EGU21-8175
https://doi.org/10.5194/egusphere-egu21-8175
EGU General Assembly 2021

Which management option has the highest greenhouse gas reduction potential for drained peatlands?

Merit van den Berg[1], Christian Fritz[1], Bas van de Riet[2], Stefan Weideveld[1], Thomas Gremmen[2], Eva van den Elzen[1], Renske Vroom[1], Jeroen Geurts[1], and Leon Lamers[1]

[1]Radboud University, Aquatic Ecology & Environmental Biology, Nijmegen, Netherlands (merit.vandenberg@science.ru.nl)
[2]B-WARE Research Centre, Nijmegen, Netherlands (b.vanderiet@b-ware.eu)

Almost all peatlands in the Netherlands are drained for agricultural purposes or in the past for peat extraction. What remains is a peatland area of about 300.000 ha of which 85 % is used for agriculture. As a result of peat oxidation, these areas are still subsiding by about 1 cm per year. Another effect is the enormous emission of CO_2, which contributes to about 4% of total Dutch greenhouse gas emissions. With the awareness of a changing climate and the need for protection against flooding of coastal areas, solutions are being searched to reduce or stop peat oxidation and coinciding land subsidence and CO_2 emission.

In this presentation we will show different management options (subsoil irrigation, pressurized subsoil irrigation, paludiculture) which are currently being tested in the Netherlands. They will be put into perspective of data from other European studies. These options all focus on increasing the groundwater table to lower oxygen intrusion and consequently lower aerobic decomposition. Depending on crop choices, water levels may need to stay 40 cm below the surface to maximize fodder plant yields, or go to surface level to increase peat ecosystem functions like C-sequestration. The management options range from maintaining the current land-use by elevating summer water levels, with submerged drainage, to the development of peat-forming plant species by complete rewetting. Data of the effects of these management options on CO_2 emission show that Sphagnum farming is the most promising mitigation option to reduce greenhouse gas emission from drained peatlands. It turned the land from a carbon and greenhouse gas source into a sink.