

Climate change leading to water shortage in Andes, Himalayas

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Climate change could have devastating effects on vulnerable residents in the Andes mountains and the Tibetan plateau, according to researchers at The Ohio State University who have been studying glaciers in those areas for decades.

Their findings—that [glaciers](#) in both parts of the world are melting more rapidly than at any point in the last 10,000 years—mean the water supply in parts of Peru, Pakistan, China, India and Nepal will decline, soon.

"Supply is down. But demand is up because of growing populations," said Lonnie Thompson, a climate scientist at Ohio State's Byrd Polar and Climate Research Center. "By 2100, the best case scenario is that half of the ice will disappear. Worst-case scenario: two-thirds of it will. And you've got all those people depending on the glacier for water."

Thompson, a distinguished university professor of earth sciences at Ohio State, presented the team's findings on Dec. 14 at the annual meeting of the American Geophysical Union in Washington, D.C.

Thompson has been studying and documenting the effects of [climate change](#) on glaciers in Peru for more than 40 years. The glaciers there supply critically needed water for people, crops and livestock. In 2016, Thompson and researchers in China and India launched a research initiative to conduct similar research on the Tibetan plateau, which holds thousands of glaciers that supply water to people in parts of Afghanistan, Bhutan, China, India, Nepal, Pakistan and Tajikistan. The international research team dubbed the plateau the "Third Pole" because it contains the largest stores of freshwater in the world outside of the North and South poles.

Since then, they have drilled ice core samples from across the Tibetan plateau and the Andes mountains, examining the ice for clues about temperature, air quality and other large-scale events in history.

"The last 200 years or so, we really understand," Thompson said. "Now we are looking at the last 10,000 years."

What they are finding is causing him some alarm.

There have been times throughout history when the glacial ice cores showed temperatures increased—during an El Niño, for example. But within the last century, the cores from both the Andes and the Himalayas show widespread and consistent warming.

"This current warming is not typical," Thompson said. "It is happening faster, it is more persistent and it is affecting glaciers in both Peru and India. And that is a problem, because a lot of people rely on those glaciers for their water."

Melting glaciers can trigger such hazards as avalanches and floods. And they also can have long-lasting effects on a region's water supply.

As the glaciers melt, initially those regions will have more water. But over time, as the glaciers shrink, the water those glaciers typically supply will dwindle, Thompson said.

"Precipitation is down and temperatures are up and that leads to retreating glaciers," he said. "There are 202 million people in Pakistan who rely on water from the Indus River—and that river is fed by the glacier.

The effects in Peru, too, could be far-reaching, particularly on Peruvian agriculture and on the water supply in Lima, the Peruvian capital.

Thompson and his team are hoping that by studying the glaciers in both areas, they will find answers to slow glacial retreat—or to provide new water sources to at-risk areas.

"The problems are similar in both the Andes and the Tibetan plateau," he said. "The hope is that by finding solutions, we can help both places."

Provided by The Ohio State University

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