

Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- | | | |
|-------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The statistical test(s) used AND whether they are one- or two-sided
<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A description of all covariates tested |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
<i>Give P values as exact values whenever suitable.</i> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated |

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

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

Data collection The annual forest maps (DOI: 10.6084/m9.figshare.21298497) are generated using Google Earth Engine and MOD09A1 surface reflectance product provided by the United States Geological Survey (<https://lpdaac.usgs.gov/products/mod09a1v006/>).

Data analysis We use ArcGIS 10.1 (<https://www.arcgis.com/index.html>), R x64 3.4.2 (<https://www.r-project.org/>), ENVI/IDL 5.2 (<https://www.harrisgeospatial.com/>), and Matlab R2017a (<https://www.mathworks.com/products/matlab.html>) to carry out data analysis.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

All the data used in this study are freely available to the public. The evergreen forest maps generated in this study are available in the Figshare (DOI: 10.6084/m9.figshare.21298497). MOD09A1 surface reflectance product (<https://lpdaac.usgs.gov/products/mod09a1v006/>) and MOD14A2 fire data (<https://lpdaac.usgs.gov/products/mod14a2v006/>) are provided by the United States Geological Survey. The PRODES project data are available from the Instituto Nacional de Pesquisas Espaciais, Brazil (INPE, <http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes>). The Global Forest Watch forest cover loss product is available from the University of Maryland (<https://glad.earthengine.app/view/global-forest-change#dl=1;old=off;bl=off;lon=20;lat=10;zoom=3;>). The MapBiomass data is available from

<https://mapbiomas.org/en>. The boundary maps of protected areas and indigenous territories are available from the Amazonian Network for Socio-environmental Information (RAISG, <https://www.amazoniasocioambiental.org/en/>).

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

Life sciences Behavioural & social sciences Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Ecological, evolutionary & environmental sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description

The conflicts between forest conservation and socio-economic development in the Brazilian Legal Amazon (BLA) have persisted for years. Previous studies reported inconsistent results on the effects of the indigenous territories (ITs) and protected areas (PAs) in reducing deforestation. Here we analyzed time-series satellite images and qualified annual forest area from 2000 to 2021 in the BLA, ITs, and PAs with different governance and management. We find that the areas classified as ITs/PAs had increased substantially since 2001 and covered 52% of forest area in the BLA by 2021. ITs/PAs accounted for only 5% of the total net forest area loss during 2000-2021 and 12% of the total gross forest area loss during 2001-2021. In terms of institution and governance, annual gross forest area loss rate after the years of establishment was reduced by 36% for national PAs, 30% for ITs, and 5% for state PAs. In terms of management objectives, annual gross forest area loss rate after the years of establishment was reduced by 48% for the PAs with "strict protection" and 11% for the PAs with "sustainable use". ITs/PAs had increased gross forest area loss in 2018-2021, and the increased rate was two times of the non-protected areas. Our findings reveal the substantial progress and the critical role of ITs/PAs in forest conservation and call for urgent actions and investment to strengthen ITs/PAs, reverse Brazil's weakened forest policies, and tackle the negative impacts of COVID-19 pandemic in the ITs/PAs.

Research sample

This study uses satellite image data covering the entire study area.

Sampling strategy

This study uses satellite image data covering the entire study area.

Data collection

This study uses MOD09A1 surface reflectance data product and MOD14A1 fire data product.

Timing and spatial scale

This study uses satellite image data at 500-m spatial resolution over the period of 2000-2021 in the Brazilian Legal Amazon.

Data exclusions

This study uses all satellite images and identifies good-quality observations.

Reproducibility

This study can be readily reproduced, as (1) satellite images are available to the public and (2) all the mapping algorithms are published.

Randomization

This study uses all the satellite images in the study area and over the study period.

Blinding

This study analyzes satellite images, thus blinding is not needed.

Did the study involve field work? Yes No

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involvement in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/> Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/> Palaeontology and archaeology
<input checked="" type="checkbox"/>	<input type="checkbox"/> Animals and other organisms
<input checked="" type="checkbox"/>	<input type="checkbox"/> Human research participants
<input checked="" type="checkbox"/>	<input type="checkbox"/> Clinical data
<input checked="" type="checkbox"/>	<input type="checkbox"/> Dual use research of concern

Methods

n/a	Involvement in the study
<input checked="" type="checkbox"/>	<input type="checkbox"/> ChIP-seq
<input checked="" type="checkbox"/>	<input type="checkbox"/> Flow cytometry
<input checked="" type="checkbox"/>	<input type="checkbox"/> MRI-based neuroimaging