

A new paleogeographic insight into the Early Devonian at the northwestern border of the Paraná Basin, central-southern Brazil

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Paleocurrent analyses based on cross-stratification orientations carried out in the sandstones of the Furnas Formation (Early Devonian) at the NW border of the Paraná Basin, revealed regional WSW and ENE mean flow directions, the former being more distinctive. Paleocurrent data were associated in earlier studies either to longshore or to tidal currents. Thin, tabular bedded, crudely laminated to massive, fine sandstones, which are a conspicuous facies of the Furnas Fm. at the NW border of the basin, are here analyzed by its grain orientation in thin sections (petrofabric analysis), and the resulting paleocurrent data are compared to those achieved in the cross-stratifications. These new data revealed a clear N-S mean of the grain's longest axes, which can be associated to a paleoflow line. We interpreted these facies as high-density turbidity flows, generated by winter storms (tempestites), which would have driven sediments to a depocenter located southward in the northern Paraná Basin (Alto Garças Sub-Basin). The nearly orthogonal directions of sand transport recorded in the cross-stratified sandstones are associated to storm-tide currents acting along the Devonian paleocoastline of the basin (geostrophic?), which moved large sandwaves mostly westward. Based on these interpretations, we propose a full connection of this part of the Paraná Basin Devonian epeiric sea with the western Gondwana paleocontinental margin, differing from the available paleogeographic maps, which show the basin closed at the West.