

UNIVERSITY OF WYOMING

Authors:

Anne M. Alexander

Associate Dean

International Programs

University of Wyoming

Roger H. Coupal

Department Head

Agricultural & Applied Economics

University of Wyoming

May 2014

Executive Summary – Economic Footprint of the University of Wyoming

The University of Wyoming, true to its land-grant and flagship missions, stands as the state's university. In every county across Wyoming, we provide courses and degrees for those who cannot come to Laramie; research that advances fundamental understanding as well as practical solutions to business, industry and government; service to professional and community organizations; information and advice to policy makers; cultural performances and exhibitions; academic programming, workshops, and seminars; access to legal services, health services, and library databases; a wide variety of other contributions to the full social, business, cultural, creative, and economic environment of the state.

Through engagement with our communities, **UW is a powerful engine supporting the state's growth. UW also has a broader economic footprint that contributes in the long run, and more broadly, to aspects of value creation**

Reported here are economic impacts that would not occur in Wyoming but for the university all directly attributable to external funding coming to Wyoming as a result of the university's varied distinct activities. These include direct expenditures by nonresident students and visitors, externally funded research support, and spin-outs and startup businesses directly resulting from UW research. University driven economic impact to Wyoming is found to be substantial as reported below.

Here are some quick facts highlighting UW's economic impact:

The total additive value of this external activity

- totals nearly \$130 million annually;
- creates over 2,200 jobs annually; and,
- with \$58,449 of value added per job.

For every external dollar of labor income generated by:
the UW Research enterprise,

- another \$3.08 of labor income and taxes generated in the state;
- the research enterprise generates over \$78 million of value added for the state annually;
- nearly 1,100 jobs; and,
- value added of over \$70,000 per job.

Nonresident student tuition, fees, and expenditures generates:

- over \$40 million annually in state economic activity, and;
- creates nearly 1,000 jobs.

UW's Agricultural Extension and Experiment Stations:

- generate over 40 jobs; and,
- nearly \$2 million annually in value added.

Economic Impacts – the University of Wyoming as a partner in development

Michael Porter writes that competitiveness is “not about having a low-cost labor force, the largest share of exports or even the fastest economic growth. It is about **creating the conditions under which companies and citizens can be the most productive so that wages and returns on investment can support an attractive standard of living.**” (2006 Council on Competitiveness Report, *Where America Stands*). Meaningful economic development requires investing in the best research infrastructure for your area, exploring the best markets to develop products and innovate for your state, and creating the best climate and quality of life for inventors and productive workers.

The University of Wyoming impacts Wyoming's economy through its attraction of external funding that flows to the state – this is funding, and expenditures that would not come to Wyoming were it not for UW. In technical terms, this means that when we report direct economic impacts, these are impacts that would not accrue to the state “but for” the University of Wyoming. And UW's impact on the economic development of the state is much broader than just technical economic impacts. We refer to the broader impacts UW has on the economic environment of the state as it's “economic footprint” to highlight that UW plays a role not just in attracting and spending money that otherwise would not flow to Wyoming, but that through providing broad access to educational opportunities continuously working with our communities to solve problems and create value for the state, UW does much more than just generate money for Wyoming. We work with our state to provide the basis for long-term, high-quality economic development.

This study outlines the broader economic impacts resulting from UW's ability to attract external funding – we call this the economic footprint of the University of Wyoming. It is more than that however, this study also outlines the engagement impact UW has with Wyoming citizens. Our footprint narrative is a result of working with university units supporting UW entities across the state, to inventory activities that enhance Wyoming's business, creative, and cultural development and include service to communities, research directly impacting Wyoming communities and businesses, and educational opportunities designed and geared towards the needs of Wyoming residents. No doubt this narrative misses some activities, but it is our hope the exercise of collecting these data will provide our state's policy makers with a relatively complete catalog of the astounding array of engagements UW, through its staff, faculty and students, have with our communities in every part of Wyoming. In this document "community" is a dual use word meaning both a geographic location and a community of people, for example, kindergarten teachers engaged somehow with UW. This economic footprint narrative catalogs hundreds of examples of UW's engagement with Wyoming stakeholders. **For example, in the last year, a small sampling of UW's service to the state includes:**

- 100 projects done by the Agricultural Experiment Stations in direct response to Wyoming producer requests statewide;
- 385 people who completed their UW degrees across the state through Outreach in Class of 2013;
- numerous projects supporting state policy, business, and agricultural needs, including the impact of prolonged droughts on the state's forested lands, enhanced oil exploration methods, CO₂ utilization and sequestration, and tools for assisting Wyomingites with PTSD and Alzheimer's disease;
- a summer dinner and seminar series at the UW-National Park Research Center each week highlighting UW's research that averages 100 patrons weekly;
- Saturday University, which brings UW's core activity – faculty teaching students – directly to Wyoming residents throughout the state;
- service to numerous and varied state professional associations, including the Wyoming Business Alliance, the Wyoming Press Association, the Wyoming Water Association, the State Early Childhood Education Advisory Board, and the Governor's Advisory Board on Substance Abuse and Violent Crime to name a few; and,
- community service on multiple boards and service organizations in our communities around the state.

UW's staff, students, and faculty view themselves as partners with our communities across Wyoming in supporting the long-term economic basis for growth, development, and a rising quality of life and increasing prosperity. What we do, in collaboration with our stakeholders around Wyoming, provides jobs, creates economic value, increases human capital and citizenship, and enhances the viability of communities for the long term and makes for a more livable Wyoming.

Table of Contents

Can One University Make a Difference? UW Can.	5
Economic Impacts of the University of Wyoming	6
Instruction-based impacts	7
Extension and the Agricultural Experiment Stations	8
Research impacts	10
Athletics	10
Grand Total and Summary of Economic Impacts	11
Economic Footprint and Contribution to Economic Development	14
Human Capital Creation	16
Broader Social Benefits of Education	23
Alumni	28
Investing in Research	30
Business Resources Network	31
Spin-Outs and Startups	32
Wyoming Technology Business Center	32
Research Products Center	33
Wyoming Entrepreneur Small Business Development Centers	34
Procurement Technical Assistance Center	35
Market Research Center	36
Manufacturing-Works	36
Wyoming SBIR/STTR Initiative	37
Wyoming INBRE	37
Wyoming EPSCoR	38
WYGISC	39
College of Law	40
College of Engineering and Applied Science	41

<u>College of Business</u>	<u>45</u>
<u>College of Health Sciences</u>	<u>48</u>
<u>College of Agriculture and Natural Resources</u>	<u>50</u>
<u>UW Art Museum</u>	<u>56</u>
<u>American Heritage Center</u>	<u>57</u>
<u>College of Education</u>	<u>58</u>
<u>Outreach School</u>	<u>62</u>
<u>UW Libraries</u>	<u>69</u>
<u>Haub School of Environment and Natural Resources, Ruckelshaus Institute</u>	<u>70</u>
<u>School of Energy Resources</u>	<u>77</u>
<u>College of Arts and Sciences</u>	<u>78</u>
<u>Athletics</u>	<u>95</u>
<u>Degrees Offered at the University of Wyoming</u>	<u>97</u>

Can One University Make an Impact? UW Can.

UW is the state's sole baccalaureate and graduate degree-grant institution of higher education. It brings both land-grant and flagship values to Wyoming. One of its goals is to apply learning through scientific, engineering and creative activity of the faculty, staff and students with the nation's broader intellectual community to problems and issues that are relevant for people in this state. Through this, the university creates intellectual value through teaching/learning, research and engagement with businesses and citizens in Wyoming and beyond. As a result, communities are supported, businesses are built and jobs created all raising the quality of life for our citizens.

UW is the link between communities and businesses and the broader collection of disciplines on campus that represent national and international scientific and creative endeavors across this nation and internationally. There is what anthropologists identify as a reciprocity relationship between the university and communities representing this state. We depend upon the generosity of the state and the state depends upon the intellectual development generated by the institution. That reciprocity relationship is fundamental to the land-grant mission and vital to its success and the broader development of communities and businesses in the state. UW is itself an economic engine, employing a highly skilled workforce, purchasing commodities and services, and providing a vital service to students and businesses in the region. This creates a multiplier effect spanning the state. But the impact of UW reaches beyond re-spending effects of the UW economic engine. Ultimately the scholarship generated and available to students and businesses produce more economic value in the form of returns on investment, employment, and enhancing community development. Estimating the long-term benefits of education provided by UW to its students is well beyond the scope of this study, these benefits are apparent everywhere and are huge. However, we can at least identify the footprint this long-term impact has and the shorter run impacts the university has on Wyoming's economy as a result of the economic engine which is UW. While we cannot catch every economic relationship we can try to describe the largest ones. This is the goal of this report.

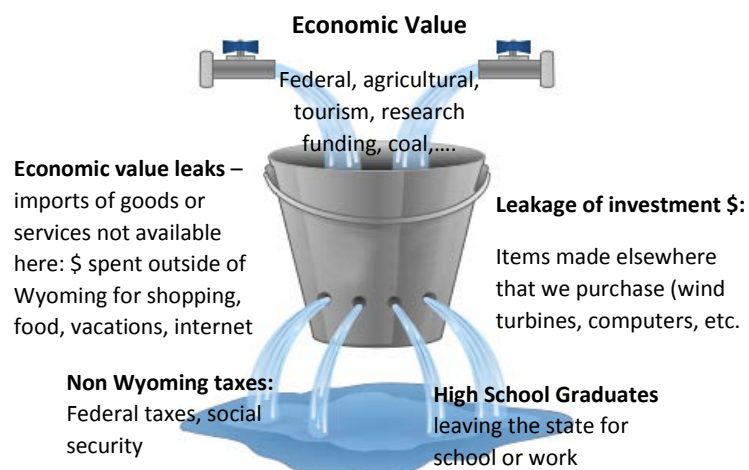
This study evaluates the economic impact of the University from two frameworks explained below:

- The economic contributions of the university directly attributable to its expenditure of funding coming into the state as a result of the University of Wyoming's distinct activities. These contributions are the result of UW being in Wyoming, and **would not occur in the state but for UW**. These include direct expenditures by nonresident students, visitors, external research funding, spin-outs and startup businesses, and other funding directly resulting from UW's activities. **Importantly, they do not include any funding provided by legislative appropriation.**
- The broader contributions made to the state via increasing educational attainment and human capital, enhanced knowledge through research, activities undertaken by UW faculty and staff in response to state stakeholder requests, and other broad educational, cultural, creative, business, and economic activities that contribute to our both geographic and groups of similar interest.

Short Term Growth - Economic Impacts of the University of Wyoming

The University plays an important role in economic growth both in the long- and short-run. The institution generates spending through instruction, extension and outreach, student spending, and research. Every year the institution brings people in from out of state in the same way the State's other major economic engine. People come to Wyoming, and specifically to UW expressly to see athletic and cultural programs. This report tracks the impacts of the largest source of non-Wyoming dollars attached by UW on the Wyoming economy.

Wyoming's economy, like all states, is driven by economic activity within the state and by economic value purchased by individuals and firms outside of the state. Economic impact analysis – like this one – attempts to track economic flows into the state and nets out economic outflows (leakage). The economy can be visualized as a bucket (Figure 1). Economic value flows into Wyoming as commodities are exported or when visitors spend money. Economic value leaks out of the state through federal taxes, imports of goods or services not available here, or waste and inefficiency. As long as dollars captured (the inflow) are greater than dollars leaked out (the outflow), there is economic growth.



It is important to understand that sources of funding originating within the state and used within the state do not necessarily “grow the economic pie.” This is especially true with research funding which is awarded to the university from Wyoming state agencies. The sources of some state funds are not always direct; for example state agencies receive federal funds which are in turn are awarded to UW where the work is completed. These are called federal pass through funds and they are considered external dollars. Also, UW receives millions of dollars from industries, the source of these funds are especially difficult to track, but the majority should be considered as external to the state. This does not mean that these funding sources, both public and private, are not important – they are of course, vitally important to the university and the state. **Not including these funds however, makes this analysis more conservative.** To be sure the state funding provided to the university that are outside of the block grant are highlighted in importance, some of these activities are discussed later in this study. **Because they are internal to Wyoming, those funds easily identified as provided by the state legislature and agencies are not included this analysis. Our intent to analyze the economic impact created by the University of Wyoming through its acquisition of external funding (not from state government) on Wyoming. As will be demonstrated this impact is substantial.**

Like businesses, the University of Wyoming provides a source of captured dollars that otherwise wouldn't come to or remain in Wyoming. This analysis focuses on two measures of that value, **jobs and value added**. For the purposes here, they are defined as:

jobs: the job count, both full-time and part-time;

value added: labor income proprietor income, other property income and tax revenue.

This section of the report will summarize these major sources of value, generating economic activity in state produced by the University of Wyoming.

Instructional-Based Impacts

For an educational institution the most obvious source of new dollars into the state is non-resident tuition. Programs offered at UW attract students from all over the country and internationally to study here at both the graduate and undergraduate level. Gross tuition revenues topped \$51 million in fiscal year 2013. Netting out the accounting value (the actual value of scholarship outlays and tuition discounts) from scholarships and fee waivers brings net tuition revenues in fiscal year 2013 to almost \$40.8 million.

Table 1: Out of State Tuition and Fee Revenue

	<i>Revenue</i>		
	FY2011^b	FY2012	FY2013
Tuition Regular Term	\$50,318,878	\$49,987,361	\$51,857,623
Differential Tuition - Law	0	\$1,254,641	\$1,368,727
Differential Tuition - MBA	0	\$140,403	\$182,866
Differential Tuition - Pharmacy	0	\$1,128,367	\$1,094,329
Total Tuition Revenue	\$50,318,878	\$52,510,772	\$54,503,544
Tuition Reduction Waivers	\$(3,978,710)	\$(1,349,902)	\$(1,652,036)
Total Scholarships	\$(15,283,519)	\$(14,539,594)	\$(14,199,286)
General Fund Scholarships	\$2,138,496	\$2,138,496	\$2,138,496
Institutional Scholarships	\$(13,145,023)	\$(12,401,098)	\$(12,060,790)
Net Revenue	\$33,195,145	\$38,759,772	\$40,790,718

a. Actual revenue and total scholarships from UW PISTOL reports

b. Differential tuition was included in "Tuition Regular Term"

The remainder of nonresident net tuition **dollars circulate and multiply in the regional economy at large, generating re-spending effects in the state economy that would not have been here otherwise.** Table 2 summarizes the total impacts on jobs and income from tuition and student expenditures. **Non-resident tuition and fees generate almost \$38 Million in value added to the state and 887 jobs, which roughly averages \$42,000 per job.**

Similarly, students spending on living expenses and personal items also generate jobs and income. Based upon UW's published estimates of student expenditures, **student spending for various personal**

items and necessities generates almost \$3.5 Million in valued added and 87 jobs in the broader economy on an annual basis.

Much of this spending is in southeast Wyoming, and some will “leak” to the Front Range, mostly Colorado. This leakage is either direct through student expenditures in the Front Range area, or indirect because local retailers source their items or service for purchase from the Front Range or otherwise out of state.

Table 2: Jobs and Value Added due to Nonresident Student Tuition and Fees

	Jobs	Total Value added
Tuition	887	\$37,808,131
Student Expenditures	88	\$3,457,928

Extension and the Agricultural Experiment Stations

Instruction at the University occurs not only in the classroom but also off campus, in and around communities throughout the State. Extension and Outreach by University departments and centers are a core part of the land-grant mission. While most of this engagement is funded through State appropriations and contracts or as part of the research enterprise (discussed below), a portion of the salaries are still funded through Federal funds. The following table summarizes jobs, payroll, and Federal contribution for both Extension and the Agricultural Experiment Station Centers. The percent of Federal funding ranges from zero to over fifty-five percent. The State average is 11.5%, with \$705,846 from Federal formula funding. This latter amount represents the direct impact at a state level.

Table 3: Employees and Payroll in State Extension Offices and Agricultural Experiment Station Centers

<i>Location</i>	<i>No. of Employees</i>	<i>Total Payroll</i>	<i>Average Federal Contribution</i>	<i>Pct Federal</i>
<i>Albany County</i>	14	535,229	4,725	0.9%
<i>Big Horn County</i>	3	102,177	4,725	4.6%
<i>Campbell County</i>	3	104,441	-	0.0%
<i>Carbon County</i>	4	132,745	4,725	3.6%
<i>Converse County</i>	3	74,593	6,085	8.2%
<i>Crook County</i>	2	89,016	-	0.0%
<i>Fremont County</i>	5	196,079	59,020	30.1%
<i>Goshen County</i>	4	501,738	90,121	18.0%
<i>Hot Springs County</i>	2	100,776	-	0.0%
<i>Johnson County</i>	2	105,984	10,326	9.7%
<i>Laramie County</i>	6	131,274	23,962	18.3%
<i>Lincoln County</i>	5	171,248	10,311	6.0%
<i>Natrona County</i>	8	209,456	28,372	13.5%
<i>Niobrara County</i>	2	170,303	93,989	55.2%
<i>Park County</i>	4	715,158	31,386	4.4%
<i>Platte County</i>	3	152,301	54,185	35.6%
<i>Sheridan County</i>	4	352,386	23,202	6.6%
<i>Sublette County</i>	3	156,937	-	0.0%
<i>Sweetwater County</i>	3	81,460	7,587	9.3%
<i>Teton County</i>	2	118,356	-	0.0%
<i>Uinta County</i>	5	237,077	45,579	19.2%
<i>Washakie County</i>	4	161,505	18,618	11.5%
<i>Weston County</i>	4	189,447	66,982	35.4%
<i>Wind River Res</i>	4	76,486	56,924	74.4%
<i>State Offices</i>	23	1,291,634	68,022	5.3%
<i>Total</i>	122	6,157,806	708,846	11.5%

Economic impacts are presented in Table 4 below. The primary source of re-spending comes from employee payroll in the communities in which they live. The federal **commitment supports 18 jobs both in Extension and the broader community and generates over \$744,753 in value added.**

Table 4: Economic Impact of UW Extension and Agricultural Experiment Stations

	Jobs	Value added
UW Extension	18	\$744,753

Research Impacts

The University of Wyoming's other primary mission is to produce scholarship which creates knowledge or new applications of existing knowledge. UW research programs are driven by the broader set of academic professions represented on the campus and by the needs of the State. Research at a land-grant university focuses on solving problems encountered by a served constituency and enhancing their quality of life. In addition, the flagship research mission is driven by knowledge creation. **According to the Office of Research and Economic Development UW's research enterprise generates over \$96 million in grants and contracts. This in turn generates almost \$164 Million in value of sales across the state, representing gross revenues to businesses in Wyoming.** Of this \$96 million spending over \$19 million is paid as salaries at UW.

Table 5: Research and Economic Development Office Funding

	<i>Federal</i>	<i>Non-Federal*</i>	<i>Total</i>
<i>Salaries & Benefits</i>	\$19,133,792.36	\$22,758,935.67	\$41,892,728.03
<i>Other Costs</i>	\$77,354,177.32	\$24,402,146.76	\$101,756,324.08
<i>Total Costs</i>	\$96,487,969.68	\$47,161,082.43	\$143,649,052.11

**Non-federal include industrial and research funded by private foundations*

Total value added generated by UW spending and businesses across the state total \$78 Million, a value added multiplier of 4.08. Along with the bump in value added are 1,073 created jobs. Average income and tax contribution per job is over \$72,000.

Table 6: Economic Impact of Research and Economic Development

	Jobs	Value added
Research	1,073	\$78,086,720

Athletics

Athletics are always a major part of university life. It brings faculty and staff together with our students, alumni, and donors. Regional economic impacts of athletic events can be a large part of the overall economic impact of the university. Wyoming Athletics averaged over **\$3.2 Million in ticket sales last year**, with 65,328 tickets sold in three major sports plus the Wyoming State High School Football Championships. Football remains as the largest ticket draw among the sports events.

Table 7: Ticket Sales and Revenue, Major Sports and Wyoming High School Football Championships

<i>Season/Game</i>	<i>Sold</i>	<i>Student</i>	<i>Total Attendance</i>	<i>Revenue</i>
<i>Football</i>	35511	14386	70072	\$2,262,990
<i>Men's Basketball</i>	18378	17029	47935	\$759,250
<i>Women's Basketball</i>	7397	4189	18848	\$239,124
<i>HS Football</i>	4042	N/A	5282	\$40,857
<i>2012-13 Totals</i>	65328	35604	142137	\$3,302,221

Revenue generation from athletics does not stop with ticket sales. **Another \$2.3 million in contract media rights and marketing is generated annually. Also, these activities generate over 1,000**

jobs and \$5.1 Million in value added. Ticket revenues generate \$78,905 in value added for every 1,000 tickets sold in the Wyoming economy. Similarly, every 1,000 tickets generate 1.85 jobs.

Table 8: Economic Impacts of Athletics

	Jobs	Value added
Athletics	1,073	\$5,154,721

A related activity by Wyoming Athletics supports the Wyoming State High School Football Championships. These activities generated \$40,857 in ticket revenue. That ticket revenue generated 1 job and \$70,733 in value of sales in the State, and of that \$40,125 was new value added.

Summary of Economic Impact Analysis

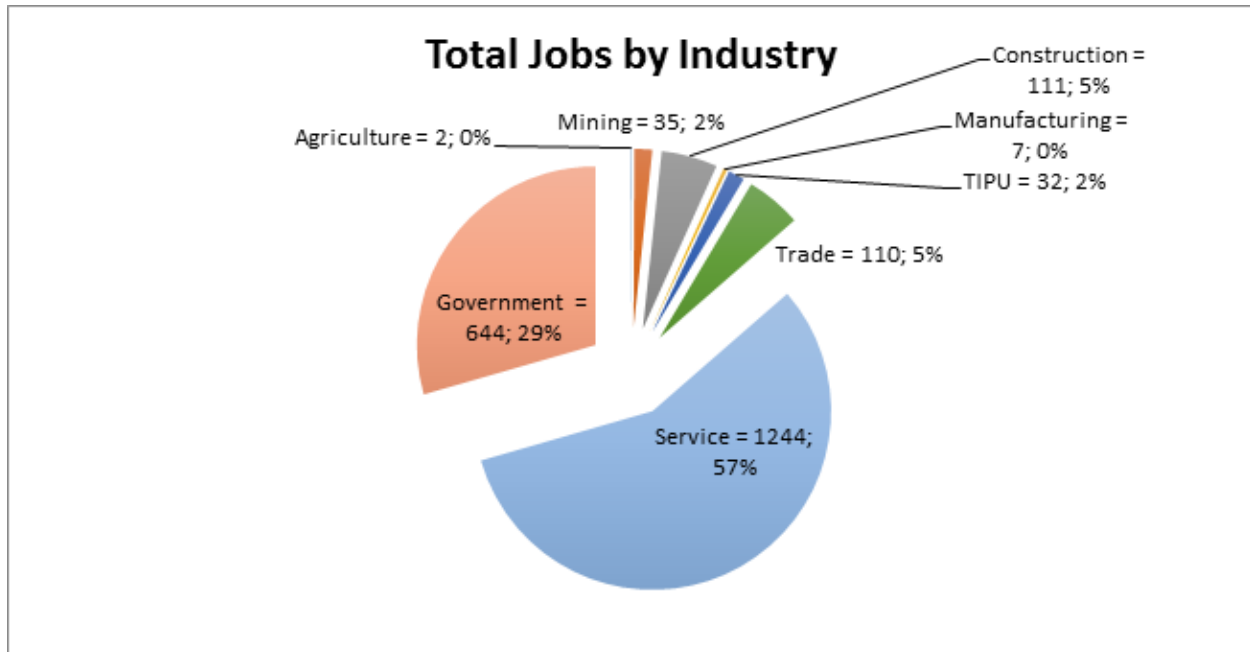
These major activities at UW, funded by external sources, generated over 2,209 jobs and \$129 Million in value added to the state annually. This represents an average income per job of \$58,449. The large research component is typical for a land-grant university.

Table 9: Grand Total, Economic Impacts of Major Funding, UW

	Jobs	Value added	Value Added per job
Tuition	887	\$37,808,131	\$42,618
Student Expenditures	88	\$3,457,928	\$39,250
UW Extension	41	\$1,817,877	\$44,195
Research	1,073	\$78,086,720	\$72,774
Athletics	121	\$5,154,721	\$42,618
Total Impacts	2,209	\$129,112,189	\$58,449

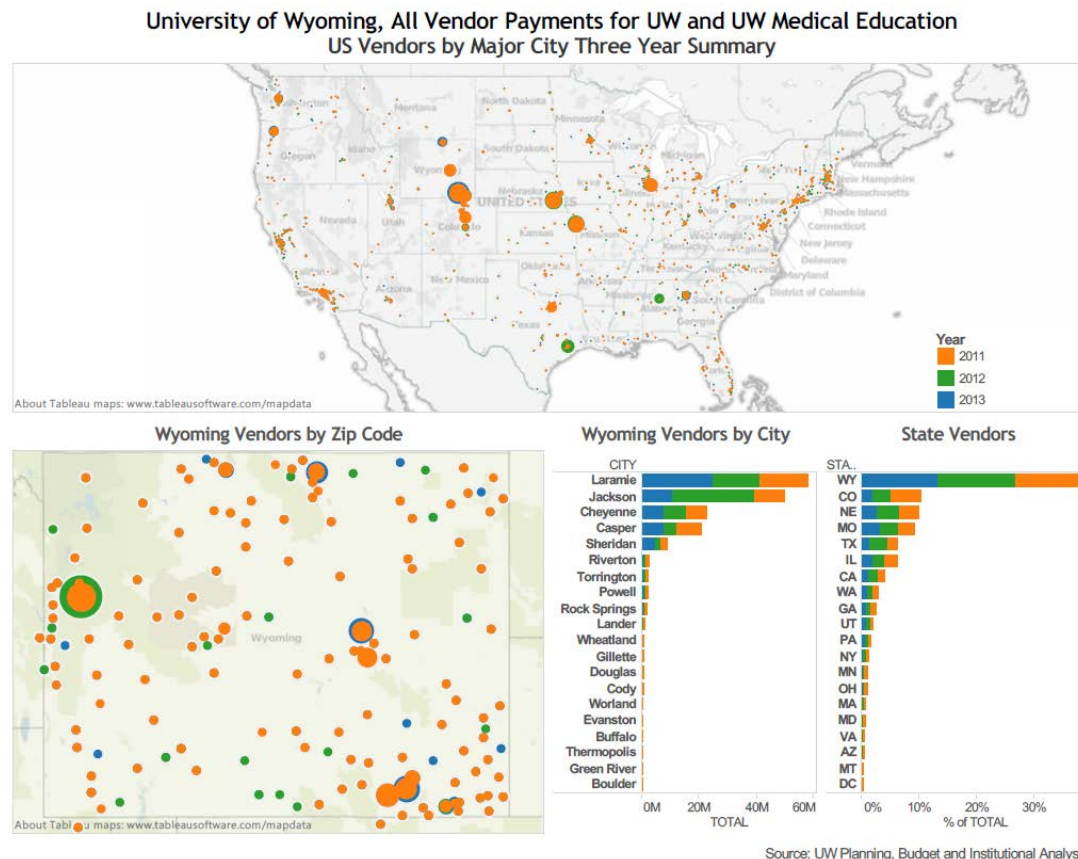
The spending represented by these impacts is distributed across a variety of industries, as shown in Figure 1. Service (57%) and government (29%) dominate the expenditure pattern from University spending. Construction is third with 5%.

Figure 1: Jobs by Industry, UW funding impacts



Another interesting visualization of UW's impact on economic activity is Figure 2, which shows the volume and location of vendor payment for UW and UW Medical Education from 2011 to 2013. This mapping shows that the vast majority of our vendor interactions use Wyoming vendors when compared to any other state.

Figure 2: Vendor Payments



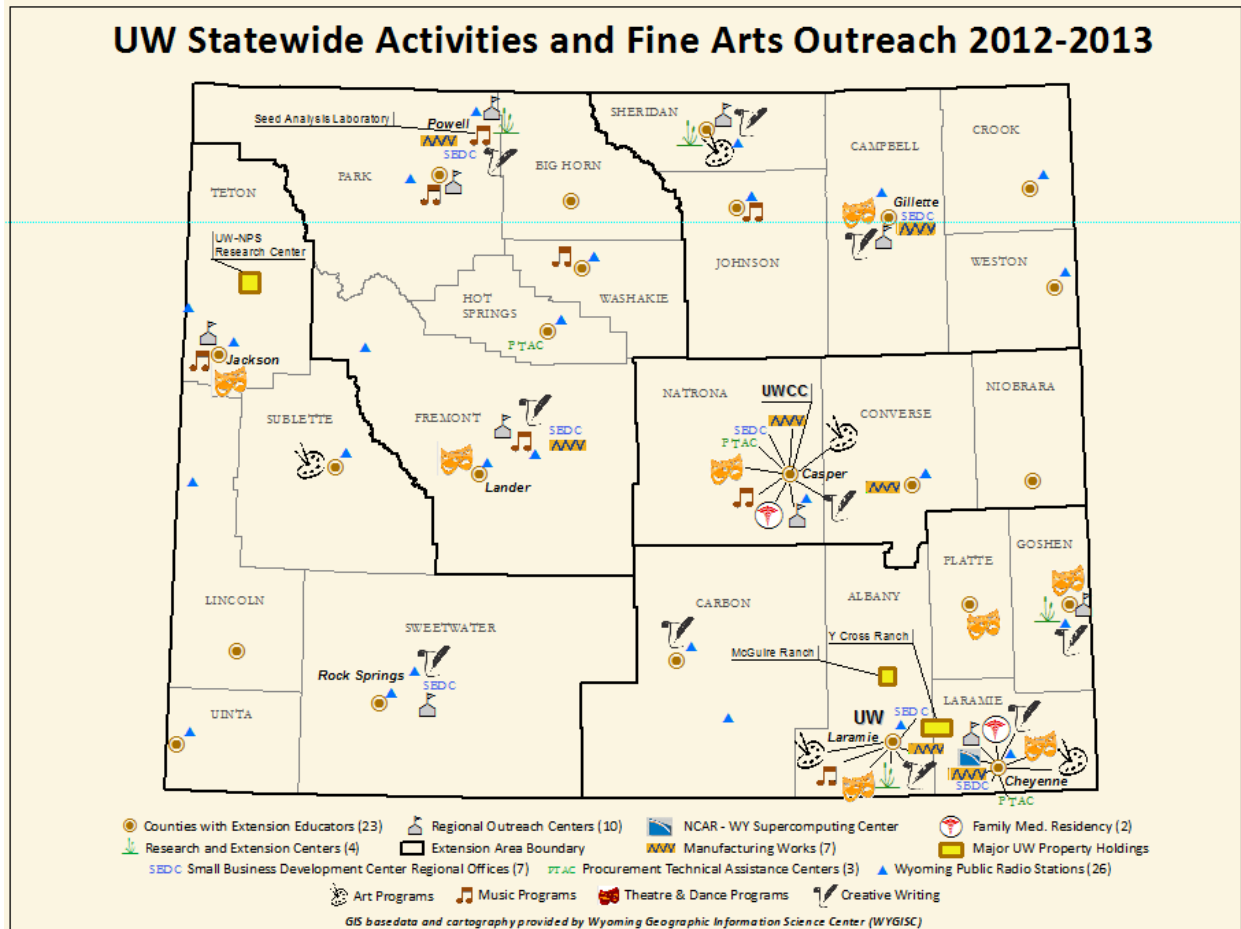
This analysis illustrates the role that the University plays in generating additional economic activity in Wyoming.

It is important to qualify this analysis by once again highlighting there is a difference between economic development/diversification and economic growth. A substantial amount of work on the campus focuses on the former. The mission of a University, and certainly this University, is building human capital and new ideas generating new products and services and facilitate viable and quality communities. Economic development and diversification can include growth but is more focused on enhancing quality of life for residents in Wyoming communities. It is important that growth be maintained and that the economic "pie" is expanding and as illustrated above – and UW is a major contributor to that growth. However, it is equally important that development improves the lives of all residents and that growth is not the only metric. Regardless of the amount of activity generated in short term spending; the long term development of Wyoming is critically dependent upon the human capital and entrepreneurship developed on campus.

Long Run Economic Development – The Economic Footprint of UW.

Through a staggeringly large array of activities, outreach, engagement, and dialogue with Wyoming citizens, UW serves the state by listening to its needs, engaging in conversations, and cooperatively providing services, research, education, and cultural enrichment activities across the state. From open and free business startup guidance to animal disease testing to service to our state's professional organizations, UW faculty and staff truly view our institution as Wyoming's University.

Figure 3: Aggregated map of UW activities throughout Wyoming

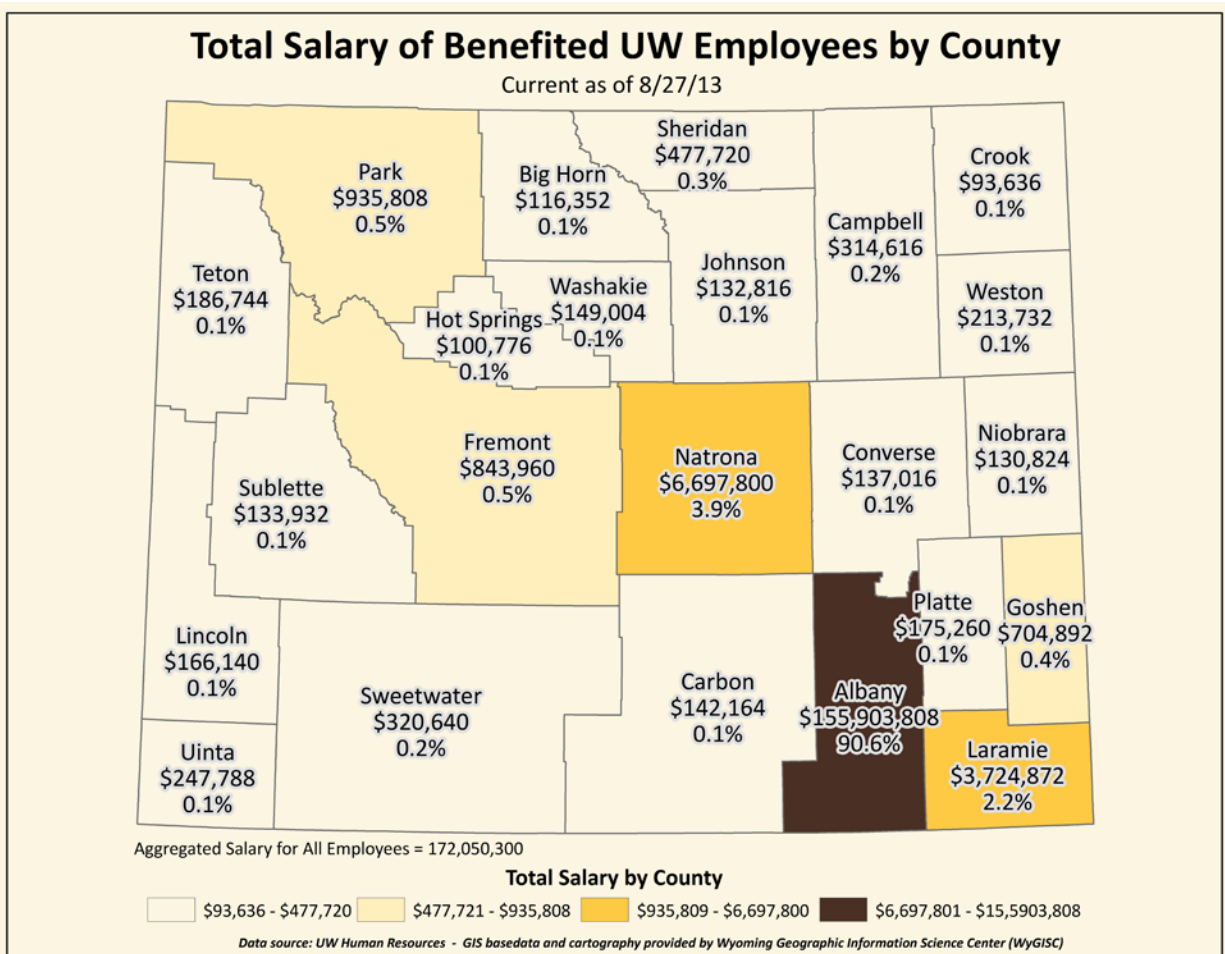


UW faculty, staff, and students live, work, and are part of your communities in every county across the state, and on the Wind River Reservation.

Table 10: Headcount and Payroll, UW statewide

COUNTY	Head Count	Total UW Payroll
Albany	2,694	\$155,903,808
Big Horn	3	\$116,352
Campbell	7	\$314,616
Carbon	4	\$142,164
Converse	3	\$137,016
Crook	2	\$93,636
Fremont	19	\$843,960
Goshen	15	\$704,892
Hot Springs	2	\$100,776
Johnson	3	\$132,816
Laramie	70	\$3,724,872
Lincoln	4	\$166,140
Natrona	118	\$6,697,800
Niobrara	2	\$130,824
Park	21	\$935,808
Platte	3	\$175,260
Sheridan	10	\$477,720
Sublette	3	\$133,932
Sweetwater	8	\$320,640
Teton	4	\$186,744
Uinta	5	\$247,788
Washakie	3	\$149,004
Weston	4	\$213,732

Figure 4: UW aggregate benefited employee salary by Wyoming county and as percent of total county income, as of August 2013



Investing in Education - Human Capital Creation

Human capital accumulation increases the productivity of a region and enhances economic development. Investment in research and education creates human capital both directly by producing graduates, and indirectly by disseminating knowledge which in turn can be used to increase human capital. According to Abel and Deitz (New York Federal Reserve, 2012) "While human capital covers an array of knowledge and skills, a college degree represents a significant block of human capital—and one that is easily quantified."

There has been a vast amount of research documenting the importance of building human capital to economic development. Human capital – the actual and potential skills, abilities, knowledge, and productivity of a person – is built and enhanced by investment in education. The quality of human capital is increasingly seen as one of the drivers of economic growth, both in attracting new firms and in attracting financial capital that supports entrepreneurship and new business creation. Clearly this is important in itself and an important role played by UW.

Human capital accumulation contributes to more robust economic activity in numerous ways. Human capital increases individual-level productivity, innovation, and idea-generation. Human capital

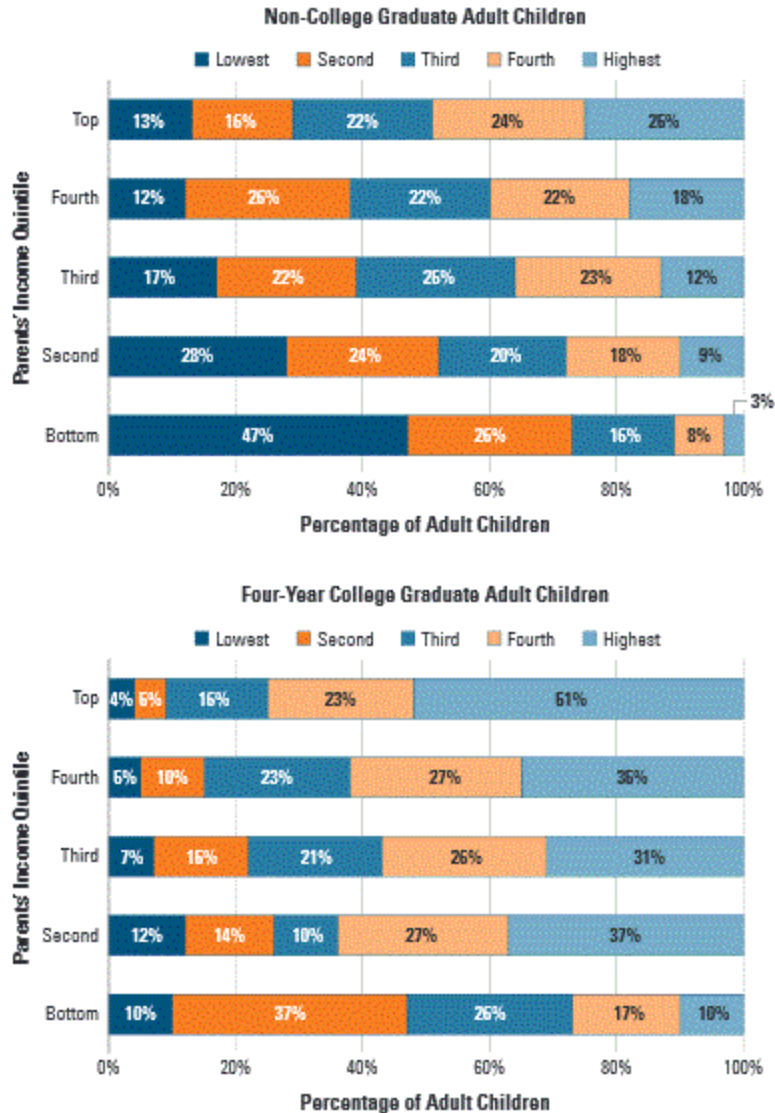
accumulation also facilitates “knowledge spillovers,” knowledge and skills transferred from one individual to another. Studies have shown that regions with higher levels of human capital also tend to have higher wages, more innovation, and greater prospects for “reinvention” as the economy changes over time. One key to increasing human capital is the presence of colleges and universities. They employ a large number of high-skilled workers, and have the ability to raise local and regional human capital levels by producing educated, skilled labor and by engaging in their research enterprise.

In a recent post, “The Economic Value of Education,” (November 12, 2013) Jonathan Rothwell of the Brookings Institution points out that “A Georgia Tech **survey of patent inventors found that 92% had a bachelor’s degree...(and) almost all of the founders (92%) of the high-tech companies that have powered GDP in recent decades are college educated,** ...Thus, it is no surprise that macroeconomic research finds very large gains from education on economic growth”.

In Wyoming, 24% of the population 25 years old or higher holds at least a bachelor’s degree, compared to the national average of 28%. The post-secondary enrollment rate in Wyoming is 45% of all youths compared to 48% nationally (College Board, “Education Pays 2013”). The College Board’s annual analysis of the value of post-secondary education, “Education Pays 2013,” shows that the **median earnings of a person with a bachelor’s degree (and no other advanced degree) was \$56,500 in 2011,** which is over \$21,000 more than a person with a high school degree only. As workers age, the **trajectory of median earnings is much steeper for those with a bachelor’s degree** than those completing only high school – when they are 25-29 years old, the gap is 54%; when they are 45-49 years old, the gap is 86%.

State and local governments also reap multiple economic benefits from investing in post-secondary education. **Less funding is needed for income support programs, for example.** Of high school graduates 25 years old and above, 12% live in households that rely on the Supplemental Nutrition Assistance Program (food stamps), 11% live in households that rely on school lunch programs, and 24% rely on Medicaid. Only 2% of those with at least a bachelor’s degree rely on school lunch programs or SNAP, and 9% rely on Medicaid. Five percent of those with a bachelor’s degree or higher live in households in poverty; 14% of those with a high school diploma only do so. In 2012, the unemployment rate for those 25-34 years old with a bachelor’s degree or higher was 4.1%; for those with a high school degree only, it was 11.2%.

Economic mobility also is enhanced with educational investment – education brings income growth. Of those children whose parents are in the lowest 20% of income, only 10% of those who earned a bachelor’s degree stayed in the lowest 20%, while 47% of those without a bachelor’s degree remained in the lower bracket. Ten percent of those whose parents were in the lowest income quintile moved to the top 20% of income earners when they earned a bachelor’s degree; only 3% of those who did not earn a bachelor’s degree moved to the top 20% from the bottom 20%. Of adults with family income in the middle 20%, nearly a third of those with a bachelor’s degree moved to the top 20% income bracket, while only 12% of those with less than a bachelor’s did so.



Source: College Board, "Education Pays 2013"

UW students also contribute to the cultural and social life of the campus in Laramie and across the state. Over 3,000 of UW's students pursue their education in locations other than the Laramie campus, and 20% of them are nontraditional, meaning they are older and may have families. UW's students participate in co-curricular activities that serve their communities; they play in our orchestra and act in our plays; they are our student-athletes; they perform new, innovative, and ground-breaking research. The University of Wyoming is proud to be the university of choice for students from all across the state, the nation, and the world.

UW works to make a high-quality university education affordable, and provides extensive support services to students once they matriculate. We also work with our partners from the community colleges and Department of Education to provide information and resources for college-going. WYO4ed (www.WYO4ed.org) was developed by the Student Pipeline Committee of the University of Wyoming's Enrollment Management Group, comprised of staff from UW, Wyoming community colleges and the Wyoming Department of Education. The goal of the Student Pipeline

Development Committee is to improve the pipeline from K-12 to higher education in Wyoming, including offering a one-stop resource website that can be used as a database for pre-college activities in Wyoming. This resource provides information for K-12 students and parents to learn about higher education in Wyoming. The goal is to target low income, underserved and first-generation populations, and provide information and resources to anyone interested in higher education in Wyoming.

UW's Admissions Office annually reaches out to Wyoming's high school and transfer students presenting the University of Wyoming as a tremendous postsecondary education opportunity. The primary goal is to **personally connect with each Wyoming student and cultivate their pursuit of educational dreams at UW**. Outreach consists of frequent visits with students at Wyoming's 85+ high schools; implementing extensive promotional campaigns using the latest in print, electronic, web and social media technology; conducting specialized individual and large format on campus visit programs; awarding a competitive array of scholarships; and ensuring a successful student transition experience through student orientation programming. **These combined efforts contribute to the enrollment of over 1,600 new freshman and 1,100 new transfer students** (approximately 1,600 Wyoming resident students annually).

Figure 5: First-Time, First Year students from Wyoming, by county, entering class 2013

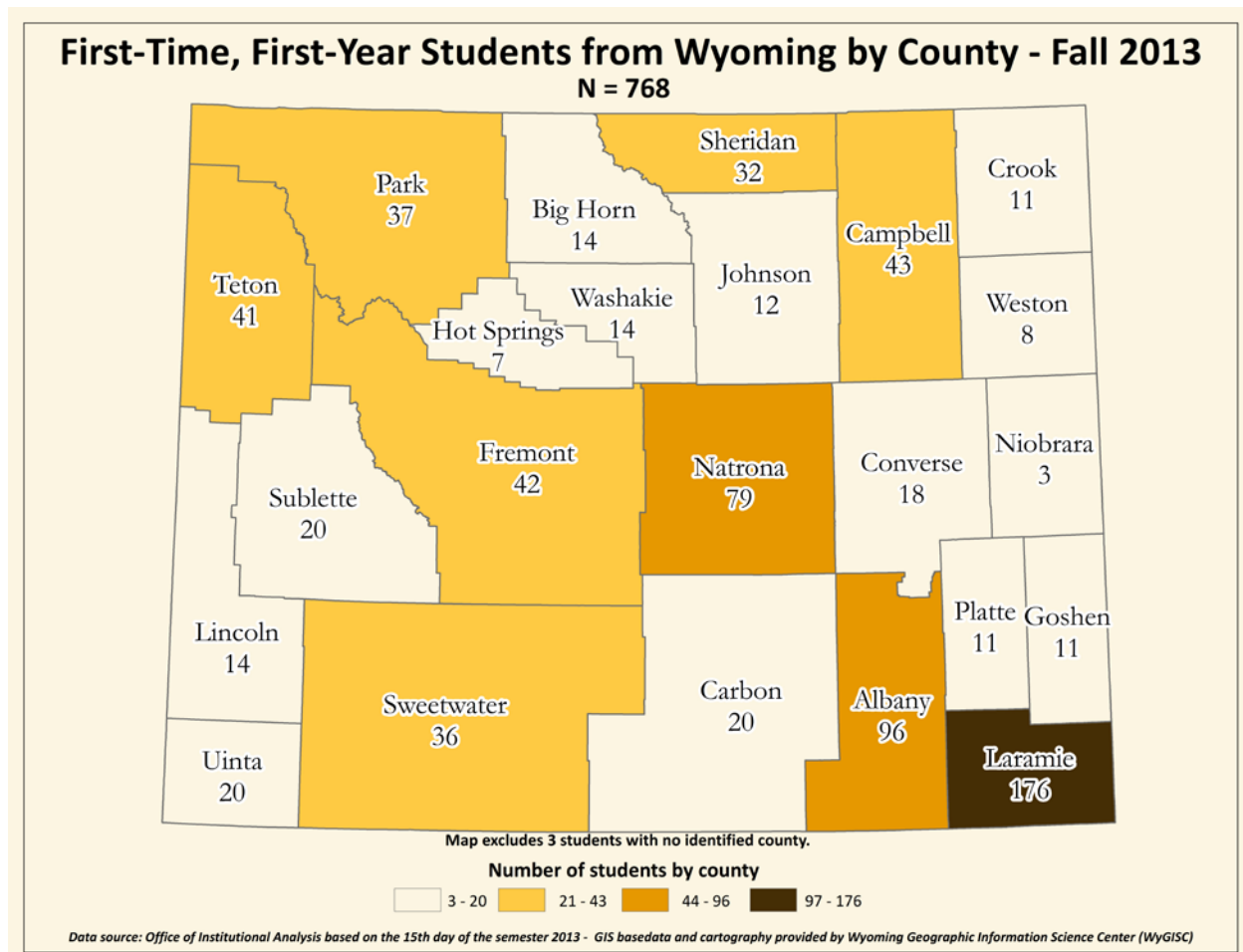


Figure 6: First-Time, First Year students by state, entering class 2013

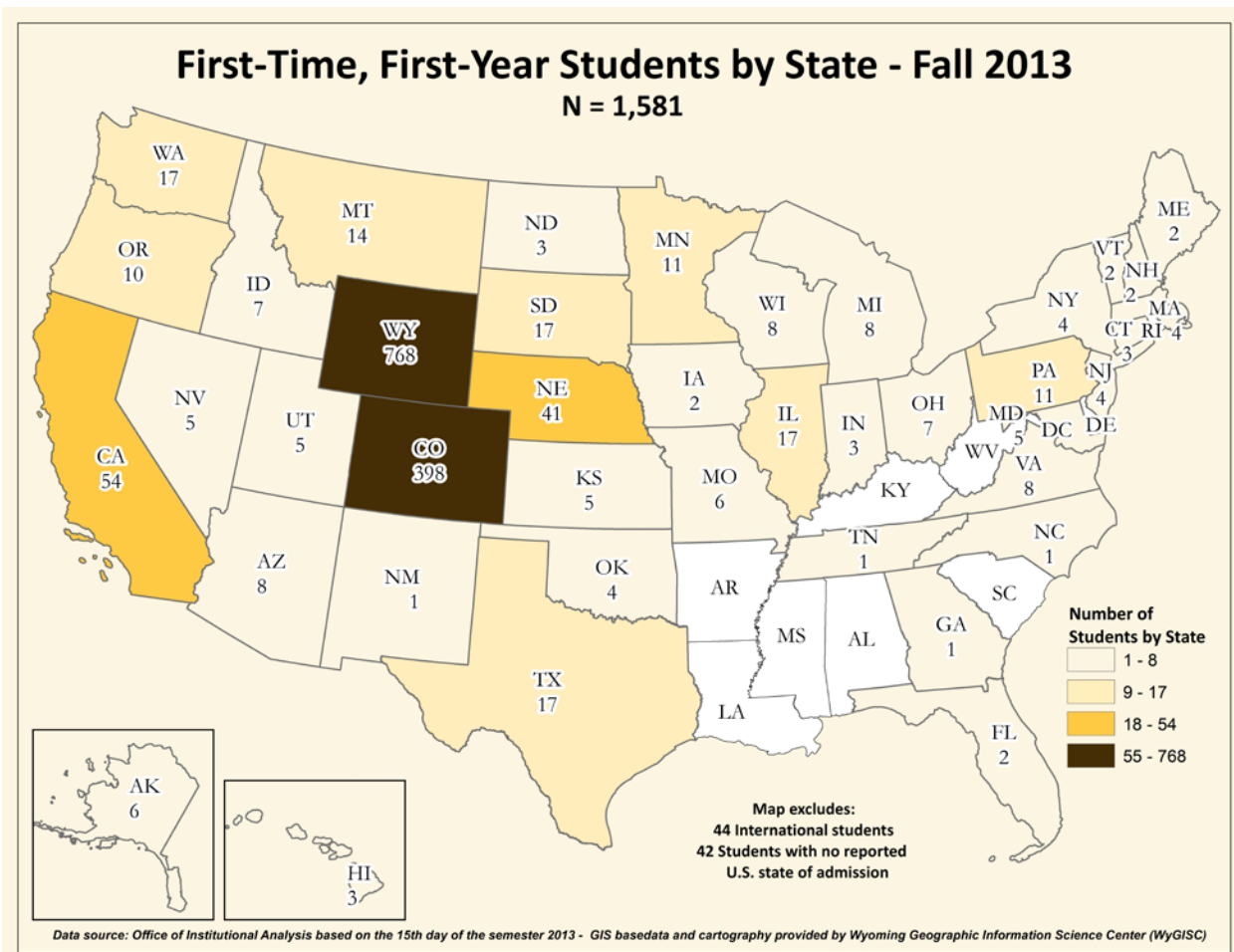


Figure 7: Financial Aid Snapshot – Wyoming Resident Students

Wyoming Resident Students

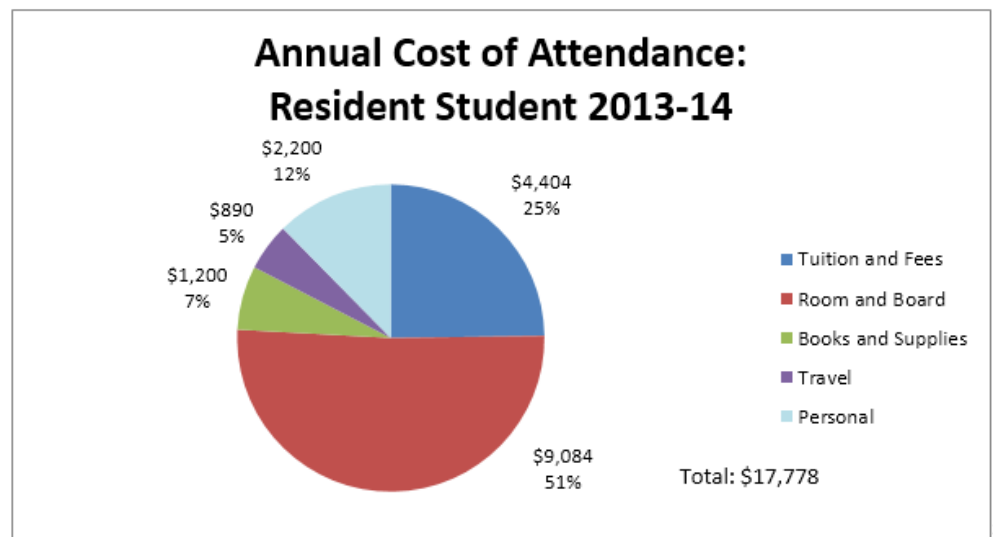
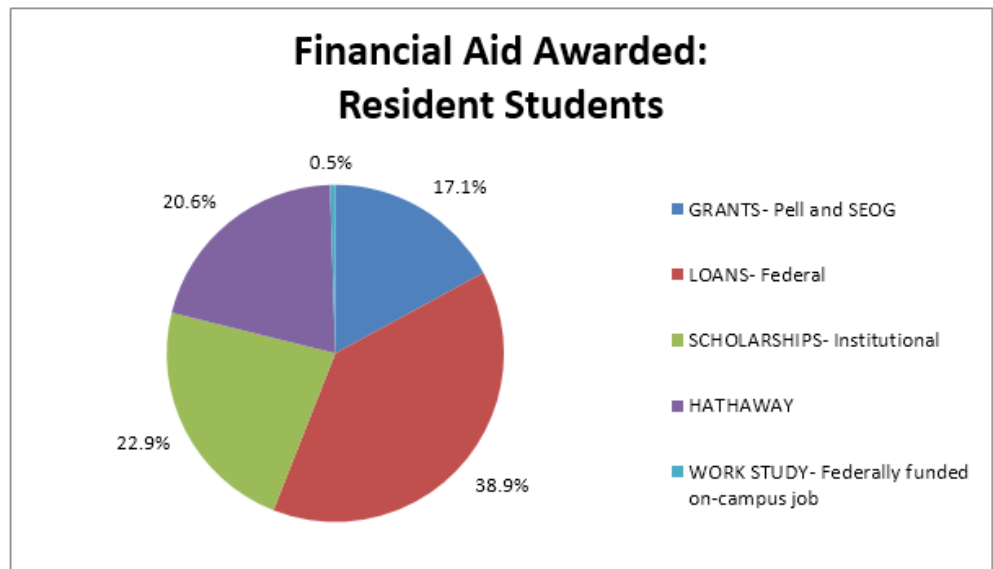
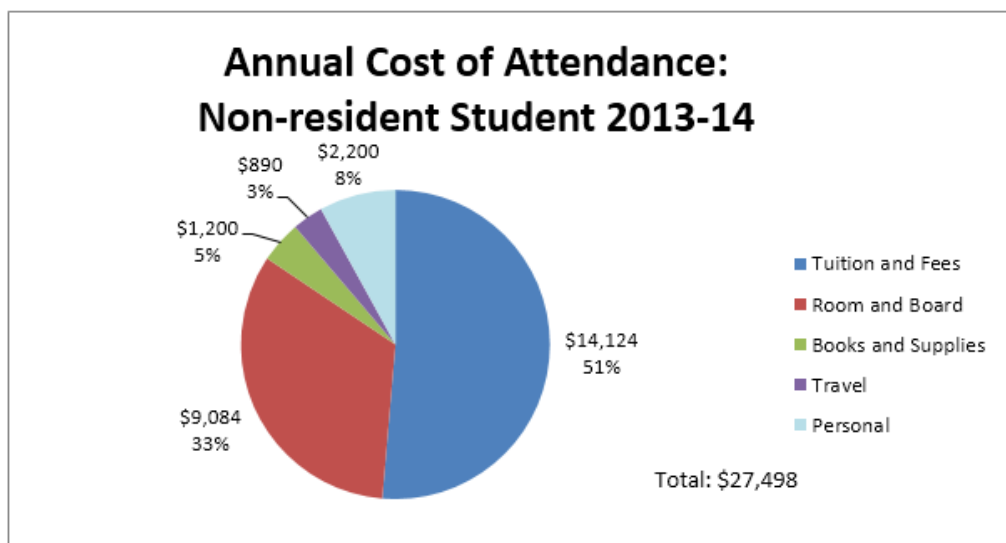
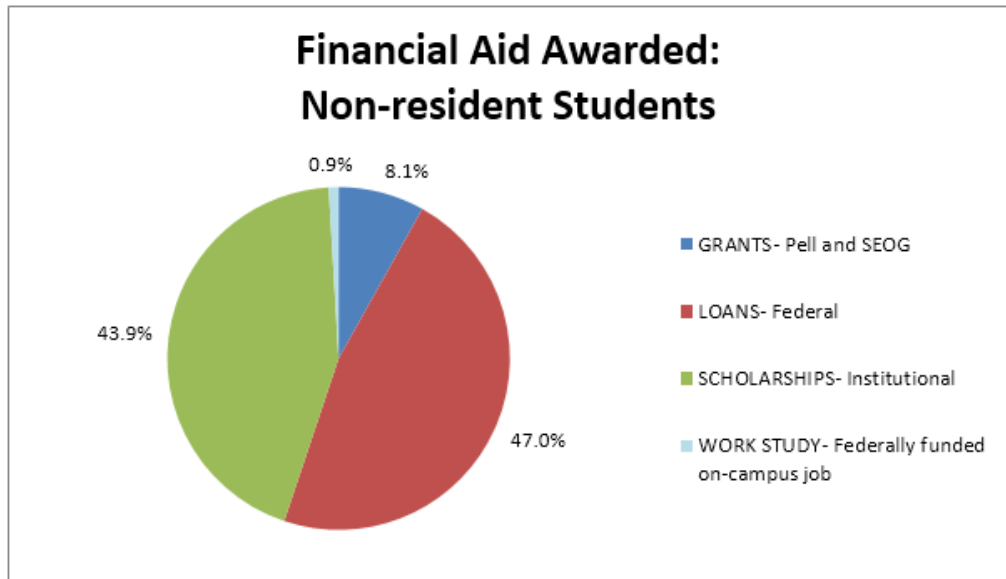


Figure 8: Financial Aid Snapshot – Non-Resident Students

Nonresident Students



Investing in Education – Broader Social Benefits

The benefits of education do not just accrue to an individual alone; as noted above, much value stems from the numerous social benefits known to positively enhance economic development. By the same token, some benefits of investing in education are not easily quantifiable yet very well documented.

According to the College Board's "Education Pays 2013" report, 85% of bachelor's degree holders age 25-34 years old report light, moderate, or vigorous exercise at least once a week, compared to 60% of those holding only a high school diploma. As noted above as well, there is a **well-documented link between health-related behaviors and educational attainment**. In addition, children who grow up in households with more education are less likely to be obese. Several public health economics studies show that obesity costs individuals significant lost productivity, wages, and higher medical and insurance costs. For example, Cawley and Meyerhoefer (The medical care costs of obesity: an instrumental variables approach. *J Health Econ.* 2012; 31:219-30) find that per capita medical spending was nearly \$3,000 per year higher for obese individuals than for individuals who were not obese.

Mothers with bachelor's degrees who are employed spend 51% more time on their children's activities than employed mothers who are high school graduates. For mothers with children under 3 years old, bachelor's holders who are employed spend 50 minutes per day on play and developmental activities with their children, while those with a high school diploma spend 30 minutes per day. There is a strong correlation between future earnings for children and the time they spend in early childhood with a parent in developmental activities.

Citizenship is also impacted by investing in post-secondary education. According to the National Opinion Research Center (2013), **45% of persons 25 years old and above who hold bachelor's degree report understanding political issues facing our world quite a bit or a great deal**, versus 21% of those holding a high school diploma only. According to the Bureau of Labor Statistics, **among bachelor's degree holders, 42% report volunteering for civic organizations and report volunteering a median of 52 hours per year**. 17% of high school diploma holders report volunteering for civic organizations and report volunteering for 50 hours per year. The U.S. Census Bureau reports that in the 2012 presidential election, **bachelor's degree holders between 25-44 years old voted at a rate 1.7 times higher than high school graduates** in the same age group (73% versus 42%). 81% of those 25-44 years old who hold bachelor's degrees are registered to vote, while 56% of those with high school degrees are registered to vote.

Some Wyoming students may have more difficulty imagining attending UW, or any university, because their families do not have a college-going tradition. The Office of Student Educational Opportunity in the Division of Student Affairs administers U.S. Department of Education grants designed to ensure effective college preparation, access to college, and **timely baccalaureate and doctoral degree completion among socioeconomically disadvantaged secondary school students as well as adults wishing to enter college after being in the workforce**. These statewide grants, totaling \$10,770,000 in federal and matching funds, **provide services to over 7,000 students throughout the state**.

Provided services are **designed to help participants overcome college access and success barriers experienced by students from low-income families whose parents did not attend college**. Services include assistance with academic preparation for competitive college admissions; extensive ACT practice and preparation; assistance with applications for federal financial aid and scholarships; services related to college and career choice; acclimation to a college environment and academic expectations through residential summer programs; laboratory and field research experiences; bridge programs;

opportunities to earn stipends and scholarships; and seminars on economic and financial literacy for both students and their families.

Investments made by the State in the education of our students pays long-standing dividends in human capital development, development of social capital benefits, and a strong foundation for our economy. Employers value UW graduates' work ethic, outlook, and skills, as illustrated by the recruiting activity of employers from across the country and the employment opportunities our graduates pursue.

Figure 9: Reported Employment of UW graduates and aggregated salary by Zip code and county nationwide, Class of 2013

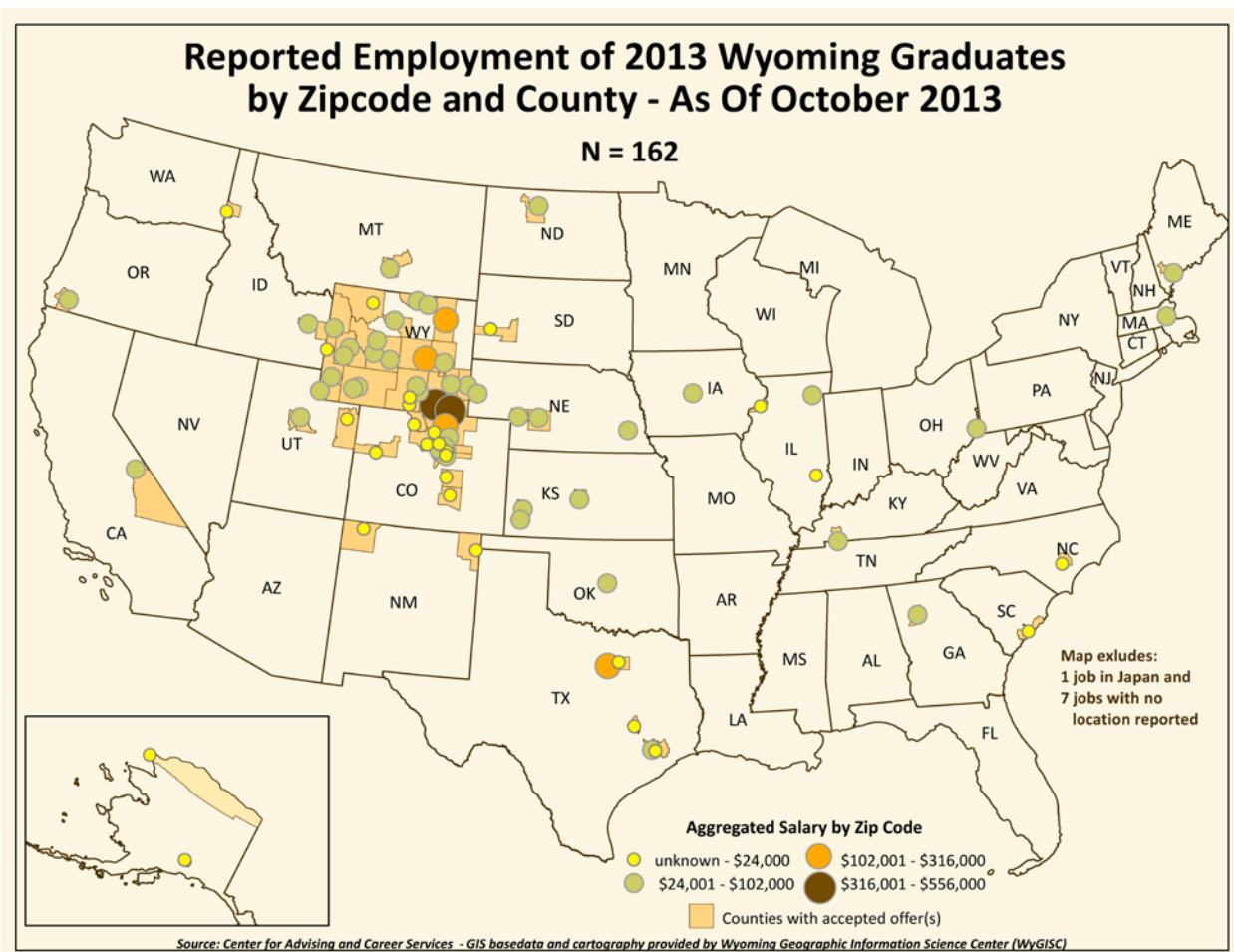


Figure 10: Reported Employment of UW graduates and aggregate salaries in Wyoming, Class of 2013

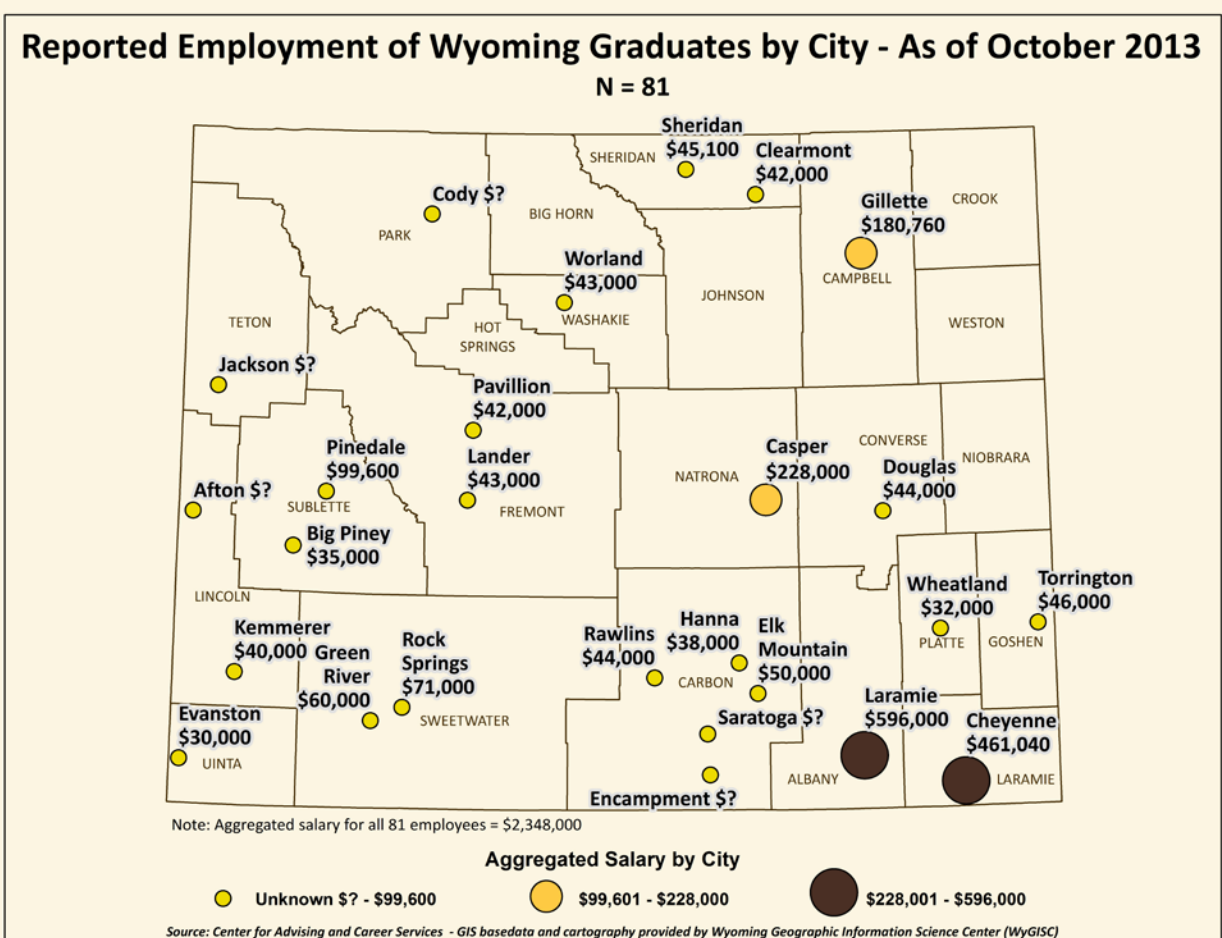


Figure 11: Employer visits to UW for recruiting, Wyoming employers, Academic Year 2012-13

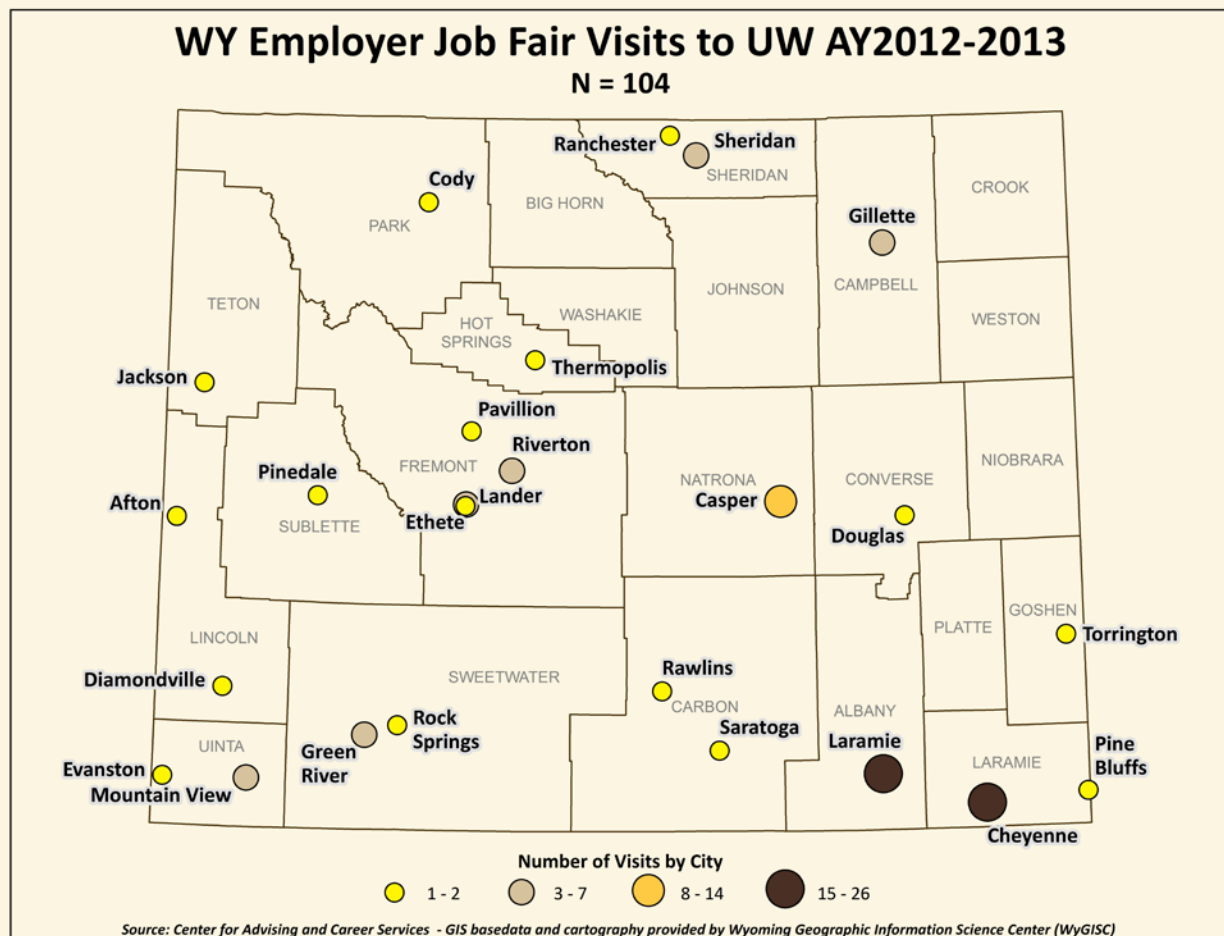
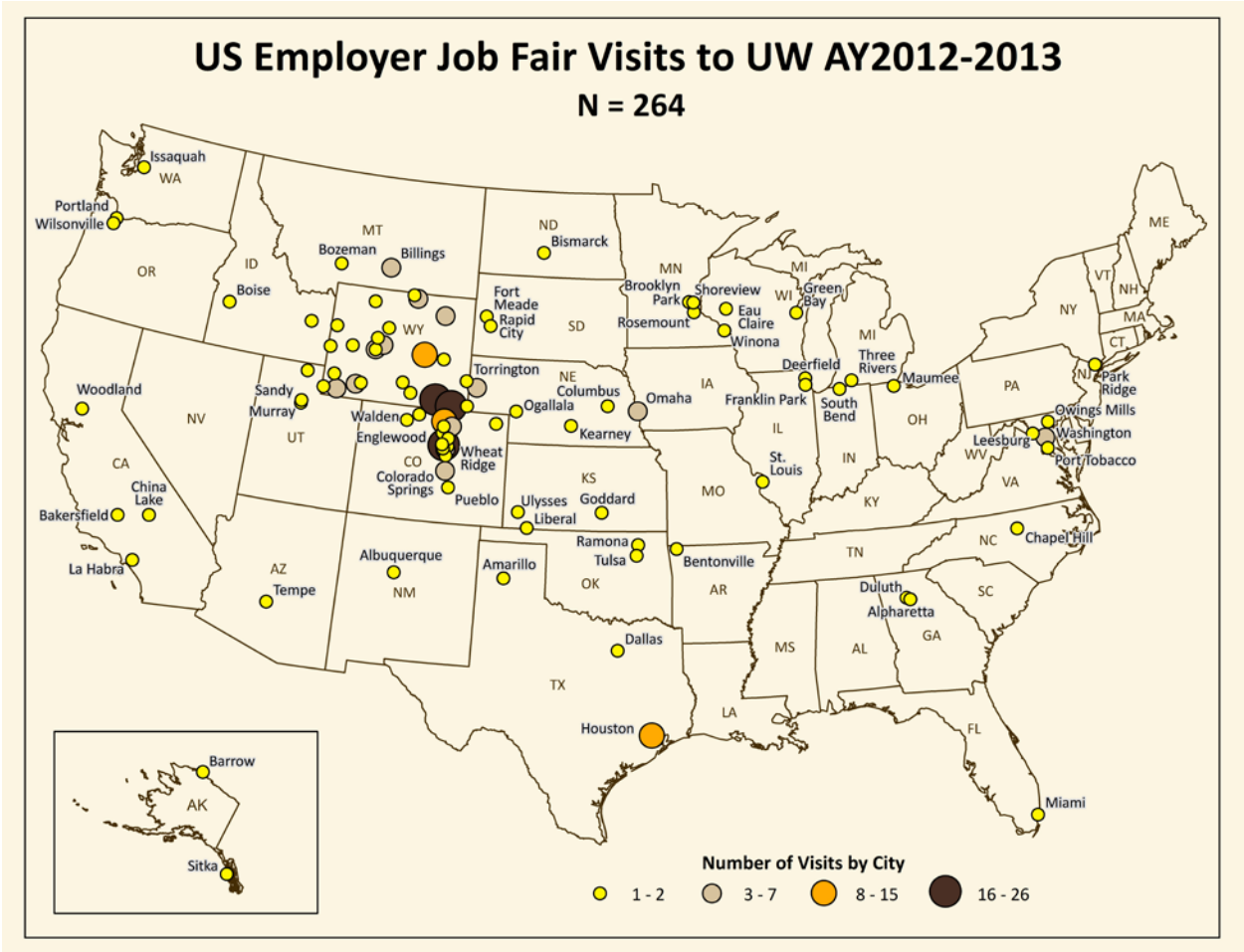


Figure 12: Employer visits to UW for recruiting, all U.S. employers, Academic Year 2012-13



Alumni

UW alumni represent the culmination of the tremendous value that UW adds to our state and our nation. They built their human and social capital during their time at UW, and are community leaders and innovators across the globe. They create jobs and bring important skills to the workforce, and they offer valuable relationships to our current student, faculty, and staff that help us build our internal capacity. Wyoming alumni live throughout the country and the world, and they live in, work in, and contribute to communities across the state.

Figure 13: UW Alumni by Wyoming County

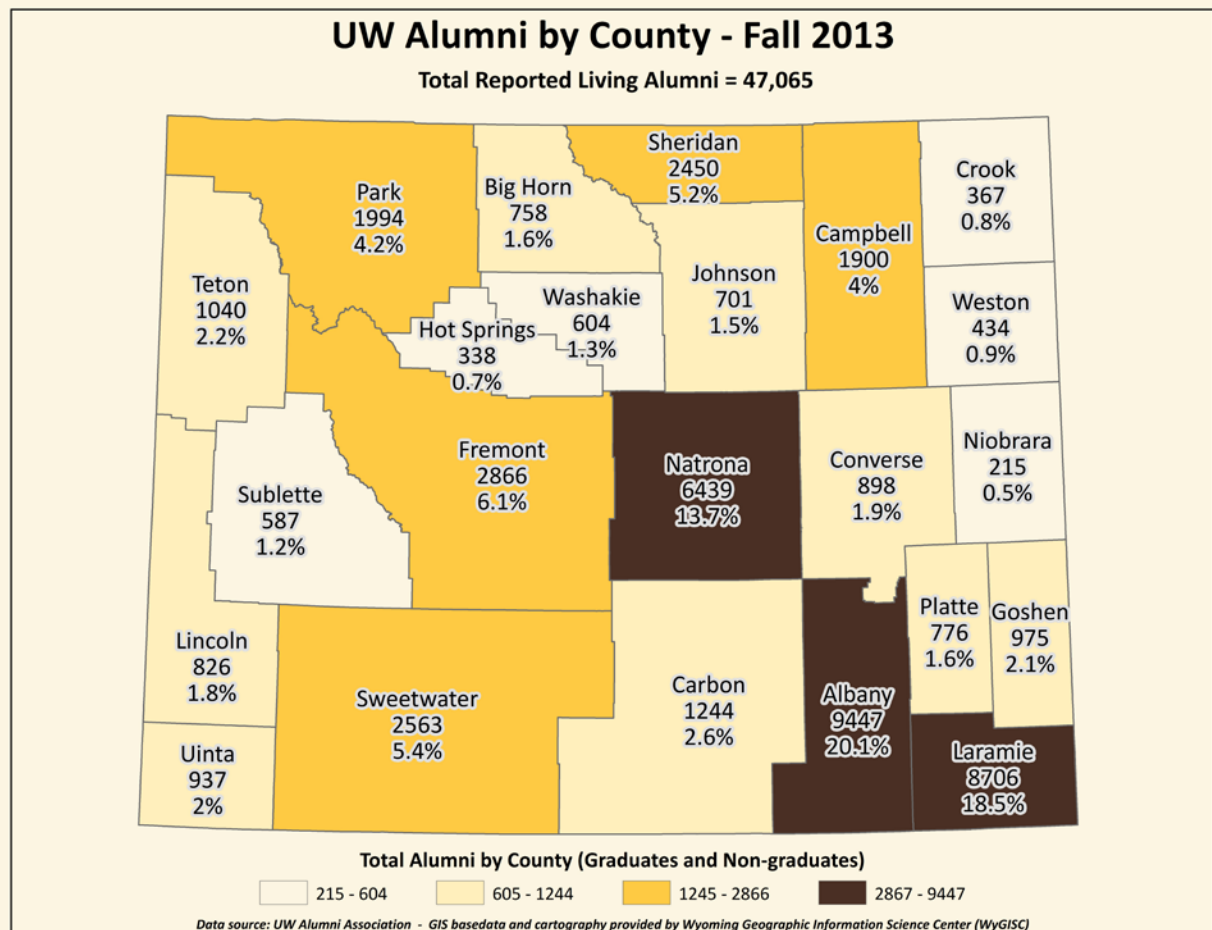
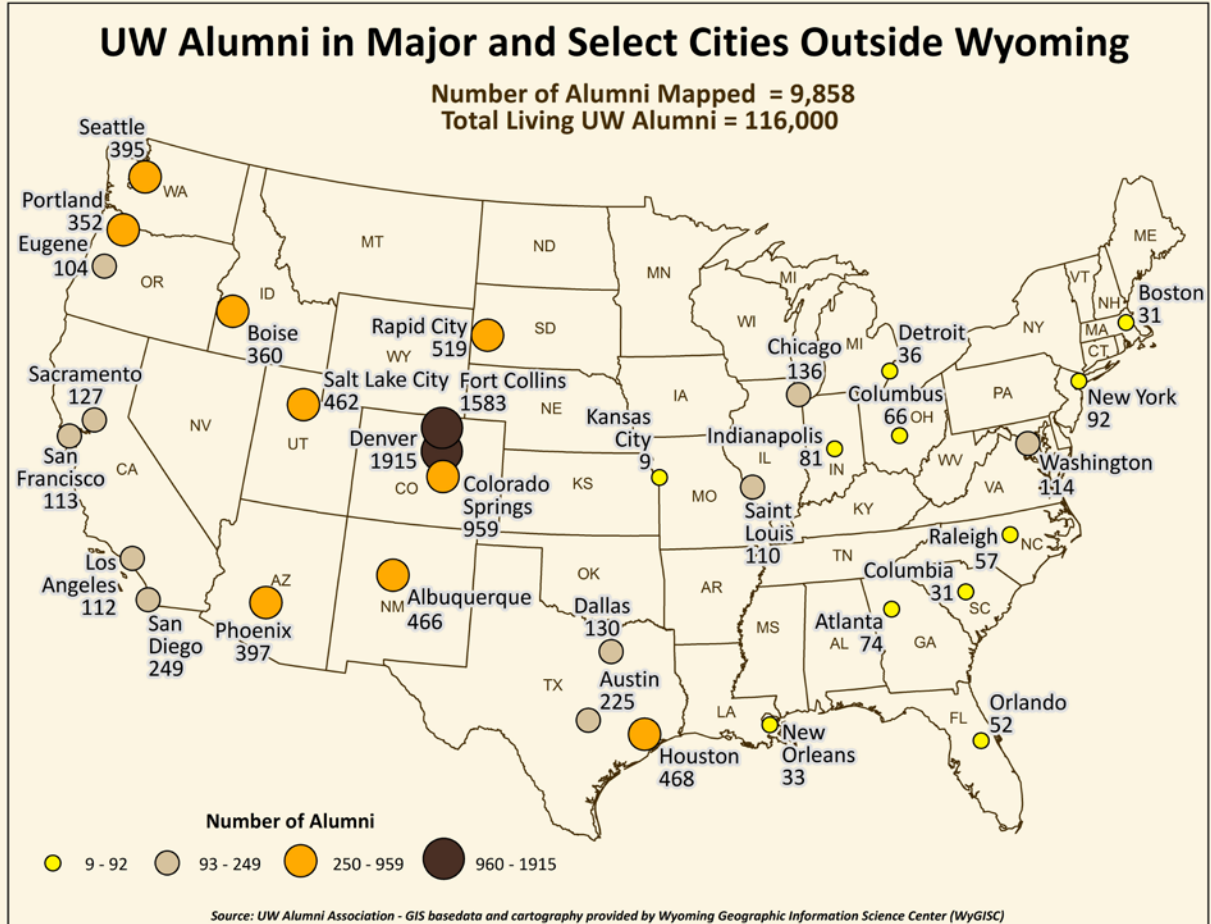


Figure 14: UW Alumni in Major and Select Cities Outside of Wyoming



Investing in Research

Michael Porter writes that competitiveness is “not about having a low-cost labor force, the largest share of exports or even the fastest economic growth. It is about **creating the conditions under which companies and citizens can be the most productive so that wages and returns on investment can support an attractive standard of living.**” (2006 Council on Competitiveness Report, *Where America Stands*). Robert Atkinson (*Deep Competitiveness, Issues in Science and Technology*, Winter 2007) also notes that meaningful economic development requires investing in the best research infrastructure for your area, exploring the best markets to develop products and innovate for your state, and creating the best climate and quality of life for inventors and productive workers.

In the innovation and competitiveness ecosystem, universities are a turbo booster as both a source of new knowledge and a trainer of scientists, engineers, and a variety of citizens with skills including mathematical literacy, critical thinking skills, and innovative thinking. Research shows that **U.S. universities are considered to be the principal strength of the U.S. national innovation system.**

University research has innovation and knowledge impacts beyond the economic impact analysis illustrated earlier. On a broad level, it can be directly incorporated into new products and processes, and it also advances basic scientific understanding that may eventually have profound effects on technology, thus impacting the trajectory of economic growth. **Basic science provides a stock of knowledge that university research expands, and tools that help solve specific commercial and scientific problems in practice.** Direct links from university research to commercial use are common in the applied sciences.

University research also impacts the university’s region in less-quantifiable ways, as well. Some research is difficult to transfer to industry without frequent personal interactions between faculty and business. Knowledge transfer is simply easier when there is **a close relationship between area businesses and innovators and the university** – this is why we tend to see start-ups near universities. There also is a tendency for graduates to stay near their alma mater, though the US is still a fairly mobile society. Those graduates facilitate the knowledge transfer process locally.

Faculty research can lead directly to patents and licensing, which generate income for the university, the researcher, and the local community and region. Faculty research that stays in the public domain can also in a general sense lead to ideas that are developed in the private domain as new products and services. In addition, technology and knowledge that is transferred through non-licensing channels from universities through faculty consulting and contracted research involve close working relationships between faculty and local firms. The prevalence of these forms of knowledge transfer also means that official counts on university technology transfer will underestimate the effects of university research on local entrepreneurship, job formation, and economic activity. In addition, public seminars and workshops that share research facilitates knowledge and technology transfer.

An illustration of the public returns to university R&D expenditures comes in Alston, Andersen, James, and Pardey (“The Economic Returns to U.S. Public Agricultural Research,” *American Journal of Agricultural Economics* (2011) 93 (5) 1257-1277). The study examines returns to agricultural research and extension, using both agricultural productivity and state and federal investments in research and extension. They found that own-state **modified internal rates of return for Wyoming’s state investment in agricultural R&E is 8.2%**, and the national rate (which includes spillovers between states) was 9.5%. Given that the cost of both the State and federal government to invest this capital in research is extremely low, this rate of return makes the investment a good one, as it has increased agricultural productivity for the state.

Business Resources Network

UW has had a long-standing, but not fully recognized, role supporting small businesses in Wyoming dating to early 1994 when the University and its Office of Research and Economic Development specifically became the operating entity for the Small Business Development Centers through action of the State Legislature and the U.S. Small Business Administration. The next year, 1995, UW again working with the state established a Manufacturing Extension Partnership entity, now called Manufacturing Works, through a grant from the National Institutes for Standards and Technology to support manufacturing small businesses state wide. Essential to the success of these programs was a carefully considered statewide service delivery system which placed six (6) regional offices of both the Wyoming Small Business Development Centers and Manufacturing Works where a one-stop-shop of services for Wyoming small businesses could be located.

This structure was reinforced when the Wyoming State Legislature created the Wyoming Business Council (1998), and the WBC placed regional directors in the same locations as the previously existing UW small business support entities. Also in 1998, UW and the WBC entered into two important agreements that continued to build the UW-WBC relationship. First, the **WBC provided partial funding to the Wyoming Research Products Center to support entrepreneurs statewide with intellectual property protection education.** The WBC also partially funded the **Wyoming Small Business Innovation Research/Small Business Technology Transfer Research Initiative (WSSI)** to assist Wyoming technology-related businesses in becoming competitive for federal SBIR STTR funding which amounts to approximately \$2 billion annually. Here the **State of Wyoming established the first state-wide “Phase 0” grant program within the US** – to assist Wyoming entrepreneurs gain access to the SBIR/STTR funds available nationally. Finally, two other entities were added to the Wyoming Small Business Development Centers; the **Wyoming Market Research Center**, developed to support market decisions with a large variety of databases related to how Wyoming businesses can expand the goods and services they offer; and a grant from the **Department of Defense’s Defense Logistics Agency with match from UW and the WBC to operate a Procurement and Technical Assistance Center**, supporting Wyoming small businesses contracting with the federal government (and now state government) to provide goods and services to these governmental entities. GRO-Biz, the Wyoming Procurement and Technical Assistance Center also is embedded within the Wyoming SBDC.

Together this network of Wyoming business support programs, operated in partnership between the University of Wyoming and the Wyoming Business Council, **constitutes the most complete set of programs operated between a state and a university in the nation.** Now called the **Wyoming Business Resource Network**, this group of programs with numerous State and Federal partners have very large economic impact for Wyoming, all done through the small businesses they support. Two of the programs, the Wyoming Small Business Development Centers and Manufacturing Works, are independently audited through their federal partners. While these audits examine multiple elements of the two programs, two pieces of performance indicator data have been accumulated since their inception; specifically the total capital injection by client small businesses into the Wyoming economy and the number of jobs created or retained by the small businesses receiving support. **As of 2012 (the last fully audited year) together small businesses supported by the Wyoming SBDC’s and Manufacturing Works have injected \$276,392,505 into the state’s economy and 39,377 jobs have been created and retained since 1994. This has tremendous economic impact on Wyoming.**

Spin-Outs and Startups

Many small technology-related businesses have their roots in UW as well. Many of these are through official agreements, called spin-out companies (or spin-outs), and others which have been started by UW faculty and students where UW's influence was strongly expressed (startup companies or startups). **Over the past decade at least 15 spin-out and another 20 startup companies have been launched under university influence.** Together, these have very strong impact because of the number of such businesses and the relatively higher wages paid in technology-related businesses. See callout box at right for one story of a spin-out directly rooted in UW's infrastructure and assistance.

Wyoming Technology Business Center

The Wyoming Technology Business Center provides numerous services for companies in several locations across the state of Wyoming. The WTBC focuses on developing early stage, technology-based companies, with an emphasis on high-growth firms. However, **unlike any other states' university-based business development organizations, our WTBC's services are provided to any interested Wyoming business to assist them in sales and marketing, organizational structure, financial and information systems, and ongoing strategic planning.** Innovators with ideas for everything from new medical devices to improved candle scents have received free, invaluable assistance from the WTBC.

In 2012, WTBC's clients, including those who are in pre-venture stages up through stability, had total revenues of **at least \$6 million with payrolls exceeding \$2.4 million.** These companies employed over **120 people**, including full-time, part-time, and student intern employees.

The incubator facility in Laramie has five (5) firms that have graduated from pre-venture to stable firms which have struck out on their own, creating jobs for 95 full-time employees. Current clients in the Laramie incubator, 15 firms in all, employ 34 full-time employees, 63 part-time employees, and 16 student employees. **The WTBC also has 4 outreach locations – not located in the original facility in Laramie – in Laramie, Sheridan, Gillette and Casper with a total of 17 clients. In Casper, UW has established agreements to assume management of the Casper Area Innovation Center. Currently there are 6 client companies in the facility now called the WTBC-Casper Area.**

Firehole Composites, a Laramie-based company, is just one example of the impacts of investing in research at UW for the state of Wyoming. In 1988, Dr. Andy Hansen, now a Professor of Mechanical Engineering, came up with the idea that there could be cost-savings for manufacturing firms that use composite materials if they could figure out how to use digital technology to simulate strength and durability, rather than using costly and time-consuming physical models. From the late 1980's through the 1990s, 15 UW graduate students worked with Hansen's research group to solve the problem. Then, during a stroll across Prexy's Pasture in 2001, Hansen suggested to two of his graduate students, Randal Six and Chris Key, that they start a company and "run with it." From the ensuing UW spin-off agreement and SBIR loans, Hansen, Key, and Six, along with fellow graduate students Mark Garnichy, Jared Stack, and Steve Mayes, founded and got Firehole Technologies off and running. Firehole was one of the first startups to locate in the Wyoming Technology Business Center incubator in Laramie. In 2013, Firehole was purchased by Autodesk, Inc., a Fortune 350 company. Today, it employs 15-20 people in Wyoming.

Research Products Center

The Wyoming Research Products Center (RPC) is a collaborative effort between the University of Wyoming Research and Economic Development Office and the Wyoming Business Council. The RPC is the technology transfer office for UW. **Alone among universities in the US, RPC also has a broad outreach mission not seen in technology transfer centers in other universities, to assist any Wyoming entrepreneur or inventor. RPC works closely and supportively with Wyoming citizens and companies to help them identify, protect and commercialize their intellectual property. No other similar program exists in any other state across the country.**

RPC's goals include:

- support Wyoming individuals and organizations in technology transfer - the protection; marketing, and ultimate transfer of their intellectual property to industry;
- develop a greater outside awareness of the University's research and development programs, along with the opportunities that the state of Wyoming offers to industry;
- support the creation of new technology startup ventures within Wyoming; and,
- encourage partnerships between University faculty and Wyoming business.

While meeting its mission of providing intellectual property assistance, RPC has a broad economic footprint in Wyoming. In fiscal year 2013, the RPC facilitated at the university and statewide.

- 6 UW provisional patent applications filed;
- 18 UW utility or non-provisional patent applications filed;
- 4 UW international patent applications filed;
- 5 patents issued to UW by the U.S. Patent and Trademark Office;
- 99 UW Agreements signed dealing in some way with Intellectual Property;
- 4 UW patent licenses/options granted; and,
- 94 Independent Wyoming Inventor IP projects (completed) and 20 UW IP Projects (new Invention or Trademark Disclosures, completed or still active).

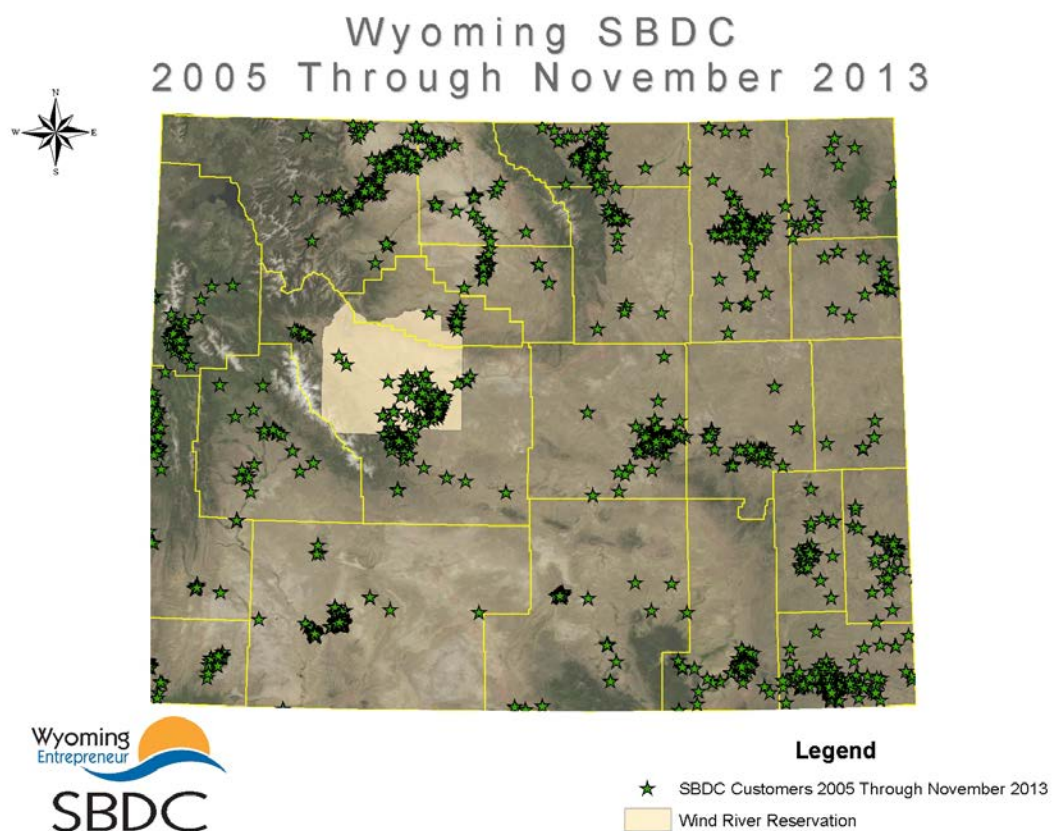
In its 13 years of assisting UW and State-wide clients, the results have been significant.

- 657 total UW patent applications filed or co-owned;
- 101 UW patents issued;
- over 700 UW Agreements signed dealing in some way with IP;
- 60 patent options, licenses, assignments; and,
- 973 independent Wyoming inventor IP projects completed.

Wyoming Entrepreneur Small Business Development Centers (SBDC)

Wyoming Entrepreneur SBDC works to **help Wyoming businesses succeed** by assisting small businesses and entrepreneurs with business development and expansion. The SBDC advisors have areas of expertise in business planning, marketing plans, social media, accessing capital and providing financial health checkups, business valuations, eCommerce, succession planning, international trade, market research, selling to government, risk management, business ethics, QuickBooks, and others. The U.S. Small Business Administration is the federal partner in this program. The SBDC has a significant economic footprint in Wyoming. In fiscal year **2012**, it created **over \$10 million in capital impact, created or retained about 1,200 jobs, and assisted nearly 1,500 Wyoming clients**. Since they began on campus 16 years ago, they have served over 37,000 clients, created nearly \$185 million in capital impact, and created or retained nearly 8,200 Wyoming jobs.

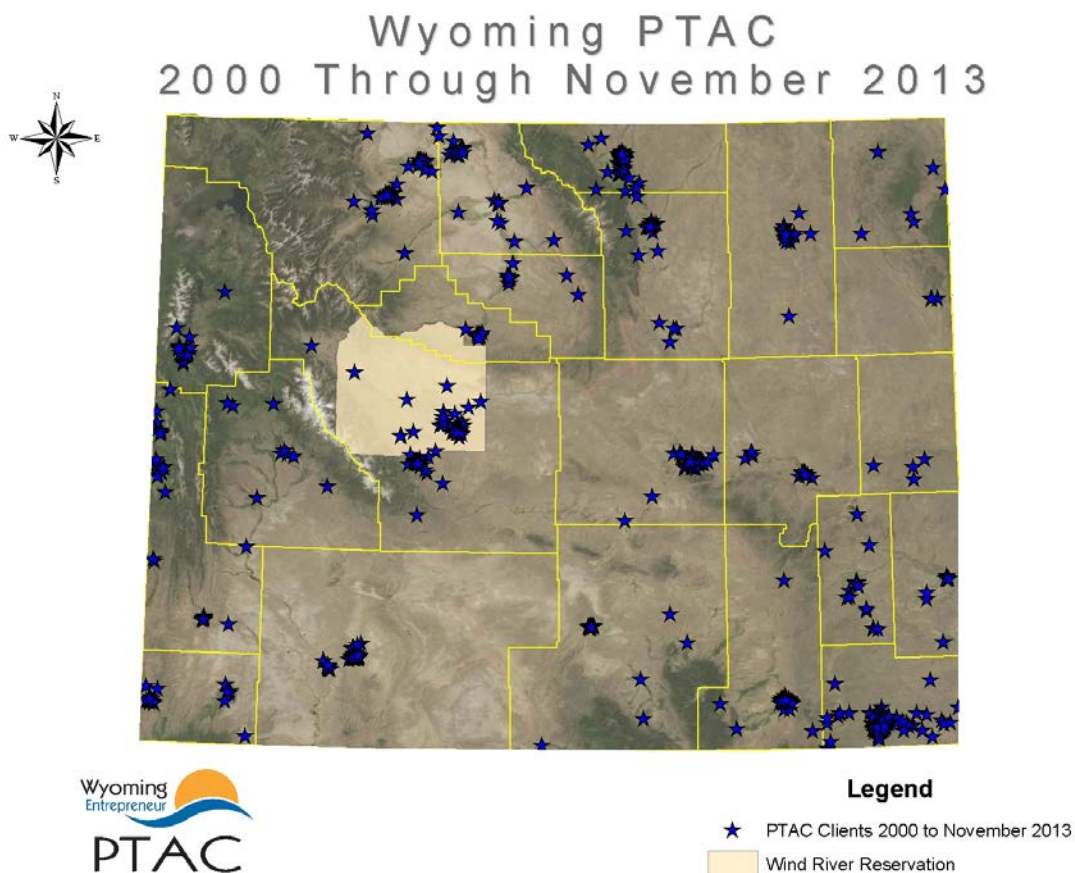
Figure 15: Wyoming SBDC, 2005-2013



Procurement Technical Assistance Center (PTAC)

The Wyoming Entrepreneur Procurement Technical Assistance Center's assists Wyoming firms with identifying and securing federal, state, and local government contracting opportunities. The PTAC helps businesses navigate through the government contracting process. In fiscal year 2012, the PTAC **assisted Wyoming businesses to procure approximately \$10.5 million in prime contract and subcontract awards, with a cumulative economic impact of over \$118 million, and create or retain 225 jobs.** The total investment in this enterprise, including federal, state, and UW dollars, is less than \$400,000.

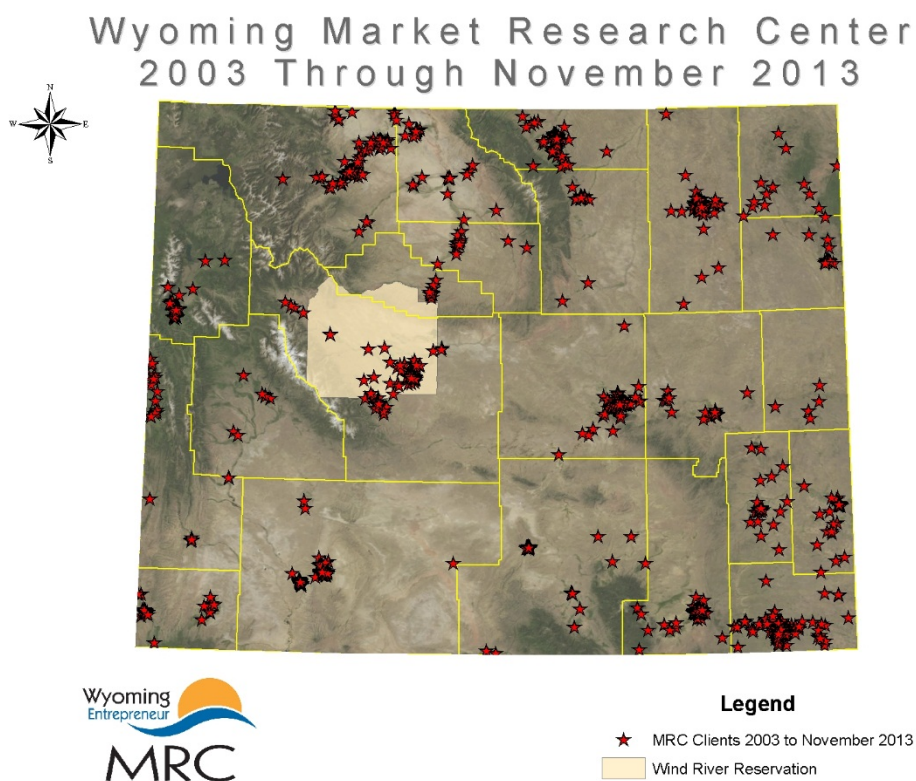
Figure 16: Wyoming PTAC, 2000-2013



Market Research Center (MRC)

The Wyoming Entrepreneur Market Research Center provides data and analysis to Wyoming businesses either directly or via other Wyoming entities such as the SBDC, PTAC, the Wyoming Business Council, Manufacturing Works, the Wyoming Women's Business Center, and other local and regional economic development entities across Wyoming. The MRC offers a wide variety of industry and business research and information services to Wyoming businesses. **All services are offered at no charge and enable businesses in Wyoming to access sophisticated resources that are normally not accessible to Wyoming businesses.** There is no federal partner for this program; the total investment of \$435 thousand-made by the WBC and UW assisted 465 Wyoming clients with over 891 projects in Wyoming Fiscal Year 2013. The MRC's services were worth an estimated \$631 thousand to Wyoming businesses during the fiscal year. **This program, the first state-wide program of its kind in the US, has, since its inception over 10 years ago, assisted over 2,600 clients with nearly 3,700 projects.**

Figure 17: Wyoming SBDC, 2005-2013



Manufacturing-Works

The National Institutes of Standards and Technology is the federal partner offering the Manufacturing Extension Partnership, of which Wyoming's Manufacturing-Works is a member. This program provides services, outlined above in the section on the Business Resource Network, to assist manufacturing businesses throughout Wyoming. **In fiscal year 2013, Manufacturing-Works assisted over 220 clients which created or retained over 150 Wyoming jobs, with a total capital impact of nearly \$20 million.** Since its founding 18 years ago, Manufacturing Works has helped create or retain nearly 2,300 Wyoming jobs and over \$112 million in capital impacts for the state. The total investment in Manufacturing Works from UW, the state, and federal funding is approximately \$1.6 million annually.

Wyoming SBIR/STTR Initiative (WSSI)

WSSI assists all qualified Wyoming small businesses and individuals to obtain federal funding opportunities provided by the Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) Programs. **In fiscal year 2012, WSSI assisted Wyoming firms and individuals obtain over \$1.8 million in funding to assist them with technology and innovation research.** Since its founding 14 years ago, WSSI has helped Wyoming businesses obtain 208 awards for over \$42 million in SBIR and STTR funding. The Wyoming Phases 0 program shared between the WBC and the University has been strongly stimulatory in aiding Wyoming innovators become competitive for the federal funding available through SBIR. WSSI also plays a special role supporting faculty business creation.

Wyoming INBRE

The University of Wyoming is one of 22 institutions funded by the National Institutes for Health IDeA Networks for Biomedical Research Excellence (INBRE) Program. INBRE funding is intended to enhance biomedical research capacity, expand and strengthen the research capabilities of biomedical faculty, and provide access to biomedical resources for promising undergraduate students throughout the eligible states. The goals of Wyoming INBRE are to (1) establish a multidisciplinary research network with scientific foci that will build and strengthen biomedical research at UW and its partner institutions (Wyoming Community Colleges), (2) provide research support to faculty, postdoctoral fellows and graduate students, (3) create a "pipeline" for undergraduate students at UW and Wyoming community colleges to foster advanced education and training in the biomedical sciences, (4) provide outreach activities for UW and community college students that are part of the university's INBRE network, (5) enhance science and technology knowledge of the state's workforce, and (6) expand Wyoming research opportunities across the region. **Research conducted by INBRE funded investigators focuses on health issues important to rural Wyoming residents including obesity, cardiovascular disease and type 2 diabetes.**

In a study performed in 2013 for UW's resubmission of its INBRE grant, it was found that the **indirect and direct expenditures due only to the grant funding are estimated** to be over \$107 million over the life of the funding, and the grant has created almost 2,000 jobs in Wyoming. **Wyoming INBRE funding to Wyoming community colleges to date totals \$2,881,448.80. As of spring 2013 almost 400 Wyoming community college students received biomedical research experience working with a mentor community college faculty member on their home campus.**

Ancillary impacts from the INBRE project have been through general changes in the state's labor force composition, the human capital of the state, and the so-called "creative economy." Biomedical research and education is likely to be especially effective at human capital formation; the knowledge creation it spurs increases both traditional human capital created by education, including entrepreneurship and productivity, and health as human capital, which further enhances productivity. According to Beeson and Montgomery (1993), university R&D expenditures have a significant impact on the labor force composition of an area measured by the share employment of science and engineering degree holders in the regional workforce. They found that a 2-3% increase in university R&D expenditures led to a 25% increase, from 2.1% to 2.6%, in the share employment of science and engineering degree holders in the area labor force. INBRE has advanced and will continue to enhance Wyoming's human capital in two ways. The educational and outreach components of the funding mean that **more Wyoming workers will be educated and better skilled in higher-level analysis and scientific literacy.** Whether those who take advantage of the outreach and education end up as life scientists or

biomedical engineers, or whether they simply learn more about biosciences, they will have **higher quality human capital** that can be applied to many other occupations and businesses. As such, INBRE has directly increased the economic development potential of Wyoming. INBRE has also enhanced human capital indirectly in Wyoming by means of those who will ultimately pursue bioscience careers. Those people, depending on their exact career path, will likely be able to enhance the health – and thus human capital – of Wyoming citizens by treating, diagnosing, and preventing ailments, and by creating ideas and knowledge that will improve health and quality of life. **The level of science literacy and skill proffered by bioscience education, outreach, and research will also create social returns to Wyoming** as they support the “creative economy.” The creative economy, which essentially stems from the technology, talent, and tolerance that surround universities and other hubs of development, is similar to human capital in that it is a socially beneficial concept that generates “positive externalities” – society benefits even though it’s virtually impossible to assess a price for those benefits. The creative economy comes from a mix of both high human capital and well-defined social networks, or what sociologists call social capital. The creative economy, like human capital, is a draw for economic growth.

Wyoming's Experimental Program to Stimulate Competitive Research (EPSCoR)

EPSCoR is a federally-funded program to promote the development of science and technology capacity in the United States. Funded by the National Science Foundation (NSF), Wyoming EPSCoR supports capacity building by investing in researchers and institutions to better position them to compete for federal research funds. EPSCoR funding are used to build science and engineering in higher education and a technology-based economy for the future. EPSCoR has helped to move the State of Wyoming along the path of research and excellence by supporting the State's research endeavors.

Among the goals of Wyoming EPSCoR are the facilitation of the building of research educational infrastructure in the state, and fostering collaborative communication among diverse participants in STEM fields. In addition, EPSCoR brings the national goals of the EPSCoR program to Wyoming. For example, The State of Wyoming is engaging in long-term strategic planning to guide science, technology and workforce development in the state. The process was initiated through the office of former Governor Dave Freudenthal. Participants include representatives from the state, business, education, research and public sectors. **The outcome of the strategic planning process is development of a dynamic and relevant Wyoming Science and Technology Plan that will guide the state government research and development, and business efforts over the coming decades.** It will be used by the Wyoming Business Council, the University of Wyoming, Wyoming EPSCoR and other entities as they undertake science and technology development in Wyoming. The first step of the process is to develop a clearly articulated vision for Wyoming's Science and Technology (S&T) future that produces a strong, diversified economy and educated workforce. The second step is to generate a plan to implement the vision. This plan will:

1. define the current state economic indicators within the context of national and global economies;
2. plan for the continued advances in energy and the extractive industry technologies, which have been a hallmark of Wyoming innovation over the last decades;
3. increase connectivity to position the state as a major center for science, technology, natural resource management and communication in the region;
4. provide mechanisms for broadening and diversifying the science and technology base in the state; and
5. prepare for educated workforce to meet these goals.

As with Wyoming INBRE, EPSCOR's investments in Wyoming will yield more human capital and business benefits for the state. The science and technology knowledge and adaptability it brings to our education and research enterprise has and will continue to enhance both economic and community development in the state.

Wyoming Geographic Information Science Center (WyGISC)

The Wyoming Geographic Information Science Center (WyGISC) is an interdisciplinary research institute focused on the development of geospatial information and technologies and their applications in science, education, government and business. Over the last 15 years, WyGISC has led the establishment of geographic information science as one of the University of Wyoming's Areas of Distinction, not only as a critical area of science and technology related to energy, earth and computational science, but also through its significant contributions to place-based planning, management, and problem-solving in the environment and natural resources arena. WyGISC continues to provide leadership to the Wyoming geospatial community, advocating for coordinated development of a statewide spatial data infrastructure and supporting standards and policies for data development, sharing and stewardship. **Center staff has consulted on geospatial information issues with the Wyoming Governor's Office and the Wyoming Office of the Chief Information Officer, and have held positions with the State GIS Technical Advisory Group and the WyGEO GIS Professionals Organization.**

With its long-running **Spatial Technologies Professional Training Program**, WyGISC's leadership role extends to the education and training of the state's future GIS professionals and practitioners who will be working in economic and community development, engineering, energy resource development, or natural resource management. This role is also supported through the Center's coordination of a state higher education GIS software license accessible by many of state's community colleges.

WyGISC supports the discovery and access of geospatial data by a wide range of constituents, including city, county, state and federal agencies, as well as the private sector. It carries this out by providing a number of Internet-based data services including the Wyoming GeoLibrary, the WyGISC Data Server, and the WyGISC Imagery Server. Access and assistance in the application of satellite and aerial remote sensing products is supported by WyGISC's Wyoming View Program which enables use of imagery products in agriculture and resource management. WyGISC supports city and county planners in the state with its Plan-IT Wyoming Initiative, a joint effort with the Haub School of Environment & Natural Resources to build capacity among planners in the use of information and communication technologies to increase the effectiveness and efficiency of community development planning activities. Related work includes a pilot program in "geospatial extension" efforts for other types of planners, managers and decision makers, offered through UW Extension.

Most recently, WyGISC has developed a collection of decision support software applications to **support place-based natural resource management in Wyoming**. Examples include: the Wyoming Interagency Spatial Data and Online Management (WISDOM) system for the Wyoming Game & Fish Department; the Sage Grouse Density-Disturbance Calculation Tool (DDCT) supporting development mitigation assessment; and the Suite Water watershed planning application supporting the Wyoming Association of Conservation Districts.

The College of Law provides a large array of legal services to the state, in addition to educating future lawyers who will practice in Wyoming and nationwide. These include:

Domestic Violence Clinic

Defender Aid Clinic

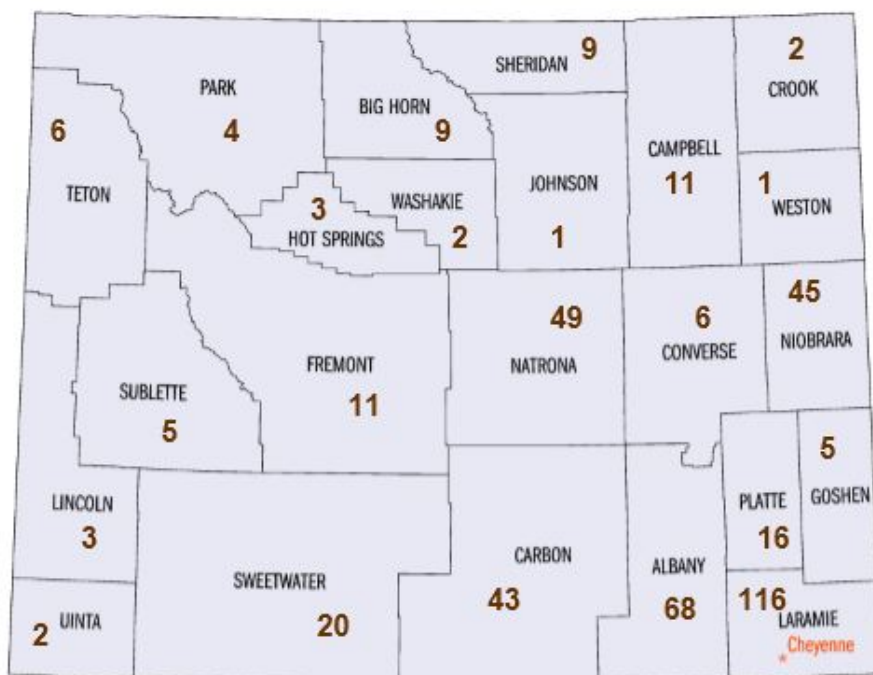
Prosecution Assistance Clinic

International Human Rights Practicum

Estate Planning Practicum

In Fall of 2014, the College will be adding an Energy, Environment & Natural Resources Clinic in partnership with the Wyoming Attorney General's office. The College also provides extensive Continuing Legal Education (CLE) opportunities throughout the year to attorneys throughout the state, who are required to regularly take CLE classes in order to maintain their licenses to practice law. The College hosts "Law Week" every October - a week-long set of speakers and events that is open to the public on a variety of legal topics. This even draws people from around the state. The College also regularly hosts conferences and speakers on issues of import to the state. For example, on November 13 we hosted a conference on "A Landscape Discussion of Energy Law in Wyoming" and had 180 attorneys, scholars, government agency reps, and industry stakeholders attend, most of whom were from all over Wyoming. The UW College of Law also is the **largest provider of uncompensated legal services in Wyoming.**

Figure 18: Cases / Clients for UW College of Law Clinics



Cases or Clients of UW College of Law's Four Longstanding Clinics (2010-12)

College of Engineering and Applied Science

The College of Engineering and Applied Science houses six academic departments, four centers, and one industrial cooperative design program. The College's annual state appropriation is approximately \$10.6M which enables generation of \$11-12M of extramural research grants per year. The College supports approximately 250 graduate students, most are funded on assistantships that carry stipends, tuition, fees, etc. Research supports 30-40 research scientists and post-doctoral researchers. Undergraduate enrollments are expanding, especially in petroleum engineering. The current undergraduate enrollment is approximately 1,450. Upon graduation our graduates readily gain employment in their fields. With the implementation of the *Engineering Initiative*, we will be able to significantly expand our efforts in research and economic development. Departments and highlights of their activities include

Atmospheric Science

The Department is internationally known for its UW King Air (UWKA) atmospheric research aircraft. The UWKA has been supported, under cooperative agreements between UW and NSF for the past 26 years, as a national facility in NSF's Lower Atmospheric Observing Facility program, and supports atmospheric scientists including department faculty nationally. It has global reach, with recent international projects based in UK, Finland, and Antigua. **The UWKA brings \$2.5M annually to the state**, in addition to facilitating additional science funding for department faculty. Recent research studies include:

- Working with Wyoming Water Development Commission on State weather modification projects
- Particle formation from Oil & Gas Operations and Air Quality issues

Chemical and Petroleum Engineering (CPE)

The Department is rapidly expanding in enrollment and research. The enrollment in Chemical Engineering is 188 (up 10.6%) and Petroleum Engineering is 310 (up 41.6%). The enrollment for masters and PhD students is 27 and 43, respectively. Many of these students are employed by the oil and gas industry. The Department has conducted research in the following areas that directly or indirectly support Wyoming funded at \$2.5 million. The Department's research is well integrated with the UW's School of Energy Resources with projects including:

- Coal Utilization
- CO₂ Separation
- CO₂ Enhanced Oil Recovery
- Gas Hydrates
- Natural Gas Dehydration
- Wax Mitigation in Well Bores
- Drilling Techniques
- Coalbed Methane
- Enhanced Oil Recovery
- Interfacial and Pore-Scale Transport in Porous Media
- Petrophysics
- Production of Crude Oil and Natural Gas
- Reservoir Engineering Simulation

Petroleum Engineering is one of only 17 ABET accredited programs in the U.S.

The Department has a small but nationally notable group conducting biomedical research in chemical engineering with primary focus on drug delivery methods. This will be an expanding area for the college as a targeted niche.

Civil and Architectural Engineering (CAE)

The CAE department has 274 undergraduate and 32 graduate students. Civil engineers are the most common engineers employed in Wyoming, and their service **supports infrastructure development of all kinds: roads, bridges, municipal services, school construction, permitting, oil, gas, and coal development.** Approximately 500 engineers and surveyors annually gather for the Wyoming Engineering Society convention. Most of these engineers are UW graduates and work in the state. Highlights of CAE's service to the State include the following:

- In the last three years the Department has executed research contracts totaling \$3.4 million **to solve problems of interest to various State agencies, including WYDOT, WWDC, WYDEQ and WSGS.**
- The **Wyoming Technology Transfer Center and Local Technical Assistance Center provide engineering training and services to Wyoming counties, local engineers, and the construction industry.** In the last three years, the centers have delivered 132 training sessions to 2,686 participants and have conducted an additional \$3.95 million in research studies focusing primarily on rural transportation problems.
- The Wyoming Water Resource Database provides water resource information and research products for the state. Their web sites receive over 200,000 hits annually, largely from professionals and others from Wyoming. This is one of the busiest web sites at UW.
- The **Wyoming Department of Transportation Design Squad**, housed on campus within the Department, provides design jobs for at least 10 students per year and three registered professional engineers who supervise their work. The design squad provides roadway designs that go directly to bid and construction. This industrial experience is invaluable to our students. The design squad's annual construction volume has averaged \$18 million over the last four years.
- **The Land Surveying Certificate** offered through the Outreach School to professionals and students unable to study in Laramie provides an invaluable set of skills to our state's and nation's engineers.

Computer Science (CoSci)

The CoSci department has 191 undergraduate students and 31 graduate students. CoSci students are highly sought after for software development and for information technology positions across the state and in the region. In the last five to seven years the number of software development jobs in Wyoming has boomed and the department could easily place more students than currently graduate.

- In 2013, the department started an **Industrial Affiliates Program** to better connect the students and faculty with the companies seeking to hire our students. (See: <http://www.uwyo.edu/ceas/csiap/>). The program has ten partner companies, three member companies, and a number of companies considering partnerships. The first annual Industrial Affiliates meeting will be held in May 2014 in collaboration with the Wyoming Technology Business Center's annual meeting which will focus on software and technology.
- The Department is working closely with the College of Education's Secondary Education department to offer a **computer education endorsement program**. This program will

provide a path for high school teachers to become “endorsed” to teach computer science classes in Wyoming high schools.

- *Generative Art in a Virtual World*, taught by Dr. Amy Ulinski Banic and Dr. Ruben Gamboa, is a **High-School Summer Institute course targeting Wyoming students in computing through visual arts**. The course teaches visually inspired programming and offers continued remote participation to facilitate peer programming among rural teens of Wyoming.

Electrical and Computer Engineering (ECE)

The ECE department has 152 undergraduate students, 16 masters students, and 13 PhD students. The department anticipates excellent opportunities throughout the foreseeable future. For instance, the McKenzie Global Institute in its May 2013 report lists the twelve most impactful technologies for the next twelve years, and ECE is the foundation for the top six of these twelve technologies. Because the projected impact is high, opportunities will be abound for our students, faculty, and the state of Wyoming, some of which are listed below:

- ECE’s **biomedical instrumentation and robotics program**, which received over \$10 million in external research funding in recent years, has already established a remote **“telehealth” clinic which connects patients in Farson to Rock Springs, Laramie, and Cheyenne healthcare through the internet**. Wyoming’s low population density, large geographic size, travel burdens due to inclement weather and a low number of health care professionals presents a significant challenge towards health care accessibility for the majority of the state residents. Wyoming has the worst ranking for number of active physicians: 1.94 per 1,000 people compared to the national average of 2.81. One way to mitigate these problems is through robot helpers to assist patients. This technology will have an estimated \$800 billion dollar impact, and thus it has significant potential for sustained growth. To help realize this potential, ECE personnel are teaming with computer science and kinesiology faculty for this initiative. Current focus areas include statewide telehealth clinics, robotic physical rehabilitation, and advanced wheelchairs.
- New technologies are needed to ensure that Wyoming’s energy can be reliably delivered. The American power grid is experiencing a transformation. Starting with the “National Energy Report” in 2001 and continuing through the current “A Policy Framework for the 21st Century Grid,” the nation has placed an emphasis on increasing the reliability of a grid that is experiencing increasing demand and greater diversity in generation including natural gas, coal, and wind turbines. **Synchrophasors are used to improve the reliability of the electric grid, and UW’s ECE Department has been on the leading edge of synchrophasor applications with over \$2.7 million in funding over the past decade**. Wyoming’s ability to continue increasing its exportation of electricity directly depends on fundamental understanding of the power grid.
- The **department works with FMC, Questar, and Infinity Power and Controls in Rock Springs to provide comprehensive training in applied process control**. Most recently, this has resulted in delivery of a new Fall 2013 course in process control with treatments specific to the challenges faced by Wyoming industrial concerns. This new course augments a second course ECE has been offering for the past several years which trains students to operate the PLCs that are ubiquitous in Wyoming’s mining and energy industry. This program prepares UW’s students for employment opportunities in the state of Wyoming.

Mechanical Engineering (ME)

With 320 students, the ME undergraduate program is the largest in the College and the sixth

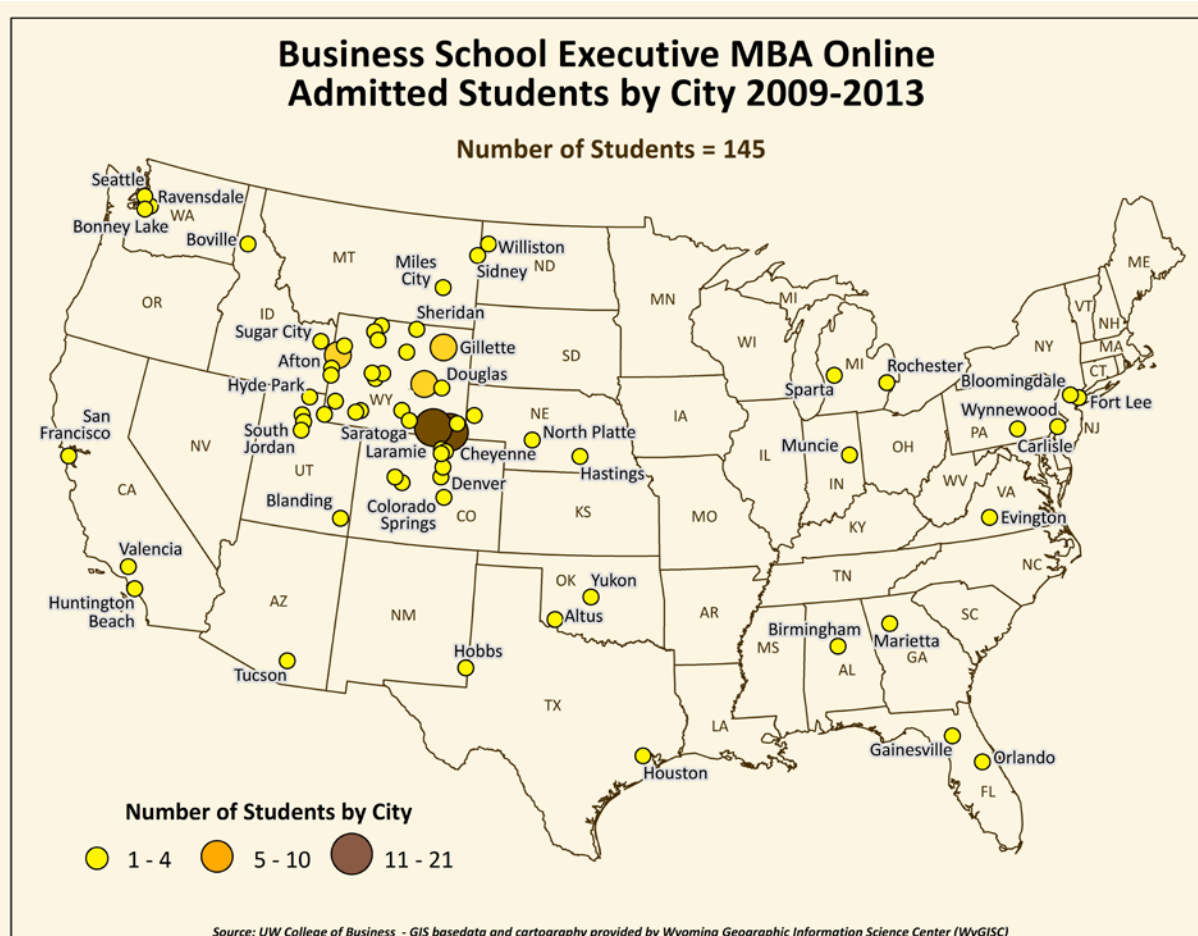
most popular undergraduate major at UW. The Department also hosts a new degree program in Energy Systems Engineering (35 students) and mentors 40 graduate students. ME students have distinguished themselves with a **10-year pass rate of 95% on the NCEES Fundamentals of Engineering exam, which is 12 percentage points higher than the national average for ME students.** ME is the broadest of all the engineering disciplines granting our graduates work opportunities in all 50 states in over 700 different companies. In addition to supporting the teaching mission, ME faculty are responsible for \$1.6 million of annual research expenditures, garnered primarily from contracts with federal agencies. Notable ME success stories include:

- **Firehole Composites** (now owned by Autodesk) of Laramie, employing 15 mechanical engineers with high-tech composite materials analysis software and services, was a company spin-off based on research by ME faculty.
- The **department is the second most prominent financial partner in one of three national VLCoE centers** (Vertical Lift Center of Excellence – i.e., helicopters) jointly funded by US Army, US Navy, US Air Force, Boeing, Bell, and Sikorsky. Other center participants include U. of Maryland, U. of Texas, Penn State, Georgia Tech, Ohio State, Iowa State, Rensselaer Polytechnic Institute, and U. of Michigan.
- The **Wind Energy Research Center** recently developed multiple reports for the Wyoming Infrastructure Authority that showed how utilization of Wyoming's wind resource could result in marketable electrical power to California and Colorado.
- Department faculty **provided direct engineering support for at least 11 different Wyoming companies** in the past two years (including Cody Labs, Z-4 Energy, Ace Salvage, Kennon Aircraft, Logimesh Technologies, Frontier Barnwood, CAM Works, and Laramie Radiator).

College of Business

The College of Business has strong ties with the business community around the state and offers two high-demand UW degrees online to students and professionals who are not located in Laramie, including the online Bachelor's degree in Business Administration and online Executive MBA program.

Figure 19: Executive MBA (Fully Online) – Locations of admitted students, 2009-2013



Faculty offer workshops and seminars across the state on current economics and business topics, and one faculty member writes a quarterly column for the **Wyoming Business Report** as well as providing analysis for the **Department of Workforce Services** each year for the prevailing wage survey on state contractors.

The Peter M. and Paula Green Johnson Career Center (JCC) is dedicated to assisting College of Business students with comprehensive career planning services which start at the beginning of a student's college journey. Career planning is an ongoing process and the JCC works with students on developing a practical road map to follow in obtaining their career goals. The JCC also works with

employers across the nation and in Wyoming to match College of Business students with internship and employment opportunities.

Figure 20: College of Business Internships, Academic Year 2012-13

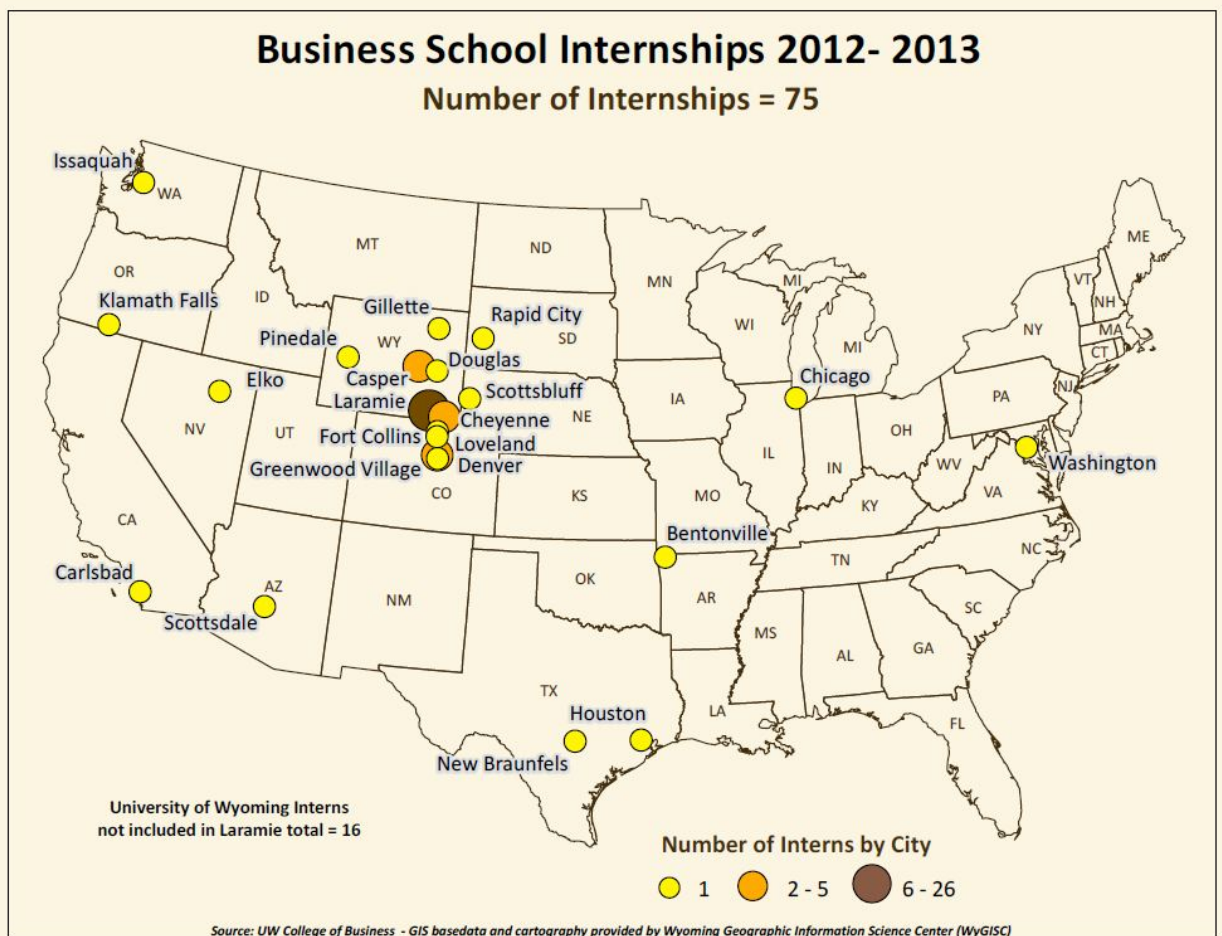
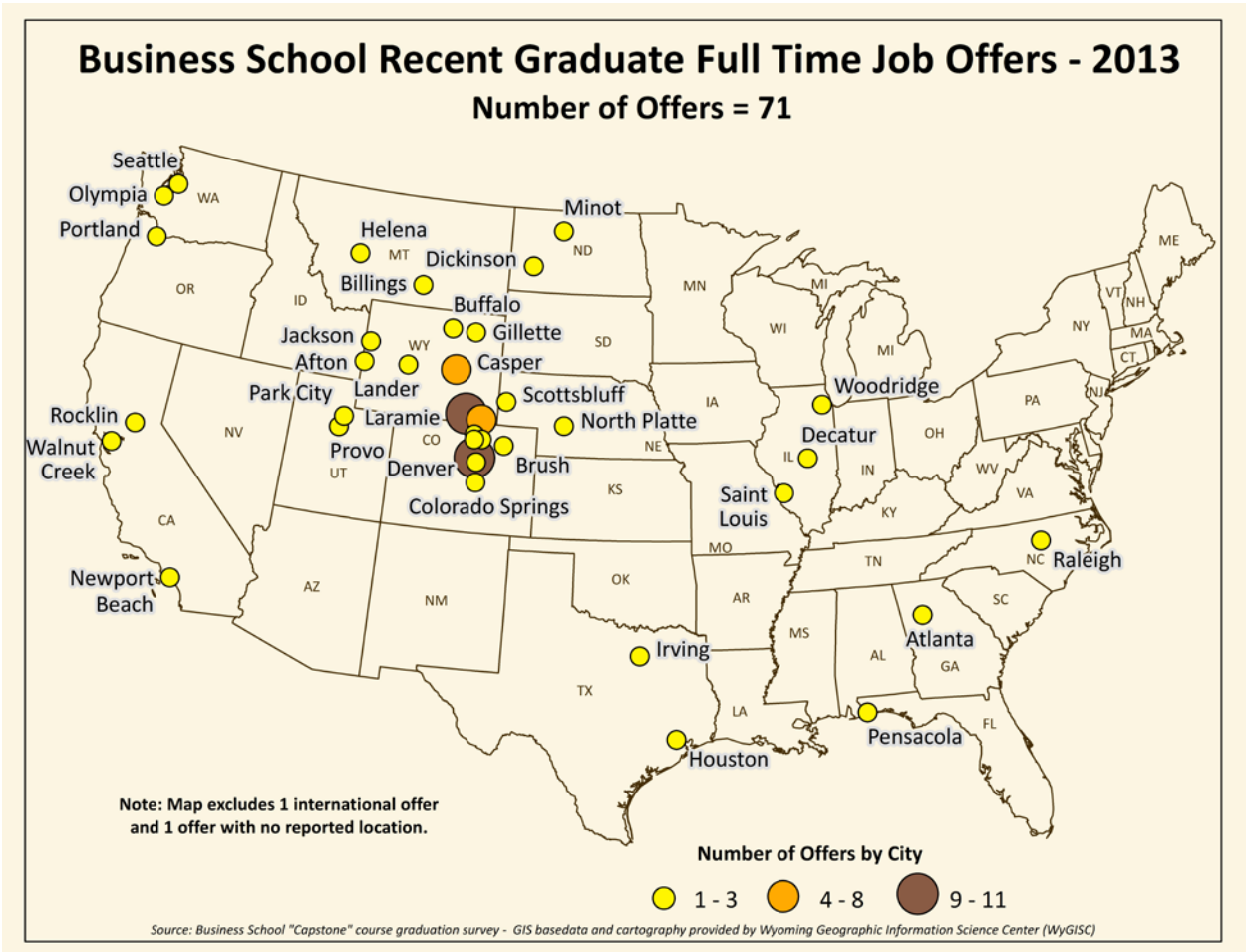


Figure 21: College of Business Full-Time Job Offers, Class of 2013



College of Health Sciences

The College of Health Sciences, including the Fay Whitney School of Nursing, School of Pharmacy, and Divisions of Communication Disorders, Social Work, Kinesiology and Health, Wyoming Institute for Disabilities, and Medical Education and Public Health/Family Medicine Residency Programs, provides significant value for the state through education and outreach. The College **offers a wide variety of education options for students who are unable to come to Laramie for their full degree.** The School of Nursing offers a program with the community colleges to teach the associate degree with a transition to the bachelor's degree (RENEW), an Accelerated BSN through the Outreach School (BRAND) and an option for RN/BSN completion online. It also offers through Outreach Master's degrees with a Nurse Educator Option, a Master's in Kinesiology and Health, and a Master's in Social Work. A Doctor of Nursing Practice (DNP) is also offered through Outreach.

The College of Health Sciences is preparing Wyoming students for professions that are rewarding, challenging, and in high demand meeting Wyoming needs. According to the Department of Workforce Services "Wyoming Occupational Projections, 2011-2021," **health care occupations are predicted to have the highest number of permanent exits – retirements, most likely – of high-growth professions in the state. It's also expected that health care will have the highest number of annual job openings in the state.**

The College's Medical Education program, the WWAMI (Washington, Wyoming, Alaska, Montana, and Idaho) Program, allows Wyoming students to attend their first year of medical school at UW, then move to University of Washington School of Medicine for their second year of medical school. For the entering class of 2010, the Wyoming WWAMI medical students and their families pay \$12,000 a year for 4 years to cover tuition and registration fees to the University of Washington School of Medicine. The State of Wyoming covers the remainder of medical school tuition costs. Residency for Wyoming WWAMI students can be served at the UW Family Medicine Residency Programs in either Cheyenne or Casper.

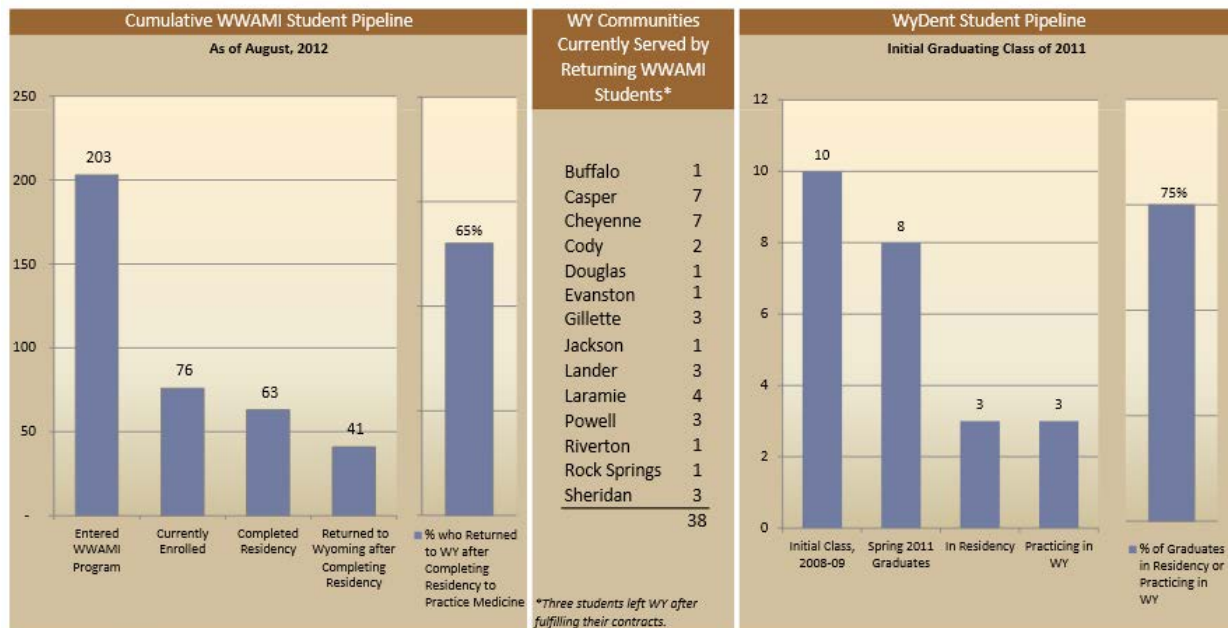
Following completion of a residency program, if the student returns to Wyoming to practice medicine for three years, he or she will have completed the contract. If the student does not return to Wyoming to practice, then he or she is required to pay back the amount of money owed on the contract. Over 220 Wyoming students will have entered the WWAMI program as of August, 2013. Over 140 Wyoming students have graduated from the UWSOM as of June 2013. Nearly 80 Wyoming WWAMI students have completed their residency and are now practicing medicine. Fifty-two out of 79 Wyoming-WWAMI graduates (65.83%) have completed residency and returned to Wyoming to practice medicine as of August 2013. Twenty-eight out of 52 returning Wyoming-WWAMI graduates (53.85%) are practicing in the primary care specialties of family medicine, internal medicine, or pediatrics as of June, 2013.

The University of Wyoming Family Medicine Residency Programs under the Educational Health Center of Wyoming provides education to graduate physicians, medical students and other health care professional students; provide patient care and serve as a source to recruit family medicine physicians to serve in Wyoming. **They served 8,679 patients in Natrona County and 6,966 patients in Laramie County with over 60,000 patient encounters. This makes the two clinics the largest safety net provider in Wyoming.** There are 81 graduates of these programs practicing in Wyoming. The Wyoming Dental Program (WYDENT) is a program similar to WWAMI where eight students per year are selected to attend dental school at either Creighton University or the University of Nebraska, four per school. The graduates also may pay back their loans by practicing in the state for three years and many of the graduates are practicing dentists in Wyoming.

The College also serves the state through centers dedicated to critical issues in Wyoming, including:

- Center for Rural Health Research and Education Center (CRHRE)
- Wyoming Geriatrics Education Center (WyGEC)
- IDeA Networks for Biomedical Research Excellence (INBRE)
- Center for Cardiovascular Research and Alternative Medicine (CCRAM)
- Area Health Education Center (AHEC)
- Western Interstate Commission on Higher Education (WICHE)

Figure 22: Medical Education Outcomes, WWAMI and WyDent



Prepared June 2013

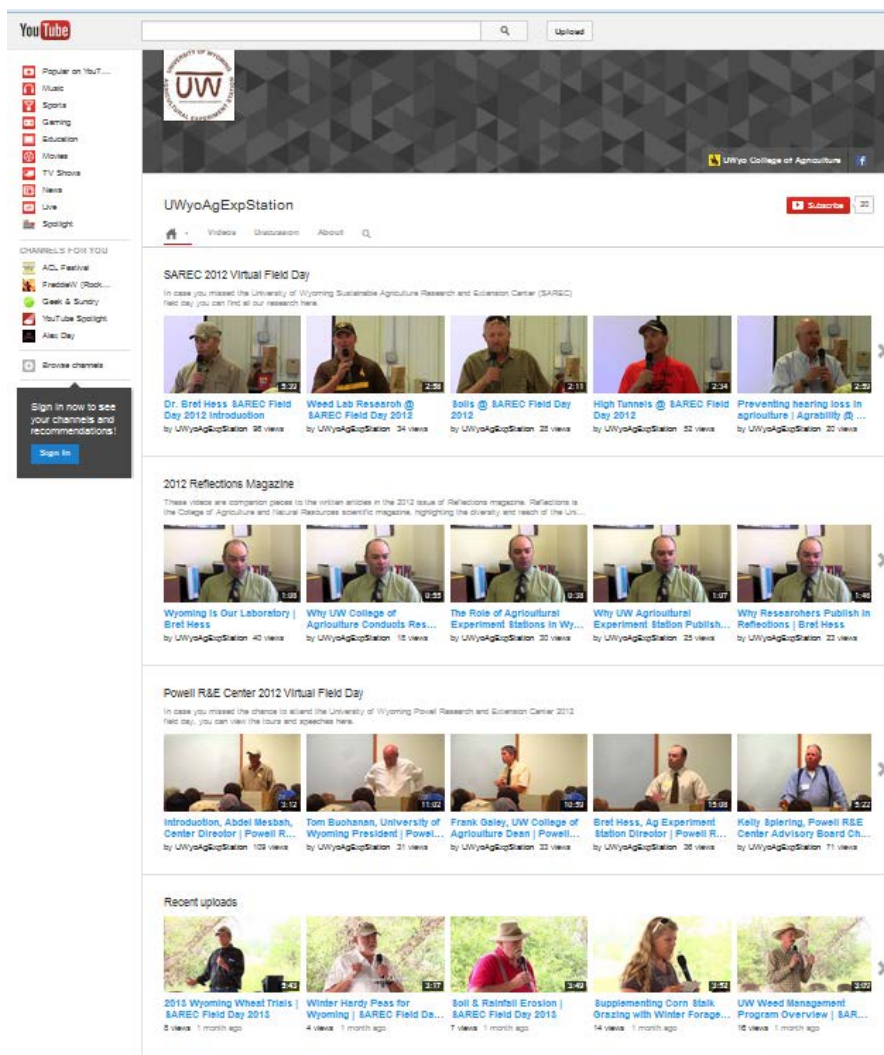
College of Agriculture and Natural Resources

The College of Agriculture and Natural Resources is incredibly active across the state, true to UW's land-grant mission. Among its many activities are the Agricultural Experiment Stations, Cooperative Extension, and the Wyoming State Veterinary Lab.

UW's Agricultural Experiment Stations, one of the hearts of the land-grant mission, are located in Sheridan, Powell, Lingle, and Laramie. The **Laramie Research and Extension Center** is host to the Cliff and Martha Hansen Teaching Arena, the Animal Science Livestock Center, and the UW Livestock Farm. **In Powell**, research focuses on agronomic weed control, irrigation, cropping systems, high tunnel production, variety performance testing, transgenic variety response to herbicide treatments, and alternative crops. **The James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC)** in Lingle comprises 1,522 acres of dry land cropland, 349 acres of irrigated cropland, 1,880 acres of rangeland, 19 acres of irrigated organic cropland, 40 acres of dry land organic cropland, a feedlot and a livestock research laboratory with a mission to facilitate mission-linked scientific inquiry on agricultural systems that promote sustainable land and resource use. The **Sheridan Research and Extension Center** has its main station at Wyarno, which includes approximately 250 acres; field crops are dryland while vegetables and fruit trees are under irrigation. ShREC also manages sites at Sheridan College (SC), which are under irrigation. In addition, ShREC is managing the 450-acres Adams Ranch south of SC. The ranch owned by Whitney Benefits, includes approximately 240 acres of irrigated cropland.

Over the past two years (fiscal year 2012 and fiscal year 2013) the **Experiment Stations have accomplished over 100 projects per year in response to producer requests.**

Figure 23: YouTube Channel for UW Agricultural Experiment Stations



Since 1914, **UW Extension** has helped Wyoming citizens and communities respond to challenges and changes. **UW Extension** has resident offices in every Wyoming county and the **Wind River Indian Reservation**. Although its roots are in agriculture, UW Extension has a broad educational mission to encompass many of the contemporary challenges facing Wyoming's people and its rural communities. UW Extension uses a team-based approach to educational program leadership. This model revolves around five State Initiative Teams, which assess the needs of Wyoming citizens and communities and then select and develop educational programs around those needs. The 5 initiatives are:


- Profitable and Sustainable Agricultural Systems State Initiative Team (PSAS)
- 4-H and Youth Development State Initiative Team (4-H and Youth)
- Nutrition and Food Safety State Initiative Team (NFS)
- Sustainable Management of Rangeland Resources State Initiative Team (SMRR)
- Community Development Education: State Initiative Team (CDE)

UW Extension provides **extensive outreach through workshops, brown bags, and series to provide information and dialogue on everything from financial literacy to energy efficiency to fiber animal production and marketing.** UW Extension also has a major social media presence that provides a wide range of information in a broad array of formats.

Figure 24: Social Media Content Offered by UW Agricultural Extension


Social Media Sites in Extension

Blogs and Podcasts




Control Freaks
Wyoming Weed Science in (almost) Real Time

Wyoming Weed Science in (almost) Real Time
weedcontrolfreaks.com
 Blog maintained by **Brian Mealor** and **Andrew Kniss**




Nutrition and Food Safety
Healthy Lifestyles Begin With Safe, Nutritious Food

Nutrition and Food Safety
<http://www.uwyoextension.org/uwnutrition/>
 Blog maintained by **Vicky Hayman**, **Kentz Willis**, **Jen Jacobsen**, **Chris Pasley**




Writing on the Range

Writing on the Range
<http://uwyoextension.org/rangewriter/>
 Blog maintained by **Ashley Garrelts**




Vicki's Voice
on Nutrition and Food Safety

Vicki's Voice on Nutrition and Food Safety
<http://www.wyomingextension.org/vickihayman/>
 Podcast maintained by **Vicky Hayman**



Bill Taylor Podcasts











































Bill Taylor Podcasts
<http://www.wyomingextension.org/billtaylor/>
 Podcast maintained by **Bill Taylor**



Chris's P-Pods
Radio Broadcasts on nutrition, food safety and healthy lifestyles

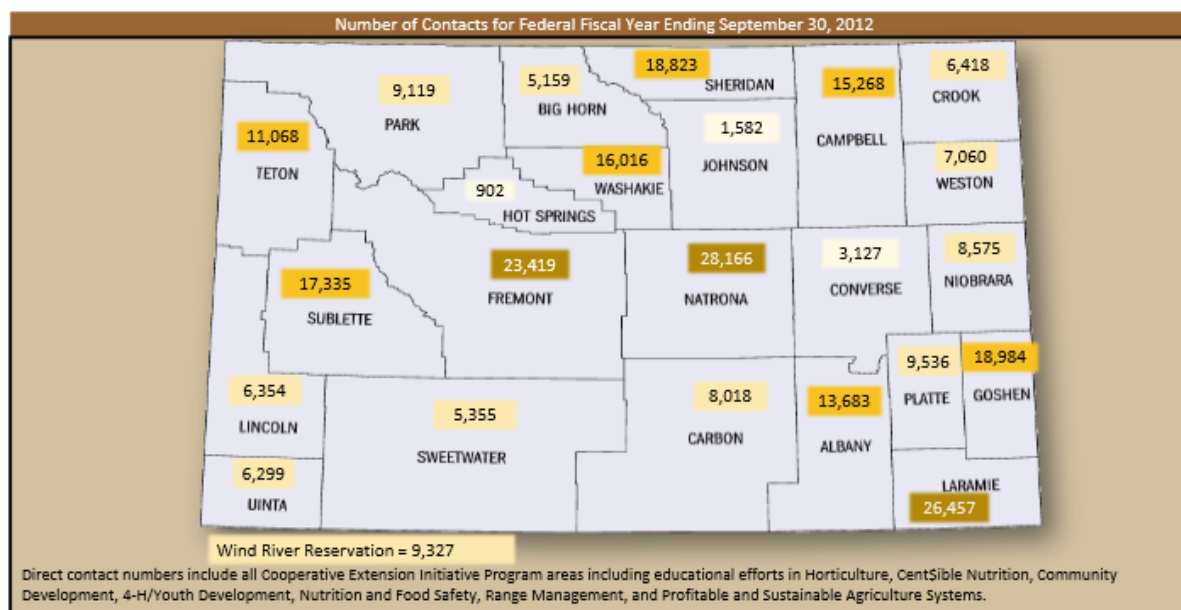
Chris's P-Pods
<http://www.wyomingextension.org/chrispasley/>
 Podcast maintained by **Chris Pasley**

Figure 25: Social Network Sites Through College of Agriculture and Natural Resources

	FaceBook	Twitter	YouTube
Social Network Sites - State			
AgrAbility			
Agricultural & Applied Economics			
Ag Publications			
Animal Science			
Barnyards & Backyards: Rural Living in Wyoming			
Cent\$ible Nutrition			
College of Agriculture and Natural Resources			
Community Development and Education			
Consumer Issues Conference			
Ecosystem Science and Management			
Laramie Research & Extension Center			
Molecular Biology			
Rural Living in Central Wyoming			
SAREC - Sustainable Agriculture Research Extension Center			
Sustainable Rangelands Roundtable			
University of Wyoming Extension			
University of Wyoming Extension Nutrition and Food Safety			
University of Wyoming Range Extension			
WyoHort			
Wyoming 4-H			
Wyoming Agricultural Experiment Station			
Wyoming Master Gardeners			
Wyoming Reclamation & Restoration Center			
Wyoming Saves			
Wyoming State Fair			
Wyoming Weed Science			

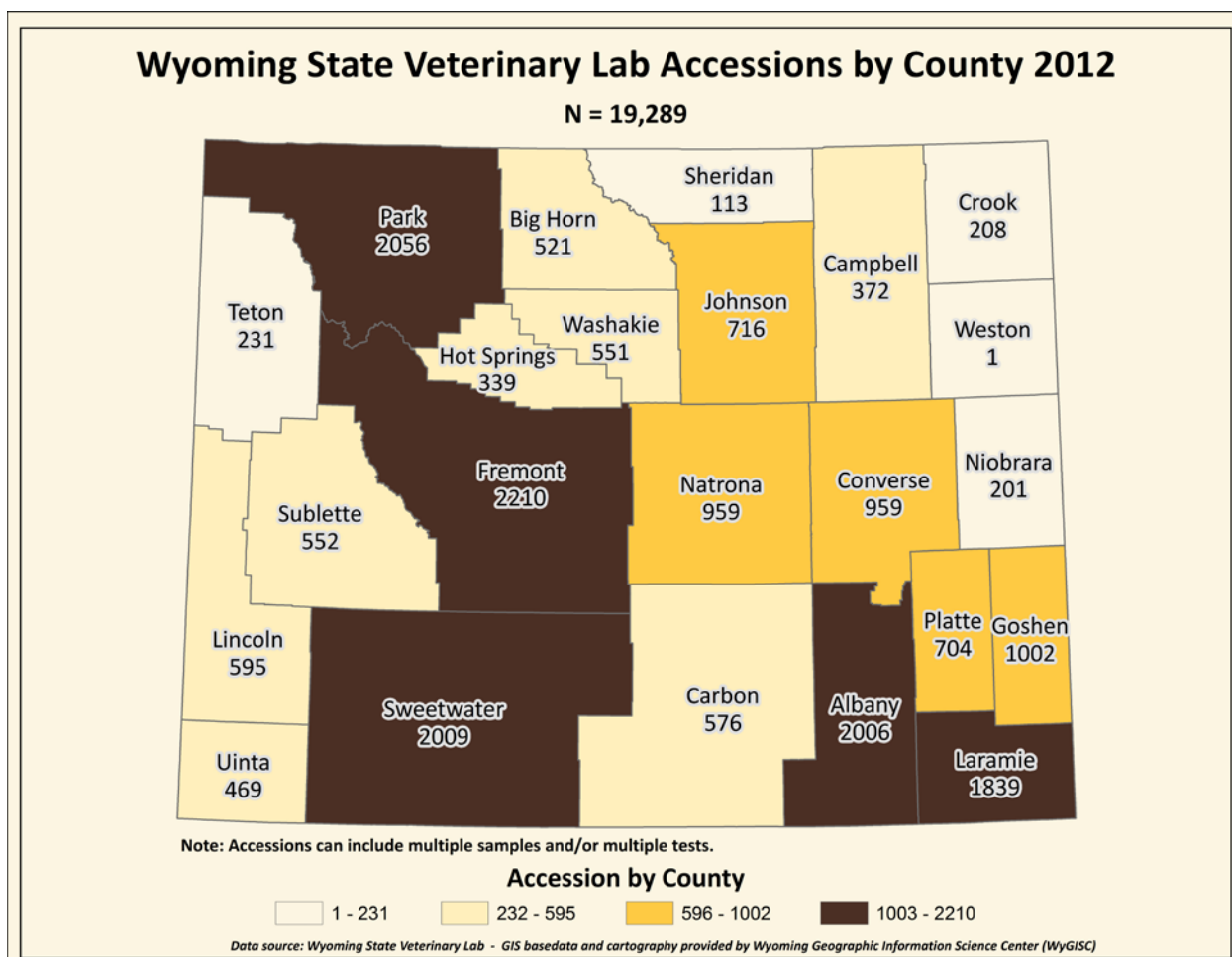
The UW Extension teams have significant engagement with Wyoming's citizens, as illustrated below.

Figure 26: Direct Contacts, UW Extension



The College's **Department of Veterinary Sciences and Wyoming State Veterinary Laboratory** provides accessible, timely, accountable, and accurate diagnostic services, animal disease research, & education to veterinarians, students, others interested in animal health, and the people of Wyoming. The WSVL analyzes a variety of samples from animals, their feeds and environments. Specimens that are tested range from whole animals to tissues and/or blood samples from animals that may be diseased or require a health-related test or screen. The WSVL tests samples submitted by veterinarians, the Wyoming Livestock Board and State Veterinarian, the Wyoming Game and Fish Department, livestock producers, and animal owners. The WSVL provides services for the State Department of Health (rabies, plague culturing, assistance with other diseases common to animals and humans) and USDA APHIS Area Veterinarian in Charge (Foreign Animal Disease Investigations and eradication programs).

Figure 27: Wyoming State Veterinary Lab Accessions by County, 2012



Also within the College of Agriculture and in cooperation with the School of Energy Resources, the **Wyoming Reclamation and Restoration Center (WRRRC)** is the **premier regional center for restoration, reclamation, and rehabilitation of disturbed ecosystems** based on sound ecological, agricultural, and economical practices. The Center cooperates with the UW Haub School of Environment & Natural Resources, the Wyoming Geographic Information Science Center, the Wyoming Natural Diversity Database, and with agencies and private partners around the state and the nation. The center provides hands-on training, workshops, and research on best practices on restoration of disturbed Wyoming lands around the state.

UW Art Museum

Bringing the world of art to Wyoming; placing original art at the center of interdisciplinary discourse, research and inquiry-based learning for all ages; stewarding a collection of 8,000 objects; and serving the state through outreach programs and partnerships.

The **Ann Simpson Artmobile** is on the road an average of two weeks each month, transporting original artwork from the UW Art Museum collections to communities and schools statewide. A partnership with the Wyoming Arts Council ensures a **special emphasis on remote and underserved Wyoming populations**. The artwork is exhibited on a series of panels and, once installed, the Artmobile Curator guides participants in inquiry-based tours and workshops, which are inspired by the exhibit and aligned with the museum's in-house model of observing, questioning, exploring, creating and reflecting. In fiscal year 2013, total attendance for the Artmobile was 6,528. **Over 76 programs were presented in Sinclair, Casper, Worland, Rawlins, Laramie (Epson Center, ARK, Recreation Center, Cathedral Home), Saratoga, Thermopolis, Lusk, Douglas, Kemmerer, Glendo, Chugwater, Elk Mountain, Hanna, Medicine Bow, Dayton, Guernsey, Casper, Ethete, Rock River, Etna, Cody, Powell, Ranchester, and Midwest.**

The **Regional Touring Exhibition Service** offers exhibitions to Wyoming organizations for only the cost of one-way shipping (round trip shipping to out of state organizations). These exhibitions are designed for sites such as libraries, schools, community centers, galleries and museums. Insurance, press releases, publicity photos and exhibition interpretation and inquiry-based education materials are provided by the Art Museum. In 2012, 2 exhibitions were presented in 3 venues with 1,255 people attending. New touring exhibitions are being mounted for 2013 and 2014 with a goal of as many as 4 exhibitions available at any one time.

Periodically, the UW Art Museum curates and organizes an exhibition for national tour. Peter Sarkisian: Video Works, 1994-2011 premiered at UW and then traveled to the Museum of Contemporary Art in Taiwan before traveling across the US. It concluded its tour in 2013 at the New Mexico Museum of Fine Art. Total attendance in New Mexico was 22,942.

The **Summer Teaching Institute** models best teaching practices for school and community educators, while providing hands-on opportunities for participants to explore inquiry-based learning together and individually, using original art, artists and scholars as the impetus for interdisciplinary investigations. Last year, the institute had 21 attendees.

The **Wyoming Secondary Art Educators (WSAE) Conference** brought **33 teachers from across Wyoming together to explore new art methods, materials and educational ideas**. Their Art Museum workshop demonstrated how to use original art as part of a quality, inquiry-based art education program.

The **Museum Tour Program** initiative provides individualized educational programs and tours for schools and community organizations statewide using an inquiry model – observe, question, explore, create, and reflect – to engage with original art in the Art Museum. **The Tour Program served 471 community members at Douglas High School, Oregon Trail School in Casper, Cathedral Home for Children (student population statewide), the Visual Arts High School Intensive (students and teachers statewide), the Wyoming State Science Fair (students and teachers statewide), Saratoga Elementary, Woods Learning Center in Casper, Freedom Elementary in Cheyenne, Cheyenne All High School Art Students, the Women in Science High School Conference, Rawlins Junior High, Greeley Dream Team in Greeley, Colorado, and Denver students at the UW Science & Math Teaching Center.**

In partnership with Albany County School District #1, the Afterschool Enrichment Program makes it possible for every elementary school in the district to take part in museum programming, including specially designed tours and studio activities and after-school enrichments programs that provide an art and writing focus for students' grades 1-6. Similar partnerships exist with five of Laramie's pre-schools. In FY2013, 92 classes with 1,202 students participated.

The **Laramie Mural Project** is a partnership program with Laramie Main Street, local artists, and businesses in downtown Laramie that recognizes Laramie's unique cultural assets and advances economic development in our historic downtown. In 2013, 3 new murals were added to the existing 5 from the last 2 summers.

Symposia provide opportunities for state, regional and national voices to be heard on timely subjects. In the Fall 2012, Never Drink Downstream: Factual Tales and Artful Musings on Wyoming's Water, brought together a wide range of perspectives from across the region on the crucial role that water plays in the lives of Wyoming people, inspired by the installation of artist and Guggenheim Fellow, Margaret Cogswell.

American Heritage Center

The American Heritage Center (AHC) is one of the nation's largest and most distinguished archives. The AHC engages in extensive outreach to bring the considerable resources surrounding American western history and a broad variety of other archival material to our state. **The AHC holds the most extensive collections anywhere documenting the history of Wyoming—from Powell to Cheyenne, from Sundance to Evanston—first and foremost for the people of Wyoming.** In addition, however, it attracts visitors to Wyoming from all 50 states and a dozen nations each year; not only do these researchers spend time in Laramie, many of them travel to other attractions in the state as well. For **History Day**, AHC holds workshops throughout the state for **teachers, school-based competitions and regional competitions throughout the state, all together involving 2,000 Wyoming students.** AHC's **traveling exhibits** are loaned to venues throughout the state, where they are used to attract visitors to museums and libraries, usually at no cost—**approximately 45,000 individuals view these exhibits in every part of Wyoming.** AHC faculty make presentations throughout the state free of charge for attendees. In addition, the **AHC Board of Advisors** meetings are held outstate once per year – the most recent meeting was in Gillette earlier this year.

College of Education

The College of Education contributes extensively to Wyoming in its partnerships with the K-12 system and the Wyoming Department of Education. Students prepare for a variety of careers in education that are in high demand in Wyoming and across the country. According to the Wyoming Department of Workforce Services Labor Market Information Wyoming Occupational Projections: 2011-2021," education will have the projected 5th highest rate of permanent exit (retirement or job change) in Wyoming, with the 3rd highest rates of annual openings. Demand, simply put, greatly exceeds supply, and the need for the College of Education to fill that gap is recognized and embraced.

One of the many ways in which the College of Education serves the state of Wyoming is through the preparation of teachers. The data chart below shows the number of Institutional Recommendations provided from the College of Education over the last three years to the Wyoming Professional Teaching Standards Board for students who have completed an undergraduate teacher education program and are thus eligible for initial teacher certification in the state of Wyoming.

Table 11: Institutional Recommendations from College of Education to Wyoming Professional Teaching Standards Board, Undergraduate Teacher Education Program

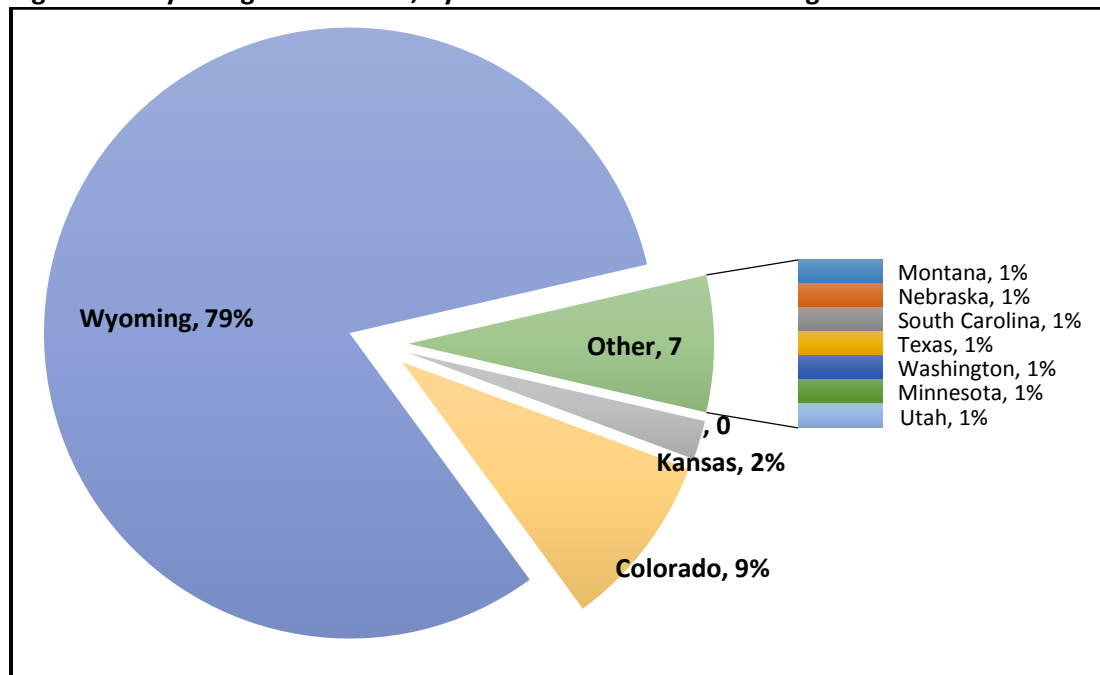
Undergraduate Certification Area	2011	2012	2013
Agriculture	5	6	6
Art	8	7	7
Early Childhood	31	46	33
Elementary	183	214	189
English	19	14	32
Mathematics	15	17	14
Modern Languages	4	8	1
Science	25	43	18
Social Studies	30	24	25
Technical Ed	1	9	5
TOTAL	321	388	330

Students in the undergraduate programs in the College of Education contribute to the state of Wyoming through their presence in classrooms, supporting Wyoming children to maximize their potential. During the 2011-12 school year, UW College of Education students contributed over 224,000 hours working in Wyoming schools. Undergraduate teacher education and certification program students spent nearly 26,000 hours in field experiences and internships. Student teachers in elementary and secondary education methods classes and residency/student teaching spent over 173,000 hours facilitating students' learning in Wyoming classrooms, and Endorsement and Certification program students worked over 25,000 hours in schools across Wyoming. The market value of College of Education students' time in schools and classrooms was over \$3 million and the value of faculty and partners' school facilitator time spent supervising field experiences, internships, and student teaching was more than \$900,000. Stipends for P-12 mentor teachers during field experience courses contributed over \$84,000 in impacts to the state. Data for 2012-2013 are expected to show similar trends.

Based on a biennial survey of principals who employed our graduates as first or second year teachers, schools in the state of Wyoming are overwhelmingly the largest employer of

teacher education program graduates. The pie chart below illustrates this preference of principals to hire our graduates.

Figure 28: Wyoming School Hires, By State Teacher Education Programs



The College of Education is also committed to service to the state by providing in-service educational opportunities and advanced, graduate study in education. These opportunities include 7 master's degree programs, 8 PhD programs, and 4 EdD programs in Education. In 2011-2012, 100 master's degrees and 17 doctoral degrees were granted. This is typical of the number of graduate degrees awarded each year.

The College of Education also offers 6 graduate endorsement programs for Wyoming in-service teachers and leaders. The table below provides data on Institutional Recommendations from the College of Education to the Wyoming Professional Teaching Standards Board for students who have completed a graduate endorsement program and are thus eligible for an add-on endorsement to their teaching certificate from the state of Wyoming.

Table 12: Institutional Recommendation from College of Education to Wyoming Professional Teaching Standards Board, Graduate Endorsement Programs

Graduate Endorsement Area	2011	2012	2013
English as a Second Language	28	40	18
Literacy	13	17	7
Principal	29	29	26
School Counselor	15	16	13
Special Education	21	14	21
Superintendent	1	2	3
Teachers of American	3	1	0

Indian Children			
TOTAL	110	119	88

In addition, faculty members in the College of Education are active providers of professional development to Wyoming teachers, counselors, and leaders through such initiatives as the Science/Mathematics Partnership grants, the Ellbogen Excellence in Early Childhood funded conferences including the Play Therapy Institute, the Annual Fall Literacy Education Conference, the Shepherd Symposium for Social Justice, the Wyoming School-University Partnership's Lost in Transition Initiative, and other ongoing projects. For more information about the professional development work carried out by College of Education faculty members, please go to the following link: <http://www.uwyo.edu/education/files/documents/PD.Task.Force.Report.2012.pdf>.

In summary, programs provided by the College of Education are essential to the state of Wyoming and to its schools and children. Faculty, administrators, and staff are committed to providing top quality professional service to further educational goals in Wyoming.

Wyoming School-University Partnership

The Wyoming School-University Partnership is a statewide collaborative group of school districts, community colleges, the University of Wyoming (with memberships from both the College of Arts and Sciences and the College of Education), the Wyoming Department of Education, and the Wyoming Education Association. The mission of the Partnership is to implement the collaborative efforts of these organizations to simultaneously improve teacher education and renew public schools in Wyoming. The Partnership engages in numerous outreach and engagement activities.

The Partnership's Lost in Transition initiative provides professional development events within the following disciplines: English/language arts, life sciences, mathematics, social sciences, and world languages. **These meetings bring together high school, community college, and university faculty within each discipline with the goal of working together to help students successfully transition from high school to higher education.** At each meeting, secondary and postsecondary faculty participants bring examples of student work from their classes to share and discuss with other faculty across levels.

The Partnership also recently supported a **school-community engagement initiative with the goal of empowering youth to improve their communities, with participating schools in Pinedale, Torrington, and Worland.** In addition, the Partnership supports four schools for membership in the **National League of Democratic Schools**, whose purpose is to promote professional development for educators and administrators that emphasizes the importance of teaching democratic traits in schools, such as respect, cooperation, open-mindedness, and responsibility. The Partnership also co-sponsors numerous professional development and outreach opportunities through the University of Wyoming.

As a member of the larger National Network for Educational Renewal, the Partnership believes that U.S. students have the right and obligation to blossom into well-prepared and socially-engaged citizens in a democracy. School is the best and most complex setting for students to learn the skills of critical thinking and civil discourse. The National Network for Educational Renewal philosophy is discussed regularly at Partnership governing board meetings. The board members (school district superintendents and representatives from other member organizations) also continually assess how the Partnership can best serve Wyoming.

Figure 29: Wyoming School University Partnership Impact Map

WYOMING SCHOOL - UNIVERSITY PARTNERSHIP

Advancing the Agenda for Education in a Democracy

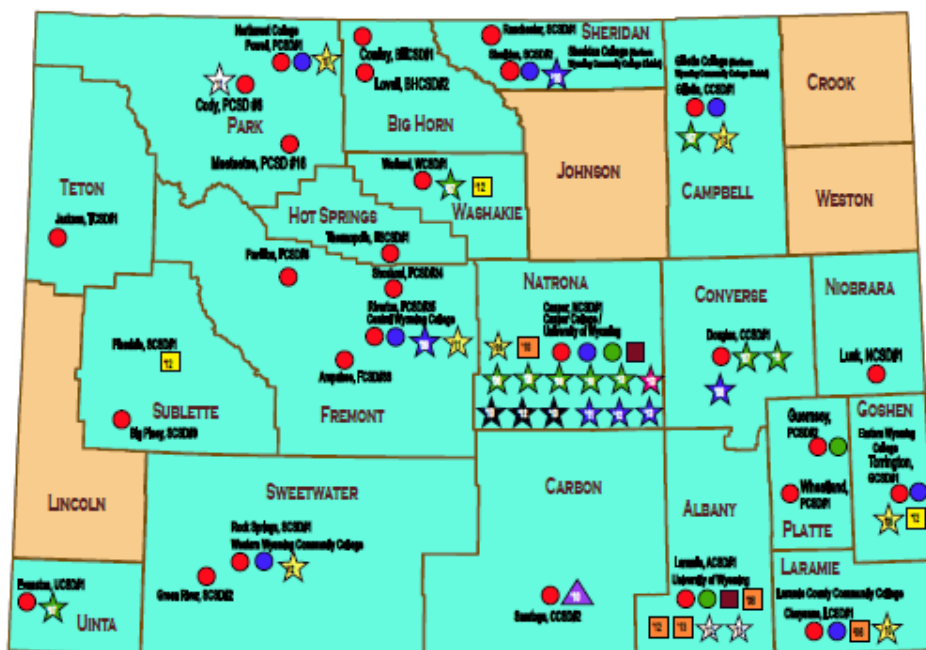
Impact Map representing the 2013-2014 School Year

Total Wyoming K-12 Student Population Served by the Partnership = 82% (74,485 students)

Student population enrollment numbers reported as of fall 2012.

Current Wyoming School District Members Paying Annual Dues: 28 of 48 districts (58%)

Counties Displayed in Blue Represent 2013-2014 Partnership Members



Partnership members include all seven community colleges, the University of Wyoming College of Arts and Sciences and College of Education, the Wyoming Education Association, and the Wyoming Department of Education.

UW Partnership School Districts working with concentrated placements of student teachers include: Albany #1, Campbell #1, Fremont #25, Laramie #1, Natrona #1, Sheridan #2, and Sweetwater #1 & #2.

Map Legend

- School District Member
- Community College Member
- League of Democratic Schools Member
- School-Community Engagement Initiative Setting
- University of Wyoming
- Partnership Cosponsored Statewide Conference
- ★ Life Sciences Lost in Transition Summit
- ▲ Life Sciences Site-Swap
- ★ Teaching Writing in Wyoming Lost in Transition Colloquium
- ★ Mathematics Lost in Transition Institute
- ★ World Languages Lost in Transition Colloquium
- ★ Social Studies Lost in Transition Institute
- ★ Literature Lost in Transition Summit

Updated by Beth Willey November 2013

www.uwyo.edu/wsyp

Outreach School

The Outreach School's mission is to **extend the University of Wyoming's educational programs to the state of Wyoming and beyond** with innovative and unique opportunities for learners of many ages, interests, locations, and motivations. Since 1976, university degree programs have been available

at the University of Wyoming/Casper College Center, and for nearly three decades a wide variety of full UW degree programs have been available statewide and nationwide through Outreach Credit Programs. A full listing of these programs is given below. Programs are delivered through technology provided by outreach Technology Services, including the Outreach Video network (OVN), online courses, audio teleconferencing, and hybrid instruction. The OVN is available for statewide partner use.

Wyoming Public Radio has brought news and entertainment to the state for over 40 years, and since 1999, UW International Programs has brought the opportunity for hundreds of Wyoming students, staff, and faculty to go abroad, and to bring the world to Wyoming. Through this variety of avenues, the **Outreach School is a critical part of the University of Wyoming's mission**, and provides access to a wide variety of UW programs. The Outreach School has **Outreach Regional Centers located in communities throughout Wyoming**.

The staff and faculty of the Outreach School, along with our colleagues in Agricultural Research and Extension, are in many cases the personal faces of UW for Wyoming communities. Our **Academic Coordinators at our Regional Centers live, work, and are part of the community in towns around the state** like Riverton, Powell, Rock Springs, Sheridan, Gillette, and Torrington. **They serve on various community boards and are members of local Chambers of Commerce and service organizations.** **Academic Coordinators also regularly travel throughout their regions providing support to Outreach School students and serving Wyoming residents wherever they live.**

Our Associate Dean in Casper works with **the Casper Area Economic Development Alliance and Casper College** to ensure workforce needs are being met in higher education. One Associate Dean in Laramie is on the **Mainstreet Laramie and Downtown Development Authority boards**, and routinely gives economic updates around the state for the Wyoming Business Report, Wyoming Business Alliance, Wyoming Taxpayers Association, and other business and community groups.

Wyoming Public Media broadcasts to over 80% of Wyoming and its signal reach makes it the 3rd largest public radio network in the US. WPM offers four distinct listener services: Wyoming Public Radio, Classical Wyoming, Jazz Wyoming, and an online service through wyomingpublicmedia.org. Combined, these services bring news, cultural affairs, music, and entertainment programming to communities across the state. They reach over 66,000 Wyoming radio listeners weekly and annual views on the online service top 450,000. The system of transmitters and translators provides a continuous WPM signal throughout Wyoming's major highways and roads, capturing additional listeners passing through the state. WPM serves as the emergency information provider to most of Wyoming.

WPM brings NPR, PRI, and APM programs to the state, but goes far beyond this by producing content relevant and impactful for the state. Wyoming Public Media's **Wyoming Stories** is a partnership with the Wyoming Cultural Trust Fund that is preserving Wyoming's history by capturing oral remembrances throughout the state, in the same spirit as *StoryCorps*. *Open Spaces*, **WPM's award-winning weekly news and public affairs program** brings the state information from across Wyoming and the west. WPM's news director has covered the Legislature and the state longer than any other broadcaster in Wyoming, and leads a trusted team of journalists who bring unique and important stories to Wyoming. WPM's cultural affairs director provides information about Wyoming's arts-related activities.

WPM's mission is to connect Wyoming through media that encourages lifelong learning and citizen involvement in community, the nation, and the world. **As part of the Outreach School, WPM provides the last mile in the education continuum, reaching people where they live, work, and play.**

Figure 30: Wyoming Public Media Broadcasting Area

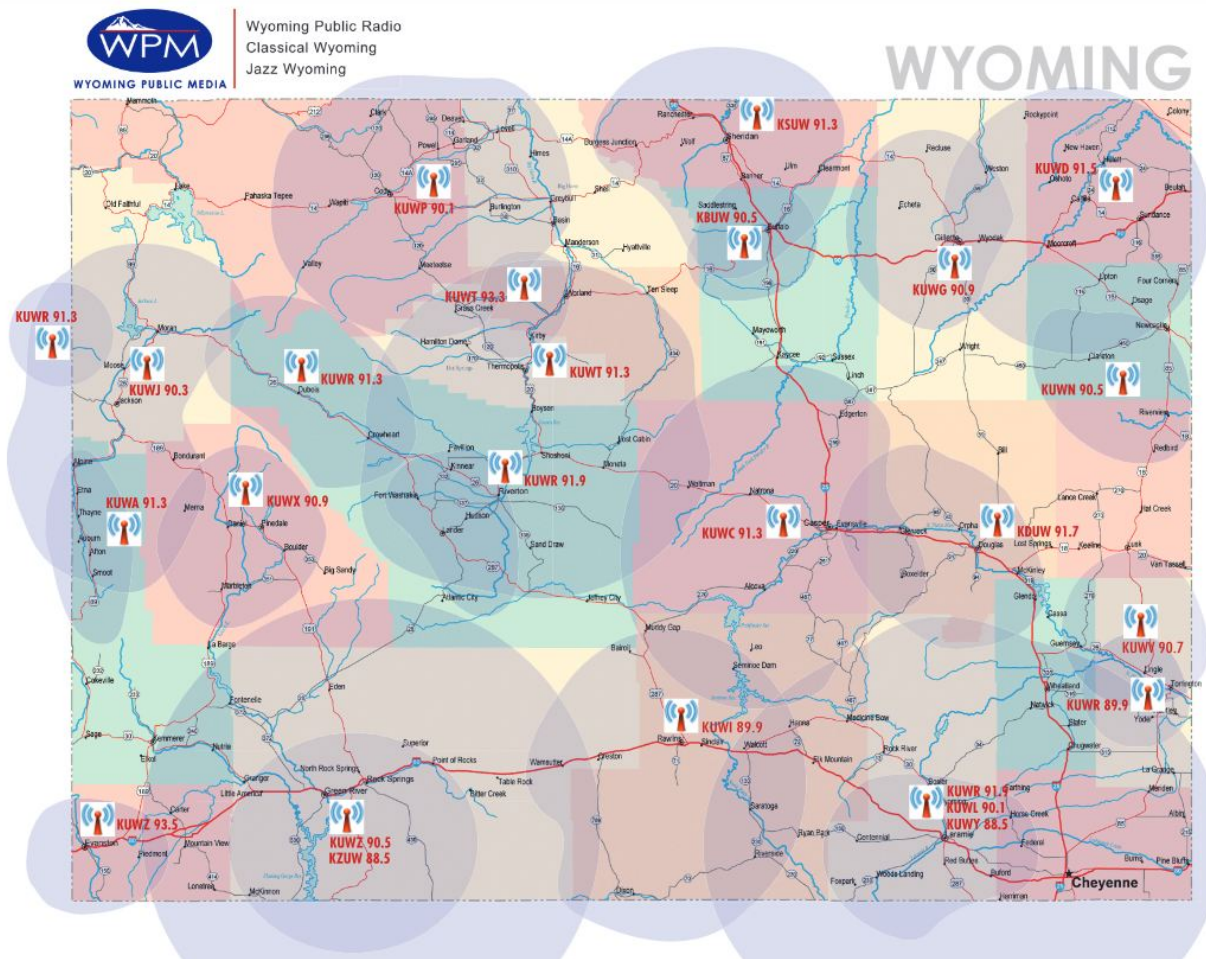
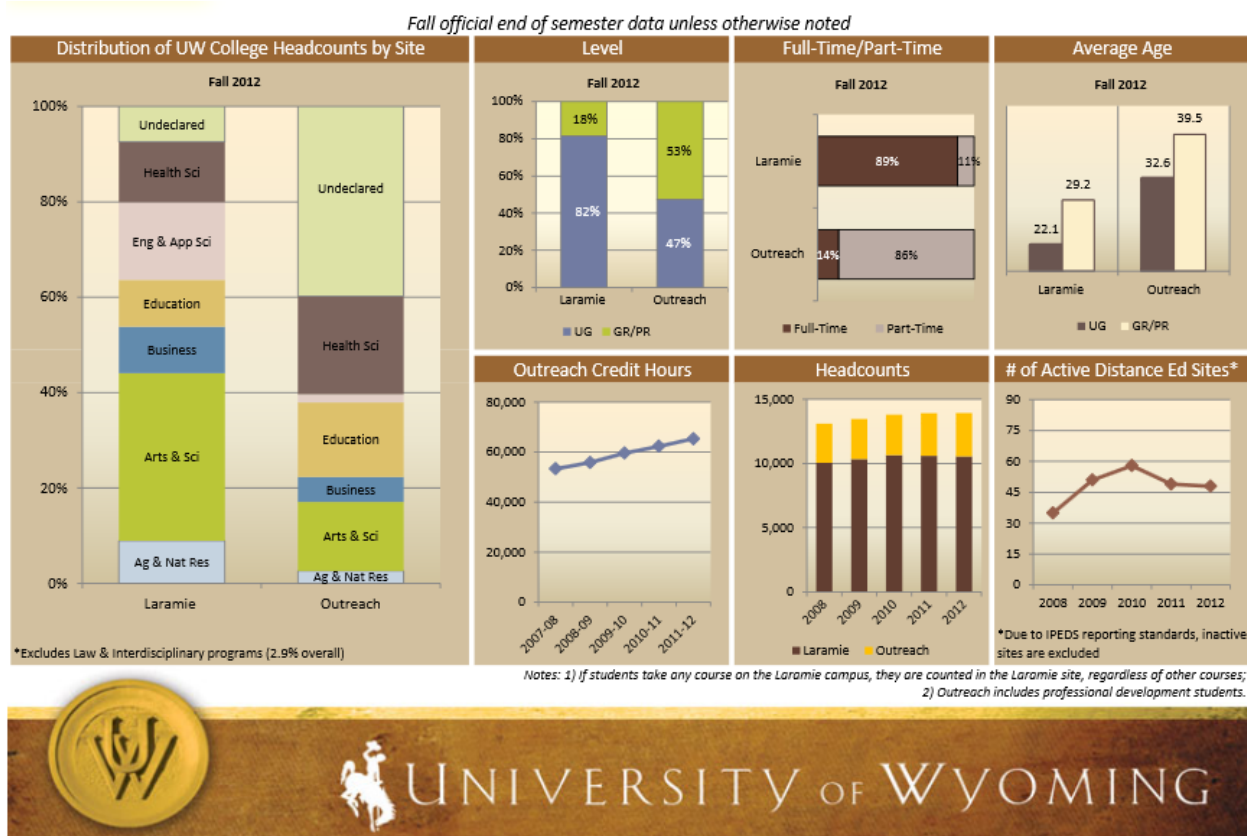


Figure 31: Outreach School Demographics and Site Activity



Saturday University brings UW's core activity—faculty teaching students—directly to Wyoming residents. Directed by Professor Paul Flesher, in cooperation with the Wyoming Humanities Council and partners in local communities, each Saturday University program features a (Saturday) morning of talks by three professors from across UW's colleges. Now in its fifth year, these events take place twice a year in three locations: **Gillette, Sheridan and Jackson. The talks are video-taped and made available online.**

At the moment, a presidential task force is evaluating the program and developing ways it can be expanded to more Wyoming communities, both large and small.

UW Bachelor's Degrees offered through Outreach Credit Programs

- B.S. Agroecology
- BRAND - Accelerated Nursing, BSN
- Bachelor of Applied Science
- B.S. Business Administration
- B.A. Criminal Justice
- B.S. Family & Consumer Sciences, Professional Child Development Option
- B.A. Psychology
- BSN Nursing, RN to BSN
- B.A. or B.S. Social Science

UW Master's Degrees offered through Outreach Credit Programs

- Education: Educational Administration in Adult & Postsecondary Education
- M.S. Education: Instructional Technology
- Education: Educational Administration in K-12 Educational Leadership
- M.A. Education: Special Education
- M.A. Education: Curriculum and Instruction
- M.A. English
- Executive MBA
- M.S. Kinesiology and Health
- M.S. Nursing - Nurse Educator Option
- M.P.A., Public Administration
- M.S. Speech-Language Pathology
- M.S.W., Social Work

UW Doctoral Degrees offered through Outreach Credit Programs

- Ed.D. Education, Educational Administration in Adult & Postsecondary Education
- Ed.D., Education, Educational Administration in K-12 Educational Leadership
- D.N.P., Nursing Practice

Certificate & Endorsement Programs

- Early Childhood Program Director Certificate
- Early Childhood - Special Education Graduate Endorsement
- Early Childhood - Birth to Five Undergraduate and Graduate Endorsement
- Early Childhood - Birth to Eight Undergraduate and Graduate Endorsement
- English as a Second Language Undergraduate and Graduate Certificate/Endorsement
- Land Surveying Certificate
- Literacy, Graduate Certificate/ Endorsement
- Online Instruction Graduate Certificate

- Principal in K-12 Educational Leadership Graduate Certificate/ Endorsement
- Social Work - School Social Work Preparatory Certificate
- Special Education Director Graduate Endorsement
- Special Education Graduate Certificate/Endorsement
- School District Superintendent in -12 Educational Leadership Graduate Certificate/Endorsement
- Teachers of American Indian Children Graduate Certificate/Endorsement

Through the University of Wyoming-Casper, a wide variety of UW degree programs are offered on site and virtually through the Outreach School, including:

UW Undergraduate Degree Programs, UW-Casper

B.S., Biology	B.A. or B.S., Communications	B.A., Criminal Justice
B.A., Elementary Education	B.A. English	B.A., Humanities/Fine Arts
B.A. or B.S., Journalism	B.A. or B.S., Mathematics and Science	B.A. or B.S., Psychology
B.A. or B.S., Social Science	B.A., Secondary Science Education (Biology)	
B.S.W, Social Work	B.S., Technical Education	

UW Graduate Degree Programs, UW-Casper

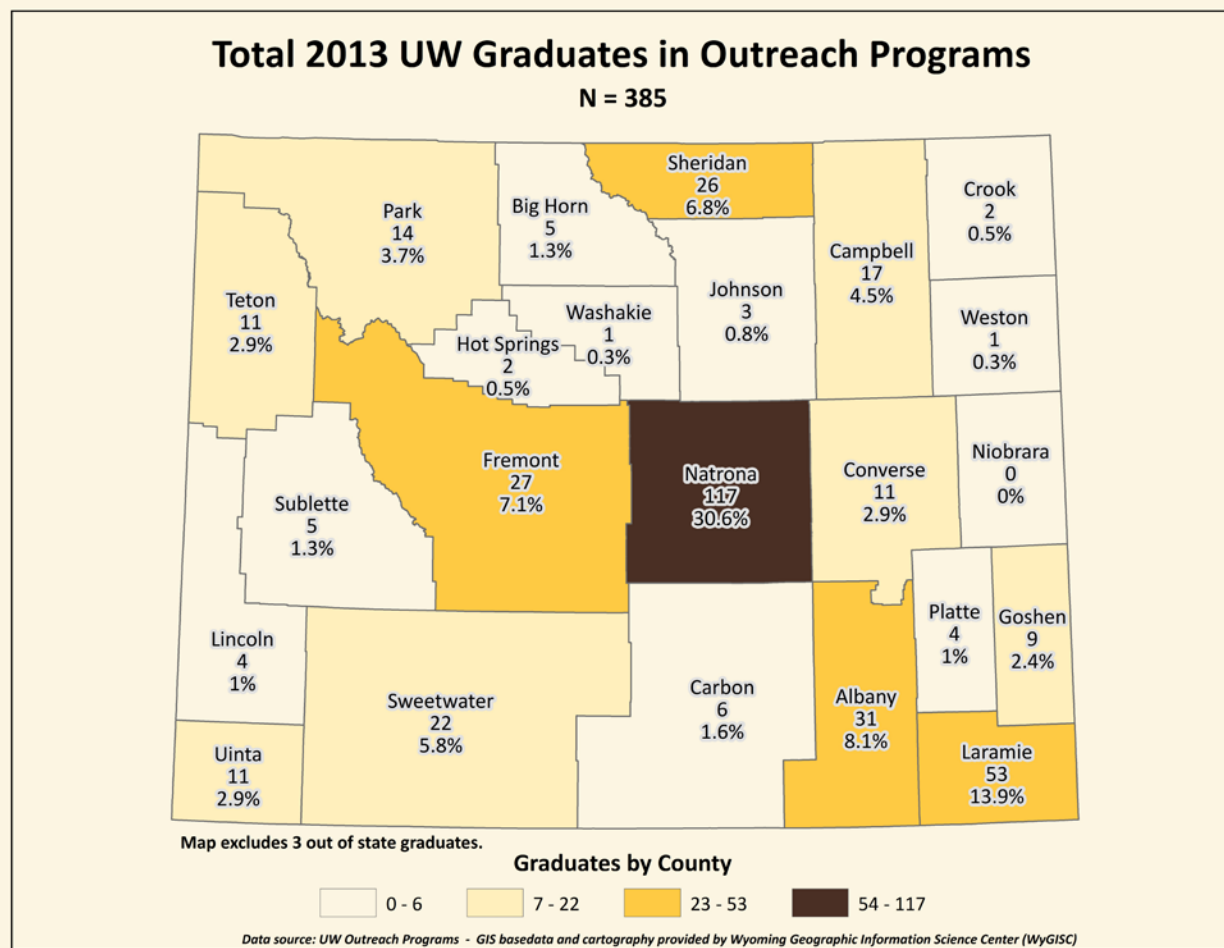
M.A., Education – Educational Leadership

Certificate and Endorsement Programs, UW-Casper

Educational Leadership – Principal Endorsement

The Outreach School, working with our colleagues in the academic colleges, provides the means for people around Wyoming, the country, and the world to take UW courses and earn UW degrees, regardless of their location.

Figure 32: UW Graduates, Class of 2013, receiving their degrees through Outreach School, by Wyoming county



To get a sense of the breadth of community involvement that the Outreach School has in the places they live and work, a sampling of community service our faculty and staff at UW-Casper volunteer for are below.

American Cancer Society Relay for Life

Big Brothers/Big Sisters Boys & Girls Club

Mercer House

Natrona County School District activities

12-24 Club

ASPIRE Board of Directors

Lion's Club

American Diabetes Association

Toastmaster's

Casper Chamber of Commerce Ambassador

Nicolayson Art Museum Board Member

Casper Rotary Club Member

Fort Casper Chapter of National Society of Daughters of the American Revolution, Membership Chair

Coaching two First Lego League, Lego Robotics teams

Provide Foster Care for over 25 children

Official with State Science Olympiad

NSTA Advisor

*Service learning class with Colorado
Heritage Camps for mentoring adopted children*

*Building and donating barn wood frames for
a fund raising auction for Kelly Walsh FFA
Windy City Chapter*

*Volunteer at Central Wyoming Hospice
and Transitions (therapy animal visits with
patients, sewing and baking)*

Medical Reserve Corp

*Serve Wyoming, Natrona County Library
Task Force and PAC*

*CAEDA Higher Education Committee Board Member
with monthly report to Central Wyoming BOCES
Board and Casper College Board of Trustees*

Wyoming Reads

*Member of Friends of the Natrona
County Public Library*

Exhibition Committee, Nicolaysen Art Museum

Review Group for Stage III Theatre

Public Art Selection Committee, Casper College

Judge for the Little Miss Wyoming Scholarship Pageant

Make-A-Wish Wyoming, "wish-granter"

Former board member of Star Lane Center

*Donated country photography for a fundraising
auction for the Kelly Walsh FFA Windy City Chapter*

Judge science fairs across Natrona County

Werner Wildlife Museum Board

UW Wyobio Advisory Board

*Designed, built and donated a shelving system
office bookshelves to Reach 4 A Star riding program
for special needs people*

Volunteer at Mount Hope Lutheran Church

Lego Robotics competition judge

*Association of Sheriffs and Chiefs of Police for
the state of Wyoming collecting and analyzing data
related to alcohol-involved arrests*

*Conductor, Casper Children's Chorale (local
regional and national performances)*

Park Elementary School Steering Committee

*Conductor, Alla Breve Community Women's Chorus
(local)*

Wyoming Public Radio Advisory Panel

Planning work for Casper Artists' Guild

Celebrity Reader, Wyoming Reads

Equality State Book Festival Committee

*Volunteer with Central Wyoming Rescue Mission
Development Department*

*Public talks statewide on "Parasite-Host
Coevolution" and "Darwin and the Galapagos"*

Former board member of Wyoming Science Zone

Central Wyoming Rescue Mission

Statewide Re-entry Taskforce, Oct. 2012-Oct. 2013

Casper Reentry Center, Therapeutic Community

*Natrona County School District, Community
Transitions Team*

Girl Scout Troup 1097 Volunteer

Food for Thought

*Natrona County School District, Book and a Bite
Program*

University of Wyoming Libraries

For our partner public libraries across the state, UW Libraries provides free access to multiple databases, including:

- Eighteenth Century Collections Online (Gale) – books, pamphlets, essays, and broadsides
- Nineteenth Century US Newspapers (Gale) – newspapers from every state, including the Cheyenne (WY) Leader
- ProQuest Congressional – all sorts of U.S. Congressional documents dating back to 1789
- ProQuest Family of Databases – over 150 databases covering every subject imaginable (some are listed below)
- Sanborn Maps – digital maps of over 12,000 American towns and cities

UW Libraries also provide **free access to ProQuest databases for UW alumni**, including:

- CSA Illumina products – Cambridge Scientific Abstracts products, including Sociological Abstracts
- ABI/INFORM – scholarly journals, trade publications, and other resources, including the Wall Street Journal
- AltPress Watch – over 200 alternative and independent press publications
- Ethnic NewsWatch – journals, magazines and newspapers from ethnic and minority presses
- GenderWatch – publications focusing on the impact of gender in a broad spectrum of subject areas
- Hoover's Company Records – proprietary information about more than 20,000 companies and 225,000 executives
- ProQuest Biology Journals – over 400 publications from major societies in a variety of biological areas
- ProQuest Career & Technical Education – over 800 trade journals, magazines, books, and scholarly journals
- ProQuest Computing – includes trade journals such as "Wired" and scholarly journals such as "The Academy of Information and Management Sciences Journal"
- ProQuest Criminal Justice Periodicals Index – nearly 500 scholarly and trade journals
- ProQuest Health & Medical Complete – over 3,000 journals, mostly scholarly, in a variety of medical areas
- ProQuest Nursing and Allied Health Source – over 1,300 nursing publications
- ProQuest Health Management – publications covering the business of health care, insurance, ethical and legal issues

- ProQuest Psychology Journals – over 1,100 scholarly journals covering many specialties within the field of psychology
- ProQuest Research Library – provides one-stop access to over 6,000 journals collectively covering a wide range of popular academic subjects
- ProQuest Science Journals – over 1,600 journals covering major fields of study in the sciences
- ProQuest Social Science Journals – over 1,200 journals covering major fields in the social sciences
- Proquest Religion – nearly 300 journals covering many aspects of religion, not limited to specific types of religion

In addition, the **UW Law Library provides free article database access to lawyers and law firms across the state.**

Haub School of Environment and Natural Resources, Ruckelshaus Institute, and Biodiversity Institute

The Haub School and its associated institutes conducts community conversations around the state to further our understanding of critical challenges in Wyoming related to air, water, sustainability, biodiversity, forest, wildlife, land use, and open space issues.

The Biodiversity Institute's outreach and engagement activities have included innovative ways of engaging the public in the science, art, and beauty of Wyoming's biodiversity. Their programs include:

- **WyoBio Web Portal**, a web-based project designed to create a community of professional and non-professional scientists interested in Wyoming's natural heritage. WyoBio provides a visually stunning and scientifically rigorous forum for scientific inquiry by enabling participants to input data, access and visualize data, and communicate among members. It is a place for citizen scientists to see and interact with their and others' data.
- **The Citizen Science Program**, which advances collaboration between biodiversity scientists and citizens by organizing year-long, state-wide data collection projects and other public events that focus on specific aspects of Wyoming's biodiversity.
- **Broader Impacts Catalyst Program** - Many UW researchers, both faculty and students, are involved in biodiversity studies that would be of interest to the public, especially students. By hosting blogs, research reports, public presentations, and workshops, the Biodiversity Institute will become the premier organ for the sharing of these exciting works-in-progress. Many researchers are required by funders to disseminate information; the goal of the Broader Impacts Catalyst Program is to help researchers find effective methods for research synthesis and communication that will inspire young people to become natural historians and conservationists.
- The Biodiversity Institute brings one **world-class speaker** to the University of Wyoming each year, to broaden our understanding, inspiration and scope of biodiversity science and studies. This speaker is an expert in a field related to biodiversity science, with broad appeal and innovative ideas and projects.
- **Music and movies are a critical component of biodiversity studies, in that they express scientific concepts through sensory vehicles.** We can all relate to sound and sight, and the wonder of a beautiful view of nature or a harmonized quintet of wind instruments is another way to experience the natural world around us. The Biodiversity Institute hosts **the BioMusica Concert Series, a monthly program dedicated to bridging music and biodiversity**

exploration. We also host the Biodiversity Movie Night once a month, showing films with a different focus relating to biodiversity and its conservation.

- **Biodiversity Expeditions** will take interested Wyomingites out into the field with our respected scholars for immersive learning environments to bring the concepts of biodiversity to life. Look for these to begin soon.

A summary of the work of the Ruckelshaus Institute over the past ten years is below.

Collaborative Decision Making

Collaboration Program in Natural Resources (first class in 2013, ongoing): Mid- and upper-level professionals as well as individuals whose work involves land or natural resource management and decision making in Wyoming and the surrounding region participate in a year-long training program to learn collaborative problem solving tools in the context of natural resource challenges. Students participate in six hands-on skills-building sessions in on-line and in-person sessions around the state.

Collaboration in Natural Resources: A Forum (April 2013, Lander): This forum brought together professionals interested in participating in or leading natural resource collaborative efforts in Wyoming to discuss lessons learned from past and present collaborative efforts, identify barriers and opportunities, and explore the needs to facilitate future efforts.

Oregon Inlet (June 2013): The Ruckelshaus Institute conducted a stakeholder assessment on the management of Oregon Inlet. This inlet is located on the Outer Banks of North Carolina and is known for its treacherous conditions for both recreational and commercial fishing boats. The purpose of this assessment is to assist Dare County in determining if a collaborative, science-based, stakeholder-driven process is possible for finding and implementing a solution to maintaining a safe navigable route through Oregon Inlet while also protecting and enhancing the environmental and cultural ecosystems of northeastern North Carolina.

Across the Great Divide (August 2012, Cody): The Ruckelshaus Institute presented a roundtable discussion at the Buffalo Bill Historic Center between Senator Alan K. Simpson, William D. Ruckelshaus and John F. Turner. In a conversation moderated by Wyoming Governor Michael J. Sullivan, these acclaimed natural resource leaders and collaborators spoke about the value of collaboration in natural resource management. The event was widely attended, and there is a video archive.

Summer Trainings Series (2010, 2011, 2012): Spicer Chair Dr. Steve Smutko leads a training series aimed at mid-career professionals in natural resource fields. The series trains participants in a variety of conflict resolution and communication skills.

Facilitating Controversial Public Issues: Process Design (for the Society of Range Management, 2010): Steve Smutko and Jill Lovato offered a training to the Society of Range Management membership based on the process design module of the “Facilitating Controversial Public Issues” training. The one-day workshop covered the important steps in collaborative process design, from determining the need and identifying the issues to conducting a situation assessment.

Public Involvement in Collaborative Decision-Making: A Legislative Workshop (February 2009): Hosted by Wyoming Representatives Rosie Berger and Pete Jorgensen and Senator John Schiffer, the Ruckelshaus Institute and Policy Consensus Initiative offered a workshop to Wyoming legislators and affiliates on how to effectively work with constituents toward durable solutions.

Land Use and Management

Forum on Conservation Finance: Creative Approaches to Sustaining Land and Water (April 2013, Casper): The RI, along with the Stroock Forum (UW) and The Nature Conservancy, hosted an event that featured a number of experts in the conservation finance field and prominent Wyoming names, including Kenneth Lay (former treasurer of the World Bank), Story Clark (leading expert on conservation finance and Haub School board member), Mark Gordon (Wyoming State Treasurer), Don Simpson (Director of BLM Wyoming), Randy Teeuwen (Haub School board member), and others. The purpose of the Forum was to 1) build an informational foundation and understanding about the practice of, and opportunities within, conservation finance, 2) share real-world applications and success stories using various conservation funding models in government and the private sector, and 3) explore novel approaches to conservation financing to inspire future conservation in Wyoming. The event was attended by 110 people from federal, state, and local government, non-profit organizations, academia, and the private sector, among other groups. Conference proceedings were released in August 2013.

Wyoming Open Spaces Initiative (2002–present): In 2002, the Ruckelshaus Institute launched the Wyoming Open Spaces Initiative, a long-term project intended to help improve the effectiveness of Wyoming citizens in maintaining Wyoming’s open spaces through education, research, information, decision-making assistance, and publications. For over a decade, the Wyoming Open Spaces Initiative has provided Wyoming citizens with objective information on land-use trends, land-use planning, and land conservation.

Private Lands Conservation Toolkit and Training for Public Land Managers (resource guide created in collaboration with the U.S. Forest Service, 2011): This toolkit is intended to help land managers in Wyoming navigate the options and mechanisms for conservation of private land. The purpose of the toolkit is to provide those interested in public land management with a comprehensive resource guide for exploring land conservation options with private landowners, communities, land trusts, and local planners.

Wyoming Community Viz™ Partnership Phase I Pilot: Aquifer Protection and Community Viz™ in Albany County, Wyoming (City of Laramie, Albany County, and Community Viz™ partners, 2003): The Ruckelshaus Institute worked with the Wyoming Community Viz™ Partnership, which included the Wyoming Business Council, the Wyoming Community Foundation, and the Spatial Data and Visualization Center (now the Wyoming Geographic Information Science Center) to draft a protection plan for the Casper Aquifer, one of the main drinking water sources for the City of Laramie. The goal of the pilot phase was to use computer technology (Community Viz™ software) to create scenarios for different land-use patterns in the aquifer recharge zone and model potential impacts.

Energy

Energy Mitigation Research and Outreach Initiative (2011–present): The Mitigation Initiative is an effort to gather, synthesize, and deliver information on mitigation practices intended to ameliorate landscape-scale energy development impacts to wildlife. Based on information from federal, state, non-profit, and industry partners, we are working to improve understanding of wildlife mitigation options, successes, and challenges.

Hydraulic Fracturing: A Wyoming Forum (Laramie, Wyoming; September 2011): Nearly 400 people gathered in Laramie to learn factual information about the use of hydraulic fracturing in oil and natural gas development in Wyoming. The forum explained technical aspects of the fracturing

process including the purpose, applications, technology, techniques, and results; reviewed existing state and federal regulations relevant to hydraulic fracturing in Wyoming; examined environmental impacts and other concerns associated with hydraulic fracturing and directly related processes; explored safety and environmental best management practices that are, or can be, used when performing hydraulic fracturing; and identified data and knowledge gaps for future research. Proceedings are available.

Coalbed Methane Produced Water Working Group (2009–2010): Wyoming Department of Environmental Quality (DEQ) Director, John Corra, convened the Coalbed Methane Produced Water Working Group December 2009. The group’s mandate was to assist in the development of a CBM permitting strategy in a way that recognizes the serious and substantial interests of landowners, industry, and the state of Wyoming so that statutory water quality standards can be met. The Ruckelshaus Institute designed, organized, and facilitated the Working Group deliberation process. Based on the comments received from oil and gas firms, conservation organizations, landowners, and other state agencies, DEQ amended its draft permitting strategy, which received no challenges.

Legal and Regulatory Implications for Coalbed Natural Gas Produced Water in Wyoming (book chapter in *Coalbed Natural Gas: Energy and Environment*, ed. KJ Reddy, 2010): This book chapter appears in *Coalbed Natural Gas: Energy and Environment*, edited by UW Renewable Resources faculty member, KJ Reddy. The book reports on global coalbed natural gas development trends over the last three decades. Chapter topics include environmental and water impacts; case studies from Canada, China, Australia, and New Zealand; and technologies for treating co-produced water. The chapter on legal and regulatory implications, authored by RI staff, covers the legal and regulatory implications of co-produced water discharge and land ownership.

Energy Resources and Produced Water Conference (Laramie, Wyoming, May 2010): Sponsored by UW’s School of Energy Resources and the Ruckelshaus Institute, this international conference addressed the quality, quantity, regulation, management, and technology associated with water co-produced from or used in the development of oil, gas, coalbed natural gas, coal mining, uranium, and carbon sequestration. The conference drew over 300 participants.

Wyoming Wind Symposium (August 2009, Laramie): The RI hosted this event, which was an opportunity for stakeholders and leaders to engage in a discussion about wind energy development and what’s in it for Wyoming. Governor Freudenthal convened the two-day event, which brought together state and national leaders, resource managers, and experts to discuss considerations and approaches to wind development, including financial, legal, transmission, wildlife, and policy—to provide best practices, and examples for the future of wind energy development in Wyoming. More than 600 people attended the event.

Commercial Wind Energy Development in Wyoming: A Guide for Landowners (2009; 2nd ed., 2011): In 2008, the Medicine Bow Conservation District invited the Ruckelshaus Institute to facilitate a public meeting on imminent wind energy development in the area. Several public concerns were identified among the participants. This publication was a response to these concerns. It outlined the process of wind energy development for landowners and highlighted some of the key issues they may face throughout the wind energy development process. The guide was updated in 2011 in partnership with the School of Energy Resources, the Cooperative Extension Service, and UW College of Law. This new edition contains updated information on the growing practice of landowner wind energy associations and the changing legislative landscape in the state.

Finding the Balance: Energy and Climate (conference in Jackson, Wyoming, co-hosted with the Enhanced Oil Recovery Institute, School of Energy Resources, and the Stroock Forum on Wyoming’s

Lands and People, October 2007): The two-day forum brought together high-level decision makers, experts in the field of energy and climate, and other interested parties from across the U.S. and beyond to share information and find common ground on balancing energy needs with climate considerations. The issues were explored from a variety of different perspectives, emphasizing economic, scientific, public policy, and societal values.

Research and Development Concerning Coalbed Natural Gas: CBNG Produced Water

Investigations (DOE-funded research initiative, 2006–2008): Research and Development Concerning Coalbed Natural Gas was a two-year, \$1.5 million project that engaged nearly a dozen UW faculty around nine research tasks, including: (task 2) estimating groundwater recharge rates in the Powder River Basin; (task 3) groundwater contamination of trace elements from CBNG disposal ponds; (task 4) use of environmental tracers in assessing water quality changes in ground and surface water systems; (task 5) development of a software toolbox to assess CBNG water treatment technologies; (task 6) potential value of CBNG water for enhanced oil recovery using low salinity waterflood; (task 7) evaluation of natural zeolites for low cost CBNG water treatment; (task 8) evaluation of aquatic toxicity testing methods required by regulatory agencies on some CBNG water discharges; (task 9) use of remote sensing to evaluate CBNG water discharges as habitat for West Nile Virus transmitting mosquitoes; and (task 10) a summary of lessons learned from historic CBNG management in Wyoming.

Energy Futures: Global Changes that Challenge Wyoming (speakers' series in Casper, Wyoming, September 2006): In this special topics course offered at Casper College, students were exposed to a breadth of energy issues in the context of a carbon-constrained world. Through case study and guest speakers, this course focused on the politics and economics of energy wedge issues as they pertained to the Rocky Mountain West, the U.S., and the world.

Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality, and Management Options (report to Wyoming Governor Freudenthal, 2005): Governor Freudenthal's office commissioned this report. The Ruckelshaus Institute contributed to and coordinated research among nearly a dozen UW faculty representing several departments. The report covered water quality and quantity issues; options for water management, treatment, disposal, and use; economic impacts; legal and regulatory issues; and alternative strategies for water management. It concluded by providing recommendations for further research and review of incremental adjustments in CBM water management and regulation.

Coalbed Natural Gas Research, Monitoring, and Applications Conference (Laramie, Wyoming, 2004): The primary objective of the conference was to share the research, monitoring, or application results of field-tested, empirically supported work. Rather than a venue for corporate advertising of services, the intent was to go one step beyond simply sharing information. This was achieved by concluding with a workshop that explored the potential for widespread application of new techniques in the field. A request for proposals generated speakers. Plenary sessions on the following topics took place during the three-day event: groundwater quality and quantity, surface water quality and quantity, produced water treatment and/or use, wildlife and habitat, vegetation and soils, and information management.

Wyoming Energy Resources Information Clearinghouse (website created with WyGISC, BLM, DOE's Office of Science, 2003–2011; formerly CBM Clearinghouse): This website provided information about Wyoming's energy resources, including coal, coalbed methane, natural gas, oil, hydropower, uranium, and wind energy development. The site also included information on reclamation as well as research on energy development impacts on water and wildlife resources. It included current

research reports, events, and links to key energy-related agencies and initiatives. WERIC also included educational pages with a visual library of energy extractive activities.

Water

Assessing the Future of Wyoming's Water Resources: Adding Climate Change to the Equation (report with State Climatologist, 2009): This report summarizes the current scientific knowledge about climate change and its anticipated effects on Wyoming's water resources. The idea for the publication came from a forum that the RI held in Laramie called "Water, Drought, and Wyoming Climate." Steve Gray, former Wyoming State Climatologist, developed a presentation based on issues identified by the forum participants representing diverse stakeholder perspectives and expertise. This publication is further development of that presentation.

Impacts of Wyoming Water Development Commission Regional Water System Projects on Land Use: An Analysis of Two Case Studies (report to Wyoming Water Development Commission, 2008): The RI contracted with the Wyoming Water Development Commission (WWDC) to coordinate the research efforts of on-campus collaborators to evaluate the relationship between regional water projects funded by the WWDC and community and rural land development for two specific case studies (Sheridan Area Water Supply and Shoshone Municipal Pipeline). The research team analyzed both positive and negative impacts of the case studies on natural and fiscal resources and brought to light the public perspective related to the origin, installation, and operation of each case study pipeline and how water is being used.

Water, Drought, and Wyoming Climate (forum in Laramie, Wyoming, 2006): Seventy-five participants representing local, state, and federal agencies; academia; the agriculture industry; local and state elected officials; and the Ruckelshaus Institute board attended the day-long discussion. Topics covered included the current understanding of climate variability and climate change as it relates to Wyoming's water, the needs of water resource managers in the context of a changing climate, and opportunities for collaborations among the participants in addressing information needs. Led to the RI publication, *Assessing the Future of Wyoming's Water Resources: Adding Climate Change to the Equation*.

Air

Upper Green River Basin Air Quality Citizens Advisory Task Force (2012, DEQ sponsored): The Ruckelshaus Institute was asked by the Wyoming DEQ to form and facilitate the Upper Green River Basin Air Quality Citizens Advisory Task Force. The purpose of this Task Force was to consider and recommend to the DEQ approaches for reducing ozone in the Upper Green River Basin (UGRB), as well as increase public engagement on the issue. The Task Force consisted of 26 members representing local citizens, industry, environmental conservation groups, public health, county and municipal government, the Wyoming Governor's office, and state and federal agencies. Meetings were held regularly in Pinedale, Wyoming and are spent evaluating available science on the issue and discussing stakeholder interests and potential solutions. Dr. Steve Smutko and Elizabeth Spaulding designed the collaborative process, led seven public meetings, spearheaded joint fact finding, and ultimately helped the group submit its final recommendations to DEQ.

Ozone Air Quality Research in Sublette County (public forum sponsored by the Sublette County Commissioners and convened by the RI, 2008): This forum provided information to the public on the human health effects of ozone, associated regulatory policy and implications associated with ozone standards, and the atmospheric chemistry of ozone. The RI served as a neutral third-party convener for the event.

Wildlife and Forestry

Our Future Forests: Ecological dynamics, the bark beetle outbreak, and forest recovery and restoration (2012–present, funded by U.S. Forest Service): The RI contracted with the USFS Medicine Bow-Routt National Forests to provide outreach and education on bark beetle outbreaks. Specific projects include a video project, photography project, annotated bibliography on research done on bark beetles with an emphasis on human dimensions, and public open houses in Laramie, Saratoga, and Steamboat Springs.

Bark Beetles in the Intermountain West: Redefining Post-Disturbance Forests and Management Strategies (workshop, 2010; proceedings, 2011): Nearly 75 invited forest managers and scientists attended this workshop sponsored by the USFS, BLM, Wyoming State Forestry Division, Laramie Rivers Conservation District, and Neiman Enterprises to evaluate science status, management approaches, and policy implications associated with the current bark beetle outbreak. Breakout teams identified desired future conditions, conventional and innovative management approaches for achieving the desired future conditions, and research and information gaps associated with management for four forest types (ponderosa pine, lodgepole pine, Douglas-fir, and Engelmann spruce/subalpine fir).

Wyoming Landscape Conservation Initiative (WLCI) Science Workshop (workshop and report to U.S. Geological Survey, May 2009): The 2009 workshop was a continuation of the 2007 event. WLCI's Technical Advisory Committee convened the event, and the Ruckelshaus Institute guided agenda development, facilitated the meeting, provided logistical support, and produced the workshop report.

Wyoming Landscape Conservation Initiative Local Planning Teams (series of local meetings in SW Wyoming, July and August 2008): In the summer of 2008, WLCI asked Institute staff to design and facilitate a series of four public meetings in the WLCI area to help launch its Local Planning Teams. These stakeholder committees work with WLCI agencies to review, select, and help develop and refine on-the-ground management projects funded by WLCI. The objectives of the meetings were to inform the public of WLCI's work in the area, publicize the opportunity to engage in its efforts through the Local Planning Teams, recruit members, and collect input on issues of greatest concern and selection criteria for project proposals.

Wyoming Landscape Conservation Initiative Science Workshop (workshop and report to U.S. Geological Survey, May 2007): WLCI represents a partnership among local, state, and federal wildlife and land management agencies; private landowners; industry; and academia dedicated to maintain ecosystem integrity and economic vitality in southwest Wyoming. In 2007, WLCI's Technical Advisory Committee held its first Science and Management Workshop. The workshop provided a venue for sharing scientific findings that are being translated into management actions in the WLCI geographic area. The work presented was sponsored by WLCI and conducted by a broad spectrum of entities. The Ruckelshaus Institute provided facilitation and logistical support for the three-day workshop and produced the workshop report.

Research Needs and Management Strategies for Pallid Sturgeon Recovery (workshop for U.S. Army Corps of Engineers, 2007; report, 2008): The Ruckelshaus Institute and the Meridian Institute co-organized, designed, and facilitated a workshop sponsored by the U.S. Army Corps of Engineers, which brought together scientists, biologists, and managers to discuss research and management needs for pallid sturgeon recovery. The primary goal of the workshop was to develop technical

guidance for resource agencies with management authority on prioritized research and management strategies to assist in range-wide recovery of the species. Nearly 60 invited experts participated in the three-day workshop. Nearly 30 public observers also attended.

Brucellosis in the Greater Yellowstone Area (workshop and report to U.S. Animal Health Association (USAHA), 2005; *The Laramie Agenda*, 2006): The USAHA Special Committee on Brucellosis in the Greater Yellowstone Area (GYA) sponsored and convened this workshop, for which the Institute provided process design and facilitation services. The primary objective of the three-day workshop was to identify the research and funding needs for the development of effective vaccines, vaccine delivery mechanisms, and diagnostic tools to address brucellosis in elk and bison in the GYA. The 125 participants represented academia, governmental agencies, and NGOs. *The Laramie Agenda* was released a year after the workshop and outlines a plan and funding needs for research and development of improved vaccine, vaccine delivery, and diagnostics. It calls for nearly \$50 million over ten years to fund R&D. The Consortium for the Advancement of Brucellosis Science (CABS), a cooperative research and outreach initiative among scientists and stakeholders, was conceived of during the workshop and was launched after *The Laramie Agenda* was released. Its mission is to “identify gaps in current research, secure funding, award grants, and conduct outreach for the advancement of brucellosis science worldwide.”

Research and Assessment Needs for Pallid Sturgeon Recovery in the Mississippi River (workshop and report to U.S. Army Corps of Engineers, 2004): The U.S. Army Corps of Engineers, USFWS, and USGS sponsored this three-day workshop to bring together experts to identify research needed to reduce uncertainty related to pallid sturgeon recovery efforts in the Missouri River system. At the request of the sponsoring agencies, the Ruckelshaus Institute organized and facilitated the workshop and prepared the report.

Sustainability

Wyoming Sustainability Summit (conference in Laramie, Wyoming, co-hosted with the UW Campus Sustainability Committee, April 2010): The summit provided a venue for information sharing and networking among organizations and individuals engaged in community, business, and residential sustainability efforts around the state. A request for proposals resulted in three concurrent sessions during the two-day event.

School of Energy Resources

The SER has extensive outreach and engagement with Wyoming. The SER Energy Outreach program specifically focuses on the transfer of technology and knowledge to Wyoming's energy stakeholders - academics, professionals, policy makers and citizens. Collaboration with UW colleges, Wyoming community colleges, industry and state constituents lead to the staging of a dynamic selection of symposia, conferences, workshops and colloquium speakers. A summary of SER's outreach activities are below.

- International Conference on Future Technologies for Wind Energy
- CERC ACTC Joint Meeting and Midpoint Review
- Hess Digital Rock Physics Laboratory Grand Opening and Technical Presentations
- Powder River Basin Coal: Domestic Challenges and International Opportunities
- Power Generation and the Environment: Choices & Economic Trade-Offs
- Secondary Biogenic Coal Bed Natural Gas International Conference

- 2012 International Advanced Coal Technologies Conference
- Sustainable Management: Strategies and Tools for Energy & Extractive Industries
- Clean Coal Technology Research Symposiums
- Hydraulic Fracturing: A Wyoming Energy Forum
- Uranium
 - Future of Uranium Production in Wyoming
 - Uranium Extraction Workshop
- 2010 International Advanced Coal Technologies Conference
- Energy Resources and Produced Water Conference
- Porous Media Flows
- Western States Energy & Environment Symposium
- Wyoming Pipelines: The Territory Ahead
- International Advanced Coal Technologies Conference

College of Arts and Sciences

African American & Diaspora Studies Program

The program partners with the student group Association of Black Student Leaders in their work in the **Linford Elementary School** in Laramie. A couple of times a year, usually during Kwanzaa and again in the Spring semester, the program works with this school teaching first and third graders about Kwanzaa, dancing, family, community, and friendship.

In the Fall and Spring semesters the program brings in guests for the benefit of the entire UW campus, Laramie, and greater Wyoming communities. For example, in the Fall 2013 semester AADS hosted many members of the Black 14 and the original Black Student Alliance members. These men spoke in classrooms of African American & Diaspora Studies, a class from the College of Education, and to the Law School. A dinner was hosted with Representative James Byrd among the attendees.

American Indian Studies Program

In April 2013, the American Indian Studies Program hosted a two day symposium, “**Building Tribal Nations,**” that brought together national speakers, political leadership from both the Eastern Shoshone and Northern Arapaho Tribes, including both tribal liaisons, representatives from other tribal agencies and organizations, college and high school students from the **Wind River Indian Reservation** (WRIR), and members of the UW community. The master of ceremonies, singers, dancers, and prayer people for this symposium were all from the WRIR. “Building Tribal Nations” focused on governance and policy, economic sustainability, education, health, and cultural vitality in the context of American Indian sovereignty. More than 50% of the 100+ symposium attendees were from WRIR.

On October 15, 2013, American Indian Studies hosted a special meeting and dinner **with Native American author Sherman Alexie for high school students from the Wind River UNITY Council, Wind River Upward Bound, and the Cathedral Home for Children.** Twenty-five students and chaperones participated in this event.

Eminent Writer in Residence Sherwin Bitsui, a member of the Navajo Nation, gave public readings in **Jackson and Riverton** during the fall 2013 semester.

Northern Arapaho language classes celebrated their tenth year at UW in fall 2013. Tribal elder Wayne C'Hair travels from the Wind River Indian Reservation weekly to teach the Northern Arapaho language at UW. The program supports Northern Arapaho language revitalization. A seventeen minute film, Words of Preservation: Arapaho Language at the University of Wyoming, was completed in 2013. This film has been distributed in Wyoming.

In fall 2013, several American Indian residents of the **Cathedral Home for Children in Laramie** regularly attended dinners held in conjunction with Northern Arapaho language classes.

The American Indian Studies Program annually hosts the **Honoring of American Indian Graduates and Scholarship Recipients**. Many of the graduates and scholarship recipients travel from the Wind River Indian Reservation to take part in this event. **Especially for Outreach students, it may be one of their only experiences connecting with the UW campus in Laramie.** Drummers, singers, and prayer people for this event all come from the Wind River Indian Reservation.

In 2013 AIST began working with a group of WRIR residents to develop an **onsite degree in tribal governance**. A delegation of UW faculty, staff, and administrators is scheduled to meet with tribal personnel on December 20, 2013 in Fort Washakie, WY.

Anthropology Department

The Anthropology department works throughout the state on field archeology research, courses, and joint work with the Office of the Wyoming State Archaeologist. Last year, the department worked in **Guernsey and Dubois on archaeological field work**, testing, and student education, purchasing \$3,900 worth of services in those communities. They also held **archeological field schools in Pine Bluffs, Sundance, and Cheyenne**, where they spent over \$12,000 on supplies, groceries, and gasoline. They also did **field work in Yellowstone National Park through the Wyoming State Archaeologists' Office**. Archaeological field crews are out in the state on a 10 day on, 4 day off basis. None of the crews live permanently at these locations, but they are active in the community when they are there. Lodging includes camping at archaeological sites, staying on National Guard Barracks, and in local lodging/motels. Food is either purchased in grocery stores (e.g., almost \$2,000 was spent in July/August 2013 at the local Guernsey grocery store) feeding a crew that included field school, volunteers, and paid staff, or in local restaurants depending on funding and availability of the services and distance to town. In addition, gasoline purchases for UW projects make up a large proportion of the services budgets. Smaller amounts go to local hardware, lumber, and equipment maintenance and repair (e.g., backhoes).

Art Department

The Department of Art participates in the **WSAE High School Arts Symposium** every April in Casper, WY. Faculty hold workshops and studio demonstrations and meet with students interested in attending the University of Wyoming Department of Art for scholarships to the program. Faculty also provide critical assessments of student work and liaise with teachers from Community Colleges and high schools in the state at the symposium.

The department hosts **weekend workshops in studio for visiting high schools throughout the state in an Art Intensive Weekend** funded through Cultural Outreach. The department hosts high school art teachers and students at the annual High School Art Intensive. This year we had representative teachers and students from schools throughout Wyoming and Northern Colorado, providing studio experiences for High School students in printmaking, sculpture, painting, ceramics, metalsmithing and other studio areas interested in participating.

In February 2013, the entire department hosted and participated in the **annual Click! Conference through the Wyoming Arts Council**. The three-day long conference was attended by artists and arts administration throughout the state.

In September, 2013, the department hosted teachers for the **annual WSAE (Wyoming Secondary Arts Educators) Annual Fall Conference** held in Laramie. Art Department faculty held workshops for art teachers from across the state with access to studios and processes not available in K-12 art classrooms.

Department of Chemistry

The Department of Chemistry serves the state via a **summer research** program that brings undergraduate students to UW each summer. The students work in chemistry research groups on problems in energy science and energy resource management. This 10-week summer research program involves hands-on research along with a variety of activities (seminars, ethics mini-course, and field trips) to educate and train students in energy science. Each student works closely with one of the 11 participating faculty mentors who have been carefully selected for their research accomplishments and successful experiences in working with undergraduate researchers. The research covers a wide variety of projects associated with the development of new energy technologies and improvements on existing energy resources. Each project tries to tackle these current research problems using modern instrumentation and the existing expertise of the research groups involved. Breakthroughs in many of the outlined projects would have **significant practical ramifications** that are urgently needed to produce technological options for both climate stabilization and sustainable energy production. Support for this program was provided by both state and federal sources. Our future endeavors will specifically target the states seven community colleges and will recruit students from these seven institutions. As part of this endeavor, the department has submitted a grant to the National Science Foundation to support bringing seven teams of community college professors and their undergraduate students from community colleges to UW each summer. **This is expected to produce a significant, scientific impact on our community colleges and our state.** Projects are integrated with participation in seminars, an ethics course, and field trips to a national lab and coal mine to educate students on the current scientific issues related to both national and global energy demand and management. The program also serves to prepare students for careers in the emerging high-tech energy field, which will continue to grow. An objective of this program is to attract students into science careers using current energy and climate problems that will **motivate and impassion students who desire to continue living in the western United States.**

The **Department of Chemistry together with the Department of Physics and Department of Chemical and Petroleum Engineering** manage an NSF funded **Graduate STEM Fellows in K-12 Education (GK-12) Program** entitled ‘Dissemination of Nanotechnologies for Energy Production and Environmental Protection in Rural Areas of Wyoming’ (2010-2016).

Every year, five K-12 teachers from Wyoming high schools (e.g. Lander Valley High School, Douglas High School, Niobrara County High School, South East High Scholl, Glendo School, Green River High School, Glenrock High School, Torrington High School, Wheatland High School, Rock Springs High School, and Rawlins High School) participate in the project. Together with ten UW STEM graduate students (i.e. GK-12 fellows), they develop inquiry-based teaching lessons connecting graduate level research in energy and nanotechnology with high school chemistry, math, and physics curriculum. The aim is to **enrich STEM content and instruction at the local high schools**. The lessons are available online (<http://www.uwyo.edu/nanotech/lessonplans/>) and are regularly **shared with Wyoming K-12 teachers at the annual Math and Science Teachers’ Conference at Casper College.**

Each Fellow develops a lab tour to introduce K-12 students to modern research facilities. Each tour includes an interactive science activity to better understand the Fellow's scientific research and his/her day-to-day tasks. K-12 students are inspired by hands-on research brought to them by real scientists and are motivated to further explore the STEM disciplines particularly in relation to energy and the environment. Fellows act as role models for K-12 students and provide an important connection between Wyoming K-12 students and the University of Wyoming.

The Franco Basile research group in the Chemistry Department at the University of Wyoming is involved in several outreach programs with **high schools across the state**, including Greybull and Kelly Walsh High Schools. The nature of these outreach programs range **from demonstrations of advanced chemical instrumentation to assisting with students' science projects**, giving them the opportunity to gain hands-on experience in the use of advanced chemical instrumentation. Dr. Basile is currently collaborating with Dr. Ami Wangeline (Dept. of Biology, Laramie County Community College) and hosting one of her students, Mr. Bill Trebelcock, who is identifying potential anti-cancer compounds in fungi present in the high plains of our state.

Chicano Studies

This program has a statewide positive impact in Wyoming in the areas of teaching, research, and programming. Chicano Studies has an extensive **outreach course offering that reaches throughout the State of Wyoming**. Some of the courses offered are: Introduction to Chicano Studies, Latina/os in Education, Mexican American Literature, American Southwest, Transnationalism and Crime, Women Gender and Migration, and Chicano Folklore. These courses have been taught via video conferencing and online broadcast national and statewide destinations to Casper, Cheyenne, Cody, Evanston, Gillette, Jackson, Laramie, Powell, Rawlins, Riverton, Rock Springs, Green River, Lander, Sheridan, and Torrington. In the summer of 2013, one faculty affiliate led a five-day teaching workshop entitled the "Emerging Latina Scholars Intensive Writing Institute" where a group of Latina youth from Jackson, Wyoming are engaged in a series of pre-writing and writing activities which culminated in 10-12 page individual autobiographies. For the remaining summer, this faculty member continued to meet with the Latina youth remotely each week focusing on improving their academic and literacy skills.

Furthermore, the Chicano Studies Director and several faculty and faculty affiliates were involved in research activities and presentations that have an impact on Latina/os in Wyoming. For the past 8 years Chicano Studies faculty have been involved with one of the most prominent events in the state of Wyoming, **"Wyoming Latina Youth Conference."** This conference brings together Latinas from all over the state to attend a series of workshops for three days. The Wyoming Latina Youth Conference is held at the Laramie Community County College on Cheyenne Campus. Each year, the Chicano Studies faculty has served on several panels to discuss a variety of topics that are unique to the field of study. In October 2013, a faculty panel titled, "Latinas/os in Academia: The Challenges and Successes," explored individual journeys and discussed survival skills that helped us navigate through college. In addition, at the Wyoming Latina Youth Conference, the program are involved in a longitudinal study where we conduct a survey on Latina youth in Wyoming. The title of the research is "Adolescent Latinas in the American West: Representations, Influences, and Constructing an Ethnic Identity in Wyoming." The purpose of this research is to conduct an in-depth qualitative study, using critical ethnography and narrative research, to survey the influences that Latina youth have in the construction of their ethnic identities. Some of the survey questions proposed by the study are: Which town in Wyoming are you from? What is your Mother and Father's race or ethnic background? In terms of race, how do you identify yourself? In terms of ethnicity, how do you identify yourself? Are there many students who share the same racial and ethnic background as you at your school? The data used in the survey for this longitudinal study will be synthesized and presented at the conference of National Association of Chicana and Chicano Scholars in Salt Lake City, UT in 2014.

The Chicano Studies Director was invited to serve as a cultural critic and moderator for the production of “No Roosters in the Desert,” written by Kara Hartzler and produced by Riot Act, Inc. in Jackson Hole, Wyoming. The play is a series of interviews with immigrant women deported while crossing into the U.S./Mexico border. The play is ultimately a powerful testimony to these many lives, and the tragic consequences of an impossible situation. The director presented **her research, “The Chicano Aesthetics: Cultural Production of “La Muerte” in No Roosters in the Desert,” at the Jackson Hole Center for the Performing Arts** in Jackson Hole, Wyoming.

An additional research project is entitled “A Critical Ethnographic Study of Latina High School Students’ Educational Experiences in Rural Wyoming.” The purpose of this research is to conduct an in-depth qualitative study, combining critical ethnography and action research, to explore and analyze the educational experiences of **geographically isolated high school Latina high school students in Wyoming.**

One of the most successful programming projects was inviting Dr. Ashley Lucas, playwright, theatre scholar, and actor, to perform her production, “Doin’ Time: Through the Visiting Glass.” The play examines the impact of incarceration on families. The child of an incarcerated father, Lucas conducted interviews in California, Texas, and New York with prisoners’ family members, former prisoners and people who do work connected to prisons. Lucas corresponded with more than 400 prisoners from across the U.S. to create this play. The play was sponsored by Chicano Studies, Gender and Women’s Studies, Criminal Justice, and Theatre and Dance, and toured throughout the Wyoming State Prisons, including Wyoming State Penitentiary in Rawlins, Wyoming, Wyoming Women’s Center in Lusk, Wyoming, and Wyoming Medium Correctional Institution in Torrington, Wyoming.

One faculty affiliate is hosting a **statewide Latina Scholars Program, a one-week mentoring program.** Latina youth from all over the state of Wyoming participate in a shadowing experience where they will have the opportunity to shadow current University of Wyoming Latina students and participate in academic enrichment, college application process, and sociocultural activities.

Beyond reaching out to the Latina/o communities in the state of Wyoming, Chicano Studies **bridges relationships with stakeholders through organizations like the El Puente and the Latino Resource Center in Jackson Hole, Wyoming, and State of Wyoming Legislators, Ken Esquibel (Jurist Doctorate) and Floyd Esquibel (Jurist Doctorate) both of Cheyenne, Wyoming.**

Overall, Chicano Studies Program serves in the capacity to continue and expand on teaching, research, and programming projects that have both statewide and national impacts. Chicano Studies is involved in opportunities in teaching and distance learning where we can disseminate information about Chicana/o and Latina/o cultures statewide. Chicano Studies identifies and conducts research throughout the state of Wyoming that gives well-supported information about Latina/os in Wyoming. With our programming efforts, Chicano Studies serves to impact marginalized and disenfranchised groups and Latina/o populations in Wyoming to encourage social change through literacy, education, and social justice practices. Chicano Studies Program is an academic unit that promotes diversity and is dedicated to serving as a statewide resource on Chicana/os and Latina/os in Wyoming.

Communications and Journalism Department

The department has a faculty member on the **Wyoming Press Association Board of Directors.** The board meets 4 times a year at different locations throughout the state. The department also **serves as the ombudsman for Wyoming newspapers.** In this role, members of the department arbitrate disputes between the newspapers and their readers. **The Wyoming Press Association annual**

convention with take place in Laramie this January. Members of the faculty will present many of the workshops at the convention.

Department of Criminal Justice

The economic impact of Criminal Justice across the state is significant. It currently serves 82 students through Outreach. It also has the distinction of being only **one of three majors offering our entire curriculum through the Outreach School**. This coming year, Criminal Justice will offer a total of 18 Outreach courses, not including cross listed classes. In order to meet Outreach obligations, the department recently hired a faculty member at the UW-Casper campus who serves Criminal Justice's 17 majors at that campus, as well as significantly contributes to the Outreach program.

Criminal Justice also works closely with the community colleges to ensure a smooth transition for students coming to UW to complete their degree. Furthermore, many of those in the Outreach program, as well as those going through the on-campus program, either already work or will seek employment in our state once they complete their degree program. In order to help facilitate this, as part of the on-campus and Outreach programs, Criminal Justice currently has an extensive **internship/practicum program where students work with various agencies** both in the state and across the nation in order to gain experience within the criminal justice field. In the past year, 35 students participated in 184 credit hours of internships/practicums.

The department is currently working with the Political Science Department to offer a **Criminal Justice track within the Masters of Public Administration program**. This will serve a considerable number of professionals in the state that will be able to get a graduate degree with a criminal justice emphasis that has not been available in the past.

The faculty of Criminal Justice contributes significantly to the state as well. One faculty member spent the past year completing grant funded research comparing **management policies and visitor attitudes of the U.S. National Park Service and five other internationally recognized parks**. Another faculty member was contracted this past year to complete a **report on Disproportionate Minority Contact within the juvenile justice system within three counties in the state: Sweetwater, Laramie, and Fremont**. Furthermore, the department has three faculty members that currently serve on State advisory boards that allow them to contribute to policy issues as they attend meetings across the state including **the Governor's Advisory Board on Substance Abuse and Violent Crime, the State Advisory Council for Juvenile Justice, and the Wyoming's Statewide Re-Entry Taskforce**. As can be seen, this Department has developed extensive relationships with agencies and committees within the state. As a consequence of some of the department's work within the state, this past year the **Wyoming Association of Sheriffs and Chiefs of Police (WYSCOP) funded new scholarships for internships/practicums and for those returning to the educational environment after serving in the criminal justice field**.

Department of English

English offers a **cohort Master's degree** delivered through Outreach. It serves mostly high school English teachers and Community College faculty, with a waiting list of over 60 for the next cohort. The department has a faculty member at UW-Casper, **Dr. Bruce Richardson, who provides instruction to allow the entire UW English degree to be offered at Casper**, supplemented by online and videoconference courses. The department also offers a **Secondary Education/English** degree, allowing all students to take a full English curriculum alongside their Education requirements.

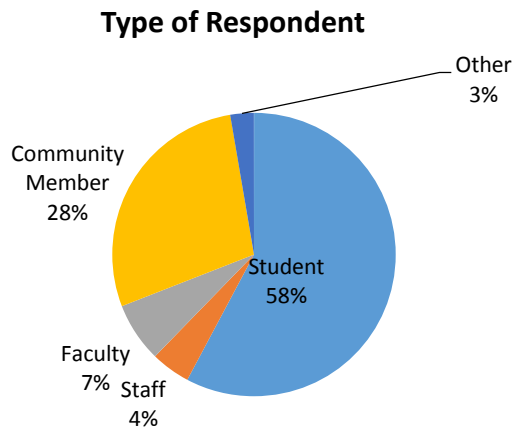
Gender and Women's Studies Program

The Gender and Women's Studies Program at UW, though small in faculty, has numerous examples of research and outreach in the state. The program regularly offers courses each semester and the summer session through the Outreach School that meet site-bound students' needs to complete university studies requirements and the distributed major in the social sciences. The program regularly offers courses that foster public service skills through service learning; past offerings have raised awareness about abandoned children's issues in India, and the current class aids the **Albany County SAFE project and Domestic Violence Awareness month**. One faculty member serves as a scholar for **Wyoming Humanities Council programs** including the Muslim Journeys series. One faculty member is co-authoring an article with a UW Counselor Education professor comparing youth's transitions from institutional care to living alone in two settings, including Wyoming and India.

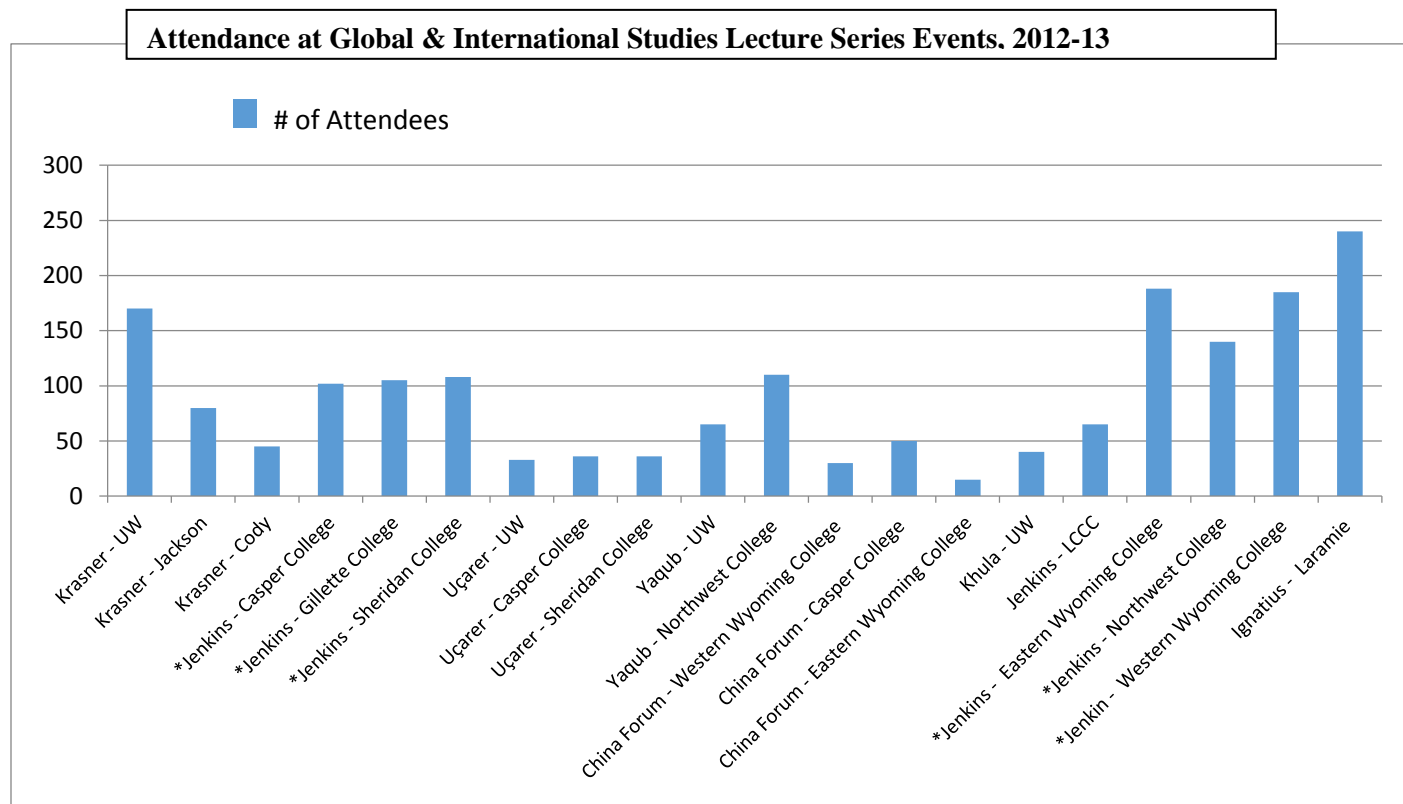
Gender and Women's studies students serve as interns in several organizations around the state, including partnerships with the **Wyoming Women's Foundation, the Equipoise Fund, and the SAFE project**. The Program features original writing and performance from both students and community members to showcase lesser-known stories about being from Wyoming in an annual theater production, the Wyoming Monologues. The GWMST program has recently **sponsored and collaborated with the Wyoming Humanities Council and the Wyoming Community Colleges to bring an exhibit of Afghan women to the state**, and has a pending grant proposal with the NEH for collaboration on a project to advance knowledge throughout the state on issues related to women, diversity and sexuality in Wyoming. One faculty member regularly gives **presentations around the state regarding the wage gap between men and women in Wyoming**, the worst in the nation. One faculty's internationally renowned research in sex-work now includes a **preliminary report funded by the Department of Justice on sex-work and workers in Wyoming, including interviews with law enforcement and service providers around the state**. This faculty member has pending grant applications with NIH and NSF to expand this research. One faculty member is a member of the **Wyoming Coalition Against Domestic Violence and Sexual Assault, Rape Prevention Education task force**. Another faculty member has initiated a nationally recognized self-esteem program called **Smart Girls/Smart Guys for elementary school children**. One faculty member is a member of the **State Early Childhood Education Advisory council and is an elected member of the Wyoming legislature** who regularly gives talks around the state about women and leadership.

Global and Area Studies (formerly International Studies)

Global and Area Studies (formerly International Studies) **sponsored 64 programs, reaching more than 7,000 citizens (90 person average at these programs), over the last 3 ½ years**. The speaker series modeled in **partnership with Wyoming's community colleges succeeded in engaging a broad group of Wyoming students and citizens in discussions of pressing global issues**. Audience members completed short questionnaires. Over 92% of respondents, which included students, faculty, staff, and community members, reported that the speaker series improved their understanding of global issues and contributed to their sense of international awareness. The charts below display Fall 2009-Fall 2012 data show the makeup of audience members.



Across 2012-13 the Global and Area Studies public talks averaged over 75 attendees each, with a total of just over 2,000 individuals attending one or more sponsored event.



**includes classroom visit*

An ongoing special feature of the department's outreach efforts is the **World to Wyoming program**. The goal of World to Wyoming is to inspire and educate Wyoming community college students and community members about the interconnectedness of our world. Every year Mark Jenkins, writer-in-residence for UW, visits **every college as well as in Jackson Hole and the Wyoming Boys School in Worland, lecturing in several classes during the day, then giving a two-hour, multimedia, National Geographic presentation**. His first state-wide presentation was titled "Who Murdered the Mountain Gorillas," a show based on his story in National Geographic that won the National Magazine Award. The following year he toured the state with a program titled "The Healing Fields," based on his award-winning story in National Geographic about landmine victims in Cambodia. This year he toured the state with "Climbing Everest: The Myths, The Madness and the Macabre." Americans first climbed Mt. Everest fifty years ago, in 1963, and in 2012 Jenkins was a member of the 2012 Anniversary Everest Expedition, sponsored by National Geographic, summiting the peak last May. This presentation is not merely about the history and struggle of climbing Everest, but about the social, societal and ecological problems on the highest mountain on earth.

In every World to Wyoming tour, one of Jenkins' goals is to synthesize science and social issues to reveal a direct connection to Wyoming students. As just one example, in "Who Murdered the Mountain Gorillas," he explains that the mineral coltan is mined in eastern Congo, in prime gorilla habitat, and that coltan is used in all cell phones and laptops. Every time a Wyoming student texts or

logs onto Facebook, she is using resources that may have come from conflict regions. The program overall brings one of our finest ambassadors for the University to the state.

Department of Geography

The Department of Geography is involved in numerous teaching, research, service and outreach activities around the state of Wyoming. In terms of outreach, one faculty member works with the **Wyoming Geographic Alliance (WGA) to provide K-12 teachers around the state instructional materials including maps for classroom use.** This summer the WGA will provide a workshop for teachers focused on “sense of place” including the concept’s relevance to fiction set in Wyoming. Two faculty members are also editing the **Student’s Atlas of Wyoming** which will include approximately 60 pages of maps on the state’s geomorphology, climatology, history, settlement patterns, natural resources, economy, and demography. This atlas will be **distributed to Wyoming teachers free of charge.**

Members of the Department are also involved in numerous research projects on Wyoming topics. One faculty member and his students are conducting research on **Wyoming rivers including the Yellowstone and Snake.** The work on the Snake in Grand Teton National Park will have implications for the National Park Service’s management plan for the Wild and Scenic segment of the river. They hope that the methods they are developing for mapping riverscapes will lead to **safer and more enjoyable use of the state’s recreational resources.** Notably, another faculty member is also working in Yellowstone National Park studying the movement patterns of beavers. Two faculty from the Department are involved in a collaborative project studying the **impact of prolonged drought on the state’s forested lands.** One of these faculty members was also involved in the EPSCoR Summer Research Apprenticeship Program with geography students **to study historical fire regimes in Wyoming forests,** and in a study examining the **long-term environmental history of the Bighorn Basin.** Another faculty member has supervised a number of graduate students studying Wyoming topics including **antelope migration patterns, truck accidents along I-80, the development of road patterns that minimize environmental impacts in areas of energy development, and the use of satellite imagery to aid natural resource management decision-making in the state.**

Geography department faculty members are also involved in numerous teaching and service activities around the state. Earlier this year one faculty member participated in the three week University of Wyoming Summer High School Institute during which he taught a dozen high school sophomores about different geospatial technologies. For example, students learned to create maps using their smart phones as GPS units, and how to capture aerial photographs using a kite. He also provided a guest lecture to **the Rock River Science Club** on nutrient cycles in Prince William Sound, Alaska. Another faculty member was a panelist this past October to discuss **careers in science at the Wyoming Latina Youth Conference in Cheyenne.** She also presented a research summary to the Wyoming Water Development Commission (WWDC) this past July entitled “Multi-Century Droughts in Wyoming’s Headwaters” based on a WWDC/USGS grant involving multiple UW faculty members in the Department of Geography. Among the Department’s service contributions to the state are one faculty member’s membership on the **Executive Board of the Wyoming Planning Association,** another’s contributions as the **Southeast Regional Division of WyGEO,** and yet another’s work with the **Western Governor’s Wildlife Council.**

Department of Geology & Geophysics

The Department of Geology & Geophysics includes faculty, staff and students who are working on a wide range of issues related to the economic, environmental and educational welfare of the State.

Several ongoing projects are tied to the mineral industry of Wyoming, with specific impacts on the State. At present five faculty members are being supported by the petroleum industry to work on issues, both specific and general, **in oil exploration and development, and CO2 utilization and sequestration in Wyoming**. Specific study areas include, but are not limited to, the Powder River, Wind River, Bighorn and Green River basins.

The **uranium exploration industry is funding two faculty members and a research scientist to evaluate controls on uranium mineralization at sites in Wyoming**. In addition the department is home to one of the highest precision facilities in the country for dating minerals bearing uranium isotopes. The facility has been utilized for dating U-bearing minerals from sites all across Wyoming.

The third leg of economic impact to the state concerns understanding the development of the scenery of Wyoming, which is much of the basis for state tourism. Studies are being undertaken of the **geologic history and landscape development of Yellowstone, the Teton, Laramie and Medicine Bow ranges, and the Bighorn and Granite mountains**. These studies involve five members of the faculty, one adjunct faculty member and several students.

Over the past year the department, in concert with several others on campus, developed the Wyoming Center for Environmental Hydrology and Geophysics. This program includes 8 faculty and staff members from the department. Besides a strong research mission, the center includes a significant component of **collaboration with environmental consulting firms in the State, outreach training components with Wyoming community colleges, as well as a high-school teacher training program conducted through the Teton Science School**. Program activities include interactions with the State of Wyoming Water Development Office and the State Engineer's Office. This program includes internships for students in Wyoming environmental and hydrologic consulting firms.

One of the department's faculty is working on the **history of major droughts in Wyoming and adjacent parts of the Rockies that took place over the past 10,000 years**. This work involves mapping, sampling and dating sediment from a variety of lakes across the region. Another one of our faculty members is conducting a study of rate and mechanism of sediment filling infilling of Seminoe Reservoir. One of our research scientists is **funded by a Wyoming Uranium company to study bioremediation associated with in-situ Uranium mining**. Lastly, one faculty member and his students are involved with broader impacts related to CO2 sequestration including studies centered on active and former oil fields in the state.

Department faculty have been engaged in a variety of educational outreach activities across Wyoming. This includes **talks presented to private and public groups in the State (including the Wyoming Geological Association and the Geologists of Jackson Hole) as well as public talks for various primary and secondary education groups**. Laboratory visits for high school groups have also taken place over the past year. The faculty includes a member of the scientific consortium working at the Yellowstone Volcano Observatory. This consortium, organized by the U.S. Geological Survey, is in charge of **monitoring volcanic activity in the Yellowstone region**. Yearly the department holds a large job recruiting event cosponsored by the School of Energy Research and the American Association of Petroleum Geologists. This event, the Rocky Mountain Rendezvous, included 24 companies (mostly energy) and 300 students this past September.

The Geological Museum, housed within the department, continues to serve as a major attraction for visitors both within the state and those passing through Wyoming. Last year we logged more than **12,000 visitors to the museum.** This includes student groups from primary and secondary schools through the state.

Life Sciences Program

The Life Sciences Program provides the core undergraduate biology courses for all life science majors at the University of Wyoming. The program serves the state through efforts to improve K-16 student success by engaging in several important articulation events. University of Wyoming and Wyoming community college life science faculty and administrators meet annually at a statewide Biology Articulation to ensure **successful student transfer from Wyoming community colleges to the University of Wyoming.** In collaboration with the Wyoming School-University Partnership, University of Wyoming faculty and administrators also coordinate and participate in an annual statewide K-16 Life Science Summit. **This summit brings together life science faculty from K-12, community colleges, and UW to discuss issues of student success, with particular emphasis on the transition for secondary to post-secondary settings.**

Department of Music

Department of Music faculty and students participate in an enormous amount of outreach activities each year. This year the **University Symphony Orchestra, the Happy Jacks, Singing Statesmen and Opera in a Gym toured.** The gamelan also travelled to Colorado Springs for a Gamelan Festival, and the Percussion Ensemble performed at the state-wide “Day of Percussion” in Casper. **Student ensembles visited schools in Cody, Worland, Jackson, Riverton, Cheyenne, and Laramie, Wyoming.** They also visited Thornton, Fort Collins, Colorado Springs, Castle Rock, Loveland, Glenwood Springs, Berthoud and Aspen, Colorado and Billings, Montana and Idaho Falls, Idaho. Additionally, Department of Music faculty performed and/or presented workshops or master classes in Riverton, Wheatland, Cheyenne, Green River, Lyman, Evanston and Casper. **The UW gamelan ensemble, under the direction of Rod Garnett, also presented an online virtual classroom performance that included students, teachers, and families throughout northern Wyoming, South Dakota, and Montana.**

A major world music outreach activity this year was arranged by professor Rod Garnett. On January 21, 2013, seven Moldovan musicians arrived in Salt Lake City to begin **a nineteen-day tour of Wyoming.** This tour was the culmination of eighteen months of planning and fund raising. The “Moldovans to Wyoming” project was made possible by grants and assistance from fourteen agencies and entities. These groups and the individuals actively involved in the process provided funds, lodging, food, logistical support, and general hospitality to make the event successful.

Concert performances by the La Taifas quartet were the centerpiece of each community visit. Marin Bunea (violin), Grigore Severin (cimbalom), Boris Rudenco (nai - Moldovan panflute), and Edgar Ștefanet (accordion) presented eight formal evening concerts, and eleven short performances for **elementary and secondary schools, Northwest College and the University of Wyoming, and the Buffalo Senior Center.** Every evening performance received a standing ovation. The group reached a vast Wyoming audience with their **live performance of Moldovan folklore music on Wyoming Public Radio,** hosted in the Laramie studios by Grady Kirkpatrick on the morning of February 6, 2013.

Department of Political Science

The Department of Political Science offers **one of the only state-wide distance education graduate programs at the University of Wyoming**. Having started more than twenty years ago, the **Masters of Public Administration Program (MPA)**, also recognized as one of the only “entrepreneurial” graduate programs offered through Outreach, is offered through compressed video, intensive weekends, and online formats. The largest master’s program in the College of Arts and Sciences, the MPA Program graduates almost twenty students each year most of whom are practicing public administrators at all levels of government across Wyoming.

In addition, the Department participates in, and funds, the **Wyoming Statewide Election Survey carried out since the 1970s**. This survey has provided important information to the University of Wyoming, state and local governments, the media, and policy analysts from across the state.

Members of the department provide **consulting and training to organizations throughout Wyoming** including Agriculture Extension, the Wyoming Association of Municipalities, Head Start, the Wyoming State Penitentiary, Casper City Government, Wyoming Department of Family Services, and the **Wyoming State High School Finals of “We The People: The Citizen and the Constitution” and the high school Model United Nations program** (to name only a few). Faculty are frequent contributors to, and provide background and analysis for, all types of Wyoming media and have recently co-authored a publication by the Wyoming Humanities Council titled “Civility Matters!” that was distributed across the state (and to Wyoming high schools) emphasizing the critical role that civility has played in the history of Wyoming and its politics.

Philosophy Department

The Philosophy department engages with the Wyoming community by participating in **Saturday University**, the **Summer High School Institute**, the **Wyoming Council for the Humanities**, hosting and making guest appearances in **Wyoming Signatures for UWTV**, working with the Science and Math Teaching Center, and the Kaiser Ethics and Willits Ethics Funds. All of these programs are programs either run by UW or coordinated with UW that reach various constituencies throughout the state. Faculty in the department have recently provided a workshop in Gillette on “Design and Conduct of workshops on the Next Generation Science Standards for K - 12 for In-Service Teachers.”

Department of Physics and Astronomy

One of the department’s graduate students has **been going to Torrington once a month for the past year to work with high school physics classes**. He prepared lessons about electricity and magnetism and had them build FM radios from a kit. Another graduate student **visited Rock Springs High School's** Annie Fletcher's classes once a month to present lessons and demonstrations over the 2012-2013 school year. He also participated as a judge for the **Southwest Regional Science Fair in Rock Springs and presented a lesson plan at the 2012 Casper College Math and Sciences Conference**. Parts of this were done as part of Science Posse activities, and parts were done through another NSF K12 grant. Faculty have assisted with teacher training workshops held in the summer in Riverton.

Department of Psychology

The Psychology department, with its mission to train clinicians and conduct research on clinical disorders and therapies, directly provides a variety of mental health services to individuals in the community and state. **An on-campus clinic in Laramie provides psychotherapy, often at no cost to student and community clients**. An on-going research program provides **innovative telehealth therapy for rural survivors of domestic violence and sexual assault (currently serving Rawlins, Cheyenne, and Gillette)**. The lingual diversity of psychology doctoral students accommodates clients who would

otherwise not receive services; for instance, a **Mandarin-speaking graduate student treated Mandarin-speaking clients in Cheyenne, and a Russian-speaking graduate student conducted a clinical evaluation via telehealth with a Russian-speaking client in Gillette.** Recent funding from the Alzheimer's Association will soon permit psychology faculty to expand **outreach services on Alzheimer's to older Wyoming residents.** Faculty members also help in the schools. Indeed, one faculty member is currently employed by the Albany County School District as a half-time school psychologist.

Along with providing mental health services directly, the Psychology department also provides **information and training to health providers in the state.** One faculty member serves as Project Director of the Wyoming Geriatric Education Center, which trains healthcare providers throughout the state on evidence-based practices. This individual collaborates in producing "Gray Matters," a program designed to educate the public and lay health care providers about cognitive aging. Approximately 600 individuals are trained per year. Faculty work with the **Cheyenne Regional Medical Center** to train health care providers in geriatric issues including Falls Prevention; Alzheimer's Disease, Continuum of Care; Program for All Inclusive Care for the Elderly. Last year, the department trained 650 health care providers at Cheyenne Regional Medical Center in this effort. Psychology faculty also collaborate with **UW Family Medical Residency (Casper)** to train medical and pharmacy residents in geriatrics, and are beginning to collaborate with the **VA Cheyenne** to provide training in Geriatrics to their health care providers. The department has contributed to the Wyoming Caring with Confidence project, to improve certified nursing assistants capacity for prevention and management of behavioral disruption in nursing home settings, a program that has trained over 800 CNAs. A Psychology graduate student is leading an effort to assess barriers and facilitators as well as needs for training among **Wyoming and Montana Clergy** members to serve older adults in Wyoming who suffer from depression.

In addition to providing training on geriatric matters, Psychology faculty conduct Diabetes Awareness and Rehabilitation Training for adults with serious mental illness and comorbid diabetes served within community mental health settings. They are developing interventions for youth and families with mental illness and serious emotional disturbance and who have experienced cardio-metabolic effects of second-generation antipsychotic medications. In this effort, collaborations with community mental health administration and staff have helped to identify service models that will increase the likelihood of intervention adoption. Psychology faculty members have conducted semi-structured interviews to understand the **oral health challenges and needs of Wyoming adults with serious mental illness with the aim of developing effective interventions.** Other research has focused on **depression among American Indian youth on the Wind River Reservation,** culminating in feedback provided to the community. Finally, Psychology faculty and graduate students have also published research involving a survey of the mental health practices of therapists across the state of Wyoming.

Many programs and groups within the state have benefited from informational workshops and talks provided by Psychology faculty. Psychology faculty provided a workshop to the Wyoming After-School Care Alliance, and they facilitate research/training collaborations with Casper College and Eastern Wyoming College (Torrington) faculty. They have presented workshops or talks on Stress Management to the Wyoming Association of Municipalities Retreat; on "Beyond PTSD: Combat stress injuries and broader readjustment difficulties of the returning student veteran" at the 5th Annual Wyoming Higher Education and Mental Health and Substance Abuse Summit; on "Treatment of combat stress injuries in active duty military populations" at the Wyoming Psychological Association Annual Conference; and on memory and aging for AARP-Wyoming at the National AARP Spelling Bee in

Cheyenne. Faculty presented a psychological treatment workshop at Wyoming Psychological Association, in Cheyenne, at no charge; a similar workshop will be presented this next year in Lander. They routinely provide free daylong treatment workshops on the UW campus to community mental health practitioners as well as UW faculty and students. One Psychology faculty member has been working with the Laramie Recreation Center's After School program (SACC) to help with behavior management and positive behavior supports and has conducted 5 trainings for staff since January of 2013. Two have been working with the Laramie Junior High on the Challenging Horizon's program, training staff and supervising an outreach credit for those staff persons.

In collaboration with **Albany Safe Project, Laramie**, Psychology faculty help coordinate care for students and community members exposed to domestic violence and assault. Statistical consultation is provided to the **Wind River School District in Pavillion** on the analyses, interpretation, and presentation of state and federal achievement data from the district. For his Seibold project, one faculty member travelled to **community colleges throughout Wyoming** to observe psychology faculty teaching and discuss teaching pedagogy. Finally, psychology faculty serve on the WWAMI team to teach UW pre-med students and are regularly invited to talk to psychology classes at Laramie High School.

Even Psychology undergraduates contribute to their communities. A service-learning class, "Service-learning in Psychology: Mentoring Adopted Youth," was taught by a Casper Psychology professor and involved over a dozen students in various types of service to the community. Moreover, at least seven Psychology undergraduates engaged in fieldwork in Laramie for class credit over the past year. This involved them in volunteer work in Laramie schools on the Challenging Horizons Program (an evidence-based organization and time-management intervention for school-age children with ADHD and related problems), at Peak Wellness (teaching psychosocial skills to children), at the Center for Aging (developing and working on on-line resources) and at Safe House (as a crisis counselors).

In addition to providing direct services, training, and education, the UW Psychology department provides leadership to communities and agencies in the state. Psychology faculty serve as representatives and leaders on the **Advisory Council of the State of Wyoming Aging and Disabilities Resource Center**, the **Wyoming State Board of Psychology** (faculty member serves as Vice-Chair), the **Board of Directors of the Wyoming Coalition Against Domestic Violence and Sexual Assault**, the **Wyoming Division of Aging Community Living Taskforce**, the **Wyoming Aging and Disability Resource Center Advisory Committee**, the advisory board for the **Wyoming chapter of the American Foundation for Suicide Prevention**, the **Governor's Juvenile Justice Advisory Council**, and a new **Child Advocacy Center for Southeastern Wyoming**.

Religious Studies Department

The Religious Studies Department serves the state of Wyoming beyond Laramie in three different ways. First, its **Outreach courses are taken by more than 500 students a year**, supplying University Studies requirements of global studies, humanities, and American diversity. Second, the department's chairperson directs **UW's successful Saturday University program**, now in its fifth year. The program brings faculty from all of UW's colleges to give mornings of talks in three Wyoming communities: Gillette, Sheridan and Jackson. It will soon be expanding to other communities. Third, in the meantime, one faculty member, UW's expert on Islam, makes regular trips around the state giving lectures about Islam and the Middle East. With the help of the Wyoming Humanities Council, he gave twelve talks in 2012 in locations ranging **from Big Horn, Douglas and Torrington to Casper**. In 2013, he has already delivered 5 talks.

Department of Statistics

In the summer of 2013, one member of the faculty, in collaboration with colleagues at the National Center for Atmospheric Research (NCAR; our partners on the supercomputer project), taught a short course on the use of R, a free and very powerful statistics package, to **community college teachers of statistics from Wyoming and Colorado.**

Wyoming Survey and Analysis Center

Providing services to Wyoming state and local agencies, governments and programs through applied social research has been the essence of WYSAC's missions for the past decade.

WYSAC researchers **collaborate with numerous State agencies and local organizations to study the impact of substance abuse prevention efforts.** This includes chairing and staffing **Wyoming's State Epidemiological Outcomes Workgroup (SEOW).** In this role, WYSAC completes annual state and county level data profiles as well as other research projects that inform policy makers. The SEOW also provides data-driven recommendations to agencies and groups planning prevention efforts. Related to this planning, WYSAC researchers recently worked with each Wyoming county to complete local needs assessments around alcohol, tobacco, and other drug use. WYSAC also evaluates specific substance abuse prevention efforts across the state

WYSAC has partnered with the Division of Kinesiology and Health to conduct an INBRE-funded pilot study with community partners in the **Wind River Indian Reservation. This study, called Growing Resilience, is measuring the impacts of home gardening health and establishing the design for a full-scale action research as a randomized controlled trial,** which will evaluate the health impacts of gardens while supporting interested families on the Wind River Reservation in growing their own food.

WYSAC conducts various studies to help inform state departments with their planning and allocation of resources for services they provide to the Wyoming public. Most recent examples are the 2012 and 2013 such **studies for the Department of Transportation and the Division of State Parks and Historic Sites.** Also in 2012, in collaboration with colleagues from UW Agricultural and Applied Economics, WYSAC conducted two studies for the **Wyoming State Trails Program to measure the economic impact of snowmobiling and use of Off-road Recreational Vehicles to the state economy.**

Department of Zoology and Physiology

For the last 4 years, **the Coon Creek Redux project has studied coniferous tree responses to forest insect outbreaks in the Sierra Madres, as well as avian responses to tree death.** This research in Riverside-Encampment, in **Carbon County has a total payroll of around \$350,000.** The study helps resource managers to understand the effect of beetle kill on forests and forest wildlife. The Neuroscience group on campus has grants and research activity that generates nearly \$300,000 in funding for UW.

The University of Wyoming-National Park (UW-NPS) Research Station is composed of 16 buildings on 360 acres within Grand Teton National Park. The UW-NPS mission is to enhance research, teaching and outreach to areas within northwestern Wyoming. The program provides housing, laboratory space, equipment, library collections and vehicles to **approximately 60 on-site researchers** at the historic AMK Ranch from mid-May to mid-October. **A weekly summer dinner and seminar series is opened to the public with an average attendance of 100 patrons from the Jackson Hole community. Workshops and conferences along with university classes in ecology, geology, geography, art and sociology from colleges throughout the country are hosted at the station.** UW-NPS grants are awarded to researchers in the social, biological and physical sciences to conduct studies within the Greater Yellowstone Area (GYA). Internship programs and scholarships are also available to **encourage University of Wyoming students to conduct studies in northwestern Wyoming.** The UW-NPS Research

station is staffed by a director, two benefited half time staff and two summer student interns. The UW-NPS Research Station is a **major extension of the University of Wyoming into the community of northwestern Wyoming through public outreach in the sciences and dollar expenditure through the maintenance of 16 buildings and purchase power of about 200 researchers living in Wyoming throughout the summer.**

Research in the department also has impacts on the state. One researcher has done an assessment of effects of **conductivity and ion concentrations on gastropod abundance and biodiversity in Grand Teton National Park.** Another has conducted field research in **streams along the eastern edge of the Wyoming Range west of Big Piney** on the effects of energy development for native fish communities. There is also a project investigating the effects of **stream habitat improvement structures on fish populations in the Laramie River.** In addition, field research in the **Wind River drainage close to Dubois on burbot movement and migration patterns** is underway. Research led by Zoology faculty on the **potential effects of wind farm development on insect pollinators, birds, and bats at four proposed wind farm sites near Rawlins and Rock Springs** will help the BLM predict pollinator populations across the landscape, and in the long term will provide critical data on potential biological impacts of wind farm development in Wyoming. Ongoing research is documenting effects of climate change on **native bee and plant phenology at several sites south of Laramie and surveys in GTNP provide the first inventory of insect pollinators in the park.**

The **Wyoming Cooperative Fish and Wildlife Research Unit**, housed within the Zoology and Physiology Department, conducts applied research on fish and wildlife across the state. In a unique cooperation among state and federal agencies, the Coop Unit serves as the **defacto research arm of the Wyoming Game and Fish Department (WGFD).** They address the most pressing research needs concerning the management of Wyoming's fish and wildlife resources on which an estimated \$1 billion tourism industry depends. In the area of big game, recent studies have evaluated the influence of **wolf and grizzly bear predation on migratory elk in northwest Wyoming**, information that helped the WGFD to modify their harvest plans. Other studies have worked with the WGFD to developed more **cost-effective methods for counting big game** and project their populations over time in order to set harvest quotas. In the area of sensitive non-game species, Coop Unit research has addressed the impact of **drought, beetle kill, invasive plants, on Wyoming's most sensitive species.** Such information is often critical in avoiding an ESA listing, which can have devastating effects to the state's economy. Across all taxa - from mule deer, to songbirds, to fish – the Coop Unit is a recognized as a leader in evaluating the impacts of energy development on wildlife. Its studies over the last two decades **have provided critical information that is moving the state towards more sustainable energy development.** The reach of Coop Unit field research is statewide, from the migratory elk of Park County, to native fish of the Sublette County, to sage grouse of Sweetwater County, and amphibians of Campbell and Weston Counties. Through its training of MS and PhD students, the Coop Unit and the Zoology and Physiology Department make a **strong contribution to the professional workforce that manages Wyoming fish and wildlife resources.** Many current fish and wildlife managers working throughout Wyoming were trained within the Zoology and Physiology Department.

Athletics

Table 13 summarizes for the 2012-13 season the revenues from and attendance at University of Wyoming Football, Men's Basketball, Women's Basketball, and Wyoming State High School Football Championships in Albany County. All of these events are major attractions for the state and draw people from around Wyoming and beyond.

Table 13 – Athletics Tickets and Revenues, AY 2012-13

Season/Game	Sold	Comps	Student	Players and Event Staff	Total Attendance	Revenue
Football						
Season	8145	1074	N/A	N/A	9219	\$1,474,052
3Pack	470	0	N/A	N/A	470	\$42,792
Toledo	5617	965	4162	1555	12299	\$131,101
Cal Poly	4646	3026	3134	1555	12361	\$113,463
Air Force	6118	2650	2692	1555	13015	\$183,828
Boise St.	4374	868	1618	1555	8415	\$140,489
Colorado St.	5265	1213	2412	1555	10445	\$154,550
San Diego St.	876	1049	368	1555	3848	\$22,715
Total	35511	10845	14386	9330	70072	\$2,262,990
Men's Basketball	Sold	Comps	Student	Players and Event Staff	Total Attendance	Revenue
Season	2591	930	N/A	N/A	3521	\$486,455
Mini Plan	205	0	N/A	N/A	205	\$11,348
Fort Lewis	848	102	N/A	N/A	950	\$7,300
Wooster	648	67	627	334	1676	\$7,489
Western State	385	82	891	334	1692	\$2,595
North Carolina Central	87	131	425	334	977	\$1,262
South Dakota	201	260	464	334	1259	\$2,526
Southern	154	114	539	334	1141	\$2,188
CSU Bakersfield	708	67	191	334	1300	\$7,964
Colorado	1881	220	2226	334	4661	\$30,010
Oklahoma Panhandle St.	618	68	886	334	1906	\$9,081
Denver	280	68	326	334	1008	\$3,713
UC Santa Barbara	1217	96	200	334	1847	\$16,715
Boise St.	1125	110	1252	334	2821	\$18,106
San Diego St.	3122	213	2202	334	5871	\$47,561
Air Force	1953	397	2090	334	4774	\$27,660
New Mexico	635	112	1030	334	2111	\$9,013
Nevada	293	102	625	334	1354	\$4,488
Fresno St.	1426	218	794	334	2772	\$21,598
UNLV	1881	215	987	334	3417	\$27,068
Colorado St.	916	148	1274	334	2672	\$15,110
Total	18378	2790	17029	6012	47935	\$759,250

Women's Basketball	Sold	Comps	Student	Players and Event Staff	Total Attendance	Revenue
Season	1631	710	N/A	N/A	2341	\$184,720
Mini Plan	17	0	N/A	N/A	17	\$640
Dakota Wesleyan	125	31	333	334	823	\$1,036
Regis Univ.	125	24	292	334	775	\$998
Idaho	460	53	466	334	1313	\$3,014
Denver	209	54	208	334	805	\$2,094
Eastern Michigan	338	70	231	334	973	\$3,628
Weber State	274	209	200	334	1017	\$2,790
Loyola Marymount	606	94	80	334	1114	\$6,120
South Dakota Tech	244	43	111	334	732	\$2,348
Nevada	193	71	105	334	703	\$1,812
Fresno State	215	48	398	334	995	\$1,892
UNLV	170	68	315	334	887	\$1,834
Colorado State	892	114	373	334	1713	\$8,594
Boise State	568	69	350	334	1321	\$4,966
San Diego State	155	55	258	334	802	\$1,666
Air Force	369	77	231	334	1011	\$2,864
New Mexico	806	128	238	334	1506	\$8,108
Total	7397	1918	4189	5344	18848	\$239,124
HS Football	Sold	Comps	Student	Players and Event Staff	Total Attendance	Revenue
Friday	1464	0	N/A	600	2064	\$14,472
Saturday	2578	40	N/A	600	3218	\$26,384.50
Total	4042	40	N/A	1200	5282	\$40,857
2012-13 Totals	65328	15593	35604	21886	142137	\$3,302,221

Degrees Offered at the University of Wyoming

Colleges	Degrees
AG: College of Agriculture and Natural Resources	B = Bachelor's
AS: College of Arts and Sciences	M = Master's
CB: College of Business	D = Doctorate
ED: College of Education	O = Other
EN: College of Engineering and Applied Science	
HS: College of Health Sciences	
LAW: College of Law	
UW: Interdisciplinary	
SER: School of Energy Resources	

Degree Title	B	M	D	O
Accounting (CB)	x	x	-	-
Agricultural Business (AG)	x	-	-	-
Agricultural Communications (AG)	x	-	-	-
Agriculture and Applied Economics (AG)	-	x	-	-
Agricultural Economics/Water Resources (AG)	-	x	-	-
Agricultural Education (ED)	x	-	-	-
Agroecology (AG)	x	-	-	-
Agronomy (AG)	-	x	x	-
African American and Diaspora Studies (AS)	x	-	-	-
American Indian Studies (AS)	x	-	-	-
American Studies (AS)	x	x	-	-
Animal and Veterinary Sciences (AG)	x	x	x	-
Anthropology (AS)	x	x	x	-
Architectural Engineering (EN)	x	-	-	-
Art (AS)	x	-	-	-
Astronomy/Astrophysics (AS)	x	-	-	-
Atmospheric Science (EN)	-	x	x	-
Biology (AS)	x	-	-	-
Biomedical Sciences (AG, EN, AS, HS)	-	-	x	-
Botany (AS)	x	x	x	-
Botany/ Water Resources (AS)	-	x	-	-

Business Administration (CB)	x	x	-	-
Business Economics (CB)	x	-	-	-
Chemical Engineering (EN)	x	x	x	-
Chemical Engineering (petroleum) (EN)	x	-	-	-
Chemistry (AS)	x	x	x	-
Chemistry (ACS Approved) (AS)	x	-	-	-
Civil Engineering (EN)	x	x	x	-
Civil Engineering/Water Resources (EN)	-	x	-	-
Communication (AS)	x	x	-	-
Computer Engineering (EN)	x	-	-	-
Computer Science (EN)	x	x	x	-
Computer Science (business option) (EN)	-	x	-	-
Computer Science Professional	-	x	-	-
Counseling (ED)	-	x	-	-
Counselor Education and Supervision (ED)	-	-	x	-
Creative Writing (AS)	-	x	-	-
Criminal Justice (AS)	x	-	-	-
Curriculum and Instruction (ED)	x	-	-	-
Dental Hygiene (HS)	x	-	-	-
Earth Systems Science (affiliated major, interdisciplinary)	x	-	-	-
Ecology (UW)	-	-	x	-
Economics (CB)	x	x	x	-
Economics and Finance (CB)	-	x	-	-
Economics/Water Resources (CB)	-	x	-	-
Education (ED)	-	x	x	x
Education Specialist (ED)	-	-	-	x
Electrical Engineering (EN)	x	x	x	-
Electrical Engineering (Francis M. Long bioengineering option) (EN)	x	-	-	-
Electrical Engineering (computer engineering option) (EN)	x	x	-	-
Elementary Education (ED)	x	-	-	-
Elementary and Special Education (ED)	x	-	-	-
Energy Resource Management and Development (SER)	x	-	-	-
Energy Systems Engineering	x	-	-	-

English (AS)	x	x	-	-
Entomology (AG)	-	x	x	-
Environment and Natural Resources (affiliated major) (UW)	x	x	-	x
Environmental Engineering (EN)	-	x	-	-
Environmental Geology/Geohydrology (AS)	x	-	-	-
Family and Consumer Sciences (AG)	x	x	-	-
Finance (CB)	x	x	-	-
Food Science and Human Nutrition (AG)	-	x	-	-
French (AS)	x	x	-	-
Gender and Women's Studies (AS)	x	-	-	-
Geography (AS)	x	x	-	-
Geography/Water Resources (AS)	-	x	-	-
Geology (AS)	x	x	x	-
Geology and Earth Sciences (AS)	x	-	-	-
Geology/Water Resources (AS)	-	x	-	-
Geophysics (AS)	-	x	x	-
German (AS)	x	x	-	-
History (AS)	x	x	-	-
Humanities/Fine Arts (AS)	x	-	-	-
Hydrological Sciences (UW)	-	-	x	-
Interdisciplinary Studies (UW)	-	x	-	-
International Studies (AS)	x	x	-	-
Journalism (AS)	x	-	-	-
Juris Doctor (LAW)	-	-	-	x
Kinesiology and Health (HS)	-	x	-	-
Kinesiology and Health Promotion (HS)	x	-	-	-
Management (CB)	x	-	-	-
Management and Marketing (CB)	-	-	x	-
Marketing (CB)	x	-	-	-
Mathematics (AS)	x	x	x	-
Mathematics/Science (AS)	x	-	-	-
Mechanical Engineering (EN)	x	x	x	-
Microbiology (AG, AS, and HS)	x	-	-	-

Molecular Biology (AG)	x	x	x	-
Molecular and Cellular Life Sciences (UW)	-	-	x	-
Music (AS)	x	x	-	-
Music Education (AS)	x	x	-	-
Music Performance (AS)	x	-	-	-
Natural Science (AS)	-	x	-	-
Neuroscience (AS and UW)	-	x	x	-
Nursing (HS)	x	x	-	-
Nursing Practice (HS) (Beginning Fall 2012)	-	-	x	-
Organizational Leadership (Bachelor of Applied Science) (AG)	-	-	-	x
Petroleum Engineering (EN)	x	x	x	-
Pharmacy (Professional) (HS)	-	-	-	x
Philosophy (AS)	x	x	-	-
Physical Education Teaching (HS)	x	-	-	-
Physics (AS)	x	x	x	-
Physics Plus {affiliated concentration} (AS)	x	-	-	-
Physiology (AS)	x	-	-	-
Planning (Community and Regional) (AS)	-	x	-	-
Political Science (AS)	x	x	-	-
Psychology (AS)	x	x	x	-
Public Administration (AS)	-	x	-	x
Rangeland Ecology and Watershed Management (AG)	x	x	x	-
Rangeland Ecology and Watershed Management/Water Resources (AG)	-	x	-	-
Religious Studies (AS)	x	-	-	-
Reproductive Biology (AG and AS)	-	x	x	-
Russian (AS)	x	-	-	-
Secondary Education (ED)	x	-	-	-
Self-Designed Major (AS)	x	-	-	-
Social Science (AS)	x	-	-	-
Social Work (HS)	x	x	-	-
Sociology (AS)	x	x	-	-
Soil Science (AG)	-	x	x	-
Soil Science/Water Resources (AG)	-	x	-	-

Spanish (AS)	x	x	-	-
Special Education (ED)	x	-	-	-
Speech, Language and Hearing Sciences (HS)	x	-	-	-
Speech-Language Pathology (HS)	-	x	-	-
Statistics (AS)	x	x	x	-
Technical Education (ED) - available only at the UW/CC Center	x	-	-	-
Theatre and Dance (AS)	x	-	-	-
Theatre and Dance-Professional (AS)	x	-	-	-
Trades and Industrial Education (ED)	x	-	-	-
Wildlife and Fisheries Biology and Management - Professional (AS)	x	-	-	-
Zoology	x	-	-	-
Zoology and Physiology (AS)	-	x	x	-
Zoology and Physiology/Water Resources (AS)	-	x	-	-