

Life Sciences Reporting Summary

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► Experimental design

1. Sample size

Describe how sample size was determined.

The used global forest map has a spatial resolution of 30 m (Hansen et al. 2013 Science 342, please see Methods section "Used forest cover map and its analysis"). This is the highest spatial resolution currently available for such a product. An extended cluster detection algorithm was used to determine the forest fragments in America, Africa and Asia-Australia (please see Methods section "Used forest cover map and its analysis").

2. Data exclusions

Describe any data exclusions.

The analysis has been done for the tropics (please see Methods section "Used forest cover map and its analysis").

3. Replication

Describe whether the experimental findings were reliably reproduced.

Our study is not based on experiments, so no replication was needed. We analysed a global map on forest cover derived from remote sensing.

4. Randomization

Describe how samples/organisms/participants were allocated into experimental groups.

Our study is not based on experiments, so no randomization into experimental groups was needed.

5. Blinding

Describe whether the investigators were blinded to group allocation during data collection and/or analysis.

Our study is not based on experiments, so no group allocation and thus, no blinding was needed.

Note: all studies involving animals and/or human research participants must disclose whether blinding and randomization were used.

6. Statistical parameters

For all figures and tables that use statistical methods, confirm that the following items are present in relevant figure legends (or in the Methods section if additional space is needed).

n/a Confirmed

- The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement (animals, litters, cultures, etc.)
- A description of how samples were collected, noting whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- A statement indicating how many times each experiment was replicated
- The statistical test(s) used and whether they are one- or two-sided (note: only common tests should be described solely by name; more complex techniques should be described in the Methods section)
- A description of any assumptions or corrections, such as an adjustment for multiple comparisons
- The test results (e.g. P values) given as exact values whenever possible and with confidence intervals noted
- A clear description of statistics including central tendency (e.g. median, mean) and variation (e.g. standard deviation, interquartile range)
- Clearly defined error bars

See the web collection on [statistics for biologists](#) for further resources and guidance.

► Software

Policy information about [availability of computer code](#)

7. Software

Describe the software used to analyze the data in this study.

The high-resolution forest cover map (Hansen et al. 2013 Science 342) was analysed using our developed software (available upon request, please see Methods section "Code availability").

Fragment size and perimeter distributions derived from the forest cover map were fitted to power law distributions using the Matlab package of Y. Virkar and A. Clauset (free available at <http://tuvalu.santafe.edu/~aaronc/powerlaws/bins/>).

Simulation models of forest fragmentation (FRAG, FRAG-B and FRAG-P) were developed in C++ (available upon request, please see Methods section "Code availability").

Potential forest areas for our simulation models were calculated using climate data operators (cdo, free available at <https://code.mpimet.mpg.de/projects/cdo/>).

Forest loss and gain data (Hansen et al. 2013 Science 342) was computed using Google Earth Engine.

Basic statistical analysis were done in R (free available at <https://www.r-project.org/>).

For manuscripts utilizing custom algorithms or software that are central to the paper but not yet described in the published literature, software must be made available to editors and reviewers upon request. We strongly encourage code deposition in a community repository (e.g. GitHub). *Nature Methods* [guidance for providing algorithms and software for publication](#) provides further information on this topic.

► Materials and reagents

Policy information about [availability of materials](#)

8. Materials availability

Indicate whether there are restrictions on availability of unique materials or if these materials are only available for distribution by a for-profit company.

Data availability statement is provided in the Methods (section "Data availability").

Data of fragment size and perimeter distributions, simulation results and the simulation models are available upon request (corresponding author).

The used vegetation map can be obtained from Hansen et al. (2013) Science 342 (see references and Methods).

The developed software for analysing the high-resolution forest cover map is available upon request (please see Methods section "Code availability").

9. Antibodies

Describe the antibodies used and how they were validated for use in the system under study (i.e. assay and species).

No antibodies were used in this study.

10. Eukaryotic cell lines

a. State the source of each eukaryotic cell line used.

No eukaryotic cell lines were used in this study.

b. Describe the method of cell line authentication used.

No eukaryotic cell lines were used in this study.

c. Report whether the cell lines were tested for mycoplasma contamination.

No eukaryotic cell lines were used in this study.

d. If any of the cell lines used are listed in the database of commonly misidentified cell lines maintained by [ICLAC](#), provide a scientific rationale for their use.

No eukaryotic cell lines were used in this study.

► Animals and human research participants

Policy information about [studies involving animals](#); when reporting animal research, follow the [ARRIVE guidelines](#)

11. Description of research animals

Provide details on animals and/or animal-derived materials used in the study.

No animals were used in this study.

Policy information about [studies involving human research participants](#)

12. Description of human research participants

Describe the covariate-relevant population characteristics of the human research participants.

No human research participants were in this study.