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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Contents

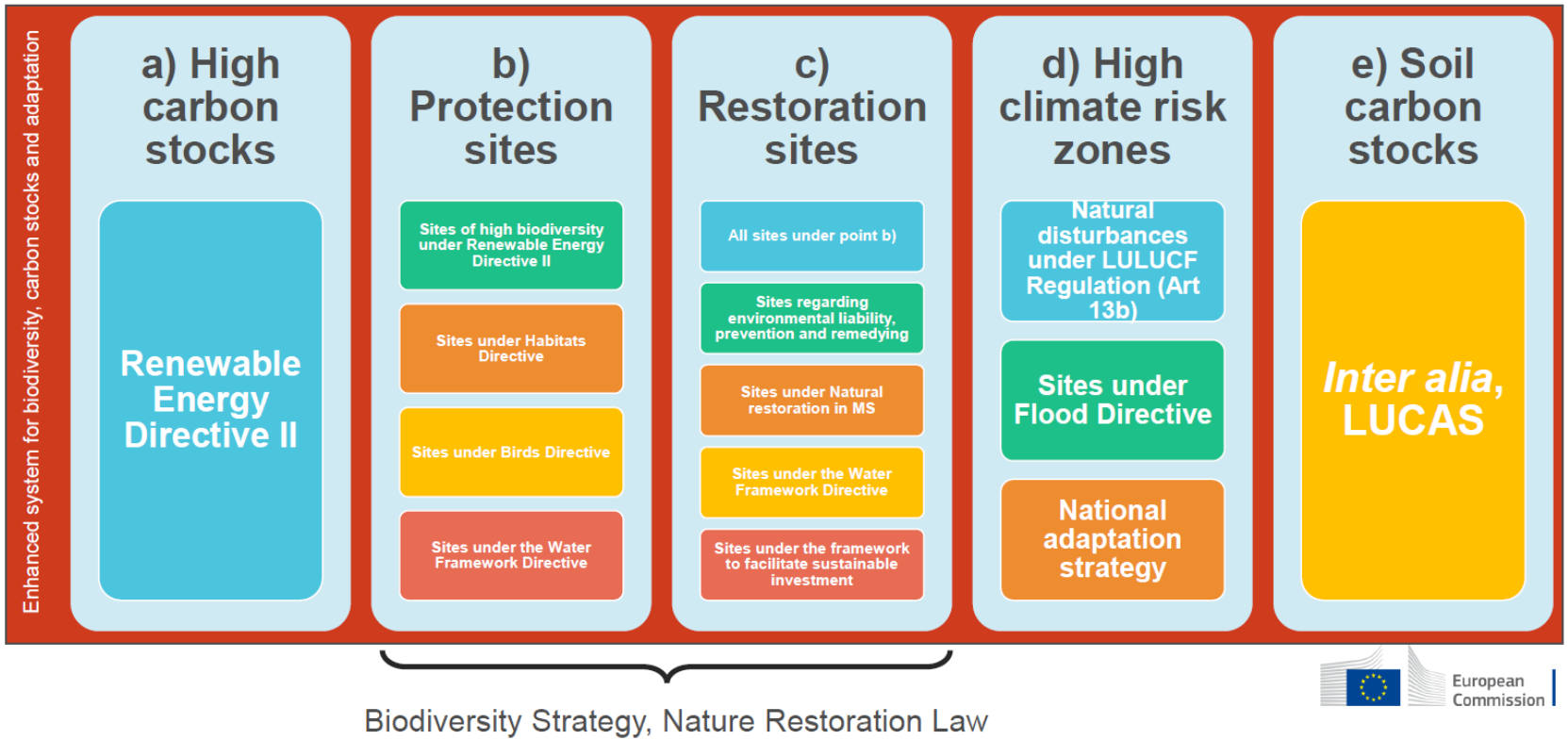
Presentation

- What is the challenge for Dutch Climate Agreement and LULUCF regarding wetlands?
- What is the promising message from the lessons learnt in the Netherlands?
- Embracing uncertainties in :
    - CH_4 / CO_2 monitoring in wet- and peatlands
    - land use change /Water management 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



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

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stowa

Ministerie van Landbouw, Natuur en Voedselkwaliteit

vereniging van bos- en natuurterreineigenaren VBNE + WAGENINGEN UNIVERSITY & RESEARCH

Uncertainties:

- *CH_4 fluxes are complex and show high variability , CO_2 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)

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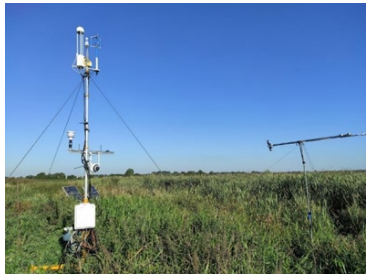
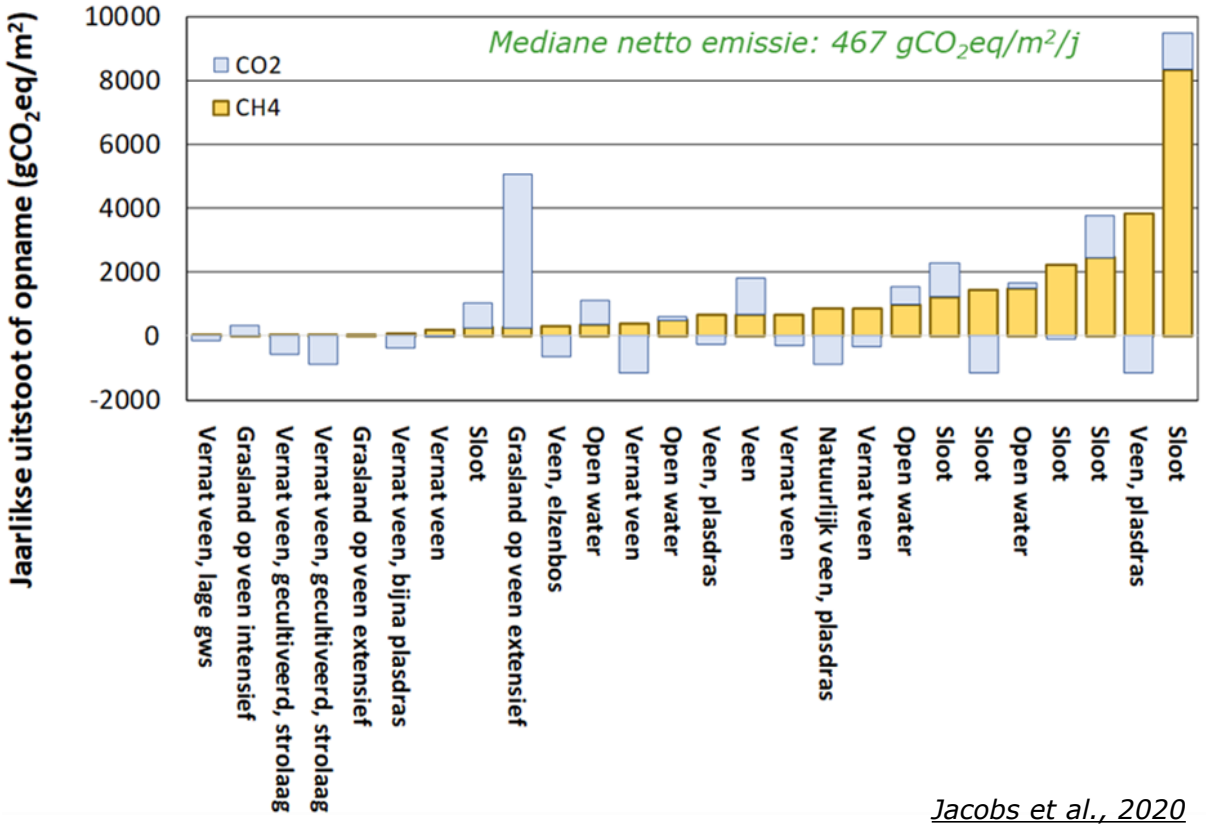
Uncertainty 1 : Methane emissions

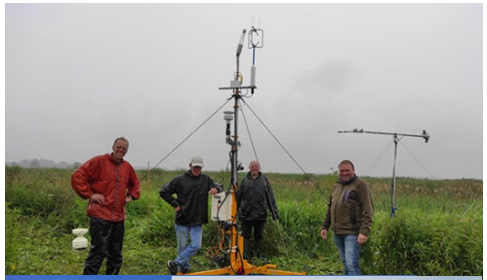


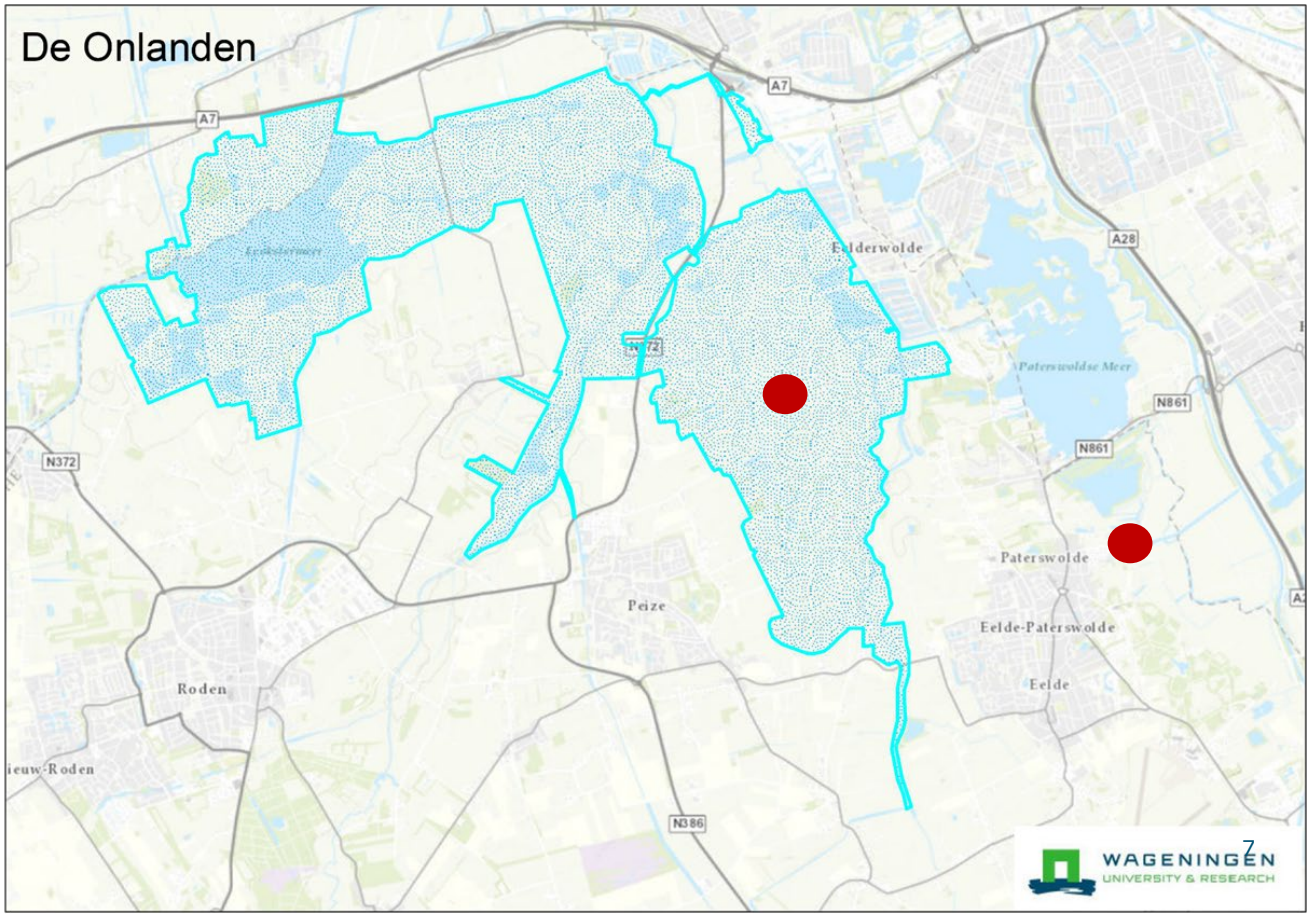
Meetlocaties in NL, B and DE:
CH4 en CO2 **tegelijkertijd** gemeten
Kamermetingen en/of EC



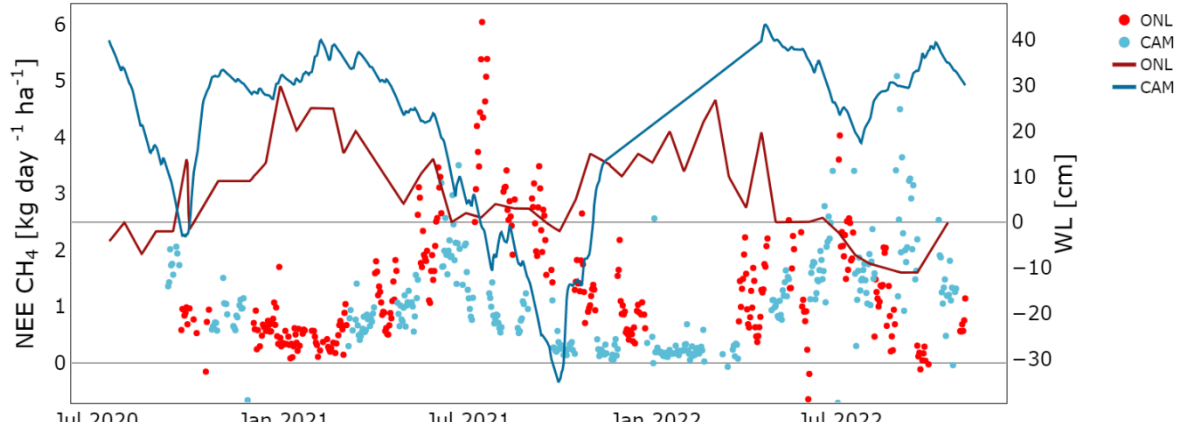
Jacobs et al., 2020

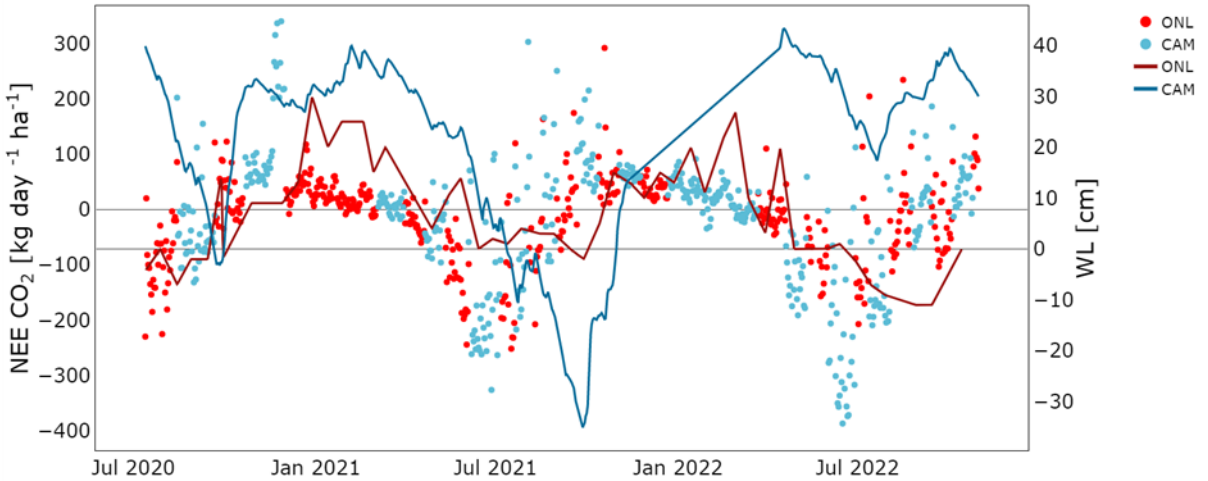
CH4/CO2 monitoring at Onlanden & Camphuys





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





Onlanden

CO_2 : sink

CH_4: source

CO_2-eq: source

Camphuys

CO_2 : sink

CH_4: source

CO_2-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 bogs
- Reduced GHG emisions by rewetting (in CO2-eq $ha^{-1}jr^{-1}$) compared to agricultural areas (*proven*), on the long-term a netto GHG sink? (*in research/uncertainty*)

Veraart et al, 2019; Zingstra & Vertegaal, 2021

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natuurlijke klimaatbuffers

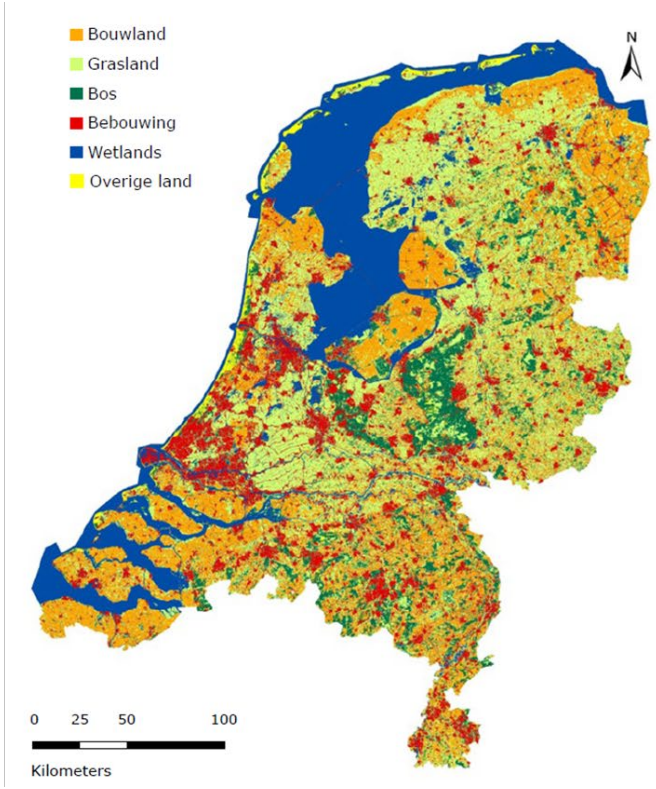
Uncertainty 2: Land use categories/Activity data

- Bos
- Bouwland
- Grasland
- Wetlands
- Bebouwing
- Overig land

Including emissions (drained) peatlands and salt marshes

Mainly open water

Geoogste houtproducten



Hendriks e.a., 2021

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
	✘	
		✘
	✘	
		✘
✘		
	✘	✘

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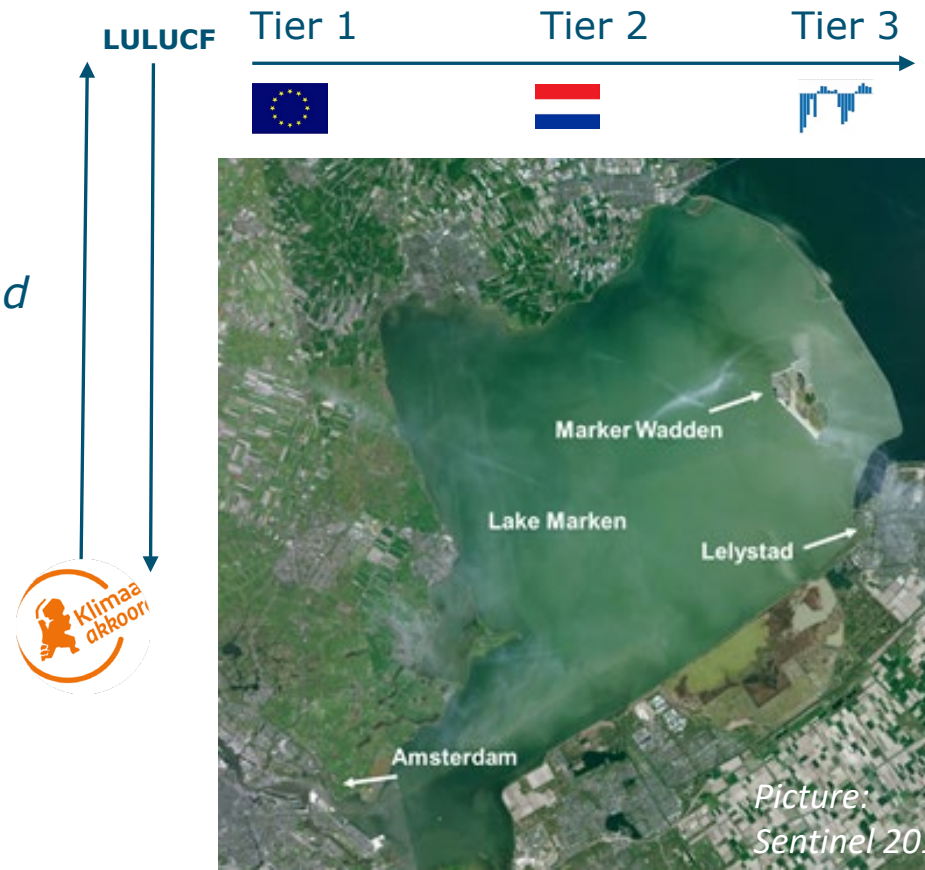
LULUCF Method - Wetlands

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



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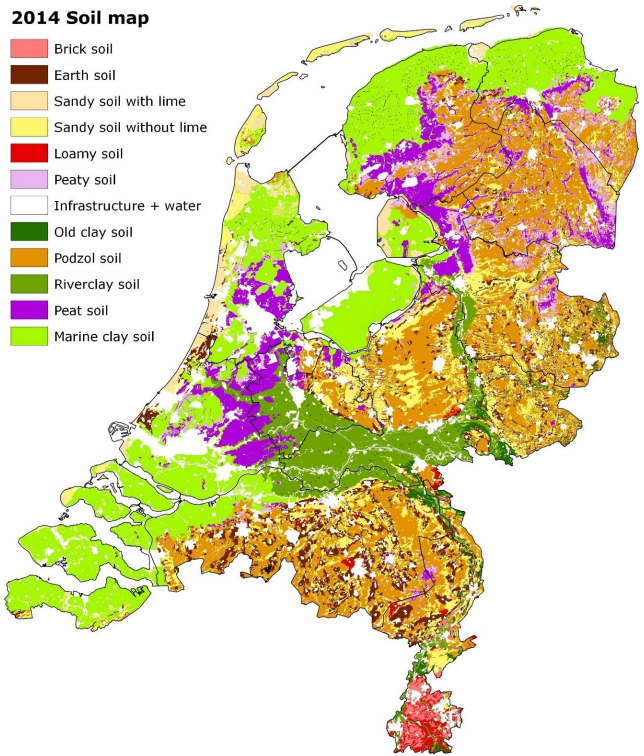
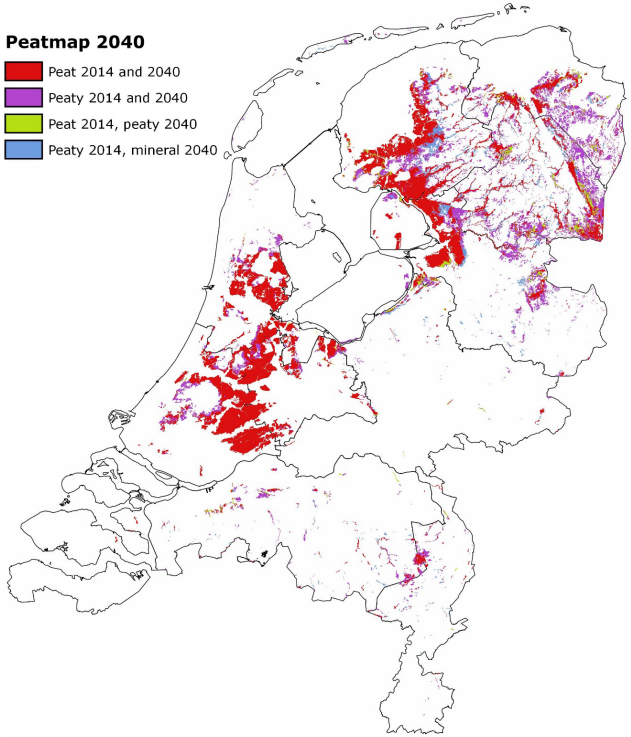
Activity data LULUCF





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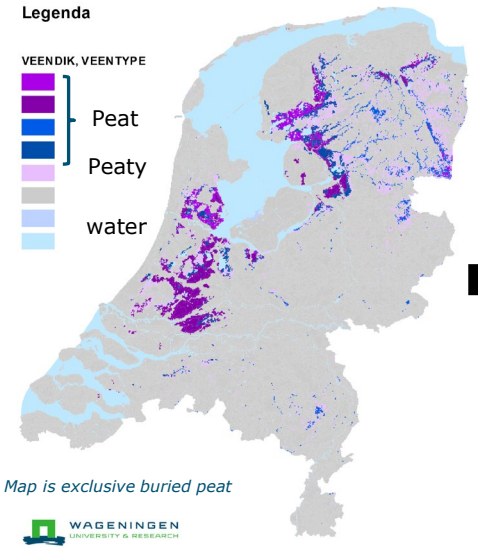
[Arets ea., 2023]

Other approaches from a biodiversity perspective



Map is exclusive buried peat

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Soil

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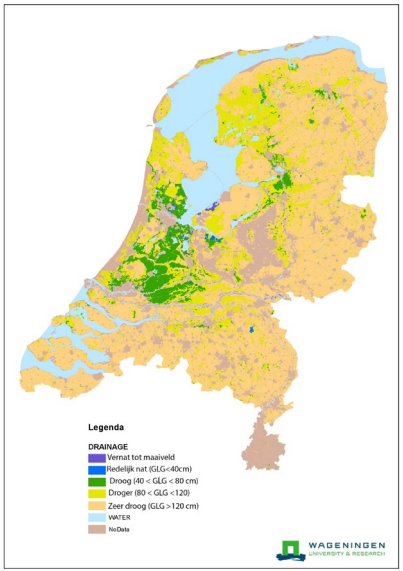

Hydrology

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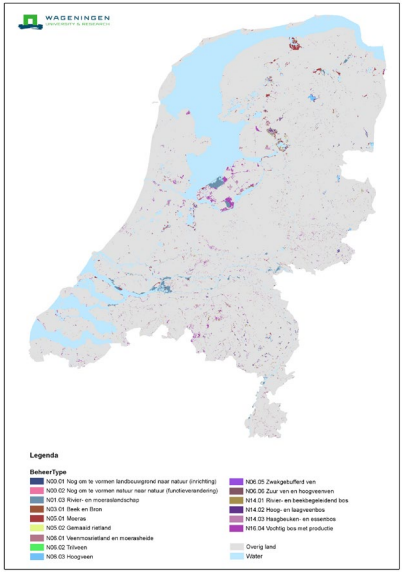

Vegetation types to be protected with high carbon sequestration potential

=

Sketch of Areas where biodiversity conservation

&

carbon emission reduction can be combined

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Wösten et al., 2020

Take home messages

- Embrace uncertainties (emission factors) instead of uncertainty reduction
- Additional environmental policies increase complexity of activity data, however,: exploring with (alternative) activity data creates eye-openers
- A smart design of the science-policy interface will reduce social uncertainties and increase support for climate measures in peatlands
- How to align research/monitoring with LULUCF accounting?

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)
- Klimaatenveloppe Natte natuur (Dutch)

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