

Middle Pleistocene Fan 2 (MPL F2) Play

Angulogerina "B" biozone

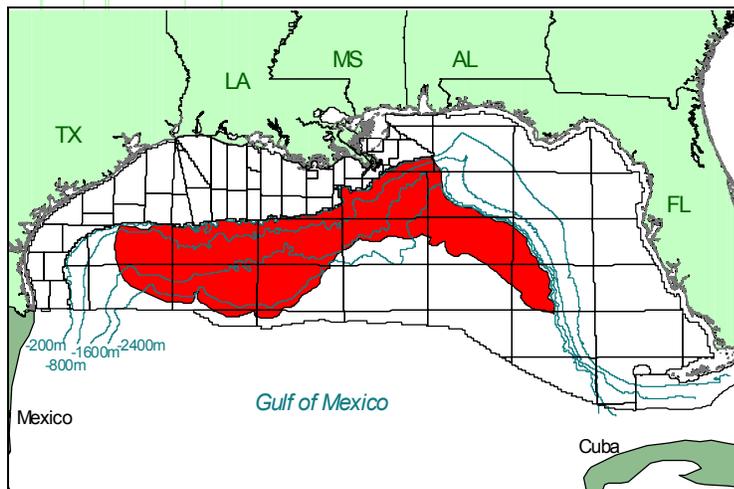


Figure 1. Play location.

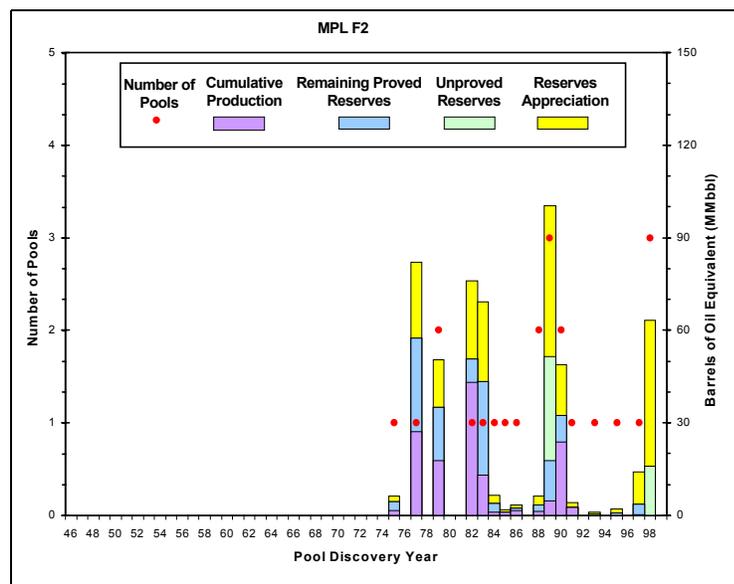


Figure 2. Exploration history graph showing reserves addition and number of pool discoveries by year.

MPL F2 Play 23 Pools 61 Sands	Minimum	Mean	Maximum
	Water depth (feet)	663	1332
Subsea depth (feet)	4414	9629	15916
Number of sands per pool	1	3	13
Porosity	27%	31%	36%
Water saturation	16%	26%	35%

Table 1. Pool attributes. Values are volume-weighted averages of individual reservoir attributes.

Play Description

The established Middle Pleistocene Fan 2 (MPL F2) play occurs within the *Angulogerina* "B" biozone and is defined by deep-sea fan sediments in a structural regime of allochthonous salt sheets and canopies with intervening salt-withdrawal basins located on the modern Gulf of Mexico Region slope. The MPL F2 play extends from the central East Breaks and Alaminos Canyon Areas to the southern Viosca Knoll and western Desoto Canyon Areas east of the Mississippi River Delta, and southeast to The Elbow and Vernon Areas offshore Florida (figure 1).

Updip, the MPL F2 play is bounded by the Middle Pleistocene Fan 1 (MPL F1) play. The MPL F2 play does not extend farther to the west because of a lack of sediment influx at the edge of the MPL depocenter. To the east, the play onlaps the Cretaceous carbonate slope. Downdip in the western and central Gulf of Mexico Regions, the play is limited by the farther downdip occurrence of either (1) the Sigsbee Salt Canopy Escarpment, where the farthest extent of large salt bodies overrides the abyssal plain, or (2) the downdip limit of the Perdido Fold Belt and Mississippi Fan Fold Belt plays. Downdip in the eastern Gulf Region, the play is limited by the southern extent of Louann Salt deposition, as defined by the downdip extent of the Upper Cretaceous to Upper Jurassic Salt Roller/High-Relief Salt Structure (UK5-UJ4 S1) play.

Play Characteristics

Component depositional facies include channel/levee complexes, sheet-sand lobes, interlobes, lobe fringes, and slumps that were deposited on the MPL upper and lower slope in topographically low areas between salt structure highs and on the abyssal plain. These

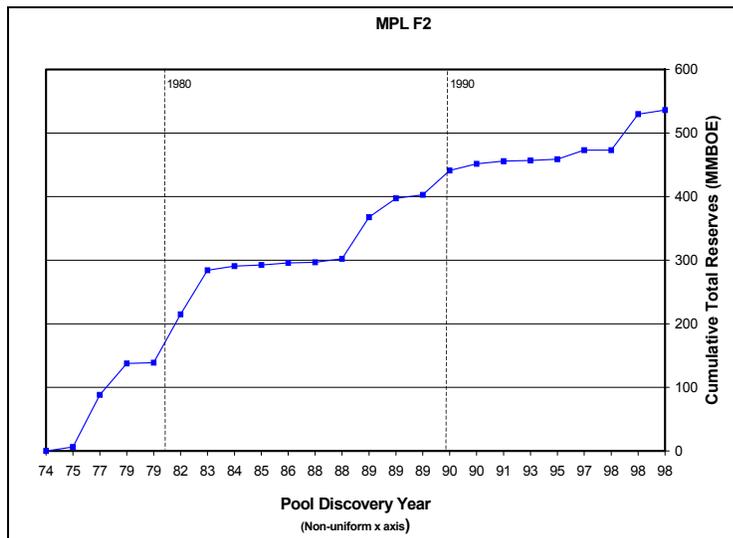


Figure 3. Plot of pools showing cumulative reserves by discovery order. Note the non-uniform x axis.

MPL F2 Play Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	18	0.087	0.969	0.259
Cumulative production	--	0.050	0.496	0.139
Remaining proved	--	0.037	0.473	0.121
Unproved	5	0.022	0.160	0.050
Appreciation (P & U)	--	0.071	0.877	0.227
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	0.179	1.506	0.480
Mean	67	0.236	2.259	0.638
5th percentile	--	0.314	3.155	0.824
Total Endowment				
95th percentile	--	0.359	3.512	1.016
Mean	90	0.415	4.265	1.174
5th percentile	--	0.493	5.161	1.360

Table 2. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

deep-sea fan systems are often overlain by thick shale intervals representative of zones of sand bypass on the shelf, or sand-poor zones on the slope.

Over half of the fields in the MPL F2 play are structurally associated with salt bodies, mostly of intermediate and deep depths, with hydrocarbons trapped on salt flanks or in sediments draped over salt. Some fields contain hydrocarbon accumulations trapped by permeability barriers, updip pinchouts or facies changes. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapirism) or stratigraphically (e.g., lateral shale-outs, overlying shales).

Discoveries

The MPL F2 mixed oil and gas play contains total reserves of 0.179 Bbo and 2.006 Tcfg (0.536 BBOE), of which 0.050 Bbo and 0.496 Tcfg (0.139 BBOE) have been produced. The play contains 61 producible sands in 23 pools, of which 18 contain proved reserves (table 1; refer to the Methodology section for a discussion of reservoirs, sands, and pools). The first reserves in the play were discovered in 1975 in the Mississippi Canyon 148 field (figure 2). Maximum yearly total reserves of 100 MMBOE were added in 1989 with the discovery of three pools. The largest discovered pool in the play was found in 1977 in the Mississippi Canyon 354 field (Zinc) with 82 MMBOE in total reserves (figures 2 and 3). Eighty-one percent of the play's cumulative production and seventy-five percent of total reserves are from pools discovered before 1990. The most recent discoveries, prior to this study's cutoff date of January 1, 1999, were in 1998.

The 23 discovered pools contain 87 reservoirs, of which 36 are nonassociated gas, 50 are undersaturated oil, and 1 is saturated oil. Cumulative production has consisted

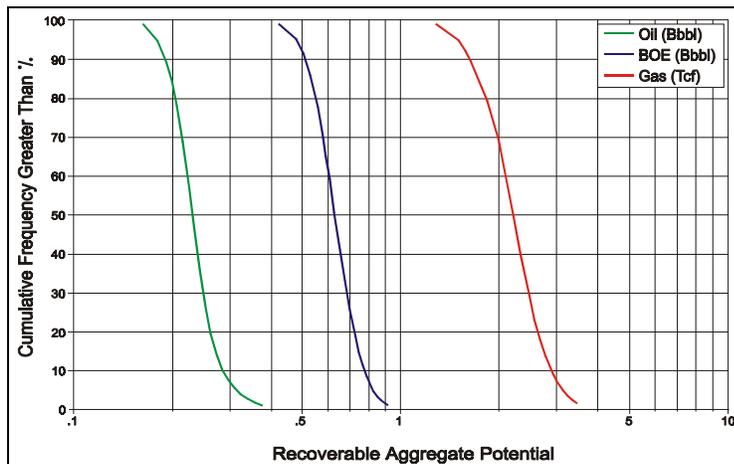


Figure 4. Cumulative probability distribution for undiscovered conventionally recoverable resources.

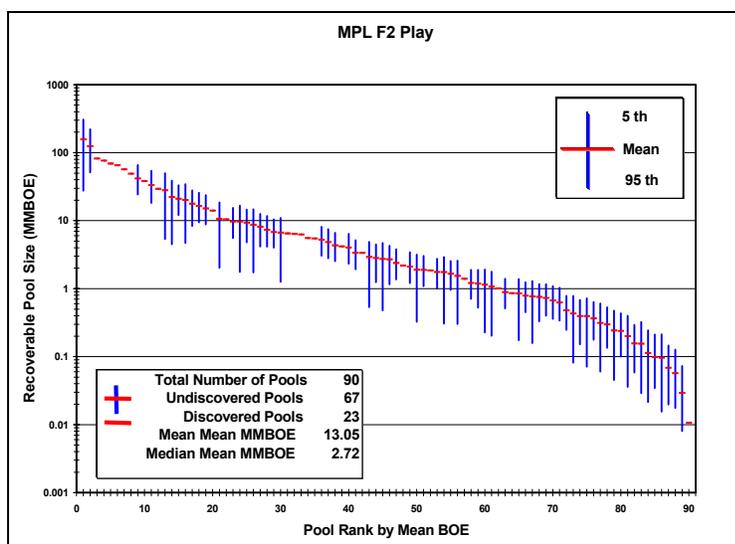


Figure 5. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).

of 64 percent gas and 36 percent oil.

Assessment Results

The marginal probability of hydrocarbons for the MPL F2 play is 1.00. The play has a mean total endowment of 0.415 Bbo and 4.265 Tcfg (1.174 BBOE) (table 2). Twelve percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered conventionally recoverable resources (UCRR) have a range of 0.179 to 0.314 Bbo and 1.506 to 3.155 Tcfg at the 95th and 5th percentiles, respectively (figure 4). Mean UCRR are forecast at 0.236 Bbo and 2.259 Tcfg (0.638 BBOE). These undiscovered resources might occur in as many as 67 pools. The largest undiscovered pool, with a mean size of 158 MMBOE, is also forecast as the largest pool in the play (figure 5). The forecast places the next four largest undiscovered pools in positions 2, 9, 11, and 13 on the pool rank plot. For all the undiscovered pools in the MPL F2 play, the mean mean size is 9 MMBOE, which is smaller than the 23 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 13 MMBOE.

BOE mean UCRR are projected to increase the play's BOE mean total endowment by 54 percent. Discoveries in the MPL F2 play are expected to be numerous, though relatively small (figure 4). Exploration potential continues to exist around salt in deep structural and stratigraphic traps, as well as in structures located below salt overhangs and salt sheets.