

Deforestation Q and A

Pontus Olofsson
Boston University

(a) Why measuring deforestation is necessary?

We're all aware of the impacts of deforestation -- but different studies, estimates, maps, surveys, initiatives, etc. paint different pictures, which complicate informed decision-making.

Abrupt increase in harvested forest area over Europe after 2015

Guido Ceccherini , Gregory Duveiller, Giacomo Grassi, Guido Lemoine, Valerio Avitabile, Roberto Pilli & Alessandro Cescatti

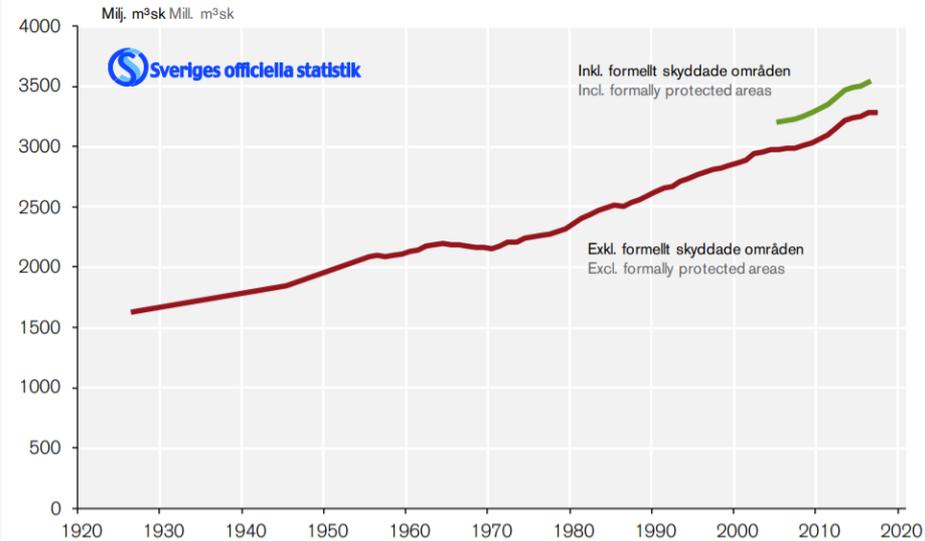
Nature 583, 72–77(2020) | [Cite this article](#)

10k Accesses | 2 Citations | 798 Altmetric | [Metrics](#)

Abstract

Forests provide a series of ecosystem services that are crucial to our society. In the European Union (EU), forests account for approximately 38% of the total land surface¹. These forests are important carbon sinks, and their conservation efforts are vital for the EU's vision of achieving climate neutrality by 2050². However, the increasing demand for forest services and products, driven by the bioeconomy, poses challenges for sustainable forest management. Here we use fine-scale satellite data to observe an increase in the harvested forest area (49 per cent) and an increase in biomass loss (69 per cent) over Europe for the period of 2016–2018 relative to 2011–2015, with large losses occurring on the Iberian Peninsula and in the Nordic and Baltic countries. Satellite imagery further reveals that the average patch size of harvested area increased by 34 per cent across Europe, with potential effects on biodiversity, soil erosion and water regulation. The increase in the rate of forest harvest is the result of the recent expansion of wood markets, as suggested by econometric indicators on forestry, wood-based bioenergy and international trade. If such a high rate of forest harvest continues, the post-2020 EU vision of forest-based climate mitigation may be hampered, and the additional carbon losses from forests would require extra emission reductions in other sectors in order to reach climate neutrality by 2050³.

Timber volym, Sweden, 1920-2020 (*Forest statistics 2020*, Official Statistics of Sweden/Swedish University of Agricultural Sciences)



Figur 1.7 Totalt virkesförråd. 1926–2017.

Alla ägoslag förutom fjäll och bebyggd mark. Utanför (röd) resp. inklusive (grön) formellt skyddade områden enligt 2018 års gränser. Medelvärde för de två första Riksskogstaxeringarna 1923–29 resp. 1938–52, därefter glidande femårsmedelvärde. Total standing volume. 1926–2017.

All land use classes. Outside alpine and urban land. Outside (red) and including (green) formally protected areas as of 2018. Mean value for the first two inventories 1923–29 and 1938–52 followed by moving five year average.

(b) What is the methodological approach you use to estimate deforestation?

A combination of remote sensing and sampling-based approaches.

Today we have more satellite data and computing power than ever before -- this has created a paradigm shift away from change detection to continuous monitoring of the land surface. In particular, more subtle changes in ecosystem health and condition and related to land use dynamics are being monitored.

Further, more comprehensive spatial products allow for more efficient landscape stratifications and more data allow for more confident reference observations.

NASA MEaSUREs project (GLanCE): Global Land Cover/Change Mapping and Estimation, 2000 onwards

Google Earth Engine

GLanCE: Continuous maps of land cover/change – users can create maps for any study area and any time or time interval

AREA², Collect Earth Online, SEPAL, etc: Support and for sampling, and for sample data collection and analysis

Users can produce stratifications, and estimates of area (and map accuracy) for any time, time interval and study area

(c) How difficult is it to measure deforestation accurately? What are the technical factors that affect estimations of deforestation?

Deforestation is often a small proportion of the study area/population -- estimating anything small is always complicated. The problem is not confined to geography but is present also in political polling, public health surveys, factory quality control, etc.

(d) From a technical point of view, why is the estimation of deforestation so controversial?

Probably because money is involved (trees aren't cut for fun but for profit), and because different approaches, studies, methodologies, definitions yield different results.

(e) What are your experiences and lessons learned related to measuring deforestation? What are the perspectives on new approaches to monitoring deforestation? What are your recommendations?

That we need to communicate better the difference between map and estimates. And that we need to learn how to make use of all the new data that is becoming available for better monitoring. And that large uncertainty is expected when deforestation is small fraction of the landscape.