

Reporting Summary

Nature Portfolio 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 Portfolio 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
☒	☐ The exact sample size (<i>n</i>) for each experimental group/condition, given as a discrete number and unit of measurement
☒	☐ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☒	☐ 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>
☐	☒ A description of all covariates tested
☐	☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ 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)
☒	☐ For null hypothesis testing, the test statistic (e.g. <i>F</i> , <i>t</i> , <i>r</i>) with confidence intervals, effect sizes, degrees of freedom and <i>P</i> value noted <i>Give P values as exact values whenever suitable.</i>
☐	☒ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐ Estimates of effect sizes (e.g. Cohen's <i>d</i> , Pearson's <i>r</i>), 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	This study did not involve any primary data collection
Data analysis	This study necessitated developed of extensive and bespoke computational modelling architecture, primarily written in the open source R programming language as scripts. We have provided access to the code underpinning our results via a Gitlab repository: https://gitlab.com/tasminsymbols/map-climatechangeimpacts , with a record deposited on Zenodo 10.5281/zenodo.17695592

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 Portfolio [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 description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The downscaled and bias-corrected CMIP6 climate projections used in this analysis are available from: <https://registry.opendata.aws/nex-gddp-cmip6/>. Citations to

other supporting datasets (on historical climate variables, flood and hydrological modelling, cyclone modelling, topology, population density, remotely sensed landcover classifications, socioeconomic indicators, malaria infection prevalence and control coverage) are provided in full in Supplementary Information Table 1.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender	This study did not involve collection of data or biological material from human participants
Reporting on race, ethnicity, or other socially relevant groupings	This study did not involve collection of data or biological material from human participants
Population characteristics	This study did not involve collection of data or biological material from human participants
Recruitment	This study did not involve collection of data or biological material from human participants
Ethics oversight	This study did not involve collection of data or biological material from human participants

Note that full information on the approval of the study protocol must also be provided in the manuscript.

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

Ecological, evolutionary & environmental sciences study design

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

Study description	This study involved computational analysis and modelling of publicly available datasets
Research sample	No research samples were used in this study. Pre-existing datasets were used representing a wide range of geotemporal variables (climatic, biophysical and population). All data sources were publicly available and are described in detail in the Extended Methods and Supplementary Information, Table 1, along with URLs to the original source repositories.
Sampling strategy	No sampling was undertaken in this study
Data collection	This study did not involve any primary data collection
Timing and spatial scale	This study did not involve any primary data collection
Data exclusions	No data were excluded from analysis
Reproducibility	All work comprised computational analysis and is fully reproducible given the code base and input datasets
Randomization	This study did not require any randomization procedure
Blinding	This study did not require any blinding procedures

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	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Plants

Seed stocks

No plants or seed stocks were required for this study

Novel plant genotypes

No plants or seed stocks were required for this study

Authentication

No plants or seed stocks were required for this study