

Middle Pleistocene Fan 1 Play

MPL F1, #0581

Angulogerina "B"

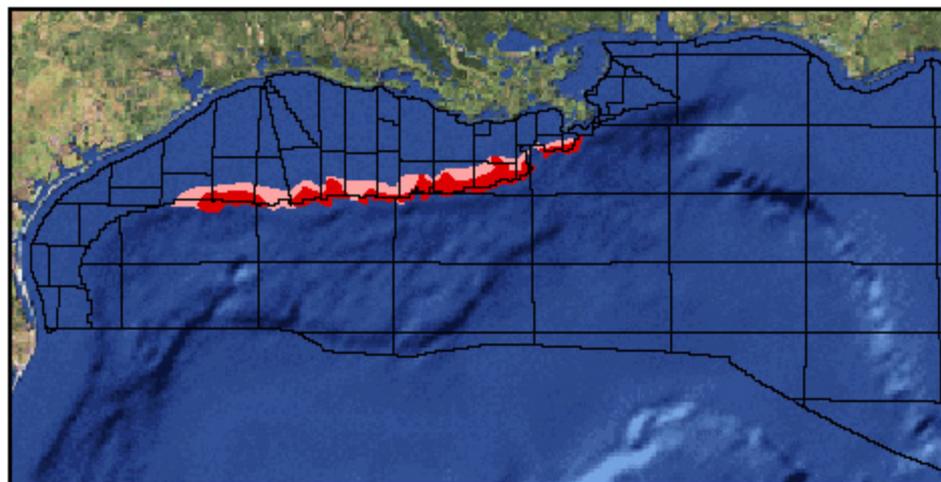


Figure 144. MPL F1 map showing location of play. Play limit shown in light red; hydrocarbon limit shown in dark red.

Overview

The Middle Pleistocene Fan 1 Play (MPL F1) contains reserves of 871,863 Bofg and 78,522 MMbo (233,822 MMBOE) in 83 sands in 31 fields. The play extends discontinuously near and along the modern GOM shelf edge from the Galveston/East Breaks to South Pass/Mississippi Canyon Area (Figure 144).

Description

MPL F1 is defined by (1) a deep-sea fan depositional style representing sediments deposited basinward of the MPL shelf edge, (2) an extensional structural regime with salt-withdrawal basins and extensive listric, growth faulting rooting into salt detachments on the modern GOM shelf, and (3) the MPL-1 and MPL-2 Chronozones, the tops of which are defined by the *Angulogerina* "B" 2nd occurrence and *Angulogerina* "B" 1st occurrence biozones, respectively (Figure 8).

MPL F1 extends discontinuously near and along the modern GOM shelf edge from the southern Galveston/northern East Breaks Area offshore

Texas to the southern South Pass/north-western Mississippi Canyon Area near the modern Mississippi River Delta (Figure 144). Hydrocarbons have been encountered in much of that same area. Located on the modern, outer-most GOM shelf and upper-most slope, MPL F1 is relatively well explored.

The ancestral Mississippi River Delta System dominated deposition of the play's sediments. As compared with the underlying Lower Pleistocene (LPL) Chronozone, the shelf edge offshore Louisiana of the MPL Chronozone occurs farther out in the GOM Basin because of the basinward progradation of the ancient delta system.

Play Limits

The play is bounded by the shelf edge associated with the *Angulogerina* "B" biozone and grades into the sediments of the Middle Pleistocene Progradational Play (MPL P1) in an updip direction. To the northeast, MPL F1 deposits grade into the sediments of MPL P1 and the Middle Pleistocene Fan 2 Play (MPL F2). MPL F1 does not extend farther to the west because of an apparent lack of shelf

source sands in offshore Texas during MPL time. Downdip, MPL F1 is limited by MPL F2.

Depositional Style

MPL F1 is characterized by deep-sea fan systems deposited basinward of the MPL-1 shelf edge, the farthest updip shelf edge associated with the MPL Chronozone. Component facies include channel/levee complexes, sheet-sand lobes, interlobe/fringe sediments, and slump sediments that were deposited on the MPL-1 and MPL-2 upper and lower slopes, in topographically low areas between salt structure highs, and abyssal plains. These 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.

The MPL deep-sea fan interval varies from less than 50 to more than 4,400 ft in thickness, with net sand thicknesses as much as approximately 400 ft. Thick, upward-coarsening and thinner, upward-fining log patterns of sand-dominated intervals represent sheet-sand lobe progradation and channel fill/abandonment, respectively, in proximal-fan areas. Irregularly stratified sand successions displaying spiky log patterns suggest deposition in distal-fan areas.

Structural Style

Over one-third of the fields in MPL F1 are structurally associated with salt diapirs—shallow, intermediate, and deep depths—with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Another third of the fields are structurally associated with anticlines. Less common structures in the play are growth fault anticlines and normal faults, plus a few fields contain hydrocarbon accumulations trapped by permeability barriers and updip pinchouts or facies changes.

Quantitative Attributes

On the basis of reserves calculations, MPL F1 is 66% gas and 34% oil. The 83 sands in the play comprise 127 reservoirs, of which 65 are nonassociated gas, 40 are undersaturated oil, and 22 are saturated oil. Proved reserves are estimated at 855,988 Bcfg and 70,926 MMbo (223,237 MMBOE) in 77 sands in 29 fields (Table 65). Unproved reserves are estimated at 15,675 Bcfg and 7,595 MMbo (10,384 MMBOE) in 6 sands in 2 fields.

	No. of Sands	Oil (MMbo)	Gas (Bof)	BOE (MMbbl)
Proved	77	70,926	855,988	223,237
Cum. production	71	53,506	561,126	153,351
Remaining proved	54	17,420	294,862	69,886
Unproved	6	7,595	15,675	10,384

Table 65. MPL F1 reserves and cumulative production.

These proved plus unproved reserves account for just over 6% of the reserves for the MPL Chronozone.

Cumulative production from MPL F1 totals 561,126 Bcfg and 53,506 MMbo (153,351 MMBOE) from 71 sands in 27 fields. MPL F1 production accounts for only 5% of the MPL Chronozone's total production. Remaining proved reserves in the play are 294,862 Bcfg and 17,420 MMbo (69,886 MMBOE) in 54 sands in 24 fields.

Table 66 summarizes that water depths of the fields in MPL F1 range from 165–958 ft, and play interval discovery depths vary from 4,918–13,506 ft, subsea. Additionally, porosity and water saturation range from 14–35% and 16–65%, respectively.

83 Sands	Min	Mean	Max
Water depth (ft)	165	351	958
Subsea depth (ft)	4,918	9,181	13,506
Reservoirs per sand	1	2	6
Porosity	14%	30%	35%
Water saturation	16%	30%	65%

Table 66. MPL F1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

Exploration History

MPL F1 has a 24-year history of discoveries (Figure 145). The first sands in the play were discovered in 1975 in the Eugene Island 342 and High Island A561 Fields. The maximum number of sands discovered in any year occurred in 1994 with nine sands from five fields. However, the maximum yearly reserves of 34,281 MMBOE were added in 1978 with the discovery of three sands from three fields. Almost the same amount of reserves was added again in 1992. Sand discoveries throughout the play's history average about three per year.

The largest sand in the play was discovered in 1992 in the East Cameron 338 Field and contains an estimated 14,983 MMBOE (Figure 148). The mean sand size for the play is 2,815 MMBOE. Since the first Atlas database cutoff of January 1, 1995,

eight sands have been discovered, the largest of which is estimated to contain 4.585 MMBOE.

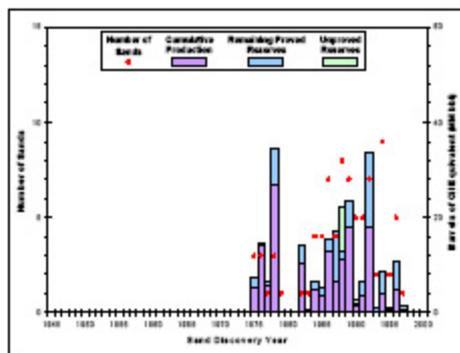


Figure 145. MPL F1 exploration history graph showing reserves and number of sands discovered by year.

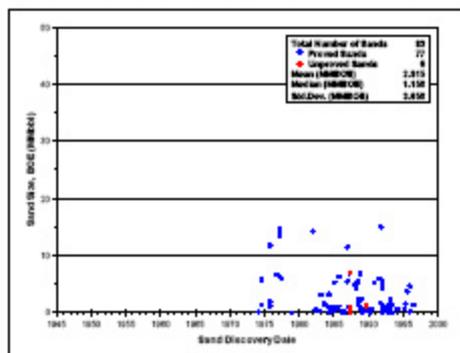


Figure 146. MPL F1 sand discovery graph showing the size of sands discovered by year.

Production History

MPL F1 has a 20-year history of production (Figure 147). Oil and gas production began in 1979. Oil production was a bit erratic, but generally increased throughout the 1990's, peaking in 1991. Since then, yearly oil production has fluctuated, but once again attained near peak levels in 1998. Gas production has fluctuated fairly erratically throughout the play's history. However, since 1993, yearly gas production values have steadily increased to their highest levels ever in 1998.

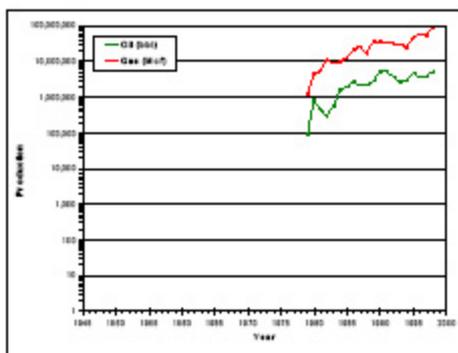


Figure 147. MPL F1 production graph showing oil and gas production by year.