UC SANTA BARBARA

THE Current

May 5, 2005
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Small Glaciers in Northern California Buck Global Warming Trend

While glaciers around the world are shrinking and disappearing, presumably due to global warming, two small glaciers in the Trinity Alps of Northern California are holding their own.

Richard Heermance, a doctoral student in geological sciences at the University of California, Santa Barbara, presented findings of his research on the glaciers at the western meeting of the Geological Society of America in San Jose last weekend.

Heermance first became familiar with the Trinity Alps in the Klamath Mountain Range while visiting there with his family when he was growing up. Recently, as a UCSB graduate student, he looked into the history of the Trinity glaciers and found that there were only two published accounts of them, one in 1903 and the other in 1960. He also found some aerial photos taken in 1955.

"First of all, it's surprising that these glaciers still exist because they are located below 9,000 feet," said Heermance. "Most California glaciers are located above 10,000 feet. And the glaciers in the Sierra Nevada have clearly receded over the past 50 years."

Yet the Trinity glaciers and those on Mt. Shasta show minimal shrinkage. The hypothesis of Heermance and his colleague Richard Briggs, a post-doctoral fellow at Caltech, is that these glaciers are being sustained due to higher precipitation. The

increase in temperature attributed to global warming, say the geologists, is offset by the increased precipitation. Globally temperature has increased 1 to 2 degrees Farenheit since 1970.

"We would have assumed the same reaction to global warming that exists in most places---that these glaciers would have disappeared," said Heermance.

For example, Heermance cites recent reports published in the journal Science within the last 3 months indicating that global warming has caused the majority of glacier fronts worldwide to retreat over the last 50 years. But the Trinity glaciers and glaciers on Mt. Shasta are holding their own, only shrinking a small amount, and certain glaciers in Alaska are growing, notes Heermance.

"This anomalous reaction of the Trinity glaciers, and others, to large-scale warming trends underscores the importance of understanding the big picture," said Heermance.

"Any individual site can show behavior contrary to the average, that of most glaciers receding globally. The Trinity glaciers can provide insight into the variability of responses of glaciers to global warming."

Heermance explained that overall changes due to global warming include changes in global air circulation patterns. "In general, warmer climates are linked to higher precipitation," said Heermance. "In some places, the precipitation increases lead to increased snowfall that balances the warmer temperatures, so that glaciers can maintain their position or even advance.

"On the average, the whole West is heating up," said Heermance.

The researchers plan to look more closely at the Trinity glaciers and examine their glacial moraines---the debris pushed up in front of the glaciers. This will help them to determine the age of recent advances in these glaciers, and will yield information on the interaction between climate and the glaciers over the last 10,000 years.

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