

**Thomas V. Lowell**

**Research Program Statement**

My research and graduate programs focus on climate change in the late Quaternary. In particular, the rapid transition and alternations from full glacial conditions to interglacial conditions between 15,000 and 10,000 years ago remain unexplained but are of society concern because of the implications for possible human impacts on the climate system.

Glaciers are a very sensitive indicators of climate change; climate gets colder and glaciers grow whereas if climate gets warmer the glaciers shrink. I study the geologic record of glacial deposits from the time period when the last great ice sheets built up and decayed to reconstruct these advances and retreats and thus make some inferences about climate change. The challenge is to extract the behavior out of the complex deposits glaciers leave behind; therefore, my interests include both chronology and glacial processes.

These studies are field based and some is in the Southern Hemisphere. We have just finished a eight-year project in the Lake District of Chile and have been in the southern Alps of New Zealand for five years. In both areas we map the distribution of moraines and outwash, conduct stratigraphic studies, and obtain cores for pollen analysis. This multiple approach allows us to integrate findings from several different fields into one story.

On a longer-term basis, I take the same approach in southern Ohio and Indiana. Several graduate efforts have refined the expansions to the maximum extent of the Laurentide Ice Sheet. The next job is to understand the timing of the retreat from these advances and when completed we can make direct comparisons between the climate change that occurred in the northern and southern hemispheres.

For training, I run a trip to modern glaciers that rotates between Alaska, the Canadian Rockies or Iceland. Traditional classes include basic glacial geology and seminars in glacial processes and Quaternary stratigraphy. Typically, graduate students complete their course requirements with topics related to their thesis research.

Graduate research that I supervise may or may not directly relate to my research. Typically, I try to find a topic that combines the students interest and mine. For example, one student worked on the snail assemblages in glacial sediments to make an independent estimate of the paleo temperatures. Another student used wind-blow loess as a proxy to record changing wind conditions. Yet a third student took a novel approach and studied loess sequence preserved in lake sediments. Other efforts sort out the evolution of major river pathways and the significance of alluvial deposits.

In order to allow such flexibility and better train my students, I only work with small (2-4) group at any one time. Should your interests parallel mine, please contact me and we can answer any other questions you might have to help formulate your graduate plans.