Supplement of

Past ice sheet-seabed interactions in the northeastern Weddell Sea Embayment, Antarctica

Jan Erik Arndt et al.

Correspondence to: Jan Erik Arndt (Jan.Erik.Arndt@awi.de)

Table S1: Coordinates, water depths and recoveries of gravity cores (GC) and piston cores (PC) deployed in the study area.

Core ID	Cruise ID	Corer type	Latitude (°)	Longitude (°)	Water depth (m)	Recovery (m)	Reference
GC631	JR244	GC	-75.1238	26.6918	-261	0	this study
GC632	JR244	GC	-75.1277	-26.6920	-256	0	this study
GC633	JR244	GC	-75.1055	-26.6568	-314	0	this study
GC634	JR244	GC	-75.0070	-25.4493	-500	0.145	this study
GC635	JR244	GC	-74.9917	-25.4635	-494	1.17	this study
GC636	JR244	GC	-74.8118	-25.4755	-626	1.77	this study
GC637	JR244	GC	-74.6838	-25.5817	-606	2.7	this study
013	IWSOE68	GC	-75.4500	-26.5500	-507	0.9	Anderson et al. (1981)
3-7-1	IWSOE70	PC	-75.4170	-26.4670	-235	5.3	Anderson et al. (1981)
3-10-1	IWSOE70	PC	-74.9000	-25.9000	-490	0.06	Anderson et al. (1981)
3-11-1	IWSOE70	PC	-74.4500	-25.7170	-528	0.06	Anderson et al. (1981)
PS1637-3	ANT-VI/3	GC	-74.7630	-26.4420	-445	0.6	Grobe and Fütterer (2015)
PS111_139-1	PS111	GC	-74.8251	-25.2659	-669	0	Schröder (2018)
PS111_140-2	PS111	GC	-75.1325	-26.6295	-341	0	Schröder (2018)
PS111_142-1	PS111	GC	-75.2169	-27.4585	-373	0.2	Schröder (2018)

Table S2: Conventional and calibrated AMS ^{14}C dates on calcareous microfossils from sediment cores recovered from the northeastern Weddell Sea Embayment shelf (for location see Fig. 2 and Supplementary Table S1) analysed in this study (GC634 and GC635) and in previously published studies (3-7-1, Stolldorf et al., 2012; Anderson et al., 1980; Anderson et al., 1981).

Lab. sample ID	Core ID	Corer type[#]	Sample depth (cm)	Mat. dated*	^{14}C age (yrs BP)	± 1σ (yrs BP)	Calibrated age ± 2σ Min. age (cal ka BP)	Max. age (cal ka BP)	Rounded mean age (cal ka BP)
CCAMS-87463	3-7-1	PC	70	E	>52800	N/A	N/A	N/A	N/A
AA-27756	3-7-1	PC	200	bF	26660	490	28589	30723	29660
CCAMS-95860	3-7-1	PC	223-227	bF	28930	160	31157	31802	31480
CCAMS-96164	3-7-1	PC	223-227	bF	30740	140	33443	33995	33720
CCAMS-96250	3-7-1	PC	223-227	bF	29490	220	31500	32839	32170
CCAMS-95861	3-7-1	PC	304-308	bF	17980	50	20014	20430	20220
CCAMS-96165	3-7-1	PC	304-308	bF	13315	30	13842	14119	13980
CCAMS-96251	3-7-1	PC	304-308	bF	15330	45	16956	17410	17180
CCAMS-96262	3-7-1	PC	304-308	bF	14655	40	15966	16348	16160
CCAMS-96263	3-7-1	PC	304-308	bF	14970	40	16366	16871	16620
CCAMS-95862	3-7-1	PC	348-352	bF	16610	45	18534	18790	18660
CCAMS-96166	3-7-1	PC	348-352	bF	18820	45	21023	21507	21270
CCAMS-96252	3-7-1	PC	348-352	bF	19400	70	21819	22289	22050
AA-27757	3-7-1	PC	400	bF	13640	130	14087	15093	14590
ETH-69711	GC634	GC	12	pF	5470	70	4651	5166	4910
ETH-69710	GC634	GC	12	bF	5490	70	4717	5200	4960
ETH-69709	GC635	GC	50	B	10475	90	10259	10783	10520

[#]Corer types: GC: gravity corer, PC: piston corer

*Material dated: B: bivalve shell, E: echinoid spine, bF: benthic foraminifera, pF: planktic foraminifera

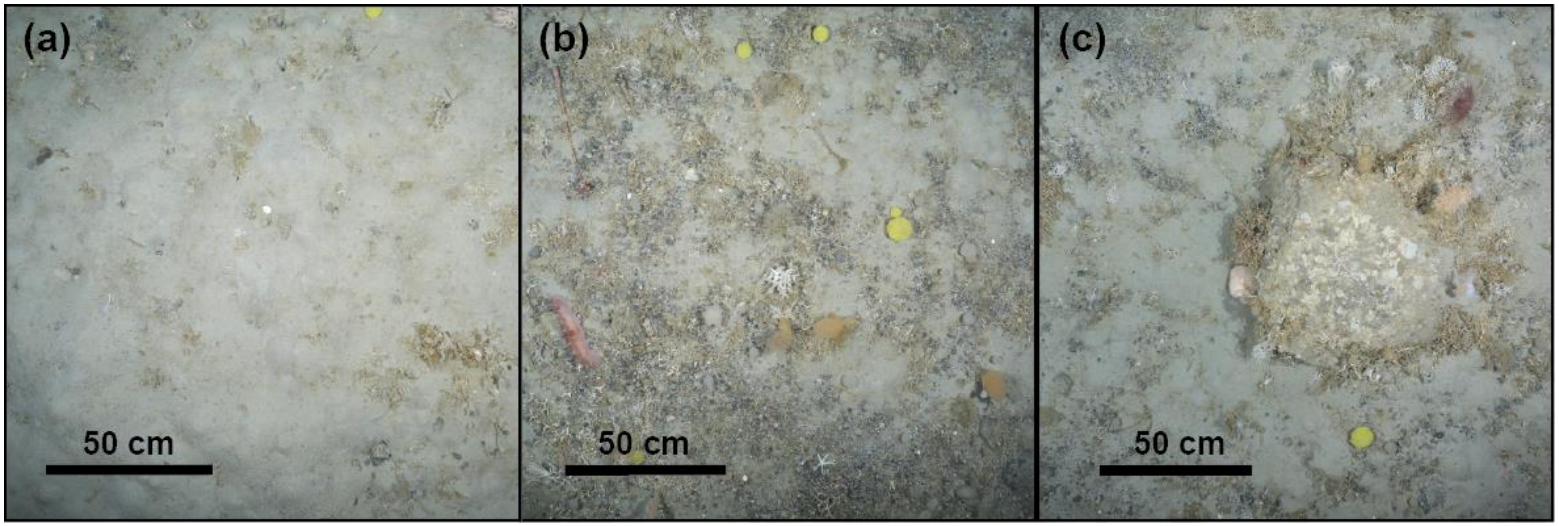

Figure S1: Ocean Floor Observation System (OFOS) seafloor images taken during RV *Polarstern* expedition PS96 on station 10-3 (Piepenburg, 2016) showing (a) a thin veneer of fine-grained mud, locally penetrated by hardrock pebbles and cobbles. Where the mud veneer is absent, the images show (b) a layer of hardrock pebbles and cobbles, and (c) locally, large cobbles and boulders, whose presence may explain the poor recovery of gravity cores in the area of Class H ramps. For location of photos see Fig. 2.

References

Anderson, J. B., Kurtz, D. D., Domack, E. W., and Balshaw, K. M.: Glacial and Glacial Marine Sediments of the Antarctic Continental Shelf, The Journal of Geology, 88, 399-414, 10.1086/628524, 1980.

Anderson, J. B., Davis, S. B., Domack, E., Kurtz, D. D., Balshaw, K. M., and Wright, R.: Marine Sediment Core Descriptions: IWSOE 68, 69, 70, Deep Freeze 79, Department of Geology, Rice University, Houston, USA, 1981.

Grobe, H. and Fütterer, D. K.: Documentation of sediment core PS1637-3, PANGAEA, 10.1594/PANGAEA.843865, 2015.

Piepenburg, D.: Seabed photographs taken along OFOS profiles during POLARSTERN cruise PS96 (ANT-XXXI/2 FROSN), PANGAEA, 10.1594/PANGAEA.862097, 2016.

Schröder, M.: The Expedition PS111 of the Research POLARSTERN to the southern Weddell Sea in 2018, Reports on polar and marine research, 718, Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, 10.2312/BzPM_0718_2018, 2018.

Stolldorf, T., Schenke, H.-W., and Anderson, J. B.: LGM ice sheet extent in the Weddell Sea: evidence for diachronous behavior of Antarctic Ice Sheets, Quat. Sci. Rev., 48, 20-31, 10.1016/j.quascirev.2012.05.017, 2012.