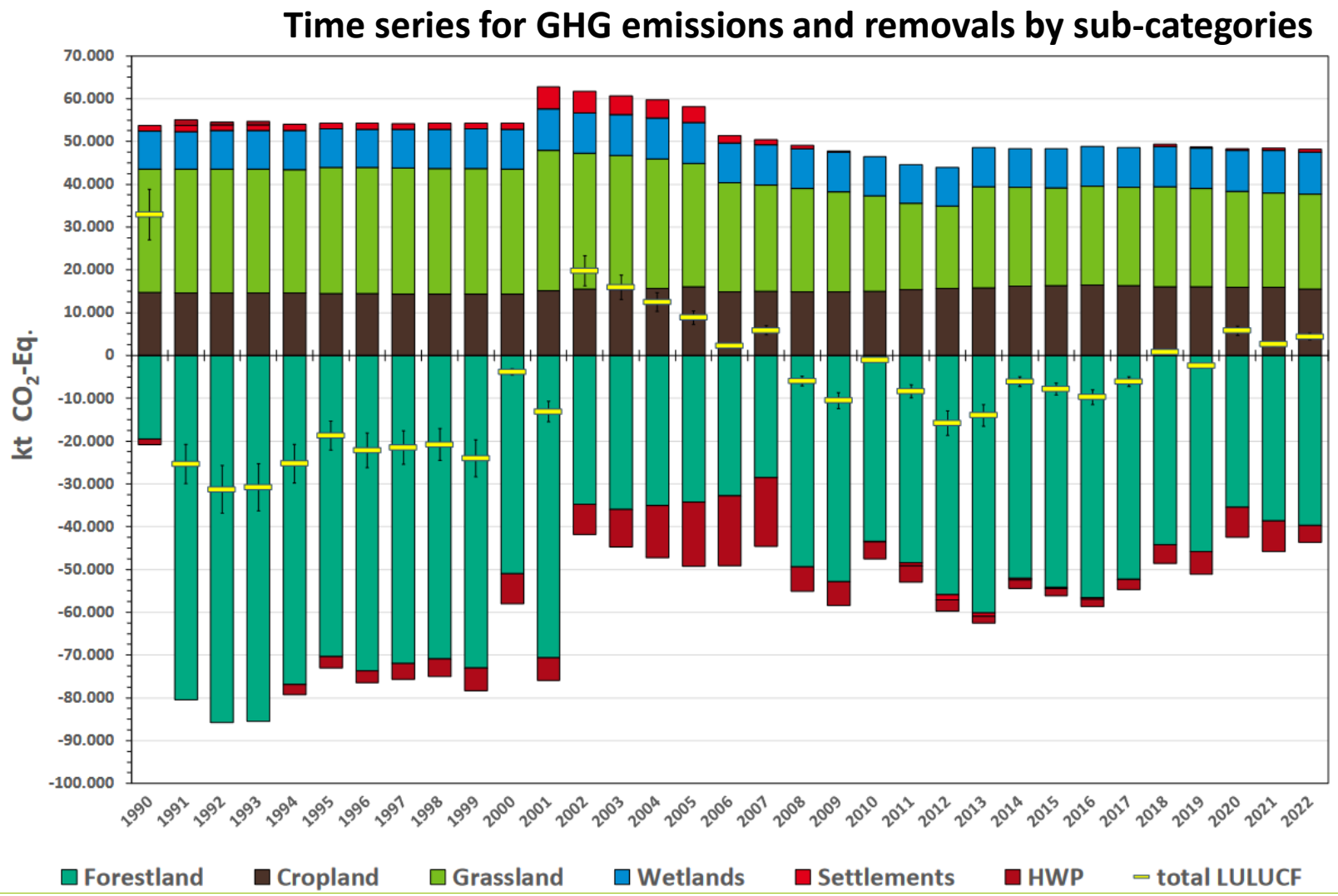
A foggy telescope: challenges for the role of German forests in climate policy

Hannes Böttcher | LULUCF Workshop Umeå (online) | 31.10.2024

Germany‘s LULUCF sector

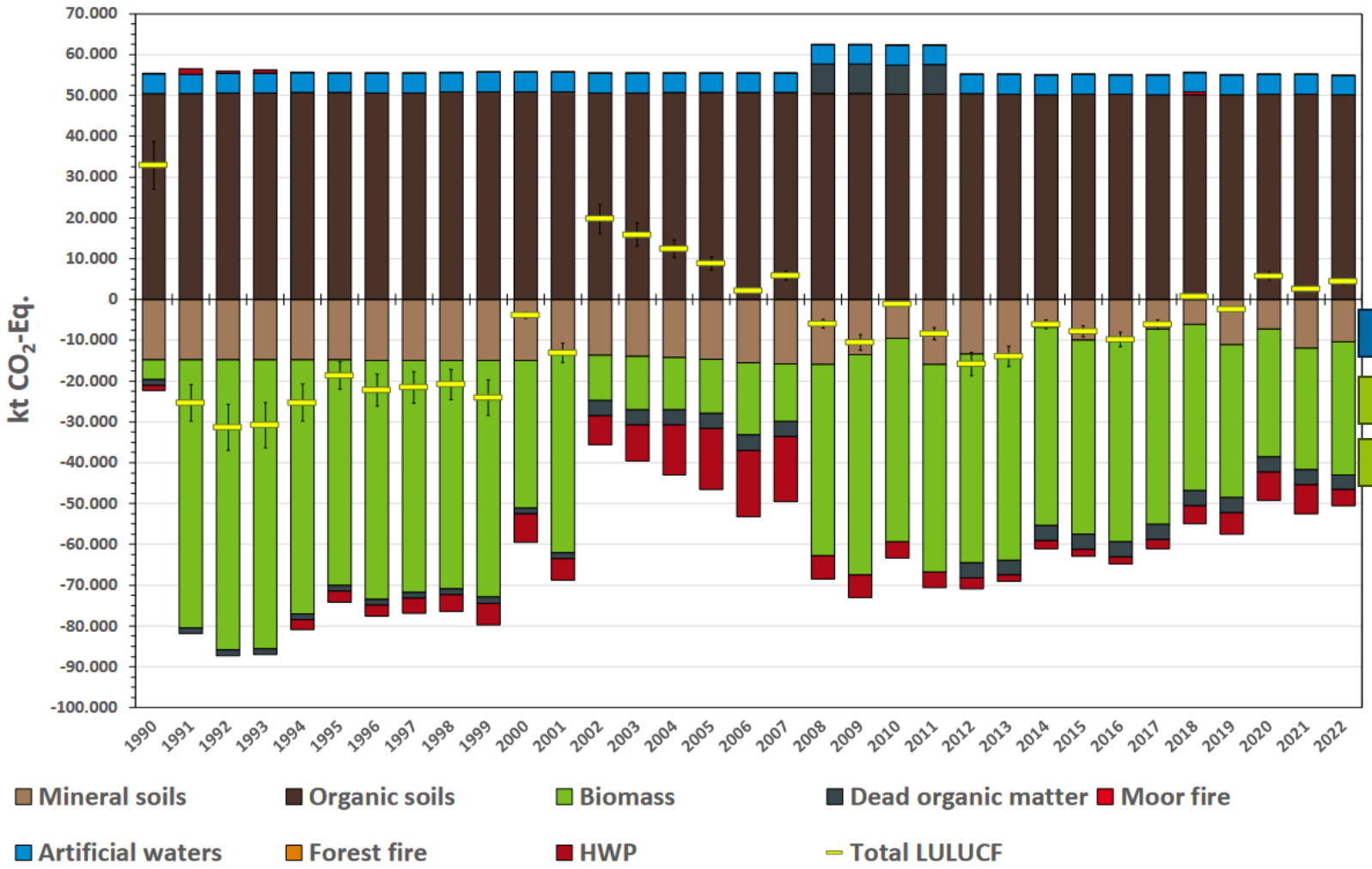
- Sector is a net source of 4 Mt CO_2eq (2022)
- Forest reported to be net sink, similar size of emissions from agricultural land and wetlands
- Highest variability reported for forests
- Highest sink about -20 to -30 Mt CO_2eq
- Periods with lower forest sink show only limited increases in HWP



NID Germany 2024, https://unfccc.int/sites/default/files/resource/2024-04-15_DE_NID_2024_UNFCCC_english.pdf?download

Germany‘s LULUCF sector

Time series for GHG emissions and removals by pools



- Forest biomass sink completely „eaten up“ by emissions from organic soils

EU LULUCF 2030 [+3.7Mt] ?

KSG 2030 [-25Mt]

KSG 2045 [-40Mt]

- Ambitious targets under EU LULUCF Regulation and national Climate Law

NID Germany 2024, https://unfccc.int/sites/default/files/resource/2024-04-15_DE_NID_2024_UNFCCC_english.pdf?download

Bad press for Germany‘s forests

Süddeutsche Zeitung

Jetzt abonnieren

Menü | Meine SZ | SZ Plus | US-Wahl | Nahost | Ukraine | Politik | Wirtschaft | Meinung | Panorama | Sport | München | Kultur

Home > Politik > Umweltpolitik > Bundeswaldinventur: Das Klima killt den Klimaschützer

Bundeswaldinventur

Das Klima killt den Klimaschützer

8. Oktober 2024, 16:44 Uhr | Lesezeit: 2 Min. | Kommentare

CLEAN ENERGY WIRE

Journalism for the energy transition

NEWS

08 Oct 2024, 13:44 Jack McGovan | Germany

Germany’s forests no longer a carbon sink, now net emitters – report

Bloomberg

Live TV | Markets | Economics | Industries | Tech | Politics | Businessweek | Opinion | More

Green

Germany’s Forests Become Carbon Source After Years of Damage

- Drought and storms have destroyed and weakened trees
- German woodland holds less carbon than 2017, survey shows

By Carolynn Look

8. Oktober 2024 at 19:00 MESZ

Menü | Suche | Abo

agrarheute

Pflanze | Technik | Tier | Management | Markt | Politik | Energie

Top-Thema BAYWA: DIE GESCHICHTE ZUR KRISE

agrarheute > Politik > Neue Bundeswaldinventur ist alarmierend: Wald fällt im Klimaschutz aus

Klimaschutz

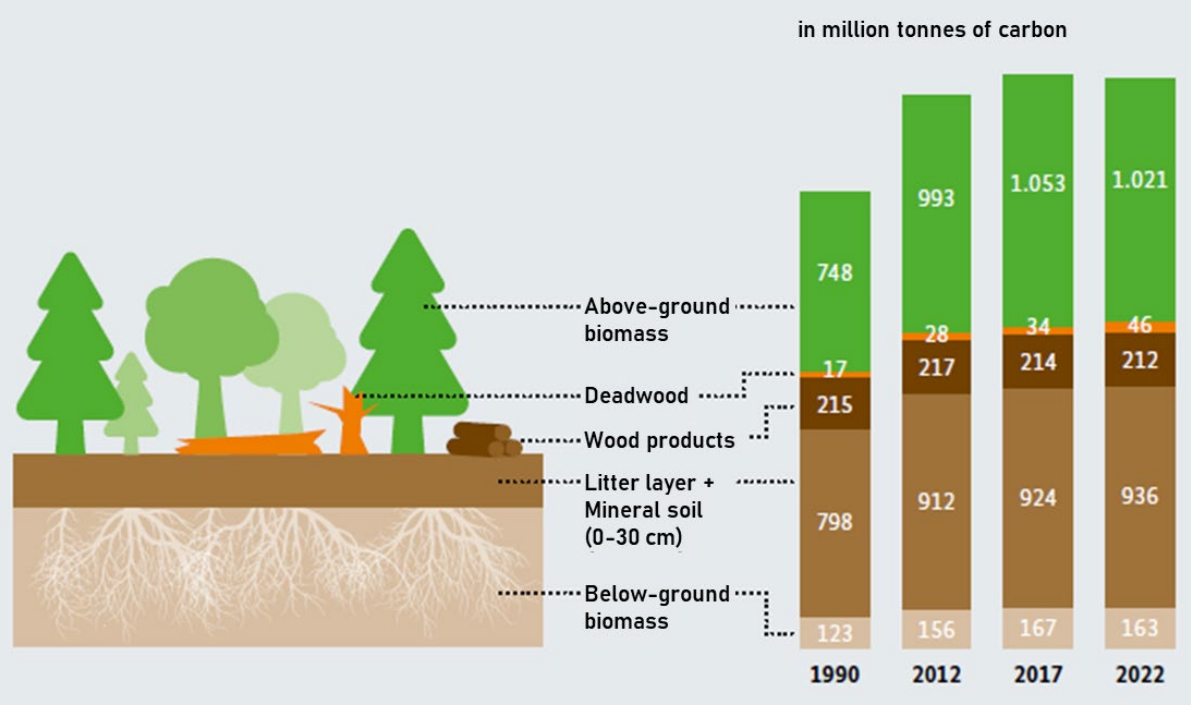
Neue Bundeswaldinventur ist alarmierend: Wald fällt im Klimaschutz aus

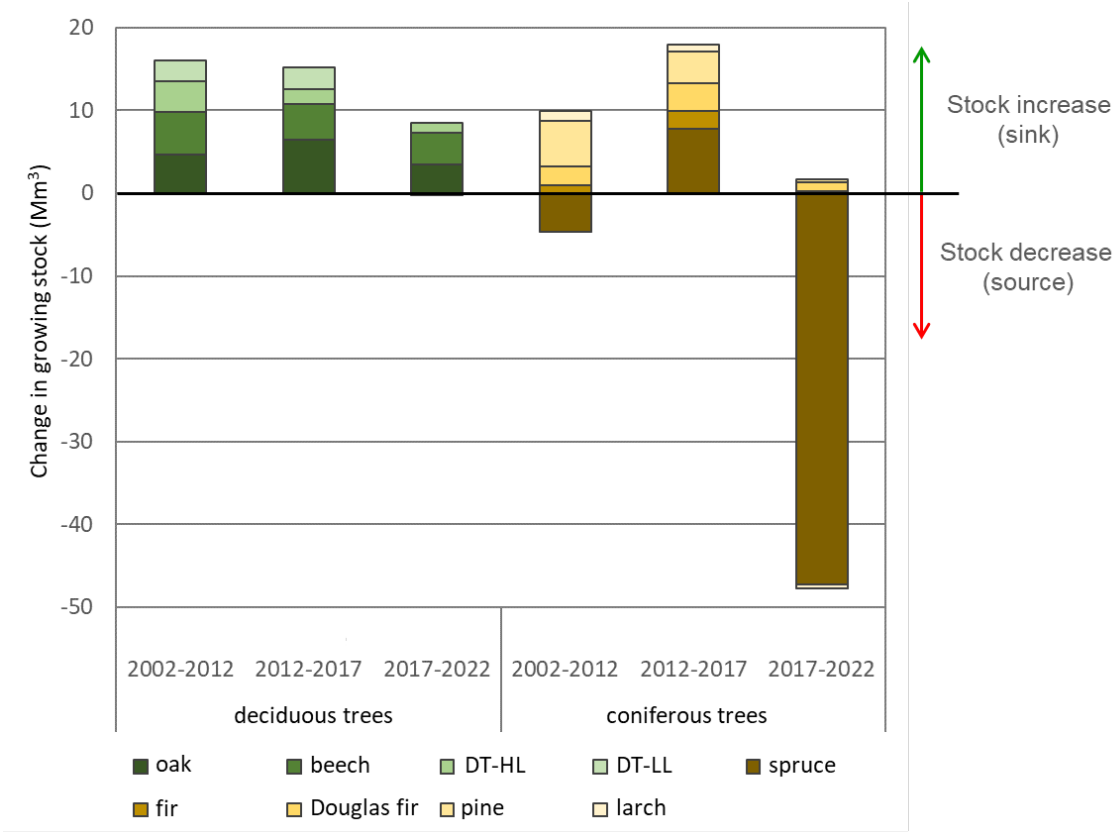
© stock.adobe.com/ Thomas Soellner Forstwirte hatten viel zu tun, um die Folgen der Dürre in den Wäldern zu beheben. Das schlägt sich auch in der Bundeswaldinventur nieder.

Germany‘s most recent NFI

- Recent NFI: forest biomass C stocks in 2022 found to be at level of 2012

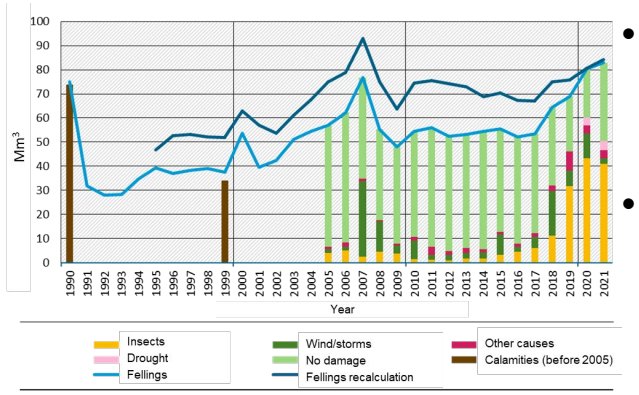
→ no increase in stocks = no (net) sink





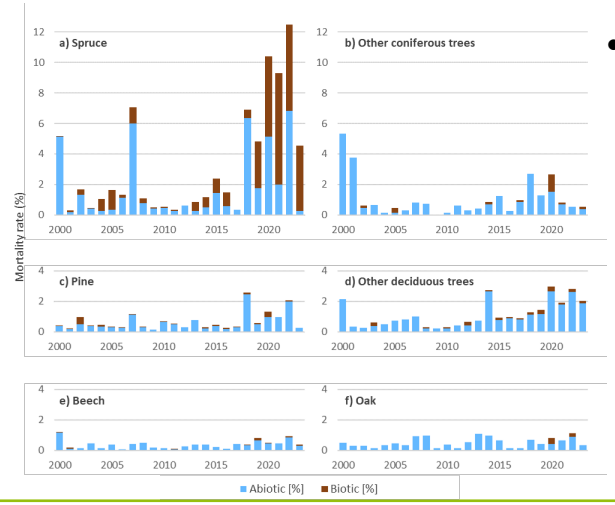
- Need for a differentiated look at species
- Massive losses of spruce biomass C!

Making use of available data for earlier estimates of effects on GHGs



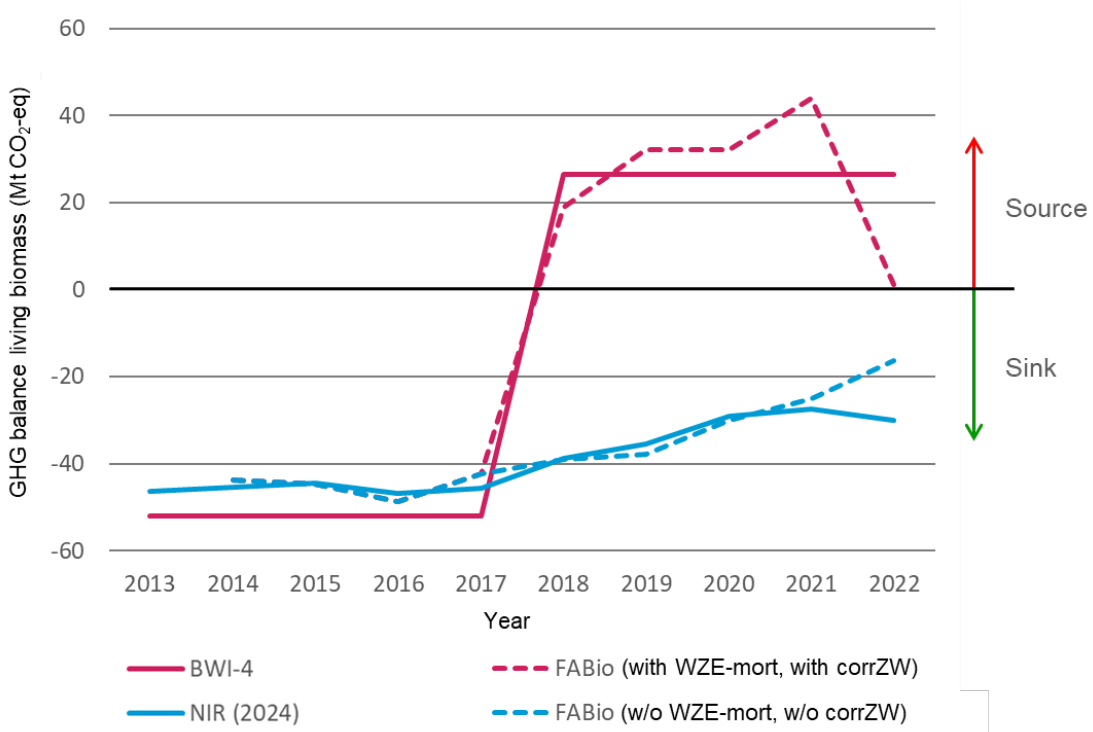
- Annual statistics on harvest statistics
- Share of wood from salvage logging

+



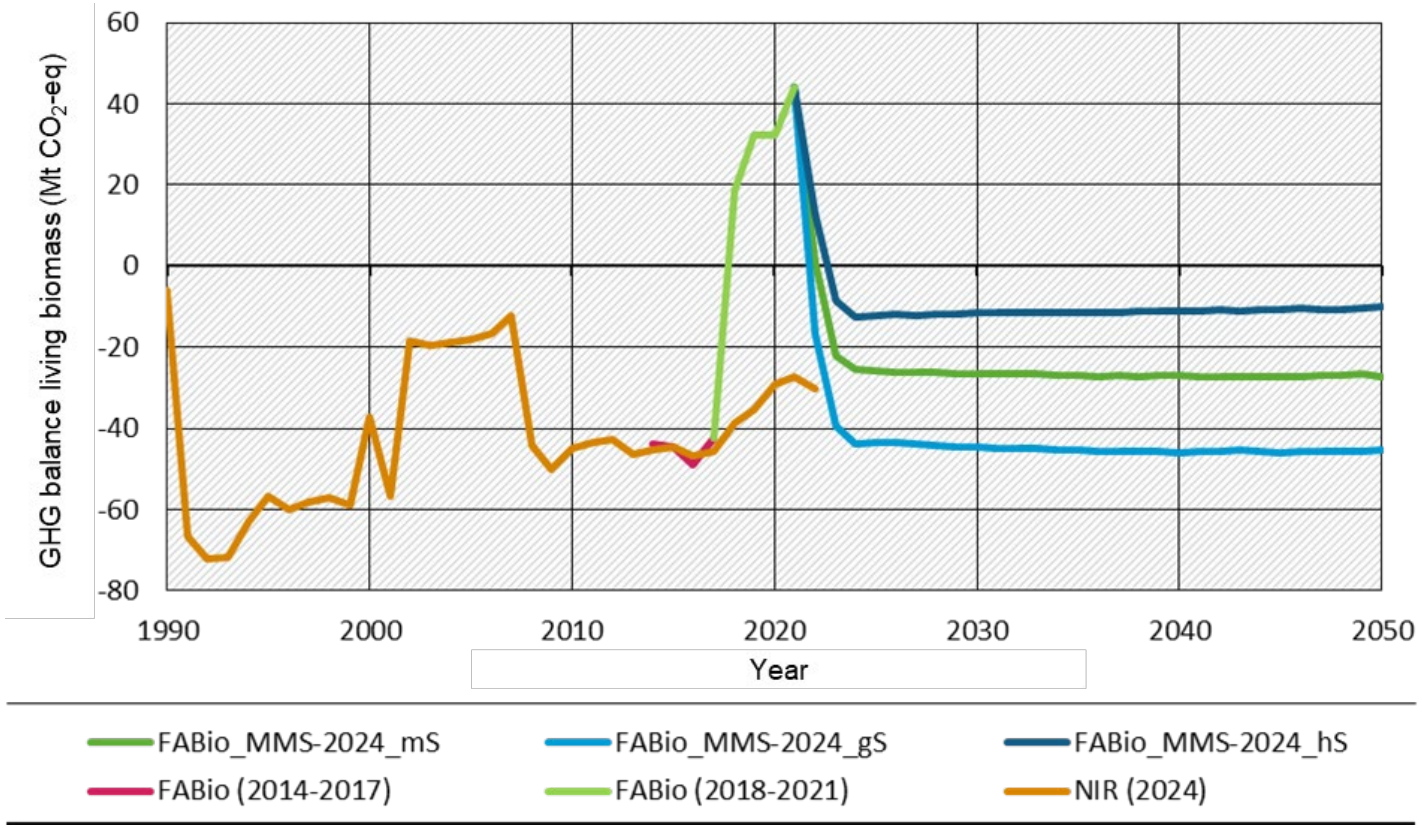
- Annual assessment of tree mortality and forest health

→ Model-based estimates of changes in living biomass C stocks

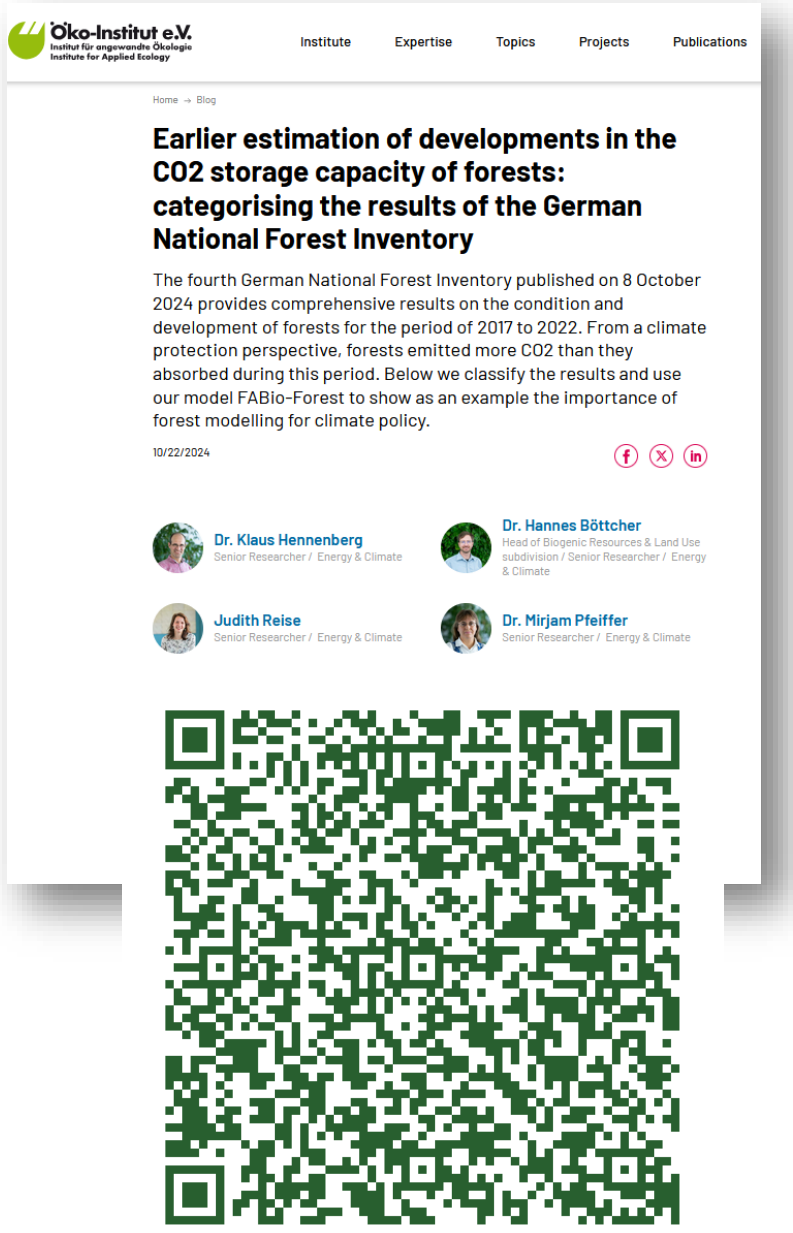


Clearing some fog from the telescope

- Model projections with alternative assumptions on intensity of natural disturbances



Hennenberg et al. (2024a)


Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Institute Expertise Topics Projects Publications

Home → Blog

Earlier estimation of developments in the CO2 storage capacity of forests: categorising the results of the German National Forest Inventory

The fourth German National Forest Inventory published on 8 October 2024 provides comprehensive results on the condition and development of forests for the period of 2017 to 2022. From a climate protection perspective, forests emitted more CO2 than they absorbed during this period. Below we classify the results and use our model FABio-Forest to show as an example the importance of forest modelling for climate policy.

10/22/2024

Dr. Klaus Hennenberg
Senior Researcher / Energy & Climate

Dr. Hannes Böttcher
Head of Biogenic Resources & Land Use subdivision / Senior Researcher / Energy & Climate

Judith Reise
Senior Researcher / Energy & Climate

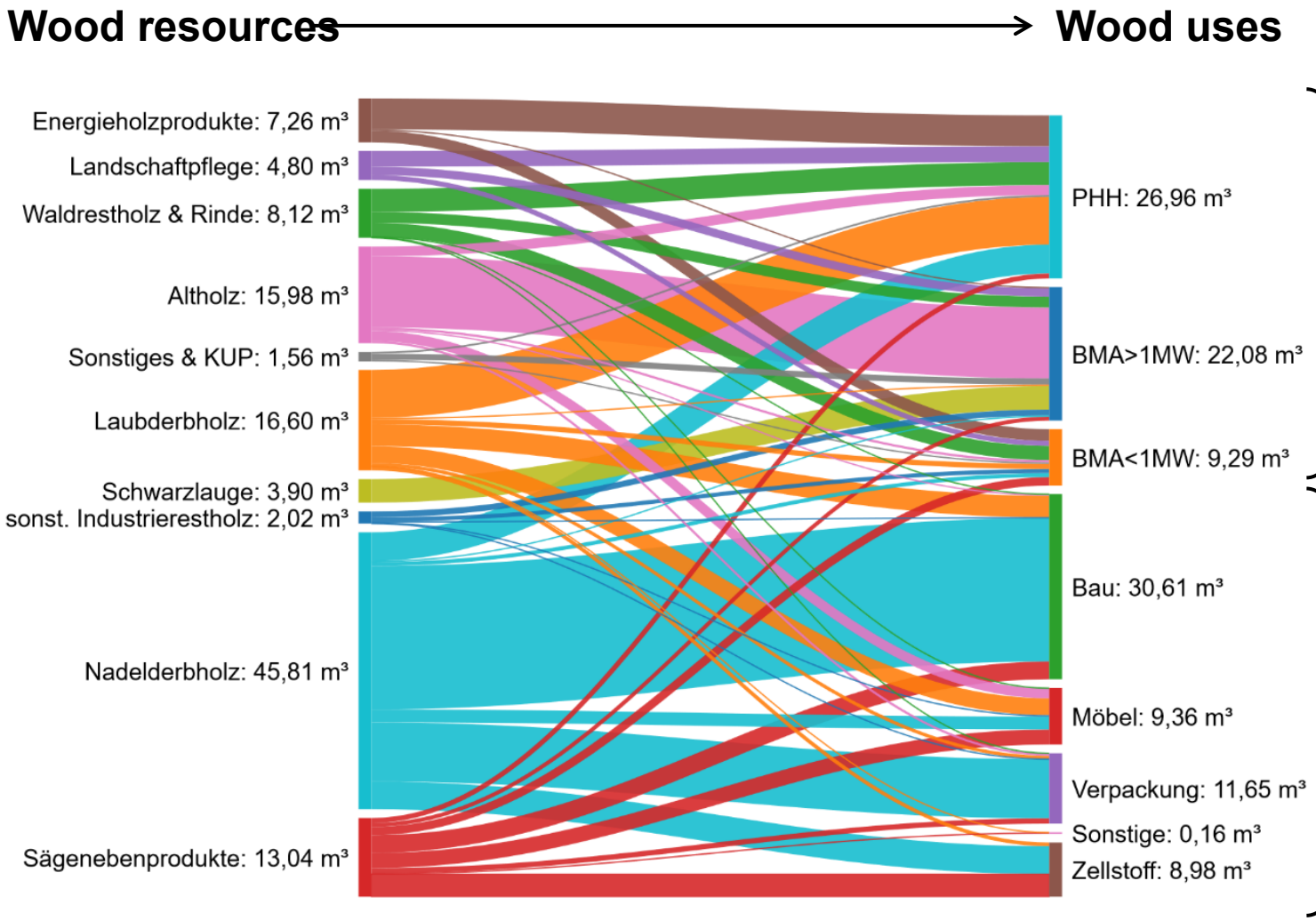
Dr. Mirjam Pfeiffer
Senior Researcher / Energy & Climate

https://www.oeko.de/en/blog/earlier-estimation-of-developments-in-the-co2-storage-capacity-of-forests-categorising-the-results-of-the-german-national-forest-inventory/

https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/projektionen_oeko_waldszenarien.pdf

Öko-Institut e.V.

Wood use matters (to some degree)



Energy use

Increase C in resilient forest stands

Geological storage

Use wood more in long-lasting products and cycles

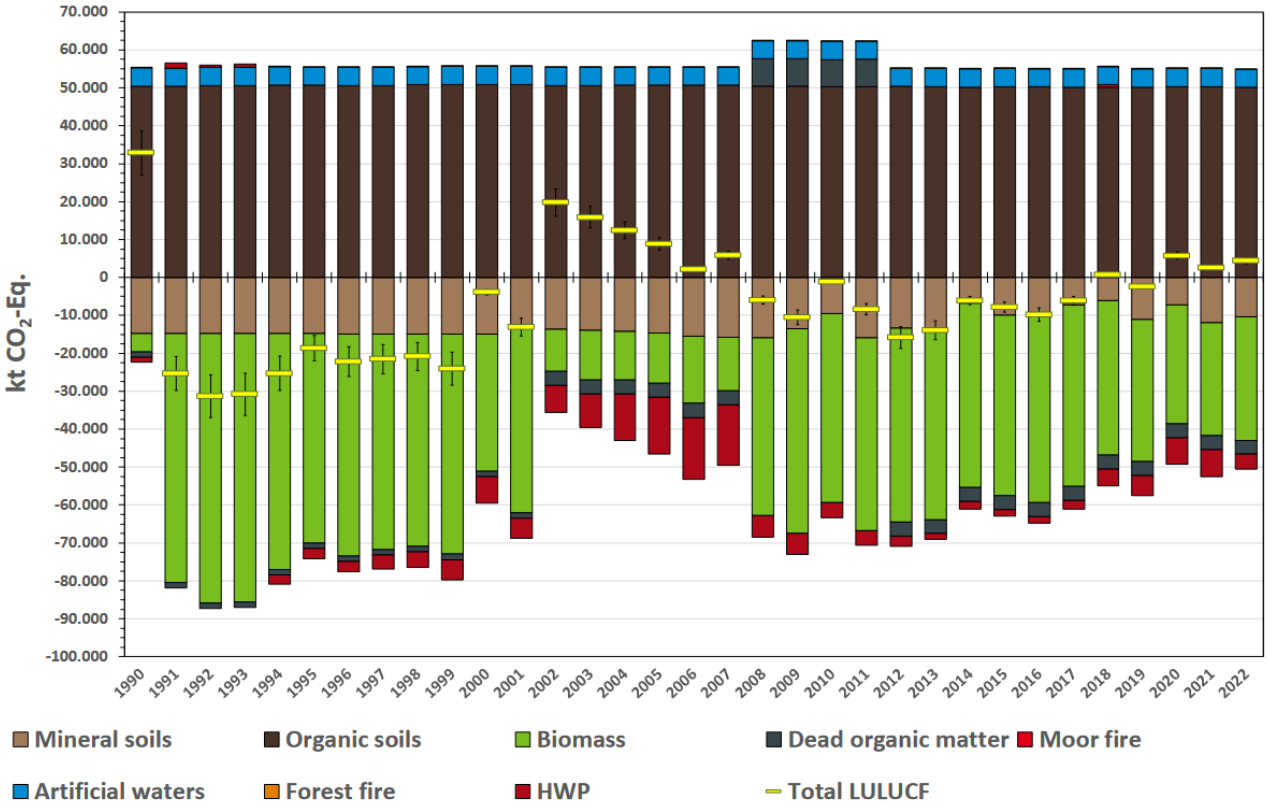
Material use

Hennenberg et al. (2024b)
BioSINK Final report (in German), Annex D

https://www.umweltbundesamt.de/publikationen/auswirkungen-der-energetischen-nutzung-forstlicher

Invisible emissions and removals in LULUCF

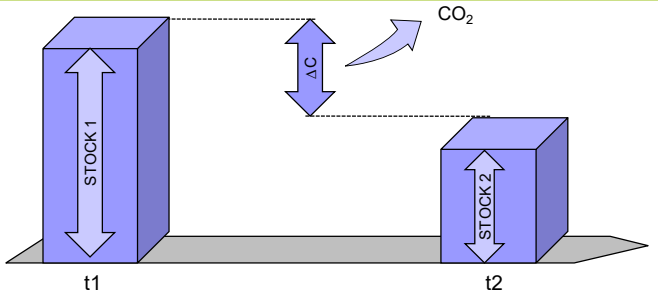
- Reporting focuses on net balance of different categories
  - Forest land = sink
  - Settlements = source
- Invisible are gross emissions and removals **within** categories
  - **The only "real" sink**: Biomass growth (NPP)
  - Biomass extraction is an emission
  - Transfer: between categories, e.g. forest biomass to Harvested Wood Products only limited



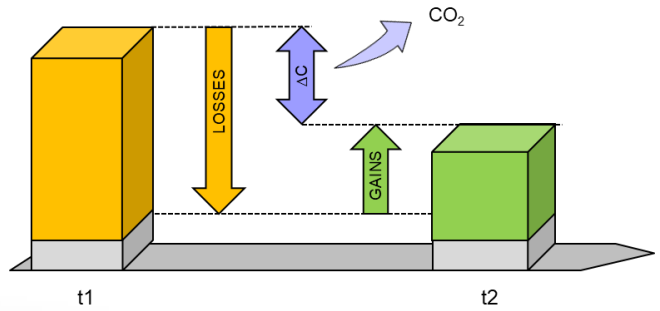
Invisible emissions and removals in LULUCF

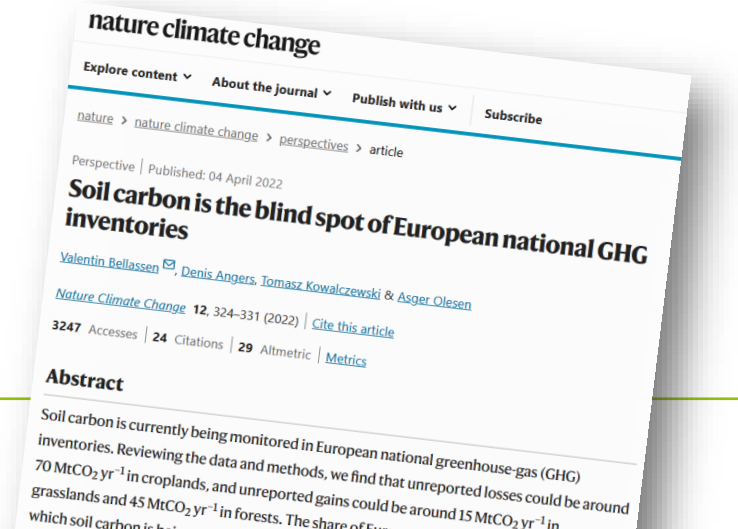
- In reporting, natural processes are simplified
  - Annual averages
  - Stock changes over time, e.g. biomass and soil carbon in forests are often estimated using “stock-difference”
  - No information on “gains” and “losses”
- Reporting is still incomplete
  - organic soils are underreported compared to independent data
  - Soil carbon often reported using default values

Stock difference method



Gain loss method





nature climate change

Explore content · About the journal · Publish with us · Subscribe

nature › nature climate change › perspectives › article

Perspective | Published: 04 April 2022

Soil carbon is the blind spot of European national GHG inventories

Valentin Bellassen, Denis Angers, Tomasz Kowalczewski & Asger Olesen

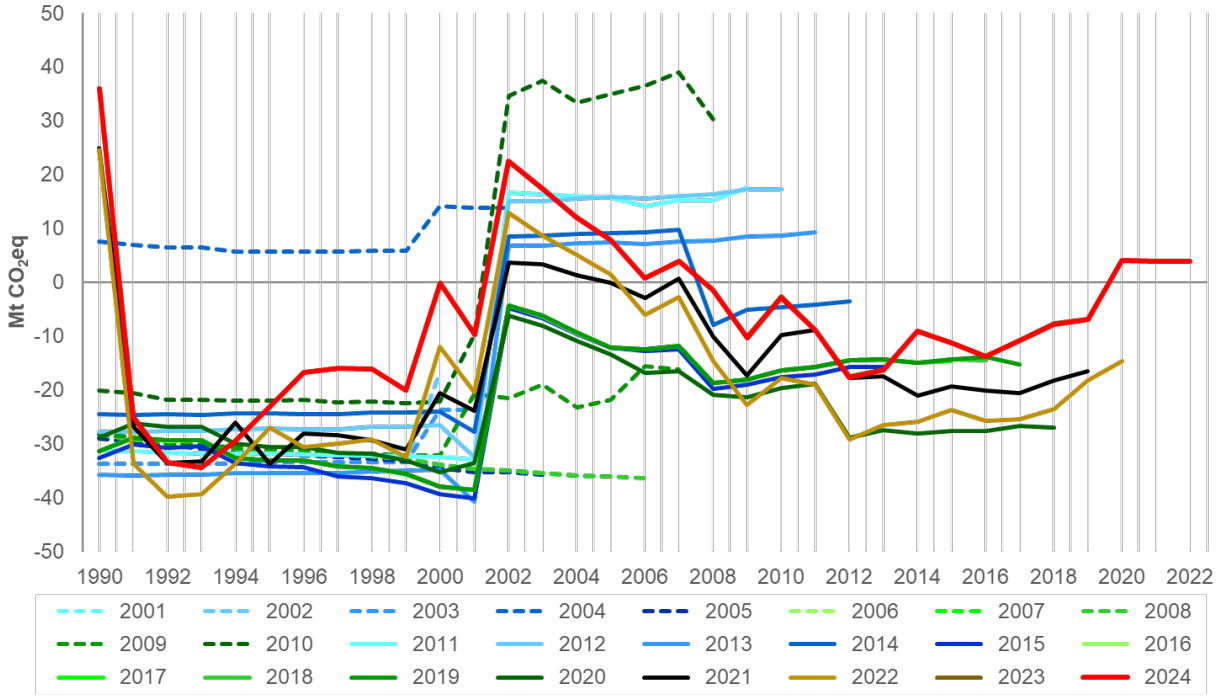
Nature Climate Change 12, 324–331 (2022) | Cite this article

3247 Accesses | 24 Citations | 29 Altmetric | Metrics

Abstract

Soil carbon is currently being monitored in European national greenhouse-gas (GHG) inventories. Reviewing the data and methods, we find that unreported losses could be around 70 $MtCO_2\ yr^{-1}$ in croplands, and unreported gains could be around 15 $MtCO_2\ yr^{-1}$ in grasslands and 45 $MtCO_2\ yr^{-1}$ in forests. The share of

Are natural sinks unreliable?



NOT IN GENERAL, BUT:

- Bottom-up development of methods by Member States
- Member States obliged to continuously improve estimates, → recalculations needed
- Lack of (measured) reference data
- Lack of separation of climate change (indirect) and management (directly human-induced) effects
- Climate change and natural disturbances not adequately considered in projections

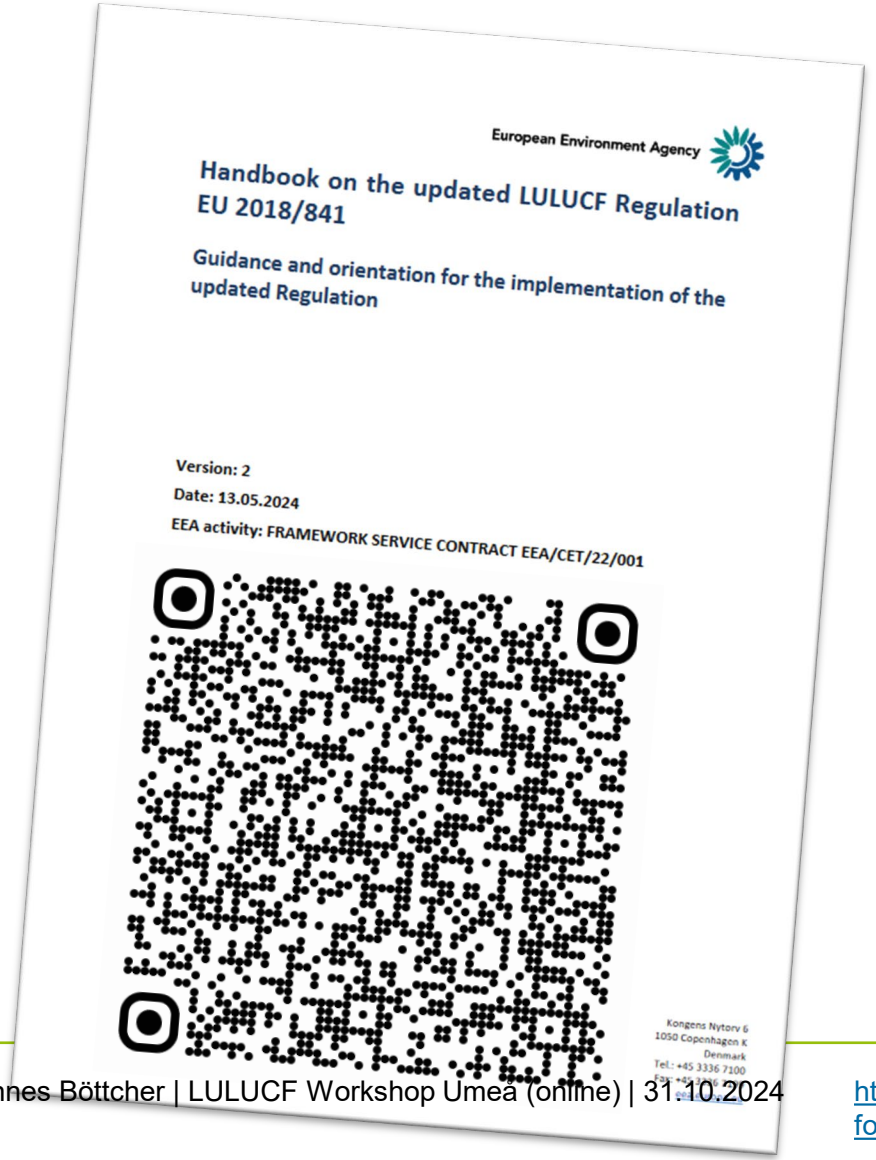
Conclusions

- LULUCF methodological improvements are demanded by LULUCF Regulation, this will improve the data basis in general
- More practical provisions for dealing with natural disturbance and climate change effects
- Include disturbances consistently (with GHGI and between MS) in projections
- LULUCF Regulation accounts for emissions **and** removals, but:
  - Net reporting categories mix emissions and removals
  - Methods are diverse, gross fluxes (forest increment) often not reported

→ More gross data needed for better assessment of real carbon fluxes

→ Ultimately: any flux to the atmosphere needs to be avoided!

LULUCF Handbook


European Environment Agency

Handbook on the updated LULUCF Regulation EU 2018/841

Guidance and orientation for the implementation of the updated Regulation

Version: 2

Date: 13.05.2024

EEA activity: FRAMEWORK SERVICE CONTRACT EEA/CET/22/001

Kongens Nytorv 6
1050 Copenhagen K
Denmark
Tel.: +45 3336 7100

- LULUCF Handbook Version 2 by EEA published in May 2024
- Explains the basics of the LULUCF Regulation
- Gives guidance for Member States for the implementation of the LULUCF Regulation
- Provides illustrative case studies from Member States

https://climate-energy.eea.europa.eu/topics/climate-change-mitigation/land-and-forests/reports/handbook-on-the-update-lulucf-regulation-v2

Thank you!

h.boettcher@oeko.de

This study benefited from funding for the projects DIFENs (Waldklimafonds FKZ: 2220WK32A4) and LANDMARC (European Union Horizon 2020 research and innovation programme, Grant Agreement No. 869367)