

Geologic Distribution of U.S. Proved Reserves, 2009

Although proved reserves of crude oil, lease condensate, and natural gas have historically been reported by their geography (e.g., States and certain State subdivisions; see [U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves, 2009](#)), the geologic contexts in which hydrocarbons form and become trapped are fundamentally unrelated to surface borders. This supplement “digs a little deeper” -- it associates the 2009 proved reserves with the **geologic provinces** in which they occur.

A **geologic province** is a spatial entity that exhibits common geologic attributes within its polygonal boundary. Geologic provinces are classified based on their mode of geologic origin (e.g. shield, platform, orogen, basin). The category which the vast majority of oil and gas deposits are associated with is *basins* and more specifically **sedimentary basins**. Sedimentary basins exhibit structural subsidence and consequent layered infilling by sediments transported from outside the basin, as well as sediments chemically precipitated from water within the basin. The accumulated sedimentary column within a basin encompasses both the source rocks and the reservoir rocks associated with current oil and gas proved reserves.

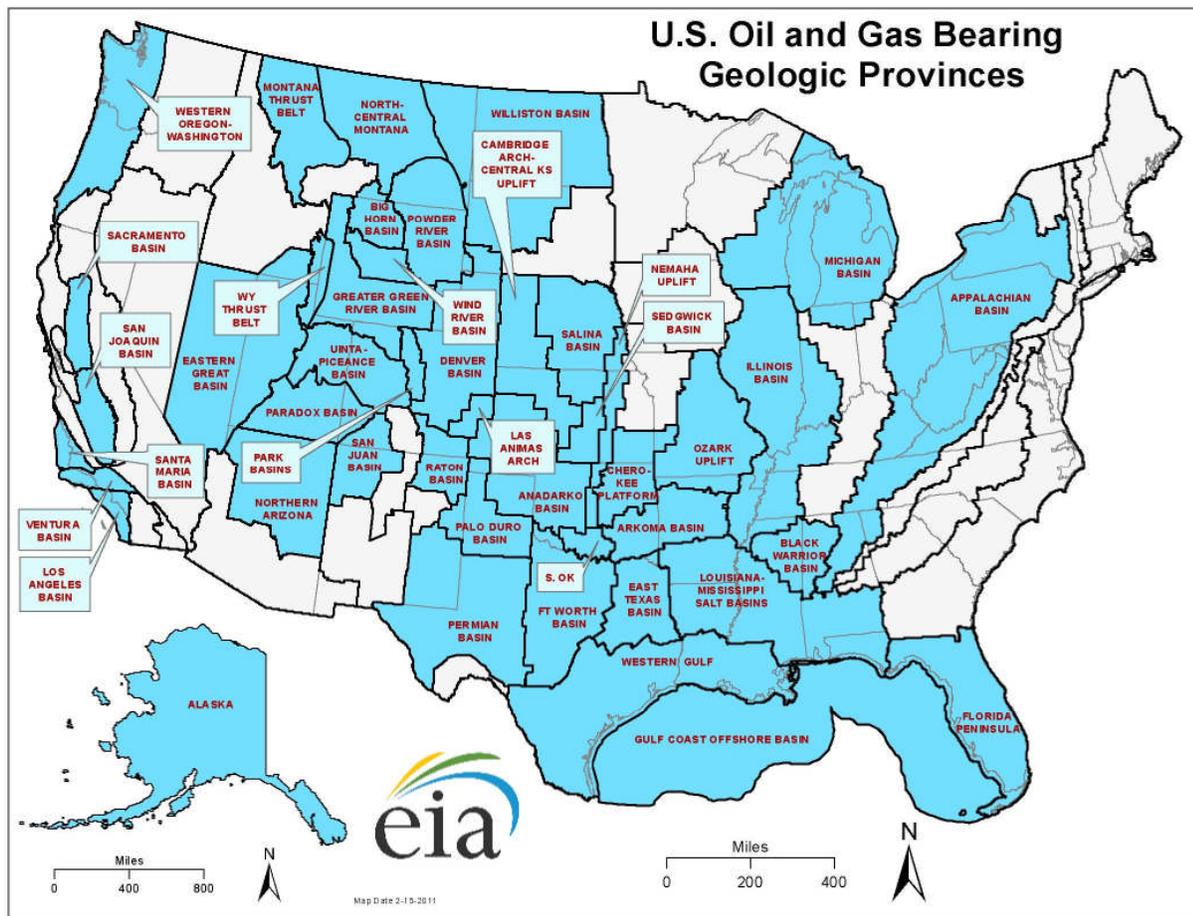
Table 1 lists 45 United States oil- and gas-bearing geologic provinces identified for this supplement.

Table 1. Listing of U.S. Oil and Gas Bearing Geologic Provinces

Geologic Province	Location of Province	Geologic Province	Location of Province
Alaska	AK	Northern Arizona	AZ
Anadarko Basin	KS, OK, TX	Ozark Uplift	AR, MO
Appalachian Basin	AL, GA, KY, NY, OH, PA, TN, VA, WV	Palo Duro Basin	NM, OK, TX
Arkoma Basin	AR, OK	Paradox Basin	CO, UT
Bend Arch-Fort Worth Basin	TX	Park Basins	CO
Big Horn Basin	MT, WY	Permian Basin	NM, TX
Black Warrior Basin	AL, MS	Powder River Basin	NE, MT, SD, WY
Cambridge Arch-Central Kansas Uplift	KS, NE	Raton Basin-Sierra Grande Uplift	CO, NM
Cherokee Platform	KS, MO, OK	Sacramento Basin	CA
Denver Basin	CO, NE, SD, WY	Salina Basin	NE, KS
East Texas Basin	TX	San Joaquin Basin	CA
Eastern Great Basin	ID, NV, UT	San Juan Basin	CO, NM
Florida Peninsula	FL	Santa Maria Basin	CA, PACIFIC OFFSHORE
Greater Green River Basin	CO, UT, WY	Sedgwick Basin	KS
Gulf Coast Offshore Basin	GULF OF MEXICO	Southern Oklahoma	OK
Illinois Basin	AR, IL, IN, KY, MS, TN	Uinta-Piceance Basin	CO, UT
Las Animas Arch	CO	Ventura Basin	CA, PACIFIC OFFSHORE
Los Angeles Basin	CA, PACIFIC OFFSHORE	Western Gulf	LA, TX
Louisiana-Mississippi Salt Basins	AL, AR, FL, LA, MS	Western Oregon-Washington	OR, WA
Michigan Basin	IN, MI, OH, WI	Williston Basin	ND, MT, SD
Montana Thrust Belt	MT	Wind River Basin	WY
Nemaha Uplift	KS, NE, OK	Wyoming Thrust Belt	ID, UT, WY
North-Central Montana	MT		

The following map shows the geologic provinces' boundaries used for this supplement.

These are based on the U.S. Geological Survey's (USGS) [National Oil and Gas Assessment Province Boundaries](#), but have been adjusted in some places to make the borders more closely match currently mappable basin boundaries. Delineation of geologic provinces is a continuous process so province boundaries may be adjusted in the future.



Source: U.S. Energy Information Administration

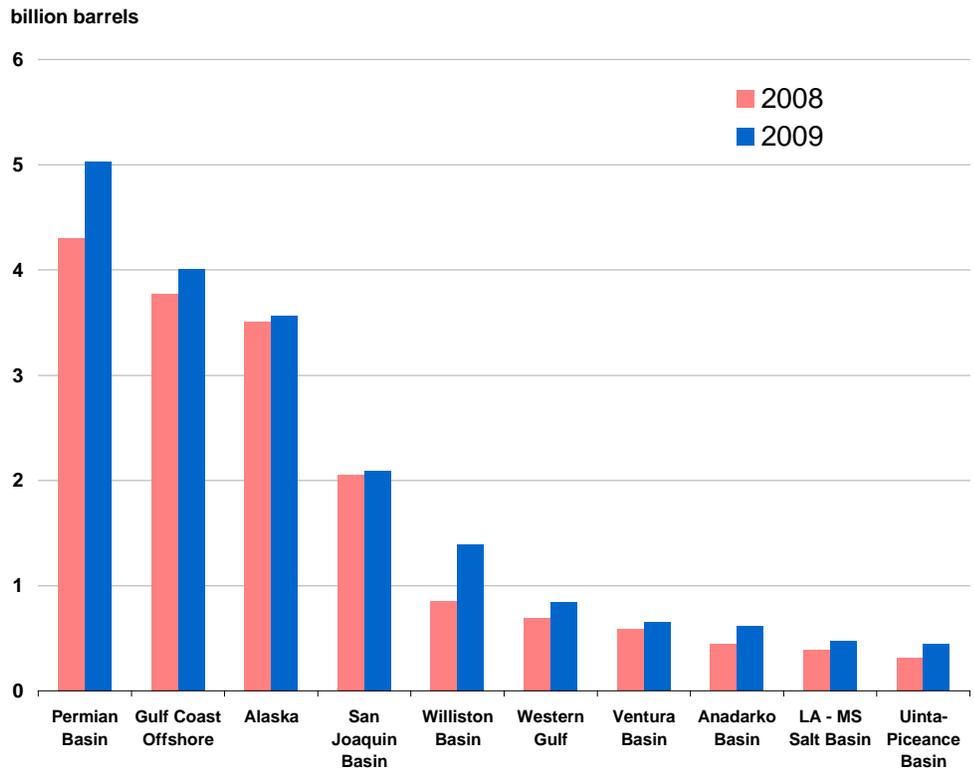
The following summary table lists the top 10 geologic provinces for oil and gas proved reserves in 2009. Cumulatively they accounted for 72 percent of the proved crude oil plus lease condensate proved reserves and 77 percent of the wet natural gas proved reserves. Note that only 4 provinces are common to both the oil and gas top ten provinces (Permian Basin, Anadarko Basin, LA-MS Salt Basin, and Uinta-Piceance Basin), The largest oil province, the Permian Basin, accounts for nearly one quarter of U.S. oil reserves and the largest gas province, the Greater Green River Basin, accounts for 11 percent of the total U.S. gas reserves.

Table 2. Top 10 Geologic Basins for Oil and Gas Proved Reserves in 2009

Crude Oil plus Lease Condensate Reserves (Million Barrels)			Wet Natural Gas Reserves (Billion Cubic Feet)		
Rank	Geologic Province	Reserves	Rank	Geologic Province	Reserves
1	Permian Basin	5,032	1	Greater Green River Basin	30,446
2	Gulf Coast Offshore	4,008	2	Fort Worth Basin	27,781
3	Alaska	3,566	3	Anadarko Basin	23,364
4	San Joaquin Basin	2,094	4	East Texas Basin	22,202
5	Williston Basin	1,392	5	LA - MS Salt Basin	20,499
6	Western Gulf	844	6	Appalachian Basin	20,404
7	Ventura Basin	649	7	Arkoma Basin	19,787
8	Anadarko Basin	614	8	Uinta-Piceance Basin	18,572
9	LA - MS Salt Basin	476	9	Permian Basin	18,386
10	Uinta-Piceance Basin	440	10	San Juan Basin	18,146
Top 10 Subtotal		16,092	Top 10 Subtotal		219,585
<i>Other Areas</i>		6,226	<i>Other Areas</i>		64,297
U.S. Total		22,318	U.S. Total		283,882
<i>Top 10 Percentage</i>		72.1%	<i>Top 10 Percentage</i>		77.4%

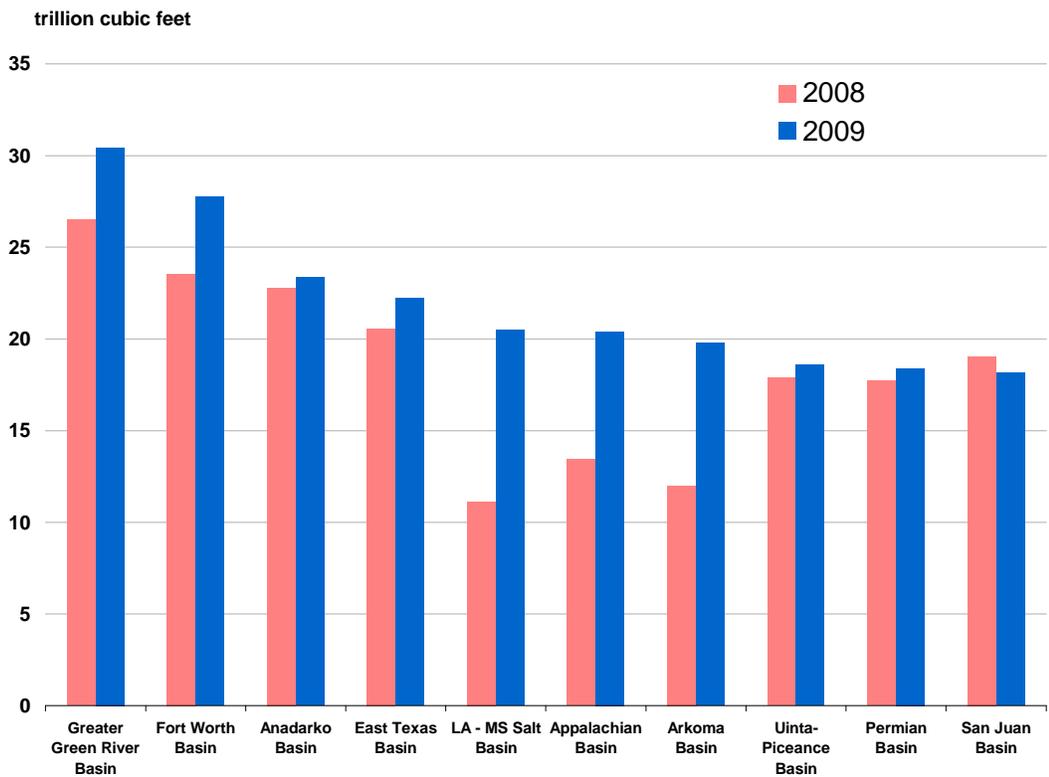
The following two figures show 2008 and 2009 proved reserves data for the Top 10 provinces for crude oil plus lease condensate or wet natural gas, respectively. All of the top 10 oil provinces and 9 of the top 10 gas provinces had an increase in proved reserves from 2008 to 2009.

Figure 1. 2008 and 2009 Crude Oil plus Lease Condensate Proved Reserves, Top 10 Geologic Provinces



Source: U.S. Energy Information Administration

Figure 2. 2008 and 2009 Wet Natural Gas Proved Reserves, Top 10 Geologic Provinces



Source: U.S. Energy Information Administration

The following tables and maps provide 2008 and 2009 proved reserves and 2009 production data for each United States province that had year-end proved reserves of at least 1 million barrels of crude oil plus lease condensate or 1 billion cubic feet of wet natural gas, respectively.

Table 3. Top U.S. Crude Oil plus Lease Condensate Provinces as Ranked by 2009 Proved Reserves (Million Barrels)

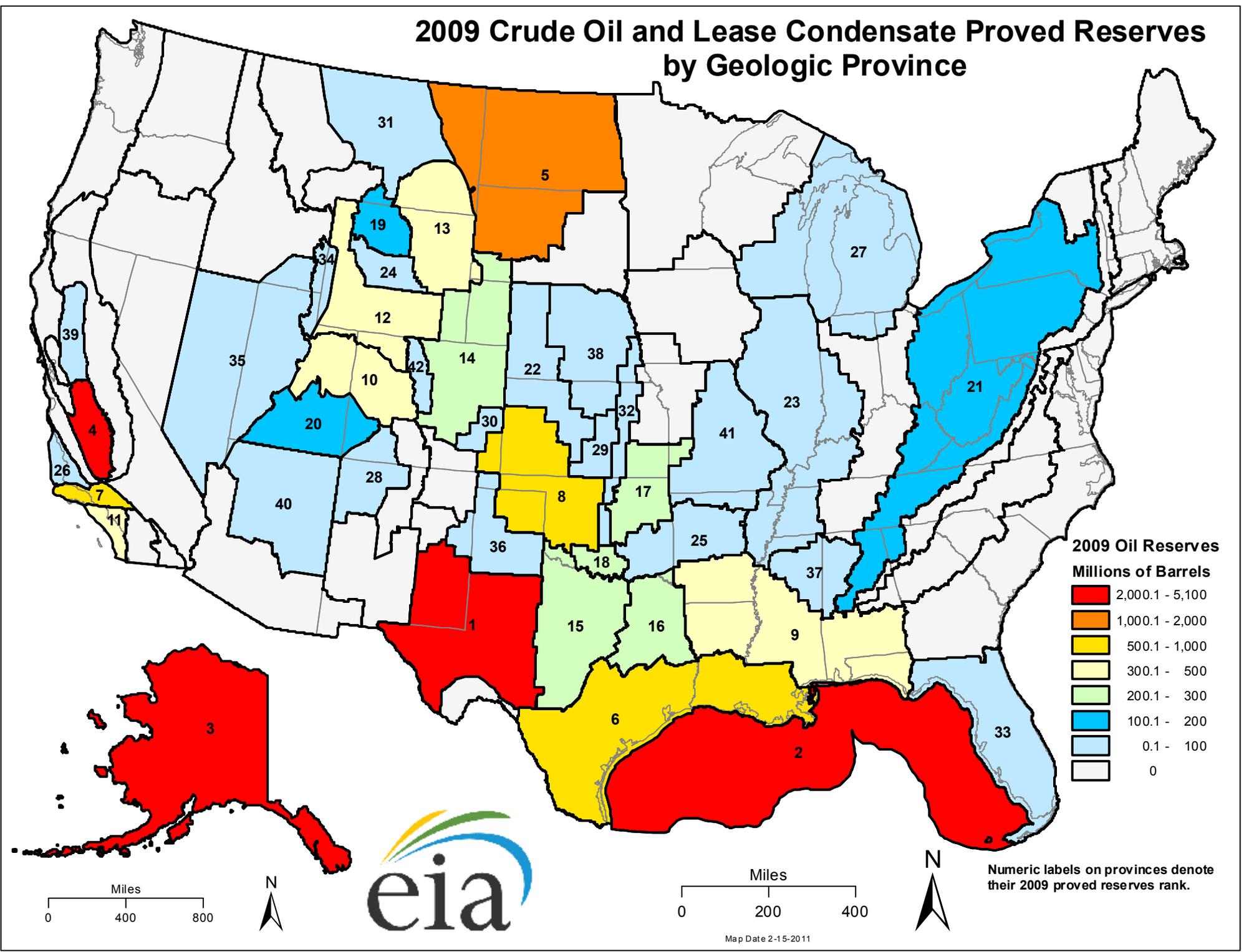
2009 Rank	Geologic Province	2009 End Year Reserves	2009 Production	2008 End Year Reserves	2009 Change	Percent of Total
1	Permian Basin	5,032	322	4,301	731	22.5%
2	Gulf Coast Offshore Basin	4,008	577	3,775	233	18.0%
3	Alaska	3,566	210	3,506	60	16.0%
4	San Joaquin Basin	2,094	161	2,055	39	9.4%
5	Williston Basin	1,392	112	852	540	6.2%
6	Western Gulf	844	121	695	149	3.8%
7	Ventura Basin	649	34	584	65	2.9%
8	Anadarko Basin	614	60	442	172	2.8%
9	Louisiana-Mississippi Salt Basins	476	57	384	92	2.1%
10	Uinta-Piceance Basin	440	23	317	123	2.0%
11	Los Angeles Basin	381	29	290	91	1.7%
12	SW Wyoming (Greater Green River Basin)	307	16	271	36	1.4%
13	Powder River Basin	305	18	273	32	1.4%
14	Denver Basin	268	22	266	2	1.2%
15	Fort Worth Basin	253	27	103	150	1.1%
16	East Texas Basin	250	23	212	38	1.1%
17	Cherokee Platform	222	18	99	123	1.0%
18	Southern Oklahoma	220	16	176	44	1.0%
19	Big Horn Basin	170	13	147	23	0.8%
20	Paradox Basin	136	7	106	30	0.6%
21	Appalachian Basin	106	10	65	41	0.5%
22	Cambridge Arch-Central Kansas Uplift	97	17	40	57	0.4%
23	Illinois Basin	82	6	33	49	0.4%
24	Wind River Basin	79	4	62	17	0.4%
25	Arkoma Basin	74	3	56	18	0.3%
26	Santa Maria Basin	60	5	40	20	0.3%
27	Michigan Basin	53	6	30	23	0.2%
28	San Juan Basin	32	3	24	8	0.1%
29	Sedgwick Basin	32	4	8	24	0.1%
30	Las Animas Arch	19	2	19	0	0.1%
31	North-Central Montana	19	2	7	12	0.1%
32	Nemaha Uplift	11	1	5	6	0.0%
33	Florida Peninsula	9	1	2	7	0.0%
34	Wyoming Thrust Belt	7	2	6	1	0.0%
35	Eastern Great Basin	4	1	0	4	0.0%
36	Palo Duro Basin	2	0	0	2	0.0%
37	Black Warrior Basin	2	0	0	2	0.0%
38	Salina Basin	2	0	0	2	0.0%
39	Sacramento Basin	1	0	1	0	0.0%
-	All Other Provinces	0	0	0	-1	0.0%
U.S. Total		22,318	1,933	19,252	3,065	100.0%

Eight of the 39 gas provinces listed in Table 4 had a drop in reserves from 2008 to 2009. Similar to oil, 24 of the 39 gas provinces listed each accounted for 1 percent or less of the U.S. total.

**Table 4. Top U.S. Wet Natural Gas Provinces as Ranked by 2009 Proved Reserves
(Billion Cubic Feet)**

2009 Rank	Geologic Province	2009 End Year Reserves	2009 Production	2008 End Year Reserves	2009 Change	Percent of Total
1	Greater Green River Basin	30,446	1,490	26,505	3,941	10.7%
2	Fort Worth Basin	27,781	1,889	23,556	4,225	9.8%
3	Anadarko Basin	23,364	1,945	22,790	574	8.2%
4	East Texas Basin	22,201	1,824	20,579	1,622	7.8%
5	Louisiana-Mississippi Salt Basins	20,499	1,331	11,134	9,365	7.2%
6	Appalachian Basin	20,404	976	13,439	6,965	7.2%
7	Arkoma Basin	19,787	1,285	11,986	7,801	7.0%
8	Uinta-Piceance Basin	18,572	1,133	17,878	694	6.5%
9	Permian Basin	18,386	1,575	17,699	687	6.5%
10	San Juan Basin	18,146	1,392	19,042	-896	6.4%
11	Western Gulf	16,099	2,470	15,469	630	5.7%
12	Gulf Coast Offshore Basin	12,117	2,402	13,201	-1,084	4.3%
13	Alaska	9,183	360	7,766	1,417	3.2%
14	Denver Basin	3,867	271	3,852	15	1.4%
15	Wind River Basin	3,044	155	2,403	641	1.1%
16	Michigan Basin	2,805	156	2,745	60	1.0%
17	Powder River Basin	2,629	601	2,730	-101	0.9%
18	Raton Basin-Sierra Grande Uplift	2,313	175	2,807	-494	0.8%
19	San Joaquin Basin	2,023	155	1,651	372	0.7%
20	Williston Basin	1,759	158	958	801	0.6%
21	Southern Oklahoma	1,514	120	1,266	248	0.5%
22	Black Warrior Basin	1,381	116	1,609	-228	0.5%
23	Cherokee Platform	1,177	172	949	228	0.4%
24	Ventura Basin	905	46	853	52	0.3%
25	Paradox Basin	848	26	157	691	0.3%
26	Wyoming Thrust Belt	759	102	685	74	0.3%
27	Sacramento Basin	586	71	543	43	0.2%
28	North-Central Montana	483	46	521	-38	0.2%
29	Sedgwick Basin	222	33	75	147	0.1%
30	Big Horn Basin	166	20	187	-21	0.1%
31	Illinois Basin	146	7	185	-39	0.1%
32	Los Angeles Basin	131	13	114	17	0.0%
33	Las Animas Arch	52	7	28	24	0.0%
34	Cambridge Arch-Central Kansas Uplift	45	8	19	26	0.0%
35	Santa Maria Basin	21	4	21	0	0.0%
36	Western Oregon-Washington	11	0	0	11	0.0%
37	Northern Arizona	7	1	0	7	0.0%
38	Nemaha Uplift	2	0	0	2	0.0%
39	Eastern Great Basin	1	0	1	0	0.0%
-	All Other Provinces	0	0	0	0	0.0%
U.S. Total		283,882	22,535	245,403	38,479	100.0%

2009 Crude Oil and Lease Condensate Proved Reserves by Geologic Province



Miles
0 400 800

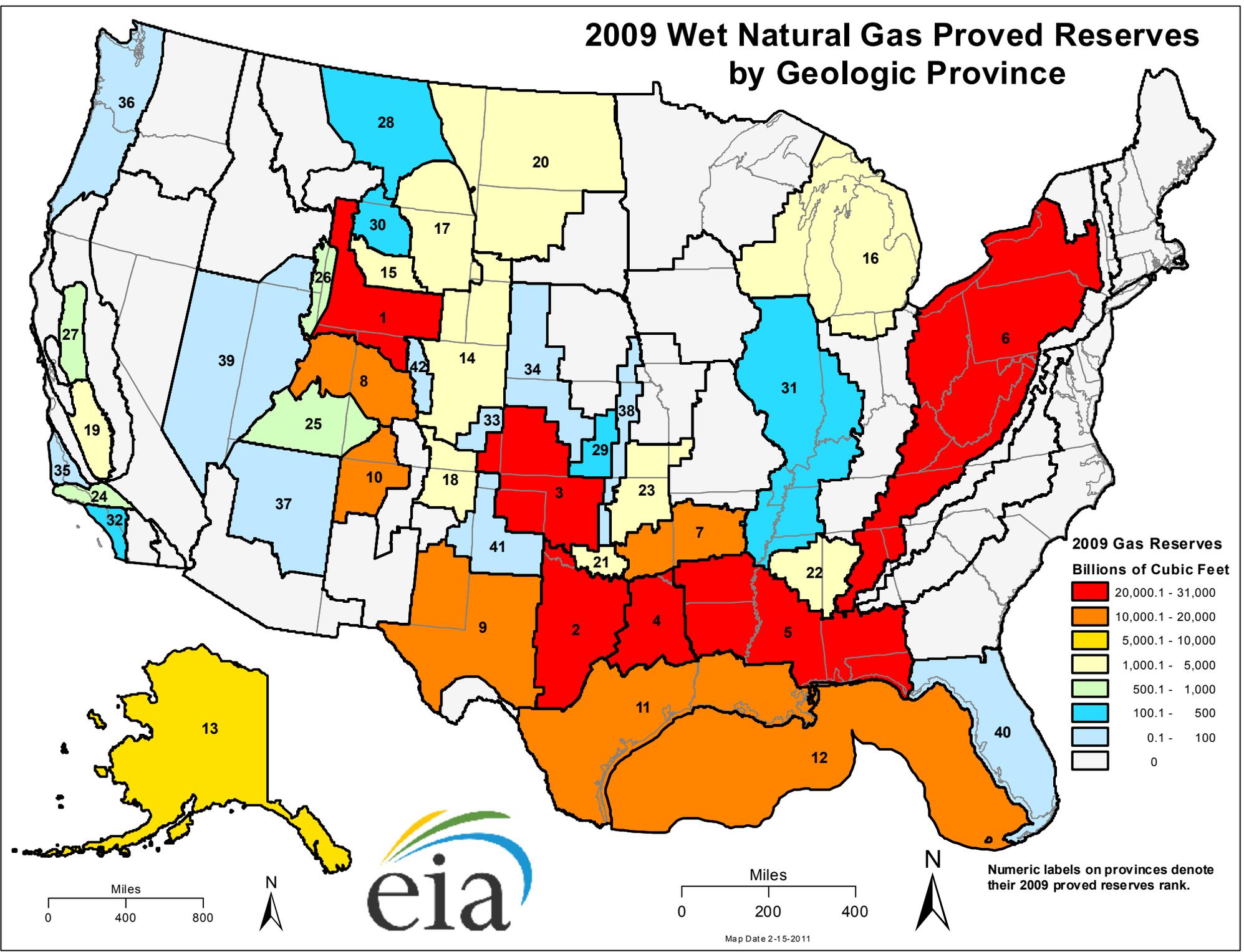


Miles
0 200 400



Numeric labels on provinces denote their 2009 proved reserves rank.

2009 Wet Natural Gas Proved Reserves by Geologic Province



2009 Gas Reserves
Billions of Cubic Feet

■	20,000.1 - 31,000
■	10,000.1 - 20,000
■	5,000.1 - 10,000
■	1,000.1 - 5,000
■	500.1 - 1,000
■	100.1 - 500
■	0.1 - 100
■	0

Numeric labels on provinces denote their 2009 proved reserves rank.