

Geomorphological Evidences of Raised Beach and Palaeosols along the Barton Peninsula, King George Island, Antarctica

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During the 91/92 Antarctic summer field campaign, geomorphic features related with glacial isostasy were observed at the Barton Peninsula and its surrounding coastal area of King George Island. There are several types of geomorphic evidences to indicate the former beach strand such as marine terrace, sea notch or beach deposits. The ancient beach deposits consist of well rounded but slightly flat gravels. These outcrops are subdivided into three different series according to outcrop location and gravel shapes. The lower series consist of succession at the level of 3.1, 5.4, 6.0, 7.2, 14-15, 17-18 m. The middle series are characterized by ice-pushed, reworked gravels at the level of 24-25, 32-33, 38-40 and 57-58 m. The upper series outcrop at two different levels, 135 and 185 m. The age of the lower series must be Holocene, the middle series for the early Holocene, and the higher series are considered pre-Holocene based on the level of the outcrop and different gravel shape. The beach gravels are rounded or flat depending on the degree of shape sorting by wave action. They are more spherical at the lower altitude, but more flat at the higher level of ancient beach.

The fine soil fractions are exposed inside stone polygons by thawing and heaving activities at the subsurface. They differ in soil colour and composition. The soils outcropping at the lower altitude are mostly gray to brownish gray (10YR 5/2), rich in chlorite, and coarser due to previous advance of glaciers. The soils inside the polygons developed at the higher altitude than about 120 m are yellowish brown (10YR 6/8), rich in kaolinite and low soil pH, 4.3-5.0, which are impossible to develop at the present climate. As the rounded gravels at this level is interpreted to belong to the pre-Holocene, the yellowish brown soil is interpreted to have been developed at the Last Interglacial period.