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## Geologists Explore Link Between Human Action And Landscape Change

*ScienceDaily* (Mar. 21, 2005) — Since they began clearing valleys and slopes for agriculture more than 9,000 years ago, and continuing with the construction of roads, buildings and cities, people have been altering landscapes. University of Vermont geologists explore the link between human actions and landscape -- and reach some important conclusions -- in the cover article of the April/May issue of *GSA Today*. Produced by the Geological Society of America, the prestigious monthly journal goes to more than 20,000 geologists and libraries worldwide.

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Paul Bierman, professor of geology, and colleagues—including three undergraduates—authored the paper, titled "Old Landscape Images Record Landscape Change Through Time." The paper is the result of research collected via UVM's Landscape Change Program, a searchable, web-based community archive of more than 10,000 images of Vermont landscapes from before 1810 to the present. The archive, which is particularly rich in rare images of rural areas, can be accessed online at <http://uvm.edu/perkins/landscape>.

Historical photographs are a powerful tool for examining and understanding the distribution of

physical and biological surficial processes over the course of decades and centuries. Such imagery is particularly valuable for understanding human-landscape interaction. The *GSA* article presents several examples of quantitative, image-based, landscape-scale analyses made using hundreds of different images, each taken at a different place. (Numerous photographs that show the same landscape at two different points in time are also available in the archive. These photographic pairs can be accessed online at <http://www.uvm.edu/~pbierman/landscape/>

"Our findings have significant environmental implications for Vermont and New England in general," said Bierman. "We found that erosion is linked to clearing trees from hill slopes, which implies that if New England were cleared of trees sediment would again pour off slopes and into streams and rivers." Also of note, said Bierman, are the condition of riparian zones; corridors running along rivers and streams have improved markedly over the past 30 years. "This is a positive environmental finding and one that's very good for stream health and the health of ecosystems in streams," he said.

Co-authors and seniors Jehanna Howe, Elizabeth Stanley Mann and Michala Peabody worked all summer and into the fall on the project, presenting posters at the *GSA* national meeting in Denver that drew such great interest they became the catalyst for the *GSA* paper. The students were funded by a National Science Foundation grant for undergraduate



Scientists are comparing historical images to learn about changes in landforms. Here an earlier dirt road in the top image is compared with a more recent paved road in the lower image, showing the work of the forces of erosion. (Credit: Vermont State Archives)

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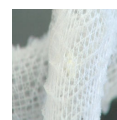
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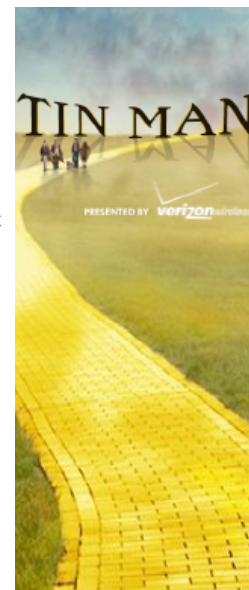
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research that Bierman and adjunct instructor Christine Massey applied for several years ago. "The students are at the core of this work," Bierman attests. The Landscape Change Program itself has been supported by the National Science Foundation and the Lintilac Foundation.

Adapted from materials provided by [University Of Vermont](#).



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