



Maine EPSCoR



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Winter 2006 –2007

UM Grant May Lead to Biorefinery

The University of Maine has received \$10.35 million to conduct research on using wood to make ethanol, plastics, industrial chemicals and other products that now are made with oil. The plan is to create what could be the country's first integrated forest biorefinery in which Maine's pulp and paper mills create the new goods using heretofore unused parts of the tree. They would develop new revenue streams while maintaining their traditional production.

"This builds on something we already have," said Janet Yancey- Wrona, science adviser to Gov. John Baldacci. "It's a good example of a new technology where Maine can expect to have a competitive advantage because we have the history, skills and natural resources."

With the three-year grant, which consists of \$6.9 million from the National Science Foundation and another \$3.45 million in matching money from the state, UM researchers will help determine the kinds of products that could be made from wood byproducts, how to make them, and how to market them.

The grant "puts us in a leadership position on a national and international scale," said Professor Hemant Pendse, chairman of the Department of Chemical and Biological Engineering and managing director of the Forest Bioproducts project. "It will allow us to continue to do research so the private sector can take these things to their commercial stage much faster."

Some of the grant will be used to purchase equipment and convert UM facilities into research labs. Openings will be created for about 45 people, including three new faculty members for the Engineering and Forest Resources departments. Postdoctoral positions will be created as well as jobs for graduate and undergraduate students, and administrative and technical staff. Other departments expected to be involved in the research include Chemistry, Biology, Forest Ecology, and Economics. *continued on*

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Maine Governor John Baldacci speaks with Lori A. Perine, Executive Director of Agenda 2020 Technology Alliance, as Dr. Hemant Pendse, co-director of the new Forest Bioproducts Research Initiative looks on, at the University of Maine's announcement of the NSF EPSCoR award in March 2006.



Maine EPSCoR Program

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Even teachers from local middle and high schools, who will be invited to work with researchers, will benefit from the funding.

"This is truly a significant day for the University of Maine, for the state of Maine and for the people of Maine," said UM President Robert Kennedy. The grant "enables UM to ensure our role in the state's economy with the creation of new jobs, with the ability to perform research and develop ideas that create and enhance industry and with unique, highly relevant educational opportunities."

As part of the grant, UM will combine research efforts with faculty and students from the University of Southern Maine and other public and private universities and colleges in the state, as well as with Rensselaer Polytechnic Institute in New York and the University of Tennessee. In addition, UM will partner with landowners and officials from the pulp and paper, building materials and chemical industries.

David Colter, president of GAC Chemical Corp. in Searsport, was excited about the technology that will be developed. "It's taking a waste product and giving it value," said Colter, whose company sells water treatment and papermaking chemicals to paper companies.

Wood sciences technology professor Stephen Shaler said the new technology would enable the state to use to their full potential the parts of the tree that now are discarded or burned in biomass plants.

"We're talking about using all the components of the tree - even those that currently can't be used to make paper or burn for energy for the mill," he said.

"The work we do with the grant will establish Maine as the most advanced and knowledgeable place in the world for forest bioproduct work," he said. "It will also teach us how to be better stewards of our forests, and it will lessen our dependence on petroleum."♦

Excerpted from the Bangor Daily News, By Ruth-Ellen Cohen, March 28, 2006

Maine NSF EPSCoR Reviewed by AAAS

In October 2006, a panel from the American Association for the Advancement of Science Research Competitiveness Service spent two days at the University of Maine conducting an evaluation of the state's new NSF EPSCoR Research Infrastructure Improvement project. While the project was only six months old at that time, the panelists were enthusiastic about its potential for Maine's future, and generated several key suggestions for how to maximize our efforts.



AAAS panel participants were (from left to right in photo): Julia Melkers Ph.D. - Associate Professor of Public Administration, Co-Director of the UIC Science and Technology Research Group, University of Illinois, Chicago, IL; Michael Wolcott, Ph.D. - Professor of Civil and Environmental Engineering, Washington State University, Pullman, WA; Michael Mann, Ph.D. - Departmental Chair and Professor of Chemical Engineering, University of North Dakota, ND; and Maria Vassileva, Ph.D. - Senior Program Associate, AAAS Science and Policy Directorate, Washington, D.C.

Maine EPSCoR Program

Maine's All Things Woods Expo



Cynthia Growe of the Maine NSF EPSCoR's Forest Bioproducts Research Institute acquaints a youngster with the Institute's display at the Expo.



The All Things Wood Expo was held October 14, 2006 at the Portland Expo Building, where over 50 exhibitors were on hand to educate the public about Maine forests. The mission of the Expo was to draw attention to all aspects of Maine's forest: jobs, clean water, vibrant rural economies, unique habitats, industry, and recreation. Cynthia Growe, accompanied by a colorful display, represented Maine NSF EPSCoR's Forest Bioproducts Institute at this event. "Our table was in the educational area, where we offered games for children as well as a simple introduction to the many aspects of our research project" said Growe. Approximately 450 people attended throughout the day, with hundreds of youth participating in the exhibit's educational activities.

EPSCoR Success Stories

The Climate Change Institute

An NSF EPSCoR Research Infrastructure Improvement Award from 1990-1996 provided the start for the Climate Change Institute at the University of Maine. This highly successful interdisciplinary unit conducts research and graduate education focused on the variability of the earth's climate, ecosystems, and other environmental systems, and on the interaction between humans and the natural world. Research activities focus on the timing, causes, and mechanisms of natural and anthropogenically forced climate change, and on the effects of past climate changes on the physical, biological, chemical, social, and economic conditions of the earth. Center Director Paul Mayewski was recently featured on the television series "60 Minutes."



The AEWCC

The Advanced Engineered Wood Composites Center at the University of Maine was also started with an NSF EPSCoR RII award from 1996-1999, which seeded construction of a 30,000 sq ft, \$4.2M facility. Over the past ten years, AEWCC has become a world leader in this field with eleven patent applications and over \$42M in income generated.



Some of the center's main goals are to:

- develop the underlying science and engineering principles needed to produce low-cost, high-performance structural composites.
- support current and emerging industries as well as government agencies that produce/use these products by providing testing, engineering and consulting services.
- actively pursue commercialization, entrepreneurship, and job creation in Maine and beyond.

Maine EPSCoR Program



Maine EPSCoR FBRI Announces Year 1 Outreach Awards

Educational Outreach Awards:

- Robert Kuech, University of Southern Maine, Science Education and Teacher Education, \$4,990, Forest and Stream Podcasting
- Kim Borges-Therien, University of Maine at Fort Kent, Environmental Studies, \$1,000, Undergraduate Student Internship
- Matthew Court, University of Maine Farmington, Social Sciences and Business, \$6,840, Undergraduate technology research experience
- Sherry F. Huber, Maine TREE Foundation, \$10,000, Workshops for K-12 teachers
- John Pierce Wise Sr., University of Southern Maine, Toxicology and Molecular Epidemiology, \$9,655, Toxicity of cellulose nanoparticles research
- Peter Vaux, University of Maine, Environmental and Watershed Research, \$8,122, Maine Woods website
- Amie Gellen, University of Maine, Center for Science and Mathematics Education Research, \$9,903.39, Three coordinated programs linking experienced teachers, pre-service teachers, and university faculty in science and mathematics
- Bruce Segee, University of Maine, Electrical and Computer Engineering, \$10,000, Refine and test classroom data visualization methods.



Small Business Development Awards:

- Jeff Dubis, University of Maine at Fort Kent, Forest Technology Program, \$4,950, Equipment for low impact timber harvesting research
- Scott Christiansen, FDC Ventures, \$4,675, Commercialization business plan
- Jake Ward, University of Maine, Student Innovation Center and Research and Economic Development, \$10,000, Innovation and Commercialization Plan Contest for Bio-products



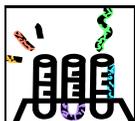
Travel Awards:

- Steven B. Selva, University of Maine at Fort Kent, Environmental Studies, \$2,006.12, Travel to workshop: Investigating Calicioid Lichen Biomonitors in the Regional Herbaria of Northeastern North America



Associate Research Awards:

- David Correia, University of Maine Farmington, Biology, \$10,000, Compare conservation outcomes of Maine programs
- John Pierce Wise Sr., University of Southern Maine, Toxicology and Molecular Epidemiology, \$21,748, Toxicity of cellulose nanoparticles research



Small Equipment Awards:

- Sherry F. Huber, Maine TREE Foundation, \$5,000, Workshops for K-12 teachers
- John Pierce Wise Sr., University of Southern Maine, Toxicology and Molecular Epidemiology, \$9,846, Toxicity of cellulose nanoparticles research

Maine EPSCoR Program

12th Annual National Conference held in KY

The 2006 NSF EPSCoR National Conference, held in Lexington, Kentucky this past November, was entitled “Rising Above the Gathering Storm: Innovating to Compete in a Global Economy.” This focus was in response to a recent government report stating “U.S. advantages in the marketplace and in science and technology have begun to erode” as a result of widespread advances the world over. The workshops and sessions over the three day event emphasized the need for EPSCoR to become a working and integral part of a new national effort to increase U.S. competitiveness and pre-eminence.

Each jurisdiction was also allowed to invite students to the conference, in hopes of helping to expand their networking and research. Sara Walton, a graduate student working with FBRI researchers at the University of Maine’s NSF EPSCoR program, was selected to attend. “The National EPSCoR conference was a great opportunity to meet other students and researchers involved in a wide range of projects very different from my own” Walton said. “I spend most of my time in the lab trying to turn wood into ethanol, but it was interesting to meet people who are concerned with such things as monitoring pollution in aquifer systems, or detecting cancerous cells.” Walton also said she very much enjoyed the opportunity to experience the culture of Kentucky while attending the conference. The next annual conference is slated for November of 2007 in Hawaii.



Top: FBRI Graduate Student Sara Walton (top) poses with a horse of a different color.

Bottom: Maine NSF EPSCoR Director Mike Eckhart (right) and state committee chair Miles Theeman (left) enjoy some of the local culture.



Above: Dr. Sherry Farwell from the NSF EPSCoR office participated in the Maine NSF EPSCoR State Conference
Right: FBRI Co-Director Dr. Hemant Pendse addresses a session on Maine’s new RII award.



Maine State Conference

Maine EPSCoR held its annual State Conference in September 2006 at the University of Maine, and over 150 took part in general and breakout sessions. Maine EPSCoR was fortunate to have in attendance Dr. Sherry Farwell, Director of NSF EPSCoR, Dr. Darrell Winner, Director of EPA EPSCoR, Dr. Sidney McNairy Jr., Director of the NIH Division of Research Infrastructure, and Dr. Maria Vassileva, of AAAS. Del Raymond, retired Director of Strategic Energy Technologies of Weyerhaeuser, served as Keynote speaker and spoke on “Maine’s Growing Opportunities in the Forest Bioproducts Research Area”.

The goals of the conference were to:

- Provide information about EPSCoR and federal agency programs
- Provide information and connections to increase funding opportunities and competitiveness
- Foster networking for research and educational outreach collaborations
- Provide information about Maine’s NSF EPSCoR RII Forest Bioproducts Research Project

Maine EPSCoR Program

Summary of EPSCoR Programs

NSF EPSCoR

Goal #1: provide strategic programs and opportunities that stimulate sustainable improvements in a jurisdiction's R&D capacity and competitiveness.

Goal #2: to advance science and engineering capabilities in eligible jurisdictions for discovery, innovation, and overall knowledge-based prosperity.

Initiatives:

- **Research Infrastructure Improvement Grant:** Provides support for sustainable improvements in research infrastructure, increased competitiveness, and capacity
 - Currently \$9 million over 3 years
 - One award per three-year period with a limited application process
 - Projects developed & chosen by state's EPSCoR committee

Application eligibility: institutions granting Ph.D.s in science and engineering (outreach portions of this program can service the whole state)

- **Co-Funding Assistance:** enables more awards to be made to researchers in EPSCoR jurisdictions from the Foundation's regular research, education, and special emphasis competitions, by providing partial support for those proposals that merit review places at or near the cutoff for funding by the reviewing program. This mechanism operates internally within NSF and does not require any action on the part of the proposer.
- **Outreach Initiative:** provides financial support for outreach visits by NSF staff to acquaint researchers in the EPSCoR jurisdictions with NSF priorities, programs, and policies. EPSCoR Outreach also serves to acquaint NSF staff more fully with the facilities, research activities, and investigator expertise/potential within the EPSCoR jurisdictions.

DoD DEPSCoR

- Basic & applied research supporting DoD goals
- State EPSCoR committee selects a limited number of proposals to submit annually from the state in the fall

Eligibility: universities with degree-granting programs in science, mathematics, or engineering

DoE EPSCoR

- **Implementation Awards:**
 - enhance capability to conduct nationally-competitive energy-related research and to develop science & engineering human resources in energy-related areas
 - limit of one per state with projects chosen by state's EPSCoR committee – generally in the early fall
- **State/National Laboratory Partnership Awards:**
 - Initiate and promote partnering and collaborative relationships that build beneficial energy-related research programs with strong participation by students, postdoctoral fellows, and young faculty
 - Pre-application with subsequent invitation to apply

EPA EPSCoR

- Co-funding of proposals to regular programs

NASA EPSCoR

- Research awards & infrastructure development

NIH IDeA

- Centers of Biomedical Research Excellence (COBRE) for Ph.D. granting institutions or biomedical research institutes
- Biomedical Research Infrastructure Networks (BRIN) for undergraduate institutions

USDA EPSCoR

- Various research, career, equipment, seed grants, etc.

Maine EPSCoR Program

Maine EPSCoR at the University of Maine:

Maine NSF EPSCoR Project Director:

Michael J. Eckardt, Ph.D.
 Vice President for Research
 University of Maine
 5703 Alumni Hall, Room 209
 Orono, ME 04469-5703
 Telephone: 207-581-1506
 Email: michael.eckardt@umit.maine.edu

Maine NSF EPSCoR Associate Project Director:

Vicki L. Nemeth
 Director of Research Administration & EPSCoR
 University of Maine
 5717 Corbett Hall, Room 403
 Orono, ME 04469-5717
 Telephone: 207-581-3399
 FAX: 207-581-1446
 Email: vicki.nemeth@umit.maine.edu

State EPSCoR Committee:

Maine EPSCoR is overseen by the Maine Science & Technology Advisory Council, a statewide steering committee of 27 individuals from Maine's education, research, and business communities, and state government. The Council is under the auspices of Maine's Office of Innovation. For more information, see: www.maineinnovation.com/epscor/default.a

For more information about Maine EPSCoR programs please visit

www.umaine.edu/epscor

Or e-mail questions to:

maineepscor@umit.maine.edu



NSF EPSCoR Maine Co-funding History

Fiscal Year 1998-2006

Institution	Award
Applied Thermal Sciences	\$99,993
Bates College	\$154,970
Bigelow Laboratory	\$755,387
BIODE, Inc.	\$50,000
Bowdoin College	\$632,172
Brims Ness Corp	\$198,717
Colby College	\$429,740
Fiber Materials, Inc.	\$97,459
Image Works	\$84,066
Jackson Laboratory	\$13,9150
Maine BioTek, Inc.	\$49,964
Maine Math & Science	\$500,000
Mainely Sensors, LLC	\$149,998
MDI Biological Laboratory	\$108,000
Priestley Consulting	\$99,992
Sensor R&D Corp	\$98,684
Sensordyne	\$100,000
St. Joseph's College	\$106,750
Technology Systems, Inc.	\$99,995
U. Maine	\$535,2720
UMA	\$23,004
UMF	\$61,351
UMFK	\$38,994
UMM	\$229,713
UNE	\$70,300
USM	\$765,950
Total Award Amount for Maine	\$10,497,069
Total Number of Awards for Maine	93

Co-funding assistance enables more awards to be made to researchers in EPSCoR jurisdictions from the Foundation's regular research, education, and special emphasis competitions, by providing partial support for those proposals that merit review places at or



Maine EPSCoR

5717 Corbett Hall, Room 403

Orono, ME 04469-5717

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Resources

NSF Strategic Plan - www.nsf.gov/pubs/2006/nsf0648/nsf0648.jsp

Maine State Science and Technology Action Plan - www.maineinnovation.com/studies_reports/default.asp

UMaine Strategic Plan - www.umaine.edu/strategicplan/Research_Strategic_plan.pdf

Kentucky National Conference presentations - www.kynsfepscor.org/06conference/