

4. Natural Gas Statistics

Dry Natural Gas

Proved Reserves

The United States had 183,460 billion cubic feet of dry natural gas reserves as of December 31, 2001, a 3 percent increase over the 2000 level (Table 8). All natural gas proved reserves data shown in this report exclude natural gas held in underground storage.

Most of the reserve increases were in Wyoming, Colorado, and Texas, owing to drilling and/or improved stimulation technology used in the Madden, Wattenberg, and Pinedale Fields of Wyoming, coalbed methane fields in Wyoming and Colorado, and the Barnett Shale and Lobo Trend gas areas in Texas. Utah and New Mexico, which had significant gas reserves increases in 2000, had smaller gains in 2001. California's and Oklahoma's reserves declined in 2001, despite last year's reserves increases.

Additions to dry gas reserves in 2001 were 25,812 billion cubic feet, 11 percent less than in 2000.

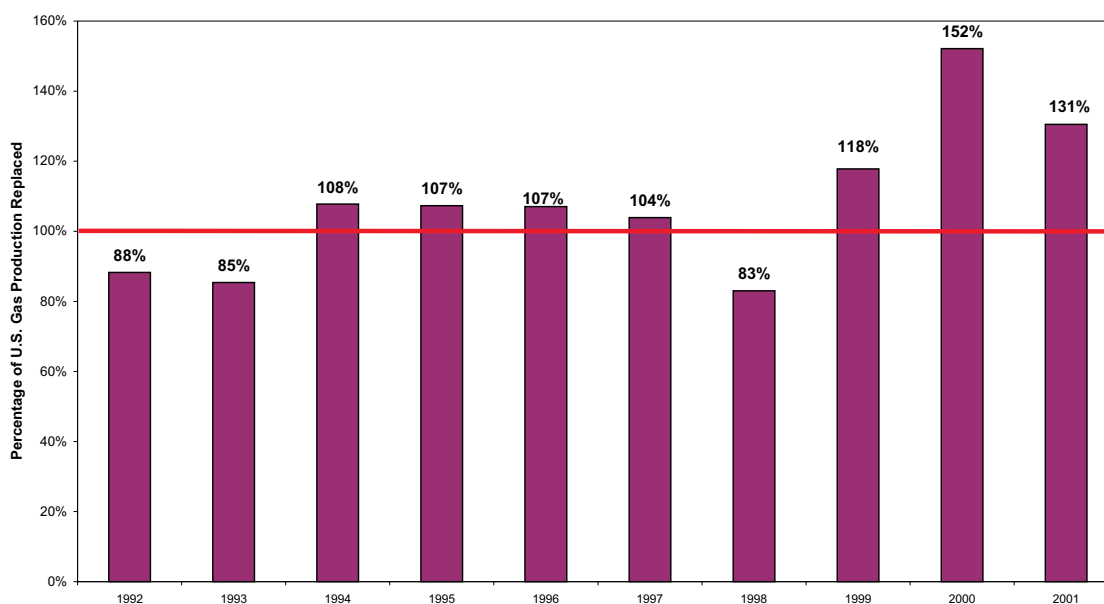
Operators replaced 131 percent of dry gas production (Figure 18). U.S. total discoveries of dry natural gas reserves were 22,758 billion cubic feet in 2001, up 19 percent from 2000 (19,138 billion cubic feet).

Proved reserves by State are shown on the map in Figure 19. Six areas account for 71 percent of the Nation's dry natural gas proved reserves:

Area	Percent of U.S. Gas Reserves
Texas	24
Gulf of Mexico Federal Offshore	14
Wyoming	10
New Mexico	9
Oklahoma	7
Colorado	7
Area Total	71

For the first time, proved reserves of dry natural gas in Wyoming exceeded those in New Mexico. However,

Figure 18. Reserve Additions Replace 131% of 2001 U.S. Dry Natural Gas Production.



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

Table 8. Dry Natural Gas Proved Reserves, Reserves Changes, and Production, 2001
(Billion Cubic Feet at 14.73 psia and 60° Fahrenheit)

State and Subdivision	Published Proved Reserves 12/31/00	Changes in Reserves During 2001									Proved Reserves 12/31/01
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)	New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	
Alaska	9,237	-11	233	335	0	0	59	74	4	461	8,800
Lower 48 States	168,190	2,753	18,125	20,341	11,380	14,010	16,321	3,504	2,796	19,318	174,660
Alabama	4,149	36	78	218	1	3	169	42	2	345	3,915
Arkansas	1,581	28	128	88	8	5	119	0	11	160	1,616
California	2,849	36	162	255	7	20	210	0	2	336	2,681
Coastal Region Onshore	234	2	14	61	0	0	0	0	0	12	177
Los Angeles Basin Onshore	193	6	17	27	1	0	8	0	0	9	187
San Joaquin Basin Onshore	2,331	28	125	161	6	20	200	0	2	307	2,232
State Offshore	91	0	6	6	0	0	2	0	0	8	85
Colorado	10,428	155	1,882	1,513	2,468	2,794	2,120	4	7	882	12,527
Florida	82	0	7	0	0	0	0	0	0	5	84
Kansas	5,299	60	279	220	259	331	46	2	1	438	5,101
Kentucky	1,760	158	348	397	50	49	42	0	23	73	1,860
Louisiana	9,239	322	1,013	1,696	496	888	1,427	27	566	1,479	9,811
North	3,298	49	298	522	58	189	993	1	23	390	3,881
South Onshore	5,245	267	648	1,091	370	524	366	17	510	931	5,185
State Offshore	696	6	67	83	68	175	68	9	33	158	745
Michigan	2,729	653	263	524	24	2	63	50	3	239	2,976
Mississippi	618	53	70	43	34	29	43	0	19	94	661
Montana	885	51	82	90	57	59	36	1	4	73	898
New Mexico	17,322	9	1,599	1,244	312	307	1,216	21	32	1,536	17,414
East	3,537	136	470	548	201	126	479	20	17	518	3,518
West	13,785	-127	1,129	696	111	181	737	1	15	1,018	13,896
New York	322	-18	29	51	1	0	47	1	17	28	318
North Dakota	433	17	48	32	8	5	3	0	18	41	443
Ohio	1,185	31	129	287	87	62	9	0	12	84	970
Oklahoma	13,699	196	1,458	1,895	480	671	1,325	13	52	1,481	13,558
Pennsylvania	1,741	3	201	219	11	32	108	33	1	114	1,775
Texas	42,082	658	3,594	5,191	2,902	4,297	4,944	603	580	5,138	43,527
RRC District 1	1,032	17	87	120	30	44	84	7	1	104	1,018
RRC District 2 Onshore	1,980	-231	146	246	93	270	175	14	108	322	1,801
RRC District 3 Onshore	3,873	54	422	498	563	639	413	86	85	741	3,770
RRC District 4 Onshore	9,645	228	809	1,211	674	712	1,284	300	258	1,395	9,956
RRC District 5	3,168	15	398	650	22	822	779	51	5	335	4,231
RRC District 6	5,976	159	408	419	886	1,110	404	5	15	644	6,128
RRC District 7B	312	-7	21	42	15	10	24	0	0	51	252
RRC District 7C	3,504	175	285	790	425	449	413	0	24	315	3,320
RRC District 8	5,388	58	431	569	111	117	340	67	67	533	5,255
RRC District 8A	1,101	5	81	90	13	13	62	0	1	75	1,085
RRC District 9	1,626	77	109	127	18	16	790	0	1	185	2,289
RRC District 10	4,079	82	381	404	46	75	152	1	8	373	3,955
State Offshore	398	26	16	25	6	20	24	72	7	65	467
Utah	4,235	135	805	606	17	37	269	4	5	288	4,579
Virginia	1,704	19	90	145	718	842	31	0	7	78	1,752
West Virginia	2,900	-225	315	279	29	32	96	0	26	158	2,678
Wyoming	16,158	306	1,860	1,488	1,845	2,026	2,574	44	49	1,286	18,398
Federal Offshore ^a	26,748	60	3,682	3,856	1,565	1,519	1,387	2,659	1,359	4,957	27,036
Pacific (California)	576	1	95	101	0	0	13	0	0	44	540
Gulf of Mexico (Louisiana) ^a	19,788	40	2,663	2,877	1,309	1,415	1,085	1,471	1,180	3,735	19,721
Gulf of Mexico (Texas)	6,384	19	924	878	256	104	289	1,188	179	1,178	6,775
Miscellaneous ^b	42	10	3	4	1	0	37	0	0	5	82
U.S. Total	177,427	2,742	18,358	20,676	11,380	14,010	16,380	3,578	2,800	19,779	183,460

^aIncludes Federal offshore Alabama.

^bIncludes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

Note: The production estimates in this table are based on data reported on Form EIA-23, "Annual Survey of Domestic Oil and Gas Reserves," and Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production." They may differ from the official Energy Information Administration production data for natural gas for 2000 contained in the *Natural Gas Annual 2001*, DOE/EIA-0131(01).

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

Figure 19. 2001 Dry Natural Gas Proved Reserves by Area

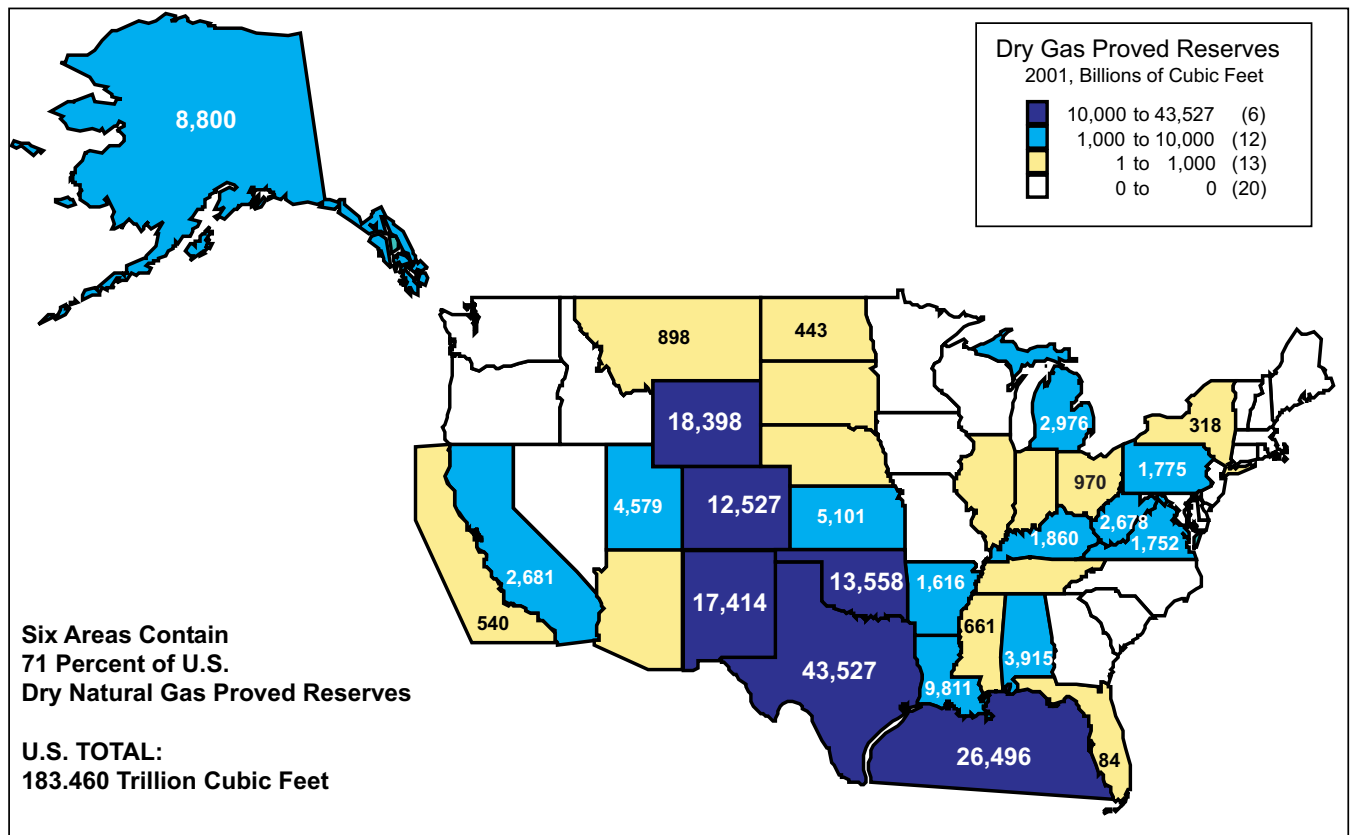
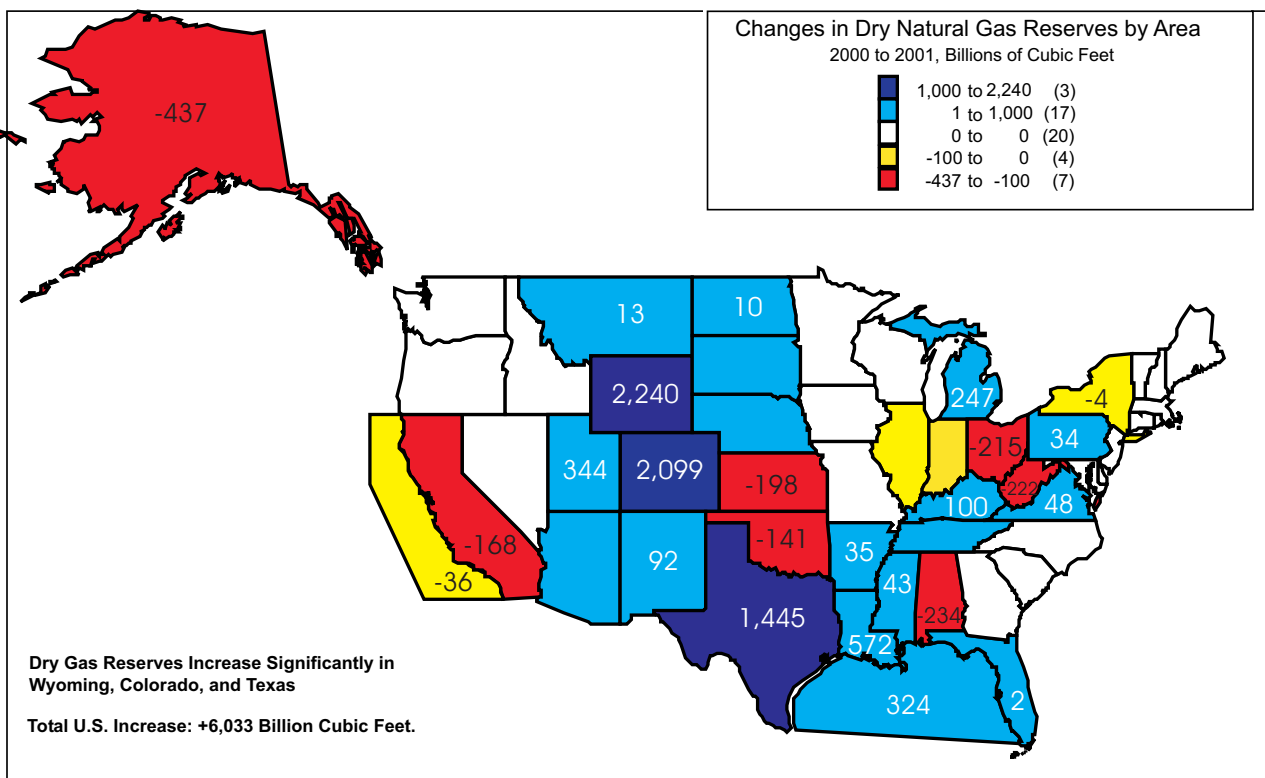


Figure 20. Changes in Dry Natural Gas Proved Reserves by Area, 2000 to 2001



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

New Mexico still reported higher production than did Wyoming.

Discussion of Reserves Changes

Figure 20 maps the change in dry gas proved reserves from 2000 to 2001 by area. Here's how the top six areas fared, compared to the total United States:

Area	Change in U.S. Gas Reserves (billion cubic feet)
Texas	+1,445
Gulf of Mexico Federal Offshore	+324
Wyoming	+2,240
New Mexico	+92
Oklahoma	-141
Colorado	+2,099
Area Total	+6,059
U.S. Total	+6,033

Figure 4 in Chapter 2 shows the components of change in dry natural gas proved reserves for 2001 and the preceding 10 years.

Discoveries

Total discoveries are those reserves attributable to field extensions, new field discoveries, and new reservoir discoveries in old fields; they result from drilling exploratory wells. *Total discoveries* of dry natural gas reserves were 22,758 billion cubic feet in 2001, a 19 percent increase from the level reported in 2000. About 27 percent of the *total discoveries* were in Texas, 24 percent were in the Gulf of Mexico Federal Offshore, 12 percent were in Wyoming, and 9 percent were in Colorado.

Extensions were 16,380 billion cubic feet, 11 percent more than 2000 and more than twice the prior 10-year average (7,802 billion cubic feet). Areas with the largest *extensions* and their percentage of total *extensions* were:

- Texas had 4,944 billion cubic feet of extensions (30 percent of the total)
- Wyoming had 2,574 billion cubic feet (16 percent)
- Colorado had 2,120 billion cubic feet (13 percent)
- Louisiana had 1,427 billion cubic feet (9 percent).

New field discoveries were 3,578 billion cubic feet in 2001—80 percent more than in 2000. The areas with the

largest *new field discoveries* were the Gulf of Mexico Federal Offshore (with 2,659 billion cubic feet of new field discoveries, 74 percent of the total), Texas (603 billion cubic feet, 17 percent), and Alaska (74 billion cubic feet, 2 percent). In the prior 10 years, U.S. operators reported an average of 1,471 billion cubic feet of reserves from *new field discoveries* per year. Reserves from *new field discoveries* in 2001 were more than twice that average.

New reservoir discoveries in old fields were 2,800 billion cubic feet, 18 percent higher than 2000. Among the areas with the largest *new reservoir discoveries in old fields* and their percentage of the total were:

- Gulf of Mexico Federal Offshore (1,359 billion cubic feet, 49 percent)
- Texas (580 billion cubic feet, 21 percent)
- Louisiana (566 billion cubic feet, 20 percent).

In the prior 10 years, U.S. operators reported an average of 2,334 billion cubic feet of reserves from *new reservoirs discovered in old fields* per year. Reserves from *new reservoirs discovered in old fields* in 2001 were 20 percent higher than that average.

Revisions and Adjustments

There were 18,358 billion cubic feet of *revision increases*, 20,676 billion cubic feet of *revision decreases*, and 2,742 billion cubic feet of *adjustments* in 2001. Combined, there were 424 billion cubic feet of net revisions and adjustments in 2001, excluding reserves additions from net sales and acquisitions. This is significantly less than the average volume of net revisions and adjustments of the prior 10 years (7,161 billion cubic feet).

Sales and Acquisitions

Sales represents that volume of dry natural gas proved reserves deducted from an operator's total through sale or transfer of operations of an existing gas field 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 by purchase or operations transfer of an existing gas field or properties.

In 2001, there were 11,380 billion cubic feet of sales transactions between operators, and 14,010 billion cubic feet of acquisitions. The net difference of 2,630 billion cubic feet was added to the National total of dry natural gas reserves in 2001.

Table 9. Natural Gas Proved Reserves, Reserves Changes, and Production, Wet After Lease Separation, 2001 (Billion Cubic Feet at 14.73 psia and 60° Fahrenheit)

State and Subdivision	Published Proved Reserves 12/31/00	Changes in Reserves During 2001									Proved Reserves 12/31/01
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)	New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	
Alaska	9,331	0	236	338	0	0	60	75	4	467	8,901
Lower 48 States	177,179	1849	18943	21279	11885	14,600	17,123	3,593	2,894	20,175	182,842
Alabama	4,269	-39	80	225	1	3	174	43	3	349	3,958
Arkansas	1,584	28	128	88	8	5	120	0	11	161	1,619
California	2,952	22	168	264	7	21	216	0	2	347	2,763
Coastal Region Onshore	244	3	15	64	0	0	0	0	0	13	185
Los Angeles Basin Onshore	204	3	18	28	1	0	8	0	0	9	195
San Joaquin Basin Onshore	2,413	16	129	166	6	21	206	0	2	317	2,298
State Offshore	91	0	6	6	0	0	2	0	0	8	85
Colorado	10,837	102	1,945	1,564	2,551	2,888	2,191	4	8	911	12,949
Florida	93	0	9	0	0	0	0	0	0	6	96
Kansas	5,682	50	299	235	277	355	50	3	1	468	5,460
Kentucky	1,837	175	365	417	52	51	44	0	24	77	1,950
Louisiana	9,512	278	1,040	1,737	511	913	1,451	29	582	1,517	10,040
North	3,344	43	302	528	59	191	1,004	1	23	394	3,927
South Onshore	5,447	230	668	1,123	381	540	377	18	525	960	5,341
State Offshore	721	5	70	86	71	182	70	10	34	163	772
Michigan	2,772	675	268	534	25	2	64	51	3	244	3,032
Mississippi	620	53	70	43	34	29	43	0	19	94	663
Montana	892	53	82	91	57	60	37	1	4	74	907
New Mexico	18,509	-29	1,712	1,343	341	332	1,310	23	35	1,649	18,559
East	3,998	92	523	610	224	141	534	22	19	576	3,919
West	14,511	-121	1,189	733	117	191	776	1	16	1,073	14,640
New York	322	-18	29	51	1	0	47	1	17	28	^a 318
North Dakota	487	15	54	36	9	6	3	0	21	46	495
Ohio	1,186	31	129	287	87	62	9	0	12	84	971
Oklahoma	14,543	181	1,545	2,008	509	711	1,404	14	55	1,570	14,366
Pennsylvania	1,740	9	202	220	11	32	109	34	1	114	1,782
Texas	45,419	274	3,833	5,550	3,086	4,520	5,268	632	612	5,460	46,462
RRC District 1	1,106	-9	91	126	31	47	88	8	1	109	1,066
RRC District 2 Onshore	2,045	-237	151	254	96	279	181	15	112	333	1,863
RRC District 3 Onshore	4,042	65	441	521	589	669	432	90	89	775	3,943
RRC District 4 Onshore	10,118	138	841	1,258	700	740	1,335	312	268	1,449	10,345
RRC District 5	3,217	9	404	659	23	834	789	52	5	339	4,289
RRC District 6	6,365	74	428	440	930	1,164	423	5	16	676	6,429
RRC District 7B	356	-5	24	49	17	12	28	0	0	59	290
RRC District 7C	4,132	30	322	893	481	509	467	0	27	356	3,757
RRC District 8	6,136	87	493	650	127	134	389	77	77	609	6,007
RRC District 8A	1,215	-1	89	99	15	14	68	0	1	82	1,190
RRC District 9	1,854	46	122	141	21	17	880	0	1	206	2,552
RRC District 10	4,433	52	411	435	50	81	164	1	8	402	4,263
State Offshore	400	25	16	25	6	20	24	72	7	65	468
Utah	4,472	66	835	629	18	38	279	4	5	299	4,753
Virginia	1,704	19	90	145	718	842	31	0	7	78	1,752
West Virginia	3,062	-239	333	295	30	33	101	0	27	167	2,825
Wyoming	17,211	151	1,961	1,569	1,946	2,136	2,714	46	51	1,356	19,399
Federal Offshore ^b	27,467	-54	3,763	3,944	1,605	1,561	1,421	2,708	1,394	5,071	27,640
Pacific (California)	576	1	95	101	0	0	13	0	0	44	540
Gulf of Mexico (Louisiana) ^b	20,466	-66	2,739	2,960	1,347	1,456	1,117	1,514	1,214	3,843	20,290
Gulf of Mexico (Texas)	6,425	11	929	883	258	105	291	1,194	180	1,184	6,810
Miscellaneous ^c	42	11	3	4	1	0	37	0	0	5	83
U.S. Total	186,510	1,849	19,179	21,617	11,885	14,600	17,183	3,668	2,898	20,642	191,743

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

^bIncludes Federal offshore Alabama.

^cIncludes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

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 natural gas for 2001 contained in the *Natural Gas Annual 2001*, DOE/EIA-0131(01).

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

Table 10. Nonassociated Natural Gas Proved Reserves, Reserves Changes, and Production, Wet After Lease Separation, 2001 (Billion Cubic Feet at 14.73 psia and 60° Fahrenheit)

State and Subdivision	Published Proved Reserves 12/31/00	Changes in Reserves During 2001									Proved Reserves 12/31/01
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)	New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	
Alaska	2,564	-1	65	206	0	0	40	56	4	213	2,309
Lower 48 States	154,113	1,356	15,852	18,179	10,733	13,756	15,947	2,322	2,416	17,238	159,612
Alabama	4,241	-35	77	224	1	2	173	43	0	345	3,931
Arkansas	1,545	28	127	87	3	5	120	0	11	157	1,589
California	754	9	80	43	5	16	123	0	2	94	842
Coastal Region Onshore	0	0	0	0	0	0	0	0	0	0	0
Los Angeles Basin Onshore	1	0	0	0	0	0	0	0	0	0	1
San Joaquin Basin Onshore	748	9	78	42	5	16	123	0	2	93	836
State Offshore	5	0	2	1	0	0	0	0	0	1	5
Colorado	9,877	65	1,882	1,530	2,524	2,865	2,113	4	6	834	11,924
Florida	0	0	0	0	0	0	0	0	0	0	0
Kansas	5,641	33	290	231	274	304	48	3	1	460	5,355
Kentucky	1,810	176	365	416	52	51	44	0	24	77	1,925
Louisiana	8,704	238	914	1,582	423	782	1,402	26	563	1,379	9,245
North	3,158	39	273	484	23	134	1,002	0	23	363	3,759
South Onshore	4,954	197	586	1,021	339	484	345	18	511	876	4,859
State Offshore	592	2	55	77	61	164	55	8	29	140	627
Michigan	2,558	687	246	493	23	2	61	50	3	218	2,873
Mississippi	585	55	66	36	31	28	41	0	19	90	637
Montana	822	48	70	82	52	56	22	1	4	67	822
New Mexico	16,922	-65	1,492	1,071	301	292	1,207	21	30	1,415	17,112
East	2,526	46	311	349	185	103	435	20	16	352	2,571
West	14,396	-111	1,181	722	116	189	772	1	14	1,063	14,541
New York	320	-19	25	51	1	0	47	1	17	28	311
North Dakota	223	5	4	8	1	0	1	0	16	15	225
Ohio	717	-51	102	145	12	62	2	0	4	48	631
Oklahoma	13,430	-31	1,417	1,743	423	689	1,271	14	52	1,420	13,256
Pennsylvania	1,583	7	184	212	10	32	100	34	1	105	1,614
Texas	38,585	255	3,276	4,625	2,634	4,134	4,940	627	594	4,776	40,376
RRC District 1	1,037	-7	84	120	8	44	88	8	1	103	1,024
RRC District 2 Onshore	1,930	-209	138	230	81	275	161	15	110	311	1,798
RRC District 3 Onshore	3,404	50	358	420	410	504	392	89	83	639	3,411
RRC District 4 Onshore	9,942	137	830	1,227	692	735	1,330	312	266	1,427	10,206
RRC District 5	3,089	8	398	604	22	828	781	52	5	329	4,206
RRC District 6	5,901	58	408	423	890	1,152	422	5	16	633	6,016
RRC District 7B	242	1	17	37	13	10	27	0	0	44	203
RRC District 7C	3,439	76	260	791	448	441	406	0	26	286	3,123
RRC District 8	3,345	26	277	303	22	37	275	73	72	375	3,405
RRC District 8A	69	17	12	8	2	2	2	0	0	10	82
RRC District 9	1,645	43	104	58	15	15	879	0	1	186	2,428
RRC District 10	4,143	30	374	379	25	71	153	1	8	368	4,008
State Offshore	399	25	16	25	6	20	24	72	6	65	466
Utah	4,125	58	790	554	1	20	279	4	5	276	4,450
Virginia	1,704	19	90	145	718	842	31	0	7	78	1,752
West Virginia	2,929	-218	330	255	6	33	101	0	27	164	2,777
Wyoming	16,559	131	1,872	1,386	1,919	2,120	2,713	46	50	1,275	18,911
Federal Offshore ^a	20,456	-46	2,150	3,258	1,319	1,421	1,071	1,448	980	3,913	18,990
Pacific (California)	76	0	0	22	0	0	0	0	0	4	50
Gulf of Mexico (Louisiana) ^a	15,350	-58	1,473	2,423	1,190	1,319	783	401	809	2,928	13,536
Gulf of Mexico (Texas)	5,030	12	677	813	129	102	288	1,047	171	981	5,404
Miscellaneous ^b	23	7	3	2	0	0	37	0	0	4	64
U.S. Total	156,677	1,355	15,917	18,385	10,733	13,756	15,987	2,378	2,420	17,451	161,921

^aIncludes Federal offshore Alabama.

^bIncludes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

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 natural gas for 2001 contained in the *Natural Gas Annual 2001*, DOE/EIA-0131(01).

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

Table 11. Associated-Dissolved Natural Gas Proved Reserves, Reserves Changes, and Production, 2001
(Billion Cubic Feet at 14.73 psia and 60° Fahrenheit)

State and Subdivision	Published Proved Reserves 12/31/00	Changes in Reserves During 2001									Proved Reserves 12/31/01
		Adjustments (+,-)	Revision Increases (+)	Revision Decreases (-)	Sales (-)	Acquisitions (+)	Extensions (+)	New Field Discoveries (+)	New Reservoir Discoveries in Old Fields (+)	Estimated Production (-)	
Alaska	6,768	0	171	133	0	0	20	19	0	253	6,592
Lower 48 States	23,065	499	3,088	3,099	1,145	845	1,174	1,268	477	2,940	23,232
Alabama	29	-4	3	1	1	1	1	0	2	4	26
Arkansas	39	-1	1	1	5	0	0	0	0	3	30
California	2,198	16	87	222	2	5	93	0	0	253	1,922
Coastal Region Onshore	244	3	15	64	0	0	0	0	0	13	185
Los Angeles Basin Onshore	203	3	18	28	1	0	8	0	0	9	194
San Joaquin Basin Onshore	1,665	9	50	124	1	5	83	0	0	224	1,463
State Offshore	86	1	4	6	0	0	2	0	0	7	80
Colorado	960	37	63	34	27	24	78	0	1	77	1,025
Florida	93	0	9	0	0	0	0	0	0	6	96
Kansas	40	19	9	4	3	51	2	0	0	9	105
Kentucky	27	-2	0	0	0	0	0	0	0	0	25
Louisiana	807	43	126	155	88	131	49	2	19	138	796
North	186	4	29	44	36	57	2	1	0	31	168
South Onshore	492	35	82	102	42	56	32	0	14	84	483
State Offshore	129	4	15	9	10	18	15	1	5	23	145
Michigan	214	-12	22	41	2	0	3	1	0	26	159
Mississippi	35	-3	4	7	3	2	2	0	0	4	26
Montana	70	4	12	9	5	4	15	0	1	7	85
New Mexico	1,588	35	220	272	39	39	103	2	5	234	1,447
East	1,473	46	212	261	39	37	99	2	3	224	1,348
West	115	-11	8	11	0	2	4	0	2	10	99
New York	2	2	4	0	0	0	0	0	0	1	7
North Dakota	264	10	49	28	7	6	2	0	5	31	270
Ohio	469	83	27	143	75	0	7	0	8	36	340
Oklahoma	1,113	211	128	265	86	22	133	0	3	150	1,109
Pennsylvania	157	3	18	8	1	0	8	0	0	9	168
Texas	6,833	21	556	924	448	386	328	4	18	685	6,089
RRC District 1	69	1	7	6	23	2	0	0	0	7	43
RRC District 2 Onshore	115	-26	13	24	16	4	20	0	1	22	65
RRC District 3 Onshore	638	16	83	101	178	165	39	1	6	136	533
RRC District 4 Onshore	176	2	11	31	8	5	5	0	2	22	140
RRC District 5	128	0	6	55	0	6	8	0	0	10	83
RRC District 6	464	13	20	16	39	12	1	0	0	43	412
RRC District 7B	114	-4	6	12	4	2	1	0	0	15	88
RRC District 7C	693	-45	62	102	33	67	61	0	1	70	634
RRC District 8	2,791	62	216	347	105	97	114	3	5	234	2,602
RRC District 8A	1,146	-21	77	91	12	13	67	0	1	72	1,108
RRC District 9	209	1	18	83	5	2	2	0	0	20	124
RRC District 10	289	22	37	56	25	11	10	0	1	34	255
State Offshore	1	0	0	0	0	0	0	0	1	0	2
Utah	348	6	46	75	17	18	0	0	0	23	303
Virginia	0	0	0	0	0	0	0	0	0	0	0
West Virginia	98	14	2	39	24	0	0	0	0	3	48
Wyoming	652	20	89	183	27	16	1	0	1	81	488
Federal Offshore ^a	7,010	-7	1,613	686	285	140	349	1,259	414	1,158	8,649
Pacific (California)	500	1	95	79	0	0	13	0	0	40	490
Gulf of Mexico (Louisiana) ^a	5,115	-7	1,266	537	156	137	333	1,112	405	915	6,753
Gulf of Mexico (Texas)	1,395	-1	252	70	129	3	3	147	9	203	1,406
Miscellaneous ^b	19	4	0	2	0	0	0	0	0	2	19
U.S. Total	29,833	499	3,259	3,232	1,145	845	1,194	1,287	477	3,193	29,824

^aIncludes Federal offshore Alabama.

^bIncludes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

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 natural gas for 2001 contained in the *Natural Gas Annual 2001*, DOE/EIA-0131(01).

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

Production

The estimated 2001 U.S. dry natural gas production was 19,779 billion cubic feet, an increase of almost 3 percent from 2000 (**Table 8**). Areas with the largest production and their percentage of total *production* were:

- Texas produced 5,138 billion cubic feet (BCF) of dry natural gas (26 percent of the total)
- Gulf of Mexico Federal Offshore produced 4,913 BCF (25 percent)
- New Mexico produced 1,536 BCF (8 percent)
- Oklahoma produced 1,481 BCF (7 percent)
- Louisiana produced 1,479 BCF (7 percent)
- Wyoming produced 1,286 BCF (7 percent).

Wet Natural Gas

U. S. proved reserves of wet natural gas as of December 31, 2001 were 191,743 billion cubic feet, a 3 percent increase from the volume reported in 2000 (**Table 9**). At year-end 2001, proved wet natural gas reserves for the lower 48 States had increased by 3 percent compared to 2000, while those of Alaska had decreased by 5 percent.

The volumetric differences between the estimates reported in **Table 8** (dry) and **Table 9** (wet) result from the removal of natural gas liquids at natural gas processing plants. A discussion of the methodology used to generate wet and dry natural gas reserves tables in this report appears in Appendix F.

Nonassociated Natural Gas

Proved Reserves

Proved reserves of nonassociated (NA) natural gas, wet after lease separation, in the United States increased by 3 percent (5,244 billion cubic feet) in 2001 to 161,921 billion cubic feet (**Table 10**). The lower 48 States' NA wet natural gas proved reserves increased 4 percent to a level of 159,612 billion cubic feet, while Alaska had a 10 percent decline to a level of 2,309 billion cubic feet. Those States with the largest increases in NA wet natural gas reserves were Wyoming, Colorado, Texas, and Louisiana.

Discoveries

NA wet natural gas *total discoveries* of 20,785 billion cubic feet in 2001 increased 24 percent compared to 2000's total of 16,741 billion cubic feet. Areas with the most *total discoveries* in 2001 were Texas (6,161 billion cubic feet), the Gulf of Mexico Federal Offshore (3,499 billion cubic feet), Wyoming (2,809 billion cubic feet), and Colorado (2,123 billion cubic feet).

Production

U.S. production of NA wet natural gas increased 3 percent from an estimated 16,863 billion cubic feet in 2000 to 17,451 billion cubic feet in 2001. The five leading producing areas were: Texas (27 percent), the Gulf of Mexico Federal Offshore (22 percent), Oklahoma (8 percent), New Mexico (8 percent), and Louisiana (8 percent).

Associated-Dissolved Natural Gas

Proved Reserves

Proved reserves of associated-dissolved (AD) natural gas, wet after lease separation, in the United States declined very slightly (-9 billion cubic feet) to 29,824 billion cubic feet in 2001 (**Table 11**). Proved reserves of AD wet natural gas in the lower 48 States increased less than 1 percent (+167 billion cubic feet) to 23,232 billion cubic feet, and in Alaska declined 3 percent (-176 billion cubic feet) to 6,592 billion cubic feet in 2001. The areas of the country with the largest AD wet natural gas reserves and their percentage of the total were:

- Gulf of Mexico Federal Offshore (27 percent)
- Alaska (22 percent)
- Texas (20 percent)
- California (6 percent)
- New Mexico (5 percent).

These areas logically correspond to the areas of the country with the largest volumes of crude oil reserves.

Production

U.S. production of AD wet natural gas decreased slightly from an estimated 3,299 billion cubic feet in 2000 to 3,193 billion cubic feet in 2001 (**Table 11**). Production of AD wet natural gas in the lower 48 States decreased from 2,987 billion cubic feet to 2,940 billion

Table 12. Coalbed Methane Proved Reserves and Production for 1989–2001
(Billion Cubic Feet at 14.73 psia and 60° Fahrenheit)

Year	Alabama	Colorado	New Mexico	Utah	Wyoming	Eastern States ^a	Western States ^b	Others ^c	United States
Reserves									
1989	537	1,117	2,022	NA	NA	NA	NA	0	3,676
1990	1,224	1,320	2,510	NA	NA	NA	NA	33	5,087
1991	1,714	2,076	4,206	NA	NA	NA	NA	167	8,163
1992	1,968	2,716	4,724	NA	NA	NA	NA	626	10,034
1993	1,237	3,107	4,775	NA	NA	NA	NA	1,065	10,184
1994	976	2,913	4,137	NA	NA	NA	NA	1,686	9,712
1995	972	3,461	4,299	NA	NA	NA	NA	1,767	10,499
1996	823	3,711	4,180	NA	NA	NA	NA	1,852	10,566
1997	1,077	3,890	4,351	NA	NA	NA	NA	2,144	11,462
1998	1,029	4,211	4,232	NA	NA	NA	NA	2,707	12,179
1999	1,060	4,826	4,080	NA	NA	NA	NA	3,263	13,229
2000	1,241	5,617	4,278	1,592	1,540	1,399	41	--	15,708
2001	1,162	6,252	4,324	1,685	2,297	1,453	358	--	17,531
Production									
1989	23	12	56	NA	NA	NA	NA	0	91
1990	36	26	133	NA	NA	NA	NA	1	196
1991	68	48	229	NA	NA	NA	NA	3	348
1992	89	82	358	NA	NA	NA	NA	10	539
1993	103	125	486	NA	NA	NA	NA	18	752
1994	108	179	530	NA	NA	NA	NA	34	851
1995	109	226	574	NA	NA	NA	NA	47	956
1996	98	274	575	NA	NA	NA	NA	56	1,003
1997	111	312	597	NA	NA	NA	NA	70	1,090
1998	123	401	571	NA	NA	NA	NA	99	1,194
1999	108	432	582	NA	NA	NA	NA	130	1,252
2000	109	451	550	74	133	58	4	NA	1,379
2001	111	490	517	83	278	69	14	NA	1,562

^aIncludes Pennsylvania, Virginia, and West Virginia.

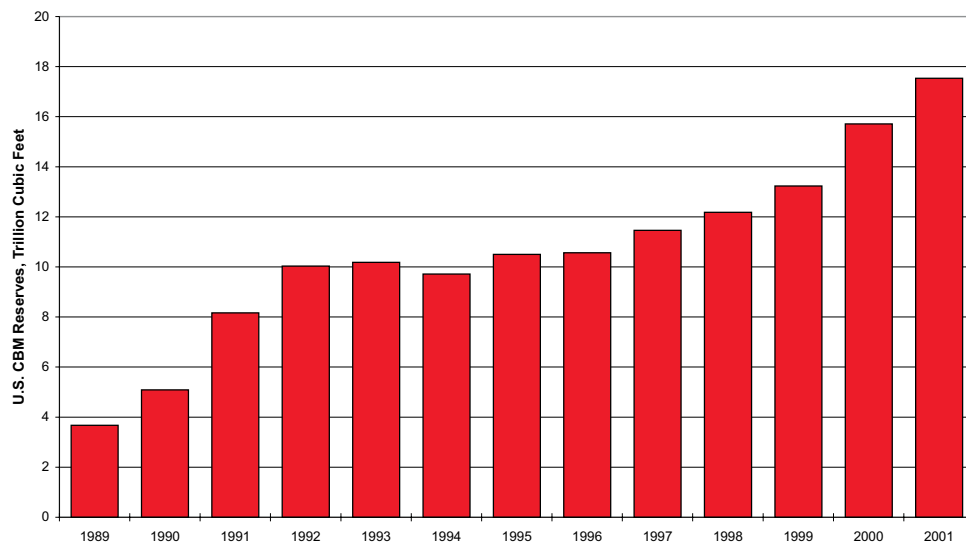
^bIncludes Kansas, Montana, and Oklahoma.

^cIncludes Oklahoma, Pennsylvania, Utah, Virginia, West Virginia, and Wyoming; these states are individually listed or grouped in Eastern States and Western States after 1999.

NA = Not available.

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

Figure 21. Coalbed Methane Proved Reserves 1989-2001



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

cubic feet in 2001, a decline of 2 percent. The areas of the country with the largest AD wet natural gas production and their percentage of the total were:

- Gulf of Mexico Federal Offshore (35 percent)
- Texas (21 percent)
- Alaska (8 percent)
- California (8 percent)
- New Mexico (7 percent).

Again, these areas logically correspond to the areas of the country with the largest volumes of crude oil production.

Coalbed Methane

Proved Reserves

In 2001, proved reserves of coalbed methane increased to 17,531 billion cubic feet, a 12 percent increase from 2000's level (15,708 billion cubic feet). Coalbed methane accounted for 9.6 percent of all 2001 dry natural gas reserves (**Table 12**). EIA estimates that the 2001 proved gas reserves of fields identified as having coalbed methane are now more than quadruple the volume reported in 1989 (**Figure 21**). Five States (Colorado, New Mexico, Wyoming, Utah, and Alabama) currently have the majority (90 percent) of U.S. Coalbed methane proved reserves. Estimates of proved coalbed methane reserves increased 11 percent in Colorado, 1 percent in New Mexico, 49 percent in Wyoming, 6 percent in Utah, and declined 6 percent in Alabama in 2001.

Production

U.S. coalbed methane production grew by 13 percent in 2001 to 1,562 billion cubic feet. It accounted for about 8 percent of U.S. dry gas production.

Areas of Note: Large Discoveries and Reserves Additions

The following State or area discussions summarize notable activities during the year concerning expected new field reserves, development plans, and possible

production rates as extracted from various trade publications and company reports. The citations do not necessarily reflect EIA's concurrence, but are considered important enough to be brought to the reader's attention.

Wyoming

Wyoming's dry natural gas reserves increased by 2,240 billion cubic feet in 2001, the largest increase of any State. This was the result of development in the Pinedale and Madden Fields, and in coalbed methane fields located in the Powder River Basin.

- **Powder River Basin:** This basin is located in northeastern Wyoming and southeastern Montana. The U.S. Geologic Survey (USGS) has increased its estimate of the basin's technically recoverable CBM resources to 14.26 TCF, up from 1.11 TCF in 1995. The coal beds are near the surface and are up to 300 feet thick. These factors tend to make the wells inexpensive to drill and operate yet highly productive relative to other CBM wells. Given these fundamentals, the basin has seen a boom as producers have increased their understanding of the techniques needed to produce the gas. The number of producing wells increased from 515 in July 1998 to 6,469 in July 2001, the latest month for which statistics were available. Output in July 2001 in the Wyoming portion of the basin reached 784 million cubic feet per day. This was an almost 40 percent increase over July 2000 and a 190 percent increase over July 1999. Production would have been even higher if it were not for the fact that over 2,200 wells were shut in, dewatering, or awaiting dewatering permits. As of July 2001 the basin had less than 15 percent of the 50,000 wells that are believed necessary to fully tap the resource. Based on the productivity of the wells drilled to date this would mean that the basin could produce over 5 billion cubic feet per day, more than the proposed capacity of the pipeline that would bring gas from Prudhoe Bay to the Lower 48 States. A current impediment to attaining the full potential of the basin is a delay in the completion of the Powder River Basin Coalbed Methane Environmental Impact Statement (EIS). It is not clear that even the release of the EIS would minimize all of the

current limitations on drilling in the basin. For example, the U.S. Environmental Protection Agency has received complaints of groundwater well contamination that are alleged to be the result of the hydraulic fracturing needed to enhance release of the methane from the coal.^{41}

Colorado

Colorado had a net increase of 2,099 billion cubic feet of dry natural gas proved reserves in 2001. This was the result of development of the Wattenberg Field and coalbed methane fields and gas fields within the San Juan, Piceance, and Raton Basins.

Texas

Texas had a net increase of 1,445 billion cubic feet of dry natural gas proved reserves in 2001. Development of gas fields in the Barnett Shale and the Lobo Trend boosted reserves additions for this State. Texas could have had the largest increase in dry gas proved reserves in 2001, but a decrease in its associated dissolved gas reserves volume offset reserves additions of nonassociated gas.

Areas of Note: Large Reserves Declines

The following areas had large declines in dry natural gas proved reserves due to downward revisions or unreplaced production.

Alaska

Alaska's proved dry natural gas reserves decreased by 5 percent (437 billion cubic feet) in 2001. Production

decreased from 506 billion cubic feet in 2000 to 461 billion cubic feet in 2001.

Alabama

Alabama's proved dry natural gas reserves decreased by 6 percent (234 billion cubic feet) in 2001. Production in Alabama decreased 4 percent in 2001.

West Virginia

West Virginia's proved dry natural gas reserves decreased by 8 percent (222 billion cubic feet) in 2001. Production in West Virginia decreased 10 percent in 2001.

Reserves in Nonproducing Reservoirs

Nonproducing proved natural gas reserves (wet after lease separation) of 52,948 billion cubic feet were reported in 2001, 24 percent more than the 42,834 billion cubic feet reported in 2000 (**Appendix D, Table D10**). About 26 percent of the reserves in nonproducing reservoirs are located in the Gulf of Mexico Federal Offshore area. Much of the new deepwater reserves are in the nonproducing category. Wells or reservoirs are nonproducing due to any of several operational reasons. These include:

- waiting for well workovers
- waiting for additional development or replacement wells to be drilled
- production or pipeline facilities not yet installed
- awaiting depletion of other zones or reservoirs before recompletion in reservoirs not currently open to production (called "behind pipe" reserves).

