This is the eighth Economic Contribution report produced by DOI. While all of the reports relied on the best available data and sound methods, there are 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 replaced models used in prior reports. In other cases, the assumptions and data within the models changed significantly from year to year.

**IMPLAN**

This analysis primarily employs the widely used input-output software and data system known as IMPLAN for estimating the economic contribution of Interior activities in terms of output (sales), value added, and employment (jobs). In particular, this analysis uses IMPLAN data released in 20161. The underlying data drawn upon by the IMPLAN software is collected by the Minnesota IMPLAN Group (MIG) from multiple Federal and State sources including the Bureau of Economic Analysis, Bureau of Labor Statistics, and the U.S. Census Bureau. Additional information about the IMPLAN modeling software can be found at: http://www.implan.com/.

**General**

- The benefits of nature provided by Interior-managed lands are typically provided free of charge, and people who benefit from these services may not be directly involved in determining the supply of services. 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, and local air quality). In general, the analytic approaches used in these studies are either a revealed or stated preference approach (or in some cases a combination).
- 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.

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1 NPS used 2014 IMPLAN data
- Economic contributions do not account for any activity that might occur even without the event or policy. Economic 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.
- 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. 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. 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. 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.
- 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. More detailed treatments of some of the topics addressed in this report are available in the FY 2012 Economic Report: www.doi.gov/sites/doi.gov/files/uploads/FY2012%20DOI%20Econ%20Report%20%28Final%29%202013-09-25.pdf.

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
- Minerals. Sales volumes and values for BIA’s oil, gas, coal and other mineral activities are based on data from ONRR and BIA. Other minerals include; cinders; gypsum; sand and gravel; and copper.
- Drilling costs for oil, gas, and dry wells were calculated for each State where Indian wells were completed in FY 2016. 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 cost data were taken from “The Oil & Gas Producing Industry in Your State” (IPAA, October 2012).
- Economic contributions associated with contractual support provided to tribal governments were evaluated by applying state and local government multipliers.
• Irrigation: 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) 2012 Census of Agriculture, Volume 2, American Indian Reservations. The Census of Agriculture does not provide complete coverage of all reservations. Irrigated acreage data were combined with average crop revenue per acre for irrigated acreage calculated based on data in the 2012 Agricultural Census. The agricultural revenue values in the Census were indexed to 2016 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.

• Timber: The economic contributions associated with BIA timber are estimated with an approach similar to that used by BLM.

BLM

• The BLM estimates the contributions from oil and gas activities by adding the value of the gross output to drilling costs and then removing 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 including drilling costs in the initial sum 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 the Bureau of Ocean Energy Management (BOEM) figures for offshore production, and use a different approach. This complicates a direct comparison between the onshore and offshore analyses. The BLM considers onshore direct output to include 1) oil and gas well drilling, with costs taken from the Independent Petroleum Producers Association report “Oil & Gas Producing Industry in Your State” (IPAA, October 2012); 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 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 data from USGS’s annual Mineral Commodity Summaries (MCS).

• The economic contributions of hardrock mining on the Federal estate were estimated at a national level using an approach similar to the approach used in previous years. The primary limitation in generating useable estimates of hardrock mineral production is identifying the portion coming from Federal lands. These data are generally unavailable. The production estimates from Nevada and Missouri account for the vast majority of production value from Federal lands. USGS’s annual MCS provide commodity prices that were used in this analysis.
• For livestock grazing, the BLM developed state-specific economic contribution estimates associated with 1,000 Animal Unit Months (AUMs) – commonly termed response coefficients. An example of a response coefficient is “1,000 AUMs for grazing beef cattle support approximately X direct jobs in state X.” These response coefficients were revised last fiscal year (FY 2015) using data primarily from the 2012 Census of Agriculture in combination with IMPLAN (2013 data). The results in the previous four DOI Economic Reports used response coefficients derived using data primarily from the 2007 Census of Agriculture, and also from the Census’ American Community Survey, in combination with IMPLAN (2007 data). Due to the revisions of the response coefficients, the FY 2015 and FY 2016 contribution estimates associated with livestock grazing are not comparable to prior years. The 2012 Census of Agriculture provides information on a specific subset of livestock that best reflects the animals that actually graze on BLM-managed lands – specifically, employment, income, sales, and expense data from operations classified by the North American Industry Classification System (NAICS) as beef cattle ranching and farming (112111) and sheep and goat farming (1124). In addition, the 2012 Census of Agriculture contains information related to self-employment as well as individuals who are unpaid or family laborers. In some areas unpaid or family labor represent a significant component of the labor used to run ranches and farms. 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 response coefficients will remain constant from year-to-year. The economic contribution estimates associated with livestock grazing on BLM-managed lands were derived by multiplying response coefficients 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. Economic contribution estimates in this report are based on the most current data on livestock grazing use on BLM-managed lands - fee year 2016 (3/1/2015 through 2/28/2016).

• 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 include fuelwood, posts, poles, etc. While the sales are negotiated, the BLM tries to follow the stipulation that sale prices will not go below 10 percent of the estimated market value. Stewardship Program timber sales are associated with BLM bartering goods (timber products) for services (land treatments) done by outside contractors. The product value is used to offset the total cost of service work in the contract.

• Timber economic contribution estimates reflect commercial sales and processing 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 over $865,000 in sales in FY2016. Personal use fuelwood gathered from BLM-administered lands in FY2015 amounted to about 125,000 CCF. Assuming a market price of $200 per cord (EIA, 2014), the market value of this fuelwood is almost $15.5 million. The BLM collected around $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). Prior to FY 2013, 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 FY 2015 and FY 2016 should not be compared to prior years.

The drop in the market price for oil and gas in 2016 reduced the average effective prices for oil and gas in FY 2016 and thus affected the calculated economic contribution estimates. While DOI's contribution to the economy may decline, society receives benefits from lower oil and gas prices as consumers have more disposable income to spend elsewhere creating its own economic impacts.

Reclamation

- The analysis relies on Reclamation visitation data collected during 2010-2013 and applies current average trip-related expenditures per day, value added, output, and employment multipliers from FWS.
- Prior to FY 2014, valuations of economic impacts from Reclamation's agricultural water deliveries in the Central Valley Project (CVP) area assumed that all crops grown in the CVP area used only Reclamation water supplies. However, Reclamation’s water supply is only supplemental. Therefore, an adjustment was made to the value of CVP crops by comparing the calculated irrigation requirements to Reclamation’s actual water deliveries.
- Reclamation is utilizing GIS imagery to document the type and acreage of irrigated crops grown. Some Reclamation projects do not have GIS data and have not been included. GIS acreage from 2016, combined with 2015 State-level yields and prices provided by the USDA, are used to estimate gross crop value. The Reclamation M&I water economic contributions are associated with operating systems for water, sewage, etc. 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 average market M&I water rates for major urban areas derived from various studies that the Bureau of Reclamation Technical Services Center combined and analyzed. For the Central Valley Project in California actual M&I delivery data was used in both FY 2015 and 2016.
- The value of hydroelectricity generated at Reclamation facilities was estimated using regional wholesale prices for Reclamation major hydropower production areas as follows: BPA, $0.035/kWh; Parker Davis, $0.010/kWh; Boulder-Hoover, $0.018/kWh; Loveland, $0.041/kWh; Billings, $0.033/kWh; Sacramento, $0.044/kWh; and Salt Lake City, $0.029/kWh.
- California’s Agricultural production in 2015 accounted for 1.3% of California’s GDP, about 19% of US agricultural GDP and about 0.1% of US GDP (California Agricultural Statistics Review 2015. GNP data from U.S. Bureau of Economic Analysis, “Table 3. Current-Dollar Gross Domestic Product (GDP) by State, 2015,” (www.bea.gov/regional/index.htm).
• Drought impacts are expected to reduce estimated 2016 water-year surface water delivery for agriculture by 2.7 MAF, resulting in an estimated increase in groundwater pumping of 1.9 MAF, and net reduction in total irrigation deliveries of 2.6% of the total approximate 26 MAF irrigation use in California. Resulting impacts statewide from the 2016 drought are expected to be a loss of 0.6% of total State agricultural revenues and about 4,700 jobs. A wetter 2016 winter and spring attributed to California partially recovery of surface water storage and increased recharge of some aquifers. As a result of the increased groundwater usage to compensate for the drought impacts, California passed the Sustainable Groundwater Management Act (SGMA) which requires groundwater-dependent regions to halt overdraft and regulate the use of groundwater. The objective of SGMA is to have a sustainable management of ground water by the year 2042 in California Sustainable Groundwater Management Act (http://www.water.ca.gov/groundwater/sgm/).

• Historically, total California irrigation deliveries have been around 26 MAF, with 18 MAF from surface water, and 8 MAF from groundwater. A 2.6 MAF drought-related reduction in surface water availability for agriculture implies a 14% reduction. However, due to increased pumping of groundwater, the total reduction in agricultural water use was 0.7 MAF, or 2.6% of typical agricultural use. (https://watershed.ucdavis.edu/news/2016/08/15/economic-analysis-2016-california-drought-agriculture-report). The calculations in the text are derived as follows: US agriculture as a percentage of total GDP = 1.21% (http://www.bea.gov/industry/gdpbyind_data.htm, GDP by industry / VA, GO, II); CA GDP in 2015 was $2.5 trillion (https://www.bea.gov/regional/index.htm); CA as a percentage of US GDP = 2,481,348/17,919,651 = 13.8% (https://www.bea.gov/regional/index.htm); CA agriculture as a percentage of CA GDP = 33,482/2,481,348 = 1.3%; CA agriculture as a percentage of US agricultural GDP =33,482/175,236= 19%

Figure 1. Bureau of Reclamation Water Deliveries by Use for Central Valley Project (2009-2016)
BOEM and BSEE

- In FY 2016, BOEM and BSEE (Bureau of Safety and Environmental Enforcement) oversaw the production of approximately 592 million barrels of oil, 1.05 trillion cubic feet of gas, and 2.17 billion gallons of NGL\(^2\) on the OCS which accounts for approximately 18 percent of domestic crude oil\(^3\) and 4 percent of domestic natural gas\(^4\) production. Our economic impact models and the macroeconomic allocation factors estimate that the activities associated with OCS production resulted in more than $55 billion in the total U.S. fiscal year 2016 output. The rows in Table S-1 identify the contribution to employment and value added and the individual components contributing to these totals.

- The total FY 2016 economic contributions are less than estimated for FY 2015 ($86 billion in total U.S. output, $48 billion in total value added and 492 thousand domestic jobs sustained). This reduction is attributed to the decline in oil prices throughout FY 2016 which lessened industry activity and government revenues collected throughout the year. For example, leasing revenues (collected from rents, bonuses, and royalties) declined 44% between 2015 and 2016 generating a 40% reduction in employment contribution from government spending. We estimate that industry spending declined approximately 36% generating a similar reduction in employment contribution from industry spending. This decline in industry spending and economic activity is consistent with actual declines in industry activity in the Gulf of Mexico. The number of GOM wells drilled declined 44% in 2016 over 2015 and the number of non-producing leases held by industry declined 34%. Similarly, employment and annual wages as identified by the Bureau of Labor Statistics for professions associated with oil and gas extraction, well drilling and support activities sectors declined between 2014 and 2015 and through the first half of 2016 in the GOM states.

- The basis for calculating the FY 2016 impacts of OCS oil and gas activity is the sales value of FY 2016 OCS oil and natural gas production as published by the Office of Natural Resources Revenue.\(^5\) Because different spending sources generate different degrees of economic impact, we distribute the sales value among industry spending, government revenue, and after-tax profits to estimate 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.\(^6\) That leaves $22.707 billion of OCS stimulated direct spending in the U.S economy, shown in the second column of Table S-1.

- 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.

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\(^3\) [http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm](http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm)
\(^4\) [http://www.eia.gov/dnav/ng/hist/n9050us2m.htm](http://www.eia.gov/dnav/ng/hist/n9050us2m.htm)
\(^6\) As shown in Table S-2, foreign revenues are retained earnings spent overseas and dividends received by shareholders in the rest of the world.
As shown in Table S-1, the sales value of OCS production in FY 2016 was $26.1 billion. 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. That leaves $22.7 billion of OCS stimulated direct spending in the U.S. economy, shown in the second column of Table S-1. The rows in Table S-1 identify the individual components that we estimated to arrive at these totals.

Table S-1. BOEM and BSEE Administered Industry Economic Impact FY 2016

<table>
<thead>
<tr>
<th></th>
<th>OCS Oil, Gas, and NGL Sales Value ($ millions)</th>
<th>Resulting Direct Domestic Spending ($ millions)</th>
<th>Resulting Total Domestic Output ($ millions)</th>
<th>Resulting Total Domestic Value Added ($ millions)</th>
<th>Domestic Jobs Sustained ('000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Spending</td>
<td>$13,051</td>
<td>$13,051</td>
<td>$35,334</td>
<td>$18,286</td>
<td>194</td>
</tr>
<tr>
<td>Government Revenue (includes profit and dividend tax revenues)</td>
<td>$5,019</td>
<td>$5,019</td>
<td>$8,586</td>
<td>$6,350</td>
<td>56</td>
</tr>
<tr>
<td>After-Tax Profits (after profit and dividend taxes)</td>
<td>$8,032</td>
<td>$4,638</td>
<td>$11,536</td>
<td>$6,247</td>
<td>66</td>
</tr>
<tr>
<td>After-Tax Profits to Rest of World</td>
<td>$3,394</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>After-Tax Profits remaining in U.S.</td>
<td>$4,638</td>
<td>$4,638</td>
<td>$11,536</td>
<td>$6,247</td>
<td>66</td>
</tr>
<tr>
<td>Sales Value</td>
<td>$26,101</td>
<td>$22,707</td>
<td>$55,455</td>
<td>$30,883</td>
<td>315</td>
</tr>
</tbody>
</table>

Note: Totals may not sum due to rounding
We estimated direct industry spending (i.e., capital and operating expenditures) to be 50% of total sales value (0.5 * $26.101 billion) in FY 2016.\(^7\) We applied MAG-PLAN national multipliers for direct, indirect, and induced spending (a total multiplier of 2.71) to estimate the total domestic output of $35.334 billion associated with the direct spending of $13.051 billion. The MAG-PLAN industry spending ratio of $1.40 in total value added for every dollar of direct spending results in $18.286 billion of added value. We estimate 194,000 industry jobs by using the MAG-PLAN ratio of 14.84 total jobs per million dollars of direct offshore oil and gas industry spending. These output and employment estimates are shown in the third, fourth, and fifth columns, first row, of Table S-1 for industry spending. Estimated after-tax profits (after both profit and dividend taxes) were estimated to be $8.0 billion. These were distributed across domestic and foreign entities through both dividends and retained earnings. To calculate this distribution, EIA data were used to split profits into retained earnings and shareholders dividends and further to split retained earnings into those that would be spent domestically versus internationally.

BOEM used Bureau of Economic Analysis, Department of Commerce data to split dividends into those for domestic versus foreign shareholders. Domestic dividends were assigned a 15 percent tax rate and those tax revenues were included with government spending. Of the after-tax domestic dividends we assume, based on two empirical studies, that 25 percent is reinvested and the remainder is spent.

The $5.019 billion of government revenue shown in Table S-1 includes both leasing revenue collected from bonus bids, rental payments, and royalty payments and tax revenue collected from corporate profits and dividends from OCS activities. The FY 2016 leasing revenue is $2.789 billion; the tax revenue is $2.230 billion.

Taxes from corporate profits are shown as $1.888 billion in Table S-2 and estimated taxes (assuming a 15% dividend tax rate) from dividends are estimated to be $342 million.

### Table S-2. Components of Tax Revenue: Fiscal Year 2016

<table>
<thead>
<tr>
<th>Direct Spending ($ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profits Tax</td>
</tr>
<tr>
<td>Tax on Dividends</td>
</tr>
<tr>
<td>Tax Revenue</td>
</tr>
</tbody>
</table>

Note: Totals may not sum due to rounding.

Economic contribution estimates were developed by using an IMPLAN Federal Government institutional spending pattern for each state. These state level calculations result in a composite multiplier of 1.72 total output and an employment response coefficient of 11.21 total jobs per million dollars of direct spending by the Federal government.

\(^7\) Calculations of the BOEM contribution prior to FY 2015 estimated this percentage to be 40% of total sales value based on results of our in-house leasing model, IMODEL. However, as the effective sales price of oil has fallen significantly from previous years, this factor was re-evaluated and applied for FY 2015 and FY 2016. The BOEM determined that 50% of sales value is a more appropriate figure.

\(^8\) An effective tax rate of 18.4% was used based on calculations from the IRS basic tables for corporations CRTAB01 for oil and gas extraction.
• BOEM’s MAG-PLAN model provides percentages of industry spending economic impacts for each of the five Gulf of Mexico (GOM) States while aggregating the remainder to the “rest of U.S.” The five GOM states account for 70% of total OCS generated spending and jobs and 65% of total value added. For the remainder of the U.S., we used Bureau of Labor and Statistics (BLS) state employment data for each of the ten largest MAG-PLAN sectors identified outside of the Gulf States and weighted industry spending accordingly.
• 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 Bureau of the Census.9
• 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.

Scientific Information


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 2016, including current and permanent Payment in Lieu of Taxes (PILT) payments, mineral revenue payments and all AML grants to States and tribes. The DOI Office of Budget provided state-level data for the grants and payments analyzed in this report.
• For certain grant and payment totals, variances between the Budget in Brief and the grant totals used in this report can be attributed to the exclusion of program administration costs in grant awards, Coastal Impact Assistance Program (CIAP) payments made during FY 2016, 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. 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.
• Energy and mineral leasing revenues (bonuses, rents, and royalties) disbursed to the U.S. Treasury 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

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employment and output impacts for onshore and offshore royalties were included in the category of Energy and Minerals for the national and state-level analyses.

- 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. 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 tracts adjacent to their seaward boundaries, receive 27 percent of the revenues.
- 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.
- Land Acquisitions: Output and employment contribution estimates for land acquisition are derived using state and national-level multipliers. It is assumed that 90 percent of funds go to landowners and 10 percent goes to transaction costs. Much of the money landowners 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 percent 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 percent 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 440 is used to model the services associated with land acquisition. In previous years, we used Sector 374 (management, scientific, and technical consulting services). The change to Sector 440 is related to IMPLAN’s switch to a 536-sector scheme. 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

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10 Alaska is an exception, receiving 50 percent of revenues for production from the National Petroleum Reserve A (NPR-A), and 90 percent elsewhere.
• For 2016 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.
• DOI payroll contributions are estimated using the IMPLAN Labor Income Change activity. Leakages in this IMPLAN activity include payroll taxes and salaries earned by employees who commute from outside of the local area (and thus primarily spend their salaries outside of the local area). Contributions are based on household spending patterns for a distribution of household income levels. Household spending patterns account for leakages related to personal taxes and savings. For the payroll contributions, a national multiplier was used to estimate the employment contributions of Interior payroll, equaling 9.4 jobs per $1 million.
• For State-level salary effects, 2016 payroll data and State-level multipliers were used. Since State multipliers do not capture leakages outside of each State, 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
• National level estimates for NPS include units in U.S. territories. Territory-level estimates for NPS are not reported here, but are provided in the NPS Visitor Spending Effects Report (https://www.nps.gov/subjects/socialscience/vse.htm). FWS estimates do not include visitation to Refuges outside of the continental United States, Hawaii, and Alaska.
• Visitation and expenditure data sources included the following: NPS data is from 2016 National Park Visitor Spending Effects, Economic Contributions to Local Communities, States, and the Nation, (Cullinane Thomas and Koontz 2016). BLM visitation data is from the Recreation Management Information System (RMIS), and spending profiles are from the US Forest Service NVUM Four-year Report (spending profiles of National Forest Visitors). USFWS visitation data was obtained from the Refuge Annual Performance Plan (RAPP) database, and spending profiles were calculated based on data from the 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (https://wsfrprograms.fws.gov/subpages/nationalsurvey/reports2011.html). Bureau of Reclamation visitation data are from the Recreation Use Data Report (RUDR), and spending profiles are calculated from the 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Economic contributions data for all bureaus is calculated using IMPLAN data released in 2016.
• NPS visitation data are for CY 2016. FWS visitation data are for FY 2016. BLM visitation data are for FY 2016. BOR visitation data are for FY 2016.
• Most BOR project recreation sites are managed by Reclamation partners, including both Federal and non-Federal entities.