Civil & Environmental Engineering
The Newsletter

Fall 2009

In this issue:

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Dr. Nancy Hayden, P.E.
Program Head

The UNIVERSITY of VERMONT

Welcome Back!

A message from Nancy Hayden, Program Head

It's been awhile since our last newsletter and many things have been happening, so we thought it was about time to send out some news. The past few years have been full of opportunities and challenges. The hardest has been the loss of our good friend and colleague, **Dr. Jean-Guy Béliveau**, who passed away in July. We miss his dedication, strength of character and hearty laugh.

Last year, **Dr. Adel Sadek** (transportation engineer) left our program for new career opportunities at the University of Buffalo and, after more than 30 years (since 1974), **Dr. David Hemenway** retired in 2008. Fortunately, we still see him on occasion, although it's hard to take him away from his garden. In 2005 **Dr. Cully Hession** left UVM to accept a position at his alma mater, Virginia Tech. We recently hired Dr. Brian Lee as a new assistant professor in transportation and, in the past few years, have added other new faculty members. You can read all about them on the following page.

Our long-time secretary **Gail Currier** retired in 2007, but has returned to help us with our NSF grant. **Dr. Donna Rizzo** received tenure in 2008 and **Dr. Mandar Dewoolkar** received tenure in 2009. Both were promoted to Associate Professor. **Dr. Jeff Laible** and **Dr. George Pinder** are also doing well; they are both active in their research and teaching.

As you may have heard, we are no longer a department. Civil, environmental, mechanical and electrical engineering have combined into a unified School of Engineering. We've been ironing out the wrinkles in this new structure, but have also had a lot more contact with our colleagues in other areas, which has been a great opportunity.

This past year, we have been busily preparing for our ABET review. The environmental engineering program received ABET Accreditation in 2006, and is now on schedule with all the other programs to be reviewed this year. Our undergraduate student numbers have more than doubled since 2003 and with faculty numbers at the same level, we have some challenges ahead. Our graduate program has also increased in student numbers and funding activity. We've been keeping very busy. Fortunately, we have had many local engineers help with teaching in our programs.

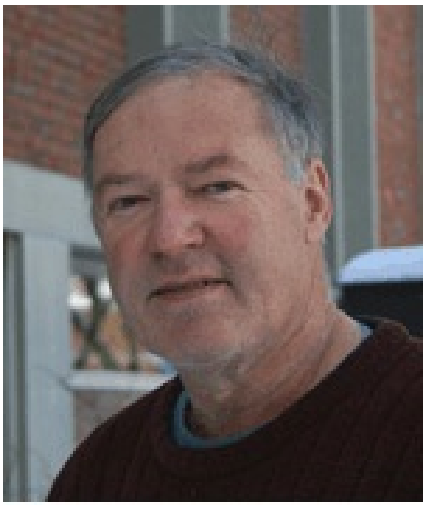
In 2005 we received an $860,000 grant from the National Science Foundation for a civil and environmental engineering curriculum reform. This has been a great opportunity to invigorate and update our programs. You can read more about this in this edition.

Please stay in touch and let us know how you are doing. You can contact me (nhayden@cems.uvm.edu) or Gail Currier (gail.currier@uvm.edu).

FAREWELL to an OLD FRIEND

Dr. Jean-Guy Béliveau

Prof. Jean-Guy Béliveau died Friday, July 17, 2009. He had been diagnosed with colon cancer two years earlier.



Prior to coming to UVM, Dr. Béliveau taught at l'Université de Sherbrooke, Quebec, Canada. He obtained his bachelor's degree in Civil Engineering from the University of Vermont in 1968 (along with Prof. Jeffrey Laible), and a doctorate in Civil Engineering from Princeton University in 1974. He was commissioned as a Second Lieutenant in the ROTC in the U.S. Army in 1968, and frequently did consulting work for the military in his later years.

During his tenure as faculty at UVM, Dr. Béliveau served as chair of the Department of Civil and Environmental Engineering and advised graduate and undergraduate students throughout his career, both in Canada and the United States. He was a licensed professional engineer in Canada and the U.S., with over 60 technical publications, 20 journal publications, and more than 20 technical reports.

Jean-Guy received the highest honor as "Fellow" by the American Society of Civil Engineers (ASCE). His service impacted teachers, educators, engineers and professionals as he served as ASCE Vermont Section president and as the Vermont State Coordinator for MATHCOUNTS, a nationwide middle school math competition.

Jean-Guy's research involved the use of measured vibrations and concepts of structural dynamics to assess structure for stiffness, stability and strength. His applications involved model testing methods as well as measurements of resonant frequencies to determine axial compression in rails and tension in the iron bars of wood and iron trusses, and the use of vibration and system identification techniques to determine the aerodynamic coefficients of suspension bridges.

A UVM tribute to honor him was held on September 18th in Ira Allen Chapel.

In remembrance of Dr. Béliveau
funds may be donated to support the:

"Jean-Guy Béliveau Memorial Fund"
for UVM Civil & Environmental Engineering
Senior Design Projects

Donations should be sent to:

Jean-Guy Béliveau Memorial Fund
University of Vermont
411 Main Street,
Burlington, VT 05405

or the

"NSPE Dr. Jean-Guy Béliveau Scholarship Fund"

to be awarded to a student of engineering going to an ABET Engineering College or University.

Make checks payable to: "
Béliveau NSPE Scholarship Fund"
and mail to:

NSPE: VSPE
c/o Forcier Aldrich & Assoc.
6 Market Place

NEW FACES

Dr. Arne Bomblies, joined the CEE faculty at the beginning of spring 2009 semester, as assistant professor of hydrology. His research interests are in hydrology and environmental drivers of disease transmission, primarily malaria and other mosquito-borne diseases, and factors governing interannual variability in hydrology and environmentally-linked diseases.

He once rode his motorcycle from Denver to Cape Horn "just for the hell of it." His outside interests also include skiing, hiking, kayaking, climbing, traveling, photography.

He chose UVM because of "The Complex Systems Center, the strength and energy of the engineering program, and UVM's location in the great city of Burlington and the snowy hills of Vermont."

Lisa Aultman-Hall joined UVM as founding director of the National Transportation Research Center in August 2006. Dr. Aultman-Hall is a Professor in the School of Engineering and adjunct Professor in the Department of Community Development and Applied Economics. She had previously served as the director of the Connecticut Transportation Institute, while an Associate Professor of Civil Engineering at the University of Connecticut. Dr. Aultman-Hall teaches transportation planning and traffic safety. Her research interests include tailpipe emissions, traffic safety (bicyclists, young drivers, old drivers), freight transportation planning, transportation network robustness, and travel behavior, especially route choice. Dr. Aultman-Hall's work is currently funded by the National Science Foundation, the Connecticut Department of Transportation and the New England University Transportation Center.

Dr. Britt Holmén's undergraduate education was at a small liberal arts college in the middle of Maine. "If engineering had been an option at Colby, I would have been an engineer from the start," she says today, although she is also very grateful for having had the opportunity to obtain a liberal arts education. After obtaining her master's degree in geological oceanography, Dr. Holmén worked as a geochemist at the Harvard-Smithsonian Center for Astrophysics (Cambridge, MA) and as an environmental consultant at Cambridge Analytical Associates (Boston, MA). These "real-world" experiences convinced her that she needed a Ph.D. in order to be the one making the decisions. She received her degree from MIT and was a post-doc at UC Davis.

Atmospheric particulate matter became a focus of her lidar research at Crocker Nuclear Laboratory, and as an adjunct faculty member in the UC Davis Department of Civil & Environmental Engineering. Dr Holmén returned to the east coast as a faculty member of Civil & Environmental Engineering at the University of Connecticut and, in 2006, joined the faculty of Civil & Environmental Engineering at UVM, where she continues her research on airborne particles.

Dr. Jane Hill was born in Sydney, Australia and raised in the central western slopes and plains region of New South Wales. After completing two years of Chemical Engineering at the University of New South Wales, Jane moved to the U.S., whereupon she finished her B.S. in Chemical Engineering and an M.S. in Environmental Management and Policy at Rensselaer Polytechnic Institute. After running a small bioremediation waste clean-up company in upstate New York for a few years, Jane returned to the university to learn more about the fascinating world of microorganisms. She completed her Ph.D. at Yale University in 2006 with Dr. Menachem Elimelech and then worked with Dr. Jordan Peccia at Yale for a short but interesting post-doctoral experience.

Now a member of the CEE faculty, Dr. Hill heads an environmental microbiology and biotechnology group.

Dr. Brian Lee joined the Civil & Environmental Engineering program this fall as assistant professor in transportation systems. He will be part of the college's Complex Systems Center to work towards addressing sustainable transportation issues. His knowledge of quantitative engineering, studies on urban theories, planning practices and social and economic processes provide a solid foundation for ground-breaking research.

"I believe the UVM community will benefit from my diverse experiences," says Dr. Lee. "As a Canadian-born Chinese who has lived in four countries on three continents, I appreciate a wide range of individual and societal perspectives and am enthused about bringing examples from diverse places to classrooms and research labs at UVM."

In 2005, our department received a National Science Foundation department level reform (DLR) grant entitled *A Systems Approach for Civil and Environmental Engineering Education: Integrating Systems Thinking, Inquiry-Based Learning and Catamount Community Service-Learning Projects*. The overall goal has been to have our students learn and apply a systems approach to engineering problem solving. A systems approach challenges students to consider the environmental, social, economic and other non-technical aspects of a problem, in addition to the technical, as essential aspects of the engineering solutions.

Our reform has taken a multi-pronged approach in two main areas that include implementing: a) a sequence of three systems courses related to environmental and transportation systems that introduce systems thinking, sustainability, and systems analysis and modeling; and b) service-learning (SL) projects as a means of practicing the systems approach. SL projects are good examples of inquiry-based learning that allow students to emphasize research and learning in areas of

most interest to them. Activities that enhance IT, hands-on experiences, and personal/interpersonal skills are also incorporated throughout the curricula as part of our reform. In addition, the grant has funded education assessment support and the purchase of undergraduate equipment for educational purposes.

The new Systems courses combine core concepts of environmental engineering, transportation, and engineering economics in a systems approach framework. In addition, systems analysis tools and modeling are used to build skills for solving some of the complex problems society is facing. The goal of integrating these subjects was to illustrate the interconnections and dependencies of these topics as opposed to teaching them separately. Creating a sequence allows us to build on these topics from one semester to the next.

Also at the core of the reform is a service-learning (SL) component, where students work with community partners on civil and environmental engineering related projects. SL projects are a way for students to experience an inquiry-based approach to learning, practice a systems approach, and develop personal and interpersonal skills, including teamwork, decision making and communication. Projects that reach out to the community were also seen as a way of generating greater interactions among students, faculty, and local communities. CEE professions are largely service-based while civil and environmental education is often theoretical based. We wanted to include the components of the profession within the academic environment.

Thus far, we have incorporated SL projects in several required courses such as the first-year Introduction to CEE, the senior Capstone Design Course and others. We have worked with many community partners including the City of Burlington, Towns of Essex, Shelburne, Monkton, Greensboro, Taluabe (Honduras), the Vermont Agency of Transportation, Preservation Trust of Vermont, and ECHO Lake Aquarium and Science Center in Burlington. Projects have ranged from developing hands-on exhibits on engineering and the environment for ECHO to analyzing and designing retrofits for foundations of historic structures to designing bridge decks, landslide mitigation, and park and rides.

We believe we are taking our curricula into the 21st century and sincerely hope that our graduates will make a positive difference in the world.

BARRETT SCHOLARS:
Undergraduate Research Opportunities

The hazy days of summer are filled with research for undergraduate engineering students in the UVM College of Engineering and Mathematical Sciences (CEMS), thanks to Richard Barrett, alumnus of the College and founder of the Barrett Foundation.

The Barrett Foundation is a family nonprofit, led by 1966 UVM graduate Richard Barrett, a successful entrepreneur whose career was boosted by early internship experiences. Aware of the importance of summer research for students, Barrett provides competitive scholarships to outstanding undergraduate students for engineering research projects. The CEMS faculty provide matching research funds that support additional undergraduates.

"These undergraduate engineering students have the unique opportunity to pursue independent research and work with leading faculty scholars in their fields," says Dr. Donna Rizzo, faculty advisor and P.I. for the Barrett Foundation scholarship grant. Each project is approved and fits within a general research area of a specific engineering faculty advisor. This year's awardees include:

Deirdre Collins (Civil & Environmental Engineering)
Emphasizing Sustainable Engineering Design by Implementing Hands-on Experiments into the Civil & Environmental Engineering Curriculum
Advisor: Dr. Nancy J. Hayden

Benjamin D. Heath (Civil Engineering with Math minor, Environmental Studies with Forestry minor)
Statistical Analysis of Chemical Constituents and Their Mean Removal Efficiencies from Stormwater Infrastructure in Chittenden County, VT
Advisor: Dr. Donna M. Rizzo

Karl Hinrichs (Anthropology with Biology Minor)
Detection of Legionella Volatile Metabolite Fingerprint Using Electrospray Ionization - Mass Spectrometry
Advisor: Dr. Jane Hill

Michael Kreigh and **Scott Quinn** (Mechanical Engineering)
Project Friendly Fuel: The Effects of Biodiesel Fuel on Gaseous and Particulate Emissions
Advisor: Dr. Britt A. Holmén

Johanna Mayerhofer (Biology)
Purification and Characterization of an Extra Cellular Phytase of Pseudomonas aeruginosa PA14
Advisor: Dr. Jane Hill

Johanna Mayerhofer, Michael Kreigh, Scott Quinn, Benjamin Heath, Laura Townsend, Deirdre Collins, Karl Hinrichs, Allison Murphy

Allison Murphy (Environmental Engineering)
The Molecular Genetic Analysis of Tubifex as an Intermediate Host of Whirling Disease
Advisors: Drs. Donna Rizzo and Lori Stevens (biology)

Laura Townsend (Environmental Engineering)
Breaking Up is Hard to Do: Freeze Thaw Effects on Surface Permeation
Advisor: Dr. Mandar Dewoolkar

Alaina Dickason Roberts (B.S. CE 2007)

In the summer of her sophomore year, Alaina was the recipient of one of the first Barrett scholarships. In her senior year, she was awarded the Brett Gorky Dean's Recognition Award and the Edward H. Phelps Senior Prize. She was also named the UVM Student Engineer of the Year, and was awarded "The Class of '67" award (for Leadership, Character and Participation in Varsity Athletics).

After graduating, Alaina moved to Washington State to work for The Boeing Company in the world's largest building by volume. She is currently a structural analysis engineer working on fleet support for the 767 Wing and Empennage. She says she's certainly learned a lot (and has a lot more to learn!) about airplanes since starting with Boeing two years ago, but she has also been pleasantly surprised with how much of what she learned for civil engineering is applicable at Boeing. "Structure is structure regardless if you are dealing with steel I beams or aluminum wing skins."

She and Jonathan Roberts (UVM '07) were married on June 21, 2008. They now live in Everett, WA with their two miniature long haired dachshunds, Elinor and Basil.

David Whitney (B.S. CE 1998, M.S. CE 2002)

In 2007 David Whitney founded EcoSolutions, LLC (www.ecosoldesigns.com)—an engineering consulting, design and construction company specializing in the practical application of ecological design principles for innovative stormwater, wastewater and site planning projects. Located in Westford, VT, their projects span the globe. They provide engineering and ecological design services for low impact developments (LID), wastewater treatment, stormwater treatment, water reuse, pond systems and landscaping systems. Their clients include single family homeowners, residential developers, Shelburne Farms and the U.S. State Department.

Over the 2009 winter Dave worked with UVM students and the United Nations to build several constructed wetlands in the hillside settlement of Au Leon on the Caribbean island of St. Lucia. Dave has since built a demonstration stormwater treatment system at the Shelburne Farms Dairy Barn, and will be traveling to Africa to construct an innovative wastewater treatment and reuse system for a new U.S. Embassy.

He and his family recently completed construction of their new barn which is used as office and workshop space for their growing business. The barn was built using innovative and energy efficient building techniques which included staggered stud construction, spray foam insulation, daylighting and a closed loop solar hot water heating system. Dave has also been helping as an adjunct lecturer in our programs.

Dave Whitney (left) & UVM Students on St. Lucia

Robert Stacey (B.S. CE 2004)

Rob Stacey recently wrote from "the middle of nowhere" Nevada. He was there to supervise a reservoir development for a 50MW Geothermal Power Plant. He said it was like the "largest - coolest" experiment he'd ever performed. They had two drill rigs drilling wells to about ~5,000ft to produce 400°F water to run the turbines and produce electricity. They were performing an injection-production tracer test with three producers and two injectors trying to understand the reservoir connectivity.

In 2006 Rob graduated from Stanford University with an M.S. in Petroleum Engineering. That fall he entered the Ph.D. program in Energy Resources Engineering at Stanford. In 2007 he went to Iceland to work as a Geothermal consultant for the Ministry of Iceland then, during the summer of 2008, he began an internship with GeothermEx Inc. He returned to Stanford to finish his thesis and graduated with an Engineering Degree in Energy Resources Engineering.

He lives in California and works at GeothermEx Inc. as Senior Reservoir Engineer, developing reservoir simulations, geologic models, and performing well tests.

When he's not enjoying a soak in the nearby hot springs, Rob is out road biking through the California redwoods, along the Pacific coast, and through the high Sierras in preparation for the Tour of the California Alps (aka 'The Death Ride'). Rob and his fiancée, will be attempting the 129 mile, 15,000ft of climbing 'Death Ride' ride next July.

Katie Duffy (2004) passed the PE exam last April (2009), and now is a registered professional engineer in New York, where she works in the highway division of WSP SELLS (formerly Chas. H. Sells) and is doing a lot of road design as well as traffic operations.

Angelo Onello (2006) has been working since a few days after graduation at Conklin Associates, a small firm in Ramsey, NJ. They are consulting engineers and surveyors who work on private projects. He's also been working on his music project: he started Blitzvixen LLC to serve as the record label, and has built a full music studio in his home. He teaches guitar to local kids and AutoCad in the evening to adults at a high school.

Alex Foraste (1998) has been working at a company in Charlottesville, VA as a senior engineer and project Manager for the past three years. After UVM, he entered the Peace Corps and worked in Cameroon, Africa for two years serving as a Water/Sanitation volunteer building drinking water wells and an elementary school. When he returned, he attended the University of Virginia for a Masters in CE.

Jerry Rogers (2006) worked for a year in California before returning to the east to escape the traffic and the smog. He's currently working for Barbato Associates, a small structural engineering firm located in Chadds Ford, PA, outside of Philadelphia.

Chelsea Ransom (2005) wrote from Mali where she has been working for two years as a Peace Corps volunteer. She will finish her work there in September and plans to travel to Ethiopia, India and Thailand before she returns to her family's home in Michigan. She's hoping to find a job in a small company working with renewable energy, preferably solar. To learn more about her life in Mali, you should check out her blog at: www.chelseamali.blogspot.com

Matt Mears (2004) has been working at CMA Engineers in Portsmouth, NH for the past 4+ years. They are a civil and environmental firm with about 20 employees, with their main focus on the design of landfills. They also do site design, roadways, and some wastewater.

Nick Roberts (2004) works in the San Diego office of Kimley-Horn Associates, Inc. in the water resource department. He loves California and has been surfing since he moved out there, having become "highly addicted" to it. "It's a complete part of my life. I can't imagine ever living without it."

Jason Powell (2000) is licensed under SE I and is also LEED accredited. He works for Wright-Pierce engineers (water and wastewater infrastructure) in Maine. "The UVM CE environmental minor option has been beneficial." He and his wife Amanda recently bought a house. Their son Max is six years old and daughter Sophie is two.

George Marshall (2005) says life in Dallas has treated him well. He passed the PE last October, was married in April and spent two weeks in Italy. He bought a house a year ago, has two dogs and a boat. He works in Dallas at USA Professional Services Group, Inc., co-owned by another UVM alumnus: **David Schnurbusch** (B.S. CE 1978).

Charley Pineles-Mark (B.S. CE 2003, M.S. CE 2005) married Erika Pineles (UVM '04) in August 2007. They currently live in Washington, DC where he is working for the U.S. House of Representative at the Congressional Budget Office. He is involved with long-term computer modeling (75+ year projections) for the Social Security, Medicare, and Medicaid programs.

Andrea Morse (2004) completed her M.S. in Civil Engineering at the University of Washington in Seattle in 2005. She worked for 1.5 years for Sanborn, Head and Associates in Randolph, VT, then moved to the Missoula Montana area where she now works for Territorial-Landworks, Inc., a consulting and land use planning firm. Last spring, she and her financé bought a house in Stevensville, MT.

Alumni Surveys

As part of our ABET accreditation we periodically need to survey our alumni. For instance, every year we survey those alumni who graduated five and ten years earlier. To make this as easy as possible, we've begun using an on-line resource—surveymonkey.com. They provide us with a link to the surveys we create and we send that info in an e-mail to the specific group.

In order to do this we need a list of everyone's current e-mail address. ***Please help us*** **by sending your current e-mail address to Gail Currier:** gail.currier@uvm.edu **THANKS!**

Kenneth Rozansky (2004) went to work for Medina Consultants in Pennsylvania after graduation, but is now in their new NYC location. He wrote that he's glad he "stuck it out" as an engineering student.

Jeremy Matosky (1995) stops by once in awhile. He's the owner of Trudell Consulting Engineers (TCE) in Williston, VT. Last spring Jeremy mentored a CEE senior design class project.

Kelly Fearney (2003) has been living in Durango, Colorado for four years and is a design engineer at Russell Engineering.

Josh Zall (2007) wanted to work with a company that dealt with water or environmental engineering and is now at Vine Associates, Inc. in Newburyport, MA. They are a waterfront consulting engineering firm, working on coastal projects all along the New England coast. "I've worked on projects ranging from pier and bulkhead inspection and design to dune stabilization on barrier beaches in Newbury, MA."

Nicole Mason (2007) is still at UVM working on her masters degree in Community Development and Applied Economics, studying International Development. She has traveled to Hondurus several times to work on a couple of small scale gravity water systems for villages there. She will be graduating next spring and hopes to find an international engineering position.

Courtney McCormick (2003) was one of several UVM engineers to travel to California to work with the LA County Department of Public Works, Building & Safety Division, having been recruited by **Kit Bagnell** (1986). In 2006 she moved to Rhode Island and started working for Gilbane Building Co, a construction management firm based in Providence. She's recently stepped out of the field, accepting a position as an Instructional Designer for Gilbane University, their internal training division. She is developing content and materials for construction-specific courses taught in-house and online.

Steven Lange (1997) is currently in the Air Force, serving as a Bioenvironmental Engineer. They provide commanders professional, health-based advice to make important decisions involving weapons systems and associated processes; facilities; and chemical, biological and radiological issues. Their usual work includes industrial hygiene, health physics, and emergency response. They also work very closely with AF Civil Engineers. He first became interested in this career field after taking Dr. Hemenway's Industrial Hygiene course in his final year at UVM. He has been assigned to bases in Oklahoma, Georgia, Maryland, Florida, and Turkey, and has an M.S. in Public Health (Env. & Occ. Health) from the Uniformed Services University of the Health Sciences, Bethesda, MD.

Brendan Henry (2005) traveled across the country to Bozeman, MT to ski at Bridger Bowl and Big Sky for the winter following his graduation. The following spring he took a job with C&H Engineering and Surveying, Inc., where **Corey Frehsee** (1998) had worked before returning to Vermont. Bozeman seems to be a UVM meeting ground since he met **John Reilly** (2006) skiing last winter. John now lives in Park City, Utah (where another alumni lives: **Bill McGrath** (1988, Ph.D. 1997). He recently obtained his EMT-B and now works as a ski patroller at Big Sky on the weekends. His hobbies these days consist of skiing, white water rafting, kayaking, mountain biking, trail running, fly fishing, duck hunting and sleeping. "I'm pretty busy, but I have found a way to incorporate all of my hobbies and passions into an extremely fun life here in Bozeman. Life really is great."


Heather & Brendan

Heather O'Shea (2005) also lived in Bozeman for awhile but is now back in Colorado in Crested Butte and running the Wastewater Treatment Plant. After graduation she received her Masters in Water Resources Engineering from the University of Colorado at Boulder. She said she still misses UVM, "though I still get together once a year with about 15 of my friends from college."

Mark Balfe (2000) and his wife recently had their first child, Ciera. Mark received his Masters from Tufts and works for Haley & Aldrich in Boston. He said "It has been a rewarding experience and I have been involved in projects from Boston to Abu Dhabi."

Jessica Clark (2004, M.S. 2006) has been working in Burlington, VT at Milone & MacBroom for over two years. It is a quiet branch office with just three engineers, one of whom is **Brian Cote** (1997). She does mostly water resource work, and has had projects including fish passage, stream assessment, river modeling, and flood control. She is happy, but misses "the wonderful ladies I had around me at UVM."