

MONTANA UNIVERSITY SYSTEM
Research & Technology Transfer Report
Board of Regents Meeting, January 2014

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.

FY 2014 Federal Initiatives Report

CONTINUING AREAS OF INTEREST

- McIntire Stennis Cooperative Forest Research Program
- Wildland Fire Science Partnership
- USGS Cooperative Research Unit (CRU)
- Forest Products/Wood Utilization
- Defense Critical Languages and Cultures Program
- NIH IDeA
- Montana EPSCoR
- Montana Safe Schools Center
- Living Well with a Disability
- Pell Grants
- Re-authorization of the Rehabilitation Act of 1973 / Workforce Investment Act
- DOD/ARL Materials Technology
- DOE EPSCoR

McIntire Stennis Cooperative Forest Research Program

The McIntire Stennis program provides support to state- certified Schools of Forestry across the U.S. The program is funded under the USDA's National Institute for Food and Agriculture (NIFA). Funds are formula-based and must be matched on a one-to-one basis. Funds can be used for research and training across a broad variety of efforts including ecological restoration; catastrophe management; valuing ecological services; energy conservation, biomass and biobased materials; carbon sequestration and climate change; fostering healthy forests; and maintaining competitiveness in the forestry resource sector. The FY 2014 House number is \$32.934 million and the Senate number is \$33.961M.

Wildland Fire Science Partnership

The Wildland Fire Science Partnership is a joint program of the US Forest Service, the University of Montana and the University of Idaho. It is funded under the Forest Service/Joint Fire Science account in the Interior Appropriations Bill and operated out of the Rocky Mountain Research Station in Fort Collins, CO. Current funding for the Partnership is \$2.6 million which is divided as follows: \$1.3 million to the Forest Service and \$650,000 each to UM and UI. The program is designed to integrate multiple fire programs to give wildland fire managers new approaches, techniques, information and advanced tools to help them address rising fire suppression costs, deteriorating ecosystems, increasing fire hazards and other disturbances that affect water and environmental quality.

USGS Cooperative Research Unit (CRU)

UM houses the Montana Cooperative Wildlife Research Unit. Research emphases within the Unit include ecology and management of carnivores, applied landscape ecology, management of large game, interactions between forest management and wildlife, environmental influences on the demography and diversity of birds and related issues. CRUs generally have several positions assigned to a campus. For FY 2013, the budget request was \$18.921 million, a slight increase over the FY 2012 appropriated level of \$18.7 million but a slight reduction from the \$19.1 million appropriated in FY 2012.

Forest Products/Wood Utilization

For many years, UM participated in a Wood Utilization Research (WUR) consortium that consisted of 14 institutions. Funding was earmarked under USDA/NIFA and used for research on sustainable bioproducts from wood and woody residues, advanced engineered wood and biopolymer composites, biofuels, biopharmaceuticals and the manufacture, marketing and economic analysis of these bioproducts. While there are no longer earmarks, some language which seems to have similar objectives has been included in the Agriculture Appropriations Bill under the title, "forest products".

Defense Critical Languages and Cultures Program

UM has received funding from the Department of Defense, Operations and Maintenance, Defense-wide, for language instruction and cultural background training related to Arabic and Chinese. A special focus has been Afghanistan, although the program is expanding into other areas and needs to turn its focus more in these new directions. Funding has been obtained through direct contact with DOD/National Security Education Program and response to BAAs. The University is also interested in looking at larger contract opportunities.

NIH IDeA

The IDeA program is NIH's version of EPSCoR. There are two components to IDeA. One is the INBRE program which seeks to develop a network of researchers in the medical and biomedical fields and the other is the COBRE program which supports the development of research clusters. UM has been successful in the COBRE program including a recently announce COBRE 3 award this year. For FY14 the Senate number is \$275.957 million.

Montana EPSCoR

Montana NSF EPSCoR is a statewide science infrastructure program funded by the National Science Foundation. EPSCoR, which stands for Experimental Program to Stimulate Competitive Research, builds capacity across the state in science and technology through investments in people, tools, and ideas. Montana currently has an NSF Track-1 EPSCoR of approximately \$4M per year to develop research infrastructure and an NSF Track-2 award which includes several NSF EPSCoR jurisdictions of approximately \$ to ? with Alaska and has submitted several NSF Track-1 awards, which are single faculty awards.

Montana Safe Schools Center

The MSSC program provides schools not only in Montana but across the US with training, research and professional development services covering a variety of topics from suicide prevention to emergency response and crisis management. UM houses MSSC, but all funding comes from grants and consultation fees, which are negotiable based on the needs and resources of the school. In particular, the Center is interested in working with the Department of Defense and the services to address domestic violence and child abuse among the force. Safe Schools for FY 14 the House number is \$75 million and the Senate number is \$150 million.

Living Well with a Disability

UM's Rural Institute on Disabilities teamed with the Research and Training Center on Independent Living at the University of Kansas to develop this program. Living Well with a Disability aims to reduce the severity and incidence of secondary conditions (e.g. depression and pressure sores) by promoting healthy, independent living. Federal funding currently comes from the National Institute on Disability and Rehabilitation Research (NIDRR) in the Department of Education.

Pell Grants

Students pursuing undergraduate degrees can apply for this need-based grant, which does not have to be repaid, by filling out FAFSA. Awards are determined based on expected family contribution, cost of attendance per institution, the student's enrollment status and whether the student attends for a full academic year or less. The grant will now only cover 12 straight semesters, rather than the previous 18. For FY 2013-2014, the maximum award will be \$5635, an increase of \$85 since FY 2010-2011 level. However, funds will only cover fall and spring courses, leaving students who take summer courses to find other sources of funding, such as Stafford loans. A recent change to that structure means the loans begin accumulating interest at the end of study, whether the student has graduated or is no longer enrolled. About 37 percent of UM students receive Pell Grants.

Re-authorization of the Rehabilitation Act of 1973 / Workforce Investment Act

UM's RTC:Rural program currently receives funding from the NIDRR, a division of the Office of Special Education and Rehabilitative Services within the Department of Education. The Rehabilitation Act of 1973 actually requires the NIDRR to fund a rural center. This requirement does not appear in at least one draft of the Workforce Investment Act of 2012 though, leaving the potential for a rural center to appear at odds with the NIDRR's long-range plan. Changing the language to include a requirement will help ensure the RTC:Rural program receives NIDRR funding.

DOD/ARL Materials Technology. Continue the 2014 plus-up emphasizing strategic materials technology for enhanced protection of warfighters and their infrastructure. Investments would focus on high-performance, affordable, next-generation protection materials, biomaterials, materials processing, process modeling, and simulation to achieve desired structures and properties. This initiative would advance and benefit the new MUS Materials Science PhD focus areas of materials processing and biomaterials.

DOE EPSCoR: DOE EPSCoR Implementation Grants would provide an excellent source of research funding for the new MUS materials science Ph.D. program. However, it is important for this program and its funding to continue. It seems to be a victim of sequestration and a 2014 proposal call appears to be in doubt. An MUS materials research center funded or partially funded by DOE EPSCoR would strengthen opportunities in all four of the Ph.D. focus areas: energy materials, materials processing, biomaterials, and electronic/photonic/magnetic materials.

SPECIAL AREAS OF INTEREST

- Systems Ecology Research
 - Wildlife Biology
 - Renewable Energy
 - Neuroscience – the Brain Initiative
 - Cybersecurity and Big Data
 - Rural Health
 - Montana Natural Resources Research Center
 - Advanced Manufacturing
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Systems Ecology Research

Forest fires are intensifying -- with longer fire seasons, hotter fires and larger fires. This situation is likely to be exacerbated by anticipated climate changes, mainly dryer and hotter seasons. The University of Montana has a long-standing expertise in fire science and landscape restoration. UM is the only university in the nation directly involved in fire operations, thus giving it a special expertise and understanding of firefighting. The University also has expertise in assessments and monitoring, especially the use of technologies such as airborne laser scanners, 3D models for simulating fire movement through shrublands and new means of conducting forest and fuel inventories. UM will continue to use Landsat/geospatial satellite data for analyzing fires and landscape impact. UM will be seeking funds to continue its work in these areas.

Wildlife Biology

The University of Montana is a leader in both educating students in wildlife biology and in conducting research in selected areas. Montana's tourism and timber and agricultural industries are dependent on understanding of the wildlife-habitat relationships. UM can be -- and needs to be -- a leader in the emerging fields of conservation genetics, landscape pattern and connectivity and quantitative wildlife ecology. It can build on its expertise in threatened and endangered species, the maintenance of biological diversity and problems associated with small population sizes. UM will be seeking research funding for these areas. We may also consider a workshop or conference designed to identify the top 10 challenges in wildlife biology research, moving beyond individual species to more integrative approaches.

Renewable Energy

The University of Montana will develop, test, and analyze the installation of biomass cogeneration facilities for research and education on the potential for renewable bioenergy for medium-sized facilities such as universities, hospitals, schools, concentrated housing units and commercial districts. Montana's forests confront extreme challenges with increased wildfire frequency each summer, and both forest researchers and managers recognize a need to expand markets for woody biomass residue to better manage forests. Traditional forest products and biomass can be coupled in modern harvesting operations to reduce fuel while advancing forest health. Further, the use of woody biomass for energy offsets carbon emissions from fossil fuel energy utilization, as wood represents carbon that already circulates continuously in the biosphere. The use of locally available wood products for heat and power represents a commitment to a sustainable, independent energy source and offers job opportunities in a variety of occupational categories.

Neuroscience – the Brain Initiative

The University of Montana has embarked on the formation of the Brain Institute in response to the national Brain Initiative. UM has a number of faculty, departments and schools/colleges that would be major contributors to the Brain Institute include the recently proposed Center for Neural Injury and Rehabilitation, the School of Physical Therapy and the Skaggs School of Pharmacy, within the College of Health Professions and Biomedical Sciences and the social sciences and psychology within the College of Arts and Sciences. The proposed institute will provide a collaborative platform for university researchers to seek additional federal funding in neuroscience and help support educational initiatives in this and related fields.

Cybersecurity and Big Data

The University of Montana is expanding our current efforts in a two-year cybersecurity degree and the newly created Cyber Innovation Laboratory, developed in collaboration with state technology companies, to create new certificate and degree offerings involving cybersecurity, big data and assurance. Working in collaboration with the IBM's Academic Initiative, the University already boasts a national, first-of-its-kind undergraduate course in stream computing, allowing

students to learn real-time analytical skills in mathematics, computer science and business process optimization. This initiative will expand our commitment to education in this field critical to local businesses and promote research in an area of increasing federal support.

Rural Health

The University of Montana is known regionally and nationally for its commitment to improving the health of Montanans through education, research and services. We propose to establish a national center on health and wellness for people with disabilities and functional limitations who reside in rural communities. We will focus on knowledge translation, translational research, technical assistance, and policy development to benefit the unique needs of rural Americans. Programs, services and resources currently available focus on specific aspects of health (e.g., mental health, physical health), or are homogenized (e.g., health promotion initiatives of the CDC or USDA) and don't account for the unique lifestyles characteristic of rural/ frontier communities (e.g., distance to services; access to reliable high speed information technology; access to specialized health care and rehabilitative services; and, reliable nutrition and diet counseling). This initiative would develop and pilot quality distance-learning, mentored, geographically accessible training approaches and opportunities to prepare licensed nurses, medical technologists, radiation technologists, physician's assistants, health-care informaticists, etc. in and for rural communities.

Montana Natural Resources Research Center. This center would focus on research to enable development of energy, mineral, and water resources while protect the environment. Topics would include clean coal, carbon sequestration, smart grid technologies, renewables, energy storage, state-wide mineral assessment, rare earth and lightweight metal resources, and Montana's surface and groundwater resources. Investigations and training would take advantage of Montana Tech's on-campus Underground Research, Education, & Training laboratory. The new center would also include studies and analyses of policy, regulation, and economics. High performance computing with 3-D visualization would complement, enhance, and integrate the field, laboratory, underground, and policy studies. MBMG would be significantly involved.

Advanced Manufacturing: Montana-wide, centered in Butte, this effort seeks to position Montana to compete successfully for one of the \$40 million advanced manufacturing R&D centers. It builds on a 2013 EDA planning grant to the Butte Local Development Corporation, with Montana Tech, Butte Silver Bow, and MERDI as major partners. The planning effort is reaching out statewide and offering technical assistance to prospective and start-up manufacturing firms. It would emphasize additive manufacturing, composites, thermoplastics, ceramics, brazing/joining dissimilar materials, along with business development/entrepreneurship assistance, job creation, and environmental sustainability.

Research and Technology Transfer Report, 2013
THE UNIVERSITY OF MONTANA-MISSOULA

Data Elements for MUS Policy	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R&D Expenditures (same data reported to NSF)	\$67,117,785	\$66,961,101	\$63,857,146	\$61,543,835	\$59,306,533
Number of new invention disclosures filed	6	7	10	12	12
Number of new start-up companies which have licensed or commercialized university-developed intellectual property	3	1	0	1	2
Number of new intellectual property licenses issued	4	1	5	4	2
Total intellectual property licenses in effect at the close of the fiscal year	23	23	28	30	28
Total gross revenues from intellectual property licenses	\$0	\$47,905	\$56,082	\$68,581	\$52,092

Data Elements for Strategic Plan	FY2009	FY 2010	FY 2011	FY 2012	FY 2013
Patents Issued (annual)	0	3	3	2	1
Active Licenses (Total)	23	23	28	30	28
Active Licenses (MT Companies)	13	12	13	9	8
Percent Licenses w/ MT Companies	57%	52%	46%	37%	29%
License/Patent Revenues	\$0	\$14,348	\$34,155	\$40,805	\$39,852
Reimbursed Patent Costs from Licenses	\$0	\$33,557	\$21,927	\$27,776	\$12,240

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Data Elements for MUS Policy	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
R&D Expenditures (same data reported to NSF)	\$8,408,515	\$9,656,552	\$9,296,423	\$11,765,000	\$11,000,000
Number of new invention disclosures filed	6	8	2	1	0
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	2	0	0	1
Total intellectual property licenses in effect at the close of the fiscal year	1	3	3	3	3
Total gross revenues from intellectual property licenses	\$0	\$2,720	\$7,110	\$0	\$0

Data Elements for Strategic Plan	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Patents Issued (annual)	1	0	0	0	3
Active Licenses (Total)	1	3	3	3	2
Active Licenses (MT Companies)	1	1	1	1	1
Percent Licenses w/ MT Companies	100%	33%	33%	33%	50%
License/Patent Revenues	\$0	\$1,500	\$0	\$0	\$0
Reimbursed Patent Costs from Licenses	\$0	\$1,220	\$7,100	\$0	\$0