Morphology, geology and oceanography of the Hinlopen Strait and Trough, Svalbard, Norway

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Pfirman, S. & Milliman, J. D. 1987: Morphology, geology and oceanography of the Hinlopen Strait and Trough, Svalbard, Norway. *Polar Research 5 n.s.*, 297–298.

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The Hinlopen Strait and Trough (Fig. 1) form a strikingly linear NW-SE feature, extending from Svalbard across the shelf and onto the Arctic Sea slope. Maximum water depths exceed 400 m, but a number of sills, some presumably structural and others sedimentary, divide the strait/trough into a series of basins. Acoustically transparent sediment, which locally is thicker than 60 m in some basins, is probably late Quaternary in age. The upper 1–5 m are Holocene, and were probably influenced by Atlantic water from the Arctic extension of the West Spitsbergen Current.

Although the Strait appears to be at least partly fault-related, the few available seismic data from the Trough show no evidence of faulting. The only reasonable alternative – fluvial excavation and glacial modification – seems likely if it occurred along a zone (or zones) of structural weakness or geological contrast. While glaciers may have occupied part or all of the Trough during glacial epochs, we see no sign of sediment accumulation on the outermost shelf and upper slope, unlike the sediment fans that characterize other cross-shelf troughs in the Arctic; presumably little or no sediment was discharged onto the Arctic slope from the Hinlopen Trough.

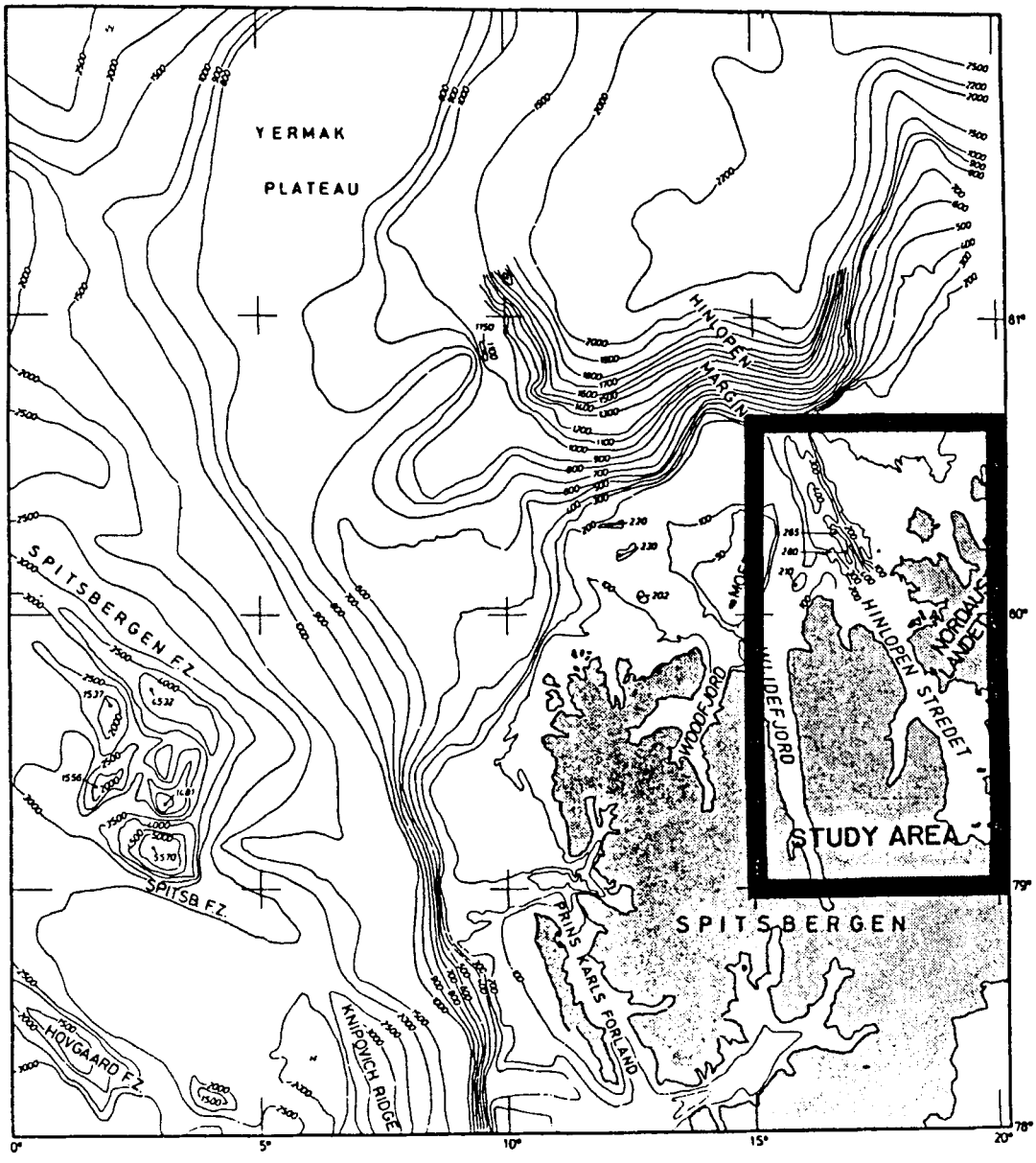

Fig. 1. The Hinlopen Strait and Trough with respect to northern Svalbard. Contours in meters.