
Oil and Gas Leasing & Permitting on State Lands: Recent Trends in the Rocky Mountain West

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ECONorthwest
ECONOMICS • FINANCE • PLANNING

The Washburne Building
72 W Broadway
Suite 206
Eugene, OR 97401
541.687.0051

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For more information about this report:

Kristin Lee
lee@econw.com
The Washburne Building
72 W. Broadway
Suite 206
Eugene, OR 97401
541.687.0051

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Introduction

A number of studies have evaluated recent trends in oil and gas development and production with a focus on federal resources in the U.S.¹ Far less attention has been paid to state-owned oil and gas resources—perhaps due, in part, to the lack of a comprehensive source of data. In this report, we help fill that gap by reporting data on leasing and permitting activity for state oil and gas resources in the Rocky Mountain west. We collected these data from agencies in each of the five Rocky Mountain states (Colorado, Montana, New Mexico, Utah, and Wyoming). We also reviewed information on trends and recent developments in the oil and gas markets.

We compiled data for the ten years from 2006 to 2015. Over that period, the amount of new leasing and permitting activity fluctuated but declined overall. Both leasing and permitting dipped in 2009, when oil and gas prices both dropped. And both leasing and permitting declined each year since 2011. In 2015, the amount of new leasing and permitting was lower than at any other time over the decade, with a 66 percent drop in new leased acreage and a 26 percent drop in new permits over that period. Based on our review of the data and the literature, we find that changing market conditions, including commodity prices and technological changes, underlie the changes in state-level oil and gas leasing and permitting activity.

Oil and Gas Leasing

One of the first steps in a firm’s oil and gas investment is leasing a tract of land for potential exploration and development. Each state included in this report has an agency responsible for oil and gas leasing on state lands. Each of these states holds auctions, often several times a year, for leases of tracts of state land for the purposes of oil and gas exploration. In this section we describe trends in oil and gas leasing in the Rocky Mountain states over the period 2006-2015, and we analyze these trends in light of changes in the price of oil and gas.

State Oil and Gas Leases in the Rocky Mountain West

Each state administers oil and gas leasing on state lands within its borders. We collected and compiled data on the total acreage in leases sold during each year in each state.

Exhibit 1 shows the amount of state-owned acreage in new oil and gas leases each year from 2006 to 2015.² Over the entire period, these states sold leases totaling approximately 8.2 million

¹ See, for example, Humphries, M. 2016. “U.S. Crude Oil and Natural Gas Production in Federal and Nonfederal Areas.” Congressional Research Service. www.fas.org/sgp/crs/misc/R42432.pdf. June; and Congressional Budget Office. 2016. “Options for Increasing Federal Income from Crude Oil and Natural Gas on Federal Lands.” www.cbo.gov/publication/51421. April.

² Note that these data reflect lease sales during each year as opposed to total acreage under lease during the year, which would include leases still in effect from prior years.

acres. At 31 percent of the total, Montana accounted for the most acreage (2.5 million acres) in leases sold over the 10-year period. Wyoming had the next-highest amount of acreage in leases sold over the period—1.8 million acres and 22 percent of the total.

Exhibit 1. Acreage of State Oil and Gas Leases Sold in Rocky Mountain States, by Calendar Year

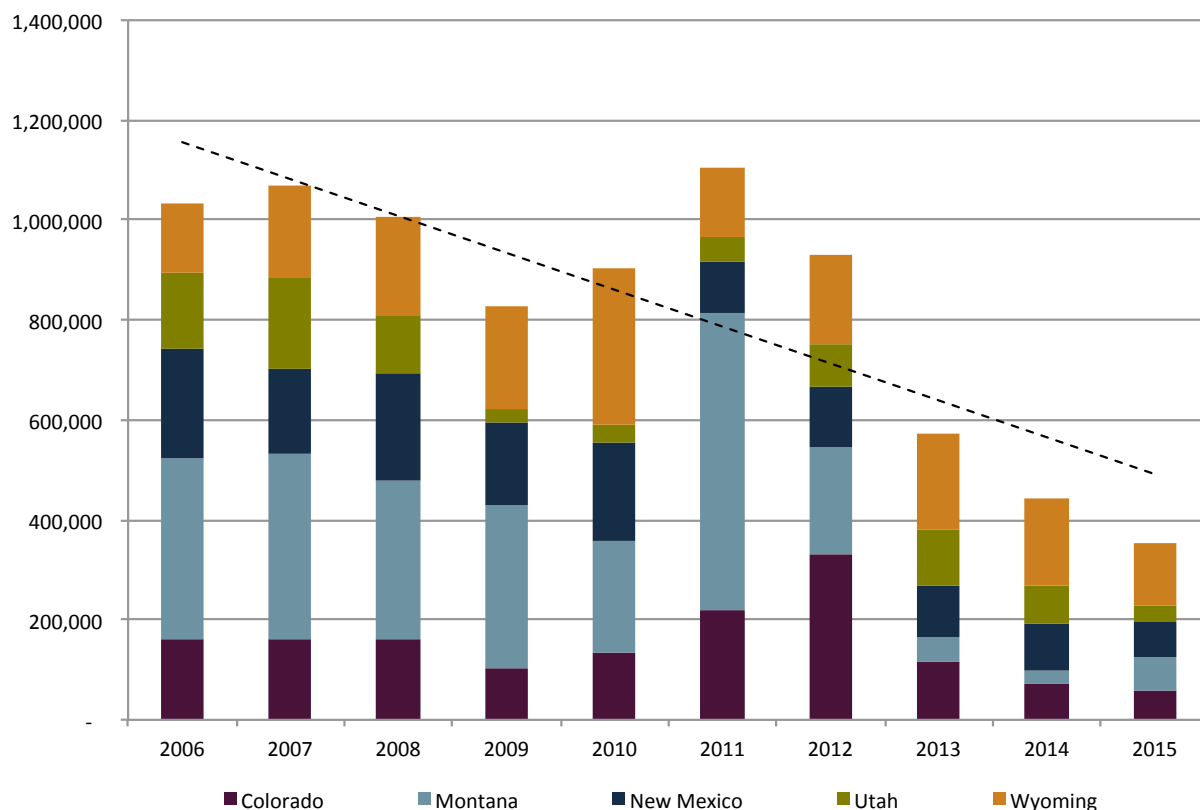
	Colorado	Montana	New Mexico	Utah	Wyoming	Total
2006	161,198	363,968	216,669	151,146	138,791	1,031,772
2007	162,204	370,475	168,413	184,593	184,239	1,069,923
2008	163,502	314,220	215,095	117,983	196,029	1,006,830
2009	102,882	325,739	165,260	26,430	205,914	826,225
2010	133,429	225,406	193,905	35,778	314,520	903,038
2011	219,499	592,558	102,771	49,496	140,103	1,104,427
2012	332,743	212,910	119,466	86,654	179,271	931,044
2013	115,897	50,539	103,709	112,422	189,200	571,767
2014	71,286	25,783	93,925	76,528	173,800	441,322
2015	60,088	67,253	71,757	30,340	122,457	351,896
Total	1,522,728	2,548,850	1,450,968	871,371	1,844,324	8,238,242
% of Total	18%	31%	18%	11%	22%	100%

Source: ECONorthwest based on data from Colorado State Land Board, Montana Department of Natural Resources and Conservation, New Mexico State Lands Office, State of Utah School and Institutional Trust Lands Administration, and the Wyoming Oil and Gas Conservation Commission.

Exhibit 2 shows how the lease sales varied by state over the years. Between 2006 and 2015, new leases of state-owned lands decreased across the Rocky Mountain states. In 2015, the Rocky Mountain states sold leases covering 352,000 acres—a reduction of 66 percent from the level in 2006. Acreage in new oil and gas leases decreased each year after 2011, with the least acreage in new leases in 2015 than in any year over the period we studied.

Among the states, Montana’s annual lease sales have declined the most since 2006. The state acreage in leases sold in Montana in 2015 was 82 percent lower than the acreage in 2006. Utah’s lease sales declined almost as much, with 80 percent less acreage in new leases in 2015 than in 2006. Among these states, the lowest reduction was in Wyoming, which sold leases with 12 percent fewer acres in 2015 than in 2006.

Exhibit 2. State Acreage Newly Leased in the Rocky Mountain States, by Calendar Year (in Acres)



Source: ECONorthwest

State Oil and Gas Leasing and Commodity Prices

Leasing is a financial investment in oil and gas resources. The decision of when and where to lease is driven by conditions, such as commodity prices, in the markets for oil and gas. Higher oil prices will encourage investments in leasing and exploration in oil-rich areas, while higher natural gas prices will encourage investment in leasing and exploration in gas-rich areas.³ Although the effects on leasing activity may show a lag in responsiveness based on the timing of lease auctions and the availability of parcels at auctions, the influence of market factors such as commodity prices is evident at the state level.⁴

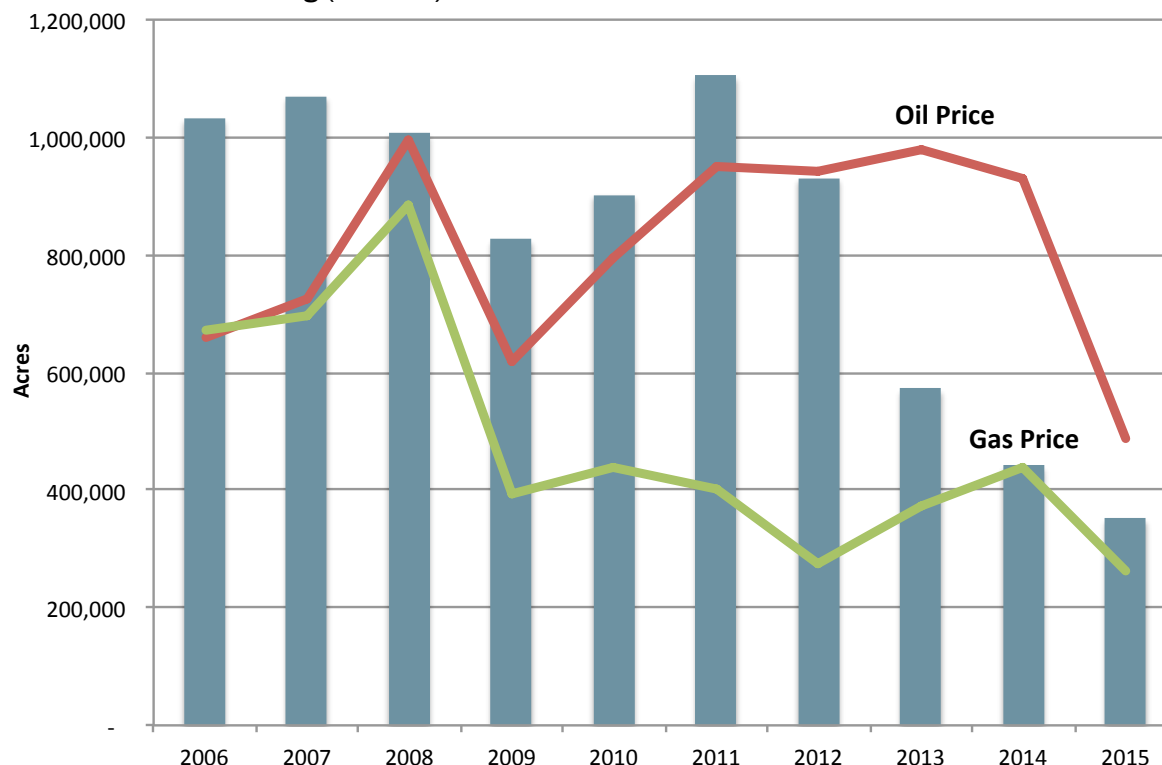
³ See, for example, U.S. Energy Information Administration. 2015. "Sustained Low Oil Prices Could Reduce Exploration and Production Investment." <http://www.eia.gov/todayinenergy/detail.cfm?id=23072>. September.

⁴ For example, the Montana Department of Natural Resources has noted the connection between oil and gas prices and leasing activity in the state in its Annual Reports each year during the period we reviewed for this report. See, for example, http://dnrc.mt.gov/divisions/trust/docs/minerals-management/oil-and-gas/reports/fy2009_mmb_annual_report.pdf. See also: <https://www.abqjournal.com/796743/new-mexico-oil-rights-sales-dip-on-trust-lands.html> and http://www.wyomingnews.com/news/state-revenue-decline-worse-than-previously-projected/article_dea70e7c-0917-11e6-b01a-e3d297cfd82f.html.

Exhibit 3 shows the total acreage in state lease sales as well as the oil and gas price trends over the 2006-2015 period. Overall, the amount of new acreage leased for state oil and gas development declined over the 2006-2015 period, although there were notable increases during the 2010-2012 period as oil prices recovered.

As Exhibit 3 shows, oil and gas prices both peaked in 2008 and declined sharply in 2009. The 2009 drop in prices corresponded to a drop in acreage of leases sold. After 2009, price trends for the two commodities diverged, with natural gas prices remaining low and oil prices climbing before falling again in late 2014. New leased acreage in the Rocky Mountain states increased through 2011 but declined each year thereafter.

Exhibit 3. State Leasing (in Acres) and Oil and Gas Prices



Source: ECONorthwest

Other market factors also influence leasing activity. For example, technological developments have had a dramatic effect on the oil and gas markets, shifting focus to unconventional resources such as shale formations. This is evident in Montana, where leasing activity has been affected by the shift to the Bakken shale region—a portion of which lies in the eastern part of the state, but the bulk of which is in North Dakota. As a result, leasing activity in Montana declined even in the face of rising oil prices.⁵

⁵ For example, see: http://dnrc.mt.gov/divisions/trust/docs/minerals-management/oil-and-gas/reports/fy2013_mmb_annual_report.pdf

Oil and Gas Permitting

After acquiring an oil and gas lease, a firm must also obtain a state permit in order to drill exploratory or production wells. A lease and a permit are the two primary forms of authorization needed to develop oil and gas resources on state lands. In this section we present the data on oil and gas permitting on state land in the Rocky Mountain states. We collected permitting data directly from the agency responsible for oil and gas permitting in each state. As in our review of the leasing data, we review the permitting data in light of prices in oil and gas markets.

State-Issued Oil and Gas Permits in the Rocky Mountain West

States issue oil and gas permits for drilling activity on federal, state, private, and Indian lands within the state. Although some states collect data on the resource ownership associated with each permit, some do not. Likewise, some states distinguish between oil permits and gas permits, and some do not. In this section we present data across all five states first, followed by disaggregated data for the subset of states where disaggregation into ownership and resource type is possible.

Exhibit 4 shows that the Rocky Mountain states issued approximately 121,000 oil and gas permits for federal, state, private, and Indian resources over the 2006 – 2015 period. Colorado accounted for 42 percent of the permits, with Wyoming at 25 percent, and New Mexico at 18 percent of all state oil and gas permits. The number of issued permits peaked in 2008 and dropped to the lowest level of the period in 2015. At the state level, permitting activity decreased to its lowest level of the period in 2015 in every state except Wyoming.

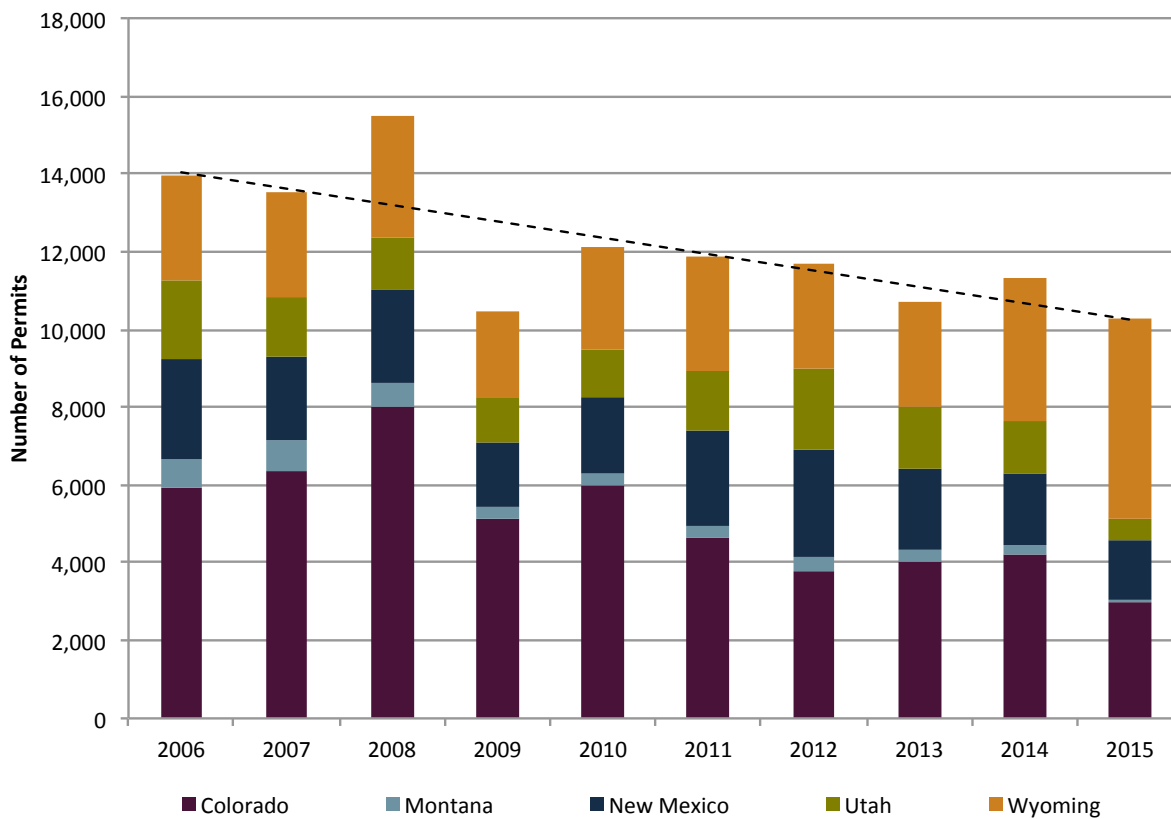
Exhibit 5 shows the trend in state permitting for oil and gas drilling over the 2006-2015 period. The data include all types of land ownership (federal, state, private, Indian), so they do not reflect the trends in state-owned resource development alone. Permitting peaked in 2008, which corresponded to the peak in both oil and gas prices. The drop in permitting in 2009 also corresponded to the drop in both oil and gas prices in 2009. The number of issued permits dropped to the lowest level of the period in 2015, a 26 percent decrease from 2006 levels.

Exhibit 4. State-Issued Oil and Gas Permits, by Calendar Year

	Colorado	Montana	New Mexico	Utah	Wyoming	Total
2006	5,906	774	2,535	2,062	2,690	13,967
2007	6,375	769	2,133	1,549	2,719	13,545
2008	8,029	604	2,392	1,353	3,137	15,515
2009	5,159	283	1,642	1,163	2,233	10,480
2010	5,996	318	1,970	1,182	2,624	12,090
2011	4,659	263	2,483	1,505	2,943	11,853
2012	3,773	405	2,703	2,089	2,722	11,692
2013	4,028	280	2,094	1,588	2,701	10,691
2014	4,191	267	1,818	1,382	3,678	11,336
2015	2,988	52	1,531	567	5,134	10,272
Total	51,104	4,015	21,301	14,440	30,581	121,441
% of Total	42%	3%	18%	12%	25%	100%

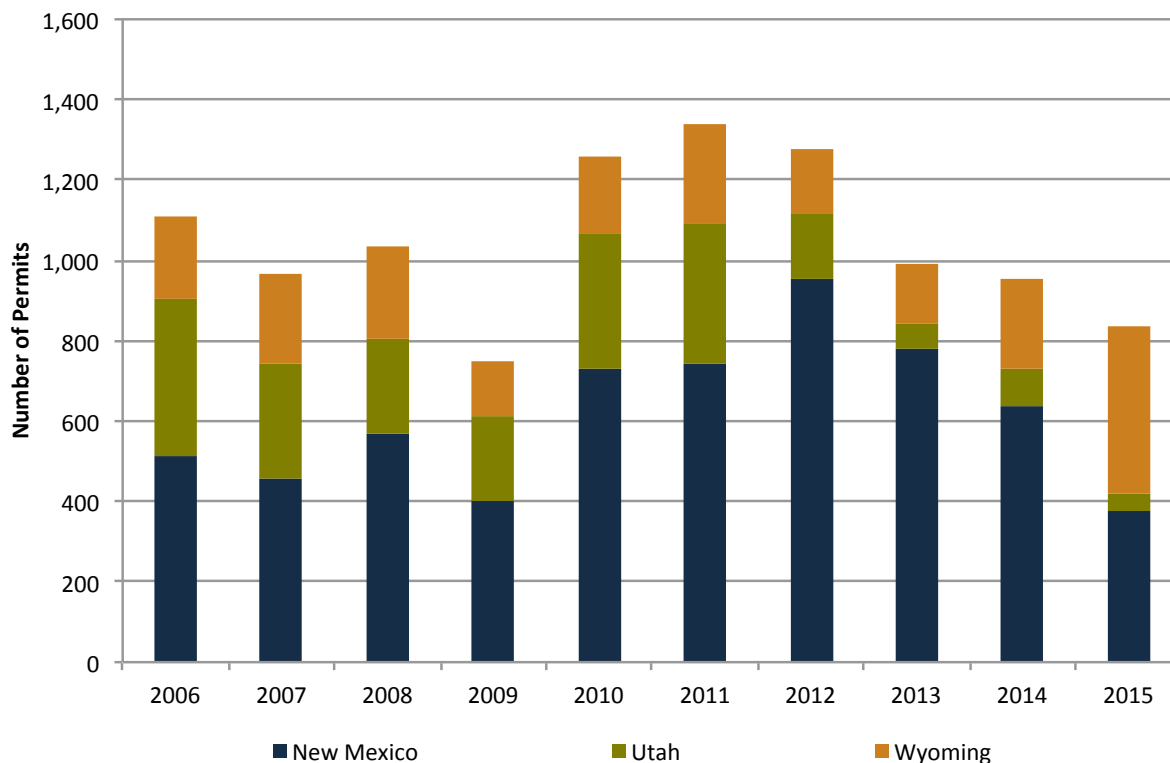
Source: ECONorthwest, based on data from Colorado State Land Board, Montana Department of Natural Resources and Conservation, New Mexico State Lands Office, State of Utah School and Institutional Trust Lands Administration, and the Wyoming Oil and Gas Conservation Commission.

Exhibit 5. State-Issued Oil and Gas Permits, by Calendar Year



Source: ECONorthwest

Exhibit 6. State-Issued Permits for State-Owned Oil and Gas Resources



Source: ECONorthwest

New Mexico, Utah, and Wyoming collect data on the mineral ownership associated with each state oil and gas permit.⁶ Exhibit 6 depicts the trend in state-issued oil and gas permits for state-owned resources in New Mexico, Utah, and Wyoming. It shows that the number of state-issued permits for state-owned resources has fluctuated over the period. The number of permits dropped in 2009, the year that oil and gas prices dropped sharply. The number of permits issued for state-owned oil and gas resources rebounded during 2010-2011, as oil prices began to recover, but dropped each year thereafter.

In New Mexico and Utah, permitting for state-owned oil and gas resources rose after 2009 but dropped below 2006 levels by 2015. In Wyoming, by contrast, 2015 permitting levels were higher than in 2006.

There are some similarities in the trends between leasing (Exhibit 3) and permitting (Exhibit 6) for state-owned oil and gas resources. For both leasing and permitting, there was a drop in 2009, corresponding to the period when both oil and gas prices dropped. There were also declines in both leasing and permitting in each year after 2011.

⁶ Wyoming's data also includes a "multi"-owner category. As we understand, this category includes permits that cover land areas with multiple owner types. Because we cannot identify the state ownership in this category, we exclude this category from our analysis.

State-Issued Permits, Distinguished by Commodity Type

The states of New Mexico, Utah, and Wyoming also distinguish between oil permits and gas permits for drilling state-owned resources. As Exhibit 7 shows, the three states issued over 7,200 oil permits and nearly 3,300 gas permits over the 2006-2015 period. During that period, the data show a shift from gas to oil: in 2006, over 60 percent of the permits were issued for gas resources; in 2015, less than 10 percent of the permits were for gas.

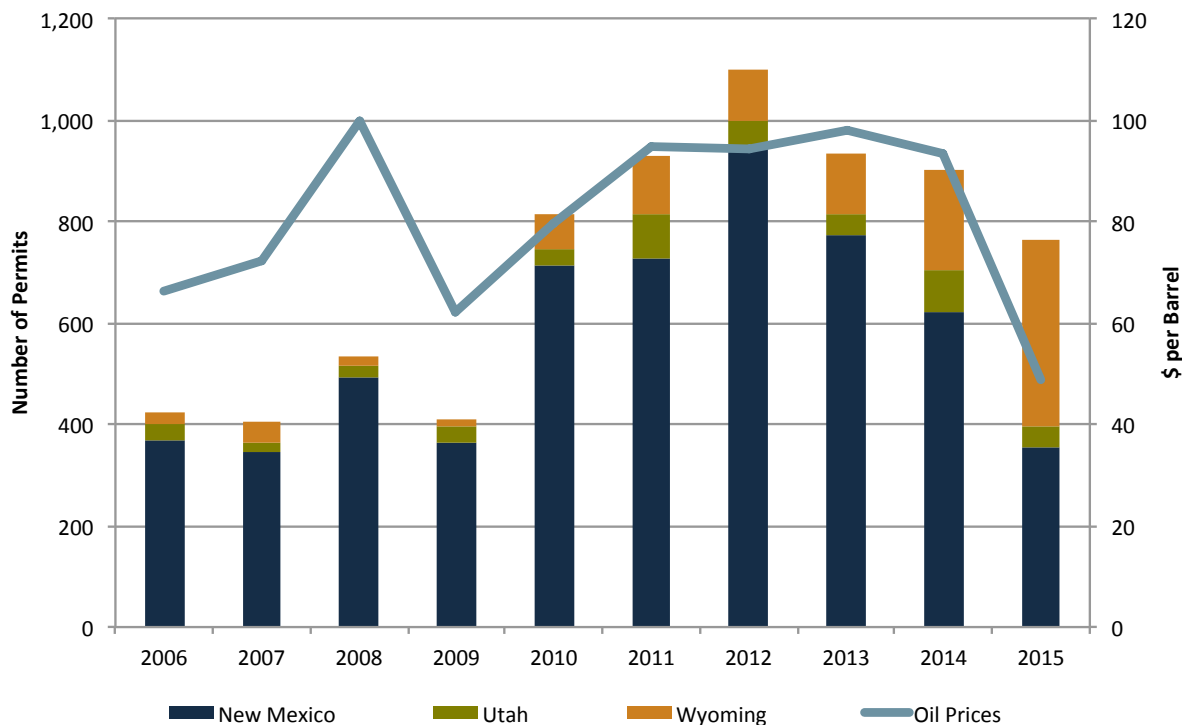
Exhibits 8 and 9 show the trends for oil (Exhibit 8) and gas (Exhibit 9). Because the permitting data for these states are separated into oil permits and gas permits, the effects of the prices of oil and gas can be evaluated with greater clarity than either the permitting data for the entire Rocky Mountain west or the leasing data (neither of which distinguish between oil and gas).

Exhibit 7. State-Issued Permits for State-Owned Oil and Gas Resources

	Oil Permits				Gas Permits			
	New Mexico	Utah	Wyoming	Total	New Mexico	Utah	Wyoming	Total
2006	370	28	23	421	140	365	181	686
2007	344	18	43	405	112	270	182	564
2008	492	22	21	535	75	214	212	501
2009	362	34	13	409	38	180	121	339
2010	712	31	73	816	20	302	119	441
2011	726	87	117	930	17	259	134	410
2012	942	56	102	1,100	11	109	56	176
2013	773	41	118	932	8	20	29	57
2014	619	83	199	901	17	9	26	52
2015	353	42	369	764	22	3	48	73
Total	5,693	442	1,078	7,213	460	1,731	1,108	3,299
% of Total	79%	6%	15%	100%	14%	52%	34%	100%

Source: ECONorthwest.

Exhibit 8. State-Issued Permits for State-Owned Oil Resources and Oil Prices



Source: ECONorthwest

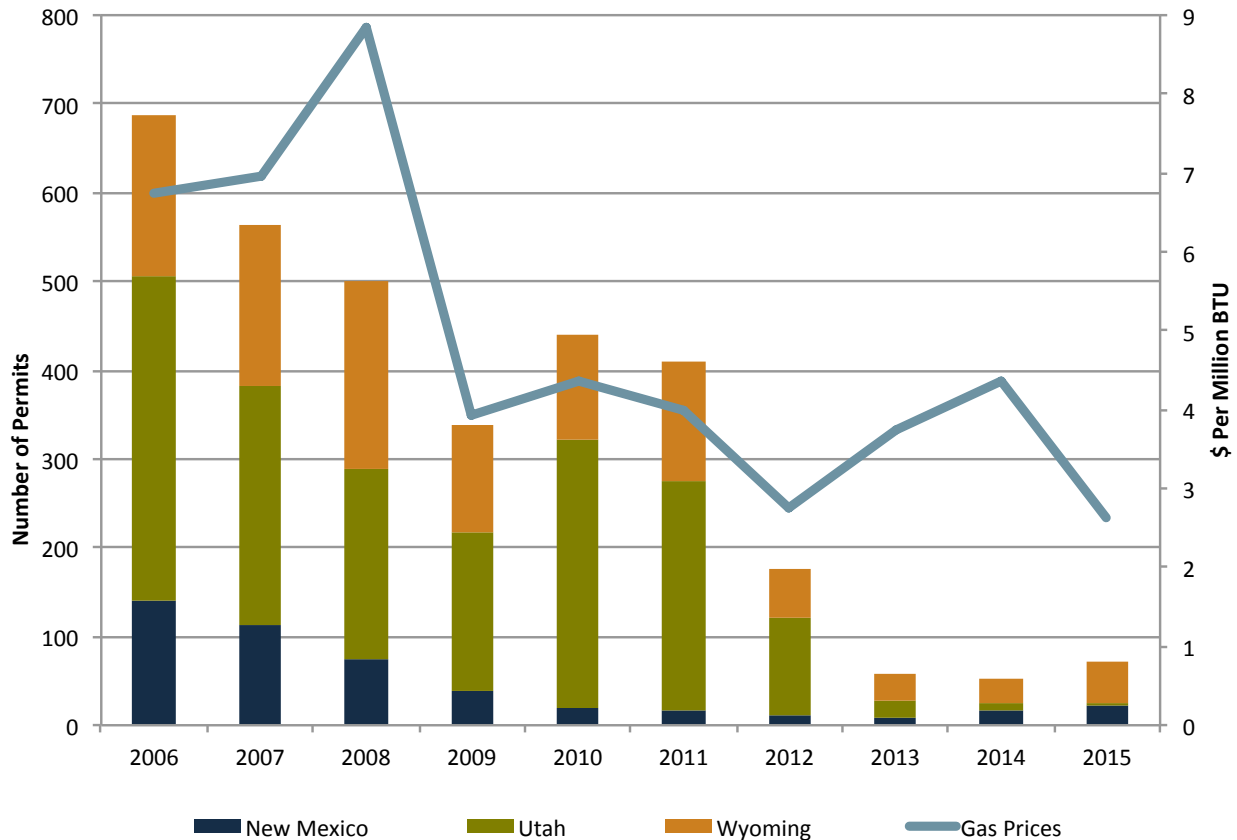
Exhibit 8 shows the annual total of state-issued permits for development of state oil resources along with the trend in oil prices. Although there are some differences at the state level, overall permitting for oil drilling was generally higher during periods of rising oil prices and lower during periods of declining oil prices.

For both New Mexico and Utah, 2015 permitting levels for state oil resources were lower than their peak in 2011 (Utah) and 2012 (New Mexico). In contrast, Wyoming reported 369 permits issued in 2015, the highest number of permits issued in Wyoming over the entire period. The permitting increase, however, was likely tied to state rules that encouraged a flood of permit applications in Wyoming by operators without an immediate intent to drill but rather seeking to protect their interests for the future.⁷

⁷ Storrow, B. 2014. "Company Files Record-Breaking Number of Drilling Applications." *Casper Star Tribune*. October 14; and Storrow, B. 2015. "Oil Companies, Racing to Acquire Wyoming Drilling Rights, Raise Questions of Fairness." *Casper Star Tribune*. June 6.

Exhibit 9 shows the annual totals for state-issued permits for development of state gas resources along with the trend in gas prices. Permitting for gas drilling has generally been higher during periods of higher gas prices and lower during periods of lower gas prices. In contrast to oil prices, gas prices never recovered from the drop in prices that occurred in late 2008-2009. The number of gas permits issued in all three states dropped to relatively low levels during 2013-2015.

Exhibit 9. State-Issued Permits for State-Owned Gas Resources and Gas Prices



Source: ECONorthwest

Conclusion

In this report we present data on state leasing and permitting for oil and gas resources in the Rocky Mountain west. Between 2006 and 2015, new leased acreage of state-owned oil and gas resources decreased across the Rocky Mountain states. In 2015, there were 352,000 acres of state-owned resources in oil and gas leases sold—a reduction of 66 percent from the acreage in leases sold in 2006. Leases sold in 2015 accounted for less acreage than in any other year over the period we studied.

The Rocky Mountain states issued approximately 121,000 oil and gas permits for federal, state, private, and Indian resources over the 2006 – 2015 period. The number of state-issued permits peaked in 2008 and dropped to the lowest level of the period in 2015. Across the entire period, from 2006 to 2015, the number of state-issued permits decreased by 26 percent. The states of New Mexico, Utah, and Wyoming collect detailed data on the ownership and commodity type associated with each state oil and gas permit. Although there are some differences at the state level, overall permitting for oil and gas drilling has trended higher during periods of higher prices and lower during periods of lower prices.

Our results are consistent with the findings of other analysts: market forces affect investments in oil and gas development. Over the period we studied, market forces—including prices and technological changes—have had profound effects on the U.S. oil and gas markets. Based on our review of the data and the economic literature, we find that these effects materialize in the state-level leasing and permitting activities across the Rocky Mountain west and help explain the changes over time.