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Title	Adaptive responses of animals to climate change are most likely insufficient
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Publication date	2019-07-23
Original Citation	Radchuk, V. et al (2019) 'Adaptive responses of animals to climate change are most likely insufficient', Nature Communications, 10(1), 3109. (14pp.) DOI: 10.1038/s41467-019-10924-4
Type of publication	Article (peer-reviewed)
Link to publisher's version	https://www.nature.com/articles/s41467-019-10924-4 - 10.1038/s41467-019-10924-4
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Last updated by author(s): Apr 15, 2019

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

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☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
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☐	☒	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	WebPlotDigitiser, metagear package in R software
Data analysis	R 3.5.0

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/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.

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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
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The PRC dataset, containing metadata on each study as well as coefficients estimated for each step of the framework (Fig. 1) per each study is available as Supplementary Data 4. We also make available the raw data for a subset of studies for which we received the consent of data owners (4819 out of 4835 studies). These data are available as part of the R package 'adRes' (www.github.com/radchukv/adRes), which implements the complete workflow of this study and provides functions to be used to conduct similar analyses on new data in the future. The source data underlying Figs 1b-c, 1e-f, 2, 3, 4, and 5a-c are provided as a Source Data file.

Field-specific reporting

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Ecological, evolutionary & environmental sciences study design

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

Study description	This study is a meta-analysis based on a systematic literature review. We addressed a question of to what extent the trait changes in animals in response to climate change are adaptive.
Research sample	We focused on adaptive responses of animals, and therefore our search targeted a wide range of animal taxa, from insects to mammals. As a result of our literature search we assembled a dataset consisting of 4835 studies (representing 1413 non-aquatic species in 23 countries). This 'Phenotypic responses to Climate' (PRC) dataset contained information on phenotypic responses to climate change. Out of these 4835 studies a subset of 71 studies (representing 17 species in 13 countries) contained all the information required to assess whether responses were adaptive and was used for the analyses for which selection differentials were necessary.
Sampling strategy	Our sample size was a result of what was available on this topic in the published literature.
Data collection	The data were collected by conducting a systematic literature review. We identified the potentially suitable papers by key words search on Web of Knowledge. In the next step, the 10090 identified abstracts were skimmed and the papers that seemed to satisfy all the necessary requirements were retained. Finally, after the full read of the subselected 180 papers, 58 of them were retained to assemble the dataset.
Timing and spatial scale	The key word search was conducted on May 23rd 2016 in Berlin and the abstract skimming took place in the following months.
Data exclusions	No data were excluded from the analysis
Reproducibility	Not applicable because this is not an experimental study
Randomization	Not applicable. We did not experiment with animals. Instead, our dataset was based on the studies that were published in the literature
Blinding	Blinding is not relevant to our study because we do not experiment with animals but collected the data from studies conducted previously and published in literature.

Did the study involve field work? ☐ Yes ☒ No

Reporting for specific materials, systems and methods

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Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology
☒	☐ Animals and other organisms
☒	☐ Human research participants
☒	☐ Clinical data

Methods

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