



Sediment fluxes of an Antarctic palaeo-ice stream system

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New marine-geophysical data (multibeam bathymetry, high-resolution acoustic profiles) acquired in 2014 have been integrated with heritage multichannel seismic-reflection and deep-tow boomer profiles from Anvers-Hugo Trough, western Antarctic Peninsula. From these datasets we have identified seismic facies relating to ice-stream advance and flow, ice-stream retreat, and post-glacial sedimentation processes. We identify multiple subglacial seismic units forming MSGL and other streamlined landforms at a variety of size scales. This may be indicative of multiple generations of ice-flow through the confluent ice-stream system. We also calculate the sediment volumes of a series of grounding-zone wedges (GZWs) located on the outer and mid-shelf that were produced during several stillstands in the trough as the grounded ice margin retreated through the system during deglaciation around c. 15-13 ka (from published core chronologies). Based on these volumes we consider the likely rates of subglacial sediment delivery by the Anvers Trough palaeo-ice stream and compare these to inferred flux rates from other palaeo- and modern Antarctic ice streams. In addition, we map the post-glacial glacial marine sediment package in the trough. Large mapped sediment thicknesses of this unit across the trough are consistent with high post-glacial sediment accumulation rates reported from cores acquired in the Anvers-Hugo Trough system. Previous authors have attributed this to exceptionally high primary productivity in a calving-bay re-entrant settings produced as ice retreated across the shelf on this part of the Antarctic margin.