

SURFACE AND GROUNDWATER IN PERMAFROST ZONE OF MARAMBIO (SEYMOUR) ISLAND, ANTARCTIC PENINSULA

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Environmental characteristics, hydrology and hydrogeology of Marambio (Seymour) Island, which is located on northeastern part of the Antarctic Peninsula, are correlated with the recent climatic change and seasonal meteorological variations. During the summer both the hydrological and hydrogeological processes are dynamic and related to geocryological conditions of this island. Surface and groundwaters of permafrost effluents are present throughout the summer season. The island has a surface drainage system and subsurface suprapermafrost waters related to drawdown and thickness of the active layer and local divergence of permafrost. In recent years several geoelectrical-geophysical studies, both shallow and deep, were carried out over the flat "meseta" as well as in selected basins. Three resistive-layer geoelectrical models were considered in relation to the three hydroclimatic sections defined as *suprapermafrost*, *permafrost* and *infrapermafrost*. Shallow geoelectrical studies in *suprapermafrost* section allowed to find the relationships between the different degree of water saturation in soil and the presence of permafrost in different localities. About 150 m deep geoelectrical surveys in *permafrost* and *infrapermafrost* sections allowed to define the characteristics of water/ice relationship. The hydrochemistry of surface water and *suprapermafrost* groundwater in each basin is related with the topographic slope and in particular with the charge and discharge mechanism in relation with the local geologic characteristics.