Energy and the Montana Economy

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Key Trends and Patterns in Growth and Change

Recent and Future Job Growth Patterns

Income and Employment Trends among Energy-related Sectors

Energy Production/Energy Consumption

Montana's Energy Future
Helena, January, 2011

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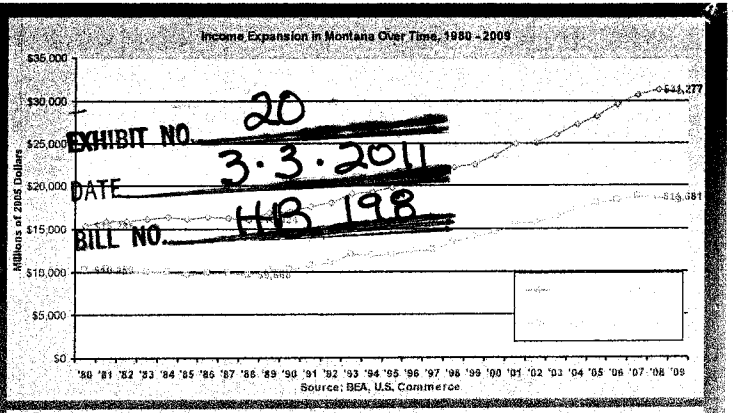
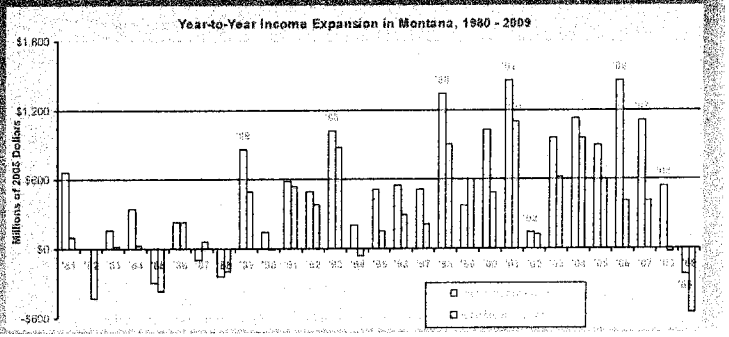
Growth in the Montana Economy – Last Three Decades

More than anything else, a state or region's economy and its growth is measured in terms of income and the single largest source of income is what people and households receive in the form of labor income.

The upper chart shows total personal income and labor income levels in Montana annually since 1980, measured in inflation-adjusted dollars. The lower chart shows year-to-year changes in these income levels.

Income growth was stagnant in the '80s, but a period of fairly strong growth occurred through the '90s and up through 2006. Growth began to stagnate in 2007 and went negative in 2009.

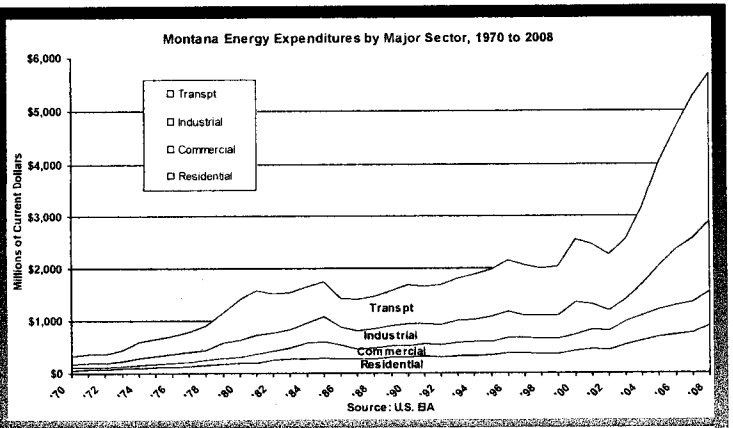


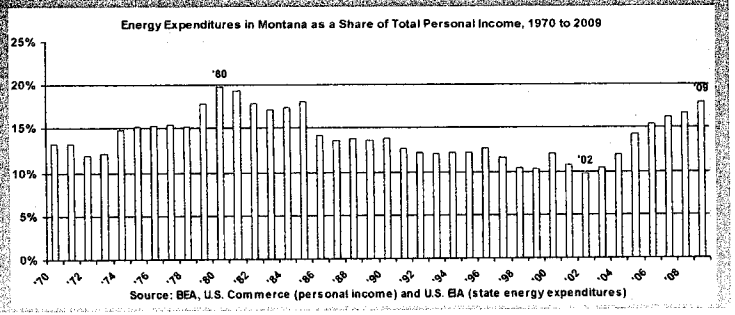


Total Expenditures for Annual Energy Consumption in Montana, 1970 to 2008

The upper chart shows the amount spent each year by various categories of energy users in Montana. In 2008 state-wide expenditure for energy totaled about $5.7 billion dollars. This is equivalent to 16.7% of all personal income received in the state that year.

The lower chart shows how annual energy expenditures in Montana have compared with total personal income levels over time. This ratio was highest in 1980 during the last major "energy crisis" in the U.S. when it reached almost 20%. In 2008 this ratio rose to about 16%. While levels of energy consumption are generally tied to expenditures, energy prices driven by industrial decisions also affect this ratio.



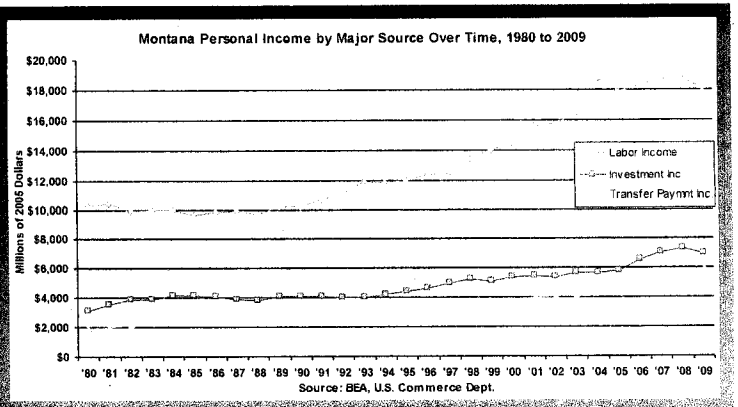


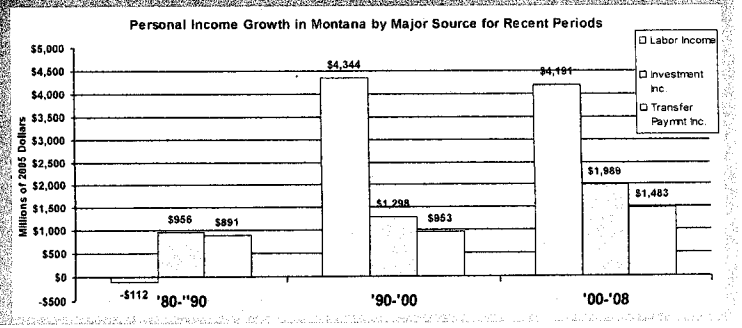
Montana Personal Income Growth by Major Source since 1980

Personal income comes from three main sources – the largest is income from employment or labor earnings. The other two sources are income from investments (received as rent or dividends, etc.) and income from transfer payments (primarily Social Security and Medicare/Medicaid).

The lower chart shows growth in income from these three main sources for recent periods – the 1980s, the 1990s, and for the period from 2000 to 2008.

Labor earnings growth has slowed more recently largely because of the nationwide recession, while investment income and transfer payments are increasing.



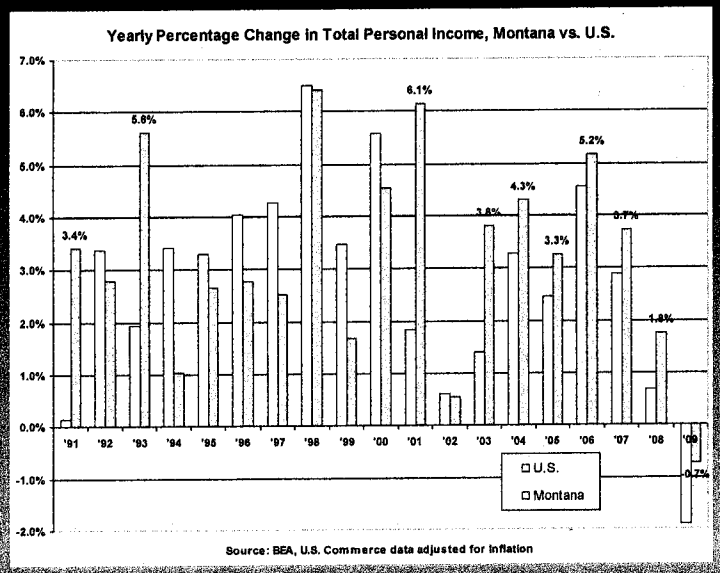


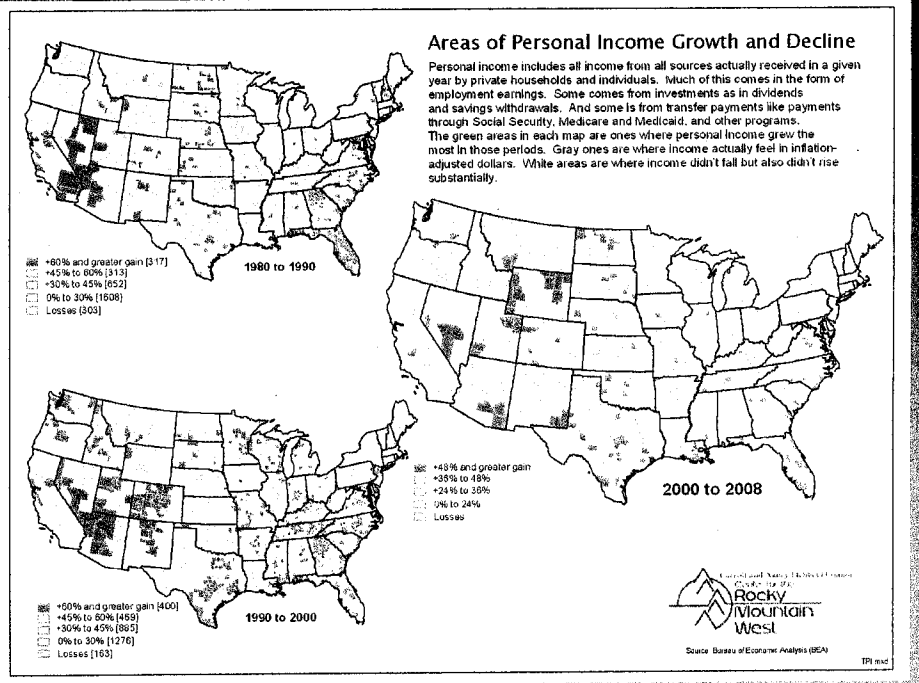
Income Growth in Montana vs. Nation-wide

The chart shows total personal income growth each year in Montana, measured in percentage change, in relation to yearly growth in personal income for the nation as a whole.

Income growth is adjusted for inflation and has been positive in both Montana and the nation as a whole every year since 1990 except 2009, when the recession deepened after initially slowing growth in 2007 and 2008.

Montana's growth exceeded nationwide growth in each of the last seven years, while trailing national growth in all but two or three years in the '90s.



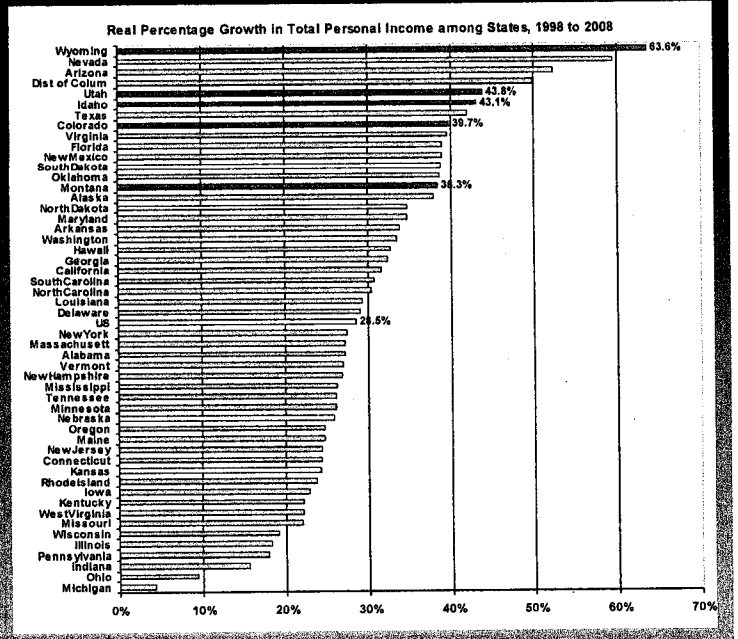


Personal Income Growth among U.S. States between 1998 and 2008

The chart shows income growth, adjusted for inflation, among all U.S. states over the ten-year period from 1998 to 2008. Income growth nationally over this period was 28.5%. Income growth in Montana during this period was 38.3%, ranking the state 14th overall in income growth for this period.

States are arrayed in the chart by growth from highest to lowest, with the five states in the Rocky Mountain West, including Montana, shown in purple.

Wyoming led the nation in growth at 63.6% and the three other Rocky Mountain West states all ranked 8th or higher.



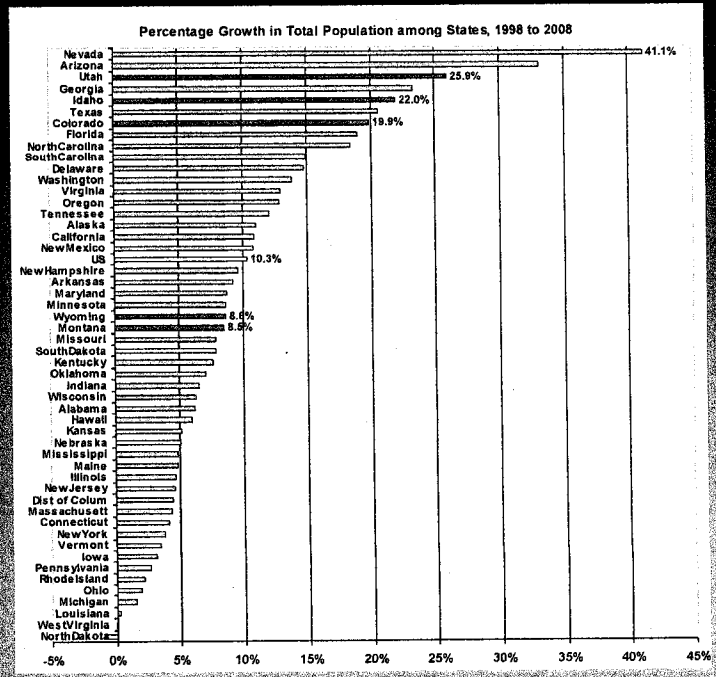
Income growth in the Rocky Mountain West five-state region was as fast as growth among any other region of the country. Nearby Plains states are shown in "yellow". Pacific Northwest states are shown in "green".

Population Growth among U.S. States between 1998 and 2008

This chart compares population growth among U.S. state during the ten-year period from 1998 to 2008. The nation as a whole grew by 10.3% during this period. Population growth in Montana was less than this at 8.5%.

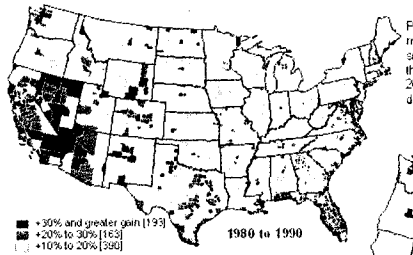
Growth in Wyoming was 8.6%. The other three Rocky Mountain West states all had much higher growth and all ranked in the top seven states for population growth, led by Utah with 25.9% growth.

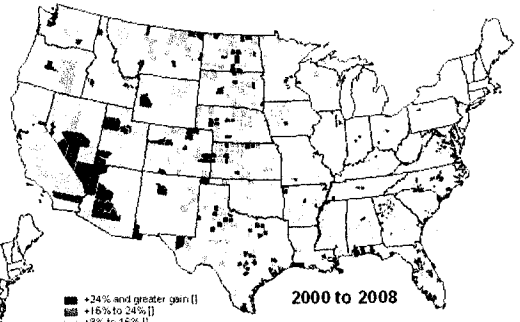
Growth among Plains states is shown in "yellow" and growth for Pacific Northwest states is shown in "green".

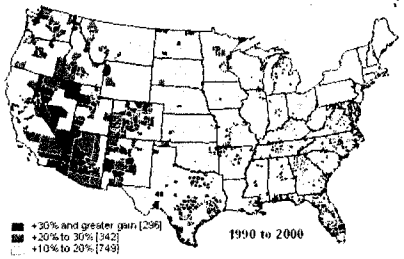


Areas of Rapid Growth or Decline

Patterns of population growth tend to shift from place to place over time. The maps show where growth or decline were focused during the '80s, '90s, and since 2000. In the '90s, population growth accelerated significantly throughout the western U.S., and spread into many areas with smaller cities. However, since 2000, population growth is becoming more focused in fewer places and population decline has begun to re-accelerate in portions of the central and northern Plains.







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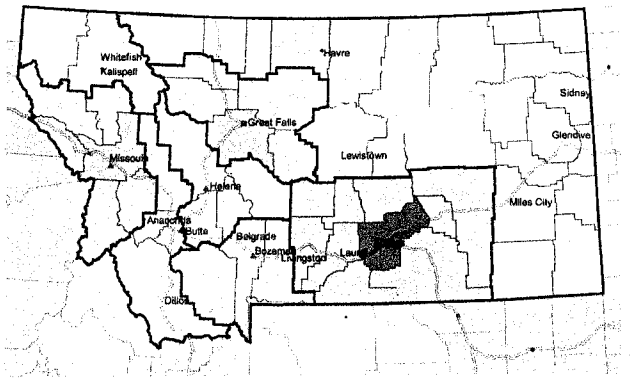
Source: Bureau of Census U.S. Dept. of Commerce

Montana Urban-to-Rural Regional Population Centers, Closely-linked Surrounding Counties, and Isolated Rural Areas

The map at the right shows how Montana counties are classified under the READ urban-to-rural classification system. This system identifies and classifies regional population center counties by size, color-coded from very large centers to small regional centers with county-wide populations of only 30,000 to 60,000 (dark yellow). Montana has no truly large population centers, but has seven small and large regional centers including Billings (Yellowstone county), Missoula (Missoula county), Great Falls (Cascade), Helena (Lewis & Clark), Bozeman (Gallatin), Butte (Silver Bow), and Kalispell-Whitefish (Flathead).

There are 27 counties shown in light yellow, light green, and light blue that are nearby and "closely-linked" to the seven regional population center counties. The 22 remaining counties are smaller in population with no major cities and are classified as "isolated rural" counties (shown in gray). Most of Montana's population resides in the state's seven regional center counties and nearby counties, that are closely-linked to these regional centers.



Read Multi-County Core-Based Regions

- 3rd "Tier" Metro Cores of 100,000 to 160,000 ...adjacent and closely linked counties
- Large Regional Trade Centers, 60,000 to 100,000 ...adjacent and closely linked counties
- Small Regional Trade Centers, 30,000 to 60,000 - ...adjacent and closely linked counties
- Isolated Rural Centers (counties under 35,000 with places of 10,000 to 20,000 pop.)
- Small Isolated Rural Counties (under 35,000 with no place of 10,000 pop).

The University of Montana, 2006 Regional Economies Assessment Database (READ)

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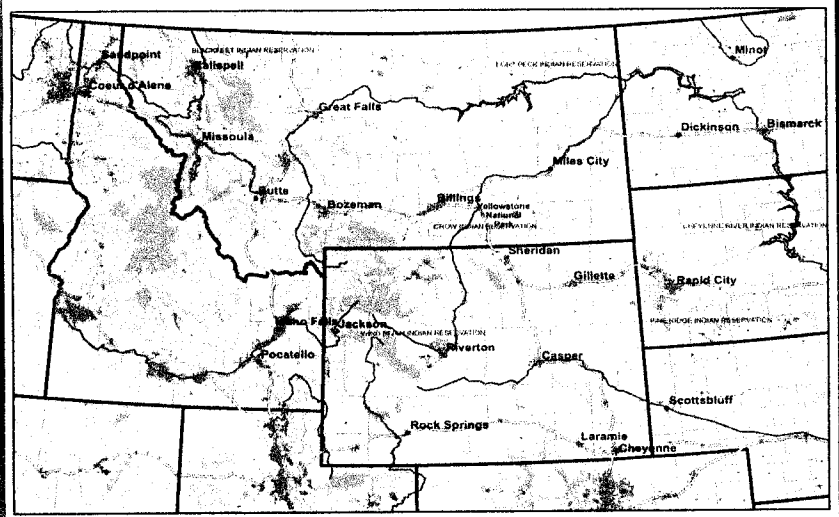
Features of the Larger Region



= 30 people

- National Park (NPS)
- National Forest Service (NFS)
- Forest Service Wilderness (FSW)
- Department of Energy (DOE)
- Department of Defense (DOD)
- Fish and Wildlife Service (FWS)
- Bureau of Land Management (BLM)
- Bureau of Indian Affairs (BIA)

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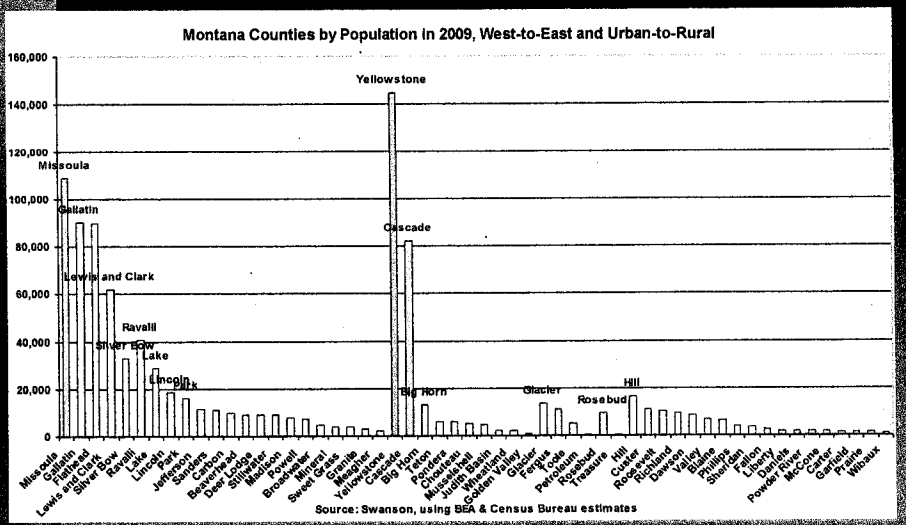
Montana Counties by Population in 2009, West-to-East and Urban-to-Rural

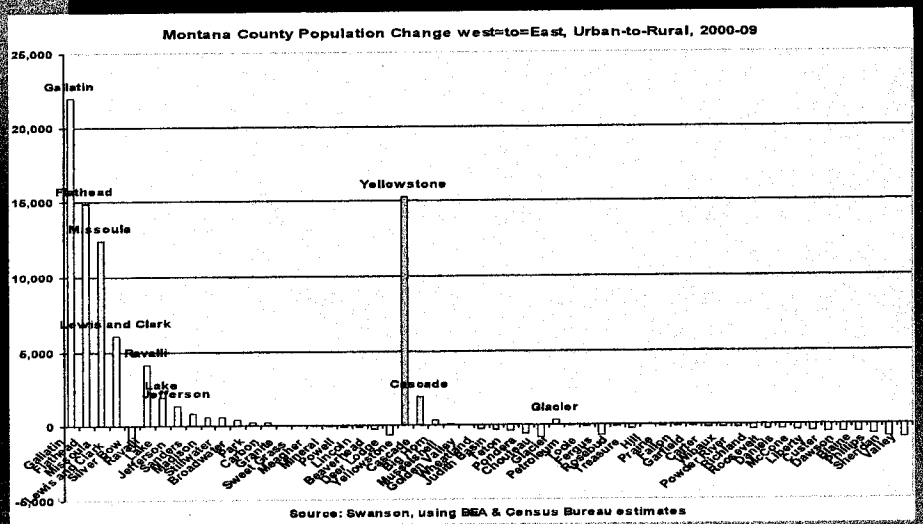


Source: Swanson, using BEA & Census Bureau estimates

Montana Population by County, West-to-East and Urban-to-Rural

The single most populated county is Yellowstone, shown in blue near the center where "central front" counties are arrayed, with a total population of nearly 146,000. The 2nd most populated county is Missoula with nearly 109,000, shown at the left along with other "western mountain" region counties. Counties are color coded to reflect their urban-rural classifications. Counties in dark blue, green, and yellow are "regional center" counties.

Montana Population Change by County between 2000 and 2009

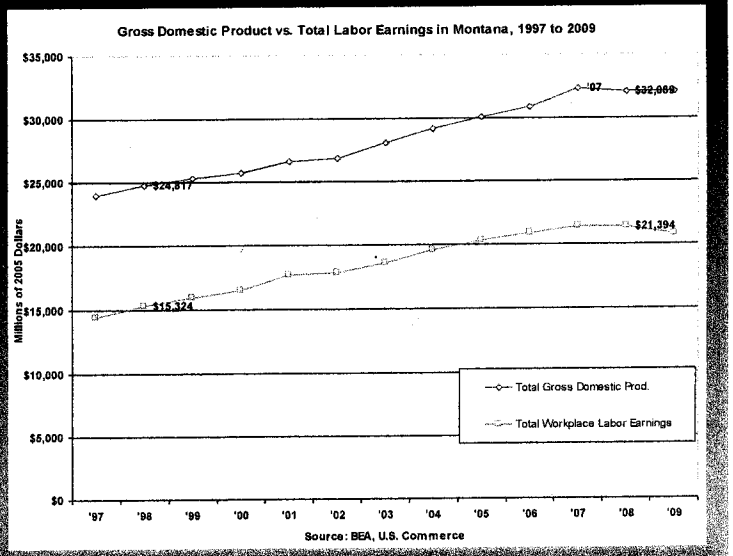


Nearly all of Montana's population growth is focused in or nearby one of its seven major regional population centers. Five of these centers saw significant population growth over the period, led by Bozeman and Gallatin County, Billings and Yellowstone County, Kalispell and Flathead County, and Missoula and Missoula County. Helena and Lewis and Clark County also grew. Great Falls and Cascade County experienced only moderate growth, while Butte-Silver Bow saw continued decline. All counties in the east lost population.

The Value of All Economic Production in Montana Over Time

Gross State Product is the total value of all production of goods and services in a state, that is attributable to "factors of production" (labor, land, capital) residing within a state. This excludes the value of goods and services produced in a state attributable to factors of production purchased from outside sources.

The chart shows the value of gross product in Montana since 1997 in relation to total workplace labor earnings during this period. Labor earnings by residents of the state who work are the largest source of gross product. These rose from $15.3 billion in 1998 to nearly $21.4 billion in 2008, in 2005 inflation-adjusted dollars.



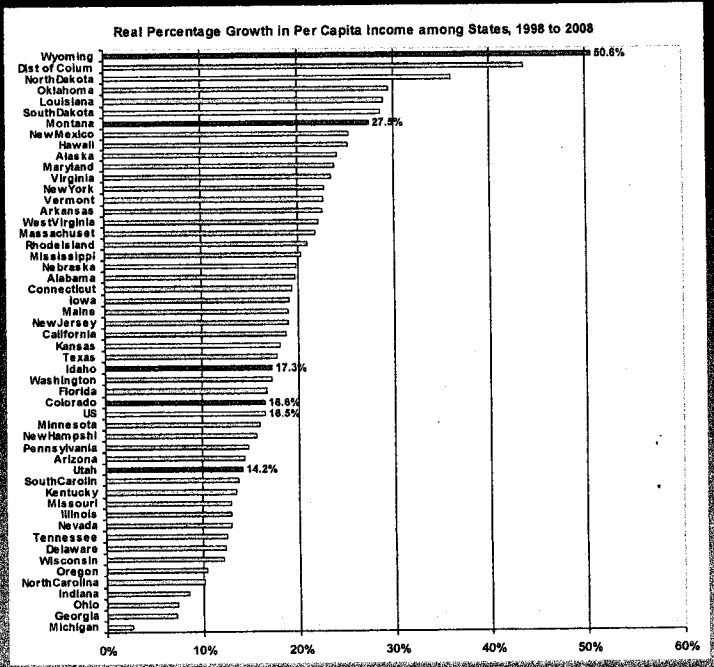
The value of all goods and services produced in Montana by Montana-based factors, including labor, rose from $24.8 billion in 1998 to over $32 billion in 2008. Growth in the economy slowed after 2007 (the nationwide recession formally began in December of 2007).

Economic value comes from a variety of industries and sectors of the state's economy, some much larger and more important than others.

Per Capita Income Growth by U.S. States between 1998 and 2008

Per capita income is determined by simply dividing total personal income for an area by that area's total population. This chart compares percentage per capita income growth for U.S. states during this recent ten-year period.

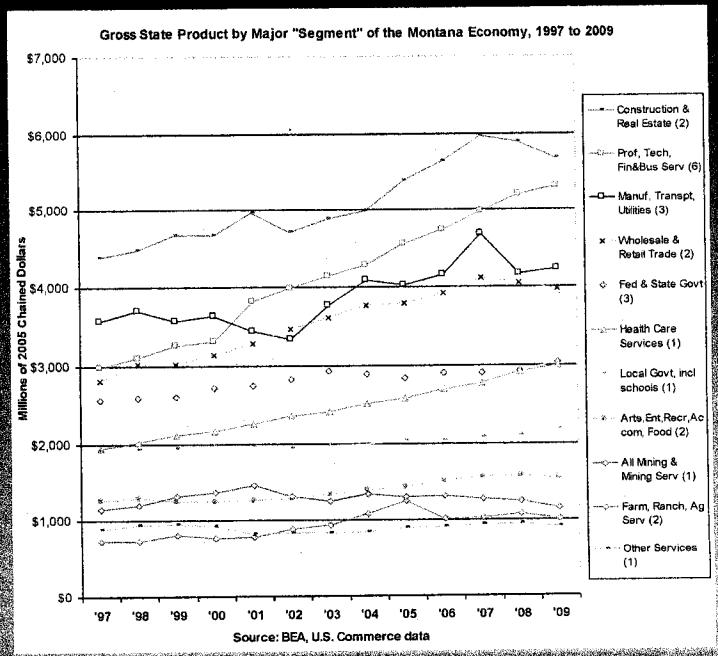
Per capita income grew nationwide by 16.5% during this period, adjusted for inflation. In Montana per capita income grew at a faster pace, increasing by 27.5%, ranking the state 7th among states (or 6th if the District of Columbia is not included). Wyoming led the nation in per capita income growth at 50.6%. Nearby North Dakota and South Dakota also had relative fast income growth.



Gross State Product by Major Segment of the Economy in Montana since 1997

This chart shows levels of gross state product by major segment of the economy for each year between 1997 and 2009. Segments of the economy are organized in the chart from largest to smallest, as measured by the value of their production.

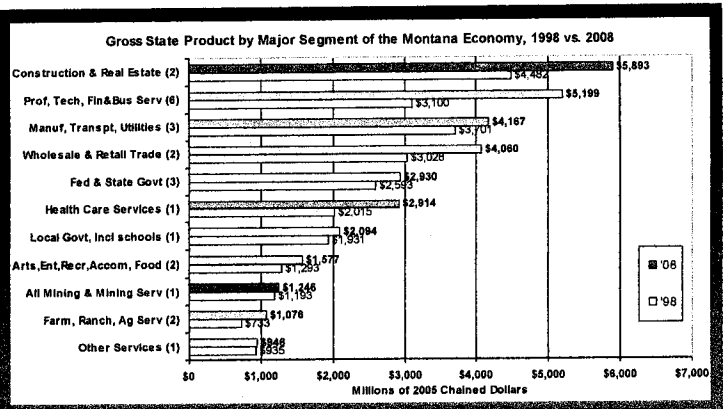
"Construction and real estate" is the largest segment of economy, measured in this way, followed by "professional, technical, financial, and business services." The latter includes 6 different "sectors" of the economy, which are discussed later. "Manufacturing, transportation, and utilities" are the 3rd largest segment, followed by "wholesale and retail trade."

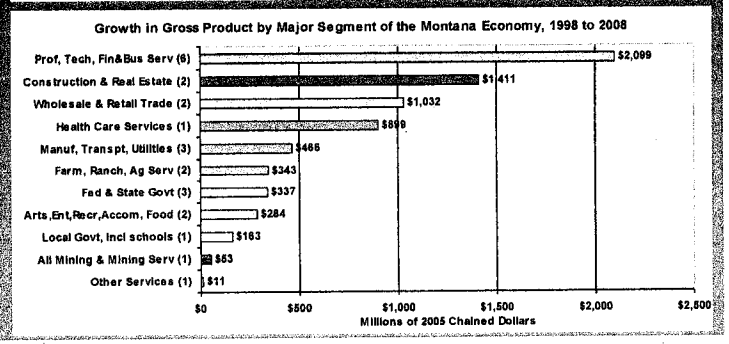


Gross State Product in Montana by Major Segment of the Economy

The upper chart shows gross state product in Montana in 1998 and 2008 by major segment of the economy. There are eleven of these segments in all and the largest in 2008 was "construction and real estate" at $5.9 billion, shown in red. "Professional, technical, financial, and business services" shown in "teal" was 2nd largest at $5.2 billion.

"Manufacturing, transportation, and utilities" are the state's 3rd largest economic segment, followed by "wholesale and retail trade," with both of these at over $4 billion in gross product. The lower chart shows growth in gross product by segment between 1998 and 2008.



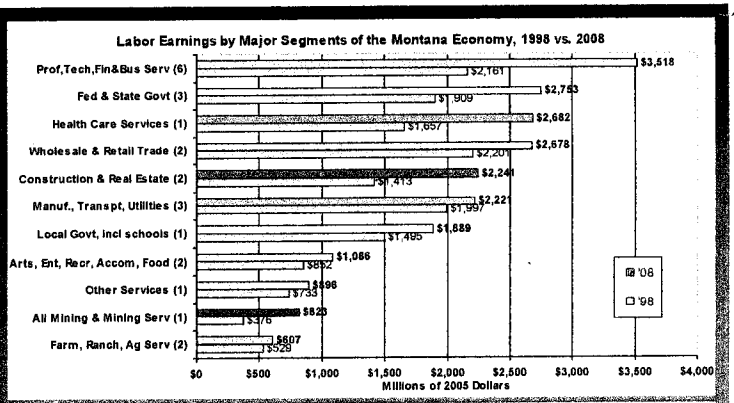


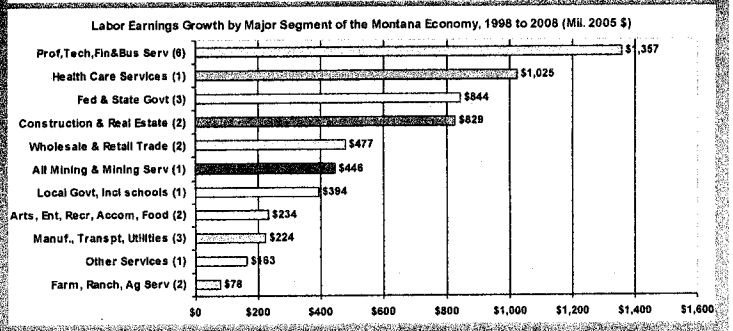
Labor Earnings in Montana by Major Segment of the Economy

The upper chart shows annual labor earnings in Montana in 1998 and 2008 by major segment of the economy. There are eleven of these segments and they are arrayed in the chart from largest to smallest, as measured in labor earnings generated.

Labor earnings in the largest of these segments – professional, technical, financial and business services – totaled over $3.5 billion in 2008, up from $2.16 billion in 1998.

The lower chart shows where growth in labor earnings over the period from 1998 to 2008 occurred. The biggest increase was in professional services and health care, followed by federal and state government and construction and real estate.

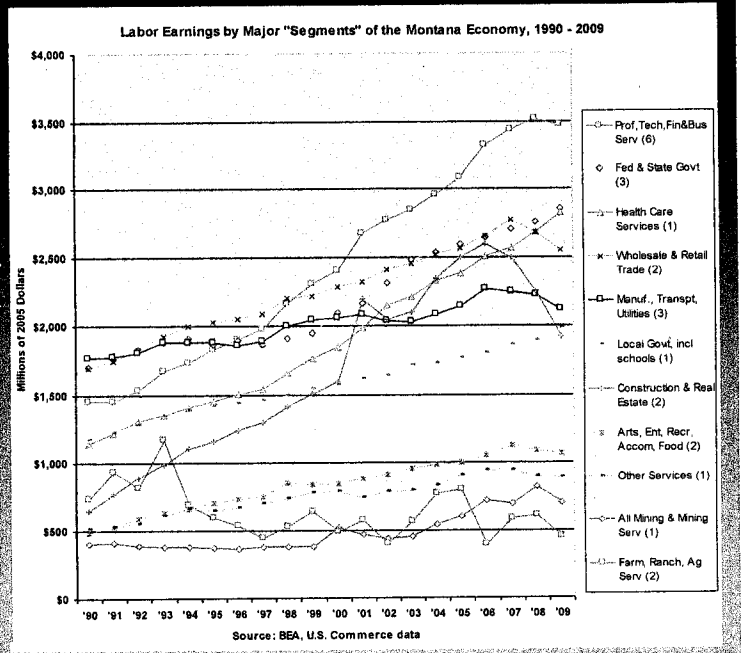




Labor Earnings by Major Segments of the Montana Economy, 1990 to 2009

This chart shows labor earnings received by persons in Montana who are employed and working within these major segments of the economy. There are eleven major segments and the largest among these in terms of labor earnings generated is "professional, technical, financial and business services." Included in this are accounting, engineering, and law firms, stock brokers and banks, and a wide array of other businesses doing administrative and managerial services.

Labor earnings received by those who work for federal and state government are the largest, followed by those who work in health care services.

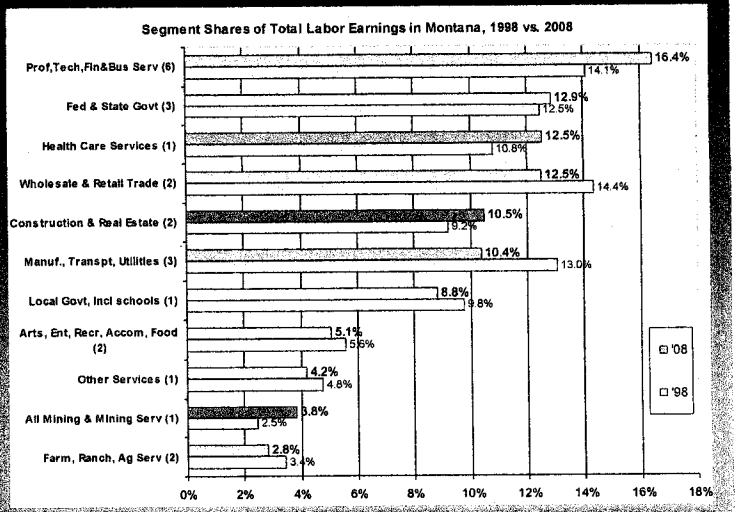


real estate, finance, construction, and healthcare industries reflects the community housing, construction, and sales

Changing Shares of the Montana Economy as measured by Labor Earnings, 1998 vs. 2008

This chart shows how much of the state's total labor earnings are accounted for by the various major segments of the economy. "Professional, technical, financial and business services" is the largest, accounting for 16.4% of all labor earnings in 2008, up from 14.1% in 1998. "Federal and state government" is 2nd largest at 12.9%, followed by "health care services" and "wholesale and retail trade" each at 12.5%.

The segment with the smallest labor earnings is "farm, ranch and agricultural services," and this segment's share of the overall economy is shrinking.



The share of the total economy represented by "local government," which includes local public education, stood at 9.8% in 2008, down from 10.8% in 1998. The share of the economy represented by manufacturing, transportation, and utilities fell from 13% to 10.4% of all labor earnings. Labor earnings in wholesale and retail trade remained at 14.4% of all labor earnings in 2008.

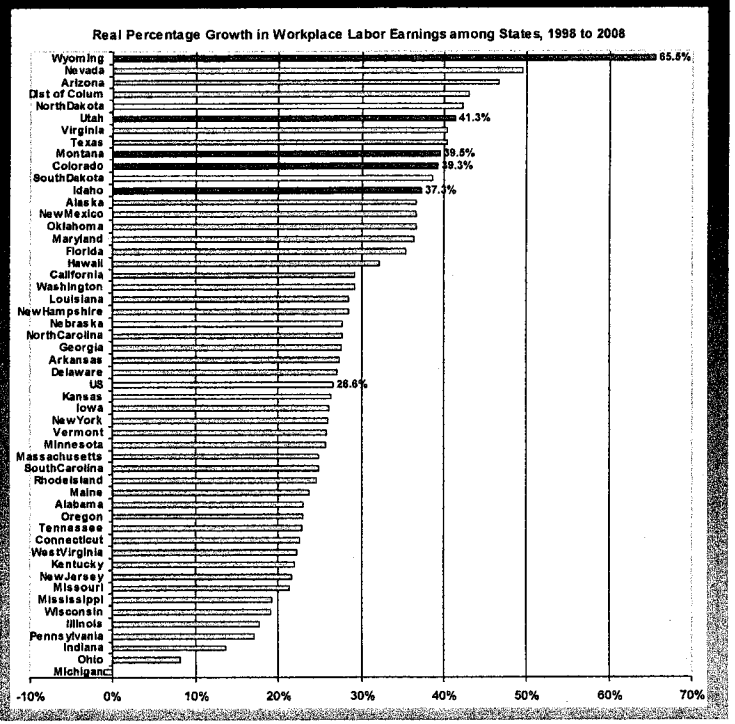
These shifts in shares reflect underlying structural changes that are occurring in the Montana economy.

Percentage Growth in Total Labor Earnings among U.S. States, 1998 to 2008

The chart compares the pace of growth in total labor earnings among all U.S. states over the recent ten-year period from 1998 to 2008.

Nationwide labor earnings grew by 26.6% over the period, as measured in inflation-adjusted dollars. In Montana labor earnings grew by 39.5%, ranking the state 9th among all states or 8th if the District of Columbia is not included.

The economies of all of the Rocky Mountain West states, shown in purple, have been relatively fast-growing over this period and all five states are ranked among the top 12 in terms of growth.

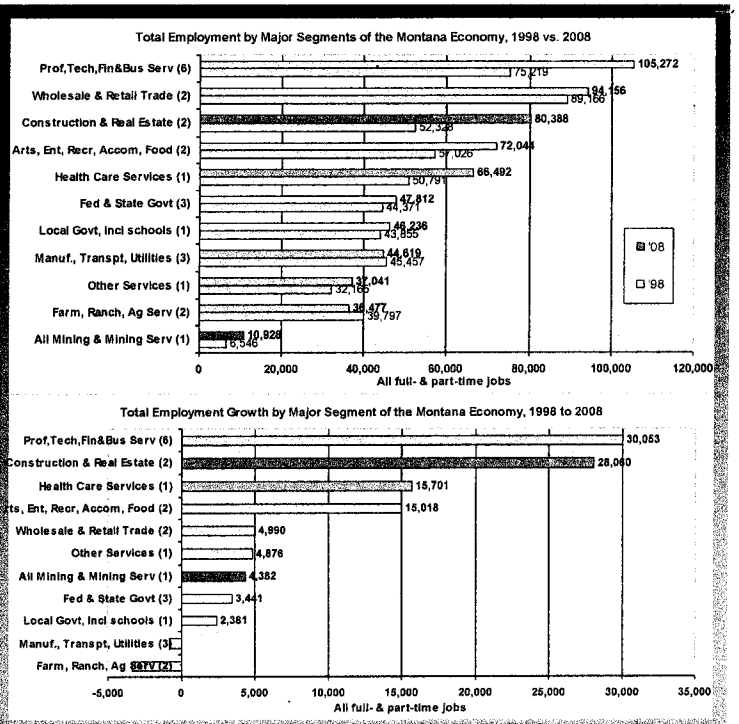


Total Employment Growth by Major Segments of the Economy in Montana

These two charts show levels of employment by each segment in 1998 and 2008. The bottom chart then focuses on growth in employment only during this period by each segment.

"Professional, technical, financial and business services" is not only the largest employer among segments, but it is the fastest growing, adding over 30,000 new jobs during the ten-year period.

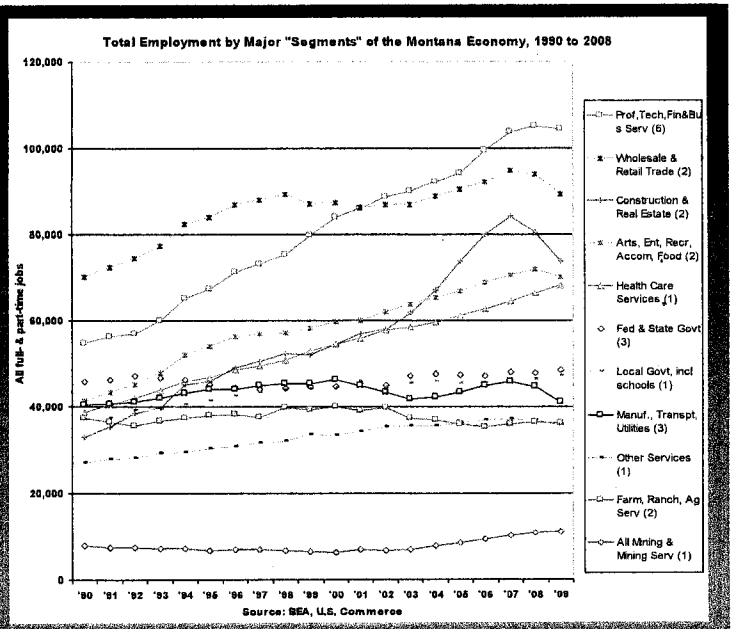
Construction and real estate is the 2nd fastest growing, adding over 28,000 jobs. These two largest segments accounted for over 55% of all job growth in Montana during this recent ten-year period.



Total Employment by Major Segments of the Montana Economy, 1990 to 2009

This chart shows how total employment or all full- and part-time jobs for each major segment of the economy over time. Here rather than measuring economic activity in terms of income levels and growth, we are examining employment levels and growth.

There are eleven major segments and the one with the highest employment currently is "professional, technical, financial and business services." It employs over 100,000 workers. Second to it is "wholesale and retail trade," which employs around 90,000. The next largest is "construction and real estate," which employs over 70,000 – down a bit from two years ago.

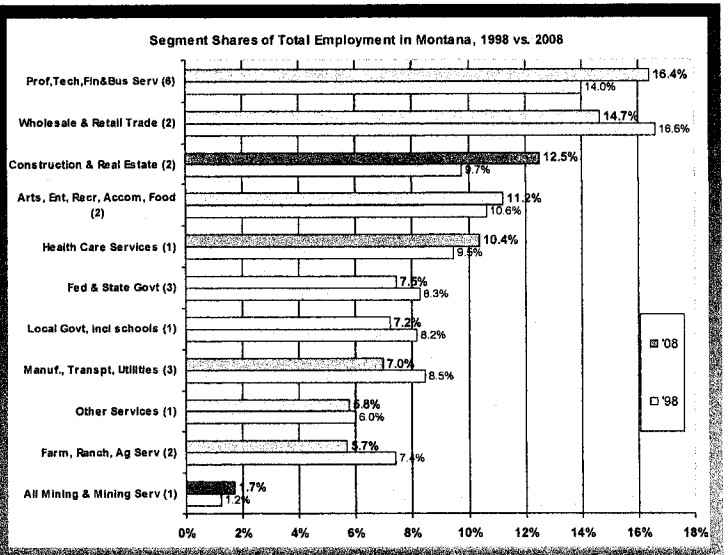


The 4th and 5th largest employing segments of Montana's economy are "arts, entertainment, and recreation services and accommodations and food services" and "health care services," both employing nearly 70,000. The six other remaining segments each employ less than 50,000. The smallest employer is "mining and mining services."

Changing Shares of the Montana Economy as measured by Total Employment, 1998 vs. 2008

This chart shows how much of the state's total employment is accounted for by each of the major segments of the economy, now and ten years ago. "Professional, technical, financial, and business services" is the largest, accounting for 16.4% of all employment, up from 14% ten years ago. "Wholesale and retail trade" is 2nd with 14.7%, down from 16.6%.

"Construction and real estate" is 3rd with 12.5%, up from 9.7%. "Arts, entertainment, recreation, accommodations, and food services" has grown to 11.2%. "Health care services" also has grown to 10.4%. Most of the remaining segments shares have shrank.



Of the eleven major segments of the economy, the smallest one in terms of total employment is "all mining and mining services." It accounts for about 1.7% of total employment, up slightly from 1.2% ten years previously.

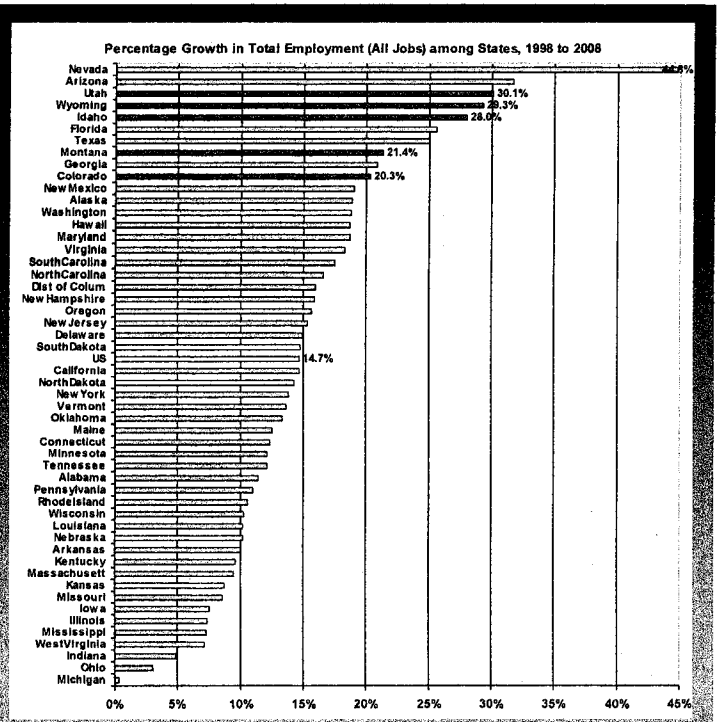
Employment in farming, ranching and agricultural services has shrunk from 7.4% of the total to 5.7%. Employment in "manufacturing, transportation, and utilities" has shrunk from 8.5% to 7.2%. The shares of total employment by both local government and federal and state government also have decreased, reflecting slower growth in these areas of employment than many other areas.

Employment Growth among U.S. States, 1998 to 2008

This chart compares the relative rate of growth in employment among all states during this recent ten-year period.

Nationally, total employment grew by 14.7% between 1998 and 2008, keeping in mind that the national economic recession officially began in December, 2007.

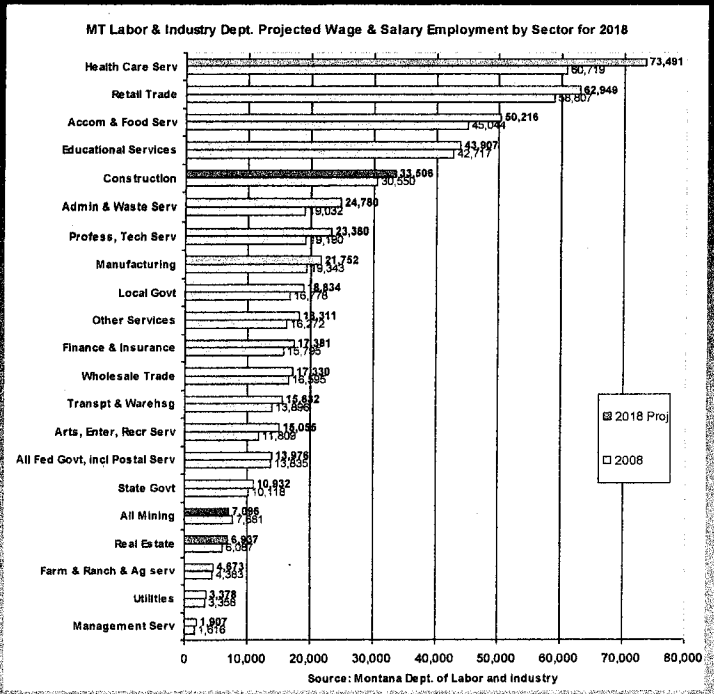
Employment grew by 21.4% in Montana during this period, ranking it 8th among all states in employment growth. Employment growth among all five of the Rocky Mountain West states was fairly strong during this period. In fact all five states ranked among the top ten in employment growth.



Current & Projected Levels of Wage and Salary Employment in Montana by Major Sector, 2008 vs. 2018

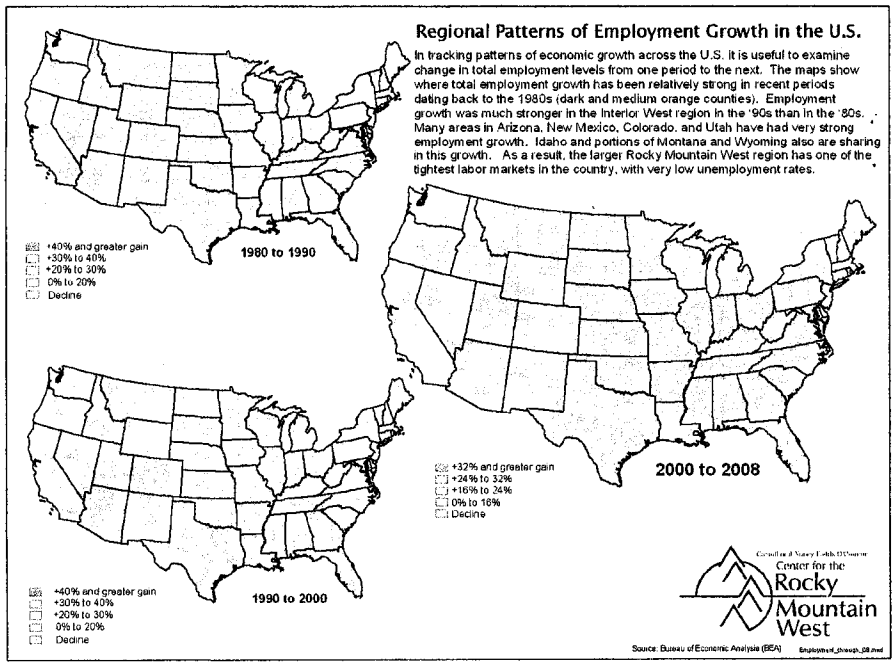
The Montana Department of Labor and Industry recently made projections of what may be expected in terms of employment levels in the future. Their projections considered only "wage and salary jobs" and excluded self-employment or proprietor jobs. Wage and salary jobs account for about 73% of all jobs in Montana.

The chart shows estimates by the Department for 2008 and projected levels for 2018. Health care services are projected to remain the largest employer among sectors, followed by retail trade.



Regional Patterns of Employment Growth in the U.S.

In tracking patterns of economic growth across the U.S. it is useful to examine change in total employment levels from one period to the next. The maps show where total employment growth has been relatively strong in recent periods dating back to the 1980s (dark and medium orange counties). Employment growth was much stronger in the interior West region in the '90s than in the '80s. Many areas in Arizona, New Mexico, Colorado, and Utah have had very strong employment growth. Idaho and portions of Montana and Wyoming also are sharing in this growth. As a result, the larger Rocky Mountain West region has one of the tightest labor markets in the country, with very low unemployment rates.

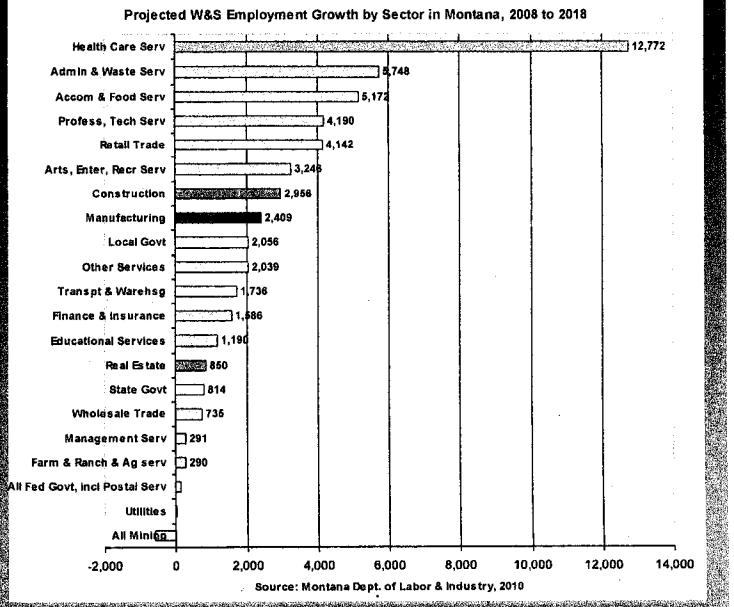


Projected Growth in Wage & Salary Employment in Montana, 2008 to 2018

This chart isolates projected growth in employment for this ten-year period, as done by analysts with the Montana Department of Labor and industry.

Wage and salary employment is projected to grow by 12,772 jobs in "health care services" during this period, accounting for nearly 25% of all job growth for the period in Montana.

The next four largest areas of projected job growth are "administrative and waste services," "accommodations and food services," "professional and technical services," and "retail trade," all with growth of more than 4,000 jobs.



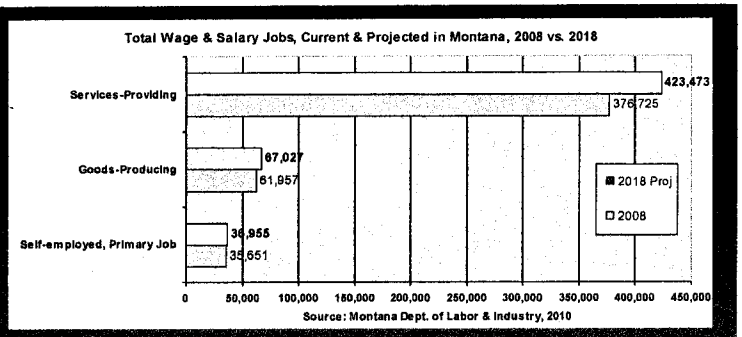
Jobs are projected to decline in mining, which includes all oil and gas, coal, and other mineral mining, as well as mining services.

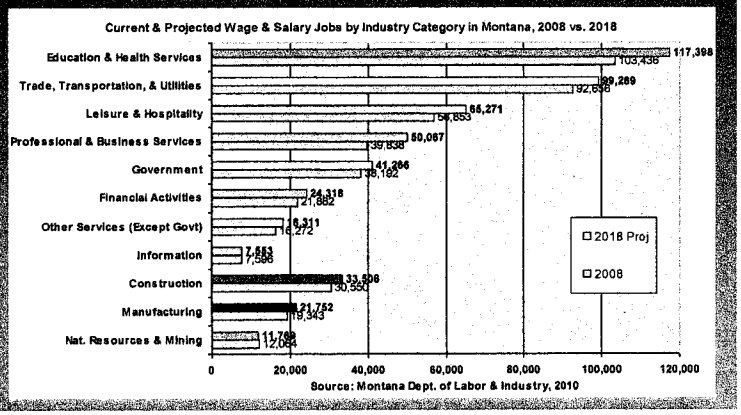
Projected Wage and Salary Job Change for Major Categories of the Montana Economy

This job growth as projected by the Montana Department of Labor and Industry also is organized by major categories including "services-providing sectors," "goods-producing sectors" and other "self-employment primary jobs."

Jobs in service areas will increase from 376,725 to 423,473 – an increase of 46,748 jobs. Jobs in goods-producing areas (which includes construction, manufacturing, and natural resources and mining) are projected to grow by over 5,000 jobs.

The lower chart shows greater detail in these categories, with goods-producing areas at the bottom.

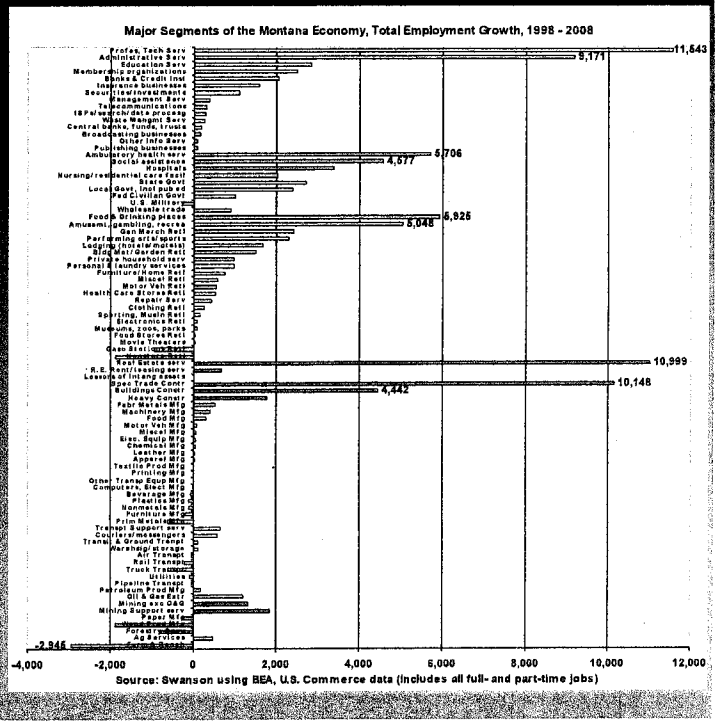




Total Employment Growth at the Sub-sector Level in Montana for Major Groupings, 1998 to 2008

This chart focuses solely on growth in total employment over the ten years from 1998 to 2008, for each sub-sector across major groupings.

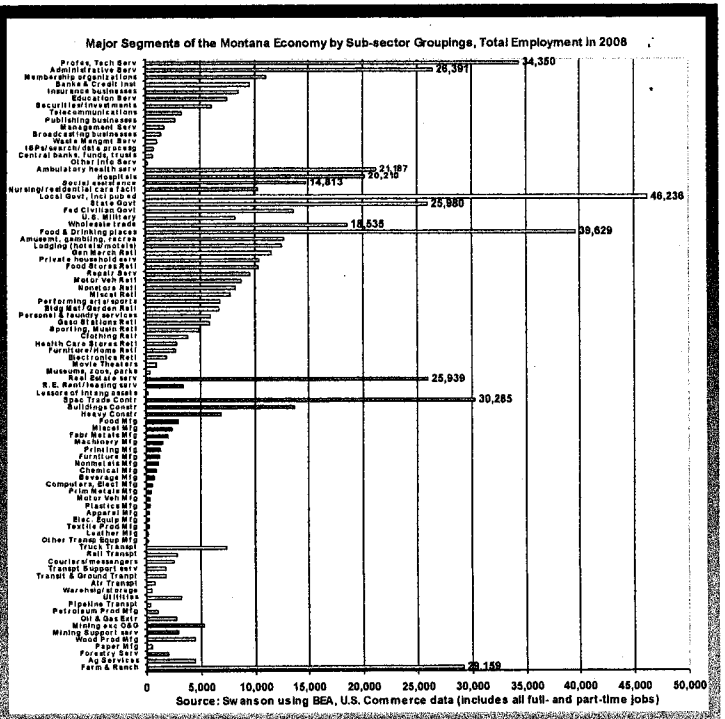
At the sub-sector level the one adding the most jobs over this period is "professional and technical services" (accountants, engineers, lawyers, computer techs, and support staff), which added 11,543 jobs. Next is "real estate services," up by 10,999; followed by "special trade contractors" at 10,148; and by "administrative services" up by 9,171. These four fastest growing sub-sectors by themselves accounted for 40% of all new jobs in Montana in the period.



Sub-sectors of the Montana Economy by Groupings

We can drill down further in examining the size and shape of the economy by looking at "sub-sectors". There are over 70 separate sub-sectors of the economy and these are grouped in the chart and arrayed by level of employment for each in 2008.

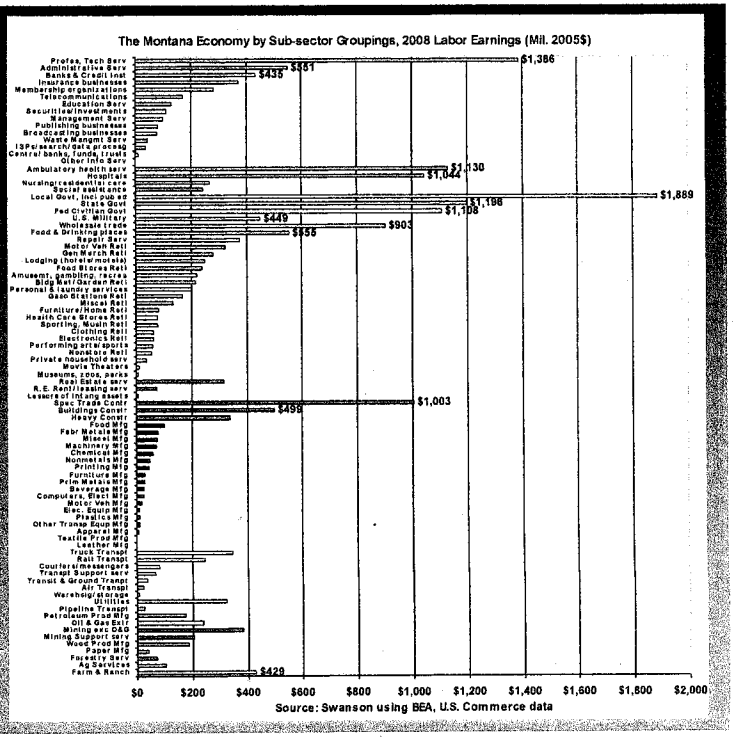
At the top of the chart are various sub-sectors that make up the large and growing "professional, technical, financial, and business services" segment (shown in teal blue). Next are the sub-sectors of health care (shown in blue). Next is government (shown in yellow), followed by all of the various sub-sectors of goods and services trade. Real estate and construction sub-sectors are shown in red, manufacturing in black, ag at the very bottom is in green, mining in brown.



Labor Earnings in Montana at the Sub-sector Level across Major Groupings within the Economy

This chart shows labor income levels earned by persons employed in Montana at the sub-sector level. The 70 plus sub-sectors of the economy are grouped by major categories, with professional, technical, financial, and business services at the top and agriculture and natural resource and mining sub-sectors at the bottom.

Local government, which includes city and county government as well as local public education, is the highest one at $1.89 billion. Professional and technical services is 2nd highest at $1.39 billion. Five other sub-sectors exceed $1 billion in labor earnings.

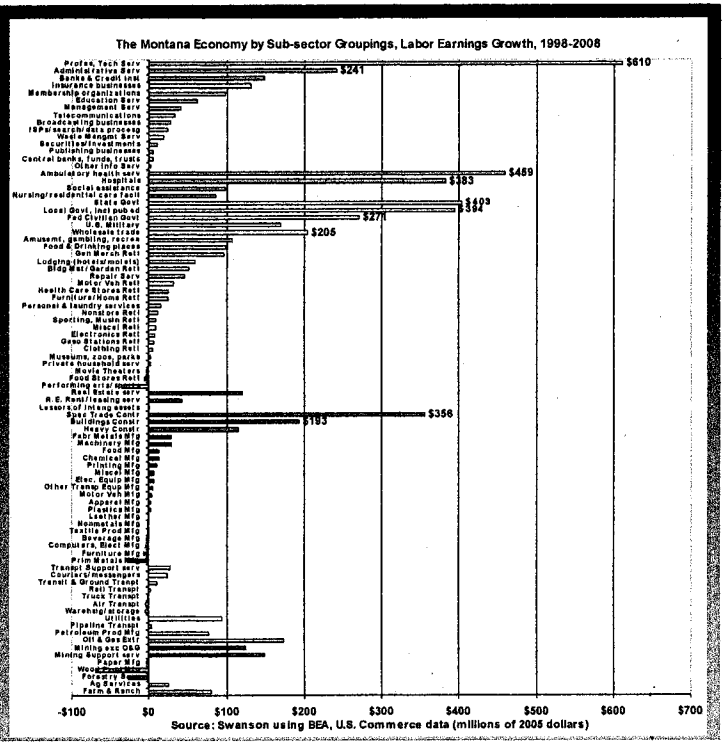


Labor Earnings Growth in the Montana Economy at the Sub-sector Levels across Major Groupings, 1998 to 2008

This chart focuses on where labor income growth has been concentrated in Montana over a recent ten-year period. Growth is measured in 2005 inflation-adjusted dollars.

The biggest increase was by "professional and technical services" at $610 million. "Ambulatory health services" (non-hospital care) had the 2nd biggest increase at $459 million.

Four others had increases exceeding $400 million – state government, local government, hospitals, and special trade contractors.

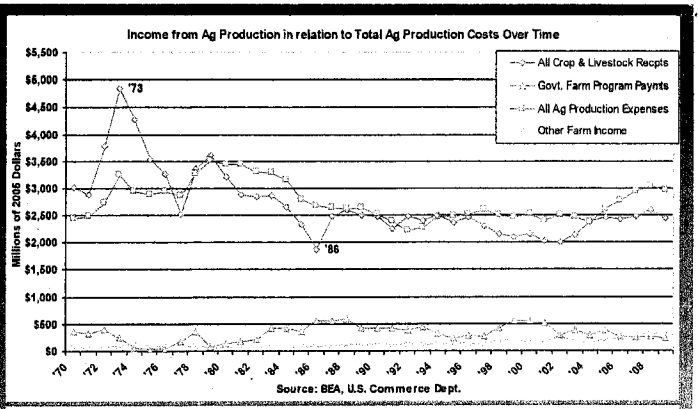


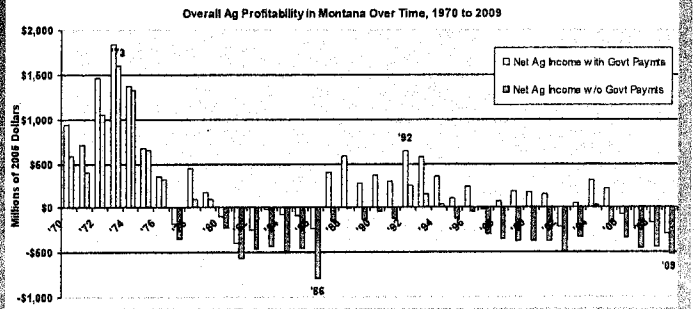
Ag Profitability in Montana – Income and Expenses Over Time

Many people in Montana think that agriculture is the state's largest industry. But while having large receipts, oftentimes these are not enough to simply cover the costs of production. The upper chart shows receipts by Montana ag producers for all crops and livestock sales each year since 1970. Dollars are inflation-adjusted. Total expenditures incurred in producing these commodities also are shown.

As can be seen, there are many years when expenses exceed gross receipts. To offset these losses, ag producers have other income, including income from farm programs (also shown in the chart).

The bottom chart shows net earnings by ag producers in Montana each year, with and without counting income from farm programs.

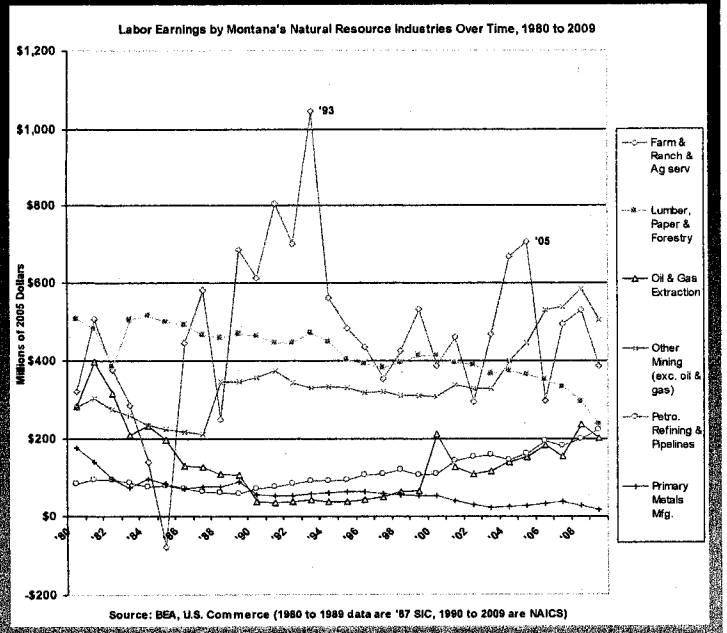




Trends in Labor Earnings for Sub-sectors within the State's Natural Resource Industries

The top chart shows labor earnings levels since 1980 for sub-sectors of Montana's natural resource industries. These include farms and ranches (net ag income), and ag services; lumber and paper manufacturing and forestry services; oil and gas exploration and extraction; other mining (coal and other minerals as well as mining services); petroleum refining and pipelines; and primary metals manufacturing.

The gyrations in income by farms, ranches, and ag services reflects the variability in year-to-year profitability. Lumber, paper, and forestry services is in long-term consolidation and decline.



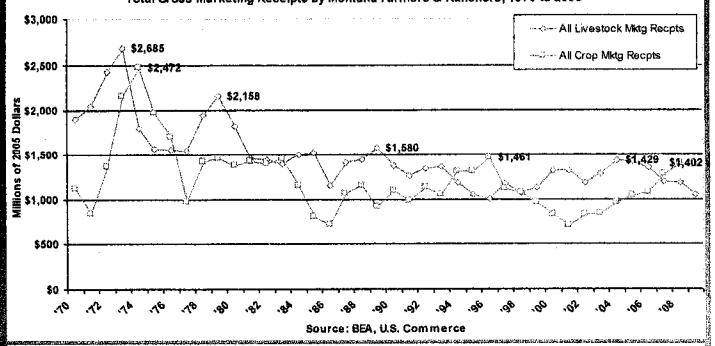
Labor earnings by those employed in oil and gas have been generally rising since the late '90s as have labor earnings for petroleum refineries and pipelines. Labor earnings also have been rising in other mining sectors.

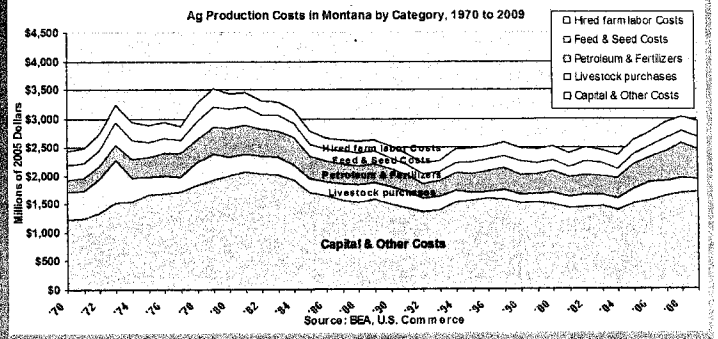
Ag Income and Expenditures by Type Over Time

The top chart shows ag marketing receipts by type in Montana – from crops vs. from livestock sales. There is considerable year-to-year variability in these, caused by both changes in prices received and production levels.

The lower chart shows ag production expenditures in Montana over time by major category. Capital and other costs are, by far, the largest expenses. These include interest charges on debt, depreciation expenses, machinery purchase and repair costs, property taxes, and other similar charges.

Agriculture has increasingly become more capital intensive and these costs are oftentimes simply not recouped on a year-to-year basis, particularly if income from marketing receipts only is considered.

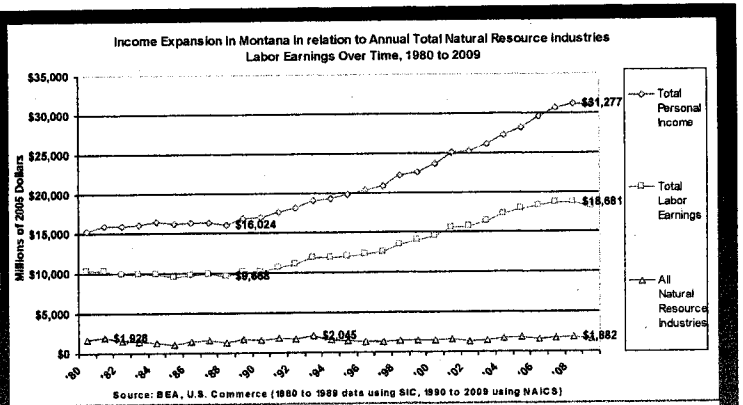


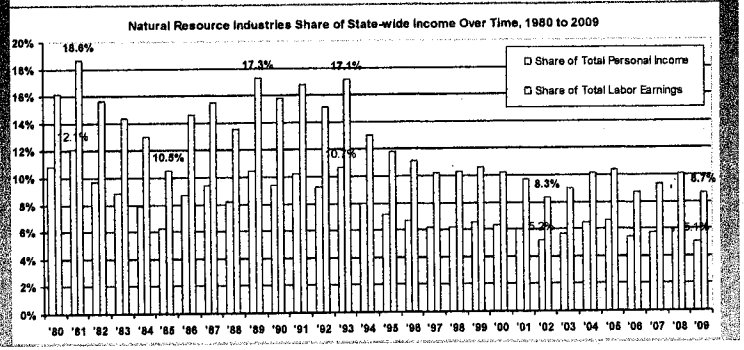


Income Expansion in Montana relative to Labor Earnings Growth in Natural Resource Industries

The upper chart shows labor earnings for all the natural resource industries combined in relation to levels of total labor earnings economy-wide in Montana and total personal income.

Personal income grew from $16 billion in the late '80s to over $31 billion in 2008, measured in 2005 inflation-adjusted dollars. Total labor earnings grew from $9.7 billion to $18.7. Meanwhile natural resource industry labor earnings have remained largely flat and are at a lower level now than in the early '90s when income expansion in Montana accelerated. The lower chart shows resource industry shares of income over time.



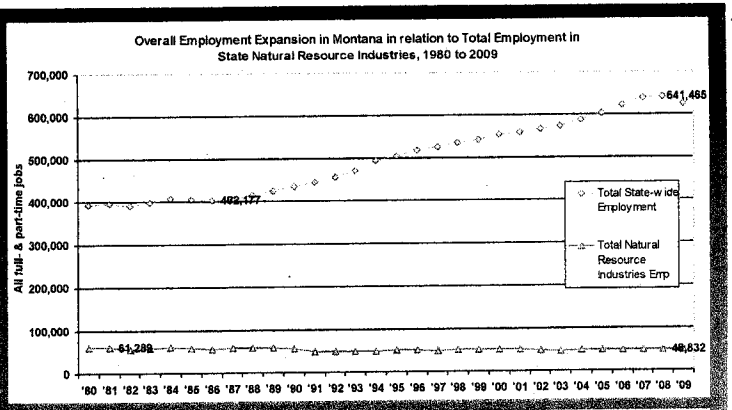


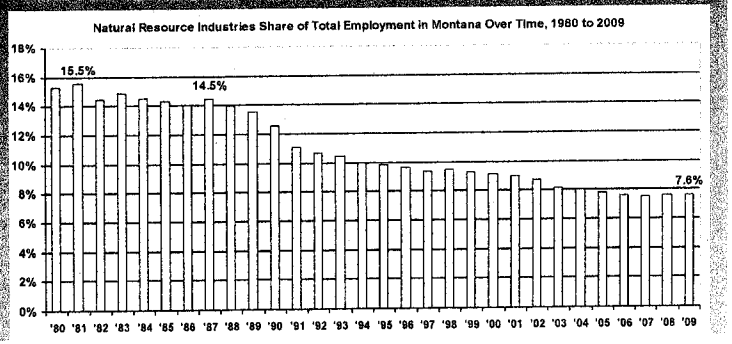
Employment Expansion in Montana in relation to Employment Change in Natural Resource Industries

The upper chart shows level of total employment economy-wide in Montana in relation to annual levels of employment in all of the natural resource industries combined.

Total employment has grown from a little over 400,000 in the late '80s to over 640,000 in 2008. The peak for employment in the resource industries as a whole was 1981 when it totaled 61,289. Today these industries employ less than 50,000.

As a result of these trends, natural resource industries account for a dwindling share of total employment, as shown in the lower chart.



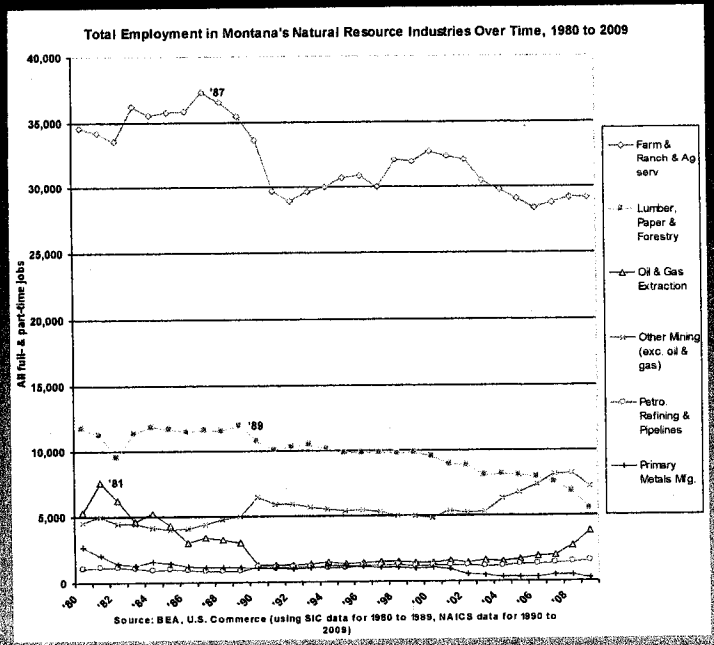


Trends in Employment for Sub-sectors within the State's Natural Resource Industries

This chart shows employment levels over time for natural resource industry sub-sectors. Employment is greatest among these for those working on farms and ranches and in providing agricultural services. However, agricultural employment is steadily declining.

Employment is also steadily falling in lumber and paper manufacturing and forestry services. Employment is also falling in primary metals.

Employment in oil and gas extraction and refineries and pipelines has increased a bit more recently, as has other mining employment.

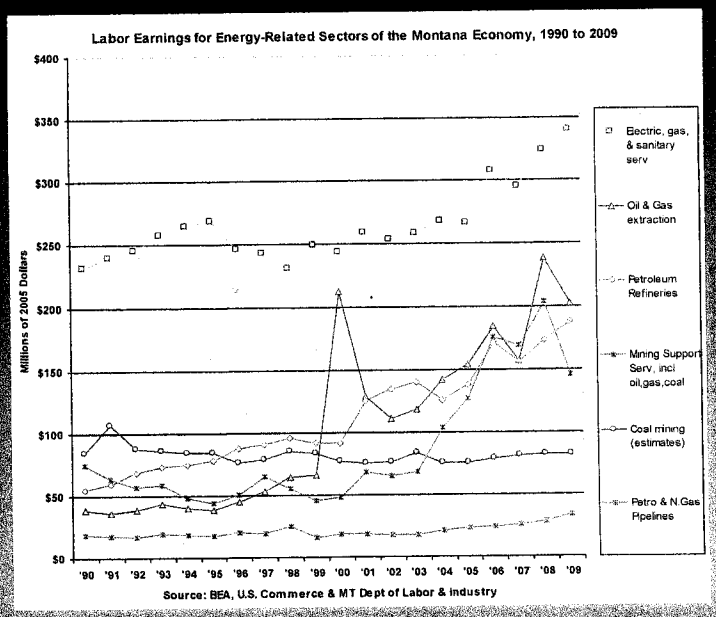


Labor Earnings Levels among Energy-Related Sub-sectors in Montana, 1990 to 2009

Annual labor earnings received by persons working in these energy-related jobs are shown in the chart in millions of 2005 inflation-adjusted dollars.

While employment among the state's utilities has fallen from levels in the mid-'90s, labor earnings for these workers have generally risen and reached a high of $340 million in 2009, up from around $250 million at the beginning of the decade.

Labor earnings by oil and gas workers reached $237 million in 2008, before falling back to $202 million in 2009. These are significantly higher than levels in the '90s.

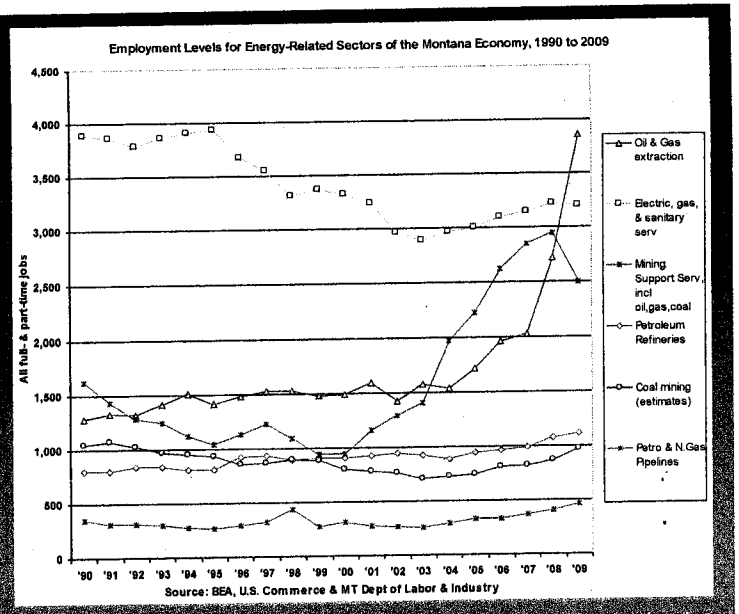


Labor earnings in mining support activities and petroleum refining also have increased steadily over most of the last ten years. Oil refinery workers received $188 million in 2009. Mining support workers received $198 million in 2009 after receiving $203 million in 2008, both significantly higher levels than in the '90s.

Employment of Energy-Related Sub-sectors of the Montana Economy, 1990 to 2009

The upper chart shows employment levels of key energy-related sub-sectors in Montana since 1990. Included in these are: oil and gas exploration and extraction, petroleum refineries, petroleum and natural gas pipelines, coal mining, mining support activities (that include some that support oil and gas and coal mining), and electric, gas, and sanitary services (that include electricity and natural gas generators, transmitters, and distributors, but also some water and sewer utilities).

The greatest area of increased employment is in oil and gas extraction with jobs rising from 1,400 in 2002 to 3,840 in 2009.



Jobs in mining support activities, many supporting oil and gas development and coal production, also have increased significantly over the last decade. The total number of jobs in coal mining, petroleum refining, and pipelines are relatively small in all cases, but these numbers have gradually increased for most of the last decade. Utility jobs have declined from levels in the early and mid-'90s, but have been gradually increasing since 2003.

Key Characteristics of Recent Growth in Montana's Economy

Recent Economic Expansion in Montana

Income and employment growth in Montana accelerated in the early '90 and continued up until the last two years. For the ten-year period from 1998 to 2008, Montana ranks 13th in personal income growth and 8th in total employment growth. Other Rocky Mountain West states also had fast-growing economies.

Current Economic Slowdown

Montana's economy slowed considerably in more recent years. However, income growth in the state has continued to out-perform the nation as a whole and unemployment remains two percentage points below national unemployment. There are many signs both nationally and in Montana that the economy is now slowly recovering (Jan., 2011).

Areas of Concentrated Economic Growth in Montana

Focusing on the period from 1998 to 2008 (largely before the slowdown) and looking across 11 major "segments" of the economy, the segment with the largest increase in gross product was "professional, technical, financial, and business services," increasing by over $2 billion in value. Construction and real estate had the 2nd largest increase ($1.4 billion), followed by wholesale and retail trade ($1 billion), and health care services ($900 million).

Professional, technical, financial, and business services also had the largest increase in labor earnings – up by $1.36 billion – followed by health care services ($1 billion), federal and state government ($844 million), and construction and real estate ($829 million). Professional, technical, financial, and business services also had the largest increase in employment over the period.

Montana's Largest Industries

Measured by the value of gross product, construction and real estate is Montana's single largest segment of the economy with a value in 2008 of $5.9 billion. The 2nd largest segment measured in this way is professional, technical, financial, and business services at $5.2 billion. Mining and agriculture are two of the three smallest segments.

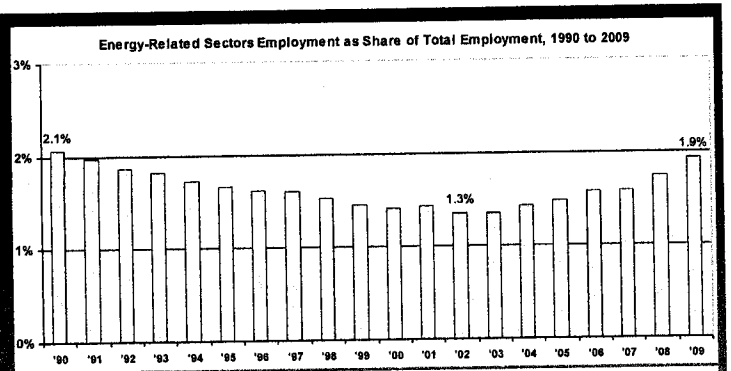
Measured in total labor earnings, professional, technical, financial, and business services is the largest segment of the economy with $3.5 billion in labor earnings in 2008. 2nd largest is the federal and state government at $2.8 billion, followed by health care services at $2.7 billion. Agriculture and mining are the two smallest contributors to labor earnings. In terms of employment, Montana's largest segment is professional, technical, financial, and business services with total employment. Wholesale and retail trade is the 2nd largest employer, followed by construction and real estate.

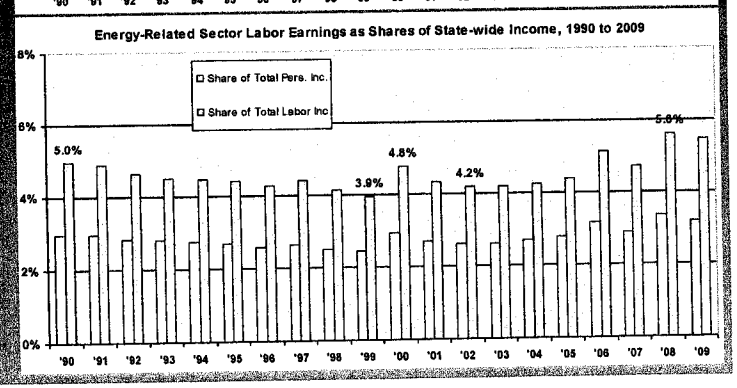
- Larry Swanson, O'Connor Center for the Rocky Mountain West, U. of Montana

Energy-Related Employment and Labor Earnings as Shares of All Jobs and Income in Montana

While employment among many of the energy-related sub-sectors has been growing in recent years, these industries and sub-sectors as a whole accounted for only about 2% of all jobs in 2009. This is up from 1.3% in 2002, but still below the 2.1% level achieved in 1990.

Labor earnings paid to workers in these industries accounted for 5.6% of all state-wide labor income in 2008, up from about 4.2% in 2002. These labor earnings also accounted for about 3.2% of all personal income received by Montanans in 2008.

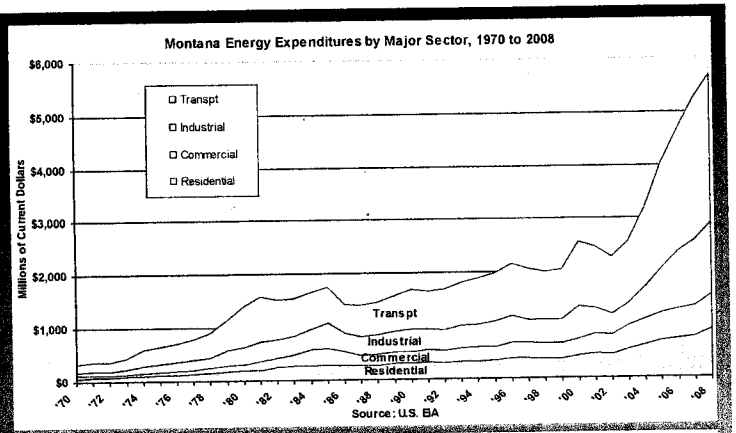


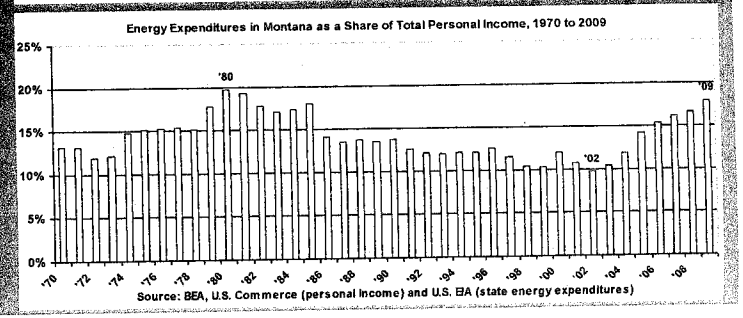


Total Expenditures for Annual Energy Consumption in Montana, 1970 to 2008

The upper chart shows the amount spent each year by various categories of energy users in Montana. In 2008 state-wide expenditure for energy totaled about $5.7 billion dollars. This is equivalent to 16.7% of all personal income received in the state that year.

The lower chart shows how annual energy expenditures in Montana have compared with total personal income levels over time. This ratio was highest in 1980 during the last major "energy crisis" in the U.S. when it reached almost 20%. In 2009 this ratio rose to about 18%. While levels of energy consumption are generally rising, expenditures are largely price-driven and this ratio will rise as prices rise.

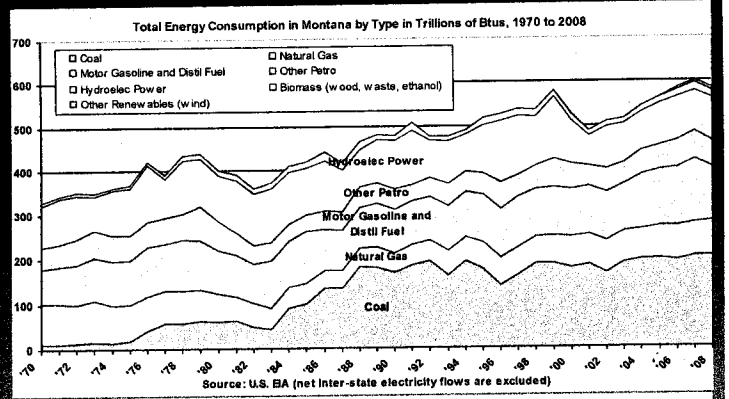


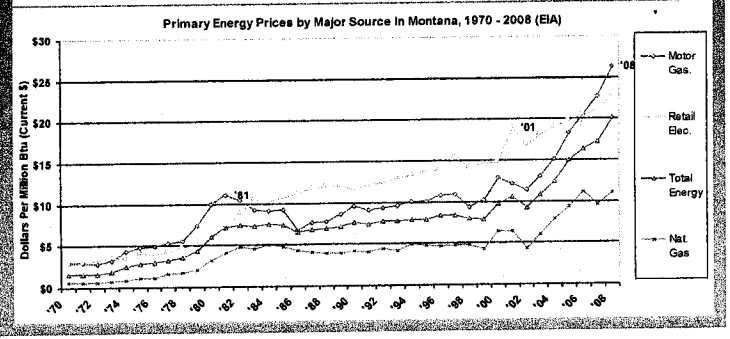


Energy Consumption in Montana by Type and Source and Price Trends

The upper chart shows energy consumption in Montana over time by major source as measured in trillions of Btu's. As can be seen, energy consumption of all types is rising, but at a considerably slower pace than are energy expenditures. This is explained by looking at prices for various primary energy sources over time. The chart below shows prices in nominal dollars per million Btu's, as paid by energy consumers in Montana.

Energy prices are very likely to rise considerably faster than overall growth in the economy and this will cause overall price inflation and constrain economic growth.

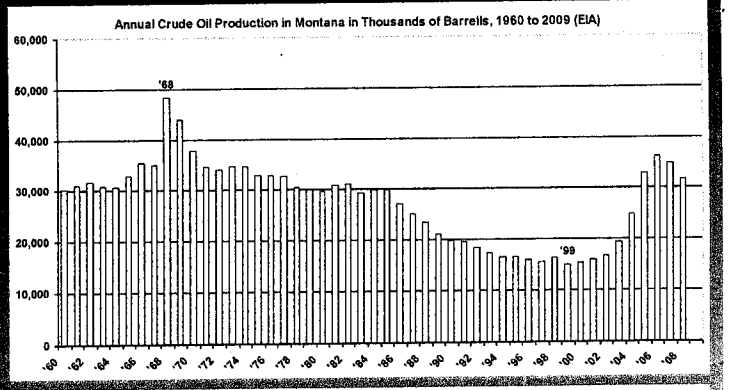


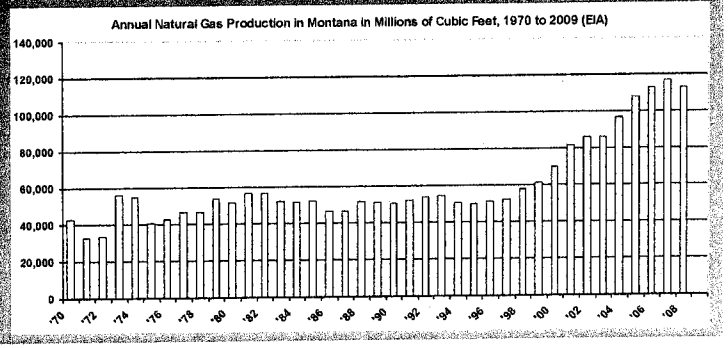


Crude Oil and Natural Gas Production in Montana Over Time

The upper chart shows annual levels of crude oil production in Montana since 1960, as measured in thousands of barrels. The peak year for production was 1968, however, oil production has risen in more recent years after hitting a low in 1999. The state accounts for less than 2% of U.S. crude production.

The lower chart shows natural gas production levels in Montana since 1970, as measured in millions of cubic feet of gas. Production was fairly flat through the '70s, '80s, and '90s, before increasing rather sharply more recently. About three-fifths of this gas is consumed in-state. The rest is exported. State gas production is about half of a percent of national output.



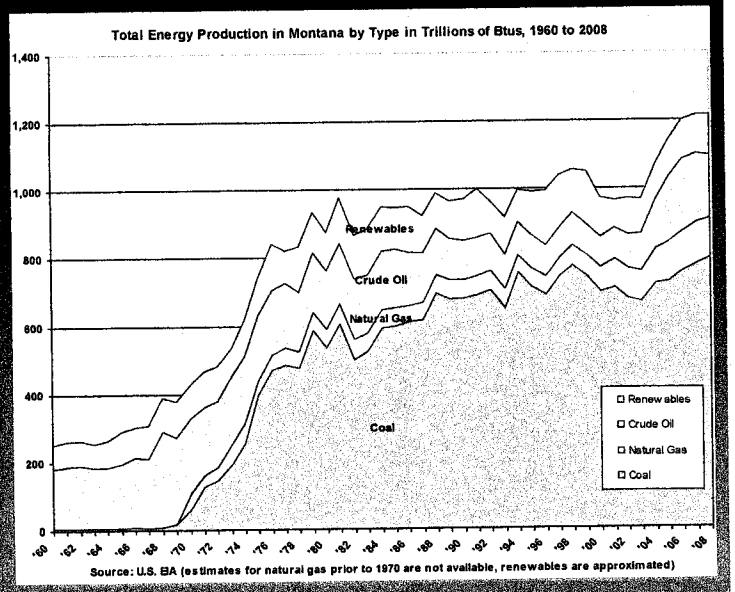


Energy Production in Montana by Type, as measured in Trillions of Btu's

Montana produces significant quantities of coal, natural gas, and crude oil, as well as growing amounts of energy from renewable sources.

The period of greatest increase in overall energy production occurred in Montana in the 1970s when production increased from less than 400 trillion Btu's in total to more than 900 trillion. There also has been a significant increase in energy production more recently in just the last five or six years.

In fact total energy production today is almost three times overall energy consumption (2008 production of 1,216 trillion Btu's versus consumption of 434 trillion Btu's.

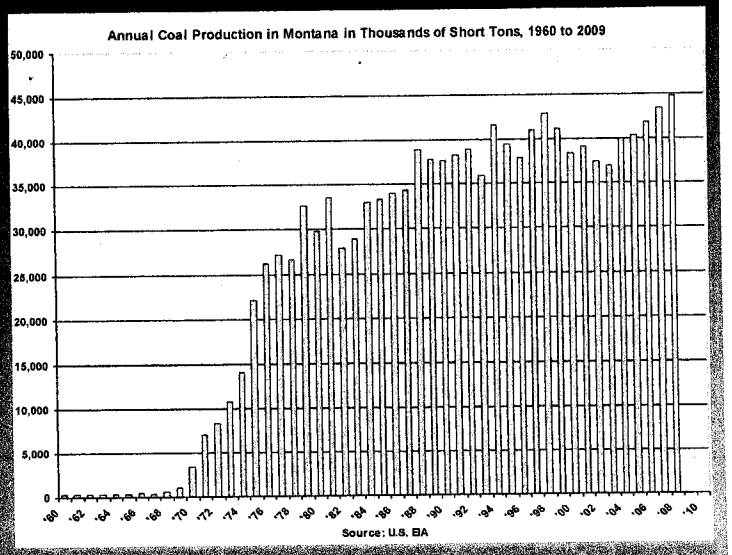


Coal is the largest source of energy production by far in Montana and overall production of coal has steadily grown over the last three decades.

Coal Production Levels in Montana Over Time

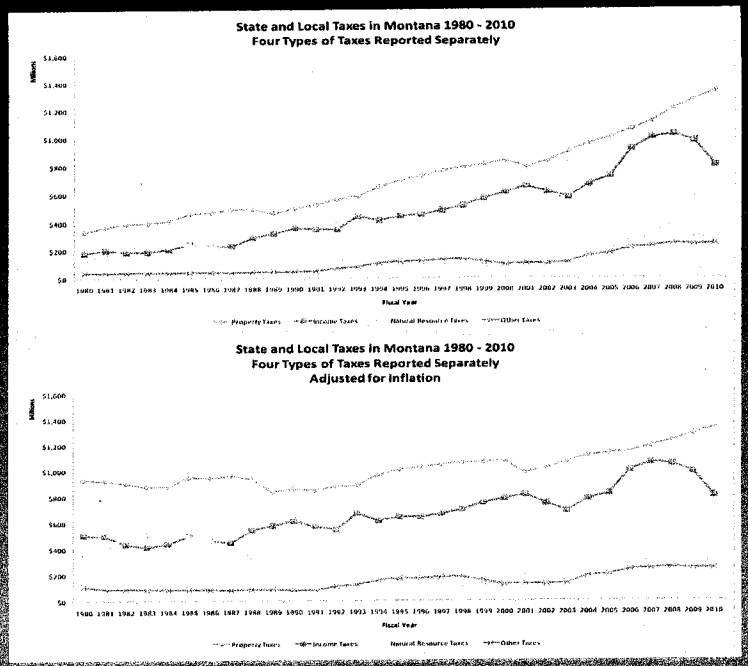
Montana contains roughly one-fourth of the nation's recoverable coal reserves. Today it is producing about 4% of total U.S. coal production.

The chart shows production levels over time, dating back to the 1960s when production was very low. The biggest increase in production occurred during the 1970s when output rose from less than 5,000 short tons a year to well over 30,000 tons. By 1998 production has rose to nearly 43,000 tons and, after several years of decline, rose again, reaching nearly 45,000 tons in 2008. About one-fourth of Montana's coal is used for in-state electricity production. The rest is delivered to markets in about 15 states.



Coal-fired power plants in Montana account for about two-thirds of all electricity generated in the state. Hydroelectric plants account for most of the rest.

Montana Tax Trends

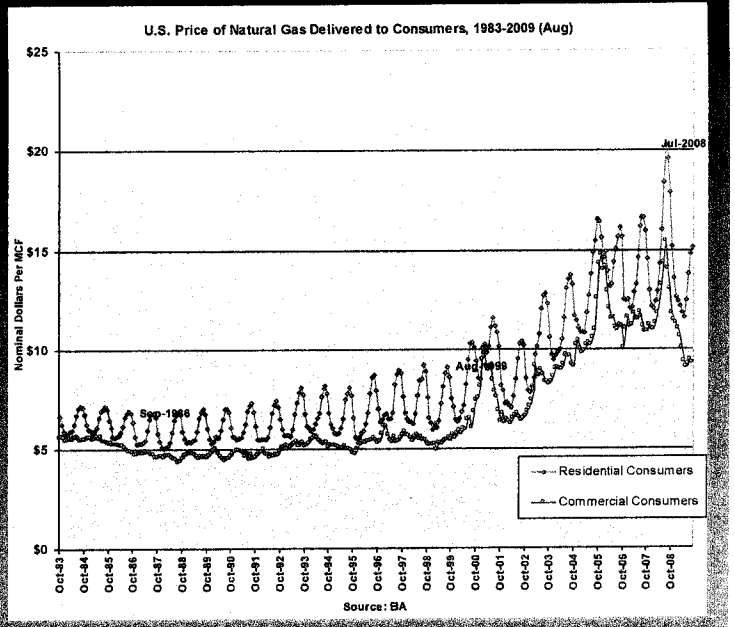


Natural Gas Prices in the U.S.

Natural gas prices have been rising steadily for much of the last 8 or 9 years, as shown in the chart. Average prices paid by both residential and commercial users of gas in the U.S. are shown in the chart in dollars per thousand cubic feet of gas or MCF.

In July of 2008 natural gas prices briefly rose to about $20 per MCF. These prices have decreased a bit more recently with a soft economy and more abundant supplies of natural gas.

However, it is very likely that natural gas prices for U.S. residential users will rise to over $20 per MCF in the next year or two and the longer term forecast is for steadily rising prices.

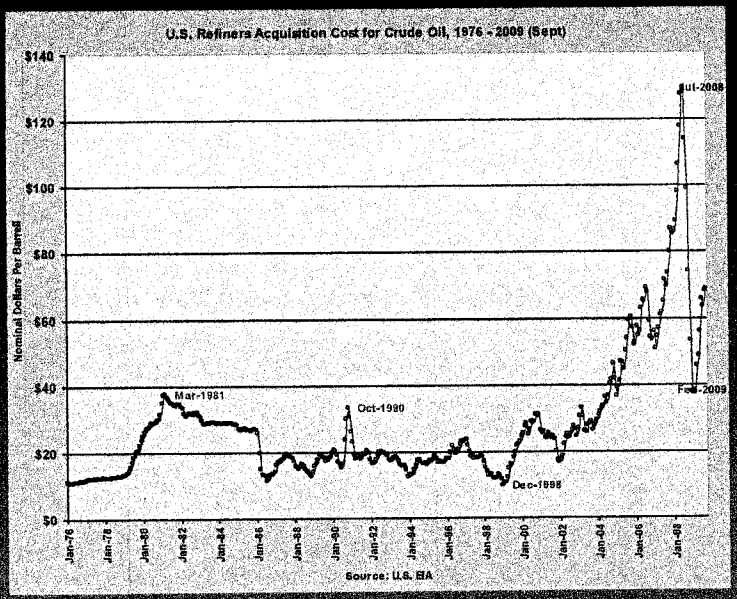


Crude Oil Prices in the U.S.

The chart shows the average monthly price paid by U.S. oil refineries in acquiring crude oil from both domestic and foreign sources since the mid-'70s. Prices are nominal or current ones and are unadjusted for inflation.

At the time of the last "energy crisis" in the early '80s, crude oil prices briefly spiked to almost $40 a barrel. This was a time of "stagflation" in the U.S. with prices rising rapidly (inflation) occurring at the same time that the economy was slowing (recession).

Prices stayed below $20 a barrel through much of the '90s. However, more recently in 2008, prices rose briefly to almost $130 a barrel. Prices then dropped as the economy slowed.



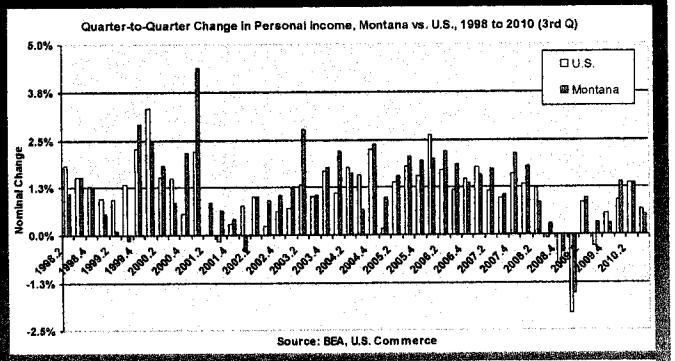
It is very possible and probable that crude oil prices will rise to over $100 a barrel again in 2010, even with relatively slow U.S. and world economies.

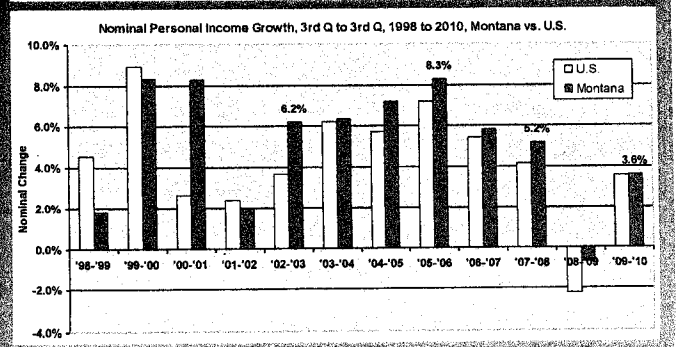
Recent Indications of Economic Recovery in Montana and the U.S.

The top chart shows quarter-by-quarter percentage change in personal income in Montana and the nation as a whole.

The current recession began in December of 2007 and became more pronounced in 2008 and 2009, with income growth going negative. However, more recently income growth has returned. The economy continues to be vulnerable, however.

The top chart shows change each quarter since 1998 and through the 3rd quarter of 2010. The lower chart shows change from 3rd quarter to 3rd quarter of each year.



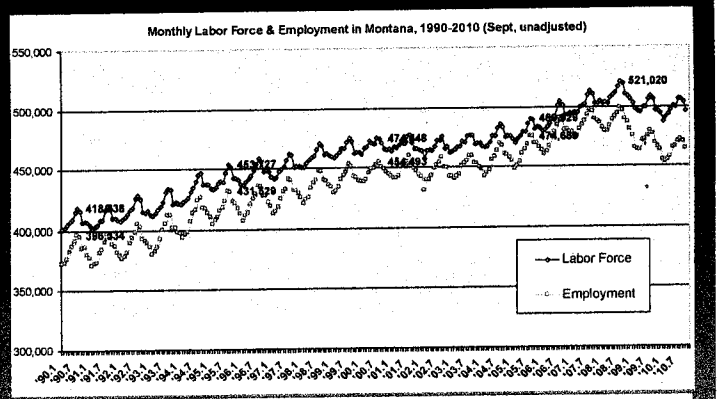


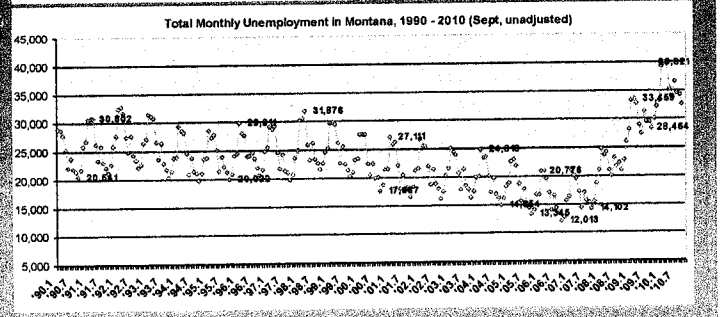
Monthly Labor Force & Employment Numbers for Montana, 1990 – 2010

The top chart shows monthly counts by the federal Bureau of Labor Statistics of total labor force and employment counts for Montana.

Montana's economy has steadily grown for over a decade and a half and these numbers reflect this. However, growth in the labor force peaked in 2008 and this slowdown in growth reflects the nation-wide recession and its impact on Montana.

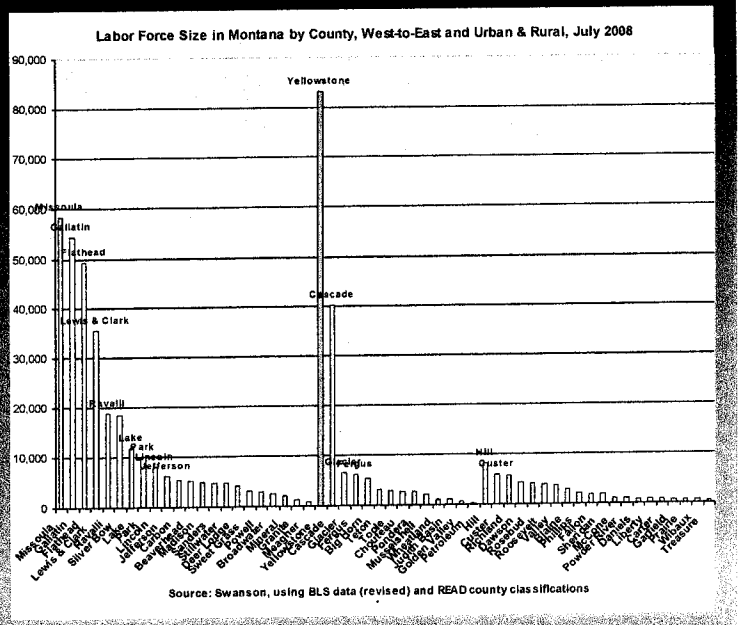
The gap between the number in the labor force and employment is unemployment and the number unemployed each month, statewide, is shown in the lower chart.

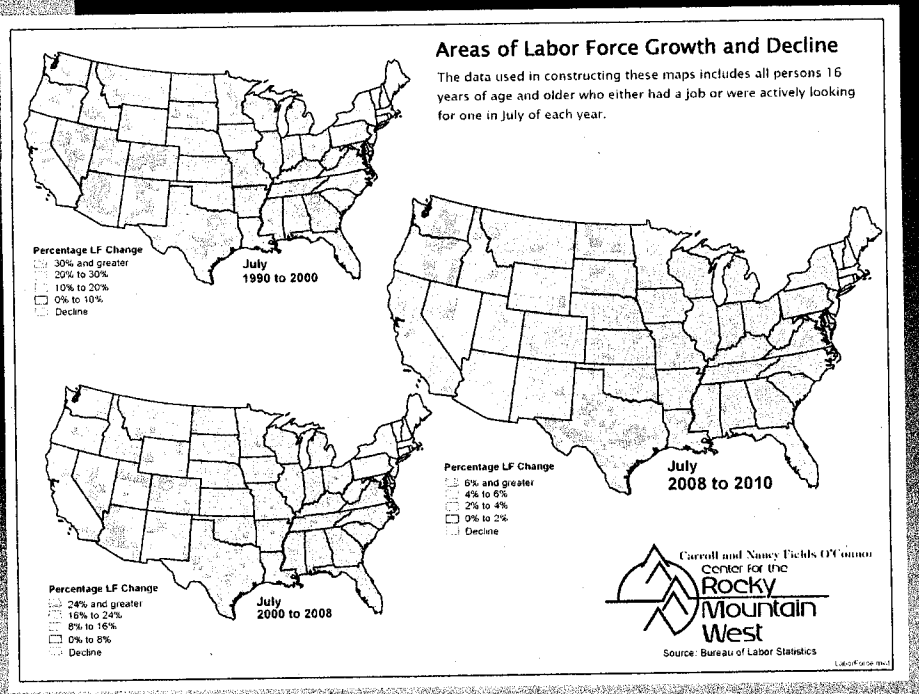




Labor Force Size by County in Montana – West to East and Urban and Rural, July 2008

The chart shows the distribution of Montana's labor force by individual county. Counties in the Western region are at the left, those in the Central Front are in the center, and those in the East are at the right. The more urban regional center counties are shown in dark colors (Blue is Yellowstone, Green is Missoula and Cascade, Yellow is Gallatin, Flathead, Lewis and Clark, and Silver Bow. Counties in light colors are linked to these regional centers. Those in white are more isolated and rural.



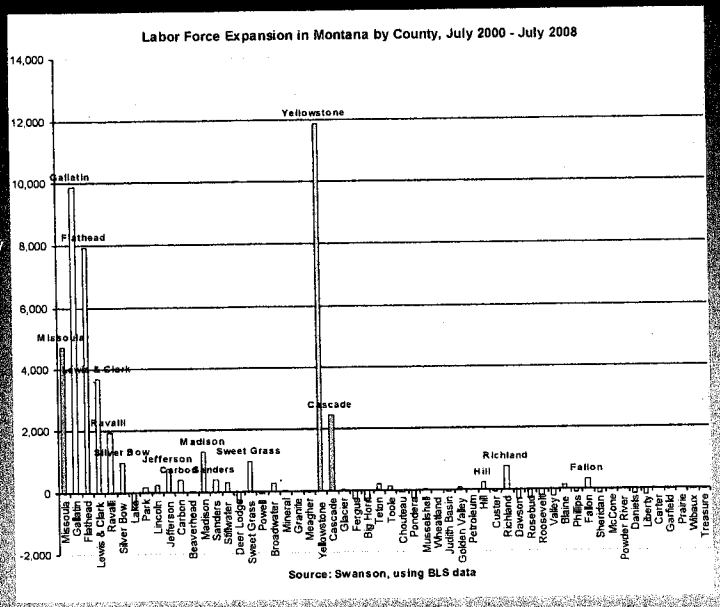


Labor Force Expansion across Montana, West-to-East and Urban vs. Rural, 2000 – 2008

This chart shows growth in the labor force among Montana counties from July of 2000 to July of 2008, prior to the significant slowdown in the current recession.

Under more normal economic times, Montana's labor force is expanding, which is a response to how and where the economy itself is growing.

Much of the growth has been concentrated in a relatively few places – the Billings area in particular. Most of the remaining growth has been in the Westland across the regional centers and their surrounding areas.

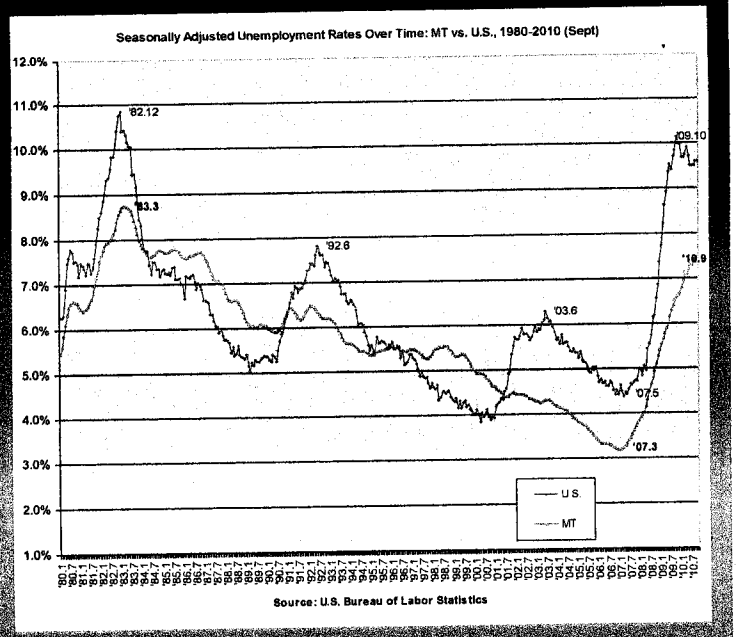


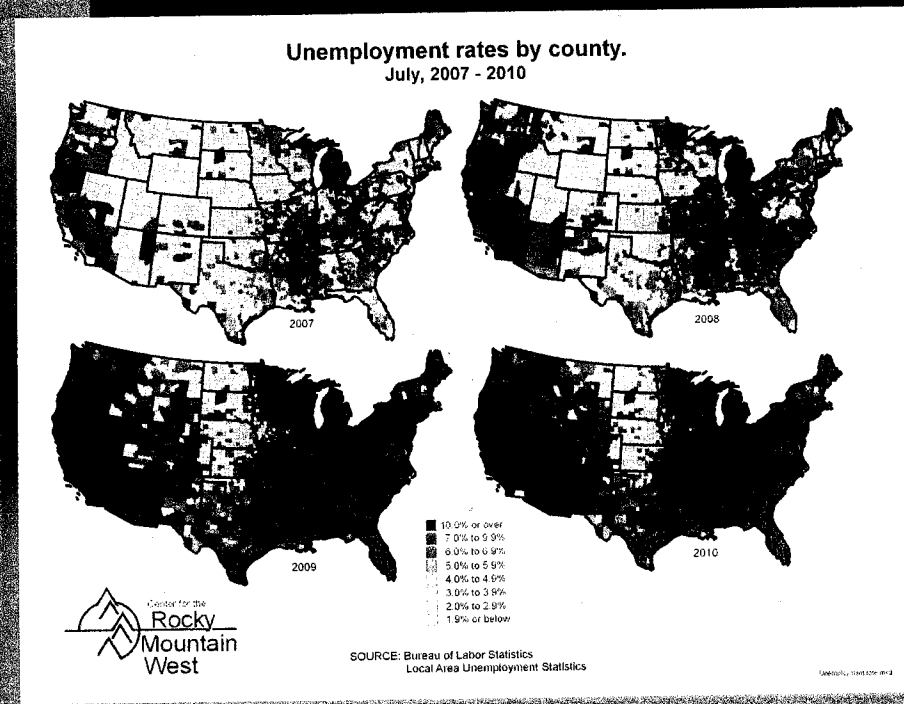
Seasonally Adjusted Unemployment for Montana vs. the U.S. Over Time

This chart focuses on unemployment rates for Montana in relation to the U.S. as a whole over time, with unemployment adjusted for seasonality.

Periods of national economic recessions or slowdowns are very clear by looking at the U.S. rates – the early '80s, early '90s, in 2002 and 2003, and more recently with the slowdown officially beginning in December of 2007.

Unemployment in Montana had reached historically low levels in 2007 and unemployment, while rising, is well below levels nationally.



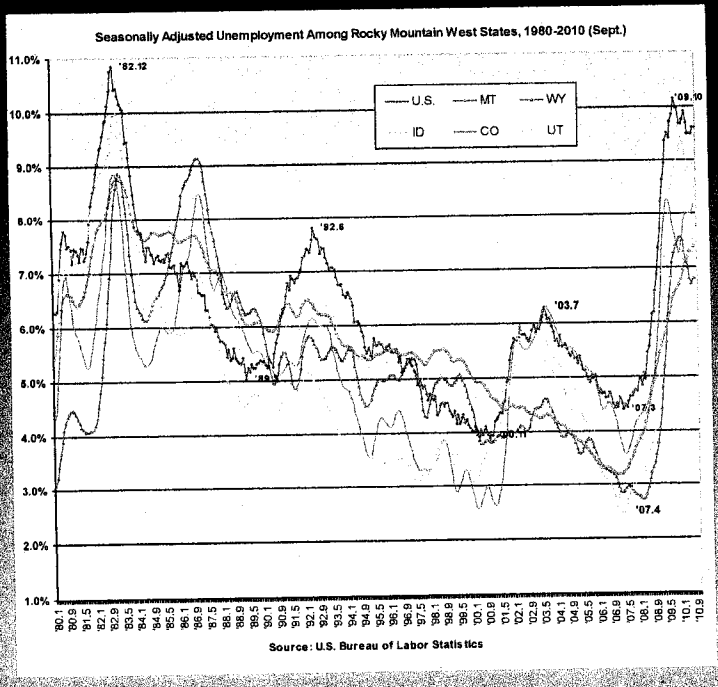


Seasonally Adjusted Unemployment Rates for Rocky Mountain States Over Time

This chart uses BLS data on unemployment that has been adjusted for "seasonality", with this seasonality that normally occurs each year largely taken out of the estimates.

This makes it easier to see the larger ebbs and flows in the economy of the nation and among states within the Rocky Mountain West.

The high levels of unemployment more recently compare to those experienced in the early '80s.

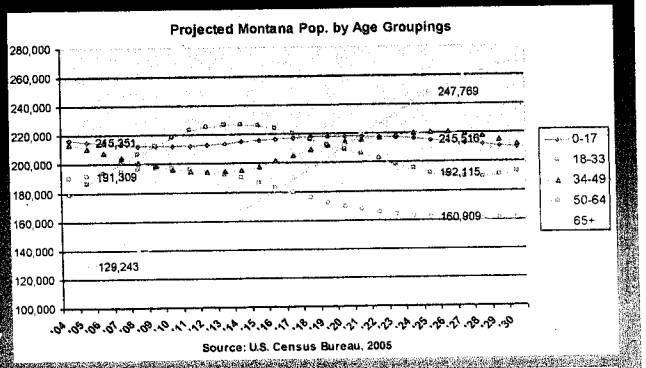


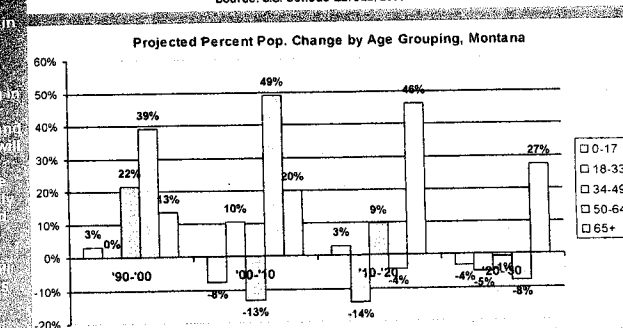
Future Pop. Change in Montana by Age Grouping

The projected aging of Montana's population over the next 20 years can be viewed by examining how the population is expected to change by age grouping. The upper chart shows the population under 18 (high school and younger), the population 18 to 33 (young post-high school adults and those at ages of family formation and childrearing), the population 34 to 49 (young and middle-age adults), the population 50 to 64 (older adults at pre-retirement ages), and the population 65 and older.

The under 18 population, which grew by only 3% in the '90s, is projected to fall by 8% between 2000 and 2010, then grow slightly in the subsequent two decades. The young adult population, which saw very little change in the last decade, would grow by 10% in the current decade before declining in each of the subsequent periods. The older adult working age population between 50 and 64, which saw massive growth in the '90s will also see very high growth in the current period before beginning a decline. And the 65 and older population, which grew by only 13% in the '90s, will grow by 20%, 46% and 27% in the subsequent three decades.

As a result of these age shifts, Montana will have one of the largest populations over 50 of any state in the country in future years.



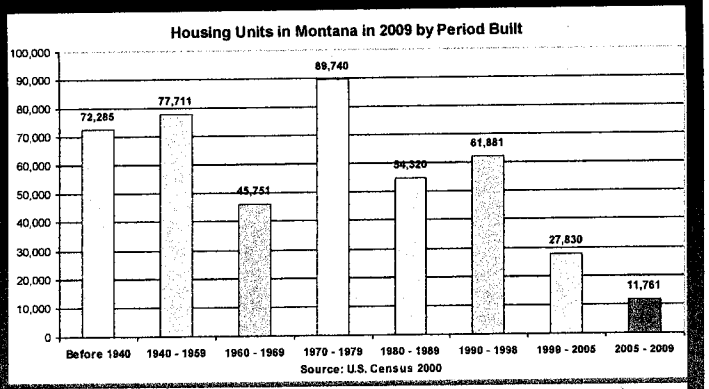


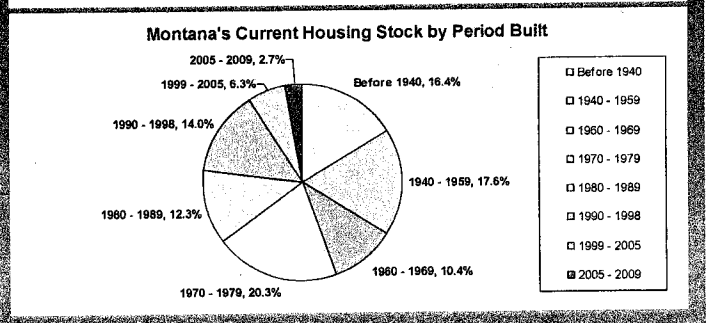
Montana's Current Housing Stock

The most recent estimate of the total number of housing units in Montana is 441,279 (July, 2009, U.S. Census). The top chart shows when these units were built, from earliest to latest.

Of the total, nearly 196,000 were built prior to 1970 – over 44% of the total. Another 20% were built prior to 1980. So nearly two-thirds of all housing units in Montana were built prior to the last great "energy crisis", the one in the early '80s when crude oil prices briefly spiked to over $35 a barrel.

The number of homes built since 1998, totals 39,600 – less than 10% of the total. Older homes are much more likely to have been built with much less focus on energy efficiency. Older homes need to be aggressively retrofitted with increasingly cost-effective and money-saving energy measures.





Key Elements of a Balanced Approach to Montana's Energy Future

Balanced Approach to Energy Planning

The "energy policy equation" has a supply or production side and also a demand or consumption side. State policymakers in Montana are tending to focus almost all of their attention on the supply side of the equation in formulating energy policy and programs in Montana. They emphasize the state's role as an "energy producer" and see opportunity to benefit by enlarging and expanding this role (more coal production, more electricity production and export, more development of large wind farms as concentrated sources of electricity for export, etc.). The economic benefits of doing so are seen as stemming from more jobs in these energy industries, income from these jobs, and state and local revenues from energy production taxes. And the emphasis is placed on "exporting" energy to places and users outside of Montana.

While there is a role for all this, what seems to be overlooked if not almost totally obscured is the much larger benefits that would accrue to a much larger number of people and entities in the state, both households and businesses, of well-targeted and aggressive programs that accelerate the production of "conservation energy" in the state, particularly when savings largely accrue to in-state users while increased production goes to out-of-state users. Each Btu of energy saved is equal to or better than each Btu of additional energy produced. And whereas the benefits of more energy production and export accrue to some Montanans, savings from broad-based programs in energy conservation accrue to almost every Montanan.

Energy expenditures by residential, commercial, and industrial consumers in Montana reached nearly $6 billion in 2009 – roughly equivalent to 17% of state-wide personal income. This will rise to 20% and above of all income in the very near future as energy prices begin to rise more rapidly in a recovering U.S. and world economy. The last time energy expenditures in Montana totaled more than 20% of total personal income was in 1981, at the height of the last energy "crisis" in the U.S. The question becomes: "What has been learned by policymakers in Montana between then and now about preparing for rising energy expenditures and their impact on the economy?" That remains to be seen.

Almost all credible experts on energy attest that gains in conservation energy and energy efficiency are the "low-hanging fruit" in the total energy supply mix - they are the most easily attainable and least costly alternatives we have before us. However, these "fruit" will not fall to the ground through gravity alone. They must be "picked" and this will require aggressive new programming involving more expansive and sophisticated energy auditing, patient and low-cost sources of capital for financing energy conservation, and speedy deployment of such measures through utilities and area contractors across the state.

- Larry Swanson, O'Connor Center for the Rocky Mountain West, U. of Montana

Key Propositions regarding Energy and the Montana Economy

Recent and Projected Growth in the Montana Economy

Over the last ten and more years, much of the growth in the Montana economy has shifted to professional and technical services, business and financial services, health care, trade, real estate, and construction. Our economy is becoming more and more services and "human resource based" and less and less "natural resource industry based". In the process, Montana's economy also is becoming much more "urban" in nature and centered in its small cities. This restructuring and transition will largely continue, as reflected in recent job projections for Montana by the State Dept. of Labor & Industry.

Employment and Labor Earnings in Montana's Energy-related Sectors

Sectors of the economy that are directly tied to energy production and distribution (utilities, oil and gas exploration and production, coal production, refineries, pipelines, etc.) are a relatively small part of the Montana economy, together accounting for less than 2% of all employment and 5% of all labor earnings. What's more, over the last two decades of growth in the overall economy, these energy-related sectors together have grown very little (2.1% of total employment in 1990 vs. 1.9% in 2009 and 5.0% of total labor earnings in 1990 vs. 5.5% in 2009). Their growth is not "driving" growth in the larger economy.

Contributions to State and Local Governmental Revenues by Energy Industries

State and local governments in Montana spend just over $7 billion annually. In 2008 about 46% of these expenditures were paid from state and local "tax" revenue (Biennial Rept.) and tax revenues from mineral severance taxes of all types accounted for about 7% of all state and local revenue. Severance taxes from oil and gas production were $213 million in 2009. Coal severance and gross proceed taxes were $64 million. While important, these energy resource taxes are still relatively small in relation to total state and local governmental revenues and expenditures.

State-wide Energy Expenditures by Households and Businesses in Montana

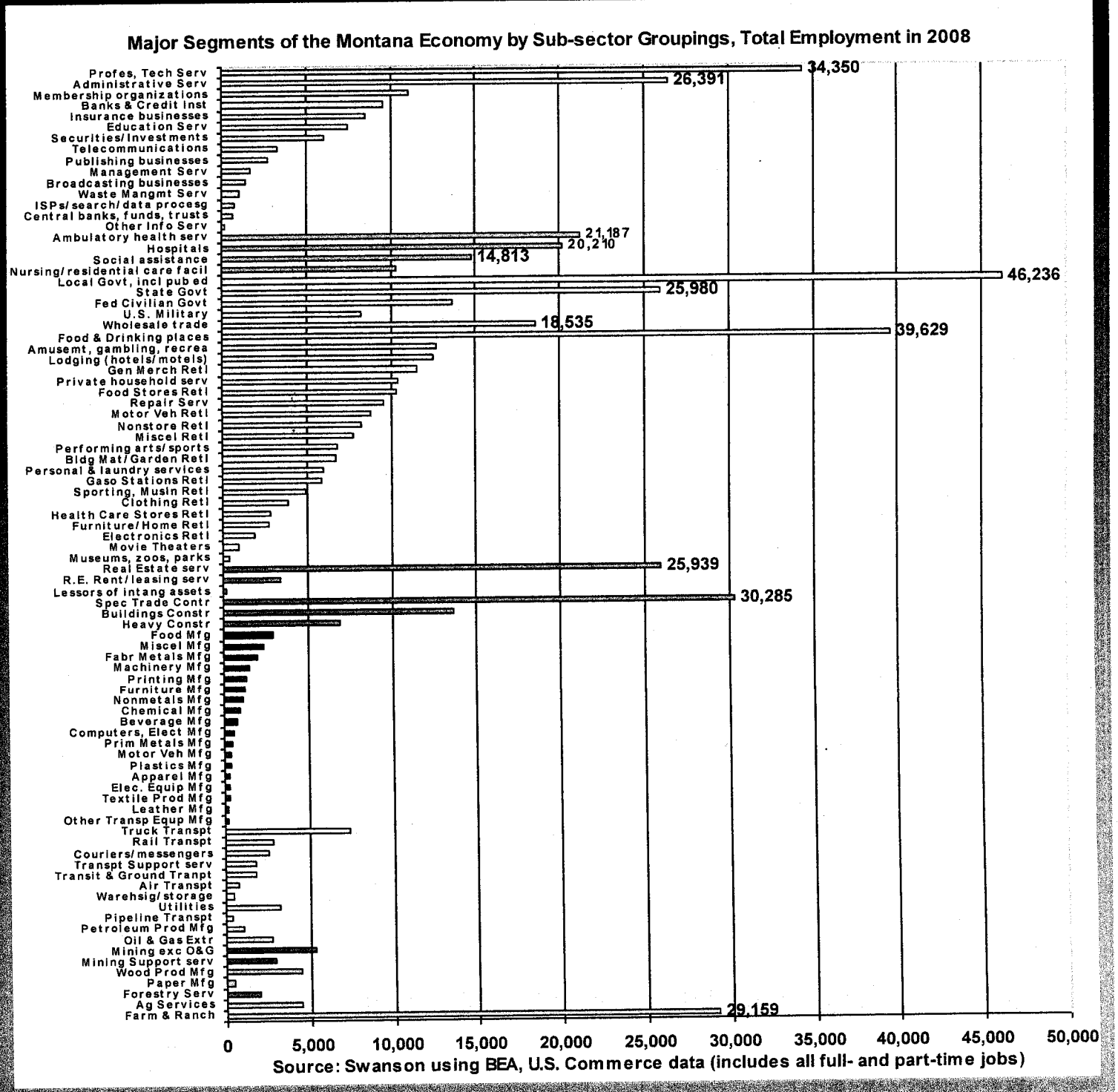
"Energy spending" and not "energy producing" is where energy as a whole has its biggest impact on the Montana economy. Montanans currently spend almost $6 billion annually on energy and this cost will only rise and probably rise precipitously as energy prices increase in the future. More aggressive implementation and deployment of cost-effective energy conservation measures in Montana would save energy users hundreds of millions of dollars each year, even taking full account for what these would cost. Doing this much more aggressively and intelligently than at present is where energy policy and programming could have its single biggest positive impact on the Montana economy.

- Larry Swanson, O'Connor Center for the Rocky Mountain West, U. of Montana

Sub-sectors of the Montana Economy by Groupings

We can drill down further in examining the size and shape of the economy by looking at "sub-sectors". There are over 70 separate sub-sectors of the economy and these are grouped in the chart and arrayed by level of employment for each in 2008.

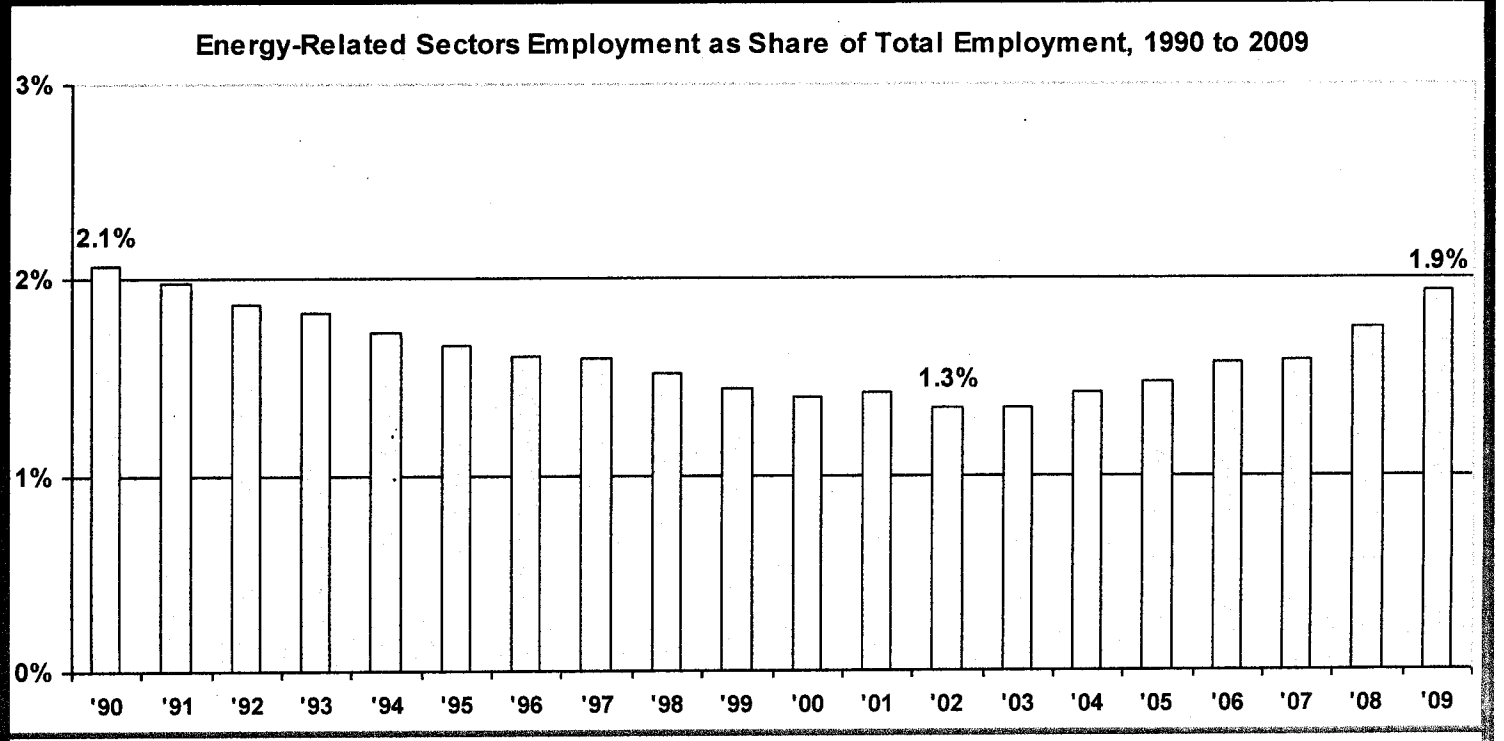
At the top of the chart are various sub-sectors that make up the large and growing "professional, technical, financial, and business services" segment (shown in teal blue). Next are the sub-sectors of health care (shown in blue). Next is government (shown in yellow), followed by all of the various sub-sectors of goods and services trade. Real estate and construction sub-sectors are shown in red, manufacturing in black, ag at the very bottom is in green, mining in brown.

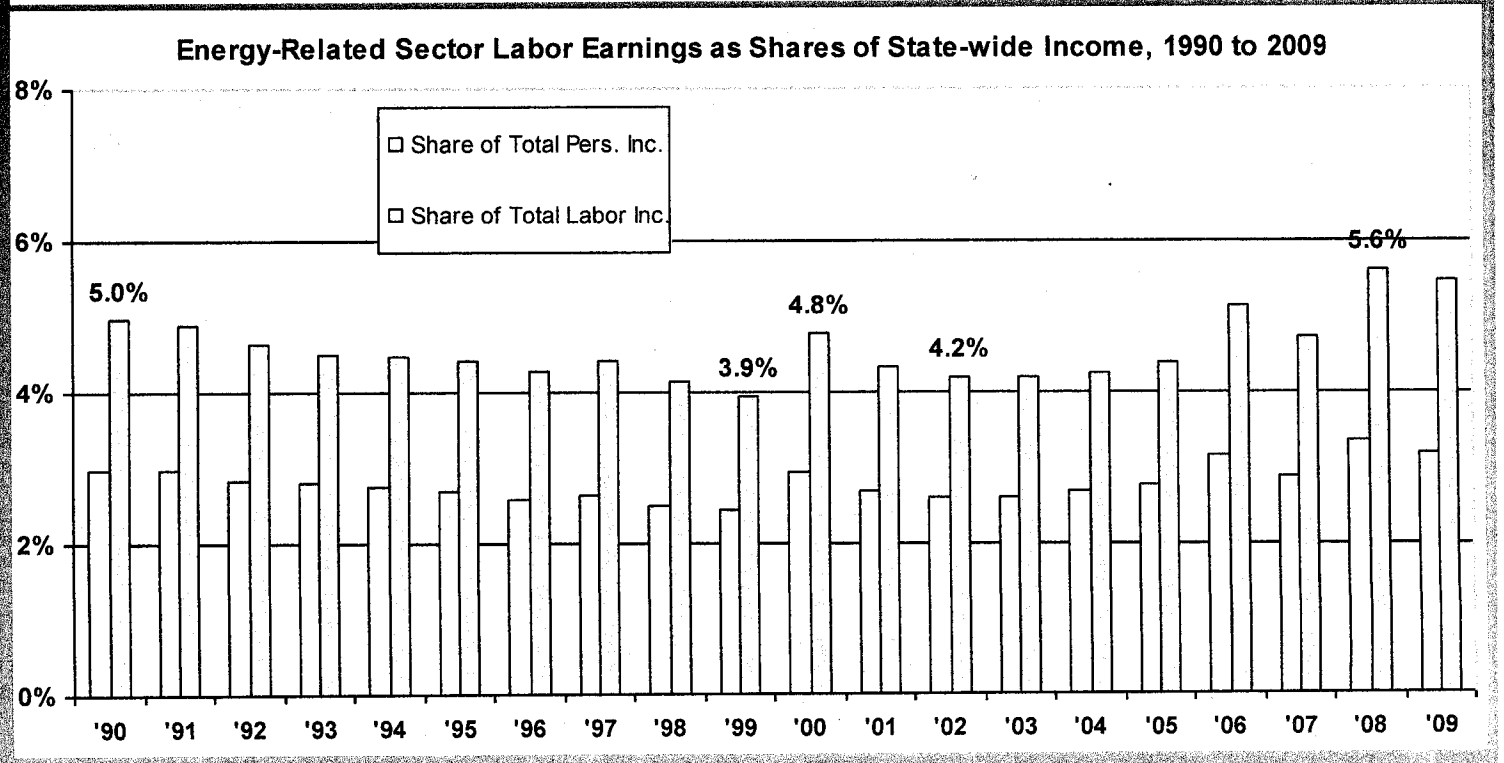


Energy-Related Employment and Labor Earnings as Shares of All Jobs and Income in Montana

While employment among many of the energy-related sub-sectors has been growing in recent years, these industries and sub-sectors as a whole accounted for only about 2% of all jobs in 2009. This is up from 1.3% in 2002, but still below the 2.1% level achieved in 1990.

Labor earnings paid to workers in these industries accounted for 5.6% of all state-wide labor income in 2008, up from about 4.2% in 2002. These labor earnings also accounted for about 3.2% of all personal income received by Montanans in 2008.





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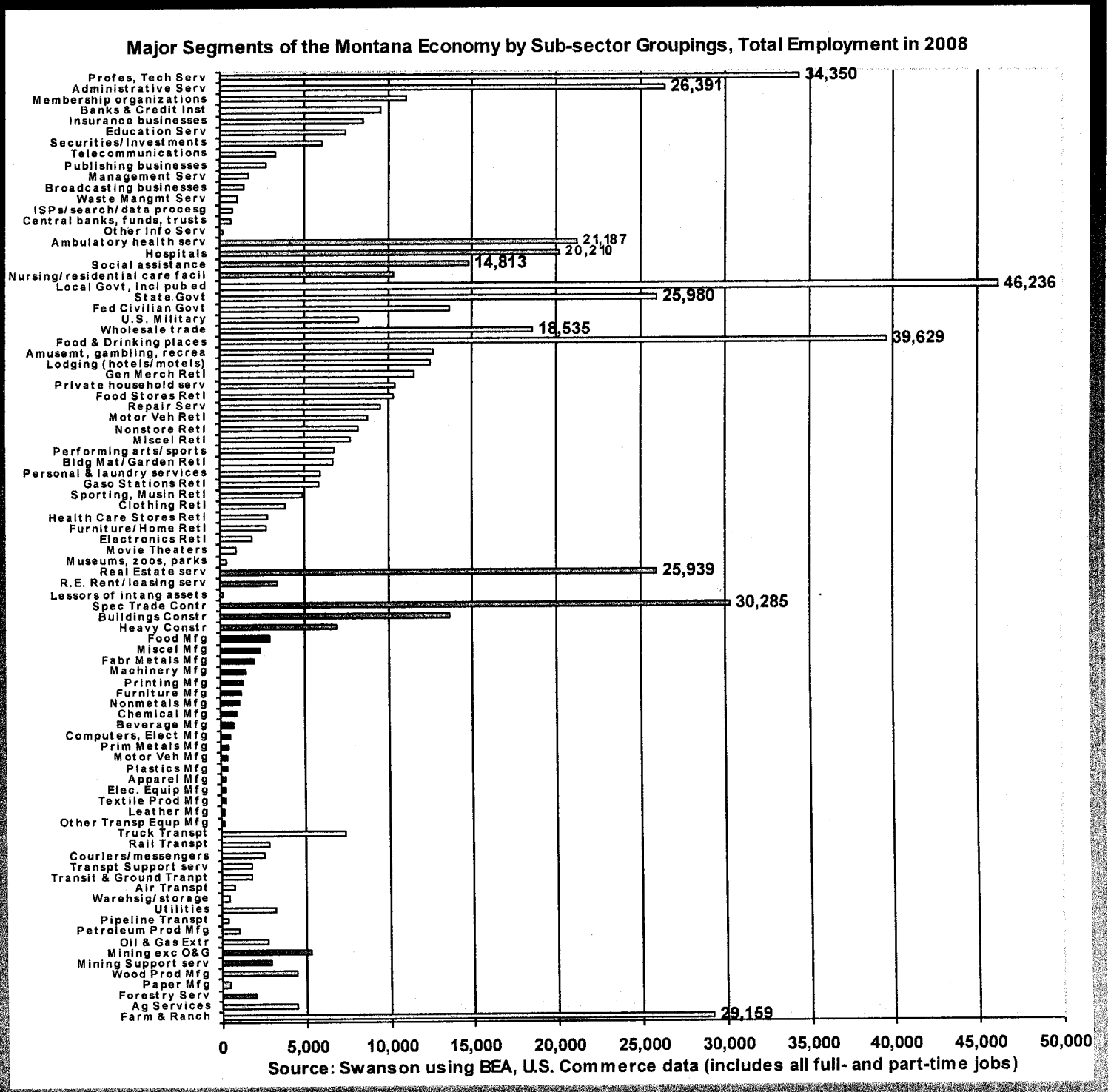
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