1 **Supplementary Material**

2

3 **Data**

4 The 2D high-resolution seismic data profile was acquired using an 88-channel Geometrics

5 GeoEel streamer with a total length of 137.5 m and group spacing of 1.56 m. The seismic

6 source consisted of a SERCEL GI air gun with a volume of 1.7 l which was shot in harmonic

7 mode at 200 bar in ~2 m water depth; the main frequency was ~150 Hz. Data were sampled at

8 0.5 ms and sorted into common midpoint (CMP) domain with a bin spacing of 5 m. Normal

9 move out correction was carried out with a velocity of 1500 m/s and an Ormsby bandpass

10 filter with corner frequencies at 40, 80, 600 and 1000 Hz was applied. The data were time

11 migrated with water velocity.

12

13 We used the hull-mounted parametric sub-bottom profiler PARASOUND P70 (Atlas

14 Hydrographic) with a parametric frequency of 4 Hz.

15

16 Multibeam bathymetric data were recorded by the hull-mounted Kongsberg Simrad EM120

17 system with 191 beams per ping, an angular coverage of 150° and 12 kHz nominal frequency.

18 The data were processed using the MB System software package. The bathymetric data was

19 gridded with GMT at various bin sizes. The grid shown in Fig. 1 has a horizontal bin size of

20 100 m. Seafloor attributes such as slope gradient and slope aspect were calculated with

21 ArcGIS.

22 The three gravity cores were opened, described and logged (magnetic susceptibility, colour

23 parameter) after the cruise. Planktic foraminifers were sampled at 40, 80 and 134 cm depth of

24 core 606 and radiocarbon dated at the Leibniz-Laboratory for Radiometric Dating and Isotope

25 Research in Kiel (Germany). Ages were calibrated to calendar years using Radiocarbon

26   Calibration Program Calib REV7.0.1 with the Marine13 calibration curve (Reimer et al.,

27   2013) including a reservoir correction of 405 ^{14}C years.

28
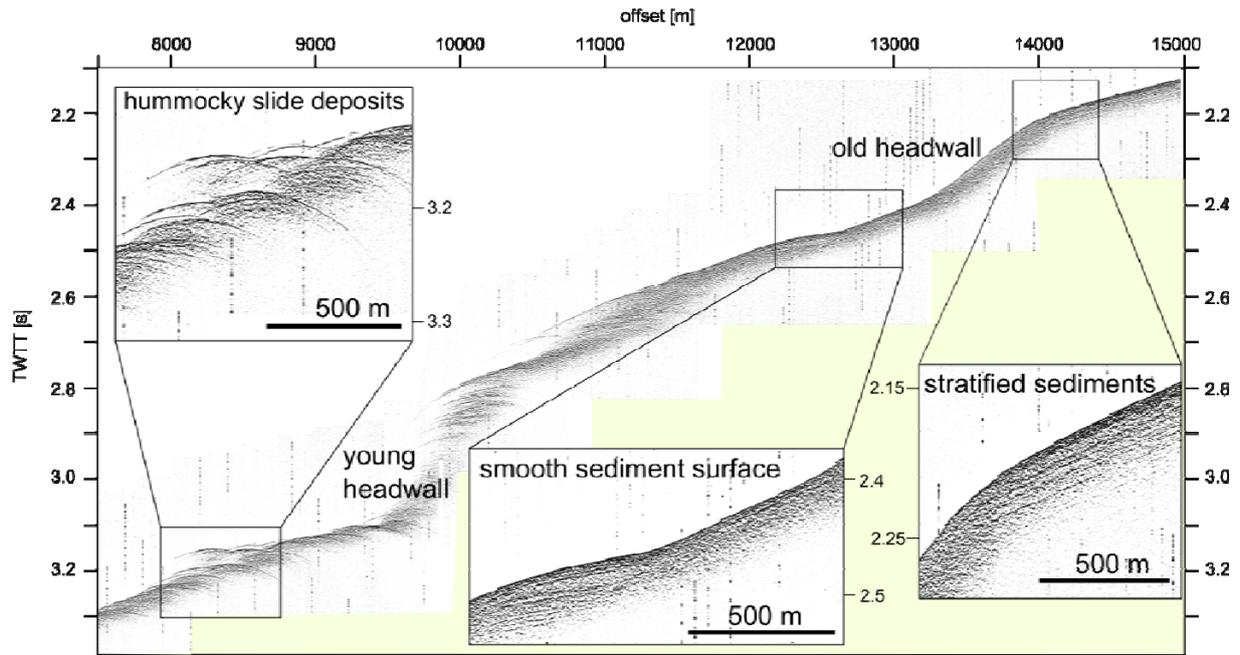
29

30   **Figure S1: Comparison of the characteristics of old and buried headwalls and probably relatively young**

31   **headwalls as shown by the Parasound sub bottom profiler data.**

32

33   **Table S1: Results of radiocarbon datings.**

Depth [cm]	Laboratory Code	^{14}C age[a] [yr BP]	Standard deviation [^{14}C yr]	Calendar age (Calib 7.0.1) using Marine13 data set and 405 yr reservoir correction	
				Mean [yr BP]	Standard deviation [yr]
40	KIA49391	15630	90	18492	109
80	KIA49392	23240	205	27194	226
134	KIA49393	38600	1345	42323	1077

34

35   **Table S2: Location of the gravity cores.**

Core number	Latitude	Longitude
603	79°49.87' N	5°14.98' E
605	79°44.14' N	4°33.25' E
606	79°47.02' N	4°10.92' E

36

Figure S2: Photograph of gravity core 606, every part of one meter length. The upper layer (0 to 210 cm)

are well stratified, underneath there is chaotic sediments that we interpret as slide deposits.

References Cited:

Reimer, P., Bard, E., Bayliss, A., and Beck, J., 2013, IntCal13 and Marine13 radiocarbon age
    calibration curves 0–50,000 years cal BP: Radiocarbon, v. 55.