

Searching For Structurally Trapped Oil In The Presence of Fault Shadow: Las Maracas Field, Llanos Basin, Colombia

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This presentation will outline the historical development of Las Maracas Field in the Llanos Basin of Colombia. This is an example of how geophysics was applied to find and develop a field. We will illustrate that there are a variety of misinterpretations, pitfalls, and limitations to the data. Success is defined by drilling in the right place, reserve adds, efficient low-cost recovery, and generating income for the company.

The Llanos basin in Colombia has been a major oil producing area since the 1950's. Large oilfields such as Cano Limon and Cusiana/Cupiaga are present within the basin and are structurally controlled oilfields containing over 1 Billion barrels of original oil in place (OOIP). Elsewhere in the basin exploration focuses on exploiting three way and four way closures to find trapped hydrocarbons within multiple zones of the stratigraphic section. Seismic data plays a crucial role in the exploration for these types of traps and the interpretation of these data is not without potential pitfalls; complex structure, fault shadow distortion, aliasing of faults using 2D seismic, and even AVO anomalies have contributed to exploration well failures. Armed with the knowledge of these problems, and even with acquisition of "state of the art" 3D seismic, the solution is still not always as clear as you might think. This will be highlighted by the history of development at Las Maracas field, a >20 million barrel OOIP, structurally controlled accumulation, with a maximum plateau of 12,500 bopd.

Conclusions

- Modern seismic and well datasets can be very effective in guiding exploration and development activities
 - Estimates of gross rock volume & reserve estimates
 - Development well positioning and proper spacing
- Modern Datasets have limitations and interpreters must be aware of the potential for misinterpretation
- Corrections and adjustments in interpretation must be iterative and should incorporate all data available.
- Petroamerica working with Parex have identified the key pitfalls in the modern 3D seismic dataset and they have been able to revise estimates and improve field prediction.
- Both companies have also identified these data can be further used to predict stratigraphic variation, which is being used in other areas of the Llanos
- Combined efforts have led to success at Las Maracas Field with an OOIP of 25 MMBO and a maximum plateau of 12,500 bopd.

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References

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