



Ice sheet variations in the western Amundsen Sea Embayment as depicted in seismic data

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The glacial history of the Amundsen Sea sector of the West Antarctic Ice-Sheet (WAIS) is of particular interest with its response to climate changes. A potential deglaciation and collapse of the Thwaites and Pine Island glacier drainage basins alone would result in a global sea level rise of approximately 1.5 m. Multichannel seismic reflection profiles offer a record of the glacial development in the western Amundsen Sea Embayment during the Neogene. We identify pronounced northwest-dipping reflector series of more than 1 s TWT thickness (> 800 m) on the middle shelf indicating well layered sedimentary units. The dipping strata reveal a striking alternation of reflection-poor, almost opaque units and sequences of closely spaced, continuous reflectors. We suggest that the distinct change in reflection pattern represents marked episodes of ice sheet advance and retreat. Due to the similarity with the seismic stratigraphy and lithology in bore-hole records of the distant Ross Sea, we suggest that these dipping strata to developed since the onset of glaciation in the Miocene. Numerous reflection-poor vertical pipes with sharp vertical boundaries are located mostly in the shallow part of the middle shelf. We identify reflection signals below them and, hence, exclude gas bearing chimneys but interpret the structures to present dewatering veins. We take the occurrence of dewatering pipes as further evidence for a glacial origin and overprint of the sedimentary sequences.