



HEADWATERS
ECONOMICS

A Profile of Mining, Including Oil & Gas

County Region

Selected Geographies:

Yellowstone County, MT; Sweet Grass County, MT

Benchmark Geographies:

U.S.

Produced by

Headwaters Economics'

Economic Profile System (EPS)

<https://headwaterseconomics.org/eps>

July 19, 2018

Mining, Including Oil & Gas

County Region

About the Economic Profile System (EPS)

EPS is a free web tool created by Headwaters Economics to build customized socioeconomic reports of U.S. counties, states, and regions. Reports can be easily created to compare or aggregate different areas. EPS uses published statistics from federal data sources, including the U.S. Census Bureau, Bureau of Economic Analysis, and Bureau of Labor Statistics.

The Bureau of Land Management and Forest Service have made significant financial and intellectual contributions to the operation and content of EPS.

See <https://headwaterseconomics.org/eps> for more information about the capabilities of EPS. For technical questions, contact Patty Gude at eps@headwaterseconomics.org or telephone 406-599-7425.



headwaterseconomics.org

Headwaters Economics is an independent, nonprofit research group. Our mission is to improve community development and land management decisions.



www.blm.gov

The Bureau of Land Management, an agency within the U.S. Department of Interior, administers 249.8 million acres of America's public lands, located primarily in western states. It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.



www.fs.fed.us

The Forest Service, an agency of the U.S. Department of Agriculture, administers national forests and grasslands encompassing 193 million acres. The Forest Service's mission is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

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Note to Users:

This is one of 14 reports that can be created and downloaded from EPS. Topics include land use, demographics, specific industry sectors, the role of non-labor income, the wildland-urban interface, the role of amenities in economic development, and payments to county governments from federal lands. The EPS reports are downloadable as Excel or PDF documents. See <https://headwaterseconomics.org/eps>.

Mining, Including Oil & Gas

County Region

Mining Sectors

	Yellowstone County, MT	Sweet Grass County, MT	County Region	U.S.
Total Private Employment, 2016	70,372	1,130	71,502	126,752,238
Mining	451	~404	~855	587,017
Oil & Gas Extraction	403	0	403	403,218
Oil & Gas Extraction	280	0	280	122,140
Drilling Oil & Gas Wells	5	0	5	53,837
Support for Oil & Gas Operations	118	0	118	227,241
Coal Mining	~2	0	~2	59,375
Coal Mining	~2	0	~2	55,008
Support Activities for Coal Mining	0	0	0	4,367
Metal Ore Mining	~2	~360	~362	41,229
Metal Ore Mining	0	~360	~360	37,863
Support Activities for Metal Mining	~2	0	~2	3,366
Nonmetallic Minerals Mining	~45	0	~45	83,195
Nonmetallic Minerals Mining	43	0	43	81,029
Support for Nonmetal Minerals	~2	0	~2	2,166
Mining Related	135	0	135	217,361
Oil & Gas Pipeline & Related Const.	89	0	89	163,704
Pipeline Transportation	46	0	46	53,657
Non-Mining	69,921	~726	~70,647	126,165,221

Percent of Total, 2016

Mining	0.6%	~35.8%	~1.2%	0.5%
Oil & Gas Extraction	0.6%	0.0%	0.6%	0.3%
Oil & Gas Extraction	0.4%	0.0%	0.4%	0.1%
Drilling Oil & Gas Wells	0.0%	0.0%	0.0%	0.0%
Support for Oil & Gas Operations	0.2%	0.0%	0.2%	0.2%
Coal Mining	~0.0%	0.0%	~0.0%	0.0%
Coal Mining	~0.0%	0.0%	~0.0%	0.0%
Support Activities for Coal Mining	0.0%	0.0%	0.0%	0.0%
Metal Ore Mining	~0.0%	~31.9%	~0.5%	0.0%
Metal Ore Mining	0.0%	~31.9%	~0.5%	0.0%
Support Activities for Metal Mining	~0.0%	0.0%	~0.0%	0.0%
Nonmetallic Minerals Mining	~0.1%	0.0%	~0.1%	0.1%
Nonmetallic Minerals Mining	0.1%	0.0%	0.1%	0.1%
Support for Nonmetal Minerals	~0.0%	0.0%	~0.0%	0.0%
Mining Related	0.2%	0.0%	0.2%	0.2%
Oil & Gas Pipeline & Related Const.	0.1%	0.0%	0.1%	0.1%
Pipeline Transportation	0.1%	0.0%	0.1%	0.0%
Non-Mining	99.4%	~64.2%	~98.8%	99.5%

This table does not include employment data for government, agriculture, railroads, or the self-employed because these are not reported by County Business Patterns. Estimates for data that were not disclosed are indicated with tildes (~).

Mining, Including Oil & Gas

County Region

Mining Sectors

What do we measure on this page?

This page describes the number of jobs (full- and part-time) and the share of total jobs in the mining industry, broken out into four sub-sectors: oil and gas extraction, coal mining, metal ore mining, and nonmetallic minerals mining.

According to the North American Industrial Classification system (NAICS), Mining (NAICS code 21) consists of Oil and Gas Extraction (NAICS 211), Mining Except Oil and Gas (NAICS 212), and Support Activities for Mining (NAICS 213).¹ In addition, we add the category "Mining Related" which captures oil and gas pipeline industries and associated employment.²

Data on this page were obtained from the U.S. Census Bureau's County Business Patterns (CBP) series. We use this source because, compared to other sources, it has fewer data gaps (instances when the federal government will not release information to protect the confidentiality of individual businesses). It also includes both full- and part-time employment. The disadvantage of CBP data is that they do not include employment in government, agriculture, railroads, or the self-employed and as a result may undercount the size of industry sectors. Also, CBP data are based on mid-March employment and do not take into account seasonal fluctuations. For these reasons, the data are most useful for showing long-term trends, displaying differences between locations, and showing the relationship between sectors over time.

Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses data from the U.S. Department of Commerce to estimate these data gaps.³

Why is it important?

To understand the economic impact of mining, it is important to grasp the relative size of the mining industry and its components, how these have changed over time, and how local trends compare to trends in other locations. For mining-dependent communities, it can be important to consider whether management action and policies stimulate growth or decline in the industry, how proposed actions and policies relate to ongoing trends, and given the relative size of the industry whether changes to it will affect the broader economy.

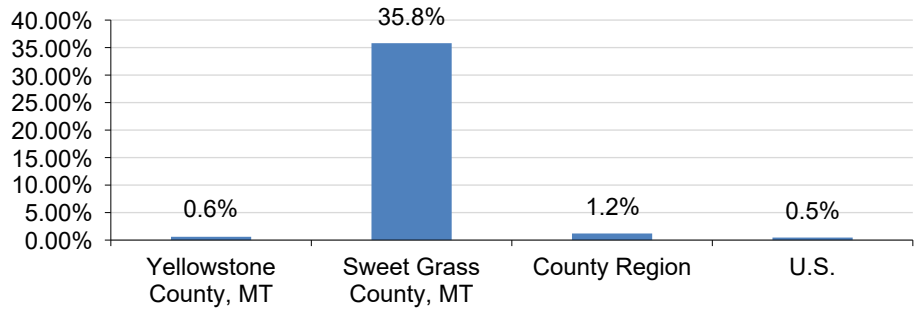
Mining, Including Oil & Gas

County Region

Mining Employment Trends

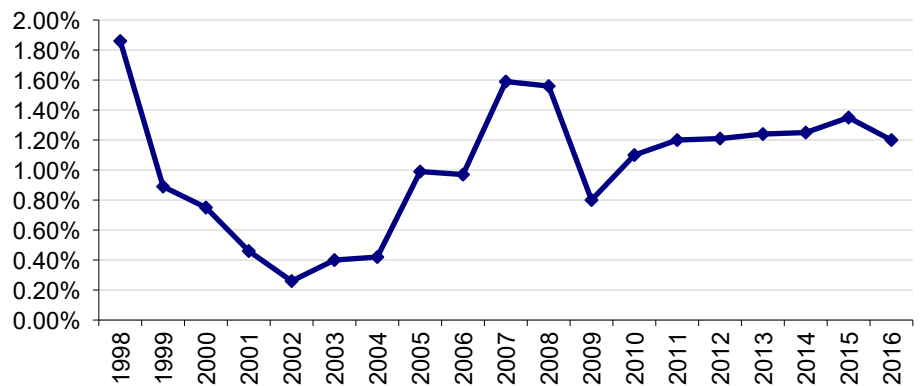
- In 2016, Sweet Grass County, MT had the largest percent of total mining employment (35.8%), and U.S. had the smallest (0.46%).

Percent of Total Private Employment in Mining, 2016



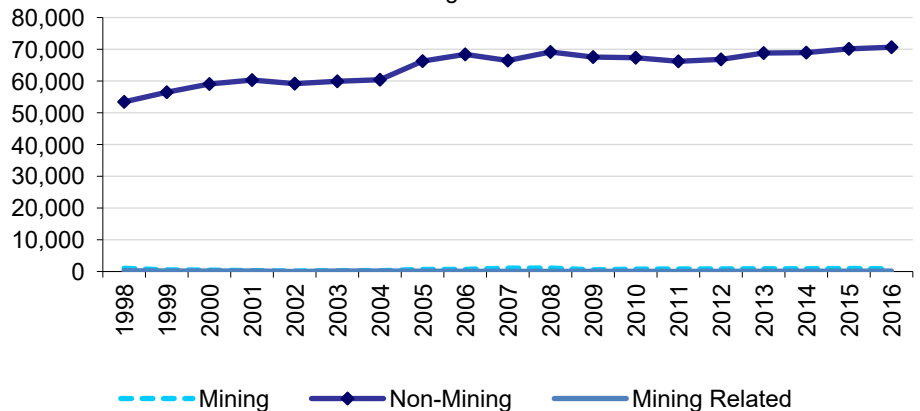
- In 1998, mining represented 1.86 percent of total employment. By 2016, mining represented 1.2 percent of total employment.

Percent of Total Private Employment in Mining, County Region



- From 1998 to 2016, mining employment shrank from 1,015 to 855 jobs, a 15.8 percent decrease.
- From 1998 to 2016, non-mining employment grew from 53,433 to 70,647 jobs, a 32.2 percent increase.

Total Jobs in Mining, Mining Related, and Non-Mining, County Region



Mining Employment Trends

What do we measure on this page?

This page describes long-term trends in mining employment as a percent of all jobs and compares mining to non-mining employment over time for the region.⁴

Data on this page were obtained from the U.S. Census Bureau's County Business Patterns (CBP) series. Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses data from the U.S. Department of Commerce to estimate these data gaps.³

Why is it important?

When the mining industry is a significant driver of the economy, other sectors of the economy, total employment, and total personal income could follow trends in the mining industry. It is important to know whether this is the case because if employment in other sectors fluctuates with the mining industry, then mining-related management actions and policies may have far-reaching impacts. If, on the other hand, jobs in the rest of the economy are growing independently of trends in the mining industry, then management actions and policies that potentially affect the mining industry may have impacts that are limited to that industry.⁵

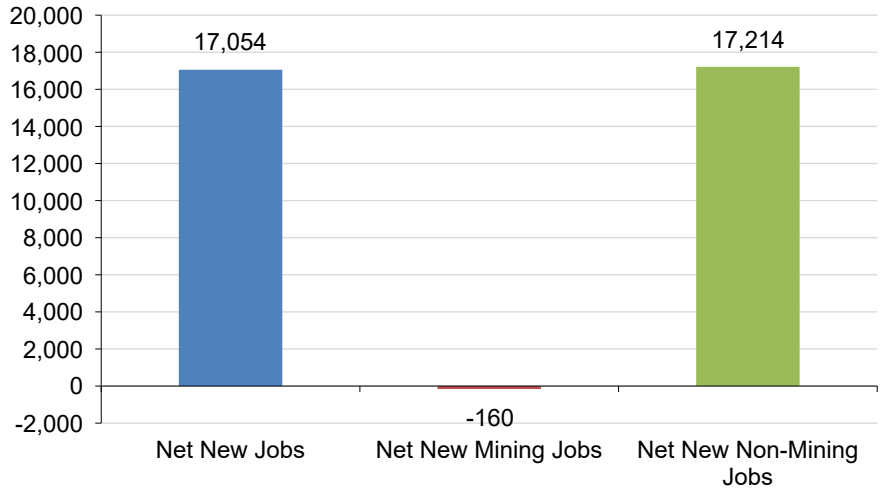
Mining, Including Oil & Gas

County Region

Mining Employment Trends (cont.)

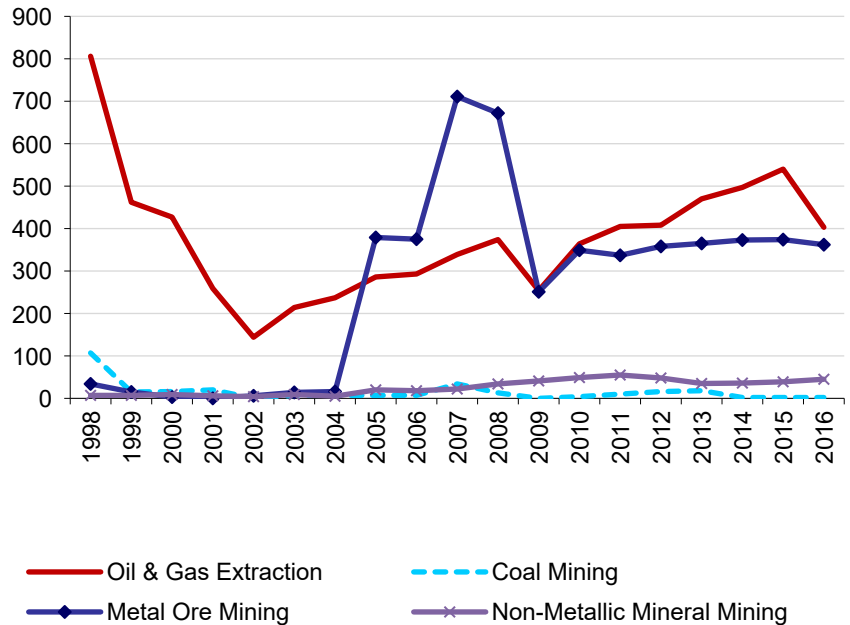
- From 1998 to 2016, mining employment shrank by 160 jobs.
- From 1998 to 2016, non-mining employment grew by 17,214 jobs.

New Jobs in Mining and Non-Mining, County Region, 1998-2016



- From 1998 to 2016, oil & gas extraction shrank from 806 to 403 jobs, a 50% decrease.
- From 1998 to 2016, coal mining shrank from 107 to 2 jobs, a 98% decrease.
- From 1998 to 2016, metal ore mining grew from 34 to 362 jobs, a 965% increase.
- From 1998 to 2016, non-metallic mineral mining grew from 7 to 45 jobs, a 543% increase.

Jobs in Mining Sectors, County Region



Mining Employment Trends (cont.)

What do we measure on this page?

This page describes the change in mining jobs compared to the change in non-mining jobs and compares how employment in various mining sectors has changed over time.⁶

The bottom chart on this page starts in 1998 because that is the year the U.S. Census Bureau (and County Business Patterns) shifted to using the new North American Industrial Classification System (NAICS).

Data on this page were obtained from County Business Patterns. Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses data from the U.S. Department of Commerce to estimate these data gaps.³

Why is it important?

Some geographies are more dependent on mining-related employment than others.⁵ Particularly for mining-dependent communities, activities and policies that impact the mining industry may have far-reaching impacts.

To understand the importance of mining in the local economy, it is useful to grasp the source of new jobs and the relative contribution of the mining industry to net new jobs. Components of the mining industry may create or lose jobs at a different rate.

Locations with economies that focus on resource extraction, particularly on fossil fuel development, can be subject to boom-and-bust cycles as well as other economic challenges such as slower long-term economic growth.^{7, 8} These difficulties are sometimes called the "resource curse" in reference to the apparent paradox that areas rich in natural resources often underperform economically.^{9, 10} Due to the economic volatility common among mining sectors, mining-dependent communities can benefit from planning for economic transitions.¹¹

Mining, Including Oil & Gas

County Region

Self-Employment

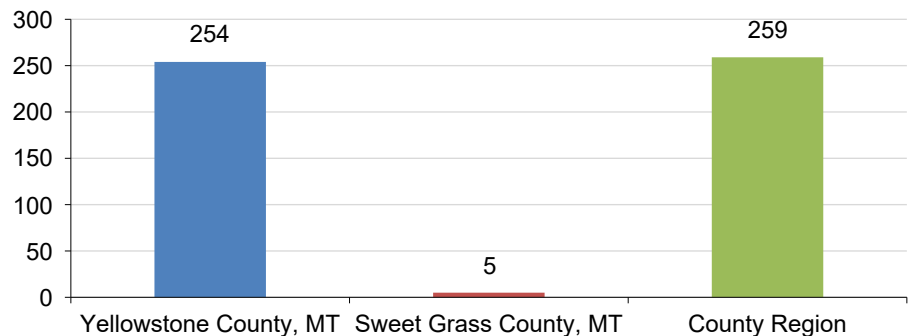
	Yellowstone County, MT	Sweet Grass County, MT	County Region	U.S.
Total Proprietors, 2015	11,441	453	11,894	24,331,403
Mining	254	5	259	98,134
Oil & Gas Extraction	218	4	222	76,255
Mining (Except Oil & Gas)	5	na	5	5,369
Support Activities for Mining	31	0	31	16,510
Non-Mining	11,187	448	11,635	24,233,269

Percent of Total, 2015

Mining	2.2%	1.1%	2.2%	0.4%
Oil & Gas Extraction	1.9%	0.9%	1.9%	0.3%
Mining (Except Oil & Gas)	0.0%	na	0.0%	0.0%
Support Activities for Mining	0.3%	0.0%	0.3%	0.1%
Non-Mining	97.8%	98.9%	97.8%	99.6%

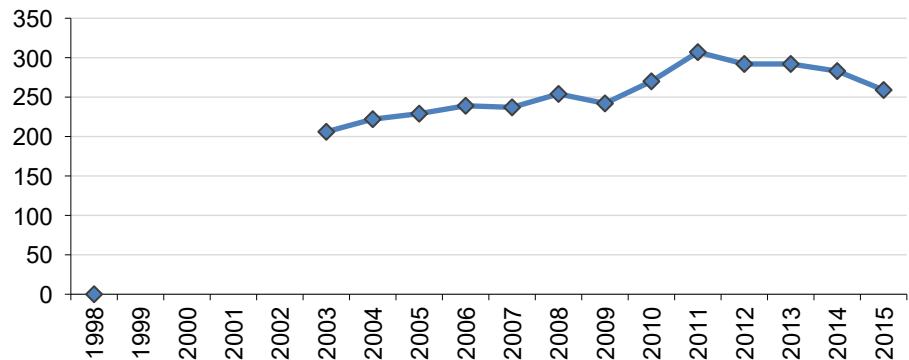
Mining Proprietors, County Region, 2015

- In 2015, County Region had the largest number of mining proprietors (259), and Sweet Grass County, MT had the smallest (5).



Mining Proprietors, County Region

- From 1998 to 2015, mining proprietors in County Region grew from 0 to 259, a more than 25,900% increase.



Self-Employment

What do we measure on this page?

This page describes the number of nonemployer businesses (in most cases self-employed individuals) in mining by sector and geography. It offers data to supplement previous pages of this report that do not include the self-employed.

Nonemployer Business: A business with no paid employees, with annual business receipts of \$1,000 or more, and subject to federal income taxes. Nonemployer businesses can be individual proprietorships, partnerships, or corporations. Most nonemployers are self-employed individuals operating very small unincorporated businesses that may or may not be the owners' principal source of income.¹²

The U.S. Census Bureau's Nonemployer Statistics provide the only source of detailed and comprehensive data on the scope, nature, and activities of U.S. businesses with no paid employment and payroll.¹³ According to the Census Bureau: "Most nonemployers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income. These firms are excluded from most other business statistics."

The three mining sub-categories in the upper table *Proprietors in Mining* are 3-digit NAICS categories from Nonemployer Statistics.¹⁴ They are different than the four summary categories (from County Business Patterns) shown on previous pages.

Depending on the locations selected, some data may not be available due to disclosure restrictions.

Why is it important?

Significant portions of the mining industry—especially support activities such as excavation, trucking, and servicing—may be conducted by nonemployer businesses. These nonemployer businesses are not reported by County Business Patterns but are reported by Nonemployer Statistics. It is important to use these two data sources in tandem when evaluating the size and trends of mining employment.

Mining, Including Oil & Gas

County Region

Wages and Employment

	Yellowstone County, MT	Sweet Grass County, MT	County Region	U.S.
All Sectors, 2016 (2017 \$s)	\$46,030	\$49,279	\$46,089	\$54,747
Private	\$45,285	\$52,767	\$45,408	\$54,639
Mining	\$120,633	na	\$120,633	\$105,151
Oil & Gas Extraction	\$167,422	\$0	\$167,422	\$165,143
Mining (Except Oil & Gas)	\$64,357	na	\$64,357	\$75,374
Support Activities for Mining	\$68,207	\$0	\$68,207	\$85,276
Non-Mining	\$44,809	~\$26,690	~\$44,621	\$54,380
Government	\$52,280	\$34,208	\$51,703	\$55,359

This table shows wage data from the Bureau of Labor Statistics, which does not report data for proprietors or the value of benefits and uses slightly different industry categories than those shown on previous pages of this report.

Percent of Total Employment, 2016

	Yellowstone County, MT	Sweet Grass County, MT	County Region	U.S.
Private	89.4%	81.1%	89.2%	84.9%
Mining	0.6%	na	0.6%	0.4%
Oil & Gas Extraction	0.3%	0.0%	0.3%	0.1%
Mining (Except Oil & Gas)	0.1%	na	0.1%	0.1%
Support Activities for Mining	0.1%	0.0%	0.1%	0.2%
Non-Mining	88.8%	~50.2%	~88.1%	84.5%
Government	10.6%	19.0%	10.8%	15.1%

This table uses employment data from the Bureau of Labor Statistics, which does not report data for proprietors or the value of benefits and uses slightly different industry categories than those shown on previous pages of this report.

Wages and Employment

What do we measure on this page?

This page describes wages (in real terms) from employment in the mining industry, including sub-sectors, compared to wages from employment in all non-mining sectors combined.¹⁵ It also describes the percent of jobs in each category. These are shown together to illustrate the relative wage levels in mining, including sub-sectors, and how many people are employed in each sub-sector.

The primary purpose of this page is to compare the average annual wages between sectors, and to investigate the relative number of people employed in high- and low-wage sectors.

The wage and employment data on this page are from the Bureau of Labor Statistics, which does not report data for proprietors or the value of benefits and uses slightly different industry categories than those shown on the initial pages of this report.^{16, 17, 18}

The three mining sub-sectors in the tables are 3-digit NAICS categories (from Quarterly Census of Employment and Wages)²² and are different than the four summary categories (from County Business Patterns) shown on the initial pages of this report.

Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses custom data aggregations calculated from various NAICS codes. Occasionally one or more data values underlying these aggregations are non-disclosed.

Why is it important?

The mining industry has the potential to provide high-wage jobs, but this may differ by mining sub-sector and by geography. Important issues to consider are how mining industry wages compare to wages in other sectors, whether some components of the mining industry pay higher wages than others, and whether there are significant wage differences between locations.

Mining, Including Oil & Gas

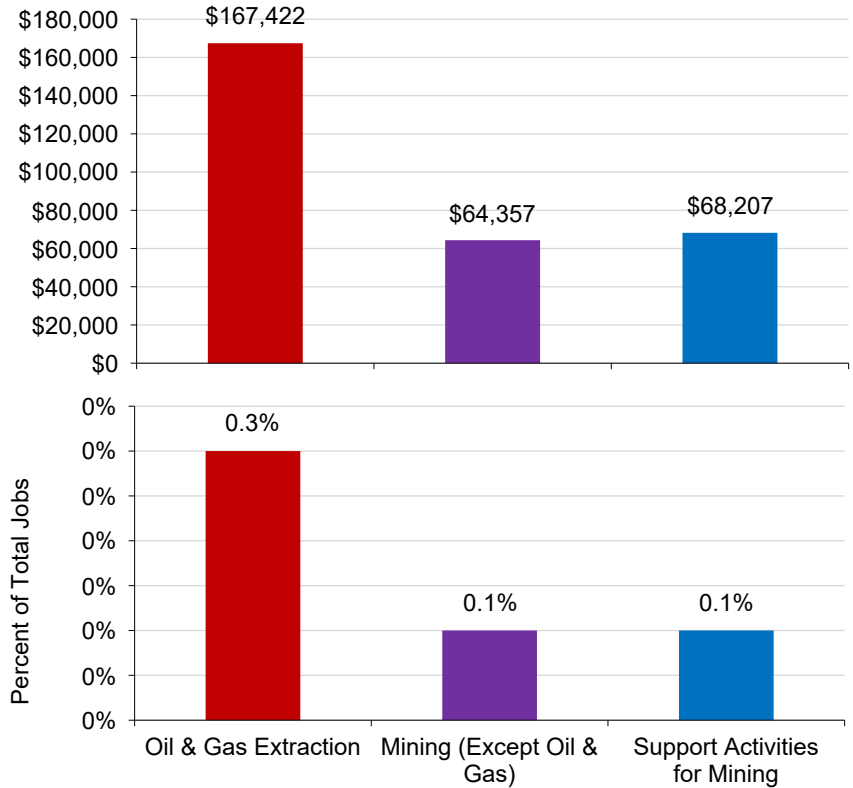
County Region

Wages and Employment (cont.)

- In 2016, mining sector average wages, from highest to lowest, were: oil & gas extraction (\$167,422), support activities for mining (\$68,207), and mining (except oil & gas) (\$64,357).

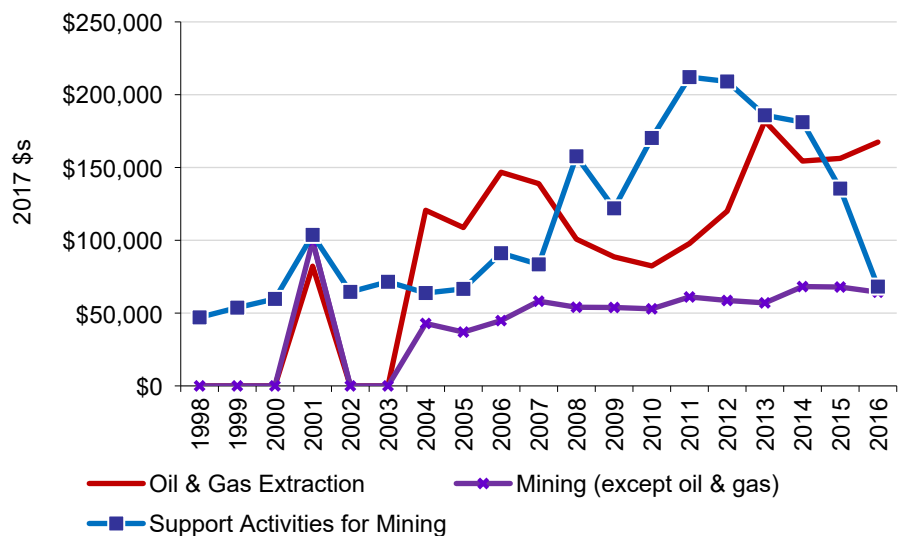
- In 2016, mining sector percent of total employment, from highest to lowest, were: oil & gas extraction (0.3%), mining (except oil & gas) (0.1%), and mining (except oil & gas) (0.1%).

Avg. Annual Wages & Percent of Total Employment in Mining Sectors, County Region, 2016



- From 1998 to 2016, average wages in oil & gas extraction grew (in real terms) from \$0 to \$167,422 a more than 16,742,200% increase.
- From 1998 to 2016, average wages in mining (except oil & gas) grew (in real terms) from \$0 to \$64,357 a more than 6,435,700% increase.
- From 1998 to 2016, average wages in support activities for mining grew (in real terms) from \$47,071 to \$68,207 a 44.9% increase.

Avg. Annual Wages in Mining Sectors, County Region



Wages and Employment (cont.)

What do we measure on this page?

This page describes average wages (in real terms) and employment levels in different mining sectors. It also shows average wage trends (in real terms) for mining sectors.

The chart *Avg. Annual Wages and Percent of Total Employment in Mining Sectors* is useful for describing how many people are working in relatively high- and low-wage mining sectors. The chart *Avg. Annual Wages in Mining Sectors* is useful for comparing wage trends by mining sector.

The wage and employment data on this page are from the Bureau of Labor Statistics, which does not report data for proprietors or the value of benefits and uses slightly different industry categories than those shown on the initial pages of this report.^{16, 17}

The three mining sub-sectors in the charts are 3-digit NAICS categories (from Quarterly Census of Employment and Wages) and are different than the three summary categories (from County Business Patterns) shown on the initial pages of this report.

The chart *Avg. Annual Wages in Mining Sectors* starts in 1998 to be consistent with the start date of figures on earlier pages of this report.

Depending on the locations selected, some data may not be available due to disclosure restrictions.¹⁹

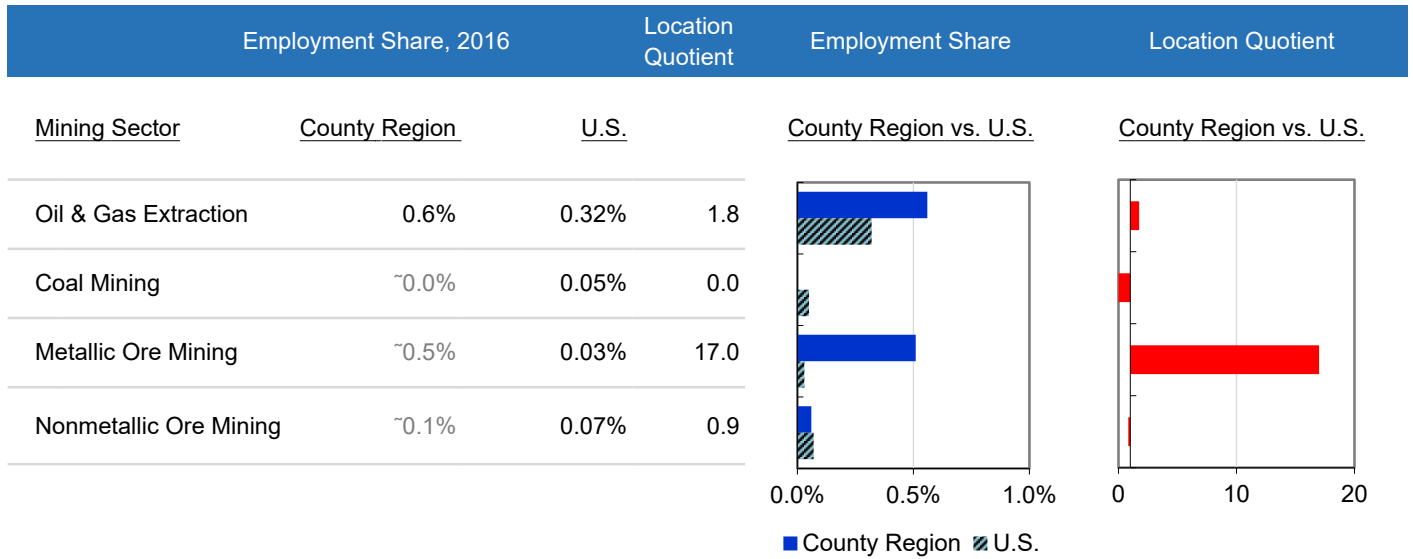
Why is it important?

While the mining industry has the potential to offer high wages, not all components of the mining industry pay the same wages or employ the same number of people. A significant increase in mining jobs that pay above the average for all industries will increase overall average earnings per job. On the other hand, a significant increase in mining jobs that pay below the average for all industries will decrease overall average earnings per job. A modest change in mining employment, especially when this industry is a small share of total employment, will not likely affect average earnings in a local area.

Mining, Including Oil & Gas

County Region

Comparisons



- In 2016, metallic ore mining had the highest location quotient score (17), and coal mining had the lowest (0).

Comparisons

What do we measure on this page?

This page describes whether the region is specialized in mining-related employment. The chart illustrates the difference between the selected location(s) and the selected benchmark area.²⁰ (If no custom benchmark area was selected, EPS defaults to benchmarking against the U.S.)

Location Quotient²¹: A ratio that compares an industry's share of total employment in a region to the benchmark. More precisely, it is the percent of local employment in a sector divided by the percent employment in the same sector in the benchmark area. In other words, it is a ratio that measures specialization using the benchmark area for comparison. A location quotient of more than 1.0 means the local area is more specialized in that sector relative to the benchmark area. A location quotient of less than 1.0 means it is less specialized.²²

Another way to think about location quotients is as a measure of whether a place produces enough goods or services from an industry to satisfy local demand for those goods or services. Results above or below the 1.0 standard indicate the degree to which a place may import or export a good or service. Although there is no precise cutoff, location quotients above 2.0 indicate a strong industry concentration (and that an area is likely exporting goods or services) and those less than 0.5 indicate a weak industry concentration (and that an area is likely importing goods or services).

Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses data from the U.S. Department of Commerce to estimate these data gaps.³

Why is it important?

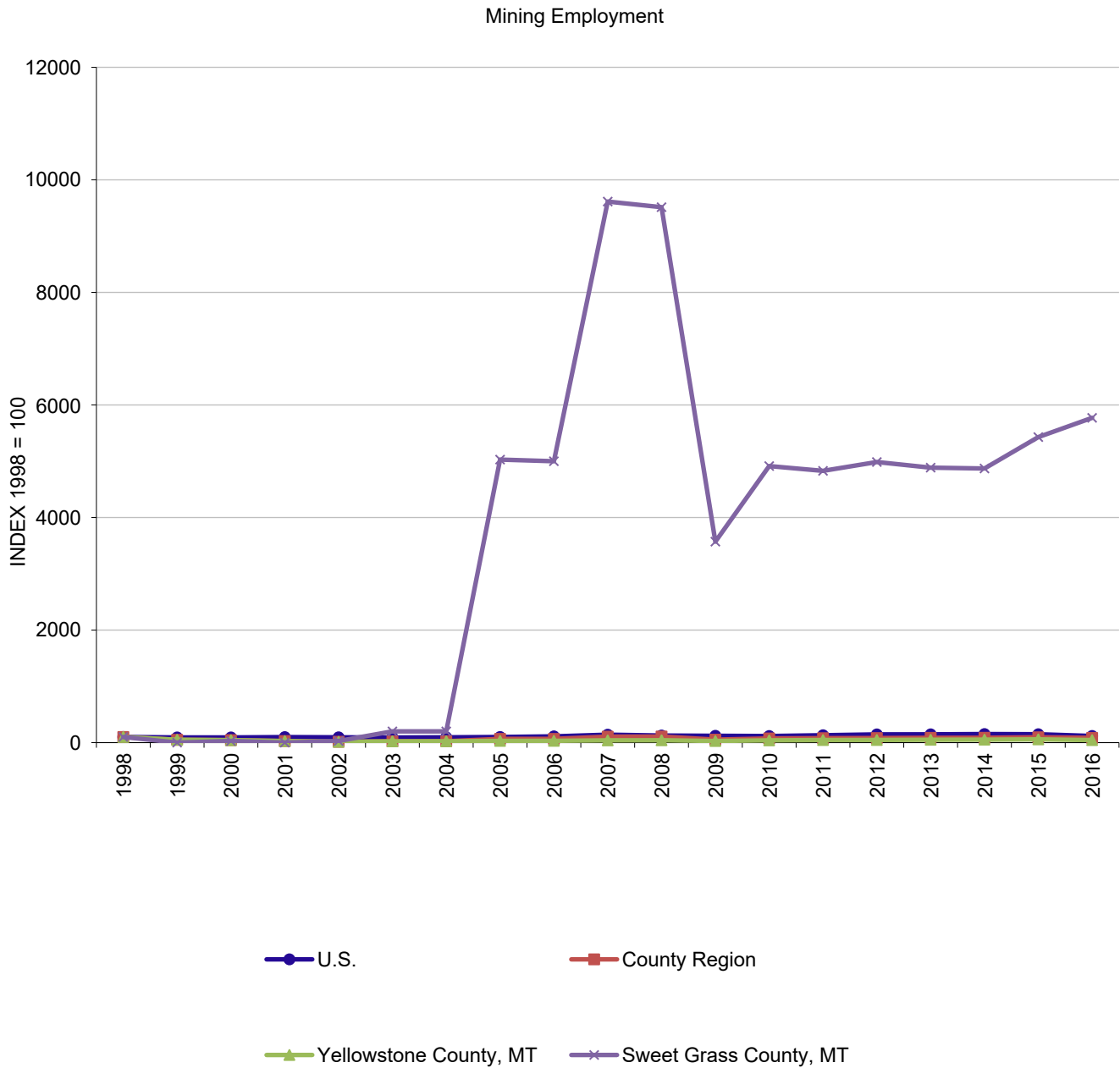
Locations with economies that focus on resource extraction, particularly on fossil fuel development, can be subject to boom-and-bust cycles as well as other economic challenges such as slower long-term economic growth.^{7, 8} These difficulties are sometimes called the "resource curse" in reference to the apparent paradox that areas rich in natural resources often underperform economically.^{9, 10}

A few caveats: (1) A large location quotient for a particular sector does not necessarily mean that sector is a significant contributor to the economy. (2) LQs greater than 1.0 only suggest potential export capacity when compared to the benchmark area and do not take into account local demand. Local demand may be greater than average, and therefore all goods and services may be consumed locally (i.e., not exported). (3) LQs can change from year to year. (4) LQs can vary when one uses income or wage data rather than employment.

Mining, Including Oil & Gas

County Region

Comparisons Over Time



- From 1998 to 2016, County Region had the fastest rate of change in mining employment, and Yellowstone County, MT had the slowest.

Comparisons Over Time

What do we measure on this page?

This page describes the change in mining employment for all selected locations and the benchmark area.^{4, 20} The information is indexed (1998=100) so that data from locations with different sized economies can be compared. Indexing makes it easier to understand the relative rate of growth or decline of mining employment over time.

Index: Indexed numbers are compared with a base value. In the line chart, employment in 1998 is the base value and is set to 100. The employment values for subsequent years are expressed as 100 times the ratio to the base value. The indexing used in the line chart enables easier comparisons between locations over time. (If many locations are selected, it may be difficult to read the figure on this page.)

The chart begins in 1998 because that is the year the Census Bureau and County Business Patterns shifted to using the new North American Industrial Classification System (NAICS).

Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses data from the U.S. Department of Commerce to estimate these data gaps.³

Why is it important?

Not all locations have attracted or lost mining industries and employment at the same rate. An index makes it clear where the rate of mining growth or decline has been the fastest. Lines above 100 indicate positive absolute growth while those below 100 show absolute decline. The steeper the curve the faster the rate of change.

It may be helpful to look for large year-to-year rises or dips in lines on the chart to identify rapid employment changes. If the reasons behind these fluctuations are not evident, it may be helpful to talk with regional experts or locals to learn more about what caused abrupt changes.

Locations with economies that focus on resource extraction, particularly on fossil fuel development, can be subject to boom-and-bust cycles as well as other economic challenges such as slower long-term economic growth.^{5, 7} These difficulties are sometimes called the "resource curse" in reference to the apparent paradox that areas rich in natural resources often underperform economically.^{9, 10}

Mining, Including Oil & Gas

County Region

Data Sources & Methods

This EPS Mining report uses national statistics from public government sources. All data used in EPS can be readily verified with the original sources:

- **County Business Patterns**
Census Bureau, U.S. Department of Commerce
<https://www.census.gov/programs-surveys/cbp.html>
Contacts
<https://www.census.gov/about/contact-us.html>
- **Quarterly Census of Employment and Wages**
Bureau of Labor Statistics, U.S. Department of Labor
<https://www.bls.gov/cew>
Contacts
<https://www.bls.gov/bls/contact.htm>
- **Nonemployer Statistics**
Bureau of the Census, U.S. Department of Commerce
<https://www.census.gov/econ/nonemployer/index.html>
Contacts
<https://www.bls.gov/bls/contact.htm>

EPS core approaches

EPS is designed to focus on long-term trends across a range of important measures. Trend analysis provides a more comprehensive view of changes than spot data for select years. We encourage users to focus on major trends rather than absolute numbers. EPS displays detailed industry-level data to show changes in the composition of the economy over time and the mix of industries at points in time. EPS employs cross-sectional benchmarking – comparing smaller areas such as counties to larger regions, states, and the nation – to give a sense of relative performance. EPS allows users to aggregate data for multiple locations to allow for more sophisticated cross-sectional comparisons.

Adjusting dollar figures for inflation

Because a dollar in the past was worth more than a dollar today, data reported in current dollar terms should be adjusted for inflation. The U.S. Department of Commerce reports personal income figures in terms of current dollars. All income data in EPS are adjusted to real (or constant) dollars using the Consumer Price Index. Figures are adjusted to the latest date for which the annual Consumer Price Index is available.

Data gaps and estimation

Some data are withheld by the federal government to avoid the disclosure of potentially confidential information. Headwaters Economics uses supplemental data from the U.S. Department of Commerce to estimate these data gaps. These are indicated with tildes (~) in tables. Documentation explaining methods developed by Headwaters Economics for estimating disclosure gaps is available at <https://headwaterseconomics.org/eps>.

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County Region

Endnotes

- 1 - For an online listing of all NAICS codes, see <https://www.naics.com/search/>. For additional online manuals and definitions of industry codes, see <https://www.bls.gov/bls/naics.htm> and <https://www.census.gov/eos/www/naics/>.

- 2 - Details on mining industry codes and definitions (NAICS codes in parentheses):

Oil and Gas Extraction:

Oil and Gas Extraction (2111)

Support Activities: Drilling Oil and Gas Wells (213111; includes directional drilling, re-drilling, spudding, tailing, water intake wells), and Support for Oil and Gas Operations (213112; includes exploration, chemical treatment, cleaning, pumping, swabbing, surveying)

Coal Mining:

Coal Mining (2121)

Support Activities for Coal Mining (213113; includes drilling, blasting, shaft sinking, tunneling, exploration)

Metals Mining:

Metal Ore Mining (2122; includes gold, silver, zinc and others)

Support Activities for Metal Mining (213114; includes blasting services, exploration, tunneling, pumping)

Nonmetallic Minerals Mining:

Nonmetallic Minerals and Quarrying (2123; includes stone, volcanic rock, granite, cement, gravel and others)

Support Activities for Nonmetallic Minerals and Quarrying (213115; includes blasting services, test drilling, mine shaft development).

Mining Related:

Pipeline Transportation (486; Industries in the Pipeline Transportation subsector use transmission pipelines to transport products, such as crude oil, natural gas, refined petroleum products, and slurry)

Oil and Gas Pipeline and Related Structures Construction (237120)

- 3 - Documentation explaining methods developed by Headwaters Economics for estimating disclosure gaps is available at <https://headwaterseconomics.org/eps>.
- 4 - For detailed information on oil, gas, and coal, see the U.S. Energy Information Administration at <https://www.eia.gov/>. The Bureau of Labor Statistics provides an overview of the mining industry at <https://www.bls.gov/iag/tgs/iag21.htm>.
- 5 - Headwaters Economics has completed a number of studies on fossil fuel development and its impact on the U.S. West: <https://headwaterseconomics.org/topic/energy/>.
- 6 - The Bureau of Labor Statistics provides an overview of the mining industry at <https://www.bls.gov/iag/tgs/iag21.htm>.

Endnotes (cont.)

- 7 - For a review of literature on economic diversity, see Sterling A. 1998. On the Economics and Analysis of Diversity. Electronic Working Papers Series, Paper No, 28. Brighton, UK: University of Sussex <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.144.8865&rep=rep1&type=pdf>; and Malizia EE and Shanzai K. 2006. The Influence of Economic Diversity on Unemployment and Stability. Journal of Regional Science 33(2):221-235.
- 8 - Headwaters Economics has completed a number of studies on fossil fuel development and its impact on the U.S. West: <https://headwaterseconomics.org/topic/energy/>. Headwaters Economics' report "Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy Focusing Counties Benefiting?" looks specifically at the economic performance of energy focused economies in the U.S. West. See <https://headwaterseconomics.org/energy/oil-gas/fossil-fuel-extraction/>.
- 9 - Humphreys M, JD Sachs, and JE Stiglitz, eds. Escaping the Resource Curse. 2007. New York: Columbia University Press.
- 10 - Haggerty J, PH Gude, M Delorey, and R Rasker. 2014. Long-term effects of income specialization in oil and gas extraction: The U.S. West, 1980-2011. Energy Economics 45: 186-195.
- 11 - Haggerty J, MN Haggerty, K Roemer, and J Rose. 2018. Planning for the local impacts of coal facility closure: Emerging strategies in the U.S. West. Resource Policy 57: 69-80.
- 12 - Nonemployer definitions can be found at <https://www.census.gov/epcd/nonemployer/view/define.html>.
- 13 - Nonemployer Statistics data can be found at <https://www.census.gov/programs-surveys/nonemployer-statistics.html>.
- 14 - Mining is the sum of the following NAICS codes shown on this page: Oil and Gas Extraction (211), Mining [except Oil and Gas] (212), and Support Activities for Mining (213).
- 15 - The EPS Socioeconomic Measures report provides more information on wages in non-mining industries: <https://headwaterseconomics.org/eps>.
- 16 - For an overview of how the Bureau of Labor Statistics treats pay and benefits, see <https://www.bls.gov/bls/blswage.htm>.
- 17 - For an overview of how the Bureau of Labor Statistics treats employment, see <https://www.bls.gov/bls/employment.htm>.
- 18 - Employment and wage estimates are also available from the Bureau of Labor Statistics for more than 800 occupations. Looking at timber by occupation rather than by sector or industry is helpful because wages can vary dramatically across occupations. For more information, see <https://www.bls.gov/oes/>.

Endnotes (cont.)

- 19 - If there are significant undisclosed data on this page, other sources for timber wage data include: The Bureau of Labor Statistics' Quarterly Census of Employment and Wages, which has data for industries at the state level (<https://www.bls.gov/cew/>); the Bureau of Labor Statistics' Occupational Outlook Handbook, which has detailed industry earnings and wages data at the national level (<https://www.bls.gov/ooh/>); and the County Business Patterns database, which reports industry-level employment and payroll and can be used to estimate earnings (<https://www.census.gov/programs-surveys/cbp.html>).
- 20 - The term "benchmark" in this report should not be construed as having the same meaning as in the National Forest Management Act (NFMA).
- 21 - $LQ = (e_i/e)$ divided by (E_i/E)
Where: e_i = Local employment in industry i ; e = Total local employment; E_i = U.S. employment in industry i ; E = Total U.S. employment.
- 22 - A succinct definition of a location quotient is offered by Indiana Business Research Center at IU's Kelley School of Business. See <http://www.incontext.indiana.edu/2006/march/1.asp>.