U.S. Department of the Interior

Economic Report

FY 2013

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Executive Summary

The U.S. Department of the Interior (DOI, or Interior) plays an integral role in protecting America's natural resources and heritage, honoring our cultures and tribal communities, and supplying the energy to power our future. Interior's people, programs, and responsibilities impact Americans across all 50 States. The Department is the steward of 20 percent of the Nation's lands, managing national parks, national wildlife refuges, and public lands and assisting States, Tribes, and others in the management of natural and cultural resources. Interior grants access to public lands and offshore areas for renewable and conventional energy development—covering roughly a quarter of the Nation's domestic supplies of oil and natural gas—while ensuring safety, environmental protection and revenue collection for the American public. Interior oversees the protection and restoration of surface mined lands and is also the largest supplier and manager of water in the 17 Western States, assisting others with water conservation and extending water supplies and providing hydropower resources to power much of the 17 Western States. The Department serves as Trustee to American Indians and Alaska Natives, fulfilling essential trust responsibilities to tribal communities. Interior's Office of Insular Affairs (OIA) carries out the department's responsibilities for U.S.-affiliated Insular Areas, which include the territories of Guam, American Samoa, the U.S. Virgin Islands, the Commonwealth of the Northern Mariana Islands, and three sovereign freely associated states (FAS, which includes the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau). The Department supports cutting edge research in geology, hydrology, and biology, informing resource management and community protection decisions at Interior and across the world.

This report represents the fifth in a series of annual economic reports initiated with a preliminary report released by Interior in December 2009. In the on-going effort to improve our data reporting and estimation while minimizing administrative burden, the FY 2013 report adopts a more streamlined format to provide information on economic contributions and value added, employment supported, and economic values associated with some of the outputs produced on Interior land.[1] Comparing output and value added, value added more accurately captures the dollar-value of Interior's resource-management activities.

Although estimates of value added and economic contributions provide important information on the effect of expenditures on outputs from Interior lands in local economies, there are additional economic values placed on DOI resources, not captured in markets, which would give a more complete accounting of Interior's activities. For example, the complete accounting of impacts would include the value individuals place on recreation above and beyond their expenditures; contributions to U.S. energy security; preservation of natural habitats and endangered species; and opportunities associated with water use. While there are established methods to value environmental benefits, their estimation is outside the scope of this report.

[1] More detailed treatments of topics from this report are available in the FY 2012 Economic Report.

In FY 2013 production and activities on DOI lands were associated with about $200 billion in value added, and $360 billion in economic output, supporting an estimated 2 million jobs. Information related to economic contributions, value added, employment, and other economic values associated with Interior's diverse activities is summarized below:

- **Recreation**: In FY 2013, Interior's lands hosted an estimated 407 million visits[2]. The net economic value of a visit to Interior lands varies depending on the activity. For FY 2013, value added provided by visitation to Interior sites was estimated to be $25 billion, economic output was estimated to be $41 billion and about 355,000 jobs were supported.
- **Renewable Energy**: In FY 2013, Interior lands and facilities produced 40 million MWh of hydropower. Also, in FY 2013, Interior approved the installation of 826 MW of wind capacity and 1,000 MW of solar power projects on public lands. Renewable energy activities were estimated to contribute about $5 billion in output and support over 20,000 jobs. In aggregate, generating electricity with renewable energy reduces the amount of electricity supplied by fossil fuel plants, along with the associated emissions, and reduces our Nation's dependence on foreign oil. Market values of power typically do not reflect the adverse environmental and health costs to society associated with fossil fuel pollution or the corresponding benefits to society from substituting cleaner sources of energy.
- **Conservation**: The value added, economic contributions, and employment supported by DOI's conservation related activities are difficult to measure separately because conservation could be a component of recreation, ecosystem restoration, water management, and even some mineral development activities. Many benefits of nature conservation accruing to households, communities, and economies are not defined with a set of consistent metrics nor are they bought and sold in markets. This creates challenges in the valuation of these goods and services.
- **Restoration**: Every Interior bureau engages in some form of restoration from physical structures to habitat and cultural resources. For example, the Office of Surface Mining Reclamation and Enforcement (OSMRE) hosts the Abandoned Mine Land Inventory System (e-AMLIS), an inventory of land and water impacted by past mining (primarily coal mining) containing information on the location, type, and extent of AML impacts, as well as information on the cost associated with the mitigation of those problems. Additionally, In May 2013, BLM published, *Abandoned Mine Lands: A New Legacy*, which covers the successes of its AML program between 2009 -2011. The DOI Restoration Program works across bureaus to ensure that responsible parties – not taxpayers – bear the cost of restoring injured resources following a release of oil or other hazardous substances at hundreds of sites around the Nation, where over 122,000 acres and more than 330 miles of stream and shoreline were enhanced/restored or managed/protected in 2013. Restoration projects have significant economic impacts, which vary in scope depending on the extent and nature of the activities undertaken.
- **Fossil Fuel Energy:** In FY 2013, Interior-managed lands and waters produced 652 million barrels of crude oil, 4 trillion cubic feet of natural gas, and 420 million tons of coal. Some average prices in FY 2013 included $101/bbl for oil, $3.72/mcf of natural gas, and $11 per ton of Powder River Basin coal. Oil, gas and coal produced from Interior lands were estimated to provide value added of $121 billion; estimated economic output contribution of $220 billion; and an estimated 1 million jobs. External costs are associated with the development of oil, gas, and coal produced from Interior lands, and with the production and the use of these resources. Market prices do not fully reflect these costs. Various regulations and other requirements designed to minimize adverse environmental impacts internalize some (but not all) of these external costs.

[2] This value includes the total visits to Bureau of Reclamation facilities in 2012 due to data availability.

- **Non-fuel Minerals**: In FY 2013, Interior lands produced a wide variety of minerals. For example, it is estimated that about 2.4 million ounces of gold were produced from Federal lands in Nevada; the average price of gold in 2013 was $1,400 per ounce. Non-fuel mineral production was associated with an estimated value added of $7.9 billion; estimated economic output of $12.5 billion; and estimated employment supported about 45,900 jobs. While minerals are generally traded in competitive markets (though some markets may be localized or thin), prices may not incorporate the external costs associated with mining. Moreover, the Federal leasing system completely offset these costs, which are primarily associated with the environmental impacts of mining. Various regulations and other requirements designed to minimize adverse environmental impacts help to internalize some of these external costs.
- **Forage and Grazing**: In FY 2013, Interior lands produced nearly 9 million animal unit months (AUMs) of forage. Prices for forage vary widely, from $1.35 per AUM fee on BLM-managed lands to $17 on State and private grazing lands. This production is associated with $1.5 billion in economic output and supported about 18,000 jobs. Value added figures were not readily available for forage and grazing. Forage prices do not fully reflect various ecosystem service values provided by rangelands.
- **Timber**: In FY 2013, about 573,000 mbf (one thousand board-feet) of sawtimber was harvested on BLM and tribal lands (approximately 40% from BLM and 60% from BIA). This timber harvest was associated with about $460 million in value added, provided $1.2 billion in economic output, and supported about 5,200 jobs. Market prices do not fully reflect changes to various ecosystem service values provided by forest lands. Interior forestry lands provide various other products besides sawtimber including biomass, fuelwood, poles, posts, and a variety of other products (e.g., seeds, Christmas trees, and mushrooms). The economic contributions associated with some of these products were accounted for in this report; while others could not be explicitly analyzed.
- **Water**: Interior stores and delivers water for irrigation, municipal and industrial (M&I), and other uses. The value of water varies widely according to location, type of use and climatic conditions. Interior's irrigation (BOR and BIA) and M&I water activities are associated with $32 billion in value added; about $60 billion in economic output; and supported an estimated 378,000 jobs. Interior also delivers water to support in-stream flows, wildlife refuges, and other uses that are difficult to value fully.
- **Scientific Data**: Investments in research and development promote economic growth and innovation, ensure American competitiveness in a global marketplace, and are critical to achieving Interior's mission. Investments in Interior's research and development will improve U.S. strategic mineral supplies, water use and availability, and natural hazard preparedness. Sustainable stewardship of natural resources requires strong investments in research and development in the natural sciences. Scientific knowledge is not typically valued in markets, and hence is underprovided by the private sector.
- **Grants/Payments**: Grant and payment programs administered by Interior provided $6.2 billion in value added; economic contributions of $8.3 billion; and supported employment of 70,000 jobs.[3] Within these totals:
    - Indian Affairs grants to support tribal governments provided value added of $0.8 billion, economic contributions of $1.2 billion, and supported about 10,000 jobs.
    - Grants and payments to Insular areas provided GDP impact of $0.9 billion and supported employment of about 26,000 jobs.

[3] It is possible that grants and payments support some of the economic activity reported for other sectors throughout this report. We have not attempted to correct for this source of potential double-counting.

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Chapter 1 Introduction and Overview

Background

The U.S. Department of the Interior's people and programs impact all Americans. Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future. The Department is the steward of 20 percent of the Nation's lands. Interior manages national parks, national wildlife refuges, and public lands and assists States, Tribes, and others in the management of natural and cultural resources. Interior provides access to public lands and offshore areas for renewable and conventional energy development—covering roughly a quarter of the Nation's domestic supplies of oil and natural gas—ensuring safety, environmental protection and revenue collection for the American public. Interior manages the protection and restoration of surface mined lands. The Department is the largest supplier and manager of water in the 17 Western States, assists others with water conservation and extending water supplies, and provides hydropower resources to power much of the 17 Western States. The Department serves as Trustee to American Indians and Alaska Natives. Interior's Office of Insular Affairs (OIA) carries out the department's responsibilities for U.S.-affiliated Insular Areas, which include the territories of Guam, American Samoa, the U.S. Virgin Islands, the Commonwealth of the Northern Mariana Islands, and three sovereign freely associated states (FAS, which includes the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau). The Department provides reliable scientific information to advance knowledge in the Earth Sciences; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life

Renewable Energy

BLM's Western Solar Plan includes 19 Solar Energy Zones on over 285,000 acres of public lands. The area could support up to 27,000 megawatts of solar energy generation, enough to power 8 million homes.

To-date, the BLM has authorized over 100 wind energy testing sites, and 39 wind energy projects with over 5,000 megawatts of capacity, enough to supply the power needs of over 1.5 million homes. In FY 2013, BLM's solar, wind and geothermal activities supported $2.3 billion in output and nearly 12,000 jobs.

BOEM is overseeing wind-energy development offshore of both coasts. In 2014, BOEM approved a 30 MW floating turbine project in Oregon. BOEM has issued wind-energy leases for Massachusetts, Rhode Island and Virginia, with more planned for Massachusetts, Maryland and New Jersey in 2014.

Recent data continue to indicate a strengthening economic recovery, a stronger outlook for consumption, and improved figures on net international trade driven largely by falling oil imports.[4] Labor markets continue to show signs of strengthening, although substantial slack still exists[5]. The goods and services provided by the lands that are managed by DOI helped to support this economic recovery. These goods and services include outputs bought and sold in markets (such as oil and gas) as well as ecosystem goods and services that are not typically bought and sold in markets (such as clean water, recreation, habitat for fish and wildlife). Ecosystems (and their service flows) provide a form of wealth – natural capital – that humans depend on for a range of important benefits. Unlike manufactured capital, and human capital (skills), options for creating new natural capital are limited, though degraded or damaged ecosystems can sometimes be restored. Further, manufactured capital may be an imperfect substitute for natural capital.

Natural resources that are bought and sold in markets (e.g., oil, minerals, timber, forage, fish, etc.) contribute to a wide range of intermediate and final products. In addition, people value the environment directly even where there is no market for environmental amenities. Furthermore, people may be unaware of the full

Land Acquisition

Investments in conservation through land acquisitions and grant programs provides benefits to society in the form of species and habitat protection, maintenance of working landscapes, and the provision of ecosystem services such as clean water, timber, fisheries habitat, and carbon sequestration. The measurement of benefits from conservation investments can provide important information to policymakers for future decisions. Economic techniques can represent the benefits and costs of conservation investments in monetary terms, enabling comparison across locations or projects in a common metric. Non-monetary terms might include physical measures of benefits (e.g., habitat acres conserved). Either type of measure of benefit can be used to calculate a return on investment, allowing decision makers to evaluate, target and prioritize land acquisition decisions or other conservation activities.

Between 2001 and 2011, around 15 to 20 percent of annual DOI land acquisition funding was used to purchase easements. In FY 2013 DOI acquired a total of 49,000 acres, of which 21,000 were fee acres and 28,000 were easement acres.

[4] Real GDP increased 1.9 percent in 2013 (that is, from the 2012 annual level to the 2013 annual level), compared with an increase of 2.8 percent in 2012 (http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm). Total nonfarm payroll employment rose by 175,000 in February 2014. Job growth averaged 189,000 per month over the prior 12 months (http://www.bls.gov/news.release/empsit.nr0.htm. However, the unemployment rate remains above estimates of the natural or equilibrium rate of unemployment. GDP, or Gross Domestic Product, is a commonly used measure of economic performance and measures the value of the goods and services produced by an economy. “Real” measures reflect quantities independent of prices, allowing comparison of measures over periods in which prices have changed. GDP represents the market value of all final goods and services produced in a country, i.e., domestic value added which can be shown to be identical to the sum of payments to labor (i.e. salaries, wages and bonuses) plus payments to capital (i.e. production and replacement of existing capital). GDP is an incomplete measure of wellbeing or welfare.

[5] See Bureau of Labor Statistics: http://www.bls.gov/news.release/empsit.nr0.htm

benefit they receive from these resources.

The ecosystem services that are provided by Interior-managed lands (land acquisition spending is discussed in more detail in the box to the right) are typically provided free of charge, and people who benefit from ecosystem services may not be directly involved in determining the supply of services. This is known as an externality. For example, timber harvests can be managed to minimize soil that enters nearby streams. This preserves water quality and stream habitat downstream of the harvest area. Numerous potential solutions have been proposed for internalizing such externalities, including payments for ecosystem services, tradable development rights, taxes on activities that result in damages to services, and direct regulations.

Some ecosystem services are traded in markets (e.g., commercial fisheries, timber, etc.) and valuation using market prices is relatively straightforward. But many ecosystem services are "public goods" that are not traded in markets; without market prices there is no ready measure of value for these services.

The value of some nonmarket ecosystem services has been well studied. For example, there are numerous empirical studies to assess the value of outdoor recreation and numerous applications of economic analysis being used to assess the value of various environmental amenities (access to open space, access to water resources, local air quality). One approach taken in these studies is based on people's revealed preferences. A second type of valuation approach is known as stated preference estimation; this includes survey techniques to estimate people's valuation of an amenity. The strengths and weaknesses revealed and stated preference methods are well understood. However, practical difficulties in assessing value in a manner that will be viewed as objective, authoritative, and accurate is difficult for some ecosystem services such as those services associated with cultural resources. This difficulty may support the argument for the simple provision of information about potential trade-offs among services without attempting to measure all services in the same metric.

Conservation Banking

Federal conservation banks are permanently protected lands managed by FWS for species that are endangered, threatened, or otherwise at risk. These banks facilitate the establishment of markets for goods not readily sold in markets. FWS approves a specified number of credits for the bank owner in exchange for permanently protecting and managing habitat for the endangered species in question.

As of March 2013, FWS had approved 105 conservation banks in 10 States and Saipan. California has 80 Federal banks; other States with multiple banks include Florida (8), Texas (6), Utah (3), and Oregon (2). Of the 105 banks, 12 have sold all of their credits, including 11 in California and 1 in Maryland. These banks are now engaged in managing the habitat associated with the credits they sold. There were 10 additional conservation banks pending approval as of March 2013.

Basic scientific knowledge is often not valued in markets, and hence is underprovided by the private sector. Beyond helping Interior bureaus achieve their missions, scientific information (such as that produced by USGS) is an input to production processes and decisions that help promote economic growth and innovation and ensure American competitiveness in a global market. Interior's bureaus are engaged in a variety of activities designed to provide basic research, scientific and technical information, and to transfer technology to decision makers in the public and private sectors. The information produced by Interior is a critical input that helps support private markets, the production processes of private entities, and many public sector decisions.

Science to Support Resource Management

A Bureau of Safety and Environmental Enforcement (BSEE) funded research project evaluated the use of Real time Monitoring (RTM) on the outer continental shelf (OCS) to obtain an independent assessment of the various types of RTM technology available for offshore oil and gas operations. Focusing on drilling and production technologies, the assessment identified the automation systems that are available or being developed, the potential such systems have to increase offshore drilling safety, and any negative impacts they may have on operations. Though many of the "global" operators conducting activities on the OCS today have various types of RTM in place, their use is, in general, not standardized nor required by the agency. Costs to install, implement, staff and maintain RTM for a company are significant, however the potential for increased operational safety with this technology appears to be significant. See http://www.bsee.gov/Research-and-Training/Technology-Assessment-and-Research/Project-707/for additional information.

The FY 2013 Report

This report represents the fifth in a series of annual reports initiated with a preliminary report released by Interior in December 2009. In the on-going effort to improve our data reporting and estimation while minimizing administrative burden, the FY 2013 report adopts a more streamlined format.[6] The remainder of this chapter presents an overview of the key outputs produced by the Department. The chapter also provides a summary of Interior's economic contributions, value added, employment supported, and economic values associated with some of the outputs.

The analysis in this report reflects the effects of the 2013 Sequestration. The Federal Government experienced automatic spending cuts in particular categories of outlays that were initially set to begin on January 1, 2013, pursuant to the Budget Control Act of 2011 (BCA). These cuts were postponed by two months by the American Taxpayer Relief Act of 2012 until March 1, 2013, when this law went into effect.

Approximately $828 million was sequestered—$617 million in discretionary appropriations and $211 million in direct spending. The effects of the sequestration are difficult to quantify. For example, Interior

[6] More detailed treatments of topics from this report are available in the FY 2012 Economic Report.

projected that approximately 300 fewer onshore oil and gas leases were issued in Western States including Wyoming, Utah, Colorado, and New Mexico in FY 2013. Delayed leases result in a lost opportunity to collect additional revenues in FY 2013, while also causing prospective production and resulting benefits from these leases to be pushed further into the future. The exact impact of these delays on the timing of operator decisions to drill and produce on their leases is difficult to estimate. Delayed Mineral Leasing Act payments to States and counties of approximately $101 million were eventually disbursed at the beginning of FY 2014.

This report presents information on: the physical and biological "outputs" produced by Interior; and on the economic "value added," output, and employment supported by Interior. *Gross output*, (or economic contributions) represents the value of industry production; *value added* nets out the cost of intermediate inputs (i.e., goods and services purchased from other industries or imported that are used as inputs to produce a good or service), and is a more appropriate concept when considering Interior's contributions to the nation's gross domestic product (GDP). Of the measures reported here, value added most accurately captures the dollar-value of Interior-managed resources in the U.S. economy. Value added estimates are not available on a comprehensive basis for all Interior resources; this information is provided where such values are readily available. More information on these concepts is included in the technical appendix.

Hurricane Sandy Recovery: Economic Impacts of Recovery Spending

Hurricane Sandy devastated the eastern U.S. in October 2012. One estimate of the value of the resources, property and assets affected by the storm is the cost to replace what was lost. Interior's efforts aimed at rebuilding natural assets include marsh, wetland and habitat restoration.

As of October 2013, Interior had more than $71 million in cumulative outlays, out of a total obligation of $252 million. These outlays went toward projects in construction, mitigation and preservation. The nearly $32 million directed toward restoration-type projects (typically at refuges or units of the NPS) supported activities with value added of over $40 million.

"Economic contributions" of an event or policy may be measured as jobs, labor income, value added (contribution to GDP), or output, though these are incomplete measures of "economic value."[7] Economic impacts measure how programs, expenditures, and investments translate to economic growth, employment, and income. Economic value is defined in terms of relative value, and is equal to the amount an individual or society is willing to give up in other goods and services in order to obtain a good, service, or state of the world. More specifically, the economic value of a resource is the amount

[7] *Contributions* of an event or policy measure how economic activity cycles through an economy as it currently exists. *Contributions* do not account for any activity that might occur even without the event or policy. *Impacts* are more narrowly defined as net changes to an economy that would not be seen without the event or policy. *Economic benefits* refer to total net values, which include both market and nonmarket values.

that society is willing to pay for the resource (not how much they actually pay for the resource). This report covers “economic contributions” and not “economic values.”

While this report relied on generally similar methodologies to estimate value added output and employment, the results are not directly comparable to those of earlier reports due to changes in some of the underlying modeling. Additional information is provided in Appendix 1.

Overview of Outputs Produced and Economic Values

Table 1-1 summarizes the quantities of the key physical and biological outputs produced by Interior in FY 2013. The table also provides information (where such information is readily available) on the unit economic values for each commodity. We report a range of economic values associated with each resource, and we report total production for the year. The table does not associate production with individual unit prices, so we do not report a total value for the annual production.

Table 1-1. Interior-Managed Resources: Production Quantities and Values, FY 2008-FY2013

Commodity [a]		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Recreation [b]	*Visits to DoI sites (million)*	n/a	415	439	434	417	407
	Economic value per visit (2013-$) [c]			$43 - $52			
Crude Oil [d]	*Federal production (millions of barrels)*	575	657	736	649	626	652
	WTI - Average price per bbl (2013-$)	$107.65	$67.15	$84.76	$98.08	$95.26	$100.64
Natural Gas [e]	*Federal production (trillions of cubic feet)*	5.8	5.7	5.4	4.9	4.5	4.1
	Avg wellhead price per thousand cubic feet (2013-$)	$8.61	$3.98	$4.78	$4.08	$2.69	$3.72
Coal [f]	*Federal production (millions of tons)*	509	488	478	470	460	420
	Avg price per short ton subbituminous coal (2013-$)	$11.49	$12.33	$12.87	$14.12	$9.13	$10.72
Hardrock Minerals – Gold [g]	*Estimated gold production on Federal lands in NV (kg)*	100,190	95,890	99,330	100,620	76,223	n/a
	Avg gold price per ounce (Calendar year)	$900	$1,000	$1,200	$1,600	$1,700	$1,400
Forage [h]	*AUMs permitted (millions)*	8.6	8.6	8.7	9.1	8.9	8.5
	Price per AUM (2013-$)			$1.35 -$17.80			
Timber [i]	*BLM, commercial sawtimber harvested (mbf)*	162,902	190,504	183,558	218,467	208,943	236,889
	BIA harvested timber (mbf)	530,972	426,250	396,532	359,697	333,209	336,320
	Total for BLM and BIA (mbf)	693,874	616,754	580,090	578,164	542,152	573,209
	Average Western OR BLM received price per mbf (2013-$)	$178.12	$153.39	$92.57	$92.61	$119.31	$126.30

(Table continues)

Commodity [a]		FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Electricity Generation							
Hydroelectric	*Net generation (million MWh)*	40.8	39.5	35.8	48.6	47.5	39.8
Geothermal [j]	*New approved capacity (MW)*	0	67.5	30	312	70	110
Wind [j]	*New approved capacity (MW)*	110	4	150	654	1815	826
Solar [j]	*New approved capacity (MW)*	0	0	2,744	1,975	489	1,000
	Average electricity spot price per MWh [k]						
	Mid-Columbia (Northwest)	$65.00	$35.66	$35.90	$29.10	$22.22	$31.93
	SP-15 (California)	$79.36	$38.31	$40.21	$36.87	$34.57	$42.43
Irrigation and M&I Water (estimated) [l]	*Acre-feet delivered (estimated)*	Estimated annual deliveries: 23.9 million acre-feet of irrigation water and 2.8 million acre-feet of M&I water				26.7	27.3
	$ per acre-foot	Values per acre-foot can range from $0 - $4,500/acre-foot depending on region, end-use, and other special circumstances. The high end of the range would not typically be encountered. Some Reclamation supplied water is also delivered for other uses such as refuge water supplies or to support instream flows.					
Ecosystem Services	Ecosystem services are measured in many different metrics; information on annual flows of these services is not readily available. Because most ecosystem services are not bought and sold in markets, prices are not readily available.						

(Table continues)

[a] Unit values are FY 2013 market values or estimated economic value, depending on the commodity.

[b] Recreation unit values are the means reported in Loomis (2005), updated to 2013-$ using the CPI-U.

[c] Currently available datasets do not track visitors' activities. Low end estimate is the mean study value for "general recreation"; high end estimate is for "wildlife viewing." This range also includes activities such as sightseeing, camping, picnicking and visiting a beach. Source: John Loomis (2005) "Updated Outdoor Recreation Use Values on National Forests and Other Lands," updated to 2013-$ using CPI-U.

[d] Production is based on ONRR sales and non-revenue volumes, by sales year. Crude oil prices are WTI per-barrel spot prices from EIA.gov. West Texas Intermediate (WTI) is a benchmark price used for indexing crude oil.

[e] Production is based on ONRR sales and non-revenue volumes, by sales year. Natural gas prices are U.S. wellhead price per mcf from EIA.gov.

[f] 2008-2011 coal prices from EIA.gov: http://www.eia.gov/totalenergy/data/annual/pdf/sec7_21.pdf, updated to 2012-$ using the CPI-U; 2012 price data are from ONRR Monthly Market Analysis reports

[g] Gold figures for 2008-2011 are estimates of gold production from the Federal estate. 2012 value represents production in Nevada only. Data for 2013 are not available.

[h] The low-end value is the Federal grazing fee; the high-end value is the 11 Western State average rental price for private forage reported by the USDA, National Agriculture Statistics Service

[i] Source : BLM Data. Data reflects sawtimber harvested for commercial use. Additional sawtimber is harvested from BLM managed lands under the Stewardship Program and Special Forest Products Program. These volumes are not shown in this table, but represent a relatively small proportion of the volume. Other wood-based timber products including biomass, post, poles, fuelwood, and other are not included in these volumes.

[j] Source: BLM data. Generation information is not available for these resources. FY 2013 data represents approved capacity. We estimate economic contributions based on installed capacity for the calendar year.

[k] Prices are annual average on-peak. Source: EIA – Electric Market National Overview, Regional Spot Prices.

[l] Results do not include deliveries for facilities where water users maintain operating and maintenance responsibilities rather than Reclamation. Therefore, the results may be understated.

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Chapter 2 Value Added, Output, and Employment Estimates

Introduction

Table 2-1 presents information on economic contributions, value added, and employment associated with Interior's activities for FY 2013. Economic contributions are a measure of the cumulative effects of spending as it cycles through the economy.[8] Value added is the contribution of an activity to overall Gross Domestic Product (GDP)[9] and equals the difference between an industry's gross output (e.g., sales or receipts and other operating income, commodity taxes, and inventory change) and the cost of its intermediate inputs (including energy, raw materials, semi-finished goods, and services that are purchased from all sources). These economic measures should not be confused with measures of economic benefits or net economic effects resulting from Interior's activities or policies Interior has implemented. The distinction between economic contributions or impacts and economic benefits as well as the limitation associated with an economic contribution analysis are discussed in the FY 2012 Economic Report.[10]

Value Added and Economic Contributions

DOI's FY 2013 value added and output are estimated to be $199 billion and $358 billion, respectively. The value added and economic contributions are estimated to have supported 2.1 million jobs in FY 2013. The value of all commodities and other inputs to production associated with Interior's activities increased by about 8% in nominal terms (5% adjusted for inflation), from $144 billion in FY 2012 to $155 billion in FY 2013. The change in value for individual inputs varied significantly across commodities largely due to commodity price changes and changes in the quantity of inputs produced. Detailed estimates of value added, economic contributions, and employment estimates are presented in Table 2-1. Some highlights for value added, economic contributions, and employment include the following:

[8] For additional information on economic contribution and economic impact analysis, see: Watson, P., J. Wilson, D. Thilmany, and S. Winter. 2007. Determining Economic Contributions and Impacts: What is the difference and why do we care? *The Journal of Regional Analysis and Policy*, 37(2): 140-146.

[9] The components of value added consist of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus. GDP measures the value of the goods and services produced by the U.S. economy in a given time period.

[10] One of the important limitations is that contribution analysis is a static approach and does not incorporate potential price changes over time or other shifts in labor or capital resources as a result of changes in the scale or scope of economic activities. A different type of modeling approach (computable general equilibrium models) would be necessary to incorporate price changes and other economy wide resource shifts.

Recreation: An estimated 407[11] million visits to DOI lands contributed about $25 billion in value added, $41 billion in output, and supported 355,400 jobs.

Renewable energy: Activities related to geothermal, wind, and solar energy contributed an estimated $2.3 billion in output, and supported 11,878 jobs. Hydropower contributed about $2.2 billion in value added, $2.8 in output, and supported about 8,700 jobs.

Energy from Fossil Fuels: Activities related to oil, gas, and coal contributed an estimated $121 billion in value added, $220 billion in economic output, and supported 1.1 million jobs.

Non-fuel minerals: Activities related to locatable minerals in Nevada and hardrock leasables in Missouri contributed an estimated $5.3 billion to value added, $8 billion in output, and supported over 25,000 jobs. In addition, activities related to salable and other leasable minerals contributed $2.6 billion to value added, $4.5 billion in output, and supported 21,000 jobs.

Timber: Activities related to timber contributed an estimated $460 million in value added, $1.2 billion in output, and supported 5,200 jobs.

Concepts: Economic Contributions and Economic Benefits

The results of an economic contributions analysis should not be equated to an analysis that measures net economic benefits. Net economic benefits are a measure of the extent to which society is better (or worse) off because of a given policy, program or event. Net economic benefits can include measures of market values and non-market values.

Economic contributions analysis estimates the total output, value added, and jobs supported by a flow of expenditures through the economy. Conversely, an analysis of net economic benefits relies on market-based valuation methods as well as non-market valuation methods to derive monetary estimates of benefits and costs to determine the net economic benefits to society

There are two elements in the value of any commodity: the market price, and any additional "nonmarket" benefits that aren't reflected in the price. For example, ecosystem services may not be fully reflected in area land prices.

Surveys often show that people are willing to pay more for recreation than they actually spend. Economists call this additional value consumer surplus or net economic value.

Forage: Activities related to forage and grazing on public and Indian land contributed an estimated $1.5 billion in output, and supported 18,000 jobs.

Water: Interior's irrigation (BOR and BIA) and M&I water activities are associated with $32 billion in value added; about $60 billion in economic output; and supported an estimated 378,000 jobs. Activities associated with irrigation alone (both BOR and BIA) contributed an estimated $29.1 billion in value

[11] This value includes the total visits to Bureau of Reclamation facilities in 2012 due to data availability.

added $55.2 billion in output, and supported 353,000 jobs. Activities associated with municipal and industrial water contributed about $2.9 billion in value added, $4.7 billion in output, and supported 25,000 jobs.

Grants and payments: Activities related to major grants and payments contributed an estimated $6.2 billion in value added, $8.3 billion in output, and supported 70,000 jobs. Indian Affair's support for tribal governments contributed about $0.8 billion in value added, $1.2 billion in output, and supported about 10,000 jobs.[12]

Insular Affairs: Interior's activities related to Insular Affairs contributed about $0.9 billion in value added (equivalent to a share of GDP ranging from 3% for the Northern Mariana Islands to 56% for Micronesia); and supported about 26,000 jobs.

Science: The Department's bureaus have varying levels of involvement with scientific and technical research and innovation, and technology transfer. The economic value associated with these activities is difficult to measure. In FY 2013, the majority of technology transfer activities being reported by the Department under the Federal Technology Transfer Act of 1986 (FTTA) were undertaken by the U.S. Geological Survey (USGS). It is the largest research and development organization within the Department, both in terms of budget and personnel, and typically accounts for about 80% of the Department's R&D budget. In addition to publishing over 2,200 reports, books, fact sheets, and other publications, the Department's scientific, technical and engineering personnel engaged in a broad range of cooperative activities to develop and disseminate innovative technologies.[13] Interior is involved with producing and disseminating all of these types of information, which have an economic value that is at least partly incorporated in the market prices of traded goods and services.

Sustainable Stewardship: Sustainable stewardship of natural resources requires strong investments in research and development in the natural sciences to inform decision-making. The Department supports cutting edge research in geology, hydrology, and biology, informing resource management and community protection at Interior and across the world. The FY 2013 enacted budget for the Department of the Interior included $789.0 million for research and development. Much of the funding was for applied research ($629.8 million), while basic research and development received $51.4 million and $107.8 million, respectively. The programs supported through these funds greatly advance knowledge, information, and technology, which help the Department meet its mission objectives and carry over to resource managers, stakeholders, and the general public[14].

[12] It is possible that grants and payments support some of the economic activity reported for other sectors throughout this report. We have not attempted to correct for this source of potential double-counting.
[13] In FY 2013, the Department collaborated on 476 Cooperative Research & Development Agreements, of which 376 were new. In addition, the Department was engaged in at least 322 other collaborative R&D relationships.
[14] Department of the Interior Annual Report on Technology Transfer FY 2013 Activities. January 2014.

Youth: The Department of the Interior works to expand job opportunities, engagement and education for youth on our public lands and to facilitate partnerships and volunteer programs that leverage resources for accomplishing the Department's mission. In FY 2013, Interior's youth programs and partnerships provided 15,546 employment opportunities for people between the ages of 15 and 25 interested in working with Interior and organization partners. Of this total, 9,654 youth were employed by DOI and 5,892 were employed by partners. In FY 2012, nearly half (7,317) of these jobs were with the National Park Service (NPS) and partners. These programs and partnerships enable participating youth to gain valuable work experience to strengthen their skills and knowledge base. Interior bureaus benefit by attracting and retaining qualified employees, especially as youth hires can convert to permanent positions, be promoted to a new position, or receive new job assignments. In FY 2013, 22% of Interior's youth employees converted to permanent positions, were promoted to a new position, or received a new job assignment. Figure 1-1 presents information on youth employment at Interior. Total FY 2013 youth employment declined slightly compared to FY 2012.

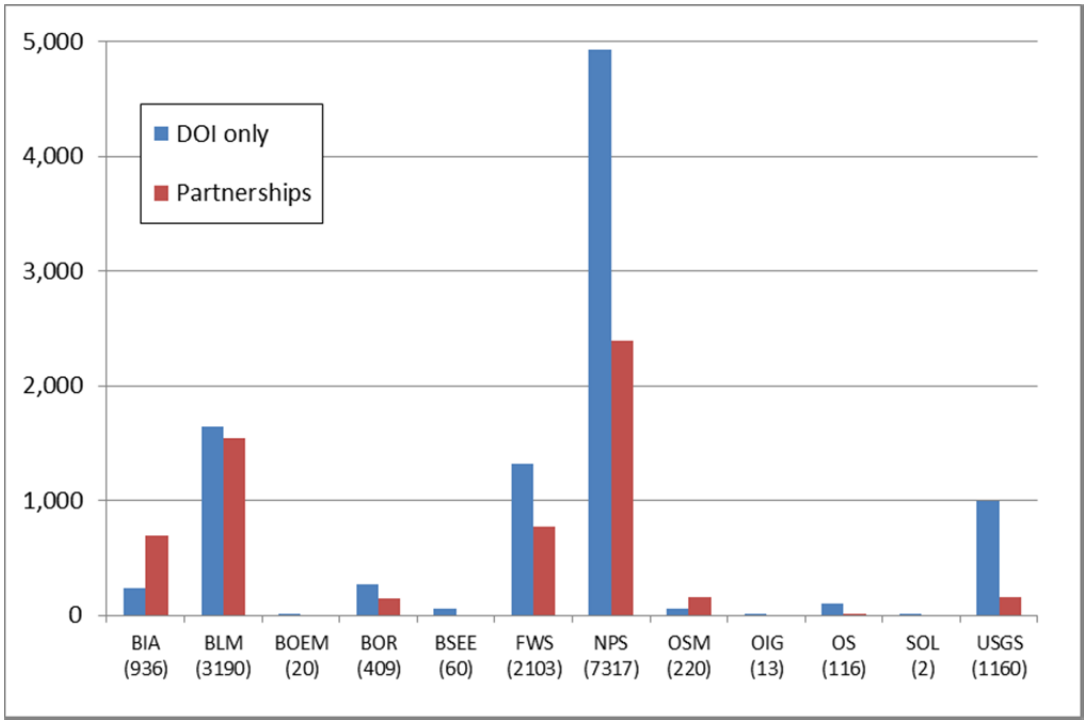

Figure 2-1. Youth Employment by Bureau (Active Employees Age 15-25, FY 2013)

Concept: Value Added

	Standing Trees	Timber	Lumber	Framing	Finished House
Sale Price	$10	$100	$1,000	$10,000	$100,000
Input Price	$0	$10	$100	$1,000	$10,000
Value Added	$10	$90	$900	$9,000	$90,000

The graphic provides a stylized example to illustrate the concept of value added. Trees on a timber lease may ultimately end up as part of a newly constructed house, though there are several supply-chain steps in between. The output approach to economic contributions totals up the sale prices at every step of the chain, in effect double-counting the contributions of intermediate goods. The value added approach focuses on the change in sale price at each step, avoiding this double-counting.

The measure of output does not account for external costs and benefits not reflected in market prices.[15] The implication of not including these costs is that statistics on gross sales or output may over- or understate the actual contribution a given activity or sector makes to the economy. *Value added* is a more appropriate concept when considering Interior's contributions to the nation's GDP, though GDP does not fully capture changes in economic welfare.[16] Where possible, this report addresses the economic value of Interior's resources and programs, but the focus of the report remains the economic impacts or contributions of the Department of the Interior.

[15] In the Department's economic report for FY 2011, Chapter 7 discussed externalities associated with Interior's activities. This chapter is available on the Department's website at http://www.doi.gov/ppa/upload/Chapter-7.pdf

[16] Economic welfare costs also are not fully measured by changes in GDP. GDP fails to capture nonmarket values, such as environmental improvement or environmental damages. These can be important components of total economic welfare. GDP also can sometimes be misleading: for example, cleanup costs from an oil spill would increase GDP, however, this provides little information about the total economic costs incurred by individuals and society overall.

Table 2-1. Estimated Economic Contributions Resulting from Interior's Activities

Category	Direct Economic Contribution (billions, 2013-$)	Direct Contribution as a Percent of National Total	Total Economic Contributions: Direct + Indirect + Induced[17] (billions, 2013-$)	Value Added (billions, 2013-$)	Total Domestic Jobs Supported
DOI Payroll ~75,000 employees in 2013	4.91		6.40	3.18	42,329
Grants & Payments to non-Federal Entities[18]	4.33		8.33	6.18	69,584
Support for Tribal Governments	0.49		1.15	0.81	10,093
Public Resources as Inputs to Production					
Recreation and Tourism	20.65	3%	40.84	24.92	355,400
Energy					
Oil, gas and coal	89.91	34%	220.19	120.77	1,098,439
Hydropower	1.21	19%	2.79	2.22	8,692
Wind Power	0.10	1%	0.14	n/a	812
Geothermal	0.09	36%	0.33	0.00	1,905
Solar	0.09		1.78	n/a	9,161
Locatable Minerals and Hardrock Leasables[19]	4.62		8.00	5.35	25,387
Salable and Other Leasable minerals	1.99		4.50	2.57	20,545
Other Production					
Irrigation water	24.45	16%	55.20	29.15	353,247
M&I water	2.31	19%	4.69	2.91	25,179
Grazing	0.19	0.31%	1.51	n/a	18,075
Timber	0.33	3.57%	1.18	0.46	5,236
Total	**155.66**		**357.04**	**198.51**	**2,044,085**

[17] The direct effect is the known or predicted change in the local economy that is to be studied. The indirect effect is the business to business transactions required to satisfy the direct effect. Finally, the induced effect is derived from local spending on goods and services by people working to satisfy the direct and indirect effects.

[18] Excludes payments via U.S. Treasury.

[19] Contribution estimates based on production from Federal lands in Nevada (locatable minerals) and Eastern States (leasable hardrock minerals primarily in Missouri) only. In addition to Nevada, locatable mineral production from Federal lands exists in many Western States. With the exception of Nevada, information on production by ownership (private, State, or Federal) was not available.

Table 2-2. Summary of FY 2013 Economic Contributions by Bureau

Production Inputs (DOI Activity)	FY 2013			
Bureau	**Sales Value (billions, 2013-$)**	**Total Economic Contribution (billions, 2013-$)**	**Total Value Added (billions, 2013-$)**	**Total Domestic Jobs Supported**
National Park Service				
Recreation	14.55	26.75	16.50	242,712
Fish and Wildlife Service				
Recreation	2.05	5.45	3.36	44,530
Bureau of Indian Affairs				
Oil, gas and coal	5.52	17.21	9.82	66,375
Irrigation water	0.43	1.05	0.49	9,758
Grazing	0.04	0.09		1,381
Timber	0.04	0.53	0.20	2,294
Other minerals	0.06	0.15	0.08	859
BIA Subtotal	*6.08*	*19.03*	*10.60*	*80,668*
Bureau of Land Management				
Oil, gas and coal	28.57	84.50	48.32	327,459
Geothermal	0.09	0.33	-	1,905
Locatable Minerals and Hardrock				
Leasable Minerals	4.62	8.00	5.35	25,387
Salable and Other Leasable Minerals	1.93	4.35	2.48	19,686
Grazing	0.15	1.43		16,694
Timber	0.29	0.66	0.26	2,942
Recreation	2.86	5.47	3.10	42,277
Wind	0.10	0.14	-	812
Solar	0.09	1.78	-	9,161
BLM Subtotal	*38.92*	*106.66*	*58.92*	*446,323*

Production Inputs (DOI Activity)	FY 2013			
Bureau	**Sales Value (billions, 2013-$)**	**Total Economic Contribution (billions, 2013-$)**	**Total Value Added (billions, 2013-$)**	**Total Domestic Jobs Supported**
Bureau of Reclamation				
Hydropower	1.21	2.79	2.22	8,692
Irrigation water	24.02	54.15	28.66	343,489
M&I water	2.31	4.69	2.91	25,179
Recreation	1.19	3.17	1.96	25,881
BOR Subtotal	28.73	64.79	35.75	403,241
Bureau of Ocean Energy Management/ Bureau of Safety and Environmental Enforcement	55.83	118.48	62.62	704,604
Subtotal: All Bureau Production Contributions	***145.93***	***341.16***	***188.34***	***1,922,078***

DOI Budgetary Items	FY 2013			
	Budgeted Amount (billions, $2013)	**Total Economic Contribution (billions, $2013)**	**Total Value Added (billions, $2013)**	**Total Domestic Jobs Supported**
Payroll				
National Park Service	1.41	1.93	1.13	12,563
Fish and Wildlife Service	0.68	0.93	0.54	6,069
Bureau of Land Management	0.70	0.96	0.56	6,294
Bureau of Reclamation	0.39	0.54	0.31	3,512
Bureau of Safety and Environmental Enforcement	0.07	0.09	0.05	597
Bureau of Ocean Energy	0.05	0.07	0.04	459

DOI Budgetary Items	FY 2013			
	Budgeted Amount (billions, $2013)	Total Economic Contribution (billions, $2013)	Total Value Added (billions, $2013)	Total Domestic Jobs Supported
Management				
Indian Affairs	0.49	0.34	0.21	2,820
US Geological Survey	0.68	0.93		6,091
Office of Surface Mining	0.04	0.06		360
Other Interior Offices	0.40	0.55	0.32	3,564
Subtotal DOI Payroll (~75,000 employees in 2013)	*4.91*	*6.40*	*3.18*	*42,329*
Grants, Payments, and Tribal Support				
Grants and Payments to non-Federal Entities[1]	4.33	8.33	6.18	69,584
Support for Tribal Governments	0.49	1.15	0.81	10,093
Subtotal Grants, Payments and Tribal Support	***4.82***	***9.48***	***6.98***	***79,677***
Total DOI Production and Budget	**155.66**	**357.04**	**198.51**	**2,044,085**

[1] Excludes payments via U.S. Treasury

Chapter 3 State-Level Estimates

This chapter presents the results of the analysis on a State-by-State basis for value added, output, and employment. Table 3-1, Table 3-2, and Table 3-3 present State-by-State estimates of value added, economic output, and employment.

Figure 3-1 shows the 10 States that contribute the largest estimated value added. The components that contribute to this value added include energy production, grants and payments, recreation, and timber and forage production. The State with the largest value added is Texas (nearly $20 billion), followed by Wyoming (over $14 billion). Most of this value added is related to Federal lands that support on- or offshore oil and gas production.

Figure 3-2 shows the top ten States for value added associated with recreation on DOI lands. The State with the largest recreation value added is California ($2.4B), followed by Alaska ($1.2B).

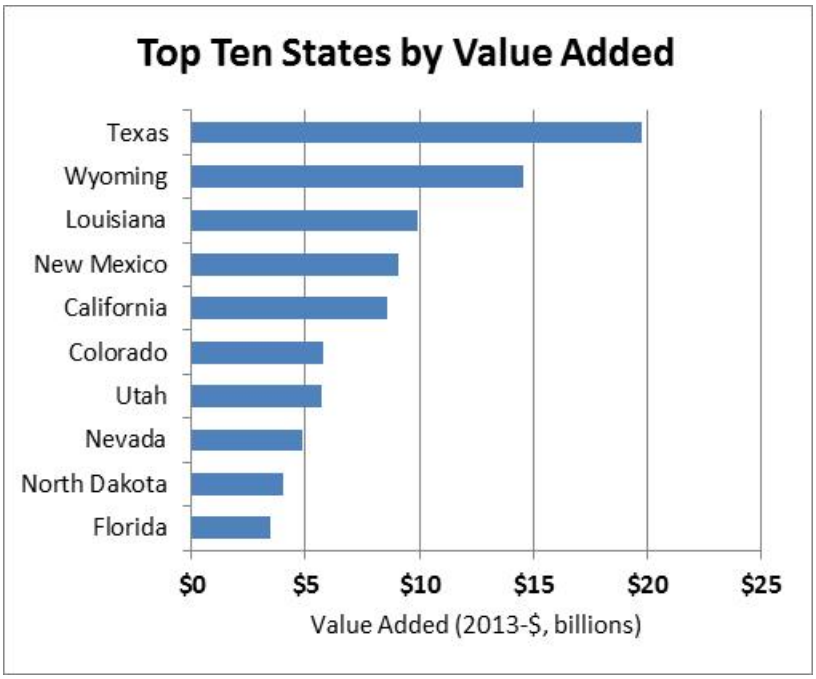

Figure 3-1. Top Ten States for Value Added in All Sectors (2013-$ billions)

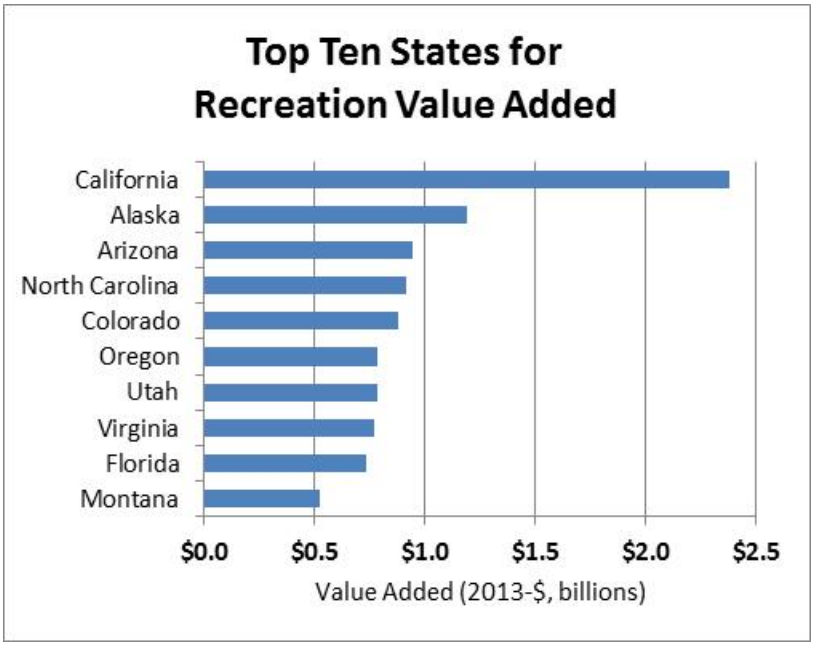

Figure 3-2. Top Ten States for Value Added in the Recreation Sector (2013-$ billions)

Table 3-1. Estimated Value Added Supported by Interior Activities, by Sector and State (FY 2013, $ billions)

State	Recreation -- Value Added[1,2]	Energy & Minerals -- Value Added[2,3]	Grazing & Timber -- Value Added [2,4]	Major Grants & Payments -- Value Added[5]	DOI Salary -- Value Added[6]	Total[7]
Alabama	0.04	1.47	0.00	0.06	0.00	1.58
Alaska	1.19	0.47	0.00	0.09	0.07	1.82
Arizona	0.94	0.55	0.00	0.07	0.15	1.71
Arkansas	0.11	0.41	0.00	0.03	0.01	0.56
California	2.38	5.62	0.00	0.28	0.28	8.56
Colorado	0.88	4.37	0.01	0.22	0.29	5.76
Connecticut	0.00	0.40	0.00	0.01	0.00	0.42
Delaware	0.00	0.07	0.00	0.01	0.00	0.08
District of Columbia	0.43	0.00	0.00	0.00	0.05	0.48
Florida	0.73	2.62	0.00	0.05	0.05	3.45
Georgia	0.30	0.77	0.00	0.03	0.04	1.14
Hawaii	0.32	0.18	0.00	0.01	0.02	0.53
Idaho	0.23	0.30	0.00	0.05	0.06	0.64
Illinois	0.05	1.35	0.00	0.06	0.01	1.46
Indiana	0.06	0.76	0.00	0.03	0.01	0.86
Iowa	0.03	0.31	0.00	0.02	0.00	0.36
Kansas	0.04	0.47	0.00	0.02	0.01	0.54
Kentucky	0.07	0.49	0.00	0.07	0.01	0.65
Louisiana	0.06	9.75	0.00	0.08	0.04	9.92
Maine	0.17	0.12	0.00	0.01	0.01	0.31
Maryland	0.19	0.70	0.00	0.02	0.02	0.93
Massachusetts	0.44	0.85	0.00	0.02	0.04	1.34
Michigan	0.15	0.97	0.00	0.04	0.02	1.18
Minnesota	0.08	0.53	0.00	0.04	0.03	0.68
Mississippi	0.12	0.99	0.00	0.03	0.01	1.14
Missouri	0.25	0.64	0.00	0.04	0.02	0.94
Montana	0.52	0.83	0.02	0.10	0.06	1.53
Nebraska	0.04	0.16	0.00	0.02	0.01	0.23
Nevada	0.50	4.24	0.00	0.05	0.06	4.84

New Hampshire	0.01	0.13	0.00	0.01	0.00	0.15
New Jersey	0.16	0.78	0.00	0.02	0.01	0.96
New Mexico	0.19	8.27	0.00	0.53	0.10	9.10
New York	0.37	1.84	0.00	0.03	0.03	2.28
North Carolina	0.92	0.80	0.00	0.03	0.02	1.77
North Dakota	0.06	3.83	0.00	0.11	0.02	4.01
Ohio	0.13	1.37	0.00	0.05	0.01	1.56
Oklahoma	0.08	1.33	0.00	0.03	0.03	1.48
Oregon	0.79	0.31	0.22	0.05	0.10	1.46
Pennsylvania	0.36	1.77	0.00	0.12	0.04	2.29
Rhode Island	0.01	0.23	0.00	0.01	0.00	0.26
South Carolina	0.09	0.46	0.00	0.02	0.01	0.57
South Dakota	0.19	0.10	0.00	0.02	0.04	0.34
Tennessee	0.46	0.61	0.00	0.03	0.02	1.12
Texas	0.19	19.42	0.00	0.11	0.04	19.76
Utah	0.78	4.61	0.00	0.22	0.06	5.68
Vermont	0.00	0.06	0.00	0.01	0.00	0.07
Virginia	0.77	1.22	0.00	0.04	0.15	2.18
Washington	0.42	0.62	0.00	0.06	0.08	1.18
West Virginia	0.04	0.25	0.00	0.07	0.02	0.38
Wisconsin	0.05	0.65	0.00	0.04	0.02	0.76
Wyoming	0.18	13.47	0.00	0.90	0.04	14.59

[1] Recreation value added based on visitor spending at units managed by BLM, BOR, FWS and NPS.
[2] BLM's Eastern States are not included in these totals due to lack of State-specific information.
[3] Energy & Minerals value added is based on activities related to onshore and offshore oil and gas, coal, and non-metallic minerals. The value added associated with locatable mineral production has only been estimated for Nevada. Locatable minerals from Federal lands are produced from other Western States but data was not available. The hardrock leasables are also not accounted for in this table because they are in the Eastern States.
[4] Timber contributions are based on the value of timber harvested on BLM lands in 2013. Grazing value added is not available.
[5] Grants and Payments valued added include AML, PILT, Royalties and certain other grants (Sport Fish, Wildlife Restoration, State and Tribal Wildlife Grants, LWCF with GOMESA, Historic Preservation, CIAP, CESCF, Preserve America, Save America's Treasures, Refuge Revenue Sharing).
[6] DOI Salary valued added is that supported by DOI employees.
[7] These totals represent valued added supported by energy, minerals, grazing, timber, salaries and grants and payments in each of the 50 States. The economic contributions reported in Table 2-1 were estimated using a national-level model that includes interstate “leakages” not captured in State-level models. Therefore, a sum of State totals would not equal the national total.

Table 3-2. . Estimated Total Output Supported by Interior Activities, by Sector and State (FY 2013, $ billions)

State	Recreation – Total Output[1,2]	Energy & Minerals – Total Output[2,3]	Grazing & Timber – Total Output [2,4]	Major Grants & Payments – Total Output[5]	DOI Salary – Total Output[6]	Total[7]
Alabama	0.08	2.86	0.00	0.08	0.01	3.03
Alaska	1.95	0.82	0.00	0.12	0.11	2.99
Arizona	1.54	1.18	0.05	0.10	0.23	3.10
Arkansas	0.20	0.84	0.00	0.04	0.01	1.09
California	3.85	12.40	0.07	0.38	0.44	17.14
Colorado	1.45	7.46	0.11	0.30	0.45	9.76
Connecticut	0.00	0.86	0.00	0.02	0.00	0.89
Delaware	0.01	0.15	0.00	0.01	0.00	0.17
District of Columbia	0.61	0.00	0.00	0.00	0.07	0.68
Florida	1.17	5.37	0.00	0.06	0.07	6.68
Georgia	0.50	1.66	0.00	0.05	0.06	2.26
Hawaii	0.50	0.40	0.00	0.02	0.03	0.94
Idaho	0.43	0.57	0.28	0.07	0.10	1.45
Illinois	0.08	2.82	0.00	0.09	0.01	3.00
Indiana	0.11	1.59	0.00	0.05	0.01	1.76
Iowa	0.05	0.65	0.00	0.02	0.01	0.74
Kansas	0.06	0.98	0.00	0.03	0.02	1.09
Kentucky	0.13	1.05	0.00	0.11	0.01	1.31
Louisiana	0.10	17.24	0.00	0.11	0.06	17.51
Maine	0.30	0.25	0.00	0.02	0.01	0.59
Maryland	0.29	1.55	0.00	0.03	0.04	1.90
Massachusetts	0.67	1.81	0.00	0.02	0.06	2.57
Michigan	0.26	2.04	0.00	0.06	0.03	2.38
Minnesota	0.14	1.10	0.00	0.06	0.05	1.34
Mississippi	0.20	1.96	0.00	0.04	0.02	2.21
Missouri	0.43	1.36	0.00	0.05	0.04	1.88
Montana	0.97	1.63	0.25	0.15	0.10	3.10
Nebraska	0.08	0.34	0.00	0.02	0.02	0.47
Nevada	0.79	6.18	0.14	0.07	0.08	7.26

New Hampshire	0.01	0.27	0.00	0.02	0.01	0.30
New Jersey	0.23	1.65	0.00	0.02	0.02	1.93
New Mexico	0.35	13.24	0.19	0.71	0.16	14.65
New York	0.54	3.94	0.00	0.04	0.05	4.57
North Carolina	1.57	1.70	0.00	0.05	0.03	3.35
North Dakota	0.11	7.08	0.00	0.14	0.03	7.36
Ohio	0.22	2.85	0.00	0.07	0.02	3.16
Oklahoma	0.14	2.52	0.00	0.05	0.05	2.75
Oregon	1.39	0.67	0.65	0.07	0.15	2.93
Pennsylvania	0.61	3.64	0.00	0.18	0.06	4.49
Rhode Island	0.02	0.43	0.00	0.01	0.00	0.47
South Carolina	0.15	0.98	0.00	0.03	0.01	1.17
South Dakota	0.34	0.23	0.02	0.03	0.06	0.67
Tennessee	0.76	1.32	0.00	0.04	0.03	2.15
Texas	0.32	31.46	0.00	0.16	0.06	32.00
Utah	1.39	8.62	0.12	0.30	0.11	10.54
Vermont	0.01	0.13	0.00	0.01	0.00	0.15
Virginia	1.27	2.67	0.00	0.06	0.22	4.23
Washington	0.66	1.32	0.01	0.08	0.13	2.20
West Virginia	0.07	0.50	0.00	0.12	0.03	0.72
Wisconsin	0.10	1.37	0.00	0.05	0.04	1.55
Wyoming	1.15	18.86	0.18	1.18	0.06	21.43

[1] Recreation total output based on visitor spending at units managed by BLM, BOR, FWS and NPS.
[2] BLM's Eastern States are not included in these totals due to lack of State-specific information.
[3] Energy & Minerals total output is based on activities related to onshore and offshore oil and gas, coal, non-metallic minerals, and geothermal, wind, and solar electricity generation. The economic output associated with locatable mineral production has only been estimated for NV. Locatable minerals from Federal lands are produced from other Western States but data was not available. The hardrock leasables are also not accounted for in this table because they are in the Eastern States.
[4] Timber contributions are based on the value of timber harvested on BLM lands in 2013. Grazing contributions are based on a State-specific estimate of jobs supported per 1,000 animal unit months (AUMs).
[5] Grants and Payments total output include AML, PILT, Royalties and certain other grants (Sport Fish, Wildlife Restoration, State and Tribal Wildlife Grants, LWCF with GOMESA, Historic Preservation, CIAP, CESCF, Preserve America, Save America's Treasures, Refuge Revenue Sharing).
[6] DOI Salary total output is that supported by DOI employees.
[7] These totals represent total output supported by energy, minerals, grazing, timber, salaries and grants and payments in each of the 50 States. The economic contributions reported in Table 1-1 were estimated using a national-level model that includes interstate “leakages” not captured in State by State-level models. Therefore, the sum of State totals will not equal the national total.

Table 3-3 shows estimates of the number of jobs supported in each State, and Figure 3-3 shows the employment supported for the top 10 States. Interior energy production-related activities in Texas and Louisiana both supported over 100,000 jobs in those States FY 2013. Recreation on Interior-managed lands supported over 30,000 jobs in California and over 20,000 jobs in Alaska.

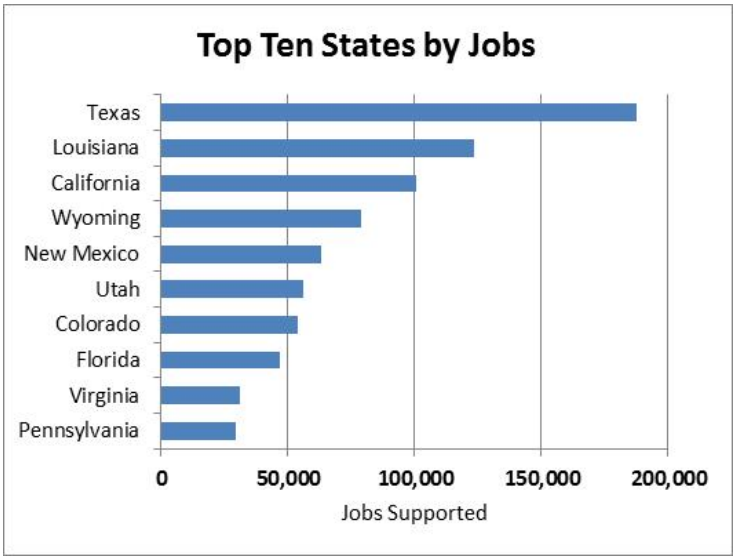

Figure 3-3. Top Ten States for Jobs Supported in All Sectors

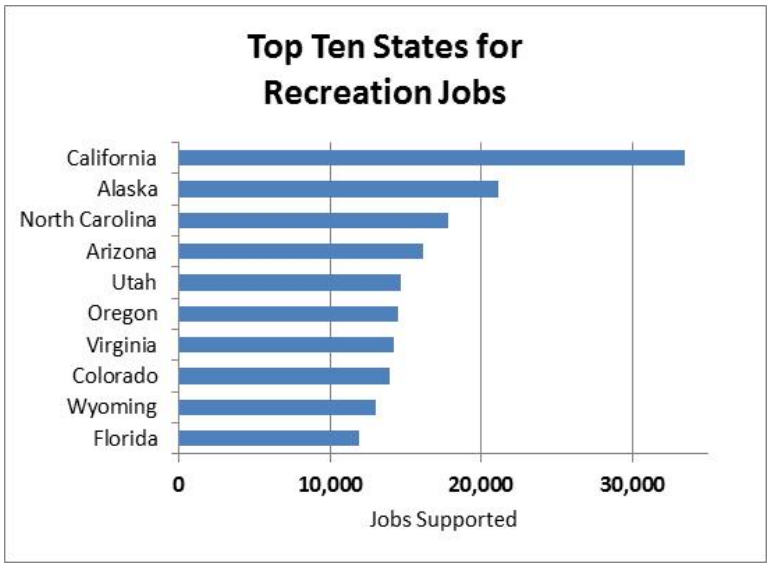

Figure 3-4. Top Ten States for Jobs Supported in the Recreation Sector

Table 3-3. Estimated Total Jobs Supported by Interior Activities, by Sector and State (FY 2013, jobs)

State	Recreation[1,2]	Energy & Minerals[2,3]	Grazing & Timber[2,4]	Major Grants & Payments[5]	DOI Salary[6]	Total[7]
Alabama	957	18,844	0	916	66	20,783
Alaska	21,136	3,920	0	1,122	799	26,978
Arizona	16,151	6,652	897	897	1,819	26,416
Arkansas	2,463	4,761	0	499	115	7,839
California	33,504	60,715	530	2,895	2,887	100,531
Colorado	13,940	32,873	852	2,851	3,465	53,982
Connecticut	24	4,782	0	157	22	4,985
Delaware	58	841	0	114	13	1,026
District of Columbia	5,554	0	0	19	438	6,012
Florida	11,888	33,711	0	577	582	46,758
Georgia	5,493	9,150	0	493	460	15,596
Hawaii	4,796	2,174	0	162	193	7,325
Idaho	4,846	2,806	2,899	783	888	12,222
Illinois	724	15,744	0	619	96	17,183
Indiana	1,336	8,796	0	468	104	10,704
Iowa	717	3,638	0	251	51	4,658
Kansas	742	5,605	0	335	141	6,823
Kentucky	1,494	5,808	0	1,027	120	8,449
Louisiana	1,080	120,946	0	1,196	490	123,711
Maine	3,516	1,413	0	220	118	5,268
Maryland	2,978	8,456	0	238	279	11,951
Massachusetts	6,877	10,021	0	178	430	17,506
Michigan	2,876	11,363	0	597	227	15,063
Minnesota	1,486	6,154	0	551	361	8,551
Mississippi	2,590	13,579	0	437	153	16,759
Missouri	5,171	7,518	0	568	309	13,566
Montana	11,467	7,619	2,447	1,657	915	24,105
Nebraska	971	1,931	2	266	169	3,338
Nevada	7,269	17,927	1,359	613	650	27,819
New Hampshire	91	1,496	0	167	44	1,798
New Jersey	2,550	9,200	0	184	137	12,070
New Mexico	3,985	47,481	2,533	7,794	1,438	63,232
New York	5,133	21,812	0	353	332	27,631
North Carolina	17,849	9,422	0	491	267	28,028
North Dakota	1,349	22,540	13	1,818	254	25,974
Ohio	2,534	15,931	0	614	153	19,231
Oklahoma	1,664	14,571	0	498	381	17,114
Oregon	14,472	3,736	4,487	629	1,293	24,616
Pennsylvania	6,903	20,606	0	1,443	466	29,418
Rhode Island	229	2,729	0	127	16	3,100
South Carolina	1,761	5,414	0	299	98	7,572

South Dakota	4,423	1,275	193	416	498	6,805
Tennessee	8,316	7,240	0	433	260	16,250
Texas	3,298	182,253	0	1,502	467	187,520
Utah	14,701	35,769	1,694	3,259	907	56,329
Vermont	60	699	0	147	33	939
Virginia	14,219	14,586	0	550	1,717	31,073
Washington	6,314	7,372	133	707	890	15,416
West Virginia	883	2,896	0	1,047	244	5,070
Wisconsin	1,149	7,599	0	551	298	9,597
Wyoming	13,006	50,109	1,595	13,869	507	79,086

[1] Recreation jobs based on visitor spending at units managed by BLM, BOR, FWS and NPS.

[2] BLM's Eastern States are not included in these totals due to lack of State-specific information.

[3] Energy & Minerals jobs are based on activities related to onshore and offshore oil and gas, coal, non-metallic minerals, and geothermal, wind, and solar electricity generation. The job estimates associated with locatable mineral production has only been estimated for NV. Locatable minerals from Federal lands are produced from other Western States but data was not available. The hardrock leasables are also not accounted for in this table because they are in the Eastern States.

[4] Timber contributions are based on the value of timber harvested on BLM lands in 2013. Grazing contributions are based on a State-specific estimate of jobs supported per 1,000 animal unit months (AUMs).

[5] Grants and Payments jobs include Mineral Revenue Payments, PILT, AML, and certain other grants (Sport Fish, Wildlife Restoration, State and Tribal Wildlife Grants, LWCF with GOMESA, Historic Preservation, CIAP, CESCF, NPS Grants, and Refuge Revenue Sharing).

[6] DOI Salary jobs are those supported by DOI employees.

[7] These totals represent jobs supported by recreation, energy, minerals, grazing, timber, salaries and grants and payments in each of the 50 States. The jobs reported in Table 1-1, were estimated using a national-level model that includes interstate “leakages” not captured in State by State-level models.

Appendix 1. Technical Information

This is the fifth Economic Contribution report produced by DOI. While all of the reports have relied on the best available data and sound methods, there have been some changes across years as improved data, methods, and models are identified or become available. When making comparisons of DOI's economic contribution estimates across years, it is important to identify all of the factors that might contribute to estimates changing from one year to the next. These factors can include:

- Changes in land use. These might be due to changes in resource demand or management decisions, or reflect a natural progression in a project's life cycle, such as a shift from construction to operational status.
- Changes in the data describing a resource's annual economic output. These might be due to actual changes in the quantity or price of a good produced, or changes in data collection and assumptions.
- Changes in the economic models that describe the underlying structure of local economies. For most sectors, these models are developed independent of this report. In some cases, new models that better describe individual sectors have replaced models used in prior reports. In other cases, the assumptions and data within the models have changed significantly from year to year.

General Notes on Table 2-1

- Estimated DOI Inputs as a Percent of National Sector – DOI contributions as a percentage of the entire industry at the national level. In general we assume that contributions are proportional to production. Thus if Interior lands produce a certain percentage of the national total for a given resource, this is equivalent to that same percentage of the national output, employment and value added associated with that resource. For hydropower, wind power, and geothermal the percentage represents the DOI capacity as a percentage of total capacity.
- The value added and economic contribution estimates do not capture output or employment effects beyond payroll spending and natural resource production. Bureaus are engaged in various other activities funded by appropriations, e.g., land acquisition, BLM's mine land reclamation, construction, road building, education, etc.

OSMRE

- The majority of the Office of Surface Mining Reclamation and Enforcement's activities related to reclamation of abandoned mine lands are encompassed by funding from the Abandoned Mine Lands (AML) fund. The impact of these funds is captured in the entry for Grants and Programs reported earlier in the report.

Indian Affairs, BIA, and BIE

- Sales volumes and values for BIA's oil, gas and coal activities are based on data from ONRR. Lacking multipliers specific to oil, gas and coal activities on Reservations, we used a multiplier based on BLM's onshore oil, gas and coal activities at the national level.
- BIA's economic contributions from oil, gas, and coal are assumed to be proportional to BLM's.

- Drilling costs for oil, gas, and dry wells were calculated for each State where Indian wells were completed in FY 2013. Costs per well were calculated as the total costs for each type of well (oil, gas, or dry) divided by the total number of completed wells of each type. The data were taken from "The Oil & Gas Producing Industry in Your State" (IPAA, October 2012).
- The ratio of dry holes to total wells completed was calculated for each State where Indian wells were drilled. These results were used to estimate the number of dry holes associated with Indian wells completed in each State.
- "Other minerals" were assumed to be construction aggregate (sand and gravel; crushed stone). The value of output was estimated by assuming the 2013 royalty collections of $3.0 million were derived from a 5% royalty. This implies a commodity value of about $60 million. The total value of construction aggregates produced in the US in 2013 was $6.7 billion (source: Sand and Gravel (Construction), U.S. Geological Survey, Mineral Commodity Summaries, January 2014).
- Economic contributions associated with contractual support provided to tribal governments were evaluated by applying State and local government multipliers.
- Irrigation: No new information was available for FY 2013. The Department of the Interior's Bureau of Indian Affairs (BIA) manages 17 irrigation projects on Indian reservations in the western United States. The overall approach for estimating economic contributions and employment estimates is similar to that used for Reclamation's irrigation activities. Economic contributions and employment estimates were estimated for agricultural activities associated with BIA operated irrigation projects using data from the USDA National Agricultural Statistics Service (NASS) 2007 Census of Agriculture, Volume 2, American Indian Reservations. The Census of Agriculture does not provide complete coverage of all reservations. Where information was not available from the Census of Agriculture, irrigated acreage information was from the GAO report "Numerous Issues Need to Be Addressed to Improve Project Management and Financial Sustainability" (GAO-06-314, Mar 27, 2006). Irrigated acreage data were combined with average crop revenue per acre for irrigated acreage calculated based on data in the 2007 Agricultural Census. The agricultural revenue values in the Census were indexed to 2011 dollars using the NASS food grain prices received index. The multipliers used were based on IMPLAN grain farming sector. The values reported for Irrigation represent the value of the crops produced using irrigation water supplied by BIA. This value overstates the actual production attributable to BIA, as some level of production would occur without the irrigation water delivered by BIA, and water is only one of many inputs into agricultural production.

BLM

- The method used by BLM to estimate the contributions from oil and gas activities is based on adjusting the sum of the value of the gross output plus drilling costs to remove inter-industry sales to derive a final demand figure. A multiplier is then applied to final demand to derive the contribution estimates. The rationale for adding drilling costs to the gross output value (prior to making an adjustment to derive final demand) is that drilling costs are not accounted for in the IMPLAN production function for oil and gas extraction. Note that BLM's results are developed independently of BOEM's figures for offshore production, using a different approach. This complicates a direct comparison between the onshore and offshore analyses. BLM considers onshore direct output to include 1) oil and gas well drilling, with costs taken from the Independent Petroleum Producers Association report *IPAA Oil & Gas Producing Industry in Your State*; and 2) oil and gas sales, based on sales volume and sales value for the fiscal year with preliminary sales year data provided by the Office of Natural Resources Revenue (ONRR). Final demand is taken to be the sum of these two items less inter-industry sales.
- BLM uses IMPLAN to estimate the economic contributions associated with salable minerals and other leasable minerals (i.e., other than oil, gas, and leasable hardrock minerals). The method parallels that of oil and gas production described above. Production and unit prices for leasable minerals for the fiscal year are based on preliminary sales year data provided by ONRR. Salable minerals production data for the fiscal year are from BLM's internal database LR2000; commodity price data are based on the USGS annual Mineral Commodity Summaries (MCS).
- In prior years of the DOI Economic Report, the economic contribution of hardrock mining on Federal estate was estimated at a national level using information from a 1993 DOI publication called the Economic Implications of a Royalty System for Hardrock Minerals (DOI 1993). This report provided information at a national level on the proportion of hardrock production from mineral claims for certain commodities. State level estimates could not be derived using the information in DOI (1993). The FY 2013 report uses a revised methodology based on hardrock mineral production data from Federal claims in Nevada and leases in Missouri. USGS's annual MCS provide commodity prices that were used in this analysis. Economic contributions were estimated using IMPLAN. The primary limitation in generating useable estimates of hardrock mineral production is identifying the portion coming from Federal lands – such data are generally unavailable. The production estimates from Nevada and Missouri account for the vast majority of production value from Federal lands.

- For livestock grazing, BLM developed State-specific economic contribution estimates associated with 1,000 Animal Unit Months (AUMs). These estimates were derived using data from the 2007 Census of Agriculture and 2005-2009 American Community Survey. These data sources provided information on a specific subset of livestock that best reflects the animals that actually graze on BLM-managed lands and also accounts for individuals who are unpaid or family laborers. In some areas unpaid or family labor accounts for up to 35% of the total labor on ranches and farms. This workforce category was accounted for by developing a ratio between paid and unpaid/self-employed individuals for each of the relevant States. The analysis assumes that the grazing operations included in the Census of Agriculture are representative of those operations using public forage from lands managed by the BLM. It is possible that ranchers utilizing public lands have different spending or employment patterns than grazing operations as a whole, but using the Census of Agriculture provides a standard dataset for comparison across States. In addition, because the Census of Agriculture is only available every five years it is assumed that the per 1,000 AUM calculation remains constant from year-to year. It is also assumed that the ratio of paid to unpaid and self-employed labor is constant across all agriculture and forestry sectors. The economic contribution estimates associated with livestock grazing on BLM managed lands were derived by multiplying the per 1,000 AUM factors by the AUMs authorized on bills (associated with leases or permits to graze livestock on BLM managed lands) that were due during a given fee year. Fee year 2012 began on 3/1/2012 and ended on 2/28/2013.
- Timber value is composed of the sales receipts for harvested sawtimber, sales of Special Forest Products, and stewardship timber sales. Contracts for sawtimber are typically sold at auction, and the BLM receives the agreed payments when timber is actually cut and sold. Special Forest Products includes fuelwood, posts, poles, etc. While the sales are negotiated, the BLM tries to follow the stipulation that sale prices will not go below 10% of the estimated market value. Stewardship Program timber sales are associated with BLM bartering goods (timber products) for services (land treatments) done outside contractors. The product value is used to offset the total cost of service work in the contract.
- Estimates reflect economic contribution from commercial sales of timber, primarily wood-based products. The BLM's forestry and woodlands management program also manages public access to a variety of other forestry products including personal use fuelwood (fuelwood gathered by individuals for personal use rather than by companies for commercial resale) and non-wood Special Forest Products (such as Christmas Trees, native seeds, mushrooms, and floral/greenery). Non-wood Special Forest Products from BLM-managed lands generated approximately $300,000 in sales in FY2013. Personal use fuelwood gathered from BLM-administered lands in FY2013 amounted to over 100,000 CCF.[20] Assuming a market price of $200 per cord (EIA, 2014), the market value of this fuelwood is over $16 million. BLM collected about $500,000 in permit fees for personal fuelwood collection.
- Economic contributions related to constructing and operating wind, solar, and geothermal energy projects were derived using the Jobs and Development Economic Impact (JEDI) models produced by the National Renewable Energy Laboratory (NREL). In prior years, economic contributions associated with geothermal energy development were developed using IMPLAN based on sales volume and value from ONRR and drilling data from BLM. Therefore, the economic contribution estimates for FY2013 should not be compared to prior years.

[20] CCF is a “cunit” equal to one hundred cubic feet of wood.

Reclamation

- FWS trip-related multipliers and average visitor expenditures were used to estimate impacts for Reclamation's recreation activities. The analysis relies on Reclamation visitation data collected during 2010-2013 and applies current expenditures per day, value added, output, and employment multipliers from FWS.
- The values reported for irrigation represent the gross value of the crops produced using irrigation water supplied by Reclamation. This value considerably overstates the actual production attributable to Reclamation, as some level of crop production would occur without the irrigation water delivered by Reclamation, and water is only one of many inputs into agricultural production. The multipliers used were developed for the 17-western State Reclamation service area. Reclamation is utilizing GIS imagery to document the type and acreage of irrigated crops grown on Reclamation projects. These data, combined with State-level yields and nation-wide prices provided by the USDA, are used to estimate gross crop value. Reclamation currently has completed approximately 80% of this project.
- The economic contributions associated with Reclamation supplied municipal and industrial (M&I) water are associated with the activities associated with operating water, sewage and other treatment and water delivery systems. The economic contribution of delivering M&I water was estimated by using total 2005 M&I contract amounts in acre-feet and multiplying the total amounts by recent (2006) average market M&I water rates for major urban areas. For the FY 2013 report, no new information was available, so the FY2011 value was indexed using the CPI values for water, sewer, and trash collection services. Actual water deliveries are not reported on a Reclamation-wide basis. The most recent year for which actual M&I deliveries were reported on a Reclamation-wide basis is 1992. Therefore, these values should also be treated as estimates.
- The value of hydroelectricity generated at Reclamation facilities was estimated using regional wholesale prices for Reclamation major hydropower production areas as follows: BPA - $0.033/kWh; Parker Davis - $0.008/kWh; Boulder-Hoover - $0.021/kWh; Loveland - $0.041/KWh; Billings - $0.033/kWh; Sacramento -- $0.023/kWh; and Salt Lake City - $0.03/kWh.

BOEM and BSEE

- The BOEM maintains an in-house socio-economic impact model, MAG-PLAN, for economic impact analyses to support its lease sale planning duties. MAG-PLAN identifies the industry sectors that contribute to offshore oil and gas activity (e.g., wells drilled, platforms installed, etc.) and calculates the size of the direct impact in each sector. Total OCS related spending and employment in the U.S. economy is estimated with ratios and multipliers from the recently updated version of the MAG-PLAN model which incorporates 2010 IMPLAN data.
- BOEM's economic impact models and the macroeconomic allocation factors available from other agencies indicate that the activities associated with this production resulted in over $118 billion in the total U.S. output in FY 2013, over $62 billion in value added[21] (approximately 0.4% of total U.S. GDP) and sustained705,000 domestic jobs (approximately 0.5% of all U.S. employment).[22] The rows in Table A1-1 identify the individual components that we estimated to arrive at these totals.

[21] Value added is defined as the difference between an industry's total output and the cost of its immediate inputs. It is an individual producer's contribution to GDP.

[22] These jobs are considered "sustained" because many are continued from OCS oil and gas activity in previous years. It should be emphasized that these estimates do not represent "new" jobs; many of these would represent

- The basis for calculating the FY2013 impacts of OCS oil and gas activity is the sales value of FY2013 OCS oil and gas production as published by the Office of Natural Resources Revenue.[23] As shown in the first column of
- Table A1-1. BOEM and BSEE Administered Industry Economic Impact FY 2013, the sales value of OCS production in FY 2013 was $55.8 billion.[24] Because different sources of spending generate different degrees of economic impact, we distributed this sales value among industry spending, government revenue, and after-tax profits to enable the calculation of total economic impact and individual State impacts. The portion of industry profits that flow to foreign entities has spending impacts that cannot be separated from those of other U.S. activities that generate income abroad, so we omit any spending impact from this portion of total sales.[25] That leaves $47.874 billion of OCS stimulated direct spending in the U.S. economy, shown in the second column of Table A1-1.

Table A1-1. BOEM and BSEE Administered Industry Economic Impact FY 2013

	OCS Oil, Gas, and NGL Sales Value ($ millions)	Resulting Direct Domestic Spending ($ millions)	Resulting Total Domestic Output ($ millions)	Resulting Total Domestic Value Added ($ millions)	Domestic Jobs Sustained (Thousands)
Industry Spending	$22,330	$22,330	$50,380	$29,570	314
Government Revenue	$13,561	$13,561	$43,253	$18,790	229
After-Tax Profits	$19,935	$11,793	$24,847	$14,264	162
Foreign After-Tax Profits	$8,142	*n/a*	*n/a*	*n/a*	*n/a*
Domestic After-Tax Profits	$10,990	$10,990	$22,285	$13,151	148
Tax on Dividends	$803	$803	$2,562	$1,113	14
Sales Value	$55,826	$47,684	$118,480	$62,623	705

NB: Totals may not sum due to rounding error

new contracts or orders at existing firms that would essentially keep the firm operating at its existing level as earlier contracts are completed and filled.

[23] http://statistics.onrr.gov/ReportTool.aspx

[24] Office of Natural Resource Revenue only reports the sales value of royalty bearing volumes of oil and gas. To calculate the total sales value, we used the effective price (the ratio of sales value to sales volume) of the revenue volumes and applied it to the non-revenue volumes. The effective price is $3.57/mcf for gas, $0.87/gal for NGL, and $105.45/bbl for oil.

[25] After-Tax profits are foreign revenues that come from a portion of retained earnings spent overseas, and dividends held by shareholders in the rest of the world.

- We assumed direct industry spending (i.e., capital and operating expenditures) was 40% of total sales value (0.4 * $55.8 billion) in FY2013.[26] We then applied MAG-PLAN multipliers for direct, indirect, and induced spending (a total multiplier of 2.26) to estimate the total domestic output associated with this direct spending of $22.33 billion. We used the industry spending ratio from MAG-PLAN of $1.32 value added for every dollar of direct spending, to derive a value added of $29.6 billion. In addition, we estimated jobs sustained by industry spending using the ratio from MAG-PLAN of 14.07 total jobs per million dollars of direct offshore oil and gas industry spending, resulting in a figure of 314,000 jobs sustained.
- Government OCS revenue originates from leasing revenue and taxes. A portion of OCS leasing revenue is allocated to grant and revenue sharing programs including State sharing in the 8(g) zone, GOMESA, Land and Water Conservation Fund (LWCF) and the Historic Preservation Fund (HPF). The remaining leasing revenue and all of the tax revenue go into the Treasury General Fund. To calculate the total output from the spending of government revenues, we used the MAG-PLAN derived Federal government spending multiplier (based on IMPLAN data) of 3.19. We converted government spending to jobs using the IMPLAN ratio of 16.85 total jobs per million dollars of direct spending by the Federal government. Leasing and tax revenue are divided between States based on historical Federal funds distributions.
- Estimated after-tax profits of $19.9 billion ($11.8 billion going to domestic entities and $8.1 billion going to foreign entities) were distributed for our analysis between retained earnings and dividends to shareholders using EIA data which indicates that retained earnings are roughly equal to 66% of after-tax profits in the oil and gas industry ($13.2 billion) and dividends are roughly equal to 34% ($6.8 billion). We split retained earnings between flows to the rest of the world and funds remaining in the U.S. Using EIA data on oil and gas expenditures, we estimate that 47% ($6.184 billion) will be spent in the rest of the world and the remaining 53% ($6.973 billion) will remain in the U.S.[27] Splitting retained earnings this way treats funds that go to the rest of the world as a leakage from the economy that have no discernable direct spending impacts in the U.S. Moreover, the domestic retained earnings are either saved or are already included in industry spending, so we assigned no additional economic impact to retained earnings beyond the direct spending. As with foreign shares of retained earnings, we allocated a portion of total dividends to foreign shareholders. Data from the Bureau of Economic Analysis, Department of Commerce, indicate 21% ($1.4 billion) of dividends are sent to shareholders in the rest of the world, and thus have no direct spending impacts. Of the $5.4 billion of dividends paid out domestically, we used the IRS dividend tax rate of 15% to calculate taxes of $0.803 billion. Of the after-tax domestic dividends ($4.6 billion), we assume, based on two empirical studies, that 25% ($1.1 billion) is reinvested and the remaining dividends ($3.4 billion) are spent by shareholders.

[26] This assumption is based on the results of BOEM's in-house leasing model, MAG-PLAN.

[27] Energy Information Agency, Financial Reporting System Survey, Schedule 5211: Petroleum Segments Expenditure and Operating Expenses: 2009. < ftp://ftp.eia.doe.gov/pub/energy.overview/frs/s5211.xls>.

- Domestic retained earnings of $6.97 billion and domestic spending from reinvested dividends of $603 million total $7.6 billion to be divided between onshore and offshore operations. Using the EIA data on oil and gas expenditures, of the 53% of expenditures in the U.S., 73% are on onshore activities, and 27% are for offshore activities. The offshore expenditure impacts are calculated identically to the industry spending described earlier (with a direct to total output multiplier of 2.26). The onshore portion is calculated using the IMPLAN Sector 20 and 29 average multiplier of 1.98 for total spending, 12.92 jobs per million dollars spent, and $1.15 in value added for every dollar spent. These calculations result in a total impact of $15.6 billion in total output, $9 billion in value added, and 100,000 jobs.
- The tax revenue from dividends is treated in the same way as government revenues with an output multiplier of 3.19 and a ratio of total jobs to direct spending of 16.85, resulting in a total output of $2.6 billion, a total value added of $1.1 billion and total employment of 14,000. We based the total impact from the spending of domestic dividends ($6.7 billion) on the average (1.96) of the multipliers of the consumer sectors in IMPLAN (sectors 320-425). Likewise, we used the IMPLAN ratio of $0.41 in value added per dollar spent and 14.10 total jobs per million dollars of consumer spending to calculate the value added of $4.1 billion and employment of 48,000 jobs.
- Additional analysis was required to estimate the distribution of economic impacts by State. For the industry spending category, the MAG-PLAN model reports the economic impacts that occur in each of the five Gulf of Mexico (GOM) States while aggregating the remainder of the U.S. Since MAG-PLAN has the breakout of economic impact (direct spending, total output, and total jobs) for the GOM States, we applied the percentages for each individual State to the FY2013 industry spending data to calculate the impacts in each of the GOM States. For the remainder of the U.S., we used Bureau of Labor and Statistics (BLS) data on employment by State for each industry sector that MAG-PLAN identifies as having meaningful levels of activity (at least 1% of activity) outside the GOM States.[28] We weighted the BLS State employment data by the contribution of each sector to total industry spending from MAG-PLAN to give us the distribution of economic impacts from industry spending by State. Next, we allocated the spending outside the GOM States according to the new BLS-derived distribution.
- For the government revenue sector, we allocated the spending and job components of grant and revenue sharing programs to the State which receives the funds. We allocated the remaining leasing revenue and tax revenue between States in the proportion in which each receives government funds based on historical Federal funds distributions to States as reported by the Census Bureau.[29]
- Note that BOEM's results are developed independently of BLM's figures for onshore production, using a different approach. This complicates a direct comparison between the offshore and onshore analyses. BOEM considers offshore direct output to include several related supporting sectors, including steel product manufacturing, water transportation, air transportation, food supply, etc. Interindustry sales are removed in calculating final demand.

[28] http://www.bls.gov/cew/

[29] U.S. Census Bureau Statistical Abstract Table 467: Federal Funds - - Summary Distribution by State and Island Areas: 2007. <http://www.census.gov/compendia/statab/2010/tables/10s0467.xls>.

Grants and Payments

- The total grants and payments included in the report represent all grants and payments for bureaus and Interior-wide programs in FY 2013, including current and permanent Payment in Lieu of Taxes (PILT) payments and mineral revenue payments. State-level FY 2013 grants and payments data were obtained from the DOI Office of Budget for the grants and payments analyzed in this report.
- The report includes a total of $5.45 billion in grants and payments. The FY 2015 Budget in Brief reports actual FY 2013 grants and payments totaling $4.74 billion. Variances between the two figures can be attributed for certain grant and payment totals to the exclusion of program administration costs in grant awards, Coastal Impact Assistance Program (CIAP) payments made during FY 2013, and payments to support tribal governments.
- Economic contribution estimates use national-level multipliers for the appropriate sectors. The State-level analysis of employment impacts related to grants and payments included in Chapter 3 only includes those categories for which State-level data were available. Including information on impacts of the full array of grant programs and payments would likely increase employment impacts. The State analysis uses State-level multipliers for the appropriate sectors for each grant category
- Energy and mineral leasing revenues (bonuses, rents, and royalties) disbursed to the U.S. Treasury are one of the Federal Government's largest sources of non-tax receipts. These revenues help fund various government functions and programs through the General Fund of the U.S. Treasury. Royalty payments are divided into offshore and onshore categories. All employment and output impacts for offshore royalties were included in the category of Energy and Minerals for the national and State-level analyses. Does not include $9.2 billion in leasing revenues and corporate taxes that flow to the Treasury as a result of Interior's offshore mineral activities. These revenues are included in the BOEM totals.
- The State-level analysis includes a preliminary estimation of the impacts of Federal offshore royalty payments (to States via Treasury). Additional details on these calculations are included in the BOEM section above.
- Federal law requires that all monies derived from mineral leasing and production activities on Federal and American Indian lands be collected, properly accounted for, and distributed. For Federal onshore lands, the revenues are generally shared between the States in which the Federal lands are located and the Federal government. In most cases, States receive about 50 percent of the revenues associated with mineral production on Federal public lands within their borders or off their coastlines[30]. In the case of American Indian lands, all monies collected from mineral production are returned to the Indian Tribes or individual Indian mineral lease owners. Revenues associated with Federal offshore lands are distributed to several accounts of the U.S. Treasury and certain coastal States with special Federal offshore tracts adjacent to their seaward boundaries. Coastal States, with certain Federal offshore 8(g) tracts adjacent to their seaward boundaries, receive 27 percent of the revenues.
- Mineral revenue payments include receipts for sales in the National Petroleum Reserve – Alaska, Mineral Leasing Associated Payments, National Forest Fund Payments to States, and Payments to States from Lands Acquired for Flood Control, Navigation, and Allied Purposes.
- Grants and Payments include mineral revenue payments to States associated with onshore production, and grant programs funded by offshore leasing and other sources of revenues.

[30] Alaska is an exception, receiving 50 percent of revenues for production from the National Petroleum Reserve A (NPR-A), and 90 percent elsewhere.

- Land acquisitions: Output and employment contribution estimates for land acquisition are derived using State and national-level multipliers. It is assumed that 90% of funds go to landowners and 10% are spent on transaction costs. Much of the money land owners receive is likely to go into savings, be used to pay off loans, or be subject to tax. It is therefore assumed that landowners will spend only 50% of funds they receive. These expenditures are modeled as a household income change for households with annual incomes greater than $150,000. The remaining 10% of funds are assumed to go to service providers associated with real estate transaction costs or monitoring and administration of easements. Specific services associated with land acquisition could include land appraisal, title examination and legal services, environmental site assessments, and ecological inventory and management planning. IMPLAN sector 374 (management, scientific, and technical consulting services) is used to model the services associated with land acquisition. Temporal issues complicate the analysis, as there may be a delay between the date of the purchase, the date the landowner receives the funds, and the dates the landowner spends the funds. Contributions are typically reported for one year, and only a small portion of the funds received by landowners is likely to be spent in that same year; monitoring expenditures will also often be incurred in perpetuity whereas transaction costs are all up-front. As a simplifying assumption, all landowner expenditures and service fees are assumed to occur in the same year that the transaction takes place.

Payroll Impacts

- The domestic jobs supported by Interior in Table 2-1represent additional jobs above and beyond Interior employees.
- For Table 2-1, 2013 payroll data were obtained from Department of the Interior Human Resources data systems. The payroll data include salary data based on the duty-station of all Interior employees through pay period 17, which covered July 28, 2013 through August 10, 2013.
- The calculation of the economic contributions associated with DOI payroll adjusts the total value of payroll for each State to account for taxes and savings rates using State-level data. These disposable income values (payroll – savings and taxes) are then used to calculate the economic impacts. This differs from the method used in last year's report, in which disposable income was assumed to be 66% of the payroll values for all States.
- For the payroll contributions shown in Table 2-1, a national multiplier was used to estimate the employment contributions of Interior payroll, equaling 8.9 jobs per $1 million.
- For State-level salary effects shown in Tables 3-1 and 3-2, 2013 payroll data and State-level multipliers were used. Since State multipliers do not capture leakages, the total of State salary impacts will not equal the national-level salary employment impacts.
- The total salary paid and number of employees for each Bureau does not necessarily reflect FTE data typically reported in budget documents. These data were used to estimate total salary impacts rather than data on total FTE's, which would not have been a complete estimate of total salary impacts of DOI employees.

Recreation Impacts

- In Chapter 2, the value of the national sector was taken to be $915 billion, the 2013 output of the travel and tourism industry, as measured by the direct output of goods and services sold directly to visitors (source: Bureau of Economic Analysis Travel and Tourism Satellite Accounts).[31]
- Total recreation economic and employment impacts are national estimates calculated using national level multipliers, which include "leakages" between States that are not captured in State-by-State models.
- Last year's report included data for NPS units in U.S. territories, but not for FWS units. This year's report does not include these areas in the economic analysis for NPS or FWS. Visitation data for NPS reported in Table 1-1 includes visitation for all NPS units including U.S. territories. FWS does maintain some visitation data for sites outside of the continental United States, Hawai`i, and Alaska, and future analysis could include these areas.
- Visitation and expenditure data sources included the following: FWS Fishing, Hunting, and Wildlife-Associated Recreation Survey; NPS visitor surveys, and unpublished data from *2012 National Park Visitor Spending Effects, Economic Contributions to Local Communities, States, and the Nation,* (Cullinane Thomas, et al. 2014). We calculated site-level impacts of visitor spending for BLM sites using Forest Service expenditure data, and for Reclamation expenditures based on the FWS Fishing, Hunting, and Wildlife-Associated Recreation survey. Spending profiles associated with these data sources were used to develop estimates of average expenditures. BLM visitation estimates are from BLM's Recreation Management Information System (RMIS). BLM used results from the U.S. Forest Service's National Visitor Use Monitoring (NVUM) survey to estimate the distribution of visitor types and the associated expenditure profile.
- In prior years, NVUM survey results used by BLM were based on *Spending Profiles of National Forest Visitors, NVUM Four Year Report* by Stynes and White, 2010. For this year's report, BLM used updated information from *Estimation of national forest visitor spending averages from National Visitor Use Monitoring: round 2, 2013 (http://treesearch.fs.fed.us/pubs/43869)*. The distribution of visit types in the 2013 publication reflects a higher proportion of local visitors when compared to the 2010 publication.
- Reclamation recently revised the method they used to collect recreation visitation information and new data has been collected over the past two years. In most cases, project recreation sites are managed by Reclamation partners, including both Federal and non-Federal entities.
- NPS and BOR visitation data are for 2012; BLM and FWS are for FY 2013. However, the economic contribution estimates for BOR are based on 2011 spending information in 2013$ (from FWS). Multipliers used for FWS and BOR are from the 2008 version of IMPLAN. Multipliers used for NPS are from the 2012 version of IMPLAN.
- The FWS National Survey of Hunting, Fishing, and Wildlife Associated Recreation State-level data were used to determine the average recreationist's trip spending per day.
- The BOR and FWS recreation valued added figures are based on the ratio of NPS valued added to total output. The FWS valued added figure for Delaware is based on the average of the MD, NJ, PA, and VA ratios because Delaware does not have a NPS unit.

[31] https://www.bea.gov/newsreleases/industry/tourism/2013/pdf/tour313.pdf

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