

Nature-based solutions - the example of peatland restoration for GHG emission reduction, carbon dioxide removal and adaptation

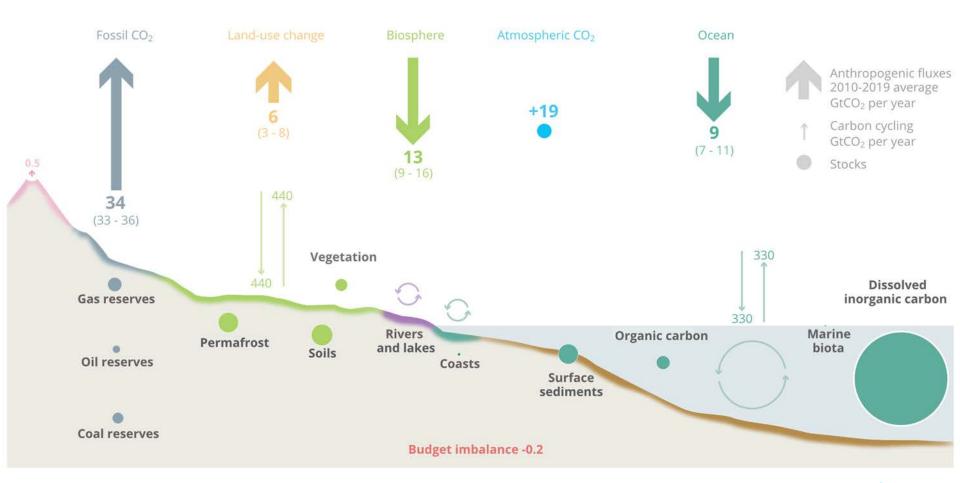
Franziska Tanneberger

COP26, 01.11.2021





Ecosystems have the potential for large additional climate mitigation by combining enhanced sinks with reduced emissions



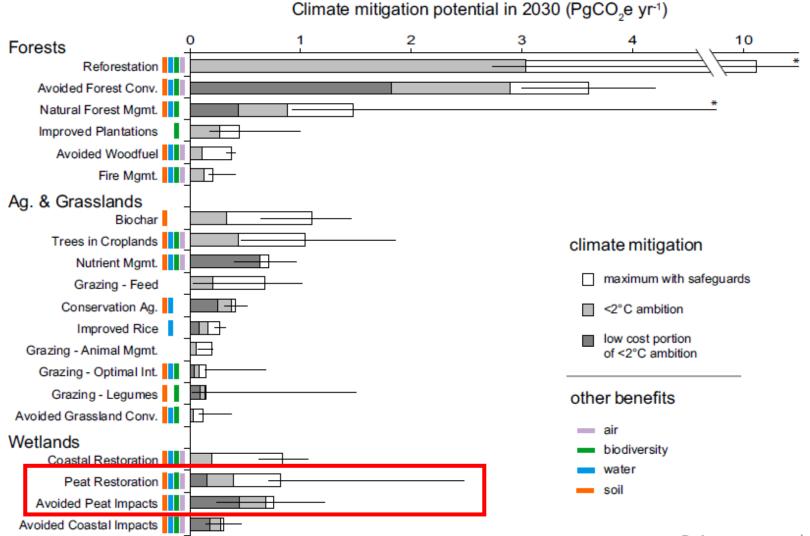


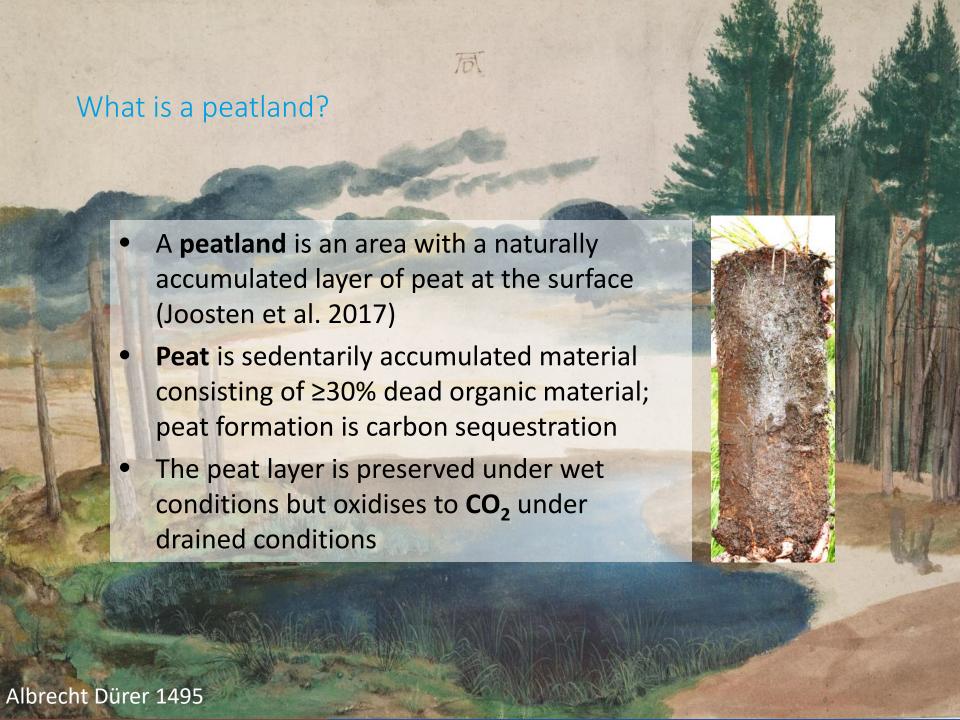
Working with nature

- Nature-based solutions (NbS): working with nature to address societal challenges
- Natural climate solutions (NCS): conservation, restoration, and improved land management actions that increase carbon storage and/or avoid greenhouse gas emissions across global forests, wetlands, grasslands, and agricultural lands
- NCS can provide over one-third of the cost-effective climate mitigation needed between now and 2030 to stabilize warming to below 2 °C (Griscom et al. 2017)
- Alongside aggressive fossil fuel emissions reductions, NCS offer a powerful set of options for nations to deliver on the Paris Climate Agreement while improving soil productivity, cleaning our air and water, and maintaining biodiversity.



Natural climate solutions





Global distribution of peatland





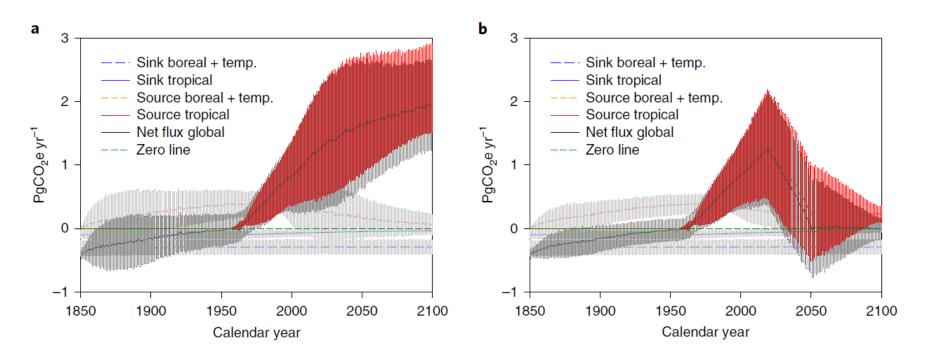




→ new Global Peatland Map, will be launched on 9.11.2021 at COP26

https://www.greifswaldmoor.de/global-peatland-database-en.html

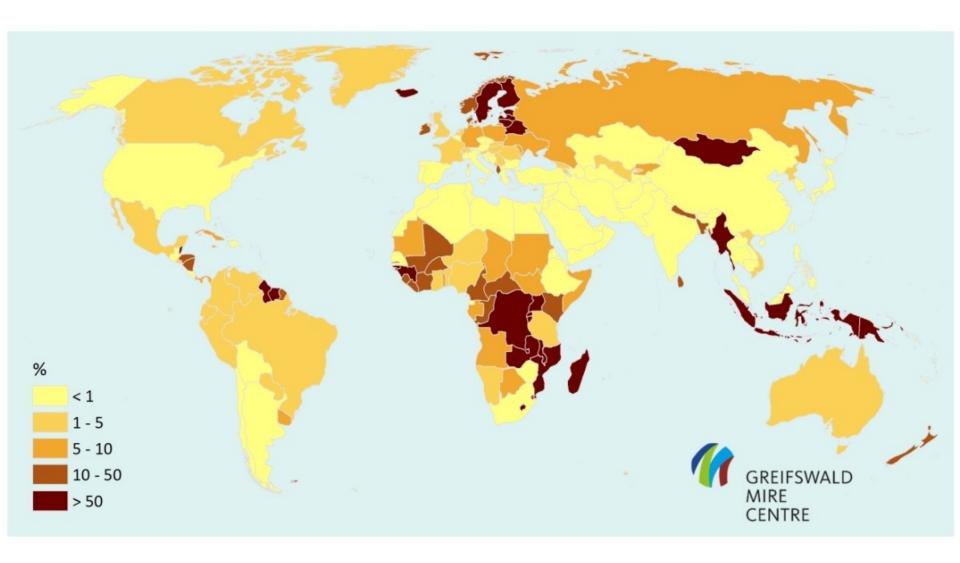
Annual GHG flux from anthropogenic peat loss and peat formation in 1850-2100 without and with peatland restoration



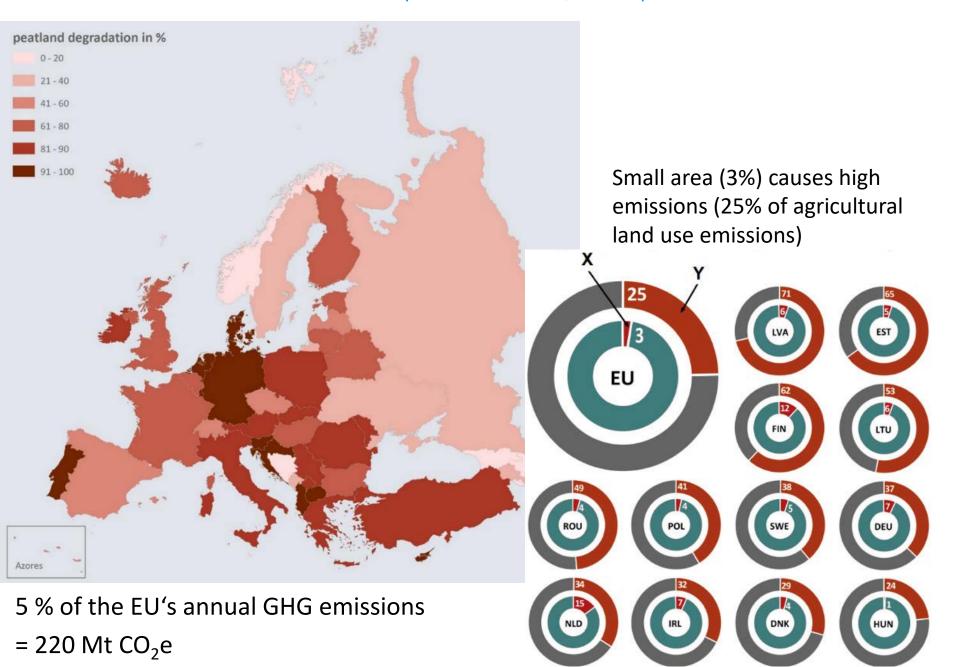
- → In 1960 the global peatland biome turned from a net sink into a net source of soil-derived GHGs due to drainage and peat oxidation
- → Annual backconversion of most of the drained area would render peatlands
 GHG neutral, whereas emissions from peatland may comprise 12–41% of
 the GHG emission budget for keeping global warming below +1.5 to +2 °C
 without restoration

 Leifeld et al. 2019

Peatland emissions as % of national fossil fuel and cement emissions

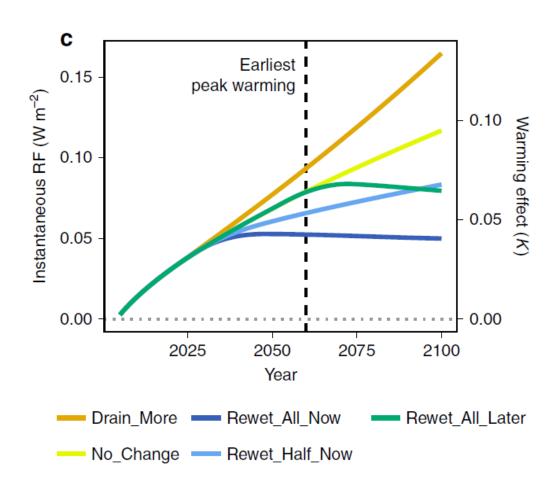


Peatland GHG emission hotspots: SE Asia, Europe

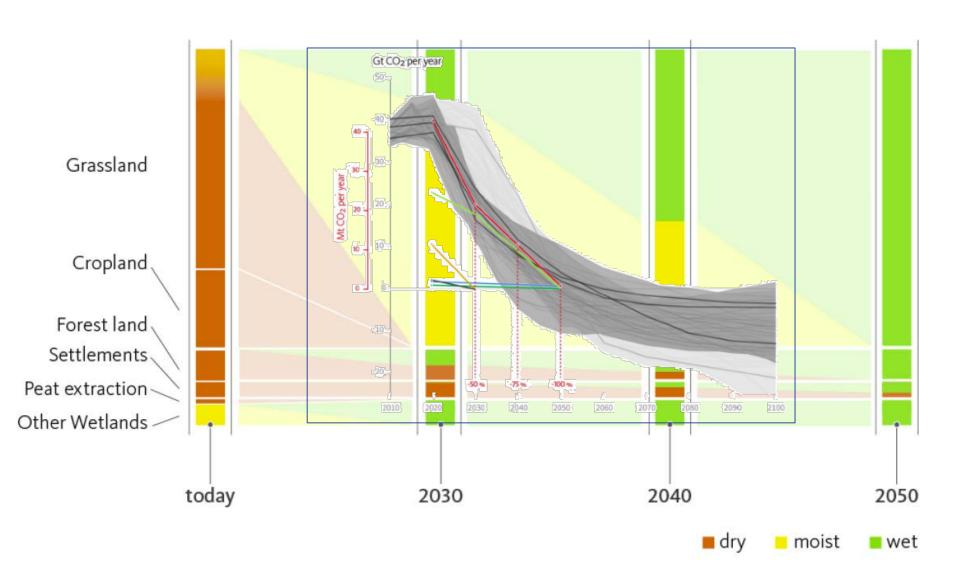




Prompt rewetting of drained peatlands reduces climate warming despite methane emissions



The Paris Agreement implies that all peatlands are (re)wet(ted)



Tanneberger et al. (2021) for Germany

... and this implies a fundamental change of agriculture on peatlands

Conventional agriculture on organic soils

Sneaking loss of the peat layer

~30-40 t CO2e ha -1 yr -1 (IPCC 2014)

Paludiculture

Preservation of the peat layer

0-8 t CO2e ha -1 yr -1 (GMC own figures)





- Construction and insulation material
- Fibre for paper and moldings
- Bioenergy
- Biorefinery
- Potting soil and substrates

Products are 3 (4) fold climate protective:

- a) Reduction of soil-borne emissions
- b) Replacement of fossil ressources
- c) Carbon sequestration in long-life products
- d) Carbon sequestration through new peat formation











Wet peatlands help achieving the SDGs

SDG1 NO POVERTY SDG17 PARTNERSHIPS FOR THE GOALS Cleaner sources of water, economic benefits from paludiculture Ramsar Convention, CBD, UNFCCC, UNCCD, CMS und PES, reduced exposure and vulnerability to disasters UN Environment, Global Peatlands Initiative SDG16 PEACE, JUSTICE AND STRONG INSTITUTIONS SDG2 ZERO HUNGER Areas of inspiration, recreation, reflection and for no loss of productive land due to subsidence, partially character d sustainable food production, renewable energy production Ňŧŧŧ SDG15 LIFE ON LAND SDG3 GOOD HEALTH AND WELL-BEING Habitats for reproduction and Clean water, recreation and stress migration, gene pool protection mitigation, reflection and spiritual SDG14 LIFE BELOW WATER enrichment, solitude and sacred places healthy and productive oceans rely on LDUCATION atlands CHOTHING COASIC Clean and safe water access Wet enhances educational opportunities, SDG13 CLIMATE ACTION subject matter for education rewetting cuts enormous amounts of CO2 released from drained peat peatlands SDG5 GENDER EQUALITY soils and is cost-efficient Improved lifelhoods of women as water provison is often a task SDG12 RESPONSIBLE given to women CONSUMPTION & PRODUCTION and the paludiculture can create engines of local communities, enhanced SDG6 CLEAN WATER AND ter supply and quality SANITATION **SDGs** Clean outflowing water supply SDG11 SUSTAINABLE CITIES AND (nutrient retention, denitrification, COMMUNITIES filtering out of pollutants) peatlands retain and detain floodwaters and protect urban areas SDG7 AFFORDABLE AND CLEAN ENERGY Renewable biomass from wet peatlands SDG10 REDUCED INEQUALITY can be used for generating heat at a local Sustainable rural livelihoods, benefits from and regional scale carbon and blue credits for land owners SDG8 DECENT WORK & ECONOMIC GROWTH SDG9 INDUSTRY, INNOVATION & INFRASTRUCTURE Food, fodder, water, fibres, fertilisers, fuel, innovative building and packaging materials from paludiculture, medicine, delicacy, chemicals) provide coastal protection, erosion control, conservation of permafrost sustainable jobs



Thank your for your attention. #peatlandsmatter