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Where do current N deposition levels lead
to lower Sphagnum production?

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Large areas of Sphagnum-dominated peatlands in the Northern hemisphere are located in N polluted areas and there is great concern for the effects of high N deposition in these N poor habitats. At present, we know to a great extent how N deposition can affect peatlands and how Sphagnum responds to enhanced N availability. However much research has been experimentally oriented and of qualitative character, while quantitative estimates of the N effect and up-scaling to large peatland areas are lacking. Of great interest is the N deposition effect on Sphagnum production because it represents the potential of a peatland to sequester carbon and it is crucial in sustaining the ecosystem function of a peatland. Here we present an attempt to use quantitative estimates of the effect of N on Sphagnum production to predict large scale effects of N deposition. A meta-analysis covering most N application field experiments was performed to obtain estimates of the N effect and possible interactions with other environmental variables. These estimates, with their uncertainty, were used together with present N deposition levels to model large scale patterns of the effects of N deposition on Sphagnum production in boreal peatlands. In addition, production measurements along the N deposition gradient, were used to examine the relationship between N deposition and Sphagnum production in nature and for comparisons with model predictions. This presentation will include results from the aforementioned analyses and will point out current gaps in our knowledge of global Sphagnum production patterns.