



ISAES 2019

XIII International Symposium on Antarctic Earth Sciences

22 July (Mon) – 26 July (Fri) , 2019
Songdo Convensia, Incheon, Republic of Korea



Presence of heavy metals in Mackellar Inlet, Admiralty Bay, King George Island, Antarctica

Luis Cerpa¹, José Herrera¹, Bernabé Moreno², Wai NG¹, Aldo Indacochea²

1. Instituto Geológico Minero y Metalúrgico –INGEMMET. lcerpa@ingemmet.gob.pe

2. Carrera de Biología Marina, Universidad Científica del Sur

During the Peruvian Antarctic Expedition ANTAR XXV expedition (2017-2018 austral summer), a sampling campaign was developed in Mackellar Inlet, Antarctica.

Several studies in sediments in Admiralty Bay and around the permanent scientific research stations shows high concentrations of Cu and Zn, associated with the natural mineralized rocks presents around Keller Peninsula (Machado et al, 2001; Trevizani et al, 2016). But we do not have reference values in the McKellar Inlet. Around the Mackellar Inlet, the geology shows andesitic and dacitic volcanic successions cut by dioritic intrusions. A small alteration halo was observed at the west near to Domeyko Glacier, and an extended alteration zone is present in Keller Peninsula.

The main objective of this work was to evaluate the presence of heavy metals and the possibility of human contamination in this particular area, due to the proximity of the Peruvian Research Station “Machu Picchu” (ECAMP). The survey considered a sampling mesh of 23 sediment samples, to evaluate the presence of As, Co, Cr, Cd, Cu, Mn, Mo, Ni, Pb and Zn. The samples were taken with a van Veen grab (0.05 m²) on board a pneumatic boat having a special consideration for the zones of potential sedimentary accumulation. The depth of the sampling stations vary from 20 to 50 meters, only 3 samples are deep (100 -150 meters).

The ranges in the contents of heavy metals are uniform and present slight variations As (12-28 ppm), Co (19-24 ppm), Cr (30-44 ppm), Cu (95-126 ppm), Mn (600- 1000 ppm), Mo (2-3 ppm), Ni (11-18 ppm), Pb (5-9 ppm) and Zn (71-97 ppm), no Cd values was detected (<1ppm). The values of the enrichment factor show us a moderate contamination and the presence of copper and arsenic, in the whole inlet. These metals show values, even a little higher than those reported by Machado et al. (2001) and Trevizani et al. (2016). In addition, there are small and moderate concentrations of Mo and Co near the Keller Peninsula. The rest of the elements have low pollution factors.

The results show a high concentration of Cu and As in the sediments, these results help to establish and characterize the presence of heavy metals, taking them as reference for future studies; in particular if the capacity of the Peruvian Research Station is expanded to improve its capacity and operate permanently.