

Figure S1: Image splits showing example of manual feature tracking from 1989-2000, 2000-2010, 2002-2012, 2006-2016, 2007-2017, 2008-2018, 2009-2019, 2010-2020, 2013-2023.

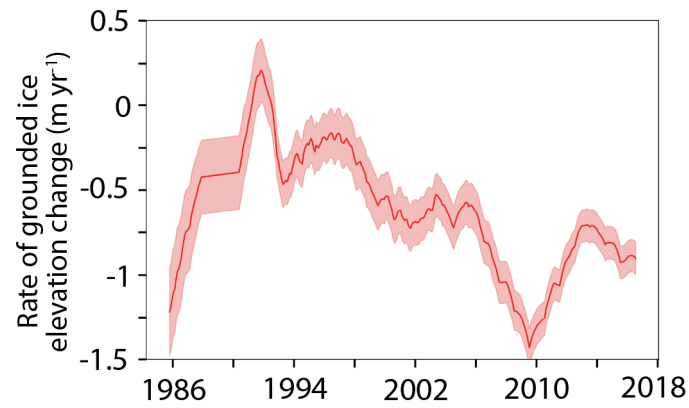


Figure S2: Grounded ice elevation change over a 5-year rolling window within a 40x40 km box upstream of the grounding line, using the Antarctic Ice Sheet Elevation Change data (Nilsson et al., 2022) provided by the NASA MEaSUREs ITS_LIVE project (Nilsson et al., 2025).

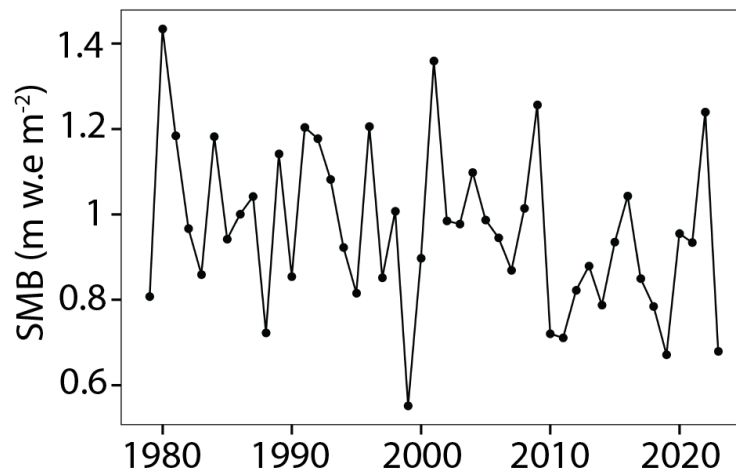
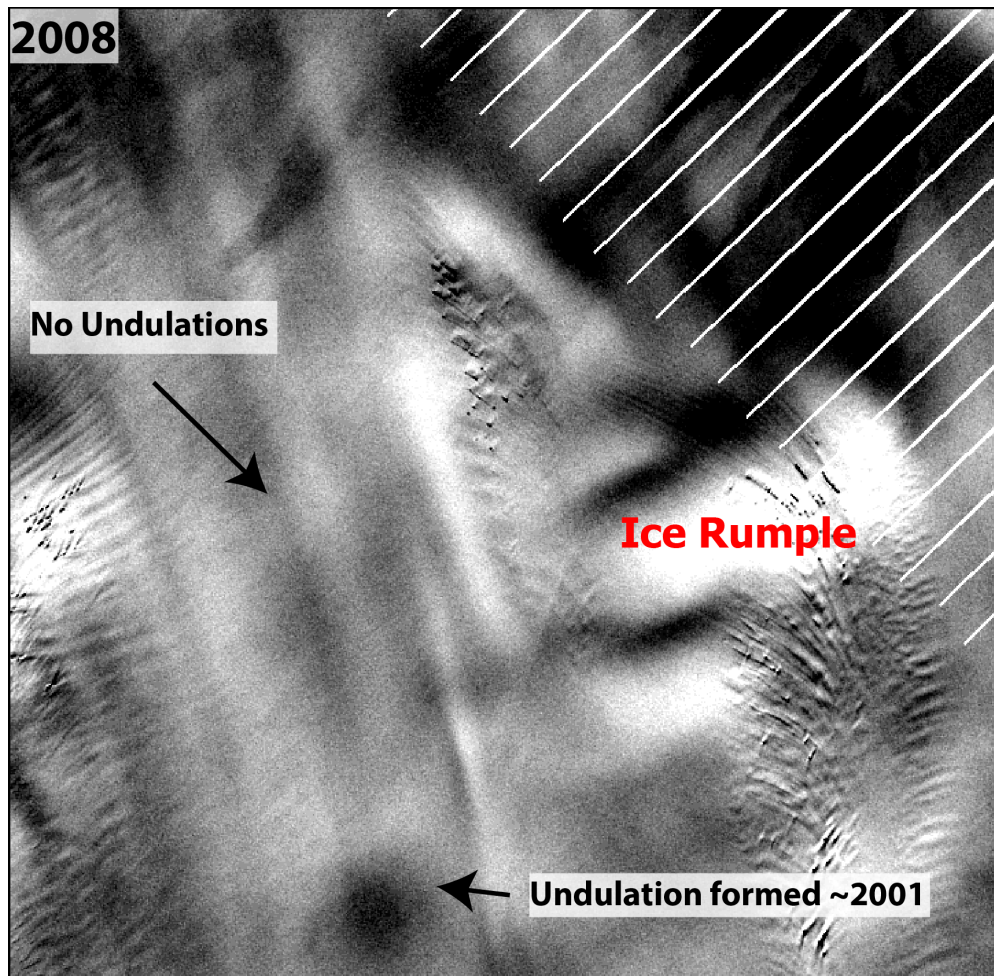


Figure S3: Surface mass balance within a 40x40 km box upstream of the grounding line, using Regional Atmospheric Climate Model (RACMO), version 2.4p1 (Van Dalum et al., 2025).



Animation S1: Sequence of Landsat images showing the formation of surface undulations adjacent to the ice rumple in circa 2010 and subsequently being advected with ice flow. Note how the ice rumple changes shape as differential waves of ice shelf thickness travel downstream. ~2010 has been reported as a cool year with ice shelf thickening anomalies and a slowdown in ice speed.