

## **Concept note for Event Attribution Working Group under the Global Extremes Platform**

Megan Kirchmeier-Young, Mark McCarthy, Peter Stott, Xuebin Zhang

Event attribution is the process of determining how anthropogenic influence on the climate has changed the likelihood or magnitude of an extreme weather event. There is an increasing demand for event attribution information, including operationally (supporting technical infrastructure and capability to provide results shortly after an event), in the context of loss and damage, and to support international activities monitoring the state of the global climate and impacts of climate change. Although many operational event attribution systems exist, with more in development, there is a wide range in the structure of these systems and in the scale and type of information they provide. There is also a range of scientific and technical challenges in the application of attribution to many types of extreme weather.

To overcome a bias in event attribution studies towards the Global North and ensure a better representativeness of event attribution studies, there is a need to increase event attribution capacity in the Global South and other underrepresented regions. There is also growing interest from meteorology centres in providing attribution information for regional and local extreme events. While there is already considerable experience in the delivery of event attribution assessments for some event types and some regions, there are growing requirements to explore a wider range of event types, impacts, and regions. In light of these developments, clear expert guidance by the climate research community is needed for the implementation and interpretation of event attribution. For event attribution to successfully meet the growing needs being placed upon it, there is a requirement for internationally recognised expert guidance based on an inclusive and collaborative approach, to ensure that the many considerations and sensitivities involved are not overlooked.

The World Climate Research Program (WCRP) has the mandate to coordinate and facilitate international climate research to develop, share, and apply climate knowledge that contributes to societal well-being. Societal demands for event attribution, and the potential for rapid growth in this capability, make it important for WCRP to establish a Working Group on Event Attribution. Although the full scope will be determined by community consultation, this Working Group will have a mandate to lead strategic discussion within the community on the direction of event attribution research, to review existing literature and practices, and to develop technical guidance on the methods and interpretation of event attribution. The goal is to provide the assessment and guidance needed to ensure event attribution information, particularly in an operational context, is clear, robust, and consistent.

Expert guidance will focus on event attribution methods and on how to properly interpret event attribution results. Interpretation includes understanding uncertainties and considering the results in the context of the data, scales, and methods used. With most studies focusing on a single, specific event, clarity is needed on if and how event attribution results can be generalized across events and regions. Additionally, the event attribution community would benefit from a focus for the mutual sharing of data and methods, thereby helping to facilitate the advancement of scientific research needed to develop further capabilities in the future. The

Working Group would be able to undertake a stocktake of the current methods, data, and capabilities. Even outside the operational context, there is a wide range of event attribution approaches in the literature. This process would identify gaps and encourage additional research. In addition, clear methodological guidance may ease the application of event attribution to new and more complex variables and their impacts.

Membership of the Working Group will be selected from the community through an open call for self-nomination and will seek a suitably diverse representation. The terms of references of the Working Group will be developed in consultation with the community through a two-step process: drafted through discussions with community volunteers and then refined and finalized by the membership of the Working Group.