Figure S1 The effect of temperature on dissolved Fe in pore water under different DO conditions: (**A**) high DO; (**B**) low DO.
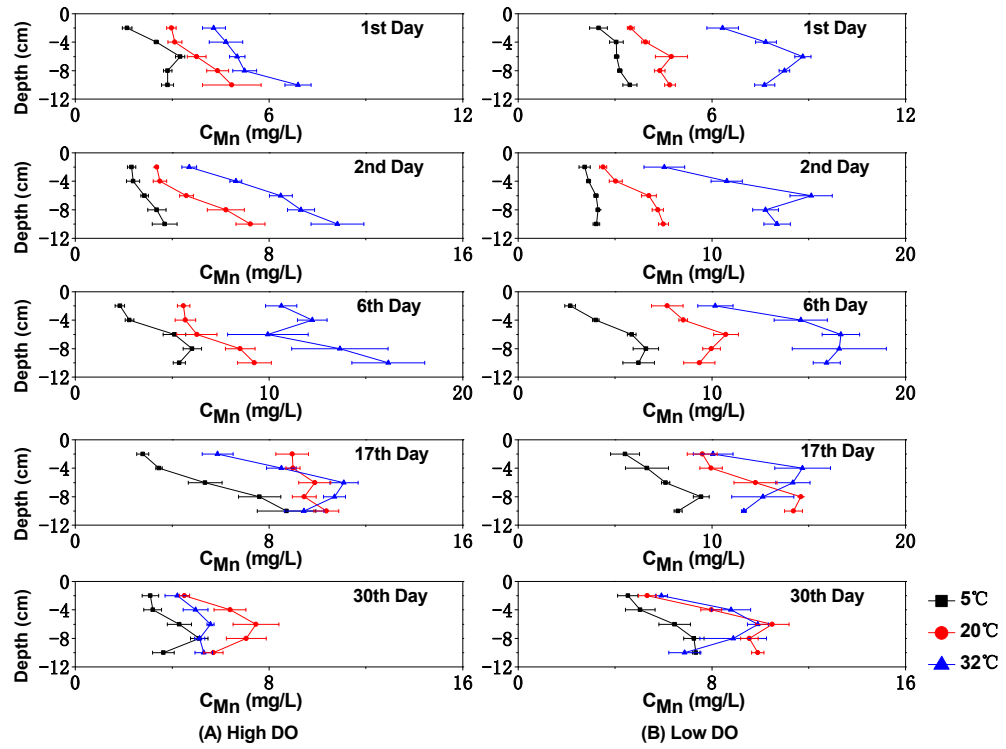
Figure S2 The effect of temperature on dissolved Mn in pore water under different DO conditions: (**A**) high DO; (**B**) low DO.
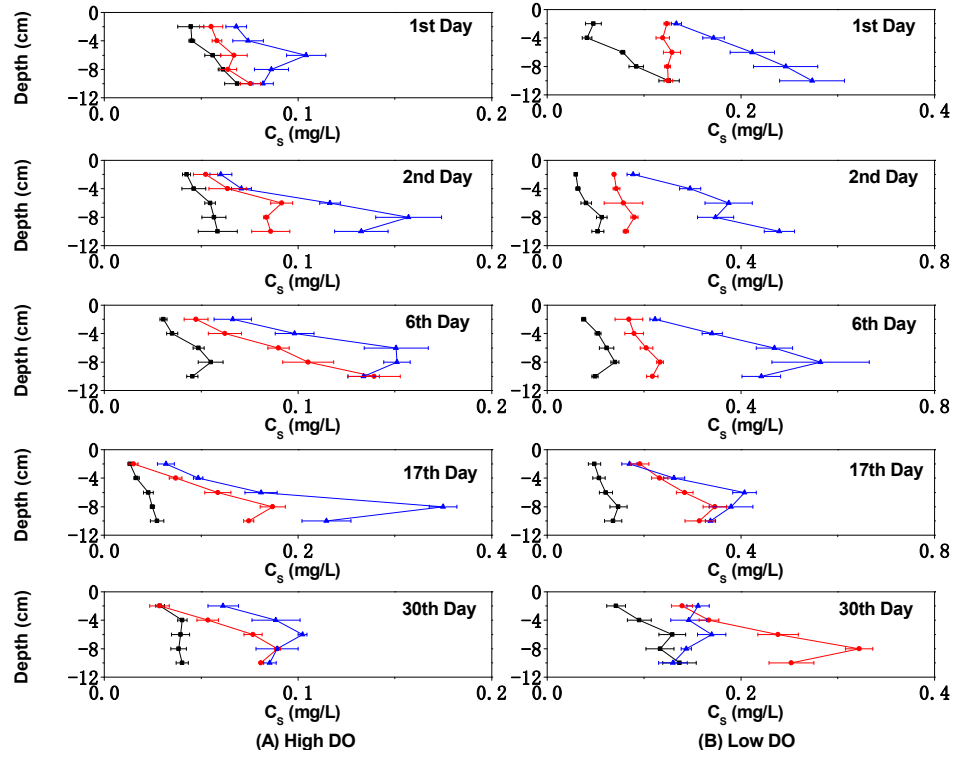
Figure S3 The effect of temperature on dissolved S of pore water under different DO conditions: (**A**) high DO; (**B**) low DO.

Table S1 The linear equation of the standard regression curve, the correlation

coefficient and LODs of each element

Detection object	Linear equation	r	LOD	Measurement method
As	y = 0.0302x + 0.0014	0.9997	0.02 μg/L	ICP-MS
As (V)	y = 0.7359x − 0.000055	0.9998	0.06 μg/L	HPLC-ICP-MS
As (III)	y = 0.6908x − 0.000069	0.9999	0.05 μg/L	HPLC-ICP-MS
Fe	y = 3.624x + 0.1607	0.9998	0.8 μg/L	ICP-MS
Mn	y = 0.1765x + 0.1763	0.9997	0.36 μg/L	ICP-MS
Fe (II)	y = 0.2028x + 0.0092	0.9997	0.04 mg/L	Phenanthroline colorimetry
S (II)	y = 0.1538x + 0.0014	0.9996	0.006 mg/L	Methylene blue method

Table S2 The correlation analysis between the mean values of dissolved As and dissolved Fe, Mn and S in sediment

	High DO	Low DO
5 °C	$C_{Fe} = 0.0591\ C_{As} + 0.406$	$C_{Fe} = 0.0658\ C_{As} + 0.7148$
	$R^2 = 0.669\ (P < 0.01)$	$R^2 = 0.7845\ (P < 0.01)$
	$C_{Mn} = 0.2408\ C_{As} + 2.0158$	$C_{Mn} = 0.1737\ C_{As} + 3.271$
	$R^2 = 0.5044\ (P < 0.01)$	$R^2 = 0.7104\ (P < 0.01)$
	$C_S = -9E^{-05}\ C_{As} + 0.0475$	$C_S = 0.0022\ C_{As} + 0.0778$
	$R^2 = 0.0016\ (P < 0.01)$	$R^2 = 0.4541\ (P < 0.01)$
20 °C	$C_{Fe} = 0.0724\ C_{As} + 0.4089$	$C_{Fe} = 0.0684\ C_{As} + 0.9141$
	$R^2 = 0.7049\ (P < 0.01)$	$R^2 = 0.7966\ (P < 0.05)$
	$C_{Mn} = 0.1683\ C_{As} + 3.2731$	$C_{Mn} = 0.1103\ C_{As} + 4.5119$
	$R^2 = 0.649\ (P < 0.05)$	$R^2 = 0.577\ (P < 0.01)$
	$C_S = 0.002\ C_{As} + 0.0442$	$C_S = 0.0025\ C_{As} + 0.1133$
	$R^2 = 0.4053\ (P < 0.01)$	$R^2 = 0.6692\ (P < 0.01)$
32 °C	$C_{Fe} = 0.06\ C_{As} + 0.5291$	$C_{Fe} = 0.0561\ C_{As} + 0.856$
	$R^2 = 0.3329\ (P < 0.01)$	$R^2 = 0.3578\ (P < 0.01)$
	$C_{Mn} = 0.1072\ C_{As} + 3.5542$	$C_{Mn} = 0.0924\ C_{As} + 6.4489$
	$R^2 = 0.3932\ (P < 0.01)$	$R^2 = 0.3219\ (P < 0.01)$
	$C_S = 0.0022\ C_{As} + 0.0262$	$C_S = 0.004\ C_{As} + 0.0829$
	$R^2 = 0.4267\ (P < 0.01)$	$R^2 = 0.4421\ (P < 0.01)$