

# GREEN MOUNTAIN



Gary Hawley on the green roof at the Aiken Center at the University of Vermont in Burlington on Thursday. GLENN RUSSELL/FREE PRESS

## ‘A COMPLETELY DIFFERENT TYPE OF ACADEMIC BUILDING’

The Aiken Center at UVM is a model green facility, but its efficiency is more than just a way to save fuel and money. The new Aiken helps teachers teach and students learn about resource conservation and sustainable management. I Believe essay by Gary Hawley, **PAGE 2**



# The Aiken Center is far more than an ultra-green building



Gary Hawley and the Eco Machine at the Aiken Center at the University of Vermont in Burlington on Thursday. GLENN RUSSELL/FREE PRESS

## GARY HAWLEY

For the Free Press

When you first see the Aiken Center on the Davis Center oval at the University of Vermont, you notice a completely different type of academic building.

The solarium on the south side contains a jungle of tropical plants and odd-looking tanks overflowing with plants. As you follow colorful river-like pathways down the halls, you notice cork floors in offices, local hardwoods on the walls and stairs, and natural light flowing through the building. Electric lights seem to magically come on and go off as you pass through spaces. On the top floor, you come across plexiglass buckets tipping back and forth with rainwater, draining from large white pipes coming out of the ceiling.

What is going on in the

## Aiken Center?

The Aiken Center (home to the Rubenstein School of Environment and Natural Resources) reopened in January as one of the greenest renovated buildings in the nation. The building first opened in 1982, and the numbers of students, faculty and staff have more than doubled since — creating a dire need for more offices and teaching space.

Since the early 1980s, I have been involved with research that examines genetic diversity of our forest trees and measures of human impacts on our forest ecosystems.

Through this work, our research group and others have discovered that extraction of products from our forests and input of pollutants into our forests have resulted in a weakened forest that is vulnerable and less resilient to current and future stresses including climate

change.

You might ask, What does this have to do with green buildings? Well, my concern for human impact always leads me back to the fact that if we are more efficient and reduce our resource use, we will have less of an impact on the environment that we need to survive. We will also save money.

For decades, faculty and staff in our school have taught about the values of conservation and sustainable management of plants and animals and human impacts on these resources. I believe it is much easier to get our message across about resource conservation and sustainable management when we are housed in a model building that demonstrates these values. We are “walking the talk.”

Many faculty, staff and students, including me, became passionate about contributing to the process of renovating our building.

We all learned and continue to learn from the ideas of others and now from the completed building.

Aiken is packed with many exciting green features, including the green roof research project that was installed just a few weeks ago. The renovated building was designed with eight green roof areas (simulated watersheds) that are separately monitored for stormwater volume and water quality. Students, staff and faculty installed different plants and soils in a replicated design to learn what combination of vegetation and soils best stores and cleans stormwater. The green roof also extends the life of the roof and helps insulate the Aiken Center.

The greenhouse on the south side of the building holds groups of large vats filled with green plants that are the biological engines of an Eco-Machine that treats the waste water

from the building using vegetation and aquatic organisms. Actually, there are three Eco-Machines that allow researchers to alter plants and aquatic organisms and learn which ones best treat waste water. After the water is treated, it will be used again to flush toilets, and no building waste water is sent to the municipal sewer system. This results in an estimated 80 percent savings in water necessary to run the Aiken Center.

One of the most important features of the renovated Aiken Center is energy efficiency. Even though we added new space and air conditioning, the building is projected to run with 80 percent less carbon emissions. Eighteen solar trackers use energy from the sun to provide about 30 percent of the energy (including heating and cooling) to run the building. And, we can document these efficien-





Gary Hawley explains an interactive display that measures the energy consumption at the Aiken Center at the University of Vermont. GLENN RUSSELL/FREE PRESS

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Some of the vegetation making up the green roof at the Aiken Center. GLENN RUSSELL/FREE PRESS

cies by monitoring more than 200 sensors in the building that measure energy use. A touch-screen monitor displays building performance data that will be stored for anyone to access on the Internet.

The renewed Aiken Center is super energy-efficient and is an exciting building to teach and learn in, but I believe it is also far more than the green features I have described. The process to renovate the Aiken Center began more than 10 years ago and involved students, faculty, staff and community members from Day 1.

Starting with a design charrette, we narrowed a list of 28 interested architectural firms to four that presented their vision for a green Aiken Center. More than 100 interested community members voted, and we ultimately selected Maclay Architects from Waitsfield to design our building.

The community input ranged from frequent meetings with building users on design advice, all the way to organized classes that continue to be taught about the Greening of Aiken. A Greening of Aiken Interns class has been taught every spring for the past 10 years and has involved students, faculty and staff in projects that helped move forward the building design and renovation. This class now will conduct research on building performance and continue to push the envelope on design features.

For me, the most exciting part of being involved in the greening of Aiken has been the unending passion of our students for the project. They constantly want to use their young brain power to solve problems.

Nearly 50 students volunteered to help us install the green roof. This involved lifting and lugging

120-pound pallets of plants and soil all around the roof. This was truly a team effort.

Students are eager to make improvements in the efficiency of the building and have a strong desire to learn about sustainable building practices and to come up with incentives for reducing the school's carbon footprint. The students are fully aware of the problems associated with climate change and are constantly demanding we strive for sustainability — not only in our building, but in the resources that we take from our planet. For example, Rubenstein School students are taking the next step to figure out how to make the Aiken Center a net-zero building, where we produce at least as much energy as we use.

The new Aiken Center will serve as a teaching, research and demonstration facility for the university

and for the Burlington community. I believe we will continue to improve and learn from the building (and each other) for many years to come.

*Gary Hawley is a research associate faculty member of the Rubenstein School of Environment and Natural Resources at the University of Vermont, where he has worked since 1986. His research focuses on human impacts on forest ecosystems. He was one of the many people involved with the greening of Aiken and is the chairman of the Greening of Aiken Committee. Contact him at ghawley@uvm.edu.*



# The making of a green roof

The UVM Rubenstein School of Environment and Natural Resources installed its new green roof last month atop its home in the recently renovated George D. Aiken Center. It's a design 10 years in the making that features eight research watersheds — sloped sections that channel unabsorbed water into separate drains for measurement and further data collection. The roof's plantings will actively absorb runoff, providing protection for Lake Champlain in the here and now, and the roof also serves a higher calling: as a testing environment to improve green roof designs of the future. **Photos by Sally McCay.**



A truck arrives at the Aiken Center on Oct. 11, carrying one delivery of the nearly 875 flats of plants to be installed on the roof.



A crane was used to hoist the flats to the roof, which, during the building's renovation, had been molded with insulation by the builders to form the eight separate watersheds.



The plants and soil types vary among the watersheds, and the roof includes sections that remain plant- and soil-less, serving as the control by which to measure the other efforts.





**4** The roof will test the effectiveness of different species of plants and types of soil at absorbing stormwater and keeping pollutants out of surrounding watersheds.



**5** Research associate Gary Hawley worked with students to move the plants to their designated spots among the watersheds. Students have been an important part of the process, contributing ideas during the design phase as part of the "Greening of Aiken" course and providing much-needed muscle to move the 120-pound flats to their proper locations during the installation.



**6** The research will test combinations of plants and soil types commonly used in green roof design as well as new combinations that might do a better job absorbing runoff, including plants native to Vermont and "biochar," a soil additive.



**7** Says Hawley, "We just finished putting it in, but now we get to learn from it." Data collected from the roof will be displayed in the building and accessible via the Web.