

# Montana College Graduates

## The Contribution of Montana College Graduates to the State's Workforce

By Amy Watson, Economist



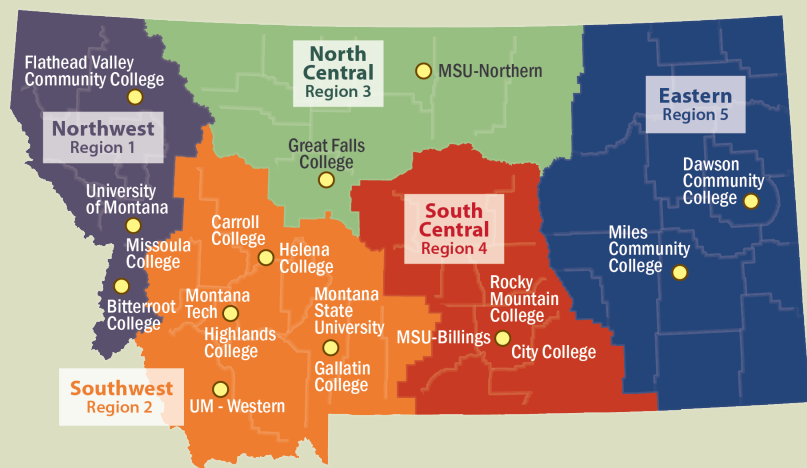
**Every year**, over 7,000 students graduate from Montana colleges with degrees or credentials after studying anywhere from one to four years to obtain skills and knowledge that will help them in the workforce. Either before or upon entering college, students must decide what career path to pursue. While this decision is important for each individual student, the collective decisions of the entire student body are of great interest to businesses and policymakers who are relying on graduates of the university system as a major provider of Montana's workers, innovators, and business leaders. Knowledge of the career training choices of Montana's college students and their outcomes allows students to know what skills are in demand, businesses to know whether they can expect workers to be available, and policy makers to know how adaptations can be made to meet the skill needs of the economy.

In an effort to ensure Montana's workforce training systems are aligned with the state's economic needs, the Montana Department of Labor & Industry (MTDLI) and the Office of the Commissioner of Higher Education (OCHE) came together to produce a report on statewide labor market outcomes for postsecondary students in Montana. This article discusses some of the results of that report, including information about whether students stay in Montana after graduating, whether they are able to obtain jobs in their field of study, and how their wages progress in their careers. The full report, entitled, "Meeting State Worker Demand: A Report on Labor Market Outcomes for Montana Colleges," is available at [lmi.mt.gov/Publications/PublicationsContainer/meeting-state-worker-demand](http://lmi.mt.gov/Publications/PublicationsContainer/meeting-state-worker-demand).

### What colleges are included?

The study includes approximately 100,000 graduates from eighteen Montana colleges (see map) over fifteen academic years from 2001-02 to 2014-15. These eighteen institutions include two-year, four-year, private, and public colleges.

While these colleges make up the majority of the postsecondary institutions in the state, some Montana colleges are not included in this report. The excluded institutions are those where no data agreement exists with MTDLI. Future studies will attempt to expand the included institutions.



**75% of graduates will work in Montana at some point within five years of graduation.**

## Most Graduates Stay in Montana, and They Work All Over the State

Montana's college students tend to graduate in high-demand fields and are able to quickly find work in the state. Approximately 75% of Montana college graduates will work for a Montana employer at some point within five years of graduation. Most of these graduates (69%) find employment in Montana within a year of graduation.<sup>1</sup> The remaining 25% could be self-employed, employed outside of Montana, or working for a Montana company that does not pay into the Montana Unemployment Insurance system.<sup>2</sup>

Graduates work in every corner of the state. Every county receives at least some of their workforce from Montana's post-secondary education system, demonstrating the breadth of the colleges' impact on

workforce development in the state.

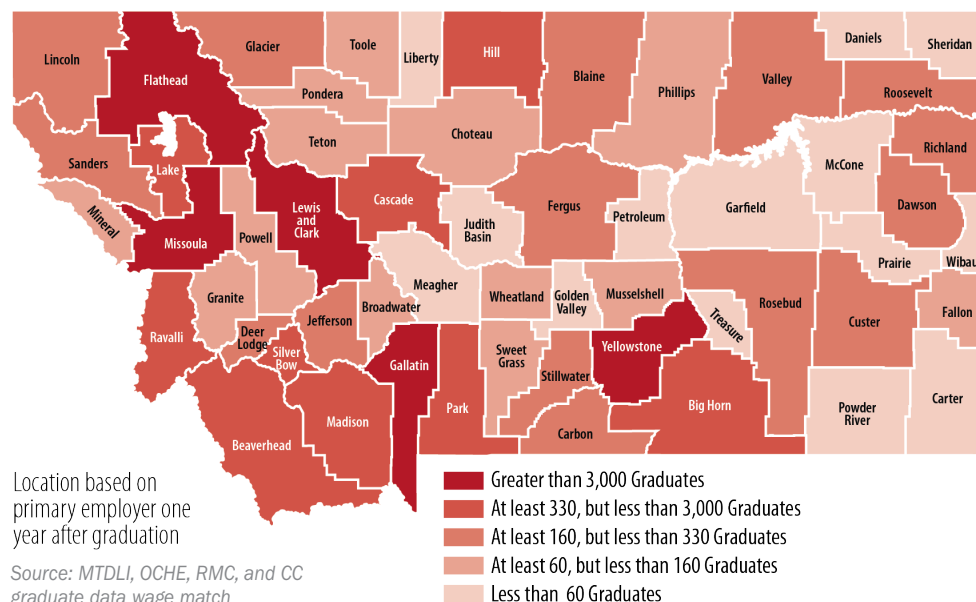
**Figure 1** shows where students are located one year after graduation based on the location of their primary employer.

Graduates disperse from the areas of the state where the colleges are located, to every county in the state. This migration of graduates post-graduation demonstrates labor force mobility, which leads to better job matches, improves wages, and promotes economic growth. Labor force mobility is particularly important in the early stages of a worker's career as they gain experience and move up the career ladder. Labor force mobility also helps stabilize the economy during downturns. Workers with the flexibility to move can better respond to changes in employment opportunities.

## Graduates Work in their Field of Study

The most common field of study among college students is liberal arts, followed by health professions, business, education, and engineering. **Figure 2** shows the top employing industry for graduates from each program

**FIGURE 1**  
**Graduates' Location One Year After Graduation**



<sup>1</sup> These percentages were determined by matching individual graduate data to administrative wage data maintained by MTDLI as a part of the Unemployment Insurance system.

<sup>2</sup> Only payroll employment is included. Programs with high-levels of self-employment may not be accurately represented. For example, agriculture graduates working on their own farm isn't captured in payroll employment. Only Montana income is considered. Graduates not filing income tax returns in Montana may be successfully employed in other states.

category five years after graduation. Consistent matches between program of study and industry of employment indicates that graduates are well prepared to work in their field of study, and that their field of study is in demand.

Healthcare and education programs have the strongest industry matches. Three quarters of healthcare and education graduates working in Montana are employed in the healthcare and education, respectively. Over half of employed architecture and law graduates are working in professional and technical services industry, which includes occupations like lawyers and architects. Across all program categories, graduates are generally employed in industries associated with their degree.

**FIGURE 2**  
**Top Employing Industry by Program Category**  
*Five Years after Graduation*

Program Category	Top Employing Industry	% Emp
Health Professions	Healthcare	75%
Education	Education	73%
Architecture	Prof & Tech Service	67%
Legal Professions	Prof & Tech Service	53%
Human Services	Healthcare	39%
Engineering	Prof & Tech Service	34%
Culinary Arts & Recreation	Healthcare	28%
Computer & Info Science	Prof & Tech Service	27%
Physical Science	Education	22%
Social Science	Healthcare	22%
Liberal Arts	Education	20%
Business	Finance	19%
Construction & Transport	Construction	17%
Ag & Natural Resource	Education	16%
Communication	Information	16%

*Source: Montana Department of Labor & Industry, OCHE MUS, RMC, and CC graduate data wage match. Healthcare industry is NAICS 62 Healthcare and Social Assistance. Prof & Tech Service represents NAICS 54 Professional and Technical Services. Program of study shown is the program associated with the graduate's highest degree earned in Montana.*

Strong program and industry matches do not necessarily mean a graduate's job matches their field of study. A nursing graduate working in the healthcare

industry may be working as a registered nurse, or as an administrative assistant for a hospital. Similarly, a mismatch between industry of employment and program of study does not always mean graduates are not utilizing their degree in their job. A pharmacy graduate working in retail could be employed at Walgreens as a pharmacist, or another retail store. One program-industry match that may look inconsistent is culinary arts and recreation graduates working in healthcare. These graduates may be working in hospital cafeterias utilizing their degree. Graduates from this program category also include those studying fitness, physical education, kinesiology, and exercise science. These graduates are likely using their education in their career working for healthcare providers.

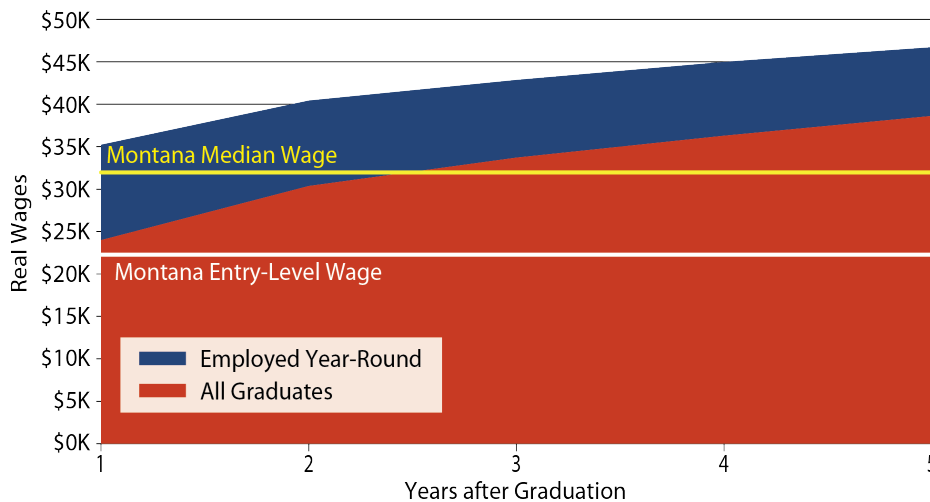
## Graduates Earn Above the Median Wage within Three Years of Graduation

Graduates who work in Montana earn more than the entry-level wage within a year of graduation, and their wages progress above the median within three years. **Figure 3** depicts the average wage progression of Montana college graduates in the five years after graduation. Graduates earned an average of \$24,000 in wages the first year after graduation, which includes part-time, temporary, and seasonal payroll employment. After five years, graduates' wages grew to an average of \$38,600.

Graduates who were able to obtain consistent, year-round employment earned significantly more. These graduates made \$35,000 in the first year after graduation, which is above the state's median wage. Their wages progressed to \$46,700 five years after graduation. While these graduates had year-round employment, they may not have been working full-time. Therefore, it is not possible to calculate an average hourly wage from total wage earnings. The wages reported in **Figure 3** reflect total wages earned by graduates from all payroll jobs they worked in a year, including part-time and full-time employment.

While wages are the primary source of income for most graduates, they are not the only source. The average earned income for graduates one year after graduation was about \$30,000, which is \$6,000 higher than the

**FIGURE 3**  
**Real Average Wage Earnings for Graduates**



Source: MTDLI, OCHE, RMC, and CC graduate data wage match. Real wages reported in 2015 dollars using the CPI-U. Median and entry level wage from 2015 Occupational Employment Statistics.

average wage.<sup>3</sup> Graduates' earned income includes both wages and business income, but excludes unearned income such as capital gains and social security.

Graduates' workforce outcomes depend largely upon their program of study. Some programs are in greater demand by Montana employers; therefore, graduates from these programs are able to find employment faster and have higher wages than graduates from other programs. **Figure 4** shows the workforce outcomes of graduates one year after graduation by program of study. The vertical axis depicts the median income, and the horizontal axis shows the percent of graduates who filed income taxes in Montana. The size of the bubble corresponds to the number of students who graduated in each program. Liberal arts is the most common program of study, followed by business, health professions, and education. Programs in the upper-right corner of the chart have better workforce outcomes than those in the lower-left corner.<sup>4</sup>

Legal professions graduates have the highest median wage of \$44,000 one year after graduation. Engineering graduates follow closely behind at \$39,000, and then health professions and architecture graduates at \$36,000. Specifically, the programs within the health

professions driving the high median income are pharmacy (\$84,900), physician assistant (\$68,600), physical therapy (\$58,100), and registered nursing (\$45,500) programs. Among the high-income programs, only law and registered nursing also have above-average retention rates in the Montana workforce. Approximately 84% of registered nursing graduates and 73% of law graduates filed income taxes in Montana a year after graduation.

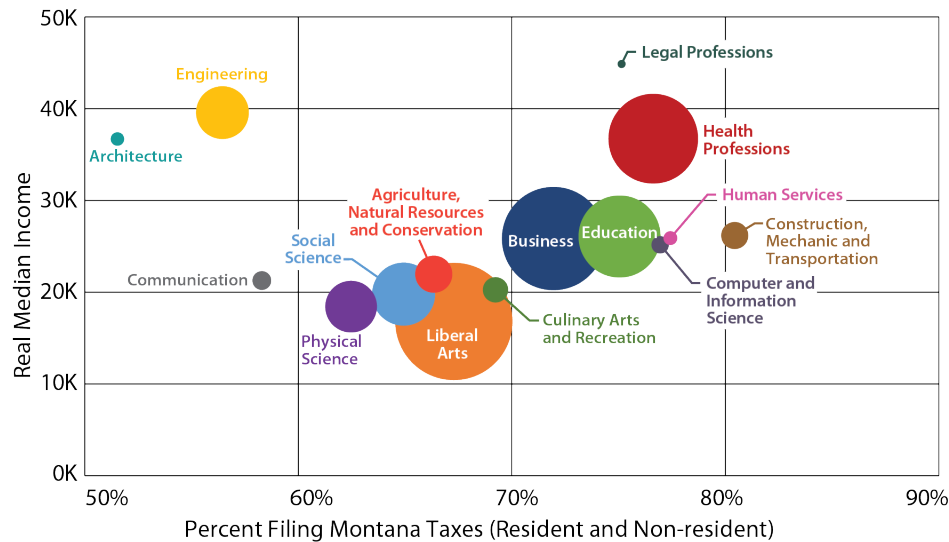
Physical science (\$18,400), social science (\$19,800), and liberal arts (\$16,800) graduates have the lowest median incomes one year after graduation. These low incomes are also coupled with below average retention rates in the Montana workforce after graduation. All of the programs in these categories have less than 69% of graduates filing income taxes in Montana one year after graduation. Below average workforce outcomes signal low employer demand for graduates from these programs. However, graduates from these programs who do not file income taxes in the following year may be successfully employed in other states, or may be pursuing higher education.

<sup>3</sup> The income data used in this report comes from matching individual-level graduate data to individual income tax records maintained by the Montana Department of Revenue (DOR). Income is defined by lines 7,12,17, and 18 on Montana's income tax return. More information about the income data used in this article is available in Appendix A of the Statewide College Report, which is available here: <http://lmi.mt.gov/Publications/PublicationsContainer/meeting-state-worker-demand>.

<sup>4</sup> Programs where it is common for individuals to continue their education after graduation may have lower reported income levels initially.



**FIGURE 4**  
**Workforce Outcomes by Program Category**  
*One Year after Graduation*



Source: DOR, OCHE, RMC, and CC income data match summarized by MTDLI. Earned income is defined as lines 7, 12, 17, and 18 on the Montana income tax return, not including farm income. Income reported in 2015 dollars using the CPI-U

## Higher Education Leads to Higher Income but Lower Retention in the Montana Workforce

With higher education comes higher income levels, particularly for those Montana college graduates who are able to obtain a Master's degree or higher. Master's degree graduates report \$34,300 in median income a year after graduation, compared to \$22,500 median income reported by Bachelor's degree earners.

However, as the education level of graduates rises, they are more likely to seek employment opportunities outside the state. Eighty-four percent of associate degree graduates work in Montana a year after graduation, compared to 67% of bachelor's degree earners and 52% of PhD graduates. The negative relationship between remaining in Montana and higher education levels likely arises because individuals with more education pursue higher-wage jobs. Montana's high-wage jobs tend to pay less than high-wage jobs in other states, whereas low-wage jobs pay just as well in Montana as in other states.<sup>5</sup> Figure 5 shows workforce outcomes by degree, where the horizontal axis is the percent filing income taxes one year after graduation, and the vertical axis is median income. The size of the bubble corresponds to the number of graduates in each degree type since 2001.

As shown in Figure 5, the largest drop in retention occurs between associate and bachelor's degree attainment. Shorter training times for associate degrees, and strong connections between two-year colleges and local labor markets result in greater retention of associate degree graduates in Montana. Ninety-four percent of students enrolled at Montana's two-year colleges came from within the state, and most of these students remain in Montana after graduation.

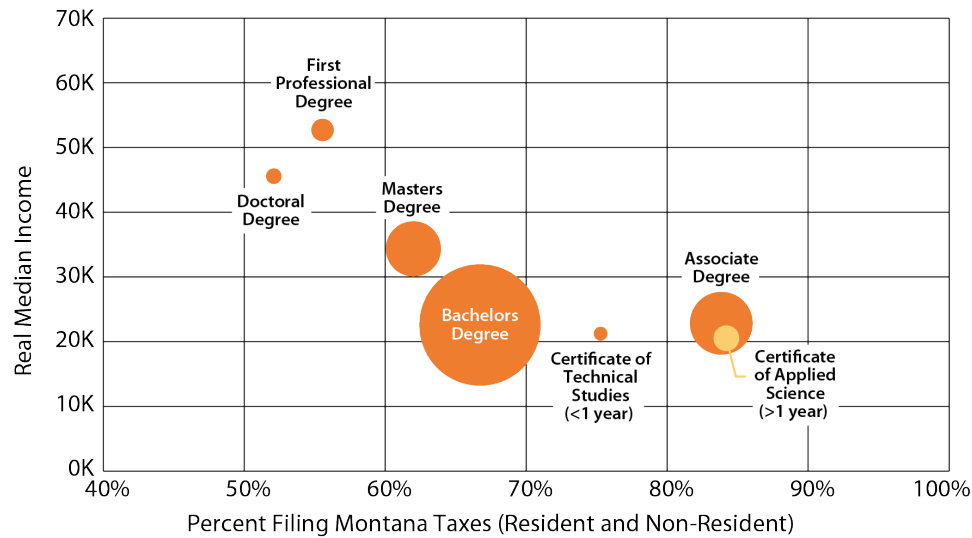
Montana's four-year colleges attract students from around the country, giving them a greater portion of non-resident students than two-year colleges have. Thirty-three percent of students at four-year colleges come from other states, and may return to their home state after graduation. The percentage of four-year students who are Montana residents is the same as the percentage employed in Montana one year after graduation, suggesting the four-year education system comes out even recruiting new people to Montana and retaining the existing workforce.

Both associate and bachelor's degree earners report a median income of about \$22,500 a year after

<sup>5</sup> Wagner, Barbara. 2015. "Montana's Growing Wages: Income and Wages are Gaining Ground on National Average" Montana Economy at a Glance, published by MTDLI, May 2015. Available at [lmi.mt.gov](http://lmi.mt.gov)

**FIGURE 5**  
**Workforce Outcomes by Degree Type**

*One Year After Graduation*



Source: DOR, OCHE, RMC, and CC income data match summarized by MTDLI. Income is defined as lines 7, 12, 17, and 18 on the MT income tax return. Multiple degree holders are counted once for each degree. Income reported in 2015 dollars using the CPI-U.

graduation. While no income premium exists for bachelor's degree attainment initially, bachelor's degree earners do experience faster income growth, reporting \$33,000 in median income five years after graduation, compared to \$31,700 for associate degree earners.<sup>6</sup> The returns to bachelor's degree attainment also vary widely by program of study. Programs that typically train graduates to work in occupations that require a bachelor's degree, such as information technology and education, have higher incomes premiums for bachelor's degree attainment than programs that do not.

## Conclusion

Montana's post-secondary education system plays a critical role in workforce development in Montana. Most graduates from Montana colleges are retained in the state's workforce, thus contributing to the growth of the state economy. These graduates migrate after graduation into every county in the state, leaving no area unaffected by the post-secondary education system. Graduates tend to work in their field of study, suggesting colleges are able to adequately prepare students for their desired careers. The post-secondary education system will continue to be an important component in the development of a high-qualified workforce that is able to meet the evolving needs of Montana business.

<sup>6</sup> The income premium for bachelor's degree attainment may continue to increase over time; however, data is not yet available to evaluate earnings over a longer timeframe.

## Updated Publication! Informational Wage Rates by Occupation

Produced annually by the Occupational Employment Statistics (OES) Program, The Informational Wage Rates by occupation provides detailed data on wage rates and employment levels for over 600 Montana occupations. Data is broken down into four major regions and 3 Metropolitan Statistical Areas: Billings, Missoula, and Great Falls.

View the publication at:

[lmi.mt.gov/Publications/PublicationsContainer/informational-wage-rates-by-occupation](http://lmi.mt.gov/Publications/PublicationsContainer/informational-wage-rates-by-occupation)

