

Climate change driving population shifts to urban areas

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Climate change is causing glaciers to shrink, temperatures to rise, and shifts in human migration in parts of the world, according to research supported by Penn State's Population Research Institute. Credit: Penn State Penn State

Climate change is causing glaciers to shrink, temperatures to rise, and shifts in human migration in parts of the world, according to a Penn State researcher.

Brian Thiede, assistant professor of rural sociology, along with researchers from the University of North Carolina-Chapel Hill and the

International Food Policy Research Institute, examined the effects of [climate change](#) on human [migration](#) in South America, and found that abnormally high and low temperatures increased migration, with especially strong effects on moves to [urban areas](#). The findings were published recently in the journal Global Environmental Change.

The researchers analyzed over 21 million census records of working-age adults from eight South American countries over almost four decades. "There have recently been a number of high-quality studies of climate impacts on migration, but they tend to be narrow in geographic scope," said Thiede. "This is one of the first studies to examine the link between climate change and migration using harmonized data from multiple countries over a long period of time."

The researchers linked census data with historical rainfall and temperature data so they could draw conclusion on the effects of climate change on migration. "We found that changes in temperature had greater effects on migration than changes in rainfall, and that exposure to both extremely high and extremely [low temperatures](#) increased the likelihood of migration," Thiede explained. "The effect of extreme temperatures was most consistent on movement to urban, rather than rural places. Each month of higher than normal temperatures led to an over three percent increase in migration to urban areas, whereas each month of lower than normal temperatures led to an almost ten percent increase in urban areas."

Thiede and his team also discovered how factors such as age, gender, and educational attainment affect migration trends. They found that migration rates among certain groups, such as women and adults with low education levels, were more sensitive to gradual changes in climate than others. "One speculative explanation is that these groups tend to work in more flexible and vulnerable occupations that tie them to particular places less than other groups," said Thiede.

The findings are important because changes in [human migration](#) patterns are expected to be one of the major social impacts of climate change. "The study highlights overarching trends in the movement of South Americans in the face of a changing climate—and those movements are often across provinces to urban centers," Theide explained. "This process raises a set of challenges, particularly for the migrants coming from rural areas who need to adapt to urban life, as well as for the communities they settle in."

The work also gives policy makers a clearer picture of migration trends. In the future, Theide plans to continue to combine demographic and climate data to examine how climate change affects migration in other areas, as well as other outcomes, such as nutrition and food security.

Provided by Pennsylvania State University

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