

Wetlands– synergies in LULUCF reporting, climate and biodiversity policies

Embracing uncertainties as a solution

19 December 2023, Jeroen Veraart (Wageningen Environmental Research)



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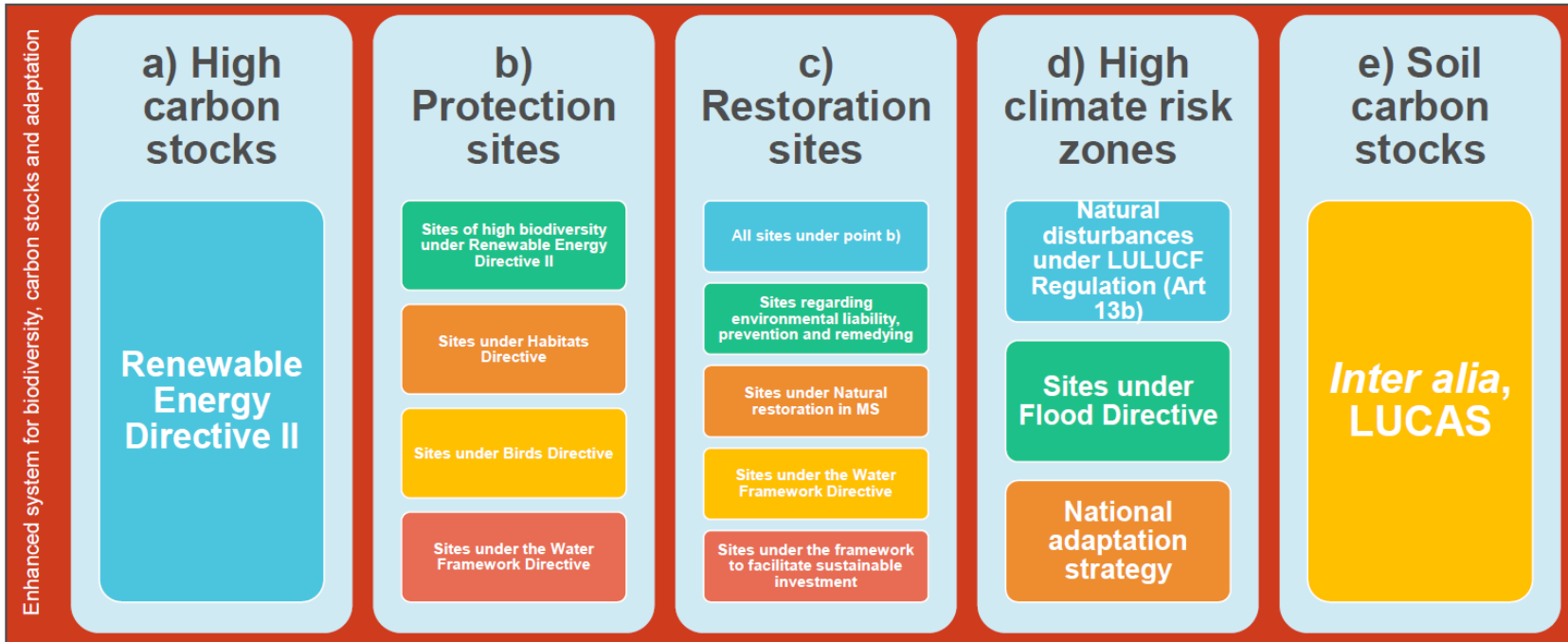
Presentation

- What is the challenge for Dutch Climate Agreement and LULUCF?
- What is the promising message from the lessons learnt in the Netherlands?
- Embracing uncertainties in :
 - CH₄ / CO₂ monitoring in wet- and peatlands
 - land use change /Watermanagement change
 - Different activity data for different environmental policies
- Take home messages for LULUCF and its handbook

For at home: Suggestions for further reading

International context

Enhanced LULUCF monitoring system



Biodiversity Strategy, Nature Restoration Law

Wetlands and climate policies in Netherlands

Dutch climate agreement (2019)



- Organic soils agriculture : 1 Mton CO_{2eq} jr⁻¹ reduction (2030)
- Wet nature & Forest (mineral, organic soils): 0.4-0.8 CO_{2eq} jr⁻¹ reduction (2030)



Research community



Uncertainties:

- *CH₄ fluxes are complex and show high variability , CO₂ dynamics are better understood*
- *Activity data for different policies*
- *Sectoral research communities*

Combined research since 2023 for nature & agriculture on peat offers advantages:

- Knowledge base for both sectors based on similar protocols for monitoring and processed based modelling at organic soils (NOBV)
- Insights from agricultural and nature sites can be used in LULUCF in view of TIER 3 (2027)
- *Embracing uncertainties* by developing an emission factor database tailored for different hydrologic regimes (SOMERS), vegetation, land use and organic soil types

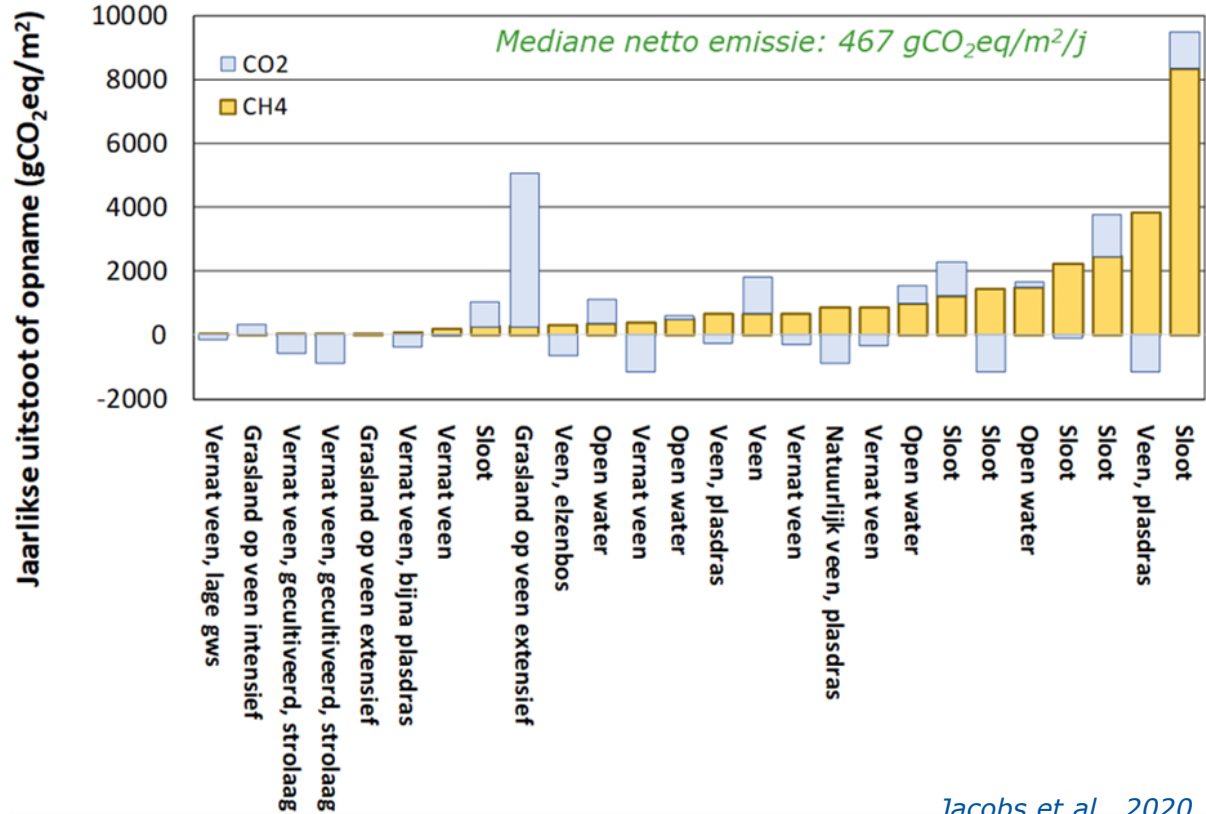


Monitoring sites NOBV (2023)

Uncertainty 1 :Methane emissions

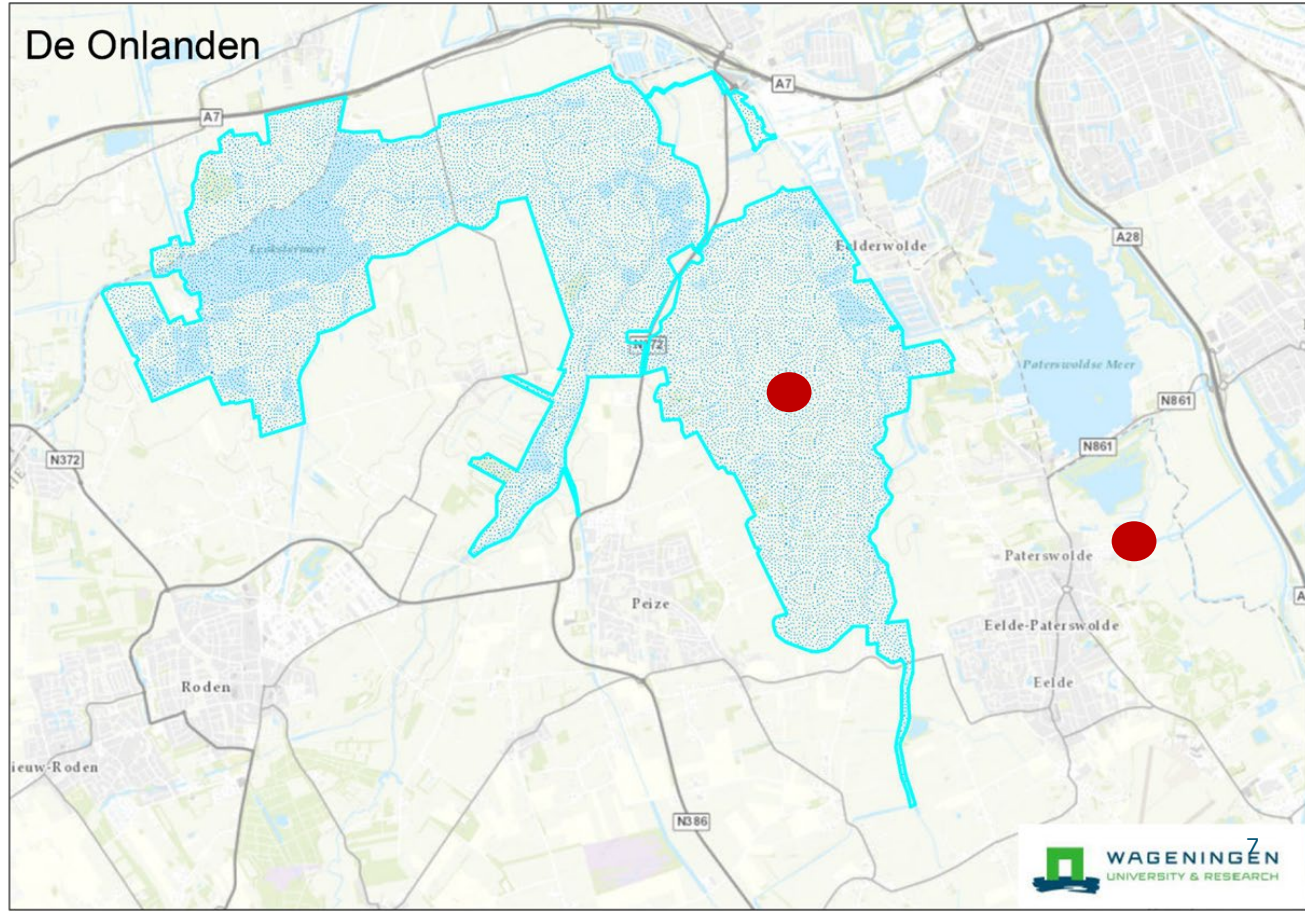
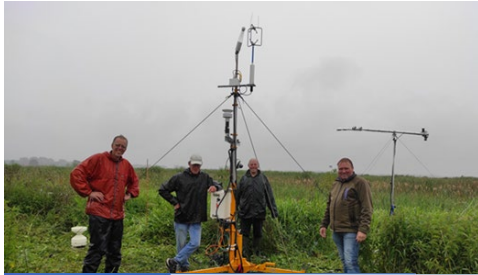


Meetlocaties in NL, B and DE:
CH₄ en CO₂ tegelijkertijd gemeten
Kamermetingen en/of EC

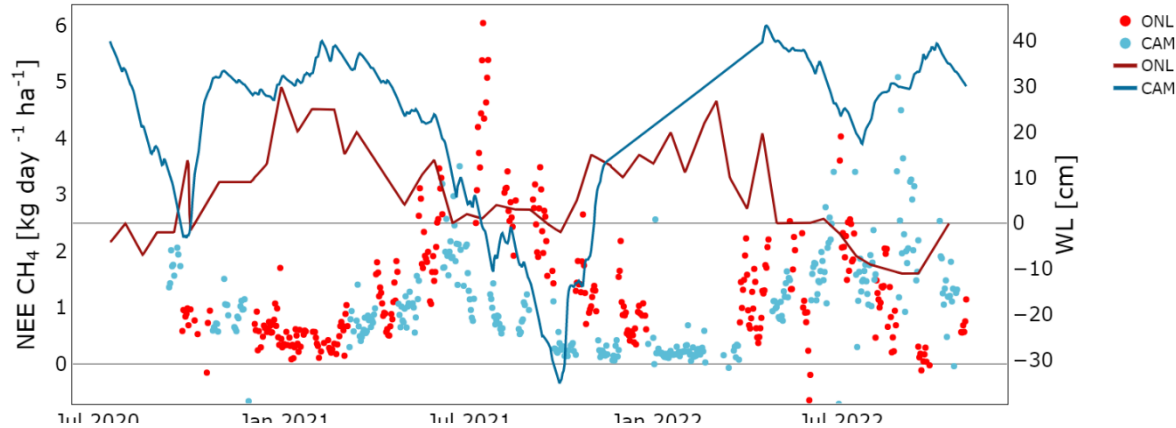


Jacobs et al., 2020

CH₄/CO₂ monitoring at Onlanden & Camphuys



CO₂/CH₄ fluxes and water levels (up to 2023)



Onlanden

CO₂ : sink

CH₄: source

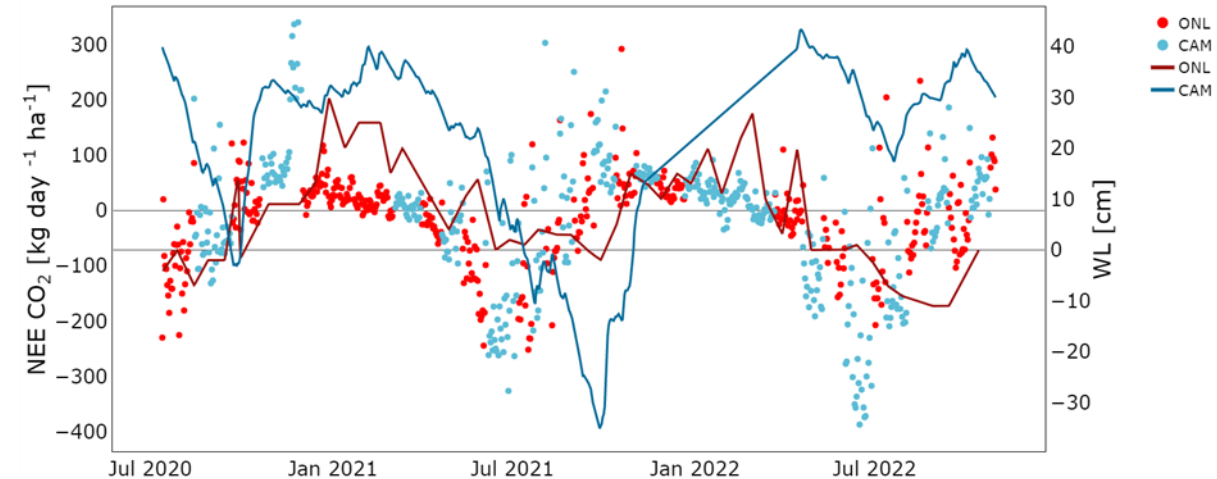
CO₂-eq: source

Camphuis

CO₂ : sink

CH₄: source

CO₂-eq: sink



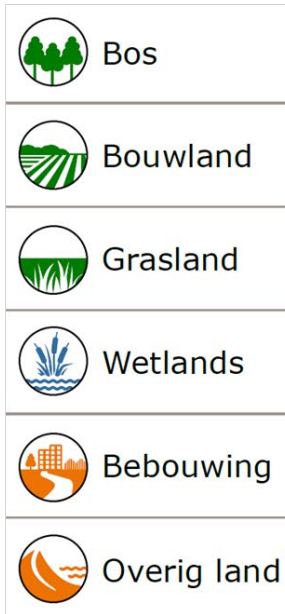
More information: [Kruijt e.a., 2023](#)


Environmental objectives in this area

- >5 million m³ Water retention capacity (surface water) to protect city Groningen for water nuisance (climate adaptation)
- Restoration of 1100ha coastal fens
- Reduced GHG emissions by rewetting (in CO₂-eq ha⁻¹yr⁻¹) compared to agricultural areas (*proven*), on the long-term a netto GHG sink? (*in research/uncertainty*)



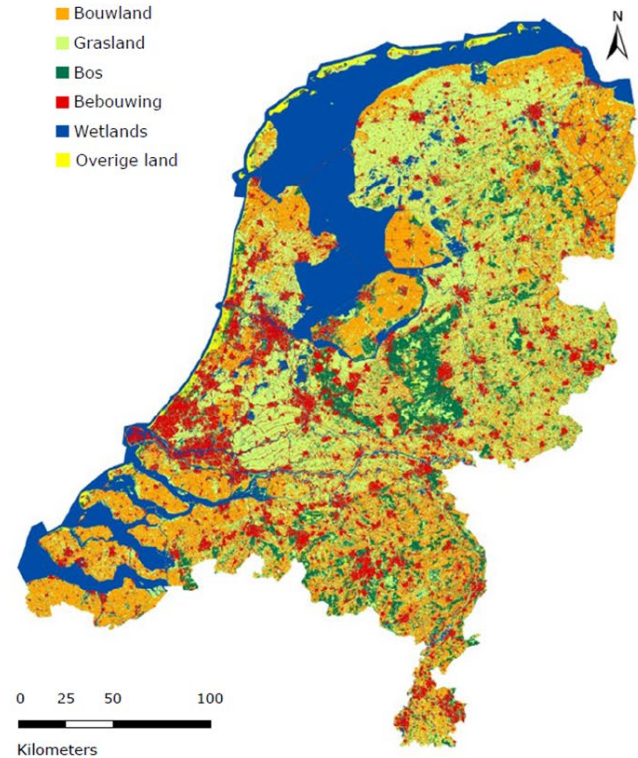
Uncertainty 2: Land use categories/Activity data



 Geogste houtproducten

Including emissions
(drained) peatlands and
salt marshes

Mainly open water



Definition of wetlands in LULUCF

WATER EN NATURE policies



- Salt marshes
- Raised bogs (many divisions)
- Coastal fens (many divisions)
- Open water
- Riparian (wet) Forest
- Reed beds

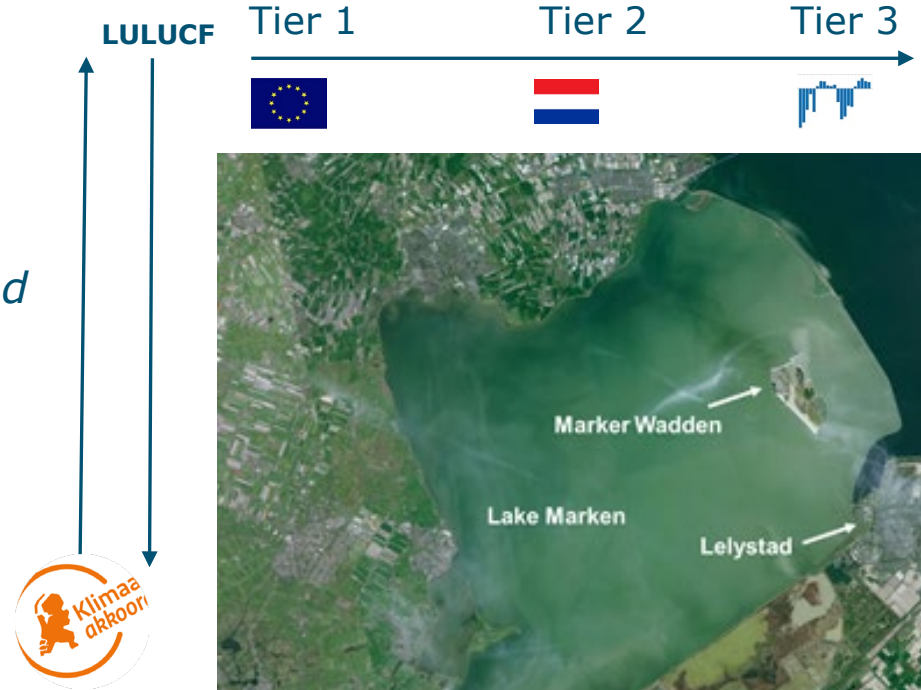
LULUCF -Netherlands

	Forest	Grasland	Wetland
	×		
			×
	×		
			×
×			
	×		×



LULUCF Method - Wetlands

- Land use change
- Emission factors per land use type
- *Management*
 - *Natural ↔ managed wetland*
 - *Hydrology*
 - *Water Quality*
 - *Vegetation*



Activity data LULUCF

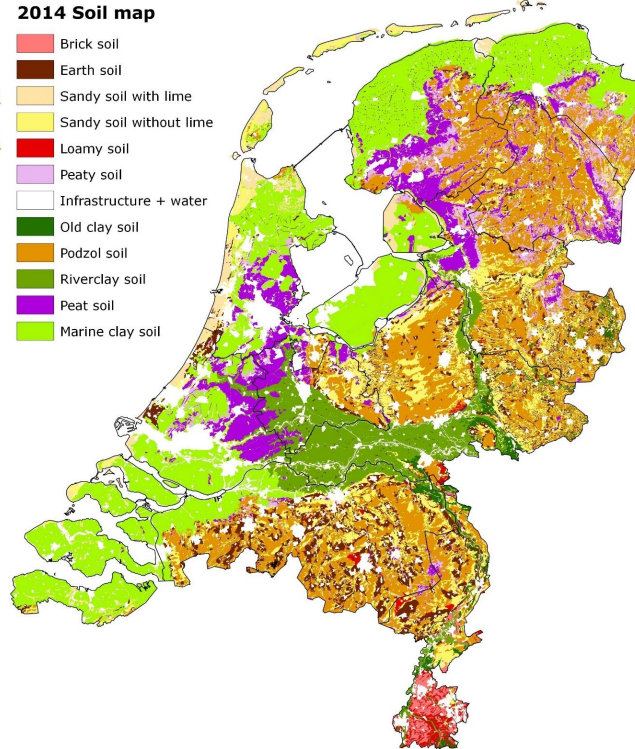
2021 Land-use map

- Grassland
- Trees outside forest
- Cropland
- Heath
- Forestland
- Settlements
- Wetland
- Reed
- Beaches, drifting sand, sand plates and dunes



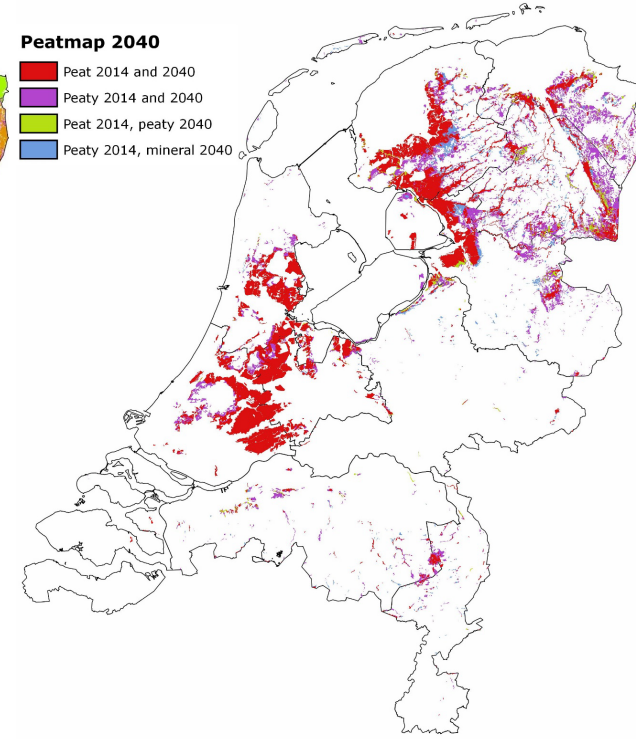
2014 Soil map

- Brick soil
- Earth soil
- Sandy soil with lime
- Sandy soil without lime
- Loamy soil
- Peaty soil
- Infrastructure + water
- Old clay soil
- Podzol soil
- Riverclay soil
- Peat soil
- Marine clay soil

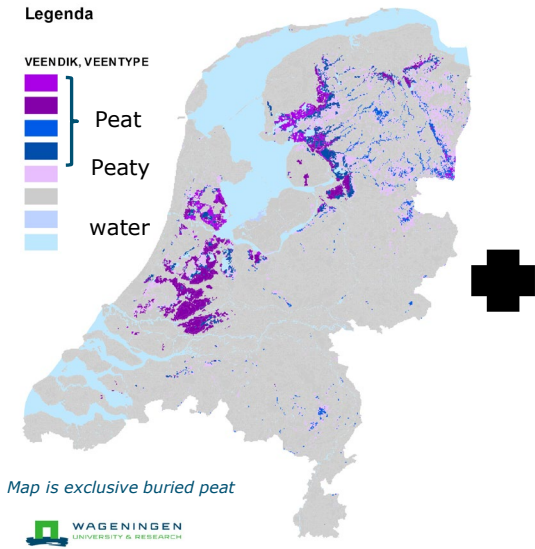


Peatmap 2040

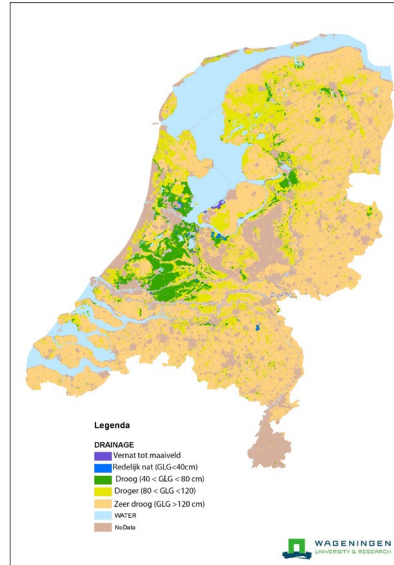
- Peat 2014 and 2040
- Peaty 2014 and 2040
- Peat 2014, peaty 2040
- Peaty 2014, mineral 2040



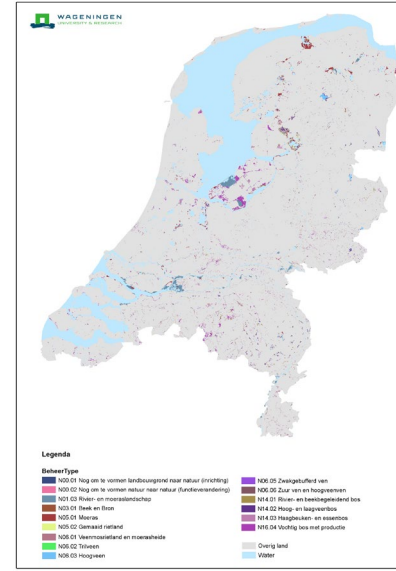
Other approaches from a biodiversity perspective



Soil



Hydrology



Vegetation types to be protected with high carbon sequestration potential

Sketch of Areas where biodiversity conservation

&

carbon emission reduction can be combined

Take home messages

- Embrace uncertainties (emission factors) instead of uncertainty reduction
- Additional environmental policies increase complexity of activity data, however, : dare to experiment with activity data as it creates eye-openers
- A smart design of the science-policy interface will reduce social uncertainties and increase support for climate measures in peatlands

Thank for your attention

More information?

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Further reading:

- [NOBV – Veenweide](#) (UK website)
- [H2020 REWET project](#) (UK website) (WENR participant)
- [Scientific publications NOBV](#) (UK)
- [Dutch LULUCF for Dummies](#) (Dutch)
- [Dutch LULUCF for experts](#) (UK)
- [Kansenkaart klimaatbuffers](#) (Dutch)
- [Klimaatenvolpe Natte natuur](#) (Dutch)

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