Geophysical Research Abstracts, Vol. 8, 07248, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07248

UV-B exposure does not affect the carbon balance of a boreal fen

J. Haapala (1), S. Mörsky (2), S. Saarnio (1), J. Silvola (1), P. J. Martikainen (2), E. Kyrö (3), T. Holopainen (4)

(1) University of Joensuu, Department of Biology, P.O.Box 111, FIN-80101 Joensuu, Finland.

(2) University of Kuopio, Department of Environmental Sciences, Bioteknia 2, P.O.Box 1627, FIN-70211 Kuopio, Finland.

(3) Finnish Meteorological Institute, Sodankylä, Tähteläntie 62, FIN-99600 Sodankylä, Finland.

(4) University of Kuopio, Department of Ecology and Environmental Science, P.O.Box 1627, FIN-70211 Kuopio, Finland.

Boreal mires have an important role as a storage of carbon. Carbon dioxide balance of the mires is very sensitive to environmental changes and varies from a sink to a source between the years. In the earlier studies, an increase of UV-B radiation reaching the Earth surface due to the ozone depletion in the stratosphere has been found to affect plant growth, litter decomposition and microbial communities in the soil. We have studied how the elevation of UV-B radiation level affects the photosynthesis of *Eriophorum russeolum* and the carbon dioxide balance of a fen ecosystem. Ten study plots in a natural flark fen in northern Finland (67º22'N, 26º38'E, 179 a.s.l.) have been exposed to the elevated UV-B radiation (30 % elevation compared to the monitored ambient) for three growing seasons. The net ecosystem carbon dioxide exchange and dark respiration were measured during the growing seasons using the closed chamber method and the wintertime emissions were estimated by taking gas samples from the snow column. The results from these measurements and the environmental data collected from the experimental field were used to reconstruct models carbon dioxide exchange during the study years. Especially total respiration of the fen ecosystem varied between the years due to variation in precipitation. In the dry year 2003, the fen was net source of carbon dioxide. Instead, the elevated UV-B radiation did not affect

significantly either the photosynthesis of *E. russeolum* or the carbon dioxide balance of the fen ecosystem.