SCCWRP # 990

Increasing probability of mortality during Indian heat waves

Omid Mazdiyasni[1], Amir AghaKouchak[1,*], Steven J. Davis[2], Shahrbanou Madadgar[1], Ali Mehran[1,3], Elisa Ragno[1], Mojtaba Sadegh[1,4], Ashmita Sengupta[5], Subimal Ghosh[6], C. T. Dhanya[7] and Mohsen Niknejad[1]

[1]*Department of Civil and Environmental Engineering, University of California, Irvine, Irvine, CA*

[2]*Department of Earth System Science, University of California, Irvine, Irvine, CA*

[3]*Department of Geography, University of California, Los Angeles, Los Angeles, CA*

[4]*Department of Civil Engineering, Boise State University, Boise, ID*

[5]*Southern California Coastal Water Research Project, 3535 Harbor Boulevard, Costa Mesa, CA*

[6]*Department of Civil Engineering, Indian Institute of Technology Bombay, Mumbai, Maharashtra 400076, India*

[7]*Department of Civil Engineering, Indian Institute of Technology Delhi, New Delhi, Delhi 110016, India*

ABSTRACT

Rising global temperatures are causing increases in the frequency and severity of extreme climatic events, such as floods, droughts, and heat waves. We analyze changes in summer temperatures, the frequency, severity, and duration of heat waves, and heat-related mortality in India between 1960 and 2009 using data from the India Meteorological Department. Mean temperatures across India have risen by more than 0.5°C over this period, with statistically significant increases in heat waves. Using a novel probabilistic model, we further show that the increase in summer mean temperatures in India over this period corresponds to a 146% increase in the probability of heat-related mortality events of more than 100 people. In turn, our results suggest that future climate warming will lead to substantial increases in heat-related mortality, particularly in developing low-latitude countries, such as India, where heat waves will become more frequent and populations are especially vulnerable to these extreme temperatures. Our findings indicate that even moderate increases in mean temperatures may cause great increases in heat-related mortality and support the efforts of governments and international organizations to build up the resilience of these vulnerable regions to more severe heat waves.

Full text:

http://ftp.sccwrp.org/pub/download/DOCUMENTS/JournalArticles/990_MortalityDuringIndianHeatwaves.pdf