



## **The effect of Sphagnum farming on the greenhouse gas balance of donor and propagation areas, irrigation polders and commercial cultivation sites**

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Drainage of peatlands for agriculture, forestry and peat extraction turned these landscapes into hotspots of greenhouse gas emissions. Climate protection now fosters rewetting projects to restore the natural peatland function as a sink of atmospheric carbon. One possible way to combine ecological and economical goals is Sphagnum farming, i.e. the cultivation of Sphagnum mosses as high-quality substrates for horticulture. This project scientifically evaluates the attempt of commercial Sphagnum farming on former peat extraction sites in north-western Germany.

The exchange of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) of the whole peatland-based production chain comprising a donor mire, a propagation area, an irrigation polder and a cultivation site will be determined in a high temporal resolution for two years using manual chambers. This will allow evaluating the greenhouse gas balance of Sphagnum farming sites in comparison to near-natural sites and the potential of Sphagnum farming for restoring drained peatlands to sinks of atmospheric carbon. The influence of different irrigation techniques will also be tested. Additionally, selected plots will be equipped with open top chambers in order to examine the greenhouse gas exchange under potential future climate change conditions. Finally, a <sup>13</sup>C pulse labeling experiment will make it possible to trace the newly sequestered CO<sub>2</sub> in biomass, soil, respiration and dissolved organic carbon.