



## **A new bathymetric compilation for the South Orkney Islands, Antarctic Peninsula (49° - 39°W to 64° - 59°S): insights into the glacial development of the continental shelf**

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We present a new, high resolution (300 m) bathymetric grid of the South Orkney Islands and surrounding continental shelf, northeast of the Antarctic Peninsula. The new grid, derived from a compilation of marine echo-sounding data offers significant and demonstrable improvements over previous regional bathymetric representations and helps to visualise the morphology of the shelf in unrivalled detail. With multiple end users (oceanographers, glacial modellers, biologists and geologists) the new compilation forms important baseline information for a range of scientific applications. In particular, due to our limited understanding of glacial history in this region, the new bathymetry grid provides the first detailed insights into past glacial regimes. The continental shelf is dominated by seven glacially eroded troughs, marking the pathways of glacial outlets that once drained a former ice cap centered on the South Orkney Islands. During previous glacial periods, grounded ice extended to the shelf break to the north of the islands. A large,  $\sim 250$  km long sediment depocenter, interpreted as a maximum former ice limit of one or more Cenozoic glaciations, suggests that ice was only grounded to the  $\sim 300$  m contour in the South. Using observations from the new bathymetric grid, we propose a preliminary ice cap reconstruction for maximum glaciation of the South Orkney plateau suggesting an areal ice coverage in the region of  $\sim 19000$  km<sup>2</sup>. The timing of maximum ice extent, number of past advances and pattern of subsequent deglaciation(s) remain uncertain and will require further targeted marine geological and geophysical investigations to resolve.