OCS Report
MMS 2004-065

Gulf of Mexico Oil and Gas Production Forecast: 2004-2013

MMS U. S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

ERRATA

This report went to press before Hurricane Ivan passed through the Gulf of Mexico, causing significant damage to several facilities and pipelines. The 2004 production estimates, therefore, should be reduced by at least 27 million barrels of oil and 110 billion cubic ft of gas (cumulative shut-in production as of November 1, 2004). For example, Table 2 shows the forecast total oil production in 2004 is 1,562,000 barrels of oil per day, which equates to an estimated 570 million barrels of oil produced in 2004. As of November 1, 2004, however, this estimate should be reduced to 543 million barrels of oil.

Cover: The Na Kika semisubmersible gathers production from six subsea projects in the deepwater Gulf of Mexico. Na Kika was installed by Shell and operated by BP (photo courtesy of BP).

MMS Report
MMS 2004-065

Gulf of Mexico

Oil and Gas Production Forecast:

2004 – 2013

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Table of Abbreviations

BCFPD	billion cubic ft per day
GOM	Gulf of Mexico
MMBOE	million barrels of oil equivalent
MMBOPD	million barrels of oil per day
MMS	Minerals Management Service
OCS	Outer Continental Shelf
TVD	true vertical depth

Introduction

This report provides a daily oil and gas production rate forecast for the Gulf of Mexico (GOM) Outer Continental Shelf (OCS) for the years 2004 through 2013. The forecast shows average daily oil and gas production estimates for each calendar year.

In this report, daily oil production rates include both oil and condensate production, and daily gas production rates include both associated and non-associated gas production. A "deepwater" project is defined as one with a production facility located in a water depth equal to or greater than 1,000 ft (305 m). Note that the water depth of a subsea project, or that of an undeveloped project, refers to the deepest water depth of a well within that project.

The methodology of this report differs from that of previous editions (e.g., Melancon et al., 2003), which were based primarily on surveys of deepwater operators. The older reports are comparable to the second section of this report. Sections III and IV have been added to extend the forecast further into the future, to capture the potential of recently announced discoveries that have not yet been sanctioned, and to include the potential from undiscovered projects that may come online within the forecast period.

This report refers to various deepwater development "projects." In most cases, the project names and their lateral extents are defined by operators. Hydrocarbon accumulations that are developed via a common surface facility or a common subsea system are typically considered to be a single project. Note that previous editions of this report (e.g., Melancon et al., 2003) referred to deepwater development "fields" instead of "projects." Field names are assigned by the Minerals Management Service (MMS) to a lease or a group of leases so that natural gas and oil resources, reserves, and production can be allocated on the basis of the unique geologic feature that contains the hydrocarbon accumulation.

This report is divided into four sections. The first section presents historical production trends. The second section outlines our 5-year forecast, which is based primarily on a survey of deepwater operators. The third section extends this forecast out to 10 years on the basis of additional, industry-announced discoveries not reported to MMS in the operator survey. The fourth section adds potential production from "yet to find" deepwater projects, on the basis of analyses of historical discovery and production trends in the GOM.

Section I - Historical Production

The divisions used throughout this report are illustrated in Figure 1. Projects in less than 1,000 ft (305 m) water depths are considered to be shallow-water projects and those in greater than 1,000 ft (305 m) are considered to be deepwater projects. For gas production, the shallow water is further subdivided according to the true vertical depth (TVD) of the producing zones and the water depth. The "shallow-water deep" zone refers to gas production from well completions that are at or below 15,000 ft (4,572 m) TVD subsea and in water depths less than 656 ft (200 meters). All other shallow-water completions are referred to as part of the "shallow-water shallow" zone.

Figures 2a-c and 3a-c show historic daily production rates for the shallow- and deepwater GOM from 1990 through 2003. The portion of shallow-water gas production that came from well completions deeper than 15,000 ft (4,572 m) TVD and water depths less than 656 ft (200 m) is also shown. This shallow-water deep-gas trend is the subject of recent royalty incentives and increased activity.

The 2003 production volumes have been estimated using the data available at the time of this writing (mid 2004). The certainty of our forecast beyond 2003 is based, in part, on the accuracy of this 2003 estimate.

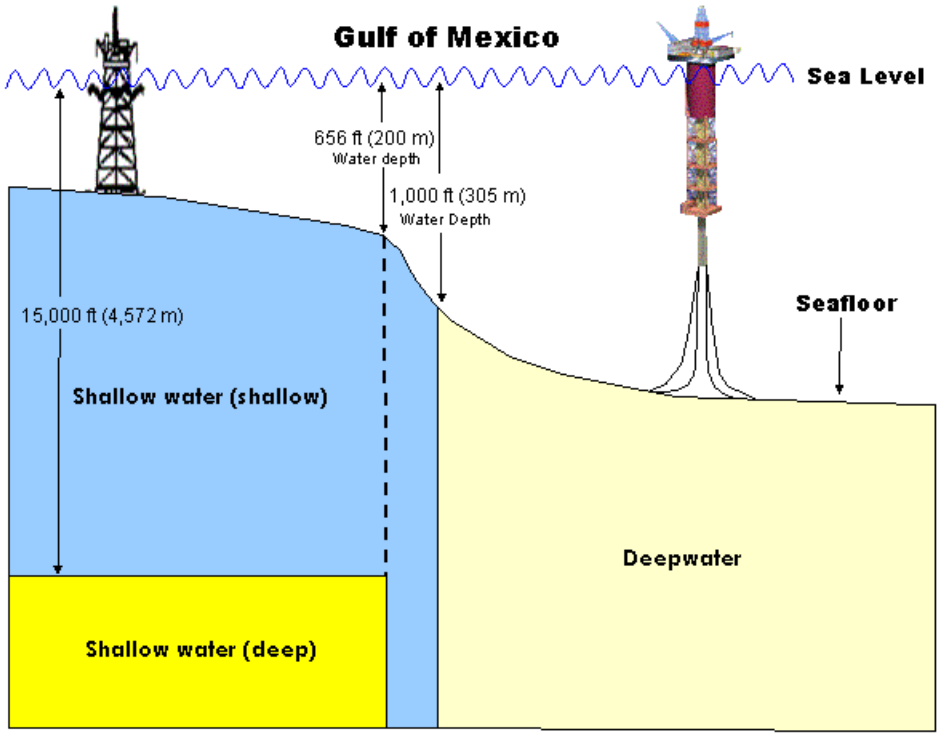
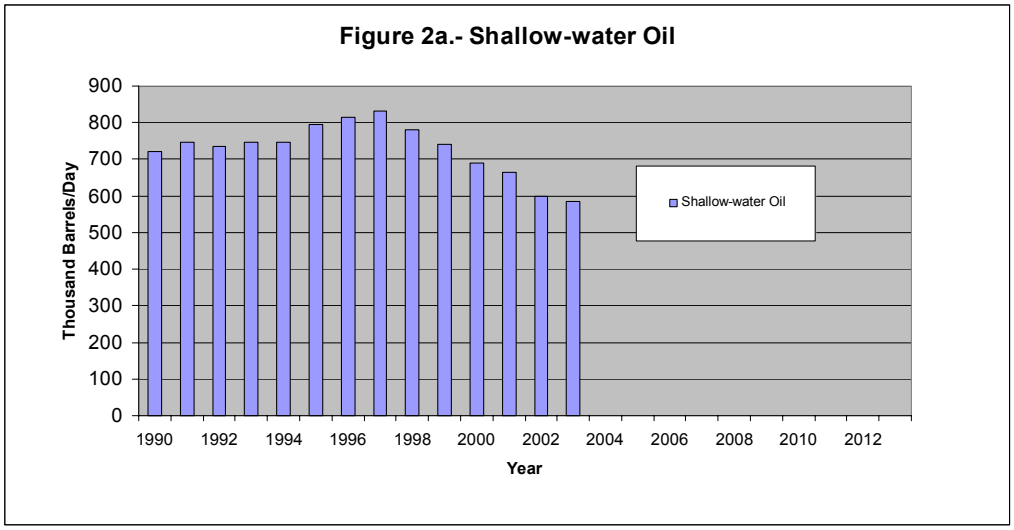
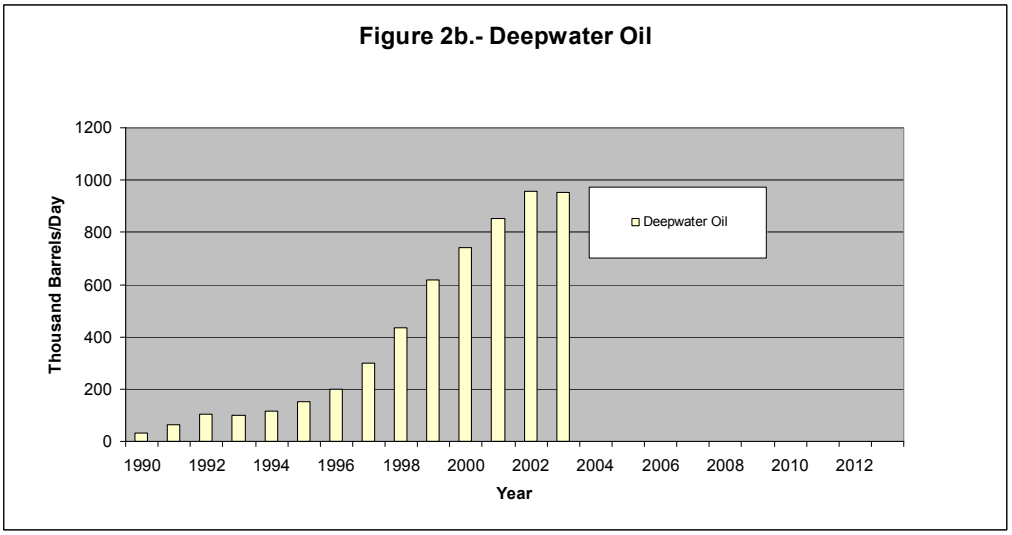


Figure 1. Water-depth and completion-depth divisions.

Section II – Short-term Forecast

Most of the Gulf's oil production and a significant portion of the Gulf's gas production come from the deepwater area. Deepwater GOM operators were surveyed in order to facilitate our short-term production forecast. Operators were asked to provide actual 2003 production volumes and the projected rates for all deepwater projects online or planned to come online before yearend 2008. The names and startup years of the publicly releasable projects are shown in Table 1.





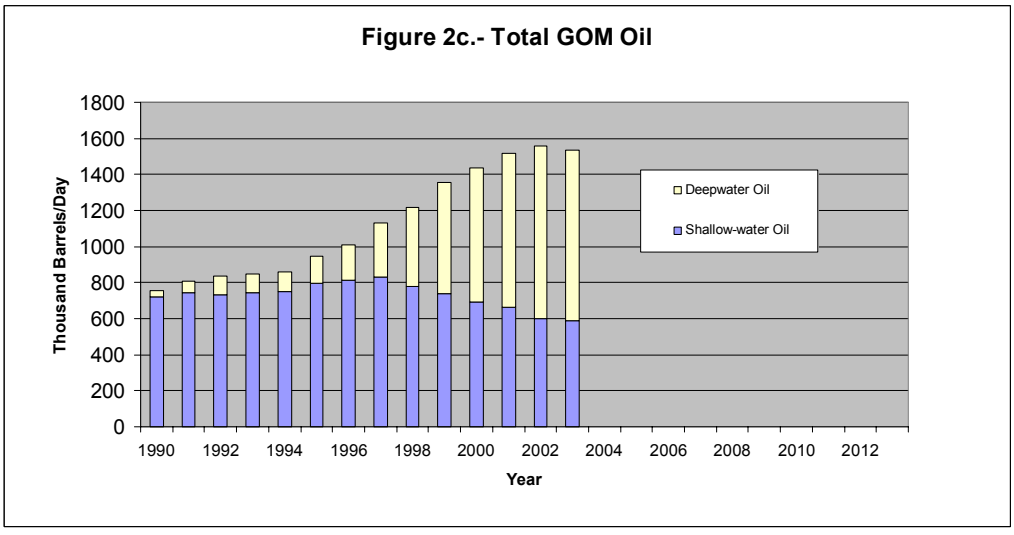
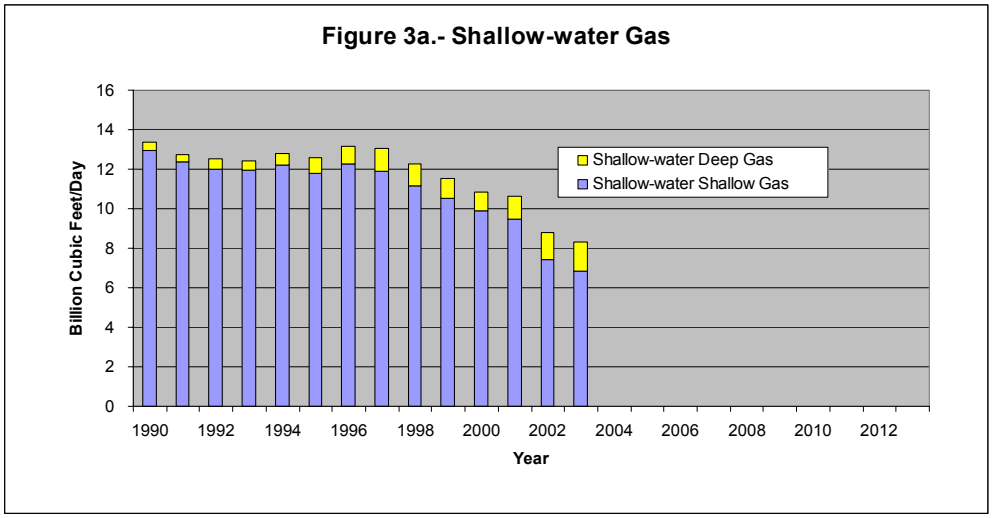
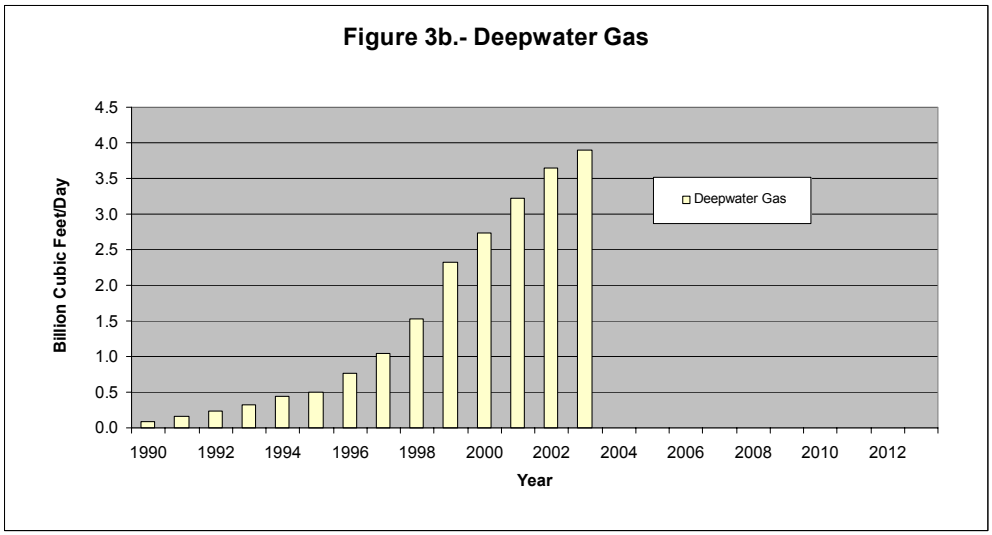


Figure 2. – Historic oil production rates.





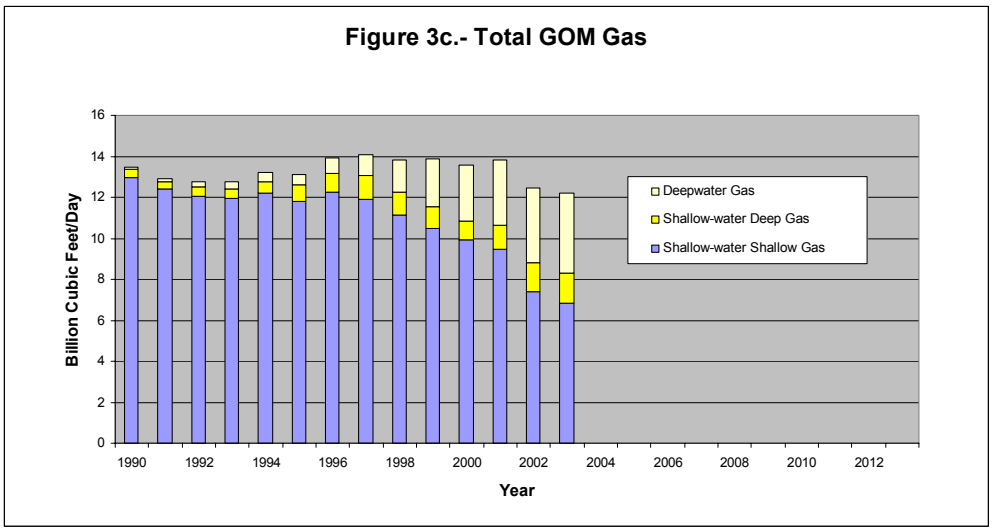


Figure 3. – Historic gas production rates.

Table 1 - Development Systems of Productive Deepwater GOM Projects

Year of First Production	Project Name[2]	Operator	Block	Water Depth (ft)	System Type	DWRR[3]
1979	Cognac	Shell	MC 194	1,023	Fixed Platform	
1984	Lena	ExxonMobil	MC 280	1,000	Compliant Tower	
1988[1]	GC 29	Placid	GC 29	1,554	Semisubmersible/ Subsea	
1988[1]	GC 31	Placid	GC 31	2,243	Subsea	
1989	Bullwinkle	Shell	GC 65	1,353	Fixed Platform	
1989	Jolliet	ConocoPhillips	GC 184	1,760	TLP	
1991	Amberjack	BP	MC 109	1,100	Fixed Platform	
1992	Alabaster	ExxonMobil	MC 485	1,438	Subsea	
1993[1]	Diamond	Kerr McGee	MC 445	2,095	Subsea	
1993	Zinc	ExxonMobil	MC 354	1,478	Subsea	
1994	Auger	Shell	GB 426	2,860	TLP	
1994	Pompano/ Pompano II	BP	VK 989	1,290	Fixed Platform/ Subsea	
1994	Tahoe/SE Tahoe	Shell	VK 783	1,500	Subsea	
1995[1]	Cooper	Newfield	GB 388	2,600	Semisubmersible	
1995	Shasta	ChevronTexaco	GC 136	1,048	Subsea	
1995	VK 862	Walter	VK 862	1,043	Subsea	
1996	Mars	Shell	MC 807	2,933	TLP/Subsea	
1996	Popeye	Shell	GC 116	2,000	Subsea	
1996	Rocky	Shell	GC 110	1,785	Subsea	
1997	Mensa	Shell	MC 731	5,318	Subsea	
1997	Neptune	Kerr McGee	VK 826	1,930	Spar/Subsea	
1997	Ram-Powell	Shell	VK 956	3,216	TLP	
1997	Troika	BP	GC 200	2,721	Subsea	
1998	Arnold	Marathon	EW 963	1,800	Subsea	
1998	Baldpate	Amerada Hess	GB 260	1,648	Compliant Tower	
1998	Morpeth	Eni	EW 921	1,696	TLP/Subsea	
1998	Oyster	Marathon	EW 917	1,195	Subsea	
1999	Allegheny	Eni	GC 254	3,294	TLP	
1999	Angus	Shell	GC 113	2,045	Subsea	
1999	Dulcimer	Mariner	GB 367	1,120	Subsea	Yes
1999	EW 1006	Walter	EW 1006	1,884	Subsea	
1999	Gemini	ChevronTexaco	MC 292	3,393	Subsea	
1999	Genesis	ChevronTexaco	GC 205	2,590	Spar	
1999	Macaroni	Shell	GB 602	3,600	Subsea	
1999	Penn State	Amerada Hess	GB 216	1,450	Subsea	
1999	Pluto	Mariner	MC 674	2,828	Subsea	Yes

Table 1 - Development Systems of Productive Deepwater GOM Projects - *continued*

Year of First Production	Project Name[2]	Operator	Block	Water Depth (ft)	System Type	DWRR[3]
1999	Ursa	Shell	MC 809	3,800	TLP	
1999	Virgo	TotalFinaElf	VK 823	1,130	Fixed Platform	Yes
2000	Black Widow	Mariner	EW 966	1,850	Subsea	Yes
2000	Conger	Amerada Hess	GB 215	1,500	Subsea	
2000	Diana	ExxonMobil	EB 945	4,500	Subsea	
2000	Europa	Shell	MC 935	3,870	Subsea	
2000	Hoover	ExxonMobil	AC 25	4,825	Spar	
2000	King	Shell	MC 764	3,250	Subsea	
2000	Marlin	BP	VK 915	3,236	TLP	
2000	Northwestern	Amerada Hess	GB 200	1,736	Subsea	Yes
2000	Petronius	ChevronTexaco	VK 786	1,753	Compliant Tower	
2001	Brutus	Shell	GC 158	3,300	TLP	
2001	Crosby	Shell	MC 899	4,400	Subsea	
2001	Einset	Shell	VK 872	3,500	Subsea	Yes
2001	EW 878	Walter	EW 878	1,585	Subsea	Yes
2001	Ladybug	ATP	GB 409	1,355	Subsea	
2001	Marshall	ExxonMobil	EB 949	4,376	Subsea	
2001	MC 68	Walter	MC 68	1,360	Subsea	
2001	Mica	ExxonMobil	MC 211	4,580	Subsea	
2001	Nile	BP	VK 914	3,535	Subsea	
2001	Oregano	Shell	GB 559	3,400	Subsea	
2001	Pilsner	Unocal	EB 205	1,108	Subsea	Yes
2001	Prince	El Paso	EW 1003	1,500	TLP	Yes
2001	Serrano	Shell	GB 516	3,153	Subsea	
2001	Typhoon	ChevronTexaco	GC 237	2,679	TLP	Yes
2002	Aconcagua	TotalFinaElf	MC 305	7,100	Subsea	Yes
2002	Aspen	BP	GC 243	3,065	Subsea	Yes
2002	Boomvang	Kerr McGee	EB 643	3,650	Spar	Yes
2002	Camden Hills	Marathon	MC 348	7,216	Subsea	Yes
2002	Horn Mountain	BP	MC 127	5,400	Spar	Yes
2002	King	BP	MC 84	5,000	Subsea	
2002	King Kong	Mariner	GC 472	3,980	Subsea	Yes
2002	King's Peak	BP	DC 133	6,845	Subsea	Yes
2002	Lost Ark	Samedan	EB 421	2,960	Subsea	Yes
2002	Madison	ExxonMobil	AC 24	4,856	Subsea	
2002	Manatee	Shell	GC 155	1,939	Subsea	Yes
2002	Nansen	Kerr McGee	EB 602	3,675	Spar	Yes
2002	Navajo	Kerr McGee	EB 690	4,210	Subsea	Yes

Table 1 - Development Systems of Productive Deepwater GOM Projects *- continued*

Year of First Production	Project Name[2]	Operator	Block	Water Depth (ft)	System Type	DWRR[3]
2002	Princess	Shell	MC 765	3,600	Subsea	
2002	Sangria	Spinnaker	GC 177	1,487	Subsea	Yes
2002	Tulane	Amerada Hess	GB 158	1,054	Subsea	Yes
2002	Yosemite	Mariner	GC 516	4,150	Subsea	Yes
2003	Boris	BHP	GC 282	2,378	Subsea	Yes
2003	East Anstey/ Na Kika	Shell	MC 607	6,590	FPS/Subsea[4]	
2003	Falcon	Pioneer	EB 579	3,638	Subsea	Yes
2003	Fourier/ Na Kika	Shell	MC 522	6,950	FPS/Subsea[4]	
2003	Gunnison	Kerr McGee	GB 668	3,100	Spar	Yes
2003	Habanero	Shell	GB 341	2,015	Subsea	
2003	Herschel/ Na Kika	Shell	MC 520	6,739	FPS/Subsea[4]	
2003	Matterhorn	TotalFinaElf	MC 243	2,850	TLP	Yes
2003	Medusa	Murphy	MC 582	2,223	Spar	Yes
2003	Pardner	Anadarko	MC 401	1,139	Subsea	
2003	Zia	Devon	MC 496	1,804	Subsea	
2004	Devil's Tower	Dominion	MC 773	5,610	Spar	
2004	Marco Polo	Anadarko	GC 608	4,320	TLP	
2004	Holstein	BP	GC 644	4,344	Spar	
2004	Magnolia	Conocophilips	GB 783	4,674	TLP	
2004	Unreleasable					
2004	Red Hawk	Kerr-McGee	GB 877	5,334	Spar	
2004	Boomvang	Kerr-McGee	EB 598	3,650	Spar	
2004	Hack Wilson	Kerr-McGee	EB 599	3,650	Subsea	
2004	Front Runner	Murphy	GC 339	3,330	Spar	
2004	North Medusa	Murphy	MC 538	2,223	Subsea	
2004	Harrier	Pioneer	EB 759	4,114	Subsea	
2004	Tomahawk	Pioneer	EB 629	3,561	Subsea	
2004	Raptor	Pioneer	EB 668	3,788	Subsea	
2004	Ariel/Na Kika	Shell	MC 429	6,274	Subsea	
2004	Kepler/Na Kika	Shell	MC 383	5,800	Subsea	
2004	Coulomb/ Na Kika	Shell	MC 613	7,591	Subsea	
2004	Llano	Shell	GB 387	2,376	Subsea	

Table 1 - Development Systems of Productive Deepwater GOM Projects *- continued*

Year of First Production	Project Name[2]	Operator	Block	Water Depth (ft)	System Type	DWRR[3]
2004	Glider	Shell	GC 248	3,440	Subsea	
2005	K2 North	Anadarko	GC 518	4,049	Subsea	
2005	K2	ENI	GC 562	4,006	Subsea	
2005	Mad Dog	BP	GC 782	4,428	Spar	
2005	Thunder Horse	BP	MC 778	6,089	Semisubmersible	
2005	Unreleasable					
2005	Unreleasable					
2005	Triton	Dominion	MC 728	5,373		
2005	Rigel	Dominion	MC 252	5,225		
2005	17 Hands	Murphy	MC299	5,881	Subsea	
2006	Atlantis	BP	GC 699	6,133	Semisubmersible	
2006	Unreleasable					
2006	Balboa	Kerr-McGee	EB 597	3,352	Spar	
2008	Unreleasable					

[1] Indicates projects that are no longer on production.

[2] The previous edition of this report listed deepwater fields, whereas this version lists deepwater projects.

[3] Indicates projects with one or more leases approved to receive Deep Water Royalty Relief.

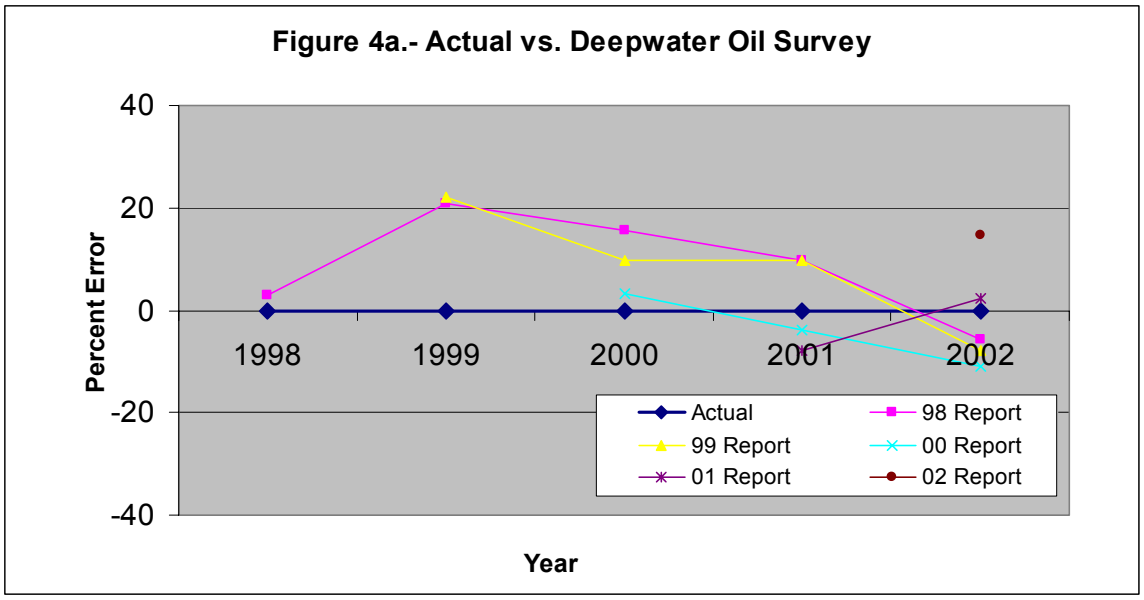
[4] Na Kika FPS is located in Mississippi Canyon Block 474 in 6,340 ft (1,932 m) of water.

AC = Alaminos Canyon
DC = De Soto Canyon
EB = East Breaks
EW = Ewing Bank
GB = Garden Banks
GC = Green Canyon
MC = Mississippi Canyon
VK = Viosca Knoll

This method of surveying operators to forecast production has been used quite successfully in previous editions of this report. Figures 4a and 4b show that GOM operators predicted their future production accurately. For example, the pink-colored line in Figure 4b shows that the 1998 survey predicted 2001 deepwater gas production within 11.5 percent of the actual volume and predicted 2002 deepwater gas production within 2.3 percent of the actual volume. The ability of operators to project future deepwater production accurately is especially significant, given the dramatic increases in deepwater production during this period. For example, deepwater gas production rose 140 percent from 1998 to 2002, and the 1998 survey predicted this increase within 2.3 percent of the actual volume. Not all estimates were this accurate, but they were all within 22 percent of the actual production and most were within 10 percent.

Although previous editions of this report offered a high and low estimate for future deepwater production, this report provides the actual deepwater volumes from the operator survey with no error estimation added. Similarly, a single estimate (rather than a high and a low estimate) of shallow-water production is made for each of the next five years. The shallow-water deep gas production is projected by performing a linear regression on the historical production in this trend and extrapolating forward in time. Shallow-water oil and gas production (excluding the shallow-water deep-gas trend) is projected by fitting an exponential decline curve to the most recent period of sustained decline (1996-2003 for oil and 1996-2001 for gas), then assuming that future shallow-water production will decline at half this rate. This method results in a 6-percent exponential decline for shallow-water oil and a 6-percent exponential decline for shallow-water gas (excluding the shallow-water deep-gas trend).

Figures 5a-c through 6a-c show production estimates through 2008 based on the method described above. Table 1 lists the projects expected to begin production by yearend 2008, according to the operator survey.



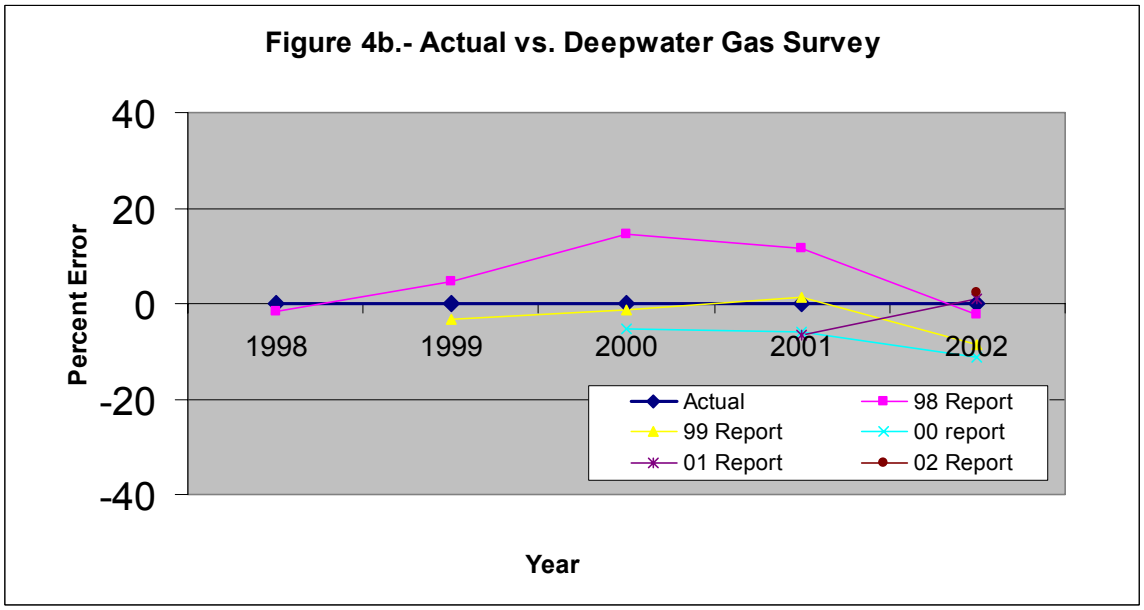
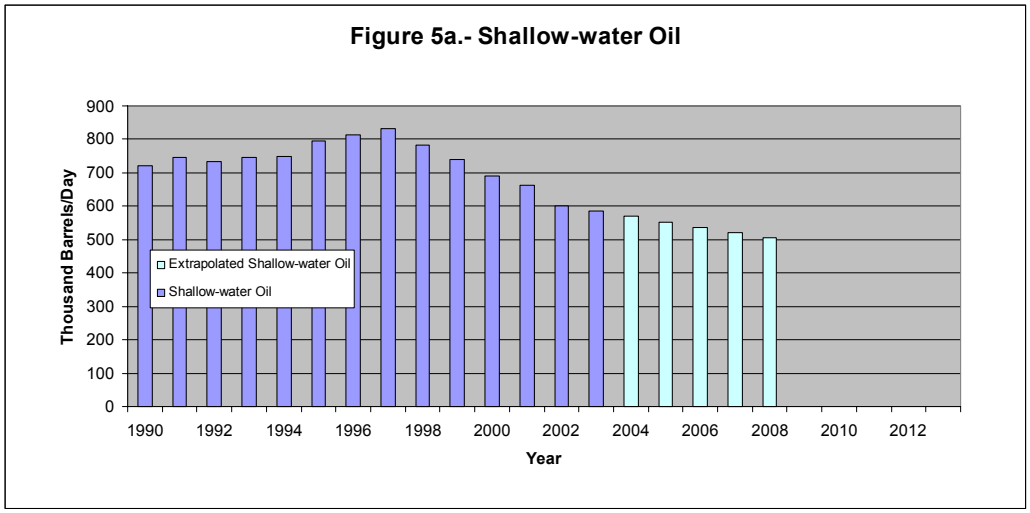
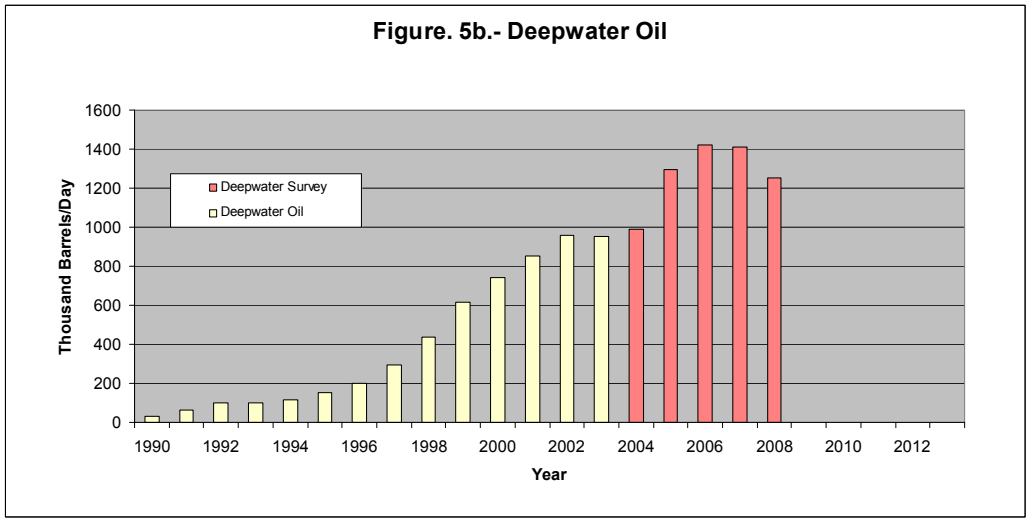


Figure 4. – Accuracy of previous forecasts.





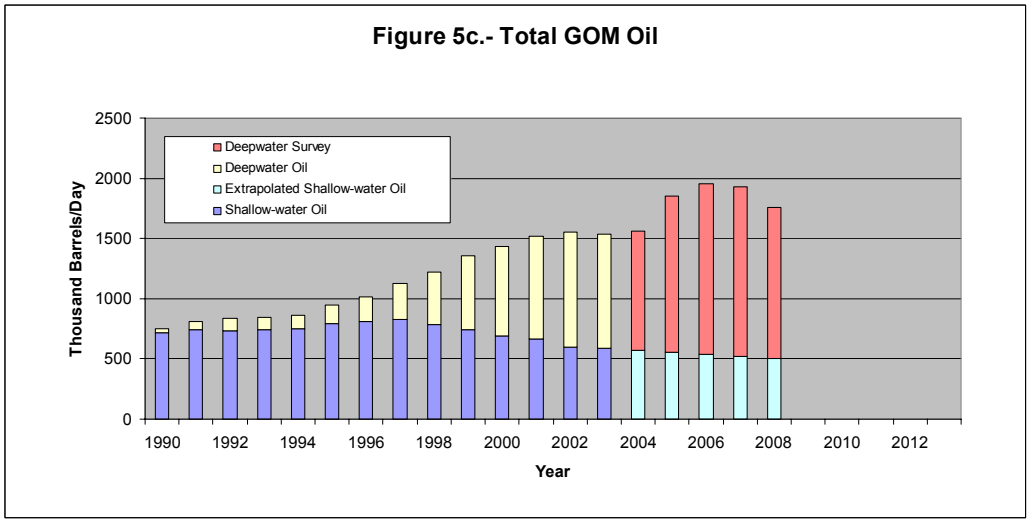
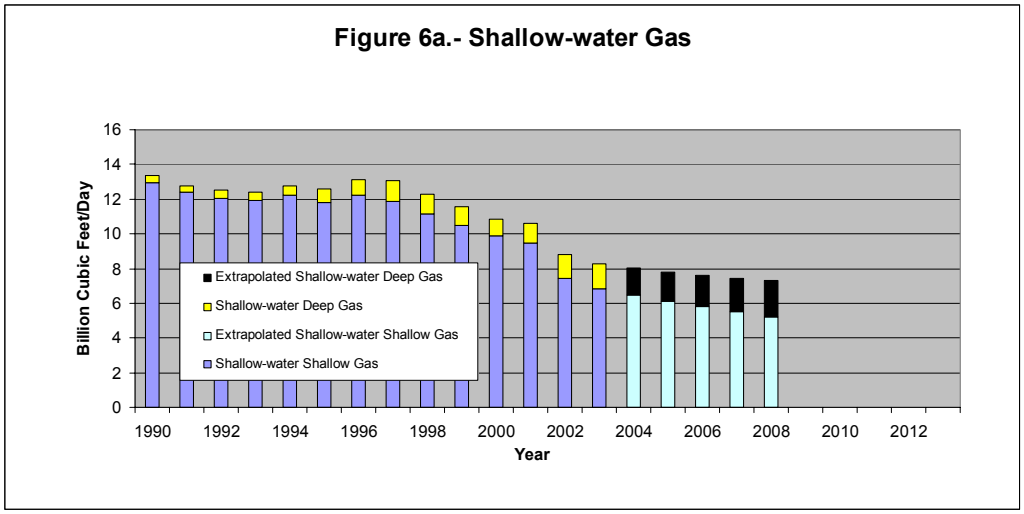
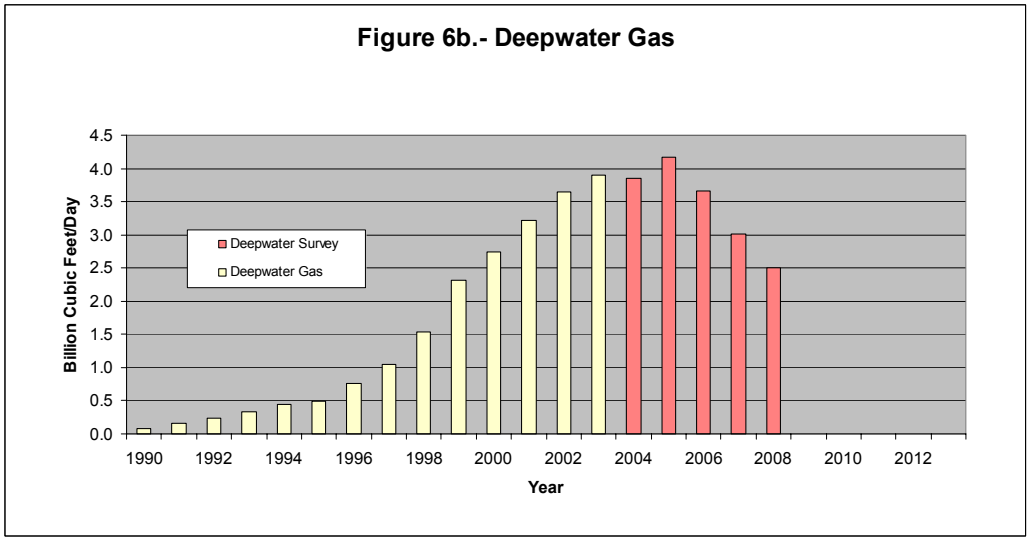


Figure 5. – Oil production estimates.





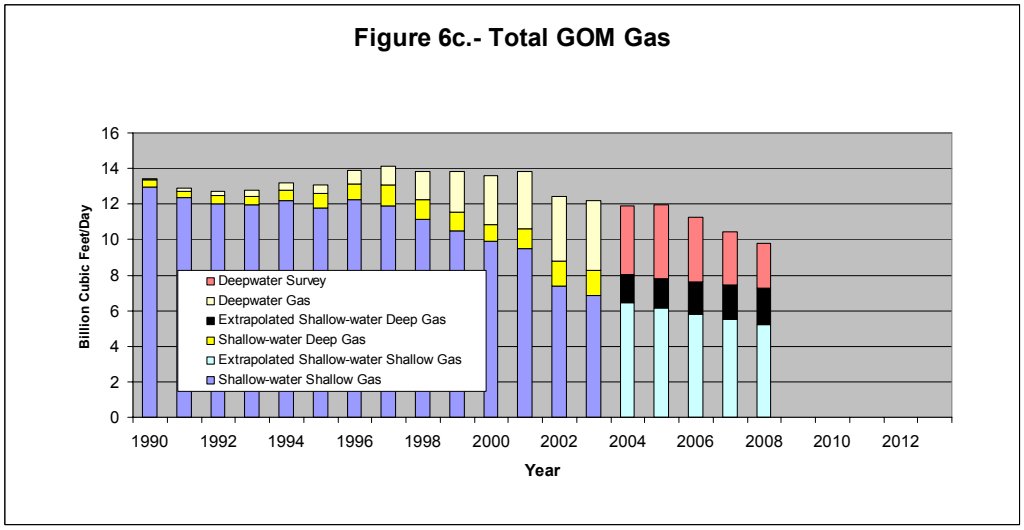


Figure 6. – Gas production estimates.

Section III - Extended Forecast

Gulf of Mexico operators have recently announced numerous deepwater discoveries that were not reported in the operator survey, possibly because these projects have not been fully assessed and operators have not yet committed to development schedules. Many of these industry-announced discoveries are likely to begin production within the next 10 years. Some may even begin production within the next 5 years.

The potential production from these industry-announced discoveries is added to the estimates from Section II and presented in Tables 2 and 3 and Figures 7a-c and 8a-c. This 10-year production forecast is more speculative than the 5-year forecast in Section II, and is based on the following assumptions:

1. The shallow-water production estimates (based on exponential declines for shallow-water oil and gas, excluding shallow-water deep gas, which is based on linear increase) from Section II are extended through 2013.
2. The deepwater production estimates from Section II (based on the operator survey) are assumed to decline exponentially at a rate of 12 percent each year (an assumption based on historic deepwater decline rates) from 2008 through 2013.
3. Ultimate recoverable volumes from the industry-announced discoveries are taken from independent, proprietary MMS assessments whenever available; otherwise, the industry-announced volumes are used.
4. During the first year of production, each project is assumed to produce at half its peak rate.
5. Projects with reserve volumes less than 200 million barrels of oil equivalent (MMBOE) are assumed to reach peak production in their second year and decline exponentially at 12 percent from that time forward.
6. Projects with reserve volumes over 200 MMBOE are assumed to reach peak production in their second year, sustain that peak rate for a total of four years, then decline exponentially at 12 percent from that time forward.
7. The estimated peak production rate for each project is based on the estimated recoverable reserves as follows:

Peak Rate = (0.00027455)*(ult rec rsvs) + 9000

where the peak rate is in barrels of oil equivalent (BOE) per day and the ultimate recoverable reserves (ult rec rsvs) are in BOE. This relationship was derived by plotting maximum production rates of known fields against the ultimate recoverable reserves of those fields and performing a linear regression. Note that MMS reserve estimates are on a field basis, so we assume here that this relationship based on historical field trends can be applied on a project basis.

8. Projects announced as gas discoveries are assumed to be 100-percent gas. The reserves of all other projects are assumed to be 61-percent oil and 39-percent gas, on the basis of an average of historic deepwater production.
9. The year when each industry-announced discovery is expected to begin production is roughly estimated by using available information.
10. All industry-announced discoveries with reserve estimates greater than 20 MMBOE are assumed to begin production within the next 10 years.

Table 2. – Gulf of Mexico Oil Rates (Thousand Barrels/Day)

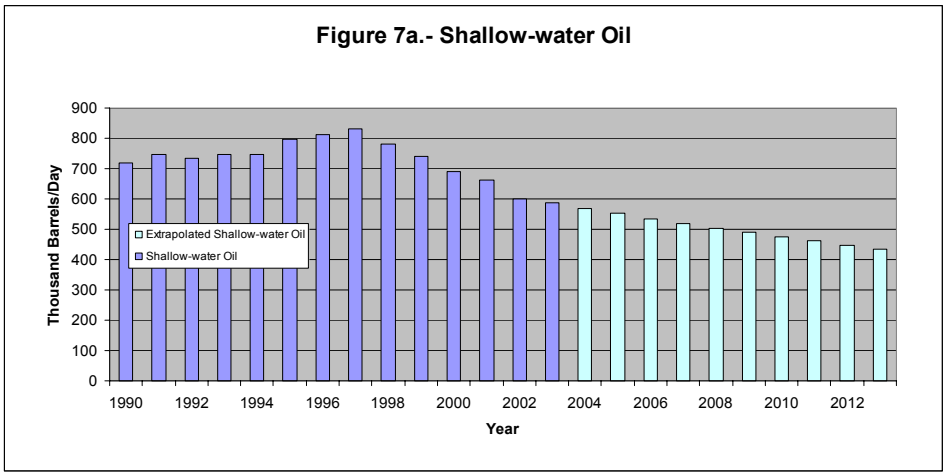
Year	Shallow-water Oil	Extrapolated Shallow-water Oil	Deepwater Oil	Deepwater Survey	Extrapolated Deepwater Survey	Industry Announced Discoveries	Undiscovered Resources	Total GOM Oil
1990	720		33					753
1991	746		63					809
1992	734		102					836
1993	746		101					847
1994	748		115					862
1995	795		151					947
1996	814		198					1012
1997	831		297					1129
1998	782		436					1218
1999	740		617					1357
2000	691		743					1434
2001	664		855					1518
2002	600		956					1556
2003	586*		951*					1537*
2004		569		990		3		1562
2005		552		1297		18		1868
2006		536		1421		42	8	2006
2007		520		1409		96	26	2050
2008		504		1251		286	56	2098
2009		489			1110	496	97	2192
2010		475			984	615	145	2219
2011		461			873	714	199	2248
2012		447			774	743	256	2221
2013		434			687	697	313	2132

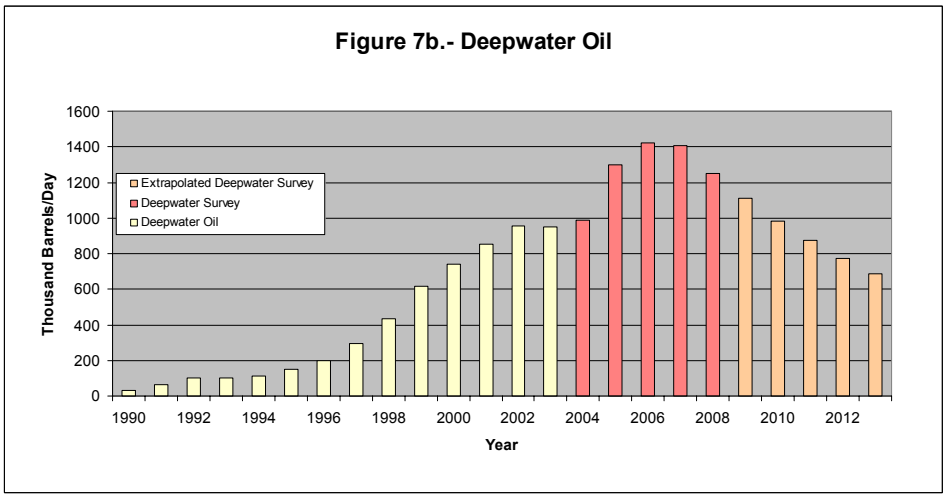
*Estimate

Table 3. - Gulf of Mexico Gas Rates (Billion Cubic Feet/Day)

Year	Shallow-water Shallow Gas	Extrapolated Shallow-water Shallow Gas	Shallow-water Deep Gas	Extrapolated Shallow-water Deep Gas	Deepwater Gas	Deepwater Survey	Extrapolated Deepwater Survey	Industry Announced Discoveries	Undiscovered Resources	Total GOM Gas
1990	12.97		0.39		0.08					13.45
1991	12.38		0.35		0.16					12.90
1992	12.03		0.48		0.24					12.74
1993	11.94		0.49		0.33					12.76
1994	12.20		0.58		0.44					13.22
1995	11.80		0.80		0.50					13.09
1996	12.24		0.91		0.76					13.91
1997	11.88		1.17		1.05					14.10
1998	11.14		1.14		1.54					13.81
1999	10.51		1.03		2.32					13.86
2000	9.91		0.94		2.74					13.58
2001	9.48		1.13		3.22					13.83
2002	7.41		1.38*		3.65					12.44*
2003	6.84*		1.45*		3.90*					12.19*
2004		6.48		1.56		3.85		0.01		11.90
2005		6.13		1.68		4.16		0.07		12.04
2006		5.80		1.81		3.65		0.15	0.06	11.48
2007		5.50		1.94		3.01		0.46	0.20	11.11
2008		5.20		2.09		2.50		1.47	0.41	11.67
2009		4.93		2.25			2.21	2.43	0.69	12.51
2010		4.66		2.42			1.96	2.78	1.03	12.85
2011		4.42		2.60			1.74	3.07	1.40	13.24
2012		4.18		2.80			1.54	3.12	1.82	13.46
2013		3.96		3.01			1.37	2.90	2.24	13.49

* Estimate





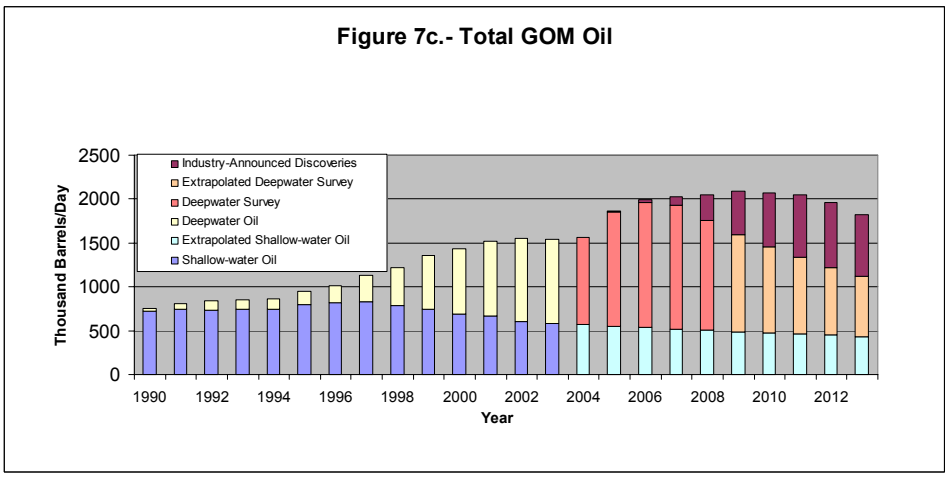
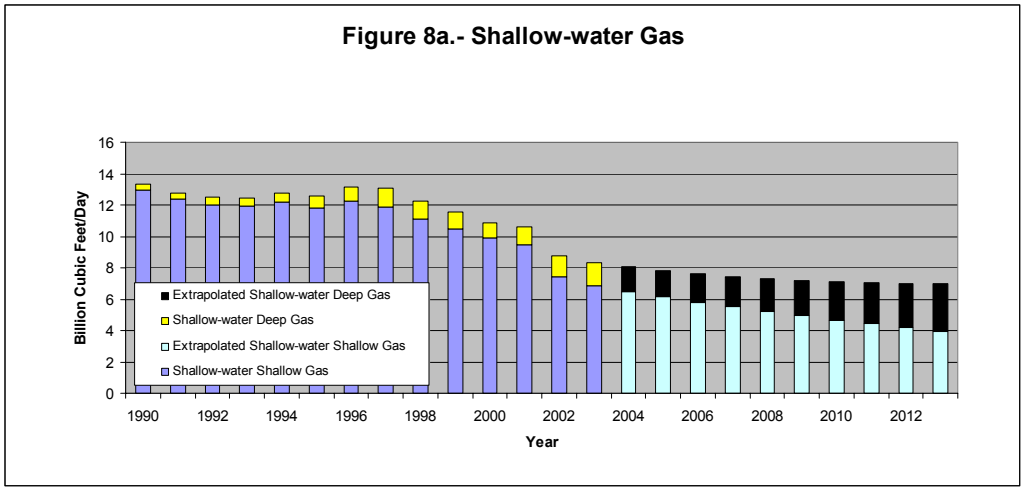
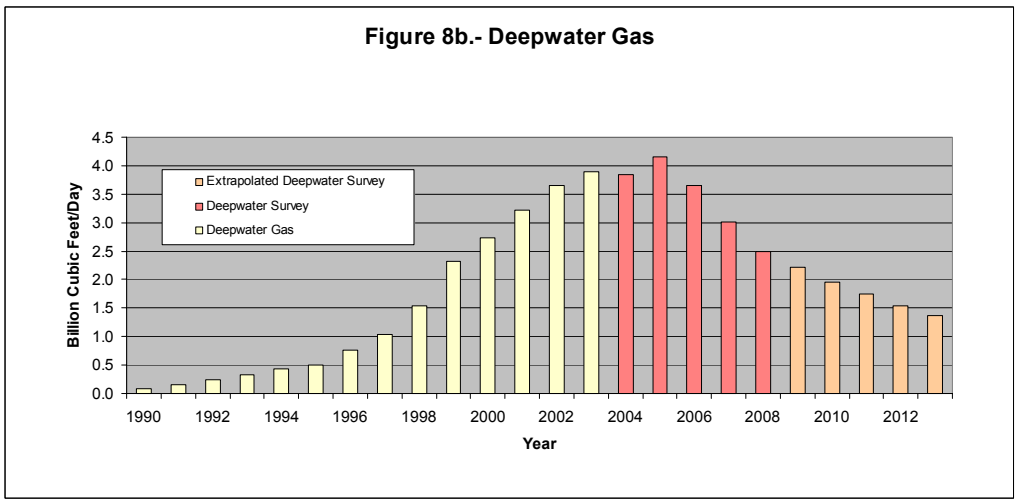


Figure 7. – Potential GOM oil production.





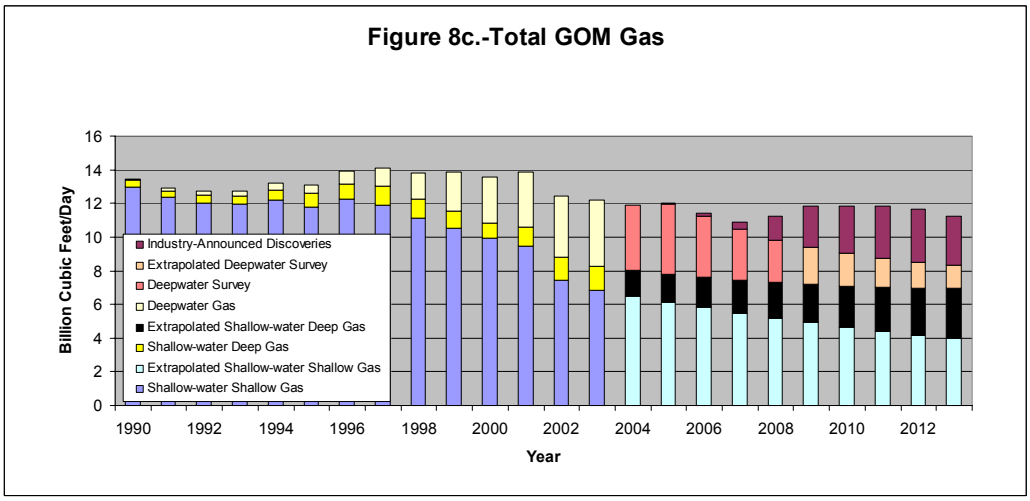


Figure 8. – Potential GOM gas production.

Section IV – Yet to Find

The shallow-water production forecasts in Sections II and III are based on extrapolations of historical production trends and several assumptions. This methodology inherently assumes that new reserves will be discovered and come on production just as they have in the past. The deepwater forecasts in Sections II and III include production from known discoveries. However, deepwater projects that have not yet been discovered are also likely to contribute to the total GOM oil and gas production during the forecast period, 2004 through 2013.

Figures 9 and 10 show our production forecast including the potential from deepwater projects that are yet to be discovered. In generating this forecast, we assume that the finding rate for new discoveries will not significantly deviate from historic levels during the forecast period. That is, these new discoveries will be realized as the result of continued investment anticipated in the exploratory drilling programs of many deepwater GOM operators, the level and intensity of investment in oil and gas product transportation infrastructure, and the number of high quality opportunities that remain untested throughout the deepwater Gulf.

The "yet-to-find" deepwater GOM discoveries anticipated during the next nine years are expected to occur on both currently leased OCS tracts as well as on OCS tracts that are expected to be leased at future GOM lease sales. We assume that the average volume of "yet-to-find" recoverable resources will be within the range of historically observed average volumes discovered on the population of deepwater tracts leased in GOM sales held between 1980 and 1995. Further, we assume that the production profiles that result from the sale-specific "yet-to-find" new discoveries will be similar to typical historical production profiles.

The estimated production schedules and daily production volumes contributing to the "yet-to-find" component of this forecast were developed using data from MMS' corporate database and the methodology outlined below.

1) Oil and gas reservoir volumes are summed for each lease sale.
2) Distributions of oil and gas volumes, discovered from the population of deepwater tracts leased in an individual sale, are developed for the GOM Central and Western Planning Areas.
3) Oil and gas production profiles are developed for the population of deepwater tracts issued in each individual lease sale.
4) The production profiles are analyzed using historic sale-specific production data, and a "typical sale" production profile is developed for each planning area.
5) The range of total oil and gas volumes estimated to be discovered on leases issued in a typical sale is applied to its respective production profile (Central or Western, oil or gas), and a forecast of annual production expected to result from a single sale is generated.
6) For lease sale years where a portion of the total deepwater production anticipated to result from the sale has been realized, the yet-to-find volumes are allocated on the basis of the "typical sale" production profile and the number of years that remain on the primary terms of the population of tracts leased in a given lease sale year.
7) Since one Central and one Western GOM sale are typically held in a given year, an estimate of the production expected from all future lease sales is generated by summing the annual production of a series of single sale production profiles that are each offset by one year.

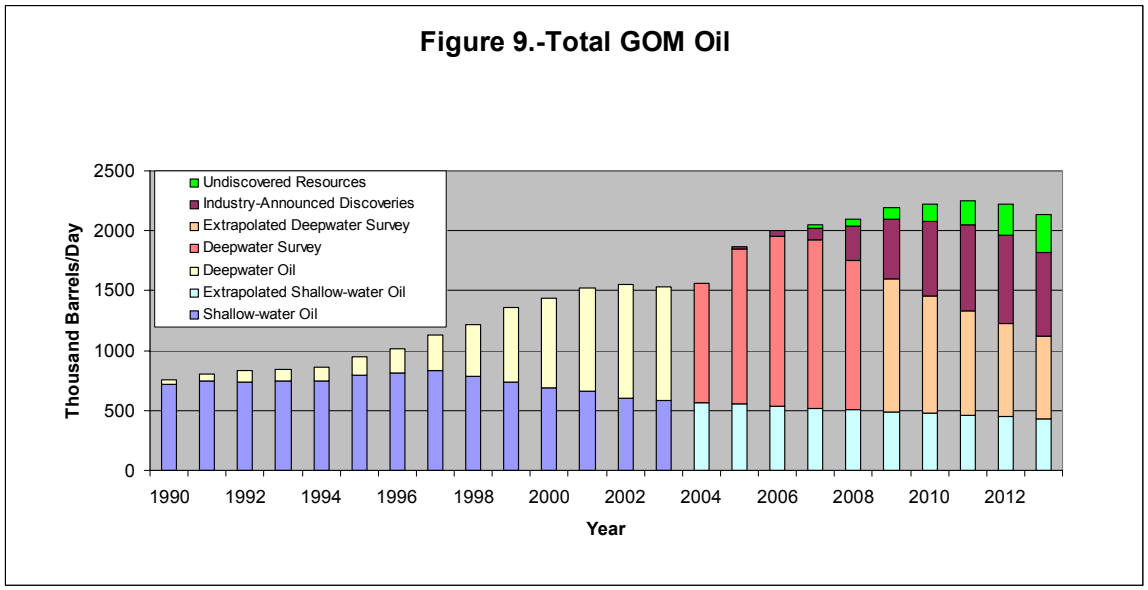


Figure 9. – Potential GOM oil production including undiscovered resources.

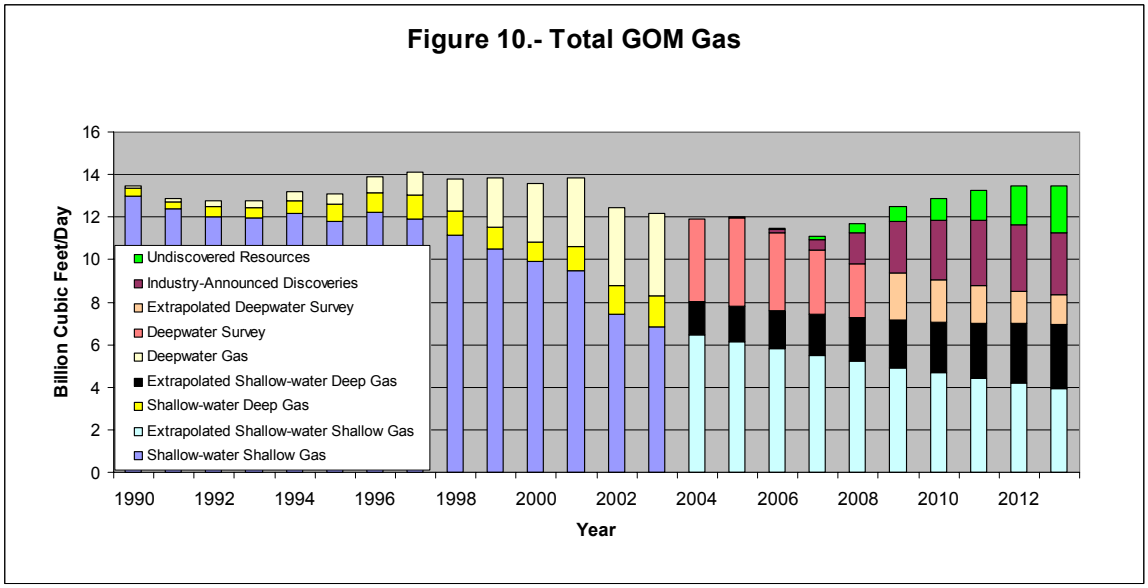


Figure 10. – Potential GOM gas production including undiscovered resources.

Conclusions

Historic oil production in the Gulf of Mexico (GOM) increased steadily from 1990 through 2001 and leveled off in 2002 and 2003. Shallow-water oil production declined steadily since 1997, but was offset by increasing deepwater production during that period. Historic gas production in the GOM followed similar trends. While shallow-water deep-gas production increased during the period 1990 through 2003, the remaining portion of the shallow-water gas production dropped steadily from 1996 though 2003. Increasing deepwater production was not sufficient to prevent an overall decline in total GOM production through 2003.

The deepwater operator survey, which has been reliable in previous editions of this report, indicates that the deepwater oil production will increase significantly over the next few years and the total GOM oil production will reach about 2 million barrels of oil per day (MMBOPD). Section II of this report, however, indicates that deepwater and shallow-water deep-gas production will not contribute enough volume to offset a short-term decline in total GOM gas production.

Section III of this report shows the estimated additional production that could come from deepwater projects not yet sanctioned. The extended forecast in Section III indicates that the existing discovered reserves are capable of sustaining total GOM oil production levels near 2 MMBOPD and gas production levels near 12 billion cubic ft per day (BCFPD). Realization of this potential will depend on operator commitments to develop these reserves within the next 10 years. The possible additional production from deepwater projects that are not yet discovered could increase production levels further, as shown in Section IV.

Each section of this report adds potential GOM production to the forecast and the uncertainty increases with each subsequent section. The data from each section of this report are presented separately in Tables 2 and 3 so that the reader may decide the degree of certainty that he or she deems appropriate. Whatever degree of certainty used, one can conclude that GOM oil production rates should increase beyond current levels in the next

few years. Total GOM gas production rates, however, would require significant contributions from as yet undiscovered deepwater projects to rise above current levels.

Contributors

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Anadarko Petroleum Corporation
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Dominion Exploration & Producing
ENI Petroleum Co.
El Paso Production
ExxonMobil Corporation
Kerr-McGee Corporation
Mariner Energy, Inc.
Murphy Exploration & Production Company
Noble Energy Inc.
Pioneer Natural Resources USA, Inc.
Shell Offshore Inc.
TotalFinaElf E&P USA, Inc.
Walter Oil & Gas

References

Melancon, J. M., R. Bongiovanni, and R.D. Baud., 2003, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections from 2003 Through 2007*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 2003-028, New Orleans, 17 p.

Melancon, J. M., R. Bongiovanni, and R.D. Baud., 2002, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections from 2002 Through 2006*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 2002-031, New Orleans, 26 p.

Melancon, J. M., R. Bongiovanni, and R.D. Baud., 2001, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections from 2001 Through 2005*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 2001-044, New Orleans, 20 p.

Melancon, J. M. and R.D. Baud., 2000, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections from 2000 Through 2004*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 2000-012, New Orleans, 20 p.

Melancon, J. M. and R.D. Baud., 1999, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections from 1999 Through 2003*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 1999-016, New Orleans, 20 p.

Melancon, J. M. and D.S. Roby., 1998, *Gulf of Mexico Outer Continental Shelf Daily Oil and Gas Production Rate Projections from 1998 Through 2002*, U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, OCS Report MMS 98-0013, New Orleans, 16 p.

Notice

Our goal is to publish a reliable production forecast based on the data available. Therefore, we periodically review our methodology in order to improve our process and provide accurate information. Please contact the Regional Supervisor, Production and Development, Gulf of Mexico OCS Region, Minerals Management Service, 1201 Elmwood Park Boulevard, New Orleans, Louisiana, 70123, to communicate any questions you have or ideas for consideration in our next report. The telephone number is (504) 736-2675.

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.

MMS Securing Ocean Energy & Economic Value for America