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Simulated last deglaciation of the Barents Sea Ice Sheet primarily driven by oceanic conditions

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An interconnected complex of ice sheets, collectively referred to as the Eurasian ice sheets, covered north-westernmost Europe, Russia and the Barents Sea during the Last Glacial Maximum (around 21 ky BP), connecting to the Scandinavian Ice Sheet to the south. Due to common geological features, the Barents Sea component of this ice complex is seen as a paleo-analogue for the present-day West Antarctic Ice Sheet. Investigating key processes driving the last deglaciation of the Barents Sea Ice Sheet represents an important tool to interpret recent observations in Antarctica over the multi-millennial temporal scale of glaciological changes. We present results from a statistical ensemble of ice sheet model simulations of the last deglaciation of the Barents Sea Ice Sheet, all forced with transient atmospheric and oceanic conditions derived from AOGCM simulations. The ensemble of transient simulations is evaluated against the data-based DATED-1 reconstruction. We find that the simulated deglaciation of the Barents Sea Ice Sheet is primarily driven by the oceanic forcing, with sea level rise and surface melting amplifying the ice sheet sensitivity to ocean warming over relatively short intervals. Despite a large model/data mismatch at the western and eastern ice sheet margins, the simulated and DATED-1 deglaciation scenarios agree well on the timing of the deglaciation of the central and northern Barents Sea. The primary role played by ocean forcing in our simulations suggests that the long-term stability of the West Antarctic Ice Sheet could be at stake if the current trend in ocean warming will continue.