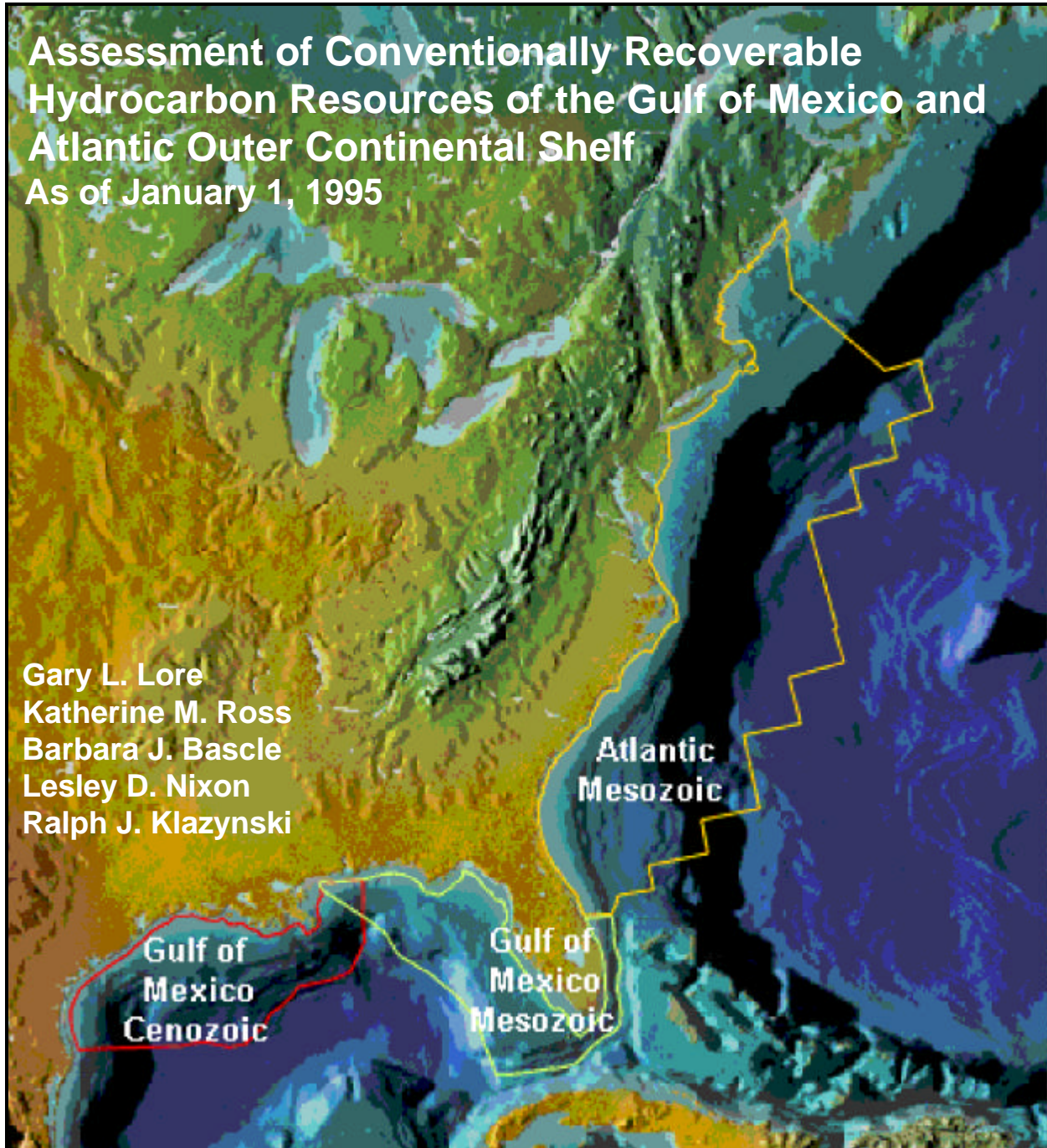




Assessment of Conventionally Recoverable Hydrocarbon Resources of the Gulf of Mexico and Atlantic Outer Continental Shelf As of January 1, 1995

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Gulf of Mexico OCS Regional Office
Office of Resource Evaluation

New Orleans
June 1999

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GULF OF MEXICO AND ATLANTIC CONTINENTAL MARGIN

MARGIN DESCRIPTION

The petroleum accumulations of the Gulf of Mexico and Atlantic Continental Margin are within the offshore portion of the Gulf of Mexico Basin and the western Atlantic Shelf. This Continental Margin consists of two regions and three provinces (figure 1). The Gulf of Mexico Region contains the Gulf of Mexico Cenozoic and Mesozoic Provinces and extends from offshore Texas to the Florida Peninsular Arch and the U.S.-International Maritime Boundary. The Atlantic Region consists of a Mesozoic Province extending from the U.S.-Canadian offshore boundary to the Florida Peninsular Arch. Figure 2 illustrates the overall extent of the 72 plays identified within the Gulf of Mexico and Atlantic Continental Margin.

The Gulf of Mexico and Atlantic Regions comprise a passive marine margin that originated during late Triassic and early Jurassic time with the breakup of Pangea when Africa/South America separated from North America. Initial sedimentary deposits were Triassic to lower Jurassic lacustrine and red bed clastics. Continental highlands provided the sediments deposited on the Atlantic Shelf and the northern and northeastern Gulf of

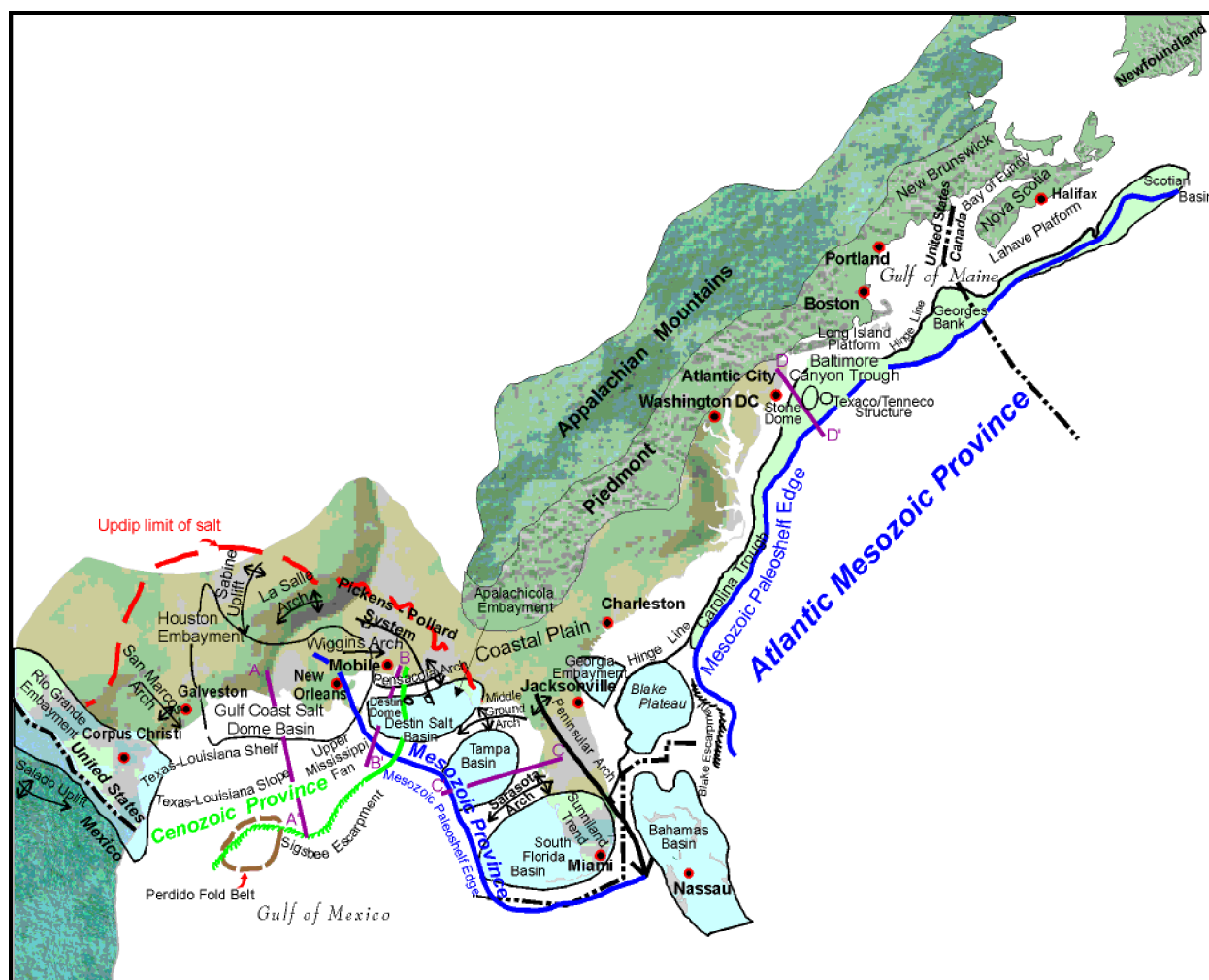


Figure 1. Physiographic map.

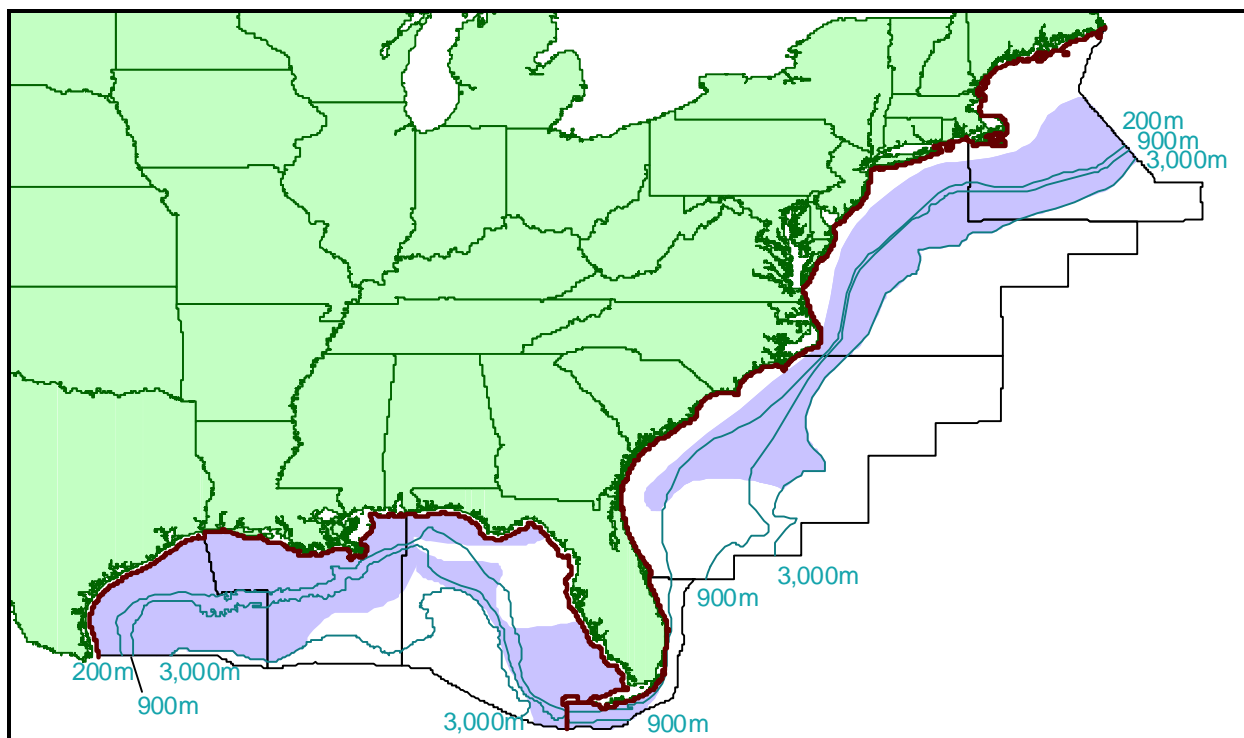


Figure 2. Map of assessed margin.

Mexico Basin during the middle to late Jurassic. While continentally derived sediments dominated deposition in the Atlantic through the late Jurassic, in the Gulf of Mexico, massive evaporites and carbonates were beginning to form. During Cretaceous time, in both the Atlantic and eastern Gulf of Mexico, a large stable carbonate platform developed with extensive reef systems growing along the shelf-edge margin. Clastic deposition became dominant in the lower Cretaceous in the Atlantic, and in the middle Miocene in the eastern Gulf of Mexico. In the central and western Gulf of Mexico, clastic deposition dominated the entire Cenozoic Era.

ASSESSMENT RESULTS

The mean total endowment for the Gulf of Mexico and Atlantic Continental Margin is estimated at 25.614 Bbo and 299.662 Tcfg (78.935 BBOE) (table 1). Thirty-seven percent of this BOE mean total endowment has been produced, all from the Gulf of Mexico Region.

Assessment results indicate that undiscovered resources may occur in as many as 2,475 pools. These undiscovered resources are estimated to have a range of 8.017 to 13.689 Bbo and 104.286 to 144.011 Tcfg at the

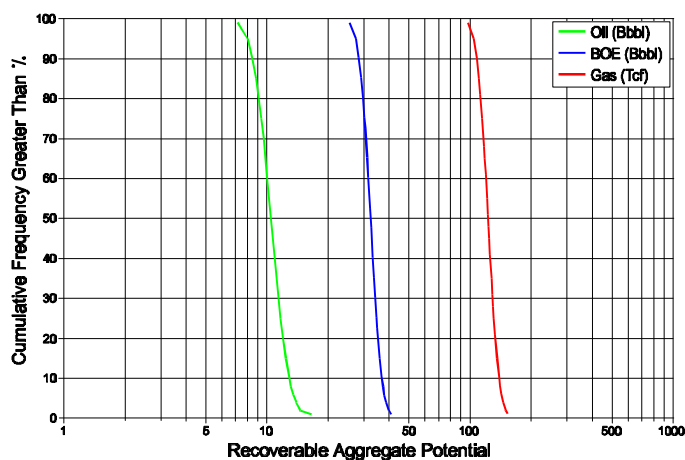


Figure 3. Cumulative probability distribution.

95th and 5th percentiles, respectively (figure 3). The majority, 78 percent, of these undiscovered resources are projected to occur in the Gulf of Mexico Region.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	2,114	11.853	141.891	37.101
Cumulative production	--	9.338	112.633	29.379
Remaining proved	--	2.516	29.258	7.722
Unproved	69	0.639	3.603	1.280
Appreciation (P & U)	--	2.507	31.028	8.028
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	8.017	104.286	27.402
Mean	2,475	10.615	123.140	32.526
5th percentile	--	13.689	144.011	38.217
Total Endowment				
95th percentile	--	23.016	280.808	73.811
Mean	4,658	25.614	299.662	78.935
5th percentile	--	28.688	320.533	84.626

GULF OF MEXICO REGION

REGION DESCRIPTION

The Gulf of Mexico Region comprises a passive marine basin that continued to subside as the North American continent rose. As the basin subsided, it was filled with a thick Mesozoic and Cenozoic sequence of sediments. These two distinct sedimentary environments provide the basis for the two provinces in the Gulf of Mexico Region, the Cenozoic Province and the Mesozoic Province (figure 1). The Region includes the submerged Federal lands offshore Texas, Louisiana, Mississippi, Alabama, and Florida and extends from the U.S.-Mexico International Boundary in the west to the U.S.-Cuba International Boundary in the southeast.

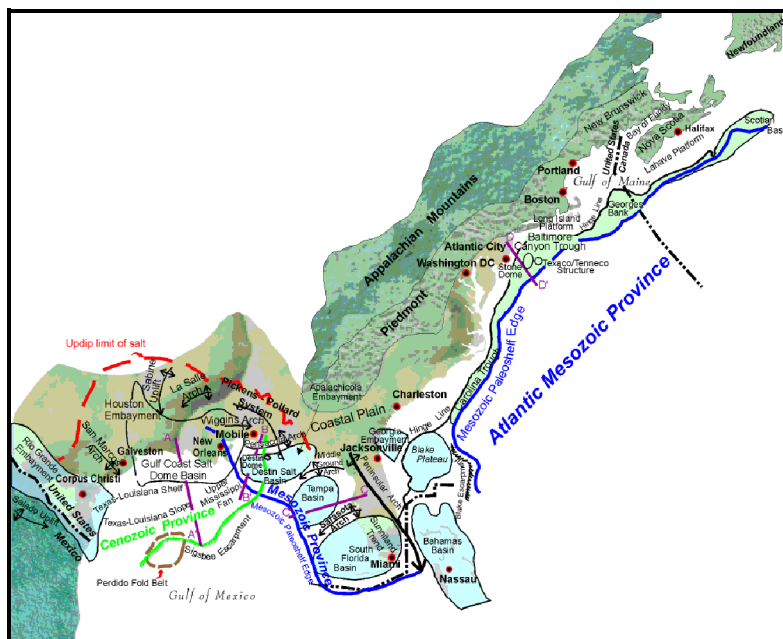


Figure 1. Physiographic map.

The Region extends from the U.S.-Mexico International Boundary in the west to the U.S.-Cuba International Boundary in the southeast. Figure 2 shows the overall extent of the assessed plays within the Region.

The Gulf of Mexico Region originated as a basin that formed during the Jurassic

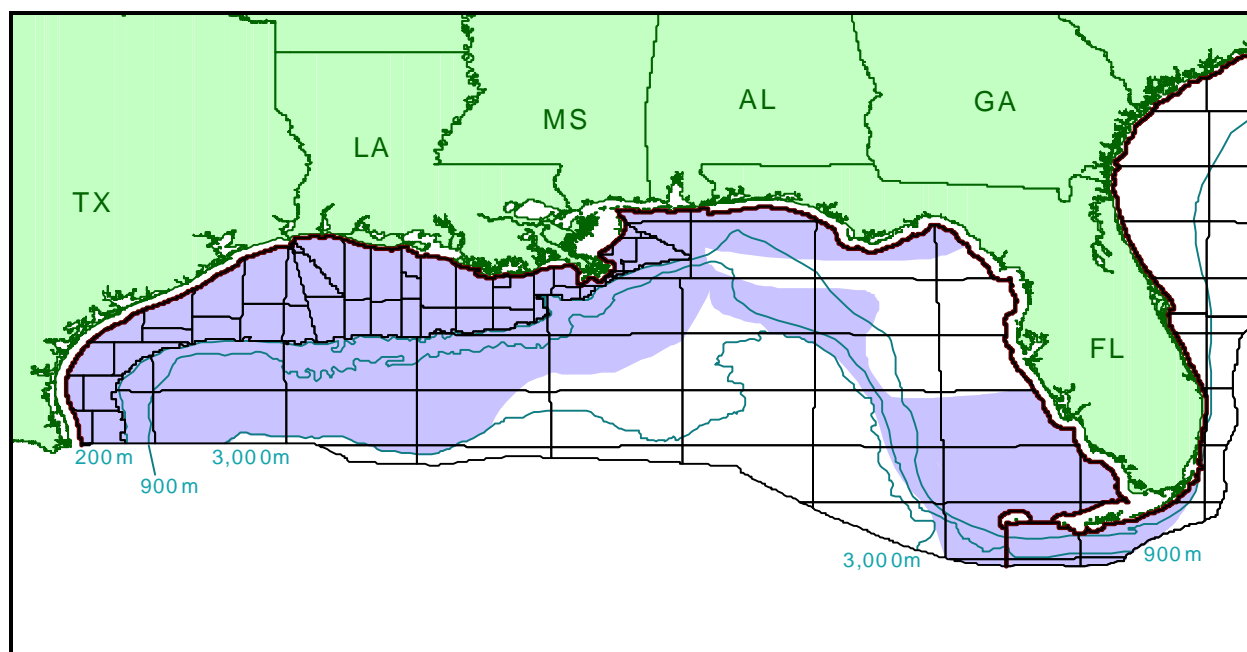


Figure 2. Map of assessed region.

Period with the breakup of Pangea when Africa/South America separated from North America. As the rifting of the basin continued, a series of shallow seas formed that were periodically separated from open ocean waters during the early Jurassic. Cycles of seawater influx and evaporation precipitated massive accumulations of salt. Subsequent loading of the salt by large volumes of Mesozoic and Cenozoic sediments deformed the salt and created many of the structures within the Region that are favorable for the entrapment of hydrocarbons.

During the late Jurassic, the basin was exposed to the open sea, changing the depositional environment to shallow marine. In these shallow seas, broad carbonate banks grew around the margins of the basin during the Cretaceous. In the eastern Gulf of Mexico, carbonates and evaporites continued to dominate the depositional setting until the middle Miocene, when Cenozoic clastic influx became significant enough to prograde onto and, subsequently, across the Cretaceous carbonate platform. These carbonates and evaporites, interbedded with clastic deposits, define the Gulf of Mexico Mesozoic Province (figure 1).

Uplift of the North American continent and the subsequent Laramide Orogeny provided the source for large amounts of clastic deltaic sediments that were deposited in the central and western areas of the Gulf of Mexico Basin from the late Cretaceous through the Tertiary. During the Quaternary, periods of continental glaciation provided an increased clastic sediment load to the central and western basin areas. This resulted in the present-day Texas and Louisiana shelf and slope that are characterized by massive amounts of clastic materials that were predominantly deposited during the Cenozoic Era. These clastic sediments define the Gulf of Mexico Cenozoic Province (figure 1).

DISCOVERIES

Initially, exploration in the Gulf of Mexico Region targeted oil, but recent discoveries have tended to be predominately natural gas in many plays. As of January 1, 1995, there were 876 proved fields, of which 157 were classified as oil and 719 as gas. Included in this number are 133 fields that were depleted and abandoned. In addition, there were 48 unproved fields that were deemed economically viable to be used in this assessment. The Gulf of Mexico Region contains total reserves of 14,999 Bbo and 176,522 Tcfg (46,409 BBOE), of which 9,338 Bbo and 112,633 Tcfg (29,379 BBOE) have been produced. The Region contains 8,856 producible sands in 2,183 pools (table 1). The first reserves in the Region were discovered in 1947 (figure 3). Even though the number of discoveries peaked in the mid- to late 1980's, only about 20 percent of the total reserves were added in this same time period.

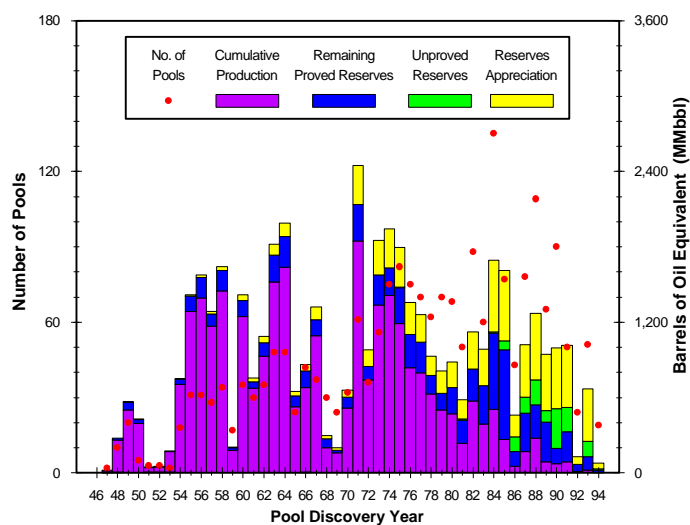


Figure 3. Exploration history graph.

ASSESSMENT RESULTS

Table 1. Characteristics of the discovered pools.

2,183 Pools (8,856 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	222	7,500
Subsea depth (feet)	950	7,892	22,600
Number of sands per pool	1	4	45
Porosity	10%	29%	39%
Water saturation	7%	28%	66%

In the Cenozoic Province, Paleocene and Eocene sediments (except for the conceptual Perdido Fold Belt [O/E X] play) were not evaluated because the existence of reservoir-quality sands in the Federal offshore is highly unlikely. In fact, much uncertainty abounds as to whether reservoir-quality sediments are present in Tertiary deposits beyond the Sigsbee Escarpment. Because of a lack of well data and a limited amount of seismic data available beyond the Sigsbee Escarpment, the 3,000 meter water depth, which approximates the southern limit of the Sigsbee Escarpment, was used as the geographical cutoff for the assessment of the Cenozoic Province.

In the Mesozoic Province, the dominantly evaporitic sediments of the Upper Triassic Series, the Lower Jurassic Series, and the Middle Jurassic Series were not considered to be of reservoir quality. Sediment type and lack of any onshore analogs provided the basis for condemning these deposits. As with the Cenozoic sediments, Mesozoic sediments beyond the 3,000 meter water depth were not assessed.

Sixty-one individual plays within the Gulf of Mexico have been identified, of which 57 were assessed. Of the four plays identified but not assessed, two are established and two are conceptual. The Middle Pleistocene Caprock (MPL C) play and the Upper Pleistocene Caprock (UPL C) play are both established, but are unique and of such limited occurrence that additional discoveries are unlikely. Two conceptual plays, the Upper Jurassic to Lower Cretaceous Transition Zone (UU-LK TZ) play and the Middle Jurassic to Upper Jurassic Florida Basal Clastic (MU-UU FBCL) play were not assessed. The Transition Zone play was evaluated to lack source rock potential, and the Florida Basal Clastic play was evaluated to have poor reservoir potential.

From the assessed plays in the Gulf of Mexico Region— 48 established, 1 frontier, and 1 conceptual in the Cenozoic Province, and 2 established, 4 frontier, and 1 conceptual in the Mesozoic Province— the mean total endowment is estimated at 23.343 Bbo and 272.183 Tcfg (71.775 BBOE) (table 2). Forty-one percent of this BOE mean total endowment has been produced.

The 95th- and 5th-percentile estimates of undiscovered resources in the Gulf of Mexico Region are 6.038 to 11.138 Bbo and 82.323 to 110.286 Tcfg, respectively (figure

4). At mean levels, undiscovered resources are estimated at 8.344 Bbo and 95.661 Tcfg (25.366 BBOE). These undiscovered resources may occur in as many as 1,973 pools. Seventy-five percent of these undiscovered oil resources and 92 percent of these undiscovered gas resources are projected to occur in the Cenozoic Province.

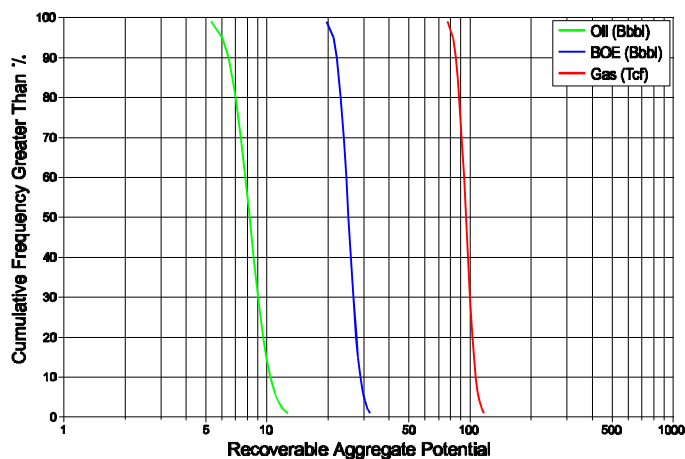


Figure 4. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbb)	Gas (Tcf)	BOE (Bbb)
Reserves				
Original proved	2,114	11.853	141.891	37.101
Cumulative production	--	9.338	112.633	29.379
Remaining proved	--	2.516	29.258	7.722
Unproved	69	0.639	3.603	1.280
Appreciation (P & U)	--	2.507	31.028	8.028
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	6.038	82.323	21.218
Mean	1,973	8.344	95.661	25.366
5th percentile	--	11.138	110.286	29.990
Total Endowment				
95th percentile	--	21.037	258.845	67.627
Mean	4,156	23.343	272.183	71.775
5th percentile	--	26.137	286.808	76.399

ATLANTIC REGION

The Atlantic Region contains only one assessed province, the Atlantic Mesozoic Province. Well data indicate that Cenozoic sediments in the Atlantic Region have poor reservoir and source rock characteristics. Therefore, the Cenozoic section is not considered prospective for hydrocarbons and is not assessed [see Atlantic Mesozoic Province].

GULF OF MEXICO CENOZOIC PROVINCE

PROVINCE DESCRIPTION

The Cenozoic Province covers an area from the U.S.-Mexico International Boundary to the Federal waters offshore the Florida panhandle (figure 1). The sedimentary section attains a thickness upwards of 50,000 feet, and water depths range from approximately 10 to over 10,000 feet. Figure 2 illustrates the overall extent of the plays assessed within the Cenozoic Province.

A general uplift of the North American continent and the subsequent Laramide Orogeny during late Cretaceous and early Tertiary time provided vast amounts of clastic sediment that were transported into the northwestern Gulf of Mexico. As the basin subsided, these large volumes of sediment were deposited as successively younger wedges of off-lapping strata. The supply of sediment, being out of phase with the load-induced subsidence, created multiple transgressive and regressive depositional environments. During periods when subsidence was rapid and sediment supply was limited, retrogradational deposits developed. When basin subsidence was minimal and the sediment load was sufficient, aggradational sediments were deposited. A very large volume of clastics, related to mountain building during the Tertiary and later due to continental glaciation during the Quaternary, was supplied to the basin. As a result, basin subsidence was overwhelmed and the Gulf of Mexico margin prograded seaward, with sediments spilling across the outer shelf and upper slope as fan systems.

This basic deltaic depositional model was the foundation for play delineation within the Cenozoic Province (figure 3 and figure 4). The major flooding events of the Cenozoic and detailed paleontological analysis provided the basis for the Cenozoic chronostratigraphic chart (figure 5).

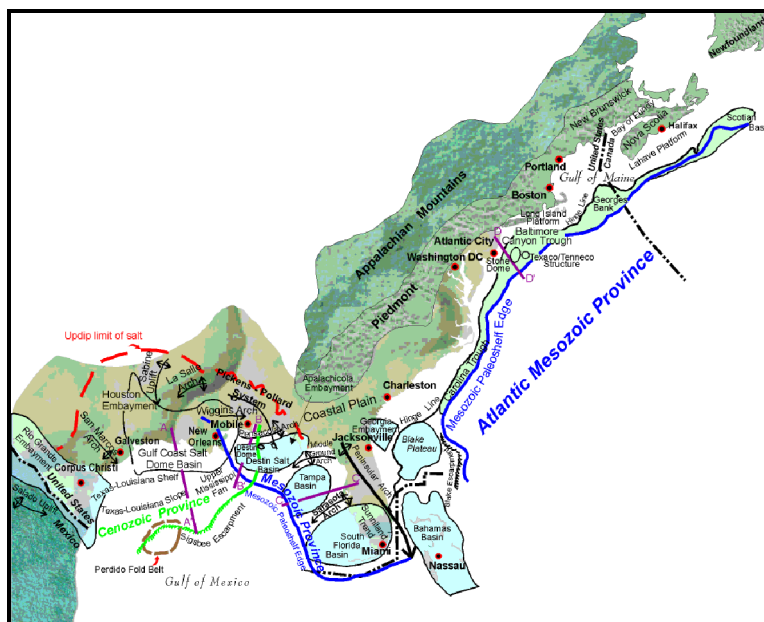


Figure 1. Physiographic map.

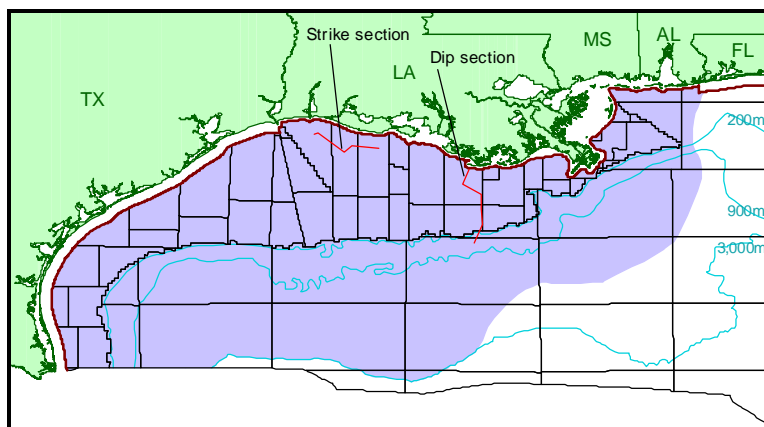


Figure 2. Map of assessed province.

Chronostratigraphy, coupled with the distinct depositional styles and environments of this model—retrogradational, aggradational, progradational, and fans—recognized by a combination of electric log curve characteristics, ecozone data, and seismic character, are the principal basis for play delineation in the Cenozoic Province (Seni *et al.*, 1994, 1995, 1997; Lore and Batchelder, 1995; Hunt and Burgess, 1995; Hentz *et al.*, 1997).

A strike and a dip cross section, exhibiting chronozones and depositional styles, have been prepared for the Cenozoic Province. The strike section (see figure 2 for location) extends from the West Cameron to Vermilion Areas and is representative of the chronostratigraphy and depositional styles found on the shelf (this cross section is too large to be presented in text format, but is available for viewing in the interactive report). Not surprisingly, aggradational and progradational deposits dominate. In general, aggradational deposits are relatively poor in hydrocarbons, perhaps as a result of the paucity of seals in this sand-rich environment. The progradational sediments are the most productive, probably due to their overall thickness, the interbedding of sands and shales typical of these sediments, and the association with structures and faulting that occur along the shelf margin. The dip section (see figure 2 for location) extends from the Ship Shoal Area on the shelf to the Green Canyon Area in deepwater (this cross section is too large to be presented in text format, but is available for viewing in the interactive report). This dip section illustrates the progradation of successively younger Cenozoic sediments into the Gulf of Mexico Basin. The localized thickening and thinning of sediments deposited in mini-basins controlled by

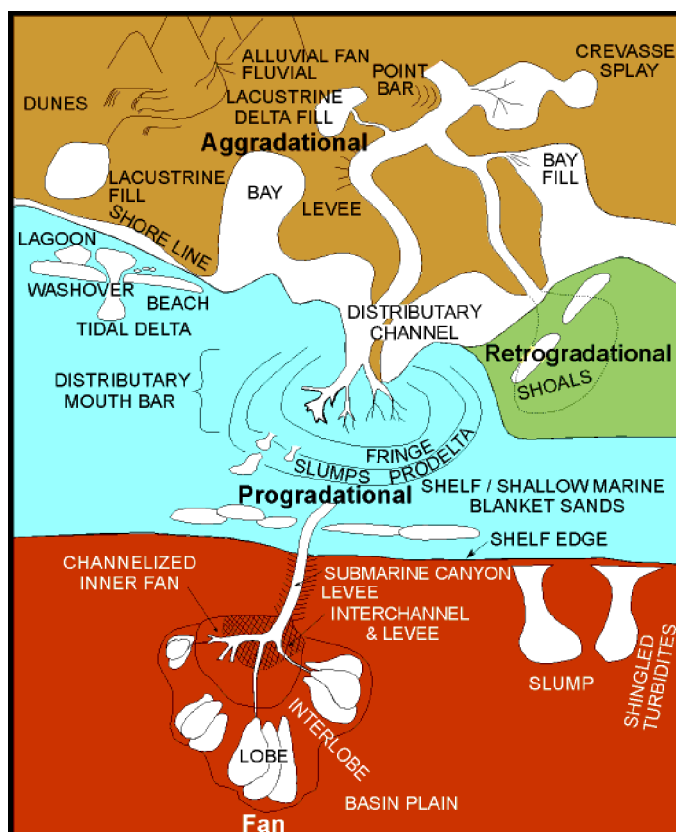


Figure 3. Model for deltaic deposition.

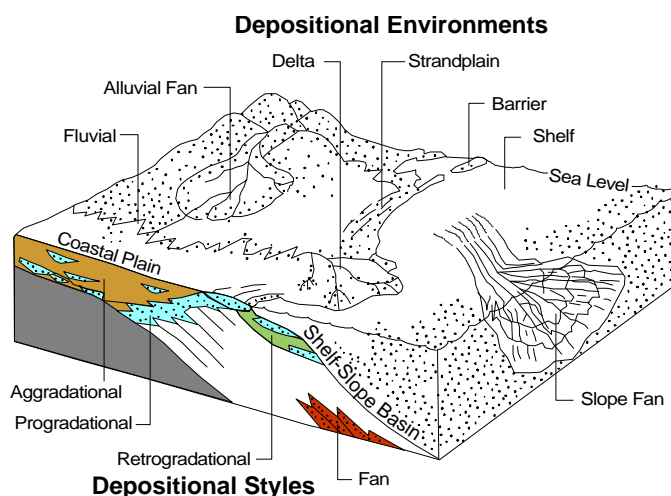


Figure 4. Siliciclastic depositional environments (Modified from Seni *et al.*, 1997).

This dip section illustrates the progradation of successively younger Cenozoic sediments into the Gulf of Mexico Basin. The localized thickening and thinning of sediments deposited in mini-basins controlled by

National Assessment Chronostratigraphy								
Geologic Time (M.Y.)	Province	System	Series	National Assessment Chronozone	Chronozone	Biozone		
						Gulf of Mexico	Atlantic	
~0.01	Cenozoic	Quaternary	Pleistocene	UPL	UPL-4 UPL-3 UPL-2 UPL-1	<i>Sangamon fauna</i> <i>Trimosina "A" 1st</i> <i>Trimosina "A" 2nd</i> <i>Hyalinea "B" / Trimosina "B"</i>		
				MPL	MPL-2 MPL-1	<i>Angulogerina "B" 1st</i> <i>Angulogerina "B" 2nd</i>		
				LPL	LPL-2 LPL-1	<i>Lenticulina 1</i> <i>Valvulineria "H"</i>		
~2.8		Tertiary	Pliocene		UP	UP	<i>Buliminella 1</i>	
~5.5					LP	LP	<i>Textularia "X"</i>	
			Miocene		UM3	UM-3 UM-2	<i>Robulus "E" / Bigenerina "A"</i> <i>Cristellaria "K"</i>	
					UM1	UM-1	<i>Discorbis 12</i>	
~10.5					MM9	MM-9 MM-8	<i>Bigenerina 2</i> <i>Textularia "W"</i>	
					MM7	MM-7 MM-6 MM-5	<i>Bigenerina humblei</i> <i>Cristellaria "I"</i> <i>Cibicides opima</i>	
					MM4	MM-4 MM-3 MM-2 MM-1	<i>Amphistegina "B"</i> <i>Robulus 43</i> <i>Cristellaria 54 / Eponides 14</i> <i>Gyroidina "K"</i>	
~18.5					LM4	LM-4 LM-3	<i>Discorbis "B"</i> <i>Marginulina "A"</i>	
					LM2	LM-2	<i>Siphonina davisi</i>	
~24.8				LM1	LM-1	<i>Lenticulina hanseni</i>		
~38.0			Oligocene	O		<i>Marginulina texana</i>		
~55.0			Eocene	E				
~63.0			Paleocene	L				
		Mesozoic	Cretaceous	Upper	UK		<i>Rotalipora cushmani</i>	
~97.5	Lower			LK		<i>Lenticulina washitaensis</i> <i>Fossocytheridea lenoirensis</i> <i>Cythereis fredericksburgensis</i> <i>Dictyoconus walnutensis</i> <i>Eocytheropteron trinitensis</i> <i>Orbitolina texana</i> <i>Choffatella decipiens</i> <i>Schuleridea lacustris</i>	<i>Favusella washitaensis</i> <i>Muderongia simplex</i> <i>Choffatella decipiens</i> <i>Polycostella senaria</i>	
~138.0	Jurassic		Upper	UU		<i>Pseudocyclammina jaccardi</i>	<i>Ctenidodinium penneum</i> <i>Epistomina uhligi</i> <i>Senoniasphaera jurassica</i> <i>Pseudocyclammina jaccardi</i>	
~163.0			Middle	MU			<i>Gonyaulacysta pectinigera</i> <i>Gonyaulacysta pachyderma</i>	
~183.0			Lower	LU				
~205.0	Triassic	Upper	UTR					

(Modified from Melancon, et al., 1995)

Figure 5. Chronostratigraphic chart.

salt tectonics is characteristic of the deepwater areas, as shown in the OCS G05889 No. 1 well in the Green Canyon 65 field (“Bullwinkle”).

During the Jurassic Period, massive amounts of salt precipitated as the Gulf of Mexico Basin was periodically separated from open ocean waters. Subsequent loading of the salt by large volumes of Mesozoic and Cenozoic sediments deformed the salt. Until relatively recently, almost all Gulf of Mexico salt structures were thought to be piercement-type structures connected to the original salt deposits. With recent developments in the collection and analysis of seismic data, the salt in the Gulf of Mexico is recognized to exist in a series of salt provinces, each having a distinct style of salt emplacement (figure 6; see figure 1 for location). Salt in the form of diapirs penetrated the late Miocene sediments, then flowed downdip due to the influence of gravity and pressure, resulting in large sheets of salt that deformed owing to subsequent sediment loading. The recognition that salt exists as lenses, winged salt piercements, and allochthonous sheets has led to the exploration of those sediments that lie below the salt. In 1993, the “Mahogany” prospect offshore Louisiana confirmed that the sediments that lie below salt can contain hydrocarbons in economic quantities.

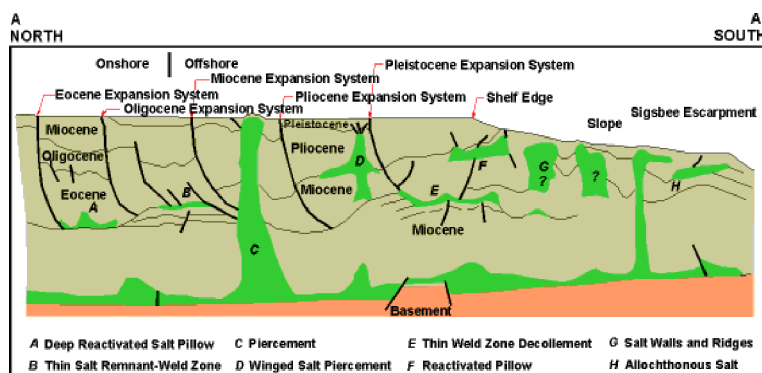


Figure 6. Cross section A-A' (Modified from Brooks, 1993).

DISCOVERIES

Since the first Federal oil and gas lease sale in 1954, there have been 71 lease offerings within the Cenozoic Province, resulting in over 11,000 leases encompassing approximately 57 million acres. In the more than 50 years of petroleum exploration in the Gulf of Mexico, over 31,000 boreholes have been drilled in the Federal waters of this Province. Since 1976, nearly 5.4 million line-miles of seismic data have been collected by industry in the area.

The Cenozoic Province contains total reserves of 14.996 Bbo and 172.713 Tcfg (45.728 BBOE), of which 9.337 Bbo and 112.434 Tcfg (29.344 BBOE) have been produced. The first reserves were discovered in the Province in 1947 (figure 7), and 914 proved and unproved fields have been discovered. The Province contains 8,845 producible sands in 2,172 pools (table 1), and 2,105 of these pools contain proved reserves (table 2).

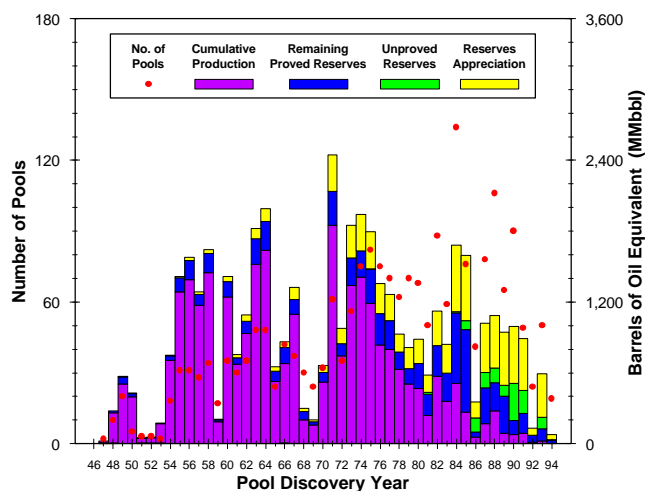


Figure 7. Exploration history graph.

Table 1. Characteristics of the discovered pools.

2,172 Pools (8,845 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	223	7,500
Subsea depth (feet)	950	7,831	19,216
Number of sands per pool	1	4	45
Porosity	14%	29%	39%
Water saturation	7%	28%	66%

ASSESSMENT RESULTS

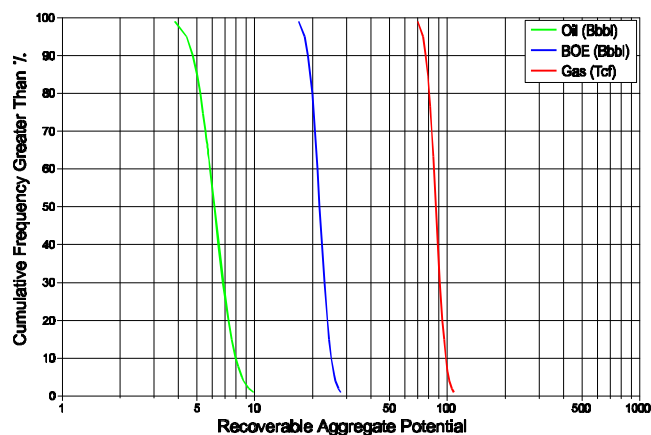
In the Cenozoic Province, Paleocene and Eocene sediments (except for the conceptual Perdido Fold Belt [O/E X] play) were not evaluated because the existence of reservoir-quality sands in the Federal offshore is highly unlikely. Because of a lack of well data and a limited amount of seismic data available beyond the Sigsbee Escarpment, the 3,000 meter water depth, which approximates the southern limit of the Sigsbee Escarpment, was used as the geographical cutoff for the assessment of the Cenozoic Province.

Fifty-two individual plays within the Gulf of Mexico Cenozoic Province have been identified. Fifty were assessed and two were unassessed, the Middle Pleistocene Caprock (MPL C) play and the Upper Pleistocene Caprock (UPL C) play. Both Caprock plays are established, but are unique and of such limited occurrence that additional discoveries are unlikely.

From the 50 assessed plays— 48 established, 1 frontier, and 1 conceptual— in the Gulf of Mexico Cenozoic Province, the mean total endowment is estimated at 21.287 Bbo and 260.266 Tcfg (67.598 BBOE) (table 2). Forty-three percent of this BOE mean total endowment has been produced.

The 95th- and 5th-percentile estimates of undiscovered resources in the Cenozoic Province are 4.428 to 8.584 Bbo and 74.766 to 101.639 Tcfg, respectively (figure 8). At mean levels, undiscovered resources are 6.291 Bbo and 87.553 Tcfg (21.870 BBOE). These undiscovered resources may occur in as many as 1,794 pools (figure 9).

The potential for significant additional discoveries on the shelf and slope of the central and western Gulf of Mexico is excellent, despite almost 50 years of extensive drilling in this area. The potential that does exist in the area,

**Figure 8.** Cumulative probability distribution.

however, is primarily dependent upon deeper drilling or discoveries being made in deepwater or subsalt, with the greatest part of the hydrocarbon potential of the Province, (72 percent in the mean case), occurring in deepwater fan deposits.

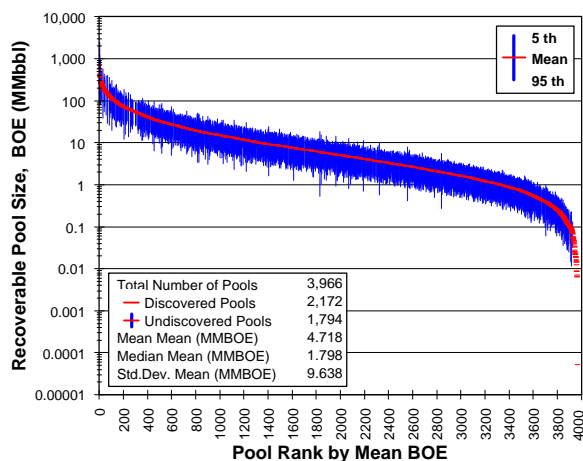


Figure 9. Pool rank plot.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	2,105	11.853	140.318	36.821
Cumulative production	--	9.337	112.434	29.344
Remaining proved	--	2.516	27.884	7.477
Unproved	67	0.638	3.006	1.172
Appreciation (P & U)	--	2.505	29.389	7.735
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	4.428	74.766	18.199
Mean	1,794	6.291	87.553	21.870
5th percentile	--	8.584	101.639	25.977
Total Endowment				
95th percentile	--	19.424	247.479	63.927
Mean	3,966	21.287	260.266	67.598
5th percentile	--	23.580	274.352	71.705

GULF OF MEXICO MESOZOIC PROVINCE

PROVINCE DESCRIPTION

The eastern portion of the Gulf of Mexico, a passive margin underlain by Mesozoic and Cenozoic sediments, extends from the Florida Peninsula Arch in the east and southeast, through the South Florida Basin, northwestward approximately to Mobile Bay, and provides an exploration frontier covering 76 million acres (119,000 square miles) (figure 1). The sedimentary section attains a thickness exceeding 30,000 feet in the South Florida Basin and eastern portion of the Gulf of Mexico Basin, and water depths range from approximately 10 to over 10,000 feet. Areas of potential discoveries within the Mesozoic section of the eastern Gulf of Mexico extend from the Louisiana-Mississippi border and the Alabama and Florida State-Federal boundaries, through the Tampa and South Florida Basins to the U.S.-Cuba International Boundary. Figure 2 illustrates the overall extent of the plays assessed within the Mesozoic Province.

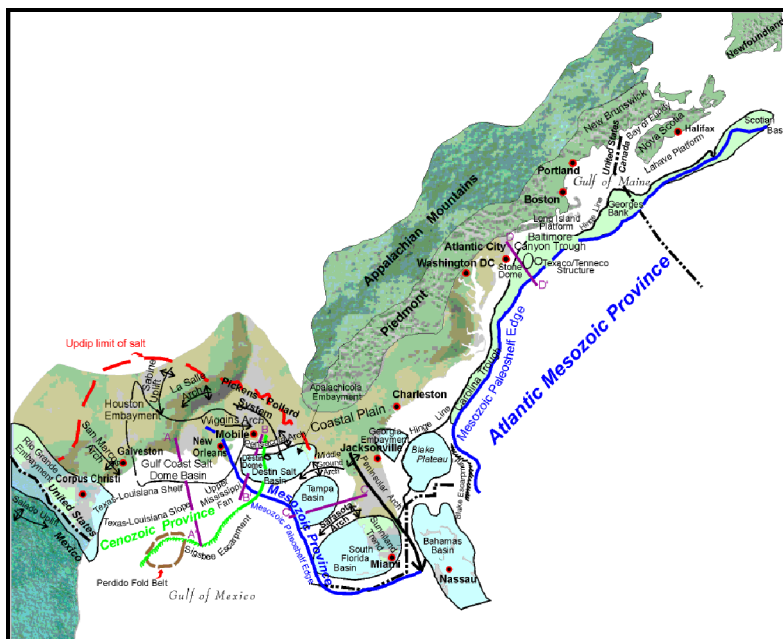


Figure 1. Physiographic map.

Areas of potential discoveries within the Mesozoic section of the eastern Gulf of Mexico extend from the Louisiana-Mississippi border and the Alabama and Florida State-Federal boundaries, through the Tampa and South Florida Basins to the U.S.-Cuba International Boundary. Figure 2 illustrates the overall extent of the plays assessed within the Mesozoic Province.

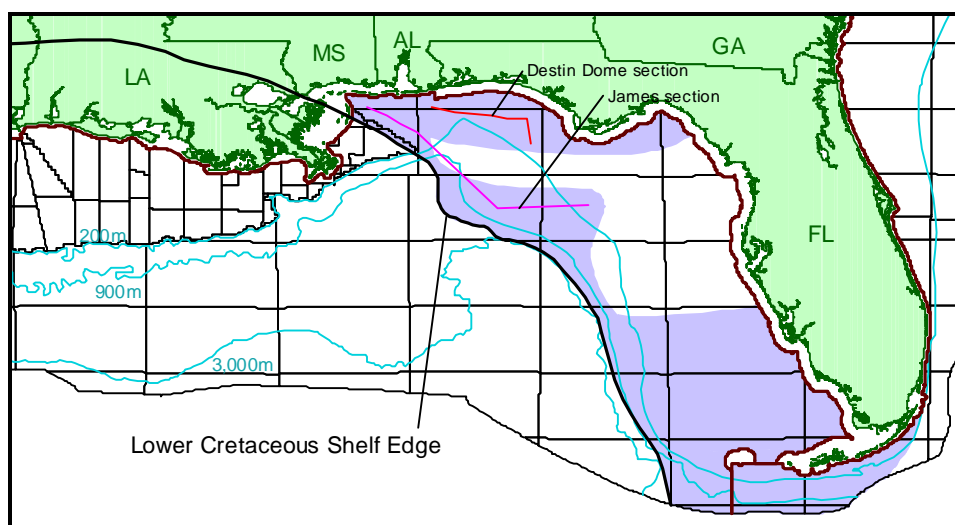


Figure 2. Map of assessed province.

Detailed paleontological analysis provided the basis for the Mesozoic chronostratigraphic chart (figure 3). The geologic history of the northern Gulf of Mexico during the Mesozoic began with the breakup of the Pangean supercontinent about 200

National Assessment Chronostratigraphy								
Geologic Time (M.Y.)	Province	System	Series	National Assessment Chronozone	Chronozone	Biozone		
						Gulf of Mexico	Atlantic	
~0.01	Cenozoic	Quaternary	Pleistocene	UPL	UPL-4 UPL-3 UPL-2 UPL-1	<i>Sangamon fauna</i> <i>Trimosina "A" 1st</i> <i>Trimosina "A" 2nd</i> <i>Hyalinea "B" / Trimosina "B"</i>		
				MPL	MPL-2 MPL-1	<i>Angulogerina "B" 1st</i> <i>Angulogerina "B" 2nd</i>		
				LPL	LPL-2 LPL-1	<i>Lenticulina 1</i> <i>Valvulineria "H"</i>		
~2.8		Tertiary	Pliocene	UP	UP	<i>Buliminella 1</i>		
				LP	LP	<i>Textularia "X"</i>		
~5.5			Miocene	UM	UM3	UM-3 UM-2	<i>Robulus "E" / Bigenerina "A"</i> <i>Cristellaria "K"</i>	
					UM1	UM-1	<i>Discorbis 12</i>	
					MM9	MM-9 MM-8	<i>Bigenerina 2</i> <i>Textularia "W"</i>	
~10.5				MM	MM7	MM-7 MM-6 MM-5	<i>Bigenerina humblei</i> <i>Cristellaria "I"</i> <i>Cibicides opima</i>	
					MM4	MM-4 MM-3 MM-2 MM-1	<i>Amphistegina "B"</i> <i>Robulus 43</i> <i>Cristellaria 54 / Eponides 14</i> <i>Gyroidina "K"</i>	
						LM4	LM-4 LM-3	<i>Discorbis "B"</i> <i>Marginulina "A"</i>
~18.5					LM2	LM-2	<i>Siphonina davisii</i>	
~24.8				LM1	LM-1	<i>Lenticulina hanseni</i>		
~38.0				Oligocene	O		<i>Marginulina texana</i>	
~55.0				Eocene	E			
~63.0		Paleocene	L					
		Mesozoic	Cretaceous	Upper	UK		<i>Rotalipora cushmani</i>	
~97.5				Lower	LK		<i>Lenticulina washitaensis</i> <i>Fossocytheridea lenoiresis</i> <i>Cythereis fredericksburgensis</i> <i>Dictyoconus walnutensis</i> <i>Eocytheropteron trinitensis</i> <i>Orbitolina texana</i> <i>Choffatella decipiens</i> <i>Schuleridea lacustris</i>	<i>Favusella washitaensis</i> <i>Muderongia simplex</i> <i>Choffatella decipiens</i> <i>Polycostella senaria</i>
~138.0	Jurassic		Upper	UU		<i>Pseudocyclammina jaccardi</i>	<i>Ctenidodinium penneum</i> <i>Epistomina uhligi</i> <i>Senoniasphaera jurassica</i> <i>Pseudocyclammina jaccardi</i>	
~163.0			Middle	MU			<i>Gonyaulacysta pectinigera</i> <i>Gonyaulacysta pachyderma</i>	
~183.0			Lower	LU				
~205.0	Triassic		Upper	UTR				

(Modified from Melancon, et al., 1995)

Figure 3. Chronostratigraphic chart.

million years ago. A series of late Triassic-early Jurassic rift basins formed as grabens in what is now onshore Georgia, Florida, Mississippi, Alabama, Louisiana, and Texas, as well as the central Gulf of Mexico. The Wiggins Arch and parts of the Sarasota Arch represent Paleozoic remnants left behind during the rifting stage (figure 1). The grabens were active depocenters receiving alluvial, fluvial, delta plain, lacustrine, and marine deposits similar to those found along the Atlantic margin. Marine incursions resulted in the deposition of thick shallow-water salt deposits in the Gulf of Mexico. The upper Jurassic is characterized by a series of clastic and carbonate regressive sequences, resulting in a seaward progradation of the shelf. As the shelf prograded, a shelf-edge reef complex developed in the early Cretaceous and continued growing through the late Cretaceous, resulting in deposition of a thick sequence of carbonate rocks that interfinger with clastics in the back-reef area.

Figure 5 illustrates the stratigraphic and lithologic relationships of the formations overlying the Louann Salt from the onshore to the Federal OCS (see figure 1 for location and figure 4 for stratigraphy). The maximum thicknesses attained by the upper Jurassic sediments exceed 5,000 feet, the lower Cretaceous 10,000 feet, and the upper Cretaceous 5,000 feet.

Three prospective chronozones have been identified in the Gulf of Mexico Mesozoic Province: upper Jurassic (UU), lower Cretaceous (LK), and upper Cretaceous (UK). Potential traps are related to folded structures, faults (normal and growth), and permeability pinchouts against nonporous shales, evaporites, and carbonates. The Destin Dome section (see figure 2 for location and figure 4 for stratigraphy) shows the sequence of Mesozoic clastics and carbonates and their characteristic log signatures in the Federal OCS area (this cross section is too large to be presented in text format, but

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Flays	Atlantic Basin/ Scotian Basin	Atlantic Flays	
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Fine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SSMbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sligo (Fattet) Fm Hobston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AUU CB AMU CL AMU CB
	Middle		Non-Deposition			
	Lower	Louann Salt			Argo Salt	
Triassic	Upper	Eagle Mills Fm	Basement		Eurdice Fm	
		Basement			Basement	

Rock unit positions do not imply age relationships between basins.

Figure 4. Stratigraphic column.

is available for viewing in the interactive report). These regionally extensive sediments exhibit thinning over the Destin Dome, indicative of the area's upwarping during the Cretaceous.

Of the upper Jurassic formations present in the area and shown in figure 5 and on the Destin Dome section, the Norphlet is the primary exploration target in Federal waters.

Exploration targets for the Cretaceous differ depending on the geologic setting. In the Viosca Knoll and Destin Dome Areas, the Lower Cretaceous James Formation is the principal target (see figure 2 for location and figure 4 for stratigraphy) (this cross section is too large to be presented in text format, but is available for viewing in the interactive report). In offshore Florida, the Sunniland Formation, or its stratigraphic equivalent, and the Brown Dolomite Zone of the Lehigh Acres Formation have the greatest reservoir potential. These formations and their stratigraphic relationships are illustrated in Figure 6 (see figure 1 for location and figure 4 for stratigraphy).

DISCOVERIES

Federal oil and gas lease sales have been held for the Mesozoic Province since 1959. Nearly 500 leases encompassing 2.5 million acres have been awarded. Approximately 125 wells targeting or penetrating the Mesozoic section have been drilled with approximately 27 finding commercially recoverable hydrocarbons (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). The remaining offshore wells are dry or have encountered subeconomic quantities of hydrocarbons.

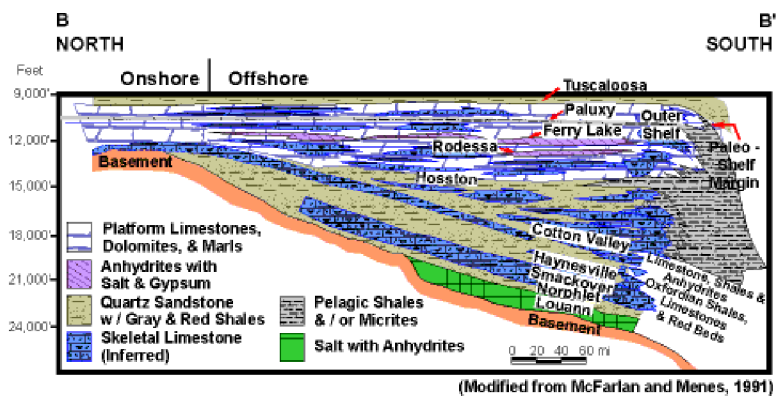


Figure 5. Cross section B-B'.

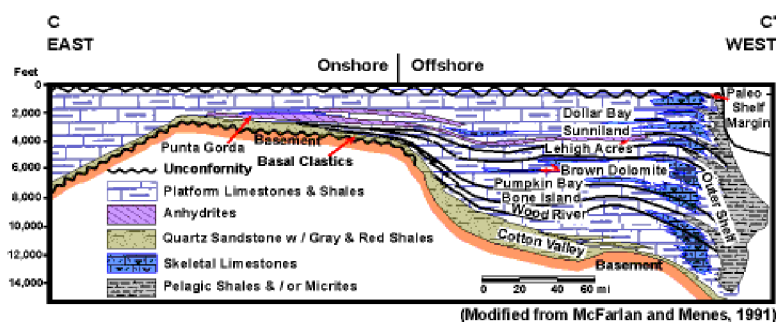


Figure 6. Cross section C-C'.

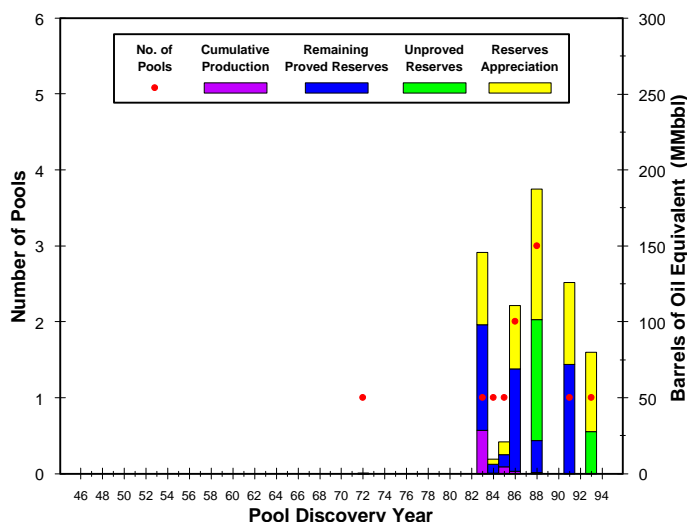


Figure 7. Exploration history graph.

The Mesozoic Province contains total reserves of 0.003 Bbo and 3.809 Tcfg (0.681 BBOE), of which less than 0.001 Bbo and 0.198 Tcfg (0.035 BBOE) have been produced. The first reserves were discovered in the Province in 1972 (figure 7). The Province contains 11 producible sands in 11 pools (table 1), and nine of these pools contain proved reserves (table 2).

Table 2. Characteristics of the discovered pools.

11 Pools (11 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	37	89	288
Subsea depth (feet)	8,700	19,974	22,600
Number of sands per pool	1	1	1
Porosity	10%	13%	20%
Water saturation	19%	31%	52%

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	9	<0.001	1.572	0.280
Cumulative production	--	<0.001	0.198	0.035
Remaining proved	--	<0.001	1.374	0.245
Unproved	2	0.001	0.597	0.107
Appreciation (P & U)	--	0.002	1.640	0.294
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	1.360	7.106	2.678
Mean	179	2.053	8.108	3.495
5th percentile	--	2.933	9.194	4.455
Total Endowment				
95th percentile	--	1.363	10.915	3.359
Mean	190	2.056	11.917	4.176
5th percentile	--	2.936	13.003	5.136

ASSESSMENT RESULTS

Potential Mesozoic reservoirs are postulated within the Mississippi fan and Perdido foldbelts and other large structures of the deepwater central and western Gulf of Mexico. The existence of these reservoirs below Cenozoic sediments is highly speculative. These potential plays were not assessed at this time due to their low probability of existence and the high degree of uncertainty concerning their reservoir characteristics and the actual occurrence of hydrocarbon accumulations.

The dominantly evaporitic sediments of the Upper Triassic Series, the Lower Jurassic Series, and the Middle Jurassic Series were not considered to be of reservoir quality. Sediment type and lack of any onshore analogs provided the basis for condemning these deposits. As with the Cenozoic sediments, Mesozoic sediments beyond the 3,000 meter water depth were not assessed.

Nine individual plays within the Gulf of Mexico Mesozoic Province have been identified, two of which are established, four are frontier, and three are conceptual. Seven were assessed and two, the conceptual Middle Jurassic to Upper Jurassic Florida Basal Clastic (MU-UU FBCL) play and the conceptual Upper Jurassic to Lower Cretaceous Transition Zone (UU-LK TZ) play, were unassessed due to poor reservoir potential and a lack of source rock potential, respectively.

The mean total endowment for the seven assessed plays in the Mesozoic Province is estimated at 2.056 Bbo and 11.917 Tcfg (4.176 BBOE) (table 2). Less than 1 percent of this BOE mean total endowment has been produced.

The 95th- and 5th-percentile estimates of undiscovered resources in the Mesozoic Province are 1.360 to 2.933 Bbo and 7.106 to 9.194 Tcfg, respectively (figure 8). These undiscovered resources may occur in as many as 179 pools (figure 9).

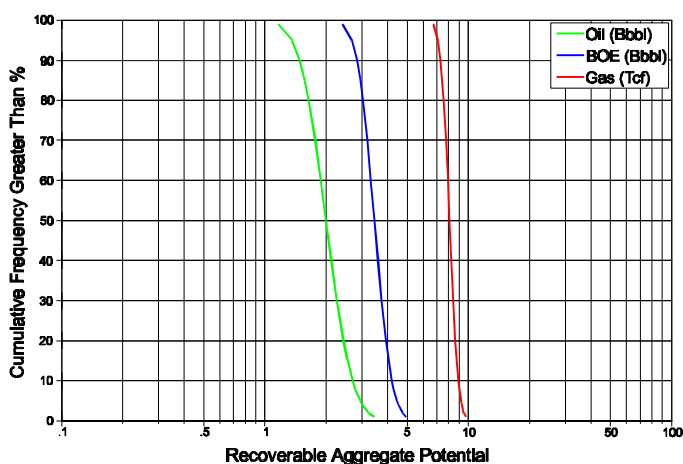


Figure 8. Cumulative probability distribution.

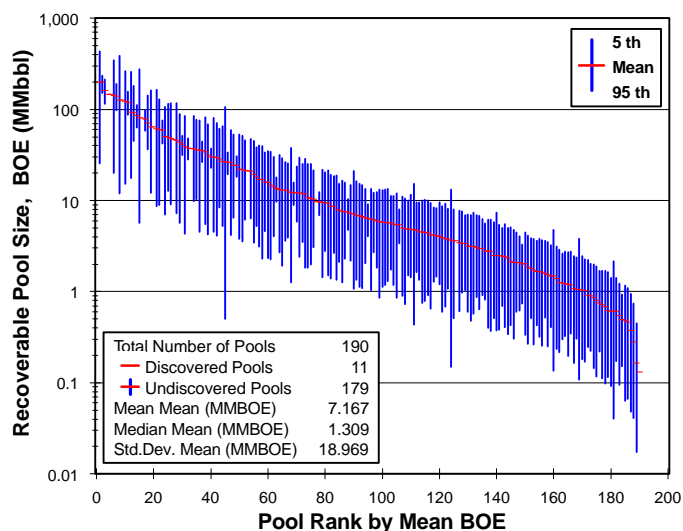


Figure 9. Pool rank plot.

ATLANTIC MESOZOIC PROVINCE

PROVINCE DESCRIPTION

The Atlantic OCS is a passive margin, underlain by Mesozoic and Cenozoic sediments, extending from the U.S.-Canadian offshore border to the Florida Peninsular Arch (figure 1). The margin encompasses an area of approximately 135 million acres (211,000 square miles). In the northern and central portions of the Province, the sediments underlying the shelf are siliciclastic, derived from erosion of the Appalachian Mountain System, and platform and reefal carbonates immediately seaward of the terrigenous detritus.

Carbonate rocks predominate in the southern portion of the Atlantic OCS. The sedimentary section attains thicknesses exceeding 40,000 feet, and water depths range from approximately 80 to more than 10,000 feet. Figure 2 illustrates the overall extent of the assessed plays within the Atlantic Mesozoic Province.

Late Triassic continental rifting initiated a system of faults paralleling the Appalachian Mountains and extending from southeast Newfoundland to southeast Georgia and then westward into Texas. These faults developed into rift basins filled with nonmarine red bed and lacustrine deposits. The easternmost band of these rifts functioned as southwestward extensions of the Tethys Seaway, accommodating marine sediments, including evaporites. A regional post rift unconformity (PRU) overlies the rift sedimentary sequence under the shelf. The PRU represents a 20-million-year hiatus and

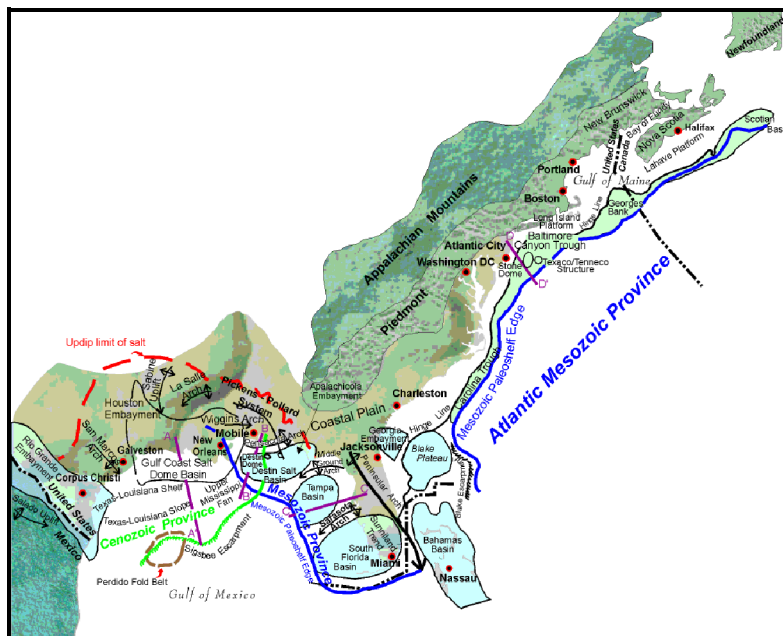


Figure 1. Physiographic map.

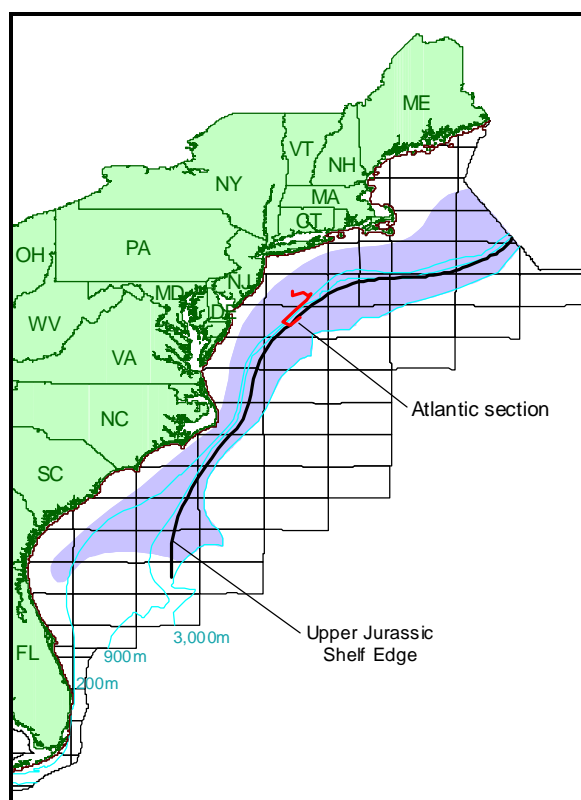


Figure 2. Map of assessed province.

National Assessment Chronostratigraphy							
Geologic Time (M.Y.)	Province	System	Series	National Assessment Chronozone	Chronozone	Biozone	
						Gulf of Mexico	Atlantic
~0.01	Cenozoic	Quaternary	Pleistocene	UPL	UPL-4 UPL-3 UPL-2 UPL-1	<i>Sangamon fauna</i> <i>Trimosina "A" 1st</i> <i>Trimosina "A" 2nd</i> <i>Hyalinea "B" / Trimosina "B"</i>	
MPL				MPL-2 MPL-1	<i>Angulogerina "B" 1st</i> <i>Angulogerina "B" 2nd</i>		
LPL				LPL-2 LPL-1	<i>Lenticulina 1</i> <i>Valvulineria "H"</i>		
~2.8		Tertiary	Pliocene	UP	UP	<i>Buliminella 1</i>	
~5.5				LP	LP	<i>Textularia "X"</i>	
~10.5			Miocene	UM3	UM-3 UM-2	<i>Robulus "E" / Bigenerina "A"</i> <i>Cristellaria "K"</i>	
				UM1	UM-1	<i>Discorbis 12</i>	
				MM9	MM-9 MM-8	<i>Bigenerina 2</i> <i>Textularia "W"</i>	
MM7				MM-7 MM-6 MM-5	<i>Bigenerina humblei</i> <i>Cristellaria "I"</i> <i>Cibicides opima</i>		
MM4				MM-4 MM-3 MM-2 MM-1	<i>Amphistegina "B"</i> <i>Robulus 43</i> <i>Cristellaria 54 / Eponides 14</i> <i>Gyroldina "K"</i>		
~18.5				LM4	LM-4 LM-3	<i>Discorbis "B"</i> <i>Marginulina "A"</i>	
~24.8			LM2	LM-2	<i>Siphonina davisii</i>		
~24.8			LM1	LM-1	<i>Lenticulina hanseni</i>		
~38.0		Oligocene	O		<i>Discorbis Zone</i>		
~38.0		Eocene	E				
~55.0		Paleocene	L				
~63.0		Mesozoic	Cretaceous	Upper	UK	<i>Globotruncana elevata</i> <i>Rotalipora cushmani</i>	<i>Globotruncana mayaroensis</i> <i>Marthasterites furcatus</i> <i>Rotalipora cushmani</i>
~97.5				Lower	LK	<i>Lenticulina washitaensis</i> <i>Fossocytheridea lenoiresis</i> <i>Cythereis fredericksburgensis</i> <i>Dictyoconus walnutensis</i> <i>Eocytheropteron trinitensis</i> <i>Orbitolina texana</i> <i>Choffatella decipiens</i> <i>Schuleridea lacustris</i> <i>Schuleridea acuminata</i>	<i>Favusella washitaensis</i> <i>Muderongia simplex</i> <i>Choffatella decipiens</i> <i>Polycostella senaria</i>
~138.0			Jurassic	Upper	UU	<i>Pseudocyclammia jaccardi</i>	<i>Ctenidodinium penneum</i> <i>Epistomina uhligi</i> <i>Senoniasphaera jurassica</i> <i>Pseudocyclammia jaccardi</i>
~163.0				Middle	MU		<i>Gonyaulacysta pectinigera</i> <i>Gonyaulacysta pachyderma</i>
~183.0	Lower			LU			
~205.0	Triassic		Upper	UTR			

(Modified from Melancon, et al., 1995)

Figure 3. Chronostratigraphic chart.

is overlain by the middle Jurassic to recent sediments. As evident from seismic data, the postrift sequence is structurally uncomplicated; growth faults, which appear to sole out into deep strata, and their associated rollover structures follow the northeast-southwest regional structural grain. Jurassic sediments include siliciclastic basin infill and platform carbonates. The maximum thickness attained by the middle Jurassic sediments exceeds 10,000 feet, the upper Jurassic 6,000 feet, the lower and upper Cretaceous 5,000 feet each, and the Cenozoic 3,000 feet. Detailed paleontological analysis provided the basis for the Mesozoic chronostratigraphic chart (figure 3). Three prospective chronozones have been identified in the Atlantic Mesozoic Province: middle Jurassic (AMU), upper Jurassic (AUU), and lower Cretaceous (ALK). Figure 4 and figure 5 illustrate the stratigraphic relationships of the Mesozoic sediments of the Atlantic OCS area (see figure 1 for location of figure 4).

DISCOVERIES

In 1976, the first U.S. Atlantic offshore lease sale was held, Mid-Atlantic Sale 40, in the Baltimore Canyon Trough area. Successful bids were submitted for 93 leases, which included both the Great Stone Dome and the Hudson Canyon 598-642

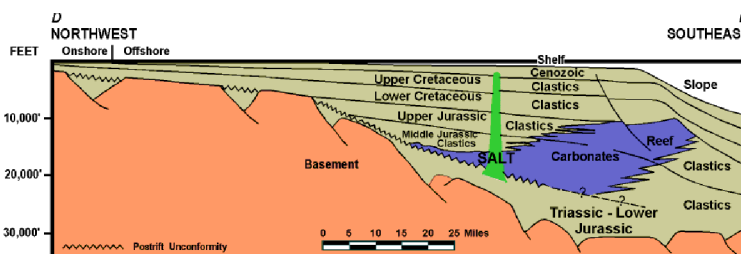


Figure 4. Cross section D-D'.

National Assessment Mesozoic Stratigraphy							
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Flays	Atlantic Basin/ Scotian Basin	Atlantic Flays		
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Fine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SSMbr Sable Island Mbr	AUK CL	
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringport Fm Ferry Lake Fm Roderessa Fm James Fm Pine Island Fm Sigo (Rettet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Ebne Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL	
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AMU CL	AUU CB AMU CB
	Middle	Louann Salt	Non-Deposition				
	Lower		Basement		Argo Salt		
Triassic	Upper	Eagle Mills Fm Basement			Eurdice Fm Basement		

Rock unit positions do not imply age relationships between basins.

Figure 5. Stratigraphic column.

(Texaco/Tenneco) structures. The former prospect was tested by seven exploration wells, which were all dry, and the latter by eight wells, five of which had significant but subeconomic hydrocarbon flows, mostly natural gas, from lower Cretaceous siliciclastics

(the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). The Atlantic Mesozoic Province cross section (see figure 2 for location) is a regional cross section showing wells drilled on the Great Stone Dome and the Texaco/Tenneco structure (this cross section is too large to be presented in text format, but is available for viewing in the interactive report).

A total of nine Atlantic OCS sales have occurred in the North, Mid-, and South Atlantic Planning Areas. Fifty-one wells were drilled, five of which were Continental Offshore Stratigraphic Test (COST) wells sited off-structure by industry consortiums in the 1970's to gain stratigraphic data. Most of the exploration wells were drilled on paleoshelf anticlinal structures, targeting siliciclastic reservoirs. However, three wells (Shell Wilmington Canyon 372-1, 586-1, and 587-1) tested the upper Jurassic-lower Cretaceous shelf-edge reef, backreef, and carbonate platform offshore New Jersey. One well (Shell Baltimore Rise 93-1) near the shelf edge penetrated a thick lower Cretaceous deltaic sequence offshore Maryland. Excluding the Texaco/Tenneco structure, all wells were dry or contained only minor shows. Altogether, 433 Federal leases have been issued in the Atlantic Region for petroleum exploration. As of January 1, 1995, 53 leases (all in the Mid- and South Atlantic Planning Areas) remain active under Suspensions of Operation.

ASSESSMENT RESULTS

Eleven individual plays within the Atlantic Mesozoic Province have been identified, of which 5 are assessed frontier plays and 6 are unassessed conceptual plays. The mean total endowment, which equals the mean undiscovered resources, for the Atlantic Mesozoic Province is estimated at 2.271 Bbo and 27.480 Tcfg (7.161 BBOE) (table 1). The 95th- and 5th-percentile estimates of undiscovered resources in the Province are 1.267 to 3.667 Bbo and 15.855 to 43.372 Tcfg (figure 6). These undiscovered resources may occur in as many as 502 pools (figure 7).

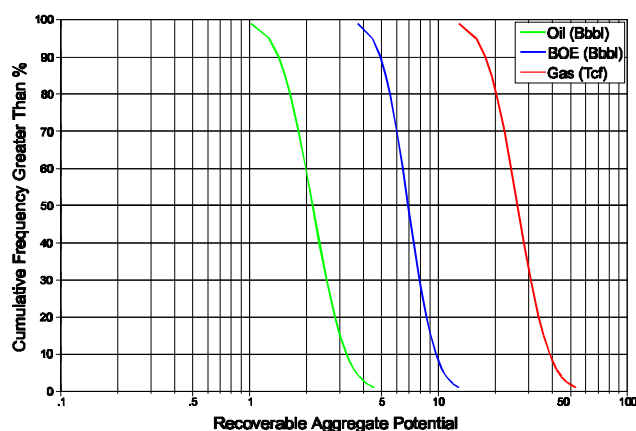


Figure 6. Cumulative probability distribution.

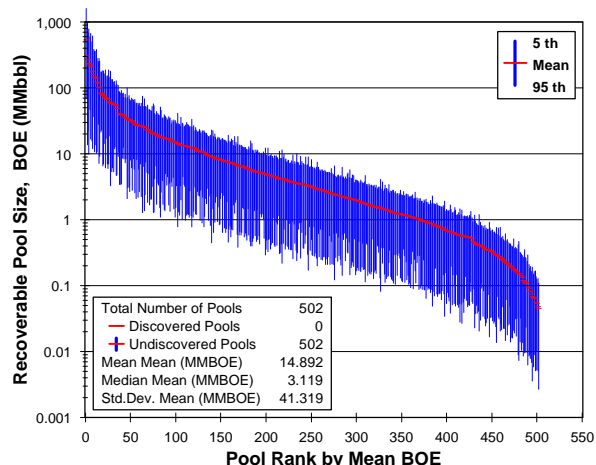


Figure 7. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	1.267	15.855	4.475
Mean	502	2.271	27.480	7.161
5th percentile	--	3.667	43.372	10.684
Total Endowment				
95th percentile	--	1.267	15.855	4.475
Mean	502	2.271	27.480	7.161
5th percentile	--	3.667	43.372	10.684

QUATERNARY SYSTEM

The Quaternary System contains only one series [see Pleistocene Series].

TERTIARY SYSTEM

SYSTEM DESCRIPTION

The Tertiary System comprises the Oligocene/Eocene, Miocene, and Pliocene Series of the Gulf of Mexico Cenozoic Province. Thirty-nine established plays, one frontier play, and one conceptual play were identified and assessed by either their depositional style (retrogradational, aggradational, progradational, or fan) or their structural style for the Tertiary System. Figure 1 illustrates the overall extent of these plays.

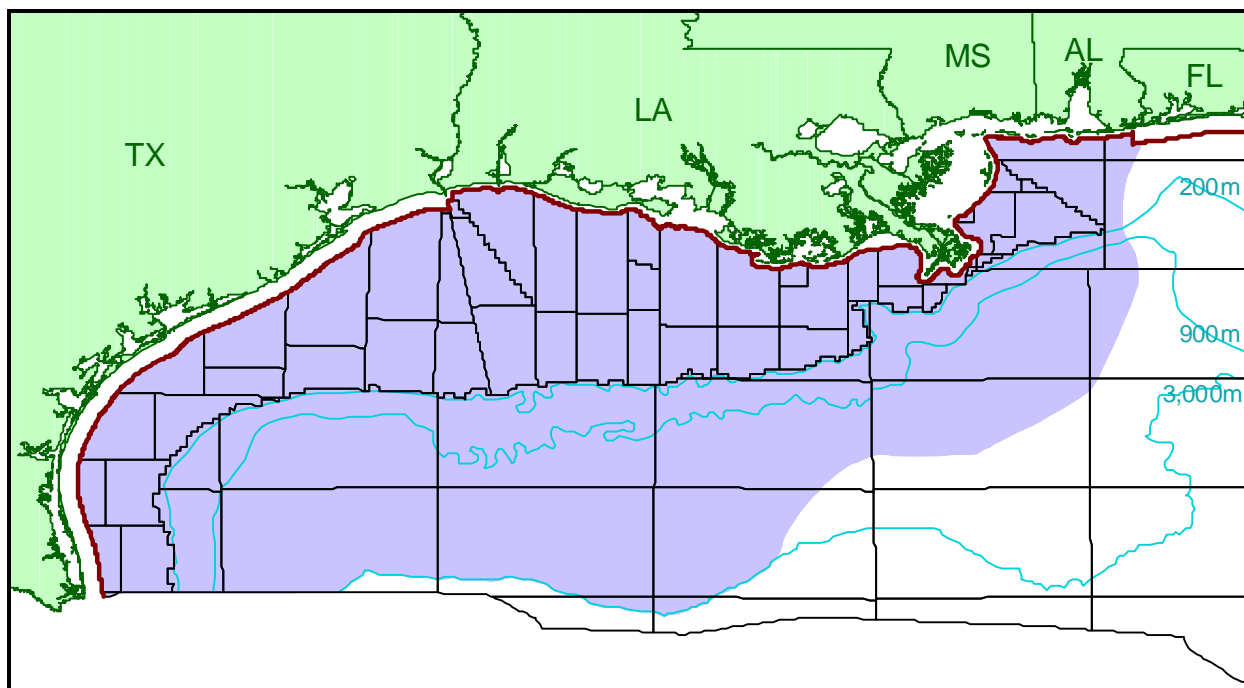


Figure 1. Map of assessed system.

DISCOVERIES

The Tertiary System contains 1,308 discovered pools (table 1). Though the number of discoveries per year peaked in the 1980's, over 70 percent of the total reserves for the Tertiary System were added prior to that decade (figure 2). In addition, almost 90 percent of the cumulative production for the Tertiary System has been from discoveries made prior to 1980.

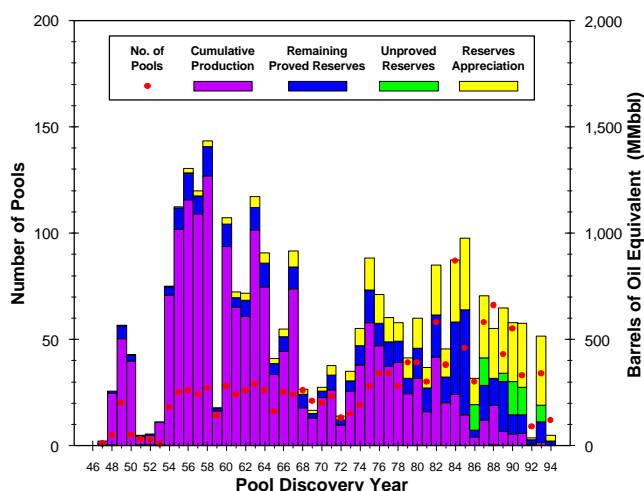


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

1,308 Pools (5,114 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	173	7,500
Subsea depth (feet)	1,500	8,938	19,216
Number of sands per pool	1	4	45
Porosity	14%	28%	39%
Water saturation	9%	29%	66%

Assessment Results

The Tertiary System contains 2,520 pools (1,308 discovered pools plus 1,212 undiscovered pools), with a mean total endowment of 12.795 Bbo and 158.396 Tcfg (40.980 BBOE) (table 2 and figure 3). Undiscovered resources have a range of 2.198 to 5.574 Bbo and 46.782 to 66.272 Tcfg at the 95th and 5th percentiles, respectively (figure 4). At mean levels, the undiscovered resources in the Tertiary System are estimated at 3.643 Bbo and 55.994 Tcfg (13.607 BBOE).

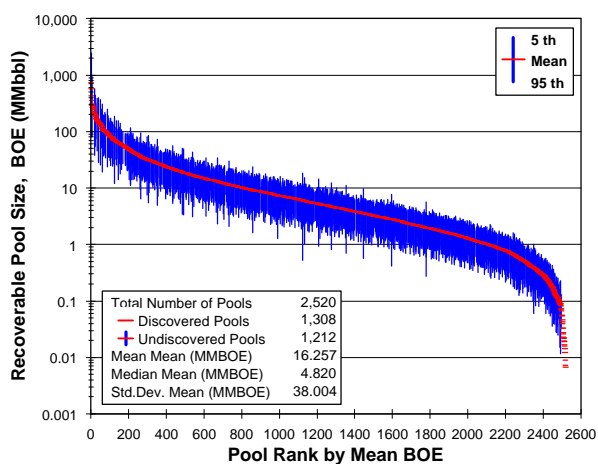
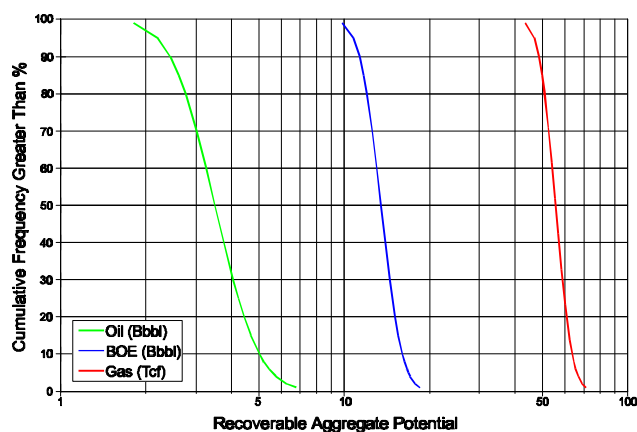
**Figure 3.** Pool rank plot.**Figure 4.** Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1,277	7.537	83.183	22.338
Cumulative production	--	6.078	66.350	17.884
Remaining proved	--	1.458	16.833	4.453
Unproved	31	0.314	1.918	0.656
Appreciation (P & U)	--	1.301	17.300	4.379
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	2.198	46.782	10.785
Mean	1,212	3.643	55.994	13.607
5th percentile	--	5.574	66.272	16.854
Total Endowment				
95th percentile	--	11.350	149.184	38.158
Mean	2,520	12.795	158.396	40.980
5th percentile	--	14.726	168.674	44.227

CRETACEOUS SYSTEM

SYSTEM DESCRIPTION

The Cretaceous System comprises the Lower Cretaceous and the Upper Cretaceous Series in the Gulf of Mexico Mesozoic Province. Five plays were identified and assessed in the Cretaceous System, one established play, three frontier plays, and one conceptual play. Figure 1 illustrates the overall extent of these plays.

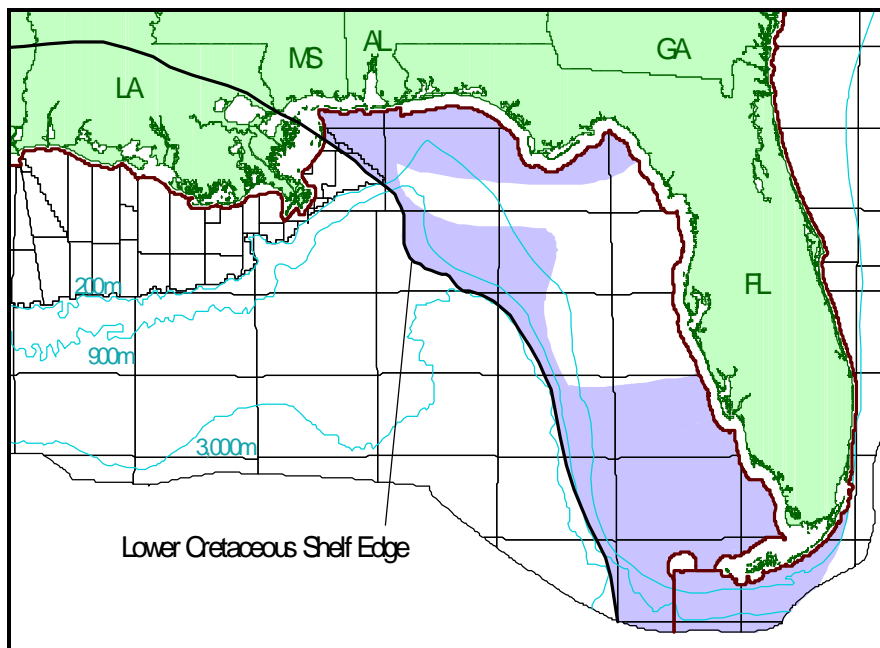


Figure 1. Map of assessed system.

DISCOVERIES

Of the five plays in the System, the Lower Cretaceous Shelf-Margin Carbonate (LK CB) play is the only play that has discovered pools, with two (table 1 and figure 2).

ASSESSMENT RESULTS

The Cretaceous System contains 144 pools (2 discovered pools plus 142 undiscovered pools), with a mean total endowment of 1.436 Bbo and 1.375 Tcfg (1.680 BBOE) (table 2 and figure 3).

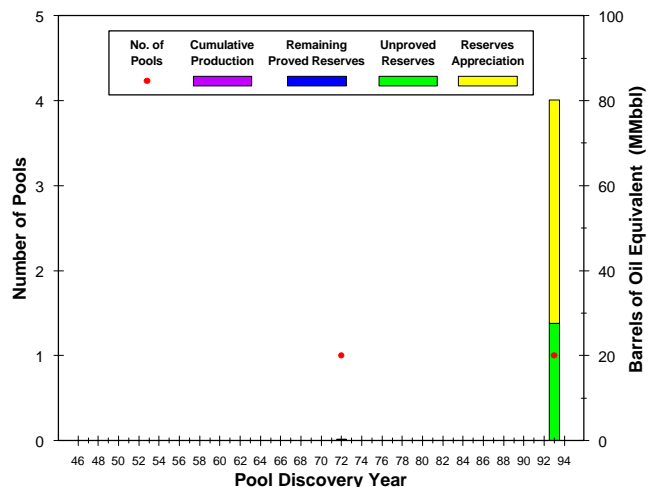


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

2 Pools (2 Reservoirs)	Minimum	Mean	Maximum
Water depth (feet)	120	204	288
Subsea depth (feet)	8,700	11,500	14,300
Number of reservoirs per pool	1	1	1
Porosity	10%	15%	20%
Water saturation	26%	29%	32%

Undiscovered resources have a range of 0.905 to 2.121 Bbo and 0.519 to 1.525 Tcfg at the 95th and 5th percentiles, respectively (figure 4). At mean levels, the undiscovered resources in the Cretaceous System are estimated at 1.433 Bbo and 0.939 Tcfg (1.600 BBOE).

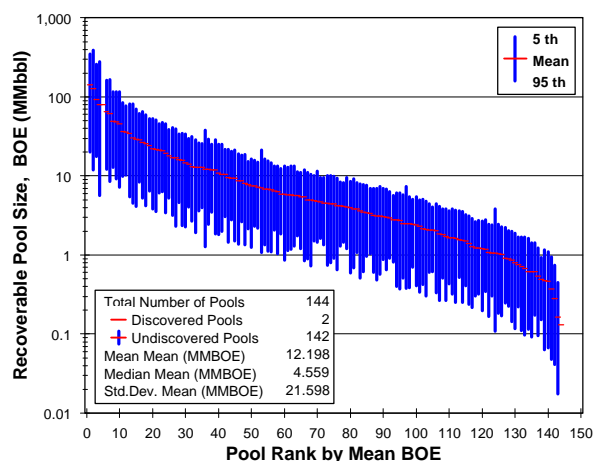


Figure 3. Pool rank plot.

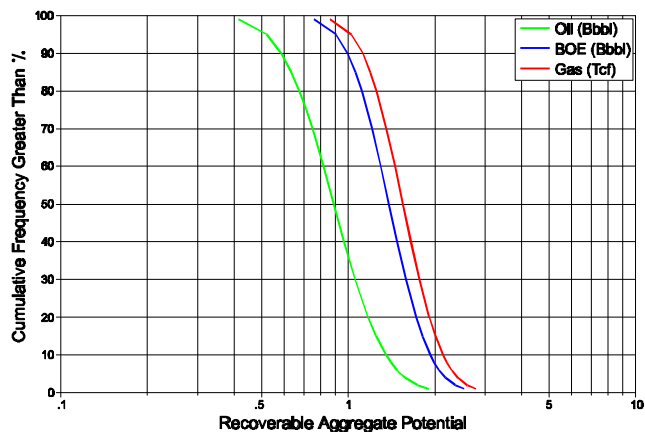


Figure 4. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1	<0.001	<0.001	<0.001
Cumulative production	--	<0.001	<0.001	<0.001
Remaining proved	--	0.000	0.000	0.000
Unproved	1	0.001	0.150	0.028
Appreciation (P & U)	--	0.002	0.285	0.052
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.905	0.519	1.026
Mean	142	1.433	0.939	1.600
5th percentile	--	2.121	1.525	2.343
Total Endowment				
95th percentile	--	0.908	0.955	1.106
Mean	144	1.436	1.375	1.680
5th percentile	--	2.124	1.961	2.423

JURASSIC SYSTEM

The Jurassic System comprises the Lower, Middle, and Upper Jurassic Series. However, only the Upper Jurassic Series contains assessed plays. The Upper Jurassic Series contains only one chronozone [see Upper Jurassic (UU) Chronozone].

TRIASSIC SYSTEM

The Triassic System comprises the Upper Triassic Series, which contains only one chronozone [see Upper Triassic (UTR) chronozone].

ATLANTIC CRETACEOUS SYSTEM

The Atlantic Cretaceous System comprises the Lower and Upper Cretaceous Series. However, only the Atlantic Lower Cretaceous Series contains a chronozone with an assessed play [see Atlantic Lower Cretaceous Clastic (ALK CL) play].

ATLANTIC JURASSIC SYSTEM

SYSTEM DESCRIPTION

The Atlantic Jurassic System comprises the Lower, Middle, and Upper Jurassic Series. Four frontier and three conceptual plays are identified within the Atlantic Jurassic System. However, only the four frontier plays are assessed. The three conceptual plays were not assessed due to poor source rock potential and lack of known hydrocarbons in structurally analogous areas. Figure 1 illustrates the overall extent of the assessed plays in the Atlantic Jurassic System.

DISCOVERIES

No pools in the Atlantic Jurassic System have as yet been discovered in the Federal OCS area.

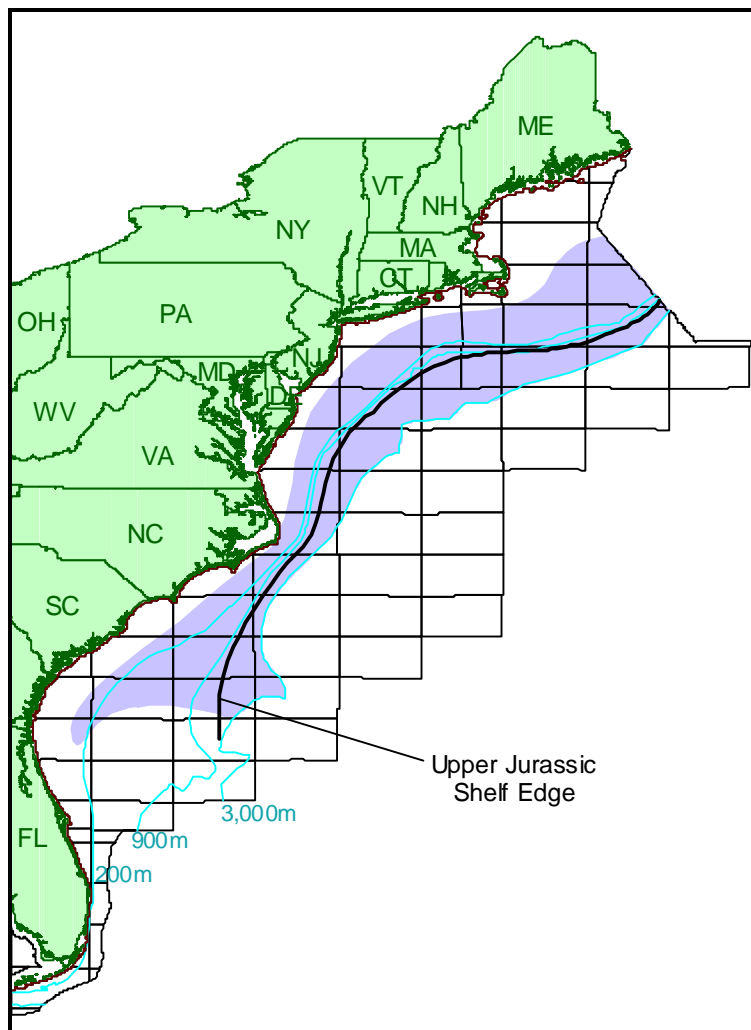


Figure 1. Map of assessed system.

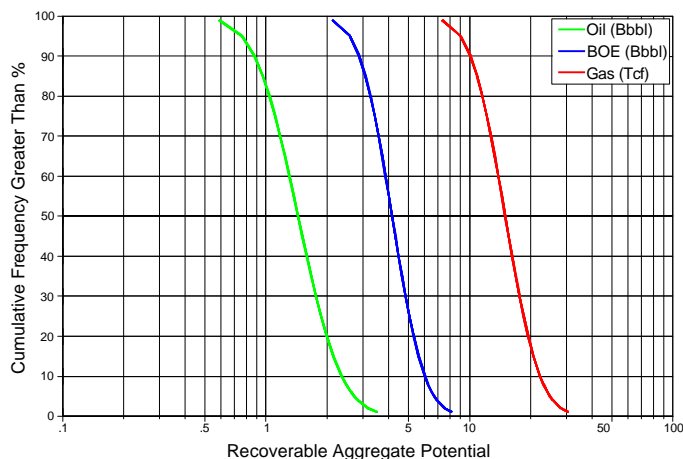


Figure 2. Cumulative probability distribution.

ASSESSMENT RESULTS

Undiscovered resources for the Atlantic Jurassic System have a range of 0.762 to 2.714 Bbo and 9.040 to 24.847 Tcfg at the 95th and 5th percentiles, respectively (figure 2 and table 1). At mean levels, the undiscovered resources are estimated

at 1.549 Bbo and 15.712 Tcfg (4.345 BBOE). These undiscovered resources may occur in as many as 382 pools (figure 3).

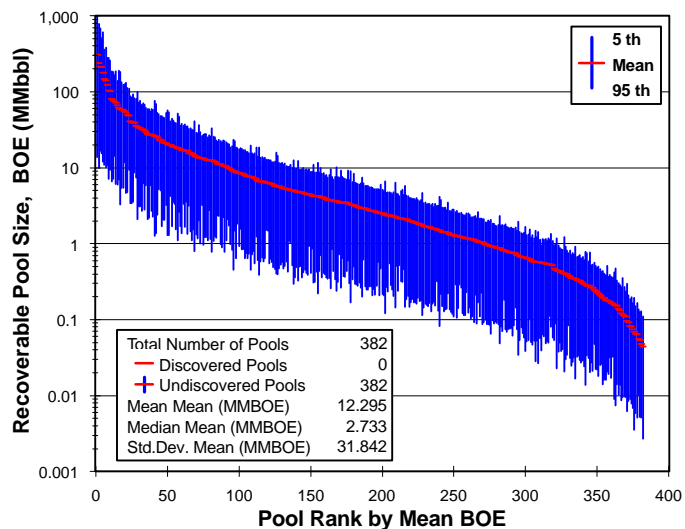


Figure 3. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.762	9.040	2.584
Mean	382	1.549	15.712	4.345
5th percentile	--	2.714	24.847	6.716
Total Endowment				
95th percentile	--	0.762	9.040	2.584
Mean	382	1.549	15.712	4.345
5th percentile	--	2.714	24.847	6.716

ATLANTIC TRIASSIC SYSTEM

The Atlantic Triassic System comprises the Atlantic Upper Triassic Series, which contains only one chronozone [see Atlantic Upper Triassic (AUTR) chronozone].

PLEISTOCENE SERIES

SERIES DESCRIPTION

The Pleistocene Series comprises the lower Pleistocene (LPL), middle Pleistocene (MPL), and upper Pleistocene (UPL) chronozones. Nine established plays were identified by their retrogradational, aggradational, progradational, or fan depositional styles and assessed. In addition, two unassessed plays—the Middle Pleistocene Caprock (MPL C) play and the Upper Pleistocene Caprock (UPL C) play—that contain reserves are included in the Pleistocene Series. Both Caprock plays are established, but are unique and of such limited occurrence that additional discoveries are unlikely. Figure 1 illustrates the overall extent of the plays in the Pleistocene Series.

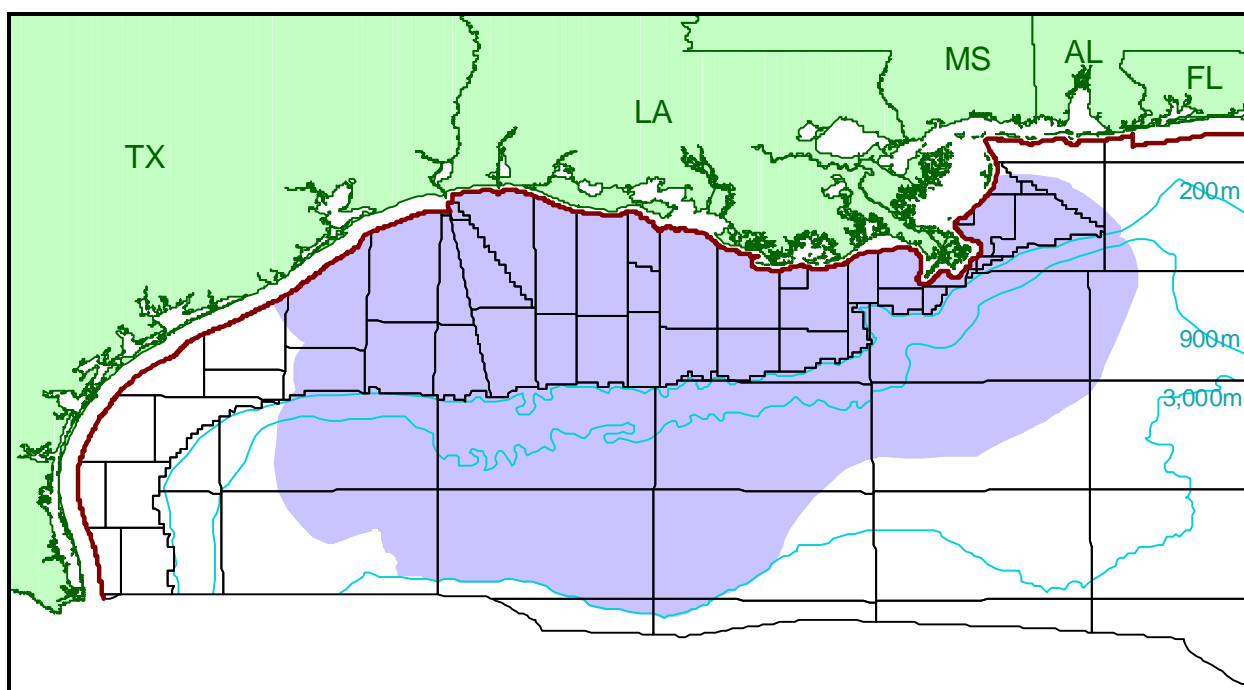


Figure 1. Map of assessed series.

DISCOVERIES

The Pleistocene Series contains 864 discovered pools, with the earliest discovery dating back to 1947 (table 1 and figure 2). The number of pool discoveries per year substantially increased after 1970. Discoveries made from 1971 through 1977 account for over 40 percent of the total reserves and over 50 percent of the cumulative production for the Pleistocene Series.

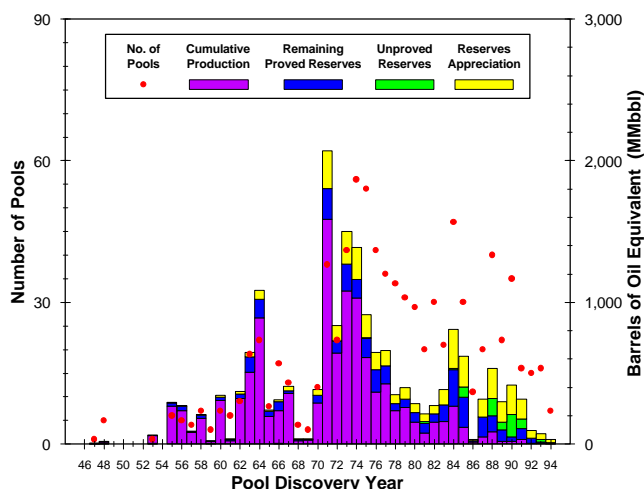


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

864 Pools (3,731 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	298	6,950
Subsea depth (feet)	950	6,154	16,950
Number of sands per pool	1	4	42
Porosity	17%	30%	38%
Water saturation	7%	26%	62%

ASSESSMENT RESULTS

The Pleistocene Series contains 1,446 pools (864 discovered pools plus 582 undiscovered pools), with a mean total endowment of 8.492 Bbo and 101.871 Tcfg (26.618 BBOE) (table 2 and figure 3). This is the second largest of the 11 Gulf of Mexico Region Series, based on BOE.

The Pleistocene Series also contains the second largest amount of BOE mean undiscovered resources of the 11 Series, with 2.648 Bbo and 31.560 Tcfg (8.263 BBOE). These undiscovered resources have a range of 2.064 to 3.326 Bbo and 26.116 to 37.668 Tcfg at the 95th and 5th percentiles, respectively (figure 4).

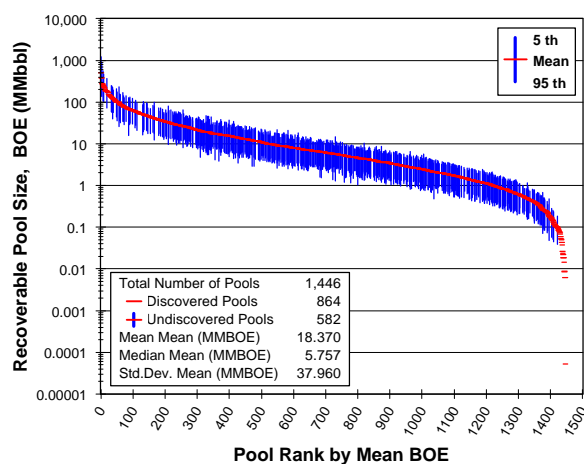
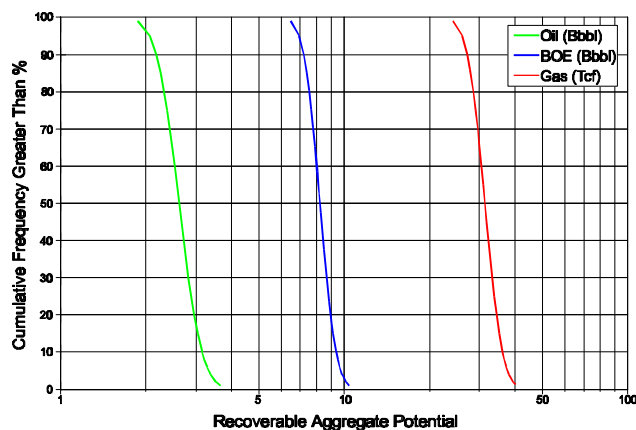
**Figure 3.** Pool rank plot.**Figure 4.** Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	828	4.317	57.136	14.483
Cumulative production	--	3.259	46.084	11.459
Remaining proved	--	1.058	11.051	3.024
Unproved	36	0.323	1.088	0.517
Appreciation (P & U)	--	1.204	12.088	3.355
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	2.064	26.116	6.944
Mean	582	2.648	31.560	8.263
5th percentile	--	3.326	37.668	9.731
Total Endowment				
95th percentile	--	7.908	96.427	25.299
Mean	1,446	8.492	101.871	26.618
5th percentile	--	9.170	107.979	28.086

PLIOCENE SERIES

SERIES DESCRIPTION

The Pliocene Series comprises the lower Pliocene (LP) and upper Pliocene (UP) chronozones. Six established plays were identified for the Pliocene Series by their retrogradational, aggradational, progradational, or fan depositional style and assessed. Figure 1 illustrates the overall extent of these plays.

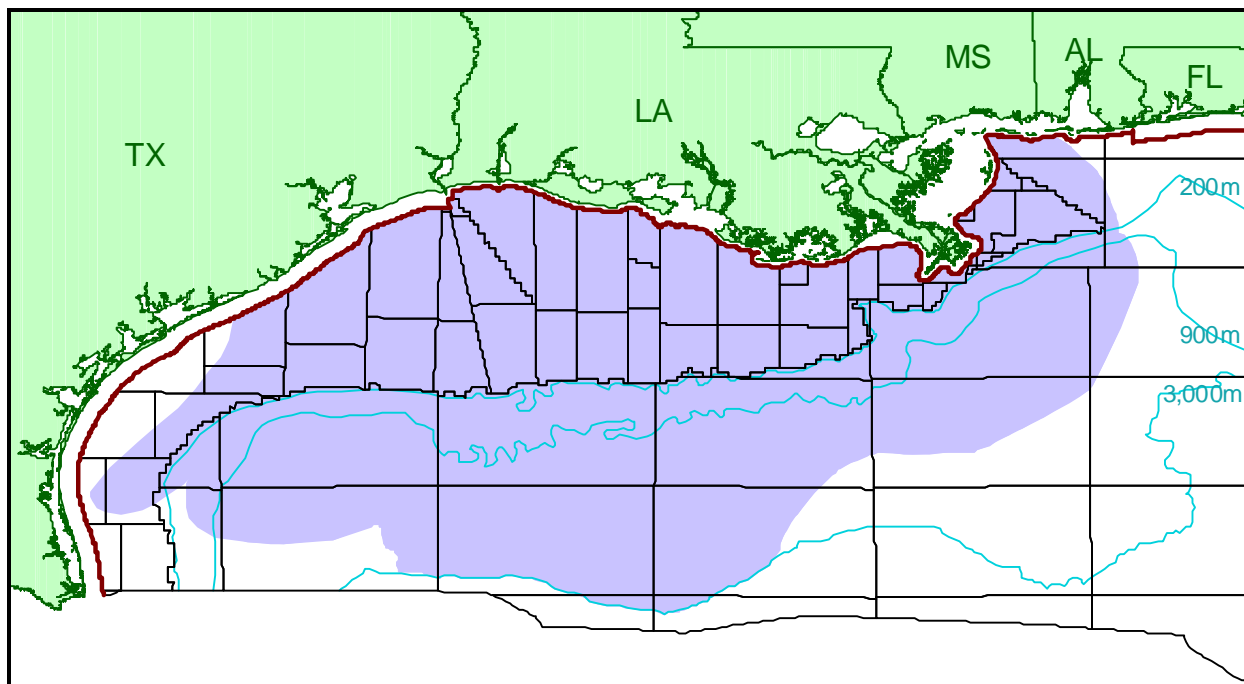


Figure 1. Map of assessed series.

Discoveries

The Pliocene Series contains 400 discovered pools, with the earliest discovery dating back to 1948 (table 1 and figure 2). Over 75 percent of the cumulative production and 60 percent of the total reserves for the Pliocene Series are associated with pools discovered prior to 1970. However, 57 percent of the total number of pools in the Pliocene Series were discovered in 1970 or later and are indicative of the smaller size of these more recent discoveries.

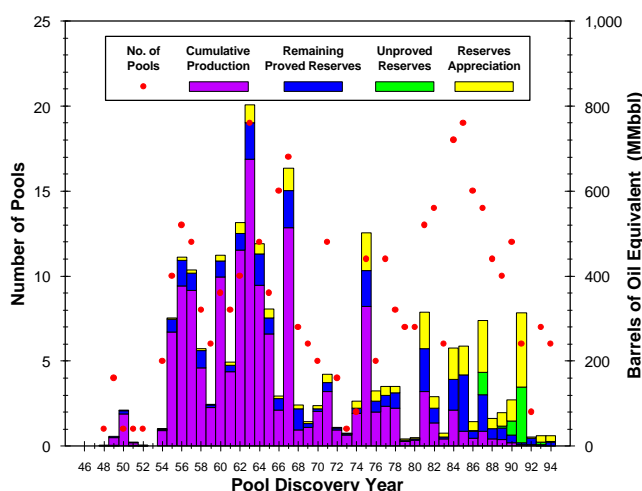


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

400 Pools (1,815 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	232	7,500
Subsea depth (feet)	1,889	8,956	19,216
Number of sands per pool	1	5	36
Porosity	21%	29%	37%
Water saturation	12%	28%	61%

ASSESSMENT RESULTS

The Pliocene Series contains 684 pools (400 discovered pools plus 284 undiscovered pools), with a mean total endowment of 5.030 Bbo and 34.740 Tcfg (11.211 BBOE) (table 2 and figure 3). This is the third largest of the 11 Gulf of Mexico Region Series.

The Pliocene Series also contains the third largest amount of BOE mean undiscovered resources of the 11 Series, with 0.961 Bbo and 8.922 Tcfg (2.548 BBOE). These undiscovered resources have a range of 0.788 to 1.155 Bbo and 7.452 to 10.562 Tcfg at the 95th and 5th percentiles, respectively (figure 4).

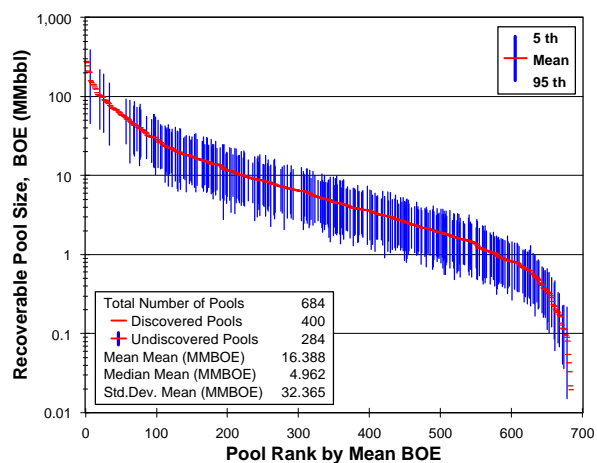
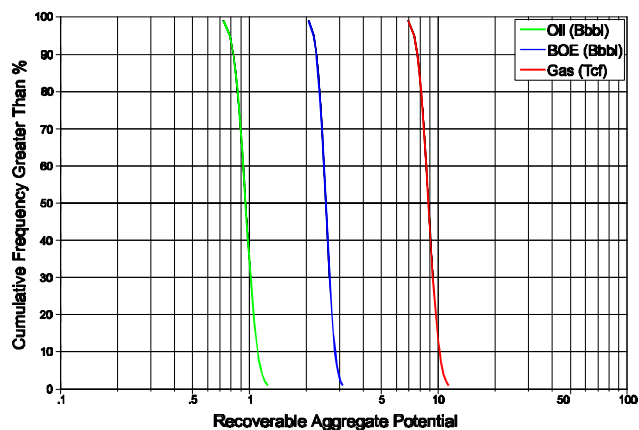
**Figure 3.** Pool rank plot.**Figure 4.** Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	387	3.412	21.715	7.276
Cumulative production	--	2.757	17.354	5.845
Remaining proved	--	0.655	4.361	1.431
Unproved	13	0.131	0.554	0.229
Appreciation (P & U)	--	0.526	3.548	1.158
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.788	7.452	2.193
Mean	284	0.961	8.922	2.548
5th percentile	--	1.155	10.562	2.938
Total Endowment				
95th percentile	--	4.857	33.270	10.856
Mean	684	5.030	34.740	11.211
5th percentile	--	5.224	36.380	11.601

MIOCENE SERIES

SERIES DESCRIPTION

The Miocene Series comprises the lower lower Miocene (LM1), middle lower Miocene (LM2), upper lower Miocene (LM4), lower middle Miocene (MM4), middle middle Miocene (MM7), upper middle Miocene (MM9), lower upper Miocene (UM1), and upper upper Miocene (UM3) chronozones. Thirty-three established plays were identified by either their depositional style (retrogradational, aggradational, progradational, or fan) or by their structural style (“Corsair” or “Seagull”) within the Miocene Series. Figure 1 illustrates the overall extent of these assessed plays.

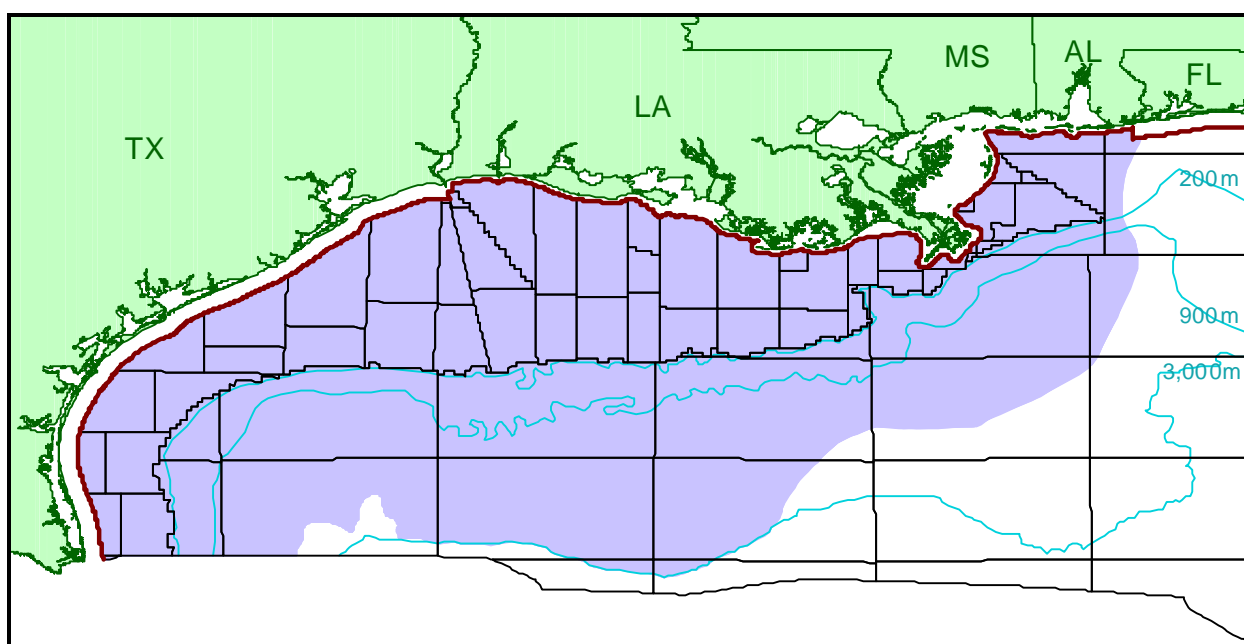


Figure 1. Map of assessed series.

DISCOVERIES

The Miocene Series contains 908 discovered pools, with the earliest discovery dating back to 1947 (table 1 and figure 2). The number of discoveries per year substantially increased after 1975, with over 60 percent of the pool discoveries in the Miocene Series occurring after 1975. However, the post-1975 discoveries added only 43 percent of the total reserves to the Miocene Series and are indicative of the smaller size of these

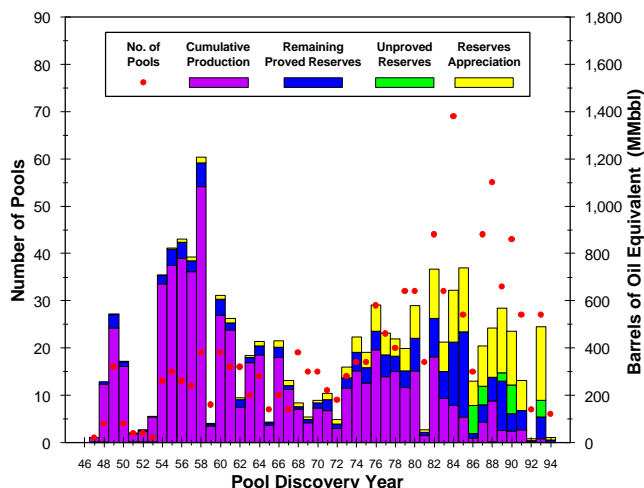


Figure 2. Exploration history graph.

more recent discoveries.

Table 1. Characteristics of the discovered pools.

908 Pools (3,299 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	147	7,500
Subsea depth (feet)	1,500	8,930	18,800
Number of sands per pool	1	4	45
Porosity	14%	28%	39%
Water saturation	9%	29%	66%

ASSESSMENT RESULTS

The Miocene Series contains 1,796 pools (908 discovered pools plus 888 undiscovered pools), with a mean total endowment of 6.963 Bbo and 118.070 Tcfg (27.972 BBOE) (table 2 and figure 3). This is the largest of the 11 Gulf of Mexico Region Series, based on BOE.

The Miocene Series also contains the largest amount of BOE mean undiscovered resources of the 11 Series, with 1.880 Bbo and 41.486 Tcfg (9.262 BBOE). These undiscovered resources have a range of 1.559 to 2.240 Bbo and 35.278 to 48.341 Tcfg at the 95th and 5th percentiles, respectively (figure 4).

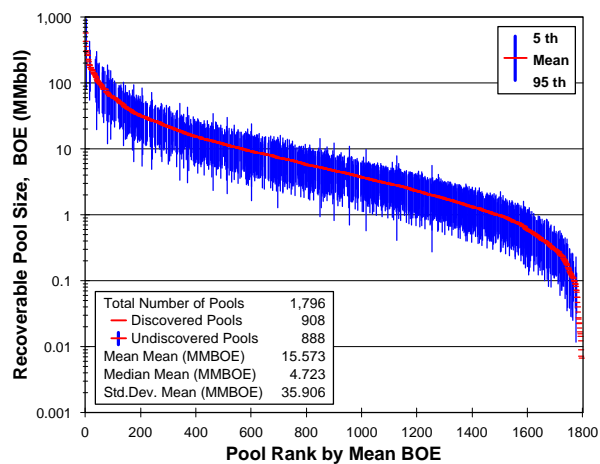


Figure 3. Pool rank plot.

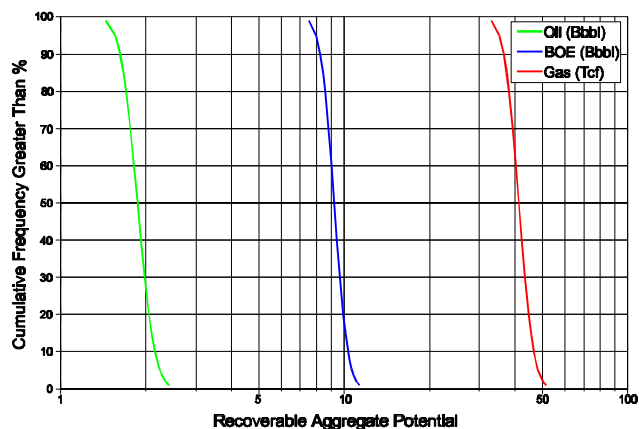


Figure 4. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	890	4.124	61.468	15.062
Cumulative production	--	3.321	48.996	12.039
Remaining proved	--	0.803	12.472	3.022
Unproved	18	0.184	1.364	0.426
Appreciation (P & U)	--	0.775	13.752	3.222
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	1.559	35.278	7.981
Mean	888	1.880	41.486	9.262
5th percentile	--	2.240	48.341	10.665
Total Endowment				
95th percentile	--	6.642	111.862	26.691
Mean	1,796	6.963	118.070	27.972
5th percentile	--	7.323	124.925	29.375

OLIGOCENE/EOCENE SERIES

The Oligocene/Eocene Series contains only one combined chronozone [see Oligocene/Eocene (O/E) chronozone].

PALEOCENE SERIES

The Paleocene Series contains only one chronozone [see Paleocene (L) chronozone].

UPPER CRETACEOUS SERIES

The Upper Cretaceous Series contains only one chronozone, which contains only one play [see Upper Cretaceous Clastic (UK CL) play].

LOWER CRETACEOUS SERIES

The Lower Cretaceous Series contains only one chronozone [see Lower Cretaceous (LK) chronozone].

UPPER JURASSIC SERIES

The Upper Jurassic Series contains only one chronozone [see Upper Jurassic (UU) chronozone].

MIDDLE JURASSIC SERIES

The Middle Jurassic Series contains only one chronozone, which contains only one play [see Middle Jurassic to Upper Jurassic Florida Basal Clastic (MU-UU FBCL) play].

LOWER JURASSIC SERIES

The Lower Jurassic Series contains only one chronozone [see Lower Jurassic (LU) chronozone].

UPPER TRIASSIC SERIES

The Upper Triassic Series contains only one chronozone [see Upper Triassic (UTR) chronozone].

ATLANTIC UPPER CRETACEOUS SERIES

The Atlantic Upper Cretaceous Series contains only one chronozone, which contains only one play [see Atlantic Upper Cretaceous Clastic (AUK CL) play].

ATLANTIC LOWER CRETACEOUS SERIES

The Atlantic Lower Cretaceous Series contains only one chronozone, which contains only one play [see Atlantic Lower Cretaceous Clastic (ALK CL) play].

ATLANTIC UPPER JURASSIC SERIES

The Atlantic Upper Jurassic Series contains only one chronozone [see Atlantic Upper Jurassic (AUU) chronozone].

ATLANTIC MIDDLE JURASSIC SERIES

The Atlantic Middle Jurassic Series contains only one chronozone [see Atlantic Middle Jurassic (AMU) chronozone].

ATLANTIC LOWER JURASSIC SERIES

The Atlantic Lower Jurassic Series contains only one chronozone, which contains only one play [see Atlantic Jurassic to Cretaceous Diapir (AU-K DIA) play].

ATLANTIC UPPER TRIASSIC SERIES

The Atlantic Upper Triassic Series contains only one chronozone [see Atlantic Upper Triassic (AUTR) chronozone].

UPPER PLEISTOCENE (UPL) CHRONOZONE

CHRONOZONE DESCRIPTION

The Upper Pleistocene (UPL) chronozone corresponds to the *Hyalinea* "B," *Trimosina* "A" 2nd occurrence, and *Trimosina* "A" 1st occurrence biozones, and Sangamon fauna. The UPL section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the UPL chronozone include aggradational, progradational, and fan, each of which defines a play: the Upper Pleistocene Aggradational (UPL A) play, the Upper Pleistocene Progradational (UPL P) play, and the Upper Pleistocene Fan (UPL F) play. Another play identified in the chronozone, the Upper Pleistocene Caprock (UPL C) play, was not assessed because it contains only one field and is of such limited occurrence that additional discoveries are unlikely. Retrogradational sands associated with marine transgressions also occur locally in the play areas at the top of the progradational and aggradational deposits. Because these retrogradational sands are discontinuous over any significant distance, they are included as part of the underlying deposits.

The potential for sand development within the UPL chronozone extends from the nearshore Brazos to the deepwater Alaminos Canyon Areas northeastward to the Main Pass, Viosca Knoll, and western Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, UPL sands continue onshore, except in the eastern Texas and western Louisiana areas where the chronozone's sediments are so shallow that they are no longer logged or where they can no longer be correlated. To the west and northeast, potential for sand development within the UPL chronozone is limited by a lack of sediment influx at the edges of the UPL depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by UPL sand development in the OCS

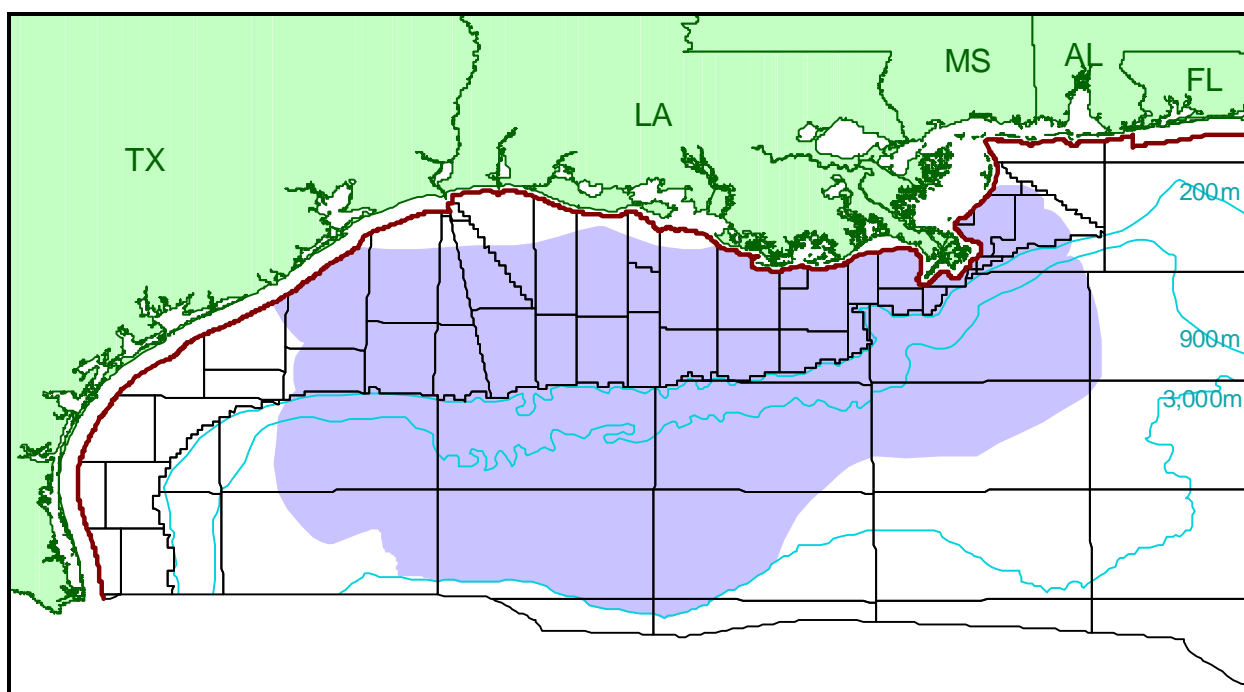


Figure 1. Map of assessed chronozone.

G11643-1 well in Keathley Canyon block 255 and by correlation of chronozone tops to seismic data.

No significant lateral shift in the Louisiana depocenter is observed from the underlying middle Pleistocene (MPL) chronozone to the UPL chronozone. The aggradational and progradational sediments of the UPL chronozone extend farther basinward than do those sediments of the MPL chronozone, indicative of delta progradation.

Major structural features in the UPL chronozone are salt diapirs, anticlines, and growth faults. Other structures include normal faults, shale diapirs, and stratigraphic pinch-outs.

DISCOVERIES

The UPL chronozone contains 233 discovered pools in four plays (table 1). Significant amounts of hydrocarbons were recently identified in the UPL chronozone in the Garden Banks 387 field ("Cooper"). Total reserves in the chronozone are 1.161 Bbo and 19.608 Tcfg (4.650 BBOE), of which 0.398 Bbo and 12.842 Tcfg (2.683 BBOE) have been produced. The largest number of discoveries in the UPL chronozone occurred when 25 pools were added in 1974 (figure 2). However, the maximum yearly total reserves of 794.753 MMBOE were added in 1973 with the discovery of 18 pools.

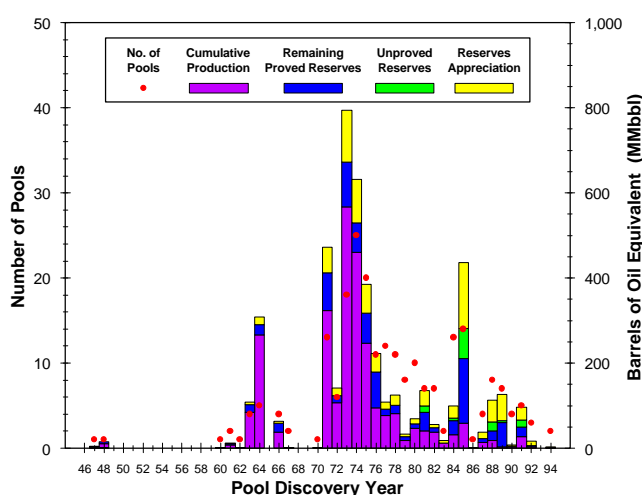


Figure 2. Exploration history graph.

Of the four plays in the UPL chronozone, the UPL P play contains the most total reserves in 135 pools, with 0.560 Bbo and 13.761 Tcfg (3.009 BBOE).

Table 1. Characteristics of the discovered pools.

233 Pools (870 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	18	325	3,180
Subsea depth (feet)	950	4,311	12,757
Number of sands per pool	1	4	27
Porosity	23%	31%	38%
Water saturation	10%	26%	47%

ASSESSMENT RESULTS

The UPL chronozone contains 395 pools (discovered plus undiscovered), with a mean total endowment estimated at 2.497 Bbo and 30.924 Tcfg (8.000 BBOE) (table 2). This is the second largest BOE mean total endowment of all 21 chronozones in the Gulf of Mexico Region.

Assessment results indicate that undiscovered resources may occur in as many as 162 pools, which contain a range of 0.962 to 1.791 Bbo and 9.813 to 12.957 Tcfg at the 95th and 5th percentiles, respectively (figure 3).

At mean levels, 1.336 Bbo and 11.316 Tcfg (3.350 BBOE) are projected. These undiscovered resources represent 42 percent of the UPL chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the largest in the chronozone (figure 4). Additionally, when compared with the other Gulf of Mexico chronozones, the UPL chronozone is projected to contain the second largest amount of mean undiscovered oil and the third largest amount of mean undiscovered gas.

Of the four UPL plays, the UPL F play is projected to contain the greatest

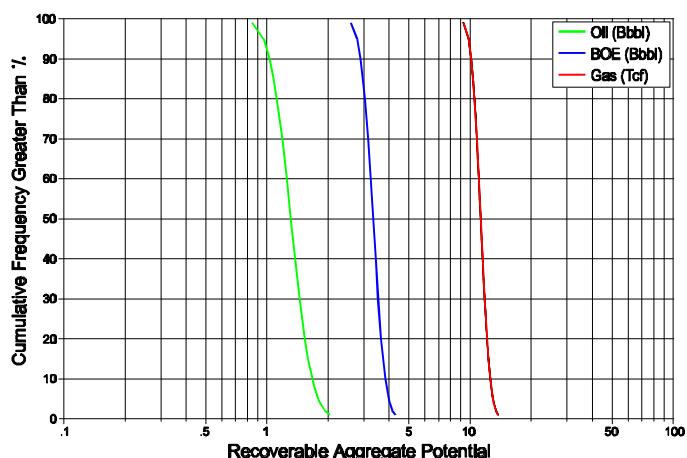


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	223	0.744	16.069	3.604
Cumulative production	--	0.398	12.842	2.683
Remaining proved	--	0.347	3.227	0.921
Unproved	10	0.100	0.199	0.135
Appreciation (P & U)	--	0.317	3.339	0.911
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.962	9.813	2.785
Mean	162	1.336	11.316	3.350
5th percentile	--	1.791	12.957	3.982
Total Endowment				
95th percentile	--	2.123	29.421	7.435
Mean	395	2.497	30.924	8.000
5th percentile	--	2.952	32.565	8.632

exploration potential, with mean undiscovered resources estimated at 1.198 Bbo and 8.448 Tcfg (2.701 BBOE) remaining to be found in 100 pools. These undiscovered resources in the UPL F play represent 34 percent of the BOE mean total endowment for the UPL chronozone. This high percentage, the potential for numerous discoveries within a large unexplored area, the potential for excellent-quality UPL sand development in deepwater areas, and prolific existing fan production make the UPL F play an attractive exploration target in UPL strata.

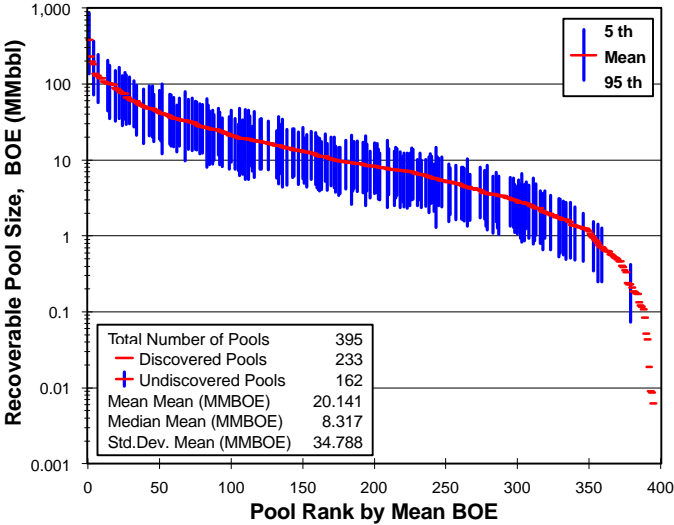


Figure 4. Pool rank plot.

UPPER PLEISTOCENE AGGRADATIONAL (UPL A) PLAY

PLAY DESCRIPTION

The established Upper Pleistocene Aggradational (UPL A) play occurs within the *Hyalinea* "B," *Trimosina* "A" 2nd occurrence, and *Trimosina* "A" 1st occurrence biozones, and Sangamon fauna. This play extends from the northeastern Brazos Area offshore Texas northeastward into the Chandeleur and Main Pass Areas east of the present-day Mississippi River Delta (figure 1).

The updip limit of the play extends onshore into Texas in the Brazos and Galveston Areas and into Louisiana from the Ship Shoal to Chandeleur Areas. Otherwise, the updip limit for the UPL A play occurs where the play is so shallow that it is no longer logged or where it can no longer be correlated. To the northeast and west, the play is limited by a lack of sediment influx at the edges of the UPL depocenter. Downdip, the play grades into the shelf deposits of the Upper Pleistocene Progradational (UPL P) play.

The UPL A play extends farther basinward than does the Middle Pleistocene Aggradational (MPL A) play. This basinward shift reflects the prograding nature of the delta systems through time.

PLAY CHARACTERISTICS

The productive UPL A play consists of delta plain and shallow marine shelf deposits that formed as distributary channels, channel/levee complexes, barrier and distributary mouth bars, delta front and fringe sands, and shelf slumps. In addition, retrogradational sands locally cap the UPL A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the UPL A play. Anticlines, salt diapirs, and growth faults are the major structural features in the play. Normal faults and shale diapirs

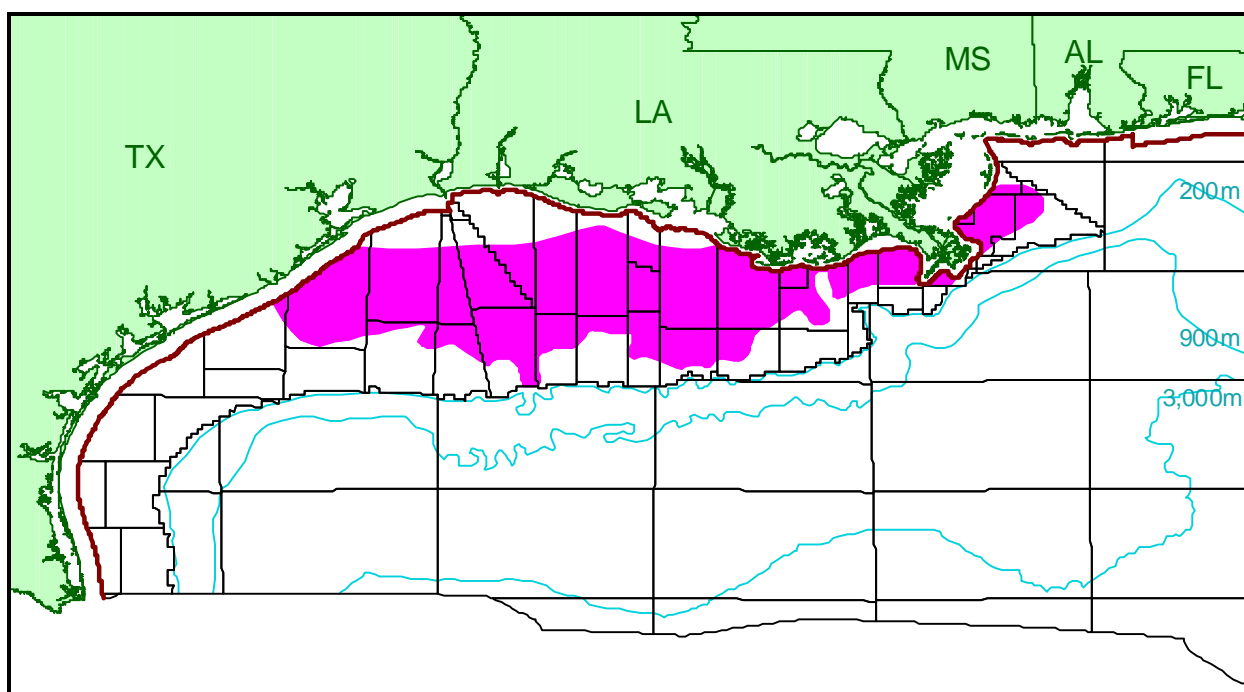


Figure 1. Map of assessed play.

also occur, but less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

Eugene Island 266 is the type field. Conoco's BT (Apache's 2000) and CP sands and Apache's 2600 sand represent the UPL A play in this field.

DISCOVERIES

The UPL A gas play contains total reserves of 0.109 Bbo and 3.072 Tcfg (0.655 BBOE), of which 0.075 Bbo and 1.915 Tcfg (0.416 BBOE) have been produced. The play contains 175 producible sands in 57 pools (table 1). The first reserves discovered in the play occurred in the Ship Shoal 32 field in 1947 (figure 2). Discoveries were minimal until the 1970's. The maximum yearly total reserves of 197.660 MMBOE were added in 1971 with the discovery of four pools, including the largest pool in the play in the Eugene Island 330 field. Over 85 percent of the play's cumulative production and 80 percent of its total reserves come from pools discovered before 1980. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1992.

The 57 discovered pools range in size from 0.009 to 135.695 MMBOE. These pools contain 255 reservoirs, of which 204 are nonassociated gas, 39 are undersaturated oil, and 12 are saturated oil.

Of the 11 aggradational plays in the Gulf of Mexico Cenozoic Province, the UPL A play contains the second largest amount of total reserves at 23 percent and has produced the third largest amount of hydrocarbons at 19 percent, based on BOE.

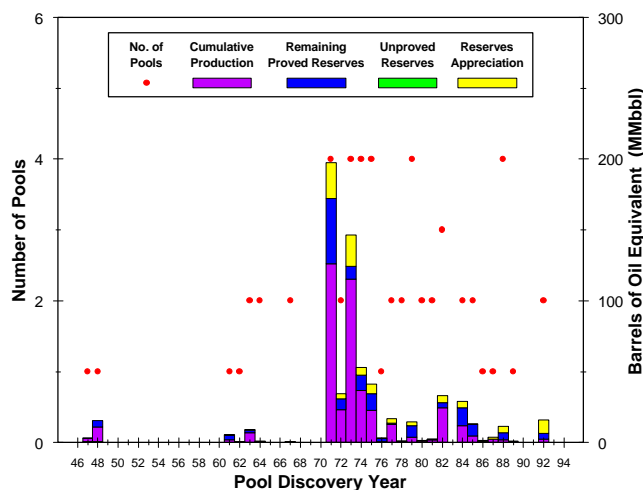


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

57 Pools (175 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	18	168	374
Subsea depth (feet)	1,285	2,579	4,675
Number of sands per pool	1	3	15
Porosity	24%	32%	38%
Water saturation	10%	25%	46%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UPL A play is 1.00. The play contains a mean total endowment of 0.118 Bbo and 3.217 Tcfg (0.690 BBOE) (table 2). Sixty percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.003 to 0.018 Bbo and 0.111 to 0.181 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.009 Bbo and 0.145 Tcfg (0.035 BBOE). These undiscovered

resources may occur in as many as 12 pools. The largest undiscovered pool, with a mean size of 6.176 MMBOE, is modeled as the twentieth largest pool in the play (figure 4). For all the undiscovered pools in the UPL A play, the mean mean size is 2.919 MMBOE, which is smaller than the 11.499 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 10.007 MMBOE.

The UPL A play is well explored. All of the undiscovered pools are modeled to have

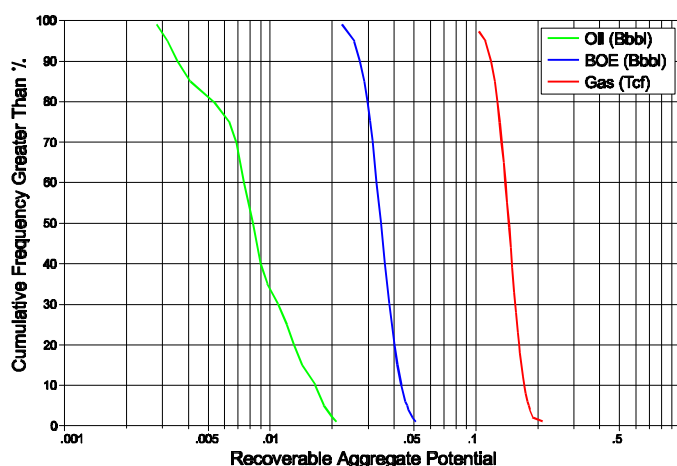


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	57	0.094	2.602	0.557
Cumulative production	--	0.075	1.915	0.416
Remaining proved	--	0.019	0.688	0.141
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.014	0.470	0.098
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.003	0.111	0.026
Mean	12	0.009	0.145	0.035
5th percentile	--	0.018	0.181	0.046
Total Endowment				
95th percentile	--	0.112	3.183	0.681
Mean	69	0.118	3.217	0.690
5th percentile	--	0.127	3.253	0.701

a mean size less than 10 MMBOE, and they contribute only 5 percent to the play's BOE mean total endowment.

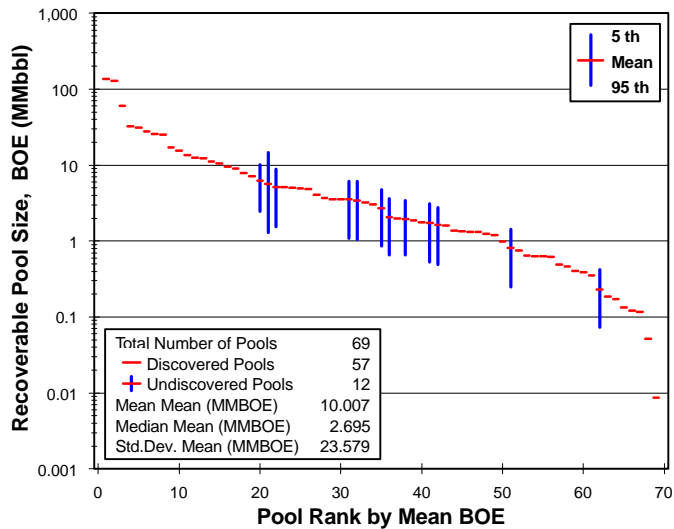


Figure 4. Pool rank plot.

UPPER PLEISTOCENE PROGRADATIONAL (UPL P) PLAY

PLAY DESCRIPTION

The Upper Pleistocene Progradational (UPL P) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs within the *Hyalinea* "B," *Trimosina* "A" 2nd occurrence, and *Trimosina* "A" 1st occurrence biozones, and Sangamon fauna. This play extends from the Galveston Area offshore Texas northeastward into the Main Pass and Viosca Knoll Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play ends where the progradational deposits grade into the nearshore deposits of the Upper Pleistocene Aggradational (UPL A) play. The UPL P play also extends onshore into Louisiana near the Mississippi River Delta. To the northeast and west, the UPL P play is limited by a lack of sediment influx at the edges of the UPL depocenter. Downdip, the play grades into the deposits of the Upper Pleistocene Fan (UPL F) play.

The UPL P play extends farther basinward than does the Middle Pleistocene Progradational (MPL P) play. This basinward shift reflects the prograding nature of the delta systems through time.

PLAY CHARACTERISTICS

The productive UPL P play consists of progradational deltaic sediments deposited in delta fringe, shelf blanket, distributary mouth bar, distributary channel, and crevasse splay environments. In addition, retrogradational locally cap the UPL P play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the UPL P play. Major structural features in the play include salt diapirs, anticlines, and growth faults. Normal fault, shale diapirs, and stratigraphic pinch-outs also occur. Seals

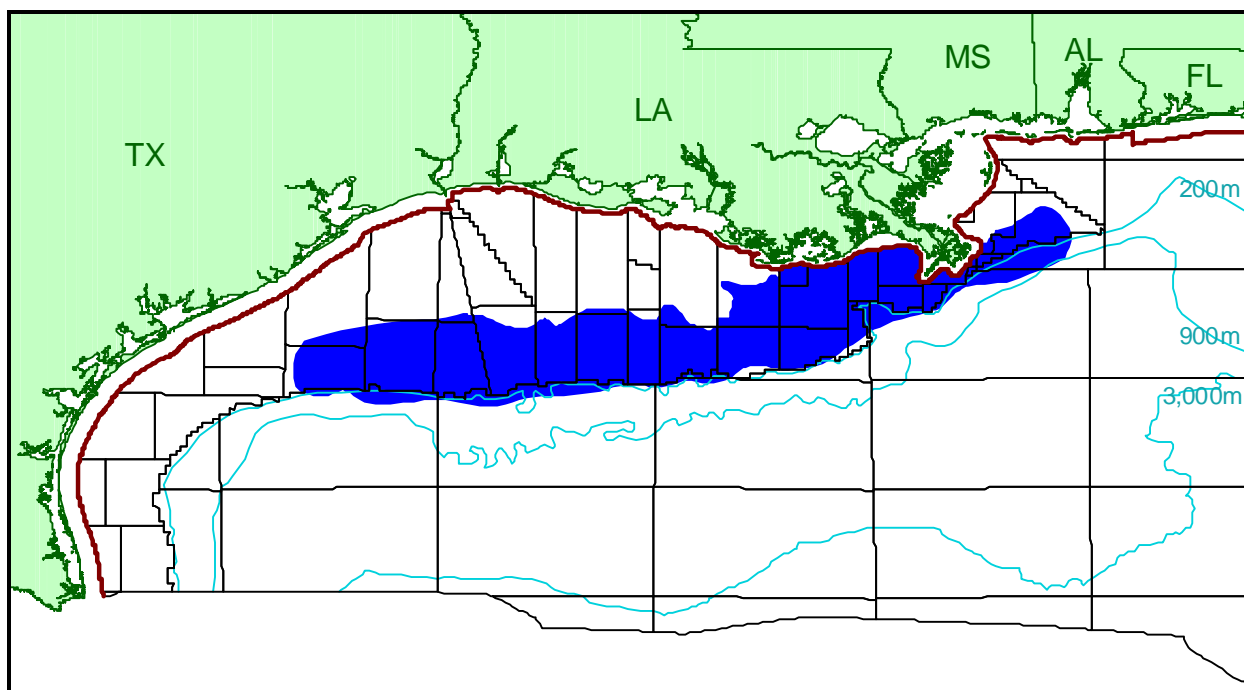


Figure 1. Map of assessed play.

are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Eugene Island 361 is the type field, and Chevron USA Inc.'s 3200, 3400, 3700, 3900, 4000, and 4100 sands represent the UPL P play in this field.

DISCOVERIES

The UPL P gas play contains total reserves of 0.560 Bbo and 13.761 Tcfg (3.009 BBOE), of which 0.208 Bbo and 9.895 Tcfg (1.968 BBOE) have been produced. The play contains 543 producible sands in 135 pools, and 134 of these pools contain proved reserves (table 1). The first reserves discovered in the play occurred in the Grand Isle 43 field in 1960 (figure 2). Discoveries peaked in the mid-1970's. The maximum yearly total reserves of 648.225 MMBOE were added in 1973 with the discovery of 14 pools. However, the largest pool in the play was found in 1964 in the Eugene Island 292 field. Over 75 percent of the play's total reserves and 85 percent of its cumulative production have come from pools discovered in 1975 and earlier. On a BOE basis, 11 percent of the play's cumulative production is oil, but remaining total reserves indicate that future production may increase to 34 percent oil. Seven pools have been discovered in the 1990's, the most recent, prior to this study's cutoff date of January 1, 1995, in 1994.

The 135 discovered pools range in size from 0.006 to 230.275 MMBOE. These pools contain 1,015 reservoirs, of which 754 are nonassociated gas, 185 are undersaturated oil, and 76 are saturated oil.

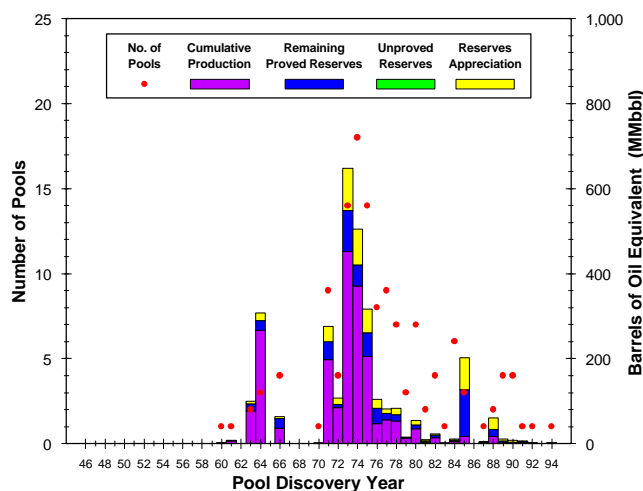


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

135 Pools (543 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	40	249	948
Subsea depth (feet)	950	4,110	9,090
Number of sands per pool	1	4	22
Porosity	23%	31%	38%
Water saturation	13%	25%	47%

Of the 61 Gulf of Mexico plays, the UPL P play contains the fifth largest amount of total reserves and has produced the sixth largest amount of hydrocarbons, based on BOE. In fact, the play contains the third-most gas total reserves at 8 percent and has produced the second-most gas at 9 percent.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UPL P play is 1.00. This play is the fifth largest in the Gulf of Mexico, based on a mean total endowment of 0.689 Bbo and 16.484 Tcfg (3.623 BBOE) (table 2). Fifty-four percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.066 to 0.212 Bbo and 2.375 to 3.084 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.129 Bbo and 2.723 Tcfg (0.614 BBOE). These undiscovered resources may occur in as many as 50 pools. The

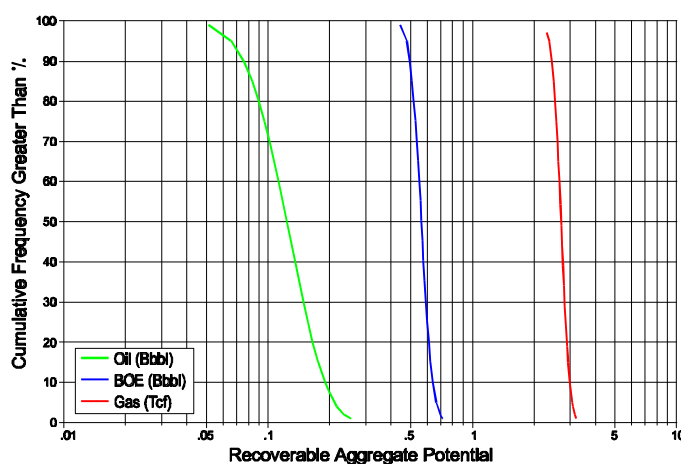


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	134	0.425	11.685	2.504
Cumulative production	--	0.208	9.895	1.968
Remaining proved	--	0.217	1.790	0.536
Unproved	1	<0.001	0.016	0.003
Appreciation (P & U)	--	0.135	2.060	0.502
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.066	2.375	0.518
Mean	50	0.129	2.723	0.614
5th percentile	--	0.212	3.084	0.722
Total Endowment				
95th percentile	--	0.626	16.136	3.527
Mean	185	0.689	16.484	3.623
5th percentile	--	0.772	16.845	3.731

largest undiscovered pool, with a mean size of 50.725 MMBOE, is modeled as the eighteenth largest pool in the play (figure 4). For all the undiscovered pools in the UPL P play, the mean mean size is 12.270 MMBOE, which is smaller than the 22.286 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 19.579 MMBOE.

Of the 14 Gulf of Mexico progradational plays, the UPL P play is projected to contain the second largest amounts of mean undiscovered oil and gas at 19 percent and 16 percent, respectively.

The UPL P play is well explored with the largest pools modeled as already discovered. The undiscovered resources are projected to account for 17 percent of the play's BOE mean total endowment.

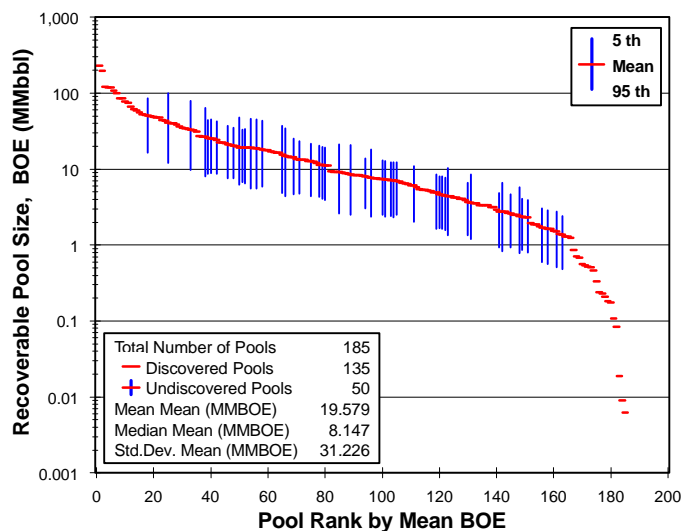


Figure 4. Pool rank plot.

UPPER PLEISTOCENE FAN (UPL F) PLAY

PLAY DESCRIPTION

The established Upper Pleistocene Fan (UPL F) play occurs within the *Hyalinea* "B," *Trimosina* "A" 2nd occurrence, and *Trimosina* "A" 1st occurrence biozones, and Sangamon fauna. This play encompasses an area from the southern Galveston, East Breaks, and Alaminos Canyon Areas northeastward to the southern Viosca Knoll and western Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

The play ends updip where turbidite sand deposits grade into the deposits of the Upper Pleistocene Progradational (UPL P) play. To the northeast and west, the UPL F play is limited by a lack of sediment influx at the edges of the UPL depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by good, reservoir-quality UPL sands in the OCS G11643-1 well in Keathley Canyon block 255 and by correlation of chronozone tops to seismic data.

The UPL shelf/slope break occurs slightly farther basinward than the middle Pleistocene (MPL) shelf/slope break, reflecting the prograding nature of the delta systems through time.

PLAY CHARACTERISTICS

The productive UPL F play consists of deepwater turbidites deposited in fan systems as channel fill, fan lobes, and fringe sheet sediments on the UPL slope between salt highs. Salt diapirs, anticlines, and growth faults are the dominant structural features in this play. Normal faults and shale diapirs also occur, but less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying

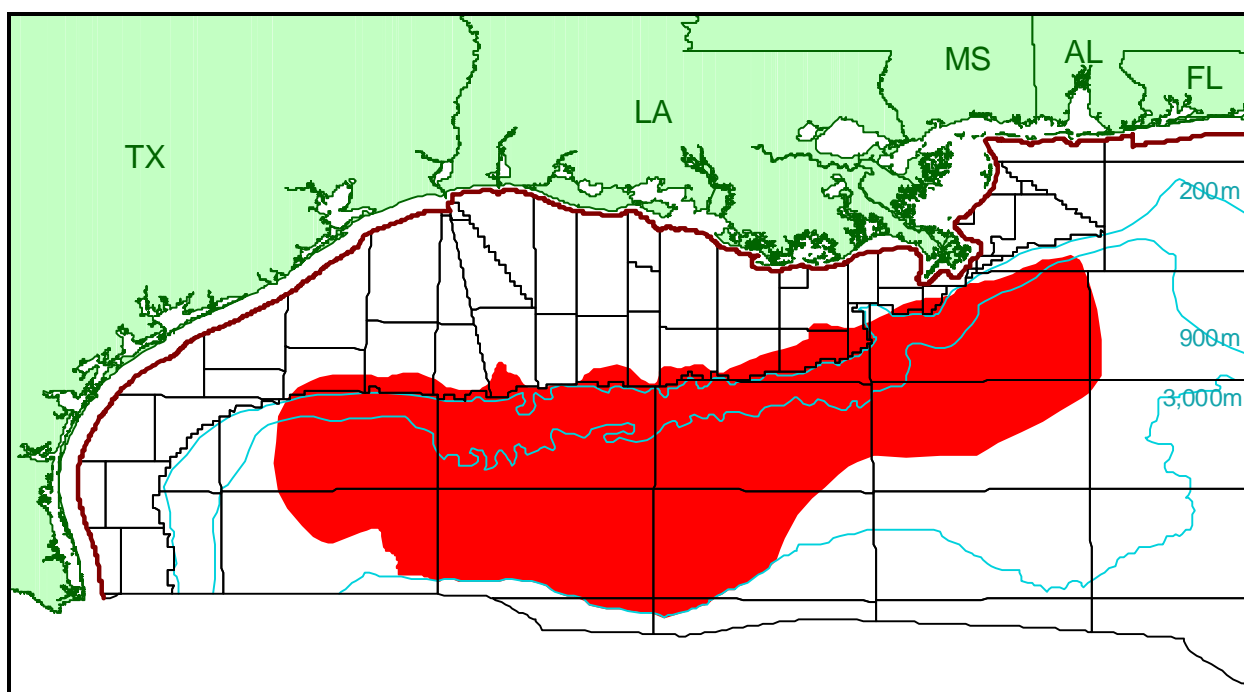


Figure 1. Map of assessed play.

shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Green Canyon 6 is the type field, and Texaco Exploration and Production's I3, I4L, TA1, TA2, TA3U, TA3L, TA4, TA6, and TA7 sands represent the UPL F play in this field.

DISCOVERIES

The UPL F mixed oil and gas play contains total reserves of 0.450 Bbo and 2.769 Tcfg (0.943 BBOE), of which 0.092 Bbo and 1.029 Tcfg (0.275 BBOE) have been produced. The play contains 151 producible sands in 40 pools, and 31 of these pools contain proved reserves (table 1). The first reserves discovered in the play occurred in the High Island 571A field in 1974 (figure 2). The maximum yearly total reserves of 221.549 MMBOE were added in 1985 when nine pools were discovered. Seventy-five percent of the play's total reserves and 96 percent of its cumulative production have come from pools discovered in 1985 and earlier. However, the largest discovered pool in the play was found in 1989 in the Garden Banks 387 field ("Cooper"), and is indicative of the play's deepwater potential. On a BOE basis, 33 percent of the play's cumulative production is oil, but remaining total reserves indicate that future production may increase to 54 percent oil. Four pools have been discovered in the 1990's, the most recent, prior to this study's cutoff date of January 1, 1995, in 1994.

The 40 discovered pools range in size from 0.576 to 105.454 MMBOE. These pools contain 279 reservoirs, of which 123 are nonassociated gas, 132 are undersaturated oil, and 24 are saturated oil.

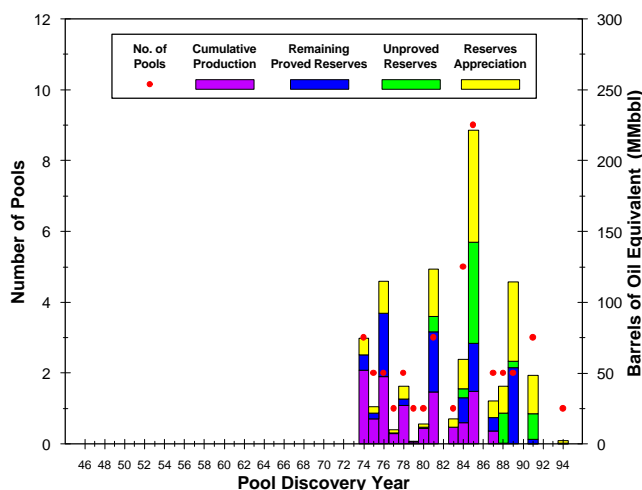


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

40 Pools (151 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	164	809	3,180
Subsea depth (feet)	3,944	7,525	12,757
Number of sands per pool	1	4	27
Porosity	24%	31%	35%
Water saturation	17%	28%	43%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UPL F play is 1.00. This play is the fourth largest in the Gulf of Mexico Region, based on a mean total endowment of 1.648 Bbo and 11.217 Tcfg (3.644 BBOE) (table 2). Eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.917 to 1.620 Bbo and 7.281 to 9.881 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 1.198 Bbo and 8.448 Tcfg

(2.701 BBOE). These undiscovered resources may occur in as many as 100 pools. The largest undiscovered pool, with a mean size of 379.920 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 2, 3, 6, and 7 on the pool rank plot. For all the undiscovered pools in the UPL F play, the mean mean size is 27.005 MMBOE, which is larger than the 23.566 MMBOE mean size of the discovered pools. The mean mean size for all pools, including

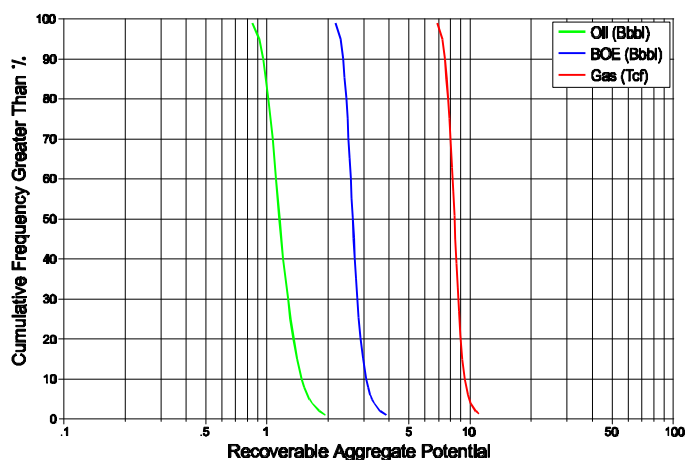


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	31	0.185	1.776	0.502
Cumulative production	--	0.092	1.029	0.275
Remaining proved	--	0.094	0.747	0.227
Unproved	9	0.100	0.183	0.132
Appreciation (P & U)	--	0.165	0.809	0.309
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.917	7.281	2.305
Mean	100	1.198	8.448	2.701
5th percentile	--	1.620	9.881	3.297
Total Endowment				
95th percentile	--	1.367	10.050	3.248
Mean	140	1.648	11.217	3.644
5th percentile	--	2.070	12.650	4.240

both discovered and undiscovered, is 26.022 MMBOE.

Of the 61 Gulf of Mexico plays, the UPL F play is projected to contain the largest amount of mean undiscovered oil (14%) and the third largest amount of mean undiscovered gas (9%). Additionally, of the 15 Gulf of Mexico fan plays, the UPL F play is the second largest, with 12 percent of the BOE mean total endowment.

A large unexplored area and good potential for sand development in UPL sediments support the numerous discoveries modeled for the UPL F play. Undiscovered resources are projected to add 74 percent to the play's BOE mean total endowment. Potential for discoveries occurs downdip of existing fields, especially in water depths greater than 1,000 feet.

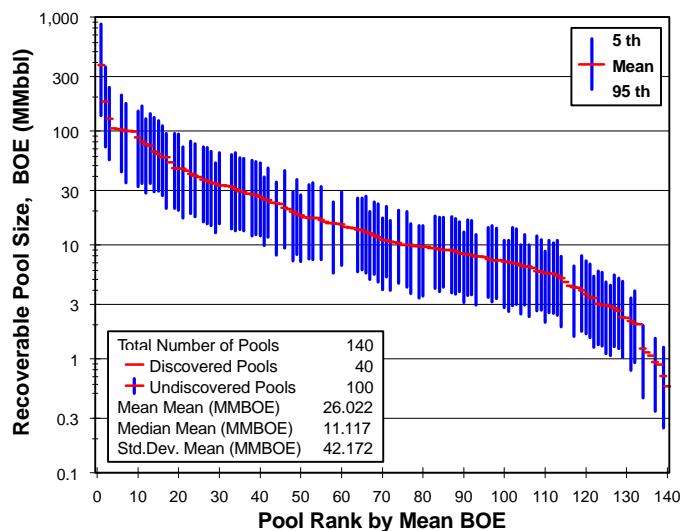


Figure 4. Pool rank plot.

UPPER PLEISTOCENE CAPROCK (UPL C) PLAY

PLAY DESCRIPTION

The established Upper Pleistocene Caprock (UPL C) play consists of the Main Pass 299 field (figure 1).

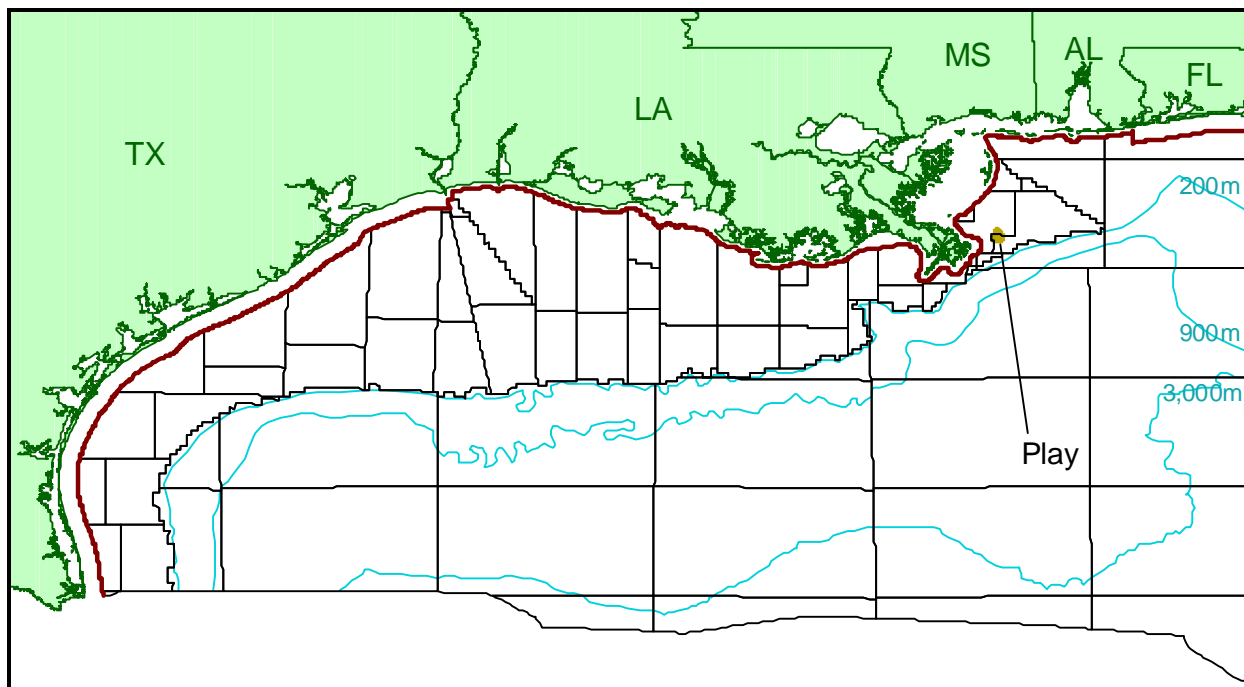


Figure 1. Map of play.

PLAY CHARACTERISTICS

The structure at the Main Pass 299 field is a salt diapir. Overlying impermeable layers of the caprock seal the hydrocarbons in this play. The UPL C play's reservoir is a vugular limestone. This caprock limestone is a product of diagenesis, and its age is unknown. Therefore, for mapping purposes, the caprock is correlated to the surrounding UPL sediments.

DISCOVERIES

The UPL C oil play contains total reserves of 0.042 Bbo and 0.006 Tcfg

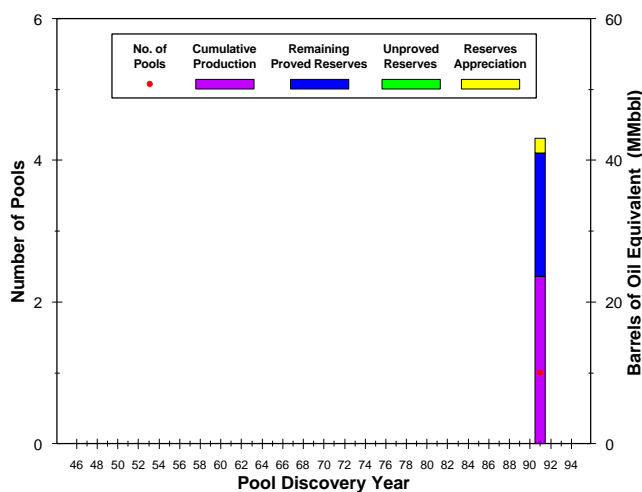


Figure 2. Exploration history graph.

(0.043 BBOE), of which 0.023 Bbo and 0.003 Tcfg (0.024 BBOE) have been produced. The play consists of one reservoir in one pool (table 1). The play's reserves were discovered in 1991 in Freeport-McMoRan Inc.'s CAPROCK reservoir (figure 2).

Table 1. Characteristics of the discovered pools.

1 Pool (1 Reservoir)	Minimum	Mean	Maximum
Water depth (feet)	--	209	--
Subsea depth (feet)	--	1,500	--
Number of reservoirs per pool	--	1	--
Porosity	--	35%	--
Water saturation	--	30%	--

ASSESSMENT RESULTS

Though hydrocarbons often occur in caprock sequences, production from them in the Gulf of Mexico is rare. Because the UPL C play is unlikely to contribute significant new resources to the UPL chronozone, it was not evaluated for this National Assessment. However, the estimates for reserves and production can be found in table 2.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1	0.040	0.006	0.041
Cumulative production	--	0.023	0.003	0.024
Remaining proved	--	0.017	0.003	0.017
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.002	<0.001	0.002
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	na	na	na
Mean	na	na	na	na
5th percentile	--	na	na	na
Total Endowment				
95th percentile	--	na	na	na
Mean	na	na	na	na
5th percentile	--	na	na	na

MIDDLE PLEISTOCENE (MPL) CHRONOZONE

CHRONOZONE DESCRIPTION

The Middle Pleistocene (MPL) chronozone corresponds to the *Angulogerina* “B” biozone. The MPL section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the MPL chronozone include aggradational, progradational, and fan, each of which defines a play: the Middle Pleistocene Aggradational (MPL A) play, the Middle Pleistocene Progradational (MPL P) play, and the Middle Pleistocene Fan (MPL F) play. Another play identified in the chronozone, the Middle Pleistocene Caprock (MPL C) play, was not assessed because it contains only one field and is of such limited occurrence that additional discoveries are unlikely. Retrogradational sands associated with marine transgressions also occur locally in the play areas at the top of the progradational and aggradational deposits. Because these retrogradational sands are discontinuous over any significant distance, they are included as part of the underlying deposits.

The potential for sand development within the MPL chronozone extends from the Galveston, East Breaks, and Alaminos Canyon Areas northeastward to the Main Pass, Viosca Knoll, and western Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, MPL sands continue onshore into Louisiana and Texas, except in eastern Texas and western Louisiana where the chronozone’s sediments are so shallow that they are no longer logged or where they can no longer be correlated. To the west and northeast, potential for sand development within the MPL chronozone is limited by a lack of sediment influx at the edges of the MPL depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by MPL sand development in the OCS G12662-1 well in Garden Banks block 568 and by correlation of chronozone tops to seismic data.

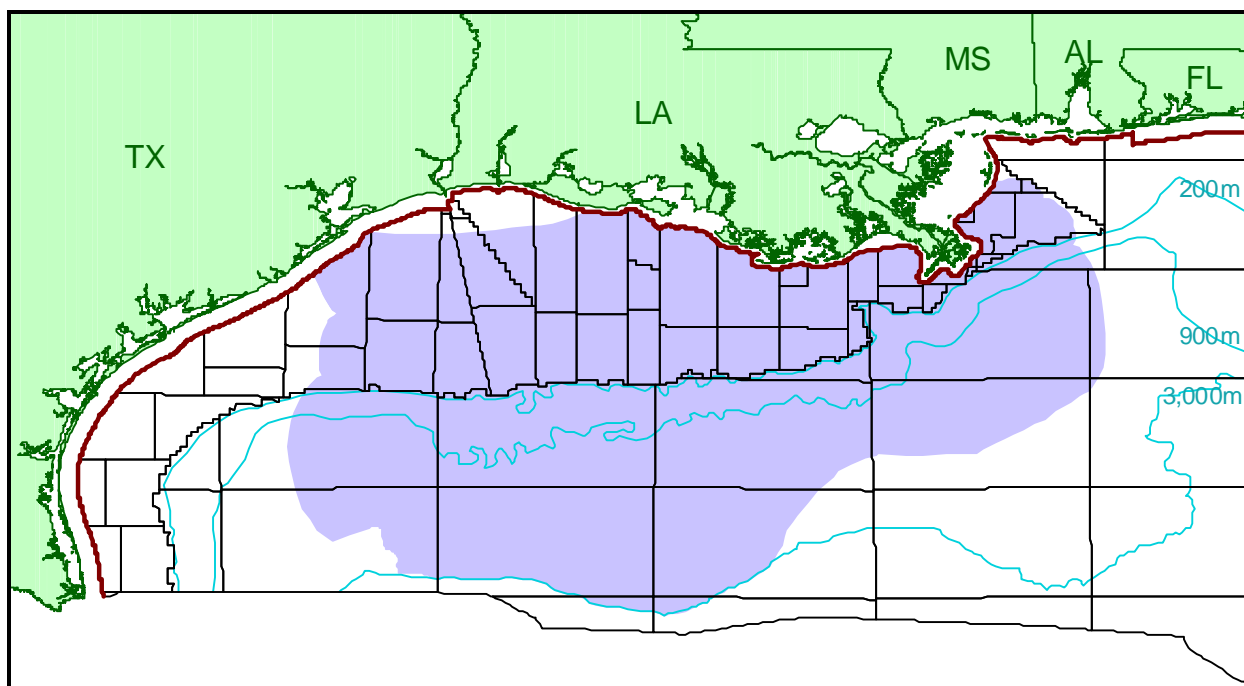


Figure 1. Map of assessed chronozone.

No significant lateral shift in the Louisiana depocenter is observed from the underlying lower Pleistocene (LPL) chronozone to the MPL chronozone. However, the updip extent of the progradational sediments in the LPL chronozone is located much farther to the north, creating a broader shelf than was present in MPL time. The shelf/slope break of the underlying LPL chronozone was also located farther to the north, resulting in MPL shelf sediments prograding out over underlying LPL fan deposits. A large sea level drop occurred during the overlying upper Pleistocene (UPL) chronozone and led to localized erosion of the upper MPL section. In places, the entire MPL section was removed.

Major structural features in the MPL chronozone include salt diapirs, anticlines, growth faults, and normal faults. Other structures include shale diapirs, stratigraphic pinch-outs, and salt ridges.

DISCOVERIES

The MPL chronozone contains 235 discovered pools in four plays (table 1). Total reserves in the chronozone are 1.037 Bbo and 15.704 Tcfg (3.831 BBOE), of which 0.667 Bbo and 10.779 Tcfg (2.585 BBOE) have been produced. The largest number of discoveries in the MPL chronozone occurred when 19 pools were added in 1974 (figure 2). However, the maximum yearly total reserves of 974.245 MMBOE were added in 1971 with the discovery of 14 pools.

Of the four plays in the MPL chronozone, the MPL P play contains the most total reserves in 137 pools, with 0.823 Bbo and 12.973 Tcfg (3.131 BBOE).

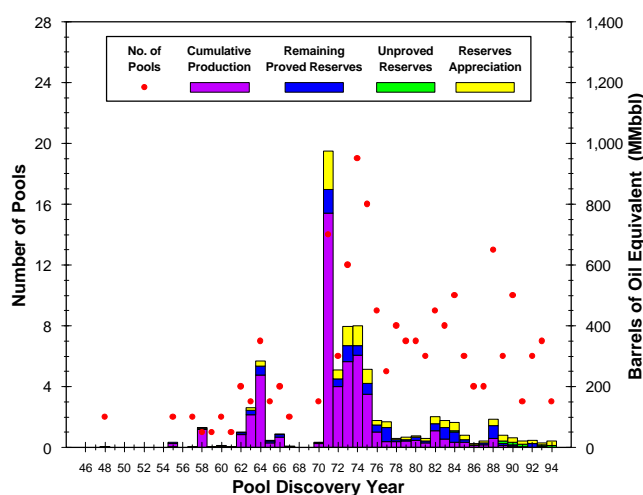


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

235 Pools (846 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	13	276	2,896
Subsea depth (feet)	2,125	5,730	15,034
Number of sands per pool	1	4	26
Porosity	21%	31%	37%
Water saturation	15%	27%	62%

ASSESSMENT RESULTS

The MPL chronozone contains 404 pools (discovered plus undiscovered), with a mean total endowment estimated at 1.271 Bbo and 19.035 Tcfg (4.658 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 169 pools, which contain a range of 0.186 to 0.288 Bbo and 2.429 to 4.419 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.234 Bbo and 3.331 Tcfg (0.827 BBOE) are projected. These undiscovered resources represent 18 percent of the MPL chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the fifth largest in the chronozone (figure 4).

Of the four MPL plays, the MPL F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.203 Bbo and 2.144 Tcfg (0.584 BBOE) remaining to be found in 105 pools. These undiscovered resources in the MPL F play represent 13 percent of the BOE mean total endowment for the MPL

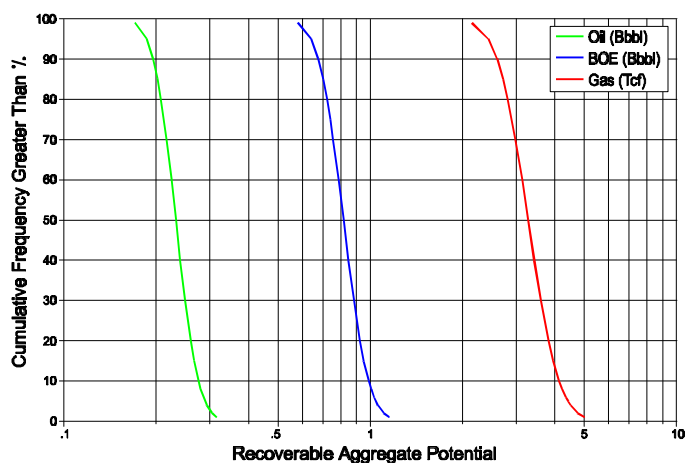


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	226	0.845	13.057	3.169
Cumulative production	--	0.667	10.779	2.585
Remaining proved	--	0.178	2.278	0.584
Unproved	9	0.013	0.139	0.037
Appreciation (P & U)	--	0.179	2.508	0.625
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.186	2.429	0.641
Mean	169	0.234	3.331	0.827
5th percentile	--	0.288	4.419	1.043
Total Endowment				
95th percentile	--	1.223	18.133	4.472
Mean	404	1.271	19.035	4.658
5th percentile	--	1.325	20.123	4.874

chronozone. This percentage and the potential for numerous discoveries within a large unexplored area make the MPL F play an attractive exploration target in MPL strata.

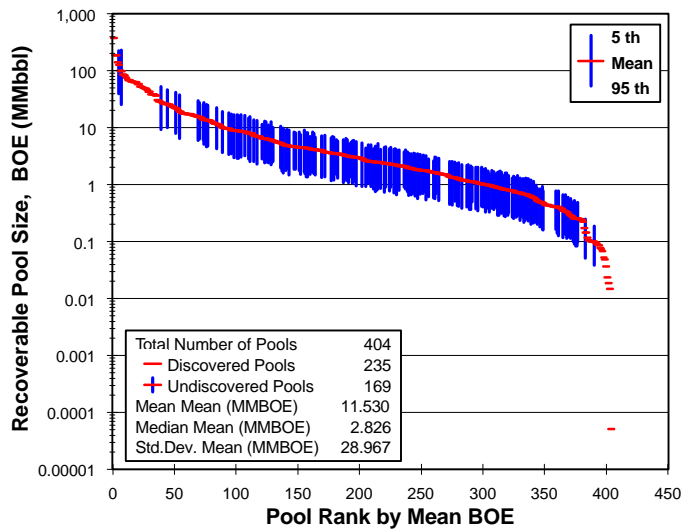


Figure 4. Pool rank plot.

MIDDLE PLEISTOCENE AGGRADATIONAL (MPL A) PLAY

PLAY DESCRIPTION

The established Middle Pleistocene Aggradational (MPL A) play occurs at the *Angulogerina* "B" biozone. This play extends from the Galveston Area offshore Texas to the Chandeleur/Viosca Knoll border east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore, except in the northern High Island, West Cameron, and East Cameron Areas where the play is so shallow that it is no longer logged or where it can no longer be correlated. To the northeast and west, the play is bounded by a lack of sediment influx at the edges of the MPL depocenter. Downdip, the play grades into the sediments of the Middle Pleistocene Progradational (MPL P) play.

The sediments in this play were supplied by ancient delta systems located in the Louisiana area. No significant lateral shift in depocenter is observed in the offshore area from the underlying lower Pleistocene (LPL) chronozone to the MPL chronozone.

PLAY CHARACTERISTICS

The productive MPL A play consists of delta plain and shallow marine shelf deposits that formed as channels, delta front and fringe sands, distributary mouth bars, crevasse splays, and shelf slumps. In addition, retrogradational sands locally cap the MPL A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the MPL A play. Major structural features in this play include salt diapirs, growth faults, and anticlines. Normal faults and stratigraphic pinch-outs occur less commonly. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs,

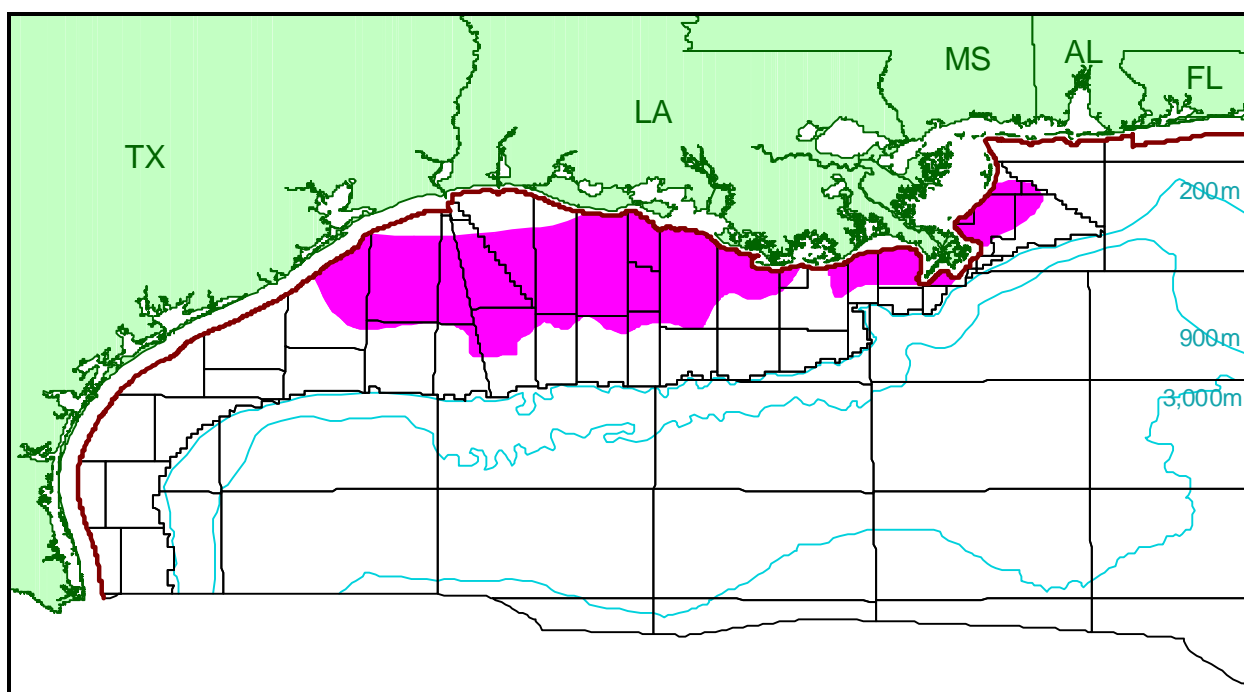


Figure 1. Map of assessed play.

overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

East Cameron 245 is the type field, and Pennzoil Exploration and Production's 3100, 3200, 3300, 3500, 3800, and 3900 sands represent the MPL A play in this field.

DISCOVERIES

The MPL A play is predominantly a gas play, with total reserves of 0.018 Bbo and 0.856 Tcfg (0.171 BBOE), of which 0.012 Bbo and 0.534 Tcfg (0.107 BBOE) have been produced. The play contains 84 producible sands in 52 pools (table 1). The first reserves in the play were discovered in the Ship Shoal 32 field in 1948 (figure 2). The maximum yearly total reserves were added in 1963 with the discovery of the largest pool in the play in the East Cameron 245 field. Pool discoveries were sparse until the mid-1970's when pools began to be discovered at an average rate of about two per year. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

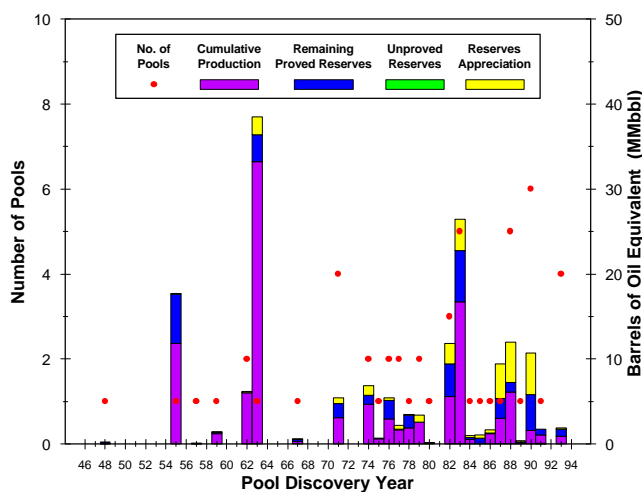


Figure 2. Exploration history graph.

The 52 discovered pools range in size from 0.053 to 38.489 MMBOE. These pools contain 97 reservoirs, of which 88 are nonassociated gas and 9 are undersaturated oil.

Table 1. Characteristics of the discovered pools.

52 Pools (84 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	13	92	211
Subsea depth (feet)	2,125	3,726	6,260
Number of sands per pool	1	2	5
Porosity	26%	32%	37%
Water saturation	16%	25%	52%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MPL A play is 1.00. The play contains a mean total endowment of 0.020 Bbo and 0.972 Tcfg (0.194 BBOE) (table 2). Fifty-five percent of this BOE mean total endowment has been produced.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	52	0.018	0.704	0.143
Cumulative production	--	0.012	0.534	0.107
Remaining proved	--	0.006	0.170	0.036
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.152	0.027
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.001	0.084	0.017
Mean	14	0.002	0.116	0.023
5th percentile	--	0.004	0.152	0.030
Total Endowment				
95th percentile	--	0.019	0.940	0.188
Mean	66	0.020	0.972	0.194
5th percentile	--	0.022	1.008	0.201

Assessment results indicate that undiscovered resources have a range of 0.001 to 0.004 Bbo and 0.084 to 0.152 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.002 Bbo and 0.116 Tcfg (0.023 BBOE). These undiscovered resources may occur in as many as 14 pools. The largest undiscovered pool, with a mean size of 6.359 MMBOE, is modeled as the seventh largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 10, 22, 24, and 30 on the pool rank plot. For all the undiscovered pools in the MPL A play, the mean mean size is 1.631 MMBOE, which is smaller than the 3.281 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 2.931 MMBOE.

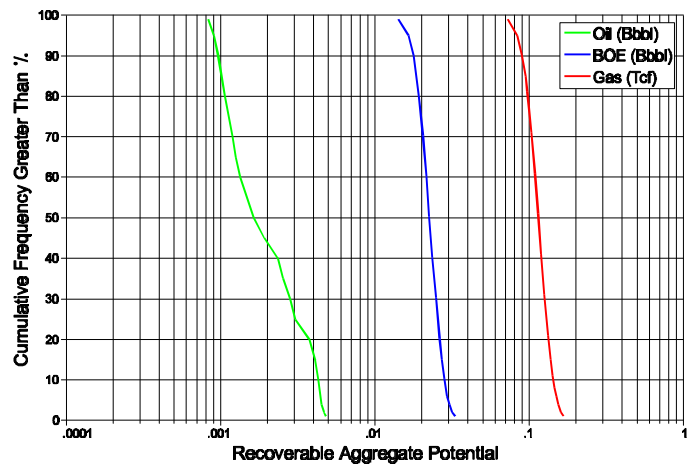


Figure 3. Cumulative probability distribution.

The MPL A play is well explored. Relative to the discovered pools, the undiscovered pools are expected to be small to moderate in size. These undiscovered resources are projected to contribute only 12 percent to the play's BOE mean total endowment.

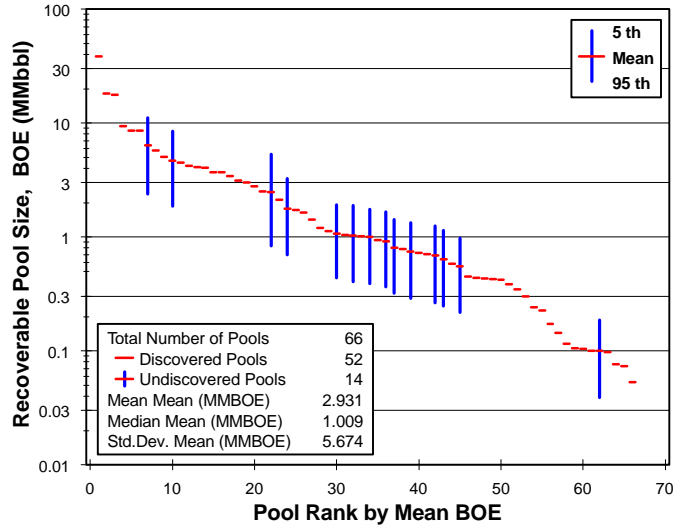


Figure 4. Pool rank plot.

MIDDLE PLEISTOCENE PROGRADATIONAL (MPL P) PLAY

PLAY DESCRIPTION

The Middle Pleistocene Progradational (MPL P) play is one of the largest established plays in the Gulf of Mexico Region. The MPL P play occurs at the *Angulogerina* "B" biozone and extends from the Galveston Area offshore Texas to the Main Pass and Viosca Knoll Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play grades into the nearshore sediments of the Middle Pleistocene Aggradational (MPL A) play. The MPL P play also extends onshore into Louisiana near the Mississippi River Delta. To the northeast and west, the play is bounded by a lack of sediment influx at the edges of the MPL depocenter. Downdip, the play grades into the deposits of the Middle Pleistocene Fan (MPL F) play.

The sediments in this play were supplied by ancient delta systems located in the Louisiana area. No significant lateral shift in depocenter is observed in the offshore area from the underlying lower Pleistocene (LPL) chronozone to the MPL chronozone. The progradational sequence of the MPL chronozone is located farther downdip than that of the LPL chronozone. Therefore, the MPL P play occurs stratigraphically above both the LPL progradational and fan deposits.

PLAY CHARACTERISTICS

The productive MPL P play consists of progradational deltaic sediments deposited in delta front and fringe, channel, crevasse splay, shelf blanket, and shelf and upper slope slump environments. In addition, retrogradational sands locally cap the MPL P play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the MPL P play. Salt diapirs, anticlines, growth faults, and normal faults are the

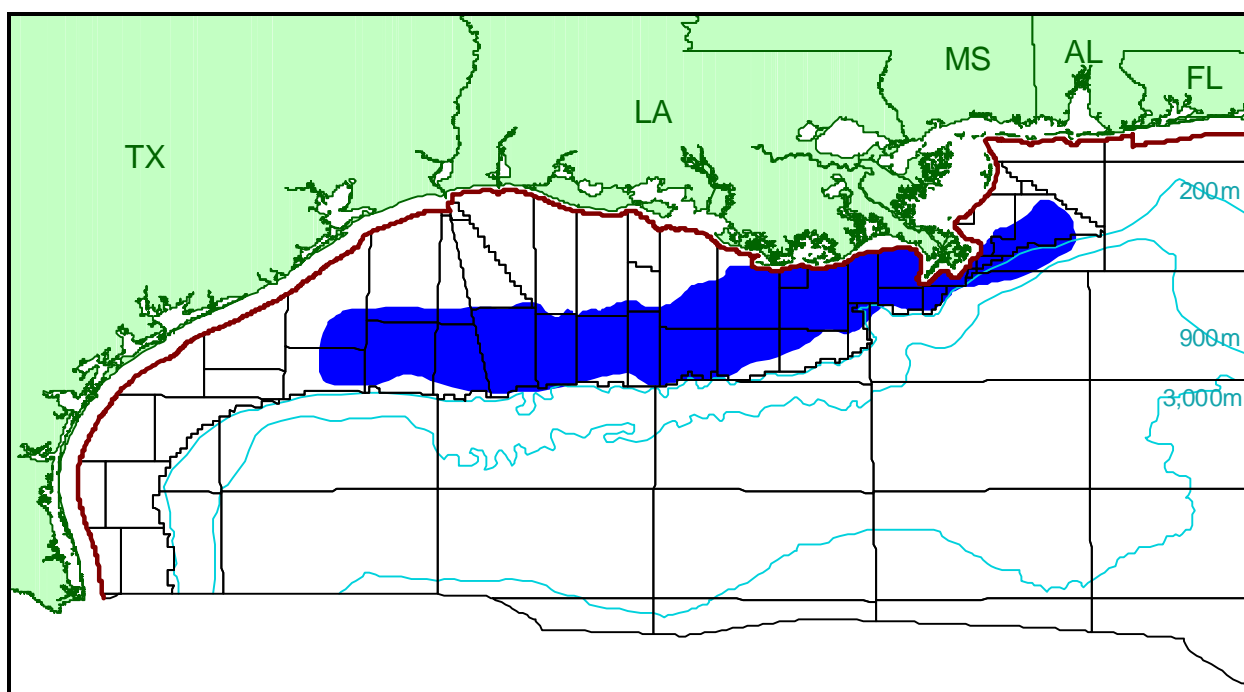


Figure 1. Map of assessed play.

dominant structural features in the play. Shale diapirs and stratigraphic pinch-outs occur less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Vermilion 340 is the type field, and Shell Offshore Inc.'s D6, E, G, G4, G6, H, I, J, L, L2, N, N2, and O sands represent the MPL P play in this field.

DISCOVERIES

The MPL P play is predominantly a gas play, with total reserves of 0.823 Bbo and 12.973 Tcfg (3.131 BBOE), of which 0.601 Bbo and 9.812 Tcfg (2.347 BBOE) have been produced. The play contains 653 producible sands in 137 pools, and 136 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the South Timbalier 34 field in 1948 (figure 2). Almost half of the pools were discovered from 1970 to 1976. The maximum yearly total reserves of 968.777 MMBOE were added in 1971 with the discovery of 10 pools, including the largest pool in the play in the Eugene Island 330 field. Pool discoveries prior to 1976 account for over 90 percent of both the play's cumulative production and total reserves. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 137 discovered pools range in size from 0.015 to 379.565 MMBOE. These pools contain 1,322 reservoirs, of which 854 are nonassociated gas, 329 are undersaturated oil, and 139 are saturated oil.

Of the 61 Gulf of Mexico plays, the MPL P play contains the fourth largest amount of total reserves and has produced the third largest amount of hydrocarbons, based on

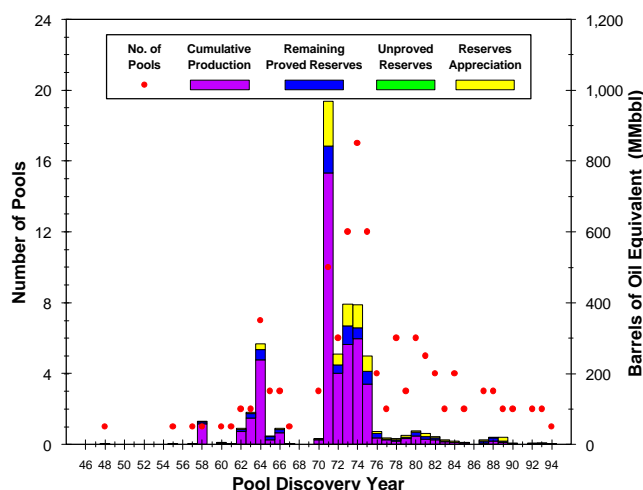


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

137 Pools (653 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	31	186	320
Subsea depth (feet)	3,016	5,585	11,055
Number of sands per pool	1	5	26
Porosity	21%	30%	35%
Water saturation	16%	27%	62%

BOE. In fact, this play has produced the third largest amount of gas at 9 percent. Of the 14 Gulf of Mexico progradational plays, the MPL P play is the third largest, based on BOE total reserves, with 11 percent of the total.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MPL P play is 1.00. This play is the sixth largest in the Gulf of Mexico, based on a mean total endowment of 0.852 Bbo and 14.044 Tcfg (3.351 BBOE) (table 2). Seventy percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.019 to 0.041 Bbo and 0.586 to 1.648 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.029 Bbo and 1.071 Tcfg

(0.220 BBOE). These undiscovered resources may occur in as many as 50 pools. The largest undiscovered pool, with a mean size of 127.500 MMBOE, is modeled as the fifth

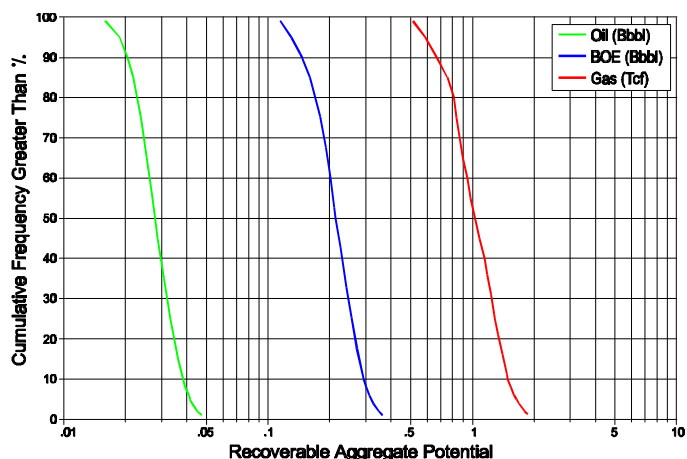


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	136	0.711	11.213	2.706
Cumulative production	--	0.601	9.812	2.347
Remaining proved	--	0.110	1.401	0.359
Unproved	1	<0.001	0.001	0.001
Appreciation (P & U)	--	0.112	1.759	0.425
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.019	0.586	0.130
Mean	50	0.029	1.071	0.220
5th percentile	--	0.041	1.648	0.320
Total Endowment				
95th percentile	--	0.842	13.559	3.261
Mean	187	0.852	14.044	3.351
5th percentile	--	0.864	14.621	3.451

largest pool in the play (figure 4). For all the undiscovered pools in the MPL P play, the mean mean size is 4.397 MMBOE, which is substantially less than the 22.856 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 17.921 MMBOE.

The MPL P play is well explored, and except for the fifth largest pool in the play, the largest pools are modeled as already discovered. Relative to the discovered pools, most of the undiscovered pools are small in size and are expected to contribute only 7 percent to the play's BOE mean total endowment.

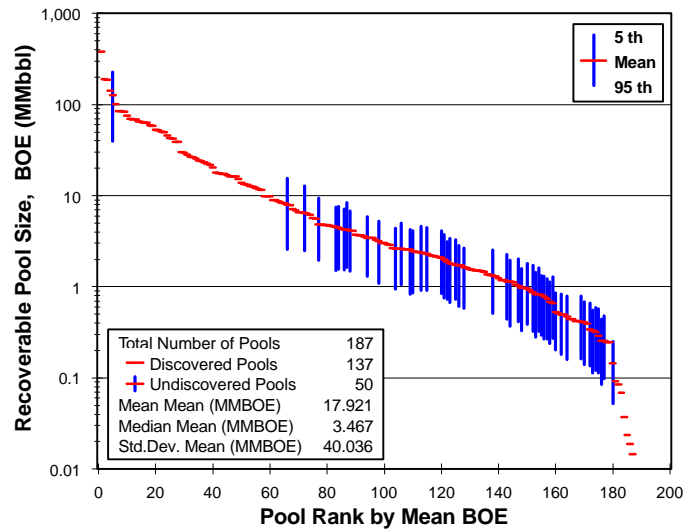


Figure 4. Pool rank plot.

MIDDLE PLEISTOCENE FAN (MPL F) PLAY

PLAY DESCRIPTION

The established Middle Pleistocene Fan (MPL F) play occurs at the *Angulogerina* “B” biozone. This play extends from the southern Galveston, East Breaks, and Alaminos Canyon Areas to the Viosca Knoll and western Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

The play is bounded updip by the shelf/slope break associated with the *Angulogerina* “B” biozone and grades into the sediments of the Middle Pleistocene Progradational (MPL P) play. To the northeast and west, the play is bounded by a lack of sediment influx at the edges of the MPL depocenter. The southern extension of the play’s potential to at least the Sigsbee Escarpment is supported by MPL reservoir-quality sands in the OCS G12662-1 well in Garden Banks block 568 and by chronozone tops correlated to seismic data.

The sediments in this play were mainly supplied by ancient delta systems located in the Louisiana area. No significant lateral shift in depocenter is observed in the offshore area from the underlying lower Pleistocene (LPL) chronozone to the MPL chronozone. The MPL shelf/slope break occurs farther basinward than the LPL shelf/slope break, indicative of the prograding nature of the delta systems with time.

PLAY CHARACTERISTICS

The productive MPL F play consists of deepwater turbidites deposited in fan systems as channel fill, overbank deposits, fan lobes, and fringe sheet sediments on the MPL slope between salt highs. The play’s major structural features are salt diapirs and anticlines. Growth faults, normal faults, and shale diapirs also occur, but less commonly.

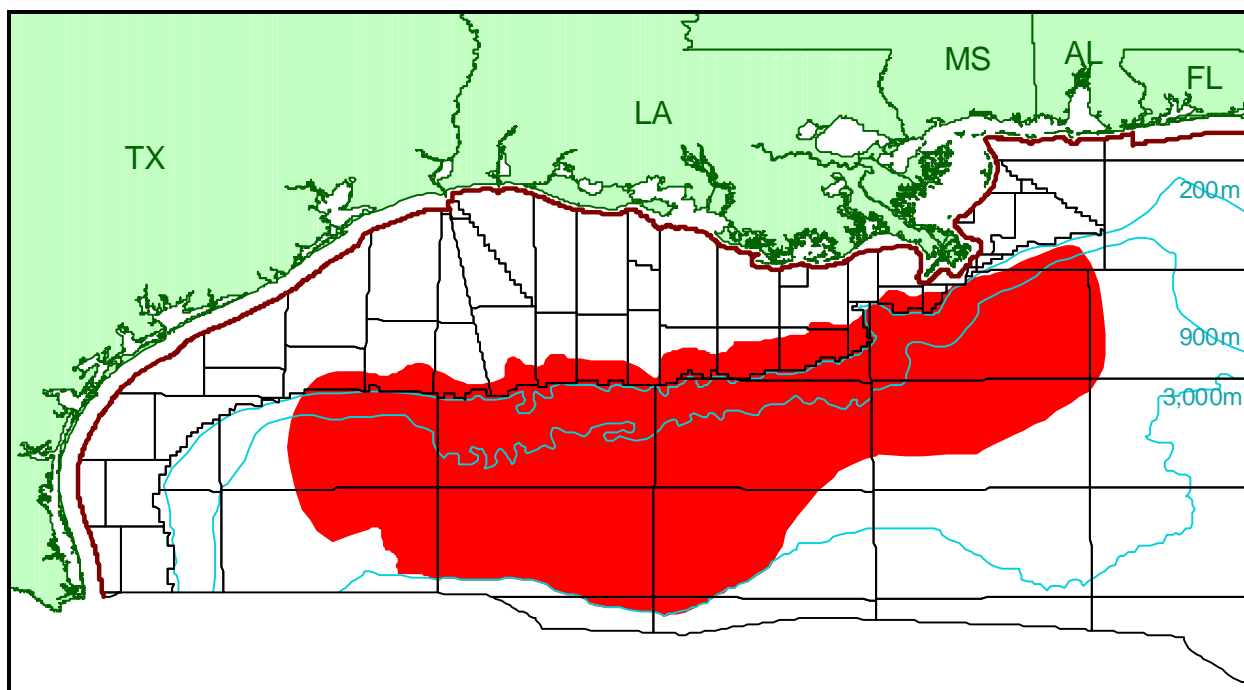


Figure 1. Map of assessed play.

Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Green Canyon 65 (“Bullwinkle”) is the type field, and Shell Offshore Inc.’s H and I sand series represent the MPL F play in this field.

DISCOVERIES

The MPL F mixed oil and gas play contains total reserves of 0.196 Bbo and 1.874 Tcfg (0.529 BBOE), of which 0.054 Bbo and 0.433 Tcfg (0.131 BBOE) have been produced. The play contains 108 producible sands in 45 pools, and 37 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the West Delta 133 field in 1966 (figure 2). The maximum yearly total reserves of 72.893 MMBOE were added in 1984 with the discovery of five pools. However, the largest discovered pool in the play in the Mississippi Canyon 354 field (“Zinc”) was found in 1977. Sixty-six percent of the play’s cumulative production is from pools discovered in 1983 or earlier. In comparison, two-thirds of the play’s pools have been discovered since 1983, including seven pools that are in water depths greater than 1,000 feet. The most recent discoveries, prior to this study’s cutoff date of January 1, 1995, were in 1994.

The 45 discovered pools range in size from 0.049 to 62.368 MMBOE. These pools contain 136 reservoirs, of which 59 are nonassociated gas, 63 are undersaturated oil, and 14 are saturated oil.

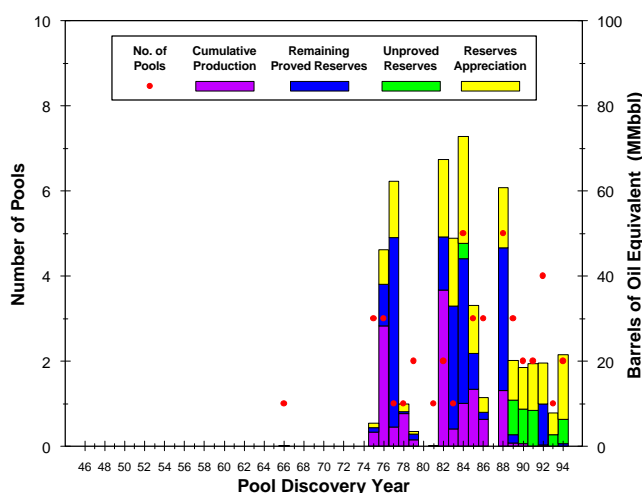


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

45 Pools (108 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	165	768	2,896
Subsea depth (feet)	4,525	8,525	15,034
Number of sands per pool	1	2	11
Porosity	22%	30%	36%
Water saturation	15%	29%	48%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MPL F play is 1.00. The play contains a mean total endowment of 0.399 Bbo and 4.018 Tcfg (1.113 BBOE) (table 2). Twelve percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.165 to 0.249 Bbo and 1.722 to 2.901 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.203 Bbo and 2.144 Tcfg (0.584 BBOE). These undiscovered

resources may occur in as many as 105 pools. The largest undiscovered pool, with a mean size of 97.668 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 8, 10, 12, and 13 on the pool rank plot. For all the undiscovered pools in the MPL F play, the mean mean size is 5.566 MMBOE, which is smaller than the 11.758 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and

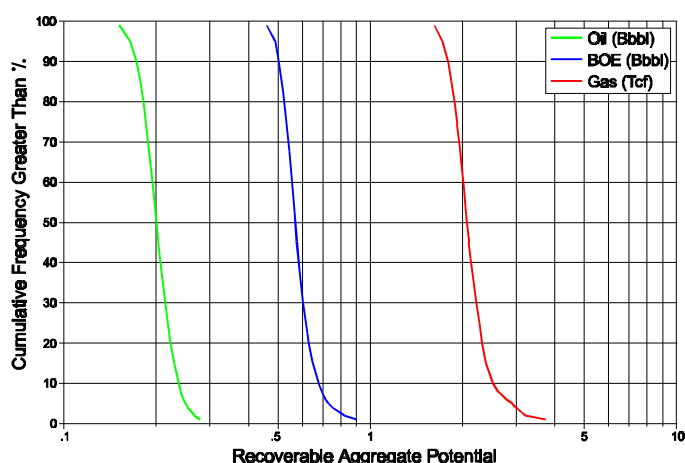


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	37	0.116	1.140	0.319
Cumulative production	--	0.054	0.433	0.131
Remaining proved	--	0.062	0.707	0.188
Unproved	8	0.012	0.138	0.037
Appreciation (P & U)	--	0.067	0.597	0.173
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.165	1.722	0.489
Mean	105	0.203	2.144	0.584
5th percentile	--	0.249	2.901	0.731
Total Endowment				
95th percentile	--	0.361	3.596	1.018
Mean	150	0.399	4.018	1.113
5th percentile	--	0.445	4.775	1.260

undiscovered, is 7.424 MMBOE.

Because of its large unexplored area and known areas of good sand development, the MPL F play is expected to contain numerous undiscovered pools, which account for over half of the play's mean total endowment. Potential for discoveries occurs downdip of existing fields, especially in water depths greater than 1,000 feet.

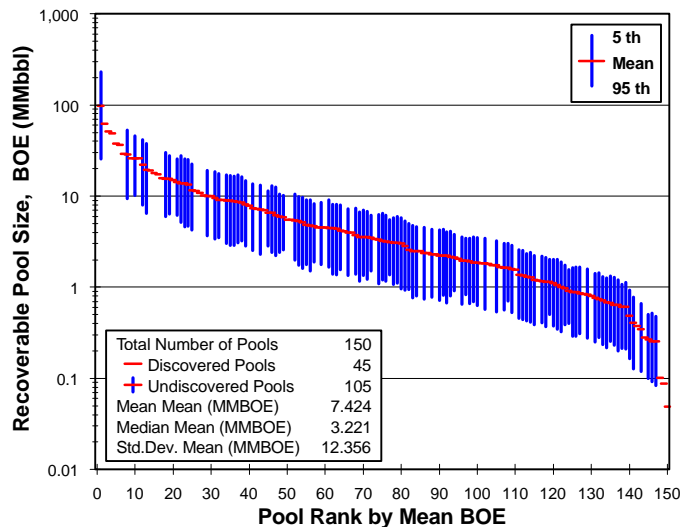


Figure 4. Pool rank plot.

MIDDLE PLEISTOCENE CAPROCK (MPL C) PLAY

PLAY DESCRIPTION

The established Middle Pleistocene Caprock (MPL C) play consists of the South Timbalier 86 field (figure 1).

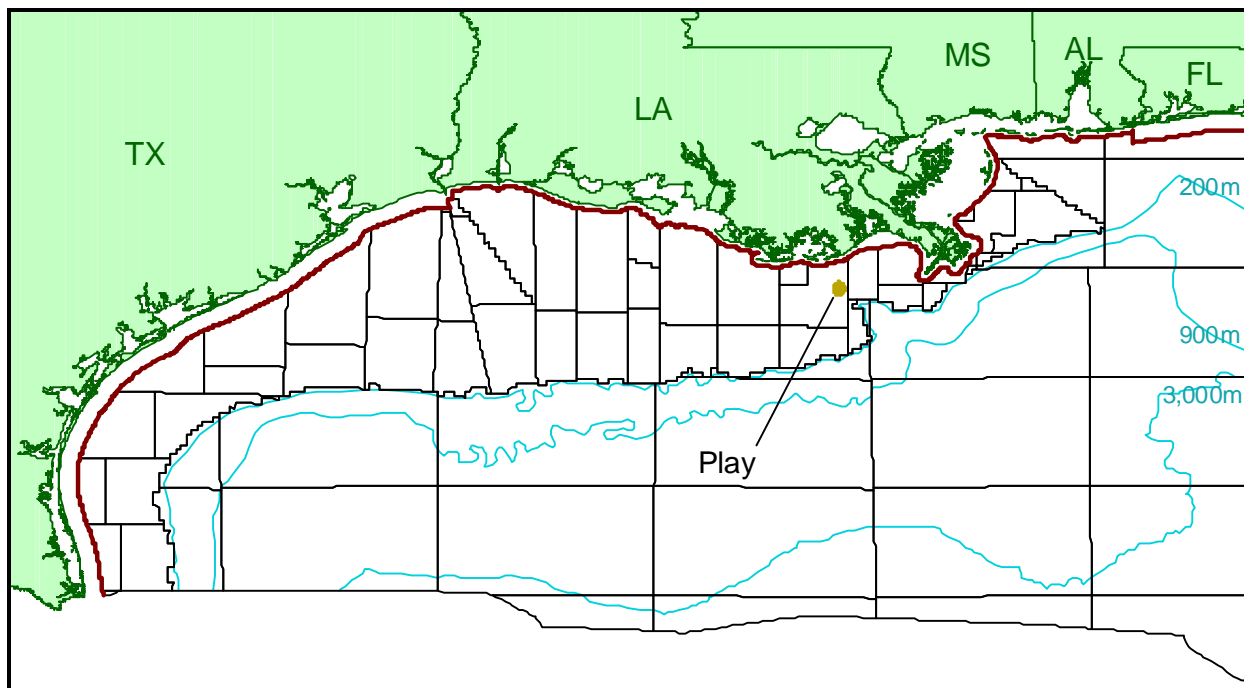


Figure 1. Map of play.

PLAY CHARACTERISTICS

The structure at the South Timbalier 86 field is a salt diapir. Overlying impermeable layers of the caprock seal the hydrocarbons in this play. The MPL C play's reservoir is crystalline limestone. This caprock limestone is a product of diagenesis, and its age is unknown. Therefore, for mapping purposes, the caprock is correlated to the surrounding MPL sediments.

DISCOVERIES

The MPL C oil play contains proved reserves of 0.039 MMbo and 0.072 Bcfg (0.052 MMBOE), of which all

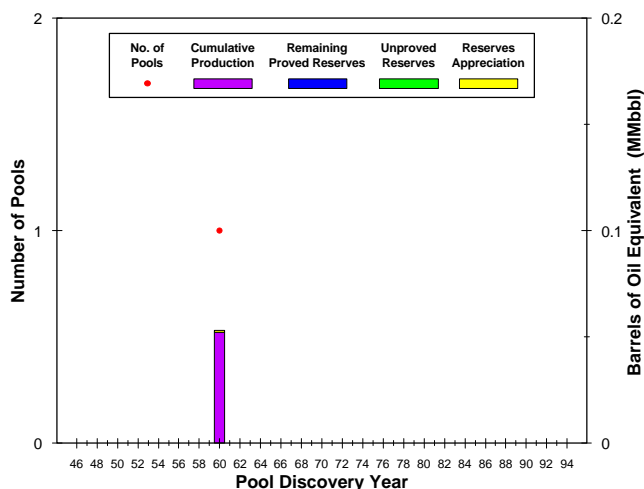


Figure 2. Exploration history graph.

have been produced. The play consists of one reservoir in one pool (table 1). The play's reserves were discovered in 1960 in Murphy Exploration and Production's ZONE 3 reservoir (figure 2).

Table 1. Characteristics of the discovered pools.

1 Pool (1 Reservoir)	Minimum	Mean	Maximum
Water depth (feet)	--	94	--
Subsea depth (feet)	--	4,070	--
Number of reservoirs per pool	--	1	--
Porosity	--	29%	--
Water saturation	--	24%	--

ASSESSMENT RESULTS

Though hydrocarbons often occur in caprock sequences, production from them in the Gulf of Mexico is rare. Because the MPL C play is unlikely to contribute significant new resources to the MPL chronozone, it was not evaluated for this National Assessment. However, the estimates for reserves and production can be found in table 2.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1	<0.001	<0.001	<0.001
Cumulative production	--	<0.001	<0.001	<0.001
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	<0.001	<0.001
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	na	na	na
Mean	na	na	na	na
5th percentile	--	na	na	na
Total Endowment				
95th percentile	--	na	na	na
Mean	na	na	na	na
5th percentile	--	na	na	na

LOWER PLEISTOCENE (LPL) CHRONOZONE

CHRONOZONE DESCRIPTION

The Lower Pleistocene (LPL) chronozone corresponds to the *Valvulineria* "H" and *Lenticulina* 1 biozones. The LPL section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the LPL chronozone include aggradational, progradational, and fan, each of which defines a play: the Lower Pleistocene Aggradational (LPL A) play, the Lower Pleistocene Progradational (LPL P) play, and the Lower Pleistocene Fan (LPL F) play. Retrogradational sands associated with marine transgressions also occur locally in the play areas at the top of the progradational and aggradational deposits. However, because these retrogradational sands are discontinuous over any significant distance, they are included as part of the underlying deposits.

The potential for sand development within the LPL chronozone extends from the Galveston, East Breaks, and Alaminos Canyon Areas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, LPL sands continue onshore into Louisiana and eastern Texas. Sand potential is limited to the west and northeast due to a lack of sediment influx at the edges of the LPL depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by LPL sand development in the OCS G11643-1 well in Keathley Canyon block 255 and by chronozone tops correlated to seismic data.

Productive and established sand locations in the LPL chronozone are a result of an ancient depocenter in the Louisiana area. During LPL time, as in upper Pliocene (UP) time, the Texas depocenter no longer received significant amounts of sand-rich sediments. When compared with underlying productive UP sediments, the productive LPL sediments

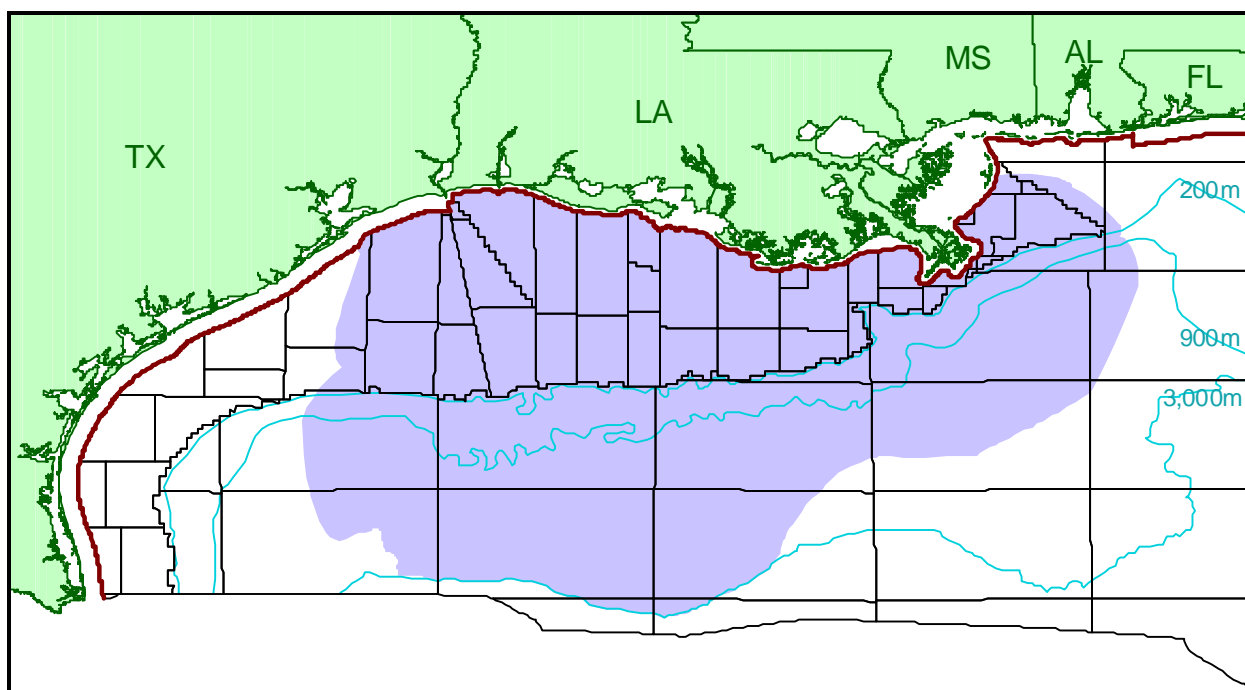


Figure 1. Map of assessed chronozone.

shifted considerably westward, with LPL sediments deposited as far west as the Galveston and East Breaks Areas. In addition, as is typical of prograding delta systems, the sediments of LPL time occur considerably more basinward as compared with the sediments of UP time.

Major structural features in the LPL chronozone include salt diapirs, anticlines, growth faults, and normal faults. Less common structures include stratigraphic pinch-outs, shale diapirs, salt ridges, and unconformities.

DISCOVERIES

The LPL chronozone contains 396 discovered pools in three plays (table 1). Significant amounts of hydrocarbons were recently identified in the LPL chronozone in the East Breaks 945 field ("Diana"), the Garden Banks 426 field ("Auger"), and the Green Canyon 205 field ("Genesis"). Of the 21 chronozones in the Gulf of Mexico Region, the LPL chronozone contains the largest amount of total reserves, with 3.646 Bbo and 35.000 Tcfg (9.874 BBOE), of which 2.194 Bbo and 22.463 Tcfg (6.191 BBOE) have been produced. The largest number of discoveries in the LPL chronozone occurred when 24 pools added the maximum yearly total reserves of 625.645 MMBOE in 1984 (figure 2).

Of the three plays in the LPL chronozone, the LPL P play contains the most total reserves in 207 pools, with 1.510 Bbo and 18.869 Tcfg (4.868 BBOE).

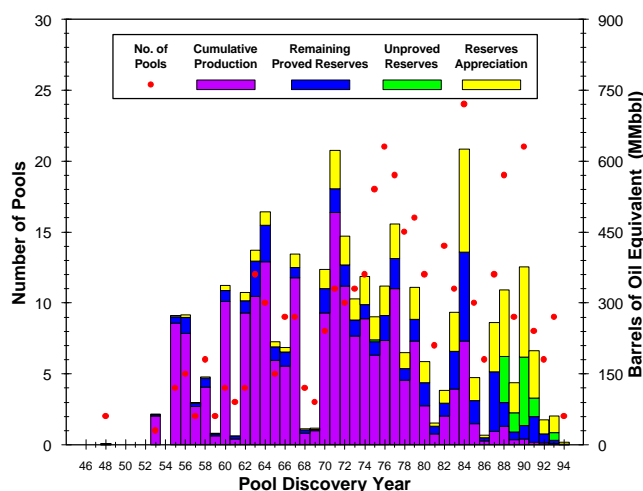


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

396 Pools (2,015 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	294	6,950
Subsea depth (feet)	1,625	7,490	16,950
Number of sands per pool	1	5	42
Porosity	17%	30%	36%
Water saturation	7%	26%	54%

ASSESSMENT RESULTS

The LPL chronozone contains 647 pools (discovered plus undiscovered), with a mean total endowment estimated at 4.724 Bbo and 51.913 Tcfg (13.961 BBOE) (table 2). This is the largest mean total endowment of all the chronozones in the Gulf of Mexico.

Assessment results indicate that undiscovered resources may occur in as many as 251 pools, which contain a range of 0.815 to 1.388 Bbo and 12.970 to 21.536 Tcfg at the 95th and 5th percentiles, respectively (figure 3).

At mean levels, 1.078 Bbo and 16.913 Tcfg (4.087 BBOE) are projected. These undiscovered resources represent 29 percent

of the LPL chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the largest in the chronozone (figure 4). Additionally, when compared with the other Gulf of Mexico chronozones, the LPL chronozone is projected to contain the largest amount of mean undiscovered gas and the third largest amount of mean undiscovered oil.

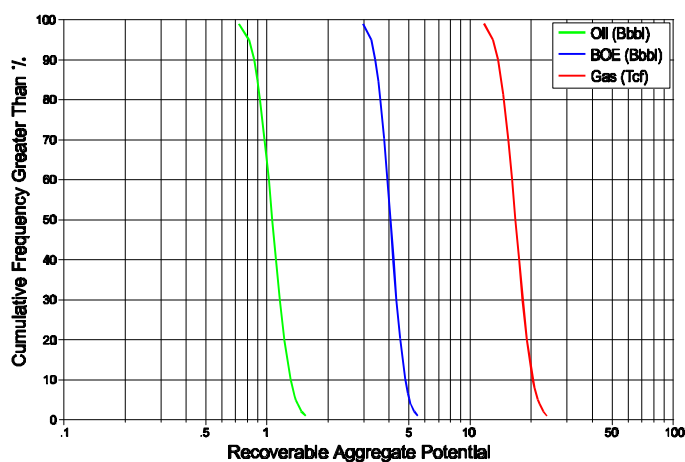


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	379	2.727	28.009	7.711
Cumulative production	--	2.194	22.463	6.191
Remaining proved	--	0.533	5.546	1.519
Unproved	17	0.211	0.749	0.344
Appreciation (P & U)	--	0.709	6.241	1.819
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.815	12.970	3.257
Mean	251	1.078	16.913	4.087
5th percentile	--	1.388	21.536	5.039
Total Endowment				
95th percentile	--	4.461	47.970	13.131
Mean	647	4.724	51.913	13.961
5th percentile	--	5.034	56.536	14.913

Of the three LPL plays, the LPL F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.837 Bbo and 12.354 Tcfg (3.035 BBOE) remaining to be found in 158 pools. These undiscovered resources in the LPL F play represent 22 percent of the BOE mean total endowment for the LPL chronozone. This percentage, the potential for numerous discoveries within a large unexplored area, the potential for good LPL reservoir sand development in deepwater areas, and prolific existing fan production make the LPL F play an attractive exploration target in LPL strata.

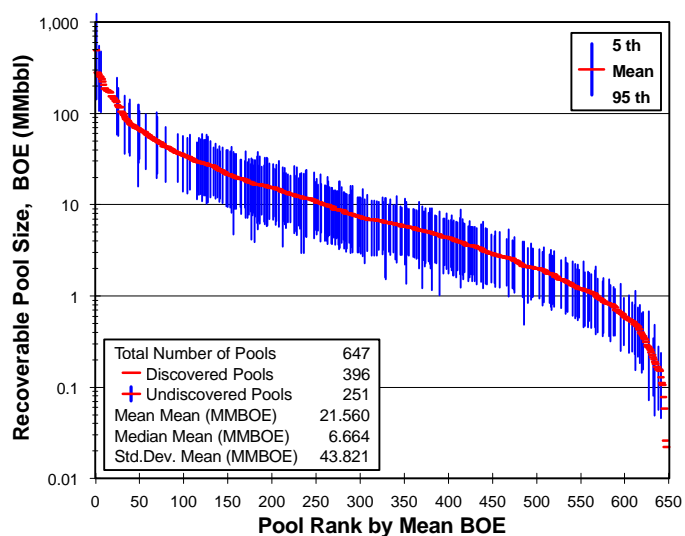


Figure 4. Pool rank plot.

LOWER PLEISTOCENE AGGRADATIONAL (LPL A) PLAY

PLAY DESCRIPTION

The established Lower Pleistocene Aggradational (LPL A) play occurs within the *Valvulineria* "H" and *Lenticulina* 1 biozones. This play extends from the northeastern portion of the Galveston Area offshore Texas to the Viosca Knoll Area east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Louisiana and eastern Texas. The play does not extend farther to the west or northeast because of an apparent lack of shelfal source sands at the edges of the LPL depocenter. Downdip, the play grades into the sediments of the Lower Pleistocene Progradational (LPL P) play.

The sediments in the LPL A play were mainly supplied by ancient delta systems located in the Louisiana area. No significant lateral shift in depocenter is observed in the offshore area from the underlying upper Pliocene (UP) chronozone to the LPL chronozone. The downdip limit of the aggradational deposits is located considerably more basinward in LPL time compared to that of UP time, indicative of the prograding nature of the delta systems with time.

PLAY CHARACTERISTICS

The productive LPL A play consists of channel and stacked channel, delta front and fringe, distributary mouth bar, crevasse splay, and shelf slump deposits. In addition, retrogradational sands locally cap the LPL A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the LPL A play. Salt diapirs, anticlines, growth faults, and normal faults are the play's dominant structural features. Less common structures include salt ridges, shale diapirs, and stratigraphic

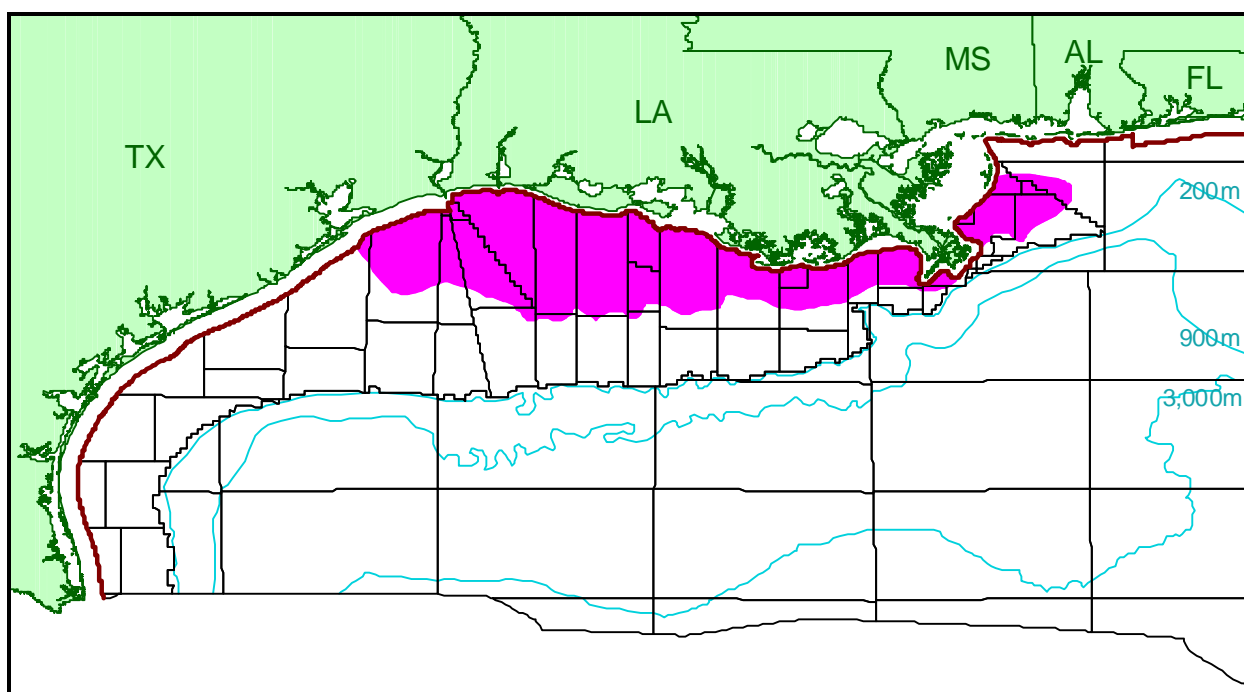


Figure 1. Map of assessed play.

pinch-outs. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

Eugene Island 126 is the type field, and Mobil Oil Exploration & Production's C1, C2, C3, C4, C5, C6, C7, C9, C11, C12, C13, D1, D2, D3, E1, E2, F1, and F2 sands represent the LPL A play in this field.

DISCOVERIES

The LPL A mixed oil and gas play contains total reserves of 0.322 Bbo and 1.800 Tcfg (0.643 BBOE), of which 0.291 Bbo and 1.335 Tcfg (0.529 BBOE) have been produced. The play contains 224 producible sands in 67 pools (table 1). The first reserves in the play were discovered in the Eugene Island 45 field in 1948 (figure 2). The maximum yearly total reserves of 203.096 MMBOE were added in 1955 when three pools were discovered, including the largest pool in the play in the West Delta 30 field. On a BOE basis, 45 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 73 percent gas. Forty-five percent of the play's pools have been discovered since 1979. However, 81 percent of the play's cumulative production and 74 percent of its total reserves come from pools discovered prior to 1970, indicative of the large size of some of these early discoveries. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 67 discovered pools range in size from 0.078 to 153.640 MMBOE. These pools contain 395 reservoirs, of which 185 are nonassociated gas, 191 are undersaturated oil, and 19 are saturated oil.

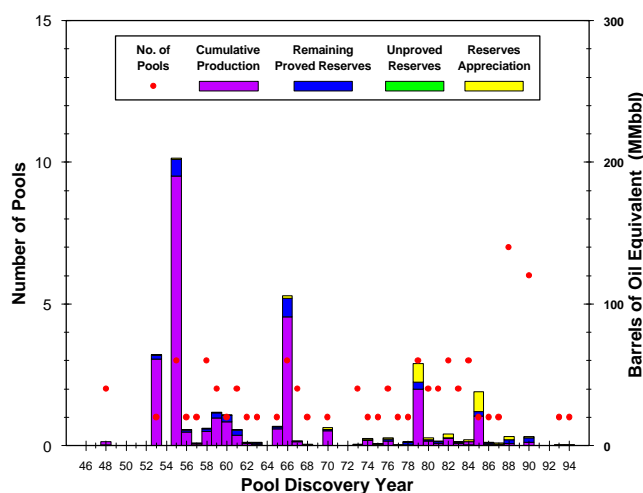


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

67 Pools (224 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	78	202
Subsea depth (feet)	1,625	4,847	6,847
Number of sands per pool	1	3	21
Porosity	22%	31%	36%
Water saturation	13%	26%	54%

Of the 11 aggradational plays in the Gulf of Mexico Cenozoic Province, the LPL A play has produced the second largest amount of hydrocarbons at 25 percent and contains the third largest amount of total reserves at 23 percent, based on BOE.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LPL A play is 1.00. This play is the second largest aggradational play in the Gulf of Mexico Cenozoic Province, based on a mean total endowment of 0.345 Bbo and 2.097 Tcfg (0.719 BBOE) (table 2). Seventy-four percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.010 to 0.042 Bbo and 0.243 to 0.358 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.023 Bbo and 0.297 Tcfg (0.076 BBOE). These undiscovered resources may occur in as many as 20 pools. The largest undiscovered pool, with a mean size of

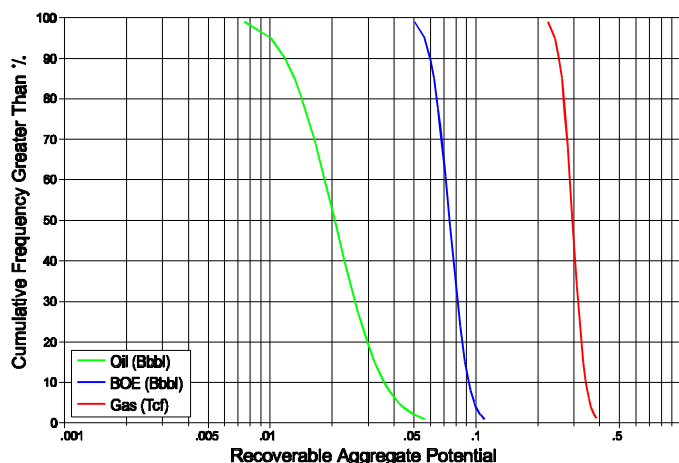


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	67	0.320	1.560	0.598
Cumulative production	--	0.291	1.335	0.529
Remaining proved	--	0.029	0.225	0.069
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.002	0.240	0.045
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.010	0.243	0.057
Mean	20	0.023	0.297	0.076
5th percentile	--	0.042	0.358	0.099
Total Endowment				
95th percentile	--	0.332	2.043	0.700
Mean	87	0.345	2.097	0.719
5th percentile	--	0.364	2.158	0.742

16.617 MMBOE, is modeled as the ninth largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 17, 18, 20, and 21 on the pool rank plot. For all the undiscovered pools in the LPL A play, the mean mean size is 3.770 MMBOE, which is smaller than the 9.592 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 8.254 MMBOE.

Of the 11 Gulf of Mexico Cenozoic Province aggradational plays, the LPL A play is projected to contain the largest amounts of mean undiscovered oil and gas, at 38 percent and 23 percent, respectively.

The LPL A play is well explored. All of the undiscovered pools are modeled to have a mean size less than 20 MMBOE and to contribute only 11 percent to the play's BOE mean total endowment. Thus, this play is believed to have limited exploration potential for large resources.

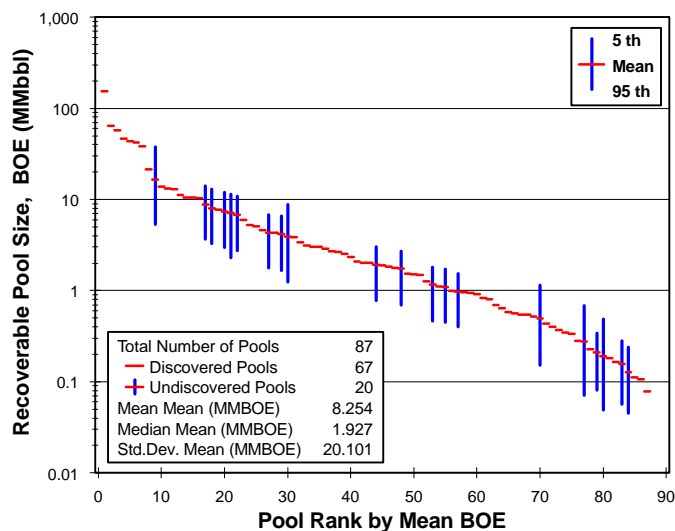


Figure 4. Pool rank plot.

LOWER PLEISTOCENE PROGRADATIONAL (LPL P) PLAY

PLAY DESCRIPTION

The Lower Pleistocene Progradational (LPL P) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs within the *Valvulineria* "H" and *Lenticulina* 1 biozones and extends from the Galveston Area offshore Texas to the Destin Dome Area east of the present-day Mississippi River Delta (figure 1).

Updip, the play grades into the sediments of the Lower Pleistocene Aggradational (LPL A) play. The LPL P play also extends onshore in some areas near the Mississippi River Delta. The play does not extend farther to the west or northeast because of an apparent lack of shelfal source sands at the edges of the LPL depocenter. Downdip, the play grades into the deposits of the Lower Pleistocene Fan (LPL F) play.

The sediments in the LPL P play were mainly supplied by ancient delta systems located in the Louisiana area. No significant lateral shift in depocenter is observed in the offshore area from the underlying upper Pliocene (UP) chronozone to the LPL chronozone. The LPL progradational sequence is located farther basinward compared with the UP progradational sequence, which demonstrates the prograding nature of the delta systems with time.

PLAY CHARACTERISTICS

The productive LPL P play consists of progradational deltaic sediments deposited in delta front and fringe, channel and stacked channel, crevasse splay, shelf blanket, and shelf and upper slope slump environments. In addition, retrogradational sands locally cap the LPL P play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the LPL P play. Salt diapirs, anticlines, normal faults, and

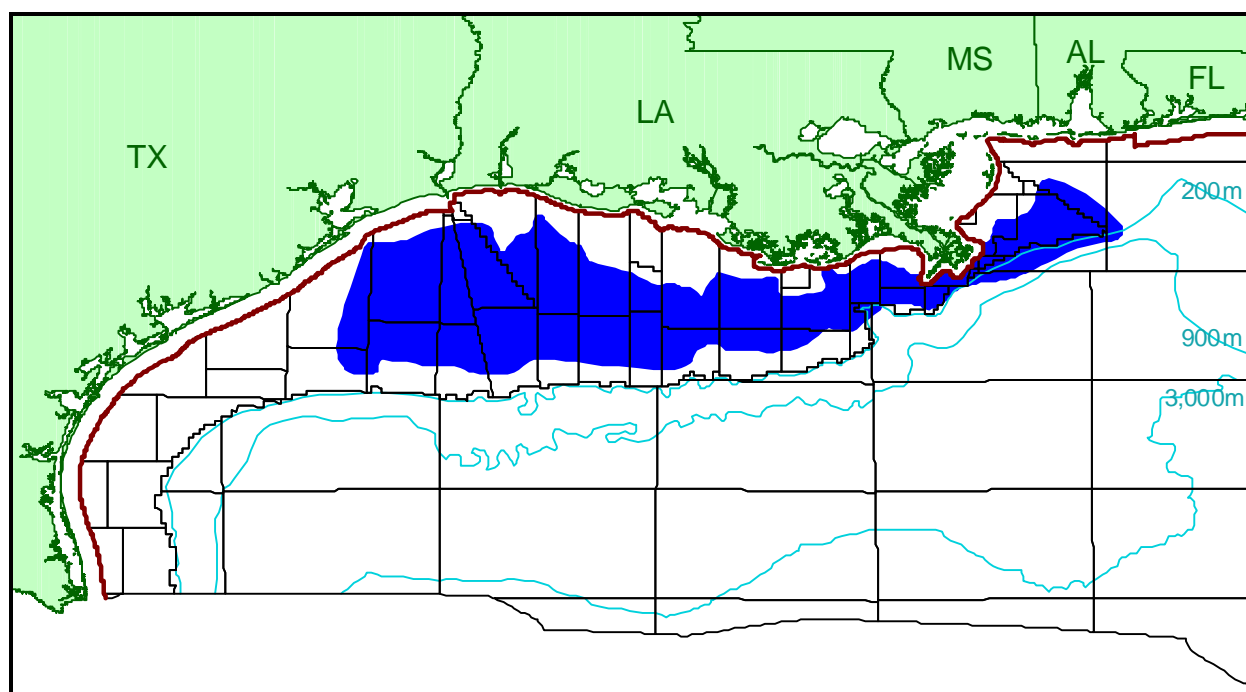


Figure 1. Map of assessed play.

growth faults are the dominant structural features in the play. Less commonly, stratigraphic pinch-outs and shale diapirs occur. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Vermilion 265 is the type field. Exxon Corporation's C5, C10, C25, C40, C50, D10 (equals Texaco Exploration and Production's I SEG500), D20, D40, D50, D60, D70 (equals Texaco Exploration and Production's JF), and D75 sands represent the LPL P play in this field.

DISCOVERIES

The LPL P play is predominantly a gas play, with total reserves of 1.510 Bbo and 18.869 Tcfg (4.868 BBOE), of which 1.212 Bbo and 13.969 Tcfg (3.698 BBOE) have been produced. The play contains 1,234 producible sands in 207 pools, and 203 of these pools contain proved reserves (table 1). The first LPL P reserves were discovered in the Ship Shoal 154 field in 1955 (figure 2). The maximum yearly total reserves of 484.902 MMBOE were added in 1964 with the discovery of eight pools. However, the largest pool in the play was discovered in 1962 in the South Timbalier 172 field. Discoveries in 1975 and earlier account for 88 percent of the cumulative production and 81 percent of the total reserves in the LPL P play. Throughout the play's history, pool discoveries have averaged about five per year. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, occurred in 1993.

The 207 discovered pools range in size from 0.059 to 278.575 MMBOE. These

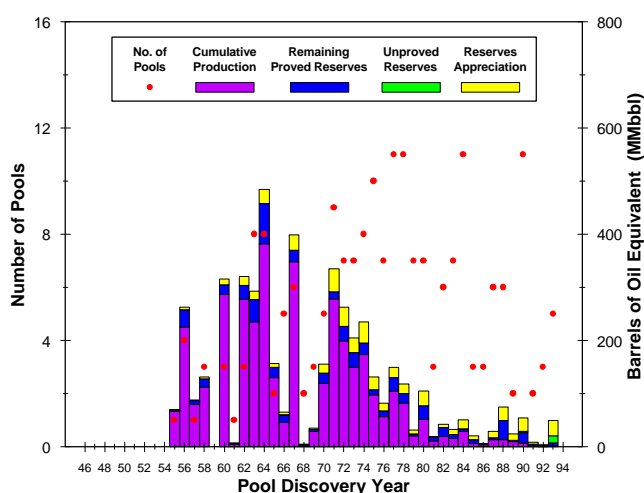


Figure 2. Exploration history graph.

and earlier account for 88 percent of the cumulative production and 81 percent of the total reserves in the LPL P play. Throughout the play's history, pool discoveries have averaged about five per year. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, occurred in 1993.

The 207 discovered pools range in size from 0.059 to 278.575 MMBOE. These

Table 1. Characteristics of the discovered pools.

207 Pools (1,234 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	40	150	516
Subsea depth (feet)	2,550	7,030	13,473
Number of sands per pool	1	6	42
Porosity	17%	30%	36%
Water saturation	7%	26%	48%

pools contain 2,630 reservoirs, of which 1,445 are nonassociated gas, 975 are undersaturated oil, and 210 are saturated oil.

Of the 61 Gulf of Mexico plays, the LPL P play is the largest based on BOE total reserves. It contains the largest amount of gas total reserves (11%) and the third largest amount of oil total reserves (10%). The play has also produced the largest amount of gas (12%) and the second largest amount of oil (13%). Additionally, the play is the largest of the 14 Gulf of Mexico progradational plays, containing 17 percent of the BOE total reserves.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LPL P play is 1.00. This play is the second largest in the Gulf of Mexico, based on a mean total endowment of 1.728 Bbo and 23.131 Tcfg (5.844 BBOE) (table 2). Sixty-three percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.153 to 0.298 Bbo and 3.775 to 4.787 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.218 Bbo and 4.262 Tcfg

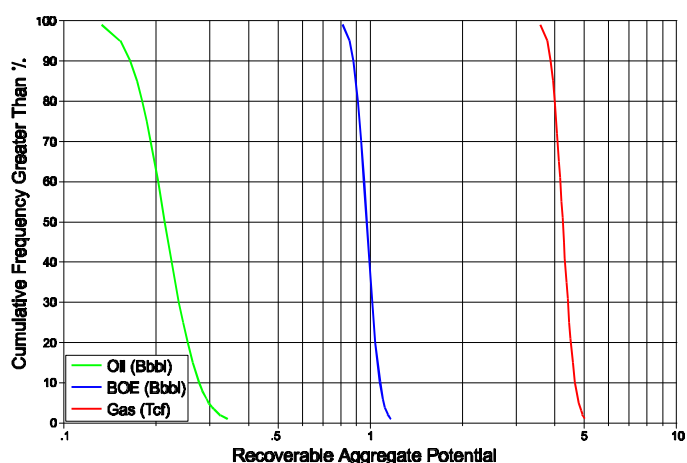


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	203	1.366	16.473	4.297
Cumulative production	--	1.212	13.969	3.698
Remaining proved	--	0.154	2.504	0.600
Unproved	4	0.007	0.047	0.015
Appreciation (P & U)	--	0.136	2.350	0.555
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.153	3.775	0.857
Mean	73	0.218	4.262	0.976
5th percentile	--	0.298	4.787	1.110
Total Endowment				
95th percentile	--	1.663	22.644	5.725
Mean	280	1.728	23.131	5.844
5th percentile	--	1.808	23.656	5.978

(0.976 BBOE). These undiscovered resources may occur in as many as 73 pools. The largest undiscovered pool, with a mean size of 91.737 MMBOE, is modeled as the thirteenth largest pool in the play (figure 4). For all the undiscovered pools in the LPL P play, the mean mean size is 13.344 MMBOE, which is smaller than the 23.515 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 20.863 MMBOE.

Of all 61 Gulf of Mexico plays, the LPL P play is projected to contain the sixth largest amount of mean undiscovered gas resources at 4 percent. Of the 14 Gulf of Mexico progradational plays, the LPL P play is projected to contain the largest amounts of mean undiscovered oil and gas resources, at 32 percent and 26 percent, respectively.

The LPL P play is well explored with large amounts of total reserves. Relative to the discovered pools, most of the undiscovered pools are of moderate size. However, the LPL P play has the largest undiscovered resources of all the progradational plays in the Gulf of Mexico. These undiscovered resources contribute 17 percent to the play's BOE mean total endowment.

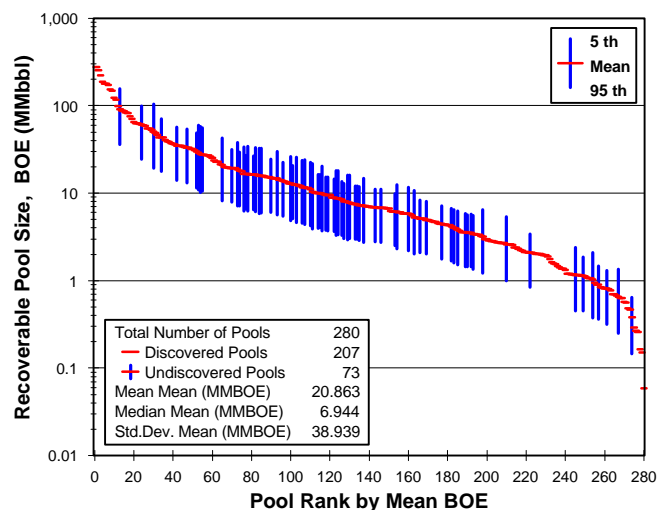


Figure 4. Pool rank plot.

LOWER PLEISTOCENE FAN (LPL F) PLAY

PLAY DESCRIPTION

The Lower Pleistocene Fan (LPL F) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs within the *Lenticulina* 1 and *Valvulineria* "H" biozones and extends from the Galveston, East Breaks, and Alaminos Canyon Areas to the western edges of the Desoto Canyon and Destin Dome Areas east of the present-day Mississippi River Delta (figure 1).

The play is bounded updip by the shelf/slope break associated with the *Lenticulina* 1 biozone and grades into the sediments of the Lower Pleistocene Progradational (LPL P) play. The LPL F play does not extend farther to the west because of an apparent lack of shelfal source sands in offshore Texas during LPL time. To the northeast, the play is limited by a lack of clastic influx at the edge of the LPL depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by LPL reservoir-quality sands in the OCS G11643-1 well in Keathley Canyon block 255 and by chronozone tops correlated to seismic data.

The sediments in the LPL F play were supplied mainly by ancient delta systems located in the Louisiana area. The shelf/slope break of the LPL chronozone occurs farther basinward as compared to that of the upper Pliocene (UP) chronozone, indicative of prograding delta systems.

PLAY CHARACTERISTICS

The productive LPL F play consists of deepwater turbidites deposited in fan systems as channel fill, overbank deposits, fan lobes, and fringe sheet sediments on the LPL slope between salt highs. Salt diapirs and anticlines dominate the play's structural features.

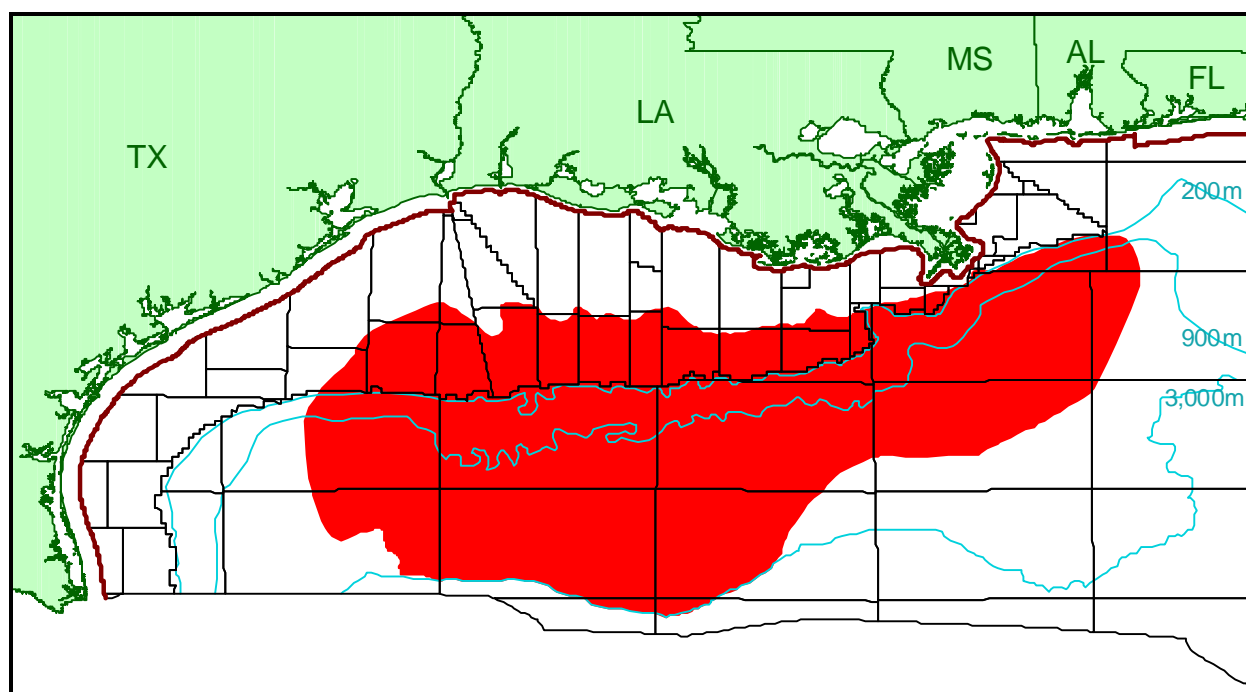


Figure 1. Map of assessed play.

Less commonly, growth faults, normal faults, stratigraphic pinch-outs, unconformities, salt ridges, and shale diapirs occur. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

High Island 467A is the type field, and Forcenergy Gas Exploration Inc.'s GO, GI, HIK, HP, ID, IP, JA, JD, JF, JG, and JM sands represent the LPL F play in this field.

DISCOVERIES

The LPL F mixed oil and gas play contains total reserves of 1.814 Bbo and 14.330 Tcfg (4.364 BBOE), of which 0.691 Bbo and 7.159 Tcfg (1.965 BBOE) have been produced. The play contains 557 producible sands in 122 pools, (table 1), and 109 of these pools contain proved reserves. The first reserves in the play were discovered in the South Marsh Island 79 field in 1963 (figure 2). Pool discoveries peaked in 1976 at 12 and have averaged about four per year throughout the play's history. Substantial reserves have been added almost every year since the initial discovery, with a maximum of 570.799 MMBOE found in 1984 in 10 pools. However, the largest discovered pool in the play was found in 1990 in the East Breaks 945 field ("Diana"). In 1987 and 1988, significant discoveries were made in the Garden Banks 426 field ("Auger") and in the Green Canyon 205 field ("Genesis"), respectively. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

Ninety-six percent of the cumulative production from this play has occurred from pools discovered prior to 1985, while 65 percent of the remaining total reserves is

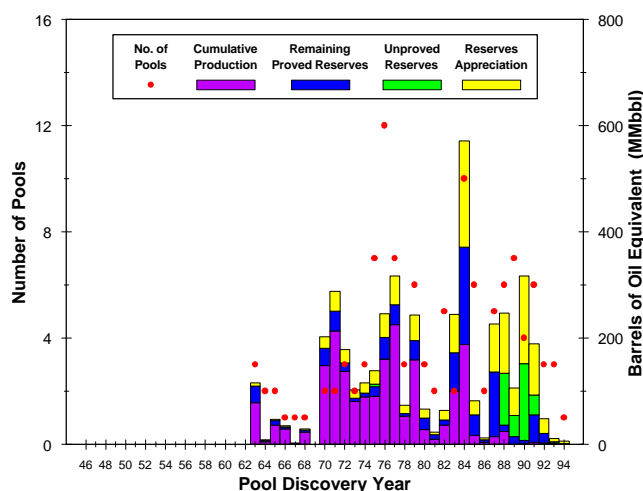


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

122 Pools (557 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	95	658	6,950
Subsea depth (feet)	5,668	9,722	16,950
Number of sands per pool	1	5	26
Porosity	20%	30%	36%
Water saturation	16%	26%	50%

estimated to be in pools discovered in 1984 or later. Deepwater, unproved pools, plus their reserves appreciation, account for most of these remaining total reserves discovered since 1984. On a BOE basis, 35 percent of the play's cumulative production is oil, but remaining total reserves indicate that future production may increase to almost 50 percent oil.

The 122 discovered pools range in size from 0.022 to 277.882 MMBOE. These pools contain 1,034 reservoirs, of which 540 are nonassociated gas, 397 are undersaturated oil, and 97 are saturated oil.

Of the 61 plays in the Gulf of Mexico, the LPL F play is the third largest, based on BOE total reserves. It contains the second largest amounts of both oil and gas total reserves, at 12 percent and 8 percent, respectively. The play also ranks seventh for BOE cumulative production (7%). Of the 15 fan plays, the LPL F play is the largest, containing 37 percent of the BOE total reserves and accounting for 43 percent of the BOE production.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LPL F play is 1.00. This play is the largest in the Gulf of Mexico, based on a mean total endowment of 2.651 Bbo and 26.684 Tcfg (7.399 BBOE) (table 2). Twenty-seven percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.622 to 1.094 Bbo and 8.783 to 16.721 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.837 Bbo and 12.354 Tcfg (3.035

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	109	1.040	9.977	2.816
Cumulative production	--	0.691	7.159	1.965
Remaining proved	--	0.350	2.818	0.851
Unproved	13	0.204	0.702	0.329
Appreciation (P & U)	--	0.570	3.651	1.220
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.622	8.783	2.499
Mean	158	0.837	12.354	3.035
5th percentile	--	1.094	16.721	3.915
Total Endowment				
95th percentile	--	2.436	23.113	6.863
Mean	280	2.651	26.684	7.399
5th percentile	--	2.908	31.051	8.279

BBOE). These undiscovered resources may occur in as many as 158 pools. The largest undiscovered pool, with a mean size of 494.930 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 3, 4, 14, and 15 on the pool rank plot. For all the undiscovered pools in the LPL F play, the mean mean size is 19.148 MMBOE, which is substantially smaller than the 35.770 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 26.390 MMBOE.

Of all 61 Gulf of Mexico plays, the LPL F play is projected to contain the largest amount of mean undiscovered gas and the second largest amount of mean undiscovered oil, or 12 percent of the BOE mean undiscovered resources. Additionally, the play contains 17 percent of the BOE mean undiscovered resources for the 15 Gulf of Mexico fan plays.

Due to a large unexplored area and known areas of good LPL sand development, the LPL F play is expected to contain numerous undiscovered pools, which account for 41 percent of the play's BOE mean total endowment. The greatest exploration potential exists downdip of discovered fields, especially in areas of present-day water depths greater than 1,000 feet.

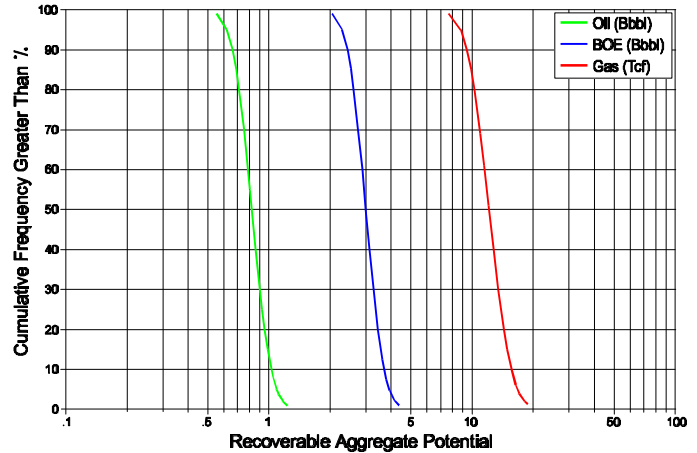


Figure 3. Cumulative probability distribution.

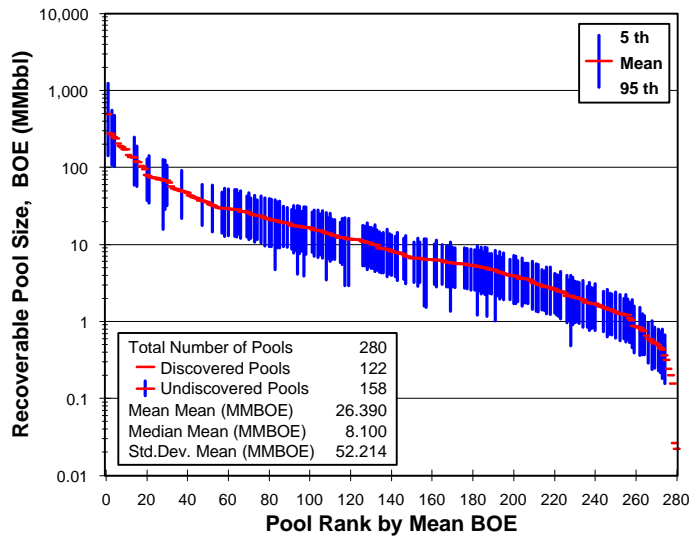


Figure 4. Pool rank plot.

UPPER PLIOCENE (UP) CHRONOZONE

CHRONOZONE DESCRIPTION

The Upper Pliocene (UP) chronozone corresponds to the *Buliminella* 1 biozone. The UP section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the UP chronozone include aggradational, progradational, and fan, each of which defines a play: the Upper Pliocene Aggradational (UP A) play, the Upper Pliocene Progradational (UP P) play, and the Upper Pliocene Fan (UP F) play. Retrogradational sands associated with marine transgressions also occur locally in the play areas at the top of the progradational and aggradational deposits. However, because these retrogradational sands are discontinuous over any significant distance, they are included as part of the underlying deposits.

The potential for sand development within the UP chronozone extends from the nearshore Galveston to the deepwater Port Isabel and Corpus Christi Areas northeastward to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, UP sands continue onshore into Louisiana and eastern Texas. Sand potential is limited to the west and northeast due to a lack of sediment influx at the edges of the UP depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by UP sand development in the OCS G12662-1 well in Garden Banks block 568 and by chronozone tops correlated to seismic data.

Productive and established sand locations in Miocene plays are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. In UP time, sand deposition was greatly diminished in the Texas depocenter when compared with deposition during lower Pliocene (LP) time. Thus, other than in the eastern Galveston and

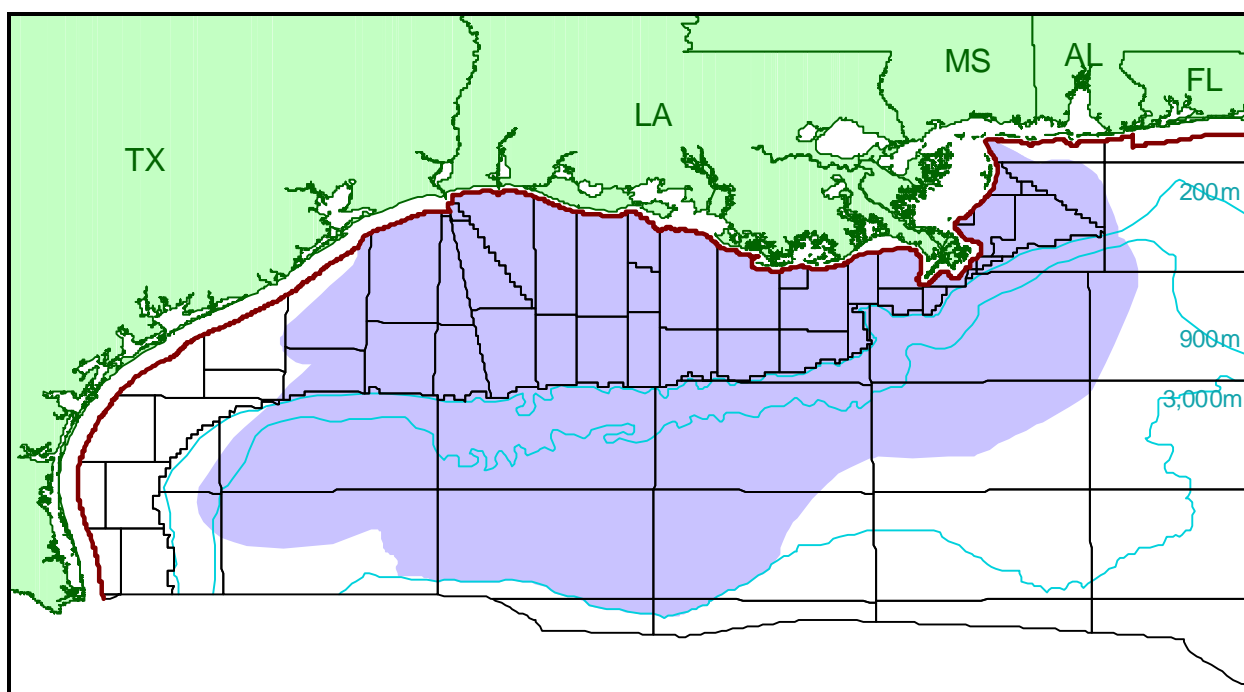


Figure 1. Map of assessed chronozone.

High Island Areas, few sands are found in the UP chronozone in offshore Texas.

In the Louisiana area, the UP shelf edge is observed farther offshore than that of the underlying LP chronozone due to the seaward progradation of deltaic deposits from the ancestral Mississippi River.

Major structural features in the UP chronozone include salt diapirs, anticlines, normal faults, and growth faults. Stratigraphic pinch-outs, salt ridges, and shale diapirs occur much less frequently.

DISCOVERIES

The UP chronozone contains 217 discovered pools in three plays (table 1). Significant amounts of hydrocarbons were recently identified in the UP chronozone in the Garden Banks 260 field ("Antioch"). Of the 21 chronozones in the Gulf of Mexico Region, the UP chronozone contains the third largest amount of total reserves, with 2.062 Bbo and 15.788 Tcfg (4.872 BBOE), of which 1.222 Bbo and 10.176 Tcfg (3.032 BBOE) have been produced. The largest number of discoveries in the UP chronozone occurred when 13 pools were added in 1984 (figure 2). However, the maximum yearly total reserves of 647.757 MMBOE were added in 1963 with the discovery of 10 pools.

Of the three plays in the UP chronozone, the UP P play contains the most total reserves in 130 pools, with 0.962 Bbo and 9.227 Tcfg (2.604 BBOE).

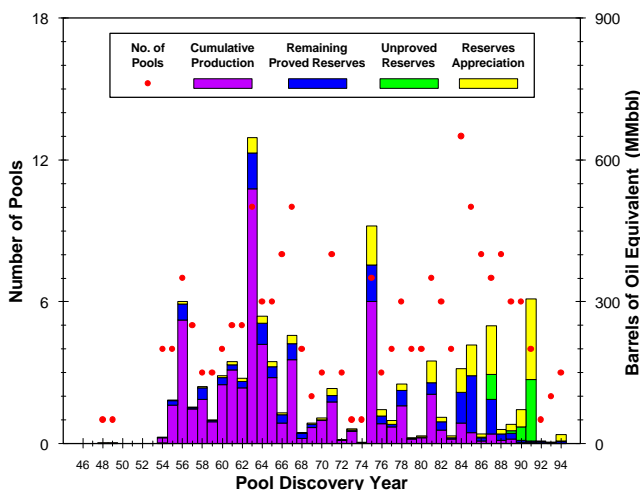


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

217 Pools (969 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	13	299	7,500
Subsea depth (feet)	1,971	8,805	19,216
Number of sands per pool	1	4	36
Porosity	21%	29%	36%
Water saturation	16%	27%	51%

ASSESSMENT RESULTS

The UP chronozone contains 371 pools (discovered plus undiscovered), with a mean total endowment estimated at 2.469 Bbo and 19.419 Tcfg (5.925 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 154 pools, which contain a range of 0.340 to 0.482 Bbo and 3.258 to 4.030 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.407 Bbo and 3.631 Tcfg (1.053 BBOE) are projected. These undiscovered resources represent 18 percent of the UP chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the thirty-ninth largest in the chronozone (figure 4).

Of the three UP plays, the UP F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.329 Bbo and 2.819 Tcfg (0.831 BBOE) in 105 pools. These undiscovered resources in the UP F play represent 14 percent of the BOE mean total endowment for the UP chronozone. Drilling results in

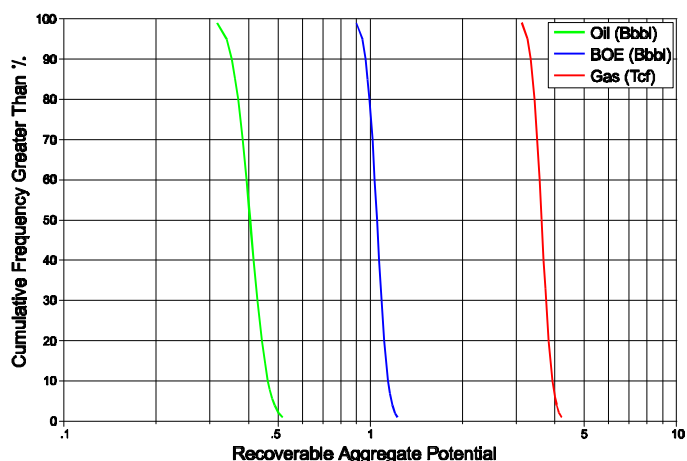


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	208	1.576	12.834	3.860
Cumulative production	--	1.222	10.176	3.032
Remaining proved	--	0.354	2.658	0.827
Unproved	9	0.126	0.525	0.220
Appreciation (P & U)	--	0.360	2.429	0.792
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.340	3.258	0.943
Mean	154	0.407	3.631	1.053
5th percentile	--	0.482	4.030	1.171
Total Endowment				
95th percentile	--	2.402	19.046	5.815
Mean	371	2.469	19.419	5.925
5th percentile	--	2.544	19.818	6.043

Garden Banks block 568 support strongly developed UP reservoir-quality sands in deepwater. This, coupled with the potential for numerous discoveries within a large unexplored area and prolific existing fan production, makes the UP F play an attractive exploration target in UP strata.

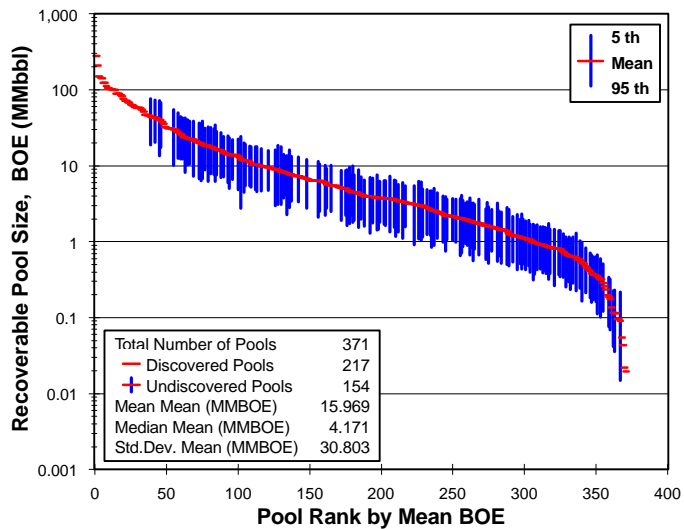


Figure 4. Pool rank plot.

UPPER PLIOCENE AGGRADATIONAL (UP A) PLAY

PLAY DESCRIPTION

The established Upper Pliocene Aggradational (UP A) play occurs at the *Buliminella* 1 biozone. This play extends from the Galveston Area offshore Texas to the Viosca Knoll and Mobile Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Louisiana and eastern Texas. Aggradational sand deposition ends to the west in the High Island Area and to the east in the Viosca Knoll and Mobile Areas at the edges of the UP depocenter. Downdip, the play grades into the sediments of the Upper Pliocene Progradational (UP P) play.

The downdip extent of the aggradational sequence in the UP chronozone is located farther basinward than that of the lower Pliocene (LP) chronozone, indicative of progradation by the ancient delta systems.

PLAY CHARACTERISTICS

The productive UP A play consists of delta plain and shallow marine shelf deposits that formed as channels, point bars, distributary mouth bars, crevasse splays, beaches, barrier islands, and nearshore bars. In addition, retrogradational sands locally cap the UP A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the UP A play. Salt diapirs, anticlines, growth faults, and normal faults are the major structural features in the play. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

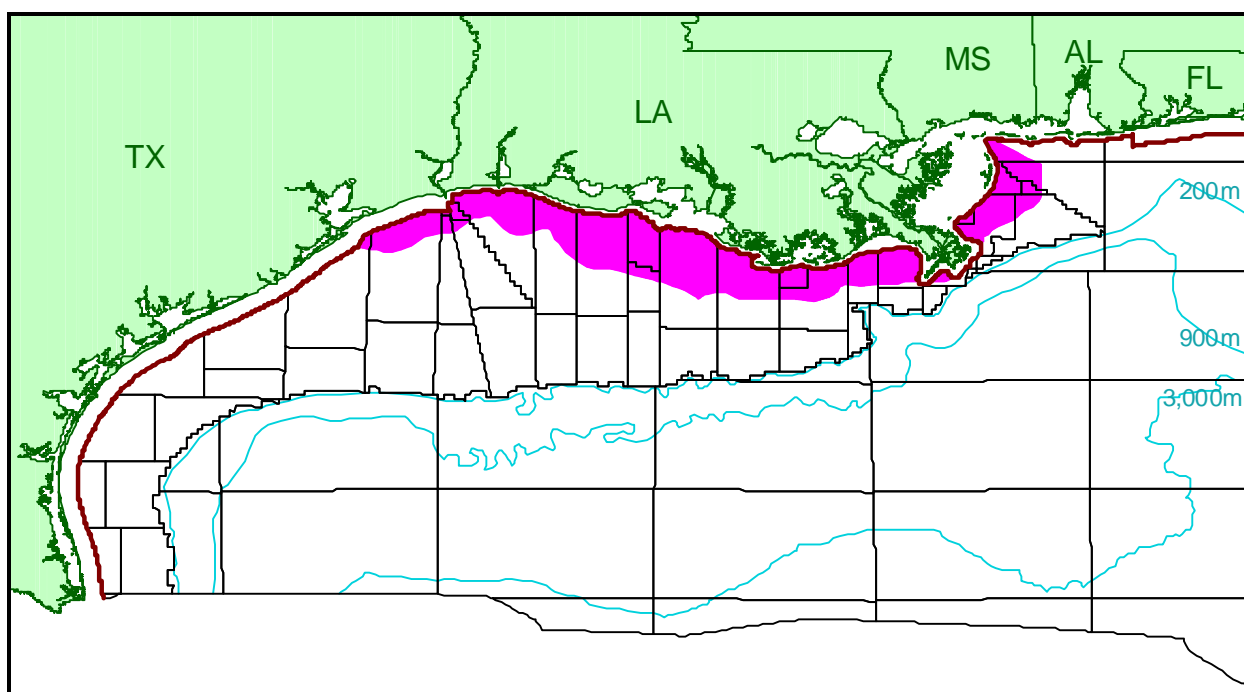


Figure 1. Map of assessed play.

South Pelto 23 is the type field, and Stone Petroleum Corporation's 8400, 8500, 8700, 9000, and 9300 sands represent the UP A play in this field.

DISCOVERIES

The UP A mixed oil and gas play contains total reserves of 0.138 Bbo and 0.960 Tcfg (0.309 BBOE), of which 0.122 Bbo and 0.773 Tcfg (0.259 BBOE) have been produced. The play contains 132 producible sands in 34 pools (table 1). The first reserves in the play were discovered in the Grand Isle 16 field in 1948 (figure 2). The most active period of discoveries lasted from 1954 to 1963, during which 18 pools and over 85 percent of the play's total reserves were found. The maximum yearly total reserves of 88.229 MMBOE were added in 1955 with the discovery of three pools. However, the largest pool in the play was discovered in 1956 in the Main Pass 41 field. On a BOE basis, 53 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 67 percent gas. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 34 discovered pools range in size from 0.019 to 63.714 MMBOE. These pools contain 301 reservoirs, of which 75 are nonassociated gas, 201 are undersaturated oil, and 25 are saturated oil.

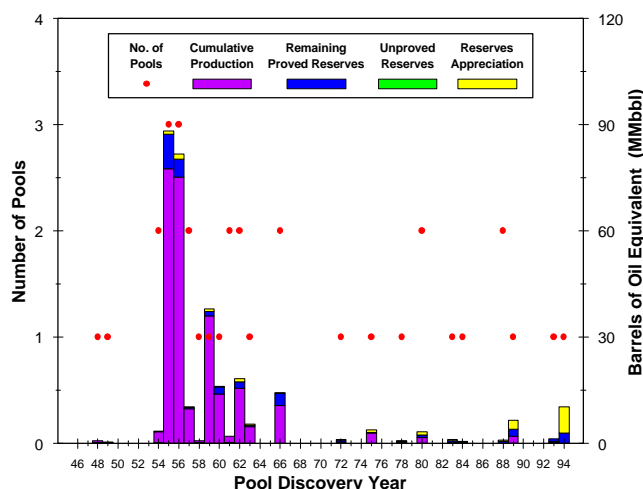


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

34 Pools (132 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	13	58	179
Subsea depth (feet)	1,971	6,449	12,100
Number of sands per pool	1	4	21
Porosity	25%	30%	36%
Water saturation	16%	27%	50%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UP A play is 1.00. The play contains a mean total endowment of 0.149 Bbo and 1.051 Tcfg (0.336 BBOE) (table 2). Seventy-seven percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.006 to 0.016 Bbo and 0.058 to 0.122 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.011 Bbo and 0.091 Tcfg (0.027 BBOE). These undiscovered resources may occur in as many as eight pools. The largest undiscovered pool, with a mean size of 8.064 MMBOE, is modeled as the eleventh largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 13, 16, 22, and 24 on the pool rank plot. For all the undiscovered pools in the UP A play, the mean mean size is 3.403 MMBOE, which is smaller than the 9.094 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 8.010 MMBOE.

Of the 11 aggradational plays in the Gulf of Mexico Cenozoic Province, the UP A play is projected to contain the third largest amount of mean undiscovered oil resources at 18 percent.

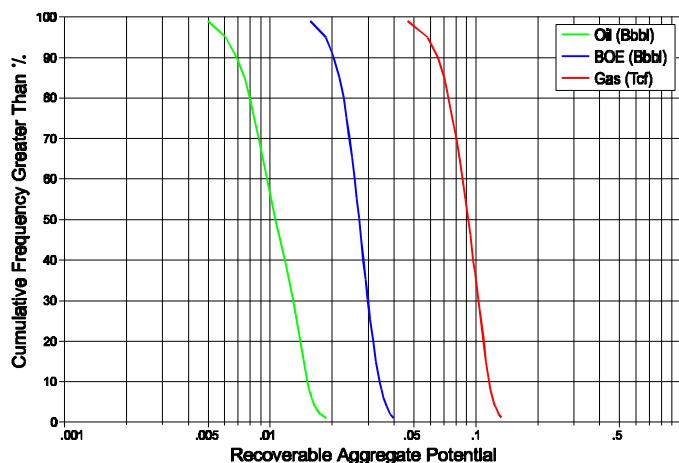


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	34	0.135	0.885	0.292
Cumulative production	--	0.122	0.773	0.259
Remaining proved	--	0.013	0.112	0.033
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.003	0.075	0.017
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.006	0.058	0.019
Mean	8	0.011	0.091	0.027
5th percentile	--	0.016	0.122	0.036
Total Endowment				
95th percentile	--	0.144	1.018	0.328
Mean	42	0.149	1.051	0.336
5th percentile	--	0.154	1.082	0.345

Many wells have tested this shallow-water play, leaving only limited interfield exploration potential. On the pool rank plot, the eight undiscovered pools are placed near the moderate and small discovered pool sizes and are estimated to add only 8 percent to the play's BOE mean total endowment.

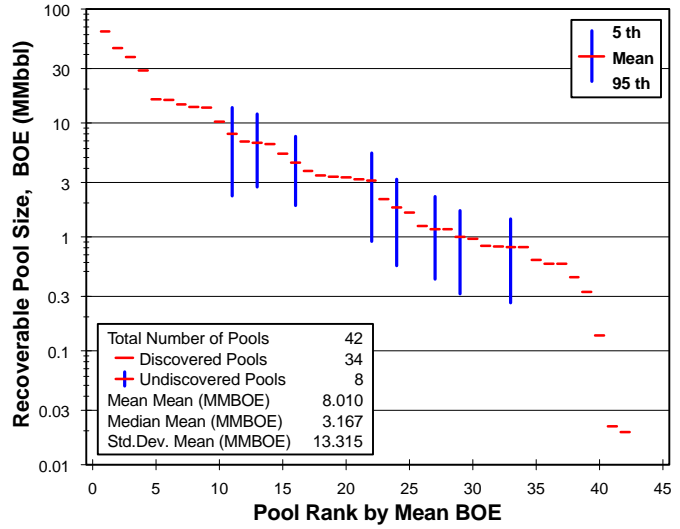


Figure 4. Pool rank plot.

UPPER PLIOCENE PROGRADATIONAL (UP P) PLAY

PLAY DESCRIPTION

The Upper Pliocene Progradational (UP P) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs at the *Buliminella* 1 biozone and extends from the Galveston Area offshore Texas to the western edge of the Destin Dome Area east of the present-day Mississippi River Delta (figure 1).

Updip, the play grades into the deposits of the Upper Pliocene Aggradational (UP A) play. To the northeast and southwest, the UP P play is limited by a marked decrease of sediment influx at the edges of the UP depocenter. Downdip, the play grades into the deposits of the Upper Pliocene Fan (UP F) play.

The ancestral Mississippi River Delta System, located in the present-day offshore Louisiana and easternmost Texas areas, was the dominant depocenter during UP time. East of the Viosca Knoll Area and West of the Galveston Area, UP sediments were deposited at the edges of the depocenter. These sediments are considered nonprospective as they are thin and very shallow in depth.

The updip boundary of the lower Pliocene (LP) progradational deposits occurs either onshore or just slightly offshore. By UP time, the delta systems had migrated basinward so that the updip boundary of the progradational deposits is primarily in Federal waters.

PLAY CHARACTERISTICS

The productive UP P play consists of progradational deltaic sediments deposited in delta front, delta fringe, and shelf blanket environments. In addition, retrogradational sands locally cap the UP P play. Because these retrogradational, reworked sands are so

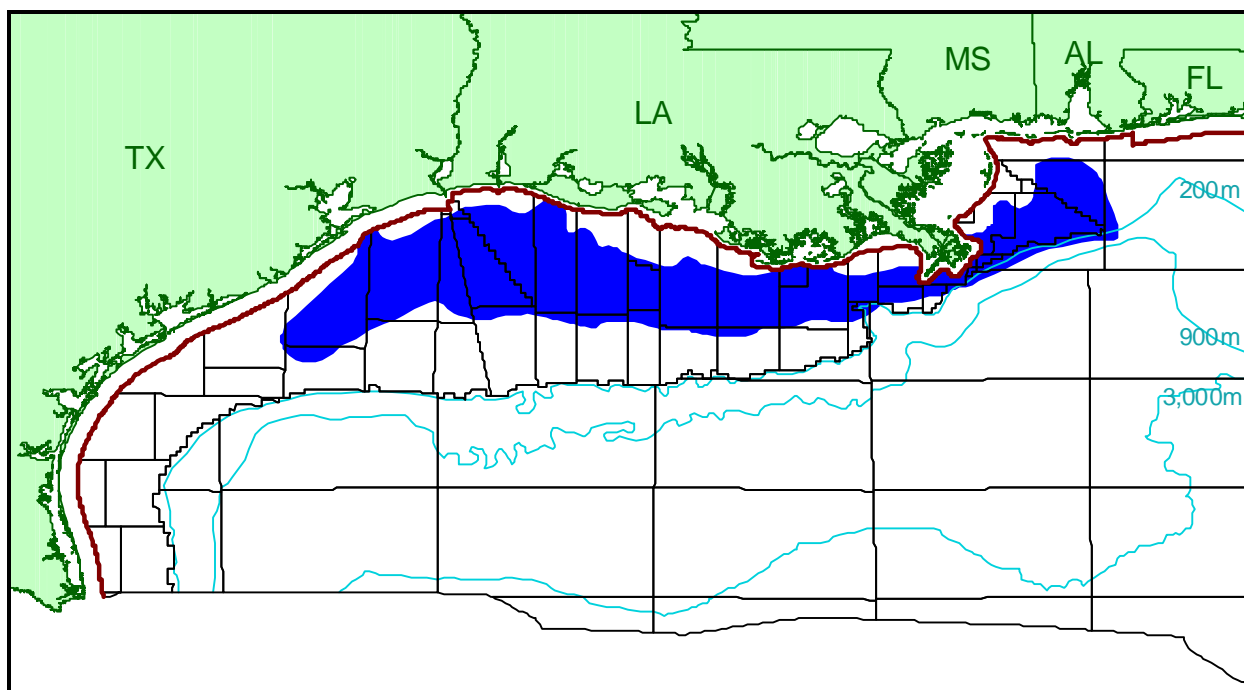


Figure 1. Map of assessed play.

discontinuous, they are included as part of the UP P play. Salt diapirs, normal faults, and anticlines are the dominant structural features in this play. Growth faults, stratigraphic pinch-outs, salt ridges, and shale diapirs also occur. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Ship Shoal 181 is the type field, and Chevron USA Inc.'s D10, D11, E2, E3, E5, E7, and E9 sands represent the UP F play in this field.

DISCOVERIES

The UP P mixed oil and gas play contains total reserves of 0.962 Bbo and 9.227 Tcfg (2.604 BBOE), of which 0.754 Bbo and 6.882 Tcfg (1.979 BBOE) have been produced. The play contains 641 producible sands in 130 pools (table 1). The first reserves in the play were discovered in the South Timbalier 52 field in 1954 (figure 2). The maximum yearly total reserves of 531.386 MMBOE were added in 1963 with the discovery of eight pools. However, the largest pool in the play was discovered in 1956 in the South Timbalier 135 field. Over 75 percent of the play's cumulative production and over 70 percent of the play's total reserves are from pools discovered in the 1960's or earlier. An average of three to four pools were discovered each year from 1954 to 1992. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 130 discovered pools range in size from 0.043 to 150.190 MMBOE. These pools contain 1,661 reservoirs, of which 783 are nonassociated gas, 726 are undersaturated oil, and 152 are saturated oil.

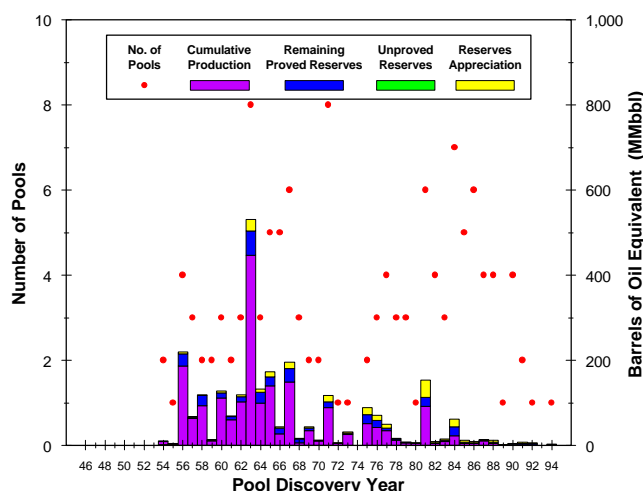


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

130 Pools (641 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	22	127	516
Subsea depth (feet)	2,260	8,207	15,148
Number of sands per pool	1	5	36
Porosity	22%	29%	36%
Water saturation	16%	27%	45%

Of the 61 Gulf of Mexico plays, the UP P play contains the seventh largest amount of total reserves (6%) and has produced the fifth largest amount of hydrocarbons (7%), based on BOE.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UP P play is 1.00. This play is the eighth largest in the Gulf of Mexico, based on a mean total endowment of 1.029 Bbo and 9.948 Tcfg (2.799 BBOE) (table 2). Seventy-one percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.045 to 0.092 Bbo and 0.611 to 0.833 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are

estimated at 0.067 Bbo and 0.721 Tcfg (0.195 BBOE). These undiscovered resources may occur in as many as 41 pools. The largest undiscovered pool, with a mean size of

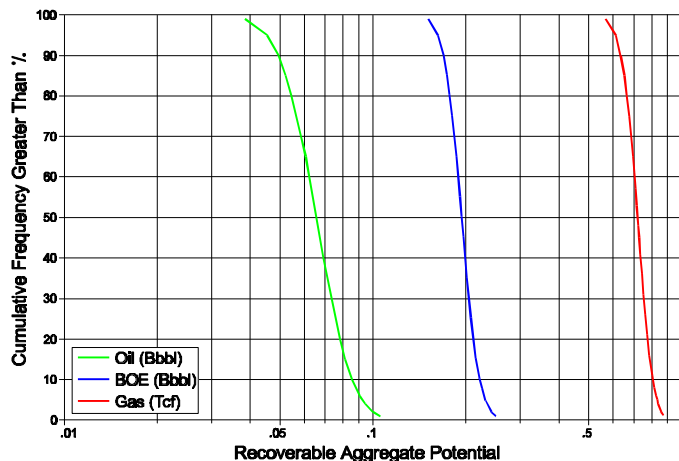


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	130	0.889	8.296	2.365
Cumulative production	--	0.754	6.882	1.979
Remaining proved	--	0.135	1.414	0.387
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.073	0.932	0.239
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.045	0.611	0.163
Mean	41	0.067	0.721	0.195
5th percentile	--	0.092	0.833	0.231
Total Endowment				
95th percentile	--	1.007	9.838	2.767
Mean	171	1.029	9.948	2.799
5th percentile	--	1.054	10.060	2.835

19.143 MMBOE, is modeled as the thirty-fifth largest pool in the play (figure 4). For all the undiscovered pools in the UP P play, the mean mean size is 4.748 MMBOE, which is substantially smaller than the 20.031 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 16.367 MMBOE.

The UP P play is well explored, with limited potential for discoveries between and downdip of discovered pools. Undiscovered pools are modeled as moderate to small in size and are expected to contribute only 7 percent to the play's BOE mean total endowment.

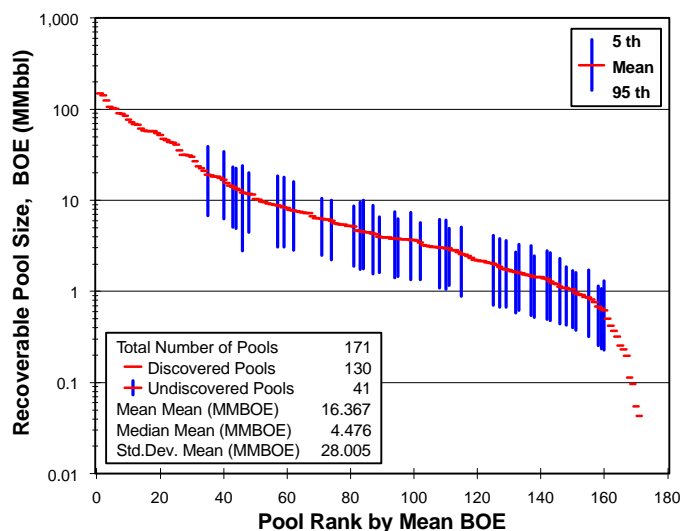


Figure 4. Pool rank plot.

UPPER PLIOCENE FAN (UP F) PLAY

PLAY DESCRIPTION

The Upper Pliocene Fan (UP F) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs at the *Buliminella* 1 biozone and extends from the Corpus Christi and Port Isabel Areas to the western edge of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip and to the northeast, the play is bounded by the shelf/slope break associated with the *Buliminella* 1 biozone and grades into the deposits of the Upper Pliocene Progradational (UP P) play. To the southwest, the play is limited by a marked decrease in sediment influx at the edge of the UP depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by good reservoir-quality UP sands in the OCS G12662-1 well in Garden Banks block 568.

The ancestral Mississippi River Delta System, located in the present-day offshore Louisiana and easternmost Texas areas, was the dominant depocenter during UP time. The active delta systems present in Texas during the Miocene no longer provided significant clastic influx to the present-day Texas offshore area.

PLAY CHARACTERISTICS

The productive UP F play consists of deepwater turbidite sands deposited in fan systems as channel fill, fan lobes, and fringe sheet sediments on the UP slope between salt highs. Salt diapirs, anticlines, and normal faults are the dominant structural features in this play. Growth faults and salt ridges occur less commonly. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future

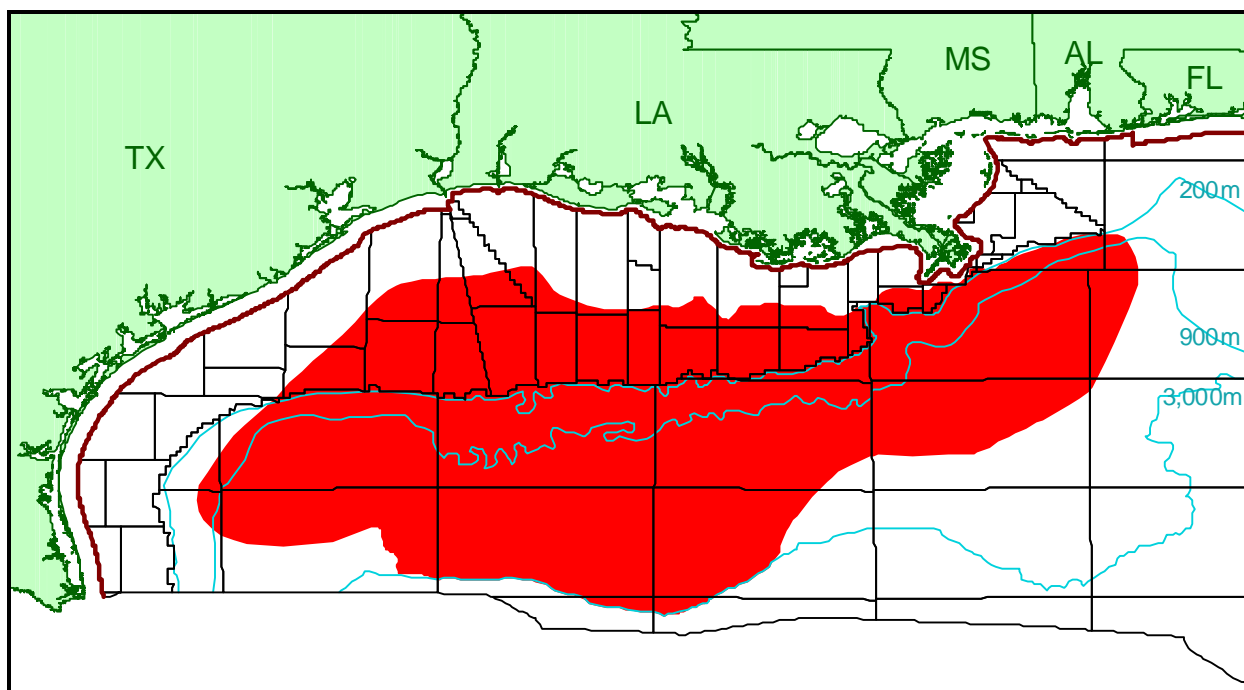


Figure 1. Map of assessed play.

discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

South Pass 89 is the type field. Marathon Oil Co.'s T10, STRAY, U1, U5, US1 and US2 sands and Exxon Corporation's P3, Z10, and Z20 sands represent the UP F play in this field.

DISCOVERIES

The UP F mixed oil and gas play contains total reserves of 0.962 Bbo and 5.600 Tcfg (1.958 BBOE), of which 0.346 Bbo and 2.521 Tcfg (0.794 BBOE) have been produced. The play contains 196 producible sands in 53 pools, and 44 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the Ship Shoal 208 field in 1961 (figure 2). The maximum yearly total reserves of 367.105 MMBOE were added in 1975 when four pools were discovered, including the largest pool in the play in the Mississippi Canyon 194 field ("Cognac"). Forty-four percent of the play's total reserves were discovered in

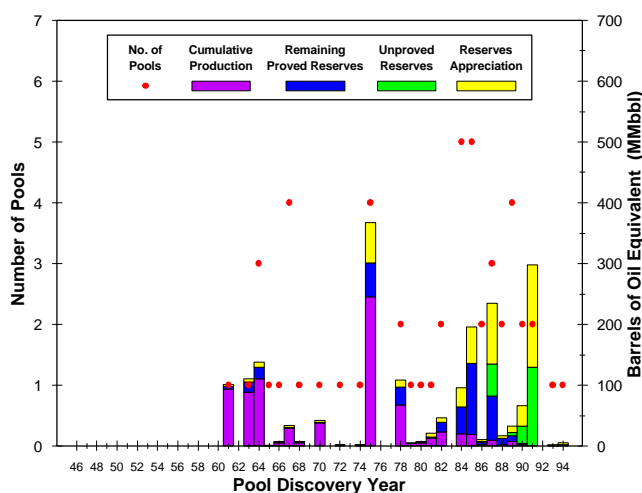


Figure 2. Exploration history graph.

22 pools in 1985 or later; half of these pools are in water depths greater than 1,000 feet. A significant discovery was made in 1991 in the Garden Banks 260 field ("Antioch"). The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 53 discovered pools range in size from 0.095 to 281.112 MMBOE. These pools contain 335 reservoirs, of which 139 are nonassociated gas, 159 are undersaturated oil, and 37 are saturated oil.

Of the 61 Gulf of Mexico plays, the UP F play contains the ninth largest amount of BOE total reserves at 4 percent. Of the 15 Gulf of Mexico fan plays, the UP F play is the second largest, based on BOE total reserves (16%) and BOE cumulative production (18%).

Table 1. Characteristics of the discovered pools.

53 Pools (196 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	71	877	7,500
Subsea depth (feet)	6,137	11,785	19,216
Number of sands per pool	1	4	17
Porosity	21%	29%	34%
Water saturation	16%	26%	51%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UP F play is 1.00. This play is the ninth largest in the Gulf of Mexico, based on a mean total endowment of 1.291 Bbo and 8.419 Tcfg (2.789 BBOE) (table 2). Twenty-eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.277 to 0.384 Bbo and 2.518 to 3.133 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.329 Bbo and 2.819 Tcfg

(0.831 BBOE). These undiscovered resources may occur in as many as 105 pools. The largest undiscovered pool, with a mean size of 44.022 MMBOE, is modeled as the fifteenth largest pool in the play (figure 4). The model results place the next four undiscovered pools in positions 16, 18, 19, and 23 on the pool rank plot. For all the undiscovered pools in the UP F play, the mean mean size is 7.915 MMBOE, which is substantially smaller than the 36.949 MMBOE mean size of the discovered pools. The mean mean size for all pools,

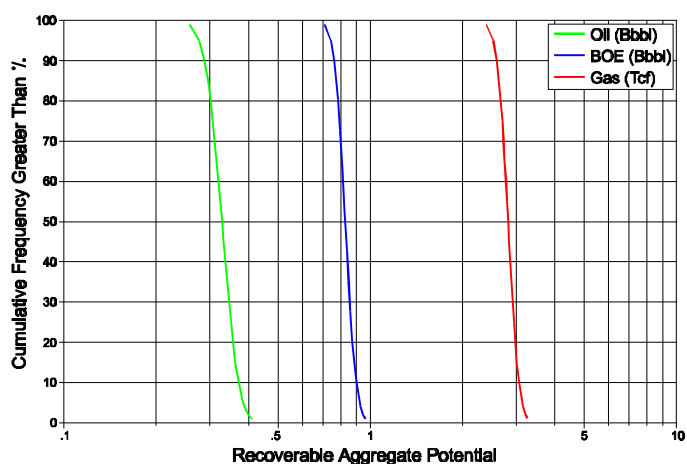


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	44	0.552	3.654	1.202
Cumulative production	--	0.346	2.521	0.794
Remaining proved	--	0.206	1.132	0.408
Unproved	9	0.126	0.525	0.220
Appreciation (P & U)	--	0.283	1.422	0.536
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.277	2.518	0.742
Mean	105	0.329	2.819	0.831
5th percentile	--	0.384	3.133	0.924
Total Endowment				
95th percentile	--	1.239	8.118	2.700
Mean	158	1.291	8.419	2.789
5th percentile	--	1.346	8.733	2.882

including both discovered and undiscovered, is 17.654 MMBOE.

Of the 15 Gulf of Mexico fan plays, the UP F play is the third largest, with 9 percent of the BOE mean total endowment.

Because of the large unexplored area and occurrence of good reservoir-quality sands in deepwater areas, numerous undiscovered pools are modeled for the UP F play. Undiscovered resources are expected to add 30 percent to the play's BOE mean total endowment. Hydrocarbon potential exists downdip of the discovered fields, especially in water depths greater than 1,000 feet.

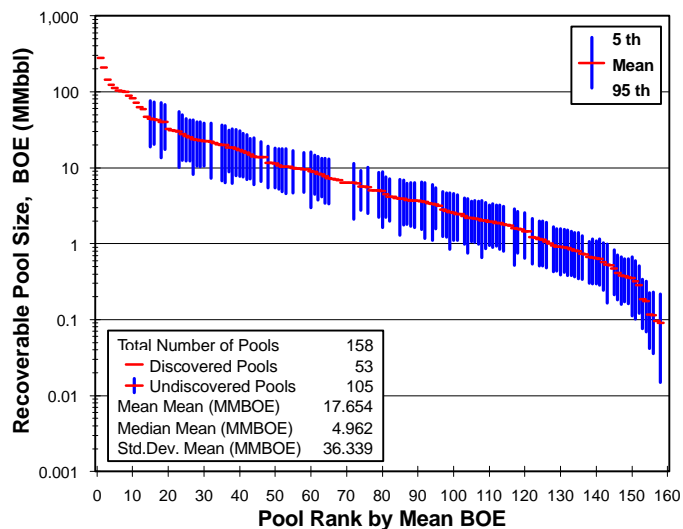


Figure 4. Pool rank plot.

LOWER PLIOCENE (LP) CHRONOZONE

CHRONOZONE DESCRIPTION

The Lower Pliocene (LP) chronozone corresponds to the *Textularia* "X" biozone. The LP section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the LP chronozone include aggradational, progradational, and fan, each of which defines a play: the Lower Pliocene Aggradational (LP A) play, the Lower Pliocene Progradational (LP P) play, and the Lower Pliocene Fan (LP F) play. Retrogradational sands associated with marine transgressions also occur locally in the play areas at the top of the progradational and aggradational deposits. Because these retrogradational sands are discontinuous over any significant distance, they are included as part of these underlying deposits.

The potential for sand development within the LP chronozone extends from the North Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, LP sands continue onshore into Texas and Louisiana or shale out. Lower Pliocene sand potential is limited to the west and northeast by a lack of sediment influx at the edges of the LP depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by LP sand development in the OCS G12662-1 well in Garden Banks block 568 and by correlation of chronozone tops to seismic data.

The influx of sand-rich sediments, which existed during the underlying upper upper Miocene (UM3) chronozone in the offshore Texas area, was reduced significantly in LP time. As a result, only a few poorly developed progradational sands have been identified southwest of the Galveston Area. The predominant delta system that fed the LP

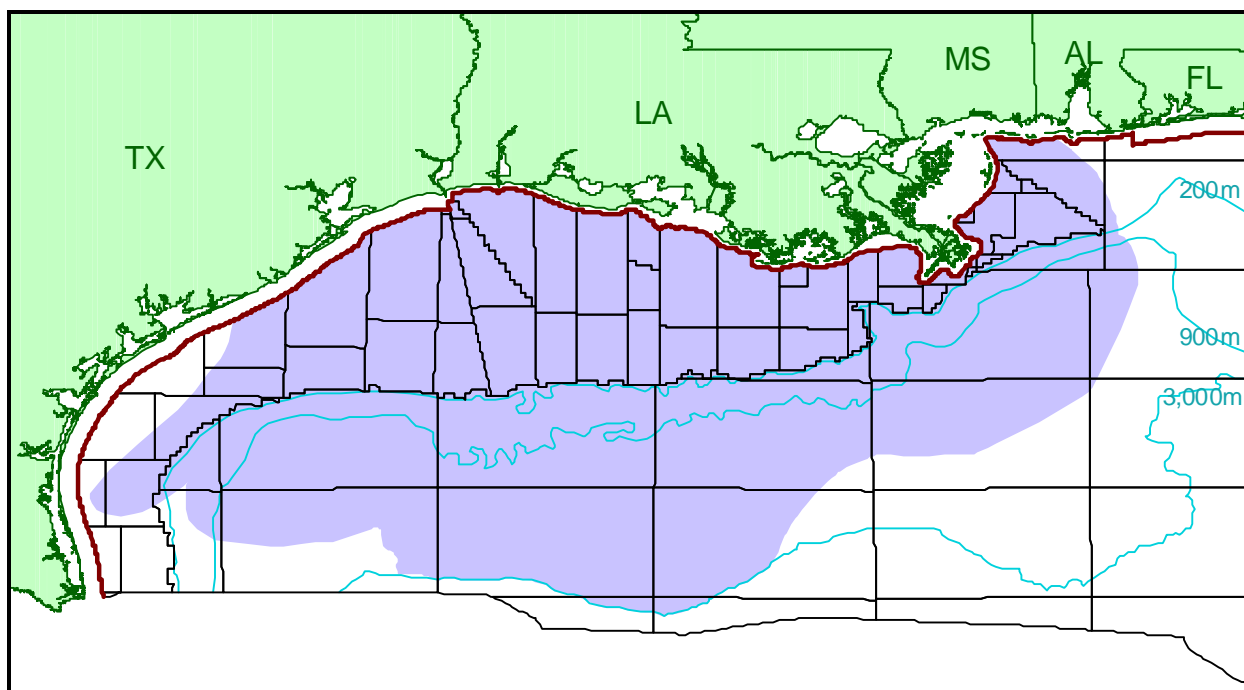


Figure 1. Map of assessed chronozone.

depocenter was centered in the Louisiana area. The shelf edge showed a relative shift basinward from that of the UM3 chronozone.

Major structural features in the LP chronozone include salt diapirs, anticlines, normal faults, and growth faults. Other structures include stratigraphic pinch-outs and shale diapirs.

DISCOVERIES

The LP chronozone contains 183 discovered pools in three plays (table 1). Total reserves in the chronozone are 2.007 Bbo and 10.030 Tcfg (3.792 BBOE), of which 1.535 Bbo and condensate and 7.179 Tcfg (2.813 BBOE) have been produced. The largest number of discoveries in the LP chronozone occurred when nine pools were added in both 1963 and 1985 (figure 2). However, the maximum yearly total reserves of 426.203 MMBOE were added in 1967 with the discovery of seven pools.

Of the three plays in the LP chronozone, the LP P play contains the most total reserves in 131 pools, with 1.348 Bbo and 7.656 Tcfg (2.711 BBOE).

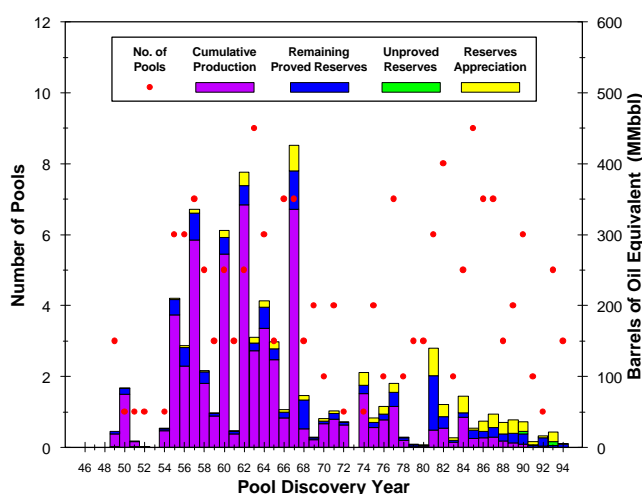


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

183 Pools (846 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	152	3,236
Subsea depth (feet)	1,889	9,134	17,109
Number of sands per pool	1	5	25
Porosity	21%	29%	37%
Water saturation	12%	29%	61%

ASSESSMENT RESULTS

The LP chronozone contains 313 pools (discovered plus undiscovered), with a mean total endowment estimated at 2.561 Bbo and 15.321 Tcfg (5.287 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 130 pools, which contain a range of 0.426 to 0.704 Bbo and 4.065 to 6.726 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.554 Bbo and 5.291 Tcfg (1.495 BBOE) are projected. These undiscovered resources represent 28 percent of the LP chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the fifth largest in the chronozone (figure 4).

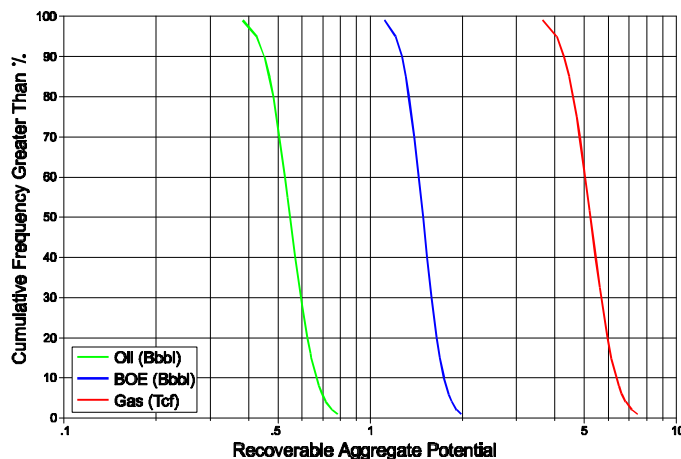


Figure 3. Cumulative probability distribution.

Of the three LP plays, the LP F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.443 Bbo and 4.133 Tcfg (1.178 BBOE) remaining to be found in 76 pools. These undiscovered resources in the LP F play represent 22 percent of the BOE mean total endowment for the LP chronozone.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	179	1.836	8.881	3.417
Cumulative production	--	1.535	7.179	2.813
Remaining proved	--	0.301	1.702	0.604
Unproved	4	0.004	0.030	0.010
Appreciation (P & U)	--	0.166	1.119	0.365
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.426	4.065	1.210
Mean	130	0.554	5.291	1.495
5th percentile	--	0.704	6.726	1.819
Total Endowment				
95th percentile	--	2.433	14.095	5.002
Mean	313	2.561	15.321	5.287
5th percentile	--	2.711	16.756	5.611

This percentage, the potential for numerous discoveries within a large unexplored area, and the potential for good-quality LP sand development in deepwater areas make the LP F play an attractive exploration target in LP strata.

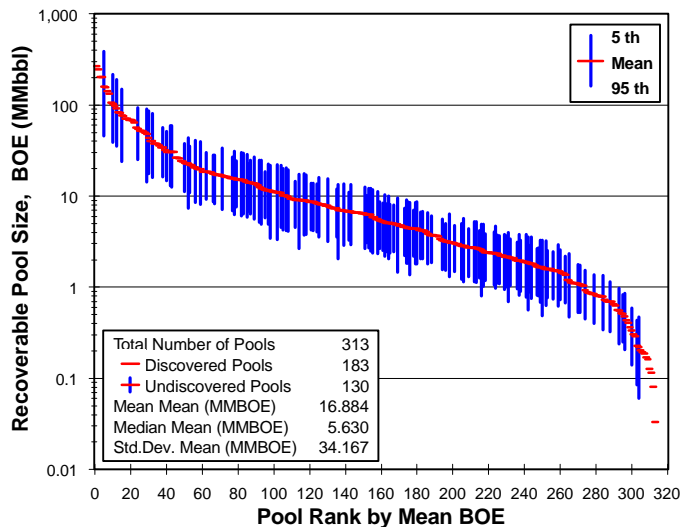


Figure 4. Pool rank plot.

LOWER PLIOCENE AGGRADATIONAL (LP A) PLAY

PLAY DESCRIPTION

The established Lower Pliocene Aggradational (LP A) play occurs at the *Textularia* "X" biozone. This play extends from the Brazos Area offshore Texas eastward into the Mobile Area east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Texas and Louisiana. To the west and northeast, the play is limited by a marked decrease in sediment influx at the edges of the LP depocenter. Downdip, the play grades into the sediments of the Lower Pliocene Progradational (LP P) play.

The underlying Upper Upper Miocene Aggradational (UM3 A) play is very extensive in the offshore Texas area. Lower Pliocene aggradational deposits have not been identified in the offshore Texas west of the Brazos Area. The depocenter present in the offshore Texas area during UM3 time no longer received significant amounts of sand-rich sediments during LP time. The LP sediments reflect the depocenter shift to the ancestral Mississippi River Delta System.

PLAY CHARACTERISTICS

The productive LP A play consists of fluvial and distributary channels, barrier and distributary mouth bars, delta fringe sands, and shelf slumps. In addition, retrogradational sands locally cap the LP A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the LP A play. Anticlines, growth faults, salt diapirs, and normal faults are the dominant structural features in the play. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying

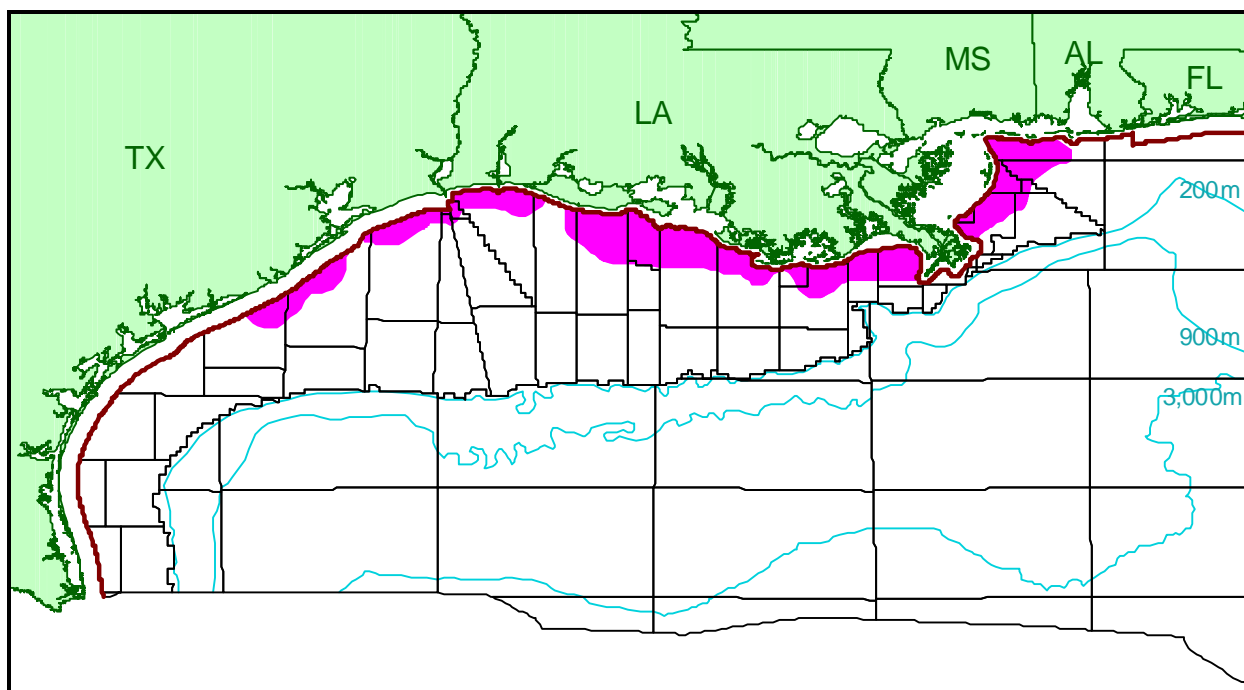


Figure 1. Map of assessed play.

shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

South Timbalier 34 is the type field, and Kerr-McGee Corporation's 8600 sand represents the LP A play in this field.

DISCOVERIES

The LP A play is predominantly an oil play, with total reserves of 0.498 Bbo and 1.270 Tcfg (0.724 BBOE), of which 0.453 Bbo and 1.085 Tcfg (0.646 BBOE) have been produced. The play contains 117 producible sands in 28 pools (table 1). The first reserves discovered in the play occurred in the Ship Shoal 28 field in 1949 (figure 2). The maximum yearly total reserves were added in 1962 with the discovery of the largest pool in the play in the West Delta 73 field. Just over 90 percent of the cumulative production and total reserves for the play are from pools discovered prior to 1966. On a BOE basis, 30 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 42 percent gas. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

The 28 discovered pools range in size from 0.163 to 267.022 MMBOE. These pools contain 253 reservoirs, of which 78 are nonassociated gas, 133 are undersaturated oil, and 42 are saturated oil.

Of the 11 aggradational plays in the Gulf of Mexico Cenozoic Province, the LP A play is the largest, containing 26 percent of the total reserves and producing 30 percent of the hydrocarbons, based on BOE.

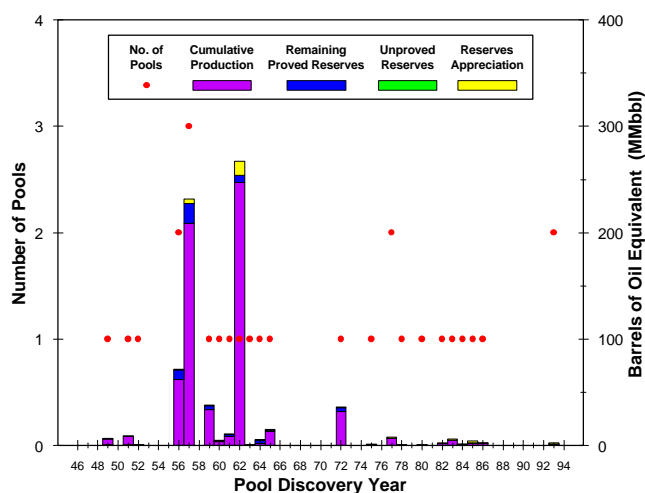


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

28 Pools (117 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	60	179
Subsea depth (feet)	2,965	7,270	10,493
Number of sands per pool	1	4	22
Porosity	25%	30%	34%
Water saturation	16%	26%	41%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LP A play is 1.00. This play is the largest aggradational play in the Gulf of Mexico Cenozoic Province, based on a mean total endowment of 0.511 Bbo and 1.503 Tcfg (0.778 BBOE) (table 2). Eighty-three percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.008 to 0.021 Bbo and 0.171 to 0.297 Tcfg at the 95th and 5th percentiles, respectively (figure 3).

The mean undiscovered resources are estimated at 0.013 Bbo and 0.233 Tcfg (0.054 BBOE). These undiscovered resources may occur in as many as 15 pools. The largest undiscovered pool, with a mean size of 15.747 MMBOE, is modeled as the seventh largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 9, 18, 19, and 22 on the pool rank plot. For all the undiscovered pools in the LP A play, the mean mean size is 3.607 MMBOE, which is substantially smaller than the 25.860 mean size of the discovered

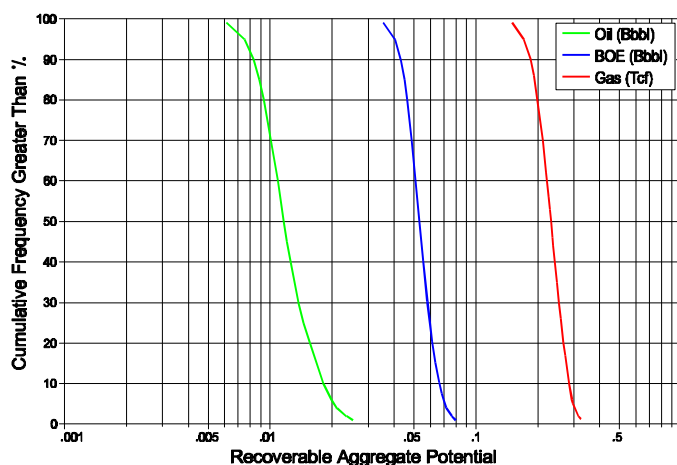


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	28	0.483	1.205	0.697
Cumulative production	--	0.453	1.085	0.646
Remaining proved	--	0.029	0.121	0.051
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.015	0.065	0.027
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.008	0.171	0.040
Mean	15	0.013	0.233	0.054
5th percentile	--	0.021	0.297	0.071
Total Endowment				
95th percentile	--	0.506	1.441	0.764
Mean	43	0.511	1.503	0.778
5th percentile	--	0.519	1.567	0.795

pools. The mean mean size for all pools, including both discovered and undiscovered, is 18.097 MMBOE.

Of the 11 Gulf of Mexico Cenozoic Province aggradational plays, the LP A play is projected to contain the second largest amounts of mean undiscovered oil and gas, at 21 percent and 18 percent, respectively.

Because the LP A play is well explored, it is modeled to have limited potential for discoveries. These undiscovered pools are projected to contribute only 7 percent to the play's BOE mean total endowment.

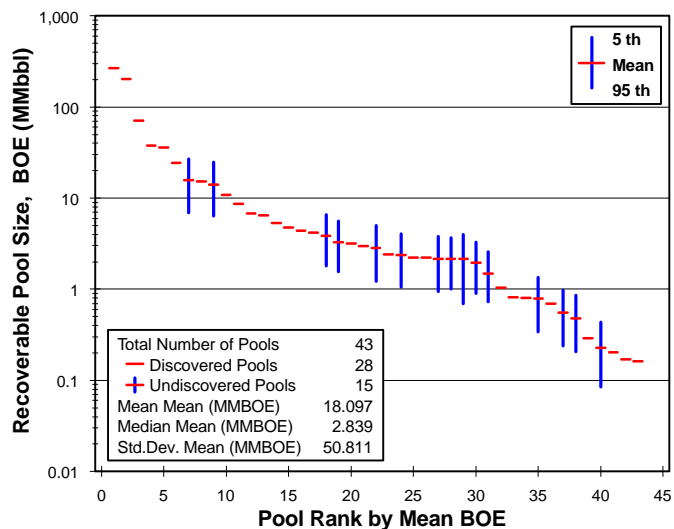


Figure 4. Pool rank plot.

LOWER PLIOCENE PROGRADATIONAL (LP P) PLAY

PLAY DESCRIPTION

The Lower Pliocene Progradational (LP P) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs at the *Textularia* "X" biozone and extends from the North Padre Island Area offshore Texas northeastward to the Mobile, Viosca Knoll, and Destin Dome Areas east of the present-day Mississippi River Delta (figure 1). Productive progradational deposits occur in a continuous band from the West Cameron Area to the eastern extent of the play, but occur very sporadic westward of West Cameron.

Except where the LP P play extends onshore into Texas and Louisiana, the updip limit of this progradational play occurs where it grades into the nearshore deposits of the Lower Pliocene Aggradational (LP A) play. To the northeast and southwest, the LP P play is limited by a marked decrease in sediment influx at the edges of the LP depocenter. Downdip, the LP P play grades into slope shales and the deposits of the Lower Pliocene Fan (LP F) play.

Occurrences of progradational deposits in offshore Texas areas southwestward of West Cameron are rare. The depocenter present in the offshore Texas area during upper upper Miocene (UM3) time no longer received significant amounts of sand-rich sediments during LP time. The LP sediments reflect the depocenter shift to the ancestral Mississippi River Delta System.

PLAY CHARACTERISTICS

The productive LP P play consists of progradational deltaic sediments deposited in delta fringe, shelf blanket, distributary mouth bar, distributary channel, and crevasse splay

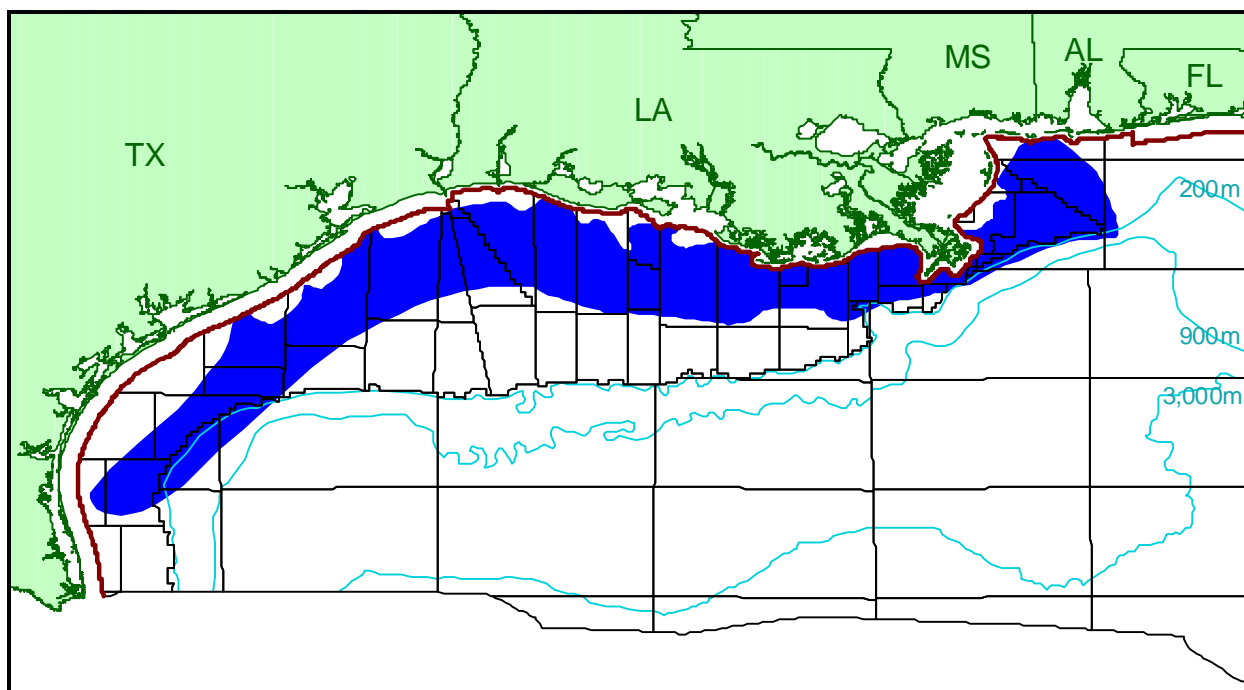


Figure 1. Map of assessed play.

environments. In addition, retrogradational sands locally cap the LP P play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the LP P play. Salt diapirs, anticlines, and normal faults are the major structural features in the play. Growth faults, stratigraphic pinch-outs, and shale diapirs also occur. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Ship Shoal 170 is the type field. PG&E Resources Offshore Co.'s H-10 sand, Newfield Exploration Co.'s and PG&E Resources Offshore Co.'s I-1 sand, and Newfield Exploration Co.'s I-3 sand represent the LP P play in this field.

DISCOVERIES

The LP P mixed oil and gas play contains total reserves of 1.348 Bbo and 7.656 Tcfg (2.711 BBOE), of which 1.045 Bbo and 5.523 Tcfg (2.028 BBOE) have been produced. The play contains 650 producible sands in 131 pools, and 130 of these pools contain proved reserves (table 1). The first reserves discovered in the play occurred in the Eugene Island 89 and Ship Shoal 28 fields in 1949 (figure 2). The maximum yearly total reserves of 426.203 MMBOE were added in 1967 when seven pools were discovered, including the largest pool in the play in the South Pass 61 field. Though discoveries have maintained a fairly rapid rate, averaging about three per year, 75 percent of the play's total reserves were discovered prior to 1970. Just over 80 percent of the play's cumulative production has come from these same pools. Ten pools have been discovered in the 1990's, the most recent, prior to this study's cutoff date of January 1, 1995, in 1994.

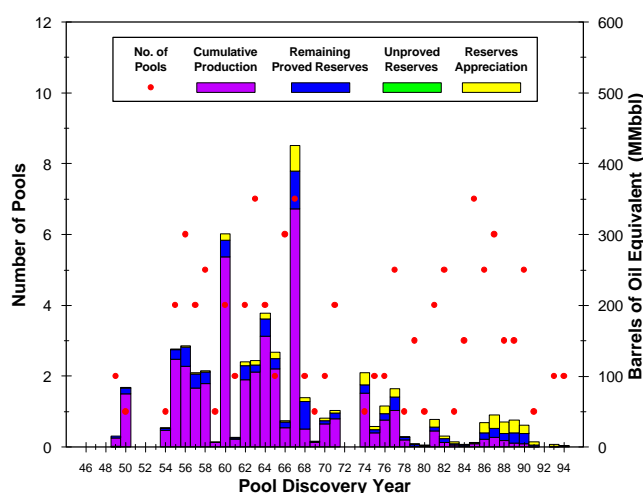


Figure 2. Exploration history graph.

Though discoveries have maintained a fairly rapid rate, averaging about three per year, 75 percent of the play's total reserves were discovered prior to 1970. Just over 80 percent of the play's cumulative production has come from these same pools. Ten pools have been discovered in the 1990's, the most recent, prior to this study's cutoff date of January 1, 1995, in 1994.

Table 1. Characteristics of the discovered pools.

131 Pools (650 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	13	103	356
Subsea depth (feet)	1,889	8,961	16,003
Number of sands per pool	1	5	25
Porosity	21%	29%	37%
Water saturation	12%	29%	61%

The 131 discovered pools range in size from 0.033 to 245.398 MMBOE. These pools contain 1,721 reservoirs, of which 696 are nonassociated gas, 872 are undersaturated oil, and 153 are saturated oil.

Of the 61 Gulf of Mexico plays, the LP P play contains the sixth largest amount of total reserves and has produced the fourth largest amount of hydrocarbons, based on BOE. In fact, the play has produced the third largest amount of oil at 11 percent.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LP P play is 1.00. This play is the seventh largest in the Gulf of Mexico, based on a mean total endowment of 1.446 Bbo and 8.581 Tcfg (2.974 BBOE) (table 2). Sixty-eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.072 to 0.128 Bbo and 0.787 to 1.074 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are

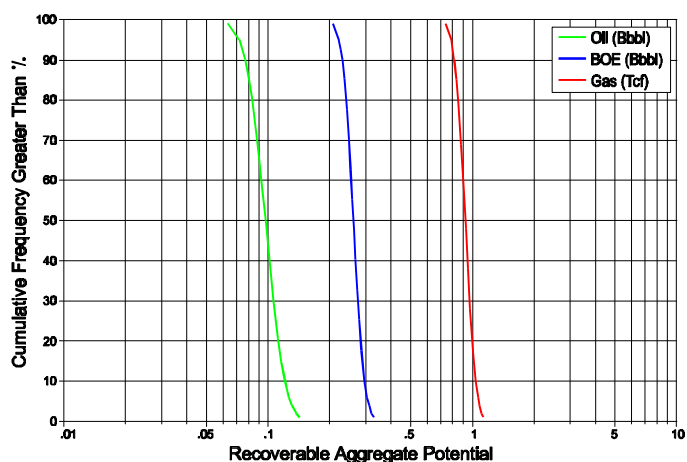


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	130	1.240	6.843	2.457
Cumulative production	--	1.045	5.523	2.028
Remaining proved	--	0.195	1.320	0.430
Unproved	1	<0.001	0.002	<0.001
Appreciation (P & U)	--	0.109	0.810	0.253
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.072	0.787	0.222
Mean	39	0.098	0.925	0.263
5th percentile	--	0.128	1.074	0.308
Total Endowment				
95th percentile	--	1.420	8.443	2.933
Mean	170	1.446	8.581	2.974
5th percentile	--	1.476	8.730	3.019

estimated at 0.098 Bbo and 0.925 Tcfg (0.263 BBOE). These undiscovered resources may occur in as many as 39 pools. The largest undiscovered pool, with a mean size of 30.381 MMBOE, is modeled as the twenty-fourth largest pool in the play (figure 4). For all the undiscovered pools in the LP P play, the mean mean size is 6.734 MMBOE, which is substantially smaller than the 20.692 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 17.490 MMBOE.

Of the 14 progradational plays in the Gulf of Mexico, the LP P play is projected to contain the third largest amount of mean undiscovered oil resources at 15 percent.

The LP P play is well explored with the largest pools modeled as already discovered. The undiscovered resources contribute only 9 percent to the play's BOE mean total endowment.

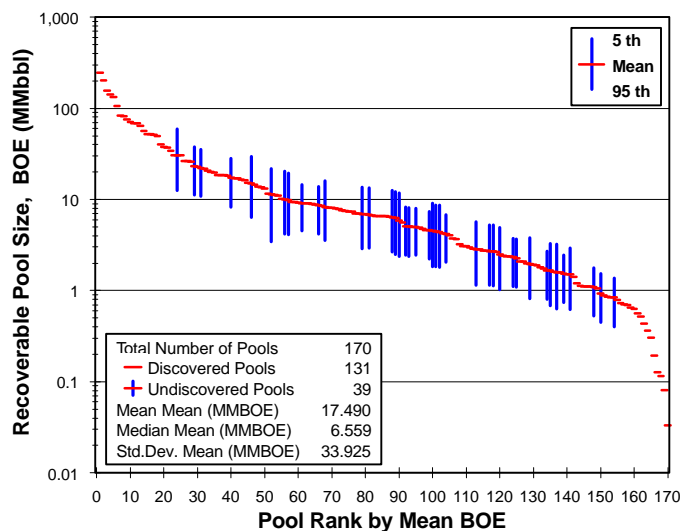


Figure 4. Pool rank plot.

LOWER PLIOCENE FAN (LP F) PLAY

PLAY DESCRIPTION

The established Lower Pliocene Fan (LP F) play occurs at the *Textularia* "X" biozone. This play extends from the Port Isabel and Corpus Christi Areas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

The play is bounded updip and to the northeast by the shelf/slope break associated with the *Textularia* "X" biozone and grades into the deposits of the Lower Pliocene Progradational (LP P) play. To the southwest, the play is limited by a marked decrease in sediment influx at the edge of the LP depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by good reservoir-quality LP sands in the OCS G12662-1 well in Garden Banks block 568.

As compared to the underlying upper upper Miocene (UM3) chronozone, the shelf/slope break of the LP chronozone occurs farther out in the Gulf of Mexico Basin because of the basinward progradation of the ancient delta systems. The depocenter present in the offshore Texas area no longer received significant amounts of sand-rich sediments during LP time as compared with UM3 time. Lower Pliocene sediments reflect the depocenter shift to the ancestral Mississippi River Delta System.

PLAY CHARACTERISTICS

The productive LP F play consists of deepwater turbidites deposited in fan systems as channel fill, fan lobes, and fringe sheet sediments on the LP slope between salt highs. Salt diapirs, anticlines, and normal faults are the play's major structural features. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally

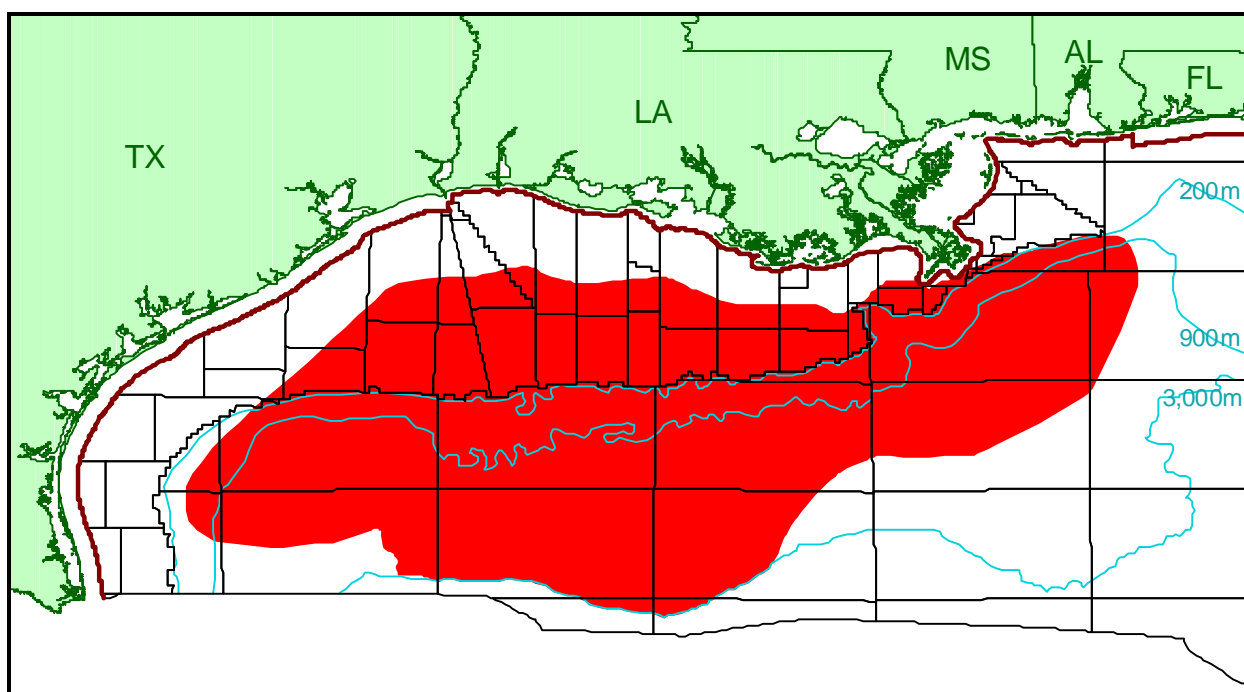


Figure 1. Map of assessed play.

(e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

West Delta 117 is the type field. Chevron USA Inc.'s H3, H4, H5, H9, H10, K12, J5, J6, J7, and K1 sands and Exxon's I15, I20, I22, and I25 sands represent the LP F play in this field.

DISCOVERIES

The LP F mixed oil and gas play contains total reserves of 0.160 Bbo and 1.104 Tcfg (0.357 BBOE), of which 0.037 Bbo and 0.571 Tcfg (0.139 BBOE) have been produced. The play contains 79 producible sands in 24 pools, and 21 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the Eugene Island 198 field in 1959 (figure 2). Since 1980, pool discoveries have occurred almost yearly. The maximum yearly total reserves of 101.089 MMBOE were added in 1981 when two pools were found, including the largest discovered pool in the play in the Viosca Knoll 990 field ("Pompano"). This field alone accounts for almost 30 percent of the play's total reserves. Therefore, it is not surprising that slightly over half of the play's cumulative production has been from pools discovered in 1981 or earlier. On a BOE basis, 27 percent of the play's cumulative production is oil, but remaining total reserves indicate future production may increase to 56 percent oil. The most recent discovery, prior to this study's cutoff date of January 1, 1995, occurred in 1994.

The 24 discovered pools range in size from 0.188 to 97.412 MMBOE. These pools contain 119 reservoirs, of which 64 are nonassociated gas, 51 are undersaturated oil, and 4 are saturated oil.

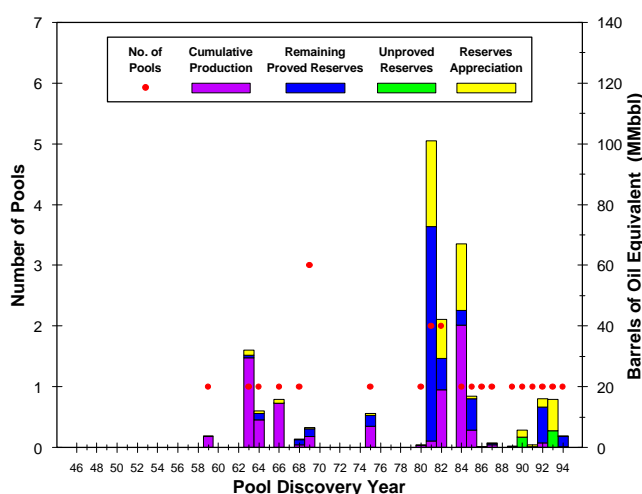


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

24 Pools (79 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	76	525	3,236
Subsea depth (feet)	5,500	12,249	17,109
Number of sands per pool	1	3	14
Porosity	22%	28%	36%
Water saturation	20%	32%	45%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LP F play is 1.00. The play contains a mean total endowment of 0.603 Bbo and 5.237 Tcfg (1.535 BBOE) (table 2). Nine percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.340 to 0.577 Bbo and 3.265 to 5.517 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.443 Bbo and 4.133 Tcfg (1.178 BBOE). These undiscovered

resources may occur in as many as 76 pools. The largest undiscovered pool, with a mean size of 158.090 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 2, 4, 5, and 7 on the pool rank plot. For all the undiscovered pools in the LP F play, the mean mean size is 15.478 MMBOE, which is comparable to the 14.866 MMBOE mean size of the discovered pools.

Of the 61 plays in the Gulf of Mexico Region, the LP F play is projected to contain

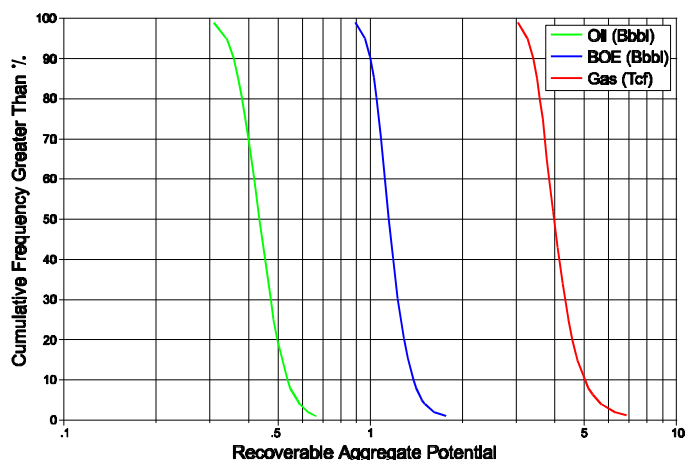


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	21	0.114	0.832	0.262
Cumulative production	--	0.037	0.571	0.139
Remaining proved	--	0.077	0.262	0.123
Unproved	3	0.004	0.028	0.009
Appreciation (P & U)	--	0.042	0.244	0.086
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.340	3.265	0.961
Mean	76	0.443	4.133	1.178
5th percentile	--	0.577	5.517	1.475
Total Endowment				
95th percentile	--	0.500	4.369	1.318
Mean	100	0.603	5.237	1.535
5th percentile	--	0.737	6.621	1.832

the sixth and seventh largest amounts of mean undiscovered oil (5%) and gas (4%) resources, respectively.

A large unexplored area and good potential for sand development in LP sediments support the numerous discoveries modeled for the LP F play. These undiscovered resources are expected to add 77 percent to the play's BOE mean total endowment. Potential for discoveries occurs downdip of existing fields, especially in water depths greater than 1,000 feet.

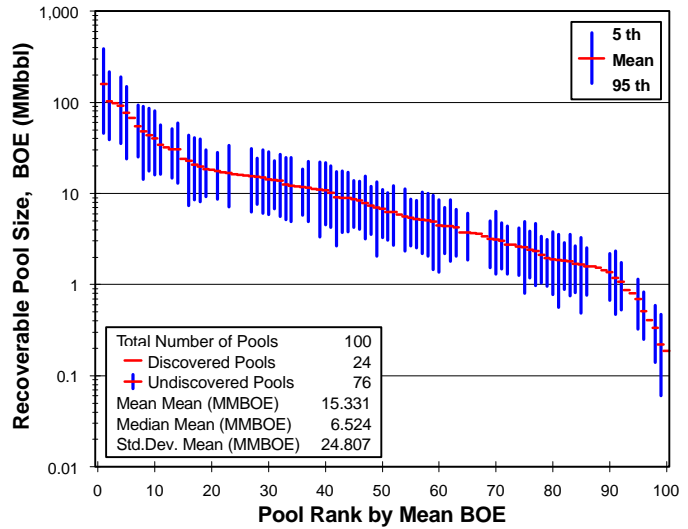


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE (UM3) CHRONOZONE

CHRONOZONE DESCRIPTION

The Upper Upper Miocene (UM3) chronozone corresponds to the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones. The UM3 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the UM3 chronozone include retrogradational, aggradational, progradational, and fan, each of which defines one or more plays: the Upper Upper Miocene Western Retrogradational (UM3 R1) play, the Upper Upper Miocene Eastern Retrogradational (UM3 R2) play, the Upper Upper Miocene Aggradational (UM3 A) play, the Upper Upper Miocene Progradational (UM3 P) play, the Upper Upper Miocene Fan (UM3 F) play, and the Upper Upper Miocene Aggradational/Progradational (UM3 AP) play.

The potential for sand development within the UM3 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Pensacola, Destin Dome, and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, sand potential extends onshore into Texas and Louisiana. To the southwest, UM3 sands extend into Texas offshore State waters and Mexican national waters. To the northeast, UM3 sands extend onshore into Mississippi and Alabama. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by UM3 sand development in the OCS G11643-1 well in Keathley Canyon block 255.

Productive and established sand locations in the UM3 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. The depositional sequences of the UM3 and lower upper Miocene (UM1) chronozones in the Texas offshore occupy approximately the same geographical areas, with only minor

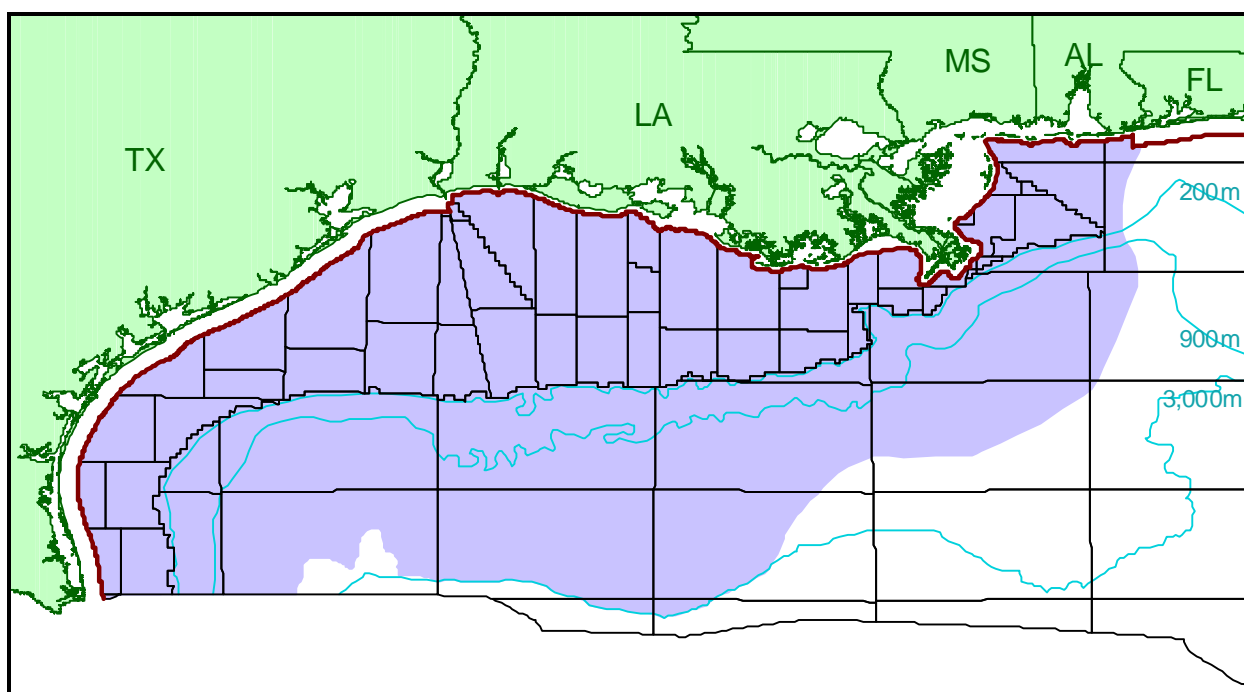


Figure 1. Map of assessed chronozone.

basinward progradation of sediments in UM3 time.

However, in the Louisiana offshore, UM3 sediments show a marked basinward shift, especially the progradational and aggradational sequences, due to the seaward progradation of deltaic deposits from the ancestral Mississippi River.

The UM3 sediments subsided in both the Texas and Louisiana offshore at the end of UM3 time, creating retrogradational deposits. In the Mississippi and Alabama offshore, the extent of the aggradational/progradational (AP) sequence in the UM3 chronozone is found in the same general geographical area as the AP sequence of the UM1 chronozone, indicative of deposition on a stable shelf. However, the UM3 deposits include more aggradational deposits from the ancestral Mobile River System than do the UM1 deposits.

Major structural features in the UM3 chronozone include anticlines, normal faults, and salt diapirs. Other structures include growth faults and stratigraphic pinch-outs.

DISCOVERIES

The UM3 chronozone contains 249 discovered pools in six plays (table 1). Significant amounts of hydrocarbons were recently identified in the Mississippi Canyon 807 field ("Mars"), the Mississippi Canyon 854 field ("Ursa"), and the Mississippi Canyon 211 field ("Mickey"). Of the 21 chronozones in the Gulf of Mexico Region, the UM3 chronozone contains the second largest amount of BOE total reserves, with 3.097 Bbo and 15.696 Tcfg (5.890 BBOE), of which 2.220 Bbo and 10.288 Tcfg (4.050 BBOE) have been produced. The largest number of discoveries in the UM3 chronozone occurred when 18 pools were added in 1984 (figure 2). However, the maximum yearly total reserves of 762.875 MMBOE were added in 1955 with the discovery of seven pools.

Of the six plays in the UM3 chronozone, the UM3 P play contains the most total reserves in 165 pools, with 2.411 Bbo and 12.110 Tcfg (4.566 BBOE).

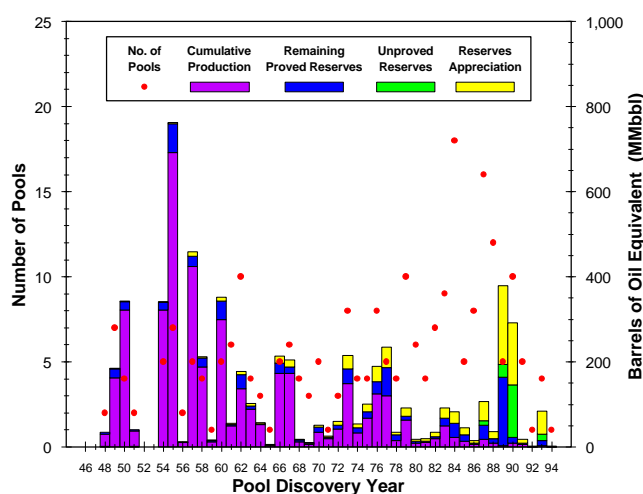


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

249 Pools (1,176 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	212	6,950
Subsea depth (feet)	1,585	8,448	17,865
Number of sands per pool	1	5	45
Porosity	17%	29%	36%
Water saturation	9%	28%	57%

ASSESSMENT RESULTS

The UM3 chronozone contains 397 pools (discovered plus undiscovered), with a mean total endowment estimated at 3.549 Bbo and 20.367 Tcfg (7.174 BBOE) (table 2). This is the third largest BOE mean total endowment of all the chronozones in the Gulf of Mexico.

Assessment results indicate that undiscovered resources may occur in as many as 148 pools, which contain a range of 0.348 to 0.574 Bbo and 3.970 to 5.446 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At

mean levels, 0.452 Bbo and 4.671 Tcfg (1.284 BBOE) are projected. These undiscovered resources represent 18 percent of the UM3 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the fourteenth largest in the chronozone (figure 4).

Of the six UM3 plays, the UM3 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.409 Bbo and 3.935 Tcfg (1.109 BBOE) remaining to be found in 90 pools. These undiscovered resources in

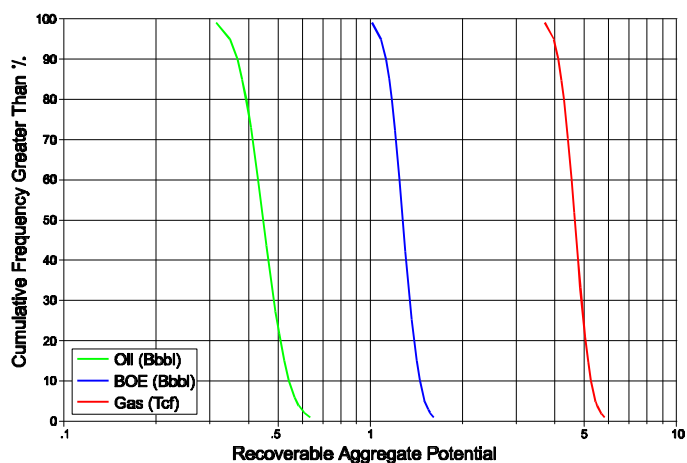


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	240	2.610	12.822	4.891
Cumulative production	--	2.220	10.288	4.050
Remaining proved	--	0.390	2.534	0.841
Unproved	9	0.105	0.422	0.180
Appreciation (P & U)	--	0.383	2.452	0.819
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.348	3.970	1.085
Mean	148	0.452	4.671	1.284
5th percentile	--	0.574	5.446	1.504
Total Endowment				
95th percentile	--	3.445	19.666	6.975
Mean	397	3.549	20.367	7.174
5th percentile	--	3.671	21.142	7.394

the UM3 F play represent 15 percent of the BOE mean total endowment for the UM3 chronozone. Recent discoveries in the Mississippi Canyon Area and deepwater drilling results in the Keathley Canyon Area suggest a large potential exploration area for the play. This, coupled with the potential for excellent UM3 sand development in deepwater areas, makes the UM3 F play an attractive exploration target in UM3 strata.

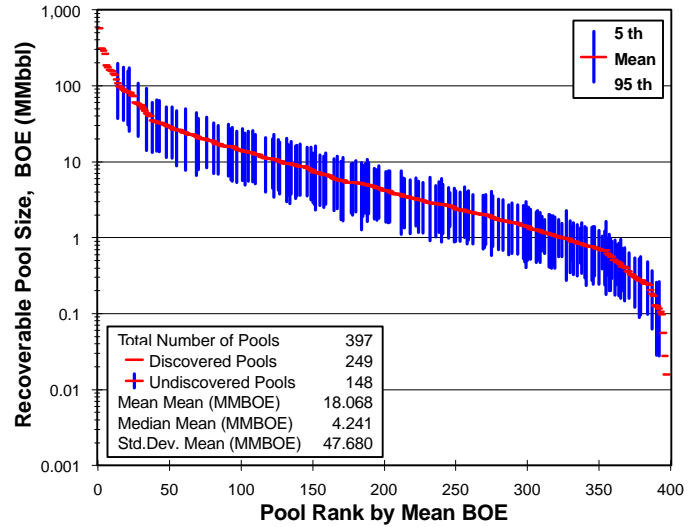


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE WESTERN RETROGRADATIONAL (UM3 R1) PLAY

PLAY DESCRIPTION

The established Upper Upper Miocene Western Retrogradational (UM3 R1) play occurs within the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones. This play extends from the Matagorda Island to High Island Areas offshore Texas (figure 1).

Updip and along strike to the west, the play grades into the deposits of the Upper Upper Miocene Aggradational (UM3 A) play. Downdip and along strike to the east, the UM3 R1 play grades into the deposits of the Upper Upper Miocene Progradational (UM3 P) play.

The UM3 R1 play is entirely in offshore Texas. Clastic influx in the offshore Texas area was waning during UM3 time, and the UM3 R1 play consequently is more sand poor than the other retrogradational play of the UM3 chronozone, the Upper Upper Miocene Eastern Retrogradational (UM3 R2) play, in offshore Louisiana. The UM3 R2 play was deposited in a more clastic-rich, active depocenter.

PLAY CHARACTERISTICS

The productive UM3 R1 play consists of reworked marine sands deposited in offshore bars, barrier islands, washover fans, and beach deposits in a delta-fringe environment. The retrogradational sands become progressively thinner and finer vertically and exhibit a back-stepping log signature, terminating in the *Robulus* "E" flooding surface. Growth faults and anticlines are the dominant structural features in this play. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive retrogradational depositional

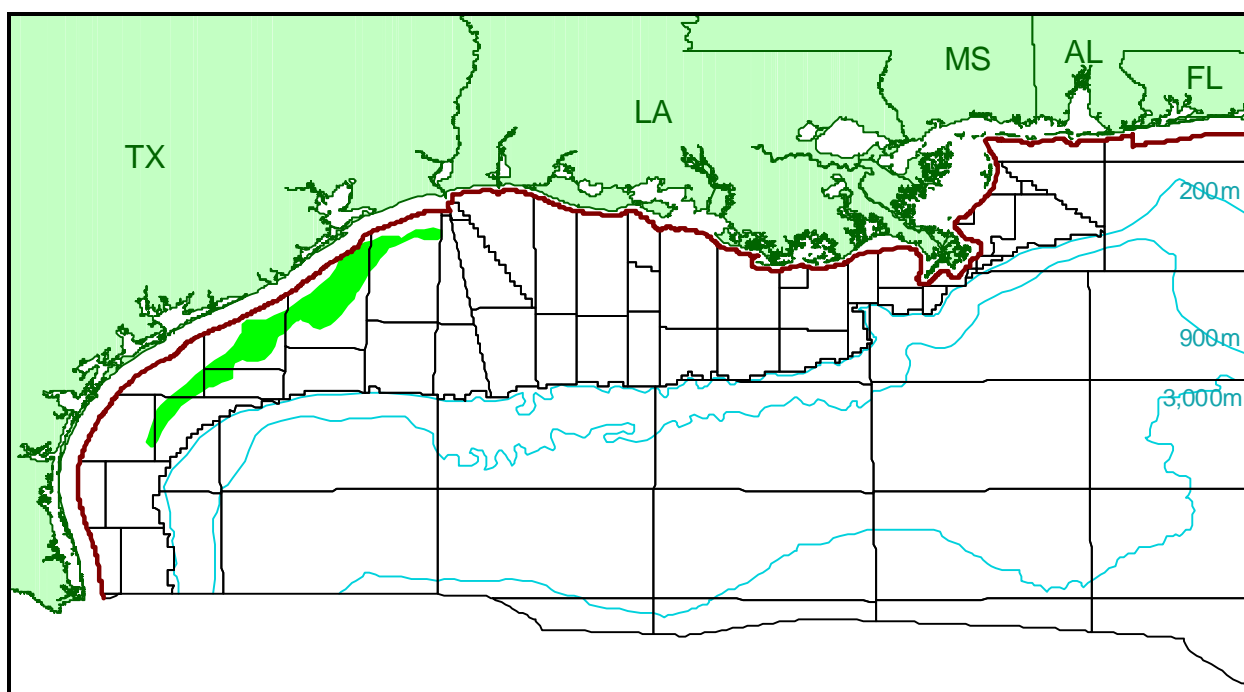


Figure 1. Map of assessed play.

environments, structures, or seals.

Galveston 389 is the type field. Walter Oil and Gas Corporation's 6300, 6400, 6500, and 6700 sands and Seagull Energy E&P's BA-3, BA-4, TL-1, and TL-2 sands represent the UM3 R1 play in this field.

DISCOVERIES

The UM3 R1 gas play contains total reserves of 0.094 MMbo and 32.774 Bcfg (5.926 MMBOE), of which 0.086 MMbo and 24.954 Bcfg (4.526 MMBOE) have been produced. The play contains 10 producible sands in three pools (table 1). The first and maximum yearly total reserves were added in 1961 when the largest discovered pool in the play was found in the Galveston 389 field (figure 2). The other two pools were discovered in 1979 in the Galveston 391 field and in 1982 in the Galveston 382 field.

The three discovered pools range in size from 1.672 to 2.545 MMBOE. These pools contain 12 reservoirs, all of which are nonassociated gas.

Of the five retrogradational plays in the Gulf of Mexico Region, the UM3 R1 play contains the smallest amount of total reserves (<1%).

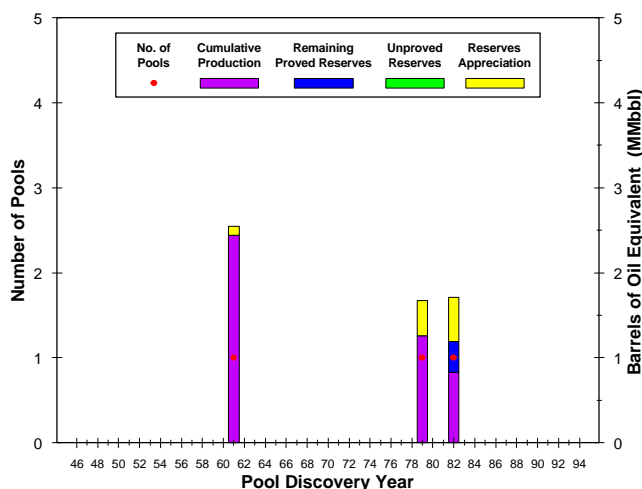


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

3 Pools (10 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	92	96	100
Subsea depth (feet)	4,565	5,247	6,484
Number of sands per pool	2	3	5
Porosity	25%	29%	31%
Water saturation	31%	36%	40%

ASSESSMENT RESULTS

Because of limited data for the UM3 R1 play, the Upper Lower Miocene Retrogradational (LM4 R) play was used as an analog to model pool sizes in the UM3 R1 play. The LM4 R play was selected as the analog because of similarities in depositional

setting, structural style, hydrocarbon type, and statistical information.

The marginal probability of hydrocarbons for the UM3 R1 play is 1.00. The play ranks within the smallest one-fourth of all 61 Gulf of Mexico plays, based on a mean total endowment of less than 0.001 Bbo and 0.065 Tcfg (0.012 BBOE) (table 2). Thirty-eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.024 to 0.041 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.032 Tcf (0.006 BBOE). These undiscovered resources may occur in as many as five pools. The largest undiscovered pool, with a mean size of 2.586 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the other four undiscovered pools in positions 5, 6, 7, and 8 on the pool rank plot. For all the undiscovered pools in the UM3 R1 play, the mean mean size is 1.158 MMBOE, which is comparable to the 1.975 MMBOE mean size of the

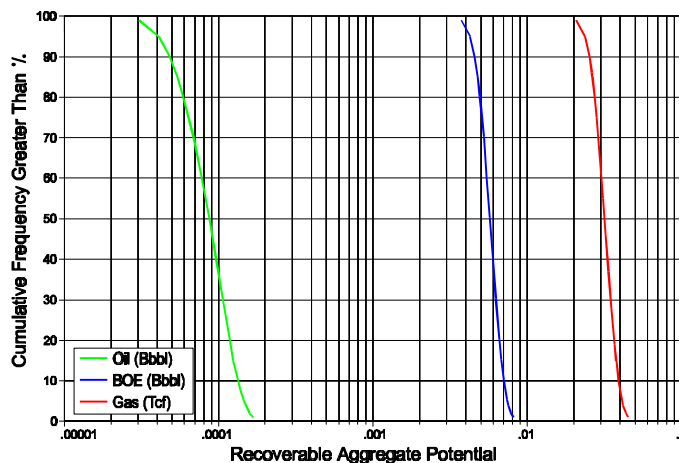


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	3	<0.001	0.027	0.005
Cumulative production	--	<0.001	0.025	0.005
Remaining proved	--	<0.001	0.002	<0.001
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.006	0.001
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.024	0.004
Mean	5	<0.001	0.032	0.006
5th percentile	--	<0.001	0.041	0.007
Total Endowment				
95th percentile	--	<0.001	0.057	0.010
Mean	8	<0.001	0.065	0.012
5th percentile	--	<0.001	0.074	0.013

discovered pools.

The UM3 R1 play has limited potential, and though 50 percent of the play's BOE mean total endowment is projected as undiscovered, these undiscovered resources will add little to the Gulf of Mexico's total resources.

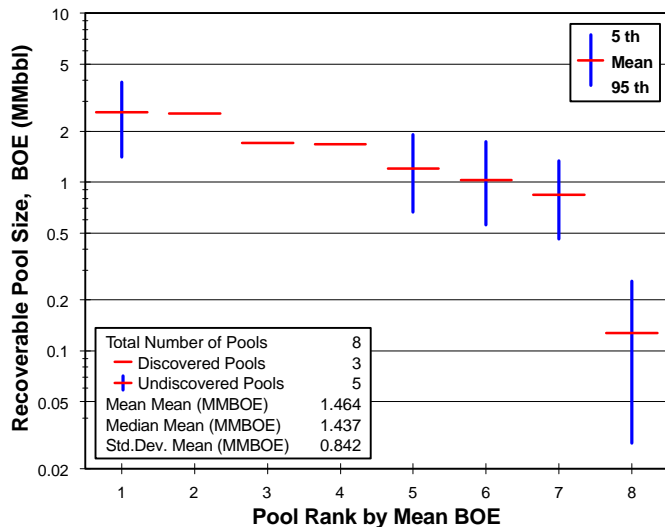


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE EASTERN RETROGRADATIONAL (UM3 R2) PLAY

PLAY DESCRIPTION

The established Upper Upper Miocene Eastern Retrogradational (UM3 R2) play occurs within the *Cristellaria* "K," *Bigennerina* "A," and *Robulus* "E" biozones. This play extends from the Eugene Island Area to the Chandeleur Area east of the present-day Mississippi River Delta (figure 1).

Updip and along strike to the east and west, the play grades into the deposits of the Upper Upper Miocene Aggradational (UM3 A) play or the Upper Upper Miocene Progradational (UM3 P) play. Downdip, the play grades into the deposits of the UM3 P play.

The UM3 R2 play is more sand-rich than the other UM3 retrogradational play, the Upper Upper Miocene Western Retrogradational (UM3 R1) play. The UM3 R1 play was deposited in the offshore Texas area where the clastic influx of the delta systems was waning.

PLAY CHARACTERISTICS

The productive UM3 R2 play consists of reworked marine sands deposited as offshore bars, barrier islands, washover fans, and beach deposits in a deltaic fringe environment. The retrogradational sands become progressively thinner and finer in the vertical sequence and exhibit a back-stepping log signature, terminating in the *Robulus* "E" flooding surface. Salt diapirs, anticlines, and growth faults are the dominant structural features in this play. Normal faults and stratigraphic pinch-outs occur less commonly. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs,

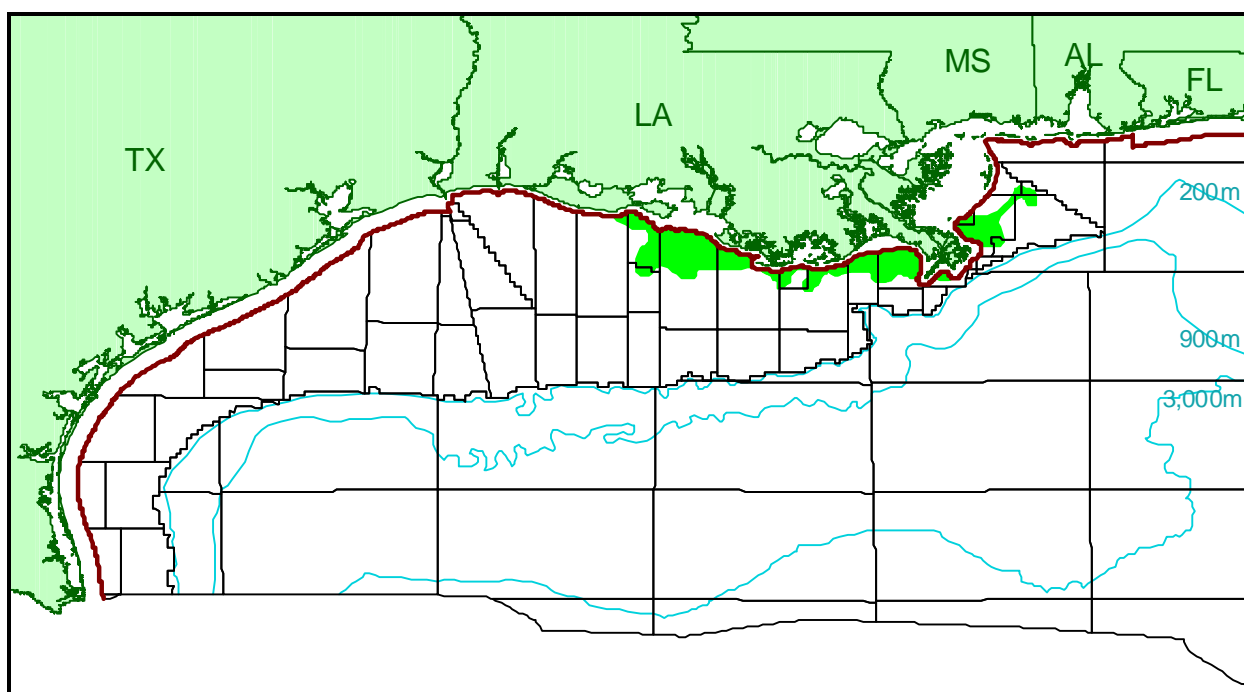


Figure 1. Map of assessed play.

overlying shales). Future discoveries are not limited to the aforementioned productive retrogradational depositional environments, structures, or seals.

South Timbalier 21 is the type field, and Chevron USA Inc.'s S-4, S-4A, S-4B, S-4C, and S-4D sands represent the UM3 R2 play in this field.

DISCOVERIES

The UM3 R2 mixed oil and gas play contains total reserves of 0.086 Bbo and 0.613 Tcfg (0.195 BBOE), of which 0.069 Bbo and 0.461 Tcfg (0.151 BBOE) have been produced. The play contains 38 producible sands in 24 pools (table 1). The first reserves in the play were discovered in the Ship Shoal 28 field in 1949 (figure 2). The maximum yearly total reserves were added in 1960 with the discovery of the largest pool in the play in the Grand Isle 43 field. This pool accounts for almost one-third of the play's total reserves. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1987.

The 24 discovered pools range in size from 0.173 to 60.486 MMBOE. These pools contain 101 reservoirs, 35 of which are nonassociated gas, 49 are undersaturated oil, and 17 are saturated oil.

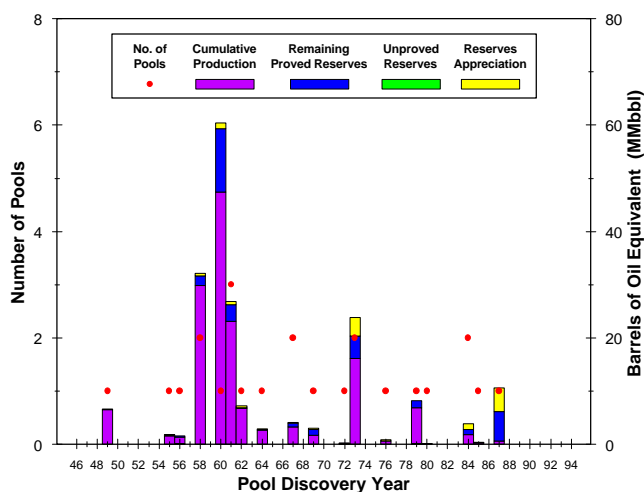


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

24 Pools (38 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	12	64	209
Subsea depth (feet)	2,832	8,458	14,500
Number of sands per pool	1	2	5
Porosity	21%	29%	36%
Water saturation	9%	29%	51%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM3 R2 play is 1.00. The play contains a mean total endowment of 0.102 Bbo and 0.744 Tcfg (0.235 BBOE) (table 2). Sixty-four percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.009 to

0.026 Bbo and 0.090 to 0.173 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.016 Bbo and 0.131 Tcfg (0.040 BBOE). These undiscovered resources may occur in as many as seven pools. The largest undiscovered pool, with a mean size of 12.611 MMBOE, is modeled as the sixth largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 8, 13, 14, and 16 on the pool rank plot.

For all the undiscovered pools in the UM3 R2 play, the mean mean size is 5.640 MMBOE, which is smaller than the 8.110 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 7.552 MMBOE.

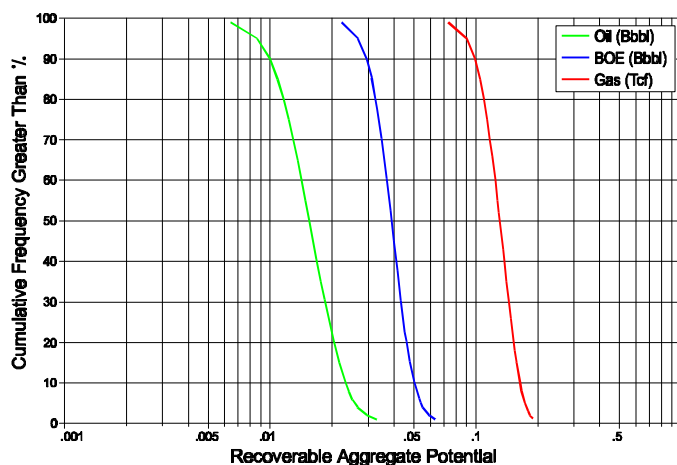


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	24	0.083	0.557	0.182
Cumulative production	--	0.069	0.461	0.151
Remaining proved	--	0.014	0.096	0.031
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.003	0.056	0.013
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.009	0.090	0.027
Mean	7	0.016	0.131	0.040
5th percentile	--	0.026	0.173	0.054
Total Endowment				
95th percentile	--	0.095	0.703	0.222
Mean	31	0.102	0.744	0.235
5th percentile	--	0.112	0.786	0.249

Of the five retrogradational plays in the Gulf of Mexico Region, the UM3 R2 play is projected to contain the largest amount of mean undiscovered oil at 62 percent.

The UM3 R2 play is well explored. The undiscovered pools are projected to be small to moderate in size when compared with the discovered pools. These undiscovered resources are expected to add 17 percent to the play’s BOE mean total endowment.

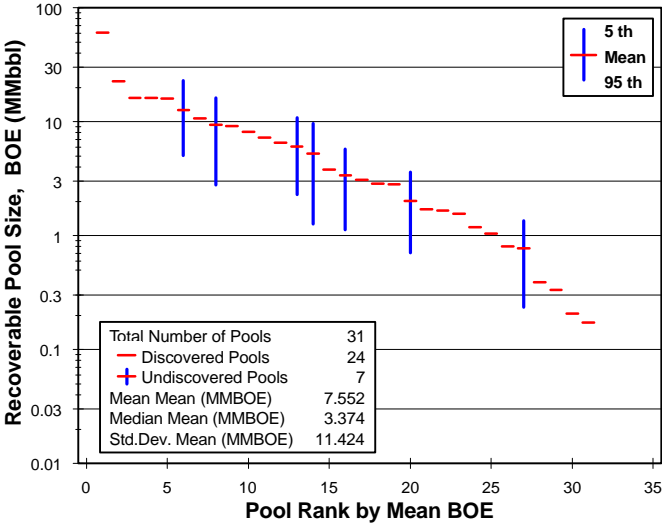


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE AGGRADATIONAL (UM3 A) PLAY

PLAY DESCRIPTION

The established Upper Upper Miocene Aggradational (UM3 A) play occurs within the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones. This play extends in a continuous band from the North Padre Island Area offshore Texas to the East Cameron Area offshore Louisiana (figure 1). East of that, the play is sporadically present in the Federal offshore. The play again enters the offshore east of the present-day Mississippi River Delta in the Main Pass Area.

Updip, the play continues onshore into Texas and Louisiana. To the southwest, the play continues into onshore Texas. Downdip, the play grades into the deposits of the Upper Upper Miocene Progradational (UM3 P) play.

In the Texas offshore, the aggradational sequences of the UM3 and lower upper Miocene (UM1) chronozones occupy very similar geographical areas, indicating stable shelf sedimentation. However, in the Louisiana offshore, the downdip extent of the UM3 aggradational sequence has moved farther offshore than the downdip extent of the UM1 aggradational sequence. Thus, shelfal UM3 aggradational deposits in the Louisiana offshore extend over the underlying UM1 progradational sequence.

PLAY CHARACTERISTICS

The productive sands in the UM3 A play formed as proximal deltaic deposits on the shelf. Aggradational sands typically have a blocky log character. However, some fining-upward sands are found within this play's aggradational sequence. Variation in the amount of clastic influx between the offshore Louisiana and offshore Texas areas resulted in different depositional characteristics within the play sequence.

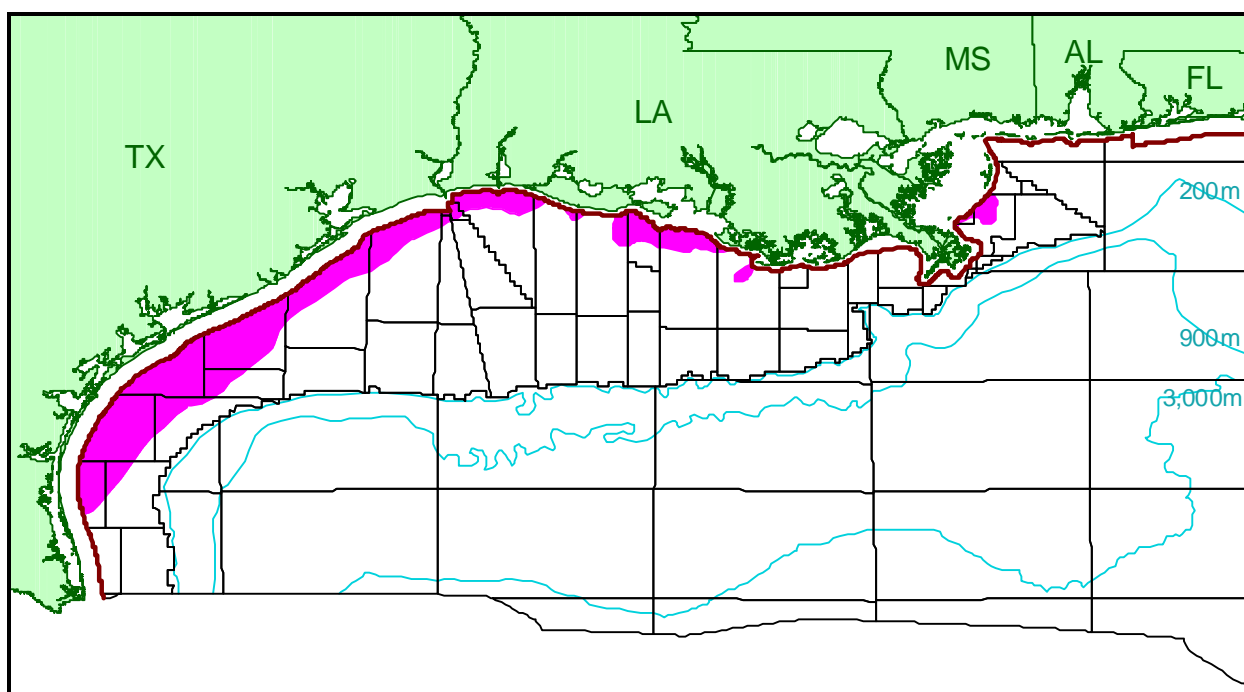


Figure 1. Map of assessed play.

The Louisiana offshore area had a higher clastic influx than did the Texas offshore area during UM3 time. The sediments in the UM3 A play in offshore Louisiana were deposited in fluvial-deltaic to paralic environments. Consequently, the aggradational reservoir sands represent a variety of environments that include channel, point bar, distributary mouth bar, crevasse splay, beach, barrier island, and nearshore bar deposits. Individual channels or stacked channels are common. These sands are thick and well developed due to the high influx of clastic sediments.

In contrast, during UM3 time in the offshore Texas area, the aggradational reservoir sands formed in bays as distributary crevasse splays and in lagoons as storm-generated washover deltas behind barrier islands. These sands are thin and poorly developed due to the low influx of clastic sediments.

Stratigraphic pinch-outs, anticlines, growth faults, and normal faults are the dominant structural features in this play. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

South Marsh Island 241 is the type field, and Texaco E&P's ASEG500 sand represents the UM3 A play in this field.

DISCOVERIES

The UM3 A play is predominantly a gas play, with total reserves of 0.019 Bbo and 0.295 Tcfg (0.071 BBOE), of which 0.016 Bbo and 0.180 Tcfg (0.048 BBOE) have been produced. The play contains 21 producible sands in nine pools (table 1). The first reserves in the play were discovered in the Eugene Island 32 field in 1950 (figure 2). A hiatus in pool discoveries occurred from 1950 to 1974. Most of the pool discoveries (7 out of 9) occurred between 1974 and 1983. The maximum yearly total reserves were added in 1976 with the discovery of the largest pool in the play in the Ship Shoal 84 field. On a

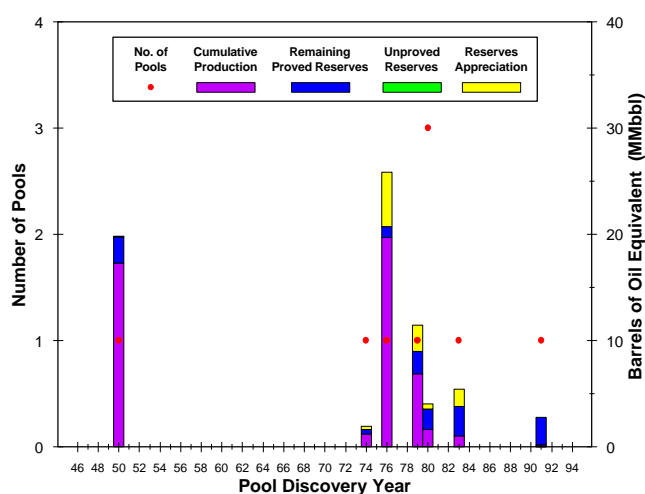


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

9 Pools (21 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	30	72
Subsea depth (feet)	1,838	6,617	11,591
Number of sands per pool	1	2	7
Porosity	27%	31%	35%
Water saturation	16%	22%	34%

BOE basis, 67 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 87 percent gas. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1991.

The nine discovered pools range in size from 0.106 to 25.839 MMBOE. These pools contain 25 reservoirs, of which 13 are nonassociated gas, 6 are undersaturated oil, and 6 are saturated oil.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM3 A play is 1.00. The play ranks within the smallest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.019 Bbo and 0.311 Tcfg (0.074 BBOE) (table 2). Sixty-five percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.008 to 0.027 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.016 Tcf (0.003 BBOE). These undiscovered resources may occur

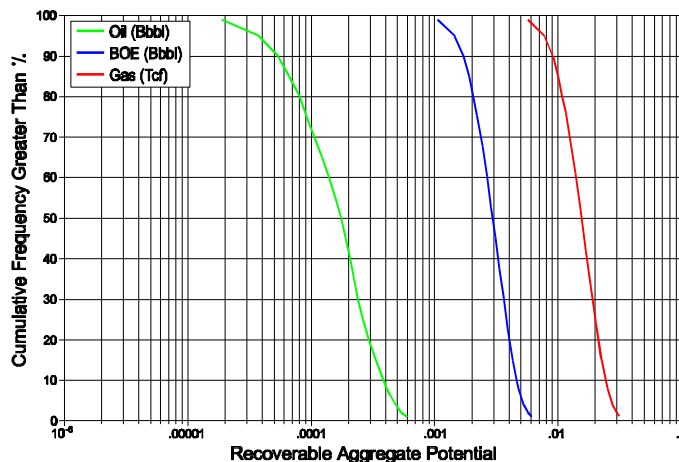


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	9	0.018	0.241	0.061
Cumulative production	--	0.016	0.180	0.048
Remaining proved	--	0.003	0.061	0.013
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.001	0.054	0.010
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.008	0.001
Mean	3	<0.001	0.016	0.003
5th percentile	--	<0.001	0.027	0.005
Total Endowment				
95th percentile	--	0.019	0.303	0.072
Mean	12	0.019	0.311	0.074
5th percentile	--	0.019	0.322	0.076

in as many as three pools. The largest undiscovered pool, with a mean size of 1.421 MMBOE, is modeled as the ninth largest pool in the play (figure 4). The model results place the remaining two undiscovered pools in positions 10 and 11 on the pool rank plot. These three undiscovered pools are projected on the pool rank plot near the smallest discovered pool. For all the undiscovered pools in the UM3 A play, the mean mean size is 1.026 MMBOE, which is significantly smaller than the 7.923 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 6.199 MMBOE.

Because of its shallow-water environment, many wells have penetrated this play and found it unproductive. The reservoir potential in offshore Texas is reduced by thin and poorly-developed sands. In the Louisiana offshore, the abundant aggradational sands and thin shale intervals reduce the opportunity of seals for hydrocarbon entrapment. Therefore, the undiscovered resources are projected to contribute only 4 percent to the play's BOE mean total endowment.

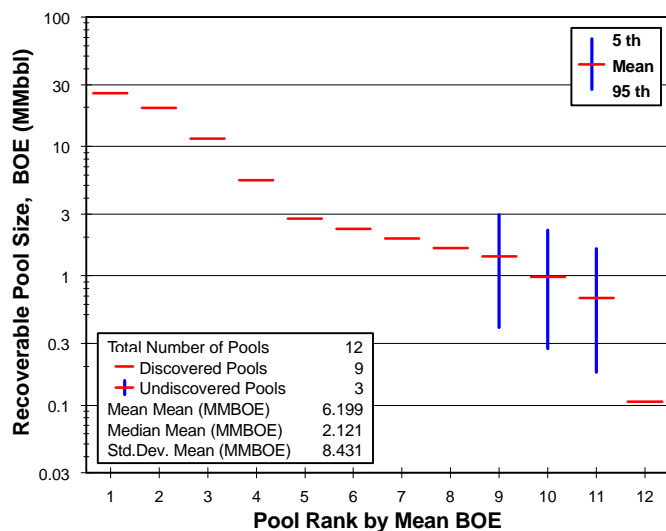


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE AGGRADATIONAL/PROGRADATIONAL (UM3 AP) PLAY

PLAY DESCRIPTION

The established Upper Upper Miocene Aggradational/Progradational (UM3 AP) play occurs within the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones. This play is located in the Mobile, Pensacola, Chandeleur, Viosca Knoll, and Destin Dome Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Mississippi and Alabama. Downdip, the play is limited by a lack of sand in the distal end of the facies.

The UM3 chronozone is one of three chronozones with combined aggradational and progradational (AP) "Shallow Miocene Bright Spot Trend" plays. The other two chronozones are the upper middle Miocene (MM9) and the lower upper Miocene (UM1). The extent of the AP sequence in the UM3 chronozone is found in the same general geographical area as the AP sequences in the MM9 and UM1 chronozones, indicative of deposition on a stable shelf. Sediments for the AP plays were sourced from a major continental drainage system formed after the Laramide Orogeny and also from the Appalachian region. The clastic influx that formed the AP plays over the Cretaceous shelf was much less than to the Louisiana area depocenter during middle and upper Miocene time.

PLAY CHARACTERISTICS

The UM3 AP play comprises incised-valley fill (channels) typical of a progradational setting, but because the channel sands are often stacked, they also have characteristics

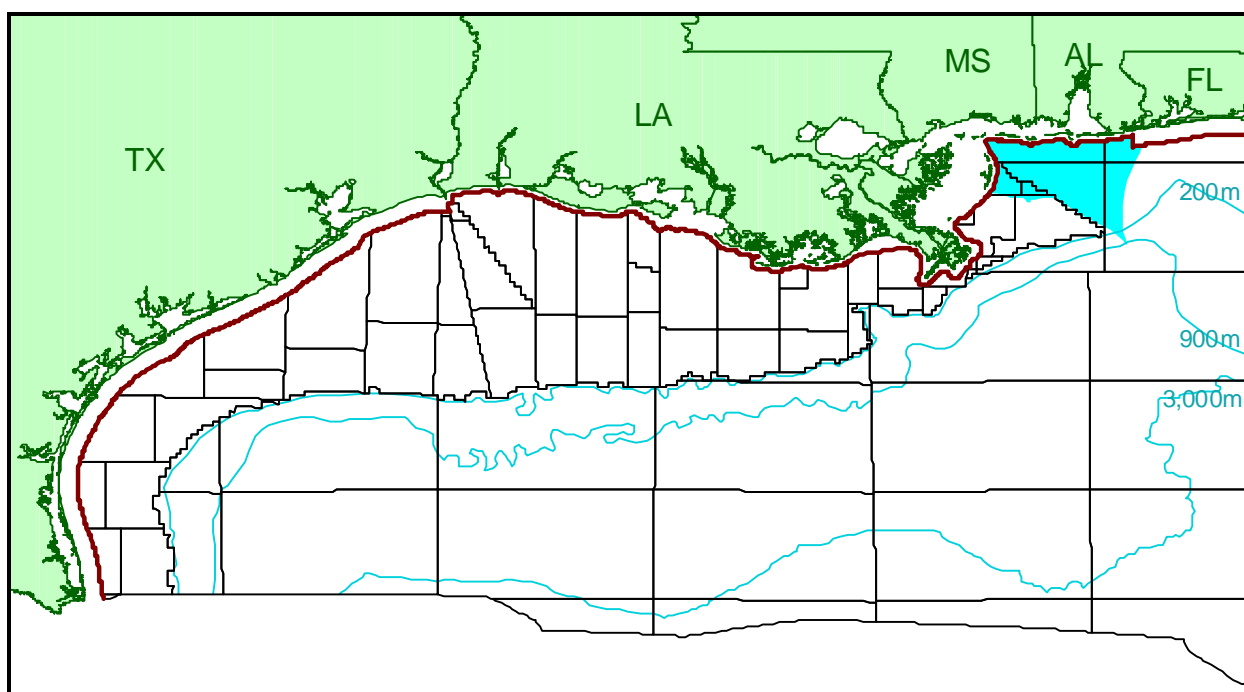


Figure 1. Map of assessed play.

of an aggradational setting. Therefore, the play is referred to as a combination aggradational/progradational (AP) play. The play occurs at shallow depths over the Cretaceous carbonate shelf, and hydrocarbon accumulations are associated with seismic hydrocarbon indicators (bright spots). Regional dip dominates the structural style of the play. Faulting and local uplifts are rare and have no role in the accumulation of hydrocarbons. Channels cut across the regional dip of the shelf area, and their deposits are sealed by lateral shale-outs and overlying shelf shales.

Viosca Knoll 74 is the type field, and Santa Fe Mineral's DISCORBIS 12 sands represent the UM3 AP play in this field.

DISCOVERIES

The UM3 AP gas play contains total reserves of 57.732 Mbo and 354.790 Bcfg (63.188 MMBOE), of which 0.470 Mbo and 47.218 Bcfg (8.402 MMBOE) have been produced. The play contains 24 producible sands in 17 pools, and 15 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the Chandeleur 14 field in 1983 (figure 2). The maximum yearly total reserves of 34.360 MMBOE were added in 1987 when eight pools were discovered, including the largest pool in the play in the Chandeleur 40 field. Almost half of the play's cumulative production has come from pools discovered prior to 1988. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 17 discovered pools range in size from 0.409 MMBOE to 10.469 MMBOE. These pools contain 26 reservoirs, all of which are nonassociated gas.

The UM3 AP play contains 23 percent of the BOE total reserves contained in the three AP plays.

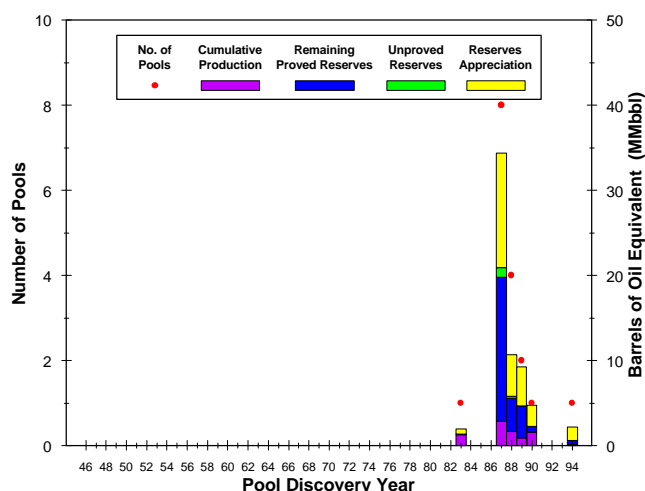


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

17 Pools (24 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	40	91	130
Subsea depth (feet)	1,585	2,515	3,850
Number of sands per pool	1	1	4
Porosity	22%	33%	36%
Water saturation	16%	27%	48%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM3 AP play is 1.00. The play ranks within the smallest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of less than 0.001 Bbo and 0.394 Tcfg (0.070 BBOE) (table 2). Twelve percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.033 to 0.046 Tcf at the 95th and 5th percentiles, respectively (figure 3).

The estimated amount of mean undiscovered gas is 0.039 Tcf (0.007 BBOE). These undiscovered resources may occur in as many as 13 pools. The largest undiscovered pool, with a mean size of 1.160 MMBOE, is modeled as the seventeenth largest pool in the play (figure 4). For all the undiscovered pools in the UM3 AP play, the mean mean size is 0.541 MMBOE, which is smaller than the 3.717 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is

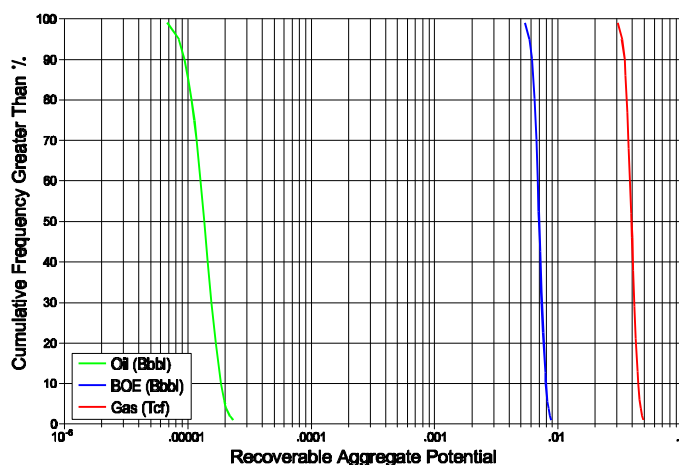


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	15	<0.001	0.192	0.034
Cumulative production	--	<0.001	0.047	0.008
Remaining proved	--	<0.001	0.145	0.026
Unproved	2	<0.001	0.008	0.001
Appreciation (P & U)	--	<0.001	0.155	0.028
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.033	0.006
Mean	13	<0.001	0.039	0.007
5th percentile	--	<0.001	0.046	0.008
Total Endowment				
95th percentile	--	<0.001	0.388	0.069
Mean	30	<0.001	0.394	0.070
5th percentile	--	<0.001	0.401	0.071

2.341 MMBOE.

The limited geographic extent of the UM3 AP play, the small discovered field sizes, and extensive drilling reduce the play's potential for significant discoveries. The undiscovered pools are modeled to be smaller than most of the discovered pools and are expected to add only 10 percent to the play's BOE mean total endowment.

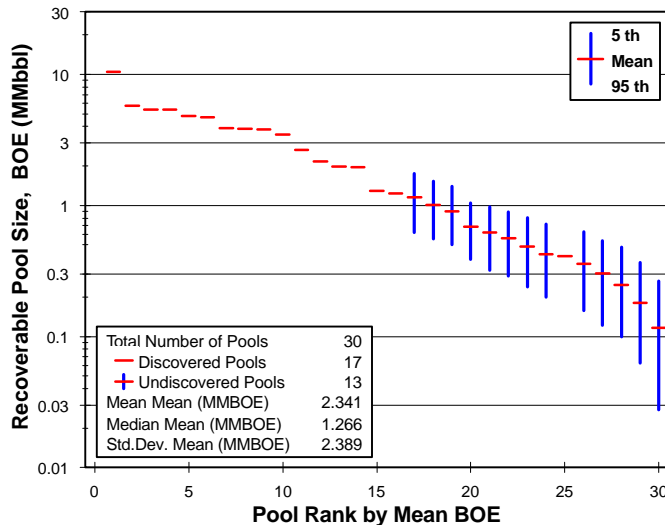


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE PROGRADATIONAL (UM3 P) PLAY

PLAY DESCRIPTION

The Upper Upper Miocene Progradational (UM3 P) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs within the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones and extends from the South Padre Island Area offshore Texas through the Main Pass Area east of the present-day Mississippi River Delta (figure 1).

Updip in the Texas offshore, the play grades into the deposits of the Upper Upper Miocene Aggradational (UM3 A) play. Updip to the north in Louisiana, the UM3 P play continues onshore. The play continues to the southwest into Texas offshore State waters and Mexican national waters. To the northeast, the play is limited by the deposits of the Upper Upper Miocene Aggradational/Progradational (UM3 AP) play overlying the Cretaceous carbonate shelf. Downdip and to the east, the UM3 P play grades into the deposits of the Upper Upper Miocene Fan (UM3 F) play.

The downdip boundary of the UM3 P play is located farther basinward than the downdip boundary of the UM1 progradational play. Therefore, UM3 progradational sediments were deposited over not only UM1 progradational sediments, but also over UM1 fan sediments.

PLAY CHARACTERISTICS

The productive UM3 P play consists of progradational deltaic sediments deposited in delta front, delta fringe, shelf blanket, and offshore bar environments. Other less commonly occurring reservoir sands were deposited as shelf slumps, channel fill, and levee deposits. Anticlines, normal faults, salt diapirs, and growth faults are the major

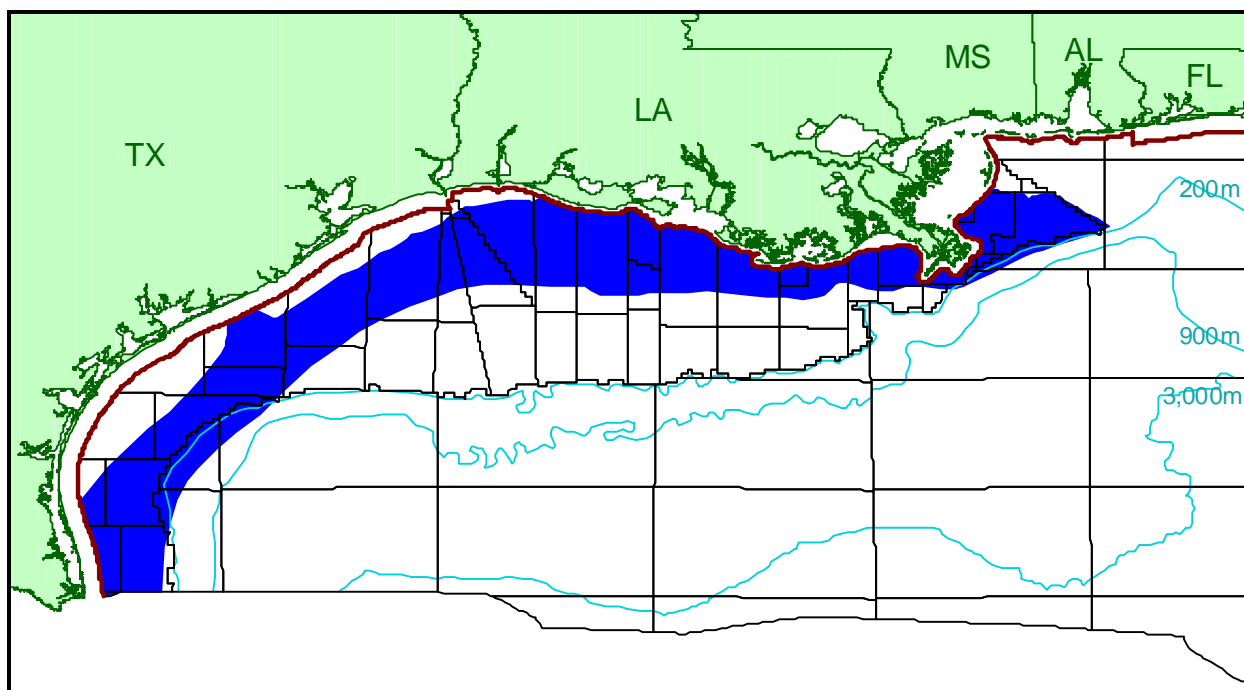


Figure 1. Map of assessed play.

structural features in this play. Stratigraphic pinch-outs occur less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Ship Shoal 69 is the type field, and Shell Offshore Inc.'s OE sand represents the UM3 P play in this field.

DISCOVERIES

The UM3 P mixed oil and gas play contains total reserves of 2.411 Bbo and 12.110 Tcfg (4.566 BBOE), of which 2.056 Bbo and 9.087 Tcfg (3.673 BBOE) have been produced. The play contains 976 producible sands in 165 pools (table 1). The first reserves in the play were discovered in the Ship Shoal 72 field in 1948 (figure 2). Pool discoveries have averaged three to four per year. The maximum yearly total reserves of 761.181 MMBOE were added in 1955 when six pools were discovered, including the largest pool in the play in the Bay Marchand 2 field. Over 70 percent of the play's total reserves are in pools discovered before 1967. On a BOE basis, 44 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 60 percent gas. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

The 165 discovered pools range in size from 0.016 to 572.278 MMBOE. These pools contain 2,329 reservoirs, of which 940 are nonassociated gas, 1,128 are undersaturated oil, and 261 are saturated oil.

Of the 61 plays in the Gulf of Mexico, The UM3 P play is the second largest, based

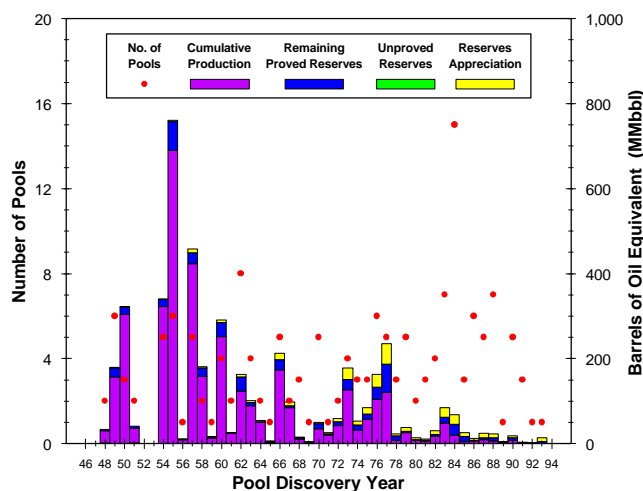


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

165 Pools (976 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	71	342
Subsea depth (feet)	1,725	8,356	16,758
Number of sands per pool	1	6	45
Porosity	19%	29%	36%
Water saturation	9%	28%	57%

on BOE total reserves. It has produced 22 percent of the total oil and contains the largest amount of oil total reserves (16%). Additionally, of the 14 progradational plays in the Gulf of Mexico, the UM3 P play has produced 31 percent of the total oil.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM3 P play is 1.00. This play is the third largest in the Gulf of Mexico, based on a mean total endowment of 2.438 Bbo and 12.628 Tcfg (4.685 BBOE) (table 2). Seventy-eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.018 to 0.039 Bbo and 0.401 to 0.650 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.027 Bbo and 0.518 Tcfg (0.119 BBOE). These undiscovered resources may occur in as many as 30 pools. The largest undiscovered pool, with a mean size of

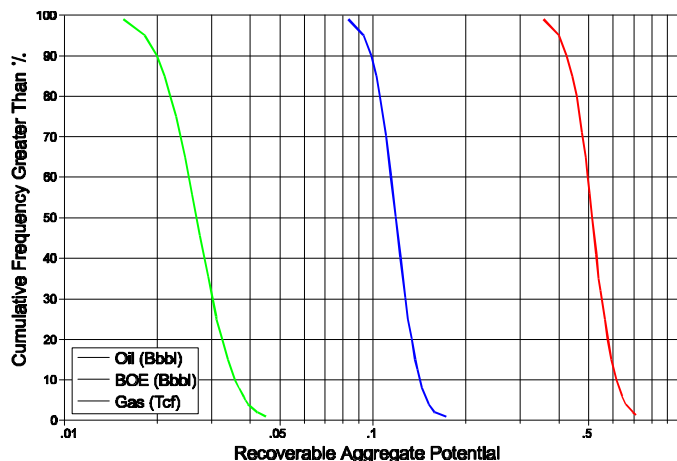


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	165	2.284	10.906	4.225
Cumulative production	--	2.056	9.087	3.673
Remaining proved	--	0.228	1.819	0.552
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.127	1.203	0.341
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.018	0.401	0.093
Mean	30	0.027	0.518	0.119
5th percentile	--	0.039	0.650	0.149
Total Endowment				
95th percentile	--	2.429	12.511	4.659
Mean	195	2.438	12.628	4.685
5th percentile	--	2.450	12.760	4.715

26.223 MMBOE, is modeled as the thirty-fifth largest pool in the play (figure 4). For all the undiscovered pools in the UM3 P play, the mean mean size is 3.986 MMBOE, which is significantly smaller than the 27.674 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 24.030 MMBOE.

In the Texas offshore, limited potential exists downdip of the discovered fields where wells have not penetrated deeply enough to reach the UM3 P play. In the Louisiana offshore, the density of wells that encounter the UM3 P play is high; therefore, limited interfield exploration potential exists. Because of this limited potential, undiscovered resources are projected to occur in small pools that add only 3 percent to the play's BOE mean total endowment.

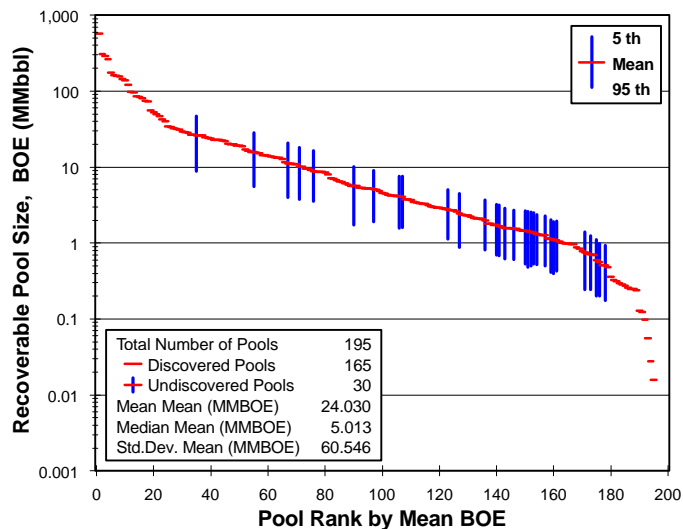


Figure 4. Pool rank plot.

UPPER UPPER MIOCENE FAN (UM3 F) PLAY

PLAY DESCRIPTION

The established Upper Upper Miocene Fan (UM3 F) play occurs within the *Cristellaria* "K," *Bigenerina* "A," and *Robulus* "E" biozones. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play is bounded by the shelf/slope break associated with the *Robulus* "E" biozone and grades into the deposits of the Upper Upper Miocene Progradational (UM3 P) play. To the northeast, the UM3 F play is bounded by the Cretaceous carbonate shelf edge. To the southwest, the play extends into Mexican national waters. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by recent discoveries of the Mississippi Canyon 807 ("Mars"), Mississippi Canyon 854 ("Ursa"), and Mississippi Canyon 211 ("Mickey") fields, along with excellent reservoir-quality UM3 sands found in Keathley Canyon block 255.

The updip limit of the UM3 fan sequence shows a slight basinward shift compared to the lower upper Miocene (UM1) fan sequence, reflecting the prograding nature of the ancient delta systems through time.

PLAY CHARACTERISTICS

The productive UM3 F play consists of deepwater turbidites deposited in fan systems as channel fill, overbank deposits, and fringe sheet sediments on the UM3 slope. Normal faults, salt diapirs, and anticlines are the major structural features in this play. Growth faults occur less commonly. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or

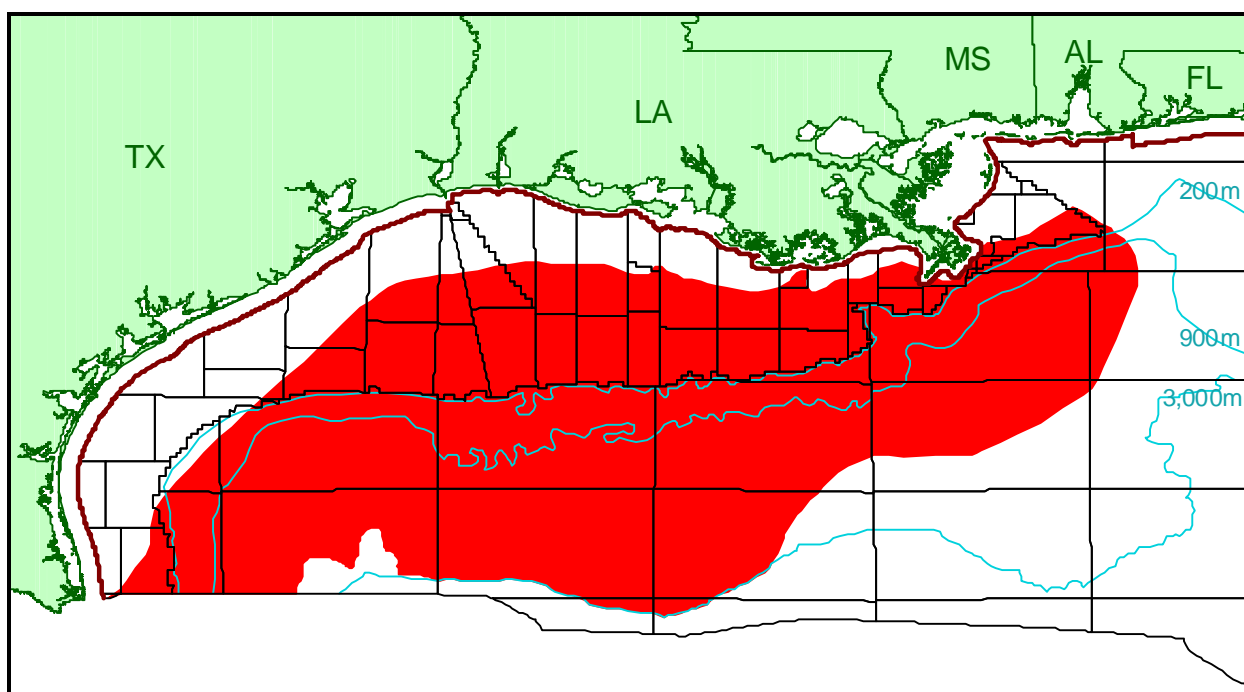


Figure 1. Map of assessed play.

stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

South Timbalier 76 is the type field, and CNG Producing Co.'s BIG-A1, BIG-A2, and BIG-A3 sands represent the UM3 F play in this field.

DISCOVERIES

The UM3 F mixed oil and gas play contains total reserves of 0.581 Bbo and 2.291 Tcfg (0.989 BBOE), of which 0.079 Bbo and 0.487 Tcfg (0.166 BBOE) have been produced. The play contains 107 producible sands in 31 pools, and 24 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the South Marsh Island 23 field in 1962 (figure 2). The maximum yearly total reserves of 366.452 MMBOE were added in 1989 when two pools were discovered, including the largest pool in the play in the Mars field. Moreover, 73 percent of the play's total reserves are in pools discovered in 1989 or later. Most of these pools are in deepwater fields. On a BOE basis, 48 percent of the play's cumulative production is oil, but remaining total reserves indicate that future production may increase to 61 percent oil. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

The 31 discovered pools range in size from 0.679 to 307.783 MMBOE. These pools contain 200 reservoirs, of which 73 are nonassociated gas, 117 are undersaturated oil, and 10 are saturated oil.

Of the 15 fan plays in the Gulf of Mexico Region, the UM3 F play contains the third largest amount of total reserves at 8 percent, based on BOE.

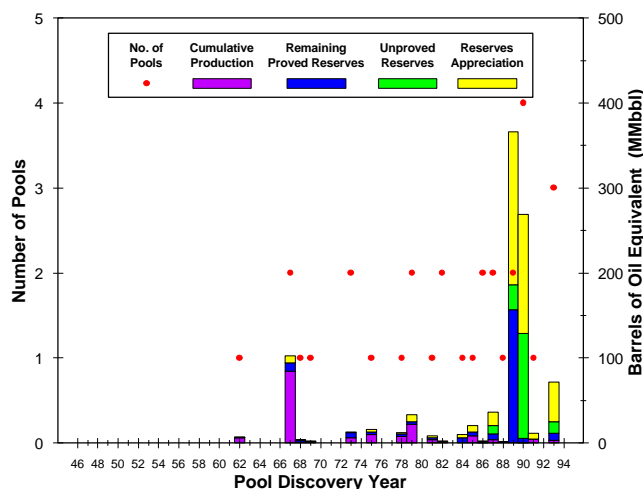


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

31 Pools (107 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	41	1,204	6,950
Subsea depth (feet)	6,548	13,026	17,865
Number of sands per pool	1	3	21
Porosity	17%	27%	36%
Water saturation	16%	26%	40%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM3 F play is 1.00. The play ranks within the largest one-third of all 61 Gulf of Mexico plays, based on a mean total endowment of 0.990 Bbo and 6.226 Tcfg (2.098 BBOE) (table 2). Eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.315 to 0.522 Bbo and 3.308 to 4.590 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.409 Bbo and 3.935 Tcfg (1.109 BBOE). These undiscovered resources may occur in as many as 90 pools. The largest undiscovered pool, with a mean size of 107.960 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 5, 6, 7, and 9 on the pool rank plot. For all the undiscovered pools in the UM3 F play, the mean mean size is 12.306 MMBOE, which is significantly smaller than the 31.904 MMBOE mean size of the

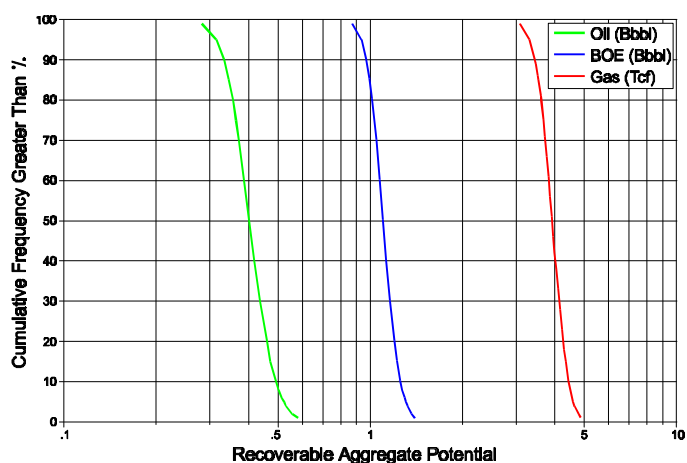


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	24	0.224	0.898	0.384
Cumulative production	--	0.079	0.487	0.166
Remaining proved	--	0.145	0.411	0.218
Unproved	7	0.105	0.415	0.179
Appreciation (P & U)	--	0.253	0.978	0.427
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.315	3.308	0.935
Mean	90	0.409	3.935	1.109
5th percentile	--	0.522	4.590	1.309
Total Endowment				
95th percentile	--	0.896	5.599	1.924
Mean	121	0.990	6.226	2.098
5th percentile	--	1.103	6.881	2.298

discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 17.327 MMBOE.

Of the 61 Gulf of Mexico plays, the UM3 F play is projected to contain the eighth and ninth largest amounts of mean undiscovered oil (5%) and gas (4%), respectively.

Because of the large unexplored area of this play, numerous undiscovered pools are expected to be found, which account for 53 percent of the play's BOE mean total endowment. On the pool rank plot, the projected undiscovered pools are interspersed throughout the entire range of discovered pool sizes. Deepwater drilling results indicate the presence of well-developed UM3 reservoir-quality sands. Therefore, hydrocarbon potential exists downdip of the discovered fields, especially in areas of present-day water depths greater than 1,000 feet.

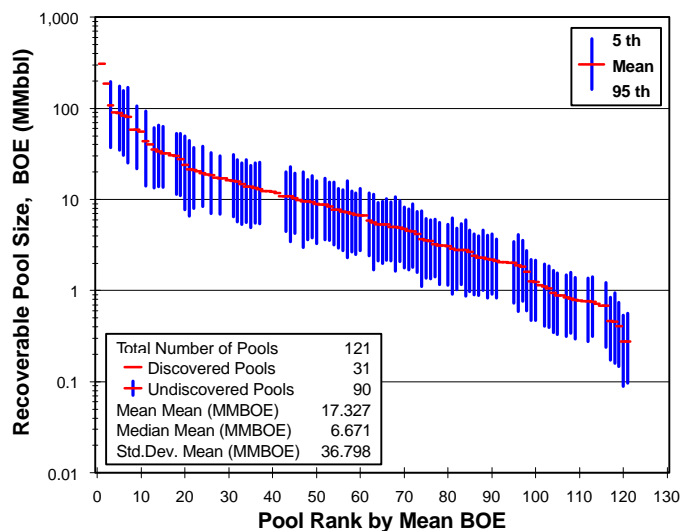


Figure 4. Pool rank plot.

LOWER UPPER MIOCENE (UM1) CHRONOZONE

CHRONOZONE DESCRIPTION

The Lower Upper Miocene (UM1) chronozone corresponds to the *Discorbis* 12 biozone. The UM1 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the UM1 chronozone include aggradational, progradational, and fan, each of which defines one or more plays: the Lower Upper Miocene Aggradational (UM1 A) play, the Lower Upper Miocene Progradational (UM1 P) play, the Lower Upper Miocene Fan (UM1 F) play, and the Lower Upper Miocene Aggradational/Progradational (UM1 AP) play. Retrogradational sands associated with marine transgressions occur locally in the play areas at the top of the progradational and aggradational deposits. Because these retrogradational sands are discontinuous over any significant distance, they are included as part of these underlying deposits.

The potential for sand development within the UM1 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Pensacola, Destin Dome, and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, UM1 sands continue onshore into Texas and Louisiana. To the southwest, sand potential extends into Texas offshore State waters and Mexican national waters. To the northeast, UM1 sands extend onshore into Mississippi and Alabama. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by strongly developed UM1 reservoir sands in the OCS G08496-1 well in Mississippi Canyon block 657 and the OCS G07955-1 well in the Mississippi Canyon 731 field (“Mensa”).

Productive and established sand locations in the UM1 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. The

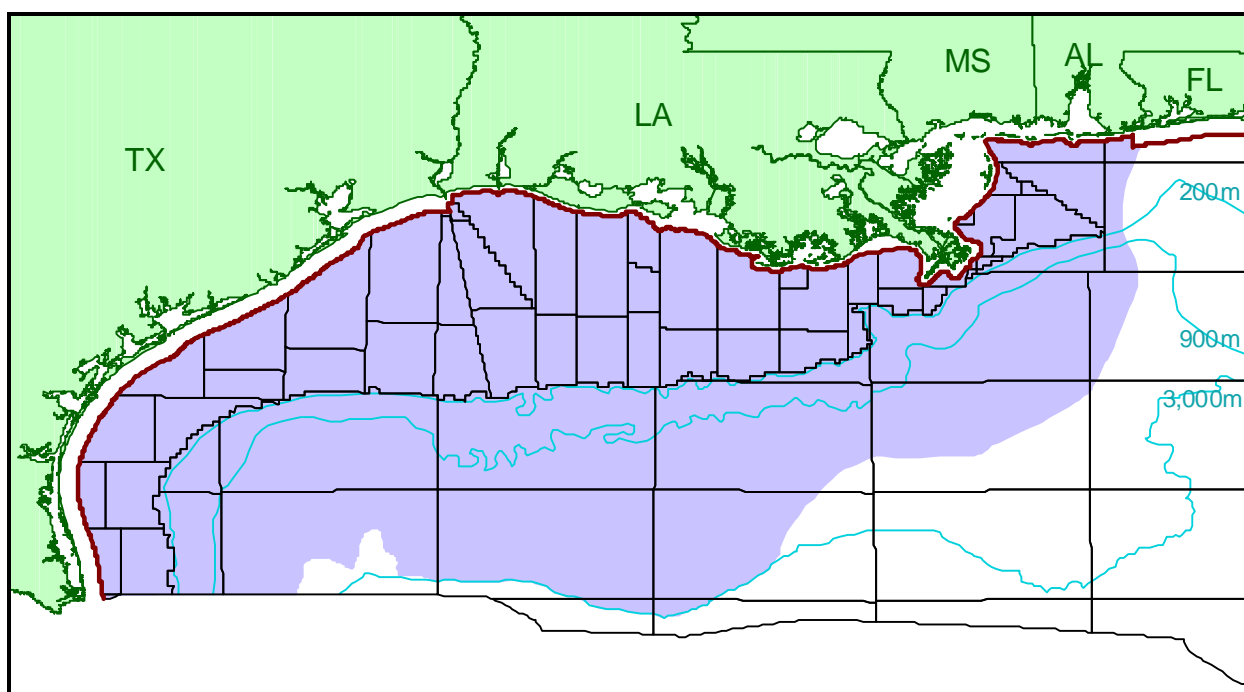


Figure 1. Map of assessed chronozone.

depositional sequences of the UM1 and upper middle Miocene (MM9) chronozones in the Texas offshore occupy approximately the same geographical areas, except for basinward progradation of sediments in UM1 time, especially in offshore Louisiana.

Productive progradational deposits of the UM1 chronozone occur offshore along most of Louisiana, whereas the underlying MM9 productive progradational deposits trend onshore from the eastern Eugene Island to the Breton Sound Areas.

In the Mississippi and Alabama offshore, the extent of the aggradational/progradational (AP) sequence in the UM1 chronozone is found in the same general geographical area as the AP sequence of the MM9 chronozone, indicative of deposition on a stable shelf. However, the UM1 deposits include more aggradational sediments from the ancestral Mobile River System than do the MM9 sediments.

Major structural features in the UM1 chronozone include normal faults, anticlines, salt diapirs, stratigraphic pinch-outs, and growth faults. Salt ridges also occur, but much less commonly.

DISCOVERIES

The UM1 chronozone contains 155 discovered pools in four plays (table 1). Significant amounts of hydrocarbons were recently identified in the Mensa field and the Viosca Knoll 783 field (“Tahoe”). Total reserves in the chronozone are 0.790 Bbo and 13.158 Tcfg (3.131 BBOE), of which 0.512 Bbo and 8.572 Tcfg (2.037 BBOE) have been produced. The largest number of discoveries in the UM1 chronozone occurred when 12 pools were added in 1984 (figure 2). However, the maximum yearly total reserves of 293.289 MMBOE were added in 1954 with the discovery of four pools.

Of the four plays in the UM1 chronozone, the UM1 P play contains the most total reserves in 104 pools, with 0.572 Bbo and 9.567 Tcfg (2.274 BBOE).

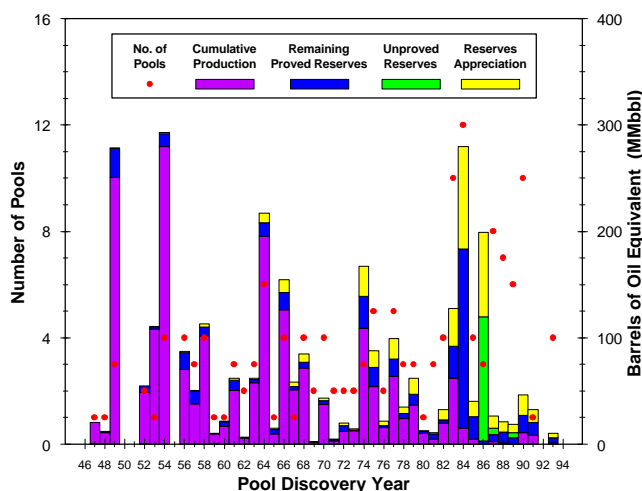


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

155 Pools (534 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	179	7,500
Subsea depth (feet)	1,500	8,969	18,050
Number of sands per pool	1	3	37
Porosity	14%	29%	39%
Water saturation	10%	28%	55%

Assessment Results

The UM1 chronozone contains 278 pools (discovered plus undiscovered), with a mean total endowment estimated at 1.152 Bbo and 17.245 Tcfg (4.220 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 123 pools, which contain a range of 0.286 to 0.449 Bbo and 3.502 to 4.731 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.362 Bbo and 4.087 Tcfg (1.089 BBOE) are projected. These undiscovered resources represent 26 percent of the UM1 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the ninth largest in the chronozone (figure 4).

Of the four UM1 plays, the UM1 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.337 Bbo and 3.638 Tcfg (0.984 BBOE) remaining to be found in 85 pools. These undiscovered resources in

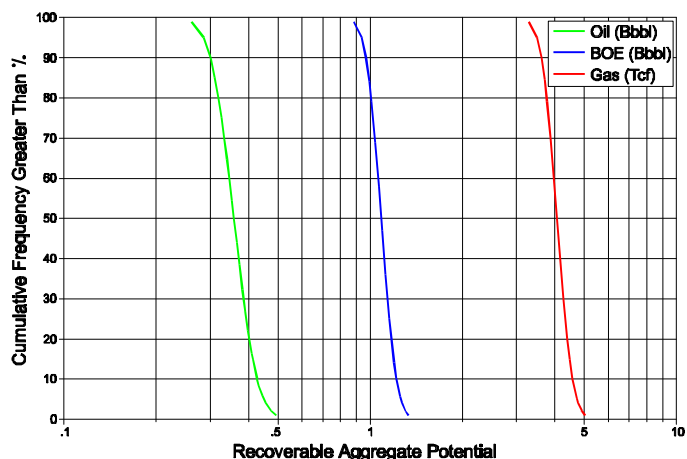


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	150	0.675	10.591	2.559
Cumulative production	--	0.512	8.572	2.037
Remaining proved	--	0.163	2.019	0.522
Unproved	5	0.013	0.646	0.128
Appreciation (P & U)	--	0.102	1.921	0.443
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.286	3.502	0.937
Mean	123	0.362	4.087	1.089
5th percentile	--	0.449	4.731	1.255
Total Endowment				
95th percentile	--	1.076	16.660	4.068
Mean	278	1.152	17.245	4.220
5th percentile	--	1.239	17.889	4.386

the UM1 F play represent 23 percent of the BOE mean total endowment for the UM1 chronozone. This percentage, deepwater drilling results that support strongly developed UM1 reservoir sands, and a large unexplored area make the UM1 F play an attractive exploration target in UM1 strata.

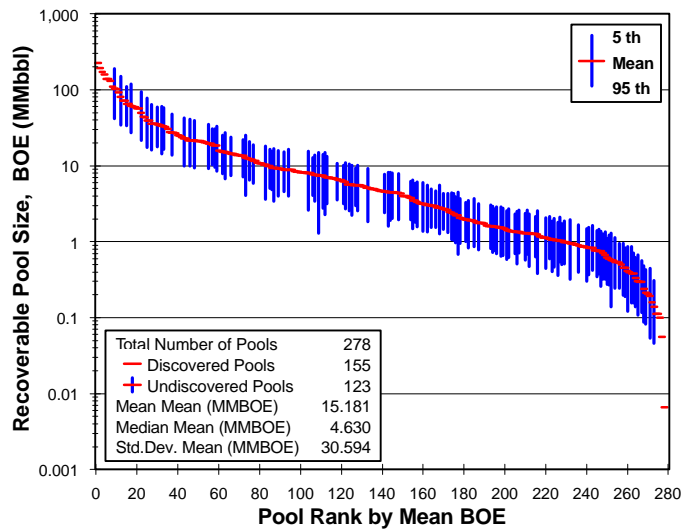


Figure 4. Pool rank plot.

LOWER UPPER MIOCENE AGGRADATIONAL (UM1 A) PLAY

PLAY DESCRIPTION

The established Lower Upper Miocene Aggradational (UM1 A) play occurs at the *Discorbis* 12 biozone. This play extends from the North Padre Island Area offshore Texas to the East Cameron Area offshore Louisiana (figure 1).

To the west, the play continues onshore into Texas. To the east, the play continues onshore into Louisiana. Downdip, the play grades into the sediments of the Lower Upper Miocene Progradational (UM1 P) play.

The downdip extent of the aggradational sequence in the UM1 chronozone is located in approximately the same area as that of the upper middle Miocene (MM9) chronozone, indicating only minor basinward movement of the UM1 aggradational sequence.

PLAY CHARACTERISTICS

The productive UM1 A play consists of thin, delta plain deposits that accumulated as distributary crevasse splays into bays and as storm-generated washover deltas into lagoons behind barrier islands. Although aggradational sands typically exhibit a thick blocky character, the sands of this play are thin and poorly developed due to their depositional origin. In addition, retrogradational sands locally cap the UM1 A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the UM1 A play. The structure of the one field in the play is a faulted anticline. Seals are provided by the juxtaposition of sands and shales along faults. Future discoveries are not limited to the above productive aggradational depositional environments, structures, or seals.

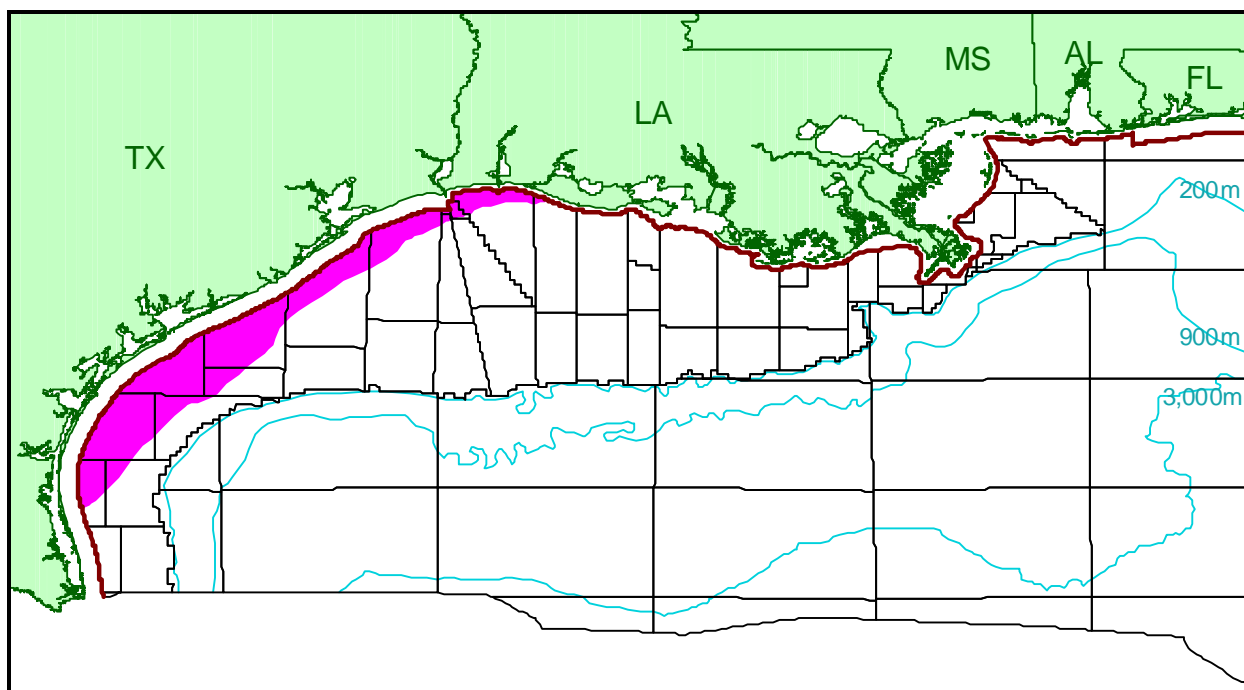


Figure 1. Map of assessed play.

Exxon Corporation's M14 and M8/M10 sands and Taylor Energy Co.'s 2 and 3 sands represent the UM1 A play in the play's only pool in the Matagorda Island 665 field.

DISCOVERIES

The UM1 A gas play contains total reserves of 6.926 Mbo and 119.035 Bcfg (21.188 MMBOE), of which 0.395 Mbo and 36.025 Bcfg (6.411 MMBOE) have been produced. The only pool in the play was found in 1977 in the Matagorda Island 665 field (figure 2). This pool contains four producible sands/reservoirs (table 1), all of which are nonassociated gas.

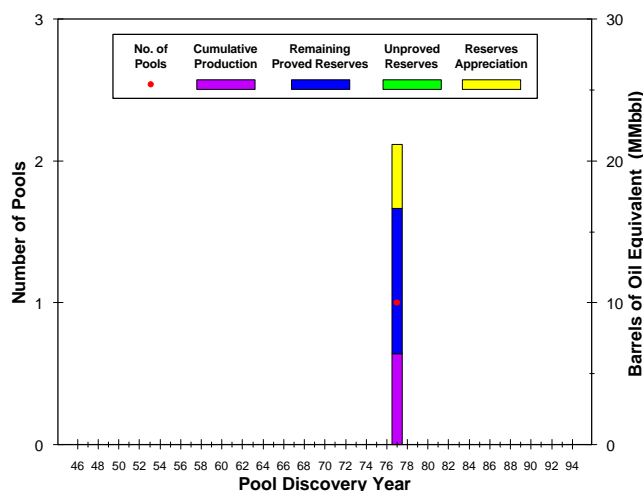


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

1 Pool (4 Producibles Sands)	Minimum	Mean	Maximum
Water depth (feet)	--	72	--
Subsea depth (feet)	--	1,907	--
Number of sands per pool	--	4	--
Porosity (percent)	--	31%	--
Water saturation (percent)	--	24%	--

ASSESSMENT RESULTS

Because of limited data for the UM1 A play, the Upper Lower Miocene Aggradational (LM4 A) play was used as an analog to model pool sizes in the UM1 A play. The LM4 A play was selected because of similarities in depositional setting, structural style, hydrocarbon type, and statistical information.

The marginal probability of hydrocarbons for the UM1 A play is 1.00. The play ranks within the smallest one-fourth of all 61 Gulf of Mexico Region plays, based on a mean total endowment of less than 0.001 Bbo and 0.141 Tcfg (0.025 BBOE) (table 2). Twenty-five percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of less than 0.001 to 0.001 Bbo and 0.015 to 0.032 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.022 Tcf (0.004 BBOE). These undiscovered resources may occur in as many as three pools. The largest undiscovered pool, with a mean size of 2.681 MMBOE, is modeled as the second largest pool in the play (figure 4). For all the undiscovered pools in the UM1 A play, the mean mean size is 1.433 MMBOE, which is significantly smaller than the size of the discovered pool. The mean mean size for all pools, including both discovered and undiscovered, is 6.371 MMBOE.

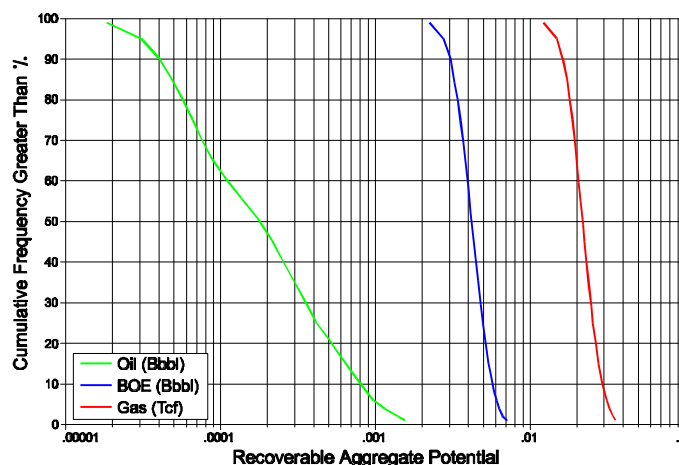


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1	<0.001	0.094	0.017
Cumulative production	--	<0.001	0.036	0.006
Remaining proved	--	<0.001	0.058	0.010
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.025	0.005
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.015	0.003
Mean	3	<0.001	0.022	0.004
5th percentile	--	0.001	0.032	0.006
Total Endowment				
95th percentile	--	<.001	0.134	0.024
Mean	4	<.001	0.141	0.025
5th percentile	--	0.001	0.151	0.027

Because of the numerous dry wells that penetrate this play, the undiscovered resources are expected to contribute only 16 percent to the play's BOE mean total endowment.

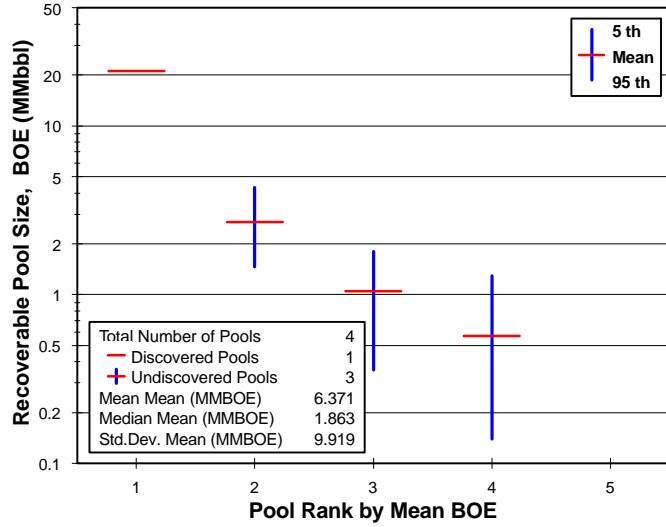


Figure 4. Pool rank plot.

LOWER UPPER MIOCENE AGGRADATIONAL/PROGRADATIONAL (UM1 AP) PLAY

PLAY DESCRIPTION

The established Lower Upper Miocene Aggradational/Progradational (UM1 AP) play occurs at the *Discorbis* 12 biozone. This play is located in the Mobile, Pensacola, Chandeleur, Viosca Knoll, and Destin Dome Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Mississippi and Alabama. Downdip, the play is limited by a lack of sand in the distal end of the facies.

The UM1 chronozone is one of three chronozones with combined aggradational and progradational (AP) "Shallow Miocene Bright Spot Trend" plays. The other two chronozones are the upper middle Miocene (MM9) and the upper upper Miocene (UM3). The extent of the AP sequence in the UM1 chronozone is found in the same general geographical area as the AP sequences of the MM9 and UM3 chronozones, indicative of deposition on a stable shelf. Sediments for the AP plays were sourced from a major continental drainage system formed after the Laramide Orogeny and also from the Appalachian region. Clastic influx to the Cretaceous shelf area was much less than to the Louisiana area depocenter during middle and upper Miocene times.

PLAY CHARACTERISTICS

The UM1 AP play comprises incised-valley fill (channels) typical of a progradational setting, but because the channel sands are often stacked, they also have characteristics of an aggradational setting. Therefore, the play is referred to as a combination aggradational/progradational (AP) play. The play occurs at shallow depths overlying the

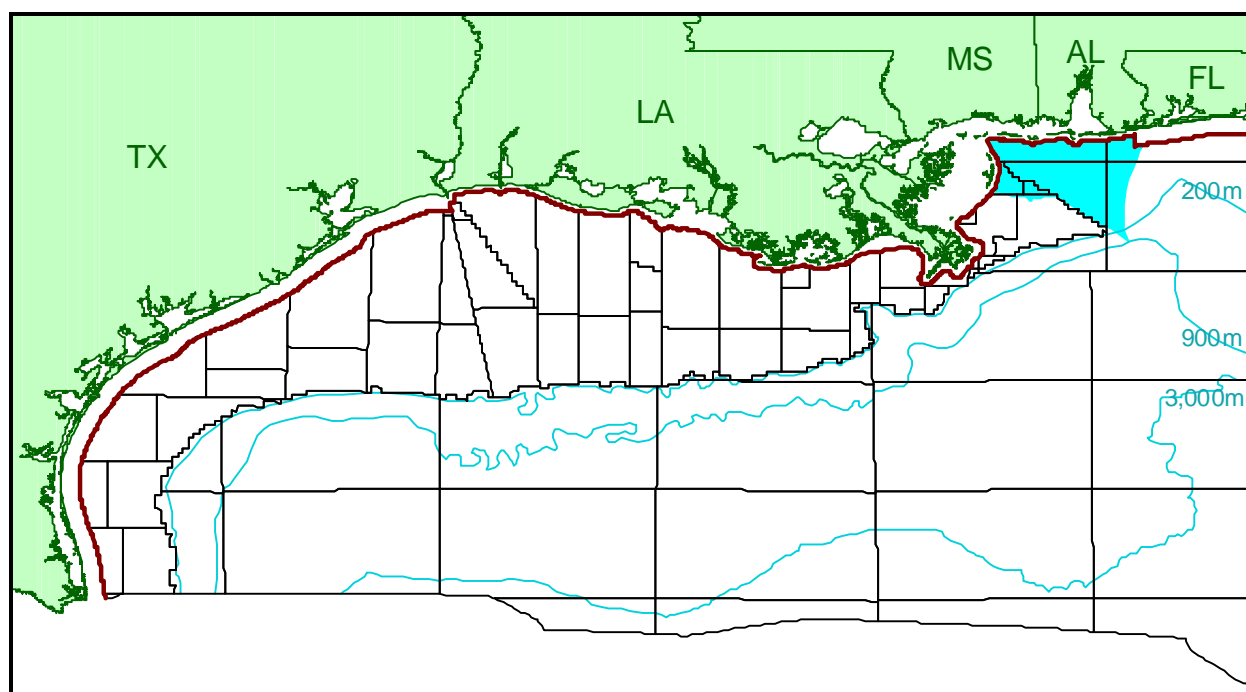


Figure 1. Map of assessed play.

Cretaceous carbonate shelf, and hydrocarbon accumulations are associated with seismic hydrocarbon indicators (bright spots). Regional dip dominates the structural style of the play. Faulting and local uplifts are rare and have no role in the accumulation of hydrocarbons within this play. Channels cut across the regional dip of the shelf area, and their deposits are sealed by lateral shale-outs and overlying Miocene shales.

Mobile 870 is the type field, and Santa Fe International Corporation's DISCORBIS 12 sand represents the UM1 AP play in this field.

DISCOVERIES

The UM1 AP gas play contains total reserves of 25.833 MMbo and 933.923 Bcfg (192.011 MMBOE), of which 0.044 MMbo and 322.640 Bcfg (57.453 MMBOE) have been produced. The play contains 31 producible sands in 25 pools, and 24 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the Chandeleur 25 field in 1982 (figure 2). The maximum yearly total reserves of 61.543 MMBOE were added in 1983 when two pools were discovered, including the largest pool in the play in the Chandeleur 29 field. Ninety percent of the play's cumulative production is associated with the first six pools found in the play. On a BOE basis, less than 1 percent of the play's cumulative production is oil, but remaining total reserves indicate that future production may increase to 19 percent oil. Discoveries peaked in 1990 when five pools were added to the play. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

The 25 discovered pools range in size from 0.878 to 34.382 MMBOE. These pools contain 34 reservoirs, all of which are nonassociated gas.

The UM1 AP play contains 69 percent of the BOE total reserves contained in the

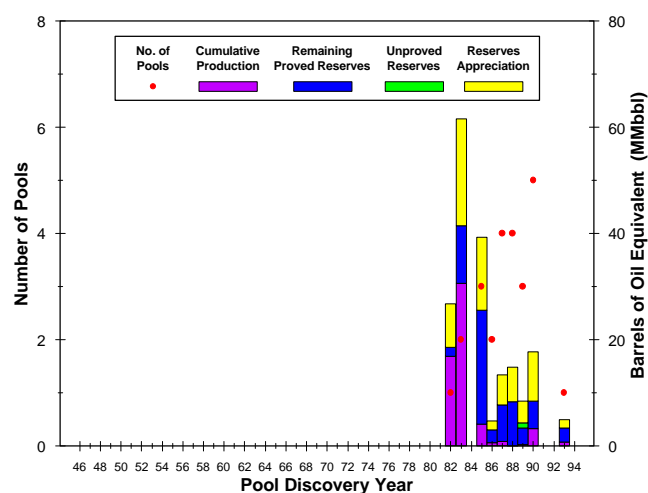


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

25 Pools (31 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	42	75	126
Subsea depth (feet)	1,500	2,904	4,957
Number of sands per pool	1	1	4
Porosity	26%	34%	39%
Water saturation	10%	25%	46%

three AP plays.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM1 AP play is 1.00. The play contains a mean total endowment of 0.026 Bbo and 1.002 Tcfg (0.204 BBOE) (table 2). Twenty-eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.054 to 0.083 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.068 Tcf (0.012 BBOE). These undiscovered resources

may occur in as many as 15 pools. The largest undiscovered pool, with a mean size of 1.596 MMBOE, is modeled as the twentieth largest pool in the play (figure 4). For all the undiscovered pools in the UM1 AP play, the mean mean size is 0.803 MMBOE, which is

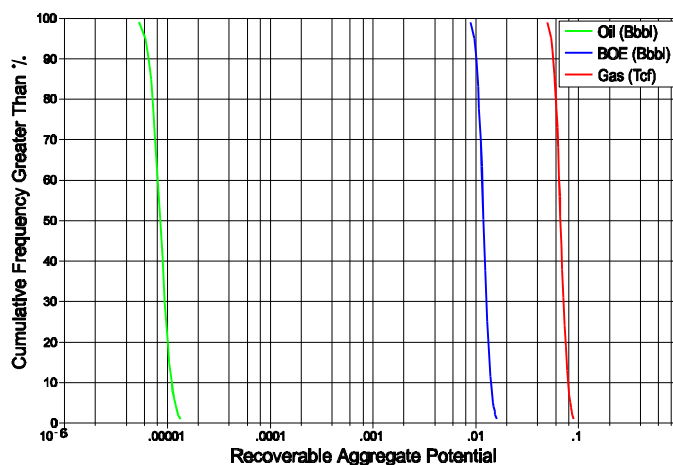


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	24	0.017	0.579	0.120
Cumulative production	--	<0.001	0.323	0.057
Remaining proved	--	0.017	0.257	0.062
Unproved	1	<0.001	0.005	0.001
Appreciation (P & U)	--	0.009	0.350	0.071
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.054	0.010
Mean	15	<0.001	0.068	0.012
5th percentile	--	<0.001	0.083	0.015
Total Endowment				
95th percentile	--	0.026	0.988	0.202
Mean	40	0.026	1.002	0.204
5th percentile	--	0.026	1.017	0.207

smaller than the 7.680 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 5.102 MMBOE.

Undiscovered pools in the UM1 AP play are expected to be much smaller than most of the discovered pools. These undiscovered resources add only 6 percent to the play's BOE mean total endowment. The limited geographic extent of the UM1 AP play, small field sizes, and extensive drilling reduce the play's potential for significant discoveries.

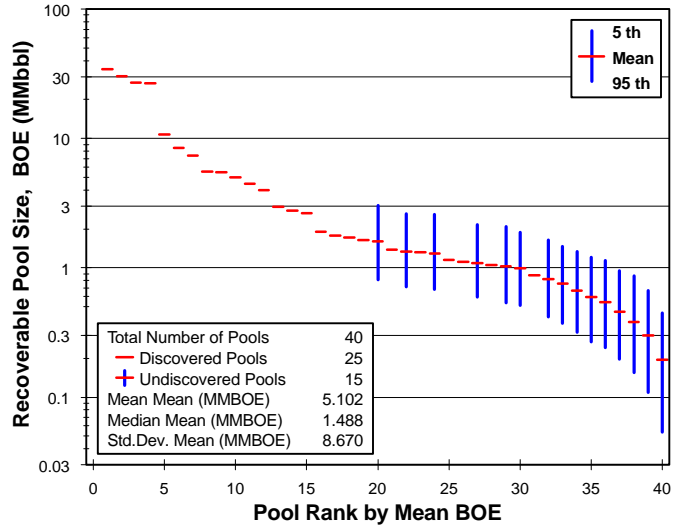


Figure 4. Pool rank plot.

LOWER UPPER MIOCENE PROGRADATIONAL (UM1 P) PLAY

PLAY DESCRIPTION

The Lower Upper Miocene Progradational (UM1 P) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs at the *Discorbis* 12 biozone and extends from the South Padre Island Area offshore Texas to the Main Pass Area east of the present-day Mississippi River Delta (figure 1).

Updip in the Texas offshore, the play grades into the nearshore deposits of the Lower Upper Miocene Aggradational (UM1 A) play. Updip to the north in Louisiana, the UM1 P play continues onshore. To the northeast, the play is limited by the deposits of the Lower Upper Miocene Aggradational/Progradational (UM1 AP) play overlying the Cretaceous carbonate shelf. The UM1 P play continues to the southwest into Texas offshore State waters and Mexican national waters. Downdip and to the east, the play is grades into the deposits of the Lower Upper Miocene Fan (UM1 F) play.

The downdip extent of the UM1 progradational sequence is located farther basinward than the downdip extent of the upper middle Miocene (MM9) progradational sequence. Therefore, the UM1 P play not only overlies MM9 progradational sediments but also MM9 fan sediments.

PLAY CHARACTERISTICS

The productive UM1 P play consists of progradational deltaic sediments deposited in delta front, delta fringe, and shelf blanket environments. In addition, retrogradational sands locally cap the UM1 P play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the UM1 P play. Normal faults, anticlines, salt diapirs, and growth faults are the major structural features in the play. Less common

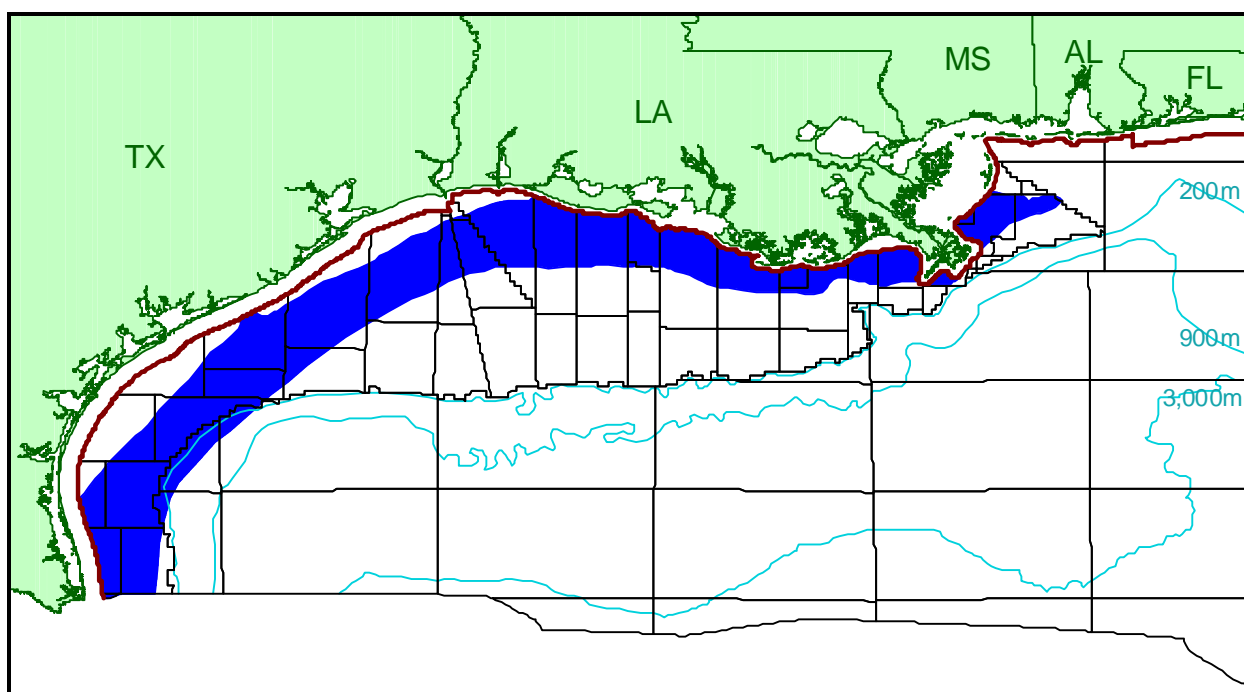


Figure 1. Map of assessed play.

structures include stratigraphic pinch-outs and salt ridges. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Ship Shoal 69 is the type field, and Chevron USA Inc.'s 11300, 11400, 11500, 11700, 11800, 121/12200 and 13200 sands represent the UM1 P play in this field.

DISCOVERIES

The UM1 P play is predominantly a gas play, with total reserves of 0.572 Bbo and 9.567 Tcfg (2.274 BBOE), of which 0.475 Bbo and 7.623 Tcfg (1.831 BBOE) have been produced. The play contains 424 producible sands in 104 pools, and 103 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the Vermilion 71 field in 1947 (figure 2). The maximum yearly total reserves of 279.742 MMBOE were added in 1954 when three pools were discovered, including the largest pool in the play in the West Delta 30 field. Though almost 50 percent of the pools in the play were discovered in 1975 or later, 80 percent of the play's total reserves is contained in pools discovered prior to 1975. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

The 104 discovered pools range in size from 0.007 to 173.200 MMBOE. These pools contain 791 reservoirs, of which 504 are nonassociated gas, 215 are undersaturated oil, and 72 are saturated oil.

Of the 61 plays in the Gulf of Mexico Region, the UM1 P play ranks as the eighth largest, based on BOE total reserves (5%) and BOE cumulative production (6%).

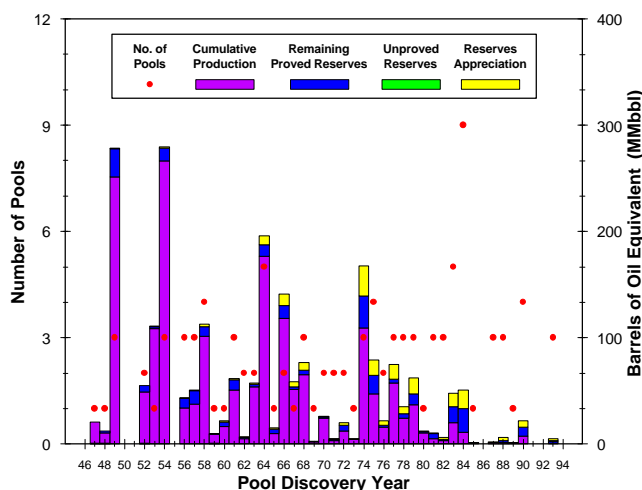


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

104 Pools (424 Producibles Sands)	Minimum	Mean	Maximum
Water depth (feet)	9	66	379
Subsea depth (feet)	3,771	9,675	17,425
Number of sands per pool	1	4	37
Porosity	14%	28%	34%
Water saturation	10%	29%	55%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM1 P play is 1.00. The play ranks within the largest one-fourth of all 61 Gulf of Mexico plays, based on a mean total endowment of 0.597 Bbo and 9.926 Tcfg (2.363 BBOE) (table 2). Seventy-seven percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.014 to 0.040 Bbo and 0.283 to 0.441 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.025 Bbo and 0.359 Tcfg (0.089 BBOE). These undiscovered resources may occur in as many as 20 pools. The largest undiscovered pool, with a mean size of 12.831 MMBOE, is modeled as the fortieth largest pool in the play (figure 4). For all the undiscovered pools in the UM1 P play, the mean mean size is 4.448 MMBOE, which is substantially smaller than the 21.870 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 19.060

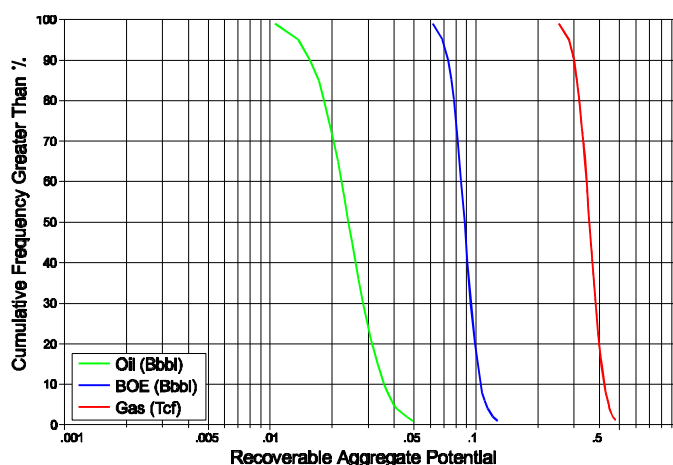


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	103	0.535	8.772	2.096
Cumulative production	--	0.475	7.623	1.831
Remaining proved	--	0.060	1.149	0.265
Unproved	1	<0.001	0.003	0.001
Appreciation (P & U)	--	0.037	0.792	0.178
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.014	0.283	0.069
Mean	20	0.025	0.359	0.089
5th percentile	--	0.040	0.441	0.113
Total Endowment				
95th percentile	--	0.586	9.850	2.343
Mean	124	0.597	9.926	2.363
5th percentile	--	0.612	10.008	2.387

MMBOE.

In the Texas offshore, limited potential exists downdip of the discovered fields where wells have not penetrated deep enough to reach UM1 P sediments. In the Louisiana offshore, the density of wells that encounter UM1 P deposits is high; thus, limited interfield exploration potential exists. Because of this limited potential, undiscovered resources are projected to occur in small pools, which add only 4 percent to the play's BOE mean total endowment.

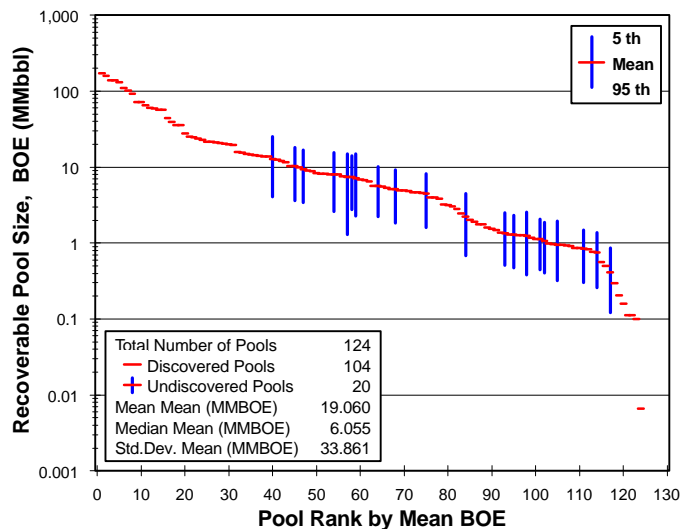


Figure 4. Pool rank plot.

LOWER UPPER MIOCENE FAN (UM1 F) PLAY

PLAY DESCRIPTION

The established Lower Upper Miocene Fan (UM1 F) play occurs at the *Discorbis* 12 biozone. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play is bounded by the shelf/slope break associated with the *Discorbis* 12 biozone and grades into the sediments of the Lower Upper Miocene Progradational (UM1 P) play. To the northeast, the UM1 F play is bounded by the Cretaceous carbonate shelf edge. To the southwest, the UM1 F play extends into Mexican national waters. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by UM1 sand development in the OCS G07955-1 well in the Mississippi Canyon 731 field ("Mensa") and in the OCS G08496-1 well in Mississippi Canyon block 657.

The updip extent of the UM1 fan sequence is located farther basinward than that of the upper middle Miocene (MM9) chronozone. The UM1 chronozone is the oldest chronozone in which the updip sequence boundary of the fan facies is located predominately in the present-day Federal offshore.

PLAY CHARACTERISTICS

The productive UM1 F play consists of deepwater turbidites deposited in fan systems as channel fill, overbank deposits, and fringe sheet sediments on the UM1 slope. Major structural features in the play are growth faults, anticlines, and salt diapirs. Normal faults and stratigraphic pinch-outs occur less commonly. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting,

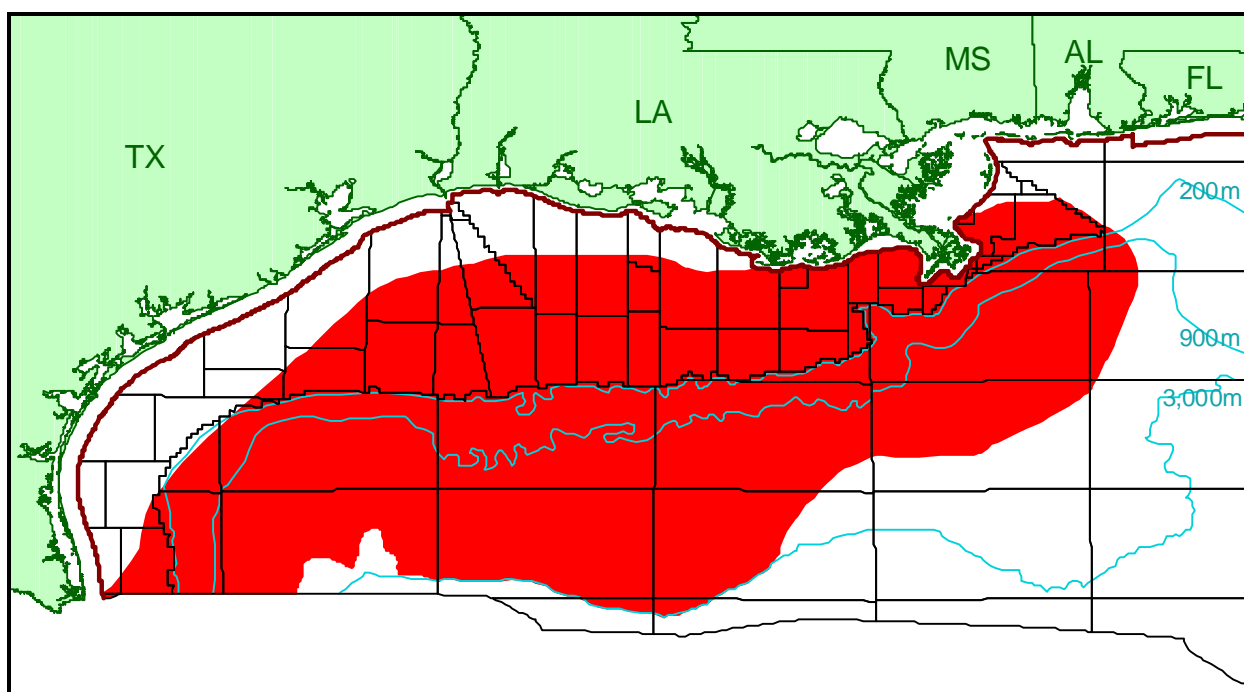


Figure 1. Map of assessed play.

diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Main Pass 311 is the type field, and Chevron USA Inc.'s M30 sand represents the UM1 F play in this field.

DISCOVERIES

The UM1 F play is predominantly a mixed oil and gas play, with total reserves of 0.192 Bbo and 2.538 Tcfg (0.643 BBOE), of which 0.037 Bbo and 0.590 Tcfg (0.142 BBOE) have been produced. The play contains 75 producible sands in 25 pools, and 22 of these pools contain proved reserves (table 1). The first reserves in the play were discovered in the West Delta 58 field in 1954 (figure 2). The maximum yearly total reserves of 229.028 MMBOE were added in 1984 when three pools were discovered, including the largest pool in the play in the Viosca Knoll 783 field ("Tahoe"). Over 50 percent of the play's cumulative production occurred from pools discovered prior to 1965. However, 65 percent of the play's total reserves occur in the Mensa and Tahoe deepwater fields discovered in the mid-1980's. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1991.

The 25 discovered pools range in size from 0.056 to 224.302 MMBOE. These pools contain 119 reservoirs, of which 78 are nonassociated gas, 35 are undersaturated oil, and 6 are saturated oil.

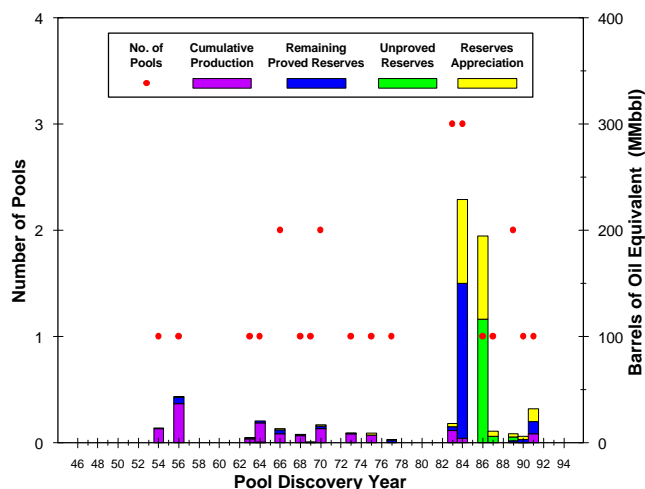


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

25 Pools (75 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	29	758	7,500
Subsea depth (feet)	6,396	12,383	18,050
Number of sands per pool	1	3	10
Porosity	14%	27%	33%
Water saturation	16%	29%	50%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UM1 F play is 1.00. The play ranks within the largest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.529 Bbo and 6.176 Tcfg (1.627 BBOE) (table 2). Nine percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources range from 0.268 to 0.416 Bbo and 3.111 to 4.232 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.337 Bbo and 3.638 Tcfg (0.984 BBOE). These undiscovered resources may occur in as many as 85 pools. The largest undiscovered pool, with a mean size of 104.730 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 4, 5, 6, and 7 on the pool rank plot. For all the undiscovered pools in the UM1 F play, the mean mean size is 11.576 MMBOE, which is significantly smaller than the 25.740 MMBOE mean size of the

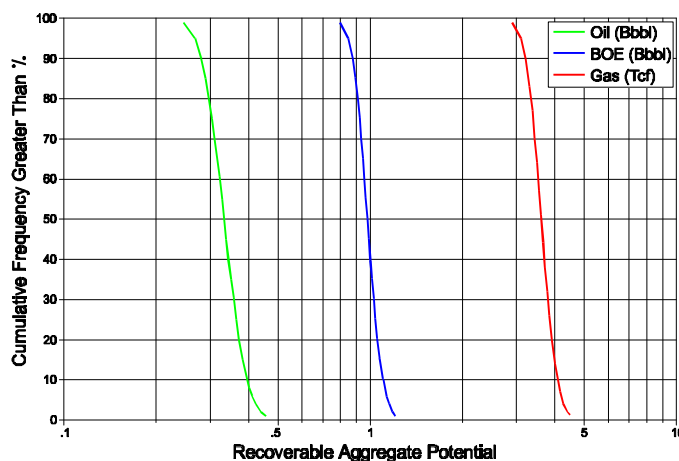


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	22	0.123	1.146	0.327
Cumulative production	--	0.037	0.590	0.142
Remaining proved	--	0.085	0.556	0.184
Unproved	3	0.013	0.638	0.127
Appreciation (P & U)	--	0.056	0.754	0.190
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.268	3.111	0.846
Mean	85	0.337	3.638	0.984
5th percentile	--	0.416	4.232	1.141
Total Endowment				
95th percentile	--	0.460	5.649	1.489
Mean	110	0.529	6.176	1.627
5th percentile	--	0.608	6.770	1.784

discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 14.795 MMBOE.

Of the 61 Gulf of Mexico plays, the UM1 F play is projected to contain the tenth largest amounts of mean undiscovered oil and gas resources, both at 4 percent.

Because of the large unexplored area of this play, numerous undiscovered pools are expected to be added to the play. These undiscovered resources account for 60 percent of the play's BOE mean total endowment. On the pool rank plot, the projected undiscovered pools are interspersed throughout the entire range of discovered pool sizes.

Hydrocarbon potential exists downdip of discovered fields, especially in areas of present-day water depths greater than 1,000 feet. Deepwater drilling results indicate the presence of well-developed UM1 reservoir-quality sands.

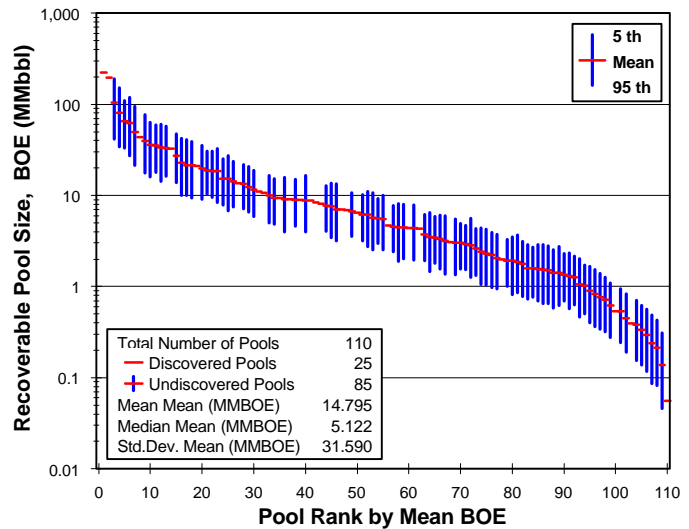


Figure 5. Pool rank plot.

UPPER MIDDLE MIOCENE (MM9) CHRONOZONE

CHRONOZONE DESCRIPTION

The Upper Middle Miocene (MM9) chronozone corresponds to the *Textularia* “W” and *Bigenerina 2* biozones. The MM9 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the MM9 chronozone include aggradational, progradational, and fan, each of which defines one or more plays: the Upper Middle Miocene Aggradational (MM9 A) play, the Upper Middle Miocene Progradational (MM9 P) play, the Upper Middle Miocene Fan (MM9 F) play, and the Upper Middle Miocene Aggradational/Progradational (MM9 AP) play. Retrogradational sands associated with marine transgressions also occur locally in the play areas at the top of the progradational and aggradational deposits. Because these retrogradational sands are discontinuous over any significant distance, they are included as part of these underlying deposits. The remaining play in the MM9 chronozone, the Upper Middle Miocene Structural Retrogradational/Aggradational/Progradational (MM9 RAP) play, is defined by its structural limits due to faulting.

The potential for sand development within the MM9 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Pensacola, Destin Dome, and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, MM9 sands extend onshore into Texas and Louisiana. To the southwest, sand potential extends into Texas offshore State waters and Mexican national waters. To the northeast, MM9 sands extend onshore into Mississippi and Alabama. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by MM9 sand development in the OCS G08512-1 well in Atwater block 471.

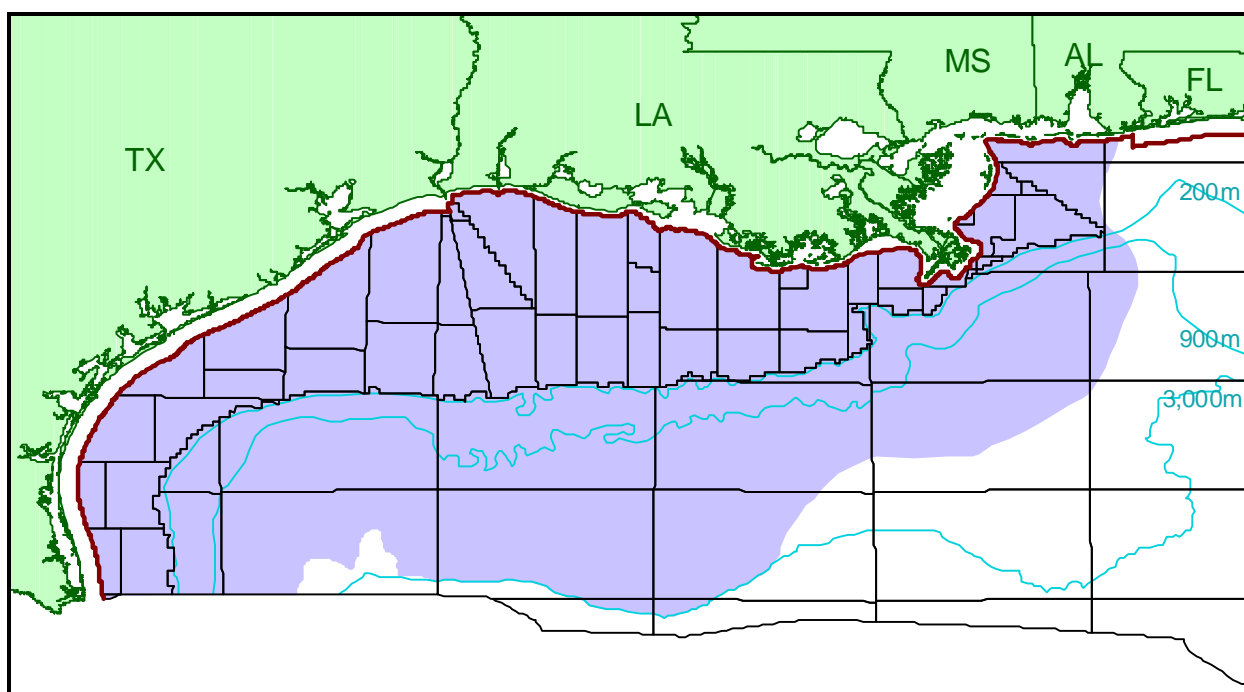


Figure 1. Map of assessed chronozone.

Productive and established sand locations in the MM9 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. In the offshore Texas area, areally smaller productive plays are observed in the MM9 chronozone as compared with the underlying middle middle Miocene (MM7) chronozone, reflecting lesser amounts of clastic influx from the ancient Texas area delta systems.

In the offshore Louisiana area, the MM9 depocenter had migrated eastward in comparison with the MM7 depocenter. Productive progradational and fan deposits in the MM9 chronozone are observed east of the present-day Mississippi River Delta, whereas in the MM7 chronozone, only one small areas of productive fan deposits are observed in that same area. The deposits of MM9 time are also observed farther offshore of Louisiana than MM7 deposits because of the seaward progradation of deltaic deposits from the ancestral Mississippi River.

Major structural features in the MM9 chronozone include normal faults, anticlines, and growth faults. Less common structures include salt diapirs, stratigraphic pinch-outs, and salt ridges.

DISCOVERIES

The MM9 chronozone contains 98 discovered pools in five plays (table 1). Total reserves in the chronozone are 0.658 Bbo and 8.929 Tcfg (2.247 BBOE), of which 0.225 Bbo and 5.313 Tcfg (1.171 BBOE) have been produced. The largest number of discoveries in the MM9 chronozone occurred when seven pools were added in both 1976 and 1990 (figure 2). However, the maximum yearly total reserves of 478.516 MMBOE were added in 1985 with the discovery of five pools.

Of the five plays in the MM9 chronozone, the MM9 P play contains the most total reserves in 63 pools, with 0.128 Bbo and 6.112 Tcfg (1.215 BBOE).

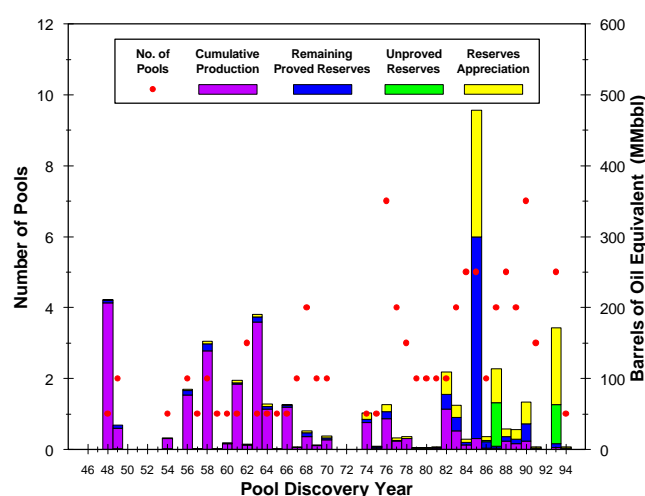


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

98 Pools (244 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	228	5,149
Subsea depth (feet)	2,129	8,794	18,800
Number of sands per pool	1	2	10
Porosity	18%	28%	35%
Water saturation	13%	30%	66%

ASSESSMENT RESULTS

The MM9 chronozone contains 220 pools (discovered plus undiscovered), with a mean total endowment estimated at 0.998 Bbo and 14.461 Tcfg (3.571 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 122 pools, which contain a range of 0.238 to 0.465 Bbo and 4.649 to 6.515 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.340 Bbo and 5.532 Tcfg (1.324 BBOE) are projected. These undiscovered resources represent 37 percent of the MM9 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the fourth largest in the chronozone (figure 4).

Of the five MM9 plays, the MM9 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.317 Bbo and 4.365 Tcfg (1.094 BBOE) remaining to be found in 86 pools. These undiscovered resources in the MM9 F play represent 31 percent of the BOE mean total endowment for the MM9

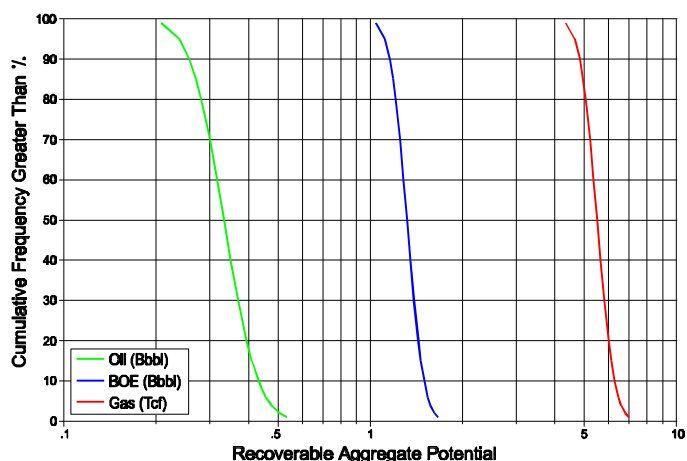


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	94	0.391	6.926	1.624
Cumulative production	--	0.225	5.313	1.171
Remaining proved	--	0.166	1.614	0.453
Unproved	4	0.065	0.295	0.118
Appreciation (P & U)	--	0.201	1.708	0.505
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.238	4.649	1.116
Mean	122	0.340	5.532	1.324
5th percentile	--	0.465	6.515	1.555
Total Endowment				
95th percentile	--	0.896	13.578	3.363
Mean	220	0.998	14.461	3.571
5th percentile	--	1.123	15.444	3.802

chronozone. This high percentage, the potential for good MM9 sand development in deepwater areas, and the potential for numerous discoveries within a large unexplored area make the MM9 F play an attractive exploration target in MM9 strata.

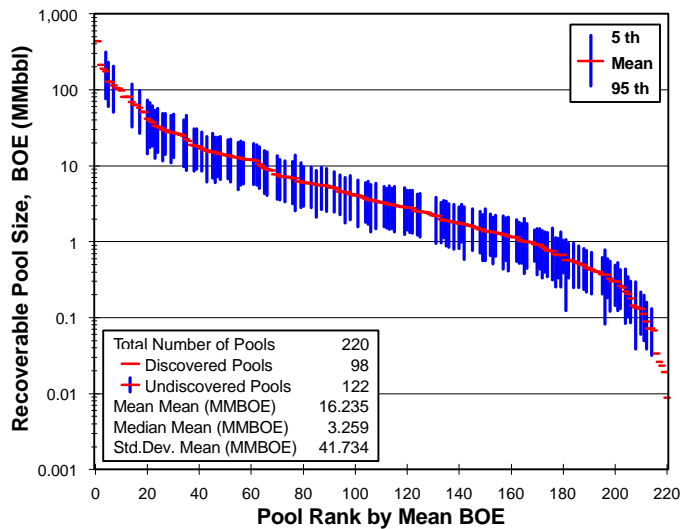


Figure 4. Pool rank plot.

UPPER MIDDLE MIOCENE STRUCTURAL RETROGRADATIONAL/ AGGRADATIONAL/PROGRADATIONAL (MM9 RAP) PLAY

PLAY DESCRIPTION

The established Upper Middle Miocene Structural Retrogradational/Aggradational/Progradational (MM9 RAP) play occurs within the *Textularia* “W” and *Bigenerina* 2 biozones. The play is defined by its structural position on the downthrown side of the regional Corsair Fault System and is commonly referred to as a “Corsair” play. It extends in a narrow band from the Mustang Island East Addition Area northeastward parallel to the Texas coastline to the central Galveston Area (figure 1).

Updip, the play is bounded by the regional extent of the Corsair Fault System. To the northeast, southwest, and downdip, the play is bounded by the relatively thin, unexpanded sediments of the Upper Middle Miocene Progradational (MM9 P) play not associated with deposition along the Corsair Fault System.

The MM9 RAP play represents the youngest deposition included in the structurally controlled plays of the Corsair Fault System. The underlying Middle Middle Miocene Structural Retrogradational/Aggradational/Progradational/Fan (MM7 RAPF) play contains productive fan sands, unlike the MM9 RAP play. The two plays generally occur in the same geographic location, as both are controlled by the Corsair Fault System.

PLAY CHARACTERISTICS

The productive MM9 RAP play consists of stacked sequences of retrogradational, aggradational, and progradational sands located downthrown to the Corsair Fault in offshore Texas. The presence of these three depositional systems associated with the

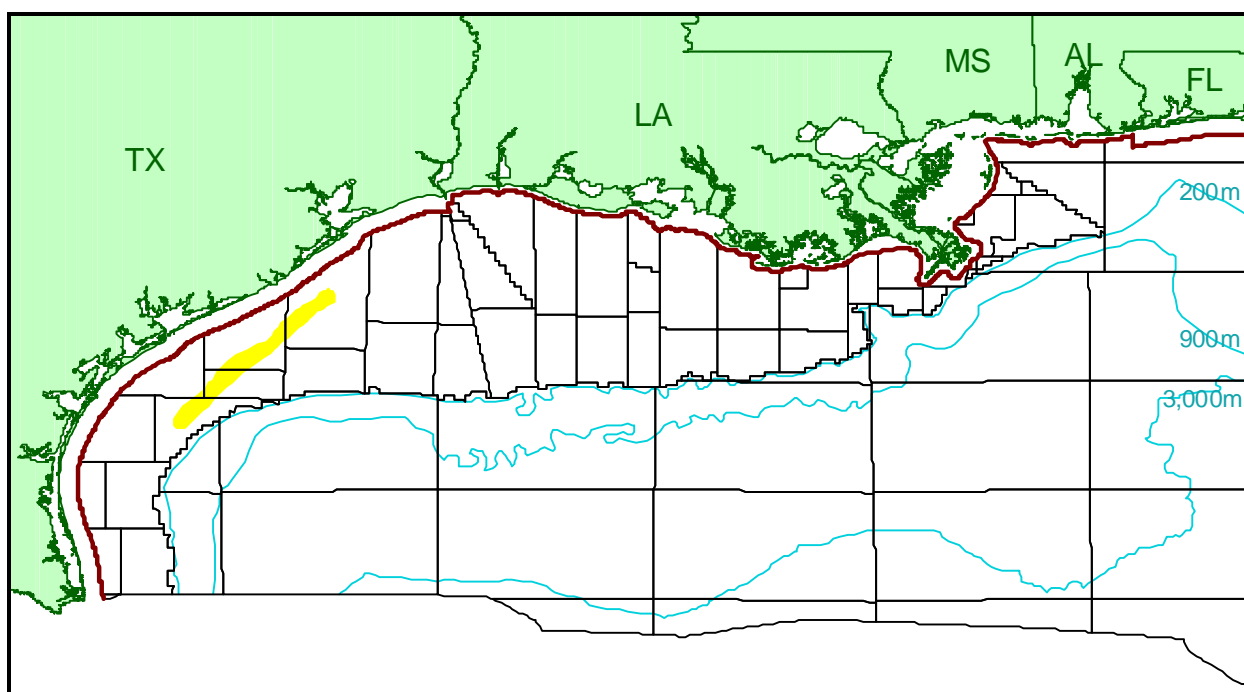


Figure 1. Map of assessed play.

Corsair Fault System accounts for the combination RAP play name. The progradational deposits dominate the 33 producible sands in the MM9 RAP play, with two-thirds of the total.

During MM9 time, growth fault movement occurred in response to a rapid influx of progradational and aggradational sands during periods of lowstand. Reworking of these sands during the *Bigenerina* 2 marine transgression produced the retrogradational deposits that locally cap the MM9 aggradational and progradational sediments. The MM9 section is greatly expanded on the downthrown side of the Corsair Fault. Because sand accumulation was so influenced by structural movement of the fault, the play is considered to be structurally controlled, rather than depositionally controlled.

The major structural feature of the MM9 RAP play is growth faults of the Corsair Fault System, with normal faults, anticlines, and salt diapirs occurring less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales).

Galveston 350 is the type field, and Walter Oil and Gas Corporation's TEXW1A, TEXW1B, TEXW2, and BIG 2-K sands represent the MM9 RAP play in this field.

DISCOVERIES

The MM9 RAP gas play contains total reserves of 0.387 MMbo and 130.004 Bcfg (23.520 MMBOE), of which 0.187 MMbo and 62.971 Bcfg (11.391 MMBOE) have been produced. The play contains 33 producible sands in 11 pools (table 1). The play began in 1969 when the maximum yearly total reserves of 6.435 MMBOE were found in two pools (figure 2). However, the largest pool in the play was discovered in 1976 in the Brazos 70A field. Over 75 percent of the play's cumulative production occurred from pools discovered during the 1970's or earlier. However, over 60 percent of the total remaining reserves were added

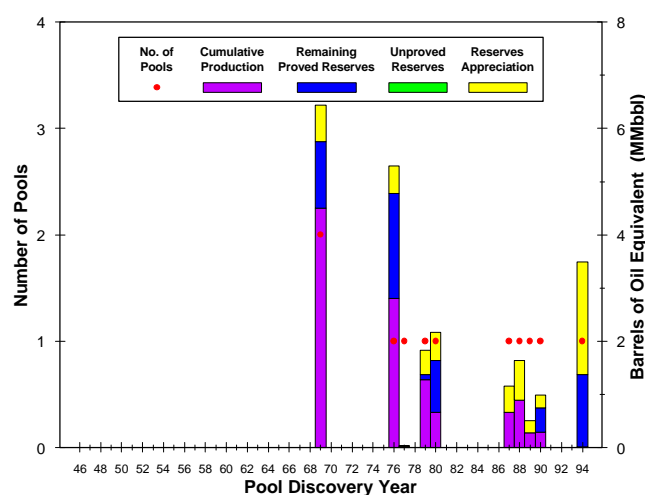


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

11 Pools (33 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	80	112	202
Subsea depth (feet)	5,457	6,866	8,940
Number of sands per pool	1	3	8
Porosity	21%	28%	34%
Water saturation	21%	36%	51%

in 1980 or later. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 11 discovered pools range in size from 0.023 to 5.292 MMBOE. These pools contain 40 reservoirs, all of which are nonassociated gas.

Of the total reserves in both the MM9 RAP and MM7 RAPF plays, the MM9 RAP play contains only 5 percent.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM9 RAP play is 1.00. The play ranks within the smallest one-fourth of all 61 Gulf of Mexico Region plays, based on a mean total endowment of less than 0.001 Bbo and 0.148 Tcfg (0.027 BBOE) (table 2). Forty-three percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.014 to 0.022 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean

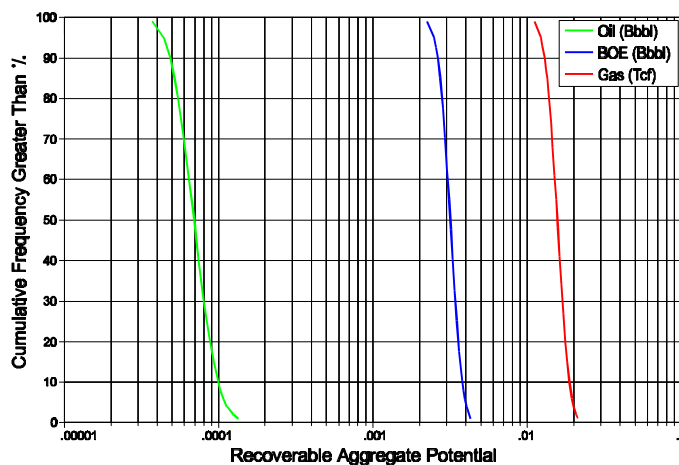


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	11	<0.001	0.097	0.017
Cumulative production	--	<0.001	0.063	0.011
Remaining proved	--	<0.001	0.034	0.006
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.033	0.006
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.014	0.002
Mean	7	<0.001	0.018	0.003
5th percentile	--	<0.001	0.022	0.004
Total Endowment				
95th percentile	--	<0.001	0.144	0.026
Mean	18	<0.001	0.148	0.027
5th percentile	--	<0.001	0.152	0.028

undiscovered gas is 0.018 Tcf (0.003 BBOE). These undiscovered resources may occur in as many as seven pools. The largest undiscovered pool, with a mean size of 0.933 MMBOE, is modeled as the tenth largest pool in the play (figure 4). For all the undiscovered pools in the MM9 RAP play, the mean mean size is 0.457 MMBOE, which is smaller than the 2.138 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 1.484 MMBOE.

The MM9 RAP play is well drilled and is limited in geographic extent by the Corsair Fault System. Undiscovered resources are expected to account for only 11 percent of the play's BOE mean total endowment. Limited potential between discovered fields exists for additional structural traps along the Corsair Fault System.

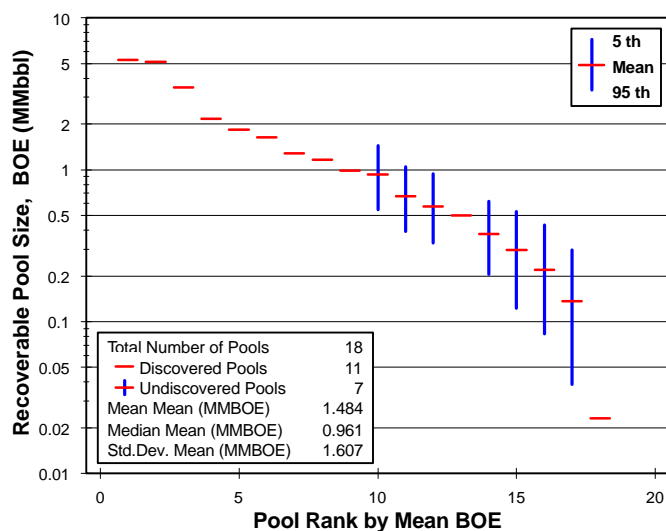


Figure 4. Pool rank plot.

UPPER MIDDLE MIOCENE AGGRADATIONAL (MM9 A) PLAY

PLAY DESCRIPTION

The established Upper Middle Miocene Aggradational (MM9 A) play occurs within the *Textularia* "W" and *Bigenerina* 2 biozones. This play extends northeastward from the North Padre Island Area offshore Texas through the West Cameron Area offshore Louisiana (figure 1).

Updip and along strike, the play continues onshore into Texas and Louisiana. Downdip, the play grades into the deposits of the Upper Middle Miocene Progradational (MM9 P) play. Additionally, downdip along the extent of the regional Corsair Fault System, the MM9 A play is bounded by the sediments of the Upper Middle Miocene Structural Retrogradational/Aggradational/Progradational (MM9 RAP) play.

The middle middle Miocene (MM7) and MM9 aggradational deposits occur in the same general geographic area, indicating little shift in the depocenter location from MM7 to MM9 time.

PLAY CHARACTERISTICS

The productive MM9 A play consists of delta plain and shallow-marine shelf deposits that include channel/levee complexes, barrier bars, and distributary mouth bar sands. In addition, retrogradational sands locally cap the MM9 A play. Because these retrogradational, reworked sands are so discontinuous, they are included as part of the MM9 A play. The major structural feature is anticlines which, when faulted, form the traps in the play. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). The paucity of seals in the typically sand-rich aggradational environment accounts for the

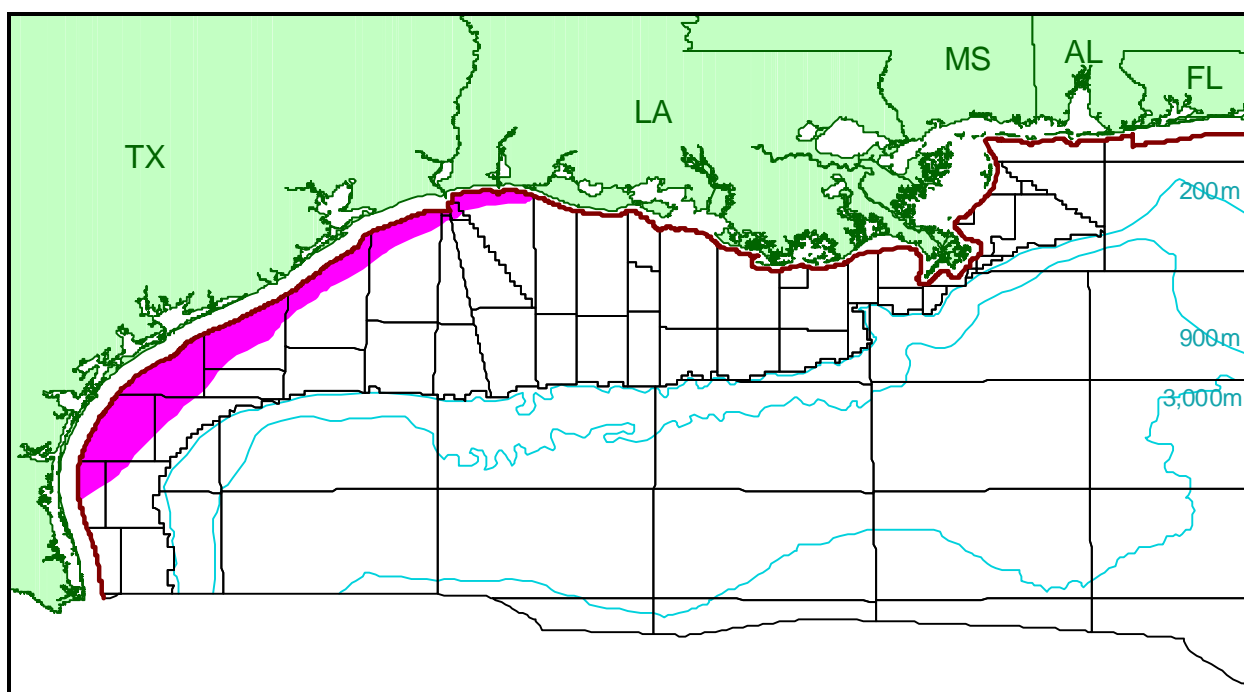


Figure 1. Map of assessed play.

low number of productive sands in the play. Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

Matagorda Island 7A is the type field, and Taylor Energy Company's I, J, K, and L sands represent the MM9 A play in this field.

DISCOVERIES

The MM9 A gas play contains total reserves of 0.842 Mbo and 26.326 Bcfg (4.685 MMBOE), of which 0.563 Mbo and 19.015 Bcfg (3.384 MMBOE) have been produced. The play contains seven producible sands in two pools (table 1). These two pools are in the Matagorda Island 665 and 7A fields and contain 3.327 and 1.358 MMBOE, respectively (figure 2). Both pools were discovered in 1977.

The two discovered pools contain eight reservoirs, all of which are nonassociated gas.

Of the 11 aggradational plays in the Gulf of Mexico Cenozoic Province, the MM9 A play contains the smallest amount of total reserves (<1%).

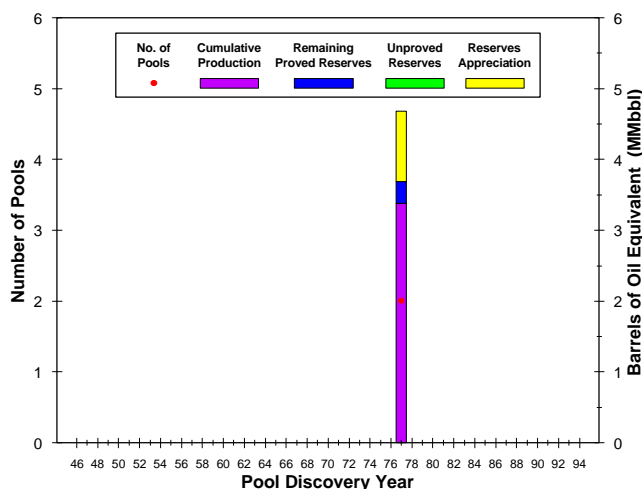


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

2 Pools (7 Producibles Sands)	Minimum	Mean	Maximum
Water depth (feet)	72	132	192
Subsea depth (feet)	2,129	2,913	3,696
Number of sands per pool	3	4	4
Porosity	29%	29%	29%
Water saturation	26%	27%	27%

ASSESSMENT RESULTS

Because of limited data for the MM9 A play, the Middle Middle Miocene Aggradational (MM4 A) play was used as an analog to model pool sizes in the MM9 A play. The MM4 A play was selected as the analog because of similarities in depositional setting, structural style, hydrocarbon type, and statistical information.

The marginal probability of hydrocarbons for the MM9 A play is 1.00. The play

ranks within the smallest one-fourth of all 61 Gulf of Mexico plays, based on a mean total endowment of less than 0.001 Bbo and 0.057 Tcfg (0.011 BBOE) (table 2). Thirty-two percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.021 to 0.044 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.031 Tcf (0.006 BBOE). These undiscovered resources may occur in as many as four pools. The largest undiscovered pool, with a mean size of 2.795 MMBOE, is modeled as the second largest pool in the play (figure 4). The model results place the three other undiscovered pools in positions 3, 5, and 6 on the pool rank plot. For the four undiscovered pools in the MM9 A play, the mean mean size is 1.396 MMBOE, which is smaller than the 2.343 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 1.711 MMBOE.

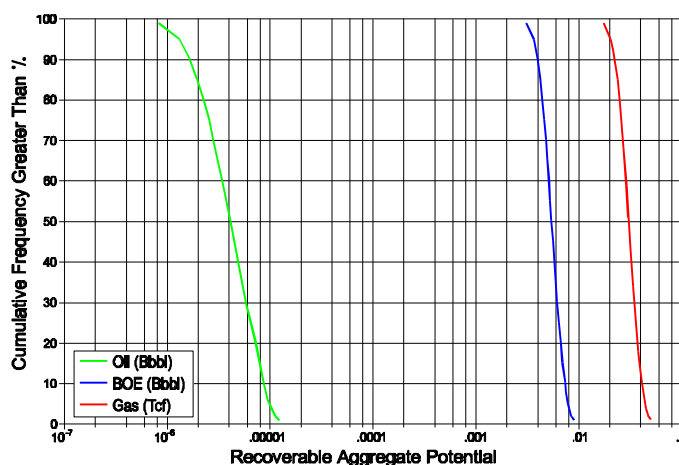


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	2	<0.001	0.021	0.004
Cumulative production	--	<0.001	0.019	0.003
Remaining proved	--	<0.001	0.002	<0.001
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.006	0.001
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.021	0.004
Mean	4	<0.001	0.031	0.006
5th percentile	--	<0.001	0.044	0.008
Total Endowment				
95th percentile	--	<0.001	0.047	0.009
Mean	6	<0.001	0.057	0.011
5th percentile	--	<0.001	0.070	0.013

The highly explored MM9 A play offers minimal potential for discoveries because the existence of seals is problematic. Undiscovered resources are expected to contribute 56 percent to the play's BOE mean total endowment. However, in comparison with many other plays in the Gulf of Mexico, the total endowment for the MM9 A play is very small.

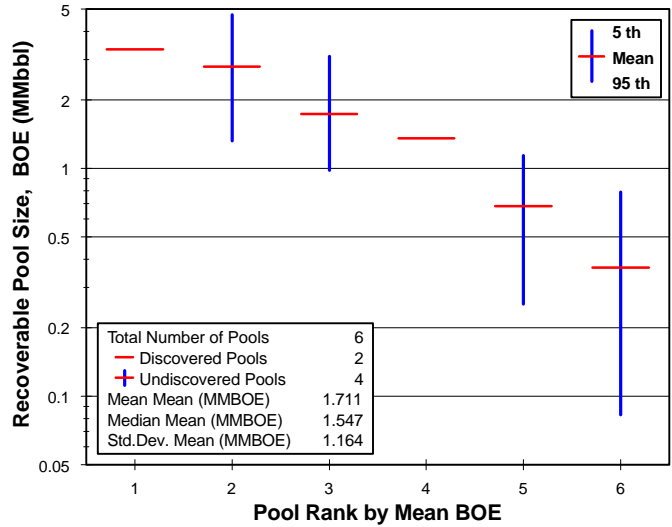


Figure 4. Pool rank plot.

UPPER MIDDLE MIOCENE AGGRADATIONAL/PROGRADATIONAL (MM9 AP) PLAY

PLAY DESCRIPTION

The established Upper Middle Miocene Aggradational/Progradational (MM9 AP) play occurs at the *Bigennerina 2* biozone. This play is located in the Mobile, Pensacola, Chandeleur, Viosca Knoll, and Destin Dome Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the MM9 AP play continues onshore into Mississippi and Alabama. Downdip, the play is limited by a lack of sand in the distal end of the facies.

The MM9 chronozone is one of three chronozones with combined aggradational and progradational (AP) "Shallow Miocene Bright Spot Trend" plays. The other two chronozones are the lower upper Miocene (UM1) and the upper upper Miocene (UM3). The MM9 AP play represents the oldest productive sediments that overlie the Cretaceous carbonate shelf. The extent of the AP sequence in the MM9 chronozone is found in the same general geographical area as the AP sequences in the UM1 and UM3 chronozones, indicative of deposition on a stable shelf. Sediments for the AP plays were sourced from a major continental drainage system formed after the Laramide Orogeny and also from the Appalachian region. Clastic influx to the Cretaceous shelf area was much less than to the Louisiana area depocenter during middle and upper Miocene times. The middle middle Miocene (MM7) chronozone includes deposits of a similar depositional setting and geographic extent as the MM9 AP play. However, the MM7 chronozone in this area is extremely thin and sand poor and, therefore, not prospective.

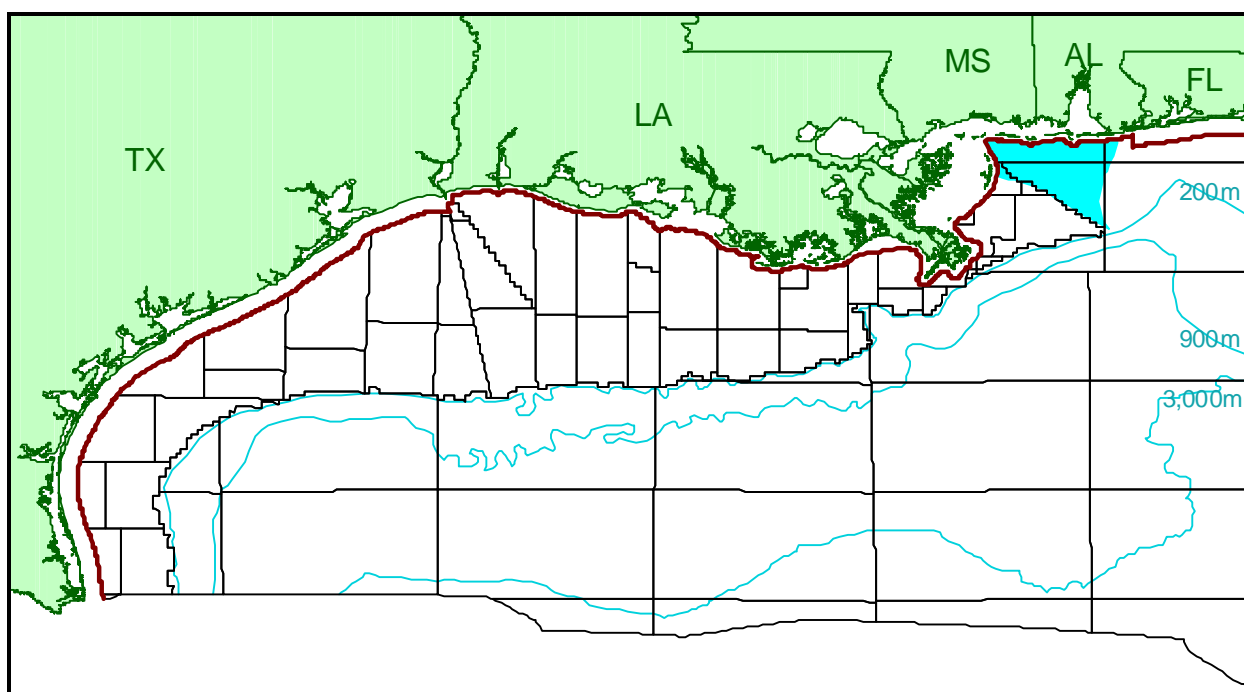


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The MM9 AP play comprises incised-valley fill (channels) typical of a progradational setting, but because the channel sands are often stacked, they also have characteristics of an aggradational setting. Therefore, the play is referred to as a combination aggradational/progradational (AP) play. The play occurs at shallow depths overlying the Cretaceous carbonate shelf, and hydrocarbon accumulations are associated with seismic hydrocarbon indicators (bright spots). Regional dip dominates the structural style of the play. Faulting and local uplifts are rare and have no role in the accumulation of hydrocarbons. Channels cut across the regional dip of the shelf area, and their deposits are sealed by overlying and laterally adjacent Miocene shales.

Viosca Knoll 204 is the type field, and Murphy Exploration and Production's 3900 sand represents the MM9 AP play in this field.

DISCOVERIES

The MM9 AP gas play contains total reserves of 0.013 MMbo and 120.593 Bcfg (21.470 MMBOE), of which 0.001 MMbo and 19.656 Bcfg (3.499 MMBOE) have been produced. The play contains four producible sands in three pools (table 1). The maximum yearly total reserves were discovered in the first and largest pool in the play in the Viosca Knoll 204 field in 1986 (figure 2). The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

The three discovered pools range in size from 1.160 to 16.124 MMBOE. These pools contain five reservoirs, all of which are nonassociated gas.

The MM9 AP play contains only 8 percent of the BOE total reserves in the three AP plays.

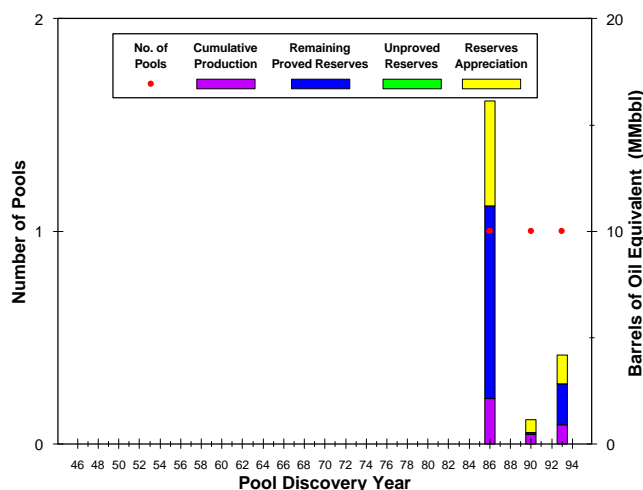


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

3 Pools (4 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	46	77	121
Subsea depth (feet)	2,500	3,534	4,150
Number of sands per pool	1	1	2
Porosity	30%	32%	35%
Water saturation	28%	31%	35%

ASSESSMENT RESULTS

Because of limited data for the MM9 AP play, the Upper Upper Miocene Aggradational/Progradational (UM3 AP) play was used as an analog to model pool sizes in the MM9 AP play. The UM3 AP play was selected as the analog because of similarities in depositional setting, structural style, hydrocarbon type, and statistical information.

The marginal probability of hydrocarbons for the MM9 AP play is 1.00. The play ranks within the smallest one-fourth of all 61 Gulf of Mexico Region plays, based on a mean total endowment of less than 0.001 Bbo and 0.153 Tcfg (0.027 BBOE) (table 2). Thirteen percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are negligible (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.020 to 0.045 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.032 Tcf (0.006 BBOE). These undiscovered resources may occur in as many as

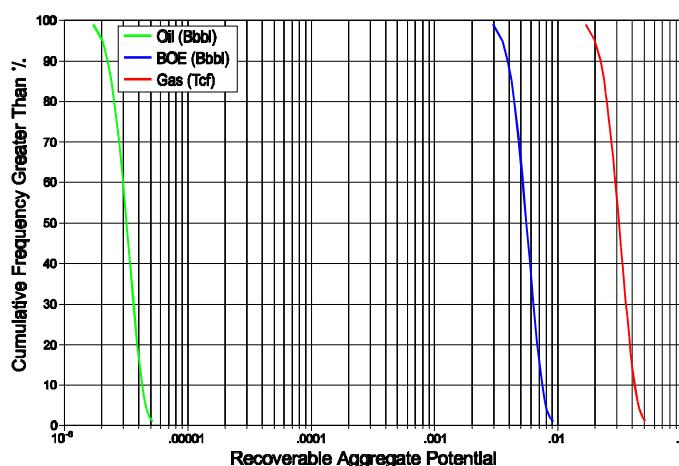


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	3	<0.001	0.082	0.015
Cumulative production	--	<0.001	0.020	0.003
Remaining proved	--	<0.001	0.062	0.011
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.039	0.007
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.020	0.004
Mean	3	<0.001	0.032	0.006
5th percentile	--	<0.001	0.045	0.008
Total Endowment				
95th percentile	--	<0.001	0.141	0.025
Mean	6	<0.001	0.153	0.027
5th percentile	--	<0.001	0.166	0.029

three pools. The largest undiscovered pool, with a mean size of 3.130 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the remaining two undiscovered pools in positions 4 and 6 on the pool rank plot. For all the undiscovered pools in the MM9 AP play, the mean mean size is 1.877 MMBOE, which is smaller than the 7.157 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 4.517 MMBOE.

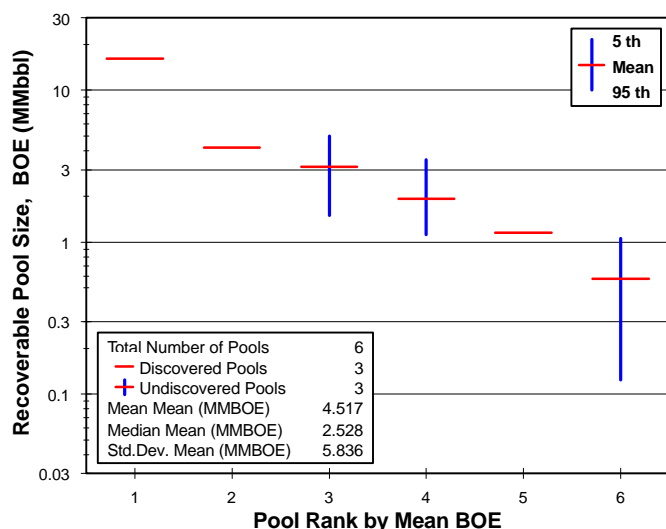


Figure 4. Pool rank plot.

Undiscovered pools in the MM9 AP play are anticipated to be about equal in number and size to the discovered pools and add only 22 percent to the play's BOE mean total endowment. The limited geographic extent of the play and small discovered field sizes reduce the potential for significant discoveries. Additionally, the AP stratigraphic section in the MM9 chronozone is relatively thinner and less sandy offshore than the AP sections in the UM1 and UM3 chronozones. Many wells drilled within the MM9 AP play's geographic limits have not been deep enough to encounter the MM9 section, and therefore have not tested the play interval.

UPPER MIDDLE MIOCENE PROGRADATIONAL (MM9 P) PLAY

PLAY DESCRIPTION

The established Upper Middle Miocene Progradational (MM9 P) play occurs within the *Textularia* "W" and *Bigenerina 2* biozones. This play extends from the South Padre Island Area of southernmost offshore Texas to the Chandeleur Area east of the present-day Mississippi River Delta (figure 1).

Updip in offshore Texas, the MM9 P play grades into the deposits of the Upper Middle Miocene Aggradational (MM9 A) play, while updip in Louisiana, the MM9 P play extends onshore. To the northeast, the MM9 P play is limited by the deposits of the Upper Middle Miocene Aggradational/Progradational (MM9 AP) play overlying the Cretaceous carbonate shelf. To the southwest, the MM9 P play continues onshore into Texas and into Mexican national waters. Downdip, the play grades into the deposits of the Upper Middle Miocene Fan (MM9 F) play. In parts of the Mustang Island, Matagorda Island, Brazos, and Galveston Areas, the MM9 P play is limited by the Upper Middle Miocene Structural Retrogradational/Aggradational/ Progradational (MM9 RAP) play.

Ancient delta systems in Louisiana and Texas supplied the sediments for the MM9 P play. The MM9 depocenter shifted basinward from middle middle Miocene (MM7) to MM9 time, as evidenced by the occurrence farther offshore of the MM9 progradational deposits in the offshore Louisiana area.

PLAY CHARACTERISTICS

The productive MM9 P play consists of progradational deltaic sediments deposited in delta fringe, shelf blanket, distributary mouth bar, channel, and crevasse splay environments. In addition, retrogradational sands locally cap the MM9 P play. Because

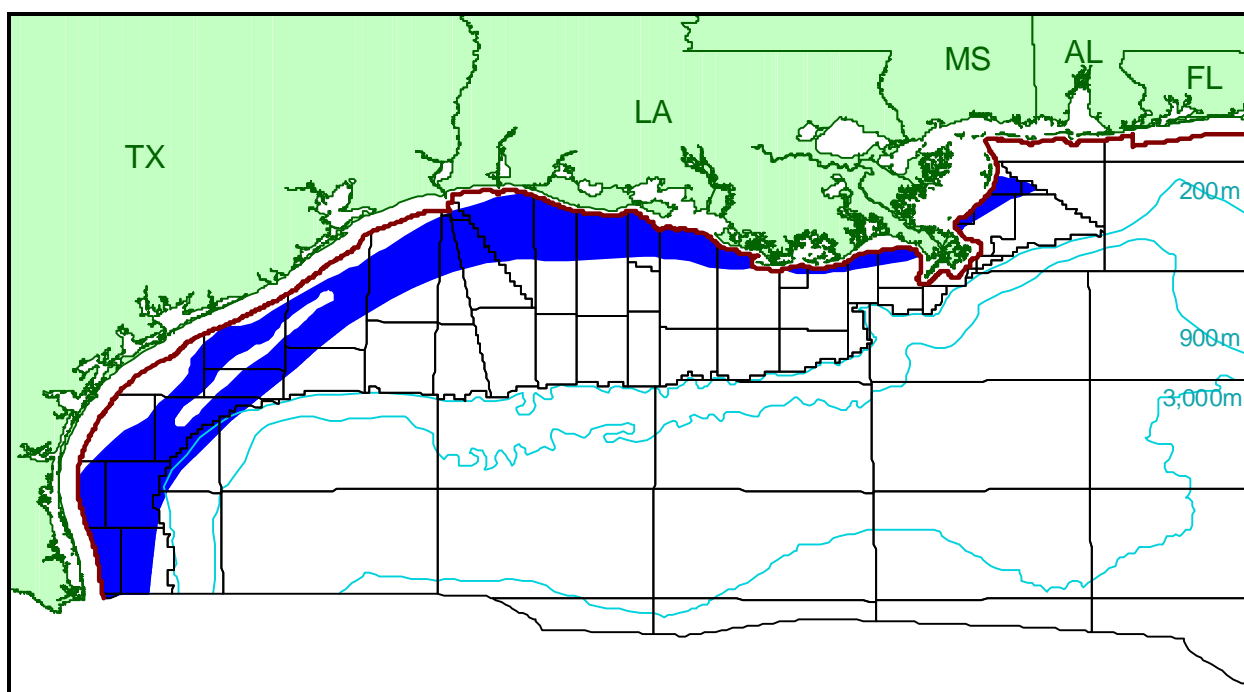


Figure 1. Map of assessed play.

these retrogradational, reworked sands are so discontinuous, they are included as part of the MM9 P play. Normal faults are the major structural feature in the play. Anticlines, growth faults, and salt diapirs and ridges are also present. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

South Marsh Island 236 is the type field. Texaco Exploration and Production's TEXL4, TEXL4S, CIBN, and CIBN1 sands and Delmar Operating Inc.'s 38 and CIBCARST sands represent the MM9 P play in this field.

DISCOVERIES

The MM9 P play is predominantly a gas play, with total reserves of 0.128 Bbo and 6.112 Tcfg (1.215 BBOE), of which 0.085 Bbo and 4.847 Tcfg (0.947 BBOE) have been produced. The play contains 151 producible sands in 63 pools (table 1). The first and largest pool in the play was discovered in the Vermilion 39 field in 1948 and accounts for the maximum yearly total reserves added to the play (figure 2). Discoveries have occurred at a steady rate throughout the play's exploration history. Over 75 percent of the play's cumulative production has been from discoveries prior to 1971. Though over half the discoveries occurred after 1975, they added only about 30 percent to the play's total reserves. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

The 63 discovered pools range in size from 0.019 to 210.898 MMBOE. These pools contain 290 reservoirs, of which 266 are nonassociated gas, 15 are undersaturated oil, and 9 are saturated oil.

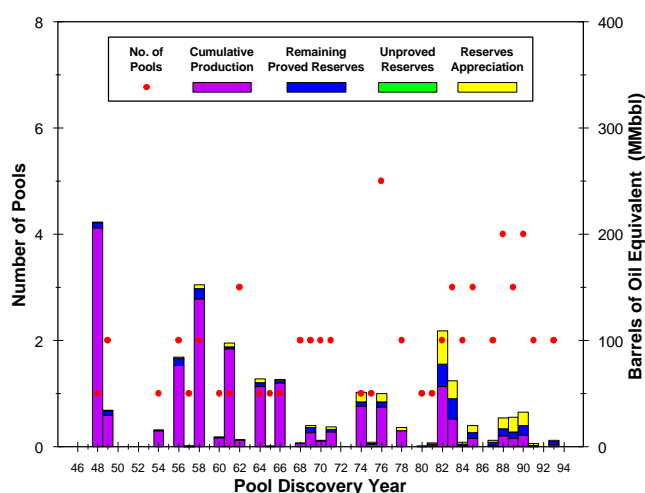


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

63 Pools (151 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	54	274
Subsea depth (feet)	3,807	8,733	16,052
Number of sands per pool	1	2	9
Porosity	21%	28%	33%
Water saturation	13%	29%	65%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM9 P play is 1.00. The play contains a mean total endowment of 0.150 Bbo and 7.198 Tcfg (1.430 BBOE) (table 2). Sixty-six percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.010 to 0.046 Bbo and 0.870 to 1.302 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.022 Bbo and 1.086 Tcfg (0.215 BBOE). These undiscovered

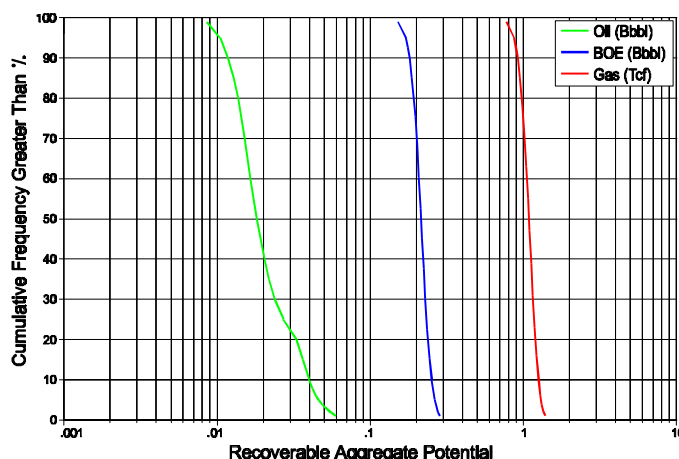


Figure 3. Cumulative probability distribution.

resources may occur in as many as 22 pools. The largest undiscovered pool, with a mean size of 33.882 MMBOE, is modeled as the tenth largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 11, 13, 16, and 17 on the pool rank plot. For all the undiscovered pools in the MM9 P play, the mean mean size is 9.801 MMBOE, which is smaller than the 19.287 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	63	0.102	5.468	1.075
Cumulative production	--	0.085	4.847	0.947
Remaining proved	--	0.017	0.621	0.127
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.026	0.643	0.141
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.010	0.870	0.171
Mean	22	0.022	1.086	0.215
5th percentile	--	0.046	1.302	0.263
Total Endowment				
95th percentile	--	0.138	6.982	1.386
Mean	85	0.150	7.198	1.430
5th percentile	--	0.174	7.414	1.478

undiscovered, is 16.832 MMBOE.

The largest pools in this well-explored play are modeled as already discovered. Relative to the discovered pools, undiscovered pools are expected to range from small to moderate in size. Their contribution to the play's BOE mean total endowment is only 15 percent.

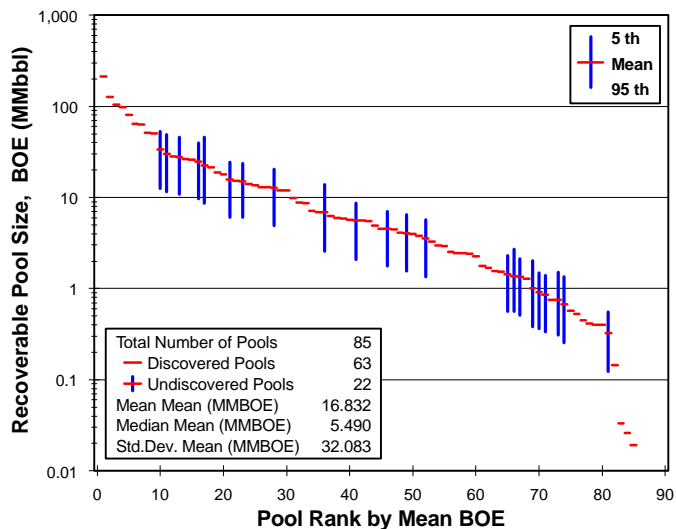


Figure 4. Pool rank plot.

UPPER MIDDLE MIOCENE FAN (MM9 F) PLAY

PLAY DESCRIPTION

The established Upper Middle Miocene Fan (MM9 F) play occurs within the *Textularia* "W" and *Bigenerina* 2 biozones. This play extends from the South Padre Island Area of southernmost offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the MM9 F play is bounded by the shelf/slope break associated with the *Bigenerina* 2 biozone and grades into the deposits of the Upper Middle Miocene Progradational (MM9 P) play, or it continues onshore into Louisiana. Northeastward, the MM9 F play is bounded by the Cretaceous carbonate shelf edge. Southwestward, the play extends into Texas offshore State waters and Mexican national waters. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by MM9 sand development in the OCS G08512-1 well in Atwater block 471.

The thickest and most productive area of the MM9 F play lies east of the present-day Mississippi River Delta in the Main Pass and Viosca Knoll Areas. The MM9 shelf/slope break lies farther offshore than that of the middle middle Miocene (MM7) chronozone, indicating basinward progradation of the ancient delta systems.

PLAY CHARACTERISTICS

The productive MM9 F play consists of deepwater turbidites deposited in fan systems as channel fill, overbank deposits, fan lobes, slump sediments, and fringe sheet sediments on the MM9 slope. Anticlines are the major structural feature in the play, though normal faults, salt diapirs, and growth faults also occur. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting,

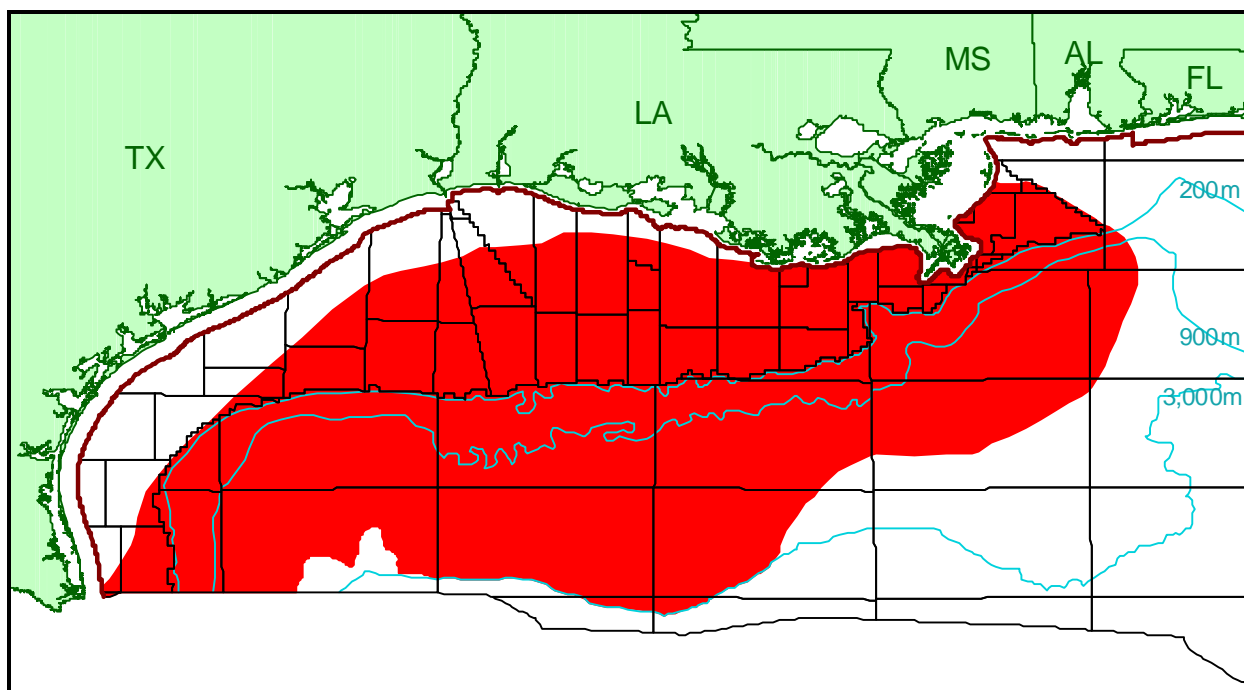


Figure 1. Map of assessed play.

diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Main Pass 73 is the type field, and Mobil Oil Exploration and Production's C-9, CY-2A, CY-2B, BB-1, and BB-4 sands represent the MM9 F play in this field.

DISCOVERIES

The MM9 F mixed oil and gas play contains total reserves of 0.530 Bbo and 2.541 Tcfg (0.982 BBOE), of which 0.140 Bbo and 0.364 Tcfg (0.205 BBOE) have been produced. The play contains 49 producible sands in 19 pools (table 1), and 15 of these pools contain proved reserves. The first reserves in the play were discovered in the Eugene Island 89 field in 1959 (figure 2). Discoveries have occurred at a fairly consistent rate since the mid-1970's. The maximum yearly total reserves of 458.202 MMBOE were added in 1985 when two pools were discovered, including the largest pool in the play in the Viosca Knoll 956 field ("Ram-Powell"). Almost 90 percent of the play's cumulative production has come from the Main Pass 41 pool discovered in 1963, whereas over 80 percent of the total reserves have been found since 1974. Additionally, on a BOE basis, 32 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 50 percent gas. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

The 19 discovered pools range in size from 0.009 to 432.623 MMBOE. These pools contain 67 reservoirs, of which 30 are nonassociated gas, 29 are undersaturated oil, and 8 are saturated oil.

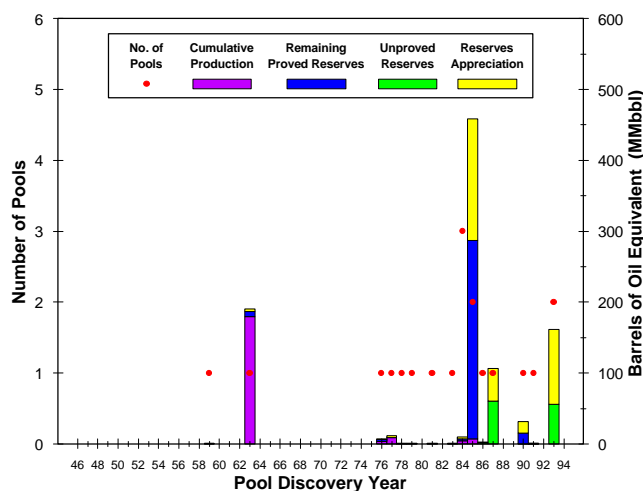


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

19 Pools (49 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	24	907	5,149
Subsea depth (feet)	8,826	11,562	18,800
Number of sands per pool	1	3	10
Porosity	18%	28%	30%
Water saturation	16%	31%	66%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM9 F play is 1.00. The play ranks within the largest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.847 Bbo and 6.906 Tcfg (2.076 BBOE) (table 2). Ten percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.226 to 0.433 Bbo and 3.634 to 5.222 Tcfg at the 95th and 5th percentiles, respectively (figure 3).

The mean undiscovered resources are estimated at 0.317 Bbo and 4.365 Tcfg (1.094 BBOE). These undiscovered resources may occur in as many as 86 pools. The largest undiscovered pool, with a mean size of 174.210 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 4, 5, 9, and 10 on the pool rank plot. For all the undiscovered pools in the MM9 F play, the mean mean size is 12.732 MMBOE, which is significantly smaller than the 51.685 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 19.780 MMBOE.

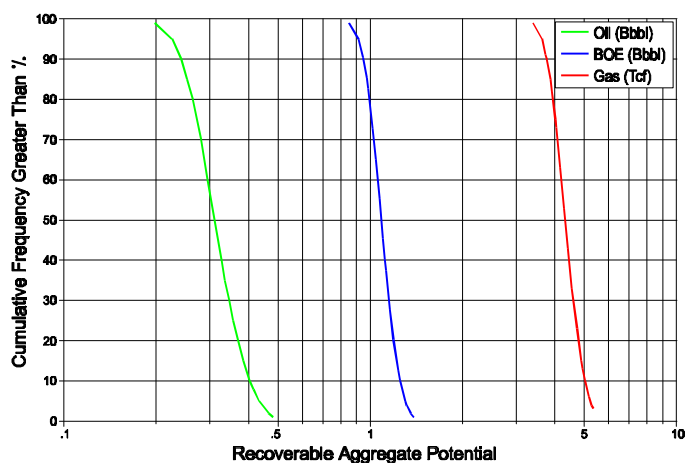


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	15	0.289	1.259	0.513
Cumulative production	--	0.140	0.364	0.205
Remaining proved	--	0.149	0.895	0.308
Unproved	4	0.065	0.295	0.118
Appreciation (P & U)	--	0.175	0.987	0.351
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.226	3.634	0.914
Mean	86	0.317	4.365	1.094
5th percentile	--	0.433	5.222	1.300
Total Endowment				
95th percentile	--	0.756	6.175	1.896
Mean	105	0.847	6.906	2.076
5th percentile	--	0.963	7.763	2.282

Of the 61 Gulf of Mexico plays, the MM9 F is projected to contain the fifth largest amount of mean undiscovered gas resources at 5 percent.

The continued exploration success and large unexplored area make the MM9 F play an attractive MM9 target for exploration in the Gulf of Mexico. The undiscovered pools are expected to be not only numerous but to include discoveries of significant size (>100 MMBOE). These undiscovered resources account for 53 percent of the play's BOE mean total endowment.

In offshore Louisiana, most of

the wells that penetrate MM9 fan deposits are located east of the present-day Mississippi River Delta. Potential in the MM9 fan deposits in offshore Louisiana exists downdip of these discovered fields, especially in water depths greater than 1,000 feet. The Ram-Powell field in 3,318 feet of water shows good sand development in this play interval.

Few wells have penetrated the MM9 F play in offshore Texas and central to western Louisiana because of the great drilling depths. The presence of good sand development in the shelfal aggradational and progradational sediments of the MM9 chronozone indicates that fan systems should have been deposited basinward throughout the area.

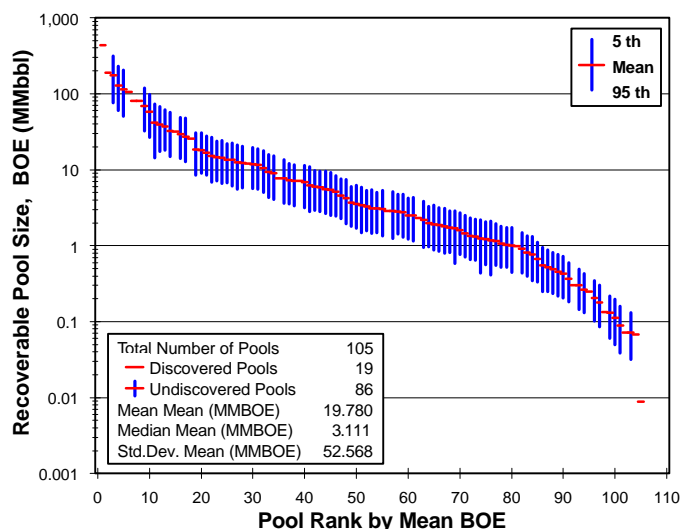


Figure 4. Pool rank plot.

MIDDLE MIDDLE MIOCENE (MM7) CHRONOZONE

CHRONOZONE DESCRIPTION

The Middle Middle Miocene (MM7) chronozone corresponds to the *Cibicides opima*, *Cristellaria* "I," and *Bigenerina humblei* biozones. The MM7 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the MM7 chronozone include retrogradational, aggradational, progradational, and fan, each of which defines a play: the Middle Middle Miocene Retrogradational (MM7 R) play, the Middle Middle Miocene Aggradational (MM7 A) play, the Middle Middle Miocene Progradational (MM7 P1) play, and the Middle Middle Miocene Fan (MM7 F) play. The two remaining plays in the MM7 chronozone are defined by their structural limits due to faulting: the Middle Middle Miocene Structural Progradational (MM7 P2) play and the Middle Middle Miocene Structural Retrogradational/Aggradational/Progradational/Fan (MM7 RAPF) play.

The potential for sand development within the MM7 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, MM7 sands extend onshore into Texas and Louisiana. To the southwest, sand potential extends into Texas offshore State waters and Mexican national waters. To the northeast, sand potential is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the MM7 depocenter. Sediments of a similar depositional setting and geographic extent as the upper middle Miocene (MM9), lower upper Miocene (UM1), and upper upper Miocene (UM3) "Shallow Miocene Bright Spot Trend" plays occurs in the MM7 chronozone, but because these sediments are extremely thin and sand poor, they are not considered prospective. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by MM7 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the MM7 chronozone are a result of

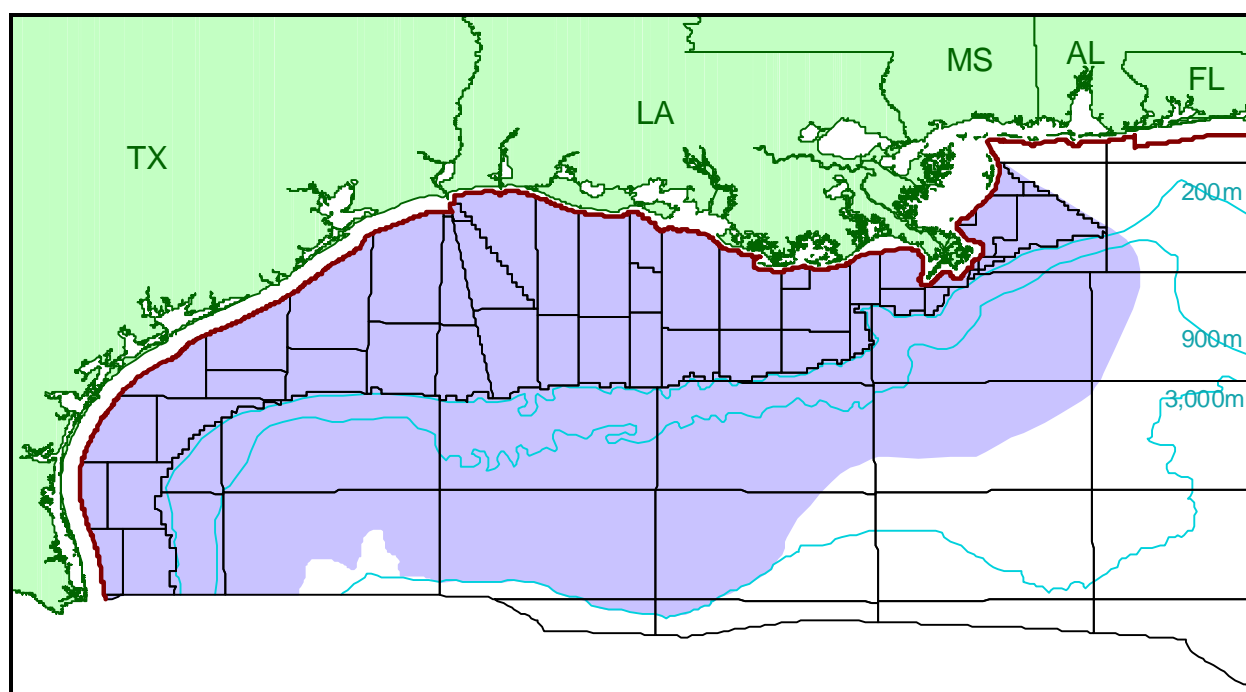


Figure 1. Map of assessed chronozone.

two ancient depocenters, one in the Texas area and the other in the Louisiana area. In the offshore Texas area, no significant lateral shift in depocenter is observed from the underlying lower middle Miocene (MM4) chronozone to the MM7 chronozone. Progradational sediment distributions are very similar for both chronozones offshore Texas. However, in MM7 time, aggradational sands had developed offshore in the Brazos and Galveston Areas, whereas in MM4 time, they had not prograded basinward enough to reach the present-day offshore.

In the offshore Louisiana area, the MM7 depocenter had migrated considerably eastward compared to the MM4 depocenter. Productive fan deposits in the MM7 chronozone are observed east of the present-day Mississippi River Delta. The deposits of MM7 time are also observed farther offshore Louisiana than MM4 deposits due to the seaward progradation of deltaic deposits from the ancestral Mississippi River.

Major structural features in the MM7 chronozone include normal faults, anticlines, and growth faults. Salt diapirs occur less commonly.

DISCOVERIES

The MM7 chronozone contains 126 discovered pools in six plays (table 1). Total reserves in the chronozone are 0.222 Bbo and 14.639 Tcfg (2.827 BBOE), of which 0.149 Bbo and 10.884 Tcfg (2.086 BBOE) have been produced. The largest number of discoveries in the MM7 chronozone occurred when nine pools were added in both 1990 and 1991 (figure 2). However, the maximum yearly total reserves of 503.554 MMBOE were added in 1958 when four pools were discovered.

Of the six MM7 plays, the MM7 P1 play contains the most total reserves in 61 pools, with 0.164 Bbo and 8.854 Tcfg (1.740 BBOE).

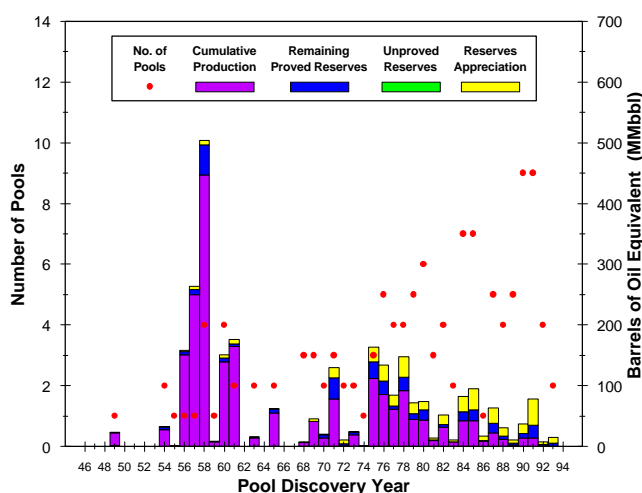


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

126 Pools (391 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	79	305
Subsea depth (feet)	3,092	9,011	16,489
Number of sands per pool	1	3	15
Porosity	15%	27%	36%
Water saturation	13%	28%	58%

ASSESSMENT RESULTS

The MM7 chronozone contains 307 pools (discovered and undiscovered), with a mean total endowment estimated at 0.570 Bbo and 27.096 Tcfg (5.392 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 181 pools, which contain a range of 0.259 to 0.455 Bbo and 8.797 to 16.953 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.348 Bbo and 12.457 Tcfg (2.565 BBOE) are projected. These undiscovered resources represent 48 percent of the MM7 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the largest in the chronozone (figure 4). Additionally, of the 21 Gulf of Mexico Region chronozones, the MM7 chronozone is projected to contain the second largest amount of mean undiscovered gas.

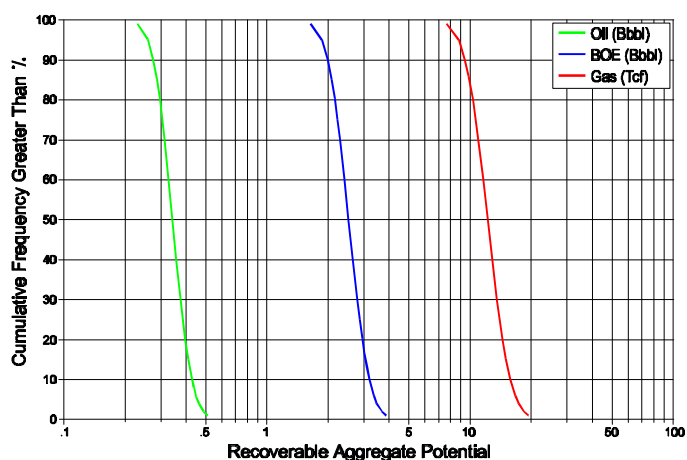


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	126	0.180	12.601	2.422
Cumulative production	--	0.149	10.884	2.086
Remaining proved	--	0.031	1.717	0.336
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.042	2.038	0.405
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.259	8.797	1.864
Mean	181	0.348	12.457	2.565
5th percentile	--	0.455	16.953	3.412
Total Endowment				
95th percentile	--	0.481	23.436	4.691
Mean	307	0.570	27.096	5.392
5th percentile	--	0.677	31.592	6.239

Of the six MM7 plays, the MM7 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.312 Bbo and 8.468 Tcfg (1.820 BBOE) remaining to be found in 83 pools. These undiscovered resources in the MM7 F play represent 34 percent of the BOE mean total endowment for the MM7 chronozone. This high percentage and the potential for numerous discoveries within a large unexplored area make the MM7 F play an attractive exploration target in MM7 strata.

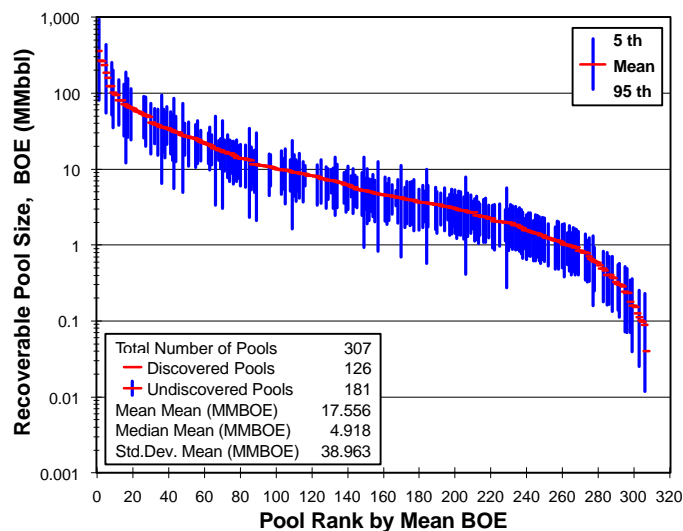


Figure 4. Pool rank plot.

MIDDLE MIDDLE MIOCENE RETROGRADATIONAL (MM7 R) PLAY

PLAY DESCRIPTION

The established Middle Middle Miocene Retrogradational (MM7 R) play occurs within the *Cristellaria* "I" and *Bigenerina humblei* biozones. This play extends discontinuously from the South Padre Island Area offshore Texas to the South Marsh Island Area offshore Louisiana (figure 1).

These retrogradational deposits are mainly associated with the *Bigenerina humblei* flooding surface, which caps the MM7 chronozone. However, in isolated portions of the High Island and West Cameron Areas, a secondary flooding surface associated with the *Cristellaria* "I" biozone occurs. Updip, the retrogradational sands either shale out, which represents the *Bigenerina humblei* flooding surface, or younger MM7 aggradational or progradational sands cap the *Cristellaria* "I" flooding surface. Along strike to the east, the play extends onshore into Louisiana. Along strike to the southwest, the play extends onshore into Texas. Downdip, the play grades into the sediments of the Middle Middle Miocene Progradational (MM7 P1) play.

Productive and established sand locations in the MM7 R play are a result of two separate depocenters in MM7 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed in the offshore areas from the underlying lower middle Miocene (MM4) chronozone to the MM7 chronozone. However, the MM7 R play occurs farther offshore than the MM4 retrogradational sequence, indicative of the prograding nature of the ancient delta systems.

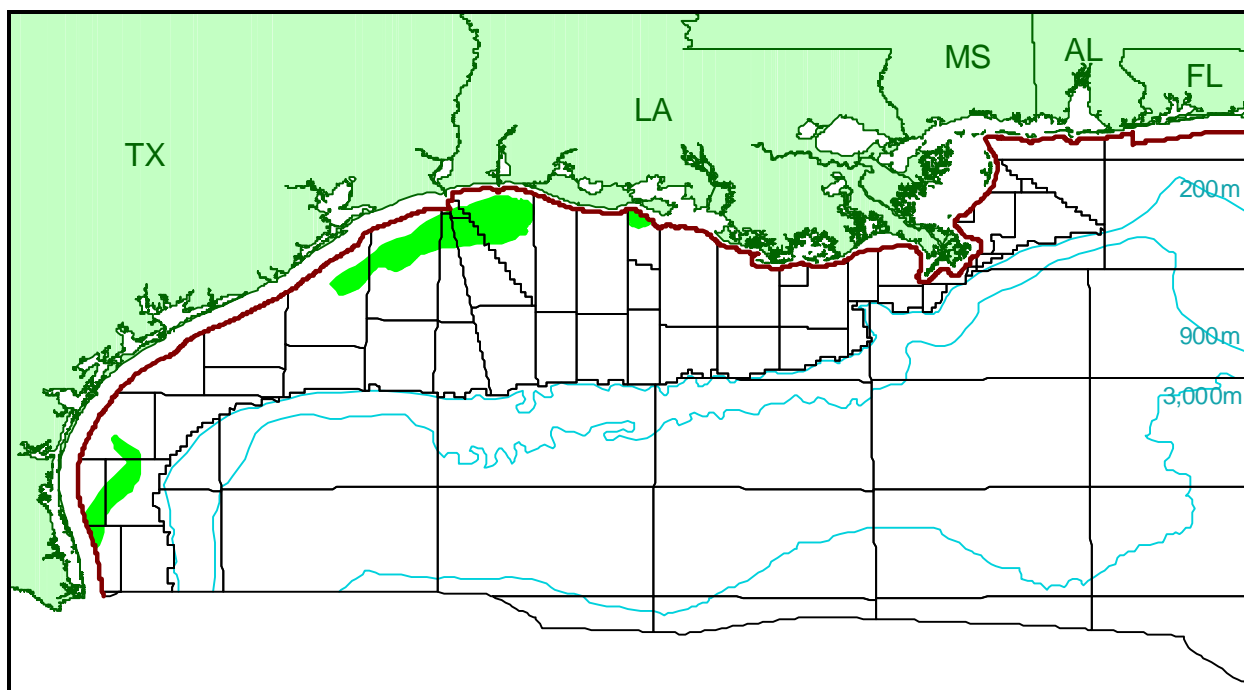


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The productive MM7 R play is characterized by predominately upward-fining, back-stepping sands, which terminate in the *Bigennerina humblei* or *Cristellaria "I"* flooding surface. These reworked marine deposits include delta fringe sands, barrier bars, channel/levee complexes, delta front sands, and crevasse splay sands. Growth faults are the major structural feature in this play. Anticlines and normal faults are also present. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive retrogradational depositional environments, structures, or seals.

Galveston 288 is the type field, and Ivory Production Company's E, E0, E1, G2, G3, and G4 sands represent the MM7 R play in this field.

DISCOVERIES

The MM7 R gas play contains total reserves of 0.028 Bbo and 2.237 Tcfg (0.426 BBOE), of which 0.020 Bbo and 1.721 Tcfg (0.326 BBOE) have been produced. The play contains 69 producible sands in 23 pools (table 1). The first reserves in the play were discovered in the West Cameron 149 field in 1949 (figure 2). The maximum yearly total reserves of 124.230 MMBOE were added in 1960 when two pools were discovered, including the largest pool in the play in the Galveston 288 field. Almost two-thirds of the play's discoveries were found since 1979. However, over 65 percent of the play's cumulative production has come from pools discovered prior to 1962, indicative of the large size of the early discoveries. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1991. The 23 discovered pools range in size from 0.097 to 123.645 MMBOE. These pools contain 118 reservoirs, of which 111 are nonassociated gas, 2 are undersaturated oil, and 5 are saturated oil.

Of the five retrogradational plays in the Gulf of Mexico Region, the MM7 R play is the largest, containing 44 percent of the total reserves and accounting for 47 percent of the

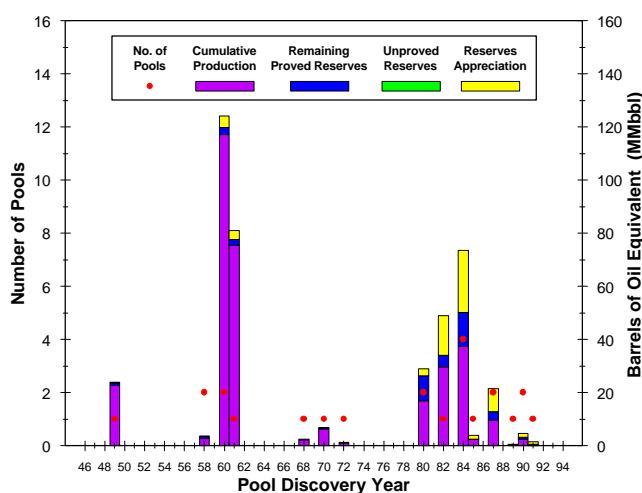


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

23 Pools (69 Producibles Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	61	221
Subsea depth (feet)	3,960	8,294	11,287
Number of sands per pool	1	3	12
Porosity	23%	27%	32%
Water saturation	16%	29%	47%

cumulative production, based on BOE.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM7 R play is 1.00. This play is the largest retrogradational play in the Gulf of Mexico, based on a mean total endowment of 0.033 Bbo and 2.525 Tcfg (0.482 BBOE) (table 2). Sixty-eight percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.002 to 0.007 Bbo and 0.237 to 0.343 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.005 Bbo and 0.288 Tcfg (0.056 BBOE). These undiscovered resources may occur in as many as 17 pools. The largest undiscovered pool, with a mean size of 6.804 MMBOE, is modeled as the twelfth largest pool in the play (figure 4). For all the undiscovered pools in the MM7 R play, the mean mean size is 3.289

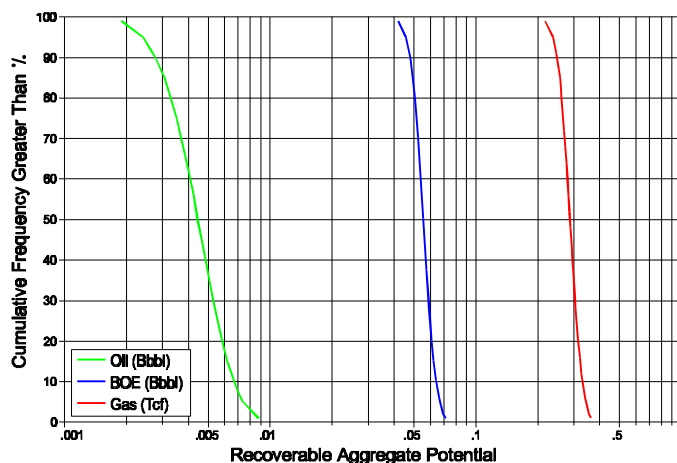


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	23	0.024	1.912	0.364
Cumulative production	--	0.020	1.721	0.326
Remaining proved	--	0.004	0.191	0.038
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.004	0.325	0.062
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.002	0.237	0.046
Mean	17	0.005	0.288	0.056
5th percentile	--	0.007	0.343	0.067
Total Endowment				
95th percentile	--	0.030	2.474	0.472
Mean	40	0.033	2.525	0.482
5th percentile	--	0.035	2.580	0.493

MMBOE, which is substantially smaller than the 18.530 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 12.053 MMBOE.

Of the five Gulf of Mexico retrogradational plays, the MM7 R play is projected to contain the largest amount of mean undiscovered gas resources at 35 percent.

The MM7 R play is well explored. Relative to the discovered pools in the play, the undiscovered pools are expected to be small to moderate in size. These undiscovered resources are expected to contribute only 12 percent to the play's BOE mean total endowment. Limited interfield exploration potential exists for untested structures and stratigraphic traps.

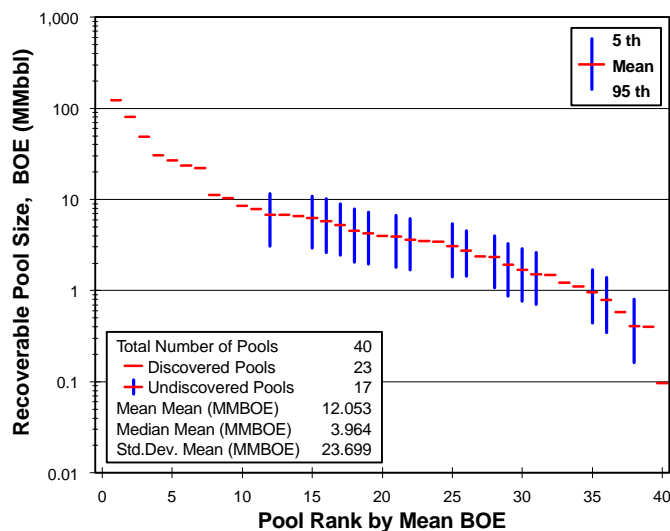


Figure 4. Pool rank plot.

MIDDLE MIDDLE MIOCENE STRUCTURAL RETROGRADATIONAL/AGGRADATIONAL/PROGRADATIONAL/FAN (MM7 RAPF) PLAY

PLAY DESCRIPTION

The established Middle Middle Miocene Structural Retrogradational/Aggradational/Progradational/Fan (MM7 RAPF) play occurs within the *Cibicides opima*, *Cristellaria* "I," and *Bigenerina humblei* biozones. The play is defined by its structural position downthrown to the regional Corsair Fault System and is commonly referred to as a "Corsair" play. It extends in a narrow zone from the Mustang Island East Addition Area northeastward parallel to the Texas coastline to the central Galveston Area (figure 1).

The play is bounded updip by the regional extent of the Corsair Fault System. To the northeast, southwest, and downdip, the play is limited by the relatively thin, unexpanded sediments of the Middle Middle Miocene Progradational (MM7 P1) and Middle Middle Miocene Fan (MM7 F) plays, which show no structural control by the Corsair Fault System.

The MM7 RAPF play represents the oldest deposition included in the structurally controlled plays of the Corsair Fault System. The overlying Upper Middle Miocene Structural Retrogradational/Aggradational/Progradational (MM9 RAP) play has no productive fan sands identified within it, unlike the MM7 RAPF play. The two plays generally occur in the same geographic location, as both are controlled by the Corsair Fault System.

PLAY CHARACTERISTICS

The MM7 RAPF play consists of stacked sequences of retrogradational, aggradational, progradational, and fan sands located downthrown to the Corsair Fault in

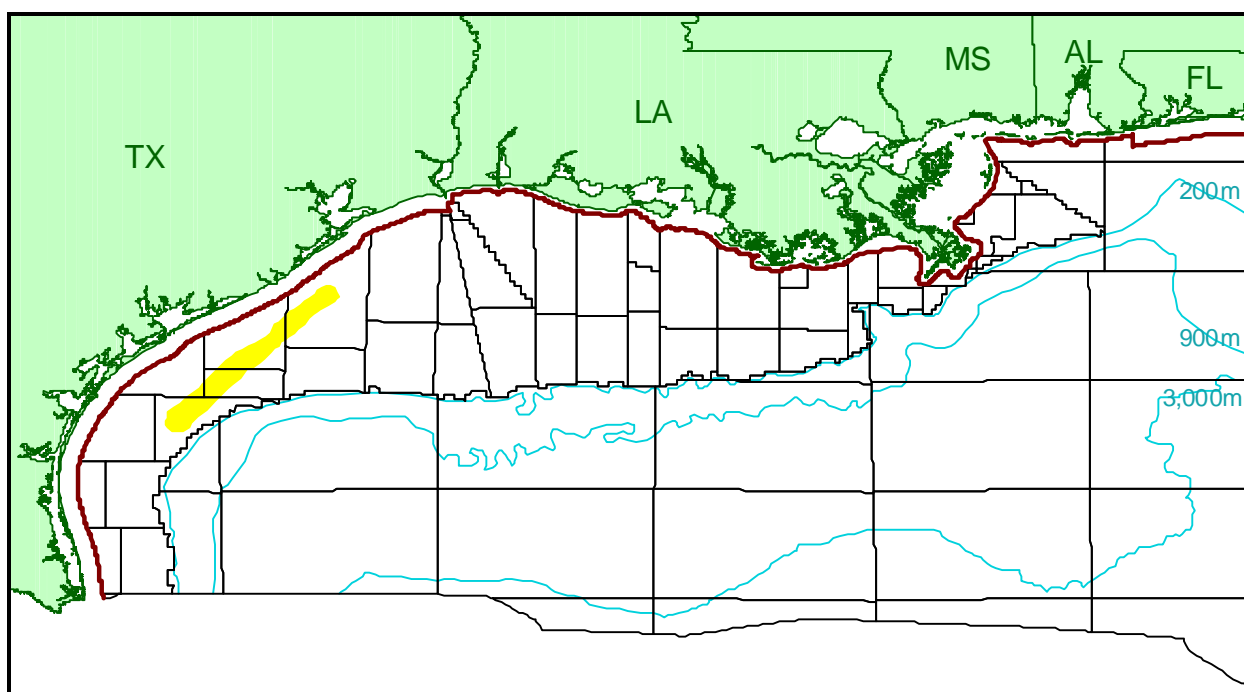


Figure 1. Map of assessed play.

offshore Texas. The play, therefore, is referred to as a combined RAPF play. Production occurs from all four depositional environments. The progradational and retrogradational deposits dominate the 100 producible sands at 48 percent and 31 percent, respectively.

The MM7 section was greatly influenced by movement along the Corsair Fault during deposition, as evidenced by the much thicker section on the fault's downthrown side. Because sand accumulation was so influenced by structural movement of the fault, the play is considered to be structurally controlled, rather than depositionally controlled.

The major structural feature in this play is growth faulting of the Corsair Fault System. Anticlines, normal faults, and salt diapirs occur less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales).

Brazos 578 is the type field. Brock Minerals Corporation's FOSHI-FOSHI, D/C, and BIG HUM sands and Shell Offshore Inc.'s P sand represent the MM7 RAPF play in this field.

DISCOVERIES

The MM7 RAPF gas play contains total reserves of 0.010 Bbo and 2.833 Tcfg (0.514 BBOE), of which 0.005 Bbo and 1.696 Tcfg (0.307 BBOE) have been produced. The play contains 100 producible sands in 22 pools (table 1). The first reserves in the play were discovered in the Brazos 76A field in 1969 (figure 2). Discoveries peaked in the 1970's, when 85 percent of the total reserves were added. Over 80 percent of the play's cumulative production has come from discoveries made in the 1970's. The maximum yearly total reserves of 141.006 MMBOE were found in 1978 with the discovery of three pools.

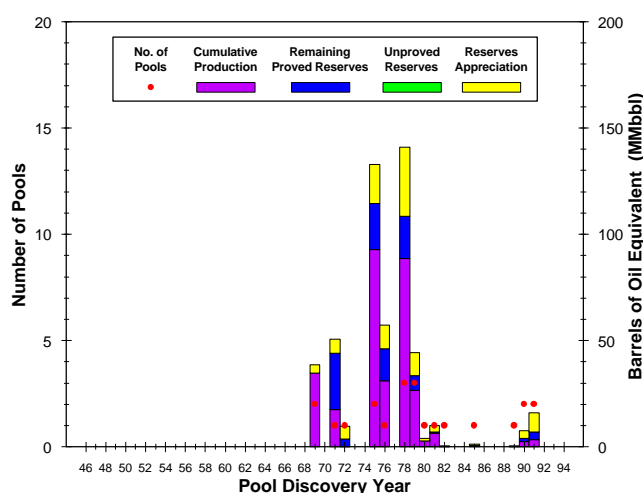


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

22 Pools (100 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	80	145	305
Subsea depth (feet)	5,890	9,929	16,489
Number of sands per pool	1	5	15
Porosity	19%	26%	33%
Water saturation	14%	31%	41%

However, the largest pool in the play was discovered in the Brazos 133A field in 1975. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1991.

The 22 discovered pools range in size from 0.125 to 96.357 MMBOE. These pools contain 168 reservoirs, all of which are nonassociated gas.

Of the total reserves in both the MM7 RAPF and MM9 RAP plays, the MM7 RAPF play contains 95 percent.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM7 RAPF play is 1.00. The play contains a mean total endowment of 0.014 Bbo and 4.255 Tcfg (0.771 BBOE) (table 2). Forty percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.002 to 0.008 Bbo and 0.810 to 2.207 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.004 Bbo and 1.422 Tcfg

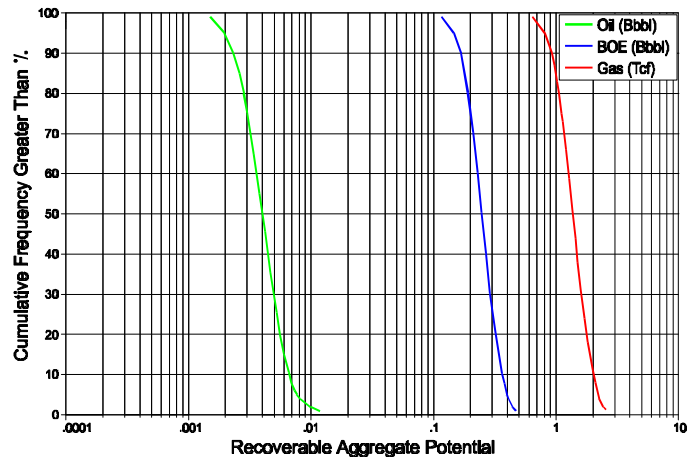


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	22	0.008	2.245	0.407
Cumulative production	--	0.005	1.696	0.307
Remaining proved	--	0.002	0.549	0.100
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.002	0.588	0.107
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.002	0.810	0.147
Mean	15	0.004	1.422	0.257
5th percentile	--	0.008	2.207	0.399
Total Endowment				
95th percentile	--	0.012	3.643	0.661
Mean	37	0.014	4.255	0.771
5th percentile	--	0.018	5.040	0.913

(0.257 BBOE). These undiscovered resources may occur in as many as 15 pools. The largest undiscovered pool, with a mean size of 70.652 MMBOE, is modeled as the second largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 9, 11, 12, and 14 on the pool rank plot. For all the undiscovered pools in the MM7 RAPF play, the mean mean size is 17.180 MMBOE, which is smaller than the 23.352 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 20.850 MMBOE.

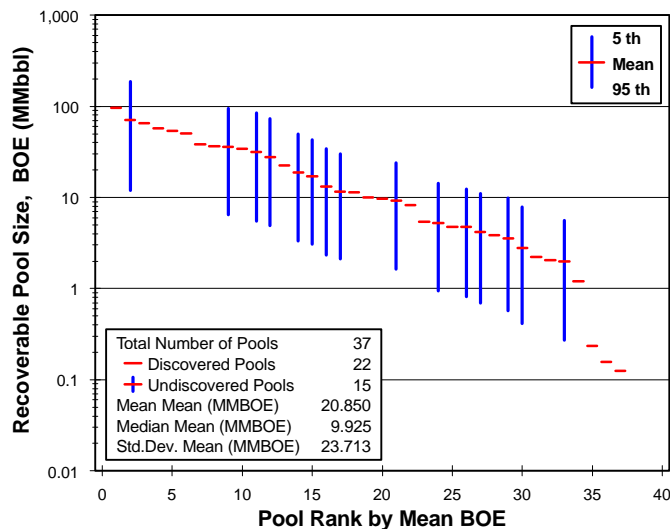


Figure 4. Pool rank plot.

The MM7 RAPF play is well explored, with a limited geographic extent. The undiscovered resources are estimated to account for 33 percent of the play's BOE mean total endowment. Exploration potential between discovered fields exists for additional structural traps along the Corsair Fault System. Even though the play is projected to have moderately good exploration potential, that potential is of localized interest only.

MIDDLE MIDDLE MIOCENE AGGRADATIONAL (MM7 A) PLAY

PLAY DESCRIPTION

The established Middle Middle Miocene Aggradational (MM7 A) play occurs within the *Cibicides opima*, *Cristellaria* "I," and *Bigenerina humblei* biozones. This play extends from the North Padre Island Area offshore Texas to the northwestern portion of the East Cameron Area offshore Louisiana (figure 1).

Updip and along strike, the play continues onshore into Texas and Louisiana. Downdip, the play grades into the sediments of the Middle Middle Miocene Progradational (MM7 P1) and Middle Middle Miocene Retrogradational (MM7 R) plays.

Productive and established sand locations in the MM7 A play are a result of two separate depocenters in MM7 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed in the offshore areas from the underlying lower middle Miocene (MM4) chronozone to the MM7 chronozone. However, in the MM7 chronozone, aggradational sands had developed offshore extending across the Brazos and Galveston Areas, whereas in the MM4 chronozone, the ancient delta systems had not prograded far enough basinward to deposit aggradational sands in the present-day offshore in most of those areas.

PLAY CHARACTERISTICS

The productive MM7 A play consists of delta plain and adjacent shallow-water deposits that comprise numerous stacked channel and distributary mouth bar sands with interbedded thin shales. Additionally, well-developed retrogradation deposits associated with the *Cristellaria* "I" and *Bigenerina humblei* marine transgressions locally cap the aggradational deposits of the MM7 A play. The major structural feature in the play is

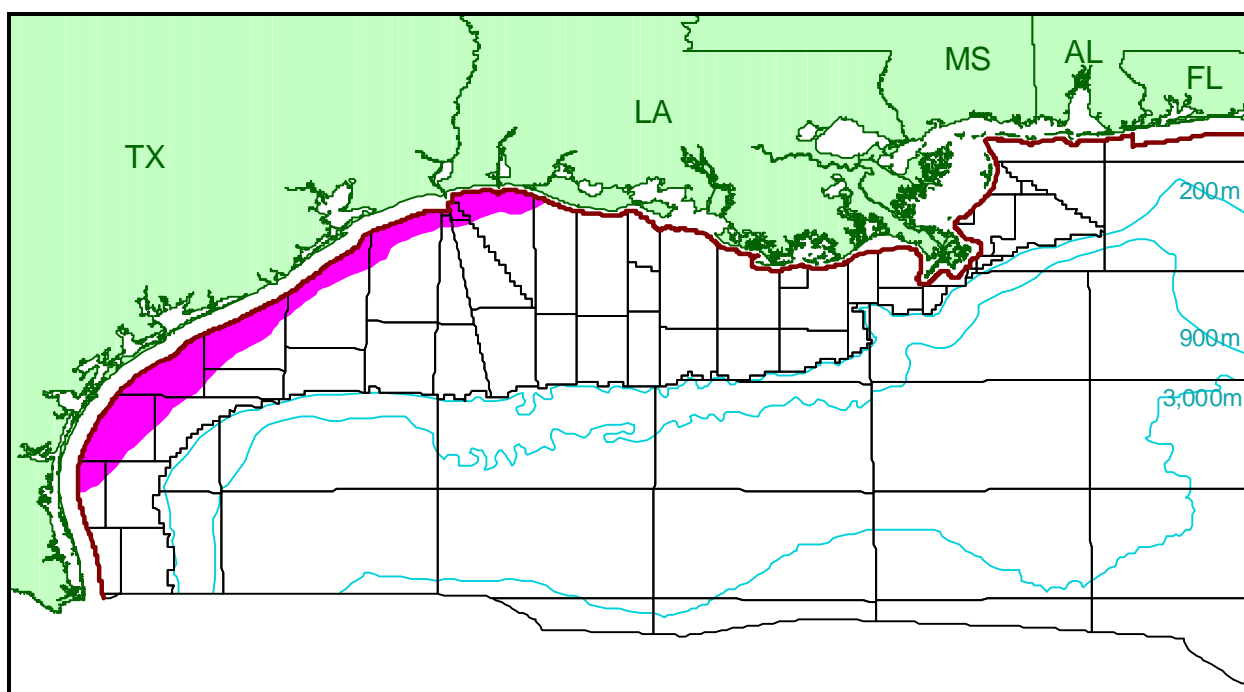


Figure 1. Map of assessed play.

anticlines. Less common structural features include normal and growth faults. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

Matagorda Island 665 is the type field. Exxon Corporation's R50 sand and Taylor Energy Company's 5, 6, and 7 sands represent the MM7 A play in this field.

DISCOVERIES

The MM7 A gas play contains total reserves of 0.354 MMbo and 99.283 Bcfg (18.020 MMBOE), of which 0.234 MMbo and 62.498 Bcfg (11.354 MMBOE) have been produced. The play contains 16 producible sands in seven pools (table 1). The first reserves in the play were discovered in the West Cameron 45 field in 1955 (figure 2). After the West Cameron 45 pool was discovered, no new pools were found until 1974. The maximum yearly total reserves were added in 1977, with the discovery of the largest discovered pool in the play in the Matagorda Island 665 field. This pool accounts for 58 percent of the play's cumulative production. In the last 10 years of the play's history, four of the seven pools in the play have been discovered. The most recent pool discovery, prior to this study's cutoff date of January 1, 1995, was in 1992.

The seven discovered pools range in size from 0.329 to 8.728 MMBOE. These pools contain 19 reservoirs, of which 17 are nonassociated gas, 1 is undersaturated oil, and 1 is saturated oil.

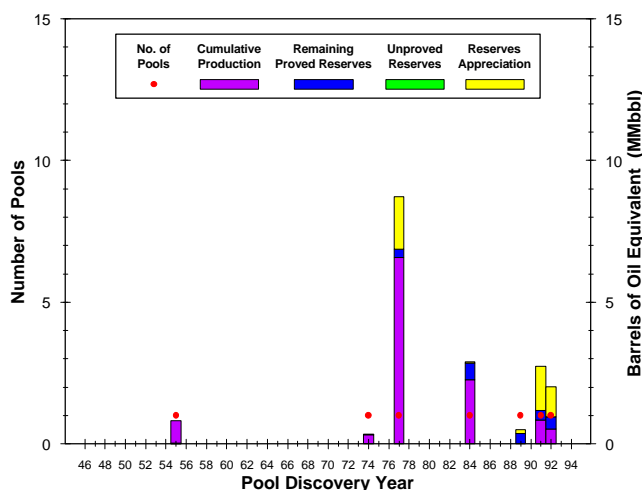


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

7 Pools (16 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	33	57	86
Subsea depth (feet)	3,092	5,281	6,688
Number of sands per pool	1	2	6
Porosity	30%	31%	36%
Water saturation	17%	24%	32%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM7 A play is 1.00. The play ranks within the smallest one-fourth of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.002 Bbo and 0.276 Tcfg (0.051 BBOE) (table 2). Twenty-two percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.001 to 0.003 Bbo and 0.121 to 0.244 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are

estimated at 0.002 Bbo and 0.177 Tcfg (0.033 BBOE). These undiscovered resources may occur in as many as 13 pools. The largest undiscovered pool, with a mean size of 9.682 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 3, 4, 5, and 6 on the pool rank plot. For all the undiscovered pools in the MM7 A play, the mean mean size is 2.553 MMBOE, which is comparable to the 2.574 MMBOE mean size of the discovered pools.

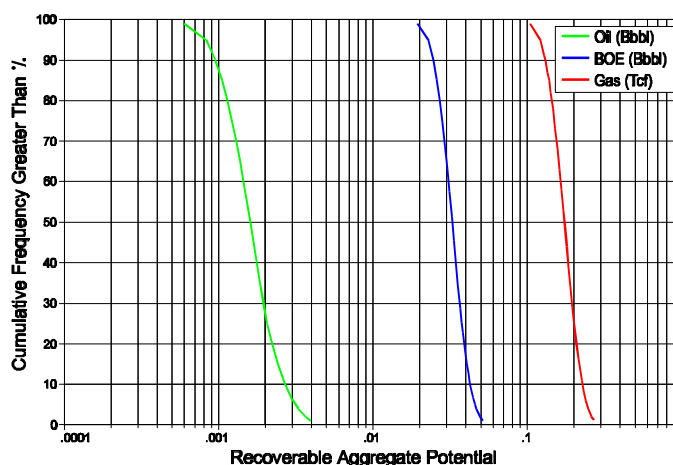


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	7	<0.001	0.074	0.013
Cumulative production	--	<0.001	0.062	0.011
Remaining proved	--	<0.001	0.011	0.002
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.026	0.005
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.001	0.121	0.023
Mean	13	0.002	0.177	0.033
5th percentile	--	0.003	0.244	0.046
Total Endowment				
95th percentile	--	0.001	0.220	0.041
Mean	20	0.002	0.276	0.051
5th percentile	--	0.003	0.343	0.064

Of the 11 aggradational plays in the Gulf of Mexico Cenozoic Province, the MM7 A play is projected to contain the third largest amount of mean undiscovered gas resources at 14 percent.

The number of undiscovered pools is expected to be about twice that of the discovered pools, with many of the largest pools projected as undiscovered. These undiscovered resources contribute 65 percent to the play's BOE mean total endowment. Exploration potential exists for untested structures between the seven discovered fields. However, because the MM7 A play is one of the smallest in the Gulf of Mexico, the play's undiscovered resources add minimally to the total endowment of the basin.

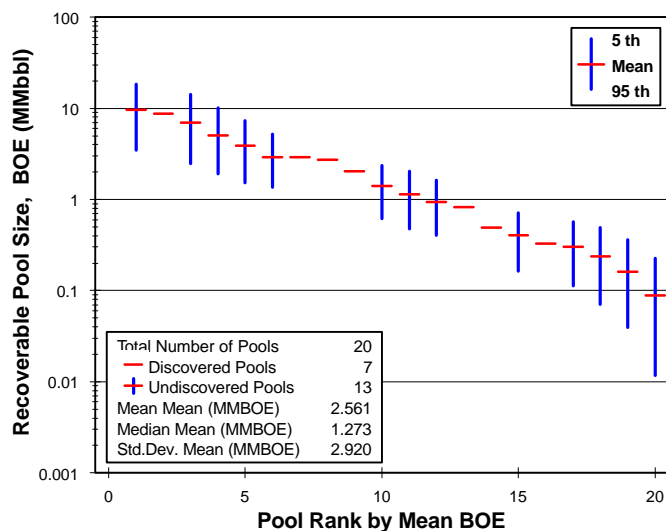


Figure 4. Pool rank plot.

MIDDLE MIDDLE MIOCENE PROGRADATIONAL (MM7 P1) PLAY

PLAY DESCRIPTION

The Middle Middle Miocene Progradational (MM7 P1) play is one of the largest established plays in the Gulf of Mexico Region. The play occurs within the *Cibicides opima*, *Cristellaria* "I," and *Bigenerina humblei* biozones and extends from the South Padre Island Area offshore Texas to the Eugene Island Area offshore Louisiana (figure 1).

Updip and along strike to the northeast, the play continues onshore into Texas and Louisiana. Along strike to the southwest, the play continues into Texas offshore State waters and Mexican national waters. Downdip, the play grades into the deposits of the Middle Middle Miocene Fan (MM7 F) play. In parts of the Mustang Island, Matagorda Island, Brazos, and Galveston Areas, the MM7 P1 play is limited by the Middle Middle Miocene Structural Retrogradational/Aggradational/ Progradational/Fan (MM7 RAPF) play and the Middle Middle Miocene Structural Progradational (MM7 P2) play.

Productive and established sand locations in the MM7 P1 play are a result of two separate depocenters in MM7 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed in the offshore areas from the underlying lower middle Miocene (MM4) chronozone to the MM7 chronozone. However, progradational sediments of the MM7 chronozone are located farther basinward than those of the MM4 chronozone due to prograding of the ancient delta systems.

The MM7 P1 play is a geographically extensive, stratigraphically controlled play, in contrast to the other progradational play in the MM7 chronozone, the MM7 P2 play, which is a small, geographically isolated, structurally controlled play.

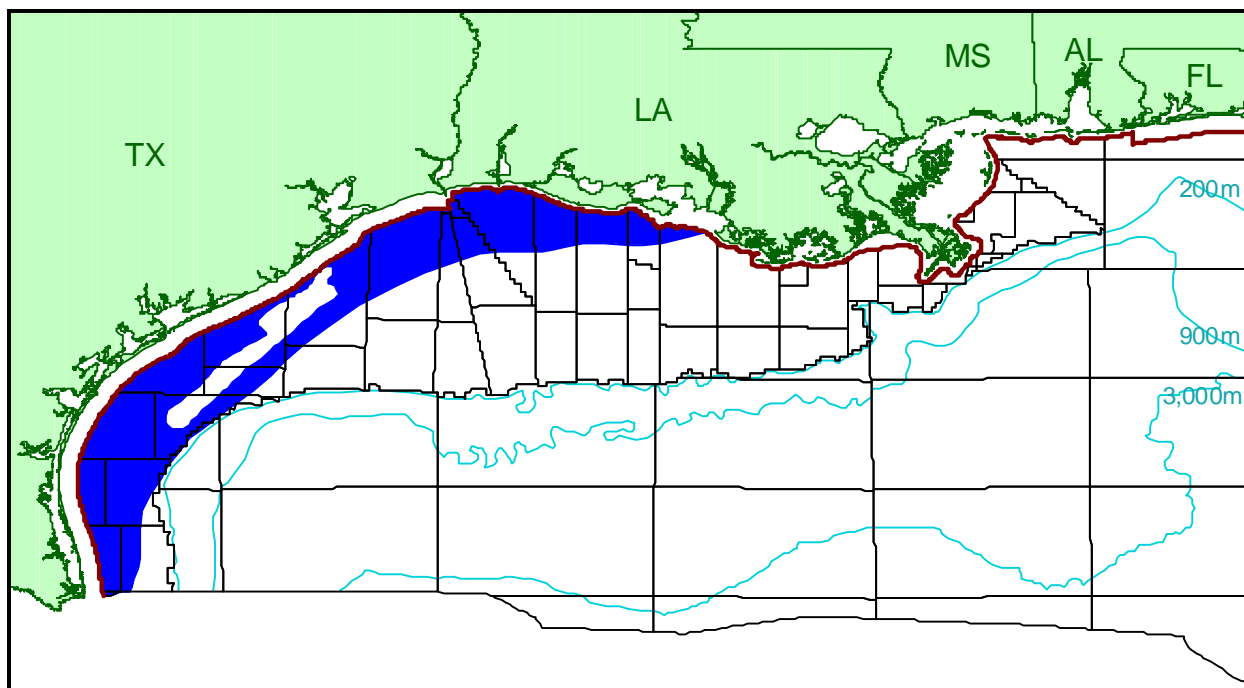


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The productive MM7 P1 play consists of progradational deltaic sediments deposited in channel and stacked channel, delta fringe, crevasse splay, shelf and upper slope slump, delta front, and shelf blanket environments. Additionally, well-developed retrogradational deposits associated with the *Cristellaria* "1" and *Bigenerina humblei* marine transgressions locally cap the progradational deposits of the MM7 P1 play. The major structural features in the play are normal faults, anticlines, and growth faults. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

South Marsh Island 239 is the type field, and Texaco Exploration and Production's CIBN and CIBO sands represent the MM7 P1 play in this field.

DISCOVERIES

The MM7 P1 gas play contains total reserves of 0.164 Bbo and 8.854 Tcfg (1.740 BBOE), of which 0.118 Bbo and 7.192 Tcfg (1.398 BBOE) have been produced. The play contains 189 producible sands in 61 pools (table 1). The first reserves in the play were discovered in the West Cameron 110 field in 1954 (figure 2). The maximum yearly total reserves of 499.936 MMBOE were added in 1958 when two pools were discovered, including the largest pool in the play in the Tiger Shoal field. Pool discoveries have been the most active during the last 20 years when 39 of the play's 61 pools were found. However, over 75 percent of the play's

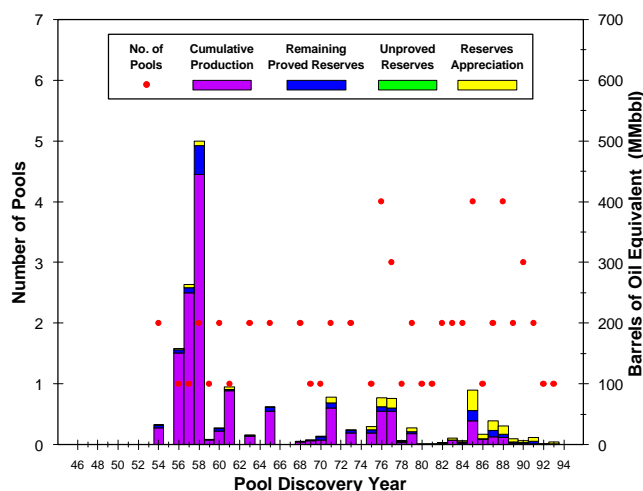


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

61 Pools (189 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	69	274
Subsea depth (feet)	3,500	8,940	14,548
Number of sands per pool	1	3	11
Porosity	15%	27%	32%
Water saturation	16%	28%	47%

cumulative production occurred from pools discovered prior to 1968, which is indicative of the large pool size of the early discoveries. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

The 61 discovered pools range in size from 0.101 to 267.750 MMBOE. These pools contain 393 reservoirs, of which 362 are nonassociated gas, 16 are undersaturated oil, and 15 are saturated oil.

Of the 61 Gulf of Mexico plays, the MM7 P1 play contains the tenth largest amount of total reserves (4%) and has produced the ninth largest amount of hydrocarbons (5%), based on BOE.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM7 P1 play is 1.00. The play contains a mean total endowment of 0.183 Bbo and 10.095 Tcfg (1.980 BBOE) (table 2). Seventy-one percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.011 to 0.031 Bbo and 1.031 to 1.475 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.019 Bbo and 1.241 Tcfg (0.240 BBOE). These undiscovered

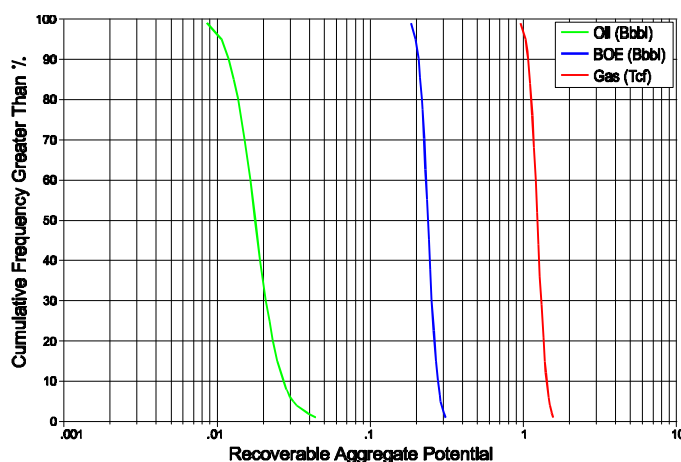


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	61	0.138	8.021	1.565
Cumulative production	--	0.118	7.192	1.398
Remaining proved	--	0.020	0.829	0.167
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.027	0.833	0.175
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.011	1.031	0.198
Mean	39	0.019	1.241	0.240
5th percentile	--	0.031	1.475	0.287
Total Endowment				
95th percentile	--	0.175	9.885	1.938
Mean	100	0.183	10.095	1.980
5th percentile	--	0.195	10.329	2.027

resources may occur in as many as 39 pools. The largest undiscovered pool, with a mean size of 35.346 MMBOE, is modeled as the eleventh largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 12, 17, 19, and 23 on the pool rank plot. For all the undiscovered pools in the MM7 P1 play, the mean mean size is 6.141 MMBOE, which is substantially smaller than the 28.523 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 19.794 MMBOE.

Of the 14 progradational plays in the Gulf of Mexico, the MM7 P1 play is projected to contain the third largest amount of mean undiscovered gas resources at 7 percent.

The MM7 P1 play is well explored and contains a large amount of total reserves. Undiscovered pools are expected to be of moderate size compared with the discovered pools. These undiscovered resources are expected to account for only 12 percent of the play's BOE mean total endowment. Exploration potential is believed to exist downdip of existing fields, where wells have been too shallow to test the MM7 section, and in interfield structures.

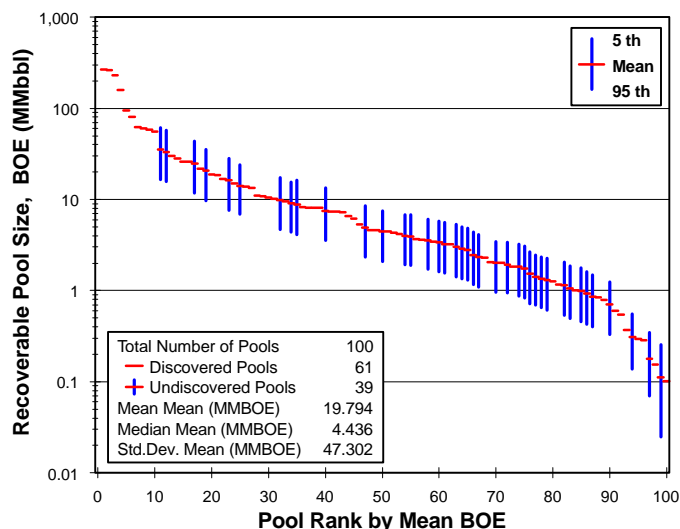


Figure 4. Pool rank plot.

MIDDLE MIDDLE MIOCENE STRUCTURAL PROGRADATIONAL (MM7 P2) PLAY

PLAY DESCRIPTION

The established Middle Middle Miocene Structural Progradational (MM7 P2) play occurs within the *Cibicides opima*, *Cristellaria* "I," and *Bigenerina humblei* biozones and is commonly referred to as the "Seagull" play. This play extends in a narrow zone from the Brazos Area northeastward parallel to the Texas coastline to the Galveston Area (figure 1).

The play is bounded updip by a major growth fault. Downdip, the play is bounded by the Middle Middle Miocene Structural Retrogradational/Aggradational/Progradational /Fan (MM7 RAPF) play. Along strike to the west and east, the play is limited by the sediments of the Middle Middle Miocene Progradational (MM7 P1) play.

Because this play is bounded by major growth faults, it is considered structurally controlled, instead of depositionally controlled. The play is defined by its structural position, which acted as the depocenter for the play's sediments. A series of slumps and slides occurred along the defining faults. Sediments prograded over these slumps and slides, forming a veneer of sands and shales. The reservoirs of the MM7 P2 play occur in this sediment veneer. In contrast, the MM7 P1 play is geographically extensive and stratigraphically controlled.

PLAY CHARACTERISTICS

The prominent feature of this play is gas production from small anticlines arched over shale diapirs that originated within failed lower middle Miocene (MM4) shelf muds. The play is also characterized by seismic hydrocarbon indicators (bright spots). Major

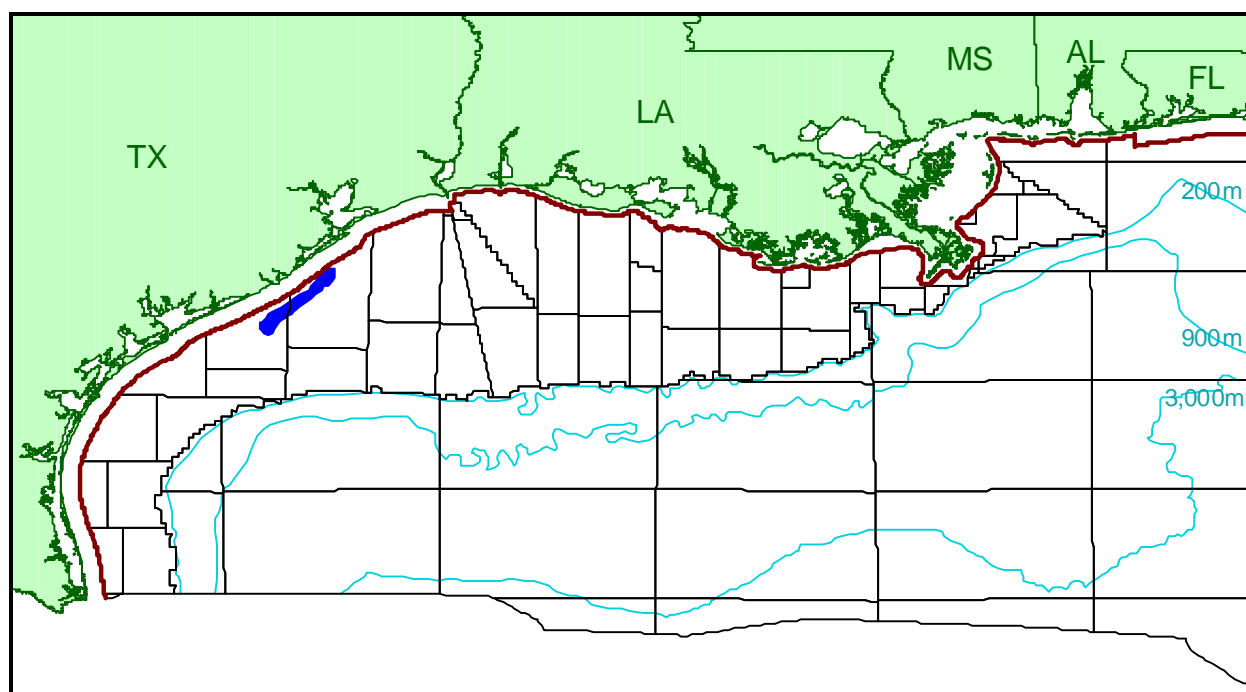


Figure 1. Map of assessed play.

structural features in the play are anticlines and normal faults. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales).

Brazos 431 is the type field, and Seagull Energy E & P Inc.'s BASAL BIG HUM sand represents the MM7 P2 play in this field.

DISCOVERIES

The MM7 P2 gas play contains total reserves of 1.722 MMbo and 376.872 Bcfg (68.781 MMBOE), of which 0.424 MMbo and 75.764 Bcfg (13.905 MMBOE) have been produced. The play contains nine producible sands in six pools (table 1). The first reserves in the play were discovered in the Brazos 455 field in 1987 (figure 2). The maximum yearly total reserves of 46.914 MMBOE were added in 1991 when three pools were found, including the largest discovered pool in the play in the Brazos 397 field. Five of the six pools in the play were discovered in the 1990's. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1992.

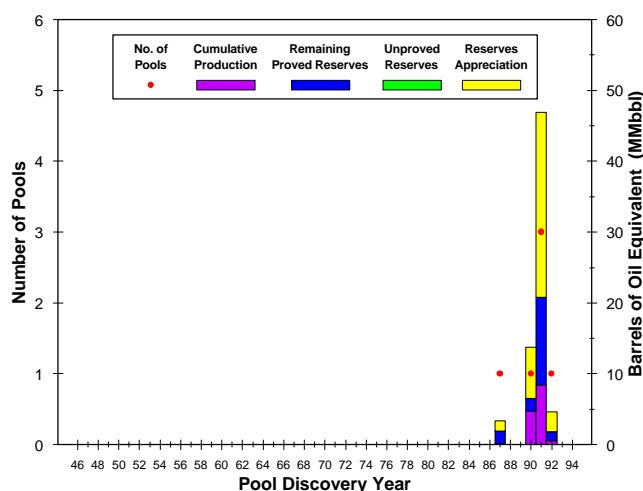


Figure 2. Exploration history graph.

The six discovered pools range in size from 3.401 to 25.775 MMBOE. These pools contain 12 reservoirs, all of which are nonassociated gas.

Table 1. Characteristics of the discovered pools.

6 Pools (9 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	57	76	92
Subsea depth (feet)	5,443	6,776	7,800
Number of sands per pool	1	2	2
Porosity	26%	29%	31%
Water saturation	16%	21%	28%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM7 P2 play is 1.00. The play contains a mean total endowment of 0.008 Bbo and 1.238 Tcfg (0.228 BBOE) (table 2). Six percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.002 to 0.016 Bbo and 0.587 to 1.382 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.006 Bbo and 0.861 Tcfg (0.159 BBOE).

These undiscovered resources may occur in as many as 14 pools. The largest undiscovered pool, with a mean size of 68.057 MMBOE, is modeled as the largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 2, 4, 8, and 9 on the pool rank plot. For all the undiscovered pools in the MM7 P2 play, the mean mean size is 11.371 MMBOE, which is comparable to the 11.463 MMBOE mean size of the discovered pools.

The number of projected undiscovered pools is more than double the number of

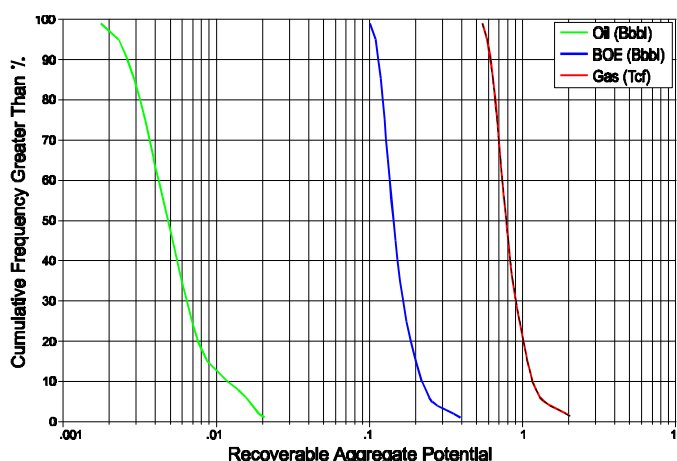


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	6	0.001	0.171	0.031
Cumulative production	--	<0.001	0.076	0.014
Remaining proved	--	0.001	0.095	0.017
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.001	0.206	0.038
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.002	0.587	0.109
Mean	14	0.006	0.861	0.159
5th percentile	--	0.016	1.382	0.256
Total Endowment				
95th percentile	--	0.004	0.964	0.178
Mean	20	0.008	1.238	0.228
5th percentile	--	0.018	1.759	0.325

discovered pools. These undiscovered resources account for 70 percent of the play's BOE mean total endowment. However, compared to many other plays in the Gulf of Mexico, the MM7 P2 play's total endowment is relatively small. In addition, the play's structural bounds limit the size of the exploration area. Therefore, even though the MM7 P2 play is projected to have good exploration potential, that potential is of localized interest only.

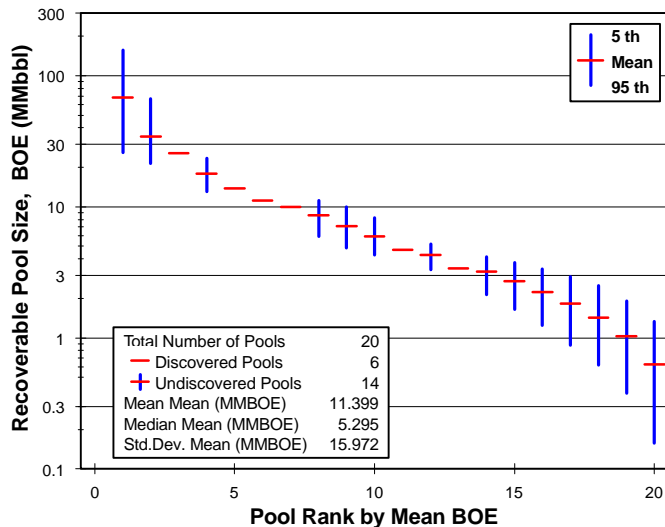


Figure 4. Pool rank plot.

MIDDLE MIDDLE MIOCENE FAN (MM7 F) PLAY

PLAY DESCRIPTION

The established Middle Middle Miocene Fan (MM7 F) play occurs within the *Cibicides opima*, *Cristellaria* "I," and *Bigenerina humblei* biozones. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play is limited by the shelf/slope break associated with the *Bigenerina humblei* biozone and grades into the sediments of the Middle Middle Miocene Progradational (MM7 P1) play, or it continues onshore into Louisiana. To the southwest, the MM7 F play extends into Texas offshore State waters and Mexican national waters. To the northeast, the play potential is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the MM7 depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by MM7 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the MM7 F play are a result of two separate depocenters in MM7 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either the Texas or Louisiana depocenters is observed in the offshore areas from the underlying lower middle Miocene (MM4) chronozone to the MM7 chronozone. However, the shelf/slope break of MM7 time is located farther basinward than that of MM4 time, indicative of the prograding nature of the ancient delta systems.

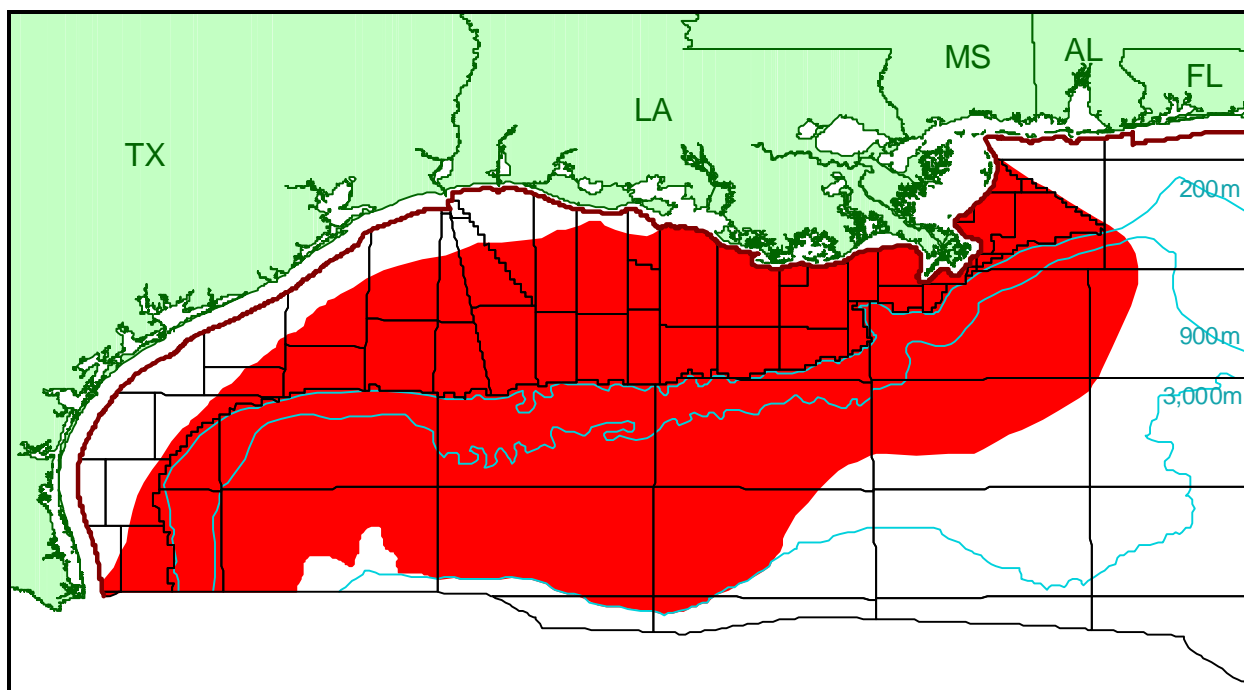


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The productive MM7 F play consists of deepwater turbidites deposited in fan systems as channel fill, fan lobes, and fringe sheet sediments on the MM7 slope. Major structural features in the play include normal faults, anticlines, and salt diapirs. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Eugene Island 24 is the type field, and Amerada Hess Corporation's 14200 and 15000 (equals Murphy Exploration & Production's CIBOP) sands represent the MM7 F play in this field.

DISCOVERIES

The MM7 F play is predominantly a gas play, with total reserves of 0.018 Bbo and 0.239 Tcfg (0.060 BBOE), of which 0.005 Bbo and 0.137 Tcfg (0.029 BBOE) have been produced. The play contains eight producible sands in seven pools (table 1). Hydrocarbons were first found in 1980 when the maximum yearly total reserves of 41.565 MMBOE were added by the discovery of two pools, including the largest discovered pool in the play in the Eugene Island 24 field (figure 2). On a BOE basis, 17 percent of the play's cumulative production is oil, but remaining total reserves indicate that future production may increase to nearly 42 percent oil. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

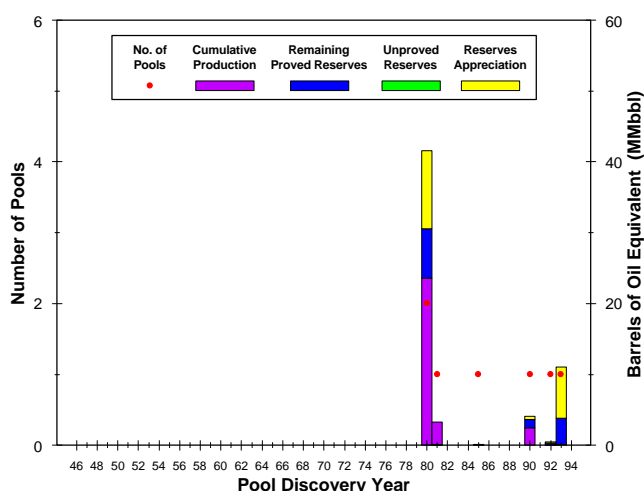


Figure 2. Exploration history graph.

The seven discovered pools range in size from 0.040 to 40.911 MMBOE. These pools contain 12 reservoirs, of which 11 are nonassociated gas and 1 is undersaturated oil.

Table 1. Characteristics of the discovered pools.

7 Pools (8 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	13	43	136
Subsea depth (feet)	12,775	14,750	16,165
Number of sands per pool	1	1	2
Porosity	18%	25%	31%
Water saturation	13%	32%	58%

ASSESSMENT RESULTS

Because of limited data for the MM7 F play, the Middle Lower Miocene Fan (LM2 F) play was used as an analog to model pool sizes in the MM7 F play. The LM2 F play was selected as the analog due to similarities in depositional setting, structural style, hydrocarbon type, and statistical information.

The marginal probability of hydrocarbons for the MM7 F play is 1.00. The play contains a mean total endowment of 0.330 Bbo and 8.707 Tcfg (1.880 BBOE) (table 2). Less than 2 percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.246 to 0.403 Bbo and 6.295 to 12.071 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.312 Bbo and 8.468 Tcfg (1.820 BBOE). These undiscovered resources may occur in as many as 83 pools. The largest undiscovered pool, with a mean size of 358.620 MMBOE, is modeled as the largest pool

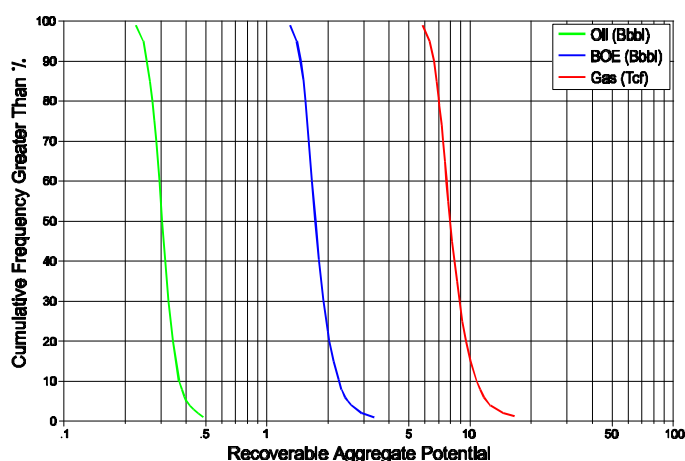


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	7	0.010	0.178	0.042
Cumulative production	--	0.005	0.137	0.029
Remaining proved	--	0.005	0.041	0.012
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.008	0.061	0.019
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.246	6.295	1.402
Mean	83	0.312	8.468	1.820
5th percentile	--	0.403	12.071	2.502
Total Endowment				
95th percentile	--	0.264	6.534	1.462
Mean	90	0.330	8.707	1.880
5th percentile	--	0.421	12.310	2.562

in the play (figure 4). In fact, the top 10 largest pools in the play are modeled as undiscovered accumulations on the pool rank plot. For all the undiscovered pools in the MM7 F play, the mean mean size is 21.894 MMBOE, which is significantly larger than the 8.635 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 20.863 MMBOE.

Of the 61 Gulf of Mexico Region plays and of the 15 Gulf of Mexico fan plays, the MM7 F play is projected to contain the second largest amounts of mean undiscovered gas resources, at 9 percent and 13 percent, respectively.

The MM7 F play contains only seven discovered pools so far. Because of a large unexplored area in the play, numerous pools are expected to be found, accounting for nearly all of the play's mean total endowment. Exploration potential exists downdip and laterally of the discovered fields where wells have been too shallow to test the MM7 section.

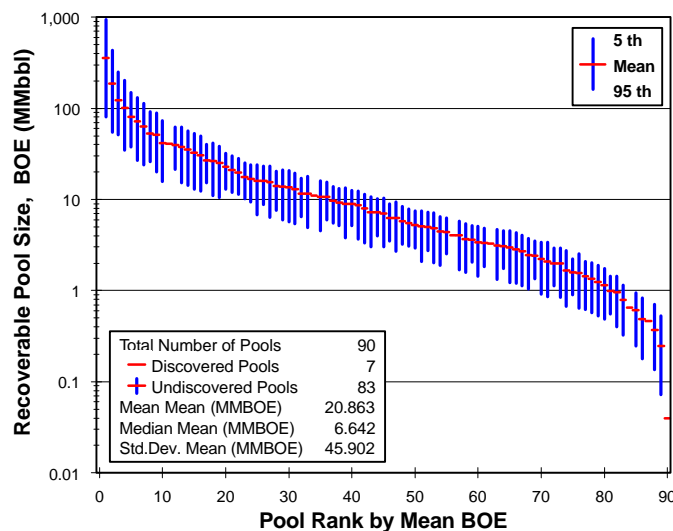


Figure 4. Pool rank plot.

LOWER MIDDLE MIOCENE (MM4) CHRONOZONE

CHRONOZONE DESCRIPTION

The Lower Middle Miocene (MM4) chronozone corresponds to the *Gyroidina* "K," *Cristellaria* 54, *Robulus* 43, and *Amphistegina* "B" biozones. The MM4 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the MM4 chronozone include retrogradational, aggradational, progradational, and fan, each of which defines a play: the Lower Middle Miocene Retrogradational (MM4 R) play, the Lower Middle Miocene Aggradational (MM4 A) play, the Lower Middle Miocene Progradational (MM4 P) play, and the Lower Middle Miocene Fan (MM4 F) play.

The potential for sand development within the MM4 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, MM4 sands extend onshore into Texas and Louisiana. Southwestward, sand potential within the MM4 chronozone extends into Texas offshore State waters and Mexican national waters. To the northeast, sand potential is bounded by the Cretaceous carbonate shelf edge and by a decrease in sediment influx at the edge of the MM4 depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by MM4 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the MM4 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. Retrogradational, aggradational, and progradational sediments of the MM4 chronozone are much more areally extensive than those sediments of the underlying upper lower Miocene

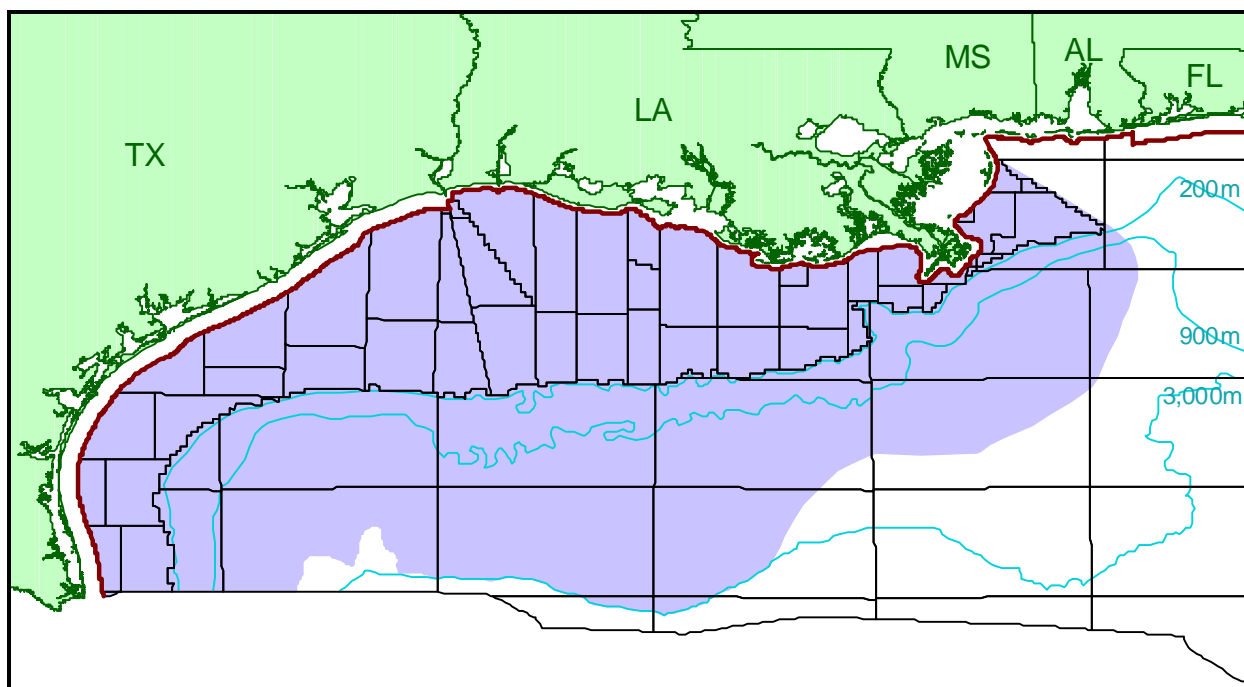


Figure 1. Map of assessed chronozone.

(LM4) chronozone. Unlike the LM4 chronozone, no productive fan sediments have been identified for the MM4 chronozone in wells west of the High Island Area. However, MM4 fan sediments are expected to be present downdip of the well-developed MM4 progradational sediments in the offshore Texas area.

Major structural features in the MM4 chronozone include normal faults, anticlines, shale diapirs, and growth faults. Less common structures include salt diapirs, rotational slump blocks, and unconformities.

DISCOVERIES

The MM4 chronozone contains 147 discovered pools in four plays (table 1). Total reserves in the chronozone are 0.205 Bbo and 11.527 Tcfg (2.256 BBOE), of which 0.143 Bbo and 7.372 Tcfg (1.455 BBOE) have been produced. The largest number of discoveries in the MM4 chronozone occurred when 16 pools were added in 1988 (figure 2). However, the maximum yearly total reserves of 225.748 MMBOE were added in 1956 with the discovery of the Vermilion 14 pool.

Of the four plays in the MM4 chronozone, the MM4 P play contains the most total reserves in 79 pools, with 0.115 Bbo and 8.331 Tcfg (1.598 BBOE).

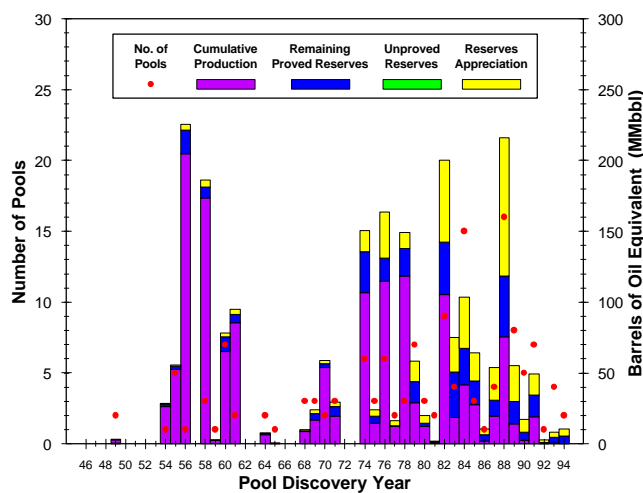


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

147 Pools (559 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	70	215
Subsea depth (feet)	4,574	8,566	18,000
Number of sands per pool	1	4	21
Porosity	18%	27%	33%
Water saturation	16%	31%	65%

ASSESSMENT RESULTS

The MM4 chronozone contains 271 pools (discovered plus undiscovered), with a mean total endowment estimated at 0.431 Bbo and 16.685 Tcfg (3.400 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 124 pools, which contain a range of 0.197 to 0.257 Bbo and 4.650 to 5.699 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.226 Bbo and 5.158 Tcfg (1.144 BBOE) are projected. These

undiscovered resources represent 34 percent of the MM4 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the sixth largest in the chronozone (figure 4).

Of the four MM4 plays, the MM4 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.210 Bbo and 4.059

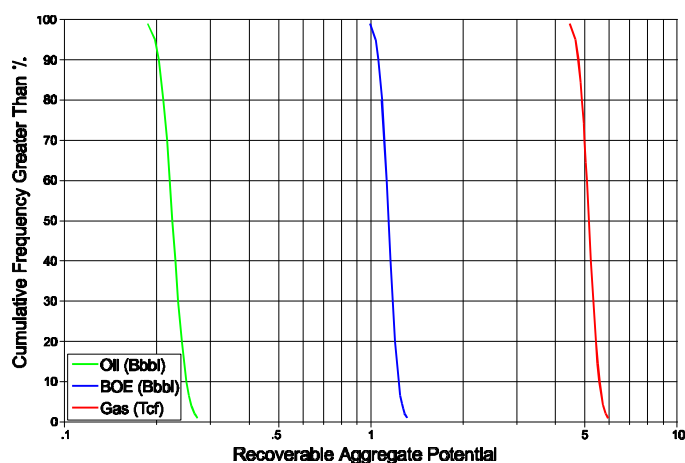


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	147	0.176	9.242	1.821
Cumulative production	--	0.143	7.372	1.455
Remaining proved	--	0.033	1.870	0.366
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.028	2.286	0.435
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.197	4.650	1.036
Mean	124	0.226	5.158	1.144
5th percentile	--	0.257	5.699	1.258
Total Endowment				
95th percentile	--	0.402	16.177	3.292
Mean	271	0.431	16.685	3.400
5th percentile	--	0.462	17.226	3.514

Tcfg (0.932 BBOE) remaining to be found in 75 pools. These undiscovered resources in the MM4 F play represent 27 percent of the BOE mean total endowment for the MM4 chronozone. This percentage, the potential for numerous discoveries within a large unexplored area, and established fan production make the MM4 F play an attractive exploration target in MM4 strata.

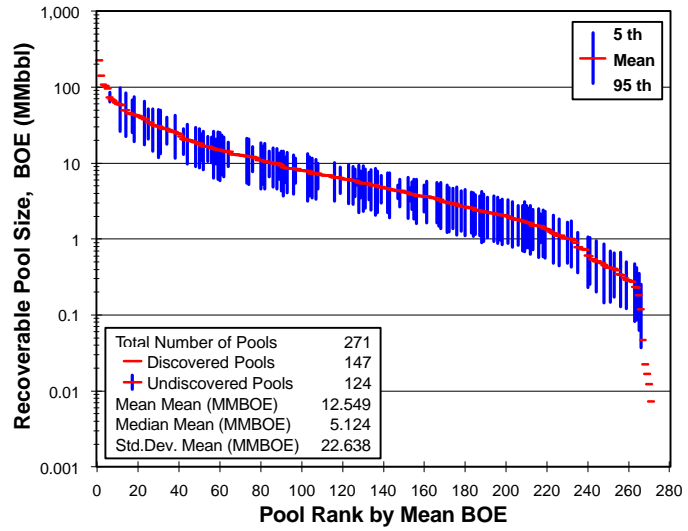


Figure 4. Pool rank plot.

LOWER MIDDLE MIOCENE RETROGRADATIONAL (MM4 R) PLAY

PLAY DESCRIPTION

The established Lower Middle Miocene Retrogradational (MM4 R) play occurs within the *Cristellaria* 54/*Eponides* 14, *Robulus* 43, and *Amphistegina* "B" biozones. This play extends from the South Padre Island Area offshore Texas through the East Cameron Area offshore Louisiana (figure 1).

Updip, the play continues onshore into Texas and Louisiana. Downdip and to the east, the play grades into the sediments of the Lower Middle Miocene Progradational (MM4 P) play. To the southwest, the MM4 R play extends onshore into Texas.

Two major depocenters existed in both upper lower Miocene (LM4) and MM4 times, one centered in the Texas area and the other centered in the Louisiana area. Deposition of retrogradational sequences in the offshore Federal area appears much more extensive for the MM4 chronozone than for the LM4 chronozone. The Upper Lower Miocene Retrogradational (LM4 R) play is confined to the offshore Texas area, while the MM4 R play extends eastward into the offshore Louisiana area.

PLAY CHARACTERISTICS

The productive MM4 R play consists of reworked marine deposits including channel/levee complexes, barrier and distributary mouth bars, and delta fringe sands. Three distinct retrogradational sequences are present in the play. They are associated with significant marine transgressions defined by the *Cristellaria* 54, the *Robulus* 43, and the *Amphistegina* "B" biozones. These retrogradational sequences locally cap either the aggradational or progradational facies of the MM4 chronozone. Major structural features in this play are normal faults, anticlines, and shale diapirs. Salt diapirs, rotational slump

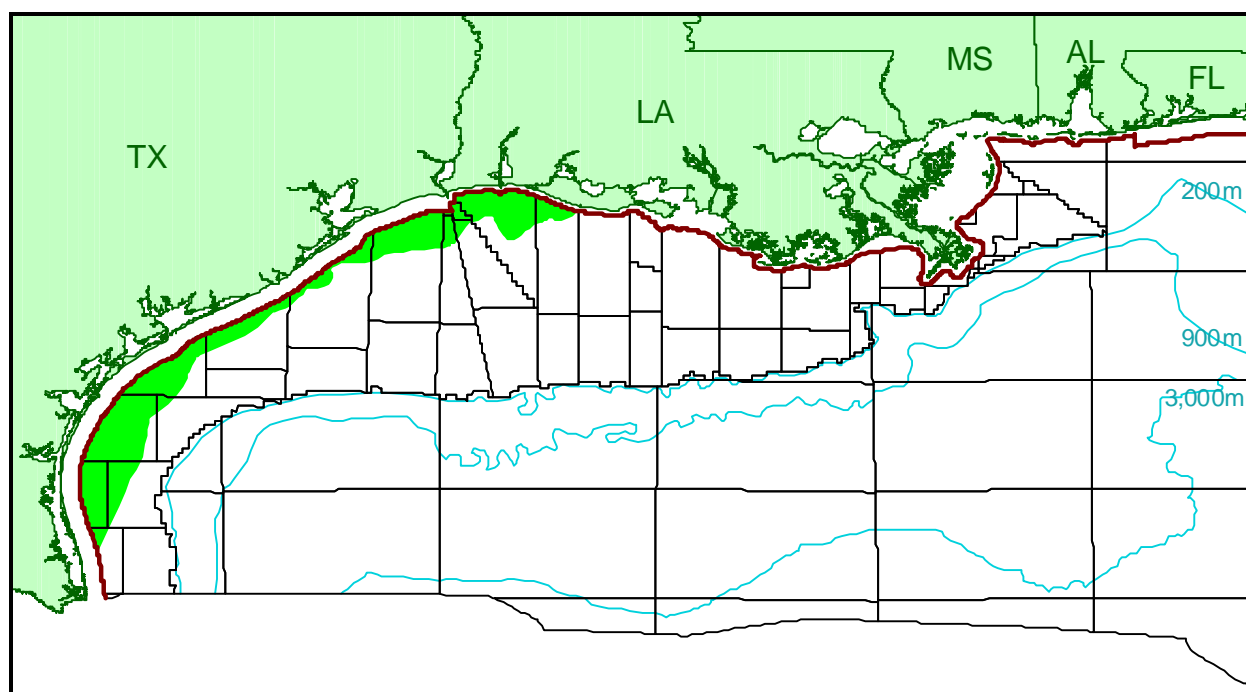


Figure 1. Map of assessed play.

blocks, and growth faults also occur, but much less frequently. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive retrogradational depositional environments, structures, or seals.

Sabine 13 is the type field, and Pennzoil Petroleum Company's MN2, MN3, and MN4 sands represent the MM4 R play in this field.

DISCOVERIES

The MM4 R gas play contains total reserves of 0.032 Bbo and 1.282 Tcfg (0.260 BBOE), of which 0.026 Bbo and 0.920 Tcfg (0.190 BBOE) have been produced. The play contains 84 producible sands in 40 pools (table 1). The first reserves in the play were discovered in the West Cameron 45 field in 1949 (figure 2). The maximum yearly total reserves of 58.689 MMBOE were added in 1970 when two pools were discovered, including the largest pool in the play in the East Cameron 33 field. In fact, 52 percent of the play's cumulative production has come from discoveries made in just two years, 1970 and 1974. Discoveries peaked in the 1980's when 16 pools were added to the play. Four pools have been discovered in the 1990's, the most recent, prior to this study's cutoff date of January 1, 1995, in 1993.

The 40 discovered pools range in size from 0.017 to 58.276 MMBOE. These pools contain 157 reservoirs, of which 133 are nonassociated gas, 13 are undersaturated oil, and 11 are saturated oil.

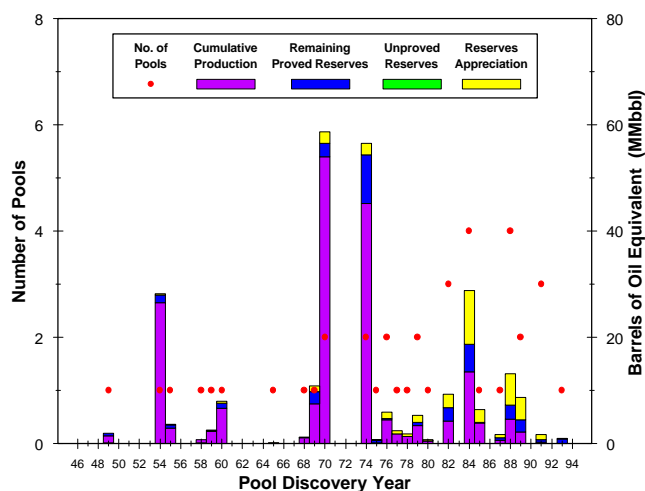


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

40 Pools (84 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	31	74	189
Subsea depth (feet)	4,729	7,163	14,490
Number of sands per pool	1	2	11
Porosity	24%	28%	32%
Water saturation	16%	31%	52%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM4 R play is 1.00. The play contains a mean total endowment of 0.037 Bbo and 1.529 Tcfg (0.309 BBOE) (table 2). Sixty-one percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.002 to 0.009 Bbo and 0.186 to 0.314 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.005 Bbo and 0.247 Tcfg

(0.049 BBOE). These undiscovered resources may occur in as many as 15 pools. The largest undiscovered pool, with a mean size of 14.926 MMBOE, is modeled as the fifth largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 8, 14, 17, and 18 on the pool rank plot. For all the undiscovered pools in the MM4 A play, the mean mean size is 3.300 MMBOE, which is about half as large as the 6.510 MMBOE mean size of the discovered pools. The mean

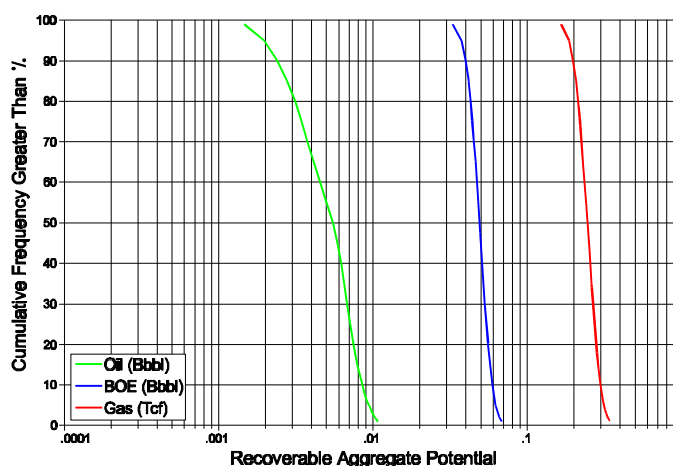


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	40	0.030	1.086	0.223
Cumulative production	--	0.026	0.920	0.190
Remaining proved	--	0.004	0.166	0.034
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.002	0.196	0.037
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.002	0.186	0.037
Mean	15	0.005	0.247	0.049
5th percentile	--	0.009	0.314	0.063
Total Endowment				
95th percentile	--	0.034	1.468	0.297
Mean	55	0.037	1.529	0.309
5th percentile	--	0.041	1.596	0.323

mean size for all pools, including both discovered and undiscovered, is 5.635 MMBOE.

The MM4 R play is well explored, with undiscovered pools expected to be limited in number. Relative to the discovered pools, the undiscovered pools are modeled to range from small to moderate in size, contributing only 16 percent to the play's BOE mean total endowment. Therefore, limited exploration potential occurs between existing fields.

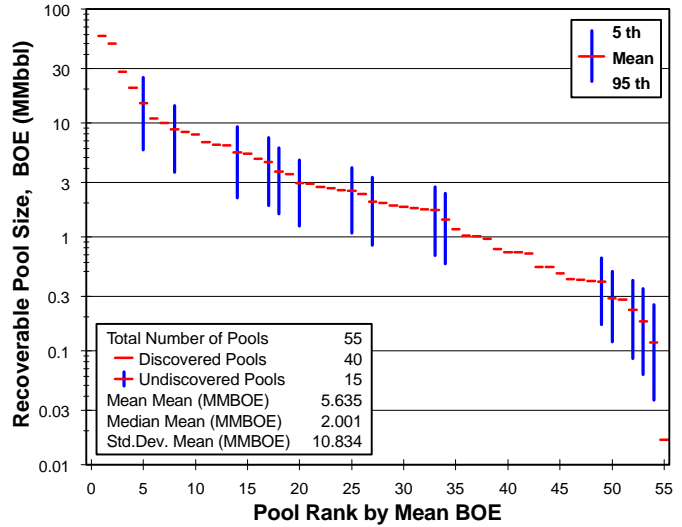


Figure 4. Pool rank plot.

LOWER MIDDLE MIOCENE AGGRADATIONAL (MM4 A) PLAY

PLAY DESCRIPTION

The established Lower Middle Miocene Aggradational (MM4 A) play occurs within the *Cristellaria* 54/*Eponides* 14, *Robulus* 43, and *Amphistegina* "B" biozones. This play extends from the North Padre Island Area offshore Texas to the East Cameron Area offshore Louisiana (figure 1).

Updip, the MM4 A play continues onshore into Texas and Louisiana. To the northeast, southwest, and downdip, the play grades into the sediments of the Lower Middle Miocene Progradational (MM4 P) play.

Two major depocenters, one centered in the Texas area and the other centered in the Louisiana area, were active in both upper lower Miocene (LM4) and MM4 times. The MM4 aggradational sediments are much more areally extensive in the offshore Federal area than the LM4 aggradational sediments. The Upper Lower Miocene Aggradational (LM4 A) play is confined to the offshore Texas area, while the MM4 A play extends eastward into the offshore Louisiana area.

PLAY CHARACTERISTICS

The productive MM4 A play consists of delta plain and adjacent shallow-water deposits. Cut-and-fill sequences formed by distributary channels occur most frequently. Crevasse splay sands, distributary mouth bars, and shelf blanket sands also characterize this play. Aggradational deposits are characteristically very sandy. They are typically the least productive of all the depositional styles because of a lack of shale to seal hydrocarbons. Well-developed retrogradational deposits associated with the *Cristellaria* 54, the *Robulus* 43, or the *Amphistegina* "B" marine transgressions locally cap the

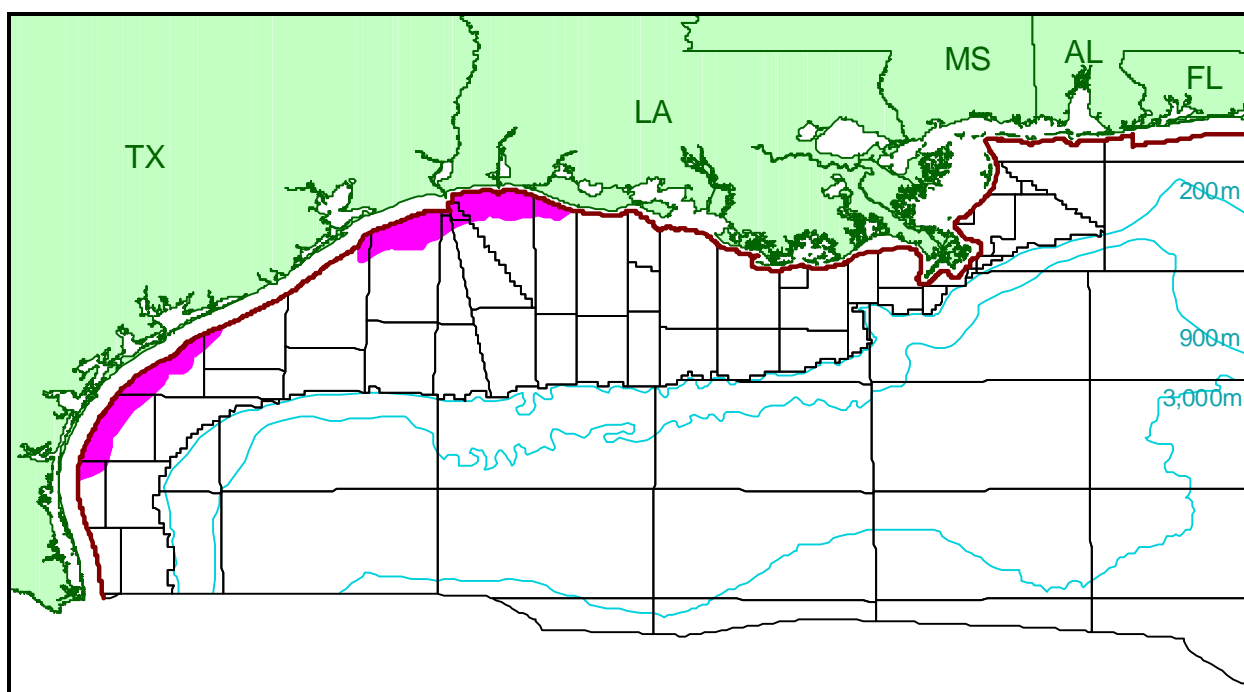


Figure 1. Map of assessed play.

aggradational deposits of the play. The major structural feature in this play is normal faulting. Anticlines, shale diapirs, and growth faults also occur. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive aggradational depositional environments, structures, or seals.

Sabine 13 is the type field, and Pennzoil Petroleum Company's MN7 and MN14 sands represent the MM4 A play in this field.

DISCOVERIES

The MM4 A gas play contains total reserves of 0.015 Bbo and 0.598 Tcfg (0.122 BBOE), of which 0.010 Bbo and 0.444 Tcfg (0.089 BBOE) have been produced. The play contains 51 producible sands in 18 pools (table 1). The first reserves in the play were discovered in the West Cameron 45 field in 1949 (figure 2). The maximum yearly total reserves were added in 1961 with the discovery of the largest pool in the play in the High Island 160 field. Two-thirds of the pool discoveries occurred during the 1960's and 1970's. In fact, 97 percent of the play's cumulative production has come from pools discovered prior to 1978. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1989.

The 18 discovered pools range in size from 0.012 to 28.355 MMBOE. These pools contain 80 reservoirs, of which 72 are nonassociated gas, 6 are undersaturated oil, and 2 are saturated oil.

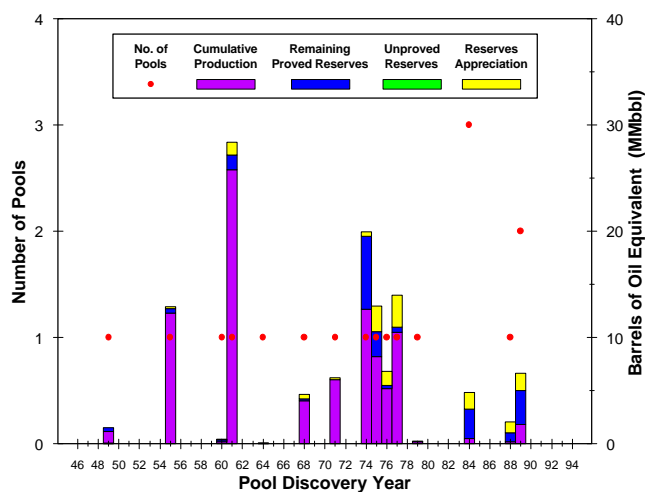


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

18 Pools (51 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	29	57	122
Subsea depth (feet)	4,574	7,787	10,842
Number of sands per pool	1	3	8
Porosity	20%	27%	32%
Water saturation	18%	31%	54%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM4 A play is 1.00. The play ranks within the smallest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.015 Bbo and 0.627 Tcfg (0.127 BBOE) (table 2). Seventy percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources range from less than 0.001 to 0.001 Bbo and 0.018 to 0.041 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are insignificant for oil (<0.001 Bbbl) and 0.029 Tcfg (0.005 BBOE). These undiscovered resources may occur in as many as four pools. The largest undiscovered pool, with a mean size of 2.335 MMBOE, is modeled as the twelfth largest pool in the play (figure 4). The model results place the remaining three undiscovered pools in positions 14, 16, and 18 on the pool rank plot. For all the undiscovered pools in the MM4 A play, the mean mean size is 1.405 MMBOE, which is smaller than the 6.756 MMBOE mean size of the

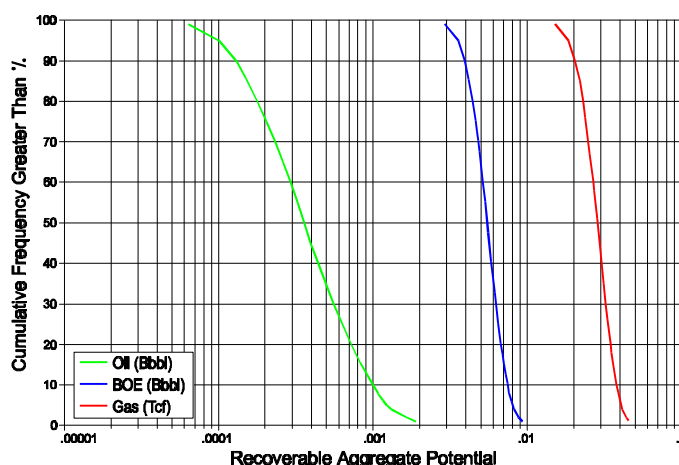


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	18	0.015	0.525	0.108
Cumulative production	--	0.010	0.444	0.089
Remaining proved	--	0.005	0.081	0.019
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.001	0.073	0.013
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.018	0.004
Mean	4	<0.001	0.029	0.005
5th percentile	--	0.001	0.041	0.008
Total Endowment				
95th percentile	--	0.015	0.616	0.126
Mean	22	0.015	0.627	0.127
5th percentile	--	0.016	0.639	0.130

discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 5.783 MMBOE.

Because of a lack of seals in this sand-rich play and the high drilling density, the MM4 A play is modeled to have very limited potential for discoveries. Relative to the discovered pools, undiscovered pools are expected to be small in size, accounting for only 4 percent of the play's BOE mean total endowment.

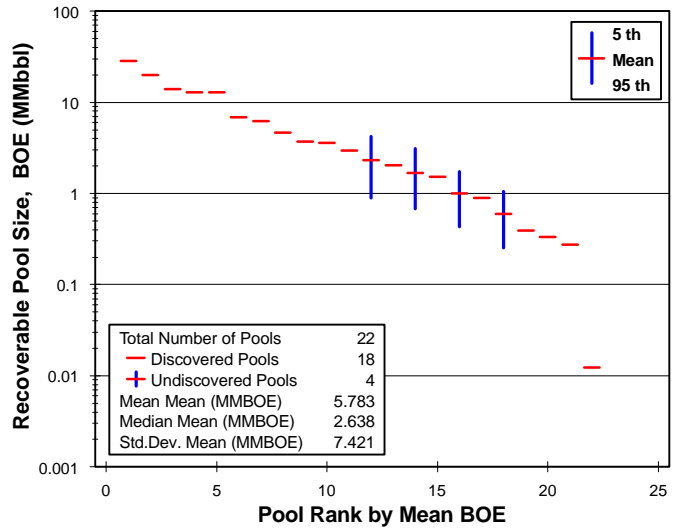


Figure 4. Pool rank plot.

LOWER MIDDLE MIOCENE PROGRADATIONAL (MM4 P) PLAY

PLAY DESCRIPTION

The established Lower Middle Miocene Progradational (MM4 P) play occurs within the *Gyroidina* "K," *Cristellaria* 54/*Eponides* 14, *Robulus* 43, and *Amphistegina* "B" biozones. This play extends from the South Padre Island Area offshore Texas to the northwestern portion of the Eugene Island Area offshore Louisiana (figure 1).

Updip, the play continues onshore into Texas and Louisiana. To the northeast, the MM4 P play continues onshore into Louisiana. To the southwest, the play extends into Texas offshore State waters and Mexican national waters. Downdip, the play is limited by a lack of sand or grades into the deposits of the Lower Middle Miocene Fan (MM4 F) play.

Two major depocenters were active in both upper lower Miocene (LM4) and MM4 times, one centered in the Texas area and the other centered in the Louisiana area. Deposition of progradational sediments appears much more continuous in the offshore Texas and Louisiana areas in the MM4 chronozone than in the LM4 chronozone. The MM4 progradational sediments also show a basinward shift from those of the LM4 chronozone due to prograding of the ancient delta systems.

PLAY CHARACTERISTICS

The productive MM4 P play consists of progradational deltaic sediments deposited in delta fringe, shelf blanket, distributary mouth bar, channel, and crevasse splay environments. Well-developed retrogradational deposits associated with the *Cristellaria* 54, the *Robulus* 43, or the *Amphistegina* "B" marine transgressions locally cap the progradational deposits of the MM4 P play. Major structural features in this play are normal faults and anticlines. Growth faults, shale diapirs, and unconformities are also

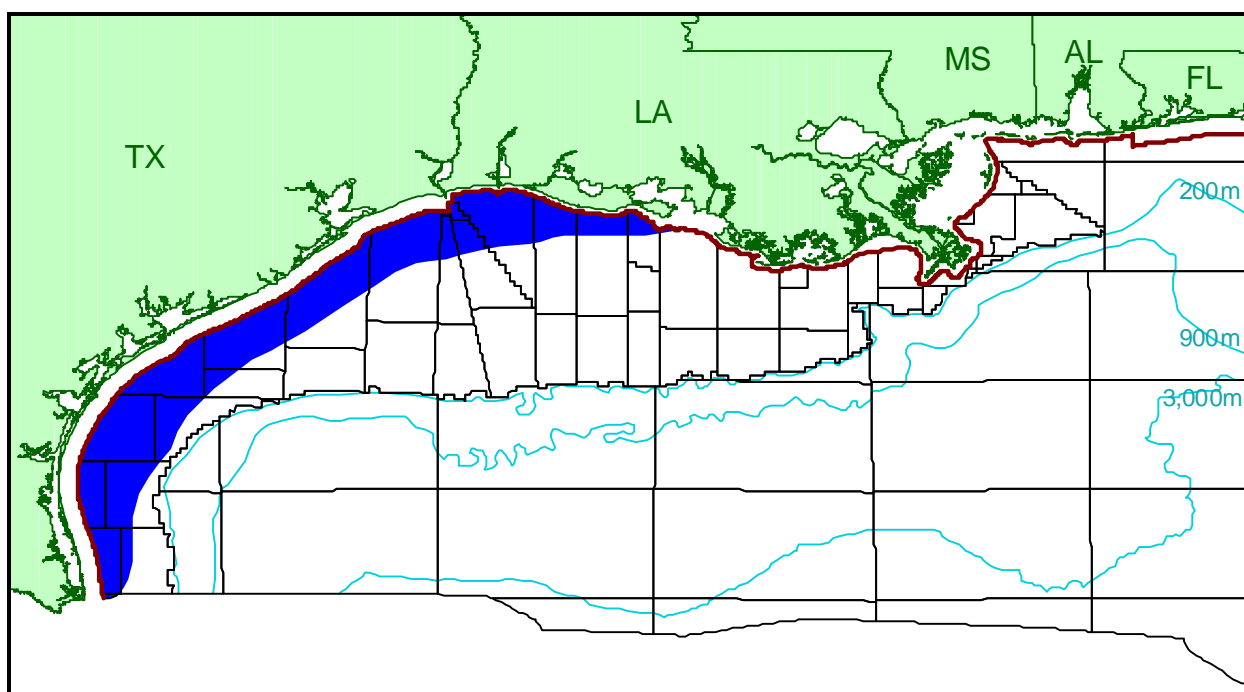


Figure 1. Map of assessed play.

present. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting, diapiric piercement) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

Mustang Island 31A is the type field, and Chevron USA Inc.'s 8100, 8700, ST 9773/9661, 8900, 9100, 9200, and 9700 sands represent the MM4 P play in this field.

DISCOVERIES

The MM4 P gas play contains total reserves of 0.115 Bbo and 8.331 Tcfg (1.598 BBOE), of which 0.083 Bbo and 5.136 Tcfg (0.997 BBOE) have been produced. The play contains 400 producible sands in 79 pools (table 1). The first reserves in the play were discovered in the Galveston 189 field in 1955 (figure 2). The maximum yearly total reserves were added in 1956 by the discovery of the largest pool in the play in the Vermilion 14 field. Fifty-three percent of the play's cumulative production has come from pools discovered prior to 1962. However, almost 60 percent of the total reserves are in pools discovered in 1976 or later.

The number of pool discoveries peaked in the 1980's at 39. In the 1990's, 12 pools have already been discovered. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 79 discovered pools range in size from 0.007 to 225.748 MMBOE. These pools contain 604 reservoirs, of which 577 are nonassociated gas, 18 are undersaturated oil, and 9 are saturated oil.

Of the 61 Gulf of Mexico Region plays, the MM4 P play ranks as the tenth largest hydrocarbon producer (3%), based on BOE.

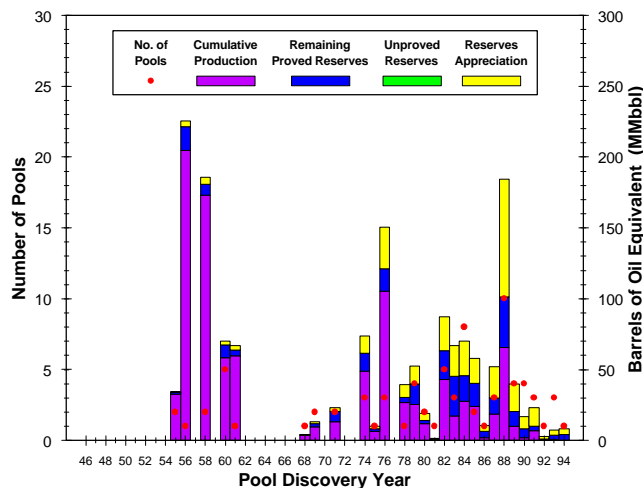


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

79 Pools (400 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	11	74	215
Subsea depth (feet)	5,560	8,779	15,900
Number of sands per pool	1	5	21
Porosity	18%	27%	33%
Water saturation	16%	32%	65%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM4 P play is 1.00. The play contains a mean total endowment of 0.126 Bbo and 9.154 Tcfg (1.756 BBOE) (table 2). Fifty-seven percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.006 to 0.019 Bbo and 0.674 to 0.984 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.011 Bbo and 0.823 Tcfg

(0.158 BBOE). These undiscovered resources may occur in as many as 30 pools. The largest undiscovered pool, with a mean size of 30.267 MMBOE, is modeled as the eighteenth largest pool in the play (figure 4). For all the undiscovered pools in the MM4 P play, the mean mean size is 5.267 MMBOE, which is substantially smaller than the 20.225 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 16.108 MMBOE.

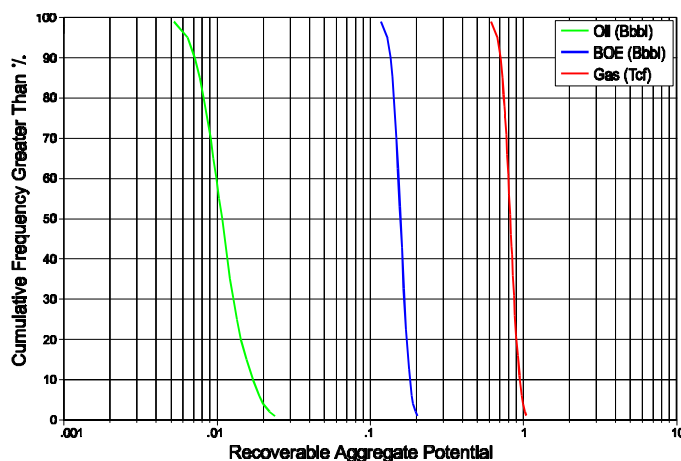


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	79	0.098	6.525	1.259
Cumulative production	--	0.083	5.136	0.997
Remaining proved	--	0.015	1.389	0.262
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.017	1.806	0.339
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.006	0.674	0.129
Mean	30	0.011	0.823	0.158
5th percentile	--	0.019	0.984	0.189
Total Endowment				
95th percentile	--	0.121	9.005	1.727
Mean	109	0.126	9.154	1.756
5th percentile	--	0.134	9.315	1.787

The largest pools in this play are modeled as already discovered. Relative to the discovered pools, undiscovered pools are expected to range from small to moderate in size. Their contribution to the play's BOE mean total endowment is only 9 percent. Future discoveries may occur between existing fields in this well explored play.

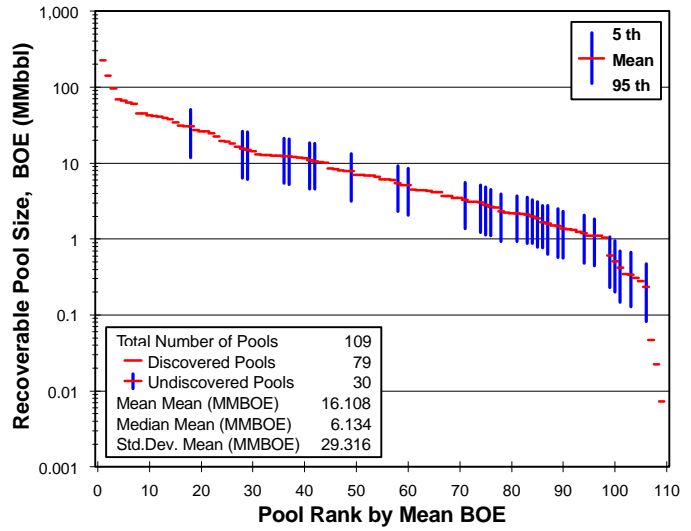


Figure 4. Pool rank plot.

LOWER MIDDLE MIOCENE FAN (MM4 F) PLAY

PLAY DESCRIPTION

The established Lower Middle Miocene Fan (MM4 F) play occurs within the *Gyroidina* "K," *Cristellaria* 54/*Eponides* 14, *Robulus* 43, and *Amphistegina* "B" biozones. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the MM4 F play continues onshore into Louisiana or is bounded by the shelf/slope break associated with the *Amphistegina* "B" biozone and grades into the deposits of the Lower Middle Miocene Progradational (MM4 P) play. To the southwest, the MM4 F play extends into Texas offshore State waters and Mexican national waters. To the northeast, the play is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the MM4 depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by MM4 sand development in the OCS G08512-1 well in Atwater block 471.

Two major depocenters were active in both upper lower Miocene (LM4) and MM4 times, one centered in the Texas area and the other centered in the Louisiana area. Fan deposition in the underlying LM4 chronozone is best developed in the Mustang Island to Brazos Areas offshore Texas. During MM4 time, fans appear best developed farther east from the High Island to Vermilion Areas.

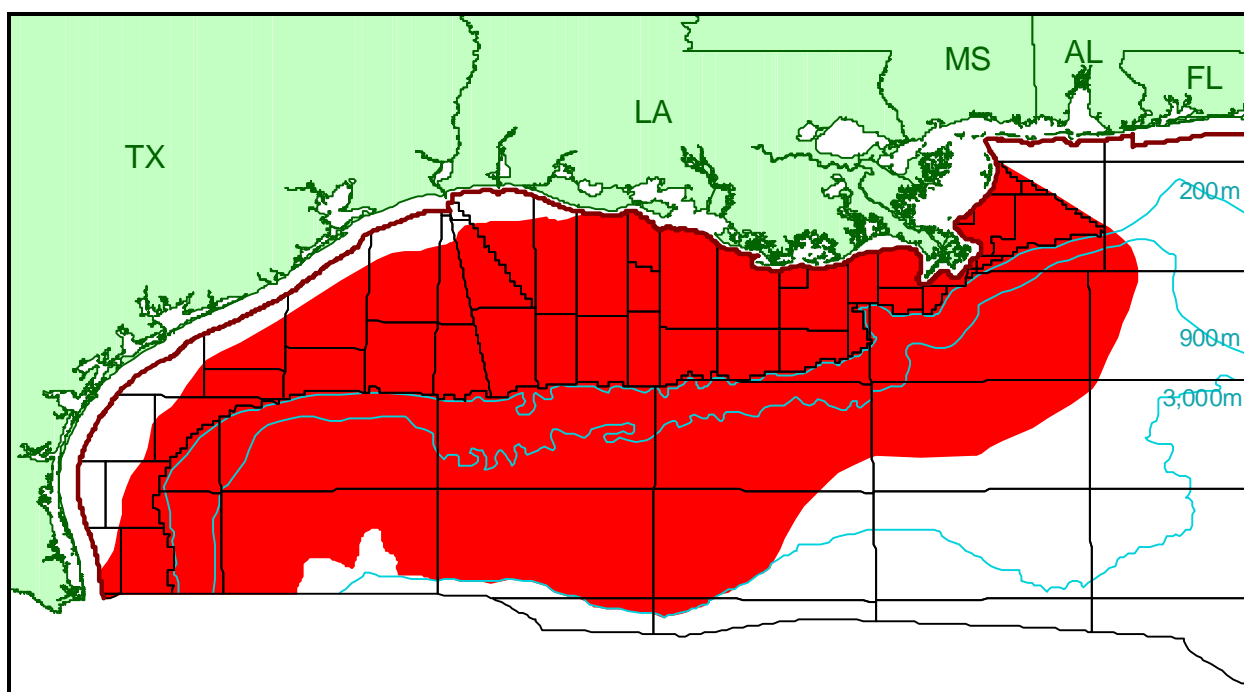


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The productive MM4 F play consists of deepwater turbidites deposited in fan systems as channel fill, fan lobes, and fringe sheet sediments on the MM4 slope. Normal faults are the major structural feature in this play. Less common structures include anticlines and growth faults. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

East Cameron 60 is the type field, and Vastar Resources Inc.'s PQ sand represents the MM4 F play in this field.

DISCOVERIES

The MM4 F gas play contains total reserves of 0.042 Bbo and 1.316 Tcfg (0.276 BBOE), of which 0.024 Bbo and 0.871 Tcfg (0.179 BBOE) have been produced. The play contains 24 producible sands in 10 pools (table 1). The first reserves in the play were discovered in the East Cameron 49 field in 1955 (figure 2). The maximum yearly total reserves were added in 1978 with the discovery of the largest pool in the play in the Vermilion 14 field. Only one pool was discovered in any given year in the MM4 F play. Two of these pools, the Vermilion 14 and 24 fields, account for over 75 percent of the BOE total reserves in the play. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

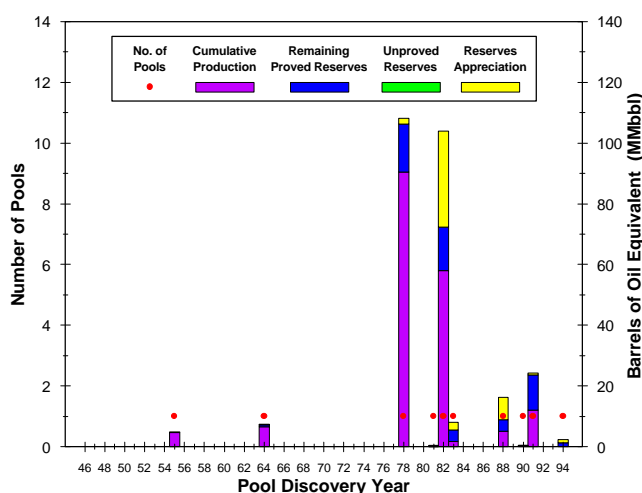


Figure 2. Exploration history graph.

The 10 discovered pools range in size from 0.490 to 108.225 MMBOE. These pools contain 26 reservoirs, of which 25 are nonassociated gas and 1 is undersaturated oil.

The 10 discovered pools range in size from 0.490 to 108.225 MMBOE. These pools contain 26 reservoirs, of which 25 are nonassociated gas and 1 is undersaturated oil.

Table 1. Characteristics of the discovered pools.

10 Pools (24 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	25	43	55
Subsea depth (feet)	10,127	13,898	18,000
Number of sands per pool	1	2	7
Porosity	18%	23%	28%
Water saturation	19%	30%	56%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the MM4 F play is 1.00. The play contains a mean total endowment of 0.252 Bbo and 5.375 Tcfg (1.208 BBOE) (table 2). Fifteen percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.187 to 0.234 Bbo and 3.666 to 4.458 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.210 Bbo and 4.059 Tcfg (0.932 BBOE). These undiscovered

resources may occur in as many as 75 pools. The largest undiscovered pool, with a mean size of 72.829 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 4, 5, 6, and 7 on the pool rank plot. For all the undiscovered pools in the MM4 F play, the mean mean size is 12.422 MMBOE, which is significantly smaller than the 27.610 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and

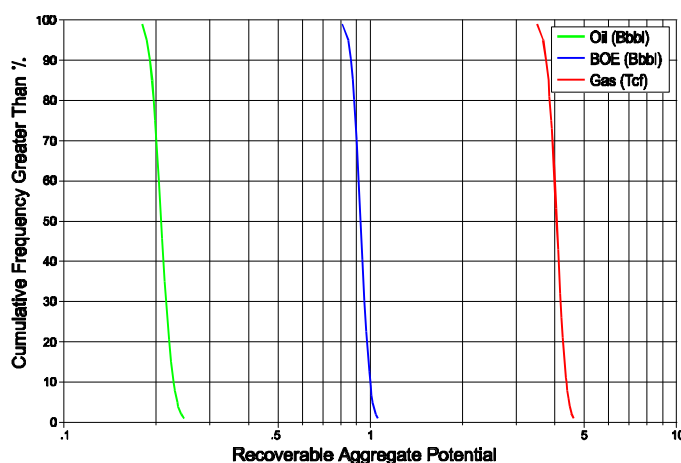


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	10	0.034	1.105	0.231
Cumulative production	--	0.024	0.871	0.179
Remaining proved	--	0.010	0.234	0.051
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.008	0.211	0.046
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.187	3.666	0.846
Mean	75	0.210	4.059	0.932
5th percentile	--	0.234	4.458	1.019
Total Endowment				
95th percentile	--	0.229	4.982	1.122
Mean	85	0.252	5.375	1.208
5th percentile	--	0.276	5.774	1.295

undiscovered, is 14.209 MMBOE.

Of the 61 plays in the Gulf of Mexico Region, the MM4 F play is projected to contain the eighth largest amount of mean undiscovered gas resources at 4 percent.

A large unexplored area supports the potential for numerous discoveries in the play. Relative to the discovered pools, undiscovered pools are modeled to occur at all pool-size levels, accounting for 77 percent of the play's BOE mean total endowment. Potential for discoveries occurs to the west, east, and downdip of existing fields where the MM4 fan deposits have not been reached by drilling. Specifically, MM4 fan deposits have not as yet been identified west of the High Island Area in the Federal offshore, but they are assumed to be present downdip of the well-developed MM4 P play.

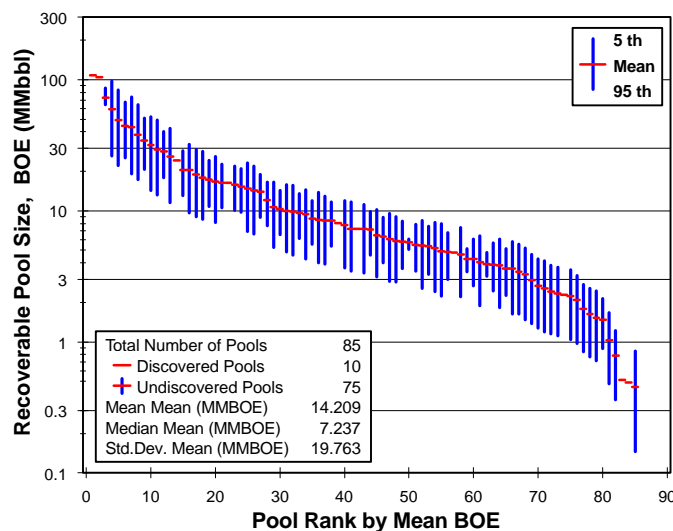


Figure 4. Pool rank plot.

UPPER LOWER MIOCENE (LM4) CHRONOZONE

CHRONOZONE DESCRIPTION

The Upper Lower Miocene (LM4) chronozone corresponds to the *Marginulina ascensionensis* and *Discorbis bolivina* biozones. The LM4 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. Depositional styles present in the LM4 chronozone include retrogradational, aggradational, progradational, and fan, each of which defines a play: the Upper Lower Miocene Retrogradational (LM4 R) play, the Upper Lower Miocene Aggradational (LM4 A) play, the Upper Lower Miocene Progradational (LM4 P) play, and the Upper Lower Miocene Fan (LM4 F) play.

The potential for sand development within the LM4 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, LM4 sands extend onshore into Texas and Louisiana. To the southwest, sand potential extends into Texas offshore State waters and Mexican national waters. To the northeast, sand potential is bounded by the Cretaceous carbonate shelf edge and by a decrease in sediment influx at the edge of the LM4 depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by LM4 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the LM4 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. In the offshore Texas area, no significant lateral shift in depocenter is observed from the underlying middle lower Miocene (LM2) chronozone to the LM4 chronozone. However, the ancient Texas delta systems had prograded more basinward by LM4 time, depositing

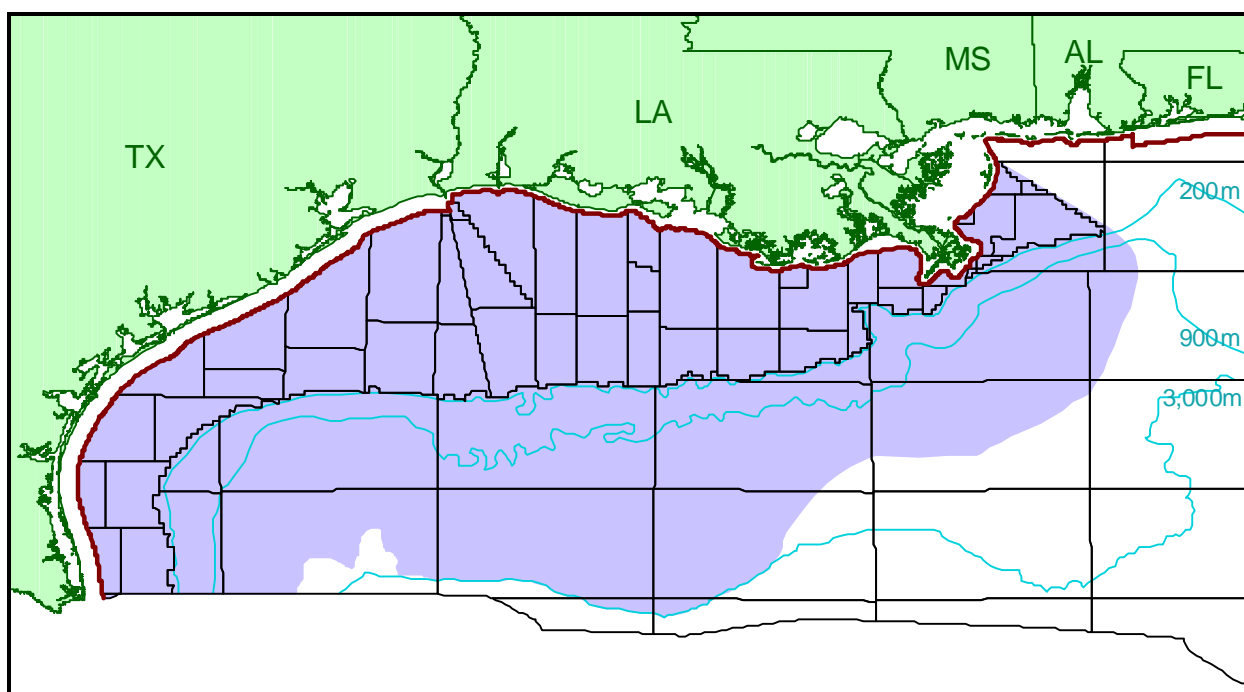


Figure 1. Map of assessed chronozone.

retrogradational and aggradational sediments in the present-day offshore Texas area.

Similarly in the offshore Louisiana area, no significant lateral shift in depocenter is observed from the LM2 chronozone to the LM4 chronozone. There still were no retrogradational or aggradational sediments offshore Louisiana through LM4 time.

Normal faults, anticlines, and growth faults are the dominant structural features in the LM4 chronozone. Less common structures include shale diapirs and rotational slump blocks.

DISCOVERIES

The LM4 chronozone contains 69 discovered pools in four plays (table 1). Total reserves in the chronozone are 0.043 Bbo and 4.482 Tcfg (0.841 BBOE), of which 0.030 Bbo and 2.377 Tcfg (0.453 BBOE) have been produced. The largest number of discoveries in the LM4 chronozone occurred when 10 pools were added in 1982 (figure 2). However, the maximum yearly total reserves of 152.424 MMBOE were added in 1988 when nine pools were discovered.

Of the four plays in the LM4 chronozone, the LM4 P play contains the most total reserves in 41 pools, with 0.040 Bbo and 3.458 Tcfg (0.655 BBOE).

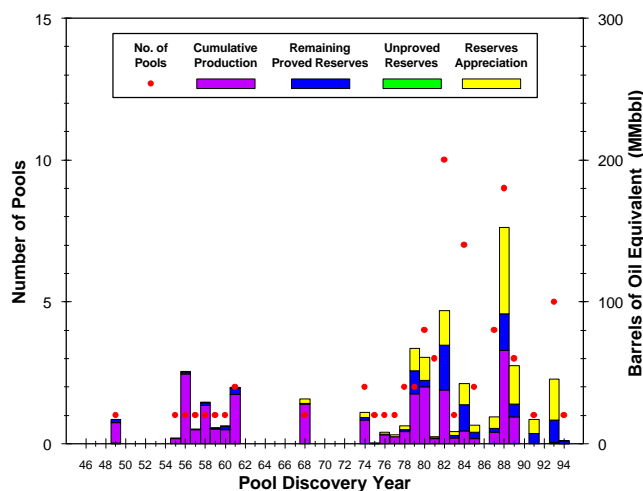


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

69 Pools (196 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	29	94	215
Subsea depth (feet)	5,230	8,947	13,250
Number of sands per pool	1	3	13
Porosity	20%	26%	31%
Water saturation	10%	30%	54%

ASSESSMENT RESULTS

The LM4 chronozone contains 181 pools (discovered plus undiscovered), with a mean total endowment estimated at 0.144 Bbo and 9.163 Tcfg (1.775 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 112 pools, which contain a range of 0.065 to 0.148 Bbo and 3.596 to 5.953 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.101 Bbo and 4.681 Tcfg (0.934 BBOE) are projected. These undiscovered resources represent 53 percent of the LM4 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the largest in the chronozone (figure 4).

Of the four LM4 plays, the LM4 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.090 Bbo and 3.446 Tcfg (0.703 BBOE) remaining to be found in 78 pools. These undiscovered resources in

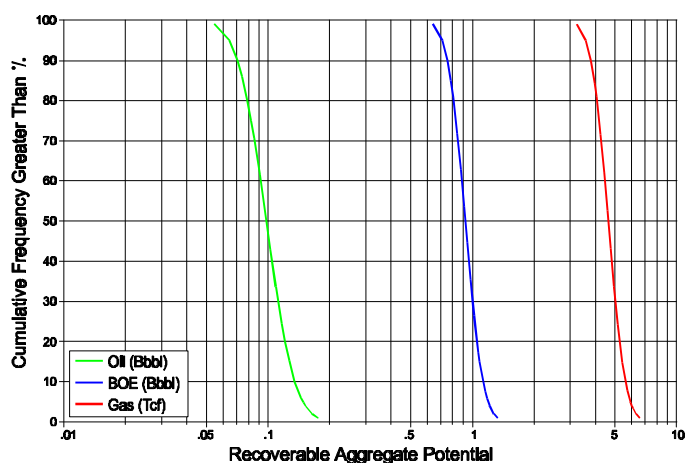


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	69	0.036	3.227	0.610
Cumulative production	--	0.030	2.377	0.453
Remaining proved	--	0.006	0.849	0.157
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.007	1.255	0.231
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.065	3.596	0.712
Mean	112	0.101	4.681	0.934
5th percentile	--	0.148	5.953	1.195
Total Endowment				
95th percentile	--	0.108	8.078	1.553
Mean	181	0.144	9.163	1.775
5th percentile	--	0.191	10.435	2.036

the LM4 F play represent 40 percent of the BOE mean total endowment for the LM4 chronozone. This high percentage and the potential for numerous discoveries within a large unexplored area make the LM4 F play an attractive exploration target in LM4 strata.

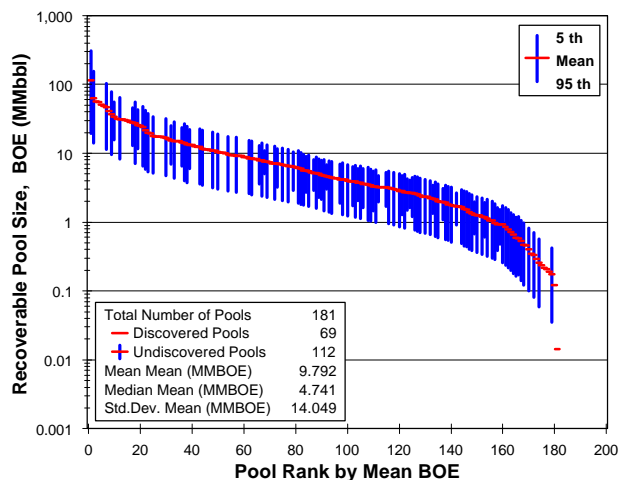


Figure 4. Pool rank plot.

UPPER LOWER MIOCENE RETROGRADATIONAL (LM4 R) PLAY

PLAY DESCRIPTION

The established Upper Lower Miocene Retrogradational (LM4 R) play occurs at the *Discorbis bolivarensis* biozone. This play extends from the North Padre Island Area to the northwestern edge of the Brazos Area offshore Texas. There are no discovered retrogradational sands in offshore Louisiana (figure 1).

Updip, the play continues onshore into Texas. Downdip, the play grades into the deposits of the Upper Lower Miocene Aggradational (LM4 A) and Upper Lower Miocene Progradational (LM4 P) plays.

The location of the LM4 R play is a result of an ancient depocenter located in the Texas area. No significant lateral shift in this depocenter is observed in the offshore Texas area from the underlying middle lower Miocene (LM2) chronozone to the LM4 chronozone. However, the ancient delta systems had prograded more basinward by LM4 time, depositing the retrogradational sands that compose this play in the present-day offshore Texas area. Middle lower Miocene retrogradational sediments have not been discovered as yet in offshore Texas.

PLAY CHARACTERISTICS

The productive LM4 R play is characterized by upward-fining, back-stepping sands. These reworked marine deposits include channel/levee complexes, distributary mouth bars, barrier bars, and delta fringe sands. The deposits in this play are associated with a significant marine transgression defined by the *Discorbis bolivarensis* biozone. These retrogradational deposits cap either the aggradational or progradational sediments of the LM4 chronozone. Major structural features in this play are anticlines and normal faults.

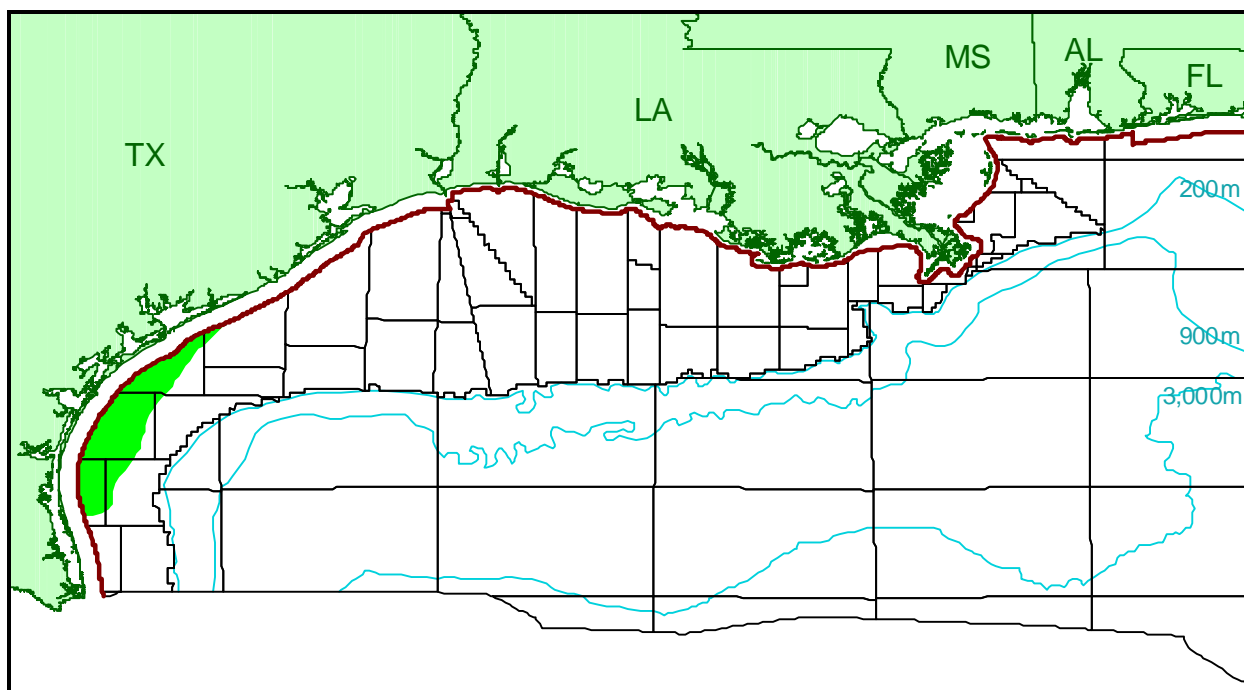


Figure 1. Map of assessed play.

Less common structures are growth faults and shale diapirs. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive retrogradational depositional environments, structures, or seals.

Matagorda Island 703 is the type field, and Vastar Resources Inc.'s FT/1234 sand represents the LM4 R play in this field.

DISCOVERIES

The LM4 R gas play contains total reserves of 0.002 Bbo and 0.503 Tcfg (0.091 BBOE), of which 0.001 Bbo and 0.161 Tcfg (0.029 BBOE) have been produced. The play contains 29 producible sands in 15 pools (table 1). The first reserves in the play were discovered in the Mustang Island 757 field in 1976 (figure 2). The maximum yearly total reserves of 25.313 MMBOE were added in 1982 when six pools were discovered, including the largest pool in the play in the Matagorda Island 703 field. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

The 15 discovered pools range in size from 0.192 to 19.261 MMBOE. These pools contain 38 reservoirs, all of which are nonassociated gas.

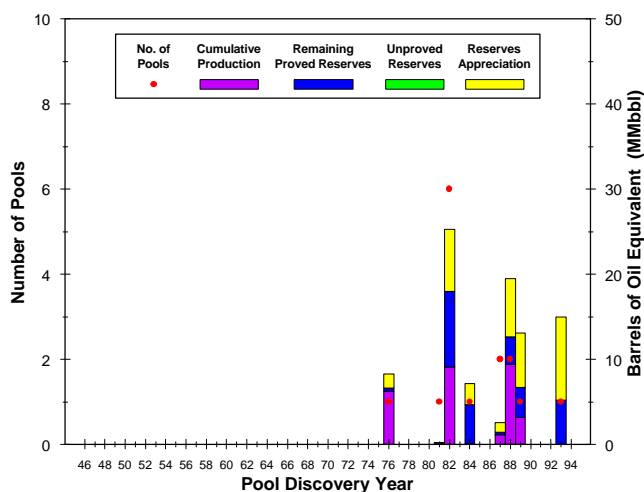


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

15 Pools (29 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	77	125	215
Subsea depth (feet)	5,230	7,457	11,091
Number of sands per pool	1	2	4
Porosity	22%	27%	31%
Water saturation	19%	36%	54%

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	15	0.001	0.306	0.055
Cumulative production	--	0.001	0.161	0.029
Remaining proved	--	<0.000	0.145	0.026
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.001	0.197	0.036
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.092	0.016
Mean	8	<0.001	0.114	0.020
5th percentile	--	<0.001	0.139	0.025
Total Endowment				
95th percentile	--	0.002	0.595	0.107
Mean	23	0.002	0.617	0.111
5th percentile	--	0.002	0.642	0.116

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM4 R play is 1.00. The play ranks within the smallest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.002 Bbo and 0.617 Tcfg (0.111 BBOE) (table 2). Twenty-six percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered oil resources are insignificant (<0.001 Bbbl) and that undiscovered gas resources have a range of 0.092 to 0.139 Tcf at the 95th and 5th percentiles, respectively (figure 3). The estimated amount of mean undiscovered gas is 0.114 Tcf (0.020 BBOE). These undiscovered resources may occur in as many as eight pools. The largest undiscovered pool, with a mean size of 5.168 MMBOE, is modeled as the seventh largest pool in the play (figure 4). For all the undiscovered pools in the LM4 R play, the mean mean size is 2.572 MMBOE, which is smaller than the 6.074 MMBOE

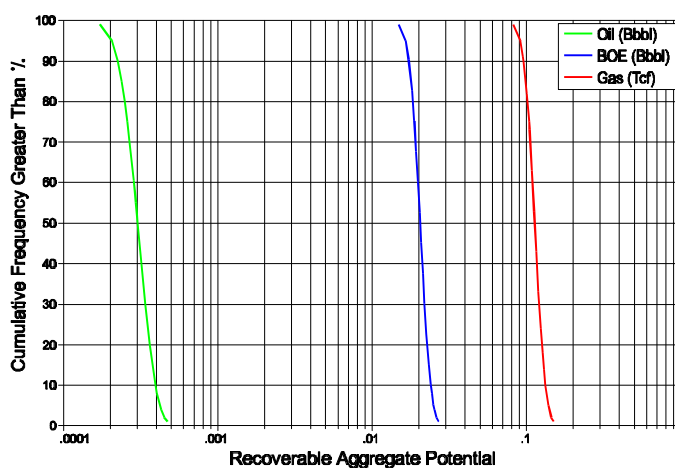


Figure 3. Cumulative probability distribution.

mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 4.856 MMBOE.

The LM4 R play is well explored. Relative to the discovered pools in the play, the undiscovered pools are expected to be moderate in size. These undiscovered resources are expected to contribute only 18 percent to the play's BOE mean total endowment. Limited interfield exploration potential exists in small untested structures and stratigraphic traps.

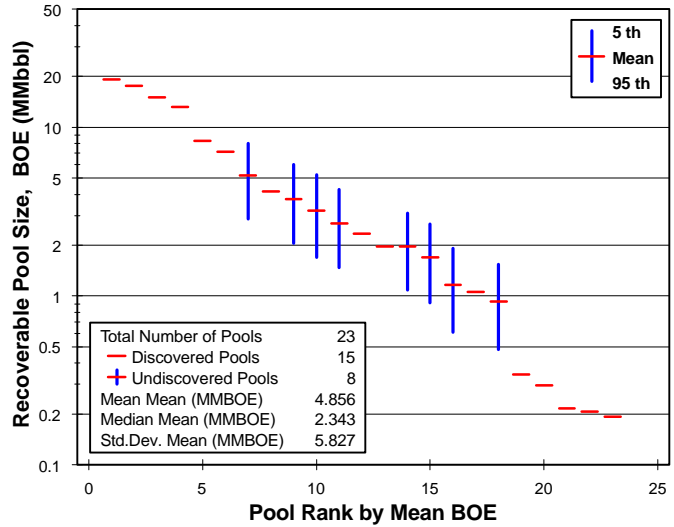


Figure 4. Pool rank plot.

UPPER LOWER MIOCENE AGGRADATIONAL (LM4 A) PLAY

PLAY DESCRIPTION

The established Upper Lower Miocene Aggradational (LM4 A) play occurs within the *Marginulina ascensionensis* and *Discorbis bolivarensis* biozones. This play extends from the North Padre Island Area to the eastern edge of the Matagorda Island Area offshore Texas. There are no discovered aggradational sands in offshore Louisiana (figure 1).

Updip and along strike, the play continues onshore into Texas. Downdip, the play grades into the deposits of the Upper Lower Miocene Progradational (LM4 P) play.

The location of the LM4 A play is a result of an ancient depocenter located in the Texas area. No significant lateral shift in this depocenter is observed from the underlying middle lower Miocene (LM2) chronozone to the LM4 chronozone. However, the ancient delta systems had prograded more basinward by LM4 time, depositing the aggradational sands that compose this play. Middle lower Miocene aggradational sediments have not been discovered as yet in offshore Texas.

PLAY CHARACTERISTICS

The productive LM4 A play is characterized by a thick, shelf-building section with coarse sands, often blocky in log character. These sands were deposited in delta plain and adjacent shallow-water environments and include channels and stacked channels, distributary mouth bars, shelf blanket deposits, crevasse splays, and delta fringe deposits. Major structural features in this play are normal faults, growth faults, and anticlines. Less common structures include shale diapirs. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the

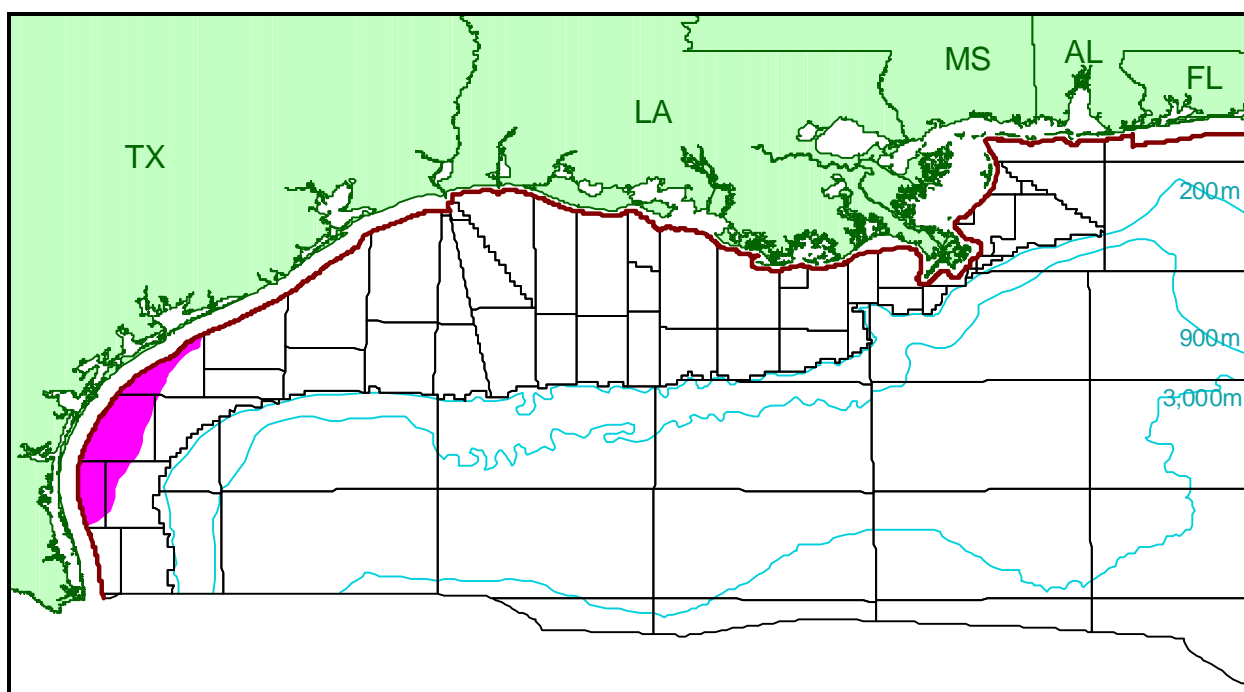


Figure 1. Map of assessed play.

aforementioned productive aggradational depositional environments, structures, or seals.

Mustang Island 31A is the type field, and Chevron USA Inc.'s MP-2, MP-3A, MP-3C, and MP4B sands represent the LM4 A play in this field.

DISCOVERIES

The LM4 A gas play contains total reserves of 1.270 MMbo and 505.949 Bcfg (91.296 MMBOE), of which 0.395 MMbo and 154.089 Bcfg (27.813 MMBOE) have been produced. The play contains 27 producible sands in 11 pools (table 1). The first reserves in the play were discovered in the Mustang Island 757 field in 1977 (figure 2). The maximum yearly total reserves were added in 1982 with the discovery of the largest pool in the play in the Mustang Island 31A field. The most recent discoveries, prior to this study's cutoff date of January 1, 1995, were in 1993.

The 11 discovered pools range in size from 0.123 to 30.765 MMBOE. These pools contain 33 reservoirs, all of which are nonassociated gas.

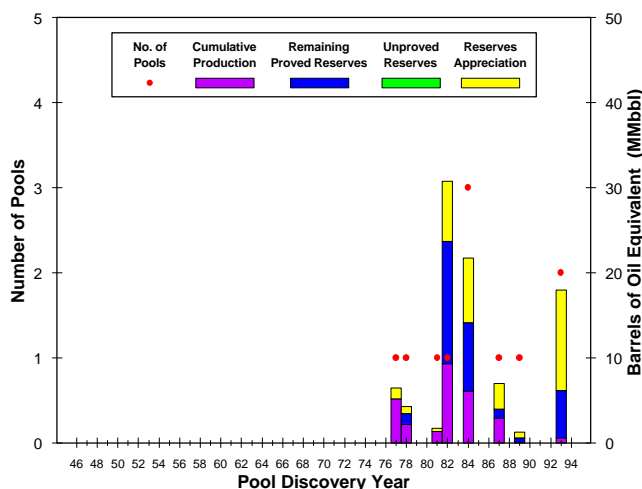


Figure 2. Exploration history graph.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM4 A play is 1.00. The play ranks within the smallest one-third of all 61 Gulf of Mexico Region plays, based on a mean total endowment of 0.002 Bbo and 0.628 Tcfg (0.114 BBOE) (table 2). Twenty-four percent of this BOE mean total endowment has been produced.

Table 1. Characteristics of the discovered pools.

11 Pools (27 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	108	144	215
Subsea depth (feet)	6,310	7,899	11,930
Number of sands per pool	1	2	4
Porosity	21%	26%	30%
Water saturation	10%	29%	40%

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	11	0.001	0.325	0.059
Cumulative production	--	<0.001	0.154	0.028
Remaining proved	--	0.001	0.171	0.031
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.180	0.033
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.103	0.019
Mean	8	0.001	0.122	0.023
5th percentile	--	0.003	0.142	0.028
Total Endowment				
95th percentile	--	0.001	0.609	0.110
Mean	19	0.002	0.628	0.114
5th percentile	--	0.004	0.648	0.119

Assessment results indicate that undiscovered resources have a range of less than 0.001 to 0.003 Bbo and 0.103 to 0.142 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.001 Bbo and 0.122 Tcfg (0.023 BBOE). These undiscovered resources may occur in as many as eight pools. The largest undiscovered pool, with a mean size of 7.610 MMBOE, is modeled as the fifth largest pool in the play (figure 4). For all the undiscovered pools in the LM4 A play, the mean mean size is 2.886 MMBOE, which is smaller than the 8.300 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 6.020 MMBOE.

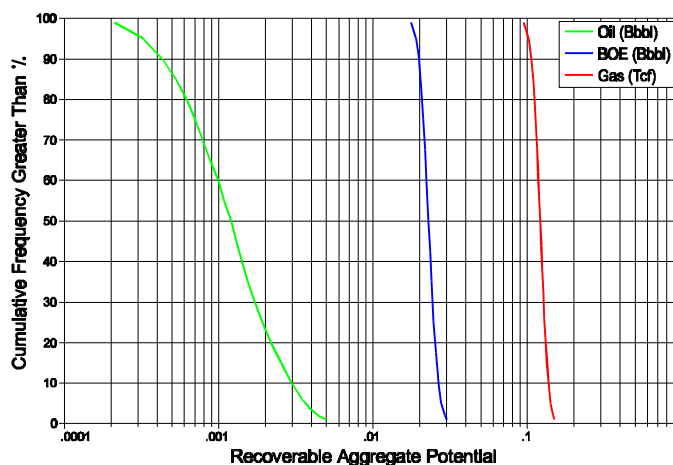


Figure 3. Cumulative probability distribution.

Relative to the discovered pool sizes in the LM4 A play, the undiscovered pools are expected to be small to moderate, contributing 20 percent to the play's BOE mean total endowment. This is a result of the relatively small number of seals in this sand-rich, aggradational depositional environment. Limited interfield exploration potential exists for untested structures.

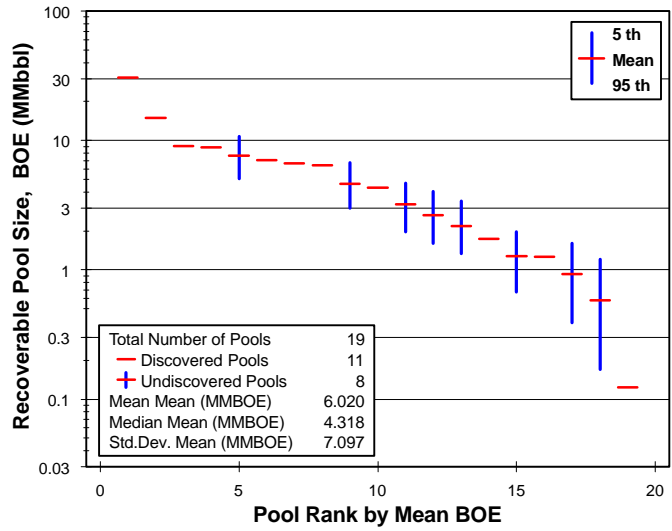


Figure 4. Pool rank plot.

UPPER LOWER MIOCENE PROGRADATIONAL (LM4 P) PLAY

PLAY DESCRIPTION

The established Upper Lower Miocene Progradational (LM4 P) play occurs within the *Marginulina ascensionensis* and *Discorbis bolivarensis* biozones. This play extends from the South Padre Island Area offshore Texas to the South Marsh Island Area offshore Louisiana (figure 1).

Updip and along strike, the play continues onshore into Texas and Louisiana. Downdip, the play grades into the deposits of the Upper Lower Miocene Fan (LM4 F) play.

Productive and established sand locations in the LM4 P play are a result of two separate depocenters in LM4 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed from the underlying middle lower Miocene (LM2) chronozone to the LM4 chronozone. However, the progradational sands of this play occur farther basinward than those deposited in LM2 time, indicative of the prograding nature of the ancient delta systems.

PLAY CHARACTERISTICS

The productive LM4 P play consists of progradational deltaic sediments deposited in delta fringe, shelf blanket, delta front, channel, slump, and crevasse splay environments. Major structural features in this play are normal faults, anticlines, shale diapirs, and growth faults. Less common structures include unconformities and rotational slump blocks. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

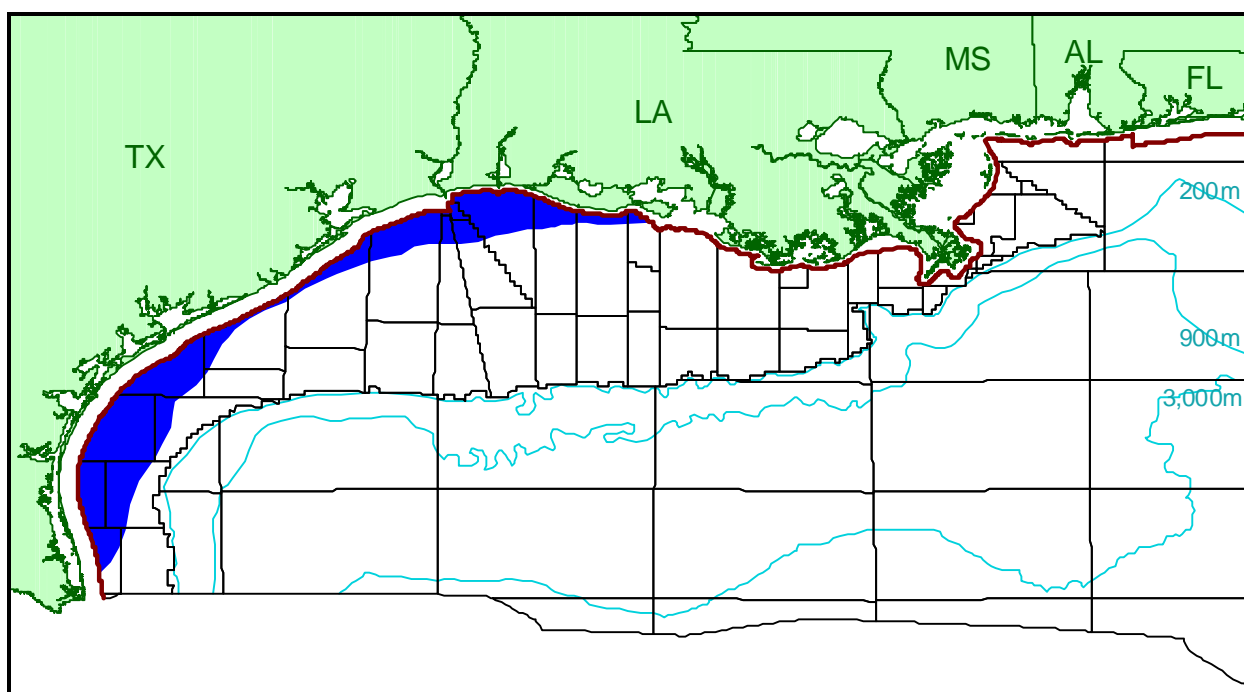


Figure 1. Map of assessed play.

Matagorda Island 527 is the type field. Seagull Energy E & P Inc.'s 8200, 8300, 8600, 8700, 9000, 9100, 9200, and LO (equals Elf Exploration's EL) sands; Enron Oil and Gas Company's D, D2, E, F, G, and H sands; McMoRan Oil & Gas Company's H sand; and Elf Exploration's H sand represent the LM4 P play in this field.

DISCOVERIES

The LM4 P gas play contains total reserves of 0.040 Bbo and 3.458 Tcfg (0.655 BBOE), of which 0.029 Bbo and 2.054 Tcfg (0.395 BBOE) have been produced. The play contains 137 producible sands in 41 pools (table 1). The first reserves in the play were discovered in the West Cameron 45 field in 1949 (figure 2). The maximum yearly total reserves of 132.951 MMBOE were added in 1988 with the discovery of seven pools. However, the largest pool in the play was found in 1979 in the Matagorda Island 527 field. In fact, pools discovered in 1979 or later contain 64 percent of the play's total reserves.

The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 41 discovered pools range in size from 0.235 to 56.135 MMBOE. These pools contain 265 reservoirs, of which 248 are nonassociated gas, 10 are undersaturated oil, and 7 are saturated oil.

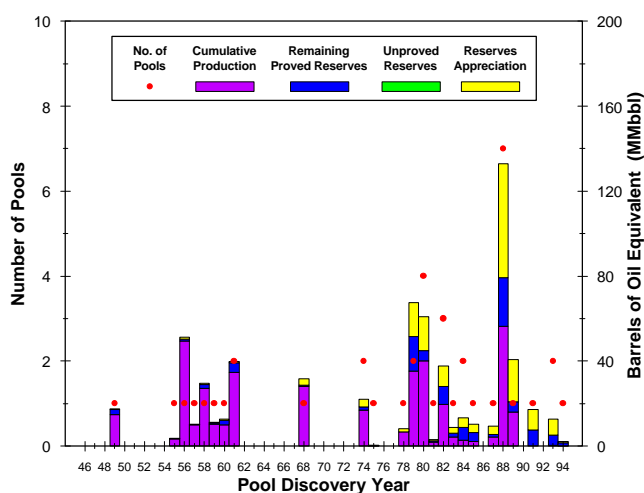


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

41 Pools (137 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	29	66	145
Subsea depth (feet)	6,130	9,575	12,947
Number of sands per pool	1	3	13
Porosity	20%	26%	31%
Water saturation	16%	29%	41%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM4 P play is 1.00. The play contains a mean total endowment of 0.050 Bbo and 4.457 Tcfg (0.843 BBOE) (table 2). Forty-seven percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.006 to 0.015 Bbo and 0.817 to 1.205 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.010 Bbo and 0.999 Tcfg

(0.188 BBOE). These undiscovered resources may occur in as many as 18 pools. The largest undiscovered pool, with a mean size of 34.057 MMBOE, is modeled as the sixth largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 11, 12, 18, and 19 on the pool rank plot. For all the undiscovered pools in the LM4 P play, the mean mean size is 10.421 MMBOE, which is smaller than the 15.976 MMBOE mean size of the discovered pools. The mean mean size

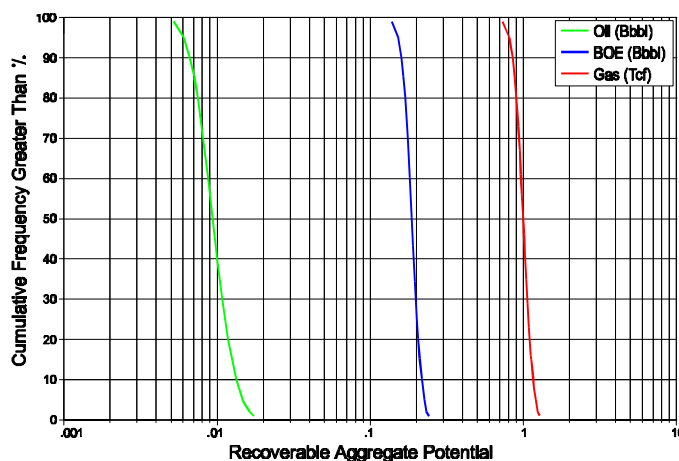


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	41	0.034	2.586	0.494
Cumulative production	--	0.029	2.054	0.395
Remaining proved	--	0.005	0.531	0.099
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.006	0.872	0.161
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.006	0.817	0.152
Mean	18	0.010	0.999	0.188
5th percentile	--	0.015	1.205	0.226
Total Endowment				
95th percentile	--	0.046	4.275	0.807
Mean	59	0.050	4.457	0.843
5th percentile	--	0.055	4.663	0.881

for all pools, including both discovered and undiscovered, is 14.282 MMBOE.

The LM4 P play is well explored. Relative to the discovered pools, most undiscovered pools are expected to be moderate in size. These undiscovered resources account for 22 percent of the BOE mean total endowment for the play. Interfield exploration potential exists for untested structures.

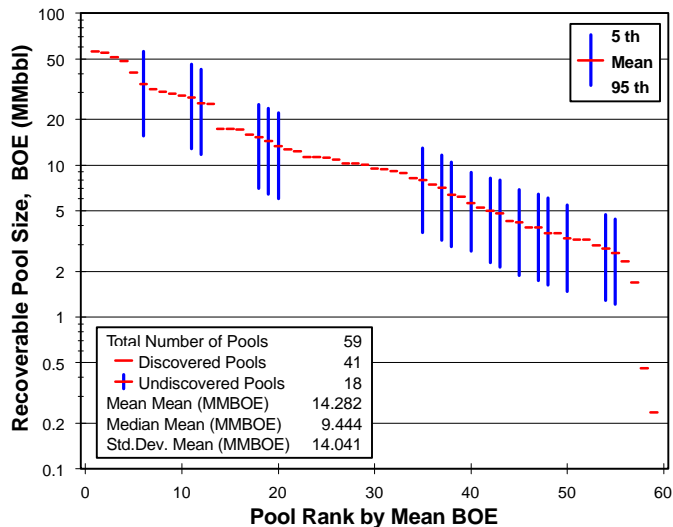


Figure 4. Pool rank plot.

UPPER LOWER MIOCENE FAN (LM4 F) PLAY

PLAY DESCRIPTION

The established Upper Lower Miocene Fan (LM4 F) play occurs within the *Marginulina ascensionensis* and *Discorbis bolivarensis* biozones. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1)

Updip, the play is either limited by the shelf/slope break associated with the *Discorbis bolivarensis* biozone and grades into the sediments of the Upper Lower Miocene Progradational (LM4 P) play, or it continues onshore into Texas and Louisiana. To the southwest, the LM4 F play extends into Texas offshore State waters and Mexican national waters. To the northeast, the play potential is bounded by the Cretaceous carbonate shelf edge and by a decrease in sediment influx at the edge of the LM4 depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by LM4 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the LM4 F play are a result of two separate depocenters in LM4 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed from the underlying middle lower Miocene (LM2) chronozone to the LM4 chronozone. However, both the Texas and Louisiana shelf/slope breaks occur farther basinward in LM4 time, indicative of the prograding nature of the ancient delta systems.

PLAY CHARACTERISTICS

The productive LM4 F play consists of deepwater turbidites deposited in fan systems as fan lobes on the LM4 slope. Major structural features in this play are anticlines

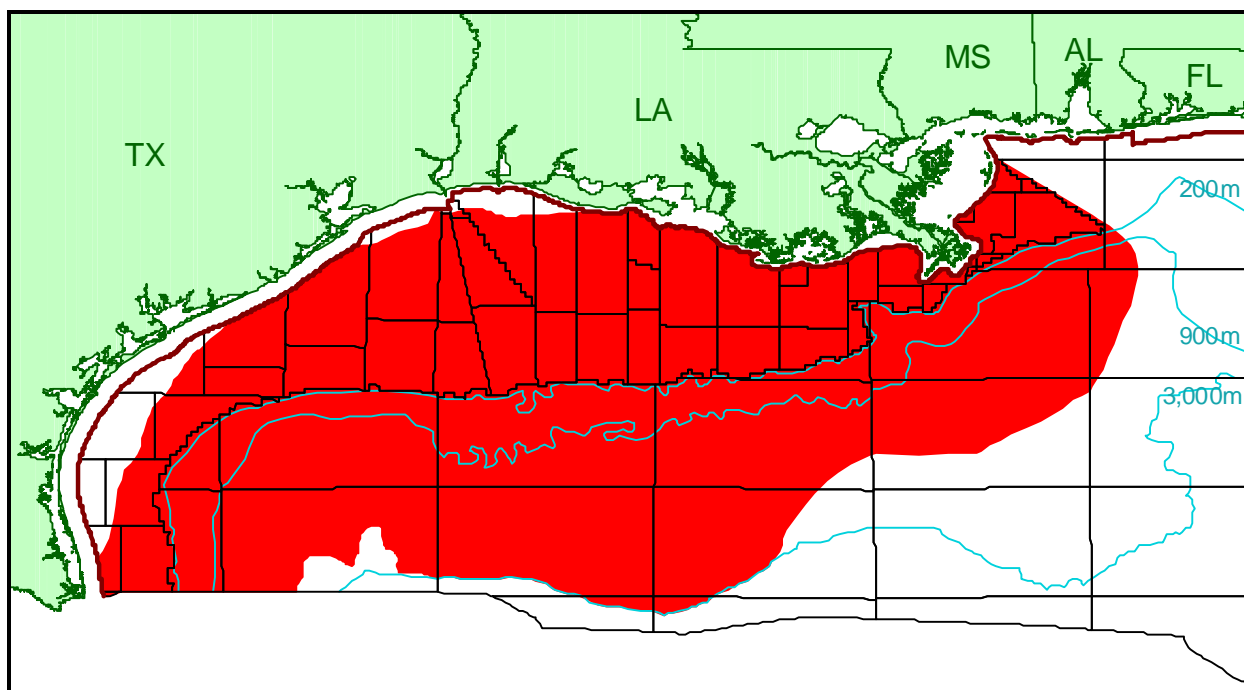


Figure 1. Map of assessed play.

and growth faults. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Matagorda Island 639 is the type field, and Louisiana Land and Exploration's 1st MARG A and 13200 sands represent the LM4 F play in this field.

DISCOVERIES

The LM4 F gas play contains total reserves of 0.340 MMbo and 15.357 Bcfg (3.073 MMBOE), of which 0.165 MMbo and 7.870 Bcfg (1.565 MMBOE) have been produced. The play contains only three producible sands, each with one nonassociated gas reservoir, in two pools (table 1). The first reserves in the play were discovered in the Mustang Island 90A field in 1984 (figure 2). The largest pool, with 3.058 MMBOE, was found in 1985 in the Matagorda Island 639 field.

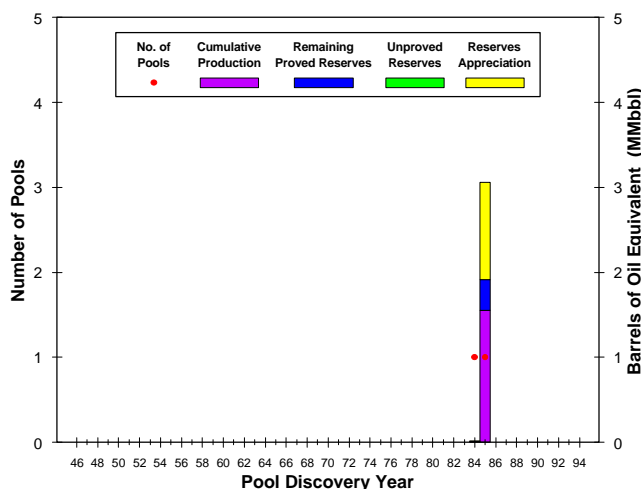


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

2 Pools (3 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	112	151	189
Subsea depth (feet)	12,800	13,025	13,250
Number of sands per pool	1	2	2
Porosity	21%	24%	26%
Water saturation	23%	31%	39%

ASSESSMENT RESULTS

Because of limited data for the LM4 F play, the Upper Pliocene Fan (UP F) play was used as an analog to model pool sizes in the LM4 F play. The UP F play was selected as the analog because of similarities in depositional setting, structural style, hydrocarbon type, and statistical information.

The marginal probability of hydrocarbons for the LM4 F play is 1.00. The play contains a mean total endowment of 0.090 Bbo and 3.461 Tcfg (0.706 BBOE) (table 2).

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	2	<0.001	0.010	0.002
Cumulative production	--	<0.001	0.008	0.002
Remaining proved	--	<0.001	0.002	<0.001
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	<0.001	0.006	0.001
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.056	2.499	0.538
Mean	78	0.090	3.446	0.703
5th percentile	--	0.133	4.594	0.943
Total Endowment				
95th percentile	--	0.056	2.514	0.541
Mean	80	0.090	3.461	0.706
5th percentile	--	0.133	4.609	0.946

Less than 1 percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.056 to 0.133 Bbo and 2.499 to 4.594 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.090 Bbo and 3.446 Tcfg (0.703 BBOE). These undiscovered resources may occur in as many as 78 pools, with the top 43 largest pools modeled as undiscovered accumulations (figure 4). The largest undiscovered pool has a mean size of 114.310 MMBOE. For all the undiscovered pools in the LM4 F play, the mean mean size is 8.983 MMBOE.

Because of a large unexplored area in the play, numerous pools are expected to be found, accounting for nearly all of the play's mean total endowment. There are no discovered fields in this play as yet in offshore Louisiana, and hence, this area represents good exploration potential. Limited exploration potential exists in the Brazos and

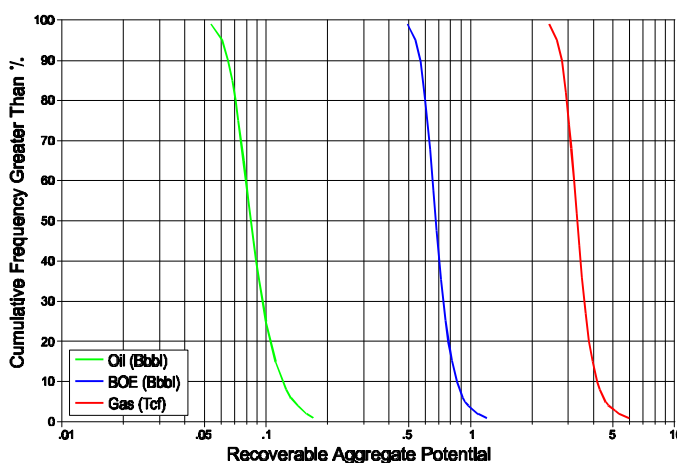


Figure 3. Cumulative probability distribution.

Galveston Areas offshore Texas because of sparse sand development.

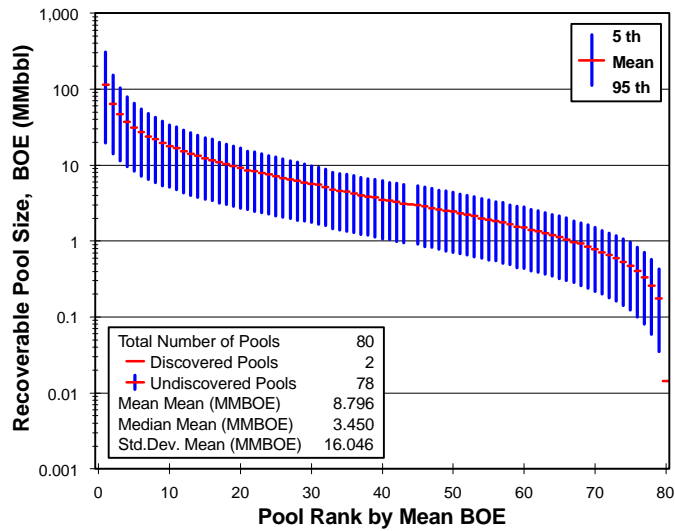


Figure 4. Pool rank plot.

MIDDLE LOWER MIOCENE (LM2) CHRONOZONE

CHRONOZONE DESCRIPTION

The Middle Lower Miocene (LM2) chronozone corresponds to the *Siphonina davisii* biozone. The LM2 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. There are two depositional styles present in the LM2 chronozone, progradational and fan, with both defining a play: the Middle Lower Miocene Progradational (LM2 P) play and the Middle Lower Miocene Fan (LM2 F) play.

The potential for sand development within the LM2 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, LM2 sands extend onshore into Texas and Louisiana. To the southwest, sand potential extends into Texas offshore State waters and Mexican national waters. To the northeast, sand potential is bounded by the Cretaceous carbonate shelf edge and by a decrease in sediment influx at the edge of the LM2 depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by LM2 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the LM2 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. As in lower lower Miocene (LM1) time, retrogradational and aggradational sands were being deposited only in the present-day onshore areas of Texas and Louisiana during LM2 time. Only progradational and fan sediments were being deposited in the offshore areas of Texas and Louisiana.

In the offshore Texas area, no significant lateral shift in depocenter is observed from

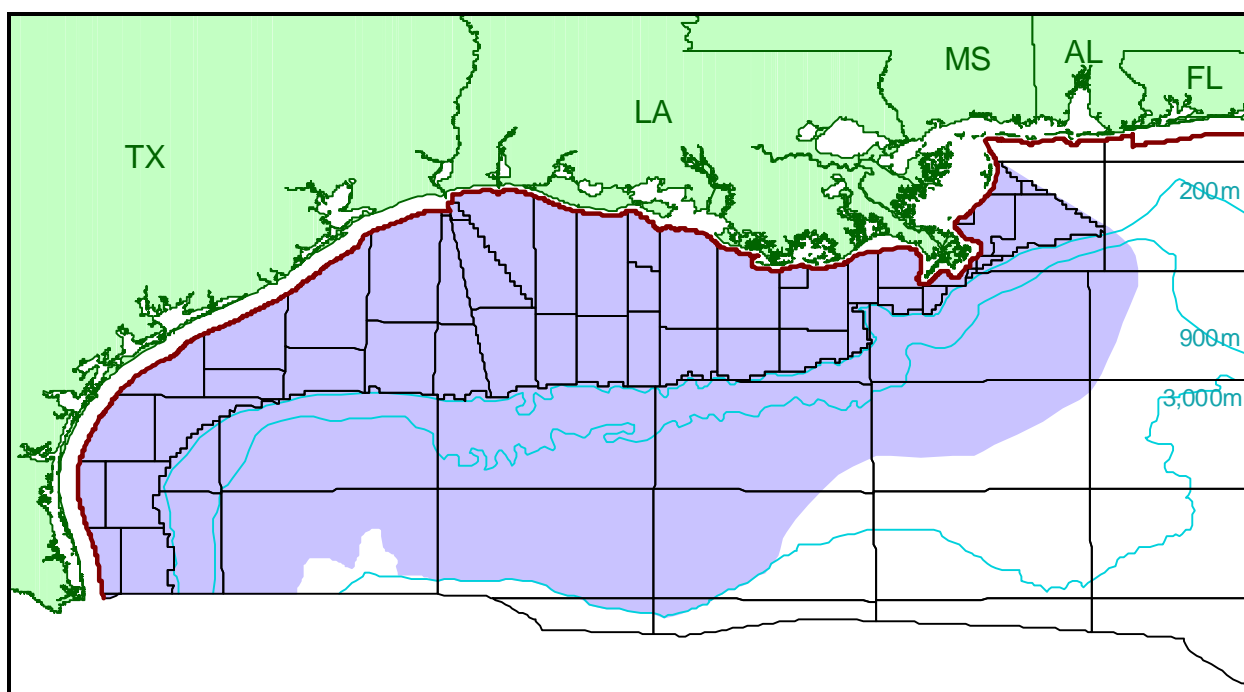


Figure 1. Map of assessed chronozone.

the underlying LM1 chronozone to the LM2 chronozone. However, LM2 progradational deposits occur more basinward than LM1 progradational deposits. Similarly in the offshore Louisiana area, no significant lateral shift in depocenter is observed from the LM1 chronozone to the LM2 chronozone. Both chronozones have progradational and fan sediments over generally the same area offshore Louisiana.

Normal faults, anticlines, and growth faults are the dominant structural features in the LM2 chronozone. Less common structures include shale diapirs and rotational slump blocks.

DISCOVERIES

The LM2 chronozone contains 44 discovered pools in two plays (table 1). Total reserves in the chronozone are 0.044 Bbo and 4.965 Tcfg (0.927 BBOE), of which 0.030 Bbo and 2.440 Tcfg (0.464 BBOE) have been produced. The largest number of discoveries in the LM2 chronozone occurred when seven pools were added in 1980 (figure 2). However, the maximum yearly total reserves of 242.451 MMBOE were added in 1956 when two pools were discovered.

Of both plays in the LM2 chronozone, the LM2 P play contains the most total reserves in 29 pools, with 0.029 Bbo and 3.374 Tcfg (0.630 BBOE).

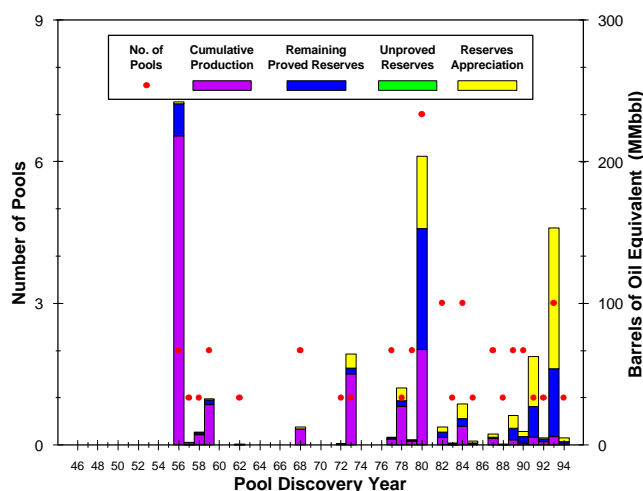


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

44 Pools (140 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	24	68	177
Subsea depth (feet)	6,285	10,745	15,080
Number of sands per pool	1	3	18
Porosity	17%	26%	33%
Water saturation	16%	29%	48%

ASSESSMENT RESULTS

The LM2 chronozone contains 83 pools (discovered plus undiscovered), with a mean total endowment estimated at 0.069 Bbo and 7.493 Tcfg (1.402 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 39 pools, which contain a range of 0.018 to 0.035 Bbo and 2.122 to 2.979 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.025 Bbo and 2.528 Tcfg (0.475 BBOE) are projected. These undiscovered resources represent 34 percent of the LM2 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the seventh largest in the chronozone (figure 4).

Of both LM2 plays, the LM2 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.015 Bbo and 1.546 Tcfg (0.290 BBOE) remaining to be found in 29 pools. These undiscovered resources in the LM2 F play represent 21 percent of the BOE mean total endowment for the LM2

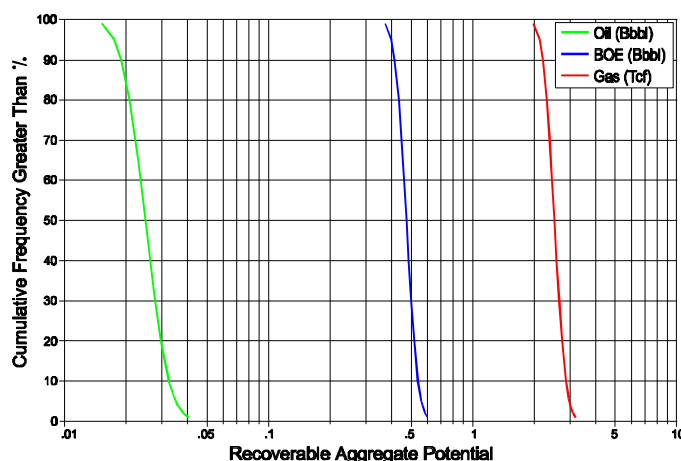


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	44	0.038	3.628	0.683
Cumulative production	--	0.030	2.440	0.464
Remaining proved	--	0.008	1.187	0.219
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.006	1.337	0.244
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.018	2.122	0.399
Mean	39	0.025	2.528	0.475
5th percentile	--	0.035	2.979	0.560
Total Endowment				
95th percentile	--	0.062	7.087	1.326
Mean	83	0.069	7.493	1.402
5th percentile	--	0.079	7.944	1.487

chronozone. This percentage and the potential for numerous discoveries within a large unexplored area make the LM2 F play an attractive exploration target in LM2 strata.

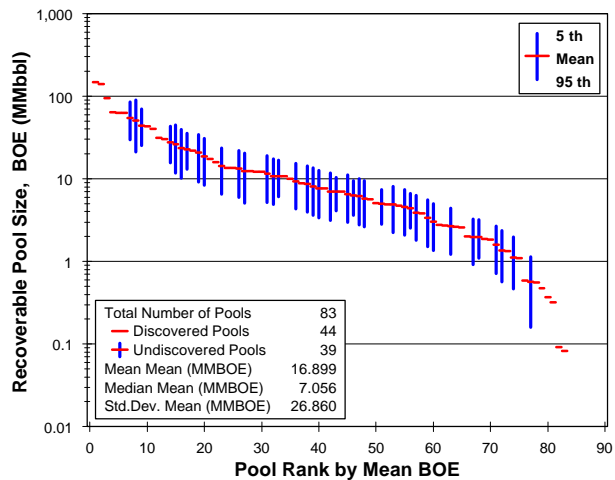


Figure 4. Pool rank plot.

MIDDLE LOWER MIOCENE PROGRADATIONAL (LM2 P) PLAY

PLAY DESCRIPTION

The established Middle Lower Miocene Progradational (LM2 P) play occurs at the *Siphonina davisii* biozone. This play consists of two separate regions: (1) a western region that extends from the northernmost portion of the South Padre Island Area to the western edge of the Brazos Area offshore Texas and (2) an eastern region that extends from the northeastern portion of the Galveston Area offshore Texas to the northernmost South Marsh Island Area offshore Louisiana (figure 1).

In the western region, updip and along strike, the play continues onshore into Texas. Downdip, the play grades into the deposits of the Middle Lower Miocene Fan (LM2 F) play. Similarly, in the eastern region, updip and along strike, the LM2 P play continues onshore into Texas and Louisiana. Downdip, the play grades into the deposits of the LM2 F play.

The locations of the western and eastern regions of the LM2 P play are a result of two separate depocenters in LM2 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed from the underlying lower lower Miocene (LM1) chronozone to the LM2 chronozone. However, in both regions of this play, the progradational sands occur farther basinward than those of the LM1 chronozone, indicative of the prograding nature of the ancient delta systems.

PLAY CHARACTERISTICS

The productive LM2 P play consists of progradational deltaic sediments deposited in delta fringe, shelf blanket, delta front, channel, and crevasse splay environments. Major structural features in this play are normal faults, growth faults, and anticlines. Less common structures include shale diapirs and rotational slump blocks. Seals are provided

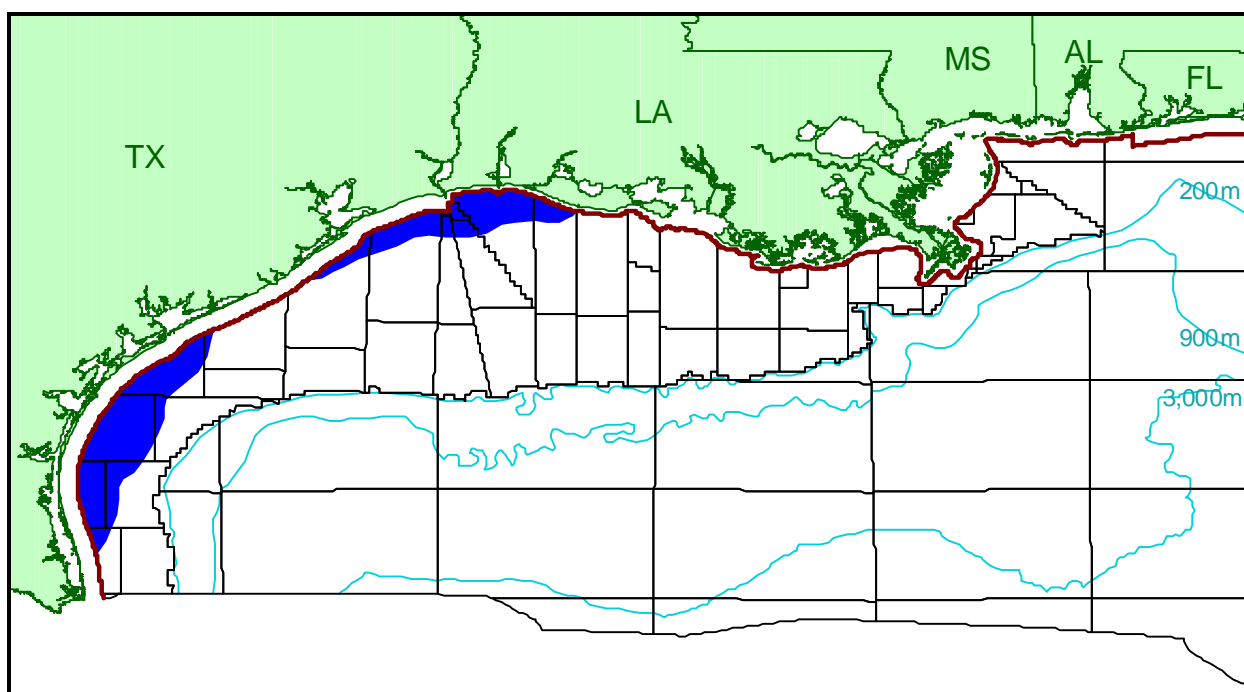


Figure 1. Map of assessed play.

by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

West Cameron 45 is the type field. Pennzoil Petroleum Company's D01, D02, D04, D06, D08, D10, E01, E04, E08, F04, F06, and F09 sands; Midcontinent Offshore Inc.'s D01, D04, E04, E08, E09, F06, F09, PLANIA, PLAN3, PLAN4, PLAN5, PLAN6, and PLAN7 sands; and BP Exploration & Oil Inc.'s "Rose" (equals Forest Oil Corp.'s ROB6 and Hall-Houston Oil Company's 9600) sand represent the LM2 P play in this field.

DISCOVERIES

The LM2 P gas play contains total reserves of 0.029 Bbo and 3.374 Tcfg (0.630 BBOE), of which 0.020 Bbo and 1.424 Tcfg (0.273 BBOE) have been produced. The play contains 93 producible sands in 29 pools (table 1). The first and largest pool in the play was discovered in the West Cameron 45 field in 1956 (figure 2). The maximum yearly total reserves of 150.716 MMBOE were added in 1993 with the discovery of two pools. In fact, almost 75 percent of the total reserves in this play were found after 1976. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1994.

The 29 discovered pools range in size from 0.082 to 147.782 MMBOE. These pools contain 167 reservoirs, of which 155 are nonassociated gas, 5 are undersaturated oil, and 7 are saturated oil.

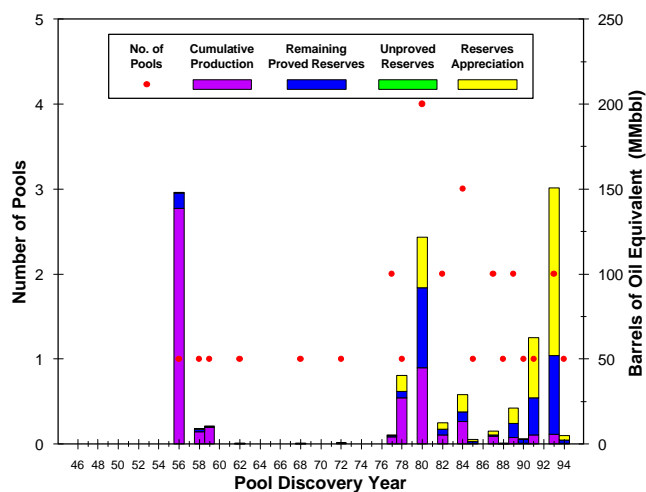


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

29 Pools (93 Producibile Sands)	Minimum	Mean	Maximum
Water depth (feet)	24	74	177
Subsea depth (feet)	6,285	9,965	14,630
Number of sands per pool	1	3	18
Porosity	17%	27%	33%
Water saturation	16%	29%	47%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM2 P play is 1.00. The play contains a mean total endowment of 0.039 Bbo and 4.356 Tcfg (0.815 BBOE) (table 2). Thirty-four percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.005 to 0.016 Bbo and 0.777 to 1.219 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.010 Bbo and 0.982 Tcfg (0.185 BBOE). These undiscovered

resources may occur in as many as 10 pools. The largest undiscovered pool, with a mean size of 54.412 MMBOE, is modeled as the fifth largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 6, 9, 10, and 17 on the pool rank plot. For all the undiscovered pools in the LM2 P play, the mean mean size is 18.474 MMBOE, which is comparable to the 21.712 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and

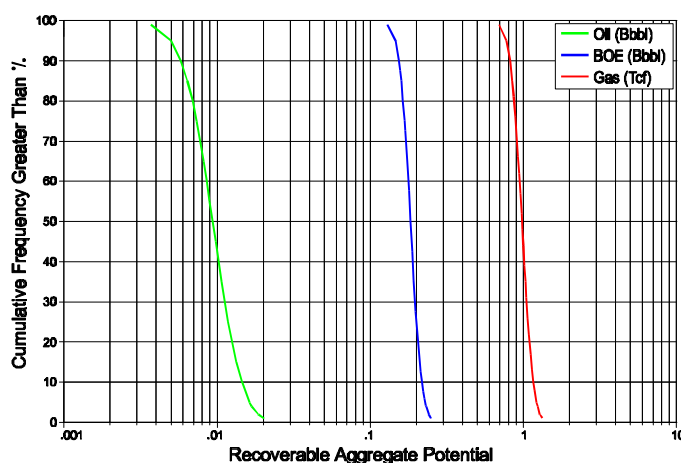


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	29	0.025	2.258	0.427
Cumulative production	--	0.020	1.424	0.273
Remaining proved	--	0.005	0.834	0.154
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.005	1.116	0.203
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.005	0.777	0.146
Mean	10	0.010	0.982	0.185
5th percentile	--	0.016	1.219	0.228
Total Endowment				
95th percentile	--	0.034	4.151	0.776
Mean	39	0.039	4.356	0.815
5th percentile	--	0.045	4.593	0.858

undiscovered, is 20.882 MMBOE.

The LM2 P play is well explored, with few pools expected to be found. The undiscovered resources account for 23 percent of the play's BOE mean total endowment. Limited interfield exploration potential exists for untested structures.

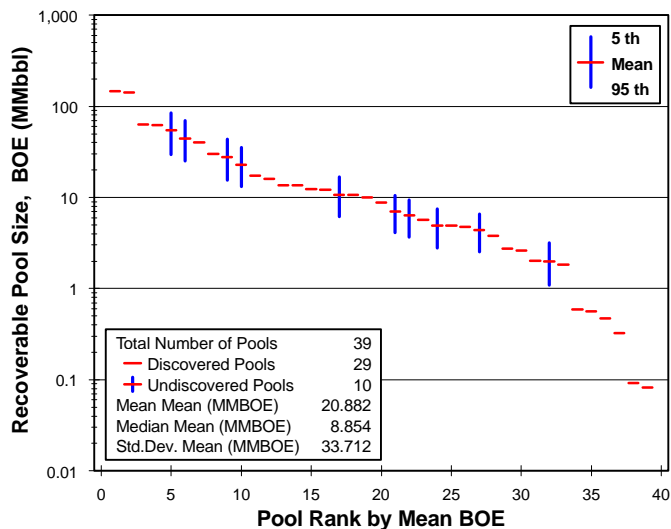


Figure 4. Pool rank plot.

MIDDLE LOWER MIOCENE FAN (LM2 F) PLAY

PLAY DESCRIPTION

The established Middle Lower Miocene Fan (LM2 F) play occurs at the *Siphonina davisii* biozone. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Texas and Louisiana, except in the High Island, Mustang Island, and North Padre Island Areas, where the play is limited by the shelf/slope break associated with the *Siphonina davisii* biozone and grades into the sediments of the Middle Lower Miocene Progradational (LM2 P) play. To the southwest, the LM2 F play extends into Texas offshore State waters and Mexican national waters. To the northeast, the play potential is bounded by the Cretaceous carbonate shelf edge and by a decrease in sediment influx at the edge of the LM2 depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by LM2 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the LM2 F play are a result of two separate depocenters in LM2 time, one in the Texas area and the other in the Louisiana area. No significant lateral shift in either depocenter is observed from the underlying lower Miocene (LM1) chronozone to the LM2 chronozone.

PLAY CHARACTERISTICS

The productive LM2 F play consists of deepwater turbidites deposited in fan systems as fan lobes, fringe sheet sediments, and channel fill on the LM2 slope. Major structural features in this play are normal faults and anticlines. Shale diapirs and growth

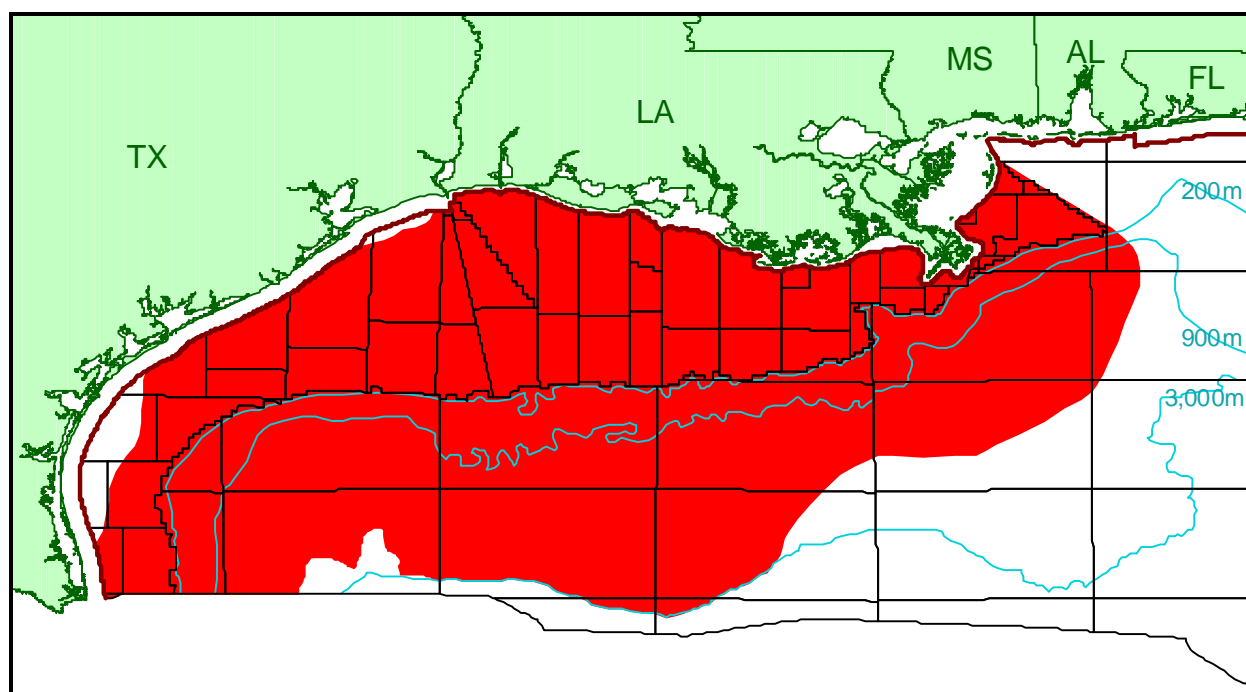


Figure 1. Map of assessed play.

faults also occur, but less commonly. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Matagorda Island 668 is the type field. Vastar Resources Inc.'s KR, KQ (equals Oxy USA Inc.'s 2MK), LJ, and LC (equals Oxy USA Inc.'s CM15) sands represent the LM2 F play in this field.

DISCOVERIES

The LM2 F gas play contains total reserves of 0.014 Bbo and 1.591 Tcfg (0.297 BBOE), of which 0.010 Bbo and 1.017 Tcfg (0.191 BBOE) have been produced. The play contains 47 producible sands in 15 pools (table 1). The first reserves in the play were discovered in the West Cameron 71 field in 1956 (figure 2). The maximum yearly total reserves were added in 1956 with the discovery of the largest pool in the play in the West Cameron 71 field. Eighty-five percent of the cumulative production from this play occurred from pools discovered prior to 1974. Though one-third of the discoveries occurred in 1982 or later, they added only 5 percent to the play's total reserves. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1993.

The 15 discovered pools range in size from 0.371 to 94.669 MMBOE. These pools contain 100 reservoirs, of which 99 are nonassociated gas and 1 is saturated oil.

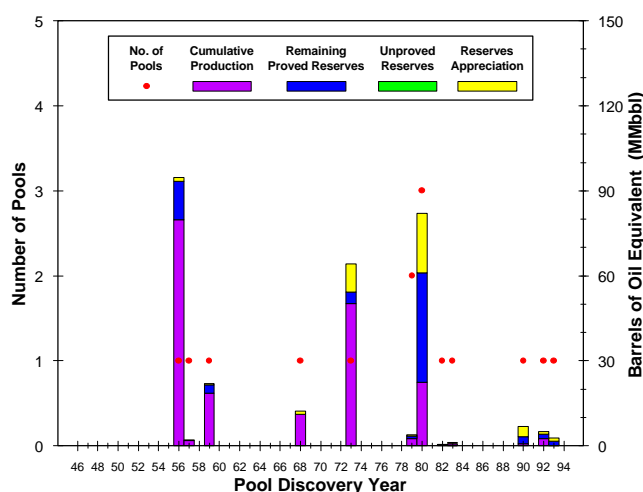


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

15 Pools (47 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	29	58	103
Subsea depth (feet)	9,536	12,252	15,080
Number of sands per pool	1	3	9
Porosity	19%	25%	32%
Water saturation	20%	30%	48%

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	15	0.013	1.370	0.257
Cumulative production	--	0.010	1.017	0.191
Remaining proved	--	0.003	0.353	0.065
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.001	0.221	0.041
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.011	1.282	0.239
Mean	29	0.015	1.546	0.290
5th percentile	--	0.020	1.840	0.345
Total Endowment				
95th percentile	--	0.025	2.873	0.536
Mean	44	0.029	3.137	0.587
5th percentile	--	0.034	3.431	0.642

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM2 F play is 1.00. The play contains a mean total endowment of 0.029 Bbo and 3.137 Tcfg (0.587 BBOE) (table 2). Thirty-three percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.011 to 0.020 Bbo and 1.282 to 1.840 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.015 Bbo and 1.546 Tcfg (0.290 BBOE). These undiscovered resources may occur in as many as 29 pools. The largest undiscovered pool, with a mean size of 50.841 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 6, 7, 9, and 10 on the pool rank plot. For all the undiscovered pools in the LM2 F play, the mean mean size is 10.025 MMBOE, which is smaller than the 19.830 MMBOE mean size of the discovered pools. The mean mean size

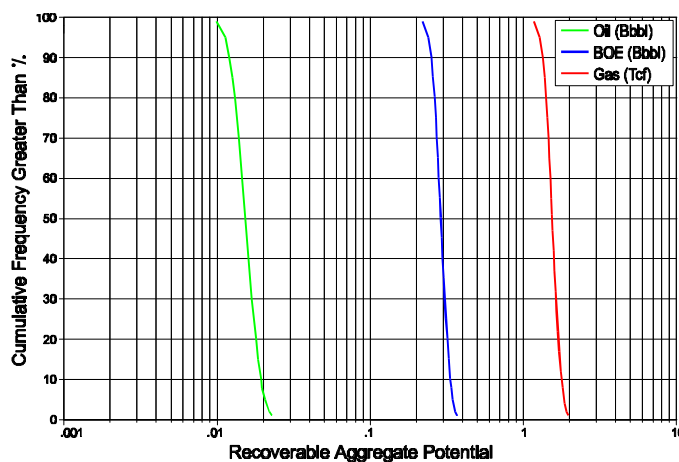


Figure 3. Cumulative probability distribution.

for all pools, including both discovered and undiscovered, is 13.368 MMBOE.

Of the 15 fan plays in the Gulf of Mexico Region, the LM2 F play contains the smallest mean total endowment (2%), based on BOE.

The LM2 F play has a large unexplored area. Numerous undiscovered pools, comparable to the range of sizes for the discovered pools, are expected to be found, accounting for nearly half of the play's mean total endowment. The greatest exploration potential exists downdip of discovered fields where wells have been too shallow to test the LM2 section. Limited exploration potential exists between the two productive areas of the play in the Brazos and Galveston Areas offshore Texas because of sparse sand development.

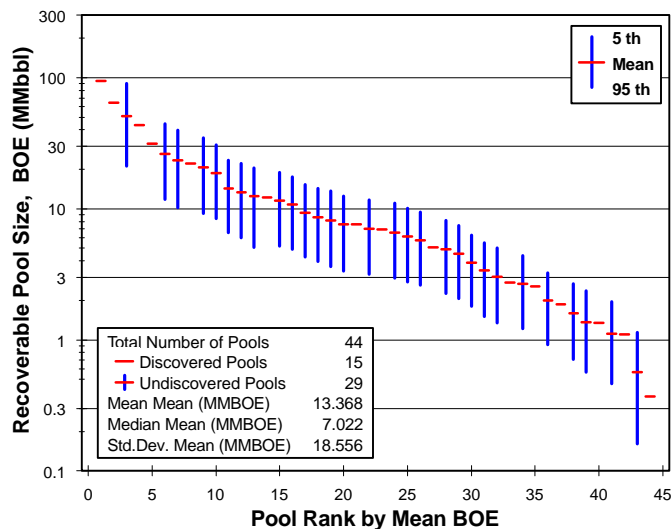


Figure 4. Pool rank plot.

Limited exploration potential exists between the two productive areas of the play in the Brazos and Galveston Areas offshore Texas because of sparse sand development.

LOWER LOWER MIOCENE (LM1) CHRONOZONE

CHRONOZONE DESCRIPTION

The Lower Lower Miocene (LM1) chronozone corresponds to the *Lenticulina hanseni* biozone. The LM1 section reflects delta systems prograding onto the continental shelf and fan deposition on the continental slope of the Gulf of Mexico Basin. There are two depositional styles present in the LM1 chronozone, progradational and fan, with both defining a play: the Lower Lower Miocene Progradational (LM1 P) play and the Lower Lower Miocene Fan (LM1 F) play.

The potential for sand development within the LM1 chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, sands in the LM1 chronozone extend onshore into Texas and Louisiana. To the southwest, sand potential extends into Texas offshore State waters and Mexican national waters. To the northeast, sand potential is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the LM1 depocenter. The downdip limit extends at least as far as the Sigsbee Escarpment as indicated by LM1 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the LM1 chronozone are a result of two ancient depocenters, one in the Texas area and the other in the Louisiana area. During LM1 time, retrogradational and aggradational sands were deposited in the present-day onshore Texas and Louisiana areas. Neither the Texas nor Louisiana ancient delta systems had prograded basinward enough at this time to deposit sediments other than progradational and fan in the present-day offshore areas.

Normal faults are the dominant structural feature in the LM1 chronozone. Less

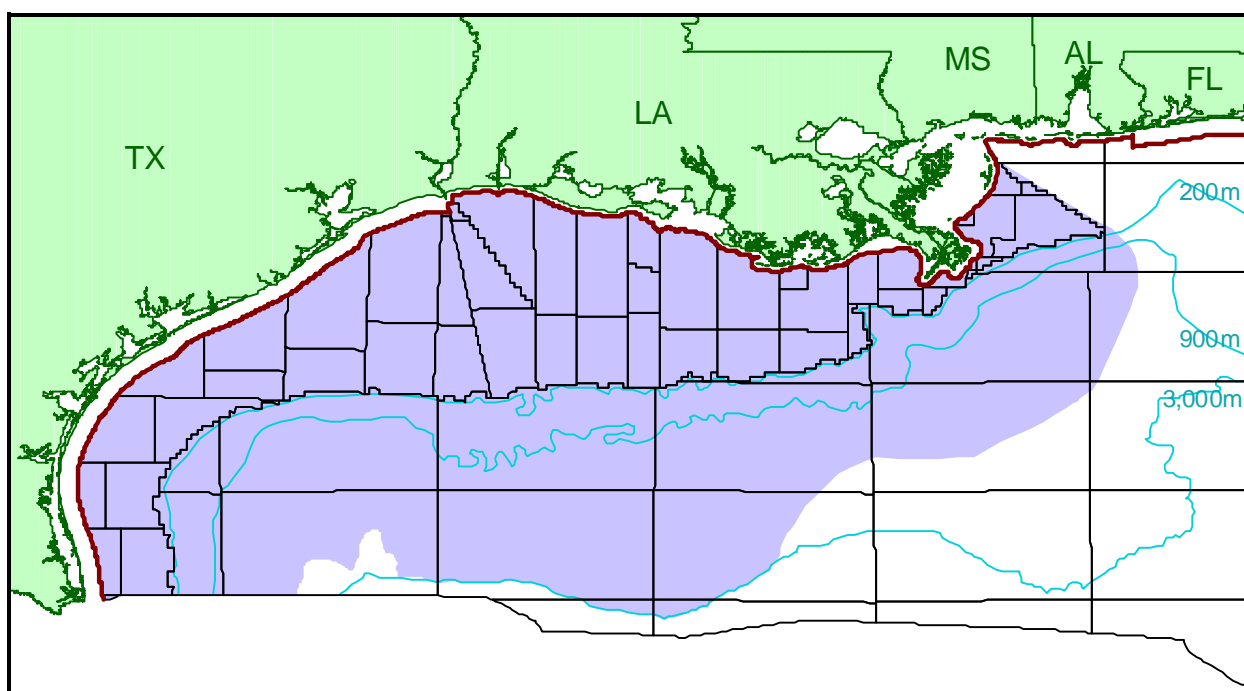


Figure 1. Map of assessed chronozone.

common structures include growth faults, shale diapirs, rotational slump blocks, and anticlines.

DISCOVERIES

The LM1 chronozone contains 20 discovered pools in two plays (table 1). Total reserves in the chronozone are 0.024 Bbo and 3.187 Tcfg (0.591 BBOE), of which 0.012 Bbo and 1.748 Tcfg (0.323 BBOE) have been produced. The largest number of discoveries in the LM1 chronozone occurred when five pools added the maximum yearly total reserves of 196.674 MMBOE in 1982 (figure 2).

Of both plays in the LM1 chronozone, the LM1 F play contains the most total reserves in 15 discovered pools, with 0.021 Bbo and 2.978 Tcfg (0.551 BBOE).

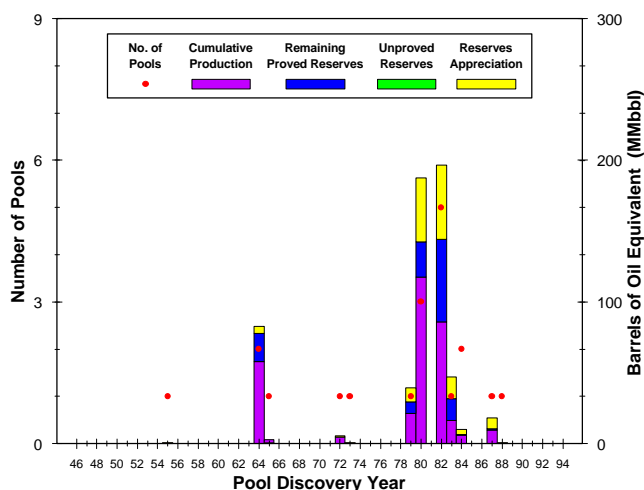


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

20 Pools (59 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	17	48	121
Subsea depth (feet)	11,024	13,424	18,250
Number of sands per pool	1	3	9
Porosity	16%	25%	31%
Water saturation	17%	30%	43%

ASSESSMENT RESULTS

The LM1 chronozone contains 59 pools (discovered plus undiscovered), with a mean total endowment estimated at 0.049 Bbo and 5.557 Tcfg (1.038 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 39 pools, which contain a range of 0.018 to 0.035 Bbo and 1.978

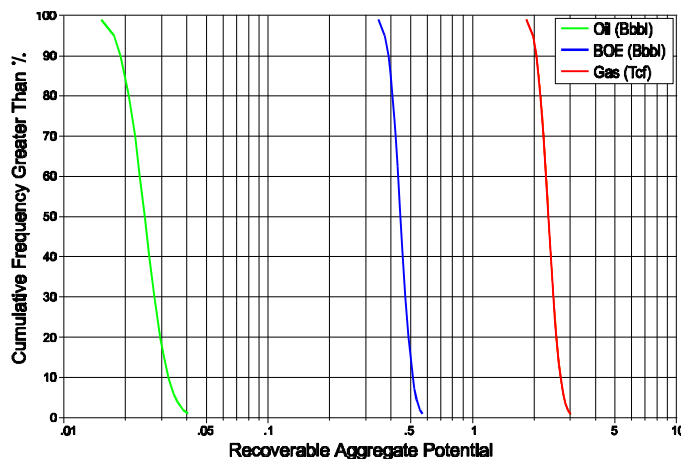


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	20	0.018	2.431	0.451
Cumulative production	--	0.012	1.748	0.323
Remaining proved	--	0.006	0.682	0.128
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.005	0.757	0.140
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.018	1.978	0.373
Mean	39	0.025	2.370	0.447
5th percentile	--	0.035	2.808	0.530
Total Endowment				
95th percentile	--	0.042	5.165	0.964
Mean	59	0.049	5.557	1.038
5th percentile	--	0.059	5.995	1.121

to 2.808 Tcfg at the 95th and 5th percentiles, respectively (figure 3). At mean levels, 0.025 Bbo and 2.370 Tcfg (0.447 BBOE) are projected. These undiscovered resources represent 43 percent of the LM1 chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the third largest in the chronozone (figure 4).

Of both LM1 plays, the LM1 F play is projected to contain the greatest exploration potential, with mean undiscovered resources estimated at 0.024 Bbo and 2.289 Tcfg (0.431 BBOE) remaining to be found in 34 pools. These undiscovered resources in the LM1 F play represent 42 percent of the BOE mean total endowment for the LM1 chronozone. This high percentage and the potential for numerous discoveries within a large unexplored area make the LM1 F play an attractive exploration target in LM1 strata.

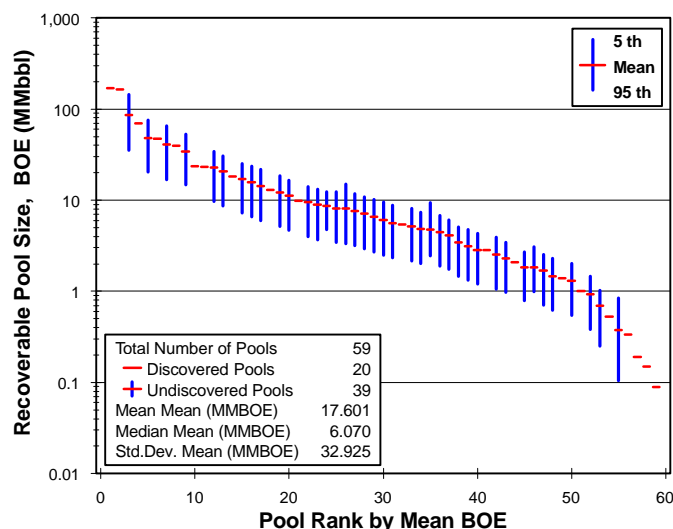


Figure 4. Pool rank plot.

LOWER LOWER MIOCENE PROGRADATIONAL (LM1 P) PLAY

PLAY DESCRIPTION

The established Lower Lower Miocene Progradational (LM1 P) play occurs at the *Lenticulina hansenii* biozone. This play consists of two separate regions: (1) a western region that includes parts of the North Padre Island, Mustang Island, Matagorda Island, and Brazos Areas offshore Texas and (2) an eastern region that extends from the High Island Area offshore Texas to the East Cameron Area offshore Louisiana (figure 1).

In the western region, updip and along strike, the play continues onshore into Texas, but is nonproductive in Federal waters. Downdip, the play grades into the deposits of the Lower Lower Miocene Fan (LM1 F) play. Similarly, in the eastern region, updip and along strike, the play continues onshore into Texas and Louisiana. Downdip, the play grades into the deposits of the LM1 F play.

The locations of the western and eastern regions of the LM1 P play are a result of two separate depocenters in LM1 time, one in the Texas area and the other in the Louisiana area. The delta systems had not prograded far enough basinward through LM1 time to deposit aggradational or retrogradational sediments in the present-day offshore areas.

PLAY CHARACTERISTICS

The productive LM1 P play consists of progradational deltaic sediments deposited in outer shelf, delta fringe environments. Normal faults are the major structural feature in this play. Less common structures include rotational slump blocks and growth faults. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future

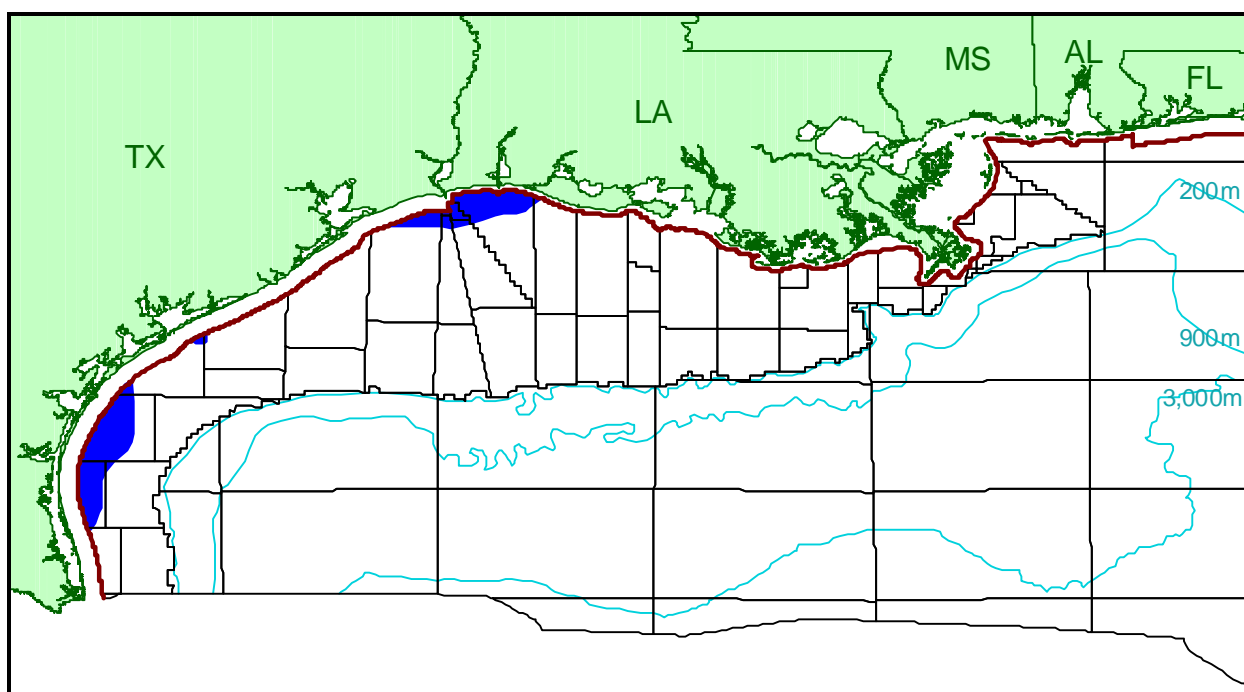


Figure 1. Map of assessed play.

discoveries are not limited to the aforementioned productive progradational depositional environments, structures, or seals.

West Cameron 55 is the type field, and Zilka Energy Company's BD-1 sand represents the LM1 P play in this field.

DISCOVERIES

The LM1 P gas play contains total reserves of 0.003 Bbo and 0.210 Tcfg (0.040 BBOE), of which 0.001 Bbo and 0.035 Tcfg (0.007 BBOE) have been produced. The play contains 15 producible sands in five pools (table 1). The first reserves in the play were discovered in the West Cameron 17 field in 1964 (figure 2). The pool discovery histogram illustrates a bimodal distribution with two pools discovered in the 1960's and the remaining three discovered in the early 1980's. The maximum yearly total reserves were added in 1982 by the discovery of the largest pool in the play in the West Cameron 55 field. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1984.

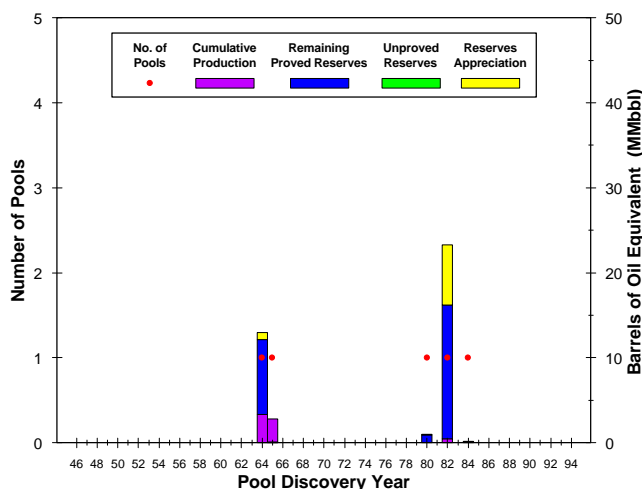


Figure 2. Exploration history graph.

The five discovered pools range in size from 0.089 to 23.298 MMBOE. These pools contain 19 reservoirs, all of which are nonassociated gas.

Of the 14 progradational plays in the Gulf of Mexico Region, the LM1 P play contains the smallest amount of BOE total reserves (<1%).

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM1 P play is 1.00. The play ranks

Table 1. Characteristics of the discovered pools.

5 Pools (15 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	17	31	37
Subsea depth (feet)	11,024	11,548	11,937
Number of sands per pool	1	3	9
Porosity	21%	26%	31%
Water saturation	21%	29%	33%

within the smallest one-fourth of all 61 Gulf of Mexico plays, based on a mean total endowment of 0.004 Bbo and 0.291 Tcfg (0.056 BBOE) (table 2). Twelve percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of less than 0.001 to 0.003 Bbo and 0.050 to 0.121 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.001 Bbo and 0.081 Tcfg (0.016 BBOE). These undiscovered resources may occur in as many as five pools. The largest undiscovered pool, with a mean size of 8.127 MMBOE, is modeled as the third largest pool in the play (figure 4). The model results place the remaining four undiscovered pools in positions 4, 6, 8, and 9 on the pool rank plot. For all the undiscovered pools in the LM1 P play, the mean mean size is 3.157 MMBOE, which is smaller than the 8.039 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 5.598 MMBOE.

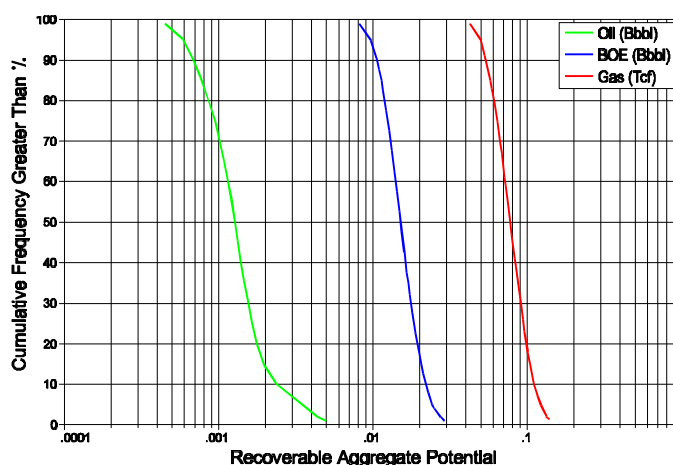


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	5	0.002	0.168	0.032
Cumulative production	--	0.001	0.035	0.007
Remaining proved	--	0.002	0.134	0.026
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.001	0.041	0.008
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	<0.001	0.050	0.010
Mean	5	0.001	0.081	0.016
5th percentile	--	0.003	0.121	0.024
Total Endowment				
95th percentile	--	0.003	0.260	0.050
Mean	10	0.004	0.291	0.056
5th percentile	--	0.006	0.331	0.064

The LM1 P play is well explored. Relative to the five discovered pools, the five undiscovered pools are expected to be small to moderate in size, contributing 28 percent to the play's BOE mean total endowment. Interfield exploration potential exists for untested structures.

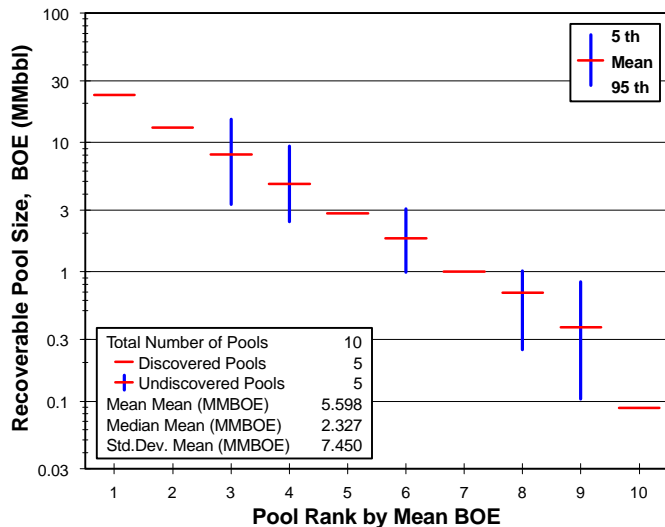


Figure 4. Pool rank plot.

LOWER LOWER MIOCENE FAN (LM1 F) PLAY

PLAY DESCRIPTION

The established Lower Lower Miocene Fan (LM1 F) play occurs at the *Lenticulina hanseni* biozone. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1).

Updip, the play continues onshore into Texas and Louisiana except in the North Padre Island and Mustang Island Areas, where the play is limited by the shelf/slope break associated with the *Lenticulina hanseni* biozone and grades into the sediments of the Lower Lower Miocene Progradational (LM1 P) play. To the southwest, the LM1 F play extends into Texas offshore State waters and Mexican national waters. To the northeast, the play potential is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the LM1 depocenter. The southern extension of the play's potential to at least the Sigsbee Escarpment is supported by LM1 sand development in the OCS G08512-1 well in Atwater block 471.

Productive and established sand locations in the LM1 F play are a result of two separate depocenters in LM1 time, one in the Texas area and the other in the Louisiana area. The delta systems had not prograded far enough basinward through LM1 time to deposit aggradational or retrogradational sediments in the present-day offshore areas.

PLAY CHARACTERISTICS

The productive LM1 F play consists of deepwater turbidites deposited in fan systems as fan lobes, fringe sheet sediments, channel fill, and slump sediments on the LM1 slope. Normal faults are the major structural feature in this play. Less commonly,

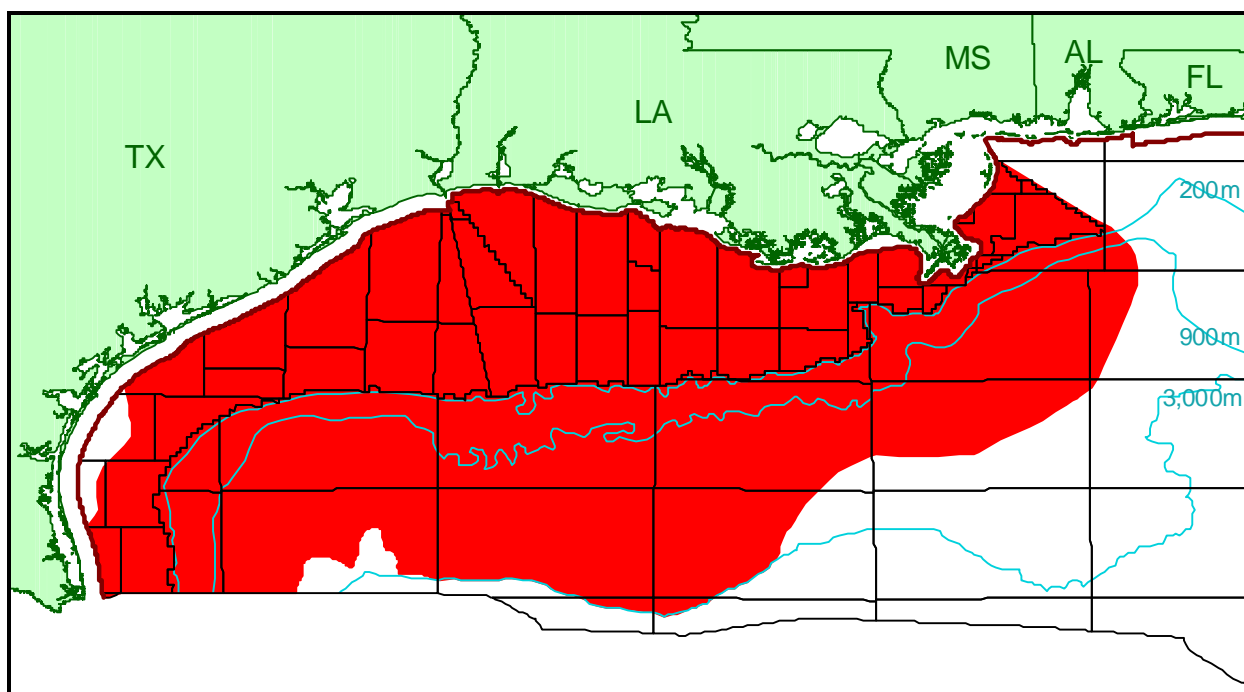


Figure 1. Map of assessed play.

anticlines, shale diapirs, rotational slump blocks, and growth faults occur. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales). Future discoveries are not limited to the aforementioned productive fan depositional environments, structures, or seals.

Matagorda Island 668 is the type field. Oxy USA Inc.'s CM15B, 3 BASAL, CM15C, and CM15 sands and Vastar Resources Inc.'s LQ, LR, and ML sands represent the LM1 F play in this field.

DISCOVERIES

The LM1 F gas play contains total reserves of 0.021 Bbo and 2.978 Tcfg (0.551 BBOE), of which 0.012 Bbo and 1.714 Tcfg (0.316 BBOE) have been produced. The play contains 44 producible sands in 15 pools (table 1). The first reserves in the play were discovered in the West Cameron 40 field in 1955 (figure 2). Pool discoveries were minimal until the 1980's when 10 out of the play's 15 pools were found. The maximum yearly total reserves of 186.673 MMBOE were added in 1980 with the discovery of two pools. However, the largest pool in the play was found in 1982 in the Matagorda Island 623 field. In fact, 90 percent of the cumulative production from this play occurred from pools discovered prior to 1983. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1988.

The 15 discovered pools range in size from 0.150 to 169.725 MMBOE. These pools contain 69 reservoirs, of which 68 are nonassociated gas and 1 is undersaturated oil.

Of the 15 fan plays in the Gulf of Mexico Region, the LM1 F play is the third largest gas play, producing 10 percent of the gas and containing 8 percent of the gas total reserves.

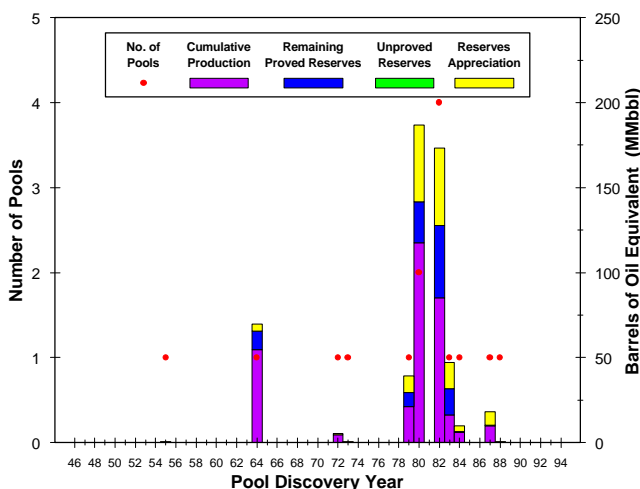


Figure 2. Exploration history graph.

Table 1. Characteristics of the discovered pools.

15 Pools (44 Producibles Sands)	Minimum	Mean	Maximum
Water depth (feet)	17	53	121
Subsea depth (feet)	11,822	14,049	18,250
Number of sands per pool	1	3	8
Porosity	16%	24%	31%
Water saturation	17%	31%	43%

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the LM1 F play is 1.00. The play contains a mean total endowment of 0.045 Bbo and 5.267 Tcfg (0.982 BBOE) (table 2). Thirty-two percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.017 to 0.033 Bbo and 1.915 to 2.707 Tcfg at the 95th and 5th percentiles, respectively (figure 3). The mean undiscovered resources are estimated at 0.024 Bbo and 2.289 Tcfg (0.431 BBOE). These undiscovered

resources may occur in as many as 34 pools. The largest undiscovered pool, with a mean size of 86.578 MMBOE, is modeled to be the third largest pool in the play (figure 4). The model results place the next four largest undiscovered pools in positions 5, 7, 9, and 11 on the pool rank plot. For all the undiscovered pools in the LM1 F play, the mean mean size is 12.696 MMBOE, which is substantially smaller than the 36.722 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and

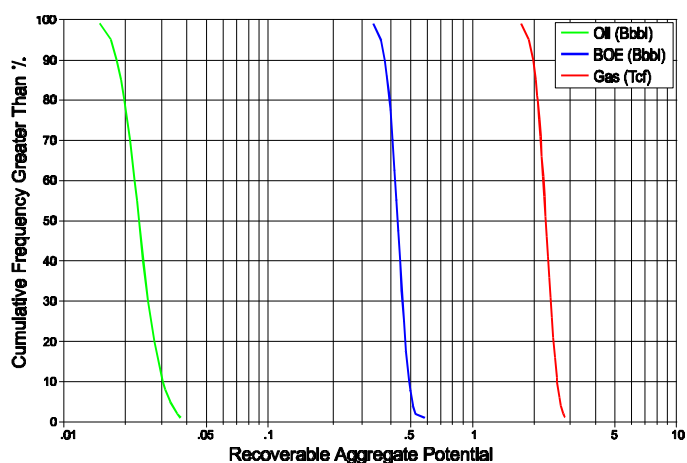


Figure 3. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	15	0.016	2.262	0.419
Cumulative production	--	0.012	1.714	0.316
Remaining proved	--	0.005	0.548	0.102
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.005	0.715	0.132
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.017	1.915	0.356
Mean	34	0.024	2.289	0.431
5th percentile	--	0.033	2.707	0.506
Total Endowment				
95th percentile	--	0.038	4.893	0.907
Mean	49	0.045	5.267	0.982
5th percentile	--	0.054	5.685	1.057

undiscovered, is 20.051 MMBOE.

The LM1 F play has a large unexplored area. Numerous undiscovered pools, comparable to the range of sizes for the discovered pools, are expected to be found, accounting for 44 percent of the play's BOE mean total endowment. The greatest exploration potential exists downdip of discovered fields where wells have been too shallow to test the LM1 section. Limited exploration potential exists between the two productive areas of the play in the Brazos and Galveston Areas offshore Texas because of sparse sand development.

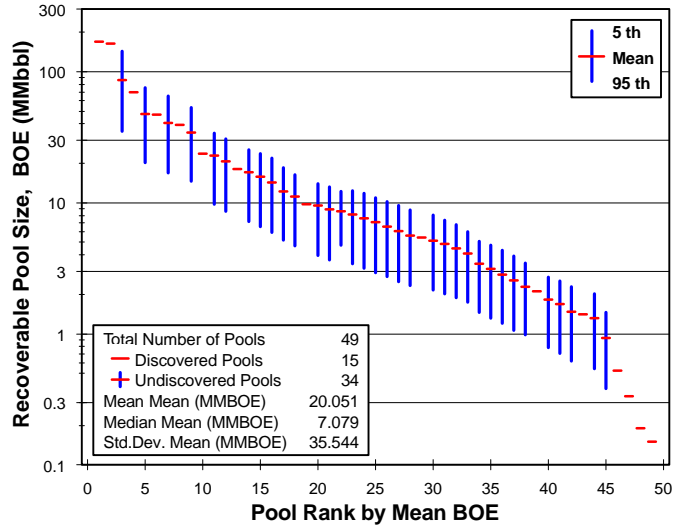


Figure 4. Pool rank plot.

OLIGOCENE/EOCENE (O/E) CHRONOZONE

CHRONOZONE DESCRIPTION

The Oligocene/Eocene (O/E) chronozone corresponds to the *Marginulina texana* biozone. The O/E chronozone comprises the frontier Oligocene Fan (O F) play and the conceptual Perdido Fold Belt (O/E X) play. The O/E X play includes both Oligocene and Eocene sediments as potential reservoir targets. Because both plays include sediments of Oligocene age and have very limited data available, the Oligocene and Eocene were combined at the chronozone level.

The potential for sand development in the O/E chronozone extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). Updip, the potential for O/E sand development continues onshore into Texas and Louisiana. To the northeast, the sand potential is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the O/E depocenter. To the southwest, the potential extends into Mexican national waters. Downdip, the potential extends at least as far as the Sigsbee Escarpment.

The O F play is characteristically similar to the younger Cenozoic deepwater Gulf of Mexico fans and consists of turbidites deposited in fan systems as fan lobes, fringe sheet sands, channel fill, and submarine slumps. Normal faults dominate the structural style.

The O/E X play is a structural play consisting of large, compressional folds that occur in front of and beneath the leading edge of the Sigsbee Escarpment in the southeastern Alaminos Canyon Area. The play extends downdip into Mexican national waters. Potential reservoir rocks of Oligocene and Eocene age may consists of mass-

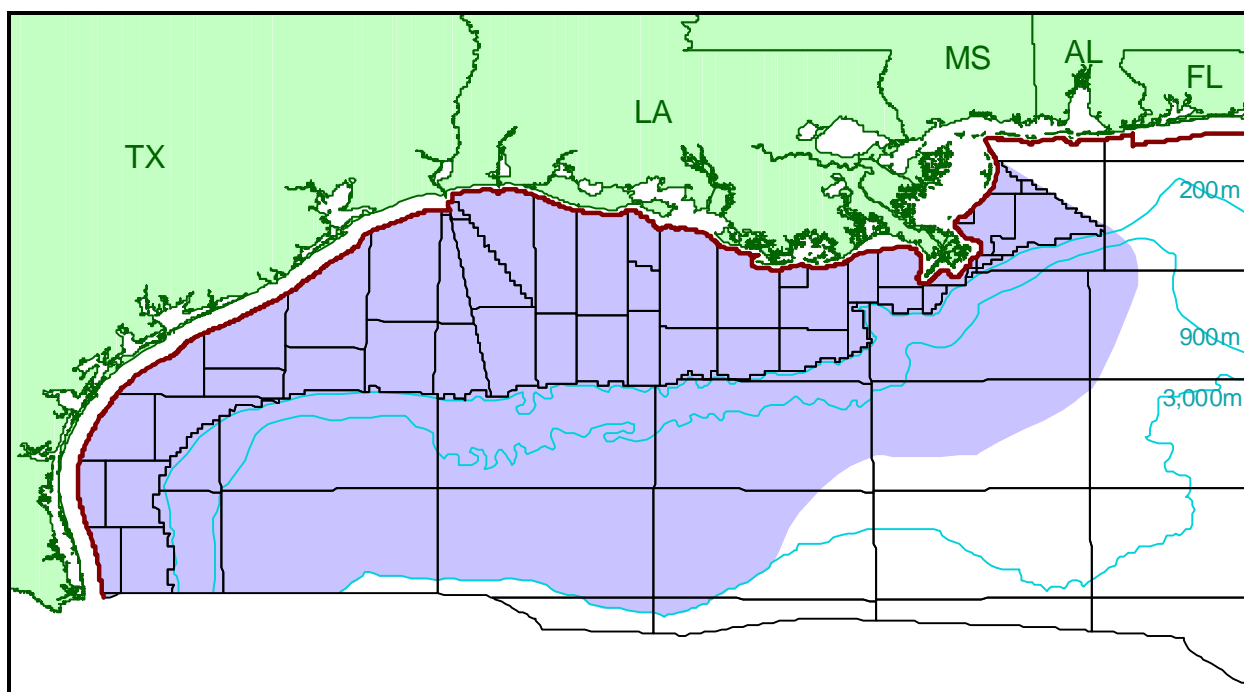


Figure 1. Map of assessed chronozone.

transport facies, debris-flows, and submarine slumps.

DISCOVERIES

There were no discoveries in the O/E chronozone prior to this study's cutoff date of January 1, 1995.

ASSESSMENT RESULTS

Assessment results indicate that undiscovered resources in the chronozone may occur in as many as 40 pools. These undiscovered resources are estimated to be 0.126 Bbo and 2.844 Tcfg at the 95th percentile but 2.327 Bbo and 9.576 Tcfg at the 5th percentile (table 1 and figure 2). At mean levels, 0.803 Bbo and 5.586 Tcfg (1.797 BBOE) are projected. The 40 undiscovered pools have a mean mean size of 12.134 MMBOE (figure 3). Of the two O/E chronozone plays, the O/E X play is estimated to contain 65 percent of the BOE mean total endowment for the chronozone.

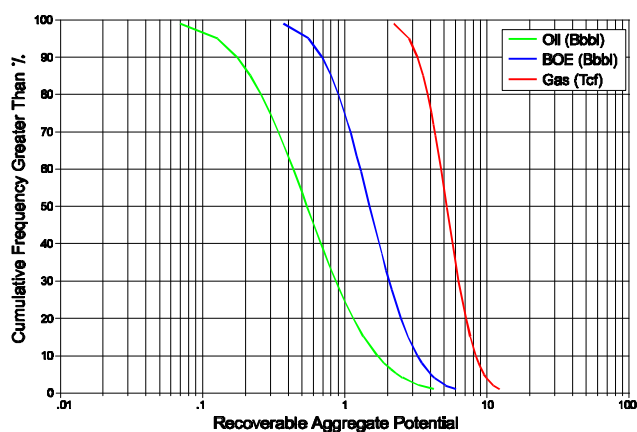


Figure 2. Cumulative probability distribution.

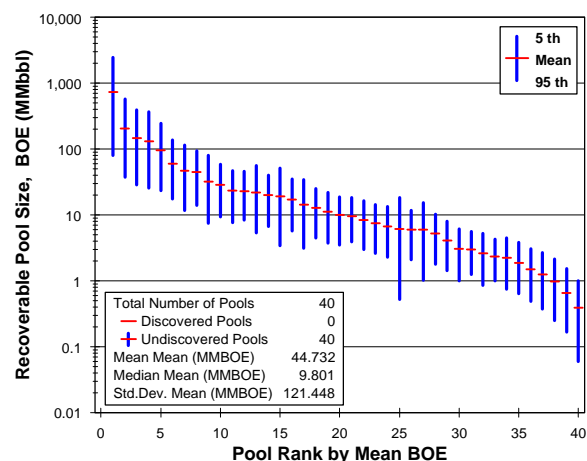


Figure 3. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.126	2.844	0.558
Mean	40	0.803	5.586	1.797
5th percentile	--	2.327	9.576	4.032
Total Endowment				
95th percentile	--	0.126	2.844	0.558
Mean	40	0.803	5.586	1.797
5th percentile	--	2.327	9.576	4.032

OLIGOCENE FAN (O F) PLAY

PLAY DESCRIPTION

The frontier Oligocene Fan (O F) play occurs at the *Marginulina texana* biozone. This play extends from the South Padre Island Area offshore Texas to the western edges of the Destin Dome and Desoto Canyon Areas east of the present-day Mississippi River Delta (figure 1). An analysis of seismic and paleontologic data indicate that fan sands may occur as deep as the base of the middle Oligocene throughout state and federal waters in the south Texas area.

The O F play is modeled after the Lower Lower Miocene Fan (LM1 F) play. Updip, the play continues onshore into Texas and Louisiana. To the southwest, the O F play extends into Mexican national waters. To the northeast, the play potential is bounded by the Cretaceous carbonate shelf edge and a decrease in sediment influx at the edge of the Oligocene depocenter. Downdip, the play potential extends at least as far as the Sigsbee Escarpment.

Oligocene sands deposited in a fan environment are recognized in the Mustang Island 858 field. Two significant wells in East Breaks blocks 191 and 404 were drilled on structural highs. These wells were drilled to a total depth of more than 10,000 feet, subsea, and were terminated just above the top of the middle Oligocene (planktonic equivalent of *Marginulina howei*) in a lower bathyal to abyssal paleoecological environment.

PLAY CHARACTERISTICS

The O F play consists of deepwater turbidites deposited in fan systems as fan lobes, fringe sheet sands, channel fill, and slump sediments. As in the LM1 F play, normal faults dominate the O F play's structural style. Less commonly, anticlines, shale diapirs,

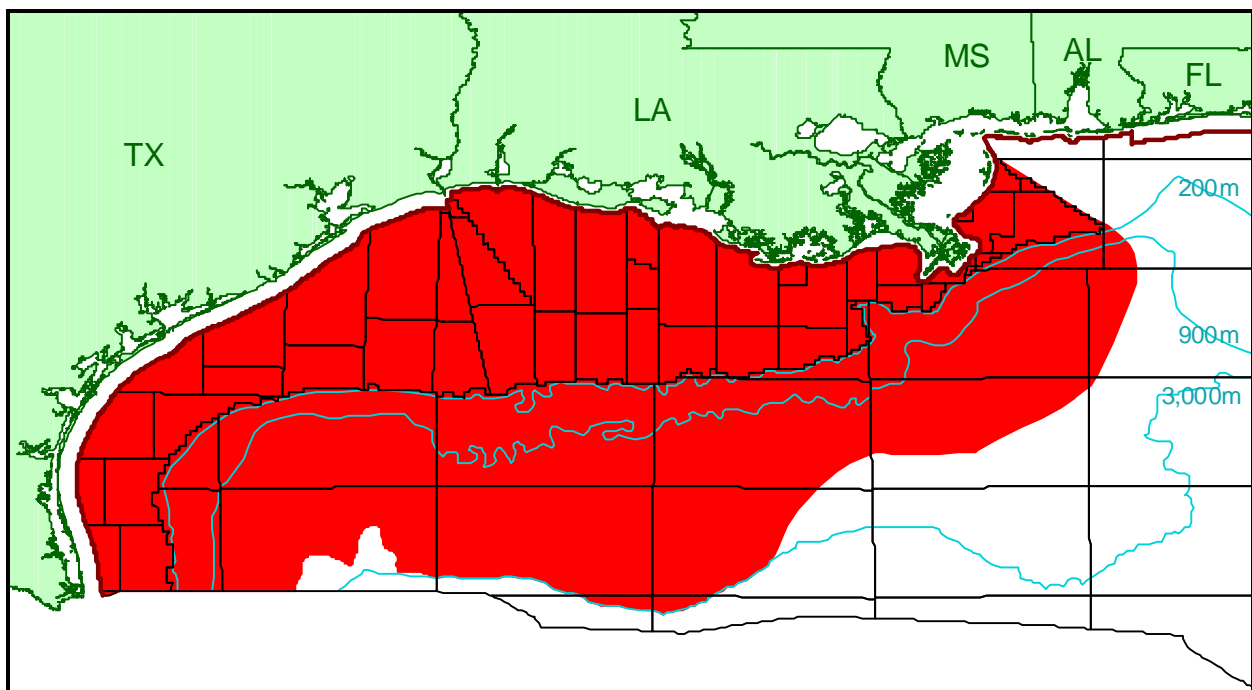


Figure 1. Map of assessed play.

rotational slump blocks, and growth faults occur. Seals are provided by the juxtaposition of reservoir sands with shales, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shale-outs, overlying shales).

DISCOVERIES

There were no discoveries in the O F play prior to this study's cutoff date of January 1, 1995.

ASSESSMENT RESULTS

Because of limited data for the O F play, the LM1 F play was used as an analog to model pool sizes in the O F play. The LM1 F play was selected as the analog because of similarities in depositional setting, areal extent, structural style, and statistical information.

The marginal probability of hydrocarbons for the O F Play is 1.00. One hundred percent of the play's total endowment is undiscovered conventionally recoverable resources. Assessment results indicate that these undiscovered resources have a range of 0.026 to 0.078 Bbo and 1.976 to 5.471 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 2). The mean undiscovered resources are estimated at 0.043 and 3.249 Tcfg (0.621 BBOE). These undiscovered resources may occur in as many as 30 pools, which range in size from 0.392 to 205.090 MMBOE (figure 3). For all the undiscovered pools in the O F play, the mean mean size is 20.657 MMBOE.

The O F play has a large unexplored area with a relatively large number of undiscovered pools. Exploration potential exists on the shelf where wells have been too shallow to test the O F section and in the largely unexplored deepwater areas of the Gulf of Mexico.

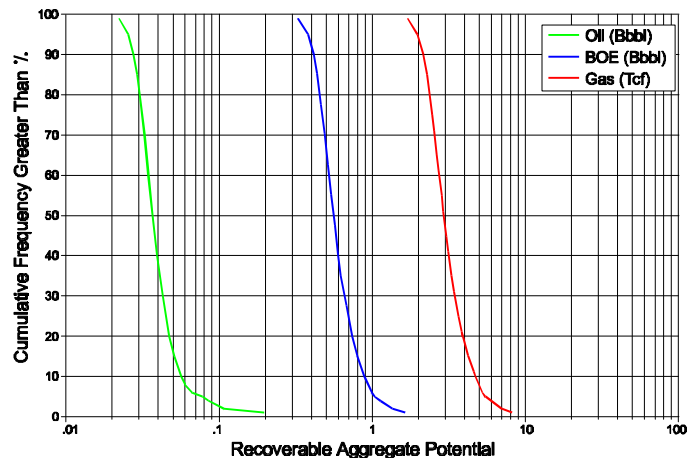


Figure 2. Cumulative probability distribution.

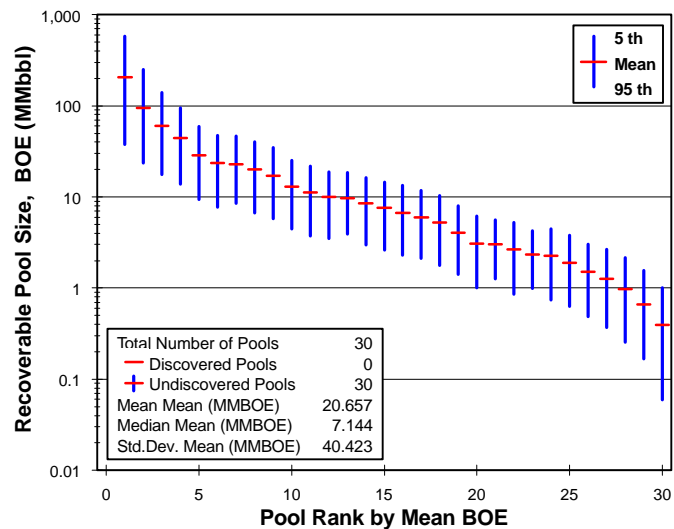


Figure 3. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.026	1.976	0.380
Mean	30	0.043	3.249	0.621
5th percentile	--	0.078	5.471	1.040
Total Endowment				
95th percentile	--	0.026	1.976	0.380
Mean	30	0.043	3.249	0.621
5th percentile	--	0.078	5.471	1.040

PERDIDO FOLD BELT (O/E X) PLAY

PLAY DESCRIPTION

The conceptual Perdido Fold Belt (O/E X) play, as assessed in this report, is lower Tertiary aged occurring in the Oligocene and Eocene Series. This play extends from the southeastern Alaminos Canyon Area offshore Texas southward into Mexican national waters (figure 1). An analysis of seismic data indicates the play is found in front of and beneath the leading edge of the Sigsbee Escarpment.

The area where the O/E X play is located contains large, untested compressional folds in water depths ranging from about 7,000 feet to greater than 10,000 feet. The folds trend parallel to the continental margin. The timing of structural deformation for the play is interpreted as late Oligocene. The cause of deformation is probably gravity sliding above a weak basal detachment in response to expansion systems to the west.

There were no wells in the O/E X play prior to this study's cutoff date of January 1, 1995. Due to the lack of well control, a great deal of the stratigraphy of the play area is conjecture. The sediment thickness in this area is estimated to be in excess of 30,000 feet. The present interpretation of the general stratigraphy of the section is as follows: oceanic crust, Jurassic aged salt, late Jurassic and early Cretaceous aged fine-grained marine carbonates, late Cretaceous fine-grained marine carbonates with interbedded siliciclastics derived from the Laramide Orogeny, and Cenozoic aged clastic and hemipelagic accumulations.

The reservoir rocks of the play probably consist of mass-transport facies, debris-flows, and submarine slumps; hydrocarbon seals are formed by shales in the section. Although there are no wells to confirm source rocks or thermal maturation in the section, numerous oil seeps have been documented in this area of the Gulf of Mexico.

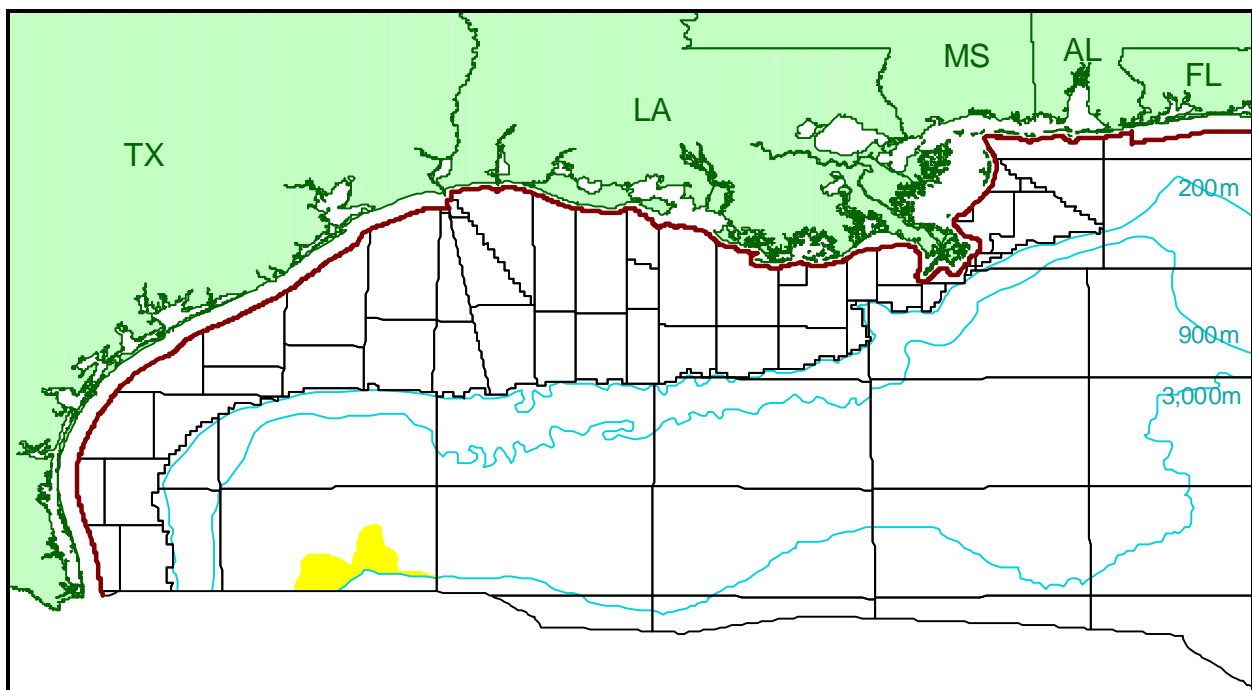


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The O/E X play is delineated by long subparallel folds that trend southwest-northeast across the area. Individual anticlines are enormous when compared to typical Gulf Coast anticlines. Structural relief of several thousand feet is common. The depositional and reservoir characteristics of the play are modeled after the late Cenozoic fan plays, with emphasis on the lower Miocene fan plays. To the south and east, the depositional system of the play is modeled to reflect a decrease in sediment influx from a source to the north and west toward the abyssal Gulf of Mexico Basin.

DISCOVERIES

There were no discoveries in the O/E X play prior to this study's cutoff date of January 1, 1995.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the O/E X play is 1.00. One hundred percent of the play's mean total endowment is undiscovered conventionally recoverable resources. Assessment results indicate that these undiscovered resources have a range of 0.181 to 2.206 Bbo and 1.030 to 4.571 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 2). The mean undiscovered resources are estimated at 0.760 Bbo and 2.337 Tcfg (1.176 BBOE). These undiscovered resources may occur in as many as 10 pools, which range in size from 5.987 to 742.450 MMBOE (figure 3). For all the undiscovered pools in the O/E X play, the mean mean size is 116.958 MMBOE.

The O/E X play has a small unexplored area in the Alaminos Canyon Area with many untested structures.

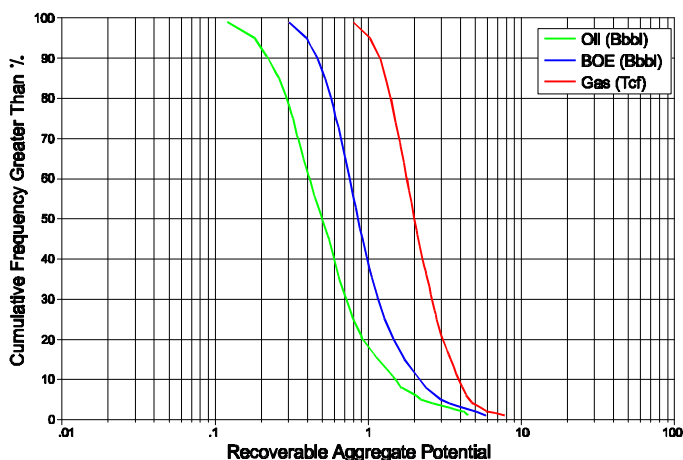


Figure 2. Cumulative probability distribution.

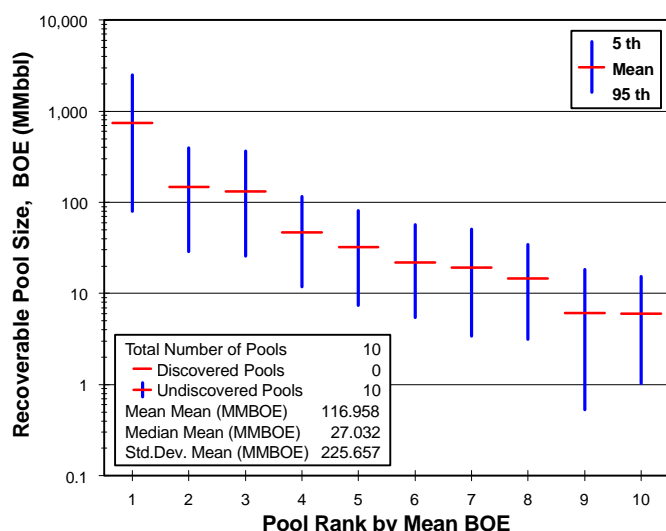


Figure 3. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.181	1.030	0.396
Mean	10	0.760	2.337	1.176
5th percentile	--	2.206	4.571	2.968
Total Endowment				
95th percentile	--	0.181	1.030	0.396
Mean	10	0.760	2.337	1.176
5th percentile	--	2.206	4.571	2.968

PALEOCENE (L) CHRONOZONE

The Paleocene (L) chronozone was not assessed because the existence of reservoir-quality sands in the Federal offshore is highly unlikely.

UPPER CRETACEOUS (UK) CHRONOZONE

The Upper Cretaceous (UK) chronozone contains only one play [see Upper Cretaceous Clastic (UK CL) play].

UPPER CRETACEOUS CLASTIC (UK CL) PLAY

Play Description

The frontier Upper Cretaceous Clastic (UK CL) play occurs at the *Rotalipora cushmani* biozone. This play extends from the Mobile/Viosca Knoll Areas to the Pensacola/Destin Dome Areas (figure 1). Updip, the UK CL play extends onshore. The downdip limit occurs where upper Cretaceous sands interfinger with prodelta shales.

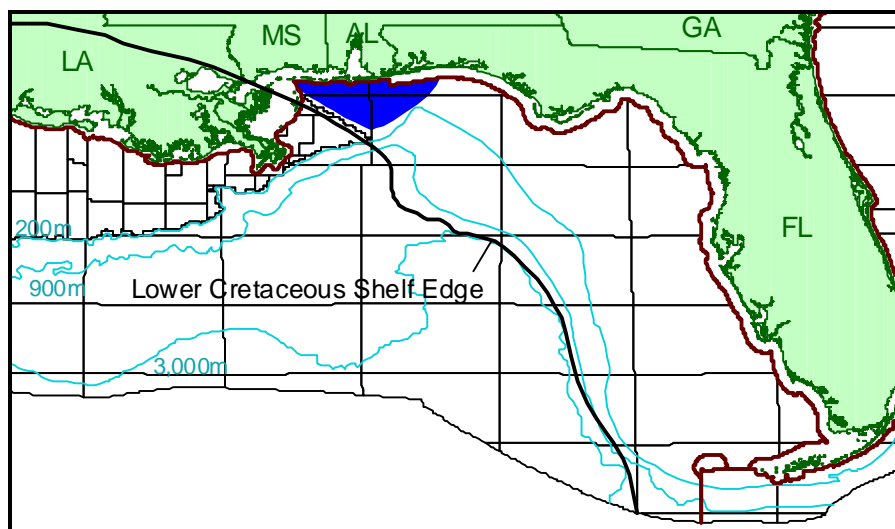


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The UK CL play consists of progradational sands and aggradational stacked barrier bars and channels of the Tuscaloosa Formation (figure 2). However, the Tuscaloosa Formation exhibits poor reservoir-quality sands in the Federal OCS. Major structural features in this play are anticlines and faults related to salt tectonics. Potential source rocks are carbonates of the Upper Jurassic Smackover Formation, with faults acting as migration routes, and shales of the Tuscaloosa Formation. Late Cretaceous marine shales provide seals for the UK CL play.

The analog type field for the UK CL play is the Hub Field, Marion County, Mississippi, which produces from the Upper Cretaceous Tuscaloosa Formation.

DISCOVERIES

One minor gas show occurred in the Upper Cretaceous Tuscaloosa Formation in Exxon's OCS G02486-1 well in Destin Dome

National Assessment Mesozoic Stratigraphy										
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Flays	Atlantic Basin/ Scotian Basin	Atlantic Flays					
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL				
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Palyu Fm Glen Rose Fm Mooringport Fm Ferry Lake Fm Rdessa Fm James Fm Pine Island Fm Sigo (Pittet) Fm Hobston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL				
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm	AUU CL AMU CL	AUU CB AMU CB			
	Middle	Louann Salt	Non-Deposition		Mohican Fm					
Triassic	Lower				Argo Salt					
	Upper	Eagle Mills Fm Basement	Basement		Eurdice Fm Basement					

Rock unit positions do not imply age relationships between basins.

Figure 2. Stratigraphic column.

block 162. However, the show occurs in a basal fluvial depositional environment and is not considered to be part of the relatively more prospective deltaic depositional environment of the UK CL play. Of the Federal OCS wells that penetrated the UK CL play as defined, no significant hydrocarbons were encountered (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory).

ASSESSMENT RESULTS

Because the UK CL play is not currently productive in the Federal OCS, the productive Tuscaloosa and Eutaw Formations of onshore Louisiana, Mississippi, and Alabama were used as an analog for this assessment (figure 2). This analog covers an area of 11.4 million acres (17,835 square miles). The best reservoir sand development in the analog occurs in reworked, retrogradational sands, which are poorly developed in the Federal OCS. Exploration in the analog has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 80 percent of the analog explored. Analog fields contain an average of 63 percent oil, 3 percent gas, and 34 percent mixed hydrocarbons. Production from the analog fields ranges from less than 1 to 678 MMBOE. Net pay ranges from 7 to 95 feet at depths of 4,700 to 14,630 feet. Reservoirs are characterized by porosities of 15 to 31 percent, oil gravities of 5 to 68° API, and GOR's of 50 to 164,500 scf/stb.

The marginal probability of hydrocarbons for the UK CL play is 0.56. Assessment results indicate that undiscovered resources are estimated to be zero at the 95th percentile but 0.190 Bbo and 0.257 Tcfg at the 5th percentile (table 1 and figure 3). The mean undiscovered resources are estimated at 0.045 Bbo and 0.070 Tcfg (0.057 BBOE). These undiscovered resources may occur in as many as five pools, which have an unrisken mean size range of 1.055 to 80.301 MMBOE (figure 4). These pools have an unrisken mean mean size estimated at 20.626 MMBOE.

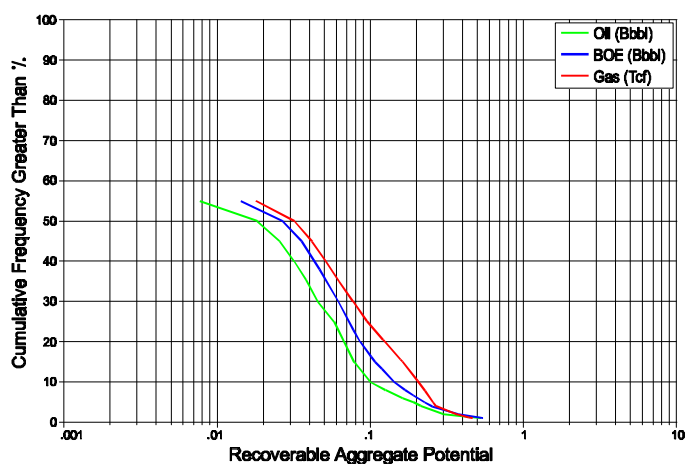


Figure 3. Cumulative probability distribution.

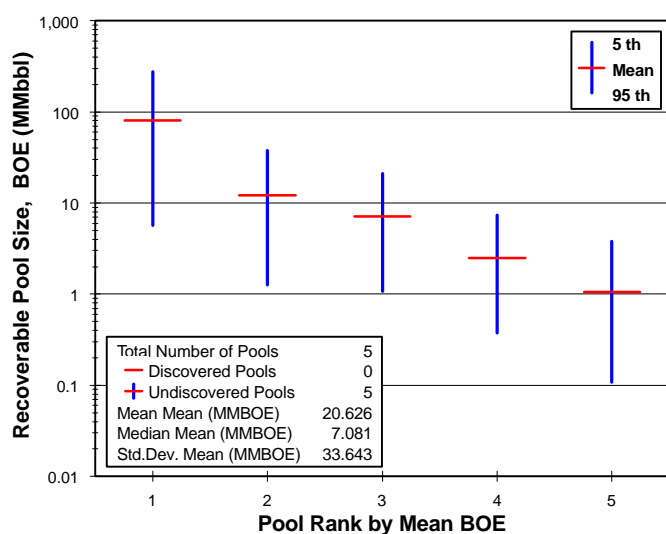


Figure 4. Pool rank plot.

Because of poor sand development in the Tuscaloosa Formation and the large number of dry holes that have tested this play in the Federal OCS, the UK CL play is expected to have few discoveries.

Table 1. Assessment results.

Marginal Probability = 0.56	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.000	0.000	0.000
Mean	5	0.045	0.070	0.057
5th percentile	--	0.190	0.257	0.226
Total Endowment				
95th percentile	--	0.000	0.000	0.000
Mean	5	0.045	0.070	0.057
5th percentile	--	0.190	0.257	0.226

LOWER CRETACEOUS (LK) CHRONOZONE

CHRONOZONE DESCRIPTION

The Lower Cretaceous (LK) chronozone in the Gulf of Mexico Region corresponds to the *Schuleridea lacustris*, *Choffatella decipiens*, *Orbitolina texana*, *Eocytheropteron trinitiensis*, *Dictyoconus walnutensis*, *Cythereis fredericksburgensis*, *Fossocytheridea lenoirensis*, and *Lenticulina washitaensis* biozones. The lower Cretaceous section consists of clastics and carbonates, each of which defines one or more plays: the Lower Cretaceous Clastic (LK CL) play, the Lower Cretaceous Shelf-Margin Carbonate (LK CB) play, the Lower Cretaceous Sunniland Carbonate (LK SUN) play, and the Lower Cretaceous South Florida Basin Carbonate (LK SFB) play. The clastics consist mainly of barrier bars and channels deposited in an aggradational delta plain environment of the Hosston, Paluxy, and Dantzler Formations and the Fredericksburg and Washita Groups (figure 1). The carbonates consist of shelf-edge rudistid bioherms, localized patch reefs, reef talus, platform grainstones, and porous dolomites associated with cyclothem. In the eastern Gulf of Mexico, formations comprising the carbonate plays include the Sligo, James, and Mooringsport. In the South Florida area, formations comprising the carbonate plays include Bone Island, Pumpkin Bay, and Sunniland, and the Brown Dolomite Zone of the Lehigh Acres Formation.

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Flays	Atlantic Basin/ Scotian Basin	Atlantic Flays	
Cretaceous	Upper	Silma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodeesa Fm James Fm Pine Island Fm Sligo (Fattet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Mississauga Fm — 0 Marker — M. Simplex shale Lower Mississauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Snackover Fm Norphet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AUU CB AMU CL AMU CB
	Middle		Non-Deposition			
	Lower	Louann Salt			Argo Salt	
Triassic	Upper	Eagle Mills Fm Basement	Basement		Eurdice Fm Basement	

Rock unit positions do not imply age relationships between basins.

Figure 1. Stratigraphic column.

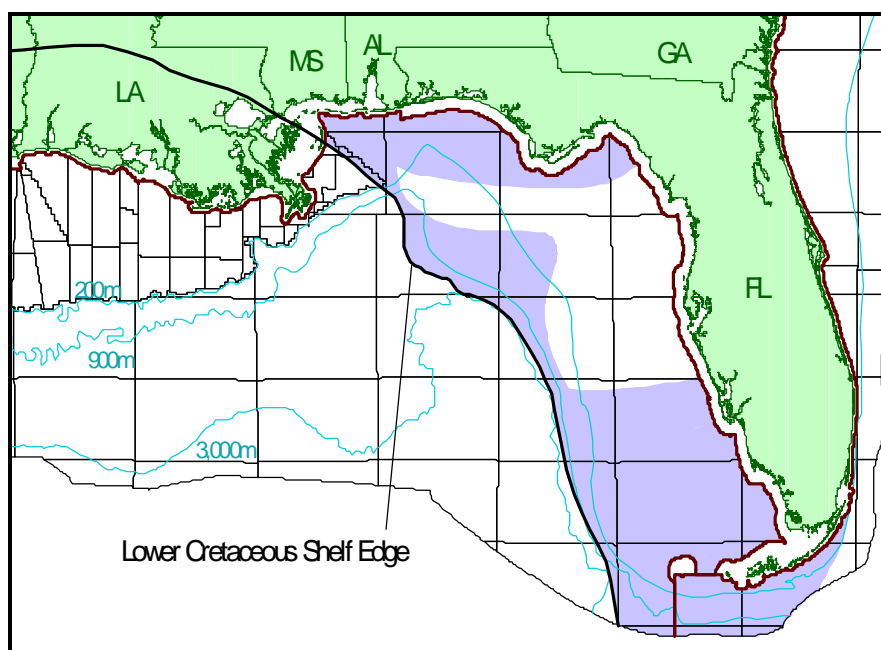


Figure 2. Map of assessed chronozone.

Clastic reservoir potential in the lower Cretaceous chronozone extends south of Mississippi, Alabama, and Florida offshore State waters into the northern portions of the Mobile, Destin Dome, Apalachicola, and Gainesville Areas (figure 2). Carbonate reservoir potential exists along the lower Cretaceous shelf-edge reef and back-reef system and in the South Florida Basin (figure 3). To the north and east, carbonate reservoir potential extends onshore into Mississippi, Alabama, and Florida. To the southwest, carbonate reservoir potential is limited by fore-reef facies of dark shales and carbonate muds.

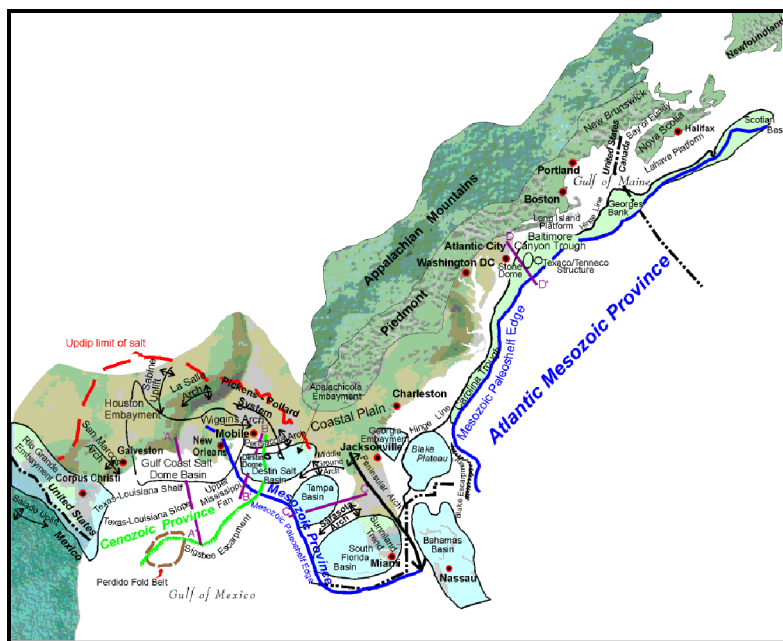


Figure 3. Physiographic map.

DISCOVERIES

Of the four plays in the lower Cretaceous chronozone, the only play that has discovered pools is the LK CB play, with two (table 1). Total reserves in the chronozone are 0.003 Bbo and 0.436 Tcfg (0.080 BBOE), of which 0.054 MMbo and 0.325 Bcfg (0.112 MMBOE) have been produced. The maximum yearly reserves of 80.106 MMBOE were added 1993 with the discovery of the Viosca Knoll 252 field (figure 4).

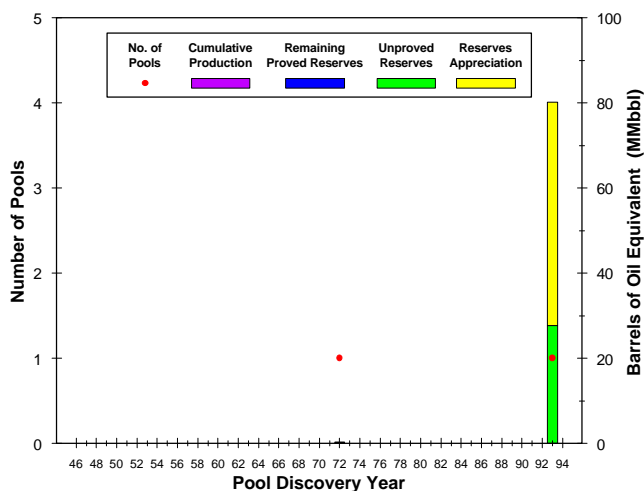


Figure 4. Exploration history graph.

Table 1. Characteristics of the discovered pools.

2 Pools (2 Reservoirs)	Minimum	Mean	Maximum
Water depth (feet)	120	204	288
Subsea depth (feet)	8,700	11,500	14,300
Number of reservoirs per pool	1	1	1
Porosity	10%	15%	20%
Water saturation	26%	29%	32%

ASSESSMENT RESULTS

The LK chronozone contains 139 pools (discovered plus undiscovered), with a mean total endowment estimated at 1.391 Bbo and 1.305 Tcfg (1.622 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 137 pools, which contain a range of 0.921 to 1.980 Bbo and 0.530 to 1.320 Tcfg at the 95th and 5th percentiles, respectively (figure 5). At mean levels, 1.388 Bbo and 0.869 Tcfg (1.542 BBOE) are projected. These undiscovered resources represent 95 percent of the chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the largest in the chronozone (figure 6). Additionally, when compared with the 21 Gulf of Mexico Region chronozones, the lower Cretaceous chronozone is projected to contain the largest amount of mean undiscovered oil.

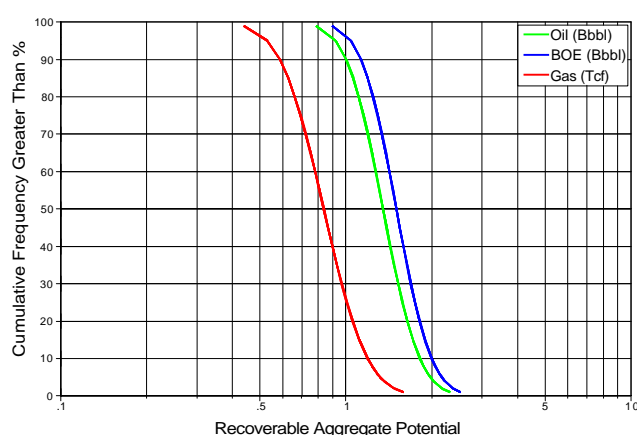


Figure 5. Cumulative probability distribution.

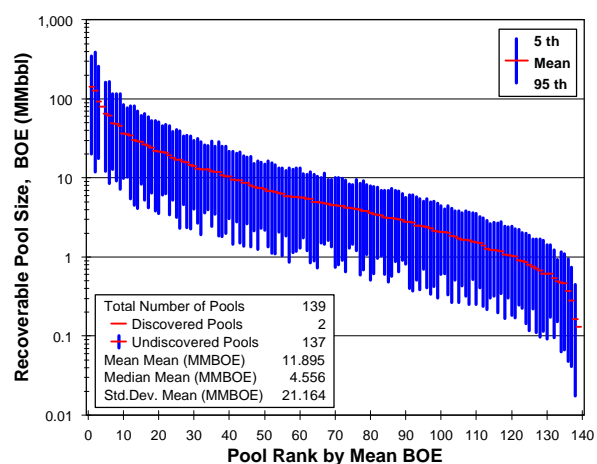


Figure 6. Pool rank plot.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1	<0.001	<0.001	<0.001
Cumulative production	--	<0.001	<0.001	<0.001
Remaining proved	--	0.000	0.000	0.000
Unproved	1	0.001	0.150	0.028
Appreciation (P & U)	--	0.002	0.285	0.052
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.921	0.530	1.042
Mean	137	1.388	0.869	1.542
5th percentile	--	1.980	1.320	2.171
Total Endowment				
95th percentile	--	0.924	0.966	1.122
Mean	139	1.391	1.305	1.622
5th percentile	--	1.983	1.756	2.251

LOWER CRETACEOUS CLASTIC (LK CL) PLAY

PLAY DESCRIPTION

The frontier Lower Cretaceous Clastic (LK CL) play occurs within the *Schuleridea lacustris*, *Eocytheropteron trinitensis*, *Cythereis fredericksburgensis*, *Fossocytheridea lenoirensis*, and *Lenticulina washitaensis* biozones. This play extends south of Mississippi, Alabama, and Florida offshore State waters into the northern portions of the Mobile, Destin Dome, Apalachicola, and Gainesville Areas (figure 1).

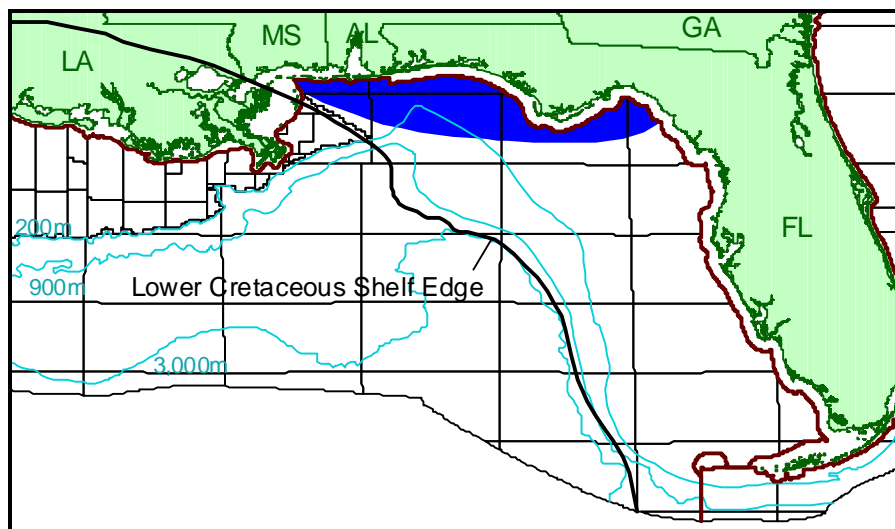


Figure 1. Map of assessed play.

Updip, the LK CL play extends onshore, while the downdip limit occurs where lower Cretaceous clastic sands interfinger with prodelta shales.

PLAY CHARACTERISTICS

The LK CL play consists mainly of aggradational, with some progradational, siliciclastic sediments that were deposited in a delta plain environment as barrier bars and channels of the Hosston, Paluxy, and Dantzler Formations (figure 2). Potential reservoirs in the LK CL play are predominantly barrier bar and channel sand deposits. The clastic Hosston Formation comprises barrier bars and stream channels, with gross interval thicknesses of 2,000 feet in the Mobile Area and 2,700 feet in the Destin Dome Area. The Paluxy Formation is widespread offshore and locally has high porosity in barrier bars and stream channels, with gross interval thicknesses ranging from 900 feet in the Mobile Area to over 2,200 feet in the Destin Dome Area. The Dantzler Formation is

National Assessment Mesozoic Stratigraphy									
		Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays			
Cretaceous	Upper	Selma Gp Tylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	LK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	ALK CL			
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Redessa Fm James Fm Pine Island Fm Sligo (Petlet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunnland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL			
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr	AUU CL AUU CB			
	Middle		Non-Deposition		Abenaki Fm Mohican Fm	AMU CL AMU CB			
	Lower	Louann Salt			Argo Salt				
Triassic	Upper	Eagle Mills Fm Basement	Basement		Eurdice Fm Basement				

Rock unit positions do not imply age relationships between basins.

Figure 2. Stratigraphic column.

thickest over the Destin Dome, but thins to the south away from its source area. Structures in the play are related to salt tectonics and faulting, and stratigraphic traps are related to facies changes. The Upper Jurassic Smackover Formation is the main source rock for the LK CL play, and early Cretaceous marine shales provide seals.

The analog type field for the LK CL play is the Oak Grove Field, Simpson County, Mississippi, which produces from the Lower Cretaceous Rodessa Formation.

DISCOVERIES

Of the Federal OCS wells that penetrated this play, all were dry (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). However, this play was probably not the primary exploration target for these wells.

ASSESSMENT RESULTS

Because the LK CL play is not currently productive in the Federal OCS, the productive Hosston, Rodessa, Paluxy, and Dantzler Formations and the Fredericksburg and Washita Groups of onshore Louisiana, Mississippi, and Alabama were used as an analog for this assessment (figure 2). The analog encompasses an area of 13.7 million acres (21,395 square miles). Exploration in the analog has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 75 percent of the analog explored. Analog fields contain an average of 27 percent oil, 43 percent gas, and 30 percent mixed hydrocarbons. Production from the analog fields ranges from less than 1 to 398 MMBOE. Net pay ranges from 10 to 179 feet at depths of 7,100 to 17,150 feet. Reservoirs are characterized by porosities of 8 to 30 percent, oil gravities of 15 to 69° API, and GOR's of 6 to 423,458 scf/stb.

The marginal probability of hydrocarbons for the LK CL play is 0.65. Assessment results indicate that undiscovered resources are estimated to be zero at the 95th percentile but 0.093 Bbo and 0.244 Tcfg at the 5th percentile (table 1 and figure 3). The mean undiscovered resources are estimated at 0.037 Bbo and 0.110 Tcfg (0.057 BBOE).

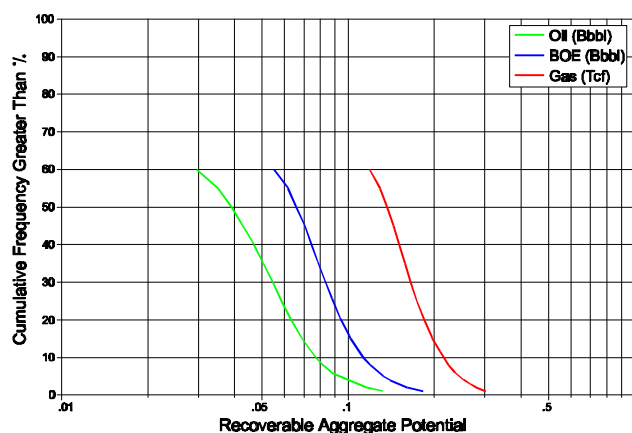


Figure 3. Cumulative probability distribution.

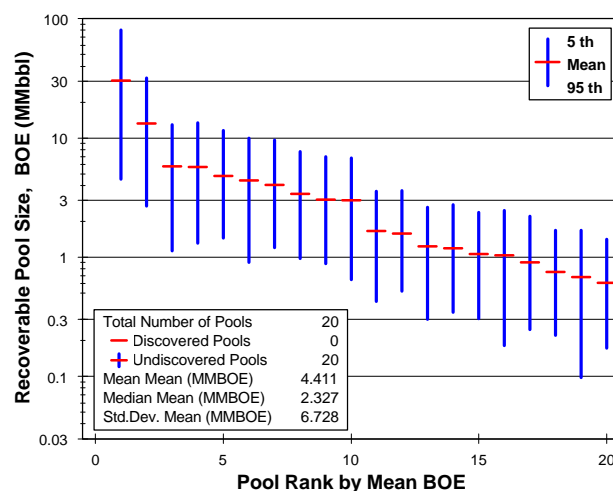


Figure 4. Pool rank plot.

These undiscovered resources may occur in as many as 20 pools, which have an unrisken mean size range of 0.613 to 30.149 MMBOE (figure 4). These pools have an unrisken mean mean size estimated at 4.411 MMBOE.

Table 1. Assessment results.

Marginal Probability = 0.65	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.000	0.000	0.000
Mean	20	0.037	0.110	0.057
5th percentile	--	0.093	0.244	0.133
Total Endowment				
95th percentile	--	0.000	0.000	0.000
Mean	20	0.037	0.110	0.057
5th percentile	--	0.093	0.244	0.133

LOWER CRETACEOUS SHELF-MARGIN CARBONATE (LK CB) PLAY

PLAY DESCRIPTION

The established Lower Cretaceous Shelf-Margin Carbonate (LK CB) play occurs within the *Choffatella decipiens*, *Orbitolina texana*, *Dictyoconus walnutensis*, and *Lenticulina washitensis* biozones. The play extends from the Mobile/Chandeleur Areas southeastward along the lower Cretaceous shelf edge to the U.S.-Cuba International Boundary (figure 1).

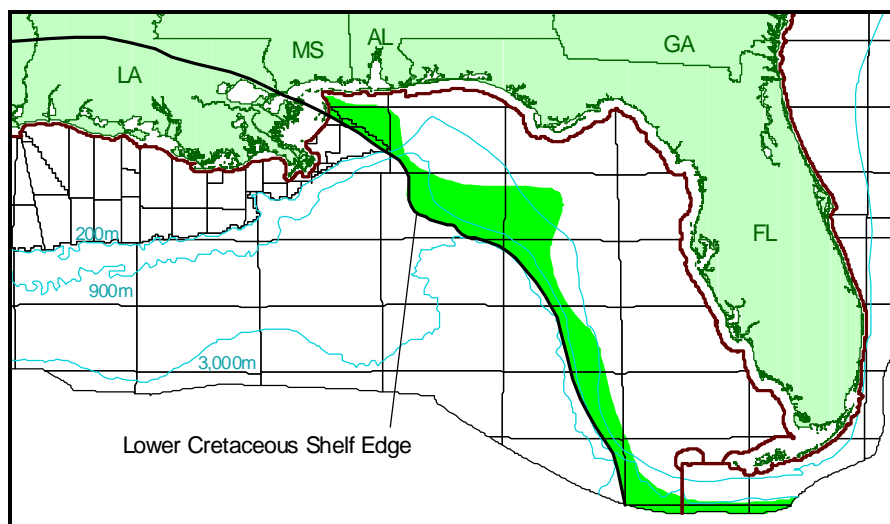


Figure 1. Map of assessed play.

The play is limited to the northeast by back-reef platform sediments characterized by carbonate muds, except where shoaling produced locally higher energy facies. Fore-reef facies of dark shales and carbonate muds bound the play to the southwest.

The LK CB play is one of only two Mesozoic plays, along with the Upper Jurassic Aggradational (UU A) play, in the Gulf of Mexico Region that has had Federal production. The Main Pass 253 field produced briefly from the Lower Cretaceous Washita Formation in the LK CB play (figure 2).

PLAY CHARACTERISTICS

The LK CB play consists of shelf-edge rudistid bioherms, reef talus, and localized patch reefs of the Sligo, James, and Mooringsport Formations and the Fredericksburg and Washita Groups of the Main Pass, Viosca Knoll, and western Desoto Canyon Areas (figure 2). The play also consists of shelf-edge rudistid bioherms and talus of the Sunniland Formation and the Brown Dolomite Zone in the Lehigh

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays	
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	LUK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Redessa Fm James Fm Pine Island Fm Sligo (Pettet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Rumpkin Bay Fm Bone Island Fm	LKCL LKCB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr	AUU CL AUU CB
	Middle		Non-Deposition		Abenaki Fm Mohican Fm	AMU CL AMU CB
	Lower	Louann Salt			Argo Salt	
Triassic	Upper	Eagle Mills Fm Basement	Basement		Eurdice Fm Basement	

Rock unit positions do not imply age relationships between basins.

Figure 2. Stratigraphic column.

Acres Formation in the South Florida Basin area (figure 3). Structure along the reef trend is related primarily to reef growth, and traps are mainly stratigraphic. Potential source rocks are early Cretaceous, locally occurring, organic-rich, lagoonal carbonates; deepwater limestones; or shales. Early Cretaceous marine shales, micrites, and anhydrites provide seals for the LK CB play.

Main Pass 253 is the type field, and the LK1 reservoir represents the LK CB play in this field.

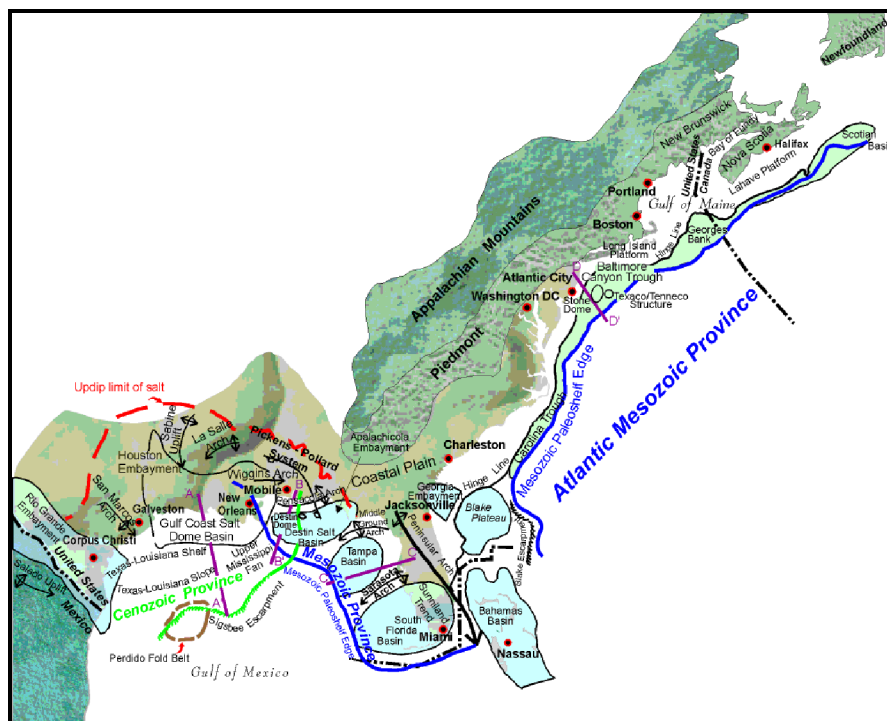


Figure 3. Physiographic map.

DISCOVERIES

The LK CB gas play contains total reserves of 0.003 Bbo and 0.436 Tcfg (0.080 BBOE), of which 0.054 MMbo and 0.325 Bcfg (0.112 MMBOE) have been produced. The play contains two pools/reservoirs (table 1), one of which is nonassociated gas and the other is saturated oil (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Of these two discovered pools, one contains proved reserves. The first pool, which contains 0.131 MMBOE, was discovered in 1972 in the Main Pass 253 field (figure 4). The maximum yearly total reserves of 80.106 MMBOE were added in 1993 when the largest discovered pool in the play in the Viosca Knoll 252 field was found. This

Table 1. Characteristics of the discovered pools.

2 Pools (2 Reservoirs)	Minimum	Mean	Maximum
Water depth (feet)	120	204	288
Subsea depth (feet)	8,700	11,500	14,300
Number of reservoirs per pool	1	1	1
Porosity	10%	15%	20%
Water saturation	26%	29%	32%

pool accounts for almost 100 percent of the play's total reserves, but none of its cumulative production. On a BOE basis, 52 percent of the play's cumulative production is gas, but remaining total reserves indicate that future production may increase to 97 percent gas.

ASSESSMENT RESULTS

Because the LK CB play contains only two discovered fields, an onshore producing analog was used to provide input parameters for this assessment. The analog comprises the onshore Texas Glen Rose Formation (equivalent to the Rodessa and Mooringsport Formations) and onshore Louisiana and Mississippi Pettet and Mooringsport Formations and Fredericksburg and Washita Groups (figure 2). The analog covers an area of 14.7 million acres (23,035 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 80 percent of the analog explored. Analog fields contain an average of 38 percent oil, 46 percent gas, and 16 percent mixed hydrocarbons. Production from the analog fields ranges from 1 to 86.8 MMBOE. Net pay ranges from 12 to 179 feet at depths of 4,650 to 14,800 feet. Fields within the analog are characterized by porosities of 12 to 26 percent, oil gravities of 13 to 62° API, and GOR's of 35 to 120,284 scf/stb.

The marginal probability of hydrocarbons for the LK CB play is 1.00. The play contains a mean total endowment of 0.348 Bbo and 1.122 Tcfg (0.547 BBOE) (table 2). Less than 1 percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.196 to 0.562 Bbo and 0.432 to 1.014 Tcfg at the 95th and 5th percentiles, respectively (figure 5). The mean undiscovered resources are estimated at 0.345 Bbo and 0.686 Tcfg (0.467 BBOE). These undiscovered resources may occur in as many as 26 pools (figure 6). The only two discovered pools are modeled as the second largest and the smallest. The undiscovered pools have a mean size range of 0.477 to 140.950 MMBOE. For all the undiscovered pools in the LK CB play, the mean mean size is 17.994 MMBOE.

Of the 61 Gulf of Mexico Region plays, the LK CB play is projected to contain the ninth largest amount of mean undiscovered oil resources.

The lower Cretaceous shelf margin can be traced around almost the entire Gulf of

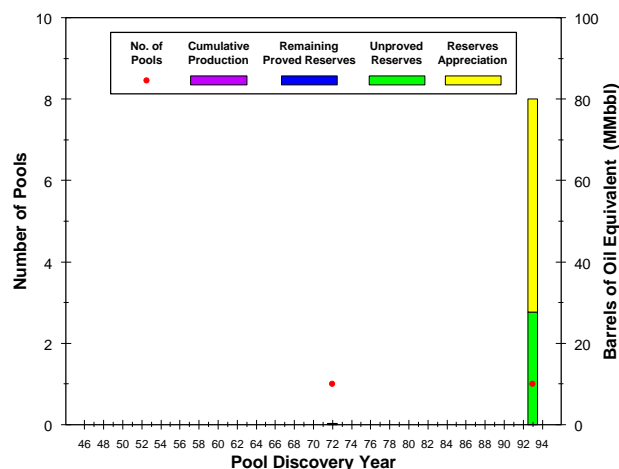


Figure 4. Exploration history graph.

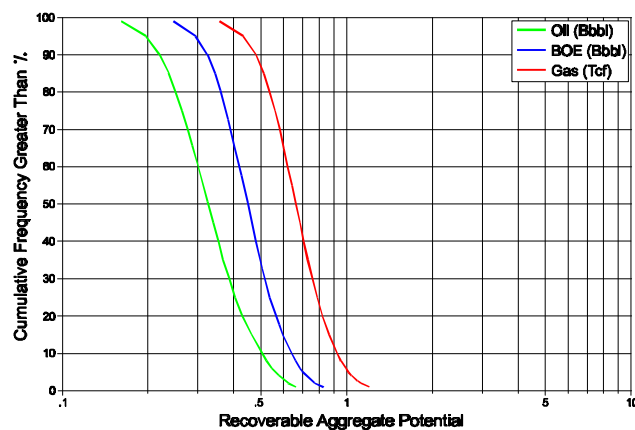


Figure 5. Cumulative probability distribution.

Mexico, from southern offshore Florida, across Louisiana and Texas, into Mexico and around the Yucatan Peninsula. Good porous carbonate reservoirs may be found along this entire trend. Although the Texas fields along the Sligo-Stuart City Reef Trend have been small, fields along the lower Cretaceous shelf-edge margin in Mexico include giant field complexes, such as the Golden Lane and parts of the Reforma Area. Other wells in the U.S. offshore have tested the lower Cretaceous shelf-margin carbonate potential and encountered both porosity and charge, but only in two locations have adequate traps been found. Although the LK CB play has only two discovered fields, the large extent of the lower Cretaceous shelf margin suggests that future discoveries are probable, especially if some form of trap can be identified. The undiscovered resources are estimated to account for 85 percent of the play's BOE mean total endowment.

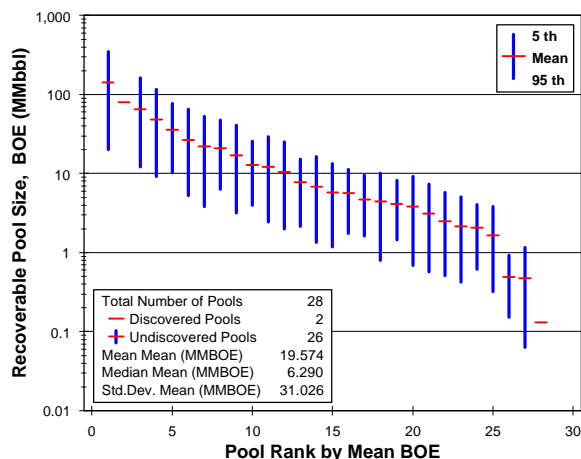


Figure 6. Pool rank plot.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	1	<0.001	<0.001	<0.001
Cumulative production	--	<0.001	<0.001	<0.001
Remaining proved	--	0.000	0.000	0.000
Unproved	1	0.001	0.150	0.028
Appreciation (P & U)	--	0.002	0.285	0.052
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.196	0.432	0.294
Mean	26	0.345	0.686	0.467
5th percentile	--	0.562	1.014	0.700
Total Endowment				
95th percentile	--	0.199	0.868	0.374
Mean	28	0.348	1.122	0.547
5th percentile	--	0.565	1.450	0.780

LOWER CRETACEOUS SUNNILAND CARBONATE (LK SUN) PLAY

PLAY DESCRIPTION

The frontier Lower Cretaceous Sunniland Carbonate (LK SUN) play occurs at the *Orbitolina texana* biozone. This play is located along the perimeter of the Lower Cretaceous South Florida Basin Carbonate (LK SFB) play (figure 1).

To the north, a facies change to clastics limits the LK SUN play. To the south and west, the play is limited by the rudistid bioherms of the Lower Cretaceous Shelf-Margin Carbonate (LK CB) play. To the east, the play continues onshore into Florida as the producing Sunniland Trend (figure 2).

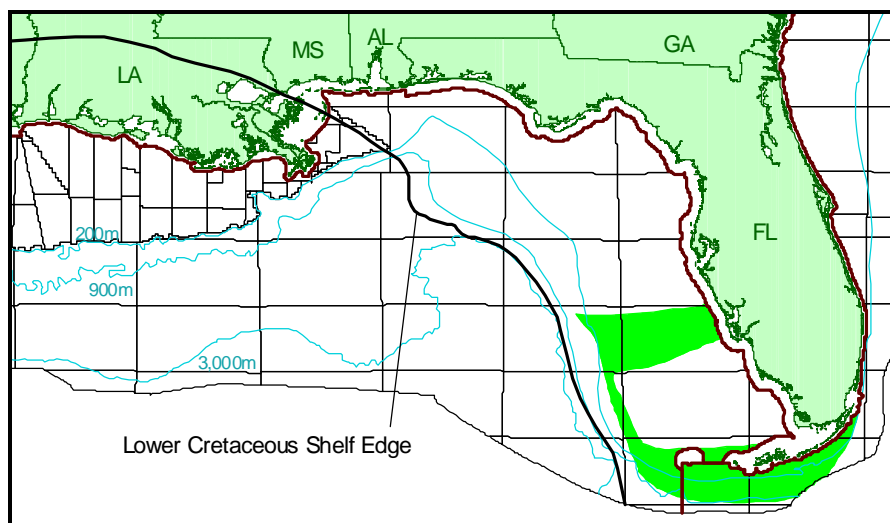


Figure 1. Map of assessed play.

PLAY

CHARACTERISTICS

The LK SUN play consists of platform grainstones, patch reefs, and reef talus of the Bone Island, Pumpkin Bay, and Sunniland Formations, and the Brown Dolomite Zone of the Lehigh Acres Formation (figure 3). Structures are related to reef buildups, and traps are mainly stratigraphic. Potential reservoirs in the LK SUN play are primarily patch reefs built up on local basement highs. Other reservoirs may

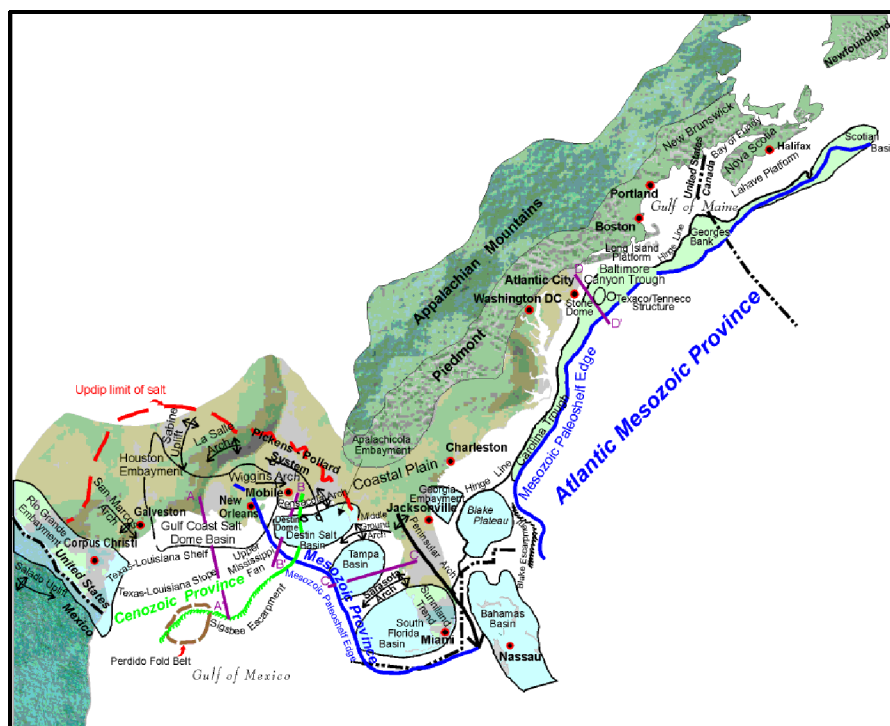


Figure 2. Physiographic map.

include platform grainstones and reef talus. Potential source rocks are locally occurring, early Cretaceous carbonates. Early Cretaceous marine shales, micrites, and anhydrites provide seals for the LK SUN play.

The analog type field for the LK SUN play is the Sunoco West Felda Field, Hendry County, Florida.

DISCOVERIES

Approximately 400 wells have been drilled in the onshore Sunniland Trend (including the Marquesa Keys wells), with about 100 MMBOE produced. The onshore Sunniland Trend contains 14 fields. The first discovery was the Sunniland Field, Collier County, Florida, in 1943. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was the Corkscrew Field, Collier County, Florida, in 1985.

The LK SUN play is not currently productive in the Federal OCS. Two wells in the offshore State waters of Florida Straits contained hydrocarbons. Seven wells in the Federal OCS have tested the LK SUN play, of which the number 1 well in block 519 of the Dry Tortugas Area and the number 1 well in block 672 of the Charlotte Harbor Area encountered oil shows (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory).

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Rays	Atlantic Basin/ Scotian Basin	Atlantic Flays	
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL	
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sigo (Rtlet) Fm Hobston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	AUK CL	
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AUU CB AMU CL AMU CB
	Middle		Non-Deposition			
	Lower	Louann Salt			Argo Salt	
Triassic	Upper	Eagle Mills Fm	Basement		Eurdice Fm	
		Basement			Basement	

Rock unit positions do not imply age relationships between basins.

Figure 3. Stratigraphic column.

ASSESSMENT RESULTS

Because the LK SUN is not as yet productive in the Federal OCS area, the productive Sunniland Trend of onshore Florida was used as an analog for this assessment (figure 2). The Sunniland Trend analog covers an area of 742,400 acres (1,160 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 90 percent of the analog explored. Analog fields average greater than 90 percent oil. Production from the analog fields ranges from less than 1 to 43.3 MMBOE. Net pay ranges from less than 3 to 24 feet at depths of 11,450 to 11,900 feet. Fields are

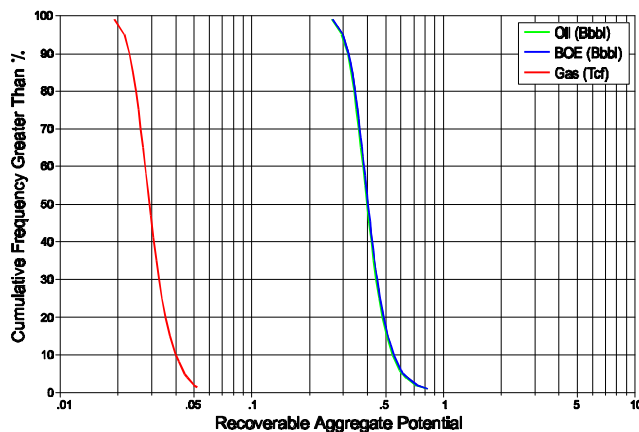


Figure 4. Cumulative probability distribution.

characterized by porosities of 7 to 17 percent, oil gravities of 21 to 28° API, and GOR's of 10 to 890 scf/stb.

The marginal probability of hydrocarbons for the LK SUN play is 1.00. Assessment results indicate that undiscovered resources have a range of 0.295 to 0.609 Bbo and 0.022 to 0.045 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 4). The mean undiscovered resources are estimated at 0.419 Bbo and 0.031 Tcfg (0.425 BBOE). These undiscovered resources may occur in as many as 33 pools, which have a mean size range of 0.618 to 93.361 MMBOE (figure 5). These pools have a mean mean size estimated at 12.874 MMBOE.

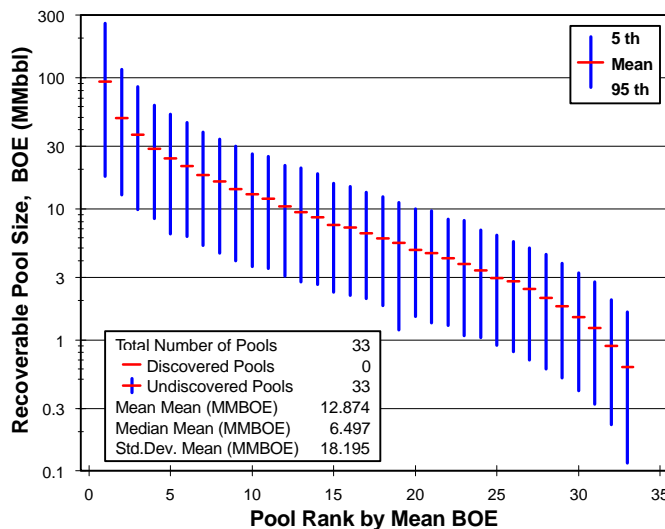


Figure 5. Pool rank plot.

Of the 61 Gulf of Mexico Region plays, the LK SUN play is projected to contain the seventh largest amount of mean undiscovered oil resources.

Areas of potential discoveries occur in the carbonate trend near the perimeter of the South Florida Basin (figure 2).

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.295	0.022	0.298
Mean	33	0.419	0.031	0.425
5th percentile	--	0.609	0.045	0.617
Total Endowment				
95th percentile	--	0.295	0.022	0.298
Mean	33	0.419	0.031	0.425
5th percentile	--	0.609	0.045	0.617

LOWER CRETACEOUS SOUTH FLORIDA BASIN CARBONATE (LK SFB) PLAY

PLAY DESCRIPTION

The conceptual Lower Cretaceous South Florida Basin Carbonate (LK SFB) play occurs within the *Choffatella decipiens*, *Orbitolina texana*, and *Dictyoconus walnutensis* biozones. This play is located in the interior of the South Florida Basin (figure 1 and figure 2). The LK SFB play is bounded in all directions by the Lower Cretaceous Sunniland Carbonate (LK SUN) play.

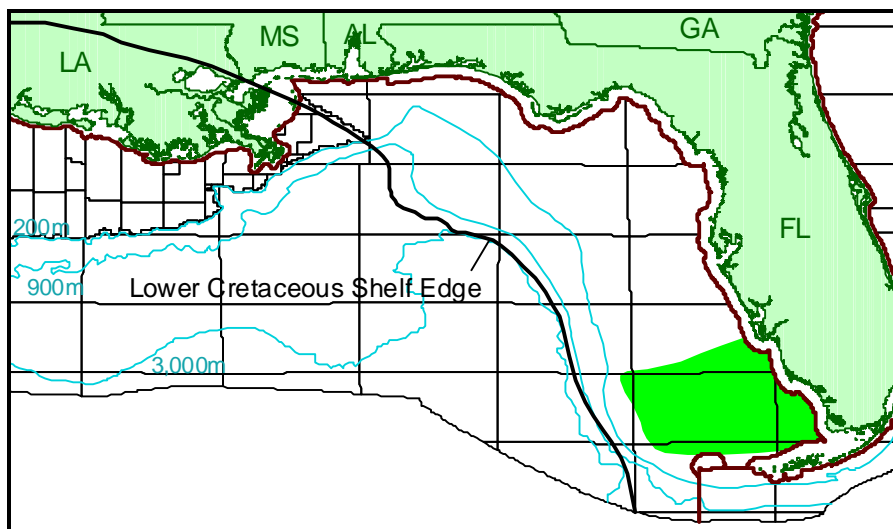


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The LK SFB play consists of platform limestones, patch reefs, reef talus, and porous dolomites associated with cyclothems of the Bone Island, Pumpkin Bay, and Sunniland Formations, and the Brown Dolomite Zone of the Lehigh Acres Formation (figure 3). Structural closures over reefal buildups are possible, but traps are mainly stratigraphic and related to platform limestones, patch reefs, and reef talus.

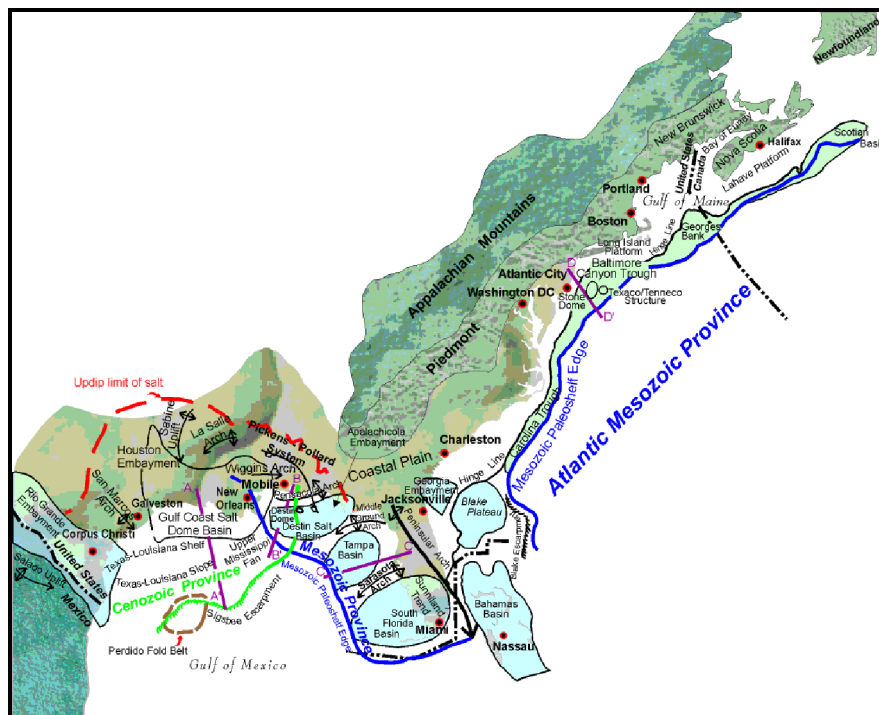


Figure 2. Physiographic map.

Potential source rocks are locally occurring, early Cretaceous carbonates. Early Cretaceous marine shales, micrites, and anhydrites provide seals for the LK SFB play.

The analog type field for the LK SFB play is the Sunoco West Felda Field, Hendry County, Florida.

DISCOVERIES

No Federal OCS wells have been drilled in this play.

ASSESSMENT RESULTS

Because the LK SFB play has not been drilled in the Federal OCS, the productive Sunniland Trend of onshore Florida was used as an analog for this assessment (figure 2). The analog covers an area of 742,400 acres (1,160 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 90 percent of the analog explored. Analog fields average greater than 90 percent oil. Production from the analog fields ranges from less than 1 to 43.3 MMBOE. Net pay ranges from less than 3 to 24 feet at depths of 11,450 to 11,900 feet. Fields are characterized by porosities of 7 to 17 percent, oil gravities of 21 to 28° API, and GOR's of 10 to 890 scf/stb. The marginal probability of hydrocarbons for the LK SFB play is 1.00. Assessment results indicate that undiscovered resources have a range of 0.400 to 0.881 Bbo and 0.029 to 0.065 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 4) The mean undiscovered resources are estimated at 0.587 Bbo and 0.042 Tcfg (0.593 BBOE). These undiscovered

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays	
Cretaceous	Upper	Seima Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sigo (Fattet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Snackover Fm Norphet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AMU CL AMU CB
	Middle	Louann Salt	Non-Deposition		Argo Salt	
	Lower		Basement		Eurdice Fm Basement	
Triassic	Upper	Eagle Mills Fm Basement				

Rock unit positions do not imply age relationships between basins.

Figure 3. Stratigraphic column.

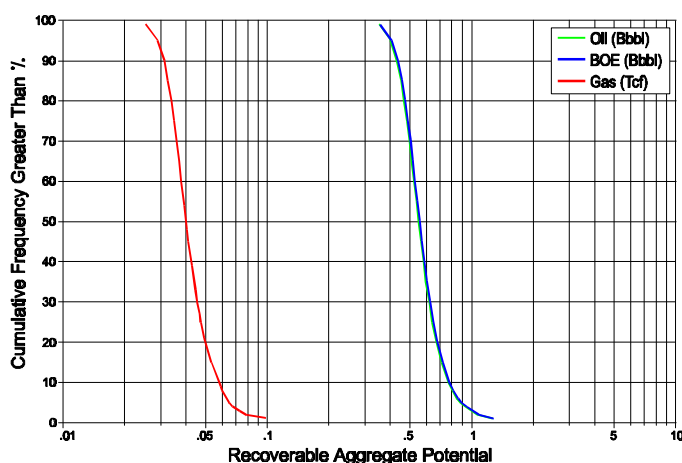


Figure 4. Cumulative probability distribution.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.400	0.029	0.405
Mean	58	0.587	0.042	0.593
5th percentile	--	0.881	0.065	0.893
Total Endowment				
95th percentile	--	0.400	0.029	0.405
Mean	58	0.587	0.042	0.593
5th percentile	--	0.881	0.065	0.893

resources may occur in as many as 58 pools, which have a mean size range of 0.165 to 126.720 MMBOE (figure 5). These pools have a mean mean size estimated at 10.211 MMBOE.

Areas of potential discoveries occur entirely within the interior of the South Florida Basin (figure 2).

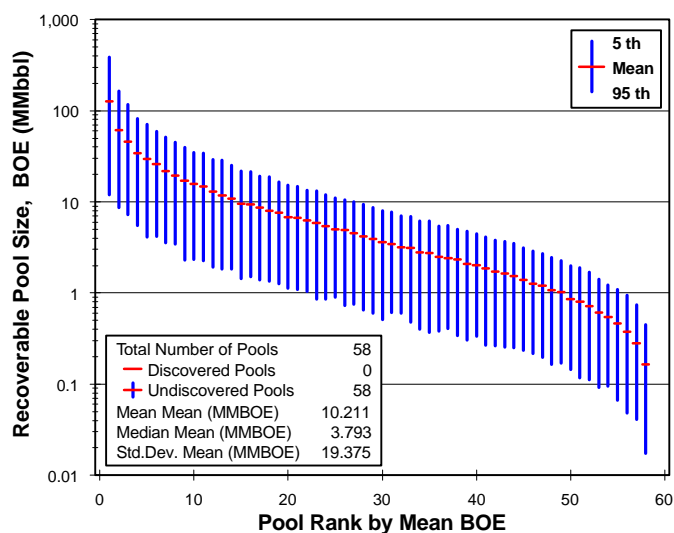


Figure 5. Pool rank plot.

UPPER JURASSIC (UU) CHRONOZONE

CHRONOZONE DESCRIPTION

The Upper Jurassic (UU) chronozone in the Gulf of Mexico Region corresponds to the *Pseudocyclammina jaccardi* biozone. The upper Jurassic section consists of clastics and carbonates, each of which defines a play: the Upper Jurassic Aggradational (UU A) play and the Upper Jurassic Smackover Carbonate (UU SMK) play (figure 1). The clastics consist of aggradational eolian dune facies of the Norphlet Formation, and the carbonates consist of oolitic grainstones and algal carbonates of the Smackover Formation. One additional play, the Upper Jurassic to Lower Cretaceous Transition Zone (UU-LK TZ) play, is also present in the chronozone, but was not assessed due to a probable lack of source rocks.

Reservoir potential in the upper Jurassic chronozone occurs in the Mobile, Pensacola, and Destin Dome Areas of the Federal OCS (figure 2). Updip, the plays extend onshore. Downdip, reservoir potential is limited by a facies change to marine shales and micrites.

Productive reservoirs in the upper Jurassic chronozone are related to faulted anticlines associated with salt tectonics and stratigraphic traps associated with dune facies, oolitic grainstones, and algal carbonates.

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Flays	Atlantic Basin/ Scotian Basin	Atlantic Flays	
Cretaceous	Upper	Salma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Flne Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Redessa Fm James Fm Pine Island Fm Sligo (Pettet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AUU CB AMU CL AMU CB
	Middle		Non-Deposition			
	Lower	Louann Salt			Argo Salt	
Triassic	Upper	Eagle Mills Fm	Basement		Eurdice Fm	
		Basement			Basement	

Rock unit positions do not imply age relationships between basins.

Figure 1. Stratigraphic column.

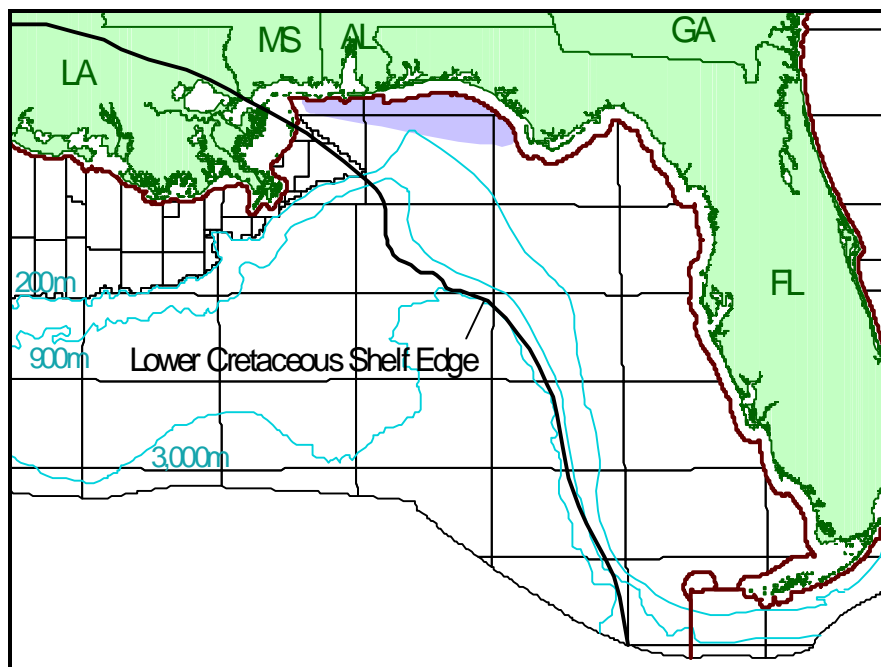


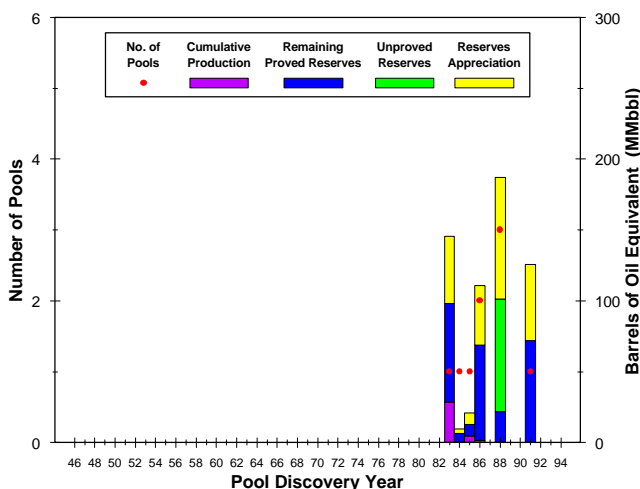
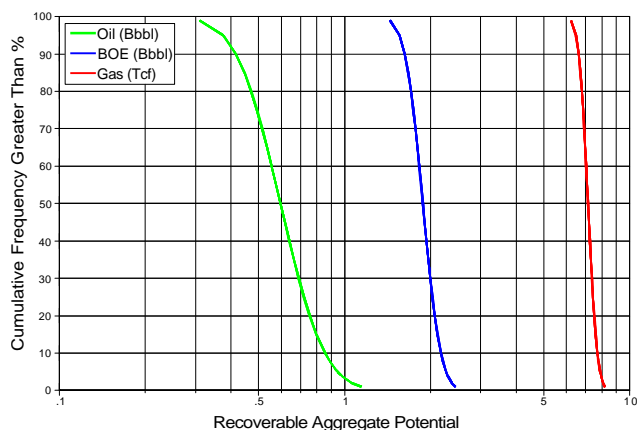
Figure 2. Map of assessed chronozone.

Table 1. Characteristics of the discovered pools.

9 Pools (9 Producible Sands)	Minimum	Mean	Maximum
Water depth (feet)	37	64	187
Subsea depth (feet)	21,243	21,858	22,600
Number of sands per pool	1	1	1
Porosity	10%	13%	16%
Water saturation	19%	31%	52%

DISCOVERIES

Of the two plays in the upper Jurassic chronozone, the UU A play has nine discovered pools in Federal waters, while the UU SMK play has none (table 1). The chronozone contains total reserves of 0.264 MMbo and 3.373 Tcfg (0.600 BBOE), of which 0.016 MMbo and 0.198 Tcfg (0.035 BBOE) have been produced. The largest number of discoveries occurred in 1988 when three pools added the maximum yearly total reserves of 187.324 MMBOE (figure 3).

**Figure 3.** Exploration history graph.**Figure 4.** Cumulative probability distribution.

ASSESSMENT RESULTS

The upper Jurassic chronozone contains 46 pools (discovered plus undiscovered), with a mean total endowment estimated at 0.620 Bbo and 10.542 Tcfg (2.496 BBOE) (table 2).

Assessment results indicate that undiscovered resources may occur in as many as 37 pools, which contain a range of 0.375 to 0.947 Bbo and 6.490 to 7.890 Tcfg at the 95th and 5th percentiles, respectively (figure 4). At mean levels, 0.620 Bbo and 7.169 Tcfg (1.896 BBOE) are projected. These undiscovered resources represent 76 percent of the upper

Jurassic chronozone's BOE mean total endowment. The largest undiscovered pool is modeled as the largest pool in the chronozone (figure 5).

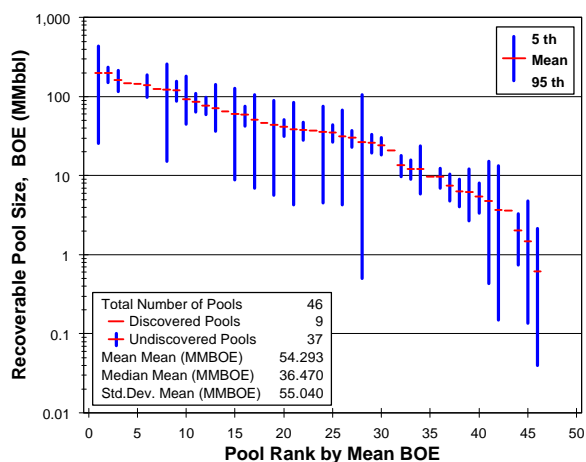


Figure 5. Pool rank plot.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	8	<0.001	1.572	0.280
Cumulative production	--	<0.001	0.198	0.035
Remaining proved	--	<0.001	1.374	0.245
Unproved	1	<0.001	0.446	0.079
Appreciation (P & U)	--	<0.001	1.355	0.241
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.375	6.490	1.561
Mean	37	0.620	7.169	1.896
5th percentile	--	0.947	7.890	2.273
Total Endowment				
95th percentile	--	0.375	9.863	2.161
Mean	46	0.620	10.542	2.496
5th percentile	--	0.947	11.263	2.873

UPPER JURASSIC AGGRADATIONAL (UU A) PLAY

PLAY DESCRIPTION

The established Upper Jurassic Aggradational (UU A) play is the largest established Mesozoic play in the Gulf of Mexico Region and occurs in the Mobile, Viosca Knoll, Pensacola, Destin Dome, and Apalachicola Areas in the Federal OCS (figure 1). The play extends onshore updip and is limited by a facies change to marine shales and micrites downdip.

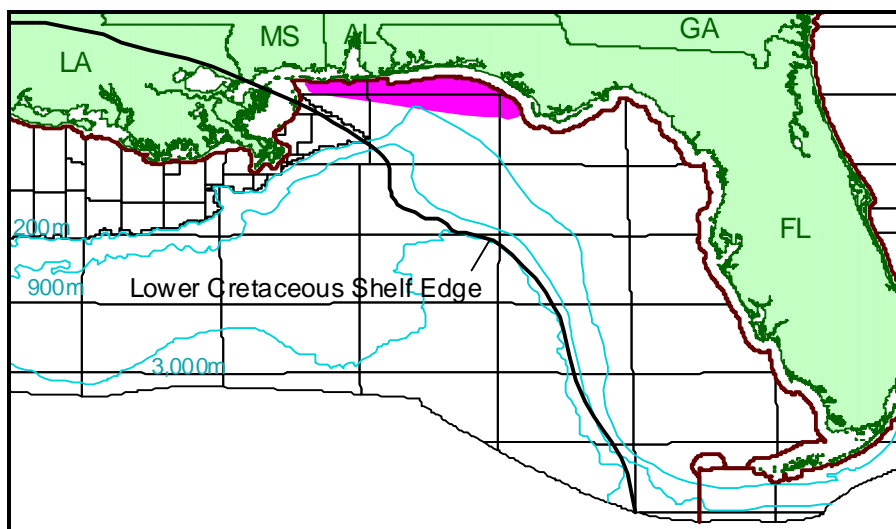


Figure 1. Map of assessed play.

The UU A is one of only two Mesozoic plays, along with the Lower Cretaceous Shelf-Margin Carbonate (LK CB) play, in the Gulf of Mexico that has had Federal production.

PLAY CHARACTERISTICS

The UU A play consists of aggradational eolian dune facies of the Norphlet Formation (figure 2). The Norphlet sands were derived from erosion of the exposed southern Appalachian highlands and basement highs. The updip area of the Norphlet Formation was deposited as alluvial fan and braided stream facies, while downdip, the Norphlet Formation formed as dune and interdune facies. Dune facies provide the most potential for offshore hydrocarbon accumulations, but are highly variable in thickness. Geopressured reservoirs occur in the southern and western Mobile and western Destin Dome Areas. Structures are mainly faulted anticlines related to salt tectonics. The overlying Upper Jurassic Smackover Formation is the source of hydrocarbons and provides seals for the siliciclastic reservoirs of the Norphlet Formation.

		National Assessment Mesozoic Stratigraphy				
		Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Rays
Cretaceous	Upper	Salma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rdessa Fm James Fm Pine Island Fm Sigo (Pittet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU S/MK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AUU CB AMU CL AMU CB
	Middle	Louann Silt	Non-Deposition			
	Lower				Argo Salt	
Triassic	Upper	Eagle Mills Fm Basement	Basement		Eurdice Fm Basement	

Rock unit positions do not imply age relationships between basins.

Figure 2. Stratigraphic column.

Mobile 823 is the type field, and the Norphlet reservoir represents the UU A play in this field.

DISCOVERIES

The UU A gas play contains total reserves of 0.264 MMbo and 3.373 Tcfg (600.479 MMBOE), of which 0.016 MMbo and 0.198 Tcfg (35.253 MMBOE) have been produced. The first Norphlet Formation discovery was in the Pelahatchie Field, Rankin County, Mississippi, in 1967. Subsequently, more than 40 fields were discovered within the play onshore. The play did not become a Federal OCS target until the 1979 gas discovery in the Lower Mobile Bay-Mary Ann Field in offshore State waters. Since then, nine pools with nine producible sands have been discovered in the UU A play in the Federal OCS

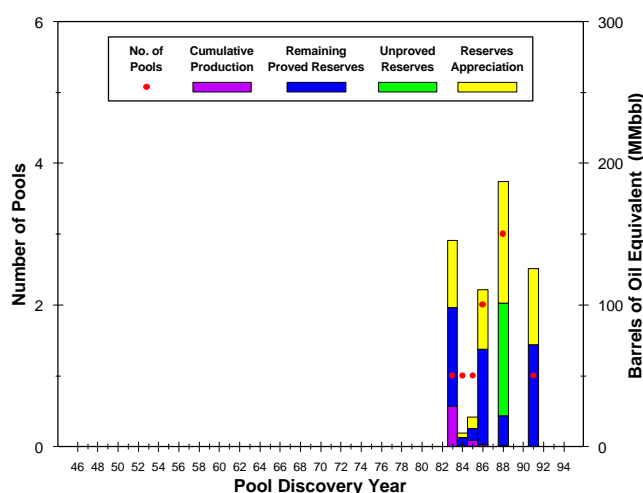


Figure 3. Exploration history graph.

(table 1 and figure 3). The first reserves in the Federal OCS portion of the play were found in 1983 in the Mobile 823 field. The most active year for discoveries was in 1988, when the maximum yearly total reserves of 187.324 MMBOE were added with the discovery of three pools, including the largest pool in the play in the Destin Dome 56 field. The most recent discovery, prior to this study's cutoff date of January 1, 1995, was in 1991. It should be noted that 28 feet of gas was discovered in the OCS G07857-2 well in Mobile block 991 (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). However, the gas occurs in a tight sand deposited in a beach environment and is not considered to be part of the prospective dune environment that defines the UU A play.

The nine discovered pools range in size from 3.599 to 146.769 MMBOE. These pools contain 12 reservoirs, all of which are nonassociated gas.

Of the nine Mesozoic plays in the Gulf of Mexico, the UU A play is the largest,

Table 1. Characteristics of the discovered pools.

9 Pools (9 Producing Sands)	Minimum	Mean	Maximum
Water depth (feet)	37	64	187
Subsea depth (feet)	21,243	21,858	22,600
Number of sands per pool	1	1	1
Porosity	10%	13%	16%
Water saturation	19%	31%	52%

containing 88 percent of the total reserves and producing over 99 percent of the hydrocarbons, based on BOE.

ASSESSMENT RESULTS

The marginal probability of hydrocarbons for the UU A play is 1.00. This play is the tenth largest in the Gulf of Mexico, based on a mean total endowment of 0.591 Bbo and 10.494 Tcfg (2.458 BBOE) (table 2). Just over 1 percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered resources have a range of 0.360 to 0.856 Bbo and 6.470 to 7.808 Tcfg at the 95th and 5th percentiles, respectively (figure 4). The mean undiscovered resources are estimated at 0.591 Bbo and 7.121 Tcfg

(1.858 BBOE). These undiscovered resources may occur in as many as 32 pools. The largest undiscovered pool, with a mean size of 200.410 MMBOE, is modeled as the largest pool in the play (figure 5). The model results place the next four largest undiscovered

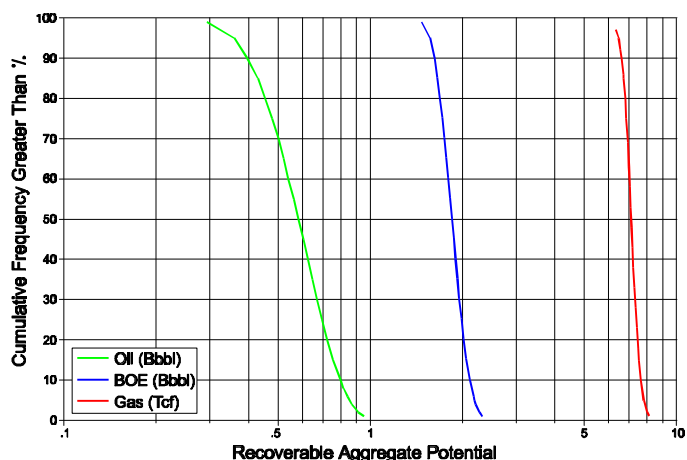


Figure 4. Cumulative probability distribution.

Table 2. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	8	<0.001	1.572	0.280
Cumulative production	--	<0.001	0.198	0.035
Remaining proved	--	<0.001	1.374	0.245
Unproved	1	<0.001	0.446	0.079
Appreciation (P & U)	--	<0.001	1.355	0.241
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.360	6.470	1.565
Mean	32	0.591	7.121	1.858
5th percentile	--	0.856	7.808	2.188
Total Endowment				
95th percentile	--	0.360	9.843	2.165
Mean	41	0.591	10.494	2.458
5th percentile	--	0.858	11.181	2.788

pools in positions 2, 3, 6, and 8 on the pool rank plot. For all the undiscovered pools in the UU A play, the mean mean size is 58.127 MMBOE, which is smaller than the 66.720 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 60.013 MMBOE.

Of the 61 plays in the Gulf of Mexico, the UU A play is projected to contain the fourth largest amounts of mean undiscovered oil and gas resources.

With a large number of pools modeled as undiscovered, the UU A play has good exploration potential.

These undiscovered pools are expected to account for 76 percent of the play's BOE mean total endowment. Areas of potential discoveries occur in the dune reservoir facies of the Pensacola and Destin Dome Areas, where the largest accumulations of sand are located. Although the UU A play is typically a gas play, oil and condensate have been found in the Destin Dome Area.

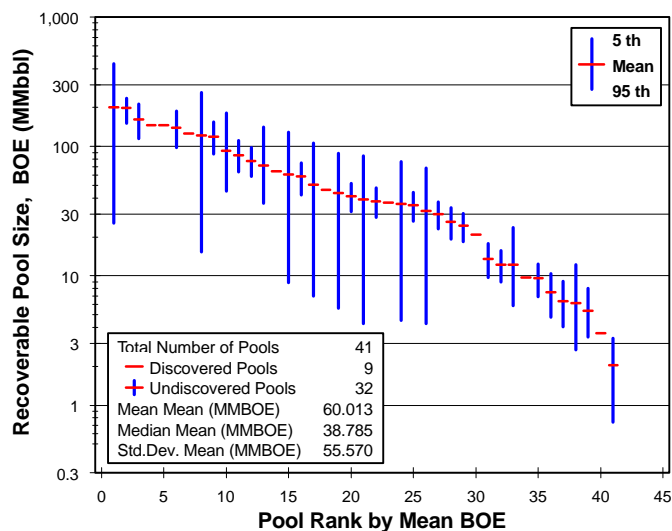


Figure 5. Pool rank plot.

UPPER JURASSIC SMACKOVER CARBONATE (UU SMK) PLAY

PLAY DESCRIPTION

The frontier Upper Jurassic Smackover Carbonate (UU SMK) play occurs at the *Pseudocyclammina jaccardi* biozone. This play is located primarily in the Pensacola Area (figure 1). Updip, the play extends onshore, while downdip, it is limited by a facies change to marine micrites.

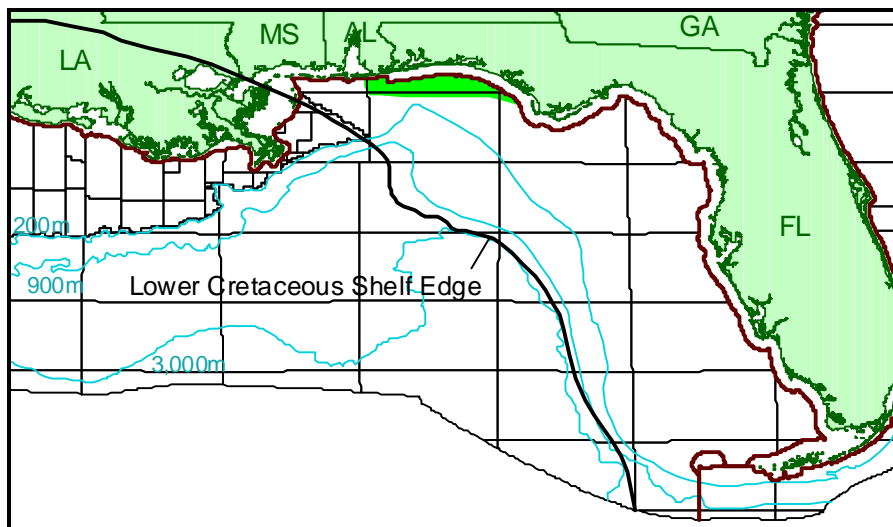


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

The UU SMK play mainly consists of oolitic grainstones and algal carbonates of the Smackover Formation (figure 2). Potential reservoirs are located primarily in the Pensacola Area, where localized carbonate buildups formed on basement highs and the varying topography of the underlying Norphlet Formation. These potential reservoirs occur primarily in oolitic and algal carbonates, which are often dolomitized and subaerially exposed and leached. Major structural features in this play are anticlines associated with the underlying Louann Salt, growth faults, and normal faults. However, traps are mainly stratigraphic. The Smackover Formation is self-sourced by a low-energy, algal-rich, micritic facies at its base. Additionally, the shales, anhydrites, and carbonates of the Smackover Formation provide the play's seals.

The analog type field for the UU SMK play is the Little Escambia Creek Field, Escambia County, Alabama, which produces from the Smackover Formation.

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Flays	
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Fredericksburg Gp Paloxy Fm Glen Rose Fm Mooringport Fm Ferry Lake Fm Ridessa Fm James Fm Pine Island Fm Sigo (Pittet) Fm Hobston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm	AUU CL AUU CB AMU CL AMU CB
	Middle	Louann Salt	Non-Deposition		Mohican Fm	
Triassic	Lower		Basement		Argo Salt	
	Upper	Eagle Mills Fm			Eurdice Fm	
	Basement				Basement	

Rock unit positions do not imply age relationships between basins.

Figure 2. Stratigraphic column.

DISCOVERIES

Two wells, Sohio's OCS G06391-1 and Tenneco's OCS G06391-2 in Pensacola block 948, encountered hydrocarbon shows (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Texaco's OCS G06396-1 well in Pensacola block 996 discovered 22 feet of oil, which was never tested.

ASSESSMENT RESULTS

Because the UU SMK play is not productive in the Federal OCS, an analog comprising the productive Smackover of onshore Louisiana, Mississippi, and Alabama was used for this assessment. This analog covers an area of 8.2 million acres (12,850 square miles). Onshore Smackover fields associated with the Pickens-Pollard Fault System produce oil primarily north of the fault system and oil and gas south of the fault system (figure 3).

This fault system extends offshore into the Destin Dome Area. In addition, the onshore Pensacola Arch extends offshore as basement highs in the Pensacola Area. Exploration of the analog has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 90 percent of the analog explored. Analog fields contain an average of 41 percent oil, 9 percent gas, and 50 percent mixed hydrocarbons. Production from the analog fields ranges from less than 1 to 481.5 MMBOE. Net pay ranges from 4 to 335 feet at depths of 11,392 to 18,425 feet. Fields are characterized by porosities of 8 to 28 percent, oil gravities of 19 to 54° API, and GOR's of 144 to 12,400

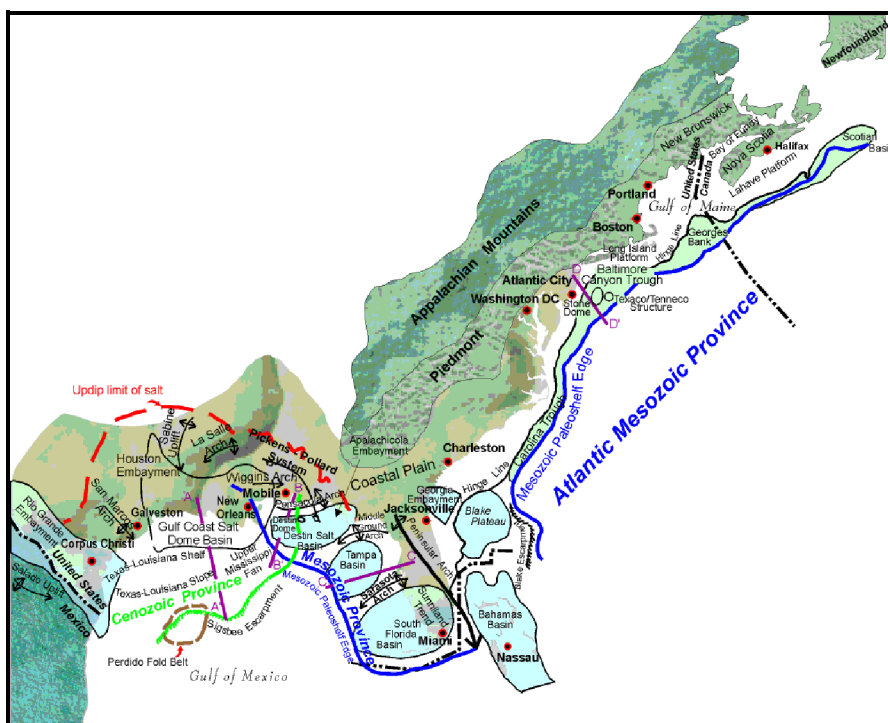


Figure 3. Physiographic map.

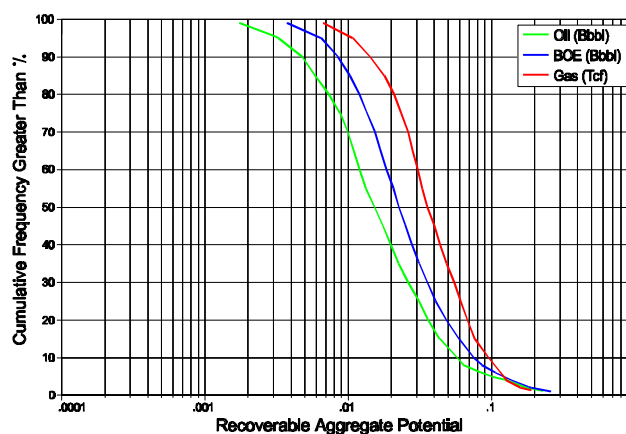


Figure 4. Cumulative probability distribution.

scf/stb.

The marginal probability of hydrocarbons for the UU SMK play is 1.00. Assessment results indicate that undiscovered resources have a range of 0.003 to 0.101 Bbo and 0.011 to 0.122 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 4). The mean undiscovered resources are estimated at 0.029 Bbo and 0.048 Tcfg (0.038 BBOE). These undiscovered resources may occur in as many as five pools, which have a mean size range of 0.613 to 26.423 MMBOE (figure5). These pools have a mean mean size estimated at 7.394 MMBOE.

Because of the limited geographic area of the prospective high-energy facies, few discoveries are expected.

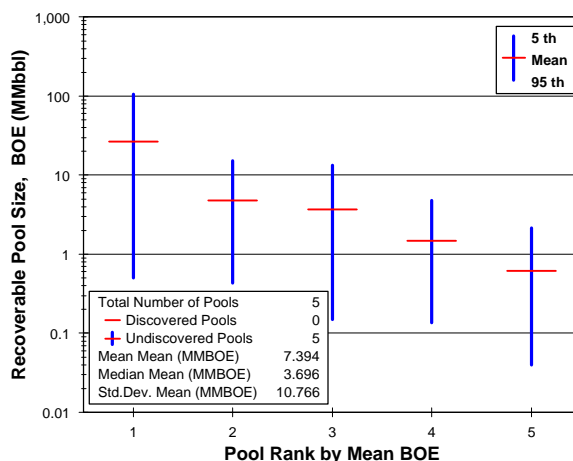


Figure 5. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.003	0.011	0.006
Mean	5	0.029	0.048	0.038
5th percentile	--	0.101	0.122	0.121
Total Endowment				
95th percentile	--	0.003	0.011	0.006
Mean	5	0.029	0.048	0.038
5th percentile	--	0.101	0.122	0.121

UPPER JURASSIC TO LOWER CRETACEOUS TRANSITION ZONE (UU-LK TZ) PLAY

The conceptual Upper Jurassic to Lower Cretaceous Transition Zone (UU-LK TZ) play is located in the Tampa Basin Area that separates the clastics of the Middle Ground Arch and the carbonates of the Sarasota Arch (figure 1). Seismic data show mainly flat-lying units with little structural disruption in the Tampa Basin. Potential reservoirs are inferred to be interfingered, fine-grained clastics and carbonates.

The play is considered to have low potential because the Tampa Basin lacks source rocks. Therefore, the UU-LK TZ play was not assessed.

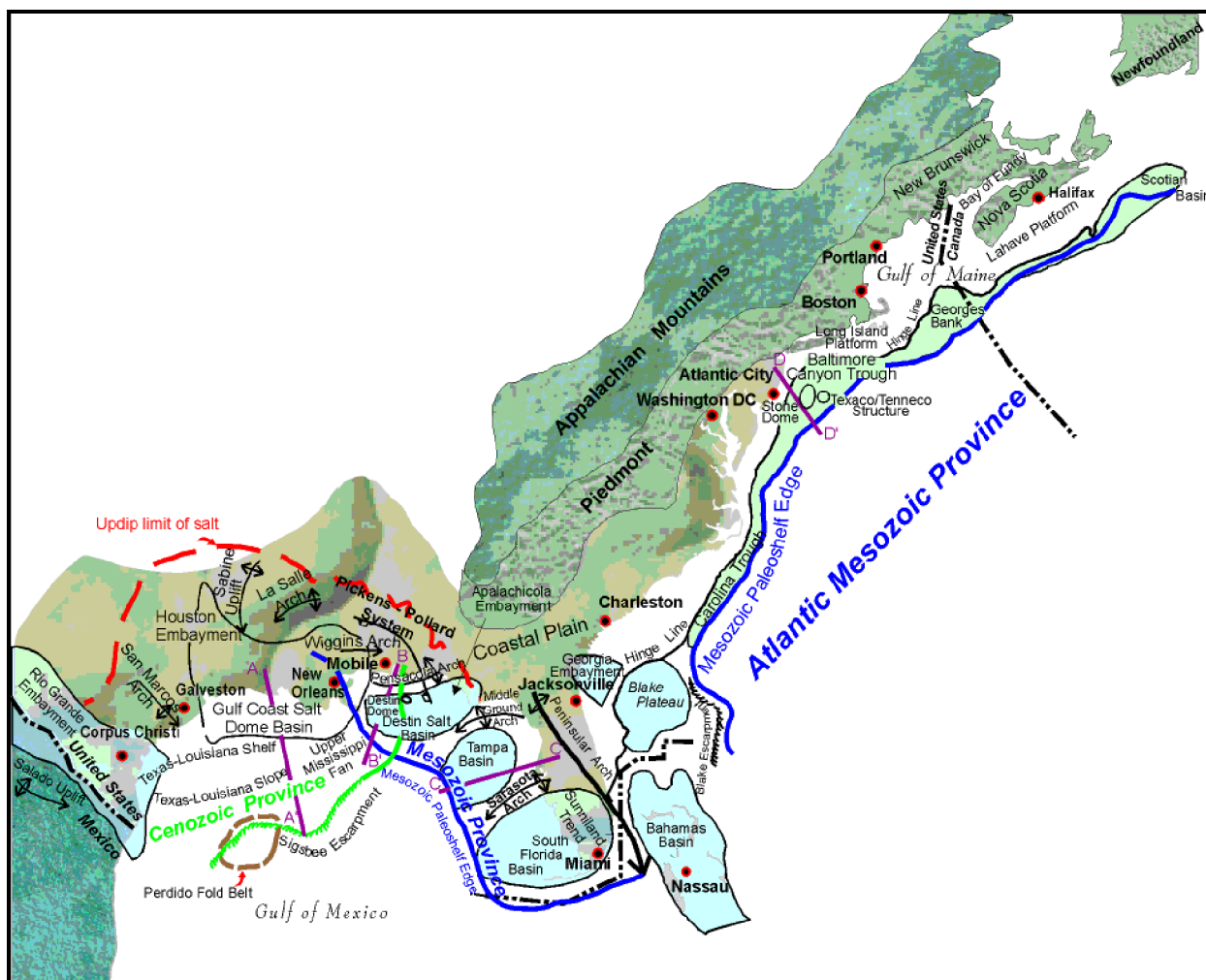


Figure 1. Physiographic map.

MIDDLE JURASSIC (MU) CHRONOZONE

The Middle Jurassic (MU) chronozone contains only one play [see Middle Jurassic to Upper Jurassic Florida Basal Clastic (MU-UU FBCL) play].

MIDDLE JURASSIC TO UPPER JURASSIC FLORIDA BASAL CLASTIC (MU-UU FBCL) PLAY

The conceptual Middle Jurassic to Upper Jurassic Florida Basal Clastic (MU-UU FBCL) play consists of siliciclastics derived from weathered basement rocks exposed from Middle Jurassic to Late Jurassic time. Potential reservoirs locally occur as a thin veneer of alluvial, strand plain, and deltaic deposits immediately overlying the middle Jurassic basement of south Florida.

Though one hydrocarbon show occurred in the Great Isaac well in the Bahamas Basin (figure 1), reservoir quality of these basal clastics was poor. Therefore, the MU-UU FBCL play was not assessed.

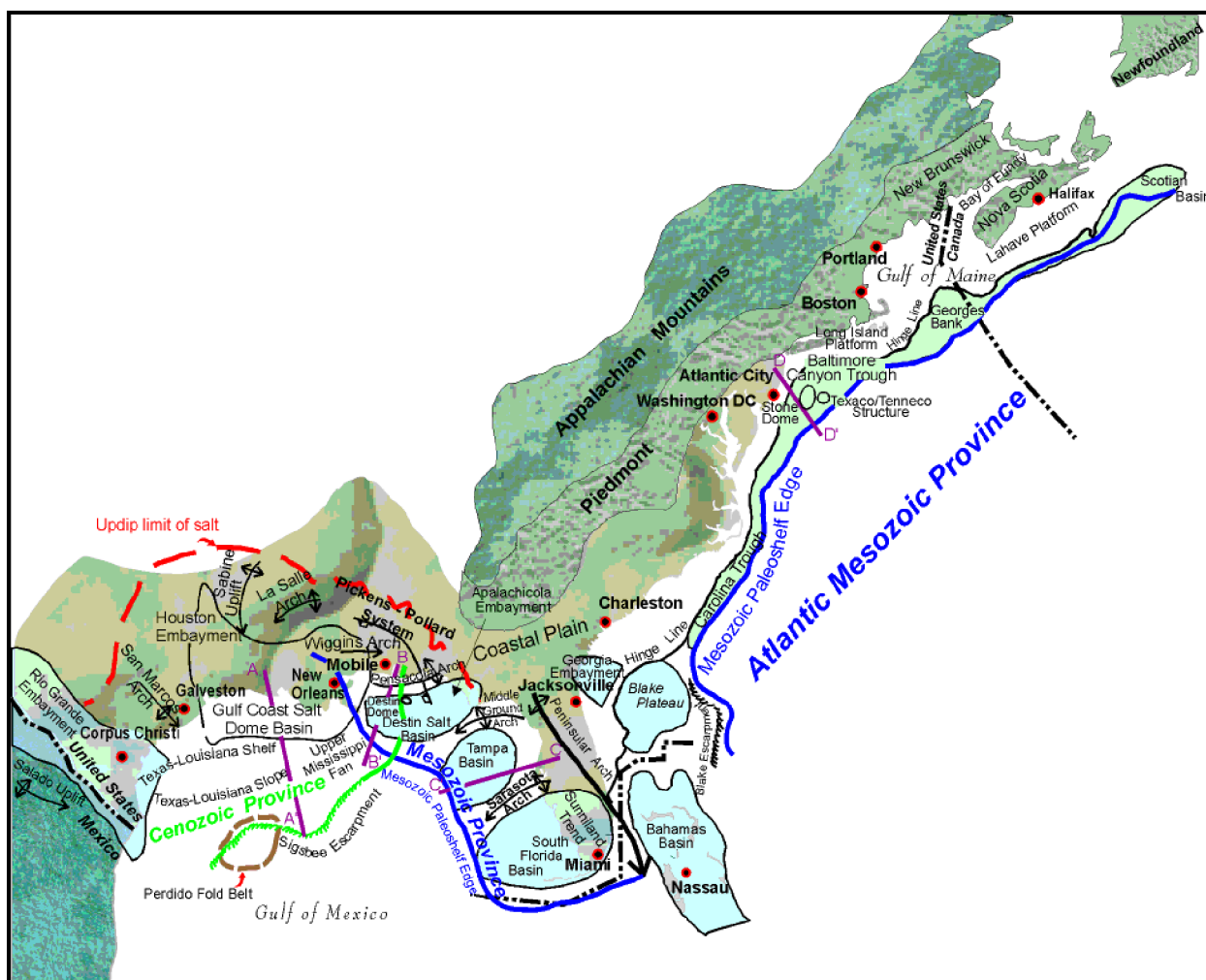


Figure 1. Physiographic map.

LOWER JURASSIC (LU) CHRONOZONE

The Lower Jurassic (LU) chronozone was not assessed. The dominantly evaporitic sediments were not considered to be of reservoir quality. Sediment type and lack of any onshore analogs provided the basis for condemning this chronozone.

UPPER TRIASSIC (UTR) CHRONOZONE

The Upper Triassic (UTR) chronozone was not assessed. The dominantly evaporitic sediments were not considered to be of reservoir quality. Sediment type and lack of any onshore analogs provided the basis for condemning this chronozone.

ATLANTIC UPPER CRETACEOUS (AUK) CHRONOZONE

The Atlantic Upper Cretaceous (AUK) chronozone contains only one play [see Atlantic Upper Cretaceous Clastic (AUK CL) play].

ATLANTIC UPPER CRETACEOUS CLASTIC (AUK CL) PLAY

The conceptual Atlantic Upper Cretaceous Clastic (AUK CL) play is identified in the Georges Bank, Baltimore Canyon, and Georgia Embayment Areas of the Atlantic Margin and extends onshore (figure 1). In Late Cretaceous time, clastic sediments were eroded from the Appalachian Mountain System. During low stands of sea level, these sediments prograded seaward over the shelf and onto the slope. Therefore, possible reservoirs occur in deltaic complexes, barrier bars, and channel systems on the shelf, and in fan complexes on the slope.

The AUK CL play was not assessed because burial depth and proximity to thermally mature source rocks were inadequate.

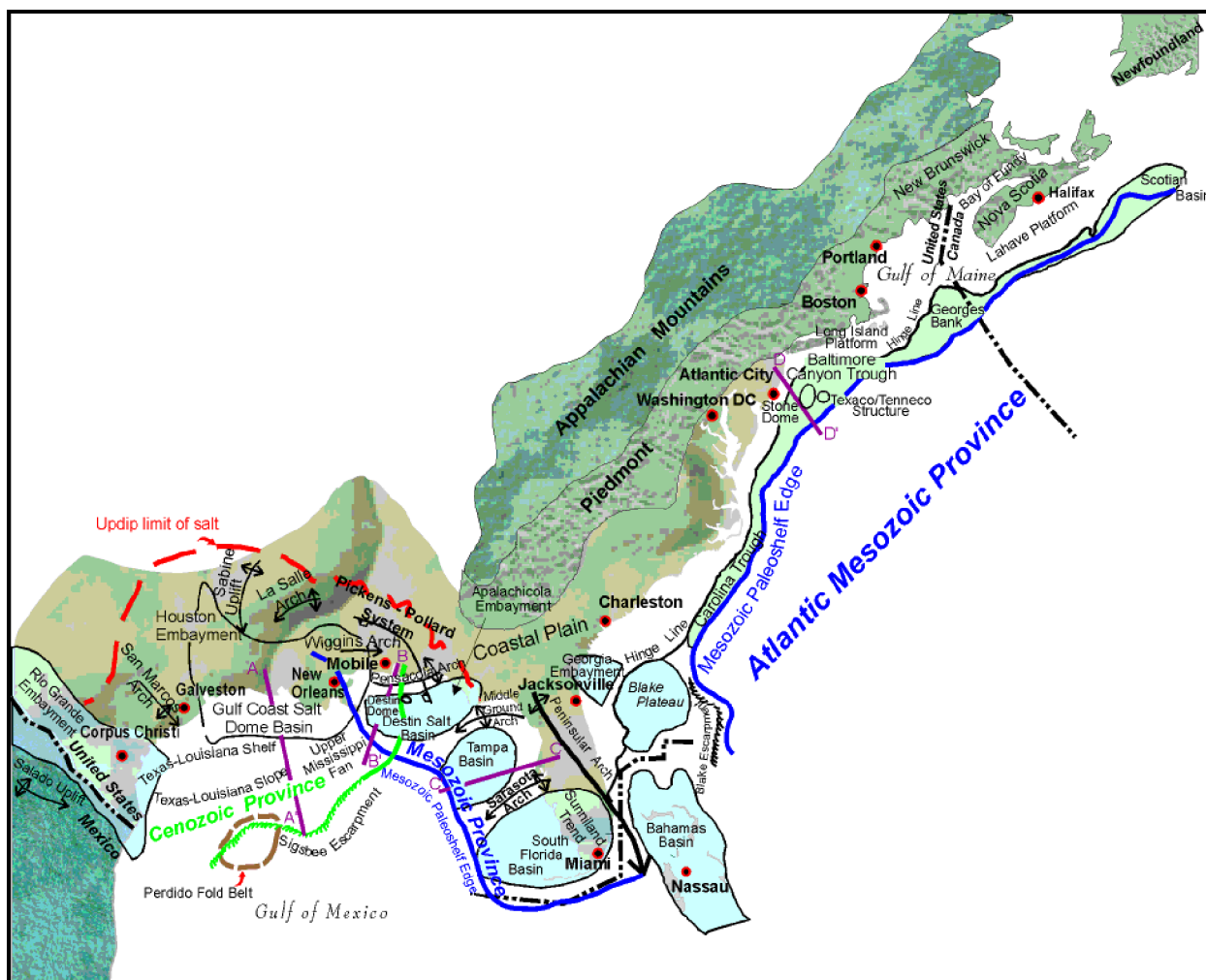


Figure 1. Physiographic map.

ATLANTIC LOWER CRETACEOUS (ALK) CHRONOZONE

The Atlantic Lower Cretaceous (ALK) chronozone contains only one play [see Atlantic Lower Cretaceous Clastic (ALK CL) play]

ATLANTIC LOWER CRETACEOUS CLASTIC (ALK CL) PLAY

PLAY DESCRIPTION

The frontier Atlantic Lower Cretaceous Clastic (ALK CL) play occurs within the *Polycostella senaria*, *Choffatella decipiens*, *Muderongia simplex*, and *Favusella washitaensis* biozones. This play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1 and figure 2).

The updip limit for this play coincides with the updip limit of potential source rocks, which are late Jurassic. Lower Cretaceous clastic sediments prograded over the Upper Jurassic Carbonate (AUU CB) play and onto the slope, defining the downdip limit of the play.

The ALK CL play is stratigraphically and structurally similar to the Atlantic Upper Jurassic Clastic (AUU CL) and the Atlantic Middle Jurassic Clastic (AMU CL) plays. The ALK CL play, however, does cover a larger geographic area than either the AUU CL or AMU CL play.

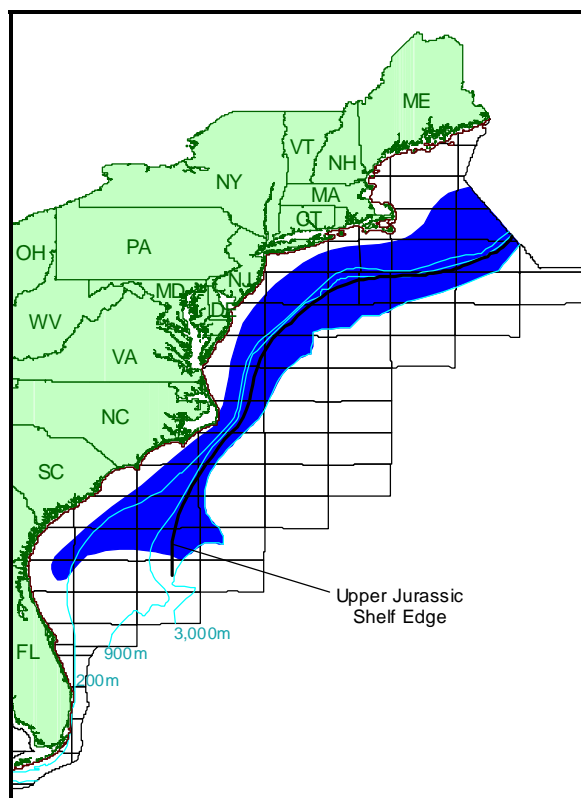


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

In the lower Cretaceous, clastic sediments were eroded from the Appalachian Mountain System. During low stands of sea level, these sediments formed deltaic complexes that prograded seaward over the shelf-edge reef and onto the slope. Potential lower Cretaceous reservoirs may occur in deltaic complexes, barrier bars, and channel systems on the shelf, and in fan complexes on the slope. Petrophysical analyses of cores indicate that some of the best reservoir-quality sands in the Atlantic Mesozoic Province

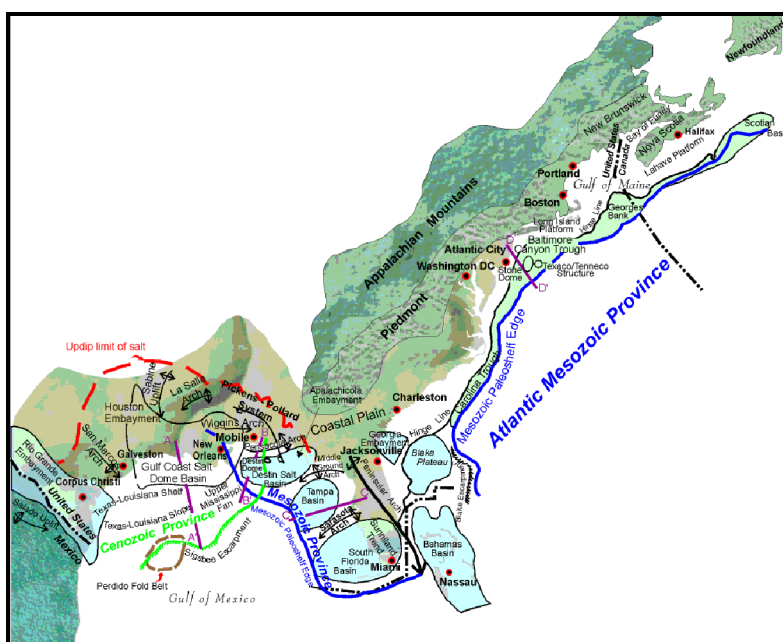


Figure 2. Physiographic map.

occur in this play.

Structures on the shelf are related mainly to anticlines, normal faults, and growth faults. Structures on the slope include anticlines and pinch-outs against diapirs. Stratigraphic traps also occur on both the shelf and slope. Potential source rocks include shelf and slope Jurassic shales. Geochemical analysis indicates organic matter to be primarily Type III with total organic carbon (TOC) ranging from 0.5 to 3 percent. The hydrocarbon evolution window (HEW) extends from approximately 7,000 to 18,000 feet. Jurassic lagoonal and platform carbonates may also provide good source rock potential. Seals are provided by early to late Cretaceous limestones or overlying shales.

The analog type field for the ALK CL play is the Citronelle Field, Mobile County, Alabama. Production from the lower Cretaceous clastic section in this field occurs from the Rodessa Formation (figure 3).

National Assessment Mesozoic Stratigraphy						
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays	
Cretaceous	Upper	Salma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Federicksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sigo (Fettel) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Snackover Fm Norphet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AUU CB AMU CL AMU CB
	Middle	Louann Salt	Non-Deposition			
	Lower		Basement		Argo Salt	
Triassic	Upper	Eagle Mills Fm			Eurdice Fm	
		Basement			Basement	

Rock unit positions do not imply age relationships between basins.

DISCOVERIES

Exploration in the Atlantic Federal OCS area consists of 46 exploration and 5 COST wells (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Of these wells, all but one penetrated the lower Cretaceous interval. The only hydrocarbons detected in the ALK CL play occurred in Tenneco's Hudson Canyon 642-2 well drilled in 1979. The well flowed at 640 bopd.

ASSESSMENT RESULTS

Since the ALK CL play contains no active Federal fields, productive lower Cretaceous clastic sediments of the onshore eastern Gulf of Mexico and lower Cretaceous and upper Jurassic clastic sediments of the Canadian offshore Scotian Basin provide the analogs for input parameters used in this assessment (figure 2).

The onshore lower Cretaceous clastic analog comprises the Hosston, Rodessa, Paluxy, and Dantzler Formations of Louisiana, Mississippi, and Alabama (figure 3). This analog encompasses an area of 13.7 million acres (21,395 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with

approximately 75 percent of the analog explored. These analog fields contain an average of 39 percent oil, 35 percent gas, and 26 percent mixed hydrocarbons. Fields producing from the well-established Norphlet trend were not used as analogs in this assessment because they produce from eolian sands, which are not analogous to the deltaic deposits in the ALK CL play.

The Scotian Basin clastic analog comprises the Lower Cretaceous Missisauga and Logan Canyon Formations and the Upper Cretaceous Dawson Canyon and Wyandot Formations (figure 3). This analog covers an area of 35 million acres (54,700 square miles). Exploration has a success rate of approximately 30 percent, and drilling is at an immature stage with approximately 30 percent of the analog explored. This analog was used primarily for field size distribution parameters, as production data are not public record.

The marginal probability of hydrocarbons for the ALK CL play is 1.00. Assessment results indicate that undiscovered resources have a range of 0.431 to 1.143 Bbo and 7.840 to 18.813 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 4). The mean undiscovered resources are estimated at 0.722 Bbo and 11.767 Tcfg (2.816 BBOE). These undiscovered resources may occur in as many as 120 pools, which have a mean size range of 0.064 to 534.780 MMBOE (figure 5). These pools have a mean mean size estimated at 23.193 MMBOE.

Of the 11 Atlantic plays, the ALK CL play is projected to contain the largest amount of undiscovered gas resources (43%) and the second largest amount of undiscovered oil resources (32%).

Potential for discoveries extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 2).

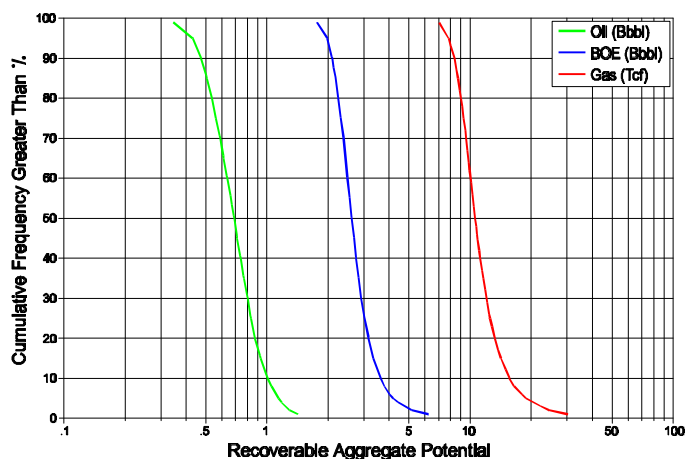


Figure 4. Cumulative probability distribution.

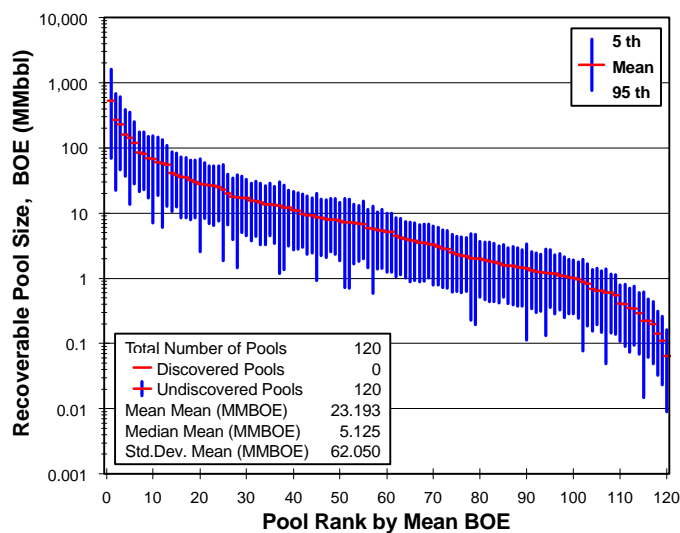


Figure 5. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.431	7.840	1.985
Mean	120	0.722	11.767	2.816
5th percentile	--	1.143	18.813	4.190
Total Endowment				
95th percentile	--	0.431	7.840	1.985
Mean	120	0.722	11.767	2.816
5th percentile	--	1.143	18.813	4.190

ATLANTIC UPPER JURASSIC (AUU) CHRONZONE

CHRONOZONE DESCRIPTION

The Atlantic Upper Jurassic (AUU) chronozone corresponds to the *Pseudocyclammina jaccardi*, *Senoniasphaera jurassica*, *Epistomina uhligi*, and *Ctenedodinium penneum* biozones. The upper Jurassic section in the Atlantic Basin consists of clastics and carbonates, each of which defines a play: the Atlantic Upper Jurassic Clastic (AUU CL) play and the Atlantic Upper Jurassic Carbonate (AUU CB) play. The clastics consist of deltaic complexes, barrier bars, and channel systems of retrogradational, aggradational, and progradational deposits on the shelf and fan complexes on the slope. The carbonates consist of shallow-water limestone platforms and reef complexes developed where deltaic clastic influx was minimal. In addition to upper Jurassic carbonates, possible lowermost Cretaceous carbonates that occur in the seaward-most edge of the carbonate complex as a discontinuous, thin section are included in the AUU CB play. Two additional plays, the Atlantic Upper Jurassic to Upper Cretaceous Basin Floor Fan (AUU-UK BFF) play and the Atlantic Upper Jurassic to Lower Cretaceous Transition Zone (AUU-LK TZ) play, are also present in the chronozone, but were not assessed due to a probable lack of source rocks and questionable seismic structures, respectively.

Reservoir potential in the chronozone extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1 and figure 2). The updip reservoir potential is limited by

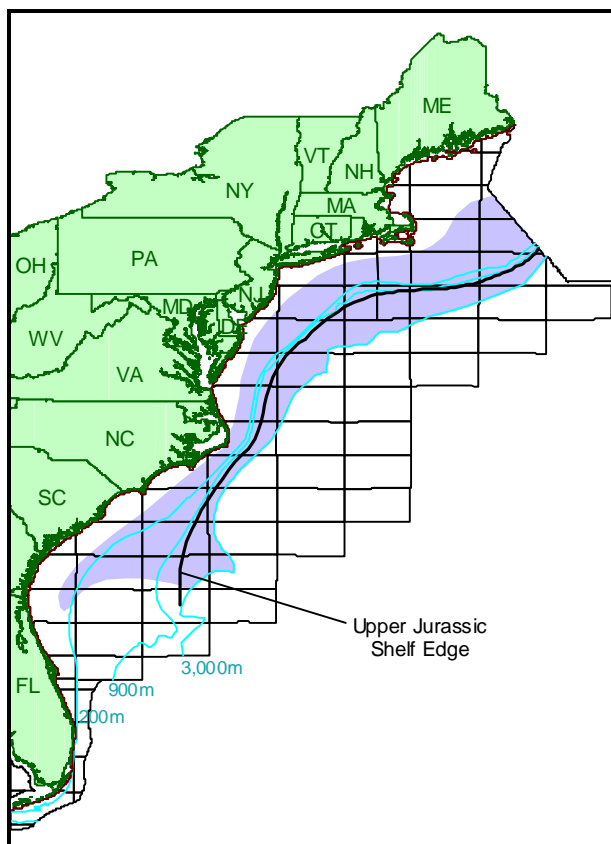


Figure 1. Map of assessed chronozone.

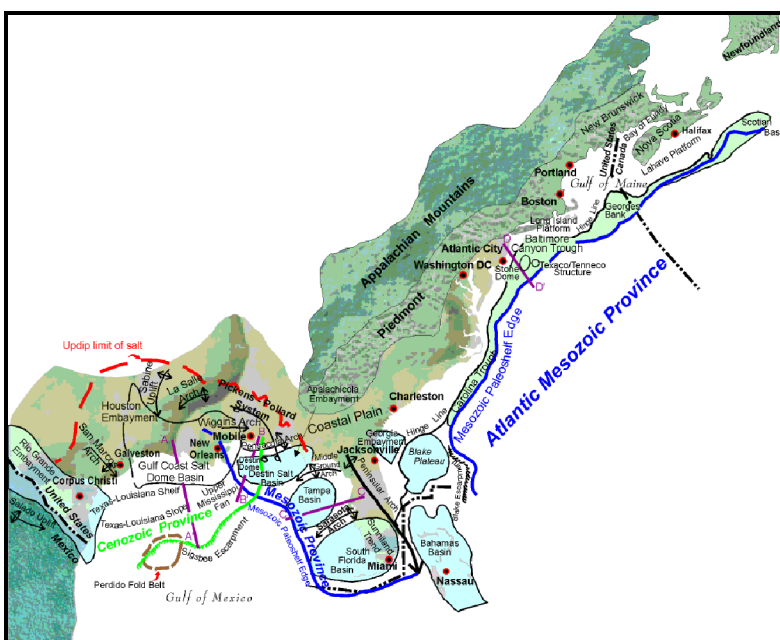


Figure 2. Physiographic map.

the shoreward erosional limit of upper Jurassic clastics. The downdip reservoir potential is limited by the extent of slope fans.

DISCOVERIES

No pools in the chronozone have as yet been discovered in the Federal OCS.

ASSESSMENT RESULTS

The Atlantic plays in the upper Jurassic chronozone are not as yet productive. Assessment results indicate that undiscovered resources may occur in as many as 235 pools, which contain a range of 0.527 to 1.733 Bbo and 6.135 to 15.667 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 2). At mean levels, 1.020 Bbo and 10.210 Tcfg (2.837 BBOE) are projected. The 235 undiscovered pools have a mean mean size of 12.379 MMBOE (figure 3). Of the two plays in the chronozone, the AUU CL play is estimated to contain 85 percent of the BOE mean total endowment for the chronozone.

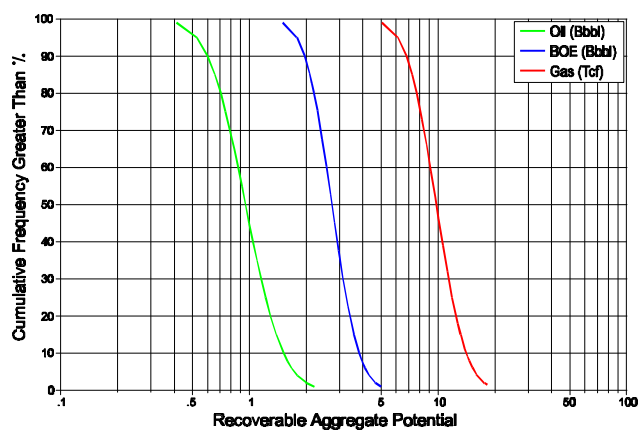


Figure 3. Cumulative probability distribution.

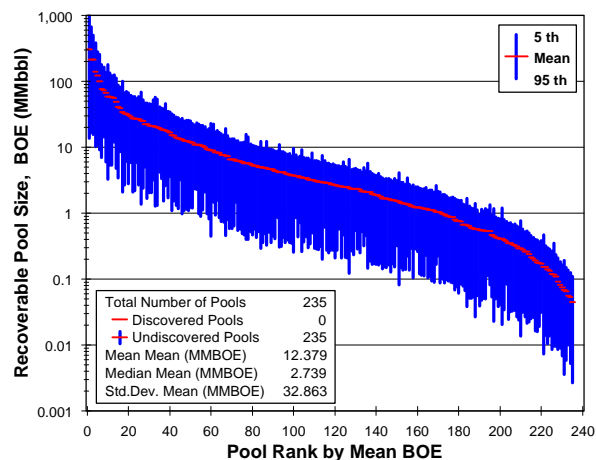


Figure 4. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.527	6.135	1.791
Mean	235	1.020	10.210	2.837
5th percentile	--	1.733	15.667	4.201
Total Endowment				
95th percentile	--	0.527	6.135	1.791
Mean	235	1.020	10.210	2.837
5th percentile	--	1.733	15.667	4.201

ATLANTIC UPPER JURASSIC CLASTIC (AUU CL) PLAY

PLAY DESCRIPTION

The frontier Atlantic Upper Jurassic Clastic (AUU CL) play occurs within the *Pseudocyclammia jaccardi*, *Senoniasphaera jurassica*, *Epistomina uhligi*, and *Ctenidodinium penneum* biozones. This play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1 and figure 2).

The updip assessment limit was determined by the shoreward erosional limit of upper Jurassic sediments. Downdip, deltas deposited clastic sediments on the shelf. The upper Jurassic sediments exhibit a lateral facies change from nearshore clastic sediments to the platform carbonates and shelf-edge reef of the Atlantic Upper Jurassic Carbonate (AUU CB) play. Where clastic sediment influx was great enough, deltas crossed the AUU CB play, depositing fans on the slope. These slope fans define the downdip limit of the AUU CL play.

The AUU CL play is stratigraphically and structurally similar to the Atlantic Lower Cretaceous Clastic (ALK CL) and Atlantic Middle Jurassic Clastic (AMU CL) plays.

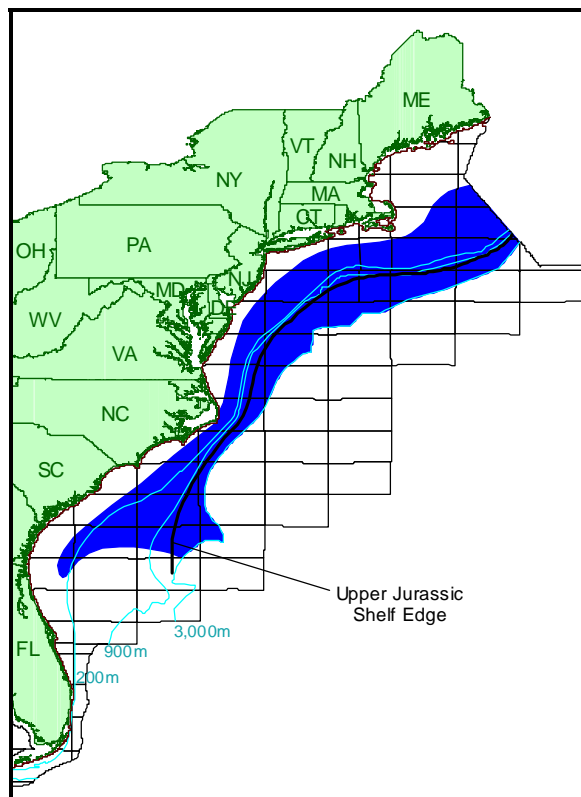


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

In the upper Jurassic, clastic sediments were eroded from the Appalachian Mountain System. During low stands of sea level, these sediments formed deltaic complexes that prograded across the shelf. Where clastic sediment influx was great enough, fans formed on the slope. Potential upper Jurassic reservoirs may occur in deltaic complexes, barrier bars, and channel systems on the shelf, and in fan complexes on the slope.

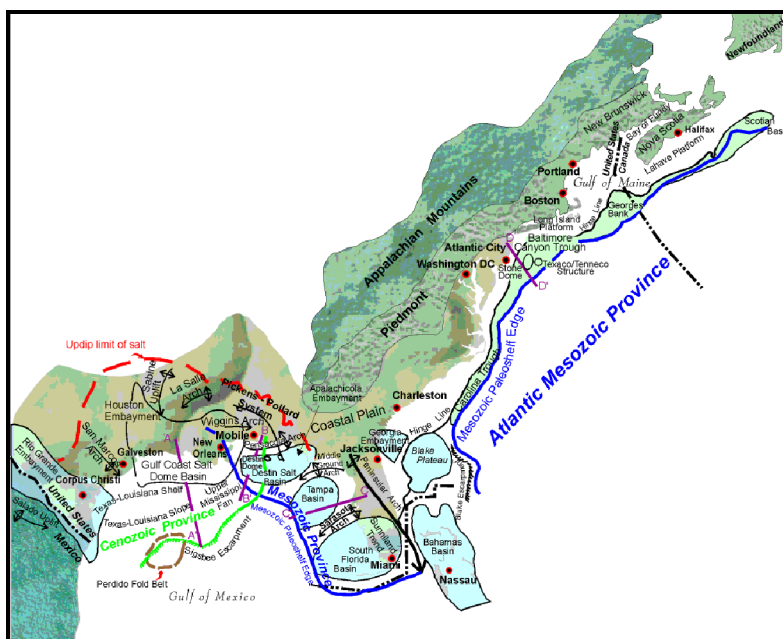


Figure 2. Physiographic map.

Structures on the shelf are related to normal faults, growth faults, and anticlines. Structures on the slope include anticlines and pinch-outs against diapiric structures. Stratigraphic closures also occur on both the shelf and slope. Potential source rocks include Jurassic shelf and slope shales. Geochemical analysis indicates organic matter to be primarily Type III with total organic carbon (TOC) ranging from 0.5 to 3 percent. The hydrocarbon evolution window (HEW) extends from approximately 7,000 to 18,000 feet. Jurassic lagoonal and platform carbonates may also provide good source rock potential. Seals are provided by upper Jurassic or lowermost Cretaceous limestones or overlying shales.

The analog type field for the AUU CL play is the Thomasville Field, Rankin County, Mississippi. Production from the upper Jurassic clastic section in this field occurs from the Smackover Formation (figure 3).

National Assessment Mesozoic Stratigraphy						
		Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL
	Lower	Dantzler Fm Washita Gp Federicksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sigo (Fattet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Suniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AMU CL AMU CB
	Middle	Louann Salt	Non-Deposition		Argo Salt	
	Lower		Basement		Eurdice Fm Basement	
Triassic	Upper	Eagle Mills Fm Basement				

Rock unit positions do not imply age relationships between basins.

Figure 3. Stratigraphic column.

DISCOVERIES

Exploration in the Atlantic Federal OCS area consists of 46 exploration and 5 COST wells, of which 41 penetrated confirmed or probable upper Jurassic clastic sediments (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Five of the eight wells in the relinquished Hudson Canyon 598 field encountered significant hydrocarbon volumes (95 MMcfd total) from upper Jurassic clastic intervals.

ASSESSMENT RESULTS

Since the AUU CL play contains no active Federal fields, productive upper Jurassic clastic sediments of the onshore eastern Gulf of Mexico and the Canadian offshore Scotian Basin provide the analogs for input parameters used in this assessment (figure 2).

The onshore upper Jurassic clastic analog comprises the Smackover Formation and Cotton Valley Group of Mississippi and Alabama (figure 3). This analog covers an area of 6.2 million acres (9,750 square miles). Exploration in the analog has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 60 to 90

percent of this analog explored. These analog fields contain an average of 40 percent oil, 29 percent gas, and 31 percent mixed hydrocarbons. Fields producing from the well-established Norphlet trend were not used as analogs in this assessment because they produce from eolian sands, which are not analogous to the deltaic deposits in the AUU CL play.

The Scotian Basin upper Jurassic clastic analog comprises the Mic Mac Formation and covers an area of 35 million acres (54,700 square miles) (figure 3). Exploration in this analog has a success rate of approximately 30 percent, and drilling is at an immature stage with approximately 30 percent of the analog explored. This analog was used primarily for field size distribution parameters, as production data are not public record.

The marginal probability of hydrocarbons for the AUU CL play is 1.00. Assessment results indicate that undiscovered resources have a range of 0.545 to 1.153 Bbo and 6.401 to 13.270 Tcfg at the 95th and 5th percentiles, respectively (table 1 and figure 4). The mean undiscovered resources are estimated at 0.822 Bbo and 8.953 Tcfg (2.415 BBOE). These undiscovered resources may occur in as many as 200 pools, which have a mean size range of 0.045 to 310.220 MMBOE (figure 5). These pools have a mean mean size estimated at 12.074 MMBOE.

Of the 11 Atlantic plays, the AUU CL play is projected to contain the largest amount of undiscovered oil resources (36%) and the second largest amount of undiscovered gas resources (33%).

Potential for discoveries extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 2).

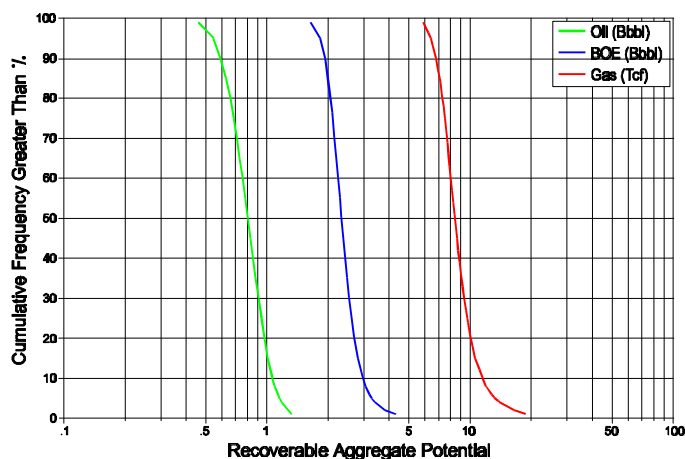


Figure 4. Cumulative probability distribution.

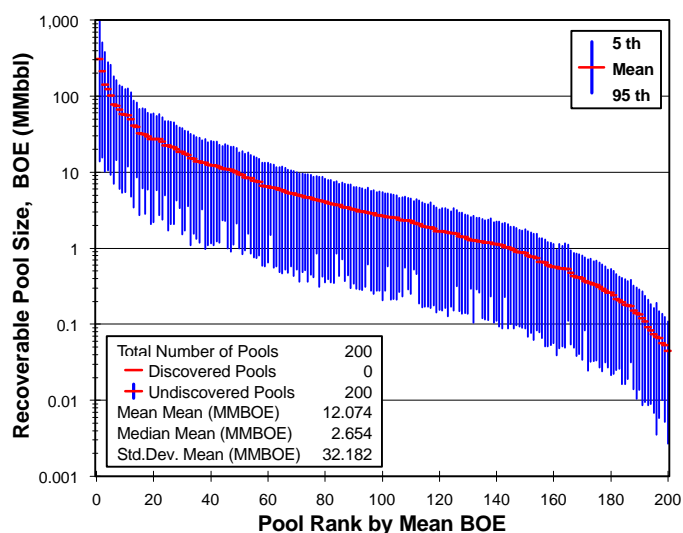


Figure 5. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.545	6.401	1.832
Mean	200	0.822	8.953	2.415
5th percentile	--	1.153	13.270	3.273
Total Endowment				
95th percentile	--	0.545	6.401	1.832
Mean	200	0.822	8.953	2.415
5th percentile	--	1.153	13.270	3.273

ATLANTIC UPPER JURASSIC CARBONATE (AUU CB) PLAY

PLAY DESCRIPTION

The frontier Atlantic Upper Jurassic Carbonate (AUU CB) play occurs within the *Pseudocyclammina jaccardi*, *Senoniasphaera jurassica*, *Epistomina uhligi*, and *Ctenidodinium penneum* biozones. This play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1 and figure 2).

The AUU CB play is stratigraphically similar to the Atlantic Middle Jurassic Carbonate (AMU CB) play; however, the carbonate platform became successively narrower through the upper Jurassic, owing to increasing siliciclastic influx. Though not conclusive, micropaleontological evidence suggests that the seaward-most edge of the carbonate complex may be lowermost Cretaceous. These possible lowermost Cretaceous carbonates are thin, averaging about 200 feet, and cover too small an area to be mappable on a regional scale. Therefore, all possible lowermost Cretaceous shelf-edge carbonates are included in the AUU CB play.

Therefore, all possible lowermost Cretaceous shelf-edge carbonates are included in the AUU CB play.

PLAY CHARACTERISTICS

The AUU CB play consists of late Jurassic shelf-edge reef complexes with associated back-reef carbonate platforms and reef-face carbonate talus, and possible earliest Cretaceous carbonates. Shallow-water limestone platforms and reef complexes developed where deltaic clastic influx was

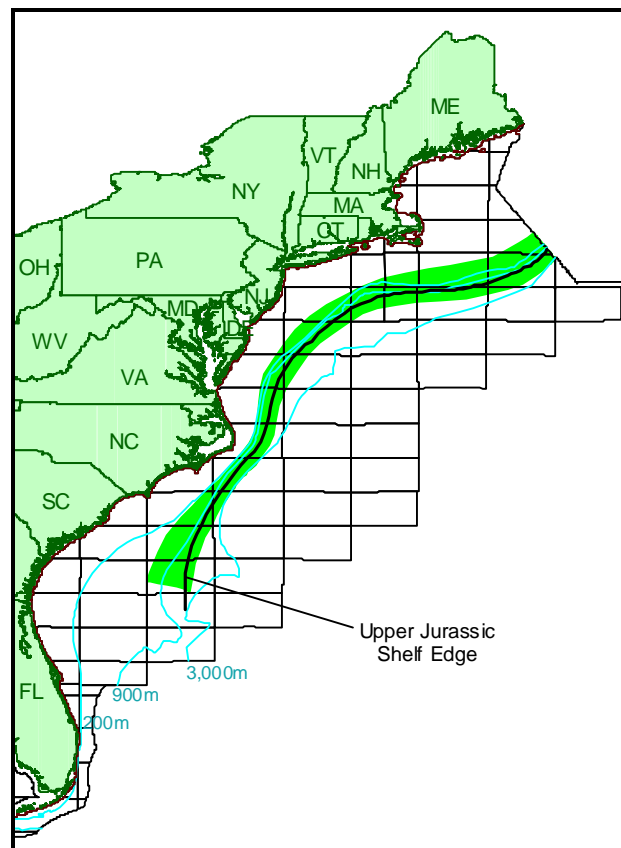


Figure 1. Map of assessed play.

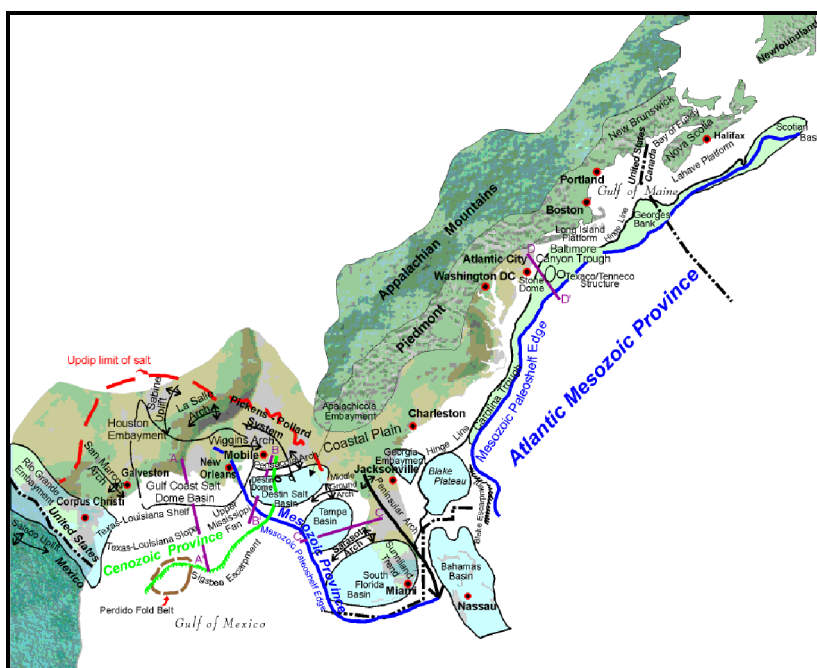


Figure 2. Physiographic map.

minimal. Potential reservoirs occur in the back-reef as oolitic, pelletal, or reef detritus grainstones, in the reef itself, and in the fore-reef as talus. The reef and back-reef deposits have the best potential for enhanced porosity due to subaerial exposure. Structures are controlled by shelf-edge reef buildups and shelf-edge normal faults. Traps are mainly stratigraphic on the carbonate platform. Combination stratigraphic and structural traps occur within the reef complex on the shelf edge and in reef talus on the slope. Potential source rocks include Jurassic shelf and slope shales. Geochemical analysis indicates organic matter to be primarily Type III with total organic carbon (TOC) ranging from 0.5 to 3 percent. The hydrocarbon evolution window (HEW) extends from approximately 7,000 to 18,000 feet. Jurassic lagoonal and platform carbonates may also provide good source rock potential. Seals are provided by upper Jurassic or lowermost Cretaceous carbonates, shales, and anhydrites.

National Assessment Mesozoic Stratigraphy							
	Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays		
Cretaceous	Upper	Selma Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL	
	Lower	Dantzler Fm Washita Gp Federicksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sligo (Fattet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Suniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL	
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm	AUU CL	AUU CB
	Middle	Louann Salt	Non-Deposition		Mohican Fm	AMU CL	AMU CB
	Lower		Basement		Argo Salt		
Triassic	Upper	Eagle Mills Fm			Eurdice Fm		
		Basement			Basement		

Rock unit positions do not imply age relationships between basins.

Figure 3. Stratigraphic column.

The analog type field for the AUU CB play is the Black Lake Field, Natchitoches Parish, Louisiana. This field's production is from the Lower Cretaceous Sligo Formation of the Sligo-Stuart City reef trend (figure 3).

DISCOVERIES

Exploration in the Atlantic Federal OCS area consists of 46 exploration and 5 COST wells (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Three exploration wells, Shell Offshore Inc.'s 372-1, 586-1, and 587-1, in Wilmington Canyon penetrated the shelf-edge reef and back-reef facies of the AUU CB play. Good reservoir rock was encountered, but no hydrocarbons were detected.

ASSESSMENT RESULTS

Because the AUU CB play contains no Federal fields, productive upper Jurassic platform carbonate reservoirs of the onshore eastern Gulf of Mexico and the lower Cretaceous Sligo-Stuart City reef trend provide the analogs for input parameters used in this assessment (figure 2).

The onshore upper Jurassic platform carbonate analog comprises the Smackover,

Buckner, and Haynesville Formations, and Cotton Valley lime in Louisiana, Mississippi, and Alabama (figure 3). This analog covers an area of 7.6 million acres (11,850 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 60 to 90 percent of the analog explored. These analog fields contain an average of 35 percent oil, 22 percent gas, and 43 percent mixed hydrocarbons.

The lower Cretaceous Sligo-Stuart City reef trend analog comprises the Sligo Formation and Edwards Group (Fredericksburg Group equivalent) and covers an area of 104 million acres (162,435 square miles) (figure 3). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 75 to 85 percent of the analog explored. These analog fields contain an average of 22 percent oil, 73 percent gas, and 5 percent mixed hydrocarbons.

The marginal probability of hydrocarbons for the AUU CB play is 0.85. Assessment results indicate that undiscovered resources are estimated to be zero at the 95th percentile but 0.435 Bbo and 3.152 Tcfg at the 5th percentile (table 1 and figure 4). The mean undiscovered resources are estimated at 0.198 Bbo and 1.257 Tcfg (0.422 BBOE). These undiscovered resources may occur in as many as 35 pools, which have an unrisksed mean size range of 0.117 to 214.820 MMBOE (figure 5). These pools have an unrisksed mean size estimated at 14.124 MMBOE.

Potential for discoveries extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 2).

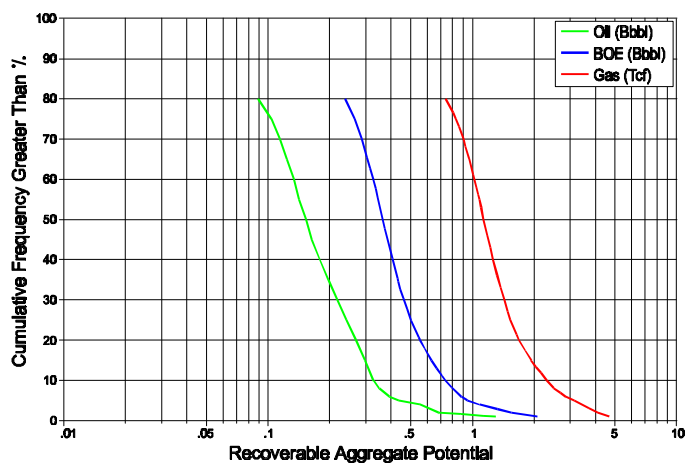


Figure 4. Cumulative probability distribution.

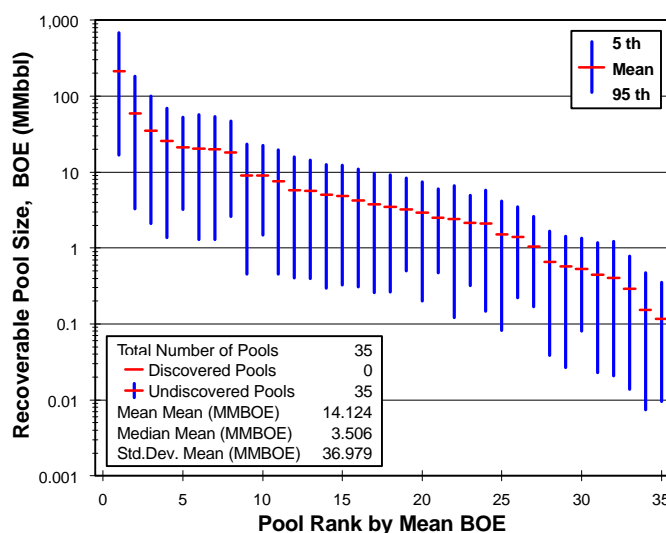


Figure 5. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 0.85	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.000	0.000	0.000
Mean	35	0.198	1.257	0.422
5th percentile	--	0.435	3.152	0.945
Total Endowment				
95th percentile	--	0.000	0.000	0.000
Mean	35	0.198	1.257	0.422
5th percentile	--	0.435	3.152	0.945

ATLANTIC UPPER JURASSIC TO UPPER CRETACEOUS BASIN FLOOR FAN (AUU-UK BFF) PLAY

The conceptual Atlantic Upper Jurassic to Upper Cretaceous Basin Floor Fan (AUU-UK BFF) play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1). The play occurs on the continental rise and consists of the distal portions of siliciclastic fan systems. The downdip limit of the play represents the basinward extent of clastic deposition during Late Jurassic to Late Cretaceous times. Potential basin floor fan reservoirs are typically thin-bedded sheet sands.

This play was not assessed due to low potential for thermally mature hydrocarbon source rocks in the relatively thin stratigraphic section of the continental rise.

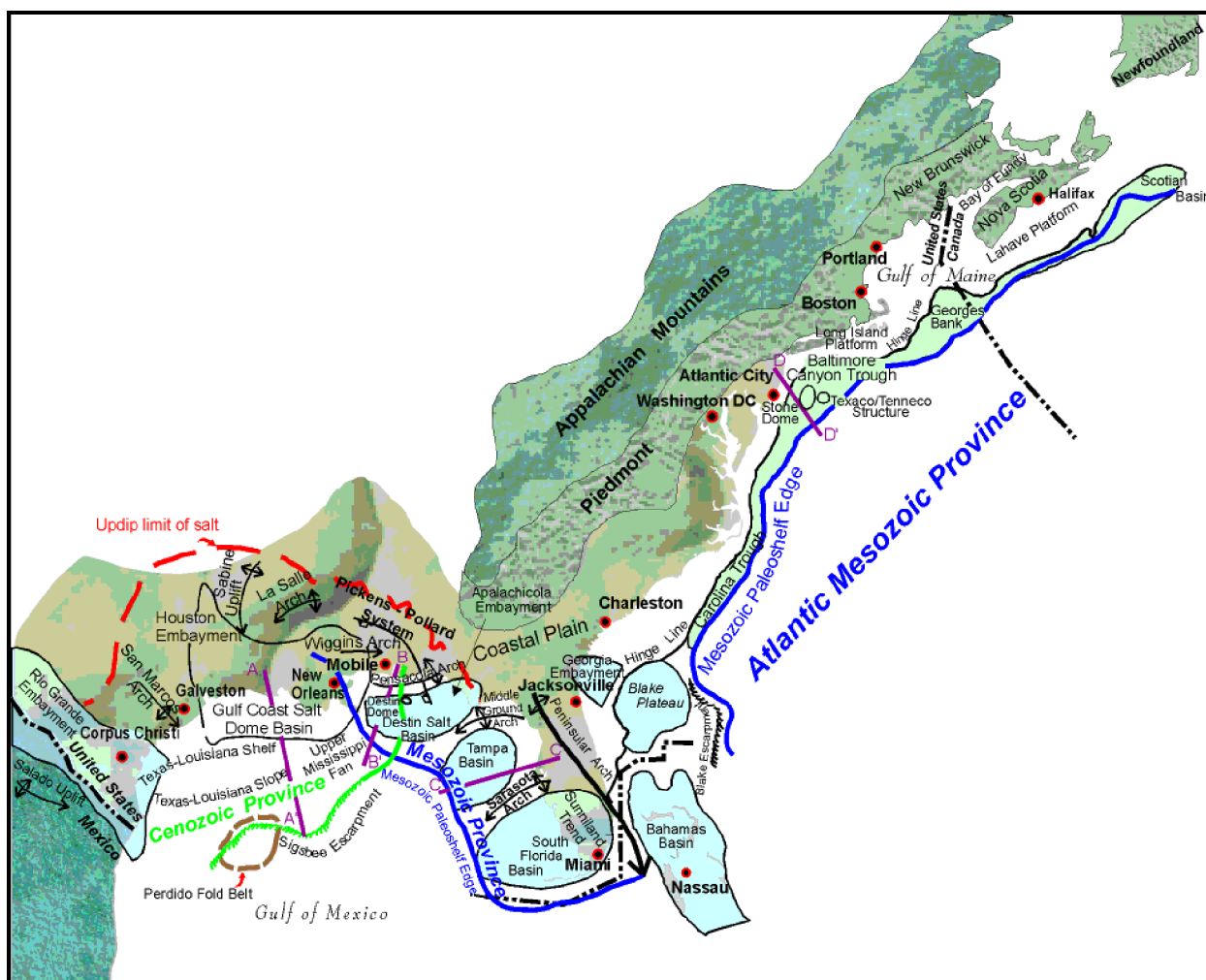


Figure 1. Physiographic map.

ATLANTIC UPPER JURASSIC TO LOWER CRETACEOUS TRANSITION ZONE (AUU-LK TZ) PLAY

The conceptual Atlantic Upper Jurassic to Lower Cretaceous Transition Zone (AUU-LK TZ) play in the Blake Plateau Area represents a transition zone from a mixed siliciclastic/carbonate regime to the north and a carbonate regime to the south in the Bahamas Basin (figure 1). Large low-relief anticlines may underlie the Blake Plateau. Potential reservoirs mainly include platform carbonates and minor amounts of deltaic clastics.

The play is considered to have low potential because the seismically mapped structures may not exist if current velocity assumptions are incorrect. Therefore, the AUU-LK TZ play was not assessed.

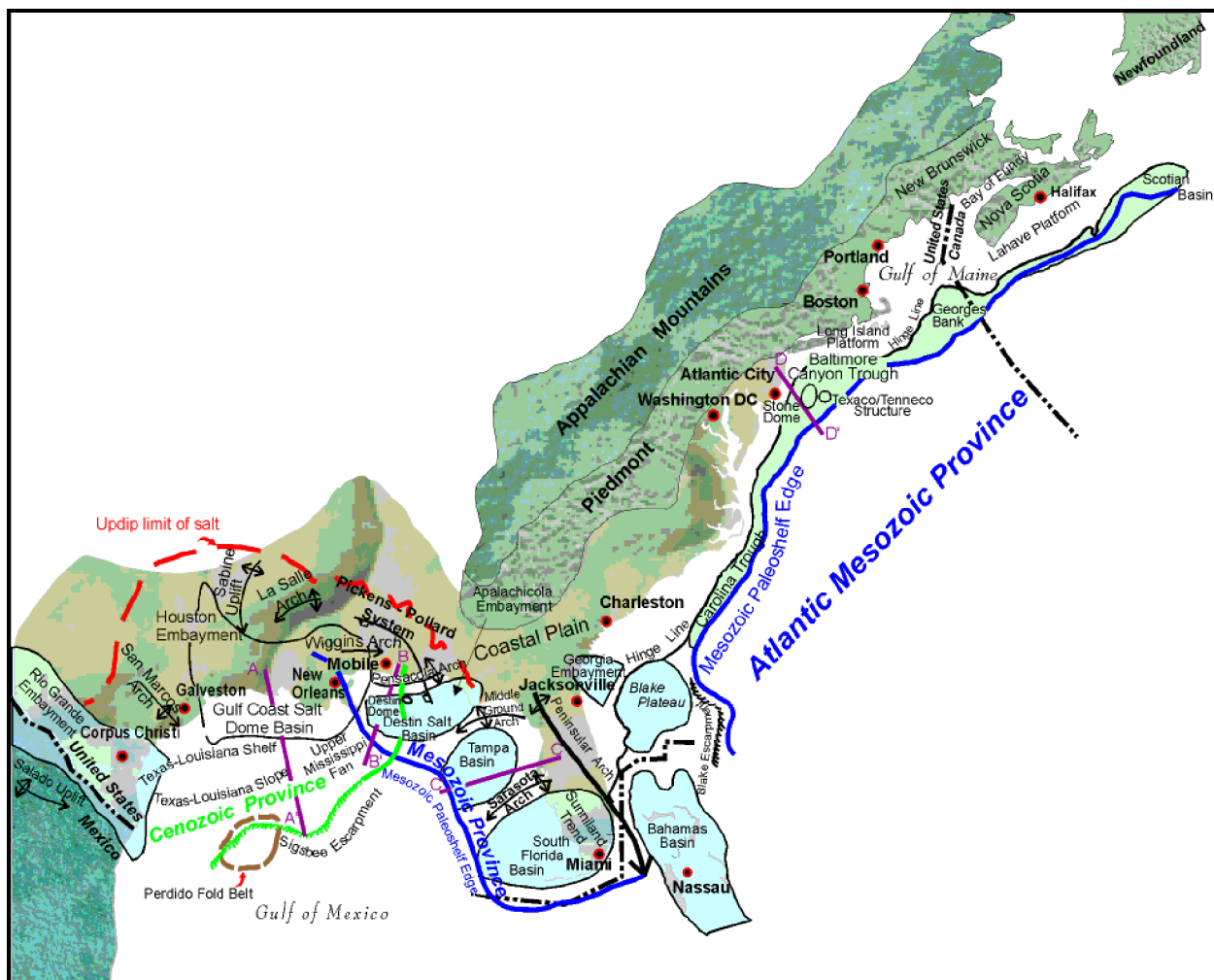


Figure 1. Physiographic map.

ATLANTIC MIDDLE JURASSIC (AMU) CHRONOZONE

CHRONOZONE DESCRIPTION

The Atlantic Middle Jurassic (AMU) chronozone corresponds to the *Gonyaulacysta pachyderma* and *Gonyaulacysta pectinigera* biozones. The middle Jurassic section in the Atlantic Basin consists of clastics and carbonates, each of which defines a play: the Atlantic Middle Jurassic Clastic (AMU CL) play and the Atlantic Middle Jurassic Carbonate (AMU CB) play. The clastics consist of deltaic complexes, barrier bars, and channel systems of retrogradational, aggradational, and progradational deposits. The carbonates consist of shallow-water limestone platforms and ramps, and possible pinnacle and patch reefs developed where deltaic clastic influx was minimal.

Reservoir potential in the chronozone extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1). The updip reservoir potential is limited by the shoreward erosional limit of middle Jurassic clastics. The downdip reservoir potential is limited by the extent of the carbonate ramp.

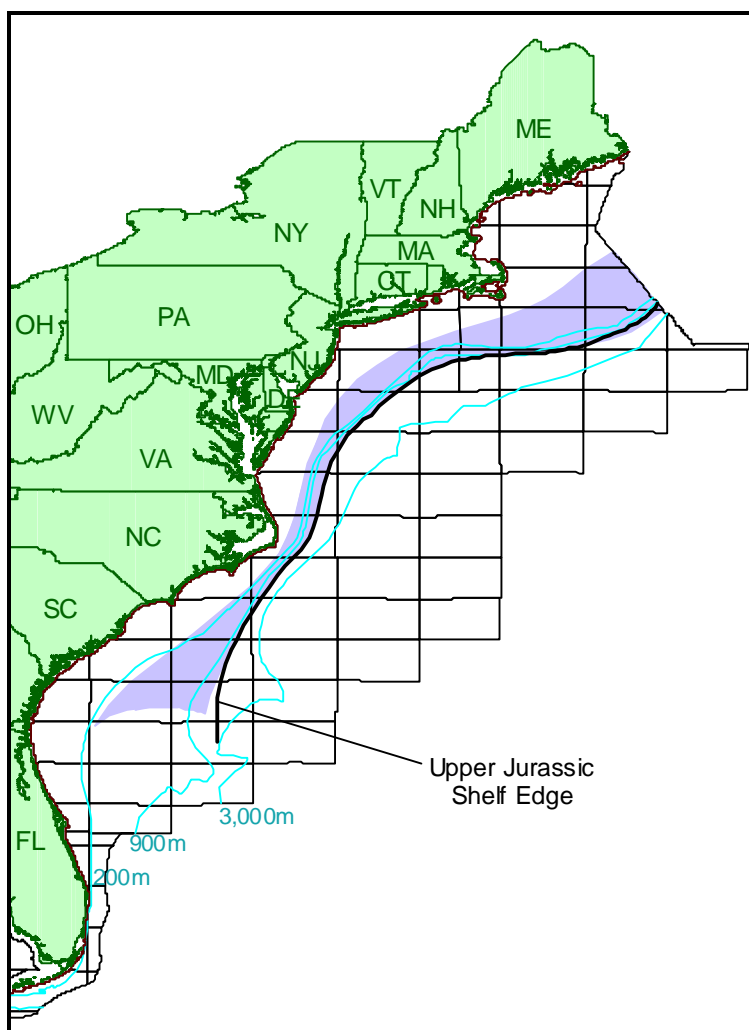


Figure 1. Map of assessed chronozone.

DISCOVERIES

No pools in the chronozone have as yet been discovered in the Federal OCS.

ASSESSMENT RESULTS

The Atlantic plays in the middle Jurassic chronozone are not as yet productive. Assessment results indicate that undiscovered resources may occur in as many as 147 pools. These undiscovered resources are estimated to be zero at the 95th percentile but 1.163 Bbo and 10.426 Tcfg at the 5th percentile (table 1 and figure 2). At mean levels, 0.529 Bbo and 5.502 Tcfg (1.508 BBOE) are projected. The 147 undiscovered pools have an unrisks mean mean size of 12.134 MMBOE (figure 3). Of the two plays in the

chronozone, the AMU CL play is estimated to contain 84 percent of the BOE mean total endowment for the chronozone.

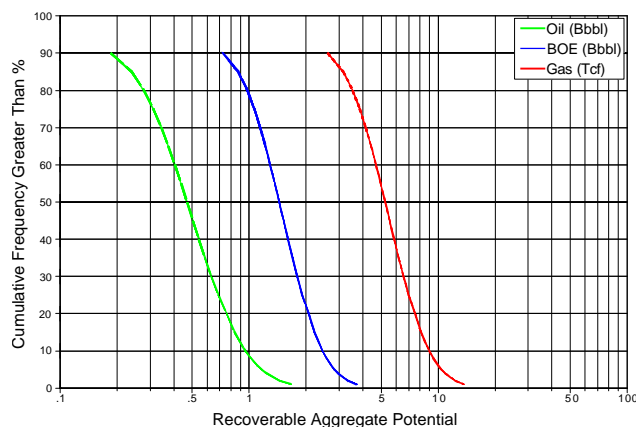


Figure 2. Cumulative probability distribution.

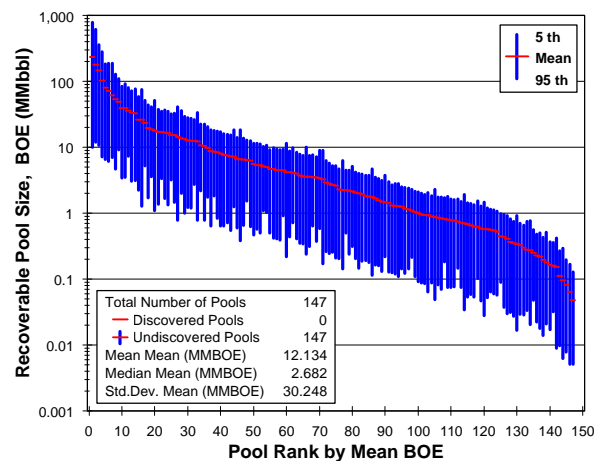


Figure 3. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 0.93	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.000	0.000	0.000
Mean	147	0.529	5.502	1.508
5th percentile	--	1.163	10.426	2.830
Total Endowment				
95th percentile	--	0.000	0.000	0.000
Mean	147	0.529	5.502	1.508
5th percentile	--	1.163	10.426	2.830

ATLANTIC MIDDLE JURASSIC CLASTIC (AMU CL) PLAY

PLAY DESCRIPTION

The frontier Atlantic Middle Jurassic Clastic (AMU CL) play occurs within the *Gonyaulacysta pachyderma* and *Gonyaulacysta pectinigera* biozones. This play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1 and figure 2).

The updip assessment limit was determined by the shoreward erosional limit of middle Jurassic sediments. Downdip, the middle Jurassic sediments of this play exhibit a lateral facies change from nearshore clastics to the platform carbonates of the Atlantic Middle Jurassic Carbonate (AMU CB) play.

The AMU CL play is stratigraphically and structurally similar to the Atlantic Lower Cretaceous Clastic (ALK CL) and the Atlantic Upper Jurassic Clastic (AUU CL) plays.

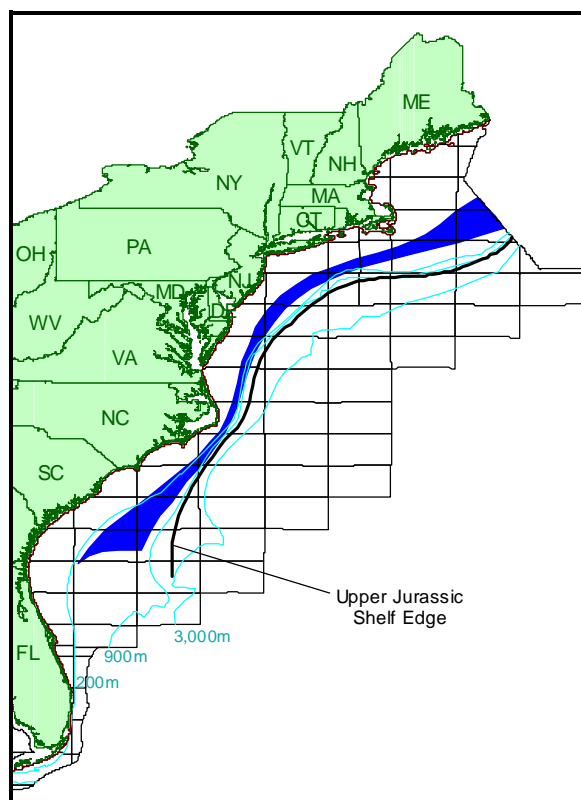


Figure 1. Map of assessed play.

PLAY CHARACTERISTICS

In the middle Jurassic, clastic sediments were eroded from the Appalachian Mountain System. During low stands of sea level, these sediments formed deltaic complexes. Potential middle Jurassic reservoirs may occur in deltaic complexes, barrier bars, and channel systems on the shelf.

Structures are related mainly to anticlines, growth faults, and normal faults. Potential source rocks include Jurassic shelf and slope shales. Geochemical analysis indicates organic matter to be primarily Type III with total organic carbon (TOC) ranging

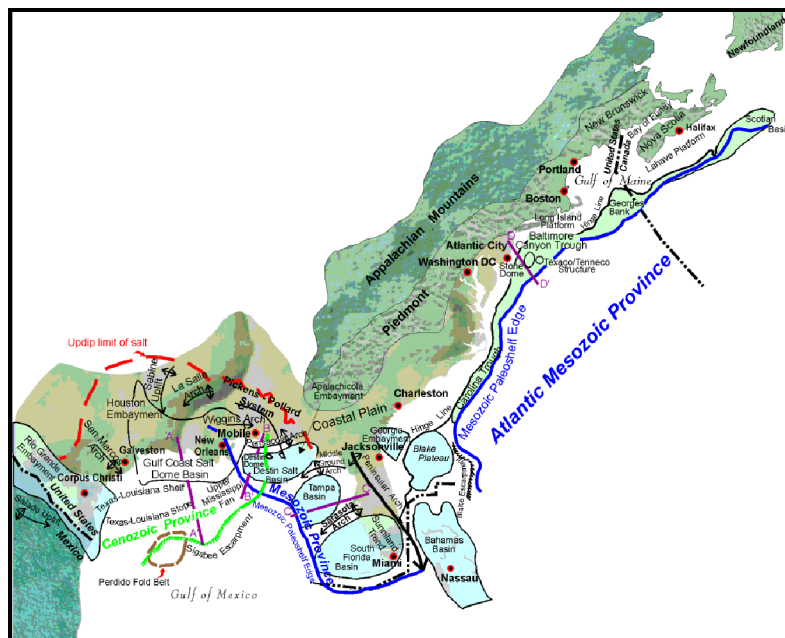


Figure 2. Physiographic map.

from 0.5 to 3 percent. The hydrocarbon evolution window (HEW) extends from approximately 7,000 to 18,000 feet. Jurassic lagoonal and platform carbonates may also provide good source rock potential. Seals are provided by middle or lowermost upper Jurassic limestones or by overlying shales.

The analog type field for the AMU CL play is the Thomasville Field, Rankin County, Mississippi. Production from the upper Jurassic clastic section in this field occurs from the Smackover Formation (figure 3).

DISCOVERIES

Exploration along the Atlantic Margin Federal OCS Area consists of 46 exploration and 5 COST wells (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Of the two wells that may have penetrated the AMU CL play, no commercial quantities of hydrocarbons were found.

National Assessment Mesozoic Stratigraphy									
		Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays			
Cretaceous	Upper	Seima Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL			
	Lower	Dantzler Fm Washita Gp Federicksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sigo (Fettel) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL			
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr Abenaki Fm Mohican Fm	AUU CL AMU CL	AUU CB AMU CB		
	Middle	Louann Salt	Non-Deposition						
	Lower		Basement		Argo Salt				
Triassic	Upper	Eagle Mills Fm			Eurdice Fm				
		Basement			Basement				

Rock unit positions do not imply age relationships between basins.

Figure 3. Stratigraphic column.

ASSESSMENT RESULTS

Since the AMU CL play contains no Federal fields, productive upper Jurassic clastic sediments of the onshore eastern Gulf of Mexico and the Canadian offshore Scotian Basin provide the analogs for input parameters used in this assessment (figure 2).

Upper Jurassic reservoirs of the onshore eastern Gulf of Mexico and Scotian Basin were chosen as analogs for the AMU CL play because suitable middle Jurassic analogs were not recognized. The eastern Gulf of Mexico and the Atlantic Continental Margin first shared similar depositional environments and a common source area during the upper Jurassic. The onshore upper Jurassic clastic analog comprises the Smackover Formation and Cotton Valley Group of Mississippi and Alabama (figure 3). This analog encompasses an area of 6.2 million acres (9,750 square miles). Exploration in the analog has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 60 to 90 percent of the analog explored. These analog fields contain an average of 40 percent oil, 29 percent gas, and 31 percent mixed hydrocarbons. Fields producing from the well-established Norphlet trend were not used as analogs in this assessment because they produce from eolian sands, which are not analogous to the deltaic deposits in the AMU CL play.

The Scotian Basin upper Jurassic clastic analog comprises the Mic Mac Formation and covers an area of 35 million acres (54,700 square miles) (figure 3). Exploration in this analog has a success rate of approximately 30 percent, and drilling is at an immature stage with approximately 30 percent of the analog explored. This analog was used primarily for field size distribution parameters, as production data are not public record.

The marginal probability of hydrocarbons for the AMU CL play is 0.90. Assessment results indicate that undiscovered resources are estimated to be zero at the 95th percentile but 0.645 Bbo and 8.455 Tcfg at the 5th percentile (table 1 and figure 4). The mean undiscovered resources are estimated at 0.399 Bbo and 4.891 Tcfg (1.269 BBOE). These undiscovered resources may occur in as many as 120 pools, which have an unrisksed mean size range of 0.048 to 236.540 MMBOE (figure 5). These pools have an unrisksed mean mean size estimated at 11.786 MMBOE.

Potential for discoveries extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 2).

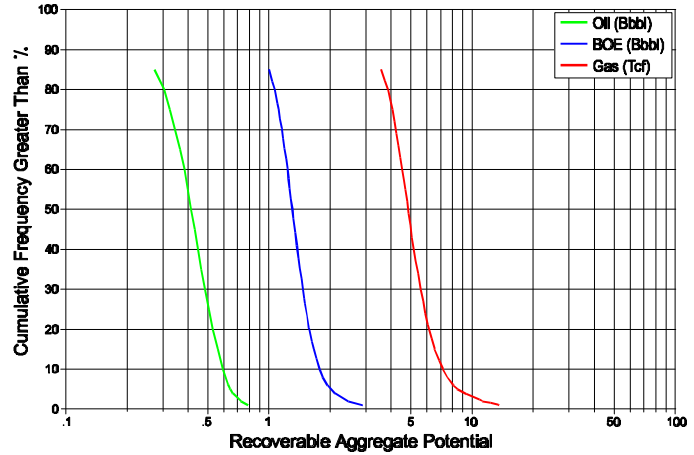


Figure 5. Cumulative probability distribution.

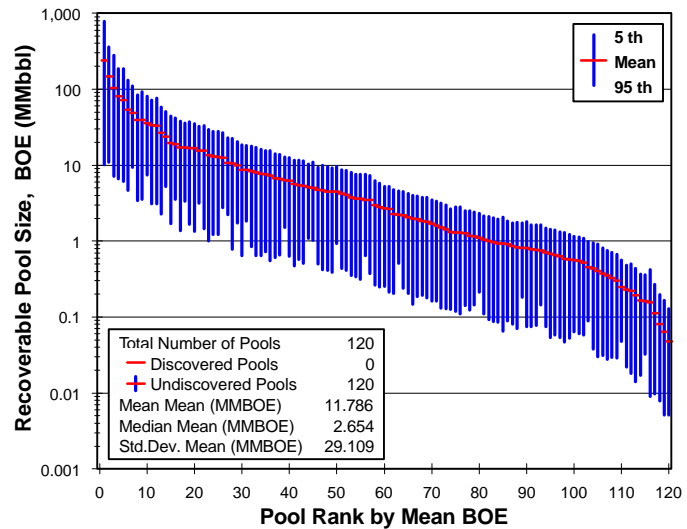


Figure 4. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 0.90	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.000	0.000	0.000
Mean	120	0.399	4.891	1.269
5th percentile	--	0.645	8.455	2.020
Total Endowment				
95th percentile	--	0.000	0.000	0.000
Mean	120	0.399	4.891	1.269
5th percentile	--	0.645	8.455	2.020

ATLANTIC MIDDLE JURASSIC CARBONATE (AMU CB) PLAY

PLAY DESCRIPTION

The frontier Atlantic Middle Jurassic Carbonate (AMU CB) play occurs within the *Gonyaulacysta pachyderma* and *Gonyaulacysta pectinigera* biozones. This play extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 1 and figure 2).

The AMU CB play is stratigraphically similar to the Atlantic Upper Jurassic Carbonate (AUU CB) play. However, the middle Jurassic limestone platform is much wider and extends farther shoreward, presumably because sediment influx had not extended as far basinward in middle Jurassic time.

PLAY CHARACTERISTICS

The AMU CB play consists of shallow-water limestone platforms and ramps that merge with the slope. Pinnacle and patch reefs may also occur. Shallow-water limestone platforms formed in the seaward portions of marginal basins where deltaic clastic influx was minimal. Potential reservoirs occur in porous bioclastic and pelletal carbonates that include pinnacle and patch reefs and associated reef talus. Hydrocarbons may also occur in carbonates deposited as shallow-water platform and deeper-water ramp facies. Structural closures over reefal buildups are possible, but traps are mainly stratigraphic. Potential source rocks include Jurassic shelf and slope shales. Geochemical analysis indicates organic matter to be primarily Type III with total organic carbon (TOC) ranging from 0.5 to 3 percent. The

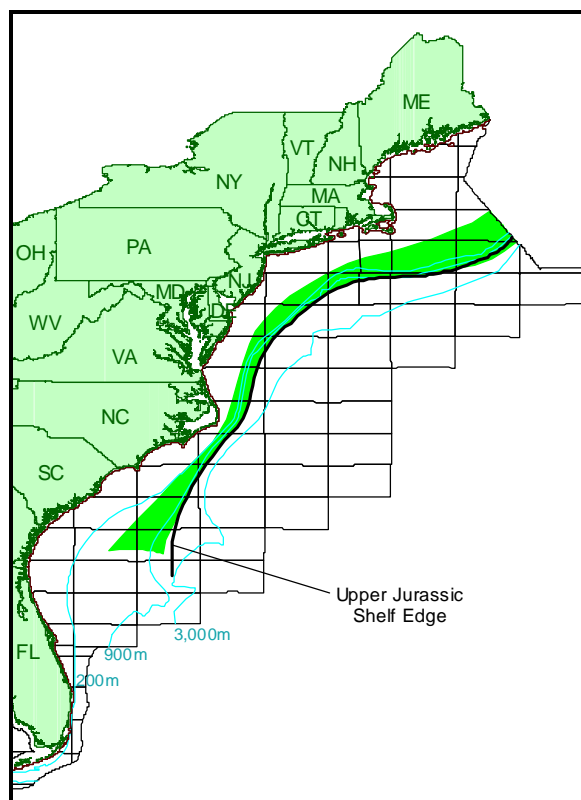


Figure 1. Map of assessed play.

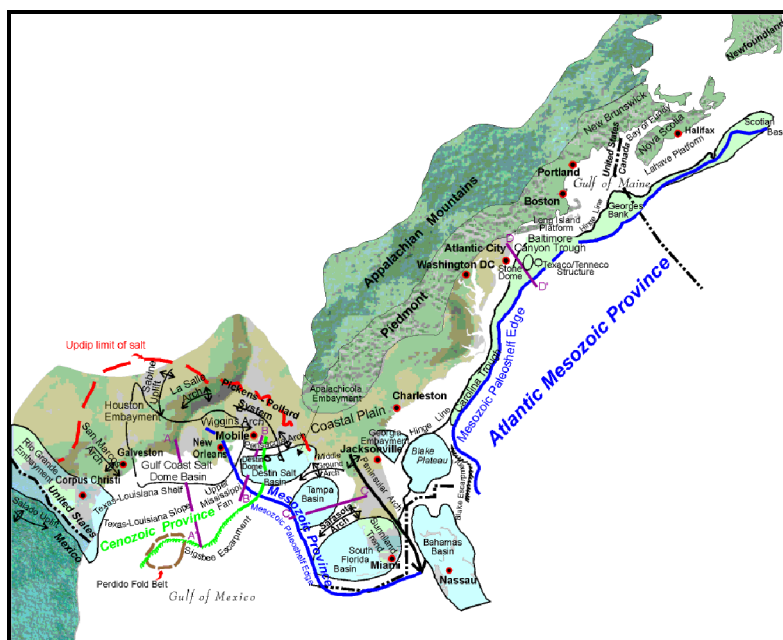


Figure 2. Physiographic map.

hydrocarbon evolution window (HEW) extends from approximately 7,000 to 18,000 feet. Jurassic lagoonal and platform carbonates may also provide good source rock potential. Seals are provided by middle or lowermost upper Jurassic carbonates, shales, and anhydrites.

The analog type field for the AMU CB play is the Chunchula Field, Mobile County, Alabama. This field's production is from the Upper Jurassic Smackover Formation (figure 3).

DISCOVERIES

Exploration in the Atlantic Federal OCS area consists of 46 exploration and 5 COST wells (the Mesozoic well database [wellmeso.dbf] is presented in the CD-ROM DataFiles directory). Of the 24 wells that may have penetrated this play, only one encountered hydrocarbons. Overpressured gas was encountered at almost 18,000 feet in probable middle Jurassic rocks in Texaco's Hudson Canyon 642-1 well. The flow was not measured nor was the presence of reservoir-quality rock established.

National Assessment Mesozoic Stratigraphy									
		Gulf of Mexico Basin	South Florida Basin	Gulf of Mexico Plays	Atlantic Basin/ Scotian Basin	Atlantic Plays			
Cretaceous	Upper	Seima Gp Taylor Gp Eutaw Fm Eagle Ford Gp Tuscaloosa Gp	Pine Key Fm	UK CL	Wyandot Fm Dawson Canyon Fm Mid SS Mbr Sable Island Mbr	AUK CL			
	Lower	Dantzier Fm Washita Gp Fredericksburg Gp Paluxy Fm Glen Rose Fm Mooringsport Fm Ferry Lake Fm Rodessa Fm James Fm Pine Island Fm Sligo (Fattet) Fm Hosston Fm Cotton Valley Gp	Dollar Bay Fm Sunniland Fm Brown Dolomite Zone Pumpkin Bay Fm Bone Island Fm	LK CL LK CB LK SUN LK SFB	Logan Canyon Fm Upper Missisauga Fm — 0 Marker — M. Simplex shale Lower Missisauga Fm Mic Mac Fm	ALK CL			
Jurassic	Upper	Cotton Valley Gp Haynesville Fm Buckner Fm Smackover Fm Norphlet Fm	Wood River Fm Basal Clastics	UU A UU SMK	Mohawk Fm Motran Mbr	AU CL	AU CB		
	Middle	Louann Salt	Non-Deposition		Abenaki Fm Mohican Fm	AMU CL	AMU CB		
	Lower		Basement		Argo Salt				
Triassic	Upper	Eagle Mills Fm			Eurdice Fm				
		Basement			Basement				

Rock unit positions do not imply age relationships between basins.

Figure 3. Stratigraphic column.

ASSESSMENT RESULTS

Since the AMU CB play contains no Federal fields, productive upper Jurassic platform carbonate reservoirs of the onshore eastern Gulf of Mexico and the lower Cretaceous Sligo-Stuart City reef trend provide the analogs for input parameters used in this assessment (figure 2).

The onshore upper Jurassic platform carbonate analog comprises the Smackover, Buckner, and Haynesville Formations, and Cotton Valley lime of Louisiana, Mississippi, and Alabama (figure 3). This analog covers an area of 7.6 million acres (11,850 square miles). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 60 to 90 percent of the analog explored. These analog fields contain an average of 35 percent oil, 22 percent gas, and 43 percent mixed hydrocarbons.

The lower Cretaceous Sligo-Stuart City reef trend analog comprises the Sligo Formation and Edwards Group (Fredericksburg Group equivalent) and covers an area of 104 million acres (162,435 square miles) (figure 3). Exploration has a success rate of approximately 10 percent, and drilling is at a mature stage with approximately 75 to 85

percent of the analog explored. These analog fields contain an average of 22 percent oil, 73 percent gas, and 5 percent mixed hydrocarbons.

The marginal probability of hydrocarbons for the AMU CB play is 0.65. Assessment results indicate that undiscovered resources are estimated to be zero at the 95th percentile but 0.413 Bbo and 1.633 Tcfg at the 5th percentile (table 1 and figure 4). The mean undiscovered resources are estimated at 0.130 Bbo and 0.611 Tcfg (0.239 BBOE). These undiscovered resources may occur in as many as 27 pools, which have an unrisken mean size range of 0.097 to 179.490 MMBOE (figure 5). These pools have an unrisken mean mean size estimated at 13.680 MMBOE.

Potential for discoveries extends from the U.S.-Canadian border through the Carolina Trough to the Blake Plateau (figure 2).

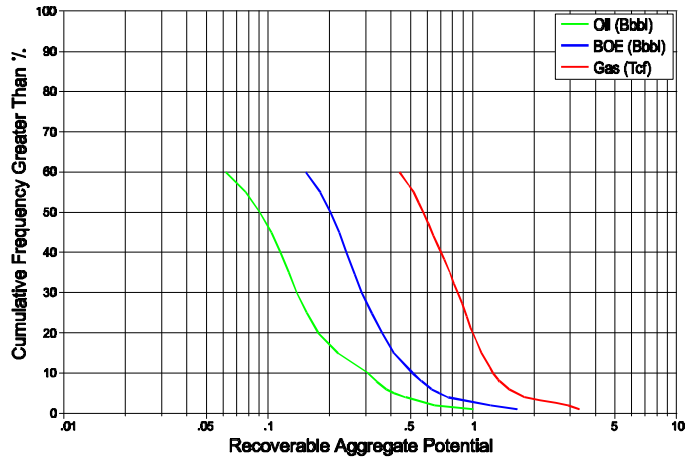


Figure 4. Cumulative probability distribution.

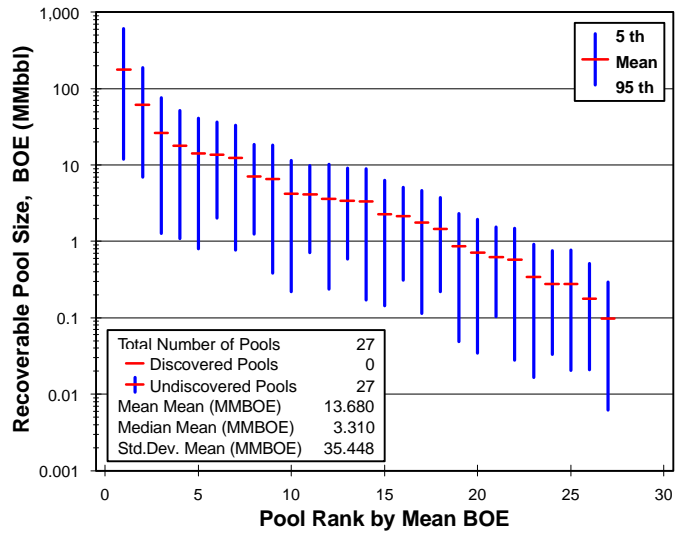


Figure 5. Pool rank plot.

Table 1. Assessment results.

Marginal Probability = 0.65	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.000	0.000	0.000
Mean	27	0.130	0.611	0.239
5th percentile	--	0.413	1.633	0.688
Total Endowment				
95th percentile	--	0.000	0.000	0.000
Mean	27	0.130	0.611	0.239
5th percentile	--	0.413	1.633	0.688

ATLANTIC LOWER JURASSIC (ALU) CHRONOZONE

The Atlantic Lower Jurassic (ALU) chronozone comprises only one play [see Atlantic Jurassic to Cretaceous Diapir (AU-K DIA) play].

ATLANTIC JURASSIC TO CRETACEOUS DIAPIR (AU-K DIA) PLAY

Salt diapirs within the conceptual Atlantic Jurassic to Cretaceous Diapir (AU-K DIA) play may occur seaward of the shelf edge from the Scotian Basin through the Carolina Trough (figure 1). Diapiric structures have been recognized on seismic data along the seaward edge of the Georges Bank Basin and Carolina Trough. Clastic or carbonate reservoirs may be associated with crestal, flank, or subsalt traps.

Because diapir-related structures have not yielded hydrocarbons in the adjacent Scotian Basin, the potential for future discoveries in the AU-K DIA play is considered to be low. Therefore, this play was not assessed.

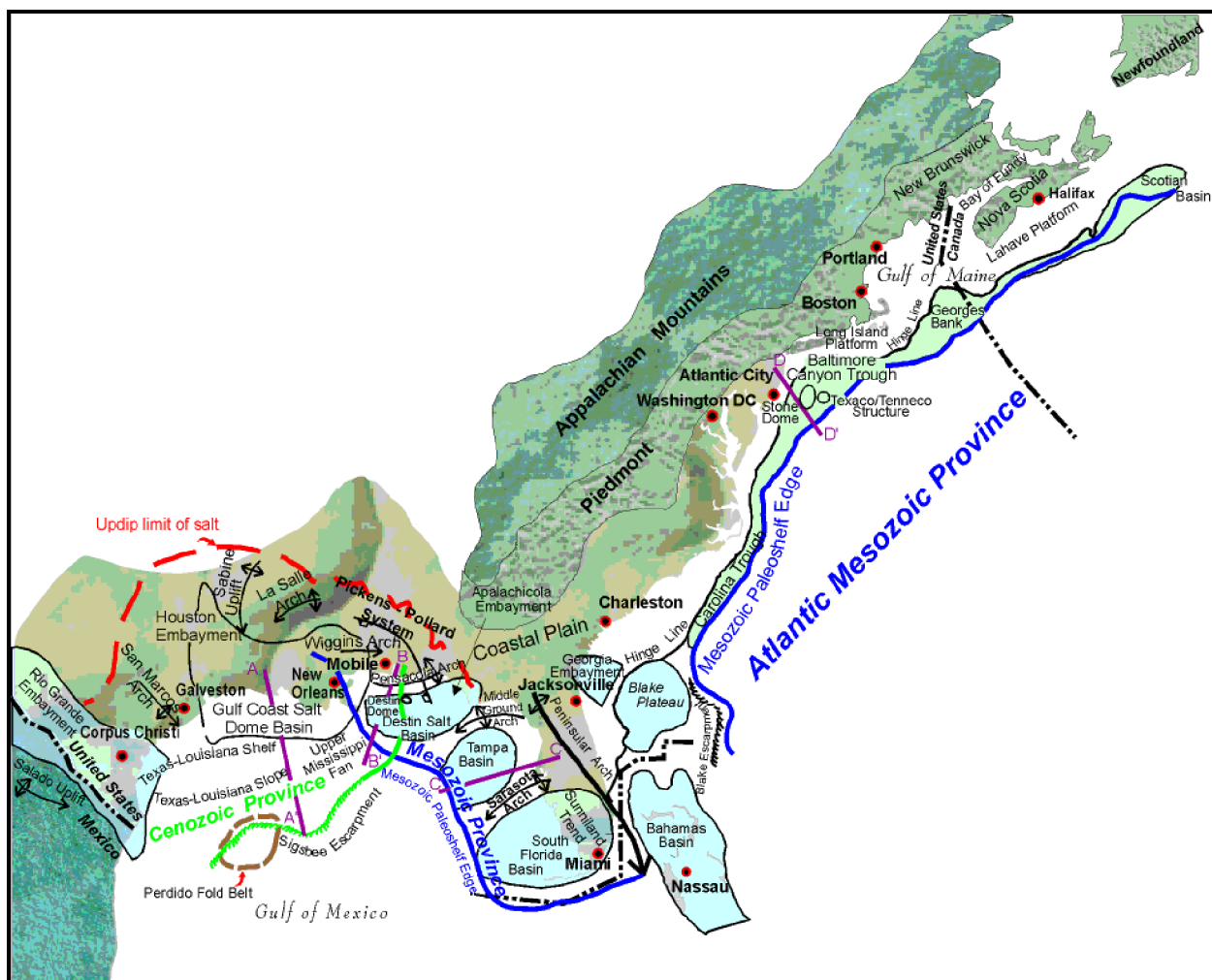


Figure 1. Physiographic map.

ATLANTIC UPPER TRIASSIC (AUTR) CHRONOZONE

The Atlantic Upper Triassic (AUTR) chronozone comprises two plays [see Atlantic Upper Triassic to Lower Jurassic Clastic Rift (ATR-LU CLR) play and Atlantic Upper Triassic to Lower Jurassic Carbonate Rift (ATR-LU CBR) play].

ATLANTIC TRIASSIC TO LOWER JURASSIC CLASTIC RIFT (ATR-LU CLR) PLAY

The conceptual Atlantic Triassic to Lower Jurassic Clastic Rift (ATR-LU CLR) play is characterized by a trend of Triassic to Lower Jurassic rift basins from eastern Newfoundland to the Carolinas (figure 1). The play includes continental and marine rift basins. Rift basin red bed deposits comprise alluvial, fluvial, eolian, and lacustrine sediments. The easternmost zone of rift basins, which comprise mainly marine carbonate-evaporite sequences of the Atlantic Triassic to Lower Jurassic Carbonate Rift (ATR-LU CBR) play, may also contain marine deltaic deposits.

The ATR-LU CLR play is considered to have low potential because of deep burial and thermal overmaturity of source rock and, therefore, was not assessed.

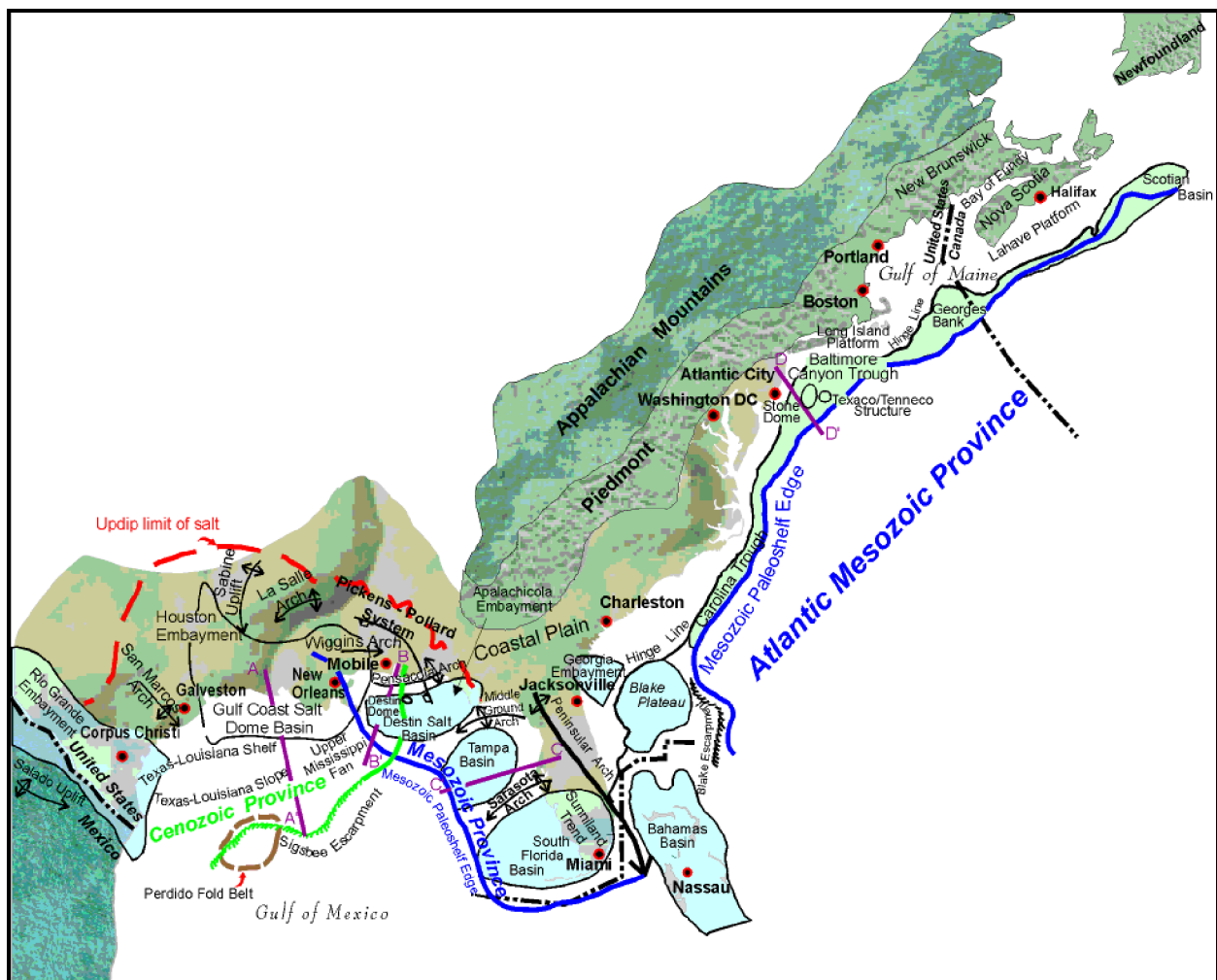


Figure 1. Physiographic map.

ATLANTIC TRIASSIC TO LOWER JURASSIC CARBONATE RIFT (ATR-LU CBR) PLAY

The conceptual Atlantic Triassic to Lower Jurassic Carbonate Rift (ATR-LU CBR) play is characterized by a trend of Triassic to Lower Jurassic rift basins from eastern Newfoundland to the Carolinas (figure 1). The play is identified seismically in the deep subsurface of the Georges Bank Area and occurs in the easternmost zone of rift basins. This play consists of carbonate-evaporite sequences of marine rift-basins. Prospective reservoir facies may include dolomites and platform limestones, as well as possible patch and pinnacle reefs.

The ATR-LU CBR play is considered to have low potential because of deep burial and thermal overmaturity of source rock and, therefore, was not assessed.

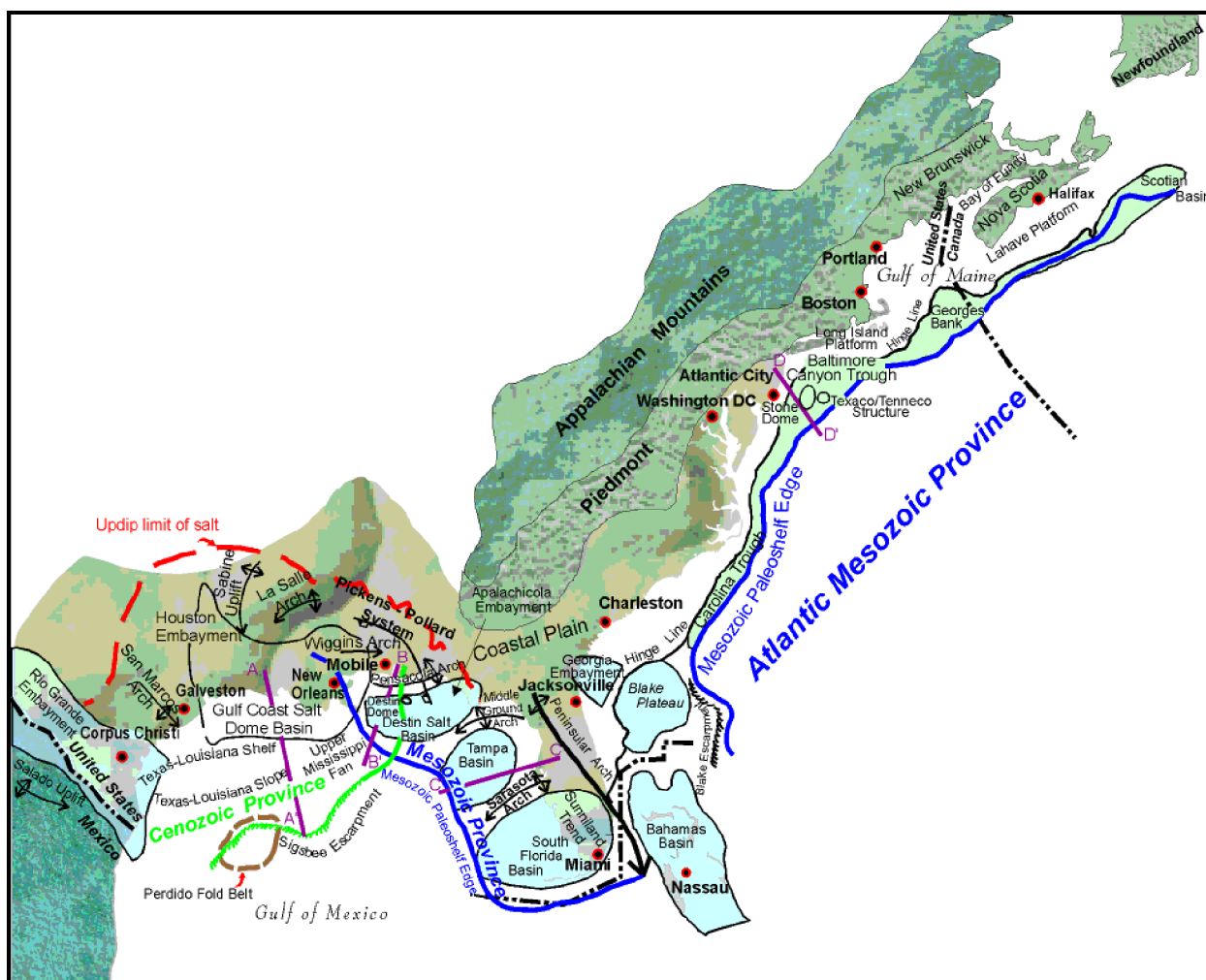


Figure 1. Physiographic map.

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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 Royalty Management Program** 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.

**Minerals Management Service
Gulf of Mexico OCS Region**



**Managing America's offshore energy
resources**

**Protecting America's coastal
and marine environments**