

SÃO FRANCISCO BASIN - GEOLOGY AND GEOPHYSICS OF A PROSPECTIVE PROTEROZOIC FRONTIER AREA IN CENTRAL BRAZIL

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The São Francisco Basin (300,000 km²) is a Proterozoic sedimentary basin situated in the central interior portion of Brazil. Petroleum exploration work carried out by Petrobras in the last decade allowed the recognition of three major depositional sequences. The two upper sequences were deposited in sag basins and are tentatively dated as Neoproterozoic (São Francisco Sgp, 800-600 Ma) and Mesoproterozoic (Macaúbas/Paranoá Gps, circa 1000 Ma) in age. The basal sequence is represented by deep, older Mesoproterozoic aulacogens filled by siliciclastic sedimentary rocks and volcanic lithologies. Both younger sequences are composed of mixed carbonate-siliciclastic sedimentary rocks. Each carbonate-bearing sequence presents a characteristic $\delta^{13}\text{C}$ isotopic signature that can be superimposed on a global curve of carbon isotopic variation, allowing the recognition of a major depositional hiatus between the Neoproterozoic and Mesoproterozoic sequences. In seismic sections these sequences are separated by an important erosional surface that locally attains the character of an angular unconformity. Although both sequences had been affected by the Brazilian orogenic event (630-550 Ma), older folds with different axial trends can be mapped within the Macaúbas Gp, below the angular unconformity. These evidence point to the existence of a previously unknown tectonic event between the Neoproterozoic and Mesoproterozoic (circa 1000-900 Ma). Significant gas shows in the São Francisco Sgp and good gas-prone source rocks in the younger Mesoproterozoic sequence indicate an effective petroleum system in the basin.