

## VT EPSCoR Awarded Three-Year NSF Grant

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The Vermont Experimental Program to Stimulate Competitive Research (EPSCoR) program is widely recognized for providing leadership in connecting Vermont's higher education community, the science and technology (S&T) based private sector, and state government to couple high quality science and engineering in Vermont with the type of economic development that provides maximum benefit to the state of Vermont.

In order to accomplish these goals, the Vermont EPSCoR program attracts funding from federal agencies which support research and development activities. These awards, all made on a competitive basis, lead to investments in both the physical and human infrastructure which allow for Vermont scientists and engineers in both the academic and private sectors to be more competitive in funding their own work. Last summer Vermont submitted a major grant proposal to the National Science Foundation to fund several exciting new initiatives and to continue current successful activities. After a rigorous review process, the Vermont EPSCoR program has been awarded a grant of just over \$8M for the next three years from the National Science Foundation. Jim Hoehn, Head NSF EPSCoR, said of the proposal: "This will position Vermont Science and Technology for great future accomplishments." Six other states competed for funding in this round with Vermont being one of the two states to receive a full award. EPSCoR states, now

numbering 22 nationally, can compete for three year grants. The proposals are evaluated on the intellectual merit and impact on the broader community. Awards of this magnitude have rigorous standards and reporting



VT Technology Council Executive Director, Paul Hale, Associate Project Dir. Judy Van Houten, Project Business Manager, Peggy Burbank, Project Coordinator, Lillian Gamache, Project Director, Chris Allen seen at the Annual NSF EPSCoR National Conference in Anchorage, Alaska, September 2002.

requirements. The previous VT EPSCoR grant expires in March 2003 and was awarded in the amount of \$3M. The recently completed grant centered on infrastructure development with a focus on early career faculty. EPSCoR supported two faculty hires in the EPSCoR focus areas chosen for development (environment and engineering).

The current project slated to begin in April 2003 entitled "Vermont EPSCoR's Research Infrastructure Improvement Plan" sets out to accomplish goals centered on program building, supporting infrastructure and outreach. This next EPSCoR phase will continue to be consistent with the state Science and Technology Plan, devoting a major component to Environ-

mental Science/Engineering and Materials Science – specifically an initiative for Research on Water in the Environment (RWE) and programmatic development in Materials Science involving establishment of a multi-department group focused on polymers and composites.

These ideas were developed through an extensive planning process with external consultants and statewide focus groups led to the identification of program building in the two research areas of interdisciplinary collaboration noted above. Additionally, supporting infrastructure such as faculty recruitment competitiveness in the Vermont EPSCoR focus areas of biotechnology, environmental science and engineering, materials science and information technology

is planned. Finally, outreach efforts will continue to be a mainstay of focus for the VT EPSCoR program. Providing resources to serve previously underrepresented groups, high school students, Vermont baccalaureate institutions and the research-based private sector community is planned. Partnerships with the S&T private sector include an award-winning Small Business Innovation Research (SBIR) Phase (0) program and a recently initiated Grant Opportunities for Academic Liaison with Industry (GOALi) development program.

Future newsletters will explore each of these components in greater detail.

# EPA EPSCoR Grant: Three Years of Accomplishments

Under the leadership of Professor Al McIntosh of the UVM School of Natural Resources and EPSCoR Project Director, Chris Allen, the Vermont EPA EPSCoR grant developed a two part approach to enhancing environmental science research in the state of Vermont. The components were Science and Engineering Environmental Research (**SEER**) and a Strategic Improvement Plan (**SIP**). The **SEER** Project was entitled "The Role of Natural Versus Anthropogenic Factors in Assessing Ecological Risk in Agricultural Watersheds" with Investigators: Mary C. Watzin, UVM (SNR), Nicholas J. Gotelli, UVM (Biology) and James P. Hoffmann, UVM (Botany). The overall goal of the truly multidisciplinary SEER project was to develop watershed systems that could be used to predict where agricultural disturbances and run-off pose a significant risk to the stream community and where restoration activities have the greatest likelihood of success. The first objective was to assess the influence of stream connectivity and adjacent land use on biological species in the rivers. The second objective was to evaluate colonization processes in natural and agriculturally influenced streams to determine which factors might be most important in assessing the potential for recovery in damaged stream systems. The third objective was to specifically evaluate the impacts of phosphorus and suspended sediments on biological species on the stream, such as periphyton and macroinvertebrates using a manipulative field experiment.

The **SIP** component had three competitive programs designed to help develop the environmental research infrastructure in Vermont:

- Stimulus Grants Program
- Postdoctoral Fellowship
- Phase 0 SBIR grants
- Diversity Support (Women & Minorities)

The **Stimulus Grants Program** was initiated to allow Vermont scientists and engineers to assemble the exploratory background needed to develop a proposal for major federal funding. An additional goal was to enhance research in EPA relevant issues in Vermont's

research university and four year colleges. Stimulus Grants were awarded following a competition to Susan Sutheimer, Professor Chemistry at Green Mountain College, and University of Vermont faculty Donald S. Ross (Plant & Soil Sciences), Jeffrey W. Hughes (School of Natural Resources), Lesley-Ann Dupigny-Giroux, (Geography); David Fleming, (Biomedical Technologies) and Beverley Wemple, (Geography).

The **Postdoctoral Fellowship Program** was designed to provide the human resources to move a University of Vermont environmentally relevant



*Students in the SEER Project collecting samples.*

research program to a higher competitive level. The competition was widely advertised. The candidates were reviewed by our EPA EPSCoR advisory group which consisted of the EPA EPSCoR leadership and faculty with research expertise in environmental research. The committee awarded funds for a postdoc to Dr. J. Ellen Marsden, School of Natural Resources, at the University of Vermont. Dr. Marsden recruited and hired Mark A. Beekey, Ph.D. for their project entitled the "Effect of zebra mussel colonization of soft sediments on burrowing invertebrates and insectivorous fish". Objectives of the research were to determine the effect of zebra mussel colonies on water quality parameters and invertebrate species living in the sediments. A second objective was to examine the effect of zebra mussel colonies on foraging by fish species, specifically slimy sculpin and brown bullhead and thirdly, to document the extent of zebra mussel colonization of soft sediment in Lake

Champlain. This project led to several publications and presentations.

The **SBIR Phase (0) Program** was designed to provide seed funds to the Vermont Science and Engineering entrepreneurial community to develop projects which could compete for federal Phase I awards in areas of environmental relevance. The solicitation for this competition was sent to 1,500 Vermont private sector individuals and firms. The proposals were included in the panel review of all of Vermont EPSCoR's Phase (0) proposals. (See Fall 2002 EPSCoR Newsletter, page 1). The panel consisted of scientists and engineers with background in the areas

proposed for support, state agency representatives and persons with SBIR experience. Three awards were made: A.J. Rossman of Drake Solar Design, "Solar Soil Vapor Extraction: An innovative, cost-effective remediation technology for a contaminated subsurface"; Bradley Eldred of Analytical Services, Inc., "Research to evaluate a capsule filter system to field concentrate ground water and finished water samples for human enteric virus analysis" and John Amadon of Dog River Alternative Fuels, "Field Trials for Beneficial Reuse of a Glycerin Byproduct From The Production of Biodiesel Fuel Made From Waste Vegetable Oils".

The issue of **Diversity Support (Women and Minorities)** was also of interest in the SIP component of the Vermont EPA EPSCoR program. Our approach to diversity enhancement involved awareness of the importance of this issue in SIP and SEER awards and availability of funds to bring potential graduate students in this category to campus for recruitments purposes. In the SIP Stimulus Grant component, half of the total awards were made to women. Additionally, the EPA EPSCoR post doctoral award mentor was a woman. In the SEER component, the lead PI of the three person faculty team was a woman. Two women were brought to campus to interview for admission to the graduate program in Environmental Engineering using EPA EPSCoR funds.

## VT EPSCoR News

**Paul Hale**, Executive Director of the Vermont Technology Council and Special Assistant to the President at the University of Vermont was named the 2002 recipient of the *Tibbetts Award*. Named for Roland Tibbetts - acknowledged as the father of the Small Business Innovation Research (SBIR) program - These prestigious national awards are made annually to those small firms, projects, organizations and individuals judged to exemplify the very best in SBIR achievement. Dr. Hale has been invaluable to the State of Vermont's small business community by providing education and outreach on the SBIR program through direct technical assistance to SBIR applicants and his work as a founding member of the SBIR Coordinating Council that was established in 2000 to create and implement a formal SBIR outreach program within Vermont. He has also helped forge strategic partnerships with other State organizations that provide education, outreach and technical assistance to SBIR participants. Paul's role as a liaison between the State's primary research institution, the University of Vermont, and Vermont's innovative business community has been instrumental in the success of the SBIR program in the State. When Dr. Hale first joined the Vermont Technology Council and the University of Vermont in 1999, there was no formal SBIR outreach program within the State. At that time, Dr. Hale began serving as the ad-hoc SBIR outreach person for the State of Vermont, in partnership with the Vermont EPSCoR program. In 2000, the Vermont Department of Economic Development received a Rural Outreach Grant through the U.S. Small Business Administration to create and imple-

ment a statewide outreach program. Dr. Hale's participation in Vermont's effort to obtain financial support for SBIR outreach was instrumental its successful bid for funding and program creation. During his tenure in the private sector, Dr. Hale was awarded 17 SBIR grants from the National Institutes of Health, the Depart-

ments to educate our small businesses on the benefits of the SBIR / STTR program.

Dr. Hale is a native Vermonter, born in Burlington. He graduated from UVM with a double major in Chemistry and Physics. He received his Ph.D. in Chemistry from Northwestern University. After post-doctoral studies, he joined the staff at Brookhaven National Laboratory and later moved to a spin off company from the Lab. Prior to his association with the Vermont Technology Council, he was employed by Biotek in Winooski.



*From left—Administrator of U.S. SBA Hector Barreto, Paul Hale, and Roland Tibbetts.*

ment of Energy and the National Science Foundation, worth \$2.75 million. This experience has allowed him to develop a series of instructional workshops to help Vermont businesses and entrepreneurs become better prepared to compete for SBIR funding. Dr. Hale has held these "SBIR 101" workshops throughout the state and has also made them available online. Dr. Hale continues to offer direct technical assistance to Vermont companies by providing SBIR proposal reviews, by linking companies to appropriate research expertise at the University of Vermont, by referring companies to other resources that are available to help in technology commercialization efforts, and chairing the EPSCoR SBIR Phase (0) review panel. Dr. Hale has served as an outstanding contributor in Vermont's

**Travis Delaney**, recently joined the VT EPSCoR team as an Information Technologist. Previously, Travis had worked for the Hughes Endeavor for Life Science Excellence (HELIX) program at UVM. Travis will be working on database and web design to meet the increasing reporting and outreach requirements of the EPSCoR program. Travis was recently inducted into the Golden Key International Honour Society as a result of his academic achievements.

**The Vermont Technology Council** welcomed three new members to its board—UVM President, Dan Fogel, President & CEO of Central Vermont Medical Center, Daria Mason, and Manager of Corporate Community Relations & Government Affairs for IBM, John O'Kane.

**Other VT EPSCoR Programs:** Two significant VT EPSCoR programs—one from DOE (Project Director, Susan Wallace) and one from NASA (Project Director, William Lakin) will be discussed at length in future newsletters.

## SBIR Phase (0) News

The 2003 SBIR Phase (0) Request for Proposals is due in the VT EPSCoR office no later than April 28. Applications can be downloaded from the web at [www.uvm.edu/EPSCoR](http://www.uvm.edu/EPSCoR). Eleven Phase (0) awards were made in 2002 to the following recipients after a competitive review process: MicroStrain, Inc. "Six Degree of Freedom Position Sensor", TeraComm Research, Inc., "Common-Path Phase-Shifting Interferometer", Burlington Advanced Technology, LLC, "Integrated Active Damping for Aerospace Electronics", Data Basics, "Nanotechnology Substrate Cleaner", Pierce Instruments Inc., "Development and Evaluation of an Improved Chemo-ablation for Treatment of the Prostate", Burlington Advanced Technology, LLC. "Thermoelectric Power Supply for Autonomous Sensors", Cambridge Engineering, Inc., "Breadboard and Experimentally Evaluate Passive Tamper Detection Device" KPTEK, "Quantum Cascade Differential Absorption Biological Agent Detector" Green Mountain Radio Research Company, "Split-band high Efficiency Amplitude Modulator", Internav, "A New Hardware Design and Associated Algorithm for Producing an Immune, Fast, Low Cost Magnetically Based Medical Navigation System", South Mountain Research & Consulting Services, "Modeling of Sediment Transport in Geomorphically Unstable Alluvial Channels Using ANNs".



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## The Vermont—NSF Partnership

The Vermont Experimental Program to Stimulate Competitive Research (EPSCoR) contributes to building an infrastructure which will improve the research competitiveness of Vermont scientists and engineers as well as bring NSF resources to the service of the broader community.

The fundamental goals of the Vermont EPSCoR program naturally parallel the two National Science Foundation (NSF) review criteria (intellectual merit and broader impact). The explicit recognition of the importance of the broader impact of science on society has been a fundamental hallmark of the Vermont EPSCoR program since its inception in 1985. The close relation to state needs is reflected in Vermont EPSCoR's governing board, the Vermont Technology Council, a privately organized non-profit group devoted to joining academic research and Vermont economic development. The state's S&T plan, developed by the Council with active EPSCoR leadership, has defined the areas of S&T emphasis which are critical to the state's economy and, therefore, are the areas where the Vermont EPSCoR program makes its infrastructure investments. (Advanced Materials, Biotechnology, Environmental Science/Engineering and Information Technology).

Visit us on the Web at  
[www.uvm.edu/EPSCoR](http://www.uvm.edu/EPSCoR)

*Upcoming EPSCoR Deadlines  
& Upcoming Events:*  
SBIR Phase (0) - April 28, 2003  
Science, Math & Technology  
Careers Day - May 20, 2003

TO:

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