Clarifying the Attribution of Recent Disaster Losses: A Response to Epstein and McCarthy

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The December 2004 issue of *BAMS* contains an article warning of the threats of abrupt climate change (Epstein and McCarthy 2004, hereafter EM04). The article seeks to raise awareness of the risks of an abrupt change in climate related to human influences on the climate system, but, in doing so it repeats a common factual error. Specifically, it identifies the recent growth in economic damages associated with weather and climate events, such as Hurricanes Mitch and Jeanne and tornadoes in the United States, as evidence of trends in extreme events, arguing "the rising costs associated with weather volatility provide another derived indicator of the state of the climate system . . . the economic costs related to more severe and volatile weather deserves mention as an integral indicator of volatility." Although the attribution of increasing damages to climate changes is but one of many assertions made by EM04, the repetition of this erroneous claim is worth correcting because it is not consistent with current scientific understandings.

The rising costs of disasters are important, and so too is human influence on climate. Policy makers should, indeed, pay attention to both issues. But a robust body of research shows very little evidence to support the claim that the rising costs associated with weather and climate events are associated with changes in the frequency or intensity of events themselves.[1] Instead, the research that has sought to explain increasing disaster losses has found that the trend has far more to do with the nature of societal vulnerability to those events. This conclusion is borne out in literature from the natural hazards community (e.g., Mileti 1999; Tierney 2001) and the societal impacts of the climate community (e.g., Glantz 2003; Changnon et al. 2000), and is consistent with the findings of the most recent assessment of the Intergovernmental Panel on Climate Change (IPCC) (Houghton et al. 2001; McCarthy et al. 2001).

[1] Emanuel (2005) reports a change in recent decades in the intensity of tropical cyclones in the North Atlantic and North Pacific . However, there has been no similar trend of increasing damage.

Nonetheless, misperceptions persist (e.g., Harvard Medical School 2004, Munich Re 2004).

In particular, research on the societal dimensions of disasters shows that over recent decades the impacts of disasters on society do show an increase, whether measured by economics (Munich Re 2004) or people affected (International Federation of the Red Cross 2004). The primary reasons for these increases lie with underlying societal trends—demographic, economic, political, social, etc.—that shape our vulnerability to impacts (Adger et al. 2003; Kunkel et al. 1999; Smit et al. 2000; Changnon et al. 1997; Easterling et al. 2000; Changnon 2003; Pielke and Downton 2000; Pielke and Landsea 1998; Raghavan and Rajesh 2003).

Concern about the possibility of abrupt climate change, whether human caused or not, is well justified (Alley et al. 2003). However, to connect the economic and other human impacts of disasters that have occurred in recent years and decades to climate changes (human caused or not) is not supported by the robust peer-reviewed literature in this area. Advancing such unsupported connections not only can create inefficiencies in disaster policy (Sarewitz and Pielke 2005), but can also open the door to an "overselling" of climate science and a resulting criticism of advocacy efforts regarding climate change (e.g., von Storch and Stehr 2005). Both science and policy will be better served by aligning the justifications advanced for action with current scientific understandings. Future research may yet reveal a connection between climate change and trends in disaster costs, but at present it is premature to attribute trends in disaster costs to anything other than characteristics of and changes in societal vulnerability.

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