vis4climate: Building a Transdisciplinary Climate Vis Community

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Abstract

The need to understand, mitigate, and adapt to climate change and its resulting problems is greater than ever. Solutions can take many forms, ranging from understanding key factors in climate modeling to monitoring forests and species distributions to deciding how to model a sustainable energy or transportation grid, and finally, to communicating the implications to non-experts. This 4th IEEE VIS workshop on visualization and climate change aims to continue the discussion of the role visualization can play in mitigating climate change and to build a strong community of academics and practitioners. In contrast to the interdisciplinary role of visualization in other domains, climate change problems include numerous and diverse stakeholders, and therefore calls for transdisciplinary collaborations among these stakeholders. This workshop aims to elevate the role of visualization in combating climate change by creating a space for interactive discussions with invited guests and the scientific community. To this end, the workshop invites a diverse set of guests from policy, community engagement, and science.

Index Terms: vis4climate, climate change mitigation, climate change adaptation, climate modeling.

1 Introduction, Workshop Motivation, and Goals

The impacts of climate change are becoming more prevalent each year. The increasing amount of CO_2 and other greenhouse gases in the atmosphere cause the earth's temperatures to rise, which in turn increases the frequency and severity of extreme weather events. Among other climate research institutes, the Intergovernmental Panel on Climate Change (IPCC) highlights the importance of limiting average global warming to 1.5 °C to minimize severe future impacts [5]. Most importantly, emissions must be reduced as soon as possible to achieve a larger positive long-term effect—an effort known as climate change *mitigation*. At the same time, strategies must be developed to address unavoidable consequences, which is referred to as climate change *adaptation*. Climate change is a global issue that directly impacts numerous societal and economic aspects, ranging from agriculture and forestry to the social sciences, health, extreme weather, energy, and many more.

Solutions to climate change problems are evolving slowly, and their adoption in the real world is slow and tedious due to a misaligned understanding among stakeholders and climate change being a wicked problem [9]: no clear problem definition, many possible but complementary solutions, and requiring buy-in from diverse audiences. For example, Kelk et al. [6] recently studied energy system modeling across different climate scenarios. In a conversation, one of the co-authors stated that their models proved highly insightful to the researchers themselves, but that they were at a loss at how the results could be made useful for the intended end users—non-scientific decision-makers. This experience exemplifies the general challenges resulting from a highly diverse range of stakeholders who need to cooperatively analyze, understand, and act on complex data and models in high-stakes scenarios.

Visualization has long been used to facilitate the understanding of complex data, and visualization research has always been inherently interdisciplinary. We therefore believe that visualization should play a more important role in driving the transdisciplinary efforts of climate change mitigation, adaptation, and communication. Previous work at the intersection of climate and visualization has explored communication [11, 20], climate journalism [12, 18], mixed reality [2, 22], open and accessible data [15], personalization [16], community engagement [10], data physicalization [19, 17, 14, 4], model understanding [21], decision support [1], and several other approaches summarized in a recent workshop report [7]. That same report of a 2024 IEEE VIS workshop also summarizes 9 key challenges for visualization for climate, which strongly motivate this 4th workshop—e.g., fostering personal relevance and transdisciplinary collaborations, evolving data and visualization literacy, establishing relevant evaluation methods, or supporting emotional shifts.

Of particular interest to this workshop, we highlight that climate change is not a coherent field of practitioners or theories: it is a highly fragmented topic that includes (climate) science (how do things work), sociology and psychology (how do people behave), economy (how to understand complex systems), politics (how to make decisions), and potentially many more. These fields imply diverse and heterogeneous audiences who need to work together to understand the problem, explore possible solutions, and implement specific scenarios. These diverse actors—policy makers, businesses, scientists, communities, and citizens—need to collaborate to define a common ground and move together in order to effectively mitigate climate change.

Continuing the effort initiated by previous IEEE VIS workshops on climate (see Section 4.1), this workshop focuses on **interactive discussions among different stakeholders**, while providing a venue for visualization research in the areas of climate change mitigation, adaptation, literacy, communication, and modeling.

The specific goals of this workshop are as follows:

- Discuss, exchange on, and identify challenges and directions for research.
- Share and discuss current work and viewpoints from the community to raise awareness of this research.
- Create a strong vis4climate community consisting of academics, practitioners, and decision-makers by fostering collaborations and a common understanding of the field.
- Summarize the results of discussions during the workshop and share it with the community.

2 Planned Activities and Program Outline

The workshop will be conducted as a half-day session and strongly focus on interactive discussions. Brief lightning talks of workshop

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submissions (2 min to 3 min) will provide input for longer discussion sessions. The talks will be a mix of introduction statements by invited external guests (see below) and brief presentations of accepted submissions. The discussion following this introductory session will be conducted in smaller break-out groups. A tentative set of discussion topics will be curated beforehand based on the list of challenges and opportunities discovered in past workshops and will be additionally informed by the submissions received. Possible discussion topics include:

(1) How to shift from anxiety to empowering diverse stakeholders to understand and make informed decisions with climate data? *(2)* How to drive impact of visualization tools for public discourse, education, and decision? *(3)* How to effectively collaborate across disciplinary boundaries? To keep the discourse dynamic, diverse, and participant-driven, the topics will be further refined according to audience interests.

2.1 Workshop Sessions

The workshop will be divided into two sessions:

Session 1 (1.5 h)—Opening, Lightning Talks, & Topic Formation: This session begins with a short opening statement by the workshop organizers. Selected authors then present their accepted submissions in short talks; interactive demos will be showcased during the coffee break. Next, invited guests with an "outside of vis" perspective introduce themselves with short statements/presentations (5 min to 10 min per speaker). After these talks, we present the preliminary set of topics for the break-out groups, which we then refine in an open discussion. The final selection of topics is announced right before the coffee break, so that participants can use the coffee break to ponder which break-out groups they would later like to join.

Session 2 (1.5 h)—Break-out Discussions, Results, & Town Hall: After the break, participants form break-out groups for discussion. We aim for group sizes of around 5 people to encourage exchange and discussion. During discussion, we ask participants to take notes or to create other artifacts, such as sketches, to be shared after the workshop. We plan 60 min for the discussions and another 25 min to bring together the results of the discussions. One person from each group will briefly present their results, followed by an open discourse. Finally, we plan to use the remaining time for a short "town-hall" style session during which participants can bring up any additional topics related to the needs or future directions of the vis4climate community, including feedback on the workshop and announcing future events and funding.

2.2 Contributers and Diversity Plan

We want to invite the following guests to the interactive discussions of our workshop:

Prof. David Rolnick (confirmed): Assistant Professor at McGill University, Mila – Quebec AI Institute, and a Co-founder and Chair of Climate Change AI. He works on innovations in machine learning driven by problems in climate change and is an expert on interdisciplinary climate research.

Dr. Kate Marvell (invited): Is a researcher in climate science and makes big efforts to communicate her research to the public.

Boston Museum of Science (invited): With their experience on community engagement and science communication they are an important addition to represent the general public.

IPCC Visualization Support (invited): To report on IPCCs efforts to use clear visualization in their reports.

ClimatePartner (invited): A company offering support for understanding emissions, reducing them, and making a real impact. They bring insights from the economic aspects of climate change.

Local Policy (TBD): We aim to invite a representative of the mayor's office or some other local politician to bring insights on the policy-maker perspective.

With this set of diverse stakeholders we aim to complement the expertise of the vis community and achieve mutually-beneficial discussions. We are aware that not all guests will follow our invitation in which case we will proceed the discussion without them.

2.3 Submission Formats

This workshop invites submissions in three major categories: **Original research contributions** that summarize original research as extended abstracts (up to 2 pages) or short papers (up to 4 pages). **Reflections, opinions, challenges, or critical views** that characterize or challenge the role of visualization in climate change (up to 3 pages). **Pictorials, posters, and interactive demos** can have any form (video, photos, comic, etc..) linked from a one-page description with relevant references.

All submissions will be peer-reviewed by at least 2 reviewers, including invited external reviewers and members of the workshop committee. We want to give authors the option to decide whether they would like their accepted submissions archived. Selected submissions will serve as guiding topics for the break-out discussions outlined below.

3 Definition of Succsess

We intend for the vis4climate workshop to have the following concrete outcomes:

Increased Awareness—Our workshop should increase awareness of climate change in the visualization community. Here, we see awareness not only in terms of climate change as an issue of global importance. More importantly, in the context of the visualization research community, we want to spread awareness of climate-change-related topics as a source of interesting and challenging research avenues, and as a fertile ground for promising research collaborations.

Identified Opportunities—Based on the submissions and the results from break-out group discussions, we will distill major visualization research challenges unique to the transdisciplinary problem of climate change. We plan to make our findings available on the workshop homepage and to use them to inform the vis4climate community.

Strengthened Community—We aim to give participants a heightened sense of community, establishing vis4climate as a vibrant forum that extends well beyond the workshop sessions. We want to lay the foundation for future vis4climate activities similar to those orchestrated by CCAI in the machine learning community while fostering transdisciplinary collaboration.

The main format of this workshop are interactive discussions with diverse stakeholders in climate change and visualization. The set of topics to discuss is flexible enough to adjust to unforeseeable changes. In particular, if *no* guests would follow our invitation and *no* high-quality submissions would be made, we can still procure enough discussion topics from challenges discovered in previous workshops. We consider the workshop a success if we manage to have interesting and engaging discussions on how to facilitate transdisciplinary collaborations for climate change problems.

4 Visualization & Climate Change: Evaluation of Previous Offerings

We see the 2026 workshop as a continuation of the 2022 *Viz4Climate* workshop and the two 2024 workshops *Viz4Climate + Sustainability* and *VISions of the Future*. The two 2024 workshops were unintentionally targeting the same issue and audience; consequently, this 4th edition combines efforts of co-organizers from all three previous workshops.

4.1 Summary of Previous Workshops

IEEE Vis Workshop on *High Impact Techniques for Visual Climate Science Communication*, 2022 [8]: this workshop features a

set of speakers, including Ed Hawkins as a keynote speaker as well as a panel on the topic *"What does High-Impact mean in the context of Visual Climate Science Communication?"*

IEEE Vis Workshop on *Visualization for Climate Action and Sustainability*, 2024 [3] focused more broadly on work addressing action, rather than just communication and raising awareness. This workshop was held online, as was the conference, and resulted in the first workshop report describing eight challenges for visualization for climate [7].

IEEE Vis Workshop on *VISions of the Future: Sustainable Practices within Visualization and Physicalization*, 2024 [13], weaved together two disparate strands of 'what can visualization do for climate research' and 'what can sustainability research teach the field of visualization' with the aim to start creating a coherent sustainability agenda. It was held online and resulted in two other build-up workshops in FAccT'25 and CHI'26.

For this 4th workshop, we start to summarize all applications of visualization in the context of climate change under the umbrella term *vis4climate*. Our vision for the vis4climate workshop series is to orchestrate and align the previously scattered initiatives in the visualization community, and to provide a common forum that facilitates exchange among diverse stakeholders. By bringing together visualization researchers, experts from climate-relevant domains, and end users such as policymakers or the general public, we seek to not only identify important future research directions, but to also allow the visualization community to contribute our part in tackling the pressing issue of climate change.

4.2 Other Related Events

Our workshop relates to other events in the visualization domain, both academic and practitioner focused: The **Visualising Climate** conference[1], scheduled for the first time this fall, aims to discuss how to use visualization to transform public understanding and support decision-making for climate challenges, targeting visualization and climate practitioners. We are currently in touch with the organizers to explore synergies and joint activities, as the conference will happen the week before IEEE VIS, with two co-organizers of this proposal aiming to attend that conference. Several other workshops at IEEE VIS and EuroVis have addressed important subtopics of climate change, including environmental and climate data visualization (**EnvirVis**, at EuroVis since 2013), the societal impact of visualization (**vis4good**, 2021–2023), urban challenges such as traffic and urban development (**CityVis**, 2018–2023), and renewable energies and smart grids (**EnergyVis**, 2020–2024). Compared to these workshops, we aim for greater diversity in topics and participants, and for community building across the full breadth of climate change mitigation, adaptation, and communication.

Outside of the visualization domain, several related workshops address climate change from complementary perspectives. The **Tackling Climate Change with Machine Learning** workshop, organized by Climate Change AI (CCAI) and hosted bi-annually at NeurIPS and ICLR or ICML since 2019, has fostered a flourishing community at the intersection of climate change and machine learning. In the long term, we seek to establish a similar community for the domain of visualization. In the Human-Computer Interaction community, several workshops at ACM CHI have addressed climate change from complementary angles, including understanding climate change (**HCI for Climate Change**, 2023), climate resilience tools (**Designing for "Last-Mile" Climate Resilience with Communities**, 2026), and the environmental impacts of AI (**HCI-TERRA**, 2026), the latter being co-organized by two of this proposal's co-organizers.

[1] https://visualisingclimate.com/

5 Organizer Details

The organizing team comprises a diverse set of members, combining expertise in visualization, human-AI collaboration, and climate/sustainability communication. The organization team has experience organizing related events at IEEE VIS and CHI.

Christina Humer (https://christina.humer.dev/) is a postdoc fellow at the ETH AI Center in Zurich. In transdisciplinary research, she investigates how to mitigate climate change using AI, visual analytics, and human-AI collaboration. Christina is interested in sustainable material science, chemistry, energy system design, and weather and climate modeling. Christina was one of the organizers of the vis4climate meetup at IEEE Vis 2025.

Andreas Hinterreiter (https://jku-vds-lab.at/persons/hinterreiter/) is a postdoctoral researcher and University Assistant in the Visual Data Science Lab at Johannes Kepler University in Linz, Austria. His research interests include dimension reduction and explainable AI. Andreas was one of the organizers of the vis4climate meetup at IEEE VIS 2025.

Aymeric Ferron (https://aymericferron.fr/en/a-propos-de-moi/) is a third year PhD student in the Bivwac team at the Inria Center of Bordeaux University, France. During his PhD, he explores concrete and immersive visualizations to communicate environmental impacts of daily actions to the general public. His research interests span extended reality, data visualizations and gamification, as well as several cognitive mechanisms like learning, memory and attitude and behavior change.

Fanny Chevalier (http://fannychevalier.net) is an Associate Professor in Computer Science and Statistics at the University of Toronto. Her research is interested in methods and tools supporting visual analytics and creative activities, with primary focus on interactive visualization for the visual exploration of rich and complex data, visualization education and statistical communication, and computing tools supporting the flow of creativity.

Marc Streit (https://marc-streit.com/) is a Full Professor at the Institute of Computer Graphics at Johannes Kepler University Linz, leading the Visual Data Science Lab. His research focuses on biological data visualization, visual analytics, and explainable AI. Marc is a co-founder of the JKU spin-off company datavisyn (https://www.datavisyn.io/), where he currently holds the position of Chief Strategy Officer.

Menna El-Assady (https://el-assady.com/) is an Assistant Professor in the Department of Computer Science at ETH Zürich, where she leads the IVIA lab. Prior to her current role, she was a postdoc fellow at the ETH AI Center and held research associate positions in Germany and Canada. Her doctoral research on human-AI collaboration earned the prestigious joint dissertation award of the German, Austrian, and Swiss Informatics Societies, along with an honorable mention for the VGTC VIS Doctoral Dissertation Award.

Luiz A. Morais (https://cin.ufpe.br/~gusto) is an Assistant Professor at the Centro de Informática of the Universidade Federal de Pernambuco (CIn-UFPE), Brazil, and a co-founder of the VIXE research group. His research bridges Human–Computer Interaction and Data Visualization, with a critical focus on sustainability and decoloniality. He was an organizer of the *VISions of the Future* workshop at IEEE VIS 2024 and served as General Chair of the Pernambuco Seminar on Visualization and Sustainability (PSVS24).

Georgia Panagiotidou (https://fourcoffees.github.io/georgiapanagiotidou/) is an Assistant Professor at King's College London in the department of Informatics. Her work broadly centers around how people engage with environmental data exploring key challenges such as biases, uncertainties, and friction in collective data use. Georgia investigates the environmental impact of AI commencing from the tools and visualizations that developers, end-users and communities experience as probes. She was leading

the 2024 VISions of the Future workshop at VIS 2024.

Benjamin Bach (https://benjbach.net) is a Senior Research (Directeur de Recherche) at Inria, Bordeaux at the Bivwac team. He has been co-organizing one of the 2024 workshops and is a co-author on the resulting workshop report. Benjamin's research spans interactive and communicative visualization, including open visualization atlas platforms and with a special interest in wicked problems and climate mitigation.

6 Workshop Logistics

We aim to enable hybrid participation to increase the accessibility of the workshop and allow a diverse audience without restrictions. This way, people who have political, financial, professional, or personal constraints can still participate in, benefit from, and contribute to the workshop. Furthermore, as a workshop focusing on climate change, we consider it our responsibility to reduce the carbon footprint as much as possible by preventing unnecessary travel.

We are aware that a hybrid setup will come with logistical overhead and will prepare accordingly. Half of the organizing team will handle logistics at the conference site, while the other half will support the online session. All planned activities are designed with a potential hybrid participation in mind. Spotlight talks and invited guest introductions can be streamed from and to the conference site Breakout discussions can be carried out locally by small groups of participants or in online breakout groups. For a smooth hybrid setup across time zones, we ask the conference organizers for a morning spot, but we understand if this cannot be guaranteed due to organizational constraints. Workshop details will be published in advance on this website: https://vis4climate.ivia.ch/.

We ask for the following support from the IEEE VIS conference:

- Ideally 5 complimentary 1-day registrations for invited external stakeholders;
- room and AV support suitable for around 50 attendees;
- tables for groups to gather;
- poster boards for 3-6 posters;
- IEEE Xplore Digital Library publication of the proceedings.

7 Proposed Timeline

We plan the following timeline for the workshop organization:

April 2, 2026: Launch call for participation.
June 25, 2026: Deadline for all submissions.
July 16, 2026: Deadline to return reviews.
July 23, 2026: Author notifications.
August 13, 2026: Submission of camera ready versions.

The call for participation will be advertised on social media to reach a broader audience and through mailing lists to reach colleagues from visualization and related research fields.

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