JRC forestry sector model for EU policy making

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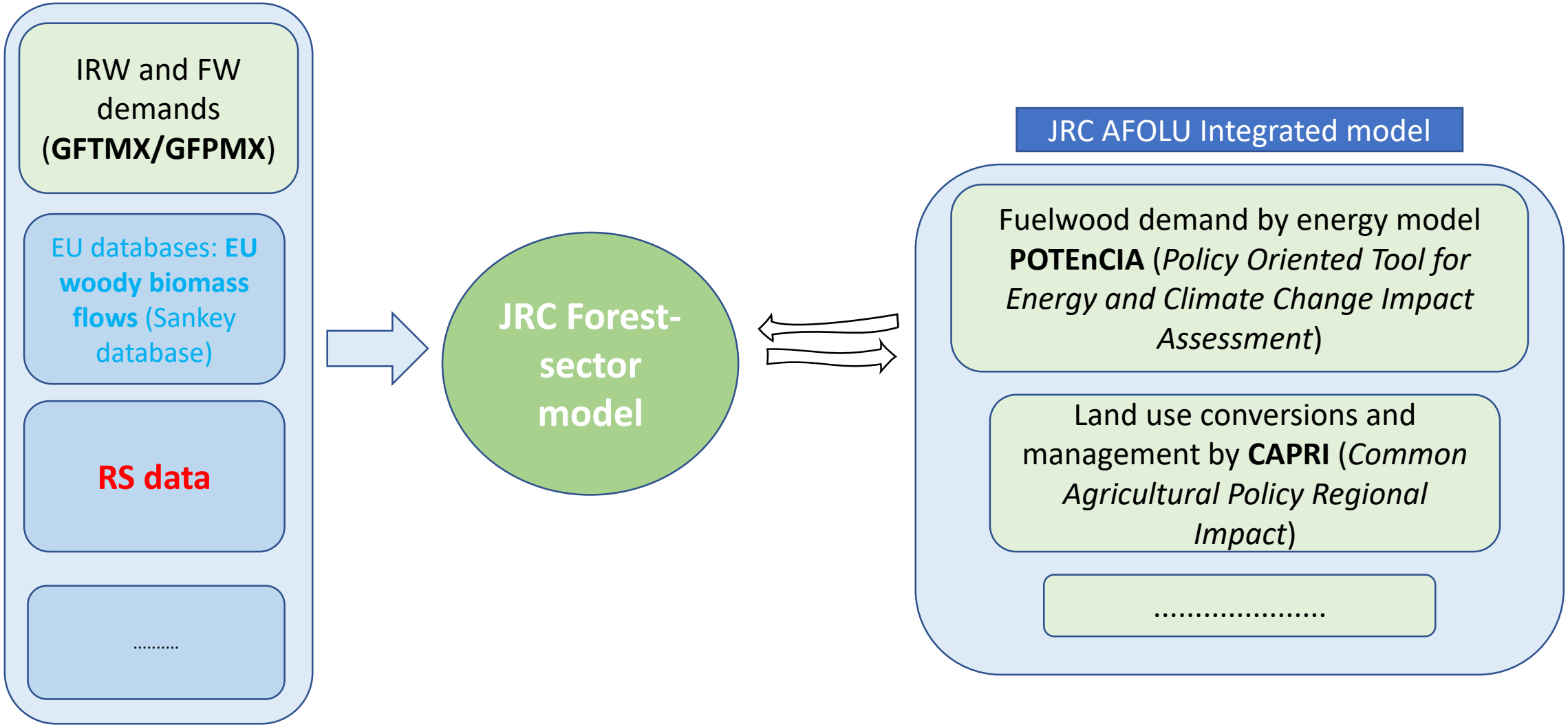
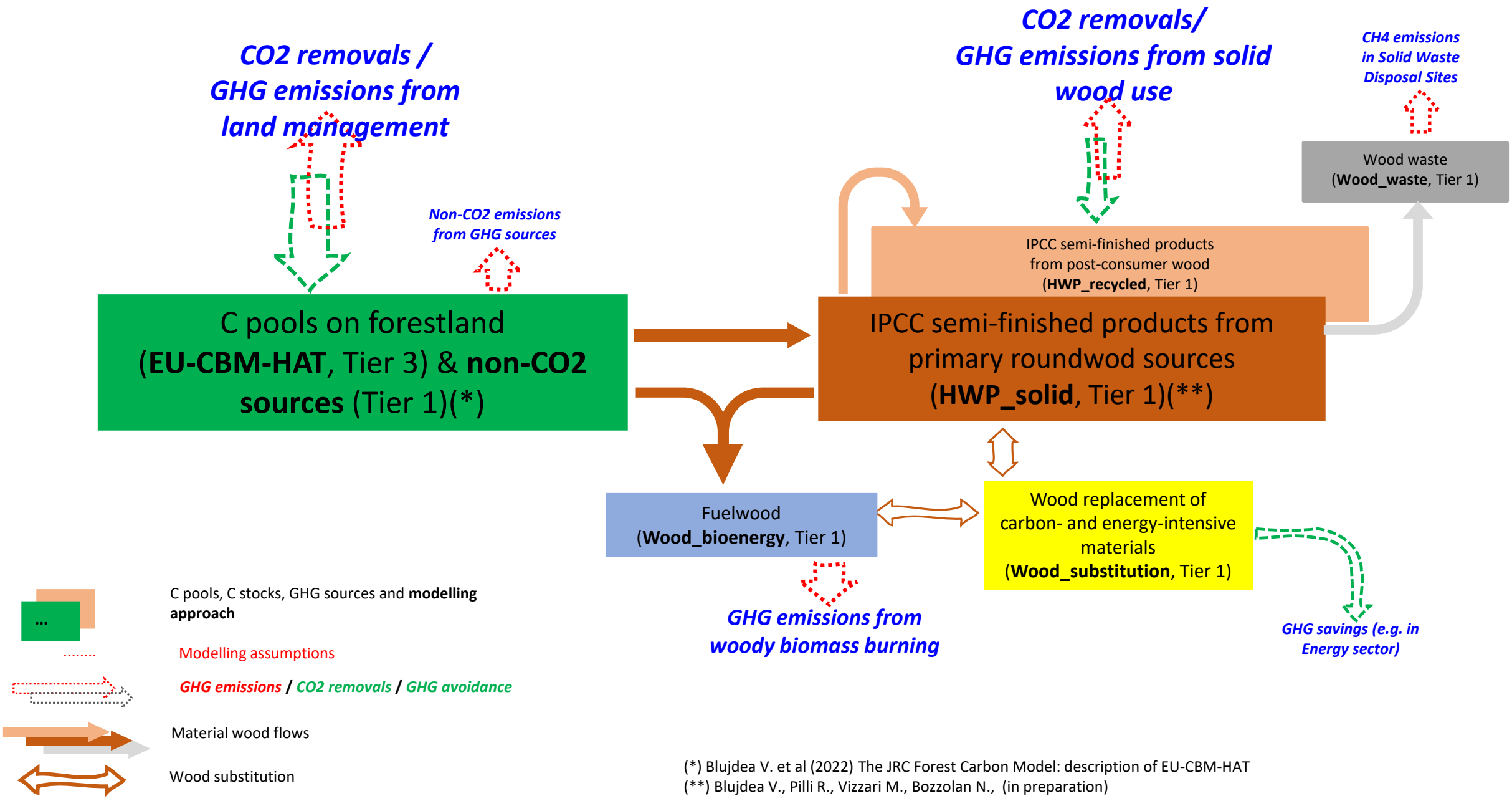
JRC modelling framework - forest-sector model interoperability with other JRC models

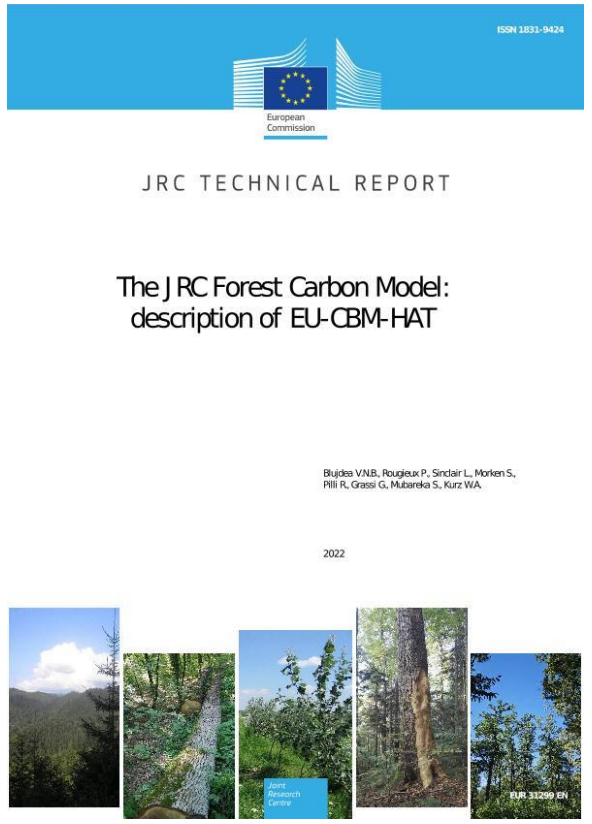


GHG accounting of emissions/removals from **forestry sector**



(*) Blujdea V. et al (2022) The JRC Forest Carbon Model: description of EU-CBM-HAT
(**) Blujdea V., Pilli R., Vizzari M., Bozzolan N., (in preparation)

Architecture of ***EU-CBM-HAT*** (three components deeply integrated):



- ***libcbm*:** enhanced version of cbmcfs3 (in C++, Natural Resources Canada)
- ***scenarios combination tool ('combo')*** (in Python, JRC)
- ***harvest allocation tool ('HAT')*** (in Python, JRC)

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‘libcbm’ – dynamics of forest carbon

- ***Converts the stand-level standing stock and increment volumes to biomass/carbon*** by Boudewyn eqs.
- ***Initializes the stocks*** in all C pools for the initial year of the simulation
- ***Simulates the gross growth during the simulated period***
- ***Applies user-defined events affecting forests***: natural disturbances and forest management practices
- ***Requires user-defined shares of biomass compartments subject to harvesting***

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‘combo’ - scenarios combination tool

allowing the ***combinations of scenarios for anthropogenic and natural events***

“dynamic” scenarios *(switching)**:***
silvicultural practices scenarios
&
IRW and FW shares scenarios

“static” scenarios *(predefined)*
afforestation scenarios
deforestation scenarios
stand replacing natural disturbances scenarios
non-stand replacing natural disturbances scenarios

‘HAT’ - harvest allocation tool

allowing ***rule-based allocation of exogenous harvest demands***

- *separate **IRW demand and FW demand are distributed** according to annual availability of irw and fw in **any standing pool*** (i.e., stemwood, other woody parts, dead wood)
- considers ***IRW and FW as inherent components of the roundwood removals for any silvicultural practice*** (i.e. a clear cut of Con results in 95% irw and 5% fw)
- modulation of harvest structure through a ***market forcing for irw.*** This allows targeting certain share of wood products.

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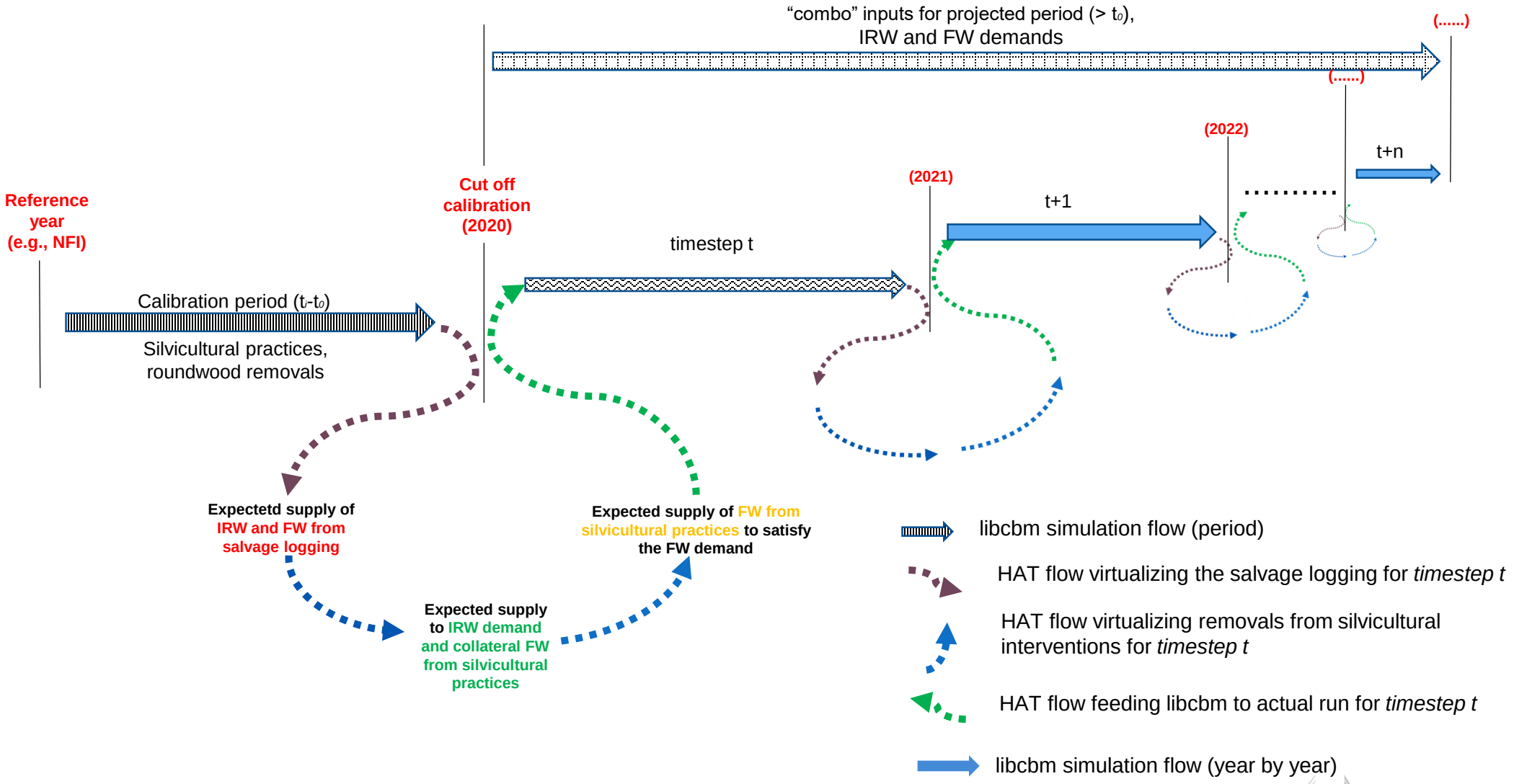
HAT's data processing flows during the simulation of a specific scenario



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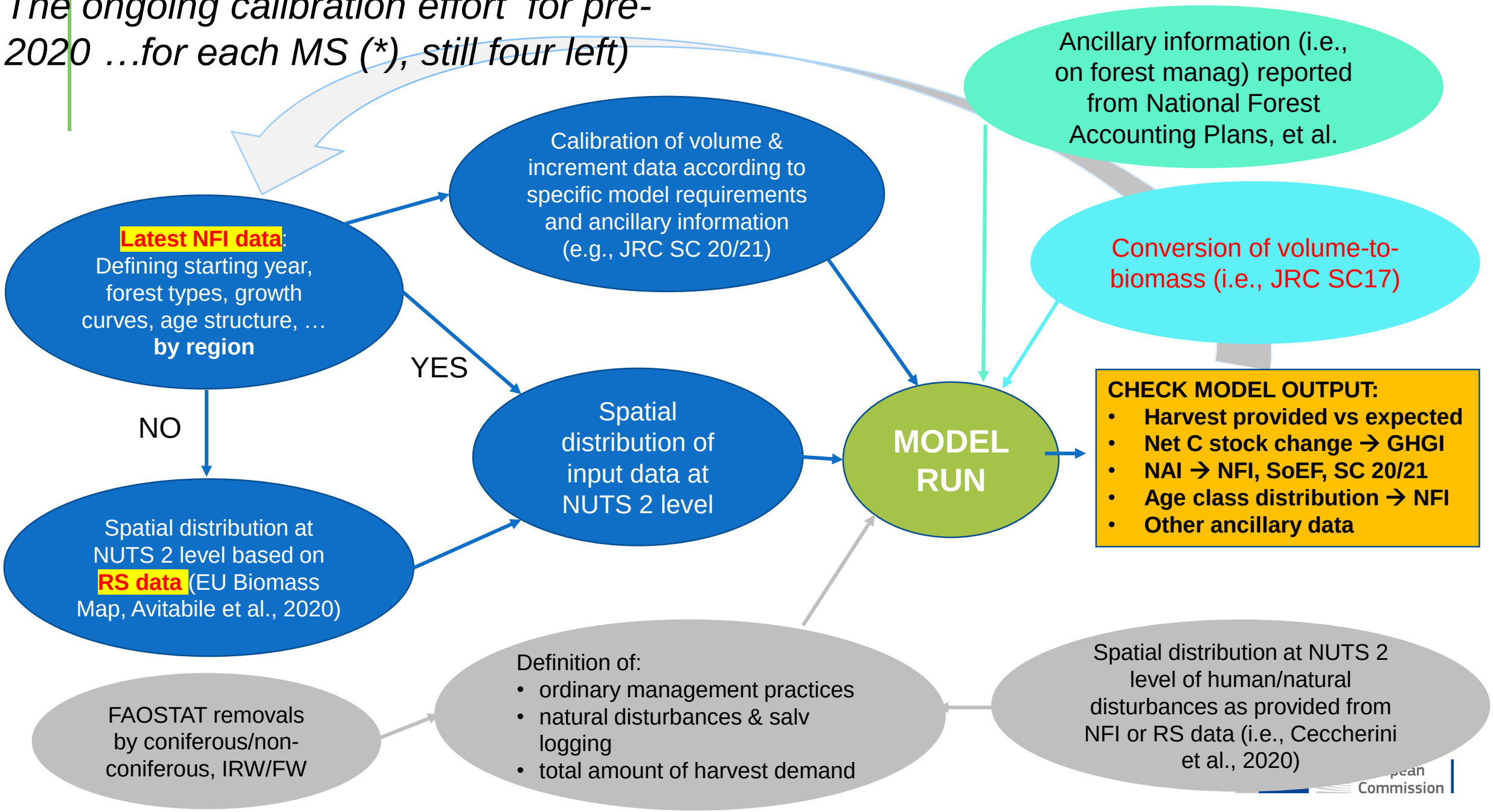
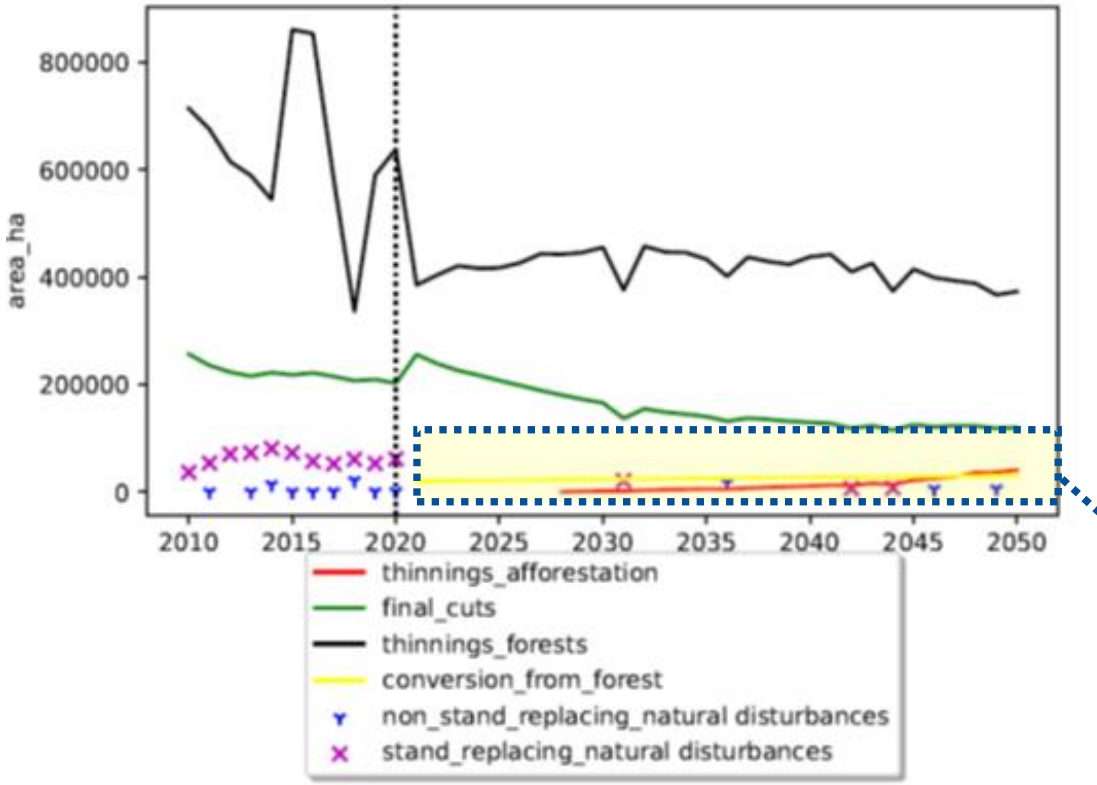
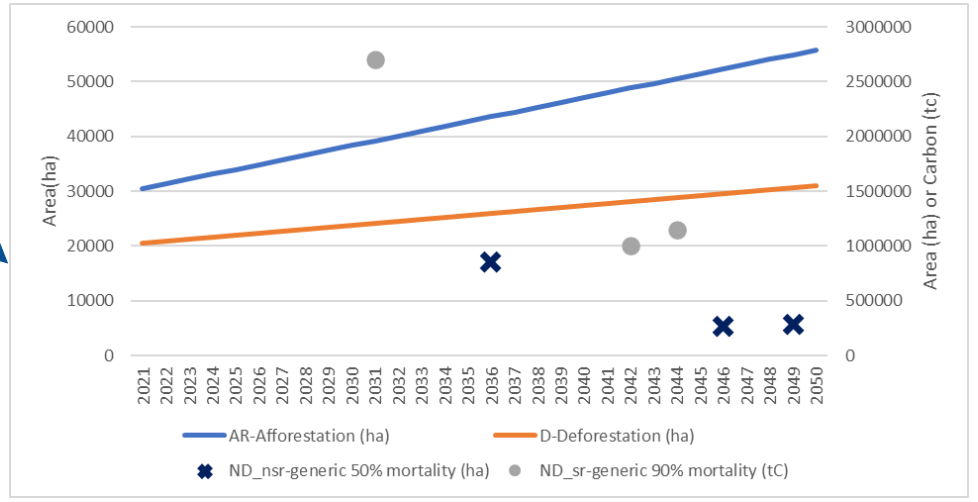
The ongoing calibration effort for pre-2020 …for each MS (*), still four left)



(*) Pilli R. et al. (in preparation)

Output example for area dynamic (ha): calibration pre-2020, projections after-2020





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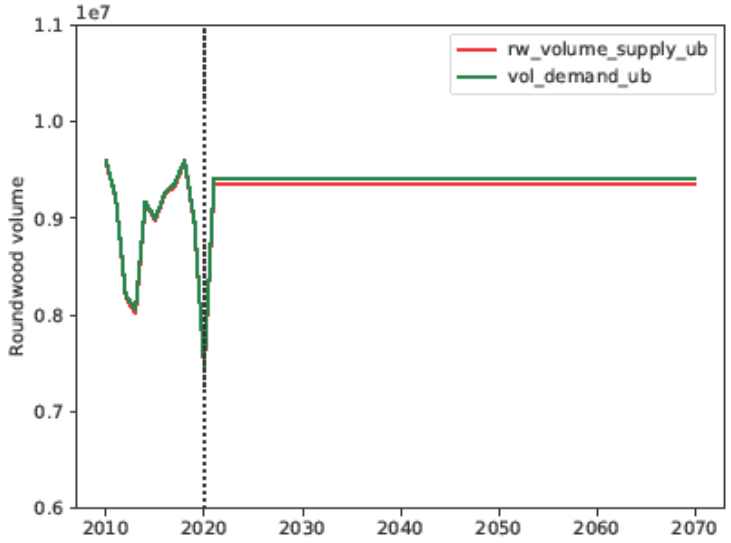
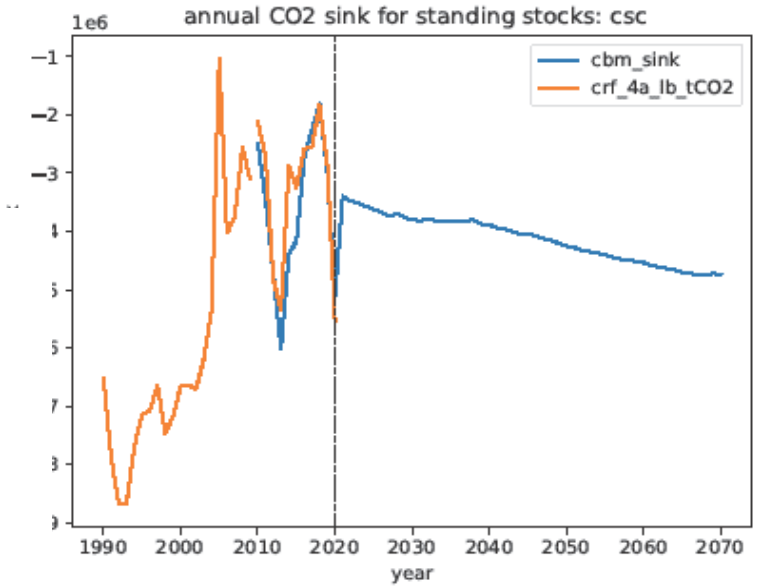
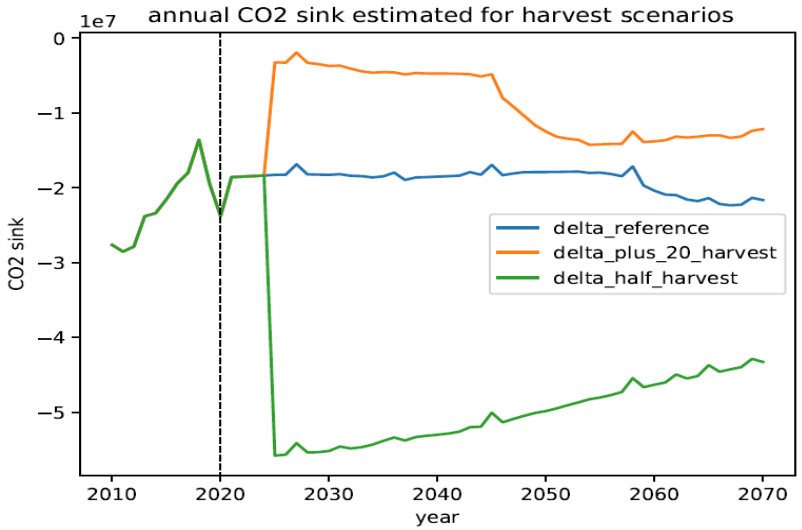
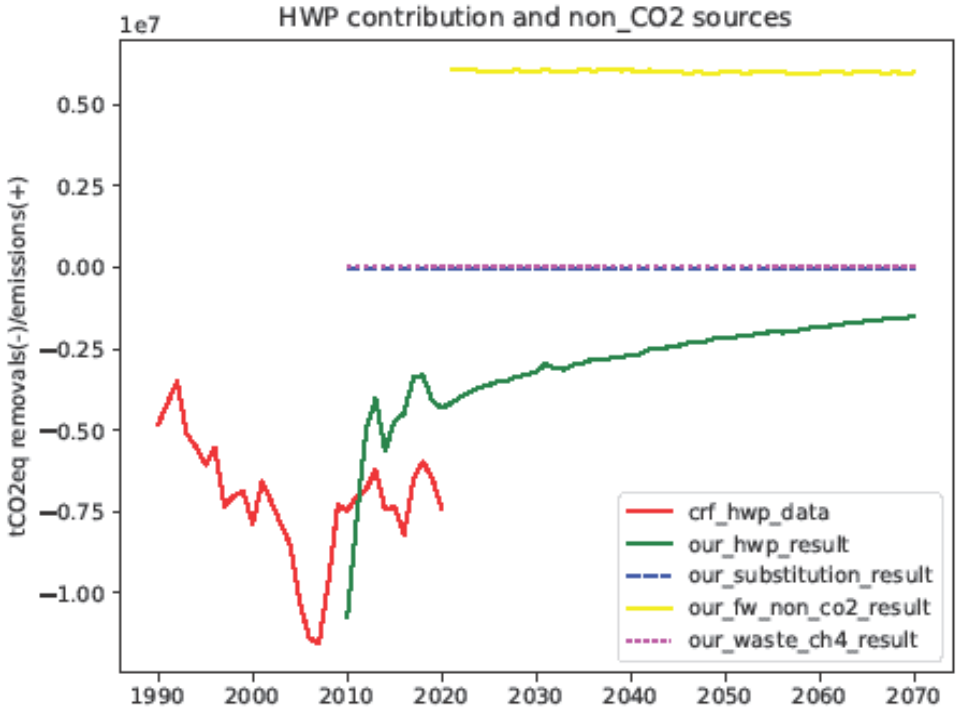
Example of outputs (vs. FAOSTAT, CRF)









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Hopefully:
a) a fully spatially explicit approach

Standing biomass stock available at RS grid (e.g., pixel)

mimick the forests initial status (e.g., pixel scale)

b) integration of RS-sampled information, i.e., for a near-real time GHG inventory (Y-1)

c) apply spatially explicit events