

TODAY'S LAND-GRANT UNIVERSITY

Empowering People, Transforming the World

MONTANA STATE UNIVERSITY

ECONOMIC IMPACT REPORT



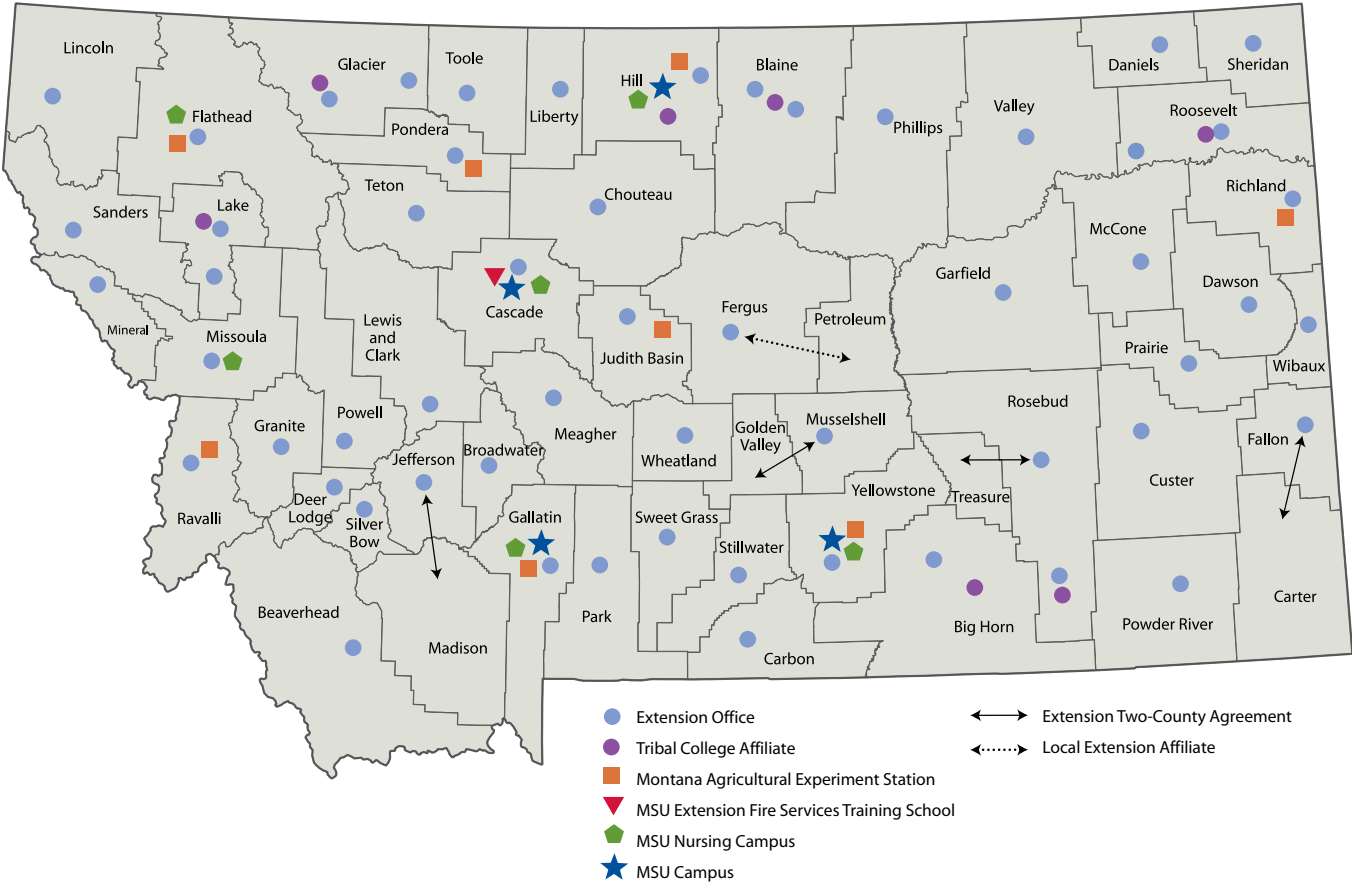
BOZEMAN | BILLINGS | NORTHERN | GREAT FALLS

MSU Extension

Montana Agricultural Experiment Station

December 2010

Montana State University Presence Across the State



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ECONOMIC IMPACT REPORT

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Economic Impact of Montana State University

Montana State University (MSU) is an integral and significant portion of Montana's economy. With a presence in every county across the state, ongoing research that drives new innovations, and a commitment to provide education that empowers all Montanans, MSU advances the economic health of Montana.

As Montana's land-grant institution, MSU is dedicated to serving the people of the state. This service is provided in many forms including: education on our four campuses in Bozeman, Billings, Havre and Great Falls; research on the campuses and at the Montana Agricultural Experiment Station (MAES) at MSU-Bozeman and its seven regional centers; and dissemination of knowledge through our county Extension offices and MAES centers across the state. Not only does MSU serve the state through education, research and outreach, but it also makes significant contributions to Montana's economy.

To quantify the impact of MSU on the state's economy, an economic impact study was conducted by the University of Montana's Bureau of Business and Economic Research. The premise of the study was to compare the actual economy with a hypothetical economy in which the university is removed. The result of this analysis, which is presented in this document, measured the University's contributions related to five key areas for which data were available. Those five areas include university operations, research expenditures, increased earnings of graduates and visitor and nonresident student off-campus spending.

Note: With a presence in all of Montana's counties, MSU Extension is unique, and cannot be effectively measured by the same five metrics as the campuses and MAES. Thus, the economic impact of MSU Extension is not included; however information describing the breadth and scope is provided in this report.

Based on the analysis of MSU and the state economy, the economic impact study reported MSU's economic impact (excluding MSU Extension) is:

- **Jobs:** 13,511 Montana jobs.
- **Income:** More than \$1 billion in personal income which equates to \$897.7 million in after-tax income.
- **Tax Revenue:** \$253 million in state tax revenue, which means the state receives \$2.60 in tax revenues for every \$1 of tax support.
- **Compensation:** MSU's presence increases annual wages across the state by \$1,087.
- **Investment Spending:** An increase of \$349.3 million in investment spending in the Montana economy occurs every year due to the operation of MSU.

MSU-Bozeman

- **Jobs:** More than 9,000 jobs are available due to the presence of the Bozeman campus.
- **Income:** Almost three-quarter billion dollars in earnings are attributable to MSU-Bozeman.
- **Tax Revenue:** The return on investment in the Bozeman campus is threefold. The 2009 appropriation of \$50.5 million was increased to \$168.6 million in state tax revenues.
- **Compensation:** Annual wages are \$690 higher across the state because of the presence of MSU-Bozeman.
- **Investment Spending:** An increase of \$234.6 million in investment spending in the Montana economy occurs every year due to the operation of the Bozeman campus.

MSU-Billings

- **Jobs:** The Billings campus creates nearly 1,700 jobs for state residents.
- **Income:** More than \$175 million in personal income results from MSU-Billings.
- **Tax Revenue:** In 2009, MSU-Billings was responsible for \$36.5 million in state tax revenues from the \$20 million investment. This means the state received \$1.80 in tax revenues for every \$1.00 of tax support.
- **Compensation:** Annual wages are \$235 higher across the state because of the presence of MSU-Billings.
- **Investment Spending:** An increase of \$36.5 million in investment spending in the Montana economy occurs every year due to the operation of the Billings campus.

MSU-Northern

- **Jobs:** The Havre campus contributes 800 jobs in a region of Montana where job availability is crucial.
- **Income:** These jobs mean an additional \$82 million in personal income.
- **Tax Revenue:** MSU-Northern produces a two to one return on investment of state dollars. The \$9 million investment resulted in \$18 million in state tax revenues in 2009.
- **Compensation:** Annual wages are \$94 higher across the state because of the presence of MSU-Northern.
- **Investment Spending:** An increase of \$14.7 million in investment spending in the Montana economy occurs every year due to the operation of the Northern campus.

MSU-Great Falls

- **Jobs:** More than 400 jobs are added to the state economy through the presence of the Great Falls campus.
- **Income:** The resulting personal income is nearly \$37 million.
- **Tax Revenue:** In 2009, Great Falls increased the initial investment of \$6 million to \$7.9 million in state tax revenues. This means the state received \$1.30 in tax revenues for every \$1.00 of tax support.
- **Compensation:** Annual wages are \$41 higher across the state because of the presence of MSU-Great Falls.
- **Investment Spending:** An increase of \$7.3 million in investment spending in the Montana economy occurs every year due to the operation of the Great Falls campus.

Montana Agricultural Experiment Station (MAES)

- **Jobs:** MAES contributes almost 1,600 jobs that support the agricultural industry in Montana.
- **Income:** Through MAES more than \$100 million in personal income is dispersed.
- **Tax Revenue:** The state's investment of \$12.7 million was increased to \$22 million in tax revenues in 2009. This means the state received \$1.70 in tax revenues for every \$1.00 of tax support.
- **Compensation:** Annual wages are \$27 higher across the state because of the presence of MAES.
- **Investment Spending:** An increase of \$56.2 million in investment spending in the Montana economy occurs every year due to the operation of MAES.

MSU Extension

Funding

- **State:** \$5.93 million (35 percent)
- **County:** \$5.68 million (33 percent)
- **Competitive or formula federal:** \$3.23 million (19 percent)
- **Federal:** \$2.20 million (13 percent)

Employment

- 188 FTE that includes 80 campus-based specialists and staff and 108 county-based faculty/staff located at 62 offices across the state serving all 56 counties and five reservations.

Community Improvement

- \$6.2 million generated for local programs and projects by county agents/staff in FY09

The Research Question

The purpose of this study was to address the following question: What would the economy of the state of Montana look like if Montana State University did not exist?

Using tools which track and measure the interaction of the key sectors of the Montana economy (see The REMI Model, page 5), the study examines a hypothetical world that removes the spending and output of MSU. The difference between the economy of today and the hypothetical economy with no university is the total economic impact of MSU. That impact can be thought of as the sum of three pieces:

Direct impact This is the impact that the operations of the University itself have on the economy. The items in this list are incredibly varied. MSU pays employees and vendors, attracts research dollars from governments and industry, and increases the earning power of its students when they graduate. It also hosts sporting events and sells merchandise. MSU attracts out-of-state scholars and students. It receives tax support from the state of Montana. All of these mechanisms directly impact the economy of the state.

Indirect impacts These are the economic activities that occur in the state of Montana because of the University, but are not part of the University itself. Companies that locate in Montana because of the presence of the University, visitors and tourists, technology companies with informal links to the University, and even highly educated workers who come to Montana because their spouses are employed at MSU are examples of these.

Induced impacts An economic stimulus such as the University produces changes in the economy that go beyond its direct and indirect impacts. When businesses and employees are economically enriched through the University's activities, they further stimulate the economy through the increases in their spending that result. This "second-round" impact is significant and can be estimated with the use of an economic model that captures the linkages between spending and production for the Montana economy.

Limitations of the Study

Many additional indirect impacts could be added to this study. For example, the presence of businesses, workers, investments and spending in Montana that are in some way related to the presence of Montana State University also contribute to the state's economy. These include start-up businesses, businesses that co-locate with the University for a variety of reasons (e.g., labor market recruitment), conferences and events, and the labor supply of educated spouses of University employees.

None of these indirect impacts are included in this report. Although substantial, the rigorous estimation of these was beyond the scope of the economic impact study. The total impact of the University involves tracing and tabulating the induced impacts caused by the direct impacts of MSU using an economic model.

In addition, it is important to note that the MSU Extension impacts are not included in this report.

The REMI Model

A critical link in this analysis involves translating Montana State University's direct and indirect impacts into overall state economic activity. This is accomplished by means of an economic model. The model is used to make two kinds of economic projections. The first is the baseline, or status quo, a projection of the Montana economy as it stands today. The second projection removes the direct and indirect contributions of MSU. These changes bring about further economic impacts—the induced impacts. The model is a critical tool in understanding how those first-round impacts alter investments and decisions that ultimately determine the size of the resulting economy. The difference between these economic projections is the total impact of the University.

The Bureau of Business and Economic Research used a top-tier economic impact model, provided by REMI, Inc. of Amherst, Mass., for this purpose. The REMI model has been in existence since the early 1980s and has been used to evaluate the economic contributions of the University of Michigan, the University of Connecticut and other higher education institutions. It has been evaluated or used in more than 700 studies and appears in more than a dozen peer-reviewed academic journal articles. The model is capable of examining impacts in fine detail and has a peerless reputation.

Economic Impact Study Research Note

Research Note from the Bureau of Business and Economic Research Regarding Comparisons of the Economic Contributions of The University of Montana-Missoula (UM) and Montana State University:

The economic impact studies for UM and the campuses of MSU were conducted at different points in time, using slightly different models and methodology. Each study was carried out so as to represent and estimate the institution's economic impact as thoroughly and accurately as possible. However, the passage of time and the evolution of the methodology make a direct comparison of the results between the two institutions inappropriate.

Both studies use the REMI model, and both construct an alternative future economy that removes the direct expenditure flows of the particular institution. However,

- i. the UM study uses a (one region) REMI model of the state of Montana, whereas the MSU studies have employed a REMI model which considers five sub-regions of the state separately, adding up the regions to produce a state impact;
- ii. some of the MSU studies incorporate the spending of business startups and other spin-offs of MSU research;
- iii. The UM study was constructed to produce an estimate of how its economic contribution changed over time, whereas the MSU studies were designed to deliver a profile of the institution's current (and ongoing) contribution.

For these reasons a numerical comparison of the results of the UM and MSU studies is misleading and inappropriate. The results clearly show that the operations of UM and the campuses and agencies of MSU are a complementary force for economic advancement in the state of Montana.

Key Terms for this Report

The Bureau of Business and Economic Research analyzed several distinct mechanisms with which Montana State University interacts to increase the state economy. To understand the analysis and its implications, it is important to define and delineate each of the factors that were examined and analyzed as part of the economic impact study.

Definitions

University Operations The payroll and purchases of the University for academic year 2008-09 were tabulated and categorized. This analysis included a thorough accounting of tax and tuition payments in support of that spending originating from the state of Montana.

University Research The University's spending and payroll for research activities, net of within state support, were assembled and summarized.

Graduate Earnings Census data are used to estimate the additional earnings of those with bachelor and graduate-level college degrees in Montana. Applying these estimates to MSU graduates residing in the state of Montana produces an estimate of the aggregate earnings impact of MSU.

Nonresident Visitors* An estimate of out-of-state visitor spending attributable to MSU is constructed by using student survey responses on visitation frequency for nonresident students, combined with spending profiles from The University of Montana's Institute for Tourism and Recreation Research.

Nonresident Student Off-Campus Spending* The spending profile of nonresident students is estimated and presented using survey responses of The University of Montana students. These are direct impacts of the University.

**Nonresident visitor and student spending were based on studies conducted at The University of Montana. The results were utilized to estimate visitor and nonresident expenditures for MSU.*

Statewide Analysis

Montana State University is comprised of four campuses in Bozeman, Billings, Havre and Great Falls, as well as all county Extension offices and Montana Agricultural Experiment Station statewide programs. Although much of the economic impact is concentrated where there is a physical campus, MSU's impact is also felt broadly across the state through the county Extension offices and Montana Agricultural Experiment Station research centers.

MSU's most valuable contribution to the state is an educated workforce that attracts, promotes, and retains higher paying jobs in Montana. With a combined fall 2010 enrollment of nearly 22,000, MSU's four campuses serve citizens throughout the state, preparing students to become productive in their communities.

In this report, it is recognized that state support for MSU and resident student expenses, including tuition and spending, does not represent additional revenue for the state economy. Therefore these resources are not reflected in this analysis. Only revenue that is truly a result of the University and its outputs are factored into the economic impact.

The Economic Impact study found that MSU has a significant impact on the state economy, even when money and resources from Montanans are excluded. The money added to the state's economy as a result of MSU comes from four primary sources:

- Higher incomes, productivity and spending of Montana residents who are MSU graduates are significant additions to the state's economy.
- MSU attracts significant support from outside the state through nonresident student spending that adds to the Montana economy.
- MSU has a record of successfully competing for research funds. These dollars represent new money for the state economy attributable to the presence of the University.
- University dollars spent on payroll, MSU education and research has a higher "made in Montana" fraction than most goods and services consumers might buy. Thus taking money away from general spending and directing it toward the University results in a net gain to the Montana economy.

Because the economic impact study is designed to compare the state's current economy and an economy without the University, the analysis of these measures is careful to include only resources that come from external sources. Support generated from in-state sources, such as state appropriations or in-state tuition, would likely still be retained in the state if the University did not exist.

The Economic Impact study found that Montana State University has a significant impact on the state economy, even when money and resources from Montanans are excluded.

The MSU campuses alone account for \$154.3 million in payroll and benefits.

University Operations

Montana State University is one of the largest employers in the state. The MSU campuses alone account for \$154.3 million in payroll and benefits, meaning that approximately 79 percent of the unrestricted funds go to employees who live and spend their wages in Montana. In addition to compensation and benefits, University faculty and staff wages and other expenditures related to instruction, academic support, student services, institutional support, public service and outreach, and operation and maintenance of facilities are accounted for in what are referred to as unrestricted funds.

Funds for University operations come from four primary sources including tuition and fees, state appropriations, private and public research support funds, and payments from individuals.

Unrestricted Spending—Campuses					
	Bozeman	Billings	Northern	Great Falls	Total
Salaries	\$75,368,821	\$19,458,671	\$7,016,171	\$6,186,163	\$108,029,826
Wages	\$1,409,992	\$353,522	\$162,318	\$145,764	\$2,071,596
Other Compensation	\$808,811	\$221,747	\$58,135	\$28,551	\$1,117,244
Benefits	\$26,892,253	\$6,478,054	\$2,389,460	\$2,050,006	\$37,809,773
Benefits and Claims	\$3,481,815	\$1,048,007	\$463,453	\$305,418	\$5,298,693
Supplies	\$3,887,088	\$1,655,430	\$564,153	\$507,273	\$6,613,944
Communications	\$967,836	\$529,810	\$133,223	\$202,465	\$1,833,334
Travel	\$1,189,302	\$784,973	\$356,588	\$116,149	\$2,447,012
Rent	\$564,765	\$1,136,413	\$50,307	\$6,795	\$1,758,280
Utilities	\$4,648,960	\$1,289,589	\$647,255	\$413,433	\$6,999,237
Maintenance	\$3,123,742	\$858,432	\$180,289	\$272,216	\$4,434,679
Transfer & Other	(\$3,380,633)	(\$299,838)	\$34,119	(\$9,215)	(\$3,655,567)
Contracted Services	\$4,390,601	\$1,979,949	\$724,962	\$252,299	\$7,347,811
Capital	\$1,408,484	\$681,582	\$82,360	\$7,400	\$2,179,826
Debt	\$96,383	—	—	—	\$96,383
Other Expenses	(\$1,486,300)	\$854,720	\$197,654	\$194,682	(\$239,244)
Scholarships	\$8,804,192	\$1,656,985	\$1,029,867	\$191,408	\$11,682,452
Total	\$132,176,109	\$38,688,045	\$14,090,315	\$10,870,805	\$195,825,274

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

MSU Extension Operations

The unique funding structure of the Extension Service includes state general fund, federal Smith-Lever Act and county sources. The state legislature appropriates both state general funds and federal Smith-Lever funds on a biennial basis. Extension agent salaries are paid from federal Smith-Lever and county funding sources. Extension specialists are paid from state general funds. Extension funds 100 percent of the benefit costs for all employees hired on current unrestricted funding from a blend of federal Smith-Lever and state general fund dollars. Operational allocations are made to specialists based on a pre-established formula. Other operating dollars are allocated to support staff development, program development, personnel recruitment and general operating purposes.

Montana Agricultural Experiment Station Operations

Unrestricted Spending— Montana Agricultural Experiment Station	
	MAES
Salaries	\$8,667,486
Wages	\$260,345
Other Compensation	\$188,386
Benefits	\$2,870,770
Benefits and Claims	\$385,262
Supplies	\$686,917
Communications	\$155,369
Travel	\$117,987
Rent	\$48,282
Utilities	\$273,295
Maintenance	\$289,051
Other	\$699,447
Contracted Services	\$279,696
Capital	\$160,406
Debt	—
Other Expenses	\$383,351
Scholarships	\$65
Total	\$15,466,113

The Montana Agricultural Experiment Station is supported by the Montana General Fund and federal Hatch Act capacity funds. Faculty, staff and students, and some operations allocations are made to the main station (Bozeman) and the seven research centers through expenditures of state and federal funds. Operations and maintenance of statewide research facilities are supported by unrestricted funds and private and public research support funds.

MAES is similar to the campuses in that the majority of its unrestricted funds are reinvested into the state through salaries and benefits, and operation of research facilities.



Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

Unrestricted Funding Sources

The sources of unrestricted funds are almost entirely tuition and fees levied on students and appropriations received from the Montana Legislature.

Tuition Revenues					
	Bozeman	Billings	Northern	Great Falls	MSU Total
Registration Fee	\$801,086	\$329,218	\$88,847	\$127,657	\$1,346,808
Resident Tuition	\$37,909,027	\$14,524,713	\$3,678,585	\$3,889,764	\$60,002,089
Nonresident Tuition	\$38,855,520	\$1,548,303	\$479,667	\$367,823	\$41,251,313
WUE Tuition	\$2,160,660	\$1,441,957	\$375,270	\$31,388	\$4,009,275
Admissions Fees	\$308,489	\$73,065	\$21,132	\$28,350	\$431,036
Program Tuition & Fees	\$1,461,253	\$0	\$48,125	\$0	\$1,509,378
TOTAL	\$81,496,035	\$17,917,256	\$4,691,626	\$4,444,982	\$108,549,899

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

If the University was removed from the economic equation, two changes would occur. First, the jobs and income supported by University operations would not exist. Second, the tax support and tuition paid by resident students would be returned to them, to be potentially spent on other goods and services.

The operation of the University boosts the state economy through unrestricted funds produced from two primary sources. The first is the fact that the University attracts students and funding from sources outside the state of Montana. These include both tuition and fees paid by nonresident students, as well as tuition support in the form of scholarships and grants that come from federal or other non-Montana sources. The University also attracts significant private sector support from both inside and outside Montana. Although there is an unequal distribution of nonresident students among all of the campuses, with the majority attending in Bozeman, all of the campuses experience some benefit from nonresident student revenue and all of the campuses are successful in attracting external funding. Thus the operations of the University bring new money into the state.

The second stimulus comes from the service-oriented nature of the University itself. MSU has a very high proportion of its output that is locally produced. Directing in-state spending to the University, instead of to most other goods, will provide more stimulus to the state economy even if the dollar amounts are the same. For example, another item a Montanan might spend money on, say, a new car, has a much lower fraction of its value that can be said to come from Montana.



University Research

Through its four campuses, Montana State University represents the largest research enterprise—public or private—in the state. The majority of the roughly \$100 million annually fueling MSU research comes from the federal government. Without the MSU campuses and Montana Agricultural Experiment Station, those funds would be dispersed elsewhere in the nation.

Research expenditures allow MSU to offer undergraduates access to research and creative experiences, attract world-class graduate students and faculty, and pave the way for new discoveries that help make Montana and the nation more economically competitive.

MSU research covers a broad range of topics, but the system’s strengths are in the areas of biomedical research, seeking new ways to fight human and livestock diseases; energy research, opening new territory in everything from biofuels to fuel cells; natural resources, discovering better ways to use waters, land and wildlife; and agriculture, advancing new crop varieties, and creating new technologies and stewardship practices.

Based on 2008-09 figures, the \$109.5 million in annual spending and the equivalent of approximately 730 high-paying jobs in MSU research would be lost to the state if the University did not exist, and so would the fruits of those research efforts—the patents and inventions, the spinoff of business into the state economy, and the well-trained engineers and scientists that will help keep Montana and the nation competitive into the 21st century.

Through its four campuses, Montana State University represents the largest research enterprise—public or private—in the state.

External Funding by Source					
	Bozeman	Billings	Northern	Great Falls	Total
Federal Grants and Contracts	\$83,666,939	\$5,547,205	\$2,289,684	\$330,799	\$91,834,627
Private Grants and Contracts	\$10,827,486	\$724,955	\$14,557	\$138,873	\$11,705,871
State Grants and Contracts	\$3,937,268	\$606,589	416,582	\$404,152	\$5364,591
Indirect Cost Recoveries	*	\$410,424	\$167,895	\$1,125	\$579,444
TOTAL	\$98,431,693	\$7,289,173	\$2,888,718	\$874,949	\$109,484,533
FTE for FY09	648	46.55	34.96	*	729.51
Compensation and Benefits	\$42,254,265	\$2,500,000	\$1,546,892	*	\$46,301,157

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

* Data not included in analysis

Products Based on Montana State University Licenses

Although not included in the economic impact study, significant economic activity is generated by discoveries made at Montana State University. Examples of these innovations follow.

Products Currently Produced and Sold

- Safflower International licenses and sells safflower varieties developed and protected by MSU. Currently seven licensed varieties are sold, including varieties for animal feed, cooking oil and birdseed.

Research expenditures allow Montana State University to offer undergraduates access to research and creative experiences, attract world-class graduate students and faculty, and pave the way for new discoveries that help make Montana and the nation more economically competitive.

- ConAgra licenses and sells an MSU-developed barley variety for use in the healthy foods market.
- Numerous MSU-developed Monoclonal Antibodies are licensed and sold by several companies for use in biochemistry, biomedicine and molecular biology research.
- WestBred, a unit of Monsanto, sells several licensed varieties of wheat, developed by MSU, to Montana and regional growers.
- SensoPath sells biosensors licensed from MSU for the rapid detection of bioterrorism pathogens.
- BioSurface Technologies sells licensed technology utilized for creating and measuring biofilms—slimy masses that can clog municipal and industrial pipelines and equipment and even contaminate implants such as prosthetic hips and heart valves.
- Innovative Biosensors’ technology uses MSU antibodies for rapid detection of ricin, a deadly poison.
- NWB Sensors sells an instrument licensed from MSU for calibrating infrared cameras designed to be mounted in unmanned aerial vehicles and used for remote analysis in agricultural work, wildlife research and military applications.
- GrayMatter Research, LLC licenses MSU technology for neurological monitoring of animals.
- Seed Source, Inc. sells a variety of alfalfa licensed from MSU.
- Seed Research of Oregon sells a variety of grass licensed from MSU.
- Agrika Foods sells a flour made from a variety of teff grass licensed from MSU.
- Westland Seed Co. sells a variety of alfalfa licensed from MSU.
- Innovative Food Project sells gluten-free flour from a variety of grass licensed from MSU.

Products Under Development

- Zdye has licensed and continues to develop specialty dyes for proteomics applications, a promising area for biomedical research.
- Aura has licensed and continues to develop nanotechnologies for use in diagnostics and therapeutics.
- LigoCyte has licensed several MSU biotechnologies for use in the vaccine market.
- Bridger Photonics has licensed and continues to develop laser-based technology for extremely precise and fine distance measurements that have applications for civil engineering, the military and a variety of other fields.
- Phillips Environmental Products (dba CleanWaste) has licensed and is in the final approval stages for a fungus that both sanitizes and deodorizes the contents of portable toilets, filling an important niche in disaster relief, recreational use, military and other massive field operations.
- Precision Laboratories, Inc. has licensed and continues to develop an organism that, when applied to seed in dry land or drought conditions, reduces water needs of the plant significantly.

- S2 Corp has licensed and continues to develop advanced radar systems.
- Montana Microbial (Montana BioAgriculture) has licensed and continues to develop a microorganism that confers a nonspecific immunologic boost—especially significant in sugar beet, tomato and pecan crops.
- InBios has licensed an MSU antibody to incorporate into a diagnostic test.
- Qiagen, Inc. licensed a method from MSU for distinguishing between live and dead bacteria in molecular assays.
- Serim Research Corporation licensed an MSU reagent for medical diagnostics and food safety tests.

Products in Research Mode

- Vaccines for autoimmune diseases such as multiple sclerosis
- Compounds to enhance innate immunity
- Antibiotic and antimicrobial compounds
- Improved mass spectrometry for use in the medical area
- Improved antenna that allows for better communications
- Biofuel technologies
- Improved wind power generation
- Carbon sequestration systems
- Technologies for use in hydrogen production
- Improved fuel cell technology
- Bioinspired nanomaterials for use in medical, energy production and computer applications
- Laser-based technologies for weather, computer storage, remote sensing of particles and other applications
- Tiny mirrors for uses in medical and military applications

Examples of Montana State University Intellectual Property-Dependent Spin-Off Companies

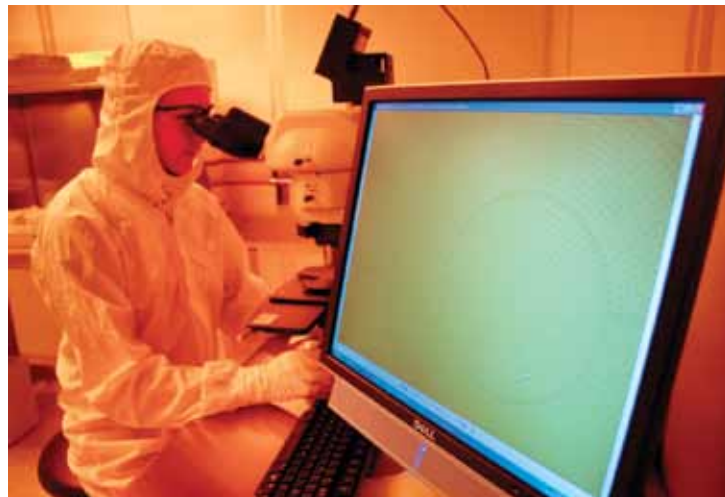
- Bridger Photonics develops laser-based technology for extremely precise and fine distance measurements.
- LigoCyte is a drug development company which has raised nearly \$30 million in venture capital and has vaccines in clinical trials.
- NWB Sensors makes instruments for calibrating infrared cameras.
- Resonon develops and manufactures spectral imaging scanning systems.
- Zdye develops dyes for medical and diagnostic uses.
- S2 Corp develops advanced radar technologies.
- ADVR develops and commercializes photonics technologies.



- Bacterin develops and markets antimicrobial medical coatings and growth factors for human grafts.
- BioSurface Technologies sells technology for creating and measuring biofilms.
- Project WET is a nonprofit organization teaching water issues to children, parents, teachers and community leaders.

Companies Influenced or Enhanced by Montana State University

- RightNow Technologies is a publicly-traded company located in Bozeman and the founder states that MSU was a significant factor in its location.
- Scientific Materials/FLIR, a crystal growth company, works closely with MSU optics.
- Zoot is a financial technology company that offers comprehensive, robust and flexible credit decisioning, loan origination, credit risk management and customer acquisition.
- Anasphere Inc. conducts cutting-edge research and develops and manufactures analytical and atmospheric technology.
- ILX Lightwave manufactures laser diode instruments and test systems for research purposes.
- Wavelength Electronics manufactures laser diode and thermal control for electro-optical equipment.
- Fluorescence Innovations designs, builds and markets instrumentation that measures the fluorescence lifetime properties for biotechnology research.



Affiliated Companies	
Company (Bozeman Affiliated)	Employment
RightNow Technologies	450
Zoot	100
LigoCyte	44
ILX Lightwave	40
Scientific Materials Corporation	30
CDI Aerospace/Sikorsky	30
Bacterin	28
Sustainable Systems	23
Wavelength	20
Clean Waste/Phillips Environmental	20
S2 Corporation	18
New Wave Research	15
Advanced Acoustic Concepts	15
Autopilot, Inc.	11
Project WET	10
Microlab	10
Hyperspectives	10
Arcomac	10
Resonon	9
Quantum Composers	8
GTC Technology	8
Altos Photonics	8
Reclamation Research Group	7
Sensopath Technologies	5
Montana Gluten Free Processors (IFP)	5

Affiliated Companies (continued)	
Company (Bozeman Affiliated)	Employment
Bridger Photonics	5
Montana Molecular	4
Fluorescent Innovations	4
CTW Energy	4
Zdye	3
Western Feedstock Technologies	3
Sustainable Bioproducts, LLC	3
Specialty Biopolymers	3
Rasiris	3
NWB Sensors	3
NanoMed Technologies, LLC	3
MPA Technologies	3
Montana Microbial Products	3
Integrated Engineering Software	3
BioSurface Technologies	3
Microbion	2
Hylitech	2
Gray Matter Research, LLC	2
Big Sky Statistical Analysts, LLC	2
Unibest	1
Safflower Technology Intl.	1
Pinyon Photonics	1
Image Labs/Aspect Components	1
Fractor Technologies	1
Chronochrome	1



The value of a college education is well documented. Benefits range from increased earning potential to a more informed citizenry, better health choices and even a more politically engaged population.

Graduate Earnings

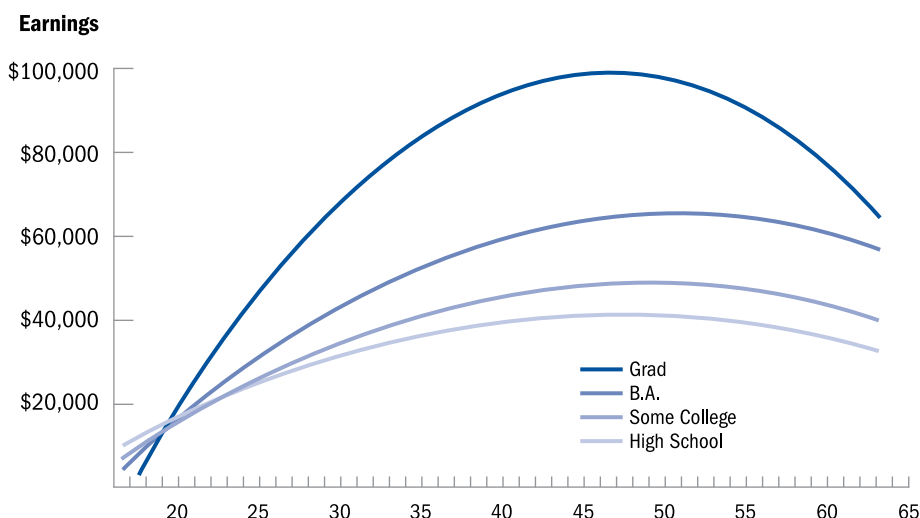
Montana State University provides access to education and development opportunities to many state citizens. Graduates fill critical needs in communities across Montana, with specialization in health professions, on all campuses; alternative energy, especially at Northern and Bozeman; and distance education to serve all Montanans, most extensively through Billings and Great Falls.

The value of a college education is well documented. Benefits range from increased earning potential to a more informed citizenry, better health choices and even a more politically engaged population. Evidence from the economic impact study suggests that college is critical for the future economic status of individuals. Using Montana data from the most recent American Community Survey conducted by the U.S. Bureau of the Census, the Bureau of Business and Economic Research was able to estimate age-income profiles for Montana men and women for four basic educational attainment categories: high school education, those with some college, those with a four-year college degree, and those with a graduate degree.

In all instances, earnings of workers rise rapidly early in their working years, peaking in middle age and declining as individuals cut back on hours or retire from the labor force, as shown in the figures. Yet the height of these earnings profiles clearly shows the impact of education on earnings through all stages of working lives.

Since 1975, the average growth in inflation-adjusted wages for high school-educated Montana workers has been 0.6 percent per year. Over this same period, average wage growth for college-educated workers was 1.1 percent per year. Taking these differing growth rates into account and recognizing that higher earnings that occur in the future must be discounted to be comparable to dollars earned today, the Bureau of Business and Economic Research has computed the lifetime earnings premium that a 25-year-old man or woman can expect to enjoy as a result of educational achievements beyond a high school degree.

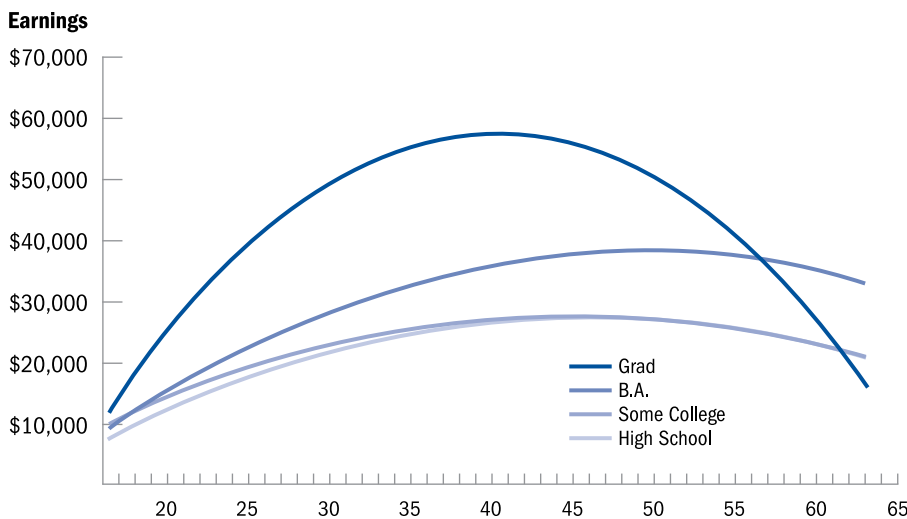
Age/Earning Profiles by Educational Attainment—Men



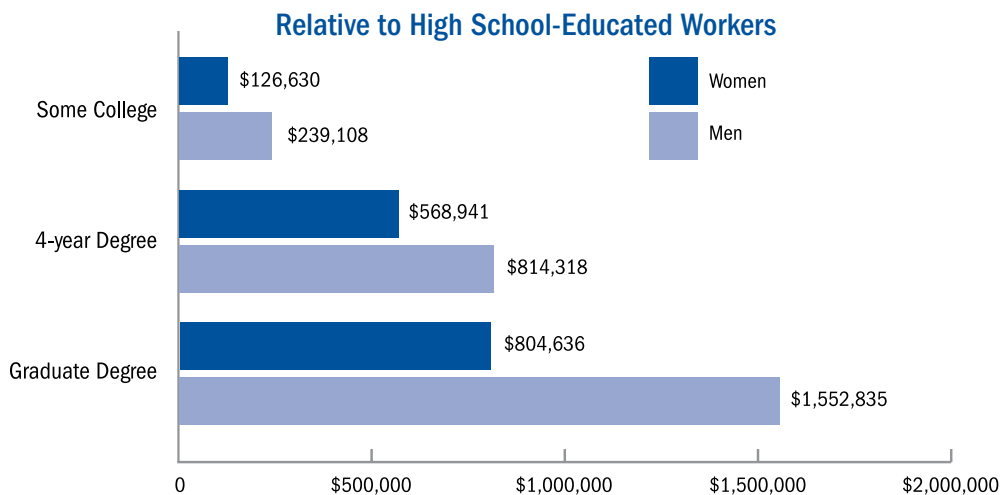
As shown in the figure, the payback to individuals for investments in educational achievement is substantial. A 25-year-old Montana man with a four-year college degree will enjoy, on average, earnings over his working life that are worth \$814,318 more in present dollars than those he would realize with only a high school degree.

The comparable figure for a 25-year-old woman with a four-year degree is \$568,941. But these additional earnings are not only a reward for the student—they are a gain for the state economy as well. An educated worker is a more productive worker, and increased productivity raises the output and the competitiveness of the entire state economy. Higher output levels and higher compensation reverberates throughout the economy with increased spending, demand and state tax revenues.

Age/Earning Profiles by Educational Attainment—Women



Lifetime Earnings Differential by Educational Status, Earnings



Visitors

Montana State University campuses generate significant visitor traffic, including visits by friends and families of its students and faculty and by those attending academic, cultural, and athletic events hosted by the University. Spending by these visitors who are traveling through the state are another way that the presence of the University enhances the economy.

Only spending by out-of-state visitors who are visiting the campuses was accounted for in the economic impact study, because it reflects the actual value added to the economy by MSU. A conservative estimate of this spending was constructed by considering only one type of visitor—friends and families of out-of-state students. Based on a Bureau of Business and Economic Research student expenditure survey conducted with nonresident UM students, it is estimated that visitors stay in Montana an average of 3.5 days. Based on daily expenditure estimates of nonresident visitors seeing family and friends, it is estimated that these trips generate spending of about \$6.2 million within the state of Montana. As shown in the table, travel, accommodations and food services account for the majority of expenditures.

Without MSU, visitors' expenditures for accommodations, food, services, retail goods and transportation would be lost to the state economy.

Visitor Spending				
Category	Bozeman	Billings	Northern	MSU Total
Retail trade	\$333,000	\$42,000	\$16,000	\$391,000
Transportation	\$1,269,000	\$161,000	\$63,000	\$1,493,000
Rental and leasing services	\$52,000	\$7,000	\$3,000	\$62,000
Administrative and support services	\$85,000	\$11,000	\$4,000	\$100,000
Performing arts and spectator sports	\$83,000	\$11,000	\$4,000	\$98,000
Amusement, gambling, and recreation	\$424,000	\$54,000	\$21,000	\$499,000
Accommodation	\$1,197,000	\$152,000	\$59,000	\$1,408,000
Food services and drinking places	\$961,000	\$122,000	\$47,000	\$1,130,000
Repair and maintenance	\$65,000	\$8,000	\$3,000	\$76,000
Other	\$815,000	\$103,000	\$40,000	\$958,000
Total	\$5,284,000	\$671,000	\$260,000	\$6,215,000

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5). MSU-Great Falls, due to its primarily local student population, does not generate significant visitor spending.

Nonresident Student Expenditure

Student spending plays a significant role in Montana State University's impact on the economy, particularly the Bozeman campus. MSU draws in nonresident students to the state that, in the absence of the University, would locate and spend their money elsewhere. For example, the fall 2008 enrollment profile of MSU-Bozeman was 28 percent nonresident or 3,415 students paying nonresident tuition. Spending by these students for living expenses represents dollars added to the state economy.

To generate an estimate of nonresident student expenditures for the MSU campuses, the results of a student expenditure survey conducted by the Bureau of Business and Economic Research were updated to 2008 using price information from the Bureau of Labor Statistic's Consumer Price Index. The results indicated that average non-housing expenditures were \$892 per month. Based on this information, the direct impact of nonresident student spending on Montana's economy in 2008 was approximately \$40.8 million. Consistent across all four campuses, retail sales accounted for the largest portion of student spending, aside from housing, at \$28.6 million annually. Aside from tuition, nonresident students' expenditures are \$67.3 million each academic year that they live in Montana.

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Expenditures by Nonresident Students				
Category	Bozeman	Billings	Northern	MSU Total
Retail Trade Establishments	\$24,330,055	\$3,082,509	\$1,200,704	\$28,613,268
Apparel and department stores	\$4,402,422	\$557,767	\$217,262	\$5,177,451
Bookstores	\$3,000,022	\$380,089	\$148,053	\$3,528,164
Vehicle purchases	\$130,336	\$16,513	\$6,432	\$153,281
Gasoline and vehicle service	\$7,690,325	\$974,330	\$379,523	\$9,044,178
Eating and drinking establishments	\$2,320,107	\$293,947	\$114,499	\$2,728,553
Food and liquor stores	\$4,585,763	\$580,996	\$226,310	\$5,393,069
Furniture and appliance stores	\$217,597	\$27,569	\$10,739	\$255,905
Other retail stores	\$1,983,482	\$251,298	\$97,886	\$2,332,666
Services	\$2,388,868	\$302,659	\$117,892	\$2,809,419
Medical, dental and vision	\$282,084	\$35,739	\$13,921	\$331,744
Auto, home, renters's health or other insurance	\$211,208	\$26,759	\$10,423	\$248,390
Beauty shops, barbers, laundries	\$414,557	\$52,523	\$20,459	\$487,539
Theaters, golf courses and other recreation services	\$1,187,555	\$150,458	\$58,607	\$1,396,620
Hotels and lodging places	\$284,918	\$36,098	\$14,061	\$335,077
Educational services, except MSU	\$8,546	\$1,083	\$422	\$10,051
Utilities	\$1,412,072	\$178,903	\$69,687	\$1,660,662
Water, gas and electric	\$258,234	\$32,717	\$12,744	\$303,695
Telephone	\$652,916	\$82,722	\$32,222	\$767,860
Garbage collection	\$46,253	\$5,860	\$2,283	\$54,396
Cable television	\$454,669	\$57,605	\$22,438	\$534,712
Housing	\$24,447,706	\$3,097,415	\$1,206,510	\$28,751,631
Apartment or house rent	\$1,885,499	\$238,884	\$93,051	\$2,217,434
MSU room and board	\$22,562,208	\$2,858,531	\$1,113,460	\$26,534,199
Charitable Donations	\$108,553	\$13,753	\$5,357	\$127,663
Transportation (bus, taxi, airline)	\$3,720,092	\$471,319	\$183,589	\$4,375,000
Other County Expenditures (Gallatin, Yellowstone and Hill, respectively)	\$810,314	\$102,663	\$39,990	\$952,967
Total	\$57,217,660	\$7,249,222	\$2,823,729	\$67,290,610
Total Spending less MSU Room and Board	\$34,655,452	\$4,390,690	\$1,710,269	\$40,756,411

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5). MSU-Great Falls, due to its primarily local student population, does not generate significant visitor spending.

The impact of Montana State University is a state economy that is increased by 13,511 jobs, including 8,891 additional jobs in the private sector. Those jobs contribute more than \$1 billion in pre-tax personal income to Montana households.

Statewide Economic Impact

The Montana State University campuses, county Extension offices and Montana Agricultural Experiment Station significantly enhance Montana’s economy. The central contribution is educated students who are prepared for careers. These graduates command higher salaries and help to make Montana competitive on a national scale. The results from the economic impact study represent the net benefits of MSU to the state as a whole. For details, see Appendix on pages 30-33.

Impacts Summary—Campuses						
Category	Units	Bozeman	Billings	Northern	Great Falls	Total
Total Employment	Jobs	9,018	1,687	800	416	11,921
Private Sector	Jobs	6,043	1,130	508	197	7,878
Personal Income	\$ Millions	\$723.3	\$175.5	\$82.4	\$36.9	\$1,018.1
Disposable Personal Income	\$ Millions	\$596.2	\$132	\$64.8	\$25.8	\$818.8
Population	People	12,098	1,371	995	397	14,861
State Tax Revenues	\$ Millions	\$168.6	\$36.5	\$18.0	\$7.9	\$231.0

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

Impacts Summary—Montana Agricultural Experiment Station		
Category	Units	MAES
Total Employment	Jobs	1,590
Private Sector	Jobs	1,013
Personal Income	\$ Millions	\$101.4
Disposable Personal Income	\$ Millions	\$78.9
Population	People	1,734
State Tax Revenues	\$ Millions	\$22.0

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

The impacts reported represent the total contribution of the University to the state economy. The tables detail the differences between an economy with, and an economy without, MSU. The analysis used the spending and enrollment levels as of fiscal year 2009 (July 2008–June 2009) as a baseline. The present impact of MSU is a state economy that is increased by 13,511 jobs, including 8,891 additional jobs in the private sector. Those jobs contribute more than \$1 billion in pre-tax personal income to Montana households and result in nearly 15,000 more people living in the state. The accompanying tables show many of the ways in which MSU contributes to the wealth and economic health of Montana. Among the highlights of the impacts are:

- More than \$1 billion of pre-tax personal income paid to Montana workers.
- \$253 million of additional state tax collections.
- MAES is estimated to increase state agricultural output by 0.75 percent per year.

Compensation Impacts—Campuses

Category	Units	Bozeman	Billings	Northern	Great Falls	Total
Wage and Salary Disbursements	\$ Millions	570.2	159.3	67.6	30.8	827.9
Compensation	\$ Millions	688.7	191.9	80.8	36.3	997.7
Earnings by Place of Work	\$ Millions	701.9	194.9	83.1	37.8	1017.7
Average Annual Wage Rate	\$ Thousands	0.690	0.235	0.094	0.041	
Average Annual Compensation Rate	\$ Thousands	0.831	0.282	0.111	0.047	
Average Annual Earnings Rate	\$ Thousands	0.789	0.275	0.110	0.047	

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

Compensation Impacts—Montana Agricultural Experiment Station

Category	Units	MAES
Wage and Salary Disbursements	\$ Millions	68.4
Compensation	\$ Millions	87.2
Earnings by Place of Work	\$ Millions	99.5
Average Annual Wage Rate	\$ Thousands	0.027
Average Annual Compensation Rate	\$ Thousands	0.035
Average Annual Earnings Rate	\$ Thousands	0.036

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).



Montana State University-Bozeman

MSU-Bozeman delivers undergraduate and graduate educational programs; engages scholars in cutting-edge research and creative projects; and provides service to the state, nation and globe.

Excellence in Education Montana State University-Bozeman was reaccredited in 2010 by the Northwest Commission on Colleges and Universities and commended for the “extremely high level of productivity and effectiveness” of its faculty. MSU-Bozeman is designated as one of 96 research universities with “very high research activity” by the Carnegie Foundation for the Advancement of Teaching. This highest tier classification—out of 4,400 institutions—distinguishes MSU-Bozeman as the only institution in a five-state region to achieve this level of research prominence.

Revolutionary Research Although the core focus continues to be the education of students, research and education at MSU-Bozeman are inextricably linked. Faculty experts mentor students from field work and lab analysis to publication of findings. In addition to enhancing student learning, research produces new discoveries that lead to improvements in quality of life, positively impacts the economy through the creation of new companies and jobs, and explores opportunities and challenges unique to the region.

Scholars at MSU-Bozeman set a new record in fiscal year 2010, boosting the University’s research expenditures to \$109.5 million—making it the state’s leading research and development enterprise. Approximately two-thirds of this amount is expended for salaries, making the research activities of the campus one of the state’s leading employers. Research money is critical to providing students and faculty with cutting-edge technology and resources to make breakthrough discoveries. Major sources of federal funding in fiscal year 2009 were the National Institutes of Health, the National Science Foundation, the U.S. Department of Energy, the U.S. Department of Agriculture, NASA and the U.S. Department of Transportation. Areas of research expertise include: biomedical sciences, energy, environment, solar physics, agriculture, optics, cold regions sciences, Yellowstone studies, earth sciences and transportation.

Economic Impact New research findings at MSU-Bozeman lead to advances that can be applied to global challenges. In addition, these new discoveries have a significant impact on the state and local economy. Many of the discoveries that have commercial potential are licensed to Montana companies. MSU-Bozeman contributes to Montana’s economic development in five major ways:

- **Business Assistance** MSU-Bozeman houses a number of business assistance programs that range from manufacturing expertise to help businesses maximize profitability and efficiency; to access to premier R&D facilities and resources to facilitate business innovation; and assistance for businesses pursuing Small Business Innovation Research (SBIR) funds.
- **Workforce Development** Research participation provides students practical, hands-on experience, better preparing them to compete for jobs and make an immediate impact when they enter the workforce.
- **Technology Transfer** MSU-Bozeman has nearly 200 active technology licenses for discoveries and more than 100 patents have been issued for discoveries.



Montana State University-Billings

Measuring the overall impact of a university in Montana's largest city can be done on a variety of levels. As a vibrant institution serving a diverse constituency with varied needs and expectations, MSU-Billings has grown into its role as a conduit to educational opportunity, not only for Billings, but also for the entire state.

With traditional undergraduate education as its core, the university also embraces alternative pathways for student success. MSU-Billings has become a leader in providing educational opportunities in areas of two-year education, distance learning and outreach.

Two-year education As one of five academic colleges at MSU-Billings, the College of Technology is the point of access for many students in the region who are seeking general education or specific workforce skills in high-demand areas. Enrollment at the two-year campus has grown from 482 in the fall of 2001 to 1,531 in the fall of 2010. More than 61 percent of the students at the COT are from Yellowstone County, with an increasing number of Hispanic and American Indian students.

Graduates in those programs have a major impact on the economy by filling jobs in the healthcare, energy, automotive technology, and computer networking and business sectors. About 95 percent of those graduates remain in Montana to work and raise their families. Through a unique partnership with Billings School District 2, the COT also provides Adult Basic Education and GED access.

Distance education Recognized as a statewide leader in distance education, MSU-Billings is committed to integrating technology and teaching in new formats for the next generation of students. Because 40 percent of MSU-Billings' student body is over 25 years old, and many attend part-time, the flexibility provided through an online format is critical to their success as they juggle education, work and family responsibilities.

About 16 percent of MSU-Billings students in fall 2010 were online-only students, taking classes from their homes in nearly every county in Montana. Producing more than just an a la carte menu of courses, the distance education portfolio includes 21 fully online degree programs and 275 fully online unique courses. In fiscal year 2010, MSU-Billings' online programs produced 29,997 student credit hours, the most in the Montana University System.

The strength and reach of the distance education program at MSU-Billings also provides for important system collaborations. Those include engineering with MSU-Bozeman; health informatics with Montana Tech of the University of Montana; and surgical technology with the University of Montana's College of Technology.

Outreach As part of its public service and with the assistance of federal funding, MSU-Billings has built programs to address needs of underserved populations:

- The Pathways to Self-Sufficiency program at the Montana Women's Prison has provided about 70 women with academic and workforce training in an effort to reduce recidivism and increase overall educational attainment.
- The Garfield Community Outreach Center, providing free or inexpensive access to basic skills training on the city's South Side.



Montana State University-Northern

MSU-Northern was founded in 1929 and has served Havre as an academic hub for the Hi-Line and north central Montana for more than 80 years. The town's dedication to MSU-Northern and the campus' commitment to the Hi-Line has always been the foundation to every program offered.

Distance Education MSU-Northern has long been a pioneer in distance education. The NorthNet system was one of the largest interactive television networks in the U.S., which reached 52 high schools across the state. These innovations and transition to the Internet has made it possible for students to access a MSU-Northern education from home.

Three Campuses MSU-Northern has campuses in Havre, Great Falls and Lewistown. These facilities make it possible for MSU-Northern to offer on-site instruction in practical programs like nursing, education and business.

Transferability Most of MSU-Northern's programs have a two-year associate's degree that leads to a four-year bachelor's degree. This approach makes it possible for a student to start by getting the two-year associate's degree and enter the workforce sooner. It also gives its students the opportunity to go back to college at a future date and seamlessly finish their bachelor's degree. This approach to education makes MSU-Northern very unique and appealing. Out of the 22 bachelor degrees offered, 18 of them have a two-year associate's degree option. The University also has many articulation agreements with other two- and four-year institutions to make it possible to continue education without starting over.

Innovative Programs MSU-Northern's diesel program is in high demand because it is one of only a handful of four-year diesel degrees in the country. This puts students in high demand for management positions in major companies like BNSF, General Electric, Caterpillar, Kiewit and Tractor & Equipment. Northern is also the hub for many state programs like the Montana Motorcycle Safety program, Montana's Veteran Upward Bound, Montana Environmental Training Center and nine Educational Opportunity Center sites.

Biodiesel Research MSU-Northern's Bio-Energy Center has a strong focus on biofuels and heavy duty diesel engines. This internationally recognized center is able to conduct comprehensive studies on biofuels, from the seed to fuel processing, fuel testing, engine testing and real-time emissions monitoring. Recently, the center partnered with Burlington Northern Santa Fe Railway (BNSF) to conduct a comprehensive test to utilize 20 percent biodiesel blend for fuel in a switcher engine. BNSF is the second largest diesel fuel user in the United States and consumes 30 million gallons a year in Havre alone. This is a year-long project that will demonstrate the performance of biodiesel under adverse weather conditions in Montana.

Unmanned Aerial System (UAS) Testing MSU-Northern, MSU-Bozeman, Mississippi State University and Rocky Mountain College are exploring the possibility of conducting research and testing on UAS's. MSU-Northern is located in the middle of a large, sparsely populated, military operations airspace (MOA) that is conducive to drone testing. Research possibilities include MSU-Northern examining aspects of biofuel use for the drones. The College of Engineering at MSU-Bozeman could potentially do research in design and engineering and the aviation program at Rocky Mountain College could handle the aviation simulations.



Montana State University-Great Falls

MSU-Great Falls is a community asset—serving the educational and career goals of more than 2,500 individual students. Partnerships with key employers in north central Montana ensure that student learning specifically meets workplace needs.

- MSU-Great Falls celebrated a record number of graduates in 2010 as 301 degrees and certificates were earned by 278 students.
- The total number of high school students enrolled in college courses with MSU-Great Falls increased 15 percent in Fiscal Year (FY) 2010 over FY2009.
- For its service to military students and families, the college was designated as a Military Friendly School for 2010 and ranked in the top 15 percent nationwide. Service to these students and others has resulted in a retention rate increase of 6 percent in 2009-10 and 16 percent since 2008.

Fiscal Stewardship Although it has some of the most expensive programming, spending at MSU-Great Falls is less per student than nearly all other institutions in the Montana University System. The state funding received for each student in FY2010 was \$4,731, representing an annual savings to the state of Montana of \$2,201 for each student who chooses to begin college at MSU-Great Falls rather than a public four-year college in Montana.

- The total annual expenditure per student at MSU-Great Falls is approximately \$2,000 less than the average for the Montana University System (\$7,924 compared to \$10,134).
- Annual tuition at MSU-Great Falls averages \$2,997 compared to \$3,821 at Montana's four-year public colleges.

Workforce Development Montana students earning a certificate or associate degree are more likely to stay and work in Montana than those earning bachelor or master degrees. Workforce development statistics from the Office of the Commissioner of Higher Education, show that 82.5 percent of resident Associate of Applied Science graduates entered Montana's workforce within one year of graduation.

- Students earning an associate degree in FY2009 earned an average salary of \$29,098 in FY2010.
- MSU-Great Falls offers 14 of the 19 healthcare occupations offered by colleges within the Montana University System. The average salary of healthcare graduates, regardless of degree level, was \$39,400, 35 percent higher than the average Montana University System graduate.
- Despite the recession, in-field job placement for graduates has remained strong with 76 percent of graduates reporting employment the fall after they graduate.

Of the FY2009 graduates, those in dental hygiene started at the highest pay rate with an average hourly salary of \$27.89. Physical therapy assistants, practical nurses, radiology technicians, and respiratory care graduates earned a starting hourly of salary averaging \$18.28 to \$20.67. In the past year, students achieved 100 percent pass rates on national exam for respiratory care, dental hygiene, surgical technology, practical nurse, and physical therapist assistant.



Montana Agricultural Experiment Station economic benefits

- MAES research programs add nearly 1,600 jobs, \$22 million in state tax revenue and more than \$100 million in personal income, according to the Economic Impact Report.
- MAES employs 160 faculty and staff FTE.
- MAES-sponsored research expenditures total more than \$22 million over the last three years from public and private external funds. In addition to job creation, these discoveries result in numerous licenses and patents.

Montana Agricultural Experiment Station

The Montana Agricultural Experiment Station is a vibrant and high impact research and outreach program with statewide impacts to agriculture and natural resource communities. MAES is a programmatic and financial partnership between the State of Montana and federal U.S. Department of Agriculture (USDA). The primary focus of MAES is research, which complements agricultural undergraduate, graduate and outreach education through split appointments with MAES-supported faculty, staff and facilities. This arrangement allows MAES and the College of Agriculture at MSU to leverage and maximize efficiencies with scarce resources.

Essential Research MAES conducts research in agricultural and natural resource systems from multiple Montana locations: the main station (Bozeman), seven research centers (Conrad, Corvallis, Creston, Havre, Huntley, Moccasin, Sidney) and allied farm/ranch properties. Research results provide short- and long-term impacts throughout Montana by focusing on key challenges that food producers face and additional future discoveries that will maintain Montana's agricultural competitiveness in a global market. Selected research themes encompass small grain and livestock production; food biosecurity; sustainability, stewardship and management; bioenergy; integrated pest management; infectious disease; trade and policy analysis; and environmental science. State and local citizen-based advisory groups provide guidance for MAES research activities to address future challenges from Montana's largest natural resource industry.

Examples of vital research projects impacting Montana agriculture include wheat stem sawfly and noxious weeds. Wheat stem sawfly is the major pest to Montana crops. Research has created new solid stem varieties in spring and winter wheat, developed alternative management strategies to combat losses, reduced fuel and chemical costs and increased yield. The research improves income to producers by at least \$10 million annually. Integrated noxious weed rangeland research has led to: a reduction in herbicide use which saves at least \$4 million (\$4 per acre); an increase in forage production through management based upon Animal Unit Months, an increase of at least \$5 million (\$5.20 per acre); and prevention of current spread and future invasions, a savings of \$10 million per year (\$20 per acre over 10 years) for a total of \$19 million a year.

Economic Impacts MAES research supports the State's primary industry—agriculture. Cash receipts from the marketing of agricultural commodities were \$1.72 billion for crops and \$1.18 billion for livestock products and the total value of agriculture to the State's economy is \$3.8 billion (in 2008). Revenue from diverse agricultural activities fuels the Montana economy across all economic sectors and sustains rural and urban communities.

While an integral part of Montana State University's land grant mission, MAES does not receive any funding from tuition, fees, or other sources. The State General Fund supports 84 percent of the MAES appropriated base budget through House Bill 2 and serves as a required match to the federal capacity funding (16 percent of MAES' budget) appropriated through the USDA National Institute for Food and Agriculture (NIFA). NIFA provides program funding and research program direction. Additional funding for MAES facility repair, renovation and new construction has been supported through the State Long Range Building Program (LRBP) with many projects leveraging state appropriations through private giving.

Montana State University Extension

The mission of Montana State University Extension is to share research-generated knowledge throughout the state by making it accessible and useful to individuals, families and communities, empowering them to improve their quality of life and strengthen agriculture, forestry and other businesses. To meet the educational needs of Montanans, Extension coordinates all appropriate educational and research resources in the region through campus-based specialists and county and reservation agents.

MSU Extension has 188 FTE that includes 80 campus-based specialists and staff and 108 county-based faculty/staff located at 62 offices across the state serving all 56 counties and five reservations. To deliver the practical advice and information needed by Montana's agricultural community, Extension taps into the resources of the entire university system. Primary concerns related to agricultural sustainability and profitability, natural resources and the environment, and technology transfer/value-added opportunities are addressed through outreach efforts across the state.

Extension's Family & Consumer Sciences program area serves people and families of all shapes and sizes—from the elderly to kids, from single parents to stepfamilies. Topics include food and nutrition, housing, health, family issues, personal finance, environmental health and many other subjects useful to Montanans. One such program emphasizes nutrition education for families with limited resources.

Montana 4-H annually reaches 23,332 Montana youth, ages 6-19. About 49 percent of these youth are involved in year-long community clubs, while the rest are active through a variety of short term and special interest education programs. These youth are supported by 4,551 trained adult and youth volunteers who lead local programs and activities.

Community and Economic Development Programs focus on addressing the needs of communities throughout Montana. Thirty-five communities have completed the Horizons program, an 18-month comprehensive process to address local needs for leadership development, asset development and strategic planning. The Local Government Center provides certification and training for county commissioners, clerks/recorders and mayors and workshops for locally elected and appointed boards.

The strategic plan for Extension outlines strategies and action plans for meeting the challenge of helping Montana families and communities thrive through practical application of research-based information. It is based on the integration of extensive input and advice from Montana citizens, advisory boards and Extension personnel. Working groups of Extension staff, an overall planning committee and the Montana Extension Advisory Council chart annual progress in achieving the goals and objectives for each major issue identified in the plan.



MSU plays a critical role in Montana's economy. The University will continue to be a major educational leader and powerful economic engine for the state, improving the quality of life for all Montanans.

Conclusions

Montana State University impacts every part of the state, providing education, research and outreach that drives creativity, productivity and economic activity.

With campuses in all regions of the state, Extension presence in all 56 counties, Montana Agricultural Experiment Station main campus and seven research centers and the largest distance learning system in the state, MSU reaches all Montana communities.

While it is impossible to measure all of the benefits of Montana State University, this report underscores several key areas which can be quantified. The economic impact analysis only measures revenue that is added to the state because of the University; no Montana-based funds, such as state-appropriations or resident tuition are included in the figures.

Based on 2008-2009 data, MSU adds 13,511 public and private jobs to the state's economy. This generates more than \$1 billion in personal income from the four campuses and MAES, which equates to \$897.7 million in after-tax income and \$253 million in state tax revenue.

MSU's research innovation has led to the creation and growth of businesses throughout the state, providing employment opportunities in industries such as agriculture, energy, construction, healthcare and technology.

MSU plays a critical role in Montana's economy. The University will continue to be a major educational leader and powerful economic engine for the state, improving the quality of life for all Montanans.



Appendix: Statewide Economic Impacts

Employment Impacts—Campuses					
Industry	Bozeman	Billings	Northern	Great Falls	Total
Forestry, Fishing, Related Activities, and Other	-1*	1	0	0	0
Mining	-5*	0	0	1	-4*
Utilities	14	5	2	1	22
Construction	740	143	46	22	951
Manufacturing	236	2	1	0	239
Wholesale Trade	119	30	10	4	163
Retail Trade	1,084	251	119	50	1,504
Transportation and Warehousing	23	7	2	0	32
Information	221	13	4	2	240
Finance and Insurance	115	41	12	4	172
Real Estate and Rental and Leasing	216	40	15	5	276
Professional and Technical Services	1,143	109	60	20	1,332
Management of Companies and Enterprises	12	1	1	0	14
Administrative and Waste Services	322	76	27	11	436
Educational Services	1,406	392	167	161	2,126
Health Care and Social Assistance	960	184	108	40	1,292
Arts, Entertainment, and Recreation	214	47	23	9	293
Accommodation and Food Services	561	98	49	21	729
Other Services, except Public Administration	719	139	67	26	951
State Government	476	25	37	18	556
Local Government	445	85	50	23	603
Total	9,018	1,687	800	416	11,921

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

*Negative jobs can occur because of the impact MSU has on wages. As a large employer, the presence of MSU makes wages higher—which may, marginally, discourage some companies from expanding/operating.

Employment Impacts—Montana Agricultural Experiment Station	
Industry	MAES
Forestry, Fishing, Related Activities, and Other	293
Mining	0
Utilities	7
Construction	152
Manufacturing	2
Wholesale Trade	49
Retail Trade	86
Transportation and Warehousing	1
Information	2
Finance and Insurance	11
Real Estate and Rental and Leasing	105
Professional and Technical Services	232
Management of Companies and Enterprises	-1*
Administrative and Waste Services	41
Educational Services	10
Health Care and Social Assistance	77
Arts, Entertainment, and Recreation	19
Accommodation and Food Services	67
Other Services, except Public Administration	47
State Government	149
Local Government	242
Total	1,590

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

*Negative jobs can occur because of the impact MSU has on wages. As a large employer, the presence of MSU makes wages higher—which may, marginally, discourage some companies from expanding/operating.

Gross Domestic Product Impacts (Private Sector, \$ Millions) – Campuses					
Industry	Bozeman	Billings	Northern	Great Falls	Total
Forestry, Fishing, Related Activities, and Other	-0.3	0	0	0	-0.3
Mining	-0.8	-0.4	0	0	-1.2
Utilities	9.4	2.2	1.1	0.5	13.2
Construction	35.8	8.1	2.2	1	47.1
Manufacturing	59.2	0.3	0.1	0	59.6
Wholesale Trade	21.3	5.8	1.9	0.8	29.8
Retail Trade	103.9	20	10.5	4.4	138.8
Transportation and Warehousing	2.5	0.8	0.1	0	3.4
Information	57.7	2.5	1.1	0.5	61.8
Finance and Insurance	18.1	6.2	2.2	0.8	27.3
Real Estate and Rental and Leasing	30.7	5.2	1.8	0.6	38.3
Professional and Technical Services	67.6	6.3	3.4	1.1	78.4
Management of Companies and Enterprises	1.4	0.1	0.1	0	1.6
Administrative and Waste Services	13.2	2.9	1.1	0.5	17.7
Educational Services	17.3	6.2	3	2.9	29.4
Health Care and Social Assistance	56	13.5	7	2.7	79.2
Arts, Entertainment, and Recreation	8.7	1.8	1	0.4	11.9
Accommodation and Food Services	12.9	2.3	1.1	0.5	16.8
Other Services, except Public Administration	16.3	3.5	1.6	0.6	22

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

**Gross Domestic Product Impacts (Private Sector, \$ Millions)–
Montana Agricultural Experiment Station**

Industry	MAES
Forestry, Fishing, Related Activities, and Other	2.4
Mining	0.0
Utilities	4.9
Construction	13.5
Manufacturing	1.0
Wholesale Trade	15.2
Retail Trade	10.0
Transportation and Warehousing	0.4
Information	1.4
Finance and Insurance	4.9
Real Estate and Rental and Leasing	17.0
Professional and Technical Services	19.4
Management of Companies and Enterprises	-0.1
Administrative and Waste Services	2.5
Educational Services	0.1
Health Care and Social Assistance	6.8
Arts, Entertainment, and Recreation	0.4
Accommodation and Food Services	1.9
Other Services, except Public Administration	1.5

Source: Bureau of Business and Economic Research at The University of Montana based on 2009 data.

Note: A comparison of the data in this report and The University of Montana report is not appropriate and may be misleading (see page 5).

MONTANA STATE UNIVERSITY

BOZEMAN | BILLINGS | NORTHERN | GREAT FALLS

MSU Extension

Montana Agricultural Experiment Station