal variation. For this purpose four 1m Wardenaar peat cores (MIS01W, 04W, 0W5 and 06W) were collected in 2008 in the ombrotrophic Misten bog (Hautes Fagnes Plateau, East Belgium). Mercury was measured using a DMA 80 at the Laboratory of Mechanisms and Transfers in Geology in Toulouse (LMTG, France). The strongest mercury concentrations are measured in the upper half peat record, in a depth interval corresponding to the Industrial Revolution period. Mercury accumulation rate was estimated by applying a coupled ²¹⁰Pb-¹⁴C age model. The mercury accumulation rate remains relatively small, ranging between 0.9 and 3.3 $\mu\text{g}\cdot\text{m}^{-2}\cdot\text{y}^{-1}$ during periods corresponding to the decline of Roman Empire and during the Middle Ages. Hg accumulation rate starts to increase when 25 cm, reaching a maximum value ($> 115 \mu\text{g}\cdot\text{m}^{-2}\cdot\text{y}^{-1}$) at 13.7 cm (i.e.; 1923-1938 AD). Then the values oscillate to reach 9 $\mu\text{g}\cdot\text{m}^{-2}\cdot\text{y}^{-1}$ at the peat surface (2000-2007AD). In the Misten bog, the evolution of Hg accumulation rate is in agreement with the chronology of other European peat records(Roos-Barraclough et al. 2002).

References

Hylander, L. D. and Meili, M. 2003. 500 years of mercury production: global annual inventory by region until 2000 and associated emissions. *The Science of The Total Environment* 304(1-3):13-27.

Roos-Barraclough, F., Martinez-Cortizas, A., Garcia-Rodeja, E. and Shotyk, W. 2002. A 14500 year record of the accumulation of atmospheric mercury in peat: volcanic signals, anthropogenic influences and a correlation to bromine accumulation. *Earth and Planetary Science Letters* 202(2):435-451.