

Land use change has warmed the Earth's surface

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Recent changes to vegetation cover are causing the Earth's surface to heat up. Activities like cutting down evergreen forests for agricultural expansion in the tropics create energy imbalances that lead to higher local surface temperatures and contribute to global warming.

Natural ecosystems play a crucial role in helping combat climate change, air pollution and soil erosion. A new study by a team of researchers from the Joint Research Centre, the European Commission's science and

knowledge service, sheds light on another, less well-known aspect of how these ecosystems, and forests in particular, can protect our planet against [global warming](#).

The research team used satellite data to analyse changes in global vegetation cover from 2000 to 2015 and link these to changes in the surface energy balance. Modifying the vegetation cover alters the surface properties - such as the amount of heat dissipated by water evaporation and the level of radiation reflected back into space - which has a knock-on effect on local surface [temperature](#). Their analysis reveals how recent land cover changes have ultimately made the planet warmer.

"We knew that forests have a role in regulating surface temperatures and that deforestation affects the climate, but this is the first global data-driven assessment that has enabled us to systematically map the biophysical mechanisms behind these processes", explains Gregory Duveiller, lead author of the study.

The study also looked beyond deforestation, analysing changes between different types of vegetation, from evergreen forests to savannas, shrublands, grasslands, croplands and wetlands. However, they found that the removal of tropical evergreen [forest](#) for [agricultural expansion](#) is the vegetation cover transition most responsible for local increases in [surface](#) temperature.

From a greenhouse gas perspective, the cutting of forests might only affect the global climate in the mid-to-long term. However, the scientists point out that local communities living in areas where the trees are cut will immediately be exposed to rising temperatures.

The study was published in *Nature Communications* today and [the datasets behind are fully described in Scientific Data](#).

More information: Gregory Duveiller et al, The mark of vegetation change on Earth's surface energy balance, *Nature Communications* (2018). [DOI: 10.1038/s41467-017-02810-8](https://doi.org/10.1038/s41467-017-02810-8)

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