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Beth Potier

UNH Media Relations

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UNH Geologist Restores Historical Relief Map Of Northern New England

August 9, 2010



DURHAM, N.H. – Thanks to Wally Bothner, the top of Mount Washington has been replaced and the Northeast’s highest peak now reaches its true height of 6,288 feet. Bothner, Professor Emeritus of geology at the University of New Hampshire, did not wear hiking boots or carry a backpack to repair the fabled mountaintop; rather, he rebuilt it with pine, glue and wood putty in a makeshift studio at the edge of campus.

Mount Washington got its facelift, along with the rest of New Hampshire, Vermont and western Maine, when Bothner undertook a painstaking restoration of a 12-by-16-foot wooden relief map created by state geologist Charles Hitchcock in the late 1800s. The map, formerly muted, pocked, and occasionally “graffiti’d” by students claiming their hometowns with x’s in ink, is now an eye-catching centerpiece of the recently restored James Hall, home of UNH’s Earth sciences department.

Far more than a pretty picture, the Hitchcock map has a curricular role, too. “It was a teaching tool for Hitchcock, and it has been part of our teaching in this department since 1929,” says Bothner, who worked with a team of undergraduate and


graduate students for nearly a year on the restoration. “It can serve as an instructional tool to see how geological thought has evolved over the last 140 years,” Bothner adds, noting that modern geology changes little of Hitchcock’s basic map pattern but refines, reorders and subdivides many of his original units.

Charles Hitchcock spent a decade mapping New Hampshire, Vermont and eastern Maine by foot, horse and railroad. Because the state at the time was largely unforested, Hitchcock’s surveys were remarkably accurate. He was allocated \$200 by the New Hampshire General Court to produce the relief map and worked on it from 1871 to 1890 at Dartmouth College, where he was a professor. The map came to UNH’s Thompson Hall in 1894, moved to Conant Hall in 1933 where it was repainted by professor Ralph Meyers, and finally, in 1966, to James Hall, where it suffered wear and neglect in the lower level until Bothner undertook its restoration.


The Hitchcock map, which was the first of three relief maps of New Hampshire, is at a horizontal scale of one inch to one mile, with its vertical scale exaggerated 500 percent. Constructed of laminated half-inch thick boards cut and glued on top of each other, it weighs nearly 1.5 tons and was moved in three pieces. In addition to 40 color-coded rock types, the map showcases bodies of water and mines that were active when the map was created. Geographic features like the boundaries and names of nearly 570 towns and major roadways reflect 1870s New England; the state’s largest lake is spelled “Winnipiseogee” and Interstates 89, 93 and 95 are noticeably absent.


When Hitchcock completed his relief map, he reportedly declared the geology of New Hampshire a closed subject of inquiry: “Now we know everything we need to know about New Hampshire.”


On the contrary, says Bothner. “All he really did was open the door for all of us. The rocks don’t change,



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New Hampshire’s White Mountains, returned to their rightful height, are a highlight of the newly restored historical relief map of Northern New England at the University of New Hampshire’s James Hall. Credit: Lisa Nugent, UNH Photographic Services.



but our ability to glean more and more history from them does." Using a key displayed alongside the map, even novice geologists can identify abundant igneous rocks – primarily granite – represented by the map's bright swaths of reds, pinks and oranges through New Hampshire that cut across intervening metasedimentary rocks in blues and greens; across the Connecticut River in Vermont, those metasedimentary rocks become dominant. Relationships between topography and geology become immediately obvious, as do the lone peaks of Pawtuckaway, Monadnock, or the Belknaps in Southern New Hampshire.

Bothner worked with a team of students – undergraduate Tyler King '10 and master's students Julianne Batchelder and Rebecca LeCain ("her hand is steady as a rock," says Bothner of her boundary-painting skills) – to clean, sand, repair, and repaint the map. "It was a really big job," says Bothner. "The challenge was to repair it in a way that only a few of us know it's been repaired." Affiliate professor of geology Peter Thompson painted much of the drainage. The restorers sought advice from Dan Valenza, Professor Emeritus of art, and received support from Matt Davis, associate professor of Earth science and the department building liaison during the restoration, and the design and construction crews working on

As part of the James Hall renovation, Professor Emeritus of geology Wally Bothner restored a unique 1878 wooden New Hampshire geological relief map by Charles Hitchcock. Credit: Perry Smith, UNH Photographic Services

James Hall. The UNH Parents Association provided a grant for the project.

For Bothner, who became Professor Emeritus in 2009 after nearly 42 years on the teaching faculty at UNH, restoring the Hitchcock map was a labor of love. "It was a great way to wrap up a career," he says. "This was the best of all retirement projects."

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,200 graduate students.

-30-

Photograph available to download: http://unh.edu/news/cj_nr/2010/apr/bp22james_03.jpg

Caption: As part of the James Hall renovation, Professor Emeritus of geology Wally Bothner restored a unique 1878 wooden New Hampshire geological relief map by Charles Hitchcock.

Credit: Perry Smith, UNH Photographic Services

Watch a video of the Hitchcock map restoration: <http://vimeo.com/8972779>

Reporters and editors: Wally Bothner can be reached at (603) 862-3143 or wally.bothner@unh.edu

Media Contact: [Beth Potier](#) | 603-862-1566 | UNH Media Relations



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