

3. Crude Oil Statistics

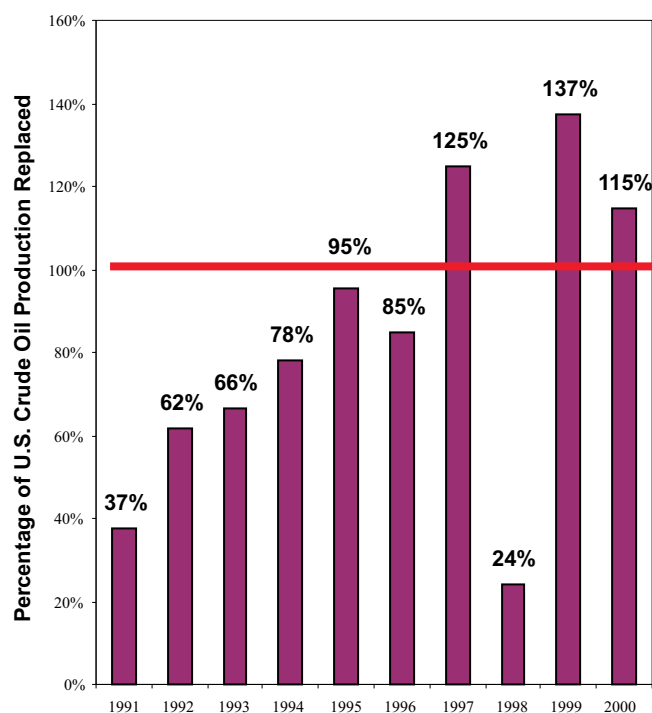
The United States had 22,045 million barrels of crude oil proved reserves as of December 31, 2000. This is 1.3 percent (280 million barrels) more than in 1999, and marks the second year in a row that crude oil proved reserves have increased.

Total discoveries of crude oil in 2000 resulted mainly from exploration in the deepwater Gulf of Mexico Federal Offshore and the Alaskan North Slope. Operators replaced 115 percent of 2000 oil production with proved reserves additions (Figure 15).

Proved Reserves

Table 6 presents the U.S. proved reserves of crude oil as of December 31, 2000, by selected States and State subdivisions.

Figure 15. Reserve Additions Replace 115% of 2000 U.S. Crude Oil Production.



Source: Energy Information Administration, Office of Oil and Gas.

Figure 16 maps 2000 crude oil proved reserves by area. The following four areas account for 77 percent of U.S. crude oil proved reserves:

Area	Percent of U.S. Oil Reserves
Texas	24
Alaska	22
California	17
Gulf of Mexico Federal Offshore	14
Area Total	77

Of these four areas, only the Gulf of Mexico had an increase in crude oil proved reserves in 2000.

Discussion of Reserves Changes

Figure 17 maps the change in crude oil proved reserves from 1999 to 2000 by area. Here's how the top four areas fared compared to the total United States:

Area	Change in U.S. Oil Reserves (million barrels)
Texas	-66
Alaska	-39
California	-121
Gulf of Mexico Federal Offshore	+430
Area Total	+204
U.S. Total	+280

Figure 2 in Chapter 2 shows the components of the changes in crude oil proved reserves for 2000 and the preceding 10 years.

Total Discoveries

Total discoveries are those new reserves attributable to *extensions* of existing fields, *new field discoveries*, and *new reservoir discoveries in old fields*. They result from the drilling of exploratory wells.

Total discoveries of crude oil were 1,291 million barrels in 2000, 78 percent more than those of 1999. Only five areas had *total discoveries* exceeding 30 million barrels:

- The Gulf of Mexico Federal Offshore had 702 million barrels of *total discoveries*, 54 percent of the National total.

Table 6. Crude Oil Proved Reserves, Reserves Changes, and Production, 2000
(Million Barrels of 42 U.S. Gallons)

State and Subdivision	Published Proved Reserves 12/31/99	Changes in Reserves During 2000							New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	Proved Reserves 12/31/00
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)					
Alaska	4,900	-1	125	1	2,990	2,838	226	0	92	328	4,861	
Lower 48 States	16,865	144	1,704	1,082	2,338	2,470	540	276	157	1,552	17,184	
Alabama	49	-3	1	7	2	4	0	0	0	8	34	
Arkansas	48	5	4	3	1	1	0	0	0	6	48	
California	3,934	-21	294	235	29	62	76	0	0	268	3,813	
Coastal Region Onshore	491	0	9	40	1	14	0	0	0	18	455	
Los Angeles Basin Onshore	297	-22	44	18	4	4	7	0	0	16	292	
San Joaquin Basin Onshore	2,949	13	211	177	24	44	69	0	0	215	2,870	
State Offshore	197	-12	30	0	0	0	0	0	0	19	196	
Colorado	203	-2	36	2	5	3	1	0	0	17	217	
Florida	85	0	0	5	0	0	0	0	0	4	76	
Illinois	100	21	6	8	24	25	1	0	0	10	111	
Indiana	10	7	1	1	1	1	0	0	0	2	15	
Kansas	175	75	30	21	17	16	9	1	0	31	237	
Kentucky	24	2	1	2	0	1	0	0	0	^a 2	^a 24	
Louisiana	600	-12	75	103	66	63	16	19	12	75	529	
North	108	6	17	21	3	4	1	0	0	15	97	
South Onshore	384	-16	50	73	47	39	7	1	9	44	310	
State Offshore	108	-2	8	9	16	20	8	18	3	16	122	
Michigan	52	10	5	5	1	2	1	0	0	8	56	
Mississippi	163	10	36	16	5	10	2	0	0	18	182	
Montana	207	13	23	15	6	9	19	0	0	15	235	
Nebraska	17	2	2	1	2	3	0	0	0	^a 3	^a 18	
New Mexico	718	-20	79	38	126	138	21	1	3	57	719	
East	705	-20	77	37	125	138	19	1	3	56	705	
West	13	0	2	1	1	0	2	0	0	1	14	
North Dakota	262	1	34	14	11	21	8	0	0	31	270	
Ohio	51	10	11	10	2	3	0	0	0	4	59	
Oklahoma	621	31	60	41	30	11	15	0	0	57	610	
Pennsylvania	16	0	1	1	8	7	1	0	0	1	15	
Texas	5,339	-2	515	221	1,642	1,636	50	1	6	409	5,273	
RRC District 1	66	34	6	9	4	3	0	0	0	9	87	
RRC District 2 Onshore	53	5	5	4	19	20	1	0	0	7	54	
RRC District 3 Onshore	221	5	39	30	11	11	10	1	1	34	213	
RRC District 4 Onshore	42	1	5	9	2	2	1	0	0	6	34	
RRC District 5	37	3	8	9	8	16	5	0	0	8	44	
RRC District 6	245	11	16	14	33	15	1	0	1	29	213	
RRC District 7B	123	-5	11	6	8	23	1	0	0	15	124	
RRC District 7C	209	-11	24	13	9	20	4	0	0	18	206	
RRC District 8	2,067	-25	204	69	394	392	20	0	4	126	2,073	
RRC District 8A	2,089	-14	165	43	1,139	1,093	4	0	0	133	2,022	
RRC District 9	123	-15	21	8	10	35	1	0	0	16	131	
RRC District 10	61	6	11	7	4	5	2	0	0	7	67	
State Offshore	3	3	0	0	1	1	0	0	0	1	5	
Utah	268	11	9	11	3	20	3	0	0	14	283	
West Virginia	21	-1	1	1	11	5	0	0	0	2	^a 12	
Wyoming	590	-1	49	34	26	33	4	0	0	54	561	
Federal Offshore	3,297	6	429	286	320	396	312	254	136	454	3,770	
Pacific (California)	553	1	79	6	20	24	0	0	0	35	596	
Gulf of Mexico (Louisiana)	2,442	3	328	242	289	341	251	171	127	381	2,751	
Gulf of Mexico (Texas)	302	2	22	38	11	31	61	83	9	38	423	
Miscellaneous ^a	15	2	2	1	0	0	1	0	0	2	17	
U.S. Total	21,765	143	1,829	1,083	5,328	5,308	766	276	249	1,880	22,045	

^aIndicates the estimate is associated with a sampling error (95 percent confidence interval) that exceeds 20 percent of the estimated value.

^bIncludes Arizona, Missouri, Nevada, New York, South Dakota, Tennessee, and Virginia.

Note: The production estimates in this table are based on data reported on Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves." They may differ from the official Energy Information Administration production data for crude oil for 2000 contained in the *Petroleum Supply Annual 2000*, DOE/EIA-0340(00).

Source: Energy Information Administration, Office of Oil and Gas.

Figure 16. 2000 Crude Oil Proved Reserves by Area

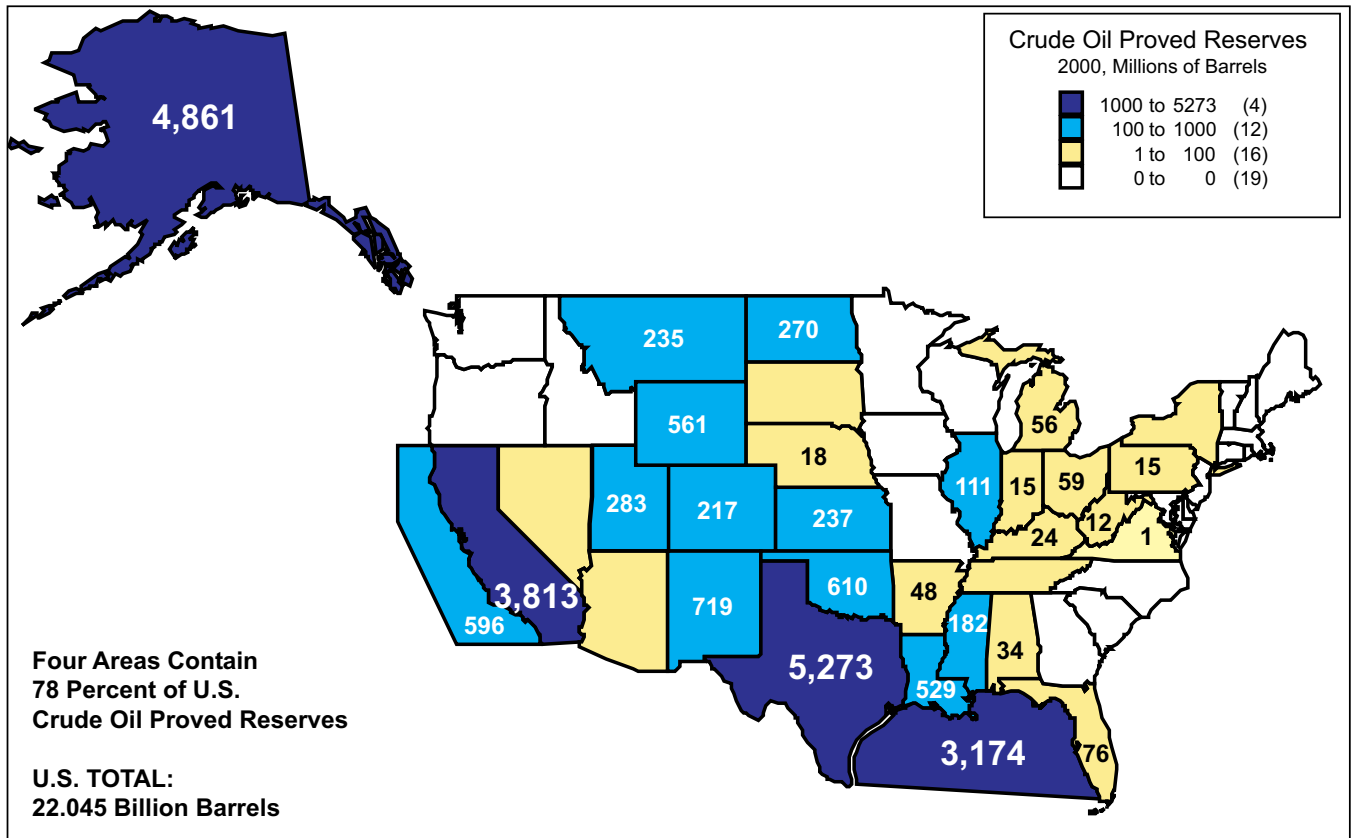
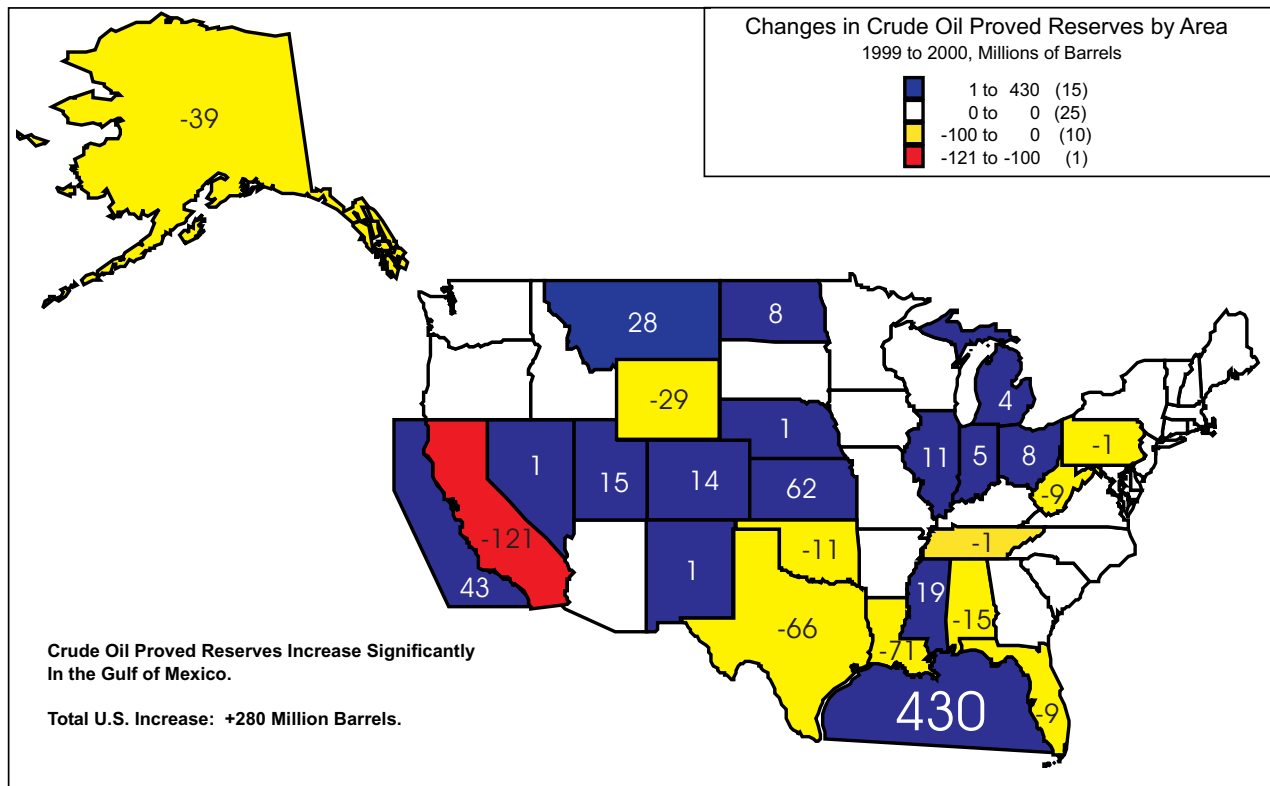


Figure 17. Changes in Crude Oil Proved Reserves by Area, 1999 to 2000



Source: Energy Information Administration, Office of Oil and Gas.

- Alaska had 318 million barrels of *total discoveries*, 25 percent of the National total.
- California had 76 million barrels of *total discoveries*, 6 percent of the National total.
- Texas had 57 million barrels of *total discoveries*, 4 percent of the National total.
- Louisiana had 47 million barrels of *total discoveries*, 4 percent of the National total.

The United States discovered an average of 753 million barrels of new crude oil proved reserves per year in the prior 10 years (1990 through 2000). *Total discoveries* in 2000 were 71 percent more than that average.

Extensions

Operators reported 766 million barrels of *extensions* in 2000. The highest volume of *extensions* was reported in the Gulf of Mexico Federal Offshore (312 million barrels). Operators in Alaska reported 226 million barrels of *extensions*. California was third with 76 million barrels, followed by Texas with 50 million barrels.

In the prior 10 years, U.S. operators reported an average of 407 million barrels of *extensions* per year. The 2000 *extensions* were almost twice that average.

New Field Discoveries

There were 276 million barrels of *new field discoveries* reported in 2000. Only five areas in the United States reported any *new field discoveries*, and only two contributed more than 1 percent to the total:

- Gulf of Mexico Federal Offshore (92 percent; 254 million barrels)
- Louisiana (7 percent; 19 million barrels).

In the prior 10 years, U.S. operators reported an average of 205 million barrels of reserves from *new field discoveries* per year. Reserves from *new field discoveries* in 2000 were 35 percent more than that average volume.

New Reservoir Discoveries in Old Fields

Operators in the United States reported 249 million barrels of crude oil reserves from *new reservoir discoveries in old fields* in 2000. As with *new field discoveries*, the most significant portion of the *new reservoir discoveries in old fields* came from the Gulf of Mexico Federal Offshore—136 million barrels or 55 percent of the total. Alaska had 92 million barrels (37

percent). Louisiana had 12 million barrels (5 percent) and Texas had 6 million barrels (2 percent). In the prior 10 years, U.S. operators reported an average of 140 million barrels of reserves from *new reservoir discoveries in old fields* per year. Reserves from *new reservoir discoveries in old fields* in 2000 were 78 percent above that average.

Revisions and Adjustments

Thousands of positive and negative *revisions* to proved reserves occur each year as infill wells are drilled, well performance is analyzed, new technology is applied, or economic conditions change. *Adjustments* are the annual changes in the published reserve estimates that cannot be directly attributed to the estimates for other reserve change categories because of the survey and statistical estimation methods employed.

There were 1,829 million barrels of revision increases, 1,083 million barrels of revision decreases, and 143 million barrels of adjustments in 2000. Combined, there were 889 million barrels of net *revisions and adjustments* for crude oil in 2000.

Sales and Acquisitions

Sales represents that volume of crude oil proved reserves deducted from an operator's total by selling existing oil fields or properties to another operator (not a volume of production "sold" at the wellhead). Similarly, *acquisitions* are that volume of proved reserves added to an operator's total through purchase of an existing oil field or properties.

Fundamentally, tracking *sales* and *acquisitions* seems like an exercise in accounting, but it is not that simple. Since operators have different engineering staffs and resources, or different development plans or schedules, the estimate of proved reserves for a field can change with a change in ownership.

In 2000, there were 5,328 million barrels of sales transactions between operators, and 5,308 million barrels of acquisitions -- yielding a net difference of -20 million barrels in 2000. It is interesting to note that the volume of *sales* and *acquisitions* transactions is more than double that of *revision increases* and *decreases*.

Production

U.S. *production* of crude oil in 2000 was an estimated 1,880 million barrels. This volume does not include

lease condensate. This was 4 percent lower than 1999's production of 1,952 million barrels. U.S. crude oil production has declined nine years in a row. The Gulf of Mexico Federal Offshore remains the largest producing area in the United States in 2000 with 419 million barrels of production (22 percent of the National total). Texas and Alaska are second and third with 22 percent and 17 percent of the total, respectively. California is fourth with 14 percent.

In 2000, the Form EIA-23 National production estimates were 2 percent less than the comparable *Petroleum Supply Annual (PSA) 2000* volumes for crude oil and lease condensate production combined (2,131 million barrels).

Areas of Note: Large Discoveries and Reserves Additions

The following State and area discussions summarize notable activities during 2000 concerning expected new field reserves, development plans, and possible production rates as reported in various trade publications. The citations do not necessarily reflect EIA's concurrence, but are considered important enough to be brought to the reader's attention.

The following areas were the major success stories for crude oil reserves and production for 2000.

Gulf of Mexico Federal Offshore

In 2000, the Gulf of Mexico Federal Offshore led the Nation in *total discoveries* of crude oil proved reserves – 702 million barrels of *total discoveries*, which is 55 percent of the National total.

- **Na Kika:** On September 27, 2000, Shell Exploration & Production Company announced final approval to develop its Na Kika project, estimated to recover ultimately over 300 million barrels of oil equivalent. The Na Kika development will consist of six subsea production systems servicing satellite fields tied back to a centrally-located floating production facility, an industry first for the deepwater Gulf of Mexico. The host facility will be permanently moored in the Mississippi Canyon area. Initially, the Na Kika development will produce hydrocarbons from five fields: Ariel, East Anstey, Fourier, Herschel, and Kepler. Coulomb, a sixth field solely owned by Shell Exploration & Production Company, will be tied back to the

host facility as production capacity becomes available. The fields are located in water depths ranging from 5,800 to 7,600 feet. {37}

- **Tanzanite:** On January 29, 2001, Anadarko Petroleum Corporation announced that it had recently begun production from the Tanzanite and Hickory fields, two sub-salt discoveries made in 1998 off the coast of Louisiana in the Gulf of Mexico. Tanzanite produces oil and gas, while Hickory is a gas field. The two fields began producing from one well each in the final week of December 2000. Currently Tanzanite is producing more than 10,000 barrels of oil and 23 million cubic feet (MMcf) of gas per day from the first completed well, the EI 346 A-1. A second well went on production in February 2001. Anadarko owns a 100 percent working interest in this field, which is located in Eugene Island Block 346 in 314 feet of water. With both wells on-line, oil production from the Tanzanite field is expected to reach 15,000 barrels per day, the platform's capacity for oil, plus about 50 MMcf per day of natural gas. Initially this field is expected to produce crude oil at high rates from the main reservoir, but oil production will decline over time and be replaced by rising natural gas production from the gas cap. The Tanzanite platform has the capacity to produce as much as 200 MMcf a day of gas.{38}
- **Oregano and Serrano:** On September 13, 2000, Shell Exploration and Production Company announced its plans to develop the Oregano and Serrano discoveries located in the Gulf of Mexico in 3,400 feet of water. A subsea production system, tied back to Shell's Auger tension-leg platform in 2,860 feet of water, will be used to develop the two discoveries. Each development is estimated to recover about 50 million barrels of oil equivalent. Reserves at Oregano are primarily oil, while Serrano's reserves are primarily gas. Although Serrano and Oregano are separate fields, the development activities are being executed through a single integrated plan. At each field Shell plans to initially complete two wells, set a flowline sled, and install a single 6-inch by 10-inch pipe-in-pipe insulated flowline which will tie back to Shell's Auger tension-leg platform. {39}
- **Prince:** On May 2, 2000, El Paso Energy Partners, L.P. announced that it had entered into an agreement with El Paso Production Company, a subsidiary of El Paso Energy

Corporation, to install a multi-purpose tension leg platform (TLP) for the Prince development prospect located in the Ewing Bank (EW) Block 958 unit in the Gulf of Mexico. After drilling a fourth well to a depth of 13,850 feet, El Paso Production Company believes that it has encountered over 200 feet of net hydrocarbon pay. Based on the results of this well and the expanded size and scope of the field development plan, El Paso Energy Partners will proceed with construction of the TLP. El Paso Energy Partners has initiated construction of the TLP under its contract with Modec International LLC, a jointly owned company of FMC Corporation and Mitsui group. The TLP will be installed in 1,500 feet of water, and will be capable of handling up to 50,000 barrels of oil per day and 80 million cubic feet of natural gas per day. Delivery of the platform is planned for April 2001, with first production from the Prince development estimated in June 2001.^{40}

Other Gain Areas

Kansas: Kansas' proved oil reserves increased by 35 percent (62 million barrels). A year 2000 adjustment of 75 million barrels mostly offsets a negative adjustment of -97 million barrels applied in 1999.

Pacific Federal Offshore: The proved oil reserves in the Pacific Federal Offshore increased by 8 percent (43 million barrels) in 2000 compared to 1999.

Montana: Montana's proved oil reserves increased by 14 percent (28 million barrels).

Areas of Note: Large Reserves Declines

The following areas had large declines in crude oil proved reserves due to downward revisions or unreplaced production.

California

California's crude oil proved reserves declined 121 million barrels in 2000. California was third in the Nation with *extensions* (76 million barrels) in 2000, but this did not offset California's oil production—an estimated 268 million barrels in 2000. California's production declined 4 percent from its 1999 level (279 million barrels production).

Louisiana

Louisiana's crude oil proved reserves declined 12 percent (71 million barrels) in 2000. Operators also reported a production decline of 14 percent (12 million barrels) from 1999.

Texas

There was a net decline of 66 million barrels of crude oil proved reserves in Texas in 2000. Texas' production declined less than 2 percent from its 1999 level.

Other Decline Areas

In the following areas of the United States, development of existing or new oil fields was outpaced by crude oil production.

Alaska: Proved oil reserves decreased by 1 percent (39 million barrels).

Wyoming: Proved oil reserves decreased by 5 percent (29 million barrels).

Reserves in Nonproducing Reservoirs

Not all proved reserves of crude oil were contained in reservoirs that were producing. Operators reported 4,019 million barrels of proved reserves in nonproducing reservoirs, 4 percent less than reported in 1999 (4,206 million barrels). Nonproducing crude oil reserves (not including lease condensate) are listed in **Table 7**.

Nonproducing reserves are those waiting for well workovers, drilling additional development or replacement wells, installing production or pipeline facilities, and awaiting depletion of other zones or reservoirs before recompletion in reservoirs not currently open to production.

Table 7. Reported Reserves in Nonproducing Reservoirs for Crude Oil, 2000^a
(Million Barrels of 42 U.S. Gallons)

State and Subdivision	Nonproducing Crude Oil Reserves	State and Subdivision	Nonproducing Crude Oil Reserves
Alaska	511	North Dakota	29
Lower 48 States	3,508	Ohio	10
Alabama	2	Oklahoma	111
Arkansas	7	Pennsylvania	1
California	464	Texas	750
Coastal Region Onshore	130	RRC District 1	12
Los Angeles Basin Onshore	68	RRC District 2 Onshore	9
San Joaquin Basin Onshore	234	RRC District 3 Onshore	34
State Offshore	32	RRC District 4 Onshore	8
Colorado	49	RRC District 5	6
Florida	9	RRC District 6	9
Illinois	4	RRC District 7B	5
Indiana	0	RRC District 7C	34
Kansas	13	RRC District 8	280
Kentucky	0	RRC District 8A	335
Louisiana	204	RRC District 9	11
North	31	RRC District 10	7
South Onshore	123	State Offshore	0
State Offshore	50	Utah	91
Michigan	4	Virginia	0
Mississippi	38	West Virginia	0
Montana	36	Wyoming	63
Nebraska	0	Federal Offshore	1,531
New Mexico	91	Pacific (California)	42
East	91	Gulf of Mexico (Louisiana)	1,267
West	0	Gulf of Mexico (Texas)	222
New York	0	Miscellaneous ^b	1
		U.S. Total	4,019

^aIncludes only those operators who produced 400,000 barrels of crude oil or 2 billion cubic feet of natural gas, or both, during the report year (Category I or Category II operators).

^bIncludes Arizona, Missouri, Nevada, South Dakota, and Tennessee.

Source: Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves," 2000.