

RiskKAN Working Group: *Artificial Intelligence for Complex Climate Risk Mitigation*

Working Group Leads

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Rationale:

Within this Risk-KAN Working Group (WG), our mission is to advance the development and application of Artificial Intelligence (AI) as a transformative tool for understanding and mitigating complex weather- and climate-related risks across timescales, from immediate hazards to near-term projections and decadal to centennial foresight. This working group builds on the recognition that AI holds unique potential to support the entire early warning chain, encompassing systemic forecast or prediction tasks beyond weather (i.e. hazards and impacts), as well as communication and early warning tasks and decision support applications (Reichstein et al., 2025).

The WG aims to establish a global platform that bridges scientific innovation with practical implementation. Through co-design of research agendas with humanitarian actors and local practitioners, AI solutions can be developed to address real-world needs and contexts (Kuglitsch et al., 2022). We seek to explore and resolve human-centered AI challenges, such as model transparency, ethical deployment, and equitable access, to ensure that technological advances translate into socially just and sustainable outcomes (Gevaert et al., 2021; Chun et al., 2025).

By fostering collaboration across disciplines and sectors, we aspire to connect fragmented research efforts and motivate development of AI methods capable of capturing the complex, interacting drivers of climate-related risks. Ultimately, contributing to ensuring AI is used for enhancing societies' resilience in a changing climate and not to diminish it.

We plan to achieve our mission by organizing our own seminar series which will highlight the work of contributors from various disciplines, locations, and career stages. We will also contribute sessions to leading scientific conferences, support workshops and summerschools, as well as through global policy forums related to climate, disaster risk reduction, and sustainable development. Through these activities,

we aim to foster dialogue, share knowledge, and build partnerships across research, practice, and policy communities.

References:

Chun, K.P., et al. Transforming Disaster Risk Reduction With AI and Big Data: Legal and Interdisciplinary Perspectives. WIREs Data Mining and Knowledge Discovery 15, 2 (2025). <https://doi.org/10.1002/widm.70011>

Gevart, C.M., et al. Fairness and accountability of AI in disaster risk management: Opportunities and challenges. Patterns 2, 11 (2021). <https://doi.org/10.1016/j.patter.2021.100363>

Kuglitsch, M.M., et al. Facilitating adoption of AI in natural disaster management through collaboration. Nat Commun 13, 1579 (2022). <https://doi.org/10.1038/s41467-022-29285-6>

Reichstein, M., Benson, V., Blunk, J. et al. Early warning of complex climate risk with integrated artificial intelligence. Nat Commun 16, 2564 (2025). <https://doi.org/10.1038/s41467-025-57640-w>