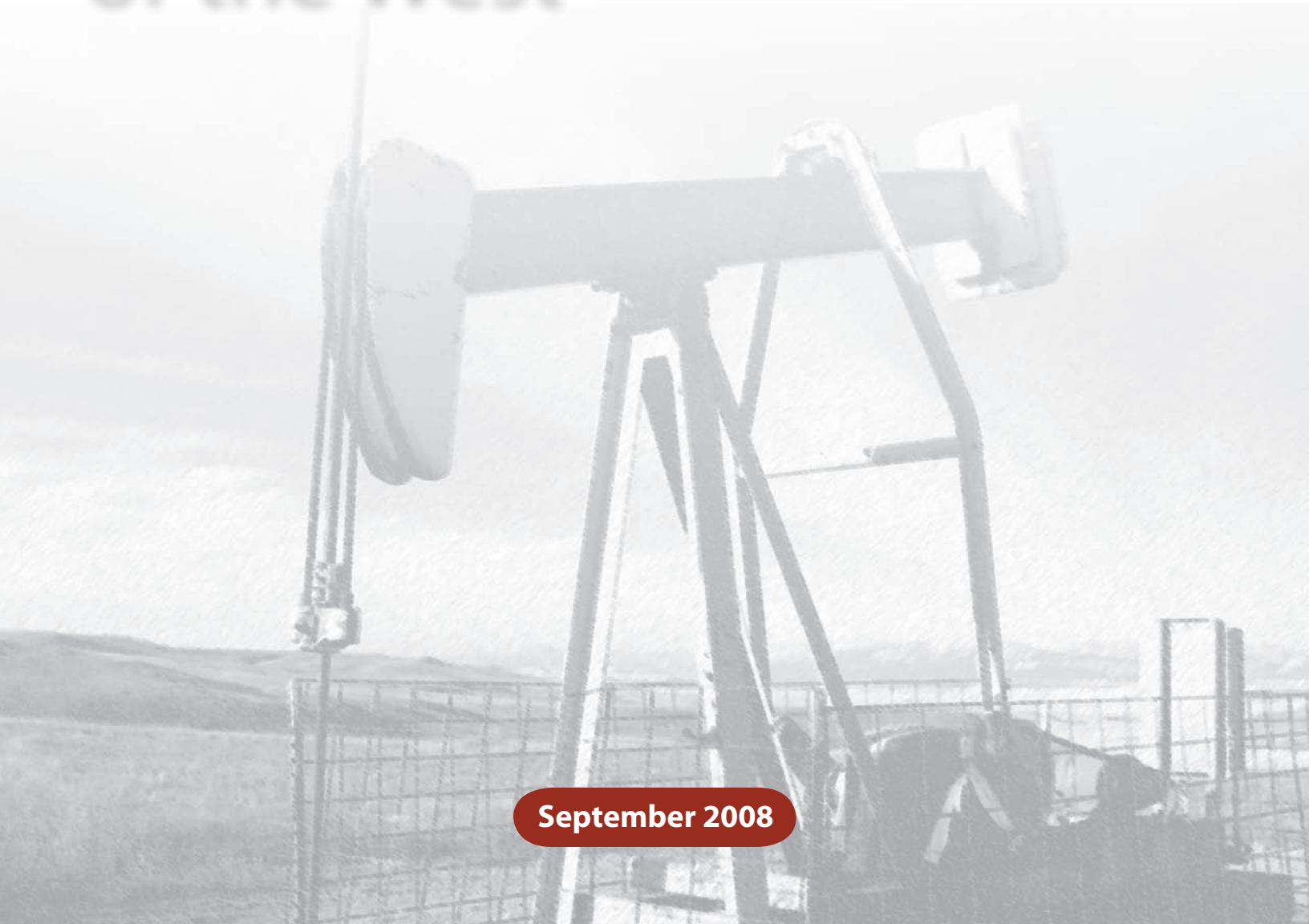


A Report from the *ENERGY AND THE WEST* Series by



Energy Development and the Changing Economy of the West



September 2008

Energy Development and the Changing Economy of the West

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ABOUT HEADWATERS ECONOMICS

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



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ABOUT THE *ENERGY AND THE WEST* SERIES

This report is the first in a series *Energy and the West* published by Headwaters Economics on the topic of energy development. This series is designed to assist the public and public officials in making informed choices about energy development that will benefit the region over the long term.

In the reports in the *Energy and the West* series listed below, we consider the policy context for energy development in the West. Our focus is the impact of energy development on states, counties, and communities, from the perspectives of economic performance (i.e., jobs, personal income, wages) and fiscal health (i.e., state and county budgets, revenues and expenses). The series also includes state and local area case studies that explore benefits and costs in greater detail.

Titles in the *Energy and the West* series:

- Energy Development and the Changing Economy of the West
- U.S. Energy Needs and the Role of Western Public Lands
- Fossil Fuel Extraction as a County Economic Development Strategy: Are Energy-focusing Counties Benefiting?
- Energy Revenue in the Intermountain West: State and Local Taxes and Royalties from Oil, Natural Gas, and Coal
- Impacts of Energy Development in Colorado, with a Case Study of Mesa and Garfield Counties
- Impacts of Energy Development in Wyoming, with a Case Study of Sweetwater County
- Potential Impacts of Energy Development in Montana, with a Case Study of the Powder River Basin
- Potential Impacts of Energy Development in New Mexico, with a Case Study of Otero County

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INTRODUCTION

The West is undergoing another surge in energy development. The last energy rush began in the 1970s and ended abruptly in the early 1980s. The current surge took off in the early 2000s and was stimulated by a number of factors including high prices and a political climate favorable to opening public lands for energy development.

Energy development today takes place in a context that is very different from the 1970s. Two major differences stand out and warrant attention.

First, the economy of the West has grown and diversified in recent decades and, with only a few exceptions, has made a transition away from a heavy reliance on resource extraction. The principal sources of prosperity in the region are now related to a modern service-, or knowledge-based, economy, and retirement and investment dollars.

Second, the economic role of public lands has changed since the 1970s. Rather than simply serving as a repository of raw materials to be extracted, today's public lands play an important role by providing recreational opportunities and scenery that attract and retain a growing population and businesses increasingly free to choose their location.

As a result, the relative economic importance of energy development has declined. And, unlike in the past, the development of oil, natural gas, and coal, if not handled properly, can have negative consequences on much larger sectors of the western economy.

In this report, we place the current surge in energy development in perspective. We examine how the West has changed, the rising importance of environmental amenities, and the relative role of energy development in the economy of western states.

Questions Answered in this Report:

1. How has the economy of the West changed in recent decades?
2. Why has the West's economy changed?
3. What is the economic role of western public lands?
4. Is the economy of the West reliant on energy development?

SUMMARY FINDINGS

The economy of the West today relies primarily on a mix of service industries, and retirement and investment income.

The economy of the West—including the rural West—is no longer dependent on resource extraction. It has adapted to a modern service-based economy by growing and diversifying in a wide variety of service- or knowledge-based occupations. Almost 90 percent of the growth in the economy of the West over the last three decades (1970 to 2000) came from service-related occupations (doctors, lawyers, engineers, schoolteachers, nurses, etc.), retirement, and money earned from investments.

In 2005, 45 percent of personal income in the West derived from people employed in service and professional occupations; another 40 percent was from non-labor income (retirement, investments, etc.). In the rural West (i.e., the West without its cities), 30 percent of personal income came from service-related industries, with non-labor income making up another 40 percent.

People and businesses today are mobile and are choosing the West because of its attractive mix of qualities.

The economy of the western U.S. has grown substantially in recent decades, more than doubling the number of jobs in the last 35 years. It has also undergone a significant change, shifting away from agriculture and resource extraction to a service-based economy that is both more diverse and stable.

There are many reasons why the economy of the West has changed. Most of these can be explained by the continued evolution of U.S. business in an ever-changing global economy. As global markets have opened and industries have been forced to compete on a larger playing field, price pressures and demands for specialized expertise have hurt some industries, changing almost every facet of how we produce goods and services, and created opportunities for U.S. industries with access to an educated work force and modern telecommunications and travel infrastructure. These trends have made it more difficult for industries in the U.S. to be low-cost producers of basic goods in competition with developing nations, and have placed a premium on more complex products and services.

As people and businesses have become more mobile, regions with a more compelling mix of qualities and infrastructure have proven to be more economically dynamic. The West has a high quality of life, with vast stretches of wild country, some of them protected as National Parks and wilderness areas. It also has developed modern telecommunications systems, highways, and a mix of large and small airports. This means it is possible to work as an engineer, software developer, or architect in a rural community, even if the clients, suppliers, and manufacturing facilities are located elsewhere. As owners move these businesses and jobs to the West's rural communities, they in turn have spawned expanded employment across a range of goods-producing and service-providing sectors.

Public lands, and their natural amenities, attract people and business.

In the past, the principal economic contribution from Forest Service and Bureau of Land Management (BLM) lands in the West came from the raw materials that were extracted and exported from the region. Today, there is an additional economic role for public lands. For many communities,

the recreational opportunities and scenery provided by public lands are essential components of a quality of life that attracts and retains people and their business, as well as retirees and investment income.

This shift in the role of public lands is clearly represented in the numbers: only 7 percent of all jobs in the West today are associated with some form of activity that may involve the use of public lands: mining, energy development, timber, travel, and tourism. The remaining 93 percent of the economy does not directly “use” public lands, though much of this economic activity, especially in rural areas, depends on the presence of these lands. Because of the importance of non-use values (scenery, wildlife habitat, *etc.*), activity that degrades natural amenities on public lands can undercut the competitive position of the larger economy.

Only one state in the West today is highly focused on energy development.

Mining, including oil and natural gas development and coal mining, remains a small part of the overall economy. In the West as a whole, mining represented 1 percent of total personal income in 2005. In the rural West, even in the midst of the current energy surge, mining represented 5 percent of total personal income in 2005.

Energy development is concentrated in five states in the West: Colorado, Montana, New Mexico, Utah, and Wyoming. Collectively for these states, personal income from employment in mining (including oil, natural gas, and coal) was 2.8 percent of total personal income in 2005.

Counties with significant energy development are relatively rare today. Five percent of the counties in the West can be counted as focusing on energy development as an economic development strategy, and four percent are experiencing a surge of energy-related jobs.

In the five energy-producing states of the West, energy is a relatively small portion of the economy, with the exception of Wyoming. The percent of total personal income from people employed in energy development is as follows: Colorado (2.2%), Montana (2.6%), New Mexico (3.1%), and Utah (1.4%).

The state the most focused on energy development is Wyoming (13.7% of total personal income). It is also the least economically diverse state in the nation (the most reliant on a single industry), and therefore the most vulnerable to change.

Definition of Mining

When we use the term “mining” in our *Energy and the West* series, we refer primarily to jobs and income associated with the development and extraction of oil, natural gas, and coal (fossil fuels). Because of restrictions placed on the level of detail available from the U.S. Department of Commerce and the Bureau of the Census, it is sometimes not possible to separate minerals mining from fossil fuels mining. In the five energy development states—Colorado, Montana, New Mexico, Utah, and Wyoming—mentioned in this report, the bulk (over 80%) of “mining” is related to energy development.

For more information, refer to [Appendix](#).

What follows is a more detailed explanation of the above findings.

HOW HAS THE ECONOMY OF THE WEST CHANGED IN RECENT DECADES?

The West

In order to understand the role of energy development in the West today, it is useful to put the oil and natural gas industry and coal mining into a larger economic context, to view the current energy surge from a historical perspective, and to explore how energy development fits with other economic development trends.

In this report, we define the West as the following 11 states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming (Map 1). Later in the report, we define the Intermountain West as the following seven states: Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming. The bulk of onshore oil and natural gas development and coal mining takes place in the Intermountain West.

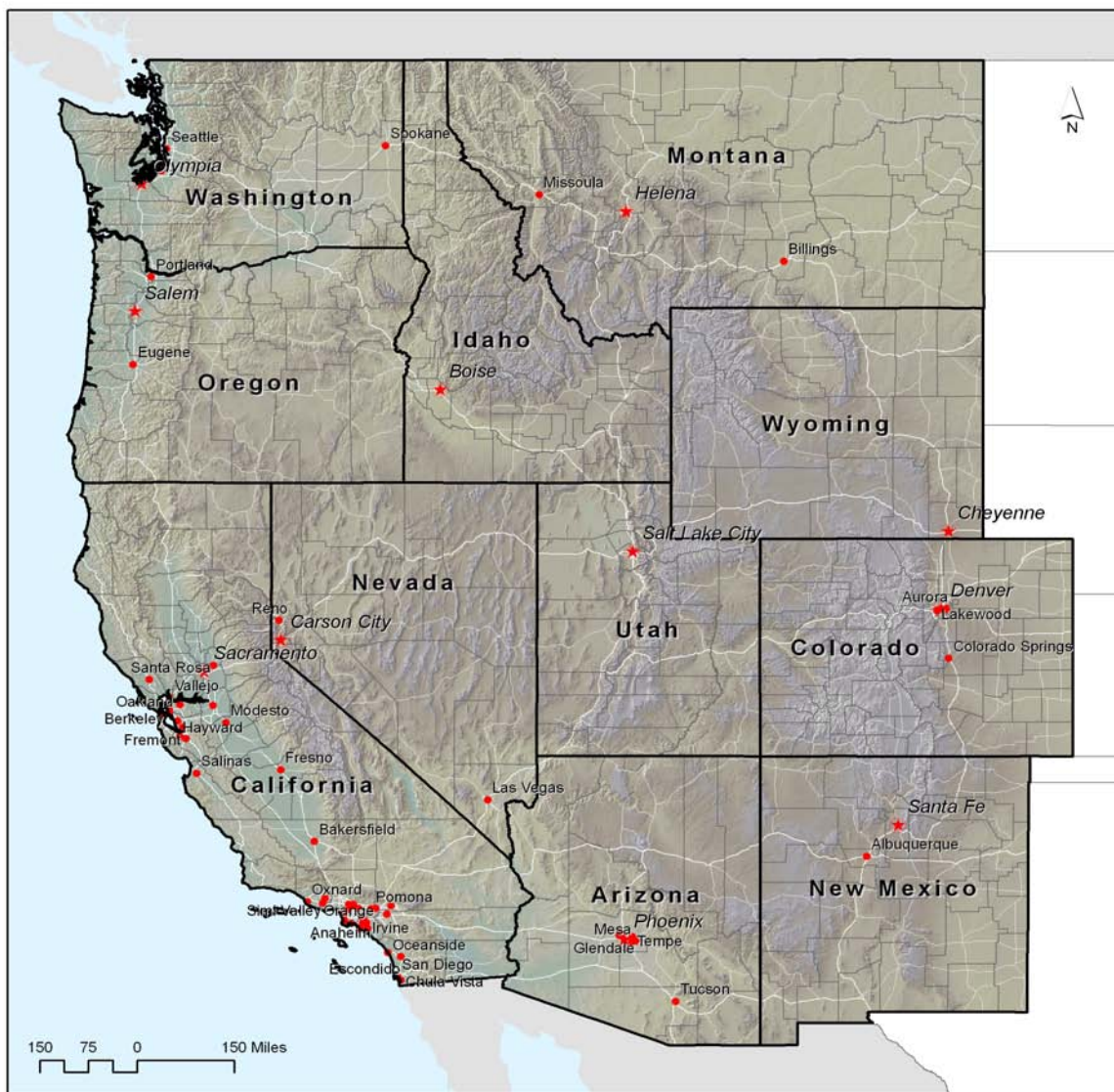
The Economy of the West

The long-term historic trends in the economy of the West can be seen in Figure 1, which shows the growth of real personal income over time from various sources. We use personal income as the metric to show how the economy has changed for a couple of reasons. First, it is a measure of personal prosperity. In this report, we are primarily interested in the welfare of the people of the West. Second, we use personal income because it allows us to document the growth of income from sources not directly related to labor. Retirement and investment income, collectively referred to as “non-labor” income, are a significant portion of recent economic growth in the West.

From 1970 to 2000, 53 percent of the net growth in personal income occurred in service and professional industries—a mixture of high- and low-wage service occupations that includes lawyers, architects, engineers, doctors, and nurses, as well as schoolteachers and shopkeepers. Another 33 percent of net growth in personal income was in the form of non-labor income. This category includes dividends, interest and rent, and government transfer payments, and can be more easily described as money earned from investments and retirement.

Together, service-based occupations and non-labor income constitute 86 percent of the growth in the economy of the West during the last three decades. In contrast, mining (including oil and natural gas development), timber, and agriculture did not contribute significantly to income growth over the last 30 years, collectively adding less than 1 percent to new income from 1970 to 2000.¹

Map 1. The West

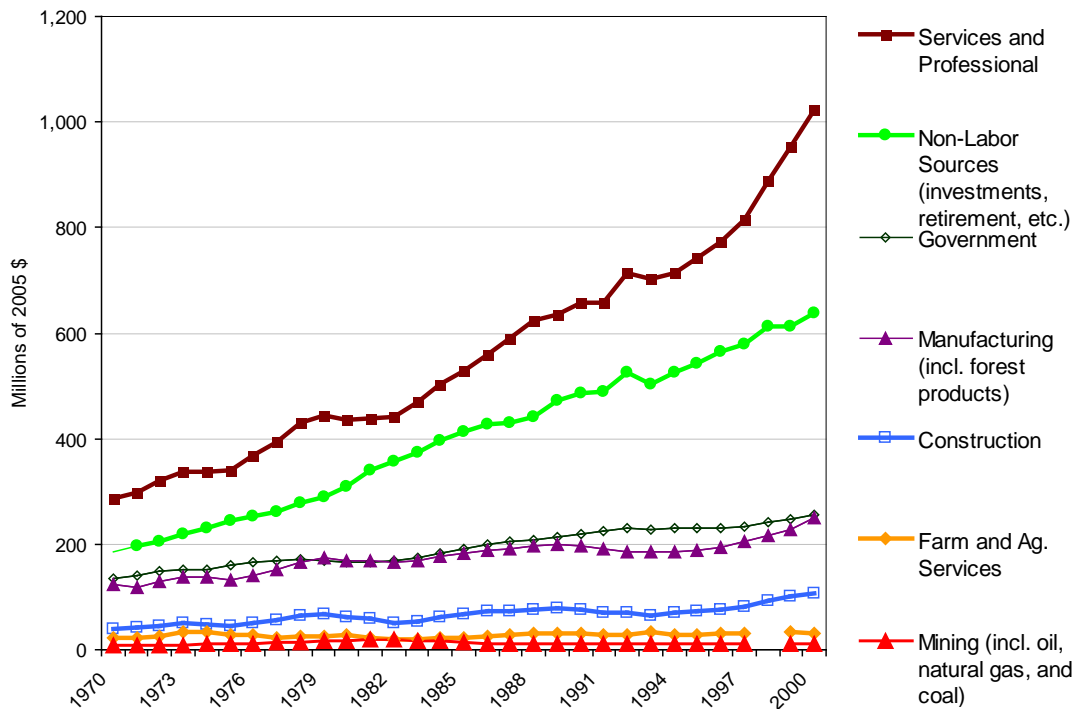


Political Boundaries		Major Roads	
	States		Limited Access Highway
	Counties		Principal Highway
Major Cities			
	State Capital		
	Population > 100,000		

Data Sources: US Census, US Geological Survey
 World Mercator Projection
 Map Date: 8/7/2008

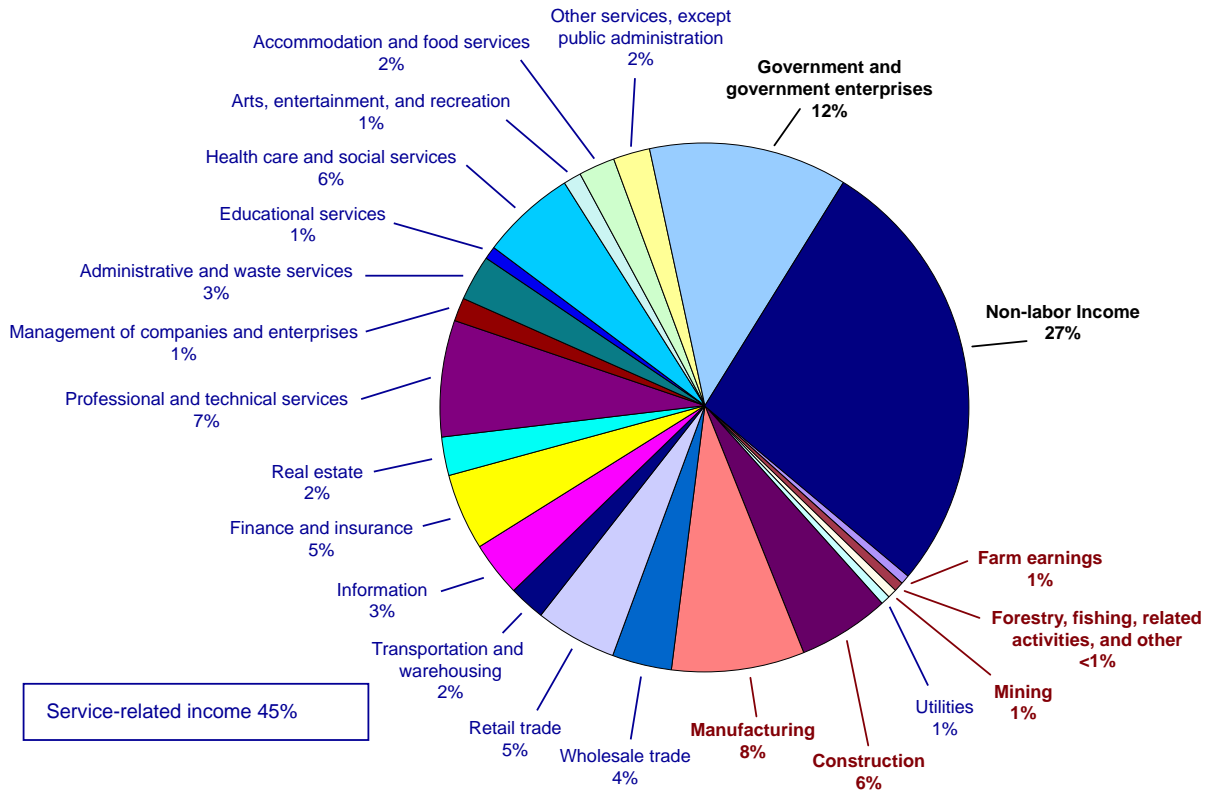


Figure 1. Personal Income in the West, by Source, 1970–2000



These trends continue today. In 2005, 45 percent of total personal income was in the form of wages earned by people employed in service-related occupations, while another 27 percent was from non-labor sources. These proportions are about the same as they were in the year 2000. Of particular note, given the recent energy surge, is the fact that “mining,” which includes oil and natural gas development, is still a relatively small component of the economy of the West, providing 1 percent of total personal income.²

Figure 2. Personal Income in the West, by Source, 2005



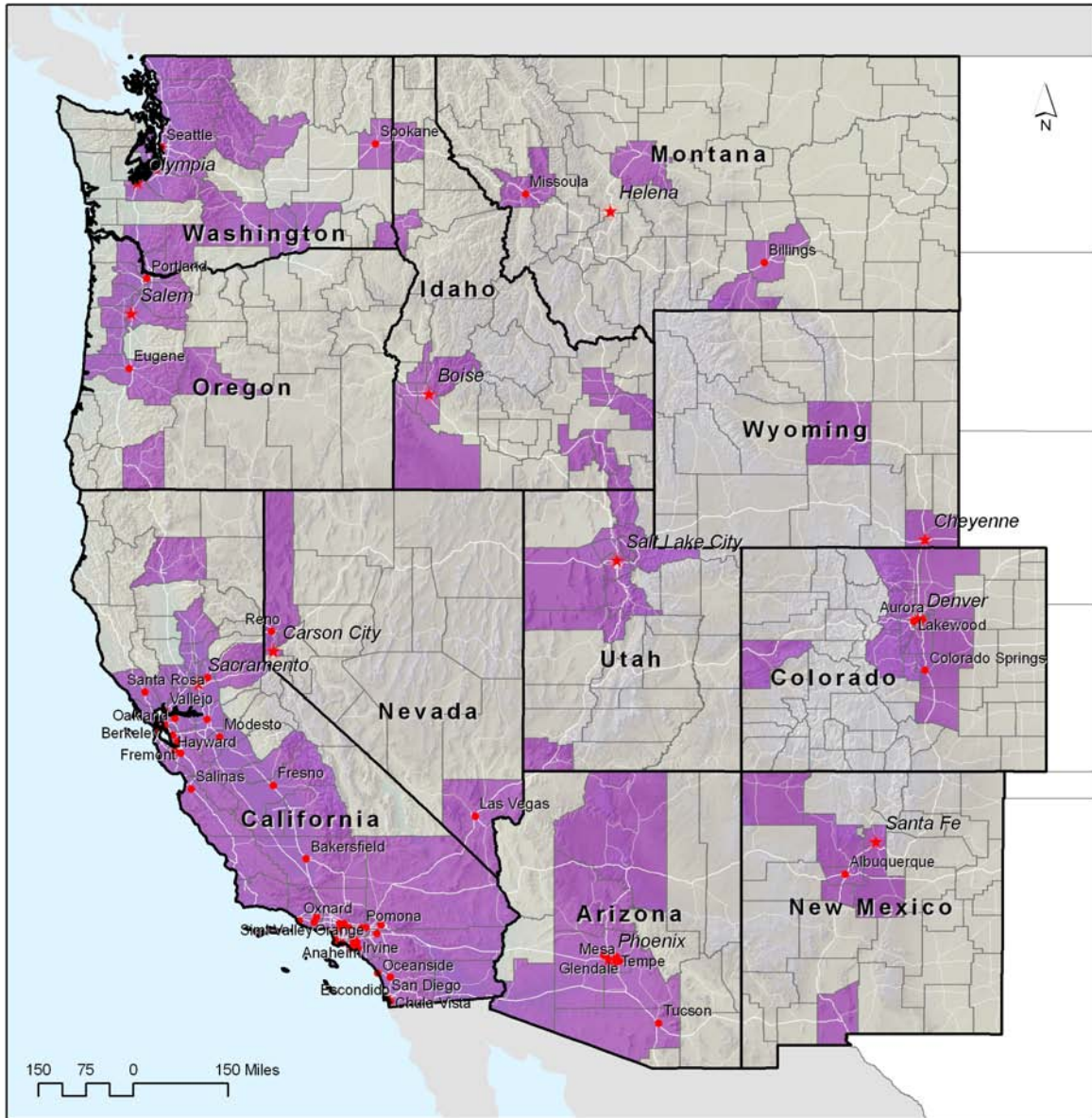
Note: Industry categories represented in this pie chart differ from those shown in the previous line chart. Before 2000, the U.S. Department of Commerce organized industry-level details on employment and income according to the Standard Industrial Classification (SIC) system. Since 2000, the Department of Commerce has used a different system called the North American Industrial Classification (NAICS) system.

The Economy of the Rural West

The West is the most urbanized part of the U.S., with 90 percent of people living in metropolitan areas.³ As a result, the trends shown in Figures 1 and 2 largely represent urban phenomena. A closer look at the rest of the West—the rural West without metropolitan areas—reveals similar findings.

In the non-metropolitan West, a third of personal income in 2005 was generated by service-related industries. Non-labor income was relatively larger than in the rural West, making up more than 40 percent of total personal income.⁴ Mining, including oil and natural gas development, constituted less than 5 percent of total personal income and 2 percent of employment.⁵

Map 2. The Rural West



Political Boundaries		Major Cities	
States	State Capital	Population > 100,000	
Metropolitan Counties	Major Roads	Limited Access Highway	
Rural Counties	Principal Highway		

Data Sources: US Census, US Geological Survey
 World Mercator Projection
 Map Date: 8/7/2008



These figures point to the magnitude of the economic shift that has taken place over the last several generations: a regional transition from an economy focused on agriculture and natural resource extraction to a more diversified mix of industries that more closely mirrors the evolving national economy.

WHY HAS THE WEST'S ECONOMY CHANGED?

Globalization Changes the Competitive Position of the West

As global markets have opened and U.S. industries have been forced to compete on a larger playing field, price pressures and demands for specialized expertise have hurt some industries, changing almost every facet of how we produce goods and services. This has created opportunities for U.S. industries with access to an educated work force and modern telecommunications and travel infrastructure. These trends have made it more difficult for industries in the U.S. to be low-cost producers of basic goods in competition with developing nations, and placed a premium on more complex products and services.

As a result, along with the rest of the developed world, the U.S. economy has made several important shifts. The first was from an agrarian economy to one dependent largely on manufacturing. The next shift was from manufacturing to services. Much of this last shift happened in the 1980s and 1990s. By the early 2000s, it became clear another shift was taking place: from services to what some economists call the “knowledge-based” economy. Whether that is the right label is open to discussion. What is important to recognize is that more and more of the value of a finished product or service is attributable to the types of occupations that require thought, and the exchange of ideas and information. Engineers, architects, designers, financiers, marketers and, almost as a caricature of this new economy, “information brokers,” are all part of this growing knowledge-based economy. In U.S. Department of Commerce and Bureau of the Census data, these occupations are broadly categorized as “services.”

A fundamental change in the nature of goods production has accompanied this shift toward service- and knowledge-based enterprises in developed economies like the U.S. While goods were made locally in the past, today the assembly line is scattered across the globe. This means the final stages of production, where factory workers are employed bolting items together or soldering circuit boards, can be located on one side of the world, while the “knowledge-based” activities—the design, finance, marketing, and management—can be sited on the other side of the world.

The West as a whole has benefited from these economic changes. The regional economy is successfully competing for higher value and more skilled pieces of the global assembly line, attracting a growing number of mobile or “footloose” industries. The West has also developed modern telecommunications systems, fast highways, and a mix of large and small airports—all of which connect a growing number of people in the region to larger markets.

These developments—the changing nature of goods production and modern forms of communicating and travel—have allowed the West to develop a service and knowledge-based economy. This trend is also supported by the region’s high quality of life, which includes vast stretches of wild and scenic country, some of which is protected as National Parks and wilderness areas. As we explore below, the health of the West’s economy is increasingly linked to natural amenities on public lands.

WHAT IS THE ECONOMIC ROLE OF WESTERN PUBLIC LANDS?

Natural Amenities Attract Business, and Retirement and Investment Dollars

In the past, public lands served, to a large extent, as a repository of raw materials to be harvested or extracted. As the economy of the West has grown and matured in recent decades, with Americans enjoying more leisure time, with an aging population, and with increased mobility of the people, the economic role of public lands has expanded to include recreation and tourism. In addition to these roles, public lands are now important as a setting that makes adjacent communities attractive places to live and do business.

Today, the public lands managed by the Forest Service and BLM play an important role in attracting entrepreneurs who can locate anywhere, retirees seeking towns with a high quality of life, and “amenity migrants” who choose where to live first, and then either find work or create business opportunities.

The body of literature documenting this phenomenon is large and growing.⁶ One detailed study of the relationship between protected public lands and economic development was conducted by the authors of this report. The study, published in the journal *Society and Natural Resources*, found that counties in the West with wilderness, National Parks, National Monuments and other protected public lands set aside for their wildland characteristics, play an important role in stimulating economic growth—and the more protected the lands are, the stronger their positive impact on economic growth.⁷

The study also found that there are many other important pieces of the economic development puzzle, and that not all communities benefit equally from protected lands. Access to metropolitan areas, via road and air travel, is also important. The education of the workforce, the arrival of newcomers, and a number of other factors allow some areas to flourish and to take advantage of protected public lands as part of an economic development strategy.

The role that public lands play in providing a high quality of life helped many communities in the West grow and diversify in the 1990s. As one of the reports in the *Energy and the West* series shows, communities like Grand Junction, Colorado recovered well from the energy bust that occurred in the 1980s largely because it was discovered as a good place to live and retire. Surrounding Forest Service and BLM lands were an important part of the success that led to the “amenity” boom of the 1990s. The economy that developed exists today side-by-side with another rush for energy resources. See the report called *Impacts of Energy Development in Colorado, with a Case Study of Mesa and Garfield Counties* for more details.

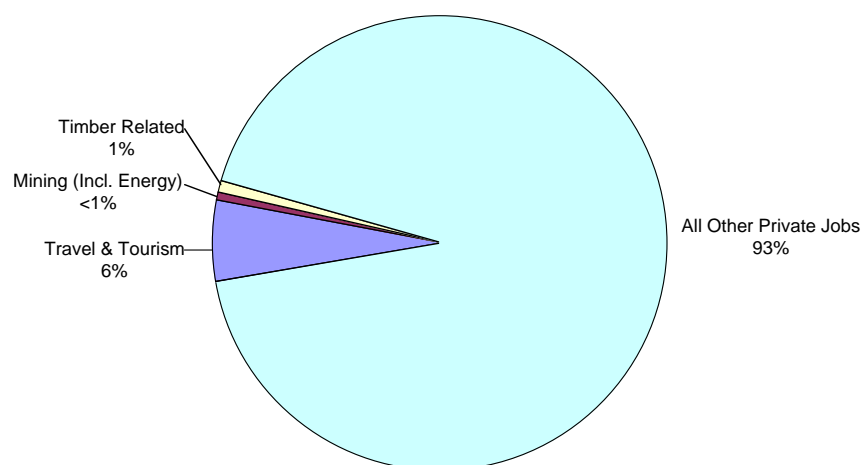
There will be continued debate over the best uses of public lands in years to come, and more discussion about how different uses can coexist with each other. As this debate unfolds, a wealth of data illuminating the West's fundamental economic restructuring has become available. These data indicate it is important to consider the scale and compatibility of direct uses with the growing importance of non-use values such as the advantage of public lands as a setting that attracts and retains people and businesses.

Figure 3 shows the scale of typical economic activities associated with public lands uses relative to all other private industry. The graph uses jobs as a measure, and does not include the self-employed, government, or non-labor income. As a result, it is best viewed as a description of relative, not absolute, economic contribution.

To put the changing economic role of public lands in perspective, it helps to see what proportion of the West's economy relies on industries that, at least in part, depend on various uses of public lands. Figure 3 shows that activities normally associated with various uses of public lands—travel and tourism, mining (including oil and natural gas development), and the timber industry—constitute approximately 7 percent of all jobs in the West (using 2006 numbers, the latest available). Ninety-three percent of employment, by contrast, has no direct link to the use of public lands.⁸

As a growing body of research has shown, many jobs in the West are in a mix of industries that are more likely to grow and thrive in a setting where public lands are attractive for recreation and as the scenic backdrop for communities. As a result, the balancing act of managing public lands, from an economic perspective, is not just between uses of the land but should also include consideration of much larger economic benefits associated with the non-use values of those lands.

Figure 3. Jobs Typically Associated with Uses of Public Lands in the West, 2006



IS THE ECONOMY OF THE WEST RELIANT ON ENERGY DEVELOPMENT?

Energy Development in the Intermountain West

Exact estimates of the number of acres leased for energy development are hard to ascertain because not all leases are captured by federal data sources, and the pace of new applications makes it difficult to keep track of up-to-date figures. According to statistics provided by the BLM, there are currently 34.9 million acres under lease in the Intermountain West.⁹ To give a sense of scale, this is an area about the size of the state of Florida.

The bulk of onshore public lands energy development takes place in the Intermountain West, and in particular in the states of Colorado, Montana, New Mexico, Utah, and Wyoming. A study by the U.S. House Committee on Natural Resources estimates that new drilling for oil and natural gas on public lands has increased exponentially – by 361 percent from 1999 to 2007.¹⁰

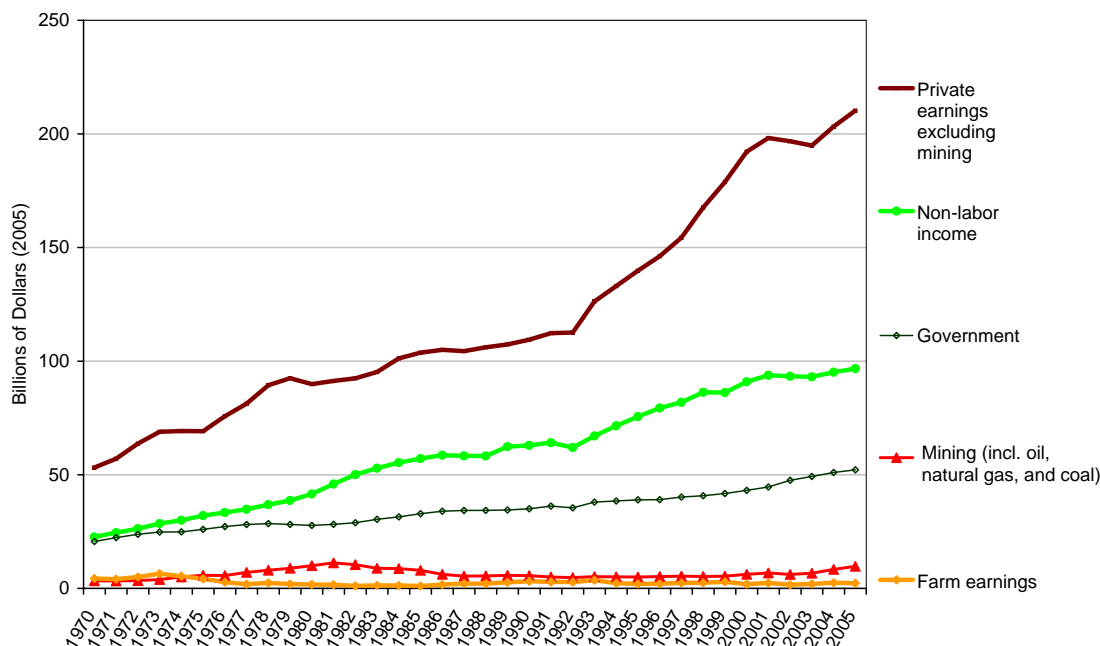
Figure 4 shows the change in personal income (in real dollars) from employment in mining (indicated in red, this category includes oil, natural gas, and coal) for the states of Colorado, Montana, New Mexico, Utah, and Wyoming, combined. This is compared to personal income from other sources.

The current energy surge can be seen in the upward turn of the red line (mining, including oil and natural gas development) in recent years, but even with this growth the industry remains small overall. In 2005, mining represented less than 3 percent of total personal income in the combined economy of the five states. (This is likely an over-estimate because the U.S. Department of Commerce’s definition of “mining” includes minerals mining in addition to fossil fuels mining.)

In 2005, employment in mining-related industries in these states generated 9.7 billion dollars of personal income. This is one-tenth that of all non-labor income (retirement, investments), which totaled \$97 billion in that year. The rest of the economy (all private labor earnings not counting mining) yielded over \$210 billion in personal income in 2005.¹¹

As noted earlier in this report, we use personal income as an economic measure because it reflects the well-being of individuals and includes the large and growing non-labor income economy. In addition, the most reliable and detailed information on long-term trends, available from the U.S. Department of Commerce, is personal income data.

Figure 4. Personal Income from Employment in Mining (Energy Development), Compared to Other Sources of Income, in Colorado, Montana, New Mexico, Utah, and Wyoming (collectively), 1970–2005



Energy Development in Colorado, New Mexico, Montana, Utah, and Wyoming

The aggregate picture of the five Intermountain West states with energy development can hide important differences between states.

Figure 5 shows the contribution of mining (energy jobs plus minerals mining and therefore an over-estimate) to each of the states' economies. Figure 6 does the same in terms of contributions to total personal income from people employed in energy development.

In Colorado in 2005, mining, including energy development, accounted for 1 percent of employment and 2.2 percent of total personal income. In Montana, 1.4 percent of employment and 2.6 percent of personal income was from mining and energy development. In New Mexico, the contribution of mining and energy development was a little larger, accounting for 2.1 percent of employment and 3.1 percent of personal income. In Utah, 0.7 percent of employment and 1.4 percent of personal income was from mining and energy development.¹²

In contrast, for the U.S. economy as a whole, less than 1 percent of employment and personal income was from mining in 2005.¹³ The only state for which energy development is a significant portion of the economy is Wyoming, where mining contributed 7.8 percent of total employment and 13.7 percent of total personal income in 2005.¹⁴

The Impact of Energy Development on Counties

In other reports in the *Energy and the West* series, we take a closer look at counties that focus on the extraction of energy resources (7% or more of total employment in energy-related sectors). We call these “energy focusing” (EF) counties. We also look at counties where there has been a recent surge in energy development (100 or more new energy-related jobs in the current surge). We call these “energy surging” (ES) counties.

For both types of counties, we look at the consequence of energy development as an economic development strategy, measuring such things as job creation, personal income, education rates, economic diversity, and ability to attract investment dollars. We compare each county type to their peers in the West who, either by choice or lack of resources, have not made energy development part of their economic development strategy.

Of the 414 counties in the West today, 26 (6% of all counties) can be called “EF.” Only 22 counties (5% of all counties), can be described as “ES.” In other words, the majority of the counties of the West—94 percent—are not significantly engaged in energy development. This is not to say energy development is unimportant, but that it is not representative of the broader economic experience of most places in the West today.

For more about the economic implications of energy development as an economic development choice, see the two reports in the *Energy and the West* series on these topics:

- Fossil-Fuel Extraction as a County Economic Development Strategy: The Performance of Energy - Focusing Counties in the West

Wyoming—the West’s Only State Highly Focused on Energy Development

Wyoming is unusual in the Intermountain West for its high economic dependence on energy development. Figure 7 shows the long-term trends in the contributions of mining, including energy development, to personal income in the state of Wyoming compared to other sources of personal income. There was a notable energy surge that began in the 1970s and started declining in the early 1980s—the “boom and bust” as it is called.

In the 1980s, personal income from people employed in other sectors of the economy (the top line in Figure 7) fluctuated up and down with the trends in mining and energy development sectors. In the 1990s, the rest of the economy (private earnings excluding mining) began to rise independently, without a big push from mining. Beginning in the 2000s, Wyoming entered another energy surge.

Figure 5. Employment in Mining (Energy Development) as a Share of Total Employment in Colorado, Montana, New Mexico, Utah, and Wyoming, 2006

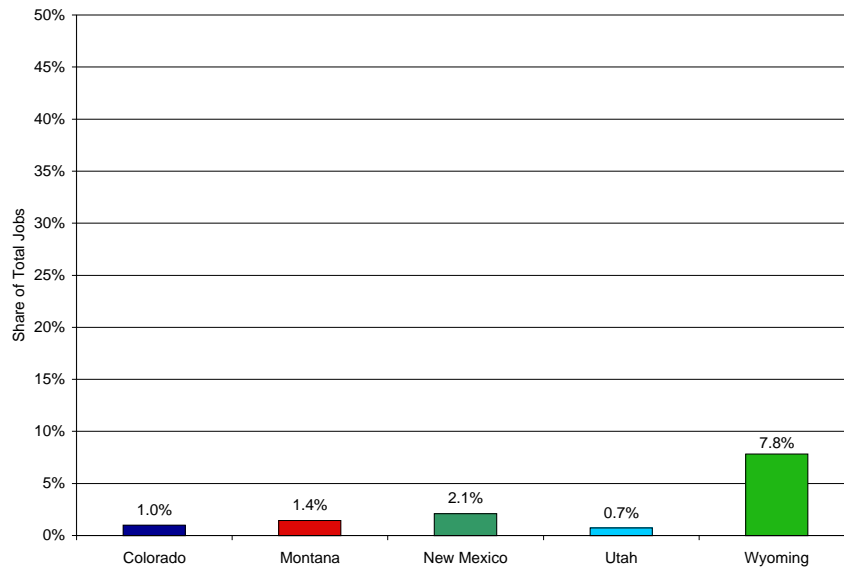


Figure 6. Personal Income from Employment in Mining (Energy Development) as a Share of Total Personal Income in Colorado, Montana, New Mexico, Utah, and Wyoming, 2006

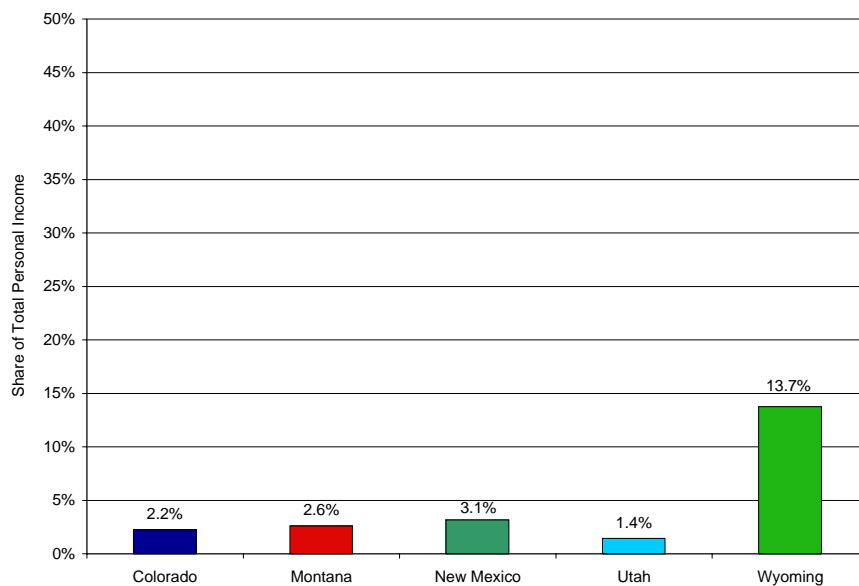
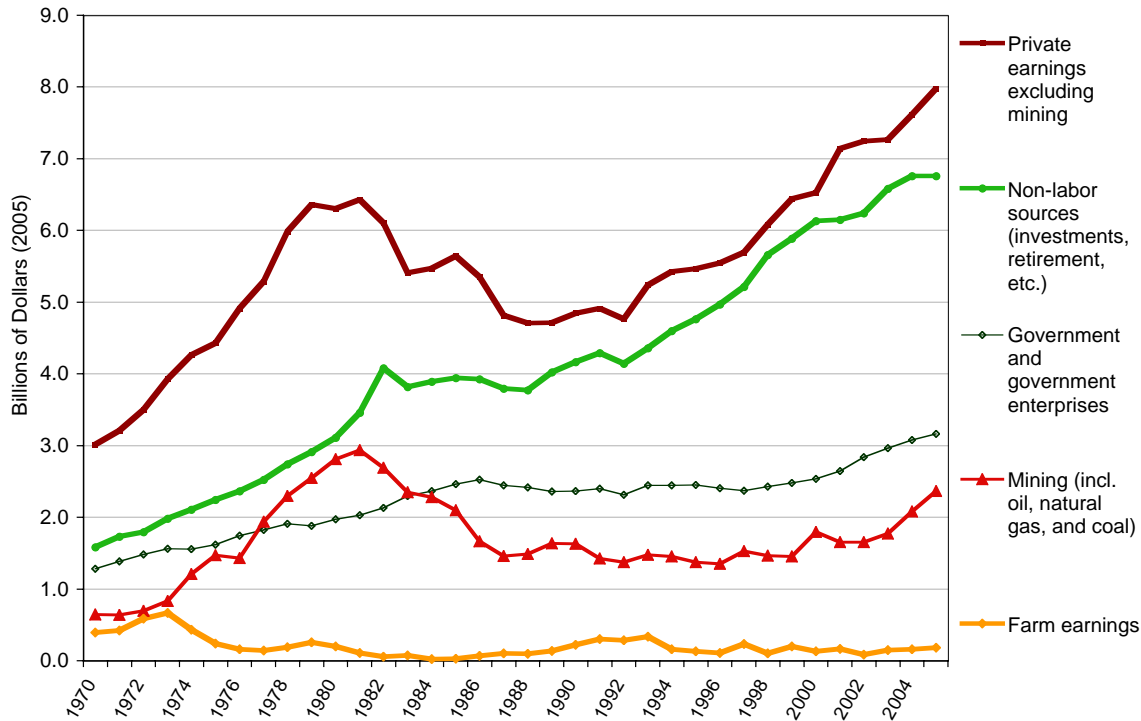


Figure 7. Personal Income from Employment in Mining (Energy Development) in Wyoming Compared to Other Sources of Income, 1970–2005



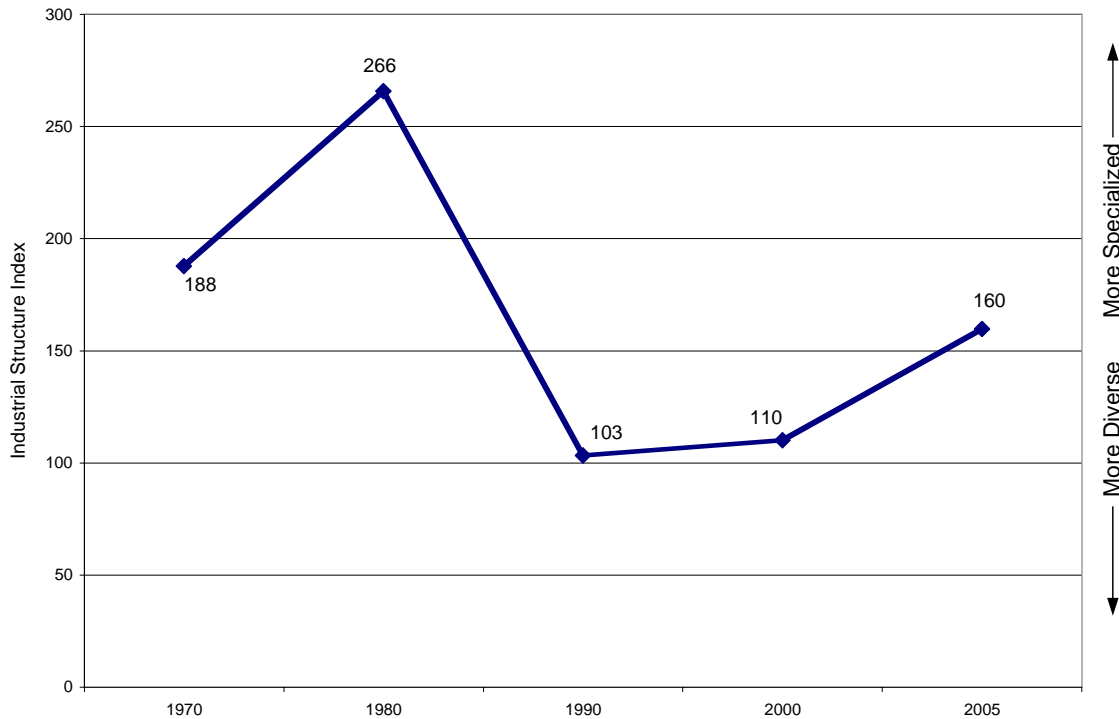
Wyoming’s reliance on energy development makes it an outlier. It is the most single-industry focused state in the nation. This also means it has the least diverse economy. Diversity is important for long-term economic success because it helps economies adapt to ever-changing economic conditions and trends. A specialized economy, in contrast, is vulnerable to large fluctuations when the industry it depends on undergoes significant changes.

To put Wyoming’s dependence on energy development into context, its economy is three times more specialized than that of Alaska, and more than ten times more specialized than its nearest energy-producing rival in the Intermountain West, New Mexico.

Figure 8 shows the Federal Reserve’s index for industrial structure from 1970 to 2005. A higher index score indicates a more narrowly specialized economy. When an energy rush is under way (the 1970s), the state’s economy becomes more specialized, and when a bust hits (the 1980s) it becomes relatively more diverse.¹⁵ As the current energy surge winds up, the state’s economy is becoming once again relatively more specialized.

The Federal Reserve's Industrial Structure Index of the five energy-producing states in the West is as follows: Colorado (4.74), Montana (16.51), New Mexico (22.83), Utah (2.33), and Wyoming (132.56). A lower score means the state's economy more closely resembles that of the nation (i.e., a diverse economy).¹⁶

Figure 8. Economic Specialization in Wyoming, 1970–2005



This economic specialization at the state level is unique, and points to the difficulty Wyoming faces in trying to attract and retain other forms of economic activity. Unlike other Intermountain states, Wyoming has not been able to build a more diverse mix of service and professional industries. The result is the most volatile economy in the region. In the 1980s when energy sectors crashed, for example, Wyoming lost over 11 percent of its population and 6 percent of its job base.¹⁷

Wyoming's economy, and that of other states with relatively high degrees of energy development, is explored further in our *Energy and the West* series. To learn more about the states of Wyoming, Colorado, New Mexico, and Montana, including the tax implications of energy development and the benefits and costs to specific counties and communities, visit: www.headwaterseconomics.org/energy.

CONCLUSIONS

In recent decades the economy of the West has grown and diversified and, with the exception of Wyoming, depends little on resource extraction industries as a whole. This is true as well for the rural counties of the West in aggregate, even in the midst of today's energy surge.

Concurrent with this change, the economic role of public lands has diversified. Today, lands managed by the Forest Service and BLM are more than just repositories of raw materials; they also play an important role by providing recreational opportunities and a high quality of life that makes surrounding communities attractive places to live and do business.

Decision makers entrusted with managing public lands for long-term public benefit will ideally ensure that energy development, or any other high impact land use, does not compromise the values and qualities that support prosperity for most residents and businesses in the West.

APPENDIX

NORTH AMERICAN INDUSTRIAL CLASSIFICATION SYSTEM (NAICS) DEFINITIONS

The language below is copied verbatim from the U.S. Census Bureau's 2002 NAICS Manual <http://www.census.gov/epcd/naics02/index.html>

211 Oil and Gas Extraction

Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Establishments in this subsector include those that operate oil and gas wells on their own account or for others on a contract or fee basis. Establishments primarily engaged in providing support services, on a fee or contract basis, required for the drilling or operation of oil and gas wells (except geophysical surveying and mapping, mine site preparation, and construction of oil/gas pipelines) are classified in Subsector 213, Support Activities for Mining.

213111 Drilling Oil and Gas Wells

This U.S. industry comprises establishments primarily engaged in drilling oil and gas wells for others on a contract or fee basis. This industry includes contractors that specialize in spudding in, drilling in, re-drilling, and directional drilling.

213112 Support Activities for Oil and Gas Operations

This U.S. industry comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related construction activities). Services included are exploration (except geophysical surveying and mapping); excavating slush pits and cellars, well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells.

2121 Coal Mining

This industry comprises establishments primarily engaged in one or more of the following: (1) mining bituminous coal, anthracite, and lignite by underground mining, auger mining, strip mining, culm bank mining, and other surface mining; (2) developing coal mine sites; and (3) beneficiating (i.e., preparing) coal (e.g., cleaning, washing, screening, and sizing coal).

213113 Support Activities for Coal Mining

This U.S. industry comprises establishments primarily engaged in providing support activities for coal mining (except site preparation and related construction activities) on a contract or fee basis. Exploration for coal is included in this industry. Exploration includes traditional prospecting methods, such as taking core samples and making geological observations at prospective sites.

ENDNOTES

- ¹ U.S. Department of Commerce, *Regional Economic Information System (REIS)*, 2008. Bureau of Economic Analysis. Washington, D.C.
- ² Ibid.
- ³ U.S. Census Bureau, *Population Estimates*, 2008. Calculations based on dividing the total number of people living in metropolitan statistical areas (MSAs) by the total population of the West.
- ⁴ U.S. Department of Commerce, *REIS 2008*.
- ⁵ Ibid. Mining personal income based on estimates. Employment based on non-disclosed data from Bureau of Land Management (BLM), Division of Land and Resource Information Systems. Data sources for the wells are the state Oil and Gas Conservation Commissions of Labor Statistics, Quarterly Census of Employment and Wages (QCEW).
- ⁶ See, for example: J.B. Cromartie and J.M. Wardwell, "Migrants Settling Far and Wide in the Rural West." *Rural Development Perspectives* 14 (1999): 2–8; W. B. Beyers, D.P. Lindahl, and E. Hamill, "Lone Eagles and Other High Fliers in the Rural Producer Services." Paper presented at the Pacific Northwest Regional Economic Conference, May 1995, Missoula, Montana; G. V. Fuguitt and C.L. Beale, "Recent Trends in Nonmetropolitan Migration: toward a New Turnaround?" *Growth and Change* 27 (1996): 156–174; D. A. McGranahan, "Natural Amenities Drive Population Change." Food and Rural Economics Division, Economic Research Service, U.S. Department of Agriculture. Report 781 (1999): 1–24; A. J. Hansen et al., "Ecological Causes and Consequences of Demographic Change in the New West." *BioScience* 52 (2002): 151–162.
- ⁷ R. Rasker, "An Exploration into the Economic Impact of Industrial Development Versus Conservation on Western Public Lands." *Society and Natural Resources* 19 (2006): 191–207; R. Rasker et al., *Public Lands Conservation and Economic Well-Being*. Bozeman, Montana: Sonoran Institute, 2004; R. Rasker, et. al, *Prosperity in the 21st Century West*. Bozeman, Montana: Sonoran Institute, 2004.
- ⁸ U.S. Census Bureau, *County Business Patterns (CBP)*, 2007. Travel and Tourism is defined using the approach outlined by Kuhbach et al. in "US Travel and Tourism Satellite Accounts for 1998–2003." Bureau of Economic Analysis, U.S. Department of Commerce, Washington, DC, September 2004. Timber Related includes NAICS industry codes (113, 1153, 321, 322) that include forestry and lumber, and paper and wood products manufacturing. Mining is defined as major NAICS code 21: Mining, Quarrying, Oil and Gas Extraction.
- ⁹ Bureau of Land Management (BLM) Division of Land and Resource Information Systems, *Public Land Statistics*, 2008. Accessed online: http://www.blm.gov/nils/GeoComm/Metadata/landmin/BLM_MAP_OIL_AND_GAS.htm
- ¹⁰ U.S. House of Representatives Committee on Natural Resources, "The Truth About America's Energy: Big Oil Stockpiles Supplies and Pockets Profits." Washington, D.C.: U.S. GPO, 2008. Accessed online: <http://resourcescommittee.house.gov>
- ¹¹ U.S. Department of Commerce, *REIS 2008*.
- ¹² Ibid.
- ¹³ U.S. Census Bureau, *County Business Patterns (CBP)*, 2007.
- ¹⁴ Ibid.
- ¹⁵ T. R. Smith, "The Relationship between the Tenth District Economy and the National Economy", *Federal Reserve Bank of Kansas City Economic Review* Fourth Quarter, 81 (1996): 77–90. <http://www.kc.frb.org/publicat/econrev/pdf/4q96smit.pdf>. B. McVeigh, Wyoming Economic Analysis Division, "Wyoming Economic Outlook," presentation to the American Association of Petroleum Geologists, Billings, Montana, June 11, 2006.
- ¹⁶ Ibid.
- ¹⁷ U.S. Department of Commerce, *REIS 2008*.



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