



Modelled trends in oceanic conditions of Pine Island Bay between 1991 and 2014

Satoshi Kimuras (1), Paul Holland (1), Heather Regan (1), Adrian Jenkins (1), and Melchior Van Wessem (2)
(1) British Antarctic Survey, United Kingdom, (2) Institute for Marine and Atmospheric research Utrecht

Two ice shelves in Pine Island Bay, Pine Island Glacier and its neighbour Thwaites Glacier, have been highlighted as major drainage pathways for the West Antarctic Ice Sheet. We quantify the melting of these ice shelves and oceanic conditions between 1991 and 2014 using a general circulation model. Two different atmospheric forcing scenarios (RACMO_{2.3} and ERA-Interim) are used as a surface boundary. The ocean heat content of the Pine Island Bay from the simulations shows periodic decrease in the late 1990s and 2012-2014, but the magnitude of cooling is different between RACMO_{2.3} and ERA-Interim forced simulations. The brine rejection of the sea ice production causes enhanced overturning and cools the water north of Pine Island Glacier Ice Shelf. This cold water flows southward along the coastline, resulting in lower melt rate in the late 1990s and 2012-2014.