

Registered Report for climate research



In this issue of *Nature Climate Change*, we publish our first Registered Report. We encourage scientists from all climate research communities to consider this format in the future.

Across various fields, the reliability and reproducibility of experimental evidence relies on sound scientific practices. However, systematic bias in the publication process can favour the publication of positive and significant results, and scholars have raised concerns that this could motivate poor or even unethical practices, including p-hacking and fraud¹. These practices might contribute to the so-called ‘reproducibility crisis’, whereby results have been shown to be difficult to reproduce by other research groups, particularly in fields where work is hypothesis-driven².

Registered Reports offer an option to address this issue, as they change the fundamental incentives leading to publication, by focusing on the importance of the research question and the rigour of the methodology. They were first introduced as a formal publication format in the field of psychology and cognitive science in 2013 (ref. 3), although the history of pre-registering studies is much older⁴. The format soon became common in the field of psychology and clinical science, and within the Nature Portfolio family, it was first adopted by *Nature Human Behaviour* in 2017 (ref. 5). Since then, the format has been adopted by other Nature Portfolio journals, and we believe that it could also be important for the climate research community.

In this issue, we are pleased to publish our first Registered Report and introduce the format to our readers. Although the published version of a Registered Report looks very similar to other research articles, the peer-review process differs drastically. Before conducting their study, researchers submit their proposal to the journal with detailed research hypotheses and planned procedures, and editors



will assess the novelty, relevance and broad interest of the question that is intended to be addressed to decide whether to send the Registered Report out for peer review. Following the editorial decision and subsequent peer-review process, the paper is accepted in principle as ‘Stage 1’ and stored in our online repository, [Figshare](#). Once the research is completed, the journal will publish the paper after another review by the original reviewers, as long as there is no major deviation from the Stage 1 design, even if the results are negative or insignificant. With this unique publication mode, we hope that the Registered Report can help to reduce publication bias and provide a more complete picture of a system.

An example is illustrated in the Registered Report published in this issue: contrary to their initial hypothesis, Stoetzer and Zimmermann find no evidence that motivated cognition causes climate denial and environmentally harmful behaviour. These findings show that null results can still help to better understand the possible causes of climate perceptions and actions. Although Registered Reports were developed for and mostly applied to hypothesis-driven or replication studies, they are now also being adopted for other kinds of work, such as comparative studies, analysis of secondary data, empirical

studies or even highly exploratory studies^{6,7}. The multidisciplinary fields of the climate research community could provide a platform for extensively exploring the applicability of Registered Reports in different disciplines.

We believe that this format is a valuable addition as it is particularly well suited for studies that can be formulated in terms of specific research questions on controversial topics, ensuring that the question is addressed in the best way possible, irrespective of the expectations of the researchers and reviewers. For example, they could be a suitable option for studies on how different parts of the Earth system respond to anthropogenic emissions, especially if there are diverging opinions or large uncertainties on a specific question. In such cases, a Registered Report could include proposing specific field measurements or model intercomparison experiments aimed at addressing these questions, thus helping researchers to better focus these resource-expensive endeavours.

Climate change researchers have a long history of working closely with the public and private sectors, which means that scientific findings could have substantial real-world consequences. Thus, climate change research requires high integrity standards. Meanwhile, null or negative results of climate research can still have important implications for practical climate actions, which can guide society to concentrate on the most urgent problems. We hope that researchers across the breadth of the climate change community explore and consider this format for their work. Submission guidelines are available on our [website](#).

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References

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