



Interaction between hydrology, microclimate and biotic factors in small Sphagnum mire in northern Poland

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Peatlands are very sensitive to hydrological change, which can be caused by natural (e.g. atmospheric) and anthropogenic factors (e.g. drainage). There are complex interactions between abiotic and biotic factors in those ecosystems. We investigated Sphagnum mire (5.95 ha) located in young glacial landscape of northern Poland. The peatland is a nature reserve and Nature 2000 site. Based on vegetation, the mire should be classified as a poor fen, but small patches of ombrotrophic vegetation exist. This mire is a unique floristic nature reserve, where the arctic-boreal species *Betula nana* is protected. This site is the most marginal (western) location of *B. nana* in Europe. Regional average annual air temperature is 7.5 - 8.0°C, and average annual precipitation ranges from 500 mm to 550 mm. The observations were made over two years 2009-2010. We aimed to study relationships between local climate, mire hydrology and Sphagnum mosses growth. Furthermore, we wanted to know the difference between peatland climate and its surroundings. The monitoring of ground water level fluctuations and microclimate of the mire has been continuing from 2006. 'Diver' loggers were used to record water level changes and HOBO sensors to measure temperature and humidity at two levels: 30 cm and 150 cm above ground. We also recorded peat temperature (at 10 cm below ground) and precipitation by Hellmann's rain gauge. We measured the growth of Sphagnum mosses in different plots at the mire. During two vegetation seasons Sphagnum was measured with the cranked wire method. Results indicated strong relationship between water level fluctuation and atmospheric conditions, particularly air temperature in summer season. However results are not the same in the all parts of the mire. Sphagnum growth that was related to ground water level and it was different and related to the microtopography of the mire (lawns – hummocks).