

Summary of the Attribution Workshop: 17-18 August 2010

NOAA and the International Group on Attribution of Climate-Related Events (ACE) held a two-day workshop to discuss the science, communication, and potential uses of climate attribution information. The workshop assembled 50 experts in physical science and the communication of science information, together with various disciplinary practitioners that are responsible for developing mitigation and adaptation strategies in the face of climate variability and change. The workshop discussed opportunities and requirements for explaining the causes of evolving climate conditions and extreme events.

The workshop also sought to advance the coordination of scientific activities, and of infrastructure necessary for near-real-time attribution efforts. It was agreed that a comprehensive and authoritative attribution activity will demand the enhanced collaboration and coordination of numerous partners, especially in the context of providing decision-imperative information on plausible causes for evolving climate conditions that is regularly updated. In this regard, the underpinning of a strong and sustained research enterprise to provide the best possible operational systems for attribution was emphasized.

There was strong consensus among attendees that unusual or extreme climate events attract public attention through their impacts, and therefore, demand explanation. A conclusion of the workshop was that an effective attribution service must be timely if it is to be relevant to decision making, and to fill the void that could be easily filled by speculations. There was also concurrence that an attribution service activity must be scientifically sound and authoritative if the public and decision makers are to correctly understand the causes of extreme climate events, draw the proper inference from such events, and appreciate the context of their occurrence in a changing climate.

The discussion focused on several well-known conditions of societal consequence including droughts, heat waves, floods, and also long-term trends in climate as a whole. The attendees probed two overarching questions--- *What are the science requirements and capabilities for near real-time attribution?* and *Who needs climate attribution, and how can attribution information be communicated?*

The diversity of expertise yielded a rich perspective on the requirements for the development of a scientifically robust and relevant attribution service. It was agreed that the foundations of an authoritative explanation of extreme events must begin with a real-time monitoring and climate analysis capability, and availability of historical data sets, such that current events can be placed into a reliable and physically consistent historical context. Model simulations and experimentation were likewise seen as core elements which provide an essential tool in "connecting the dots" so as to establish plausible cause-effect relationships. The workshop attendees also emphasized that society, and decision makers also need to be provided with a clear statement of the meaning and implications of the scientific findings.

Nature itself provided no shortage of illustrations regarding the question of who cares about the causes for climate conditions and extreme events. Newsprint and media were suddenly deluged with discussions regarding the Russian heat wave, Pakistan floods, and China floods and of the concerns about the implications such events held for the immediate future, for example, on food supplies and commodity prices. The events impressed upon the attendees of this workshop the need for rapid, yet accurate, attribution information. The "teaching opportunity" that such extremes offer via a receptive window to educate the public about future climate change was appreciated by all, though the danger of premature attribution and misattribution were also recognized. The attendees were also in concurrence about the relevance of the attribution information to the prediction enterprise and early warning systems. In this regard the image of "*Swimming the Moat of Attribution to Attain the Castle of Prediction*" was found to be useful in discussions.

In summary, the urgent need to reduce the lead time between climate events and assessment of their causes, the need to build capability through partnerships, ongoing collaboration, and the urgency for sustained governmental support were all emphasized as touchstones that would define the quality and effectiveness of attribution services.