

Federal Priorities in FY14 Montana State University

CONTINUING AREAS OF INTEREST

1. Energy Efficiency and Renewable Energy (EERE)

The Department of Energy's Energy Efficiency and Renewable Energy (EERE)'s is of special interest to Montana. MSU has active research programs in biofuels (both algal and crop based), solar, hydrogen energy, fuel cells, energy efficiency and wind energy. Annual total research expenditures in these areas (including private sector match) total \$4.9 million and involve 22 faculty, 30 professionals, 30 graduate students and 33 undergraduates. MSU plans to expand its work in wind energy, biofuels and fuel cell research.

2. Fossil Energy (FE)

MSU's major activities in fossil energy have involved Carbon Capture and Storage (CCS, also called Carbon Sequestration). Carbon capture and storage efforts are critical to our state and nation. With approximately 25% of the nation's coal supply (6% of the world's) Montana has a huge resource that can contribute to the nation's energy security and the state's economy. CCS provides a means to tap this resource in a more environmentally friendly fashion which can help ensure it remains viable for use. MSU annual total research expenditures in this area (including private sector match) total \$11.8 million and involve 24 faculty, 32 professionals, 31 graduate students and 17 undergraduates. In addition, MSU leads the Big Sky Carbon Sequestration Regional Partnership (BSCSP), one of 7 DOE funded regional partnerships focused on mitigating greenhouse gases (particularly carbon dioxide, CO₂, a natural product of burning fossil fuels for energy) via storage in underground geological traps. It also has investigated "terrestrial" storage of CO₂ in soil and plants by change of land use. And, it operates the Zero Emission Research and Technology Center (ZERT). This center also deals with carbon sequestration, but has a *basic science and engineering* focus.

3. Hatch Act, and the Agriculture and Food Research Initiative (AFRI)

The Hatch Act provides capacity funding for State Agricultural Experiment Stations. Hatch Act funding is distributed by USDA's National Institute of Food and Agriculture (NIFA) to eligible institutions under a statutory formula. The maintenance or an increase in Hatch Act funding would have significant impacts on Montana and agricultural research across the nation. In Montana, an increase would be used, among other things, to improve new bio-cropping systems, such as with oil seeds and pulse crops; improve stewardship for soil quality, plant community establishment and multiple future land uses; and pursue improved insect, weed and disease management practices.

4. Institutional Development Award (IDeA) Program NIH NCRR in FY 2012; transferred to NIGM in FY 2013

IDeA is designed to broaden the geographic distribution of NIH funding for biomedical research. As authorized by Congress, the program is intended to enhance the competitiveness for research funding of institutions located in states with historically low levels of funding and low aggregate success rates for grant applications to the NIH. Currently, the two core components of IDeA are: 1) Centers of Biomedical Research Excellence (COBRE) program and 2) IDeA Networks of Biomedical Research Excellence (INBRE) program. The FY 2012 appropriation for IDeA is \$276,480,000. Montana has five COBRE awards and one INBRE award, resulting in approximately \$14,000,000 total costs per year.

5. MilTech

Miltech is a Department of Defense (DOD) "partnership intermediary" that helps small US companies to overcome technical hurdles and manufacturing problems in production of new technology for DoD. Its mission is to get innovative technology into the hands of the US military more quickly, reliably, and cost-effectively. MilTech was established at MSU in 2004 and represents a partnership between two nationally recognized university centers, TechLink and the Montana Manufacturing Extension Center (MMEC). MilTech provides hands-on assistance to help small companies. MilTech has been highly effective. Its assistance has resulted in the successful transition of more than 95 new technologies from US small business to DoD operational use

6. Montana NSF 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 a \$4 million per year award from the NSF to develop research infrastructure, as well as several smaller grants.

7. NASA EPSCoR

The NASA Experimental Program to Stimulate Competitive Research (EPSCoR) is designed to develop a national research capacity in support of NASA by developing research infrastructure and expertise in states that have traditionally had a limited research base in NASA and NASA-related areas, including space, aerospace and earth sciences associated with NASA. The program consists of (a) a small award (\$125,000 per year) to each participating jurisdiction to facilitate interactions with NASA centers and programs to develop research proposals and (b) competitively awarded three-year, \$750,000 grants to pursue a specific research topic. The FY 2012 appropriation is \$18.4 million. Montana EPSCoR has competed successfully for a number of research awards, including the grant instrumental in forming the Montana Gravitational Wave Astronomy Group (MTGWAG), the grant key to forming the Native American Research Laboratory (NARL) at UM, and several others in the fields of Lidar, Solid Oxide Fuel Cells, Climate Change, Radiation Tolerant Computing, and Content-Based Image Recognition.

8. NASA Space Grant

The NASA Space Grant program, operating through an awardee in each state and connecting more than 850 affiliates around the country, promotes NASA science, research, education and outreach through scholarships and fellowships, public programs, teacher support, research, curriculum enhancement, faculty development and related activities designed to ensure a workforce pipeline for NASA and NASA-related industries, as well as STEM education and professions in general. The FY 2012 appropriation is \$40 million. Major programs in Montana include the student satellite program, BOREALIS student scientific high altitude ballooning programs, research funds available to every STEM undergraduate student in Montana, Tribal College tethered ballooning and aurora detector programs, internships in Montana and at NASA Centers, STEM education grants to Montana faculty for new courses or other enhancements, the Space Public Outreach Team (SPOT) where specially trained undergraduates travel around the state teaching K-12 students about current NASA missions, and more.

9. TechLink

TechLink was established as a federally funded technology transfer center at Montana State University in 1996. Since 1999, it has served as the US Department of Defense's primary external "partnership intermediary," helping DoD to develop productive technology partnerships with US small business. TechLink helps companies to: (1) license DoD-developed inventions, enabling them to develop new products using these innovations; and (2) secure competitive R&D contracts for new technology development, primarily through the DoD Small Business Innovation Research Program. Approximately a third of its 800 technology partnerships involve companies in the state.

10. University Transportation Center (UTC)

The Research and Innovative Technology Administration (RITA) currently operates a network of university transportation centers (UTCs). The Western Transportation Institute (WTI) is the **nation's largest transportation institute focusing on rural transportation** and was designated as a UTC in 1998. We need to restore this designation to WTI.

11. USDA Agricultural Research Service Animal Bioscience Building and Program

Agriculture is the largest basic industry in the Montana economy and the livestock industry is its largest segment. Montana is a global leader in the production of high quality seed stock, genetics, and resource stewardship, leading to quality exports around the world. Innovations in Montana seed stock are quickly incorporated in herds across the United States. To advance our standing and world leadership in quality beef production we will need to move the science to emphasize functional genomics. A \$24 million research building funded, built, and staffed by USDA-ARS on the Montana State University campus would be dedicated to work on functional genomics in partnership and in cooperation with the MSU College of Agriculture, USDA-ARS in Miles City, MT, and USDA-ARS in Clay Center, NE.

AREAS OF SPECIFIC INTEREST

1. Unmanned Aerial Systems (UAS) -- Augmentation for DOD

The US Department of Defense (DOD) operates a number of unmanned aerial systems (UAS) platforms, dedicated to specific missions and needs. All branches of the DOD Armed Forces are fully vested in UAS activities. Montana interests have been pursuing the establishment of a major program in Unmanned Aerial Systems (UAS). Montana State University and Mississippi State University collectively, and through partnerships, have very unique research capabilities that are valuable to the DOD. We propose to pursue further collaborative efforts through DOD.

2. Unmanned Aerial Systems (UAS) -- FAA Center of Excellence Program

The FAA operates a number of Centers of Excellence (COE), dedicated to specific topics and operated by universities with numerous academic and industrial partners. The lead for a CoE must be a research university and CoEs tend to have a number of academic partners. In fact, FAA encourages universities in different states to work together. MSU has been working with Mississippi State University on the creation of a dedicated and comprehensive UAS Center of Excellence. The FAA had included UAS as a subject under a General Aviation CoE in early early 2012, but pursuant to language in the Senate report on the FY 2012 Transportation-HUD Appropriations Bill and letters from the Montana and Mississippi Senators, the FAA decided to separate UAS from the General Aviation solicitation and to pursue UAS as a separate university Center of Excellence. MSU and Mississippi State intend to propose the UAS program, mostly likely with one or more other university partners, and want to see the solicitation move forward expeditiously.

3. Student Retention, Time-to-Graduation and Engagement

MSU is committed to assisting students in completing their education and in doing so in a timely manner. First generation students, students from some rural high schools and students wishing to pursue certain degrees often encounter difficulty in some courses. Interventions can help them overcome these difficulties and complete their education, enhancing their own individual opportunities and contributing to a trained workforce for the state. Graduation within a six year period is an often cited goal in current higher education. A shortened time-to-graduation has a relationship to degree completion and also helps reduce the cost of higher education. Finally, student engagement in the community and state is a natural part of the land grant mission of outreach and an important component of community life. MSU believes these issues will be prominent during the next several years and plans to be an active participant in such activities for the benefit of our students, the state and the nation.

4. Student Aid

Pell grants, the TRIO programs, student tax credits and deductions are all essential elements of support for students across Montana and the nation. In recent years, students have been forced to borrow more and student debt has increases, at least in part due to the general economy and student bodies drawn from an increasingly diverse demographic base. In addition, the DREAM Act offers new opportunity for many students seeking a college education. We support a full range of strong programs designed to ensure that our nation's students can pursue the education necessary for an increasingly competitive, technological and global world.

**Research and
Technology Transfer
Report, 2012**

MONTANA STATE UNIVERSITY-BOZEMAN

Data Elements for MUS Policy	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
R&D Expenditures	\$103,048,865	\$102,116,323	\$96,150,553	\$98,431,691	\$109,481,694	\$102,767,291	\$112,304,270
Number of new invention disclosures filed	32	30	22	26	22	17	18
Number of new start-up companies which have licensed or commercialized university-developed intellectual property	5	1	2	3	1	0	0
Number of new intellectual property licenses issued	29	35	43	48	50	43	52
Total intellectual property licenses in effect at the close of the fiscal year	109	130	153	184	191	200	205
Total gross revenues from intellectual property licenses	\$219,931	\$257,621	\$664,244	\$557,832	\$466,181	\$322,051	\$853,384

Data Elements for Strategic Plan	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Patents Issued	3 patents, 1 TM	13 patents	13 patents, 3 TM	20 patents, 1 TM	9 patents, 2 PVP	11 patents	6 patents
US Patents Filed	52	46	31	27	29	27	28
Active Licenses (Total)	109	130	153	184	191	200	205
Active Licenses (MT Companies)	68	81	89	105	109	98	87
Percent Licenses w/ MT Companies	62%	62%	59%	57%	57%	49%	42%
License/Patent Revenues	\$49,949	\$69,165	\$221,614	\$290,690	\$256,690	\$181,473	\$622,781
Reimbursed Patent Costs from Licenses	\$169,982	\$138,562	\$442,630	\$267,142	\$209,491	\$140,579	\$230,603