

Research & Technology Transfer Report

Board of Regents Meeting, January 2012

Under Policy 401 of the Board of Regents, The University of Montana – Missoula and Montana State University – Bozeman are required to meet the following reporting elements:

Federal Initiatives Report. Targeted federal initiative funds (commonly referred to as “earmarks”) are funds included in federal appropriations requested by members of Congress to fund specific projects or programs. To keep the regents informed of these funding requests, UM-Missoula and MSU-Bozeman, as representatives of the affiliated campuses, shall coordinate requests for federal initiatives for their affiliated campuses and shall each submit to the Commissioner of Higher Education a report of the requests for any non-competitive federal funds which the units anticipate submitting to Montana’s congressional delegation for inclusion in the federal budget. The report will be submitted before the January board meeting unless otherwise scheduled by the board.

Reports. Annually, at the September regents’ meeting, UM-Missoula and MSU-Bozeman, as representatives of the affiliated campuses, shall submit to the Commissioner of Higher Education a report summarizing the research and technology transfer activities for the previous fiscal year. The report shall contain, at a minimum, the following data for the previous fiscal year:

1. All expenditures from grants and contracts managed by the respective research administrative offices;
2. Number of new invention disclosures filed;
3. Number of new start-up companies which have licensed or commercialized university-developed intellectual property;
4. Number of new intellectual property licenses issued;
5. Total intellectual property licenses in effect at the close of the fiscal year;
6. Total gross revenues from intellectual property licenses; and
7. Assessment of progress toward meeting the goals pertaining to technology transfer outlined in the campus strategic plans.

Federal Initiatives Report

While The University of Montana will not be requesting any individual federal initiatives, UM will approach the Montana Federal Delegation to continue support for the following efforts:

- McIntire Stennis funds
- National Center for Landscape Fire Analysis
- Defense Critical Language and Culture Program

McIntire Stennis

The McIntire-Stennis program (Cooperative Forestry Research), administered by NIFA within the USDA, is a base federal-state cooperative program that supports research and graduate education on a wide variety of forestry and natural resource topics. Every state participates in the program, receiving a formula based allocation. Montana receives in excess of half a million dollars each year. As a base program, it provides foundational support for forestry and natural resource research and graduate education at UM. Current funding is approximately \$33 million and the request is to maintain or increase this level of support nationally. It is an important program for UM that is leveraged by UM.

National Center for Landscape Fire Analysis

Since 2001, the National Center for Landscape Fire Analysis has served as a bridge between on-the-ground fire managers, fire science, and applied fire technology and as an interdisciplinary science, research, and development center in the College of Forestry and Conservation at the University of Montana. The Fire Center develops applications to help managers access and use data more efficiently; conducts research to characterize fire and fuels; provides direct incident support; and offers classes, trainings, and other learning opportunities to develop a highly skilled current and future fire workforce.

Original funding for NCLFA came through the USDA Forest Service and the USDI Bureau of Land Management through Congressional appropriations. In 2007, the Fire Center became part of the base budget in the USDA Forest Service Wildfire Research Program and in 2008 the Rocky Mountain Research Station (USDA Forest Service), the University of Idaho (College of Natural Resource, and The University of Montana (College of Forestry and Conservation) formed the **Wildland Fire Science Partnership** to continue developing and delivering useful products and services to fire management. The Wildland Fire Science Partnership currently operates on base funding within the Wildfire Research Program.

In May, 2010, the Montana Board of Regents voted to approve the National Center for Landscape Fire Analysis as an official Montana University System center. With a formal wildland fire center, The University of Montana addresses specific knowledge gaps faced by fire and land managers, strengthens the research and service the University provides to land managers and to the public, and enhances educational and training opportunities for students.

The Fire Center's work supports four broad initiatives: incident management and support; workforce development; assessments and monitoring; and application development.

Incident management and support: We participate directly in fire operations to maintain our close relationships with land managers and to guide our research and development projects. Many staff have fire backgrounds; others acquire some fire experience in their work for the Fire Center. In 2011 we filled operational fire roles at Missoula Dispatch, as Computer Technical Specialists on three Montana wildfires, and as Incident Commander and Fire Effects Monitor on a fire on the Powell Ranger District in Idaho. We also helped the Montana DNRC investigate using mobile technology to streamline their business operations from the field.

Workforce development: University students must juggle academic requirements and calendars with the courses necessary to advance their federal firefighting qualifications. Fire management increasingly requires

advanced knowledge and technical skills to manage the complex fires of the future. The Fire Center offers experiential learning initiatives and targeted research and mentoring opportunities to give those students the diverse training they need to compete for professional land management positions. In January, 2012, the Fire Center will lead its fifth class of UM students to southeastern Georgia to conduct prescribed burns as part of the Prescribed Fire Practicum. This wintersession class helps The Nature Conservancy restore its longleaf pine stands while giving firefighter students opportunities to participate in operational fire in a learning environment. The practicum is now part of the College's expanding service learning curriculum and its new Fire Science and Management minor. Before the practicum, students take a wildland fire class to gain a solid foundation in fire policy and management fundamentals. After the practicum, instructors identify top students to participate in a semester-long research project. This introduces undergraduate students to cutting edge research and allows faculty to provide more targeted mentoring and advising to these students. Such relationships have led students into successful positions on fire crews, into grad school, and into full-time jobs with entities like the Missoula Fire Sciences Laboratory.

Assessments and Monitoring: Land managers need accurate information on the structure and quantity of fuels in order to make safe decisions about fuel treatments and possible fire behavior and to conduct full-scale forest inventories. Laser scanning is one of the most promising new technologies to achieve multiple-use forest assessments accurately and at lower cost than traditional assessments. Researchers at the Fire Center have worked with airborne laser scanners for nearly a decade to produce precise forest and fuel inventories at the scale of the individual tree. In addition, the UM's College of Forestry and Conservation owns a 3-D terrestrial scanning system to validate laser-measured forest parameters and to investigate new methodologies for conducting forest and fuel inventories. The Fire Center is currently involved in two externally funded projects: developing new crown biomass equations for seven conifer species in the western US; and building 3-D models of sagebrush and chamise shrub fuels that will more successfully simulate how fire moves through shrublands under a variety of conditions.

Application Development: The Fire Center utilizes current technology and data to make information more usable and accessible to managers. This winter the Fire Center is completing enhancements to the Fire Effects Information Systems database by adding spatial search capabilities. This new user interface will provide search options such as geographic and subject-matter keywords and an option to find literature review and synthesis documents about a species in an area by selecting that area on an interactive map.

Defense Critical Language and Culture Program

The Defense Critical Language and Culture Program (DCLCP) seeks continued funding support from the Defense Language Office/National Security Education Program funding line. Moreover, thanks in large measure to support from Senators Baucus and Tester, DCLCP is working on a way forward with DoD that would include a multi-year contract vehicle of between 3 to 5 years beginning FY 2013,.

Staff. Currently, DCLCP faculty consists of two FTE Pashto/Dari instructors, two visiting scholars from Afghanistan and three graduate teaching assistants – all have college degrees, one is an MD, and significant linguistic experience. Additionally, the cultural/regional studies segments are either taught by a former DIA analyst, UM faculty members for relevant course segments, or local area subject matter experts (SME).

Courses. In November 2011, DCLCP started another 24-week elementary/intermediate "in residence" Pashto course for six US marines. No other Pashto language program in the country can match these results. DCLCP has enhanced this course of study by adding a 10-day "iso-immersion" segment to be conducted at the end of the course at UM's Lubrecht Experimental Forest complex.

One of DCLCP's principal customers, the US Army Special Operations Forces (SOF) community, is undergoing a significant uptick in deployment tasking. As conventional forces begin to withdraw from Afghanistan, a greater deployment burden is put on the SOF. In fact, current SOF "taskings" exceed forces available by a significant margin. Thus, though their deployment requirements are increasing, they paradoxically have a diminished opportunity to complete pre-deployment training

Courseware. In addition to classroom instruction, our faculty has been very actively engaged in producing courseware and course support materials that are available to any DoD organization in need of Pashto/Dari language and culture training. To date, we have completed two DVDs that represent various aspects of the Afghan culture and made them available DoD-wide (great reviews). We have also produced a Practical Pashto collection of general preparation language role playing exercises (text with accompanying audio CD) and are near completion of course segments centered on the language proficiency and cultural issues needed to deliver healthcare to Afghan families and medical treatment for members of the Afghan National Security Forces.

New Initiatives

- A nation-wide Project GO ROTC initiative is also funded under our current DoD funding line. This program provides 8-weeks concentrated language programs to ROTC students from all ROTC host schools throughout the nation. We are actively seeking the opportunity to use our current staff and provide Dari and/or Pashto training to students who elect to come here for 8-week language courses this July and August. We would provide this training with our current grant funding though additional monies will be available for this program in succeeding years
 - In addition, we are also discussing various opportunities with the USMC and SOF for meeting some of their other critical language needs, with Urdu, Farsi, French (Francophone African dialects), Chinese, and Vietnamese being the languages currently under discussion.
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2013 Federal Items of Interest – Montana Tech

- 1. Title:** Low Acoustic and Thermal Signature Battlefield Power Source
Summary: This request is for the 4th and final year of funding to support the ONR fuel cells program. Membrane development and optimization for use in light weight fuel cells will be performed at both Montana Tech and the University of Montana.
- 2. Title:** Army Program for Strategic Rare Earth Elements Research, Education and Technology Development
Summary: The objective of this program is to expand research, education and technology development in the United States in Extraction and Beneficiation of Strategic Metals. The proposed University Consortium will address the DOD need for rare earth elements and strategic metals
- 3. Title:** Developing Improved Alloying and Fabrication Methods for Titanium
Summary: The Center for Advanced Mineral and Metallurgical Processes (CAMP), in collaboration with the Metallurgical and Materials Engineering Department at Montana Tech, the Chemistry Department at the University of Montana and SeaCast are developing new methods and materials for titanium casting and fabrication. These include conventional casting, milling and machining methods, new free form fabrication techniques using titanium powders and the development of new structures using metal/ceramic/polymer composites.

MONTANA UNIVERSITY SYSTEM

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Research and Technology Transfer Report, 2011
THE UNIVERSITY OF MONTANA-MISSOULA

Data Elements for MUS Policy	FY 2007	FY 2008	FY2009	FY2010	FY2011
R&D Expenditures (same data reported to NSF)	\$62,020,361	\$62,405,729	\$67,117,785	\$66,961,101	\$63,857,146
Number of new invention disclosures filed	5	8	6	7	10
Number of new start-up companies which have licensed or commercialized university-developed intellectual property	0	3	3	1	0
Number of new intellectual property licenses issued	0	5	4	1	5
Total intellectual property licenses in effect at the close of the fiscal year	17	22	23	23	28
Total gross revenues from intellectual property licenses	\$0	\$0	\$0	\$47,905	\$56,082

Data Elements for Strategic Plan	FY 2007	FY 2008	FY2009	FY2010	FY2011
Patents Issued (annual)	3	2	0	3	3
Active Licenses (Total)	17	22	23	23	28
Active Licenses (MT Companies)	7	12	13	12	13
Percent Licenses w/ MT Companies	41%	55%	57%	52%	46%
License/Patent Revenues	\$0	\$0	\$0	\$14,348	\$34,155
Reimbursed Patent Costs from Licenses	\$0	\$0	\$0	\$33,557	\$21,927

MONTANA TECH OF THE UNIVERSITY OF MONTANA

Data Elements for MUS Policy	FY2007	FY2008	FY2009	FY2010	FY2011
R&D Expenditures (same data reported to NSF)	\$7,141,492	\$7,882,940	\$8,408,515	\$9,656,552	\$9,296,423
Number of new invention disclosures filed	1	6	6	8	2
Number of new start-up companies which have licensed or commercialized university-developed intellectual property	0	0	0	0	0
Number of new intellectual property licenses issued	0	0	0	2	0
Total intellectual property licenses in effect at the close of the fiscal year	1	1	1	3	3
Total gross revenues from intellectual property licenses	\$0	\$0	\$0	\$2,720	\$7,110

Data Elements for Strategic Plan	FY2007	FY2008	FY2009	FY20010	FY2011
Patents Issued (annual)	0	1	1	0	0
Active Licenses (Total)	1	1	1	3	3
Active Licenses (MT Companies)	1	1	1	1	1
Percent Licenses w/ MT Companies	100%	100%	100%	33%	33%
License/Patent Revenues	\$0	\$0	\$0	\$1,500	\$0
Reimbursed Patent Costs from Licenses	\$0	\$0	\$0	\$1,220	\$7,110