



*Drs. Julia Perdrial, Carol Adair and Andrew Schroth (shown l to r) discuss the installation of sensors in a wetland in the forested headwaters of Wade Brook (Photo credit, Vince Franke, Peregrine Productions)*

## Vermont Experimental Program to Stimulate Competitive Research



# Our New and Continuing Partnerships



Celebrates and promotes women entrepreneurs and ventures that impact and empower the lives of women and families.



Vermont's statewide business pitch competition.



Working to enhance understanding of science by helping train the next generation of scientists and health professionals to communicate more effectively with the public, public officials, the media, and others outside their own discipline. University of Vermont became an Alda Center Affiliate in 2015.



A NSF funded project focusing on extreme events and resilience; building transdisciplinary research and integrated modeling capacity.



Works in partnership with government agencies from New York, Vermont, and Québec, private organizations, local communities, and individuals to coordinate and fund efforts that benefit the Lake Champlain Basin's water quality, fisheries, wetlands, wildlife, recreation, and cultural resources.



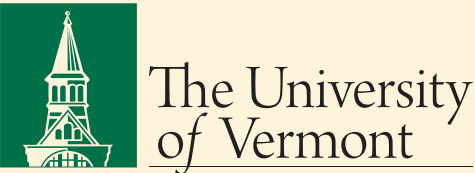
Promoting the sustainable use of Vermont's natural resources, protecting and improving the health of Vermont's peoples and ecosystems, and promoting sustainable outdoor recreation.



**The Ana G. Méndez University System (AGMUS) and Universidad Metropolitana**  
Providing undergraduate summer research internships and an opportunity to present VT EPSCoR research at the annual "Research Symposium for Minority Students" in San Juan, Puerto Rico.



Vermont Public Broadcast Station educates, informs, entertains and inspires Vermonters to be lifelong learners and engaged in their community.



Home of Vermont EPSCoR and center of RACC interdisciplinary research aligning with its mission to be among the nation's premier small research universities for faculty, post-doctoral associates, graduate students, undergraduates.



Facilitating the VT EPSCoR Water Quality Research laboratory and undergraduate and high school research opportunities.



**University of Puerto Rico at Rio Piedras and the Luquillo Long Term Ecological Research (LTER)**  
Integrating high school teams into Vermont EPSCoR RACC research to learn about climate change and water quality.



Balancing liberal arts and nationally recognized professional programs that integrate theory with hands-on experiences to prepare individuals for success.



Home to the VT EPSCoR Center for Workforce Development and Diversity (CWDD), water quality analysis laboratory for total suspended solids and summer internship opportunities for undergraduates and high school students.



Offering researchers valuable insights into Lake Champlain processes enhanced by data from the research vessel, David Folger.



**VSSMF (Vermont State Science and Math Fair) and Norwich University**  
Vermont 5th-12th grade students' state-wide science fair competition inspires students and provides opportunities to further their interests in STEM.



**Vermont Center for Emerging Technologies**  
Offering select early stage firms substantive business mentoring along with traditional business incubator services and infrastructure.



Providing motivated adults the opportunity to participate in authentic research opportunities leading to continued STEM education or career opportunities.



A leader in creating successful learning strategies for students who learn differently and strengthening the STEM workforce.



**Vermont Technology Council**  
A catalyst for the creation of science-and-technology-based business in Vermont.



**The National Science Foundation**  
Where discoveries begin



## Vermont EPSCoR Wins \$20 Million NSF Award to Promote Resiliency in Lake Champlain Basin

By University Communications

### RESEARCH WILL INFORM PUBLIC POLICY, SUPPORT ECONOMIC AND WORKFORCE DEVELOPMENT

What makes some parts of the Lake Champlain Basin and its watersheds resilient in the face of extreme weather events, increasingly common in a warming Vermont, while other parts fail to recover and rebound?

A \$20 million award from the National Science Foundation to Vermont EPSCoR will help answer that question, providing much needed information to decision-makers as they govern the basin and develop policies that reach far into the future.

The award, one of the largest in UVM history, was announced by U.S. Sen. Patrick Leahy and University of Vermont president Tom Sullivan at a press conference on the Echo Leahy Center for Lake Champlain on April 18.

The five-year project will support research teams from UVM and colleges across the state that will collect data from sensors in streams, soil, and the lake and gather information on adjacent land use -- by farms or developers, for instance.

A computer model will then be created, integrating all three information sources. The model will be used to test management scenarios and identify strategies for maintaining infrastructure, environmental health and drinking water quality in the event of intense storms.

"We'll essentially be giving managers a tool that will help them build resiliency in areas that have been vulnerable in the past," said Judith Van Houten, University Distinguished Professor at the University of Vermont, who is directing the research effort.

### A DIVERSE TEAM OF PARTNERS, COMBINING NATURAL AND SOCIAL SCIENCES

The project will be undertaken by a diverse group of scientists and stakeholders working together with Vermont EPSCoR. In addition to UVM, other partner institutions include Johnson State College, Lyndon State College, Castleton University, Middlebury College, Saint Michael's College, Dartmouth College and the Community College of Vermont. Also participating in the project will be key stakeholders, including the Lake Champlain Basin Program (LCBP) and the Vermont Agency of Natural Resources (ANR) and partners from Quebec and Lake George, New York.

NSF made the award to Vermont EPSCoR partly because both natural and social scientists working on the project will utilize complex systems approaches in creating their predictive models.

An earlier NSF award to Vermont EPSCoR, utilizing the same approach, provided insights into sources of phosphorus and nitrogen in the Lake Champlain basin and how these elements feed algal blooms. The work also identified a dominant role for extreme events in determining water quality in the Basin, providing a strong foundation for the current project's focus on resiliency.

"I congratulate Vermont EPSCoR and the Vermont Technology Council for securing this federal grant to provide our state's research community with the tools they need to explore both the science and effects of extreme weather events," Sen. Leahy said. "This research will support valuable new STEM learning opportunities for all students, including high school, undergraduate, graduate and post-doctoral researchers right here in Vermont. We are fortunate for this opportunity to build on our commitment to developing stronger, more resilient communities, while protecting our treasured Lake Champlain."

"VT EPSCoR is matched by none in terms of their track record for success as a state-wide federally funded program in Vermont," said John Evans, president of the Vermont Technology Council, the statewide board for EPSCoR. "They have enabled multiple partnerships throughout the state in building research

**"We are so fortunate to have the Basin as a living laboratory to examine, first hand, the many critical components that must be considered when tackling such large questions," said UVM President Thomas Sullivan. "Our ability to have such an interdisciplinary team of researchers, post-doctoral associates, graduate students and undergraduates working together at UVM and with our partner institutions, embedded in this Basin, is another example of the incredible value the research has for all of Vermont and beyond."**

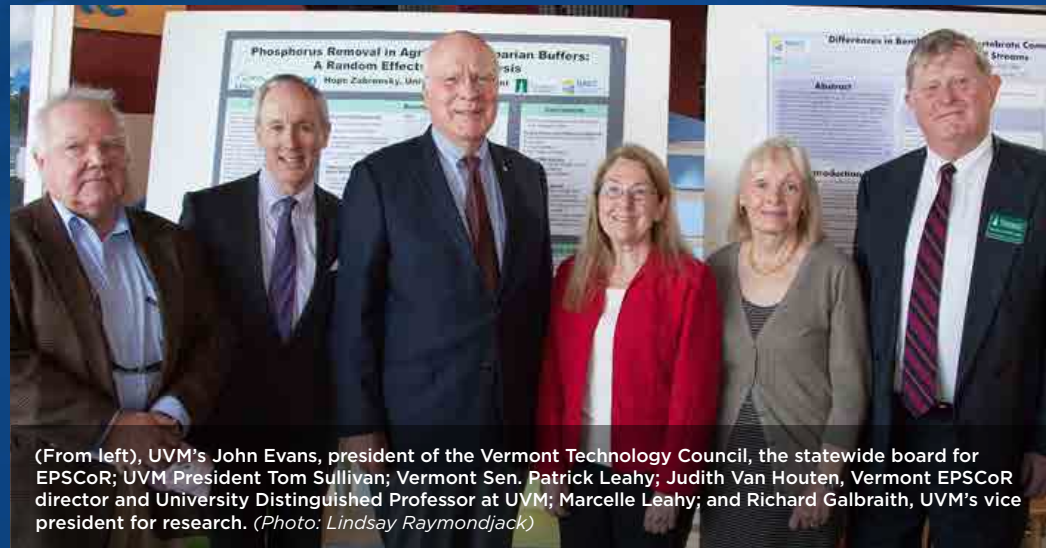
infrastructure, workforce size and diversity, and private sector competitiveness. You will see around you the evidence of their work with undergraduates, high schools and small businesses who are presenting their Vermont EPSCoR sponsored research today."

"The merit review of the proposal for this new award is a true testament to the high caliber of research and innovation being conducted here by many talented researchers, and the relevance this research has not only to Vermont, but also to the region and beyond," said Van Houten.



## WORKFORCE DEVELOPMENT A KEY PART OF AWARD

A key element of the award will be the work performed by the Vermont EPSCoR Center for Workforce Development and Diversity at Saint Michael's College, which will offer research opportunities to Vermont high schools, middle schools and undergraduates from across Vermont, including a new partnership with Landmark College. Scholarships will be available to Abenaki students, first-generation college students, students with disabilities and veterans who are seeking science, technology, engineering or mathematics (STEM) majors. Girls will be supported through the Vermont Works for Women, Rosie's Girls Program. Small businesses will also be able to participate through internships and funding from the Small Business Innovation Research Phase (0) program and support through Innovate HERS and LaunchVT.



(From left), UVM's John Evans, president of the Vermont Technology Council, the statewide board for EPSCoR; UVM President Tom Sullivan; Vermont Sen. Patrick Leahy; Judith Van Houten, Vermont EPSCoR director and University Distinguished Professor at UVM; Marcelle Leahy; and Richard Galbraith, UVM's vice president for research. (Photo: Lindsay Raymondjack)

EPSCoR, the Experimental Program to Stimulate Competitive Research, is a program designed to fulfill the National Science Foundation's mandate to promote scientific progress nationwide.

Through the program, NSF establishes partnerships with government, higher education and industry that are designed to effect lasting improvements in a state's or region's research infrastructure, R&D capacity and hence, its national R&D competitiveness. Through her work with Vermont EPSCoR, funded by the National Science Foundation, and the Vermont Genetics Network, funded by the National Institutes of Health, Van Houten has brought in \$110.45 million in statewide research infrastructure grants for which she is the principal investigator.

**For further information about the Vermont EPSCoR program, visit [www.uvm.edu/EPSCoR](http://www.uvm.edu/EPSCoR)**

## Vermont EPSCoR BREE Award announced at the White House Water Summit on World Water Day, March 22, 2016

## NATIONAL SCIENCE FOUNDATION INVESTS IN A CLEAN WATER FUTURE

**On World Water Day, NSF declares agency commitments to clean water research, supporting accessible, secure and sustainable water resources.**

*Excerpts from Press Release on March 22, 2016*

"Today, at the White House Water Summit, the National Science Foundation (NSF) joins other federal agencies to emphasize its commitment to a sustainable water future.

Access to affordable clean water is vital for energy generation, food cultivation and basic life support. With drought pressure and population demands, water is an increasingly precious resource.

NSF supports national efforts to bolster water security and supply by investing in fundamental science and engineering research.

Despite the importance of water to life on Earth, major gaps exist in our understanding of water availability, quality and dynamics, as well as the impact of human activity and a changing climate on the water system. These gaps must be filled in order to create new concepts for water desalination, purification, reuse and treatments.



A network of levees and wetlands protect the low-lying agricultural communities in California's Sacramento-San Joaquin River Delta. (Credit: California Department of Water Resources)

New NSF investments announced on March 22, 2016 White House Water Summit: \$20 million to support cutting-edge water-research projects through the NSF Experimental Program to Stimulate Competitive Research program."

*Research teams will apply a systems-based, highly integrated approach to determine when and where the impacts of extreme events cascade through the combined social-ecological system. An integrated model of the watershed will be used to test management scenarios and identify strategies for maintaining infrastructure, environmental health and drinking water quality in the face of extreme weather events.*

[https://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=138061&org=NSF](https://www.nsf.gov/news/news_summ.jsp?cntn_id=138061&org=NSF)



# Wetland Site Installation

By Dr. E. Carol Adair, Co-lead of the BREE Ecological Systems Group with Dr. Andrew Schroth. *Photos by Julia Perdrial*

**“The site shown here is in the larger Missisquoi Watershed, but more specifically in the Wade Brook Watershed (a forested headwater). The site was installed (mostly) in July of 2016.**

We aim to use a set of riparian areas of contrasting characteristics and land uses to examine how the biophysical configuration, antecedent conditions, and ongoing changes in climate and land-use will interact to impact the response of water quality to extreme events. Specifically, we are interested in identifying system properties or processes that may be critical to maintaining water quality - can these processes or properties be preserved, restored, or promoted to enhance water quality resilience, especially during extreme events?

We will compare this wetland riparian site to a dry riparian site and agricultural riparian areas, using a state of the art soil and water monitoring network and targeted field campaigns.”



Dr. Carol Adair installs Apogee oxygen sensors.



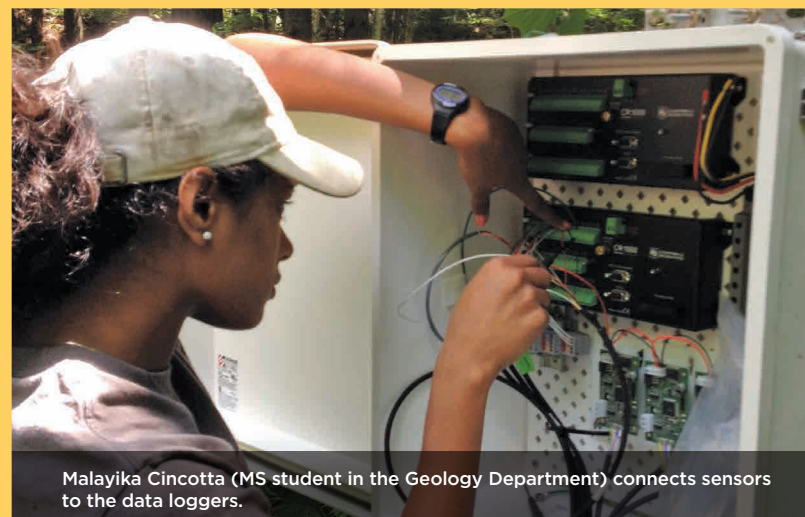
Malayika Cincotta (MS student in the Geology Department) and Haley Jean prepare Decagon soil moisture, T and Electric conductivity probes for installation in a soil pit.



Malayika Cincotta (MS student in the Geology Department) installs zero tension soil solution samples in a soil pit.



Several undergraduate students and Nate Abramson (field specialist at the Arizona Critical Zone Observatory, consulting for VT EPSCoR) install solar panels to power the soil sensor network.



Malayika Cincotta (MS student in the Geology Department) connects sensors to the data loggers.



Dr. Julia Perdrial “installs” Decagon soil moisture sensors auger holes.



Dr. Don Ross and Laboratory Technician Haley Jean back fill a completely installed soil pit.



Dr. Andrew Schroth signals successful wiring of sensors despite rain!



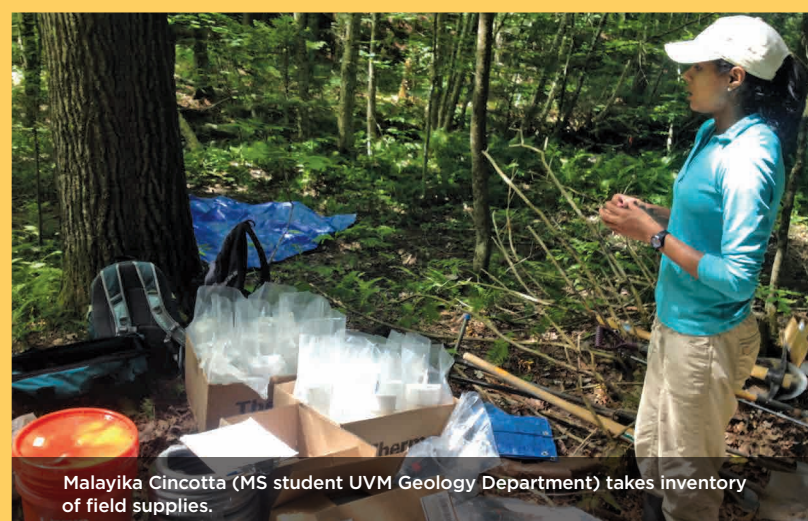
Malayika Cincotta (left, MS student UVM Geology) Jack Ehrenkranz and Ben Wilkes (right, both undergraduate students in Geology) prepare logger casings prior to field installations.



Dr. Farrah Fatemi, Saint Michael's College Department of Environmental Studies (Left) and Dr. Andy Vermilyea, Castleton State University Department of Natural Sciences (right) get ready to dig a soil pit.



Dr. Julia Perdrial, Assistant Professor of Geochemistry in the Geology Department (UVM) prepares Oxygen sensors for installation.



Malayika Cincotta (MS student UVM Geology Department) takes inventory of field supplies.



# Vermont EPSCoR Greatly Expands Local Compute Capabilities with Pascal

by **Dr. Patrick Clemens**, Cyber Specialist, Vermont EPSCoR Asst Research Professor, Dept of Computer Science, University of Vermont



Pascal, Vermont EPSCoR's newest compute server, arrived at the UVM Data Center on October 11th and was released into production on November 30th. Pascal is an NVIDIA DGX-1 Deep Learning System, specifically designed to accelerate massively parallel computations such as those required by the deep learning neural networks and agent-based models proposed for Vermont EPSCoR's new Track-1, Basin Resilience to Extreme Events (BREE). Pascal is just the 24th DGX-1 to be built, and is one of the first few to be installed in an academic environment. Thus, Pascal provides Vermont EPSCoR researchers with cutting-edge computing technology to build and efficiently run the new BREE Integrated Assessment Model (IAM).

While traditional compute servers rely on dozens of complex processor cores, such as those based on the Intel x86 architecture, Pascal's compute power lies in its 28,672 much simpler CUDA processor cores. CUDA cores cannot perform as complex of operations as an x86 core, but they can perform floating-point arithmetic extremely fast. And, because they are simple and small, thousands of cores fit into a single chip. Pascal was named for its 8 Pascal™-powered Tesla® P100 NVIDIA graphical processing units (GPUs), each of which contain 3,584 CUDA cores. For comparison, Intel central processing units (CPUs) currently top out at 24 physical cores. Effective use of this GPU computing paradigm does require specific software development methods, but Vermont EPSCoR's software development team is excited about learning these new software development methods and passing that knowledge on to their Vermont EPSCoR colleagues.

Vermont EPSCoR would like to thank Mike Austin, Director of Systems Architecture & Administration (SAA), for managing the installation of Pascal and Jim Lawson, and SAA Senior System Administrator, for configuring Pascal for production.

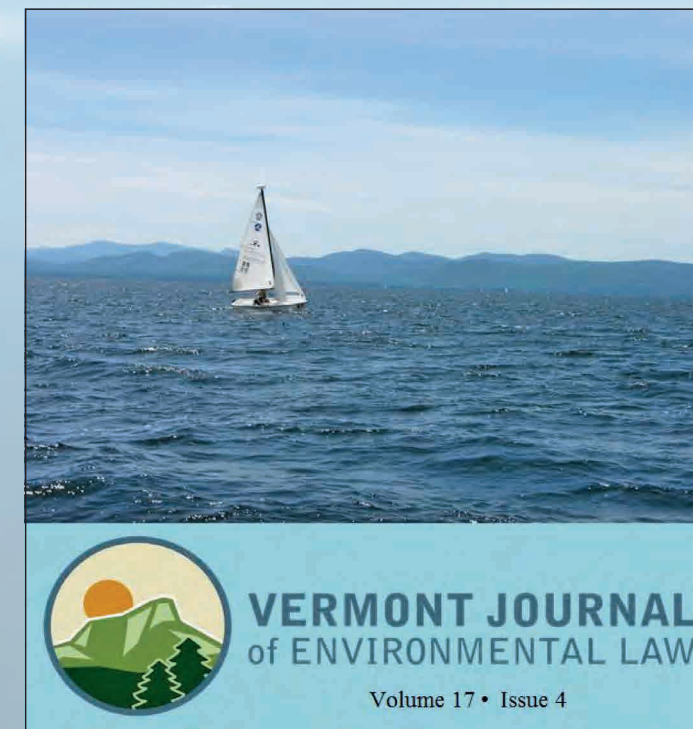
You can learn more about Pascal, including all the system specifications, at [www.nvidia.com/object/deep-learning-system.html](http://www.nvidia.com/object/deep-learning-system.html).

## RACC Team Contributes to Groundbreaking Environmental Law Publication

Maryellen Apelquist  
Director of  
Communications,  
VT Law School  
[mapelquist@vermontlaw.edu](mailto:mapelquist@vermontlaw.edu)

RACC faculty and stakeholders authored twelve of nineteen articles featured in the Spring 2016 Vermont Journal of Environmental Law. Articles covered topics from "A Natural and Human History of Lake Champlain" to "The Lake Champlain Basin as a Complex Adaptive System: Insights from the Research on Adaptation to Climate Change "RACC" Project" and "Controlling Polluted Stormwater Runoff from Roads".

The Vermont Journal of Environmental Law (VJEL) at Vermont Law School announced the publication of a timely new set of information and perspectives on the Lake Champlain restoration plan recently approved by the United States Environmental Protection Agency (EPA) under the federal Clean Water Act.



In June the EPA issued a document referred to as a Total Maximum Daily Load (TMDL) that assigns responsibility to landowners, farmers, and businesses for reducing the levels of phosphorus they are responsible for introducing into Lake Champlain. The "Lake Champlain Edition" of the Vermont Journal of Environmental Law (Volume 17, Issue 4) provides helpful and interesting insights into the scientific, policy and legal implications of this groundbreaking plan.

Editors Trey Martin, deputy secretary of the Vermont Agency of Natural Resources, and David Mears, VLS vice dean and professor of law, are joined by an impressive array of scientists, government officials, policy experts and attorneys in presenting a top-to-bottom analysis of the TMDL.

"The 'Lake Champlain Edition' of the Vermont Journal of Environmental Law is a must-read for anyone who wants to understand how science, policy and law are intertwined in the efforts by the state, the EPA and the many Vermont businesses, citizens and farmers who are working to restore Lake Champlain," Mears said.



# VT EPSCoR Center for Workforce Development and Diversity (CWDD)

The VT EPSCoR Center for Workforce Development and Diversity (CWDD) is off to a busy start with the beginning of the new academic year and the new Basin Resilience to Extreme Events (BREE) research program. Led by new CWDD Coordinator, Mike Winslow, the CWDD Team hit the ground running! Visits included local Vermont elementary, middle, and high schools, a college, and a visit to partner Puerto Rico Universities to help cultivate new connections for undergraduate summer internship opportunities.

Here are just a few highlights of their outreach efforts so far this year:

## Burlington High School

Students from Burlington High School received a visit from Vermont EPSCoR Senior Research Technician Janel Roberge on September 21, 2016. Ms. Roberge spoke with 15 special education students about macroinvertebrates, land use, and how those factors impact stream health.



This presentation served as an introduction to concepts and techniques that were then put to use in a field outing five days later at Potash Brook in South Burlington. In order to allow for a hands-on experience that would provide the most effective learning possible, the students also got to pick and sort macroinvertebrates from a stream sample. Then, they selected specific specimens to examine and identify under microscopes.



## Flynn Elementary School Learns About the Life of a Scientist



Members of Vermont EPSCoR CWDD spoke with three separate first grade classes at J.J. Flynn Elementary School in Burlington, Vermont. Sessions were held as part of teacher Courtney Asaro's STEAM (science, technology, engineering, arts, math) curriculum on September 14, September 29, and October 7, 2016. CWDD members Livia Donicova, Janel Roberge,



and Veronica Sosa-Gonzalez, PhD spoke about their jobs as scientists, their individual roles in the EPSCoR program, and gave the students a chance to use tools to make observations about bugs – like real scientist do!

During the event, students made observations about healthy and unhealthy water samples and discussed what that means for our health and the health of Lake Champlain. They then made observations about various macroinvertebrate samples using magnifying glasses. For many, this was the first time using a magnifying glass as well as looking closely at various bugs that live in streams. The session ended with students playing a game that described what scientists did at work – travel, work outside, build things – and related those tasks back to their own interests.



## New Faces at CWDD by Mike Winslow

Vermont EPSCoR's Center for Workforce Development and Diversity (CWDD) welcomed a number of new faces to the organization this year. A new Program Coordinator, Mike Winslow, started in September, while Program Manager Livia Donicova, and Outreach Professional Veronica Sosa-Gonzalez both started in May. They join Senior Research Technician Janel Roberge who is mid-



Left to right: Veronica Sosa-Gonzalez; Mike Winslow; Janel Roberge; Declan McCabe; Livia Donicova

way through her second year, and long standing faculty advisor Declan McCabe. The team will lead the program's efforts to inspire diverse students to pursue careers in science, technology, engineering and math fields (STEM).

"I am very excited to join the EPSCoR program and help increase STEM literacy in students and the general population, said

Mike. "Last year I attended the EPSCoR Student Research Symposium where student's present the results of their research before even learning of the position. I was very impressed with the quality of their work, and I look forward to helping facilitate it in the years to come."

Mike brings a wealth of experience translating the science that comes from programs like EPSCoR to the general public and law makers. Prior to joining CWDD he worked for 15 years as the staff scientist for the Lake Champlain Committee, a local non-profit organization focused on water quality. He wrote the book, *Lake Champlain: A Natural History*, based upon a series of monthly column about the lake. He also helped develop and run a network of volunteer cyanobacteria monitors.



My work in the policy realm really accentuated the importance of both diverse points of view and solid scientific grounding in crafting solutions to society's environmental problems," noted Mike. "CWDD gives me a chance to improve both for Vermont."

CWDD works to foster diverse students' interests and abilities in STEM courses. The Undergraduate Internship Program offers the opportunity to participate in current

research conducted through the Basin Resilience to Extreme Events (BREE) program. The High School Program helps students and teachers develop skills in scientific methods and Earth systems thinking while experiencing what it is like to be a scientist. CWDD offers scholarships to Native American (including Abenaki) and First Generation college students who enter STEM majors at a Vermont college or university. And, the CWDD team conducts classroom visits for Middle School teachers interested in expanding their student's horizons.

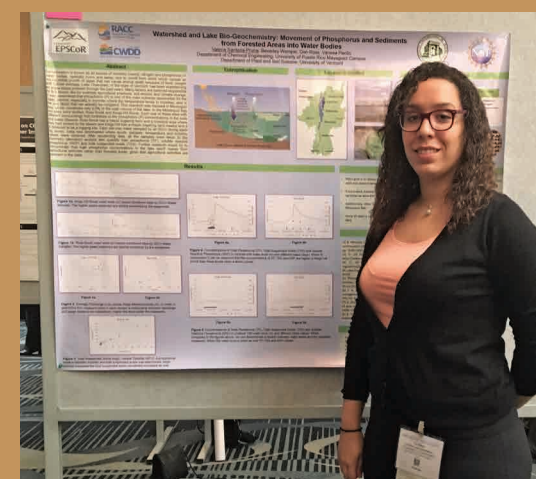
## Veronica Sosa-Gonzalez Discusses Internship Opportunities with Several Puerto Rico Universities

On September 6-9 Vermont EPSCoR's CWDD Outreach Team Leader Veronica Sosa-Gonzalez delivered talks to several universities in Puerto Rico. She talked to about 150 students at the University of Puerto Rico - Rio Piedras, 40 at Universidad del Este, 70 at Universidad Metropolitana and 20 at Universidad del Turabo. Veronica discussed Vermont EPSCoR summer internship opportunities as well as her experiences as a graduate student. Each talk encouraged students to get a doctoral degree and to pursue a career in a STEM field.



Dr. Sosa-Gonzalez pictured front center in red with UPR students

## STUDENT *Spotlight*



### RACC Undergraduate Intern Presents Research at 2016 American Institute of Chemical Engineers Annual Meeting

On November 13-18, 2016 RACC Undergraduate Summer Intern Valeria Santana Pruna presented research at the American Institute of Chemical Engineers (AIChE) annual meeting in San Francisco, California. Valeria is a student at the University of Puerto Rico - Mayagüez Campus (UPR) and the President of the AIChE Puerto Rico chapter, and of the Instituto de Ingenieros Químicos - Colegio de Ingenieros y Agrimensores de Puerto Rico (IIQ-CIAPR), an association of chemical engineering students at UPR. Valeria's research, "Watershed

and lake bio-geochemistry: Movement of Phosphorus and Sediments from Forested Areas into Water Bodies" was conducted with the mentorship of VT EPSCoR University of Vermont faculty members Drs. Beverley Wemple and Don Ross.



## Students Receive a Total of \$40,000 in Scholarships for STEM Scholarships



Patricia Moulton

Eight Vermont college students received a total of \$40,000 in VT EPSCoR Native American and First-Generation College Student Scholarships for Science, Technology, Engineering, and Math (STEM) at the Vermont State House. Patricia Moulton, former Secretary of the Vermont Agency of Commerce and Community Development, presented the students with their awards and encouraged them to consider a career in Vermont.

The location in front of Vermont's capital city of Montpelier served as a reminder to students of the many career opportunities available to them in the state. Initiatives such as this scholarship program serve to help improve the quality of the STEM workforce in Vermont.

The VT EPSCoR Center for Workforce Development and Diversity (CWDD) at Saint Michael's College offers these scholarships on an annual basis as a way of encouraging a diverse range of students to pursue STEM careers. The competitive scholarships help to defray college expenses and enable young Vermonters to pursue degrees and careers focused on STEM fields.

Each of the students selected for a scholarship has shown an interest in pursuing a STEM career and is either of Native American ancestry or the first in their family to attend a four-year college. Individual recipients received a \$5,000 award that ensures that these Vermont students will attend a Vermont college or university in the coming academic year, either as new attendees or returning undergraduates.

The scholarships are awarded based on academic standing, an essay written by the students, and letters of recommendation. For more information about this scholarship opportunity or to apply, visit <http://epscor.w3.uvm.edu/2/node/134>.

Applications for 2017 scholarships are currently being accepted. The deadline for applications is **April 1, 2017**. For more information, please contact:

**The Vermont EPSCoR Center for Workforce Development and Diversity (CWDD)**  
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Colchester, Vermont 05439  
802-654-3270 • [cwdd@smcvt.edu](mailto:cwdd@smcvt.edu)



## 2016 SCHOLARSHIP AWARDEES:

**Emily Cass** is the recipient of a First-Generation Scholarship. A recent graduate of Randolph Union High School, she is currently pursuing a degree in mathematics at the University of Vermont.

**Daniel Cliche** was chosen to receive a First-Generation Scholarship. He is a graduate of Lyndon Institute and is pursuing a major in environmental engineering at the University of Vermont.

**Joshua Dam** received a First-Generation Scholarship. A graduate of Vergennes Union High School, he is currently attending the University of Vermont in pursuit of a degree in civil engineering.

**Kyle Dash** is the recipient of a First-Generation Scholarship and is a graduate of Harwood Union High School. He is currently attending Castleton College and plans to major in environmental science.

**Steven Gilbeau** was chosen for a First-Generation Scholarship. He is currently continuing his education at the Community College of Vermont and plans to pursue an associate's degree in STEM studies.

**Ena Ibrsimovic** is a recipient of a First-Generation Scholarship and is currently enrolled at the University of Vermont. A graduate of Burlington High School, she is currently seeking a chemistry major.

**Bridget Kimsey** received a Native American Scholarship. Having completed a Bachelor's in Fine Arts at New York University in 1997, she is now enrolled at the Community College of Vermont, which she plans to use as a springboard into conducting research in pathology.

**Erikka Sherman** is the recipient of a Native American Scholarship. She graduated from Missisquoi Valley Union High School and is a junior at Saint Michael's College, where she plans to major in mathematics and elementary education.



By University  
Communications

## Dupigny-Giroux to Lead Northeast Chapter of National Climate Assessment

Professor Lesley-Ann Dupigny-Giroux, chair of the Department of Geography at the University of Vermont, has been named regional lead of the northeast chapter of the fourth National Climate Assessment.

Dupigny-Giroux was selected from nearly 200 experts across the United States nominated by her peers to serve as author on NCA4.



Lesley-Ann Dupigny-Giroux. (Photo: Sally McCay)

In a letter to Dupigny-Giroux, David Reidmiller, director of the National Climate Assessment, described her as having “a unique set of qualifications, experiences, and perspectives that will elevate the utility of the Northeast Chapter -- and the NCA4 as a whole.”

The National Climate Assessment is the U.S. Government’s premier resource for articulating the risks posed to the nation by climate change, as well as what is being and can be done to minimize those risks. It is an inter-agency effort, bringing together experts from not only the 13 federal agencies of the U.S. Global Change Research Program, but the broader federal government, and hundreds of experts in the academic, non-profit, and private sectors.

Dupigny-Giroux is also the State Climatologist for Vermont. Her work takes her across Vermont to assist colleagues in State Agencies (transportation, emergency management, agriculture, forestry and legislators) to help plan for and adapt to climate change. She is an expert in floods, droughts and severe weather and the ways in which these affect Vermont’s landscape and people.

*Dupigny-Giroux is profiled in the current issue of Directions magazine.*

By  
AGU

## Betts Receives 2016 Bert Bolin Global Environmental Focus Group Award

Alan K. Betts is the first recipient of the Bert Bolin Award/Lecture of the American Geophysical Union’s Global Environmental Change focus group. He will receive the award and present this lecture at the 2016 AGU Fall Meeting, to be held 12–16 December in San Francisco, Calif. The award recognizes an Earth scientist “for his/her ground-breaking research or/and leadership in global environmental change through cross-disciplinary, interdisciplinary, and transdisciplinary research in the past 10 years.”

*Alan K. Betts is the first recipient of the Bert Bolin Award/Lecture of the American Geophysical Union’s Global Environmental Change focus group. He will receive the award and present this lecture at the 2016 AGU Fall Meeting, to be held 12–16 December in San Francisco, Calif. The award recognizes an Earth scientist “for his/her ground-breaking research or/and leadership in global environmental change through cross-disciplinary, interdisciplinary, and transdisciplinary research in the past 10 years.”*

*Alan Betts’s research “has been transformative by providing a new understanding of one of the fundamental climate processes—land-atmospheric coupling and how it varies from the diurnal to monthly time scale, with land cover, and how it may vary under environmental change. His environmental change leadership in Vermont has been exceptional. His writings, public talks and TV interviews dealing with weather, climate, climate change, energy, and policy issues have fostered positive debate; as they both clarify the climate issues we all face, while encouraging readers and listeners to explore alternative, hopeful paths for themselves, their families and society.”*

—Rong Fu, President, Global Environmental Change focus group, University of Texas



Alan K. Betts

“I am grateful to the AGU Global Environmental Change focus group for selecting me as the first recipient of the Bert Bolin Award.

My work over the past 40 years has covered a wide range of topics central to understanding the Earth’s climate over land and ocean, and the coupling between the oceans and land surface, the atmospheric boundary layer, clouds, convection, and radiation across scales. Because I have worked as an independent scientist in Vermont for decades, this work would not have been possible without the support of so many across the globe. I would specifically like to thank Martin Miller, Anton Beljaars, Pedro Viterbo, and Gianpaulo Balsamo (and the late Tony Hollingsworth) at ECMWF for 30 years of collaboration using data to evaluate and improve the physics of their analysis-forecast system. My recent work on land-atmosphere-cloud coupling over the Canadian Prairies that this award cites would not have been possible without the foresight of Ray Desjardins at Agriculture Canada, and the generous support of other Canadian scientists. My understanding of the Amazon owes much to my Brazilian friends and collaborators, Maria and Pedro Silva Dias. Long-term support from NSF and grants from NASA made all this possible.

My role as a climate advisor in Vermont owes a profound debt to the people of Vermont, who have deep roots in the land. They see what is happening to their climate, and have reached out to me, urgently seeking understanding and answers, as ongoing climate change is transforming the state. So for more than a decade, it has been clear that my research must address these critical questions, and translate all that we know, both locally and globally, into concepts that citizens and professionals can understand and apply to their work and lives.”

—Alan K. Betts, Atmospheric Research, Pittsford, VT

## New England Regional Summit



As part of VT EPSCoR’s ongoing effort to build capacity for technology infrastructure, competitiveness and economic development throughout Vermont, travel awards for small businesses were offered for the first time in 2016 and resulted in 5 Vermont attendees at the Small Business Innovation Research (SBIR) New England Regional Summit in Cambridge, Massachusetts. The summit was held on October 6, 2016, with a pre-conference networking held on October 5, 2016.

The summit was held at the Massachusetts Institute of Technology (MIT). The preconference event on October 5th focused on networking to increase engagement for female innovators and entrepreneurs. The theme of the full-day conference on October 6th was “Connecting New England Innovation Ecosystem Leaders, Entrepreneurs, Technologists, Investors, and SBIR/STTR Federal Funding Decision Makers.”

The five travel awardees included:



**Christian Fayomi** of Synapse IC, LLC in Winooski, Vermont, who is currently working to create a low-cost method wearable alcohol biosensors.



and data communications.

**Stephen Guerrero, Bill Parker, and Julie Parker** of the Creative Microsystems Corporation. The company is focused on fields including augmented reality, advanced vision, situational awareness,



creation of novel materials and structures.

**Ting Tan** is an assistant professor in the University of Vermont’s College of Engineering and Mathematical Sciences, who is currently involved in NASA’s flexible thermal protection systems project and whose long-term research is focused on understanding the

VT EPSCoR also offers entrepreneurs the opportunity to compete for seed funding of up to \$15,000 through its SBIR Phase (O) awards intended to help be more competitive for federal SBIR/STTR competitions. More information may be found here: <http://epscor.w3.uvm.edu/2/node/45>

For more information about the SBIR conference please visit: <http://www.sbirroadtour.com/boston/> To learn more about the SBIR program, please visit: <https://www.sbir.gov/>

## Where Are They Now?

### IN BRIEF FROM RECENT VT EPSCOR GRADUATE STUDENTS AND POSTDOCTORAL ASSOCIATES



**Peter Isles, Ph.D.** completed his PhD dissertation, “A Multiscale Analysis of the Factors Controlling Nutrient Dynamics and Cyanobacteria Blooms in Lake Champlain,” on March 18, 2016 and currently holds a postdoctoral position at the Department of Ecology and Environmental Sciences at Umea University.



**Ibrahim Mohammed, Ph.D.** accepted a permanent position as a Support Scientist with NASA Goddard in Greenbelt, Maryland. He provides support for the development and maintenance of Earth observation framework for improved hydrologic decision in the Lower Mekong River Basin.



**Jody Stryker, Ph.D.** completed her PhD dissertation, “Sediment mobilization from streambank failures: Model development and climate impact studies” on December 19, 2016 and currently works at Stone Environmental, a company focused on environmental science and data management, in Montpelier, VT.



**Yaoyang Xu, Ph.D.** accepted a position with the Chinese National Academy of Sciences (CAS) in Xiamen, China and recruited to the Institute of Urban Environment (IUE) in January 2016 through the CAS Pioneer Hundred Talents Program.





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## From the Director

We are so happy to share the good news of our successful Research Infrastructure Improvement (RII)

Track-1 award from the National Science Foundation Experimental Program to Stimulate Competitive Research (EPSCoR). Lots of effort and energy from many contributors made this possible. You will see some familiar faces and some new ones as we begin our highly meritorious research on Resilience to Extreme Events in the Lake Champlain Basin (BREE).

For more information, and to learn more, please visit us on the web at [www.uvm.edu/EPSCoR](http://www.uvm.edu/EPSCoR)

Please check in with us often and follow us on twitter, Facebook and our awesome web page.

Cheers!

Judith Van Houten, Ph.D.  
Vermont State EPSCoR Director

