

## Upper Pleistocene Progradational Play

### UPL P1, #0161

#### *Hyalinea* "B"/*Trimosina* "B" through Sangamon fauna

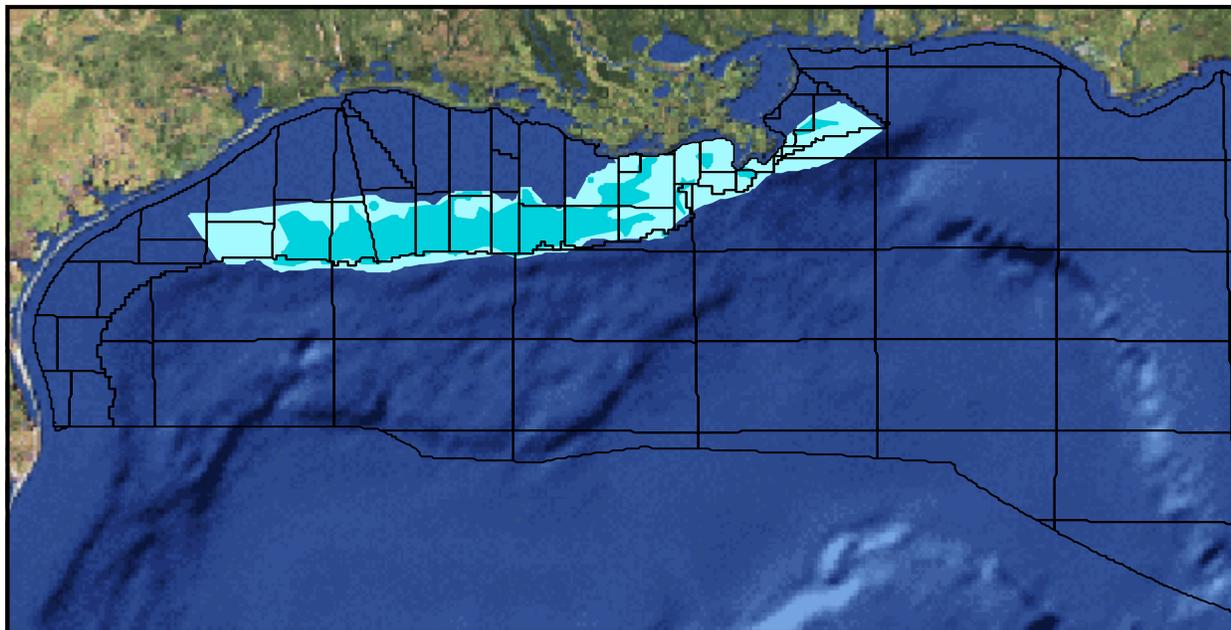


Figure 121. UPL P1 map showing location of play. Play limit shown in light cyan; hydrocarbon limit shown in dark cyan.

## Overview

The Upper Pleistocene Progradational Play (UPL P1) contains reserves of 12,686.199 Bcfg and 332.643 MMbo (2,589.974 MMBOE) in 637 sands in 149 fields. Comparing all 65 GOM plays, UPL P1 ranks second in gas reserves (8%). Additionally, comparing the 13 progradational plays, UPL P1 ranks second in gas reserves (12%). The play extends continuously across the modern GOM shelf from the Brazos to Main Pass and Viosca Knoll Areas (Figure 121).

## Description

UPL P1 is defined by (1) a progradational depositional style representing major regressive episodes in which sediments outbuild onto the shelf and slope and (2) the UPL-1, UPL-2, UPL-3, and UPL-4 Chronozones, the tops of are defined by the *Hyalinea* "B"/*Trimosina* "B", *Trimosina* "A" 2<sup>nd</sup> occurrence, and *Trimosina* "A" 1<sup>st</sup> occurrence biozones, and Sangamon fauna, respectively (Figure 8).

UPL P1 extends continuously across the southernmost modern GOM shelf from the east-central Brazos Area offshore Texas to the Main Pass and Viosca Knoll Areas east of the modern Mississippi River Delta (Figure 121). Hydrocarbons have been encountered in much of that same area except, most notably, in the Galveston, northern Grand Isle, eastern and southern West Delta, and Viosca Knoll Areas.

The sediments of UPL P1 were supplied mainly from ancestral Mississippi River Deltas. Compared with the location of the older Middle Pleistocene Progradational Play (MPL P1), UPL P1 shifted basinward.

Recently, shallow, between 1,500 and 3,000 ft, subsea, gas sands have become an attractive trend for several exploration companies. Because the gas was considered too under pressured to be economic, this trend is noted for being largely ignored by exploration companies. In general, the shallow gas was not logged and was avoided as a shallow drilling hazard. The shallow gas causes good seismic hydrocarbon indicators (bright spots), and the sands are characterized by very high porosity and

permeability. Faulted traps are frequently associated with hydrocarbon seeps at the seafloor. Drilling risks are very low with 3-D seismic data.

## Play Limits

UPL P1 deposits grade into the sediments of the Upper Pleistocene Aggradational Play (UPL A1) in an updip direction. UPL P1 also extends onshore in some areas of Louisiana. The play does not extend farther to the west because of an apparent lack of shelf source sands in offshore Texas during UPL time. At its farthest northeast extent, the play pinches out. UPL P1 deposits grade into the sediments of the Upper Pleistocene Fan 1 (UPL F1) and Upper Pleistocene Fan 2 (UPL F2) Plays in a down-dip direction.

## Depositional Style

UPL P1 is characterized by sediments deposited predominantly on the UPL shelf, with less common, generally finer-grained sediments deposited on the UPL upper slope. These sediments represent major regressive episodes in which outbuilding of both the shelf and the slope occur. Additionally, retrogradational, reworked sands with a thinning and back-stepping log signature locally cap the play. Because these retrogradational sands are poorly developed, discontinuous, and not correlatable for any significant distance, they are included as part of UPL P1.

The UPL progradational interval varies from approximately 150 to more than 11,500 ft in thickness, with net sand thicknesses as much as approximately 1,500 ft. Individual sand-dominated successions exceed 500 ft in thickness. Intervening shaly intervals can be more than 1,500 ft thick. Progradational depositional facies, predominantly comprising delta fringe sands, channel/levee complexes, and distributary mouth bar, characterize UPL P1. These facies exhibit upward-coarsening (delta fringe and distributary mouth bar) and blocky to upward-fining (channel/levee) log signatures. The thickest sand-dominated intervals probably represent stacked facies of multiple episodes of delta-lobe switching and progradation. The play less commonly contains shelf blanket sands, crevasse splay deposits, and delta slump deposits that are characterized by isolated, prominent, and subdued spiky log patterns.

## Structural Style

Almost half of the fields in this play are structurally associated with salt diapirs—shallow, intermediate, and deep depths—with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Other fields are structurally associated with anticlines, growth fault anticlines, and normal faults. Some fields also contain hydrocarbon accumulations trapped by permeability barriers and updip pinch-outs or facies changes.

## Quantitative Attributes

On the basis of reserves calculations, UPL P1 contains 87% gas and 13% oil. The 637 sands in the play comprise 1,302 reservoirs, of which 977 are nonassociated gas, 244 are undersaturated oil, and 81 are saturated oil. All reserves are proved and estimated to be 12,686.199 Bcfg and 332.643 MMbo (2,589.974 MMBOE) ([Table 53](#)). These reserves account for 65% of the reserves for the UPL Chronozone.

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	637	332.643	12,686.199	2,589.974
Cum. production	611	253.355	11,105.466	2,229.417
Remaining proved	415	79.288	1,580.732	360.557
Unproved	0	0.000	0.000	0.000

Table 53. UPL P1 reserves and cumulative production.

Of all 65 GOM plays, UPL P1 ranks second in gas production (8%). Cumulative production from UPL P1 totals 11,105.466 Bcfg and 253.355 MMbo (2,229.417 MMBOE) from 611 sands in 147 fields. UPL P1 production accounts for 70% of the UPL Chronozone's total production. Remaining proved reserves in the play are 1,580.732 Bcfg and 79.288 MMbo (360.557 MMBOE) in 415 sands in 115 fields.

[Table 54](#) summarizes that water depths of the fields in UPL P1 range from 39-922 ft, and play

637 Sands	Min	Mean	Max
Water depth (ft)	39	263	922
Subsea depth (ft)	950	4,188	9,218
Reservoirs per sand	1	2	18
Porosity	20%	32%	39%
Water saturation	16%	27%	71%

Table 54. UPL P1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

interval discovery depths vary from 950-9,218 ft, subsea. Additionally, porosity and water saturation range from 20-39% and 16-71%, respectively.

## Exploration History

UPL P1 has a 51-year history of discoveries (Figure 122). The first sand in the play was discovered in 1948 in the South Timbalier 52 Field, after which no sands were discovered again until 1960 in the Grand Isle 43 Field. The maximum number of sands discovered in any year occurred in 1974 with 64 sands from 24 fields. However, the maximum yearly reserves of 418.126 MMBOE were added in 1973 with the discovery of 33 sands from 18 fields. Almost the same amount of reserves was added again the following year. Sand discoveries per year peaked from 1971 to 1980, when 369 of the play's 637 sands were discovered.

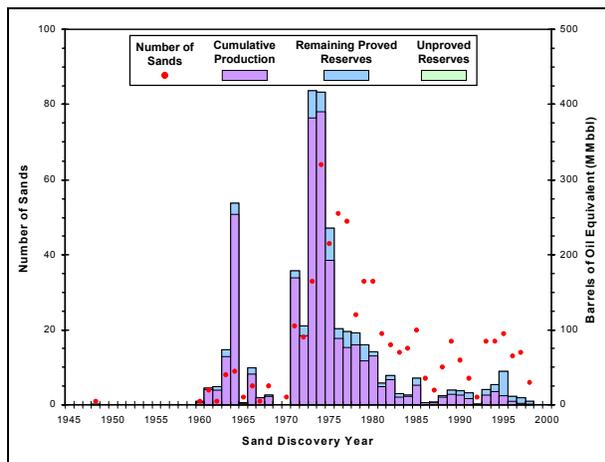


Figure 122. UPL P1 exploration history graph showing reserves and number of sands discovered by year.

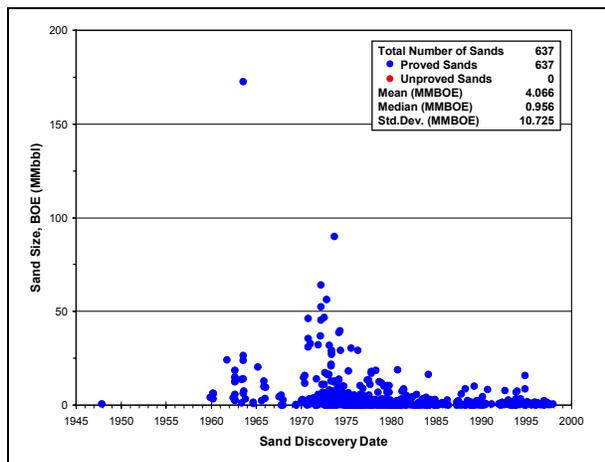


Figure 123. UPL P1 sand discovery graph showing the size of sands discovered by year.

The largest sand in the play was discovered in 1964 in the Eugene Island 292 Field and contains an estimated 172.601 MMBOE (Figure 123). All sands containing more than 50 MMBOE were discovered before 1975. The mean sand size for the play is 4.066 MMBOE. Since the first Atlas database cutoff of January 1, 1995, 52 sands have been discovered, the largest of which is estimated to contain 15.737 MMBOE.

## Production History

UPL P1 has a 33-year history of production (Figure 124). Oil and gas production began in 1966. Oil production was somewhat erratic through the mid-1970's, after which it steadily increased, peaking in 1986. Since then, yearly oil production values have fallen and fluctuated just below this peak value. Gas production generally increased each year until its peak in 1979. Since then, yearly gas production values have, except for a few upward fluctuations, decreased.

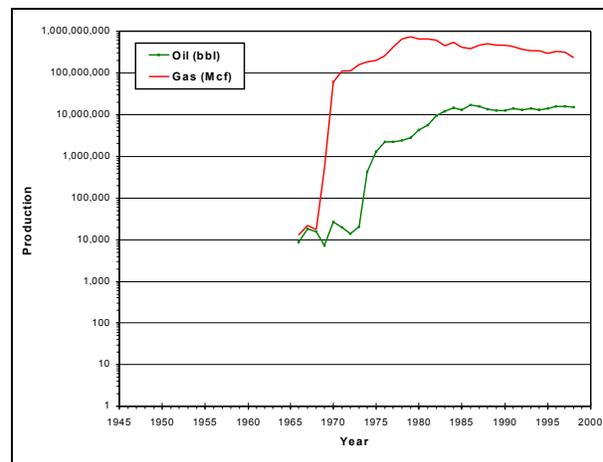


Figure 124. UPL P1 production graph showing oil and gas production by year.