Governments are not using the latest mapping technology to report key environmental data about tropical forests to the UN, say researchers.

Under what is known as the UN's Global Stocktake, set up as part of the Paris Agreement, governments report on the level of carbon emitted or removed in forested areas. Known as carbon-flux budgets, they are important metrics to mark progress towards climate change targets.

But calculating carbon-flux budgets is challenging work.

To remove some of the burden on governments, space agencies and remote sensing scientists have developed specialist global forest maps. These maps reflect the latest scientific assessment of forest health and are based on satellite images and computer models of the way carbon flows between land, vegetation and the atmosphere.

A team of scientists led by the University of Leeds has investigated whether these specialist maps are being used by governments when they submit data to the UN Framework Convention on Climate Change, the UN body responsible for supporting the global response to climate change.

Fifty-six nations made official submissions to the UN from 2014 to 2022 about tropical forests. Taken together, they covered an area of 1.5 billion hectares, about one third of the world's forests and four-fifths of forested areas in the tropics.
Despite the global maps being made available free of charge, just under half of the countries in the tropics (46%) used them: that ranged from 25% of Latin American and Caribbean countries to 65% of African states.

With so many countries not using the maps, the researchers—writing in the journal *Environmental Research Letters*—raise questions about the accuracy of the data being sent to the UN.

Joana Melo, a doctoral researcher in the Faculty of Environment at Leeds who led the study, said, "Forests are the only effective carbon capture technology we have for immediate climate change mitigation at scale."

"However, their realistic contribution to achieve carbon neutrality is uncertain if we cannot accurately measure their carbon fluxes or changes at national and global scale."

"Space agencies and the Earth observation community are making large investments in the order of billions of US dollars to measure the Earth's surface consistently in space and time."

"Our study highlights many of the satellite-based global maps offered over the last decade are not used by sovereign nations monitoring and reporting forest carbon fluxes to the Climate Change Convention."

The study said there was a host of factors to blame for the problem, including:

- Complex UN rules around how the global maps should be used and the data reported
- Individual nations finding it difficult to apply one-fit-all maps to their national circumstances
Lack of co-operation between experts who develop products based on satellite imagery and the users of those products who can find them overly complicated and confusing.

Guy Ziv, Professor of Socio-Environmental Systems in the School of Geography at Leeds who supervised the research, said, "There needs to be a greater alignment between the information that nations need to collect for their own monitoring and reporting purposes and the investments being made by the global remote sensing community."

"Our study demonstrates how important it is for scientists to co-design and co-develop global maps with end users, including Governments, and to provide guidance and solutions for those nations about how to apply those global maps in ways that meet the requirements of the Intergovernmental Panel on Climate Change."

More information: Joana Melo et al, Satellite-based global maps are rarely used in forest reference levels submitted to the UNFCCC, Environmental Research Letters (2023). DOI: 10.1088/1748-9326/acba31

Provided by University of Leeds

Citation: Accuracy at risk as governments reject specialist forest mapping tools (2023, February 21) retrieved 13 July 2024 from https://phys.org/news/2023-02-accuracy-specialist-forest-tools.html

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