

Provenance of upper cretaceous turbidites from the Rosario Formation, Baja California, Mexico

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Geology and Aim

The Rosario Formation forms part of the Peninsular Ranges Forearc basin complex, which crops out discontinuously along the Pacific coast of the Baja California Peninsula, Mexico. The study is being performed in the San Fernando Canyon, between El Rosario and Punta San Carlos towns. In this area, the Rosario Formation comprises a lower, shallow marine member, overlain by an upper, deep marine member, including several slope channel systems. Based on previous research, the San Fernando channel systems consist of five channel complex sets (CCS1 to CCS5), each one characterized by three filling stages. Stage one consists of predominantly clast- and matrix-supported conglomerates, with subordinate medium to coarse grained sandstones. Stage two consists of units of clast-supported conglomerates with subordinate medium to coarse-grained sandstones, separated mainly by thinly-bedded turbidites (intercalation of thin beds of fine-grained sandstones and mudstones). Stage three corresponds mainly of hemipelagic mudstones. The main objective of this research is to determine source area and to compare the coarse fraction and fine fraction (fragments minors 2cm of size) from conglomerates of each channel set, combining provenance methodology such as heavy minerals, bulk petrography and clast counting.

Preliminary Results and Discussion

Clast counting and petrographic characterization showed that the pebble fraction of the conglomerates is constituted at least 18 different, and the major part of the volume is composed by pyroclastic, porphyritic volcanic and sandstone rocks. Bulk quantification indicates that the main provenance tectonic mode of the fine fraction of the conglomerates can be interpreted as dissected magmatic arc, with subordinate uplifted basement and recycled orogenic contributions. The preliminary conclusion is that the sedimentary supply to the Rosario Formation was mostly derived from volcanic and plutonic rocks of the Upper Peninsular Ranges Arc complex known as the Alisitos Arc, which follows the western margin of the Peninsular Ranges batholith, as well as from older magmatic arc, and from recycling of sedimentary-metasedimentary terrains.