



Early Pleistocene onset of Trough-Mouth Fan (TMF) growth on the NW Barents Sea margin: new results based on seismic reflection data

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Among the seismic reflection data acquired within the IPY NICE-STREAM activity (the Spanish SVAIS cruise on board BIO Hespérides in summer 2007 and the Italian EGLACOM cruise on board R/V OGS-Explora in summer 2008), a series of multi-channel profiles provides a nearly 400 km long continuous tie between Ocean Drilling Program Site 986 (offshore Svalbard) and the Kveithola Trough deposits (on the continental shelf just NW of the Bear Island). This tie crosses in strike direction (subparallel to the shelf edge) three TMFs: Bellsund, Hornsund and Storfjorden. Beyond their tie function, these profiles allow us to analyze the characteristics of these TMFs. The seismic units below reflector R4A are relatively uniform in thickness all along the profile, notwithstanding a general northward thinning trend. Conversely, thickening within TMFs is evident essentially only above this reflector. This suggests that for these TMFs the growth appears to have started after the formation of reflection R4A. Thus, the reflection (with an estimated age of about 1.3 Ma) lies in a stratigraphic interval that is recognized as pivotal for the glaciation of the area and the development of the margin. We suggest that it is the reflector that best correspond to the onset of the TMF growth and hence to the onset of the most significant phase of glacial development of the western Barents Sea continental margin. This inference is consistent with a recent finding that contourites produced by deposition of sediments suspended within alongslope bottom currents on the same margin start to develop in correspondence with the same reflector. The availability of suspended sediments for these contourites since Early Pleistocene is ascribed to originate from frequent episodes of small-scale mass-wasting events produced during TMS growth and resulting in more favourable depositional conditions for the Isfjorden and Bellsund contourite drifts.