PLOS Climate

EDITORIAL

Four years of *PLOS Climate*: Past, present and future

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As we celebrate four years since *PLOS Climate*'s first publications, and with two of us having joined as Editors-in-Chief of the journal relatively recently, we would like to share some reflections on what our community has achieved so far and where we're heading next.

The changing global context

The climate- in all senses of the word- in which we find ourselves in 2026 is very different from that in which *PLOS Climate* was launched. It seems clear by now that the Paris Agreement target of 1.5°C will be exceeded, with the dramatic pace of global heating posing unprecedented challenges to human societies. As climate impacts intensify and widen, and as concerns grow about approaching tipping points, targeted and clear communication of robust science must remain the cornerstone of our collective societal response.

We cannot ignore, however, that evidence-based calls for urgent and concerted action on the causes and impacts of climate change are at risk of being drowned out. We are in a new political and social era marked by the increasing threat of disinformation and misinformation, backtracking on environmental pledges, surging energy use for new technologies, and emerging geopolitical situations that have shifted attention away from the climate. In many countries, funding cuts and deprioritisation pose an existential risk to the enterprise of climate research itself.

Despite these formidable challenges, new opportunities are also emerging. For example, in many regions, great strides have been made in local-scale climate adaptation programmes, and there has been significant progress in the affordability and deployment of renewable energy infrastructure. Increasingly, issues of justice and equity are acknowledged in these processes, highlighting the unequal distribution of the associated burden and benefits. There have also been important methodological advances in modelling the climate system and impacts of climate change facilitated by the success of Artificial Intelligence (AI) models in learning complex relationships from ever more abundant data.

In the context of this fast-evolving landscape, the broad and inclusive approach to climate research across the natural and social sciences that was envisaged with

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the launch of *PLOS Climate* is more important than ever. We remain committed to championing rigorous and transparent research that maximises impact and trust, and encouraging collaboration between researchers, decision-makers, practitioners and educators from local to global scales.

Taking stock of *PLOS Climate*'s first four years

Since the launch of *PLOS Climate* [1], we have published hundreds of Research Articles, Reviews, Essays and Opinion pieces which have achieved a remarkable cumulative impact. These contributions span topics as diverse as tools for probabilistic climate projections [2], analyses of energy transport under extreme warming scenarios [3], climate risks to the UN Sustainable Development Goals [4], country-level assessments of climate change impacts [5], Early Career Researchers' visions for the future of polar research [6], and data democracy in climate science [7]. We have also convened Collections of articles on topics ranging from carbon pricing (https://latitude.plos.org/2023/03/introducing-a-plos-climate-mini-collection-on-carbon-pricing/) to human health (https://collections.plos.org/collection/climate-change-human-health/), and from environmental policy (https://collections.plos.org/collection/environmental-policy/) to climate obstructionism (https://latitude.plos.org/2025/03/emerging-themes-in-climate-obstruction-a-plos-climate-mini-collection/).

Beyond the peer review and publication of this wealth of research and commentary, our community has also been engaged in a huge range of activities in support of our wider mission. We have collaborated with Early Career Researcher networks including APECS (https://collections.plos.org/collection/early-career-scientists-apecs/) and the PAGES Early Career Network (https://www.youtube.com/watch?v=5kOVwu2v3q8), convened stakeholder 'think tables' across the research-policy interface (https://latitude.plos.org/2025/11/cop30-can-enable-greening-plant-nutrition-in-east-and-southern-africa/), and delivered in-person and virtual training sessions and workshops on scientific writing and Open Science for the next generation of researchers.

In all of this, we have been supported by the committed, global editorial board that sits at the heart of our community. Their insights, experience and energy continue to make the development of the journal an exciting co-creative process.

Next steps for *PLOS Climate*

Looking ahead, we foresee several major themes running through the next phase in *PLOS Climate*'s evolution.

The rise of AI, alongside ever increasing amounts of observational data, provides tremendous opportunities for improving our capacity to understand past behaviour and to model the future of the Earth's climate system. Deep Learning, but also simpler data-driven models promise major advances in reconstructing missing data in past climate fields, in bias correction and downscaling of climate model output, or in the parameterization of unresolved processes in climate models. *PLOS Climate* aims to publish key research both on the development of data-driven methods for more accurate modelling of the Earth's climate system and on the use of state-of-the-art

machine learning models for climate change impact assessments, as well as for the identification of sustainable adaptation and mitigation strategies.

Given the significant risks associated with potential tipping points in the Earth's climate and ecosystems- as well as in social systems- there is an urgent need to advance our understanding of these systems. In line with this need, in 2026 we are assembling an interdisciplinary Collection on Tipping Points (https://latitude.plos.org/2026/02/forthcoming-collection-on-tipping-points-led-by-plos-climate/), which aims to bring together a diverse range of research on abrupt transitions, constraining associated thresholds, and assessing the possible impacts. Indeed, we anticipate tipping points research to be of such ongoing importance that we are establishing a new section of the journal (see below) to provide a home for this work even beyond the timeline for our Collection.

Another key theme will be the effectiveness of mitigation and adaptation measures. This includes understanding how different policy instruments work and how well they reduce emissions or support climate resilience, as well as wider implications for social justice and for the economy. Furthermore, in the current geopolitical context, it is increasingly important to understand how climate policy can remain at the top of the agenda politically. Understanding how competing policy agendas may divert attention and resources is therefore of great importance, and we encourage contributions on this theme.

We also emphasise here the importance of not attempting to view the climate system in artificial isolation. In keeping with the interdisciplinary outlook of *PLOS Climate*, we will continue to strongly encourage submissions that explore the connections between climate, water, biodiversity, energy, health, sustainability and other domains, and we look forward to future collaborations with other PLOS journals (https://plos.org/our-journals/) in these nexus areas.

Meanwhile, the teams of editors involved in each of *PLOS Climate*'s sections have been laying out their visions for how their respective research communities can contribute to the journal's overarching mission. For example, Editorials from our sections on Adaptation (https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000794), Cryospheric Science (https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000439) and Policy and Governance (https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000668) outline key topics and priorities for their communities. Excitingly, this year we are also launching four new sections of *PLOS Climate*: Climate Impacts and Attribution; Climate Resilience, Extremes and Tipping Points; Machine Learning and Artificial Intelligence; and Methods in Climate Science. These new sections have been conceived to provide dedicated spaces in the journal for contributions on some of the most pressing issues in climate research, and they will follow the interdisciplinary approach of the wider journal.

Finally, with work on the IPCC's AR7 cycle well underway, there is a heightened consciousness in the research community of the importance of evidence synthesis. With this in mind, we will be strongly encouraging contributions to *PLOS Climate* that draw together and critically assess research findings, whether in the form of systematic reviews/meta-analyses (https://journals.plos.org/climate/s/what-we-publish#loc-systematic-reviews-scoping-reviews-mixed-method-reviews-meta-analyses) or narrative reviews (https://journals.plos.org/climate/s/what-we-publish#loc-reviews).

We firmly believe that our mission (https://journals.plos.org/climate/s/journal-information) is more important than ever. It is our aspiration that *PLOS Climate* can provide a much-needed dynamic, constructive and inclusive forum for the exchange of knowledge and perspectives for real-world impact. Whether as a reader, an author, a reviewer, an editor or a friend, we invite you to join us as a member of our community in support of this goal.

Author contributions

Conceptualization: Jamie Males, Niklas Boers, Sirkku Juhola.

Writing – original draft: Jamie Males, Niklas Boers, Sirkku Juhola.

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