

From Play to Prospect: Petrobras Exploratory Effort in a Huge and Complex Gondwanan Province, the Paraná Basin of Southern Brazil

Milani, E.J., and A. B. França, Petrobras, Rio de Janeiro, Brazil

The Paraná basin is a vast geological domain in South America, with an area of about 1,600,000 sq km, mostly in Brazil but also encompassing parts of neighbor countries. It holds an up to 7,000 m-thick package of intermixed sedimentary-magmatic rocks included in six major sequences, ranging in age from Late Ordovician to Late Cretaceous.

The basin has been intermittently explored for oil and gas since the last decade of XIX century. From 1986 to 1996, a comprehensive review and integration of the available data led to a better understanding of petroleum habitat in that province. Due to a pervasive magmatic event during the Early Cretaceous, the Paraná basin is characterized by a non-conventional petroleum system where source rocks maturation is fully dependent on the heat of the igneous bodies.

The play concept was applied to selecting the most promising areas for exploration, regarding the occurrence and interplay between source beds, reservoir rocks and seals. By the same time regional seismic structural mapping, field observation and geochemical modeling revealed the styles of deformation and the timing of petroleum generation and expulsion, thus providing the geological framework that drove exploration towards the first gas discovery in the basin.