Deadly Heat Waves Projected in the Densely-Populated Agricultural Regions of South Asia

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Video Abstract

Keywords: Hong Kong University of Science and Technology, Loyola Marymount University, Massachusetts Institute of Technology, Science Advances, heat wave, South Asia, India, wet-bulb temperature (TW), greenhouse gas,business-as-usual scenario, Representative Concentration Pathway (RCP), RCP8.5, RCP4.5, Massachusetts Institute of Technology Regional Climate Model (MRCM), Coupled Model Intercomparison Project 5 (CMIP5), Atmosphere-Ocean Global Climate Model (AOGCM), climate change, poverty, population density, climate change policy

Posted Date: March 22nd, 2021

DOI: https://doi.org/10.21203/rs.3.rs-353568/v1

Abstract

The Earth is undeniably getting hotter. For the third time in a row, the past year has gone down as the hottest on record. While researchers don't expect every year to be record-shattering, the trend is disconcerting—perhaps nowhere more so than in South Asia. A new study shows that here, unique climate effects converge with poor living conditions and high population density to create the most at-risk hot spot on our planet. Climate data shows that some of the world's hottest zones lie across Asia. In these areas, the wet-bulb temperature, a measure of temperature that accounts for humidity, reaches life-threatening highs, commonly above 28°C. For perspective, consider that spending just a few hours at a wet-bulb temperature of 35°C is enough to cause death. And according to an international team of researchers, this heating trend might only get worse.

Using high-resolution climate models of India and surrounding regions, they predicted temperatures through the end of this century. Specifically, they considered two scenarios: one assuming successful mitigation of greenhouse gases, similar to what the Paris Agreement calls for, and the other assuming the current pace of emissions. Left unabated, greenhouse gases would catapult a few locations over the threshold for human survival, with many other areas approaching that limit. Under the low-emissions scenario, the situation is overall less grim. While portions of South Asia are expected to experience dangerous heat waves, with wet-bulb temperatures above 31°C, no region is projected to top 35°C. And the fraction of the population exposed to heat waves of such intensity is predicted to be considerably lower: 2% versus 30%. Those results could serve as a cautionary tale regarding greenhouse gas emissions, especially given South Asia's unique demographics. The Indus and Ganges River Valleys are home to more than 1 billion people, many of whom are low-income farmers. Constant exposure to outdoor temperatures and limited access to air conditioning make those living here uniquely vulnerable to the effects of heat waves. The positive twist of fate implied by a low-emissions future suggests that it might not be too late to redirect this region's deadly path. But as a country with growing carbon emissions, India is faced with a difficult choice between supporting rapid economic growth and saving its low-income farmers from unprecedented heat waves.