Irrigation in India found to be increasing heat stress on people living there

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A team of researchers from the Indian Institute of Technology, Purdue University and the Helmholtz Center for Environmental Research has found that increased irrigation in parts of India has led to increasing heat

stress on the people who live there. In their paper published in the journal *Nature Geoscience*, the group describes their multi-pronged study of weather conditions in the region and what they learned about it.

When people are subjected to high temperatures, they can suffer from two kinds of heat stress. The first occurs simply when it is hot outside. The body is heated and cools itself by producing perspiration. The other type of heat stress comes from exposure to warm temperatures combined with high humidity levels. This is considered to be more of a health problem because there is no remedy. Drinking more water does not help, nor does sweating. In this new effort, the researchers investigated the possibility of increased humidity levels in the Indo-Gangetic plain, a part of India that has been very heavily irrigated, and the possible impact on residents.

The work involved studying weather conditions in the area using a variety of tools, from in situ sensors to satellite data, by which they were able to measure ground temperature and the air temperature just above the ground. They were also able to measure humidity levels. The researchers also measured other regions in the area that were not associated with irrigation to use as a control.

The researchers found that ground temperatures in the area were approximately 1 degree Celsius cooler than the control area (due to evaporation of the irrigated water). Air just over the ground was on average 0.5 degrees cooler. They also found that humidity levels varied as expected, but were on average higher than the control regions—more than enough to offset evaporative cooling.

The findings indicate trouble ahead for many parts of India and similar regions around the world. As global temperatures continue to rise, hot regions will grow hotter. When combined with increased levels of humidity due to irrigation, the combination could prove deadly.

More information: Vimal Mishra et al. Moist heat stress extremes in India enhanced by irrigation, *Nature Geoscience* (2020). DOI: 10.1038/s41561-020-00650-8