

Curie isotherm map of Scotia Arc from near surface magnetic anomaly data

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The opening of the Drake Passage, situated between South America and Antarctica, represents the final stage of the fragmentation of Gondwana supercontinent. It led to the Scotia Arc formation, bordering the Scotia Sea, which is surrounded by fragments of the former continental connection. It is currently composed of Scotia and Sandwich Plates.

Shackleton Fracture Zone constitutes its sinistral transpressive western boundary and it is a key structure that accommodates former Phoenix and Scotia Plates' differential movement. The formation of the Drake Passage and the Scotia Sea is considered of great importance to ocean circulation, as it allows the establishment of the Antarctic Circumpolar Current that isolated the Antarctic continent, with strong implications for climate and global changes.

Thermal structure of the Earth's crust is one of the main parameters controlling geodynamic processes. There is few information regarding heat flow values on Scotia arc. These values are mainly located in its westernmost, southern and easternmost part, which are not enough to extract conclusions regarding lithospheric thickness variations and asthenospheric flow. Taking advantage of the World Digital Magnetic Anomaly Map Project's compilation we have extracted magnetic anomaly data which fall inside the Scotia Arc and surrounding areas. This magnetic anomaly picture provides the best representation of magnetic properties to date. We propose to use spectral methods on this regional magnetic compilation to obtain depth to the bottom of magnetic sources as a proxy to infer Curie depth and heat flow distribution in the Scotia Sea.