

**Theme 5. Continental clastic depositional systems****General Session**

Oral presentation

## End-Permian paleoenvironmental changes in Parana Basin, Western Gondwana

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The last stages of the Permian period sedimentary record provide relevant clues for understanding global atmospheric and biological changes that led to the largest known mass extinction event. The Rio do Rasto Formation records this critical interval within the Paraná Basin, southeastern South America, and raises the discussion relative to the very complex stratigraphic framework and variable hierarchies of sedimentary processes related to distributive fluvial systems (DFSs). This field-based study holds sedimentological, stratigraphic, paleontological, and petrographic data, with more than 600 m of logged section surveyed in 40 outcrops in South Brazil, besides 1200 m of core described. In this sense, 22 lithofacies were recognized and arranged in 13 facies associations, being part of four subsystems within DFSs: 1) fluvial deposits; 2) low-slope, shallow lakes; 3) terminal splay lobes, and 4) eolian deposits. The overall strata exhibit a progressive process of aridization, and the paleocurrent pattern reveals an endorheic drainage basin, where the Norte Basin, in Uruguay, and the Huab Basin, in Namibia, would also be part of a low-relief, depression area within Gondwana. This process is well-recorded through a change from shallow lacustrine environments affected by storm events to a high-variability discharge setting, where perennial channels and lakes were replaced by small lakes, ephemeral streams, and extensive floodplain areas, with the development of paleosols and eolian sand sheets. However, this process was not abrupt, and this study reveals a cyclic pattern, in which aqueous flows are deposited and exposed to subaerial conditions, at different frequencies and depositional settings. The fossil content of a portion of the Rio do Rasto Formation strata indicates a progressive loss in biological diversity to the end-Permian, in particular to the non-marine bivalves, conchostracans, tetrapods, and plants, due to an increase in the input of freshwater and sediment, revealing import changes in discharge variability, sedimentation rates, and aridity. This study brings a data collection that reveals the architectural complexity within DFSs, when Western Gondwana underwent a progressive aridization and climate change, affecting directly the biota and depositional processes.