



Near-coastal Antarctic Iceberg Size Distributions Determined From SAR Images

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Over the past decades, the iceberg size distribution in Antarctic waters is a recurrent topic. Icebergs are moving sources of freshwater. Their drift and decay have an impact on the hydrology, circulation and biology of the ocean regions and are needed for a realistic simulation of the ocean dynamics.

During the Radarsat-1 Antarctic Mapping Project (RAMP) Antarctic Mapping Mission-1 (AMM-1) a mosaic of Antarctica and the adjacent ocean zone was compiled from more than 3000 high-resolution Synthetic Aperture Radar (SAR) images. The mosaic offered the unique opportunity to determine spatial distributions of iceberg sizes along the entire coastline of Antarctica.

A combination of automated iceberg detection and visual control as well as a correction of false detections resulted in identifying nearly 7000 icebergs with areas between 0.3 and 4717.7 qkm. Their spatial distribution showed correlations with coastline classes. These classes are based on the spatial distribution of surface features on ice shelves close to the calving front.

From the detections and assumed mean iceberg thicknesses, we can calculate the distribution of floating freshwater ice mass within the coastal zone of Antarctica at the time of image acquisitions.

For models of ocean dynamics, this dataset offers the opportunity to simulate the freshwater input into the Southern Ocean on a more realistic basis.