

SEG 2023 Conference: Resourcing the Green Transition

Genesis of Gold Placers of the Cordón Baquedano, Tierra del Fuego, Austral Andes (54°S)

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Gold placers are formed by weathering, transport, and depositional processes that affect various lithologies, including gold-bearing ores and gangues. This work conducts a geological recognition of gravel placer gold deposits and their rock sources using geomorphologic and sedimentologic techniques. The study area is part of a mining placer gold district at the Cordón Baquedano, a mountain range of 600 m of altitude and NW-SE direction located in the northern part of the Tierra del Fuego Island (54°S). The origin of this placer gold district has been related to the great ice ages of the Upper Pleistocene. It is believed that glaciers eroded rocks from the Darwin Cordillera, transporting sediments 40 to 50 km to the west or northwest into the foreland basin, liberating gold particles in a fluvio-glacial sedimentary environment. Our results indicate that the origin of gold placers is related to plio-pleistocene foreland fluvial events. Sedimentological and geological results confirm the formation of fluvial deposits that represent the last event in the Upper Cenozoic part of the Magallanes foreland basin, probably during the Pliocene to Lower Pleistocene. Rock sources may have been located at the Darwin Cordillera, where rock outcrops with equivalent textures and mineralogy to the clasts of the placer deposits were observed, as well as structurally controlled gold-bearing hydrothermal alteration (e.g., silica-sulphide veins). Morphologic results suggest that repeated local episodes of fluvio-alluvial incision and deposition cut the uplifted fluvial deposit (related to the development of a regional pediplane or alluvial plain-like landform) and re-concentrate gold particles in the youngest fluvial morphologies (e.g., terraces and channels), likely since the Upper Pleistocene. This work highlights the importance of conducting detailed geological studies to prepare the geometallurgical models necessary to propose sustainable mining strategies in gold placers at Tierra del Fuego and similar gold deposits worldwide.