Drained peat soils in Belgium – multiple benefits from rewetting

Potential to mitigate GHG emissions and support climate neutrality by large-scale rewetting activities

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biodiversa

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Reported greenhouse gas (GHG) emissions from drained peatlands

Occurrence of peatlands is moderate in Belgium compared to the more northern regions (Fig. 1). Most of the original peatland area has been drained, mainly for agriculture. The total peatland area is about 106 000 ha, and an area of 1900 ha of cropland and 820 ha of grassland were reported in the GHG inventory. However, there is a discrepancy (more than 20-fold underestimation) with the Global peatland database that shows an area of 56000 ha of drained agricultural and forested area of peatlands (van Giersbergen et al. 2025).

The net sink of the LULUCF sector is modest compared to the total GHG emissions of Belgium (Fig. 2).

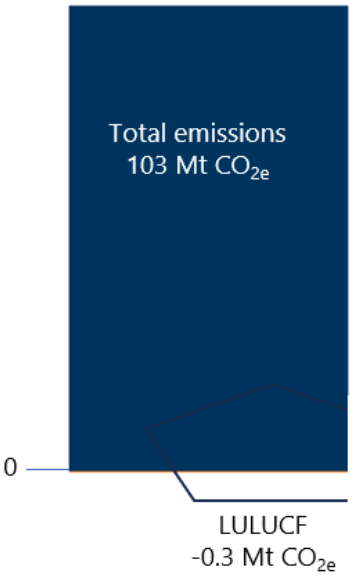
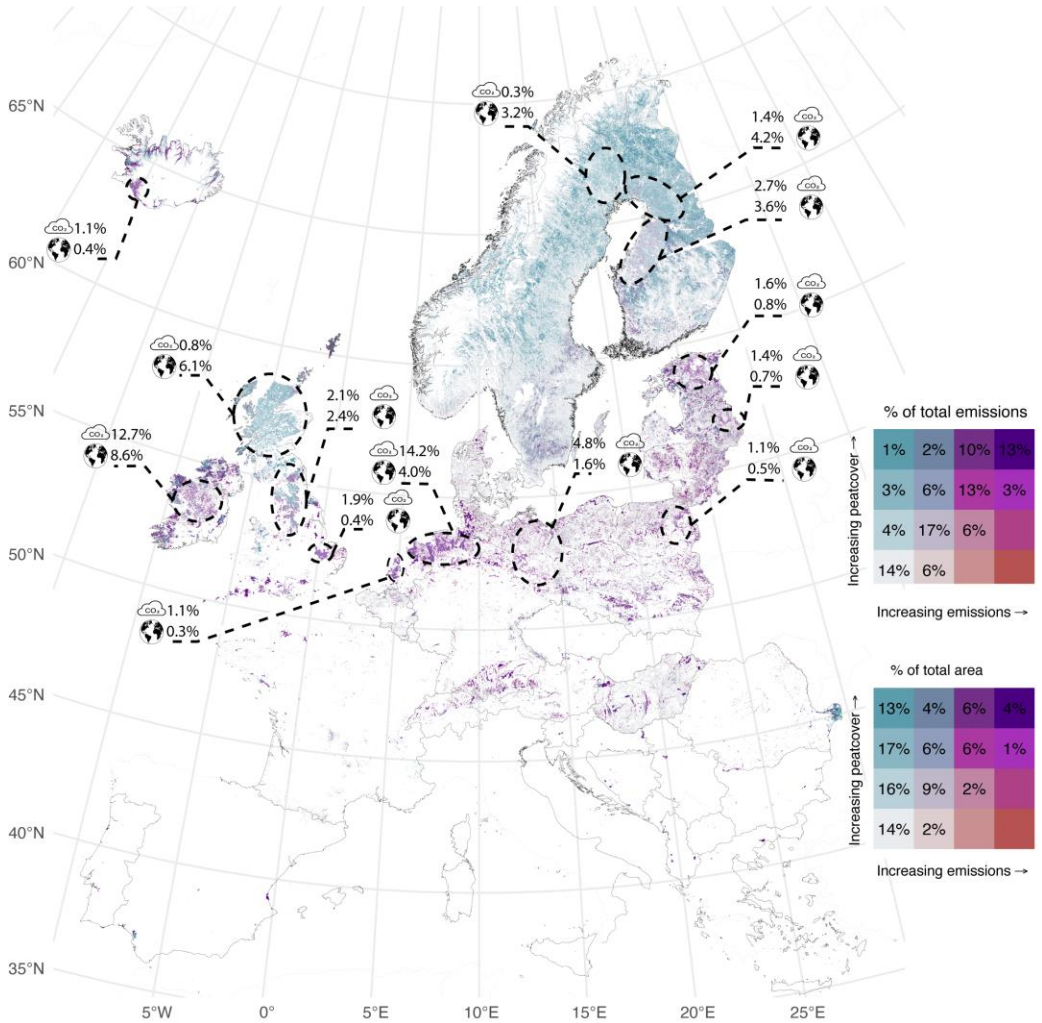


Figure 2. Total GHG emissions and the net sink of the land use (LULUCF) sector of Belgium in 2022



Hotspot map of peatlands showing the contribution of regions to the total emissions or area of peatlands in Europe. The darker the colour, the higher fraction of European peatland area or emissions the region represents. See details in Tanneberger et al. 2025.

Rewetting can strengthen the carbon sink

Reported GHG emissions from drained peatlands amounted to 0.08 Mt CO_{2e} in 2022. The emissions are related to agricultural use, croplands and grasslands. However, both the area estimates and emission factors used in the GHG inventory are outdated, and forests on peatlands are excluded.

The emissions would be much larger (1.8 Mt) if the newest soil and land use maps and emission factors were used in the reporting (Fig. 3; van Giersbergen et al. 2025). These emissions are high compared to the current net sink of the LULUCF sector but they would reduce to 0.6 Mt CO_{2e} if all drained peatlands were rewetted, suggesting a significant potential to .reduce the climatic impact of drained peatlands.

The additional benefits from such land use change would be:

- Flood, drought and fire prevention
- Less nutrient pollution in watercourses
- New business opportunities from paludiculture (crop production in wet environments)
- Feeding sites for migrating birds->less damages to fields
- Improved status of protected areas currently surrounded by drained areas
- Improved sustainability of food production and consumption.

The >150 ha De Zegge area will be an example of multi-benefit conversion of drained peatland to wet use.

What is rewetting?

In rewetting, water flow out from a drained area is restricted. The ground water level rises and enables restoring the wetland functions of the ecosystem. Emissions of carbon dioxide (CO_2) and nitrous oxide (N_2O) decrease and the increase in methane (CH_4) emissions is usually moderate.

The effects of rewetting were calculated assuming an instant change from the current reported average emissions of each land use type to emissions corresponding to the default emissions of rewetted peatlands (IPCC 2014).

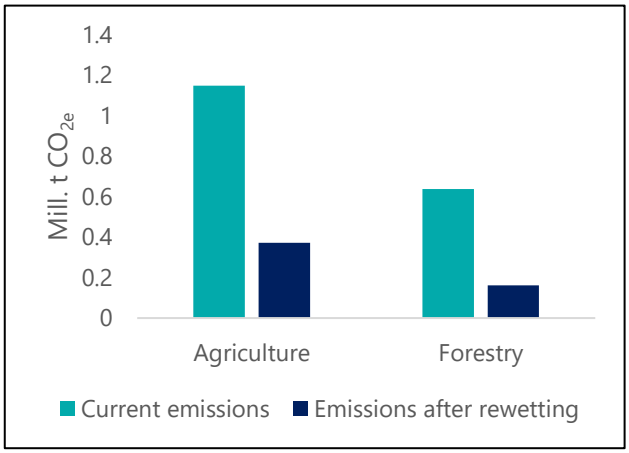


Figure 3. GHG mitigation achieved by rewetting all drained peat soils in Belgium.

Policy recommendations

As part of the green transition, livelihoods currently utilising peatlands will need to adapt to future demand of sustainability in production. Transformation pathways involving large-scale rewetting urge for policies that abolish harmful subsidies and create incentives for protective actions on peat soils. The recent plan to convert De Zegge area from conventional agriculture to paludiculture is a good first step.

We recommend that:

1) The Belgian emission estimates for the greenhouse gas inventory are updated using the latest peatland data and emission factors.

2) Cooperation of authorities is needed to ensure best possible benefits from rewetting drained peatlands. All agricultural peatlands need to be restored or converted to paludiculture in the near future.

References

Van Giersbergen et al. 2025. Identifying hotspots of greenhouse gas emissions from drained peatlands in the European Union. Nature Communications. https://doi.org/10.1038/s41467-025-65841-6

IPCC 2014. https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/

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