

Southern ocean iceberg drift

Christine Wesche, Thomas Rackow und Wolfgang Dierking

Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

Icebergs are fragments of glacier ice, which break-off from the ice shelves and glacier tongues all around Antarctica. After calving, icebergs drift through the ocean, driven by a number of forces. The main forces are the ocean currents and the wind, but also the Coriolis force, sea surface tilt, sea ice concentration and strength, as well as the wave radiation do influence the drift of icebergs. The relative contributions of the individual forces depend on the environmental conditions (e. g. sea ice or open water) and the iceberg size and thickness.

A drift algorithm is used to simulate the drift of icebergs through the Southern ocean. The iceberg drift algorithm is implemented in the Finite Elemente Sea-ice Ocean Model (FESOM), which has a spatial resolution of 10 km close to the ice shelf edge and 30 km offshore.

A test was carried out to study the effect of iceberg size and thickness as well as model set ups on the drift pattern. “Test icebergs” of a simplified shape were released into the model domain from 77 locations around Antarctica to simulate and analyse their path. The model results were compared with available observations.

Additionally to the drift, the model also calculates the melting of icebergs and therefore the freshwater input into the ocean.