

Quantifying forest change in the European Union

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ARISING FROM G. Ceccherini et al. *Nature* <https://doi.org/10.1038/s41586-020-2438-y> (2020).

Using remote-sensing data on forest cover change in the European Union (EU), Ceccherini et al.¹ report an abrupt increase in harvested biomass (69%) and in harvested forest area (43%) on the basis of a comparison between two periods, 2010–2015 and 2016–2018, in a single decade. They demonstrate a spike in harvests in 2016–2018, and use the short-term rise to infer a long-term trend of increasing harvests, causing them to question the viability of European forests remaining a terrestrial carbon sink in the future. They then suggest that the recent expansion of wood markets around the globe may portend sustained growth in the area harvested for forest products in the EU, and that this might adversely affect goals to mitigate climate change in the coming decades. We feel that this argument is misinformed and, together with their analysis, leads Ceccherini et al.¹ to several errors in their conclusions.

Ceccherini et al.¹ state that more than half of the 69% increase in EU harvest volumes comes from Sweden and Finland; however, independent national data from these countries show a more modest increase of 10–11% when comparing the two periods^{2,3}. The selection of the two periods for comparison seems to be problematic. The period that Ceccherini et al.¹ select for comparison, 2016–2018, marks a time of global economic expansion and therefore higher market demand for forest products. According to Ceccherini et al.¹, the selected period 2016–2018 also saw a 210% increase in the number of forest fires and a 90% increase in major windstorms compared to the control period—effects that must be factored out to support the conclusions. The control period itself is truncated to cover only five or six years, which is a fraction of the typical forest-management cycle.

Ceccherini et al.¹ acknowledge that forest growth in the EU has outpaced harvests, noting that: “The amount of carbon sequestered by forest carbon sinks in the EU has remained stable over the last 25 years and currently offsets about 10% of total EU greenhouse gas emissions”. They implicitly recognize that net carbon stored in the EU continues to increase as forest volume accumulates faster than additions to (and fluctuations in) the annual harvest. This growth in forest volume arises primarily from the increased density of forests rather than from an expansion in forest area. Ceccherini et al.¹ themselves provide some evidence of the growth in density of EU forests by stating a 69% increase in harvested forest biomass from only a 43% increase in harvested forest area, which indicates a rise in forest density.

The GFC Landsat dataset⁴ that Ceccherini et al.¹ use for their analysis is based on remote-sensing satellite data that does not give information on changes in forest density beyond a certain threshold. Although this data-collection method records sharp changes in the landscape from year to year, such as clear-cuts and large natural disturbances, it fails

to capture the annual incremental growth in forest biomass⁵. Managed forests, such as those in Finland and Sweden, deliberately aim for harvest cycles of several decades to maximize the volume of wood growth per hectare of forest. The increase in forest volume beyond tree cover is not captured by remote sensing and relies on estimates from the European Space Agency and other pan-European organizations. Better area estimation from sample data would reduce the discrepancy with national data sources.

As the cause of the projected increase in harvests, Ceccherini et al.¹ suggest an abruptly rising demand for wood products. However, this argument does not correlate well with the market dynamics. Although wood products can be stockpiled from year to year, wood harvests closely follow global economic cycles as well as responding to long-term trends in product use. For example, economic expansion in Asia has increased the global demand for pulp, while the transition from print to electronic products has reduced the consumption of pulp and paper. Global demand for sawn wood has been relatively stable since 2000, rising and falling with global economic cycles but not showing signs of secular growth. Part of this stability may result from the increase in consumption of resource-efficient plywood and other engineered wood products. The use of wood as fuel is mandated by the EU as a part of its policy for climate change mitigation, but—to our knowledge—clear-cutting has not been carried out in Europe for the sole purpose of obtaining energy from harvested wood. Wood residues—including black liquor (from pulp production), bark and sawdust—fuel forest-product facilities across the EU. As well as this internal industry consumption, the production of wood pellets for energy in Europe in 2018 (16.9 million metric tonnes⁶) accounted for a small fraction (less than 7%) of the production of domestic forest products, and was supplemented by imports from North America and Asia.

In summary, we suggest that there are inconsistencies in the proposal by Ceccherini et al.¹ that sustained increases in the harvested area of EU forests lead to net atmospheric carbon emissions from these forests.

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Matters arising

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Competing interests The authors declare no competing interests.

Additional information

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