

General:

The preprint by Rossi et al. introduces a long-awaited for dataset that captures LULUCF fluxes at global scale, and subdivided at country level to support MRV and overall comparisons at various scales. This work is crucial to support upcoming IPCC AR7 and support the verification and transparency of NGHGI in a GHG sector that has numerous uncertainties. The dataset presents a globally consistent but country relevant approach, and methodologically I have very few comments.

The dataset is available to download: <https://doi.org/10.5281/zenodo.20381556>

My general comments are:

1. I did wonder if the author's considered carrying out a sensitivity analysis of using e.g. a different age dataset, LULC product for the time period (e.g. at National scale). This is not mentioned in the paper and would be helpful to clarify how robust/sensitive the results are to inputs datasets.
2. The paper mentions it is a LULUCF flux model, but focuses on forest loss/gain fluxes. It would be helpful to mention what the contribution of the non-forest related fluxes is, or clarifying that it is a forest-flux model.
3. The Uncertainty section comes quite late in paper, and I wonder if the authors can incorporate the uncertainties into the figures or at least in the text when introducing the various fluxes for the regions and at global scale.
4. Overall I found the paper to be lacking in either quantitative evidence to back up some of the statements or not referring to figures that could otherwise support the claims. Below I point out various places where the work could be substantiated more with quantitative detail and/or reference to a figure.

Line by line/Specific comments:

Line 77: would argue to remove "potentially" as it most definitely results in uncertainties and biases.

Line 88: I assume by "declining trend" in the removals you mean less "removals." i.e. less negative. I wonder if it helps to make this clearer by showing e.g. the 2001 – 2010 and 2011-2021 average removals, and thus help to showcase this declining trend?

Line 105: Quantify "substantial share". If this is mentioned in line 111 (i.e. 25%) I wonder if this whole paragraph can be condensed.

Line 114 to 115 : the global sink has remained stable, but I would argue the geographical distribution has shifted, no?

Line 120 to 126: you could mention that EDGAR-LULUCF was therefore excluded in IPCC AR6, which compared the major products used in the GCB and independent assessments, as well as NGHGI compilations. The development of EDGAR-LULUCF now opens the door to benchmark and compare existing models etc.

Line 155: here you could cite review paper from Heinrich et al. 2026, Science Advances: [A meta-analysis of carbon losses and gains from tropical moist forest degradation and regeneration | Science Advances](#)

Line 181 to 190: would it make more sense to introduce these tiers earlier or even at the start of section 2. Then you could have a summary table of the various approaches e.g. bookkeeping, DGVM, remote sensing based, and include the approximate "Tier" these approaches belong to?

Line 210 – 211: if DOM and mortality losses are not always considered, does that mean they are not considered in EDGAR-LULUCF, worth mentioning/clarifying here.

Line 234- 235: regarding the overestimating forest gain sentence, is there a supplementary figure you can include/guide reader to.

Line 236 to 239: if you used IPCC guidelines for 100+ year old forests C flux, what did you use for 21 to 100? Worth mentioning here or directing reader to the section where you talk about it.

Line 250 to 255: what is the proportion outside Southern Asia, would be helpful to contextualise the numbers.

Line 319 to 325: did you consider using other age products at global e.g. GAMI or regional/national scales

Line 330 to 335: did you apply a managed land map to countries where it is available as has been done in the past? E.g. in Brazil

Line 348: what do you mean by “deforestation gains”? you mean GHG gains in deforested landscapes with non-forest growing e.g. tree crop plantations?

Line 413: I believe they are now called “Global Nature Watch” 😊

Line 435 to 439: do these countries also have a different definition of forest e.g. in terms of canopy cover/height compared to what can be detected with CCI?

Line 440: in this section, please direct the reader to Figure 4 wherever possible.

Lines 457 – 460: could you include a figure of these 3-4 countries in a supplementary figure?

Line 461 to 465: I got quite lost in this paragraph, what do you mean “statistical population”, and what are “observations”? Is there a Figure for this paragraph to help make your point?

Line 466: suggest to rephrase to “Considering temporal/annual net fluxes, the aggregated global...”

Line 474 to 476: please include what you mean by statistically significant in the form of a p-value or similar.

Line 480 to 481: what is the magnitude of the difference – quantify please.

Fig 7 – sorry to be a pain and so picky, but the legend does not match the figure caption: JRC_Tier1 vs EDGAR-LULUCF.... Same goes for Figure 10...

Line 508 to 515: are there any figures/reference to numeric values to support these statements?

Line 523 to 524: do you know the GFW and EDGAR have such good agreement? Does this agreement hold at national scale or is it an aggregating effect?

Figure 8 – I found this figure really hard to read, it is small and highly pixelated.

Figure 9 – please add that the red dotted line is the NGHGI – either global or at country scale.

Figure 569 to 571: could test this by plotting the trend for the period before and after 2015, rather than for the whole time period?

Line 627: I am confused, why is it two datasets? Is one Emissions and the other removals? This is not clear to me.

Line 658-9: reference needed