ForestNavigator

Project advancements

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IIASA

Funded by the European Union

1x1km map of EU Forest Types and Forest Structures (BOKU)

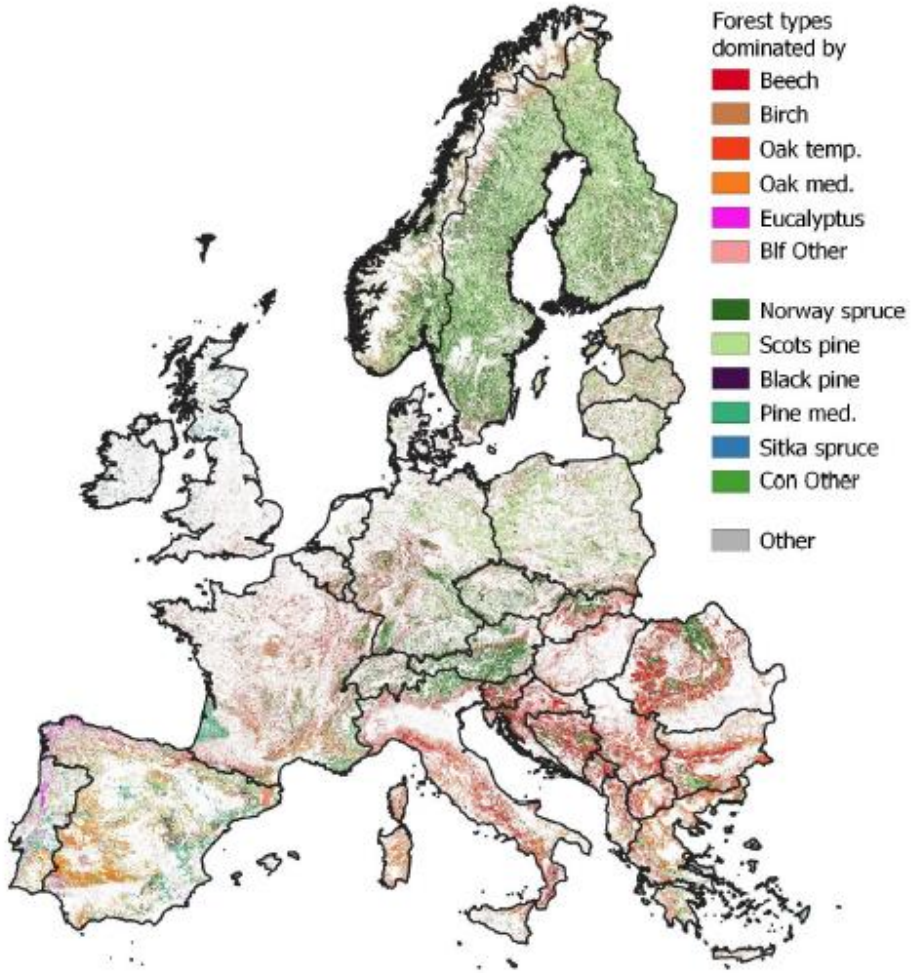
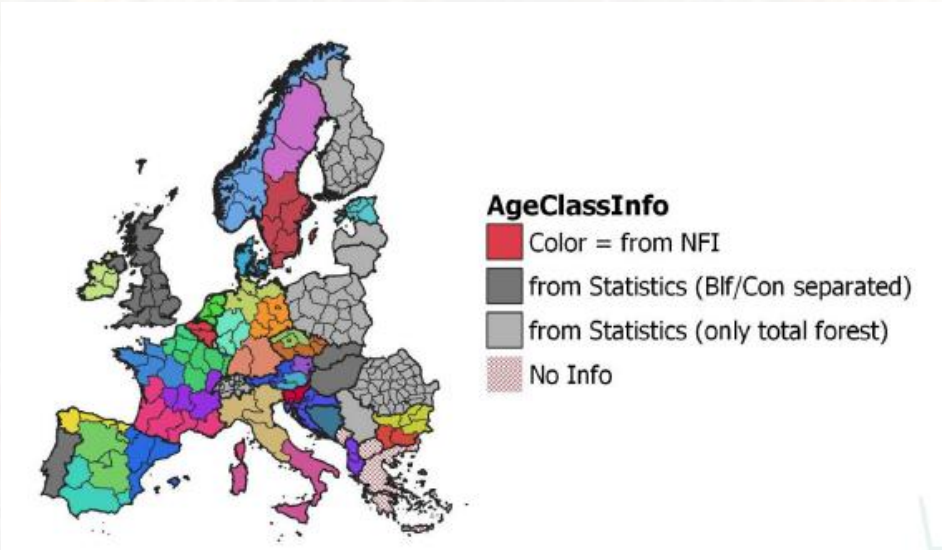


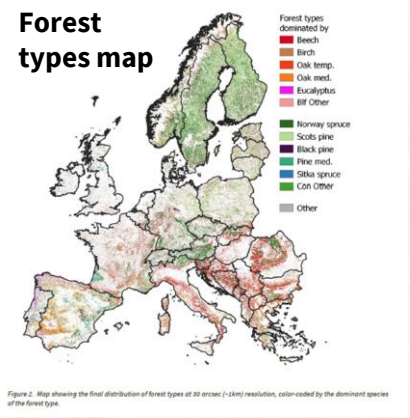
Figure 2. Map showing the final distribution of forest types at 30 arcsec (~1km) resolution, color-coded by the dominant species of the forest type.

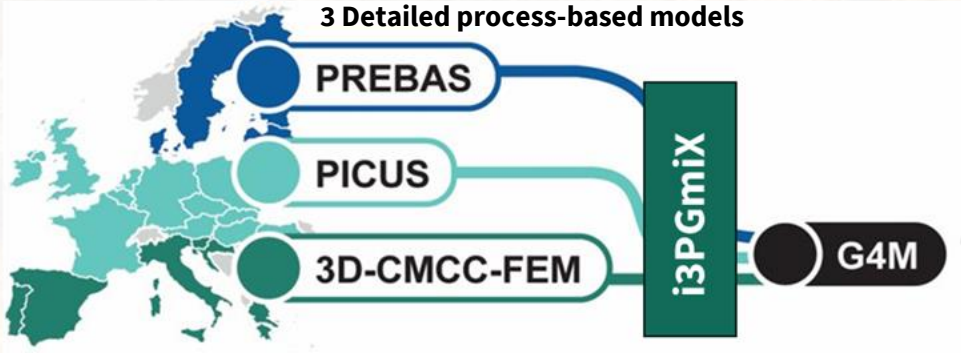
- New EU scale map of **Forest Types** distribution (update of Pucher et al. 2022)
  - 1 x 1 km resolution
  - Based on NFI plot data from 18 countries
  - Identified > 600 forest types
  - Gap-filling algorithm was applied, based on bioclimatic, topographical, forest and tree occurrence data



- **Forest structures** derived from age class distribution available at plot level & national/sub-national statistics + gap filling approaches from forest types

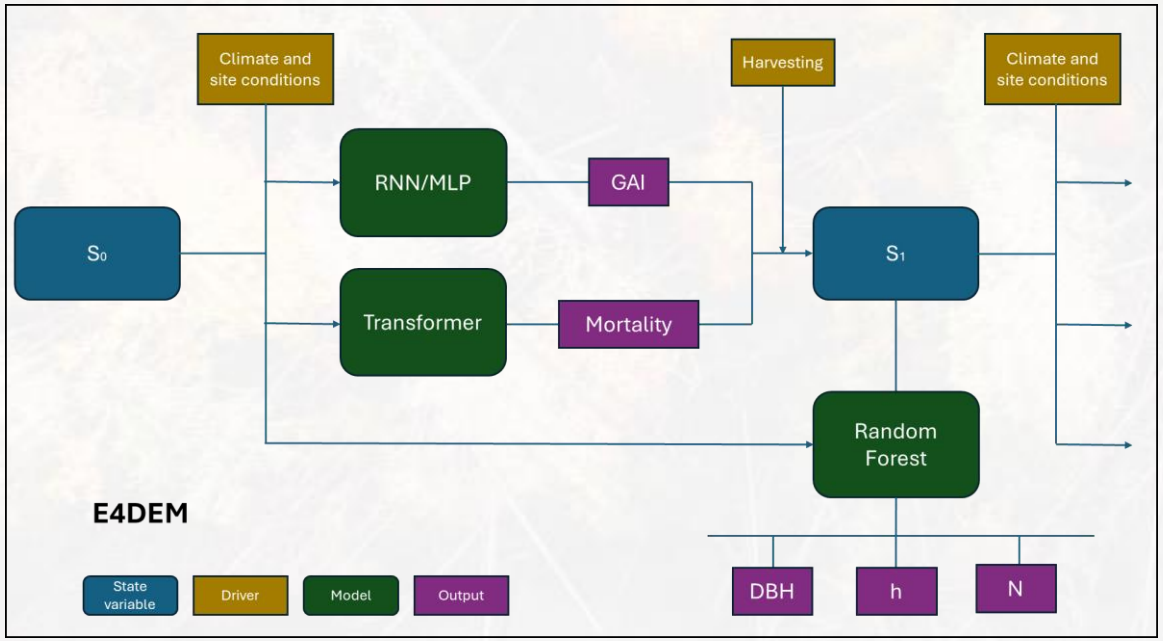
Climate Sensitive Forest Growth Emulator (E4DEM) calibration



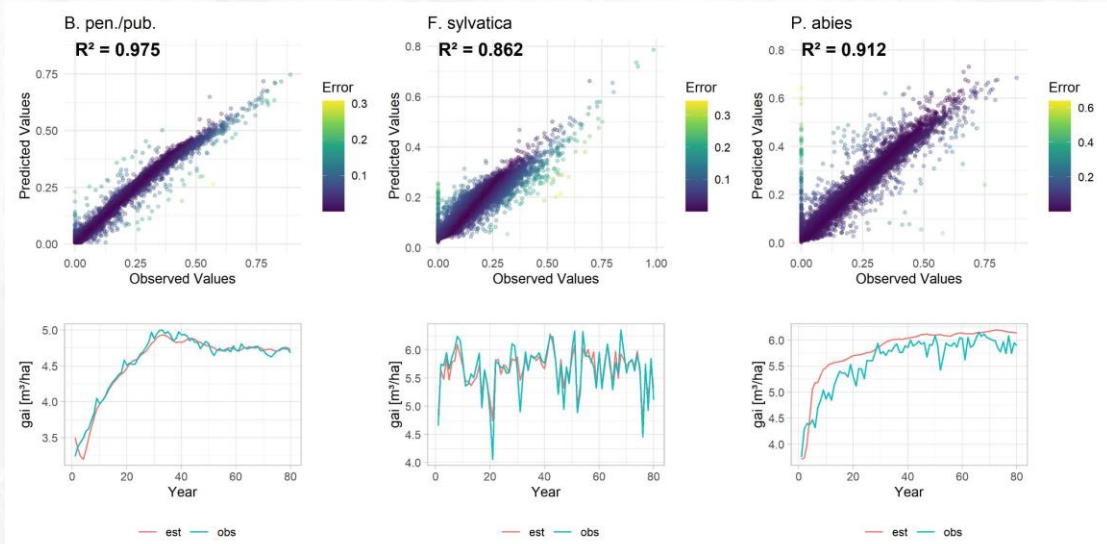


	Detailed models	Emulator
Climate input	Daily temporal resolution	Yearly climate inputs with subset of drivers
Required input	Detailed tree level data, biomass compartments, ecophysiological parameters, detailed management prescription	Parsimonious input data (BA, species identity, and initial volume), but still able to capture climate impacts
Output	Detailed carbon and water cycle at daily resolution	Indicators of interest at yearly time step (e.g. GAI, mortality rate, fellings and stand structure)
Simulation requirements	Long processing time and computing storage ressource needs (large input data and daily time steps)	Lightweight with low simulation time and limited ressource requirements

Detailed process-based model simulation (200 grid cells) x 3 climate scenarios



E4DEM Emulator fit to detailed simulations



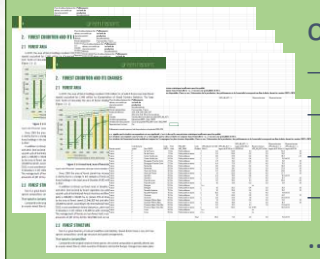
EUFo Database (BOKU) – An overview
Reconciled EU forest carbon stocks status/change

- **Database of sub-national time series of forest carbon stocks and dynamics for Europe 2000-2022**
- **Various versions based on different approaches for harmonization and adjustment can be established based on the reported primary data (collected in EUFo-reported)**

EUFo-reported | **EUFo-harmonized**

Collection of primary data

- FISE
- NFI portals
- Census portals

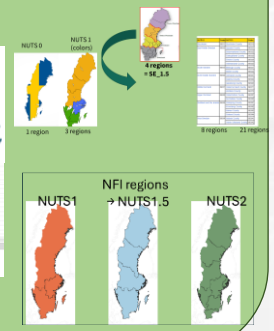


on
- **area**
- **harvest**
- **stock**
- **increment**

… for con / non-con
… 2000-2022

Database

- **documenting national specifics**
- **unit** conversions for comparability
- **integration of subnational regionalization systems** (NUTS+)

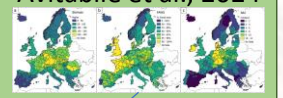


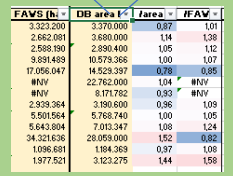
Harmonization

- towards a common definition per indicator
- based on comparison with harmonized datasets

SoEF,
FAO, FRA

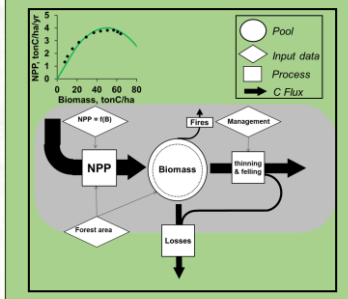
JRC
Avitabile et al., 2024

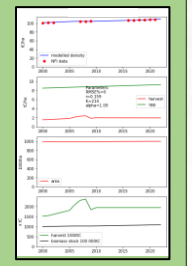




Gap-filling and modeling of C-stock dynamics

- **CRAFT** model
- consistency between changes in area, stocks, harvest and increment
- annual data

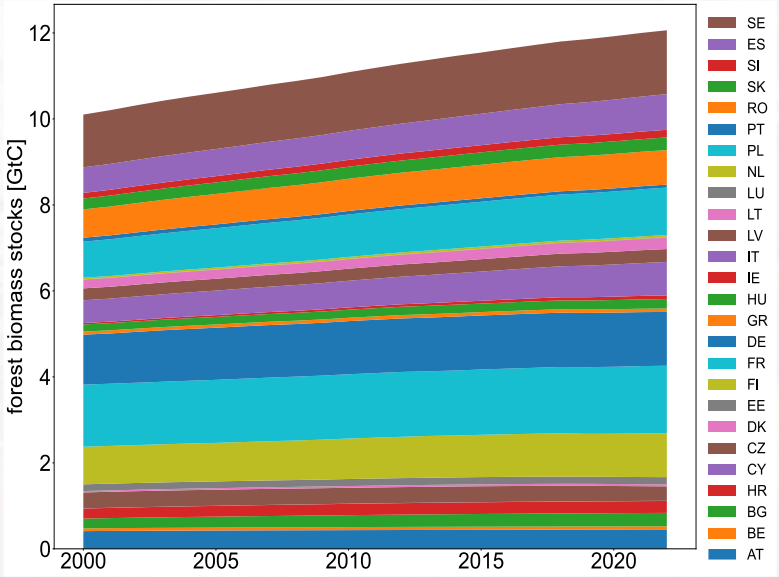




Le Noë, et al. 2020

The EUFo Database (BOKU)
Reconciled EU forest carbon stocks status/change

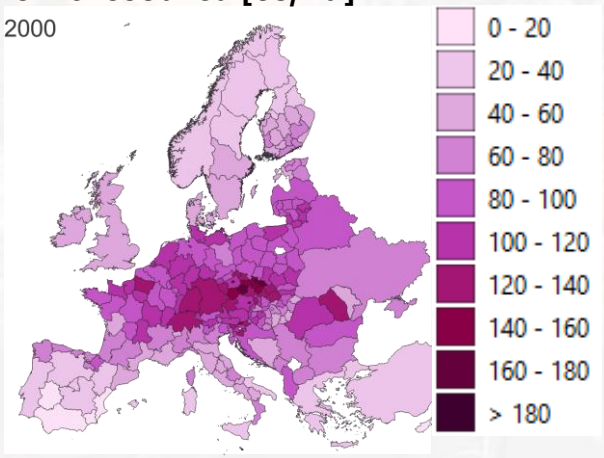
Forest carbon stock of total living biomass



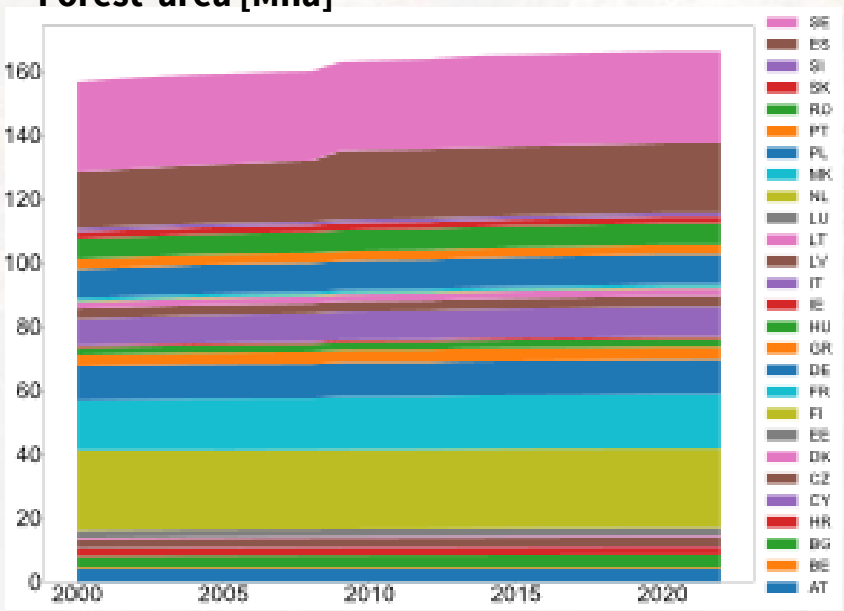
EU-27 (excl. Malta) **2000 to 2022**:

- Increase of European forest biomass stocks by +19% (+2.0GtC) driven by density increases (+13%)
- Forest area increased by +6% to 165Mha in 2022, but increase is slowing in recent years.
- Forest harvest increased by +21% to 210 MtC/yr (inc. losses)
  - Economic crisis and pandemic lead to short-term reduction in harvest, but did not change trend

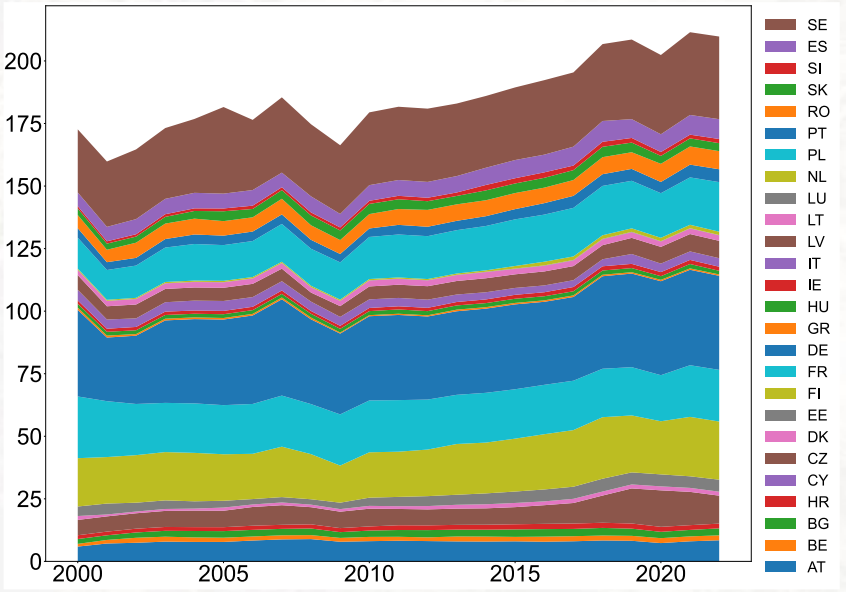
Per forest area [tC/ha]



Forest area [Mha]

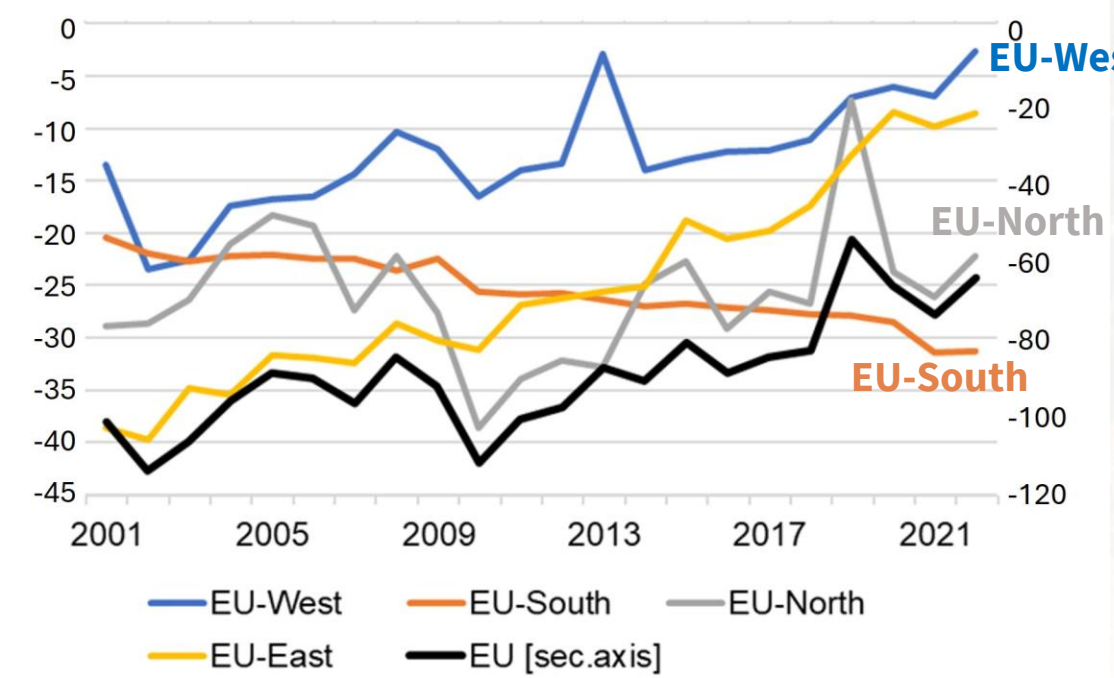


Forest harvest (incl. losses) [MtC/yr]

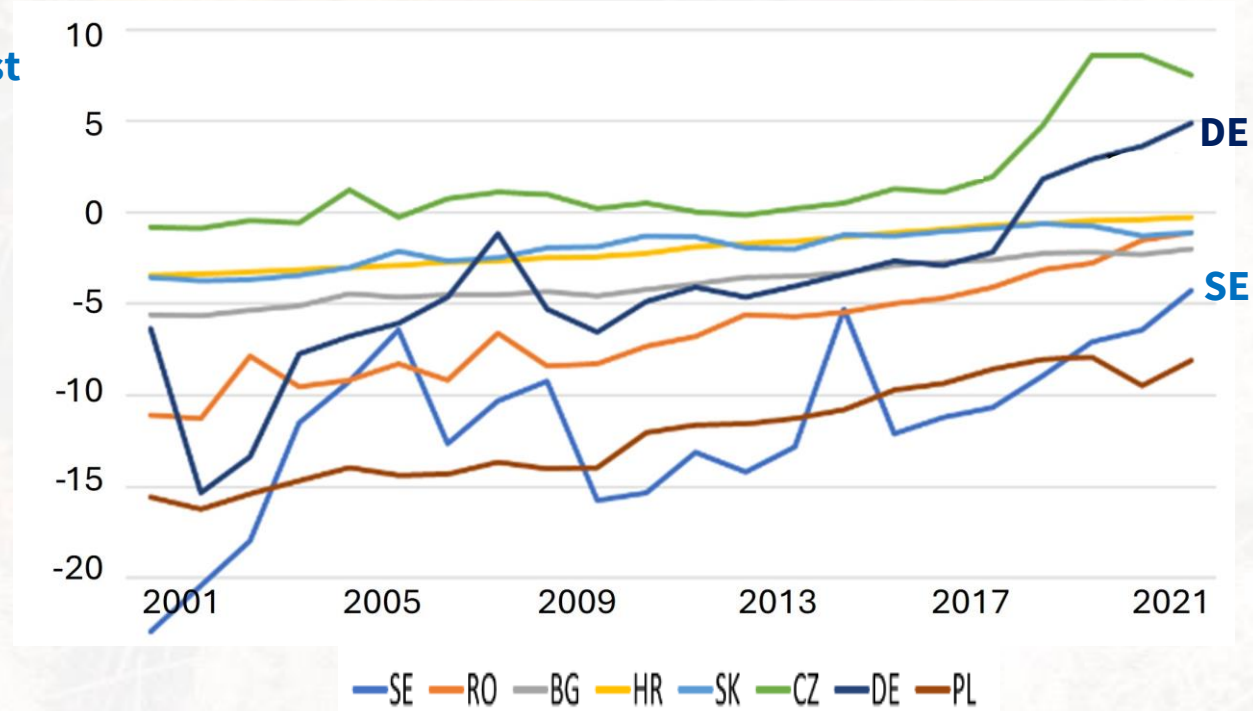


The EUFo Database (BOKU) Forest Carbon Sink

Annual forest biomass C sink EU Region [MtC/year]



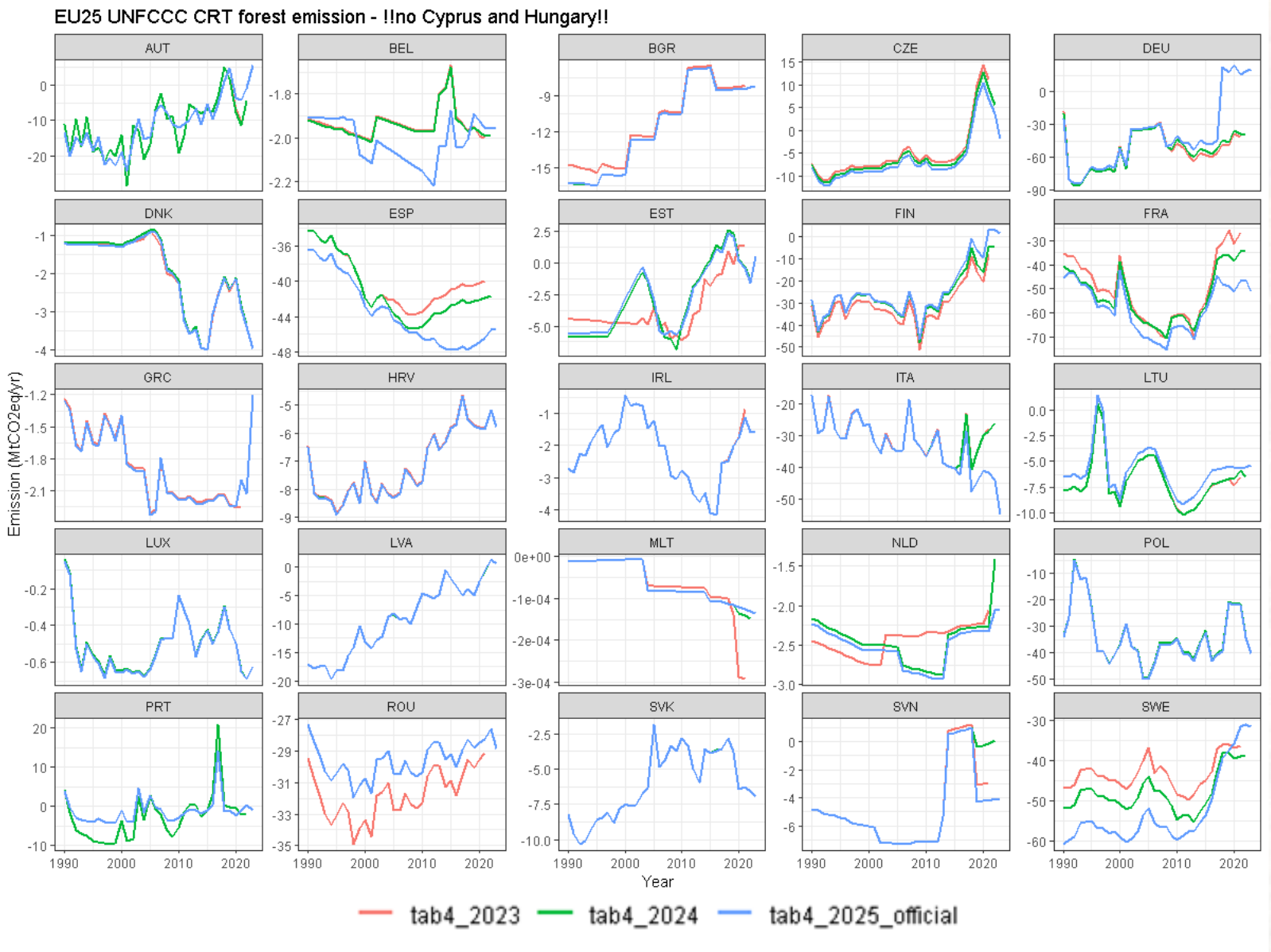
Annual C sink forest biomass selected country [MtC/year]



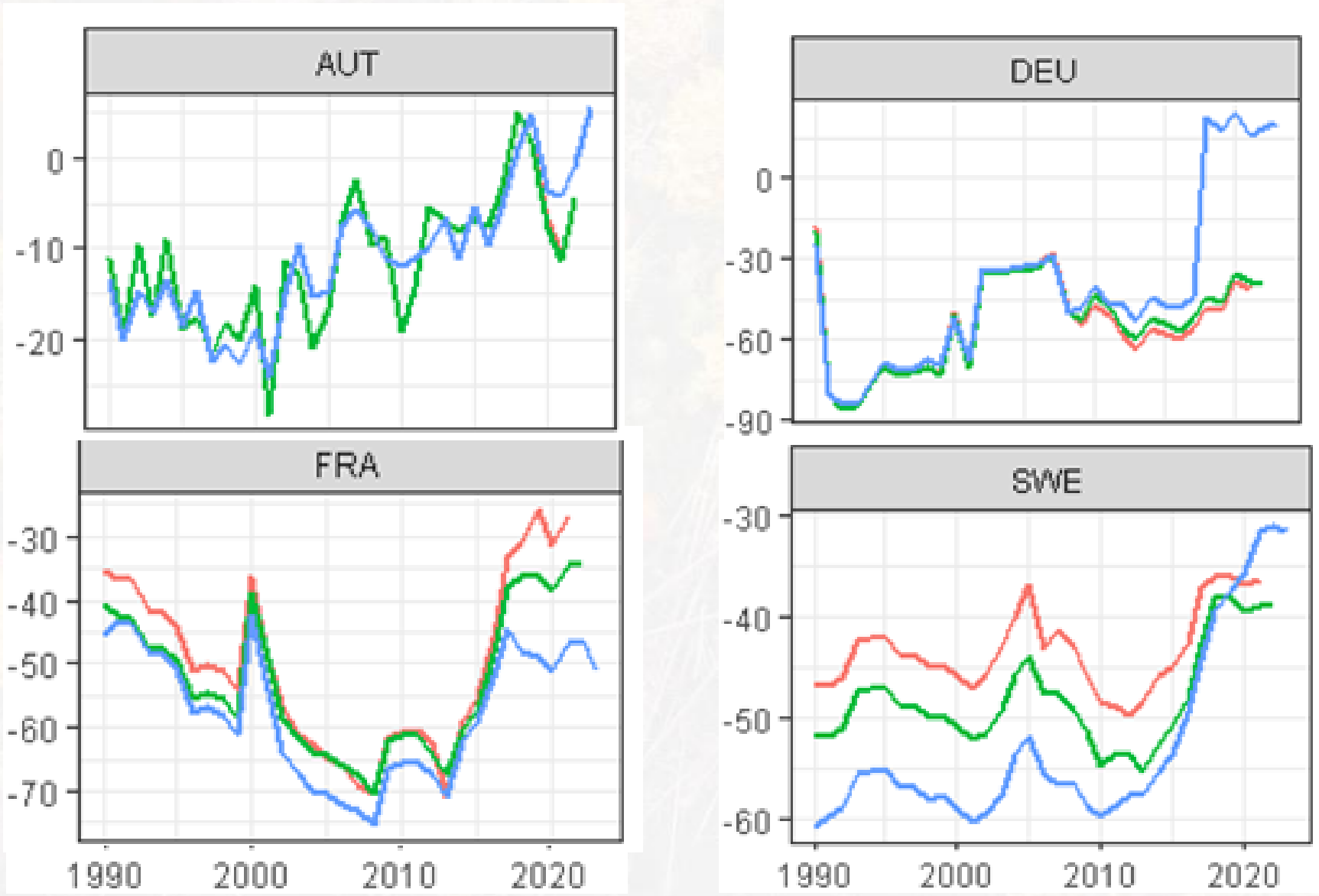
- In Europe, on average annual Carbon sink is declining
- The decreasing trajectory applies to all regions, except EU-South

- Sink becoming a source or strong reduction already spotted in the database for some countries (e.g. Germany, Sweden)

Recent FL-FL emission recalculations



Recent FL-FL emission recalculations



Simulating recent FL-FL Bm emission recalculations with G4M

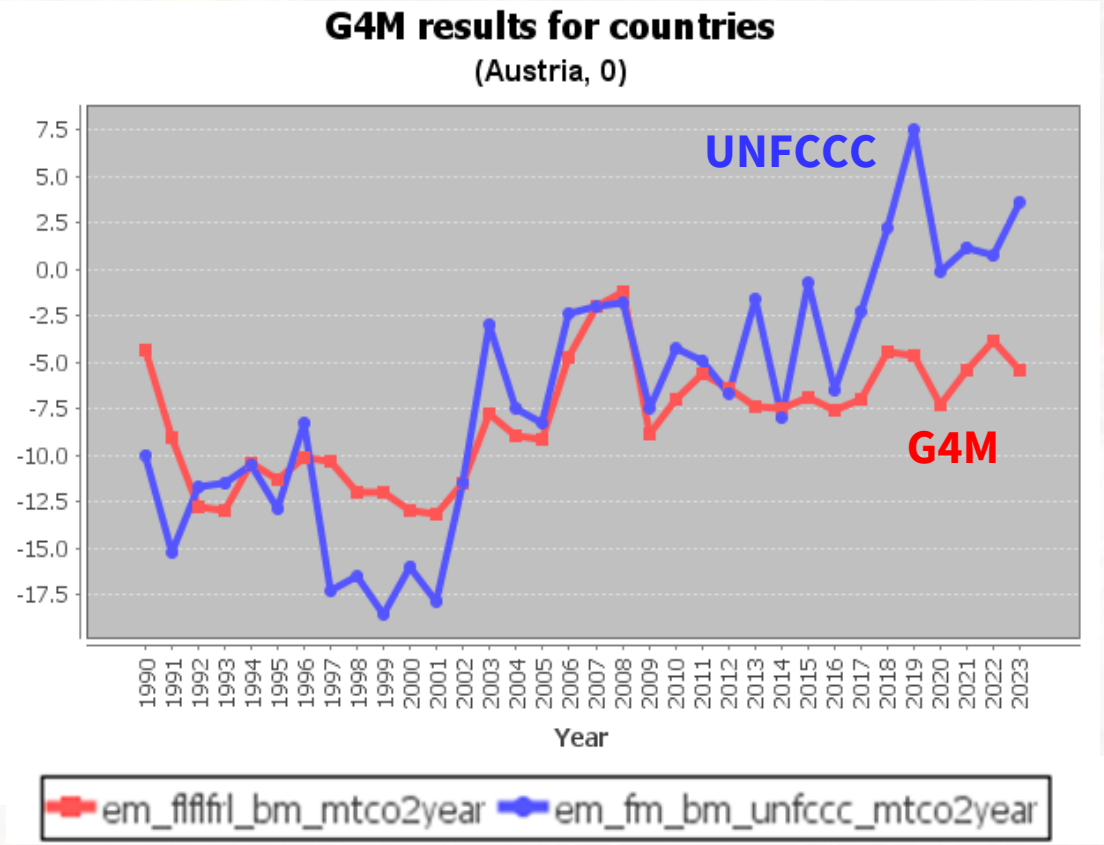
Countries with considerable recalculations

Country	ΔUNFCCC 2023-2025 FL-FL Bm, Mt CO2	Reason	Available data
Austria	+ 4	Declined increment Increased disturbances	New NFI Salvage log. Stat.
Germany	+ 60	Declined increment Increased disturbances	New NFI, by species Salvage log. Stat.
France	+ 2 (+ 4 comp. 2022)	Increased mortality Afforest. + 1 Mha	NID 2025
Italy	- 6	Afforest. + 0.7 Mha ??	CRT ??
Spain	- 2	Afforest. + 1 Mha ??	CRT New NFI ??
Sweden	+ 23	Declined increment	New NFI ??

Simulating recent FL-FL Bm emission recalculations with G4M

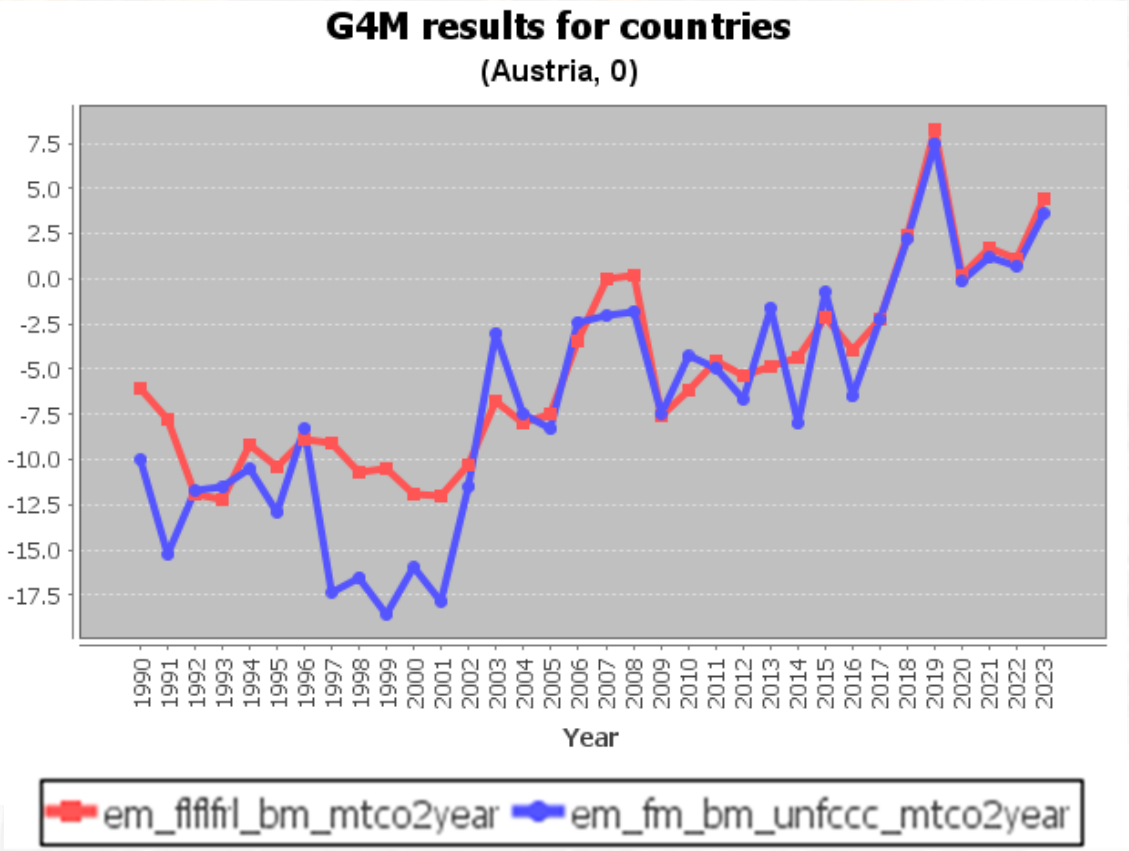
FL-FL Bm emissions in Austria

- No additional information



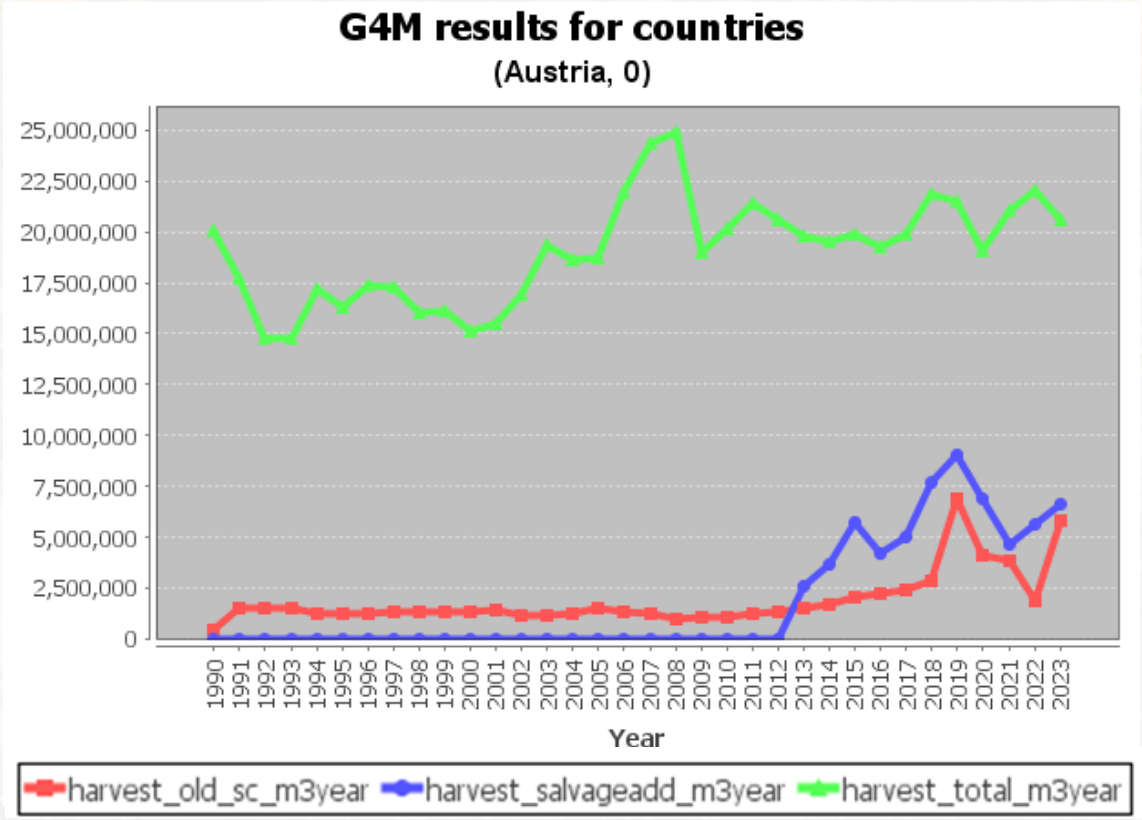
FL-FL Bm emissions in Austria

- With additional information



Simulating recent FL-FL Bm emission recalculations with G4M

Roundwood removals in Austria: Total, background sanitary cut and added salvage logging



Total roundwood removals

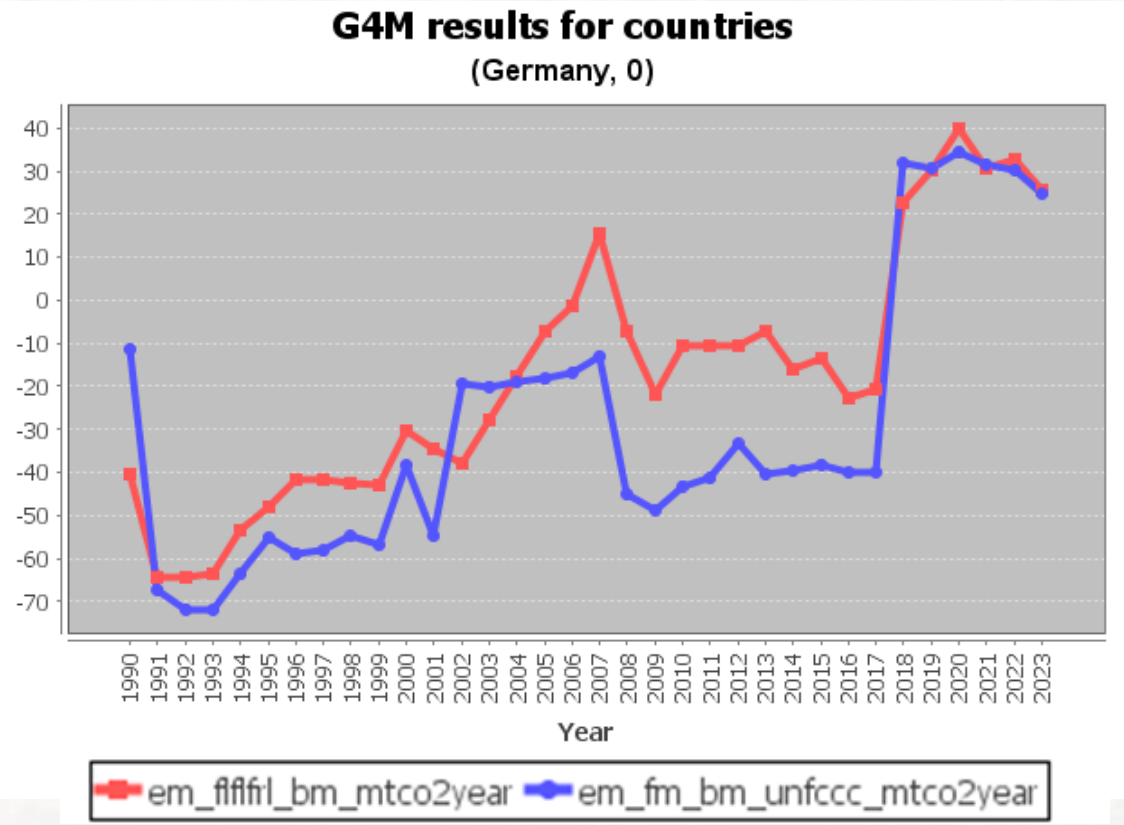
Sanitary cut

Salvage logging (added from statistics)

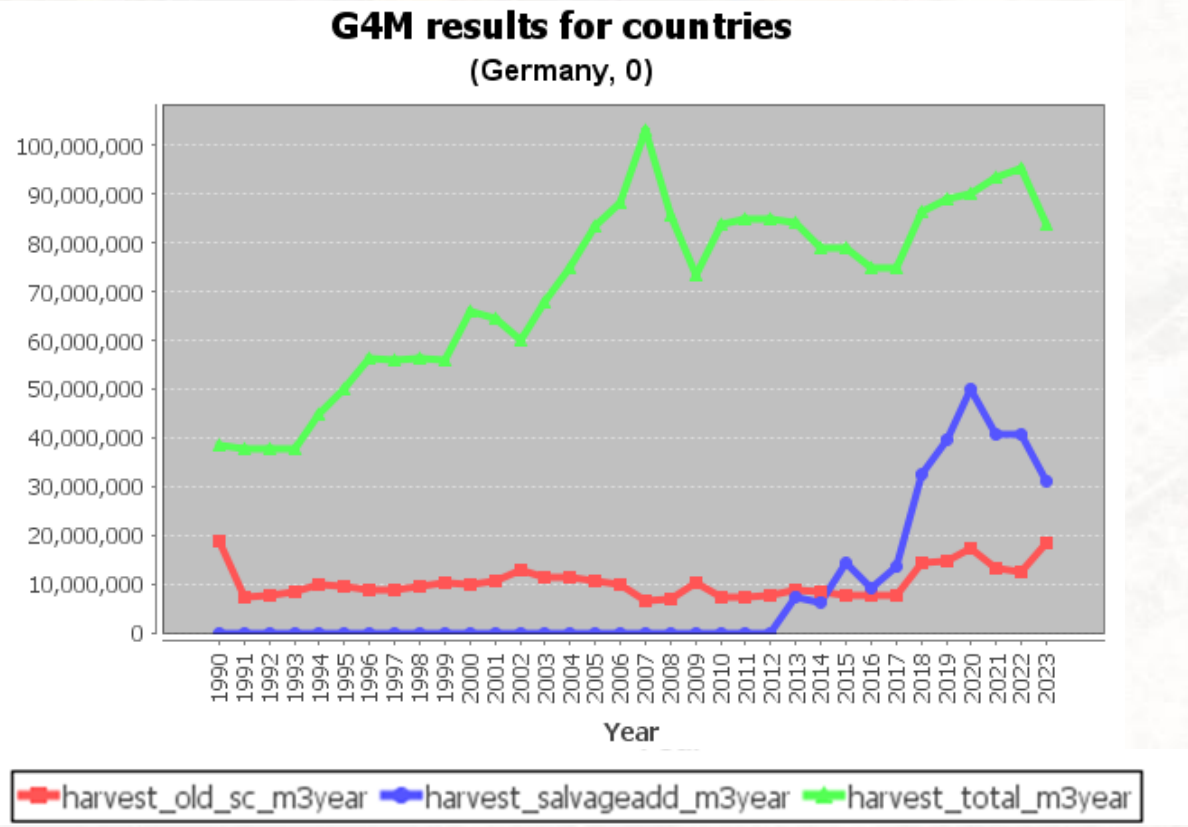
Simulating recent FL-FL Bm emission recalculations with G4M

FL-FL Bm emissions in Germany

- With additional information



Roundwood removals in Germany:
Total roundwood, background sanitary cut and added salvage logging (from statistics)

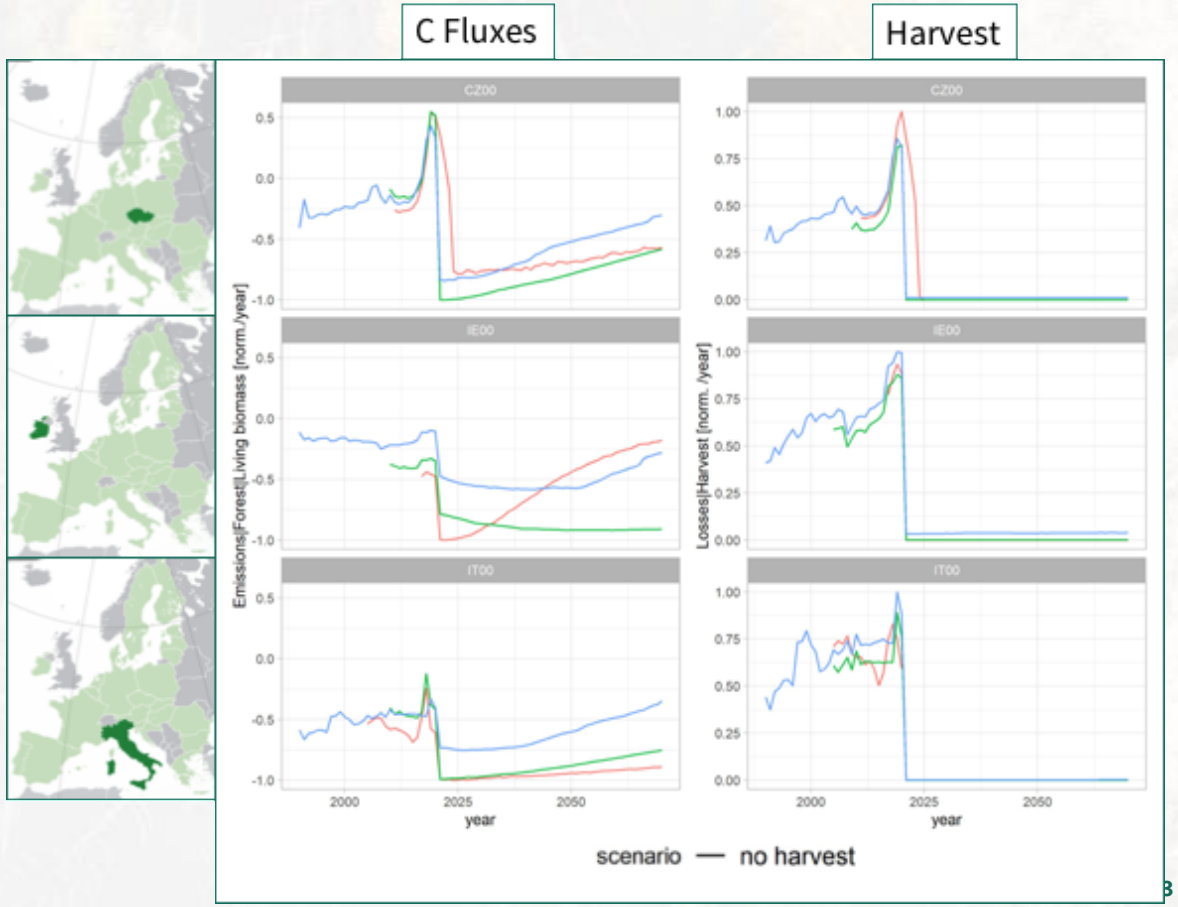


Forest Policy Modelling Forum (FPMF)

- EU and national policy makers and modellers together at one table:
  - Discuss EU (EC DGs) and National (Ministries, Agencies) raising policy questions (e.g. NRR)
  - Update on model developments for supporting national and EU policies (National/EU modellers) (e.g. impact of CC and natural disturbances)
  - National-EU scale pathways intercomparisons (early scenarios with G4M, CBM EU, CBM-IT, CBM-CZ, CBM-IE, expanding)
  - Scenarios simulated: No-Harvest, Full Harvest -> Next steps: Baseline, Impact of natural disturbances/extreme events

1st Meeting in Brussels, 18-19 September 2024

https://www.forestnavigator.eu/forest-policy-modelling-forum



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For more on the project:

- www.forestnavigator.eu
- https://www.forestnavigator.eu/forest-policy-modelling-forum
- LinkedIn @Forest NavigatorEU