

3. Crude Oil Statistics

The United States had 22,667 million barrels of crude oil proved reserves as of December 31, 2002. This is 1 percent (231 million barrels) more than in 2001, and marks the fourth year in a row that crude oil proved reserves have increased.

The majority of crude oil total discoveries in 2002 were extensions, primarily in Texas, California, and the Gulf of Mexico Federal Offshore. The North Slope of Alaska, a key area for discoveries, had no significant impact on the National total in 2002. Operators replaced 112 percent of 2002 oil production with proved reserves additions (Figure 15).

Proved Reserves

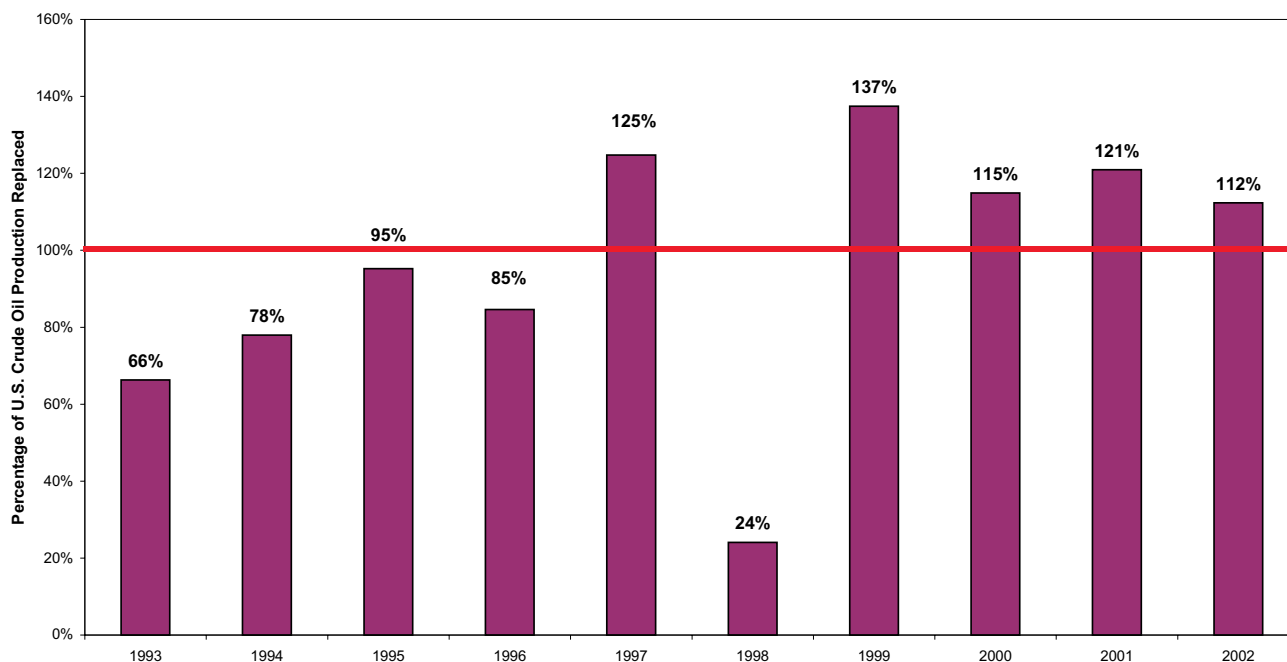
Table 6 presents the U.S. proved reserves of crude oil as of December 31, 2002, by selected States and State subdivisions.

Figure 16 maps 2002 crude oil proved reserves by area. The following four areas account for 79 percent of U.S. crude oil proved reserves:

Area	Percent of U.S. Oil Reserves
Texas	22
Alaska	21
Gulf of Mexico Federal Offshore	20
California	16
Area Total	79

Of these four areas, Texas, the Gulf of Mexico Federal Offshore, and California had increases in crude oil proved reserves in 2002. Alaska reported a decline in crude oil proved reserves.

Figure 15. Replacement of U.S. Crude Oil Production by Reserves Additions, 1993-2002.



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

Table 6. Crude Oil Proved Reserves, Reserves Changes, and Production, 2002
(Million Barrels of 42 U.S. Gallons)

State and Subdivision	Published Proved Reserves 12/31/01	Changes in Reserves During 2002							New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	Proved Reserves 12/31/02
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)	New Field Discoveries (+)			
Alaska	4,851	2	192	39	0	0	25	0	8	361	4,678
Lower 48 States	17,595	414	1,733	1,166	804	828	467	300	146	1,514	17,999
Alabama	42	3	8	2	1	0	1	0	5	5	51
Arkansas	^a 43	11	9	5	4	2	0	0	0	7	49
California	3,627	18	223	85	6	25	88	0	0	257	3,633
Coastal Region Onshore	385	3	19	2	4	12	9	0	0	18	404
Los Angeles Basin Onshore	297	4	48	16	1	0	15	0	0	17	330
San Joaquin Basin Onshore	2,766	14	130	66	1	0	64	0	0	205	2,702
State Offshore	179	-3	26	1	0	13	0	0	0	17	197
Colorado	196	18	30	13	1	0	1	0	0	17	214
Florida	75	1	2	1	0	0	0	0	0	4	73
Illinois	92	22	17	15	0	0	0	0	0	9	107
Indiana	^a 12	2	3	0	0	0	0	0	0	2	15
Kansas	216	44	37	40	4	3	11	2	0	32	237
Kentucky	^a 17	-5	2	0	0	15	0	0	0	2	27 ^a
Louisiana	564	18	59	140	18	22	35	2	19	60	501
North	87	6	15	26	2	1	5	0	0	11	75
South Onshore	341	12	33	58	16	20	20	2	17	36	335
State Offshore	136	0	11	56	0	1	10	0	2	13	91
Michigan	46	11	13	6	2	3	2	0	0	6	61
Mississippi	167	12	23	14	40	44	3	1	1	18	179
Montana	260	0	22	9	13	14	27	5	0	18	288
Nebraska	^a 45	5	3	2	0	0	0	0	0	3	18
New Mexico	715	16	80	75	31	38	27	0	4	64	710
East	703	16	79	72	30	35	27	0	4	63	699
West	12	0	1	3	1	3	0	0	0	1	11
North Dakota	328	-2	52	13	57	58	9	0	0	33	342
Ohio	46	19	11	2	3	0	1	0	0	5	67
Oklahoma	556	43	79	68	176	199	23	0	0	58	598
Pennsylvania	10	2	3	1	0	0	0	0	0	2 ^a	12a
Texas	4,944	188	427	232	331	289	91	0	7	368	5,015
RRC District 1	46	7	13	9	13	12	1	0	0	7	50
RRC District 2 Onshore	48	3	8	6	2	5	4	0	1	7	54
RRC District 3 Onshore	195	22	37	22	7	4	16	0	1	28	218
RRC District 4 Onshore	32	2	5	7	4	3	2	0	0	5	28
RRC District 5	29	0	3	5	0	1	0	0	0	4	24
RRC District 6	200	27	19	22	10	1	3	0	0	20	198
RRC District 7B	91	31	10	9	36	5	1	0	0	11	82
RRC District 7C	188	15	23	13	30	6	4	0	0	16	177
RRC District 8	1,880	28	156	74	158	164	29	0	1	113	1,913
RRC District 8A	2,070	25	132	41	61	74	27	0	2	135	2,093
RRC District 9	104	17	13	14	10	14	3	0	1	15	113
RRC District 10	55	11	7	9	0	0	1	0	0	6	59
State Offshore	6	0	1	1	0	0	0	0	1	1	6
Utah	271	-18	12	16	0	0	4	0	0	12	241
West Virginia	8	2	4	0	0	0	0	0	0	1	13 ^a
Wyoming	489	5	92	22	93	81	18	0	0	46	524
Federal Offshore	4,835	3	521	403	24	35	125	290	110	483	5,009
Pacific (California)	547	1	24	8	0	0	32	0	0	31	565
Gulf of Mexico (Louisiana)	3,877	-2	401	264	23	32	92	260	110	395	4,088
Gulf of Mexico (Texas)	411	4	96	131	1	3	1	30	0	57	356
Miscellaneous ^b	21	-4	1	2	0	0	1	0	0	2	15
U.S. Total	22,446	416	1,925	1,205	804	828	492	300	154	1,875	22,677

^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 2002 contained in the *Petroleum Supply Annual 2002*, DOE/EIA-0340(02).

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

Figure 16. Crude Oil Proved Reserves by Area, 2002

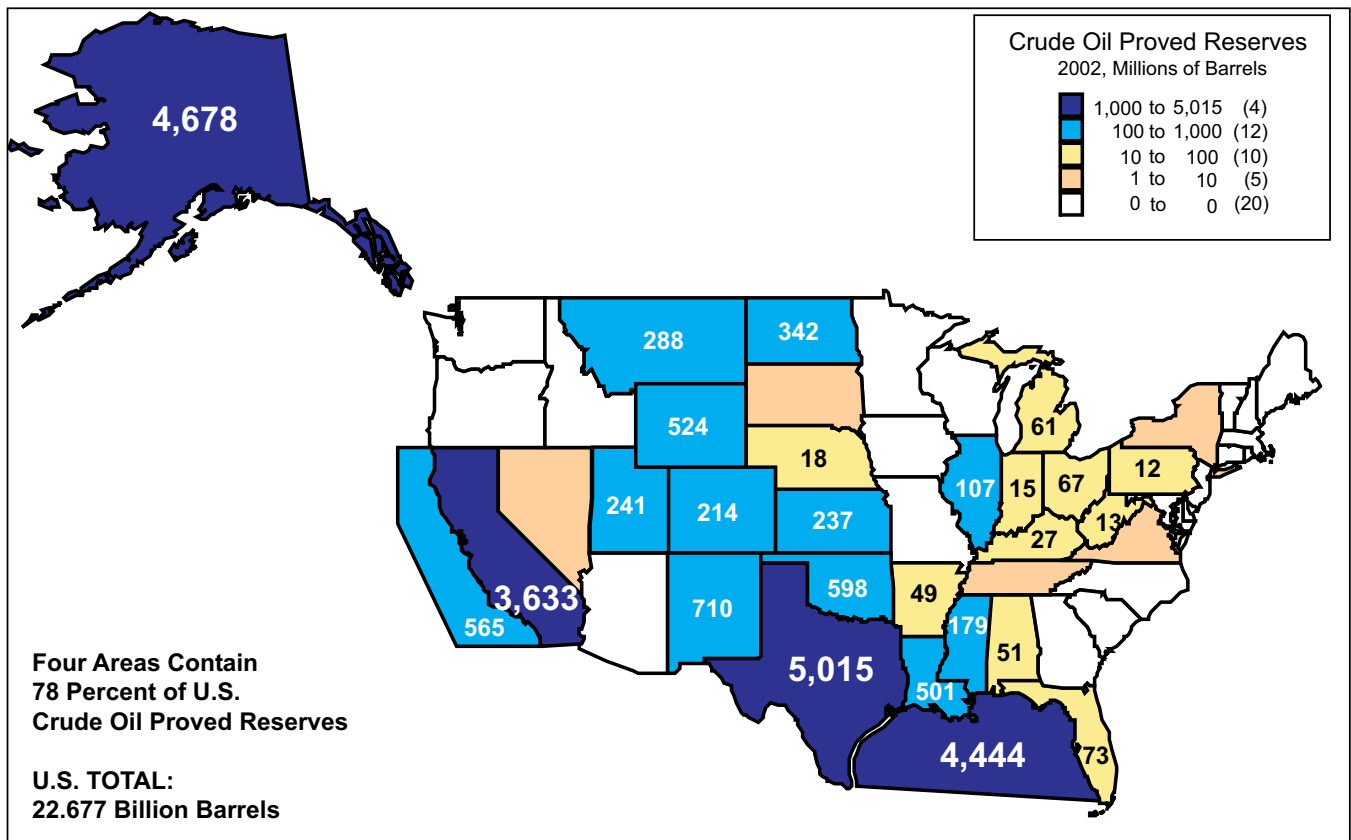
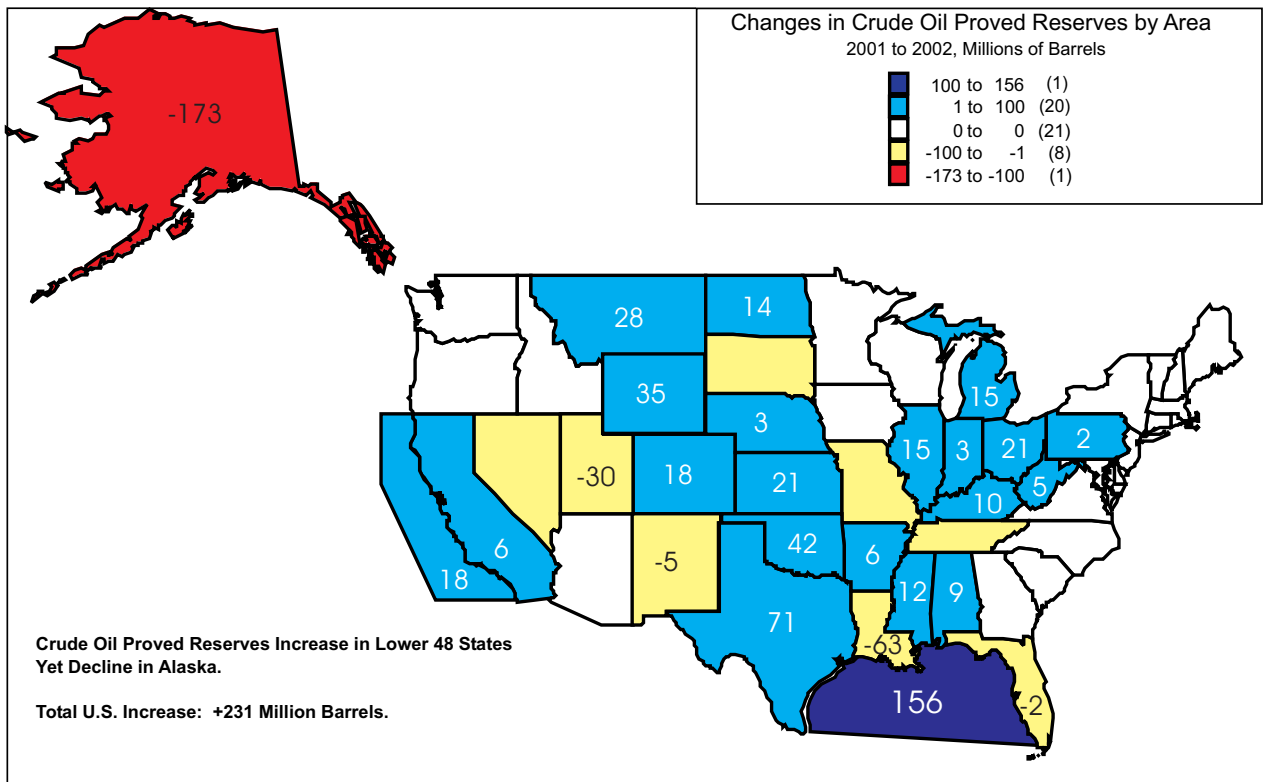


Figure 17. Changes in Crude Oil Proved Reserves by Area, 2001 to 2002



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

Discussion of Reserves Changes

Figure 17 maps the change in crude oil proved reserves from 2001 to 2002 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	+71
Alaska	-173
Gulf of Mexico Federal Offshore	+156
California	+6
Area Total	+60
U.S. Total	+231

Figure 2 in Chapter 2 shows the components of the changes in crude oil proved reserves for 2002 and the preceding 10 years.

Total Discoveries

Total discoveries are those 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 946 million barrels in 2002, 63 percent less than those of 2001. This is not surprising because 2001, which featured new proved reserves from bp's Thunder Horse Field, was an unusually successful year. Domestic field discoveries of that magnitude are not common. Only four areas had total discoveries exceeding 50 million barrels:

- The Gulf of Mexico Federal Offshore had 493 million barrels of total discoveries, 52 percent of the National total.
- Texas had 98 million barrels of total discoveries, 10 percent of the National total.
- California had 88 million barrels of total discoveries, 9 percent of the National total.
- Louisiana had 56 million barrels of total discoveries, 6 percent of the National total.

The United States discovered an average of 1,014 million barrels of new crude oil proved reserves per year in the prior 10 years (1992 through 2001). Total discoveries in 2002 (946 million barrels) were 7 percent less than that average.

Extensions

Operators reported 492 million barrels of extensions in 2002. The highest volume of extensions was reported in the Gulf of Mexico Federal Offshore (93 million barrels). Texas reported 91 million barrels of extensions. California was third with 88 million barrels of extensions in 2002.

In the prior 10 years, U.S. operators reported an average of 488 million barrels of extensions per year. The 2002 extensions were 1 percent more than that average.

New Field Discoveries

There were 300 million barrels of new field discoveries of crude oil reported in 2002. Only five areas in the United States reported any new field discoveries, and only the Gulf of Mexico Federal Offshore contributed a significant volume (97 percent; 290 million barrels).

In the prior 10 years, U.S. operators reported an average of 354 million barrels of reserves from new field discoveries per year. Reserves from new field discoveries in 2002 were 15 percent less than that average volume.

New Reservoir Discoveries in Old Fields

Operators reported 154 million barrels of crude oil reserves from new reservoir discoveries in old fields in 2002. As with new field discoveries, the most significant portion of new reservoir discoveries in old fields was in the Gulf of Mexico Federal Offshore—110 million barrels or 71 percent of the total. Louisiana had 19 million barrels (12 percent), Alaska had 8 million barrels (5 percent), and Texas had 7 million barrels (5 percent).

In the prior 10 years, U.S. operators reported an average of 172 million barrels of reserves from new reservoir discoveries in old fields per year. Reserves from new reservoir discoveries in old fields in 2002 were 10 percent less than 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 1,925 million barrels of revision increases, 1,205 million barrels of revision decreases, and 416 million barrels of adjustments in 2002. Combined, there were 1,136 million barrels of net revisions and adjustments for crude oil in 2002.

Sales and Acquisitions

Sales represents that volume of crude oil proved reserves deducted from an operator's total by selling or transferring operations in existing oil fields 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 or operations transfer in existing oil fields.

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, the estimate of proved reserves for a field can change with a change in ownership. Timing of the transfer of operations can also impact these values.

In 2002, there were 804 million barrels of sales transactions between operators, and 828 million barrels of acquisitions -- yielding a net difference of 24 million barrels in 2002.

Production

U.S. production of crude oil in 2002 was an estimated 1,875 million barrels. This volume does not include lease condensate. This was 2 percent lower than 2001's production of 1,915 million barrels. The Gulf of Mexico Federal Offshore remained the largest crude oil producing area in 2002 with 452 million barrels of production (24 percent of the National total). Texas and Alaska were second and third with 20 percent and 19 percent of the total, respectively. California was fourth with 14 percent.

In 2002, the Form EIA-23 National production estimates (2,082 million barrels of crude oil and lease condensate) were 1 percent less than the comparable Petroleum Supply Annual (PSA) 2002 production volumes for crude oil and lease condensate combined (2,097 million barrels).

Areas of Note: Large Discoveries and Reserves Additions

The following State and Area discussions summarize notable activities during 2002 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 2002.

Gulf of Mexico Federal Offshore

The Gulf of Mexico Federal Offshore led the Nation in total discoveries of crude oil proved reserves in 2002 with 493 million barrels of total discoveries, 52 percent of the National total.

On February 12, 2003, the Minerals Management Service (MMS) released information about 2002 deepwater Gulf of Mexico activity levels. "Calendar year 2002 was a year of significant deepwater activity in the Gulf of Mexico despite the general downturn in drilling. Twelve new deepwater discoveries were made and three of these were in 8,000 feet or greater water depths," said MMS's Gulf of Mexico Regional Director Chris C. Oynes. Fourteen new deepwater projects began production in 2002. These joined the 51 that were already in production for a new total of 65. "Deepwater development projects continue at a fast pace and the 14 new projects in the Gulf of Mexico, include 11 that were subsea production systems that tied back to another project," said Oynes. This raised the total number of subsea projects to 41 out of the 65 total deepwater projects. Three of the new deepwater starts utilized a spar as a production system. Oynes noted that "we expect a significant rise in the number of deepwater projects that will start production in the year 2003 -- perhaps as many as 19." {38}

- **Mad Dog Field:** On February 13, 2002 BHP Billiton announced details about the development of the Mad Dog field, located in Green Canyon Block 826 of the Gulf of Mexico. BHP Billiton holds a 23.9 per cent working interest in Mad Dog with partners bp (the designated operator) 60.5 per cent interest, and Unocal 15.6 per cent. The Mad Dog field has estimated reserves in the range of 200-450 million barrels of oil equivalent. Mad Dog is located in water depths of 4,500 to 6,800 feet and

will be developed using proven technology - a truss SPAR with an integrated drilling rig, dry trees, and 16 well slots. The gross design capacity of the facility will be 80,000 barrels of oil per day and 40 million standard cubic feet of gas per day. First production is expected by the end of calendar year 2004, with production at full design capacity expected to occur within 12 months thereafter. The field has an estimated life of 20 years. The Mad Dog field is situated in the Atwater Foldbelt, 125 miles from the Louisiana coast. It is a very large structure, with over 4,000 feet of structural closure covering 26,500 acres. {39}

- **Crosby Field:** As of January 18, 2002, Shell Exploration & Production Company's Crosby subsea field is now online and sending production to the Ursa hub platform. The first subsea tieback to Ursa, the 3-well Crosby development, is located in Mississippi Canyon Blocks 898 and 899 in the Gulf of Mexico. Production from Crosby's first well began on Dec.17, 2001. Currently, all three wells are online and producing 20,000 barrels of oil per day. Peak production for Crosby was expected to be approximately 60,000 barrels of oil per day and 90 million cubic feet of gas per day by the end of the first quarter of 2002. Crosby is located about 160 miles southeast of New Orleans in approximately 4,400 feet of water. Crosby's production is carried from a six-slot manifold to Shell's Ursa tension leg platform, 10 miles away on Mississippi Canyon Block 809 in 3,950 feet of water. Once all of Crosby's wells are at peak production, Shell expects Ursa's total platform production to increase to 170,000 barrels of oil per day. "Like other subsea production systems that recently came online, Crosby is another example of SEPCo's growth in the Gulf of Mexico and its aggressive development of its Mars Basin discoveries," said Dave Lawrence, SEPCo vice president, Exploration & Development. "But, Crosby is the first field to begin production in the southern part of the Mars Basin. Ursa, Mars, King, and ultimately, Princess, are all located in the northern part of the Basin." {40}

Other Gain Areas

Texas: Texas reported a net increase of 71 million barrels of proved oil reserves in 2002, and had the second largest volume of new field discoveries in 2002 (98 million barrels). Operators in the Permian Basin developed extensions of their existing fields in 2002.

Oklahoma: Proved oil reserves in Oklahoma increased by 8 percent (42 million barrels) in 2002 compared to 2001. Production in Oklahoma increased by 9 percent (5 million barrels).

Wyoming: Wyoming's proved oil reserves increased by 7 percent (35 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.

Alaska

Alaskan crude oil proved reserves declined 4 percent (-173 million barrels) in 2002. Alaskan operators reported revision increases and extensions in 2002, but this did not offset Alaska's oil production—an estimated 361 million barrels in 2002. Alaska production increased 2 percent (+6 million barrels) from its 2001 level.

Louisiana

Louisiana's crude oil proved reserves declined 11 percent (-63 million barrels) in 2002. Operators also reported a production decrease of 20 percent (-15 million barrels) over the 2001 level. Hurricanes Isadore and Lili swept up through the Gulf of Mexico came ashore in Louisiana in October of 2002, disrupting operations.

Utah

There was a net decline of 11 percent (-30 million barrels) in Utah's crude oil proved reserves in 2002. Utah's crude oil production declined 8 percent (-1 million barrels) from its 2001 level.

Other Decline Areas

Discovery and development of new or existing oil fields was also outpaced by crude oil production in the following areas of the United States.

New Mexico: Proved oil reserves decreased by 1 percent (-5 million barrels).

Florida: Proved oil reserves decreased by 3 percent (-2 million barrels).

Reserves in Nonproducing Status

Not all proved reserves of crude oil reported in 2002 were producing. Operators reported 5,195 million barrels of proved reserves in nonproducing status, 29 percent more than reported in 2001 (4,019 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 Status for Crude Oil, 2002^a
(Million Barrels of 42 U.S. Gallons)

State and Subdivision	Nonproducing Crude Oil Reserves	State and Subdivision	Nonproducing Crude Oil Reserves
Alaska	546	North Dakota	62
Lower 48 States	4,725	Ohio	8
Alabama	1	Oklahoma	105
Arkansas	5	Pennsylvania	1
California	336	Texas	753
Coastal Region Onshore	61	RRC District 1	11
Los Angeles Basin Onshore	122	RRC District 2 Onshore	14
San Joaquin Basin Onshore	111	RRC District 3 Onshore	41
State Offshore	42	RRC District 4 Onshore	5
Colorado	56	RRC District 5	4
Florida	7	RRC District 6	14
Illinois	15	RRC District 7B	2
Indiana	0	RRC District 7C	36
Kansas	23	RRC District 8	258
Kentucky	4	RRC District 8A	345
Louisiana	185	RRC District 9	16
North	16	RRC District 10	7
South Onshore	139	State Offshore	0
State Offshore	30	Utah	91
Michigan	4	Virginia	0
Mississippi	42	West Virginia	0
Montana	65	Wyoming	69
Nebraska	0	Federal Offshore	2,746
New Mexico	146	Pacific (California)	62
East	146	Gulf of Mexico (Louisiana)	2,530
West	0	Gulf of Mexico (Texas)	154
New York	0	Miscellaneous ^b	1
		U.S. Total	5,271

^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," 2002.