GSA DATA REPOSITORY 2016311 **Rossi et al.**

Table DR1: Complete list of the 24 runs used in this paper.

Run Name	Tidal Amplitude [m]	Initial sediment composition [%sand-%mud]	Total simulation time [days]
RL-A_3-S_1	1.5	25-75	2640
RL-A_2-S_1	0.5		
RL-A_1-S_1	0.25		
RL-A_0-S_1	0		
RL-A_3-S_2	1.5	50-50	
RL-A_2-S_2	0.5		
RL-A_1-S_2	0.25		
RL-A_0-S_2	0		
RL-A_3-S_3	1.5	100-0	
RL-A_2-S_3	0.5		
RL-A_1-S_3	0.25		
RL-A_0-S_3	0		
RS-A_3-S_1	1.5	25-75	110
RS-A_2-S_1	0.5		
RS-A_1-S_1	0.25		
RS-A_0-S_1	0		
RS-A_3-S_2	1.5	50-50	
RS-A_2-S_2	0.5		
RS-A_1-S_2	0.25		
RS-A_0-S_2	0		
RS-A_3-S_3	1.5	100-0	
RS-A_2-S_3	0.5		
RS-A_1-S_3	0.25		
RS-A_0-S_3	0		

Table DR2: Data used to calculate *A** and *H** in all the runs and in modern deltas. Data for modern deltas is from Thompson (1968), Allen et al. (1979), Caline and Huong (1992), Guillen and Palanques (1992), Carriquiry and Sánchez (1999), Lambiase et al. (2002), Syvitski and Saito (2007), Baitis (2008), Kim et al. (2009), Sassi et al. (2011), Shaw et al. (2013), Shaw and Mohrig (2014), Cummings et al. (2016).

Initial Sediment Composition	Tidal Amplitude [m]	Shoreline [m]	Area [m^2]	Slope [-]	Qw [m^3/s]	½ Tidal Period [s]	H_1 Depth [m]	H_1 Grainsize [mm]	H_2 Depth [m]	H_2 Grainsize [mm]	*A**	H_1*	H_2*
100-0	0				2000	-	6.94	0.21	6.31	0.194	0	33068.1	32553.09
100-0	0.25	2265.3	7250893	0.00057	2000	22050	7.27	0.189	6.78	0.192	0.00795852	38462.96	35320.83
100-0	0.5	2374.39	7018459	0.001	2000	22050	12.00	0.2	9.13	0.2	0.01675680	60027.5	45635.5
100-0	1.5	2386.14	5140991	0.001	2000	22050	12.76	0.2	12.51	0.2	0.10992458	63801.5	62574
50-50	0				2000	-	8.85	0.15	6.59	0.156	0	59039.33	42282.69
50-50	0.25	2610.7	9762638	0.00045	2000	22050	9.96	0.179	5.85	0.146	0.01177712	55670.95	40055.48
50-50	0.5	2753.39	7972377	0.0007	2000	22050	9.66	0.165	5.32	0.092	0.02344895	58570.91	57879.35
50-50	1.5	2395.55	4206146	0.001	2000	22050	13.31	0.17	10.21	0.16	0.08958247	78286.47	63834.37
25-75	0				2000	-	6.23	0.116	6.22	0.128	0	53702.58	48574.22
25-75	0.25	2764.7	8480778	0.00041	2000	22050	12.94	0.15	7.78	0.142	0.01060340	86312.66	54826.76
25-75	0.5	2776.45	6678393	0.00043	2000	22050	11.67	0.124	8.32	0.124	0.03171137	94112.09	67104.84
25-75	1.5	2510.21	4497021	0.00074	2000	22050	15.96	0.146	10	0.139	0.12351709	109316.44	71942.44
WLD	0.2	10000	104719755	0.0001	4800	22050	5	0.094			0.03957662	53290.41	
WLD	0.2	8000	67020643	0.0001	4800	22050	4	0.094			0.03166130	42632.33	
Han	4.5	45000	2.1e+09	0.0002	5000	22050	30	0.25			42.8571428	120000	
Mahakam	0.6	41000	1.3e+09	0.0005	3000	22050	5	0.07			0.35287695	71428.57	
Copper	1.7	40000	1.92e+09	0.0006	7000	22050	5	0.07			1.49789439	71428.57	
Colorado (CA)	2.5	50000	6.34e+08	0.0004	2182	22050	5	0.07	6	0.07	4.11790136	71428.57	85714.2857
Baram	0.85	26000	3e+08	0.0005	2270	44100	5	0.06			0.16655256	83333.33	
Ebro	0.1	28000	3.38e+08	0.00021	2475	22050	6	0.101			0.01053308	59405.94	

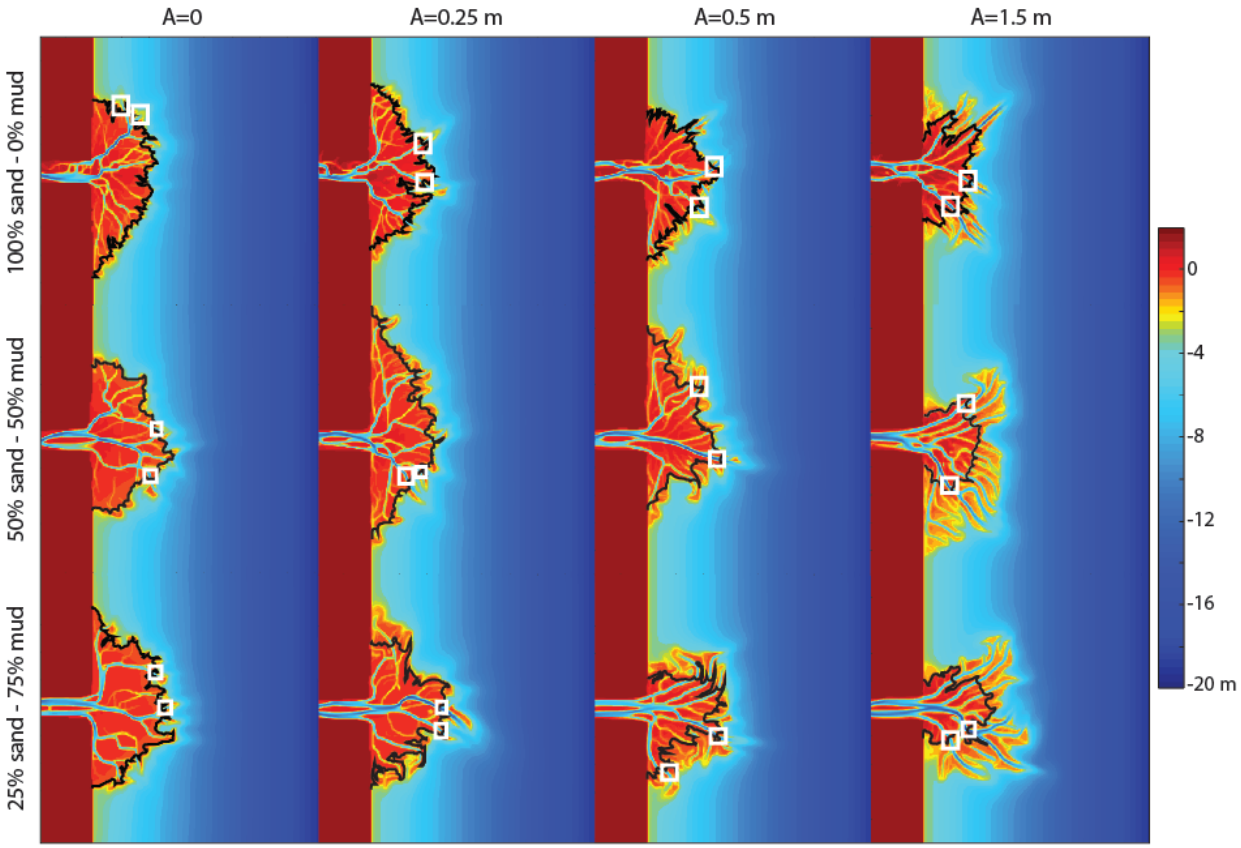

Figure DR1: Location of the two deepest channels (white rectangles) used to calculate *H** (see Table DR2). The shoreline position is marked by the black line.

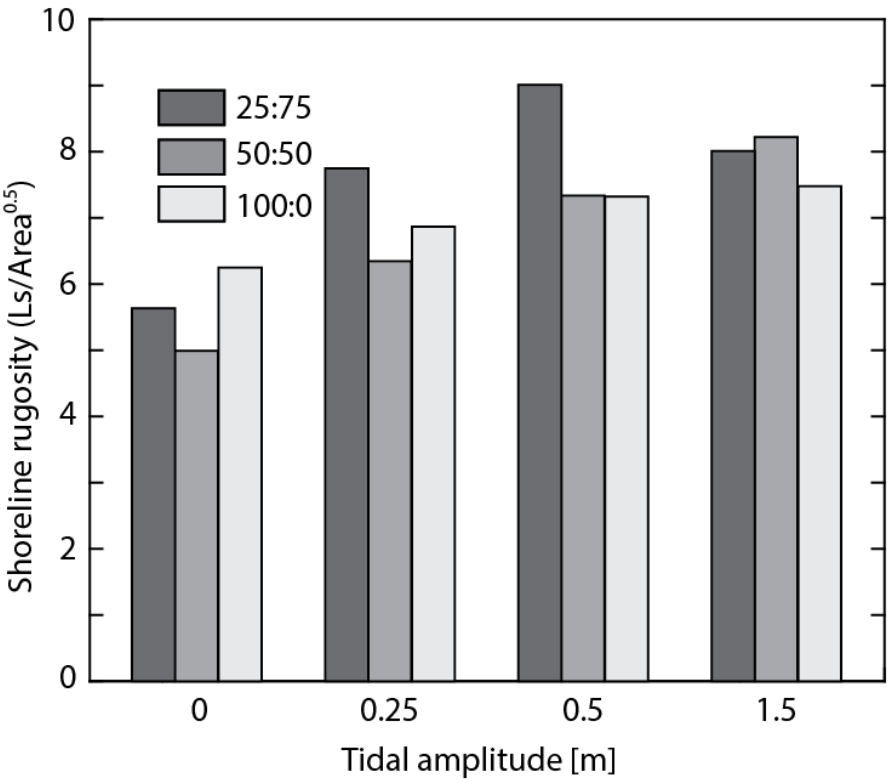

Figure DR2: Final shoreline rugosity for all model runs. The rugosity is calculated as the ratio of the total shoreline length (Ls) to the square root of the subaerial delta surface area (Area), based on Wolinsky et al. (2010).

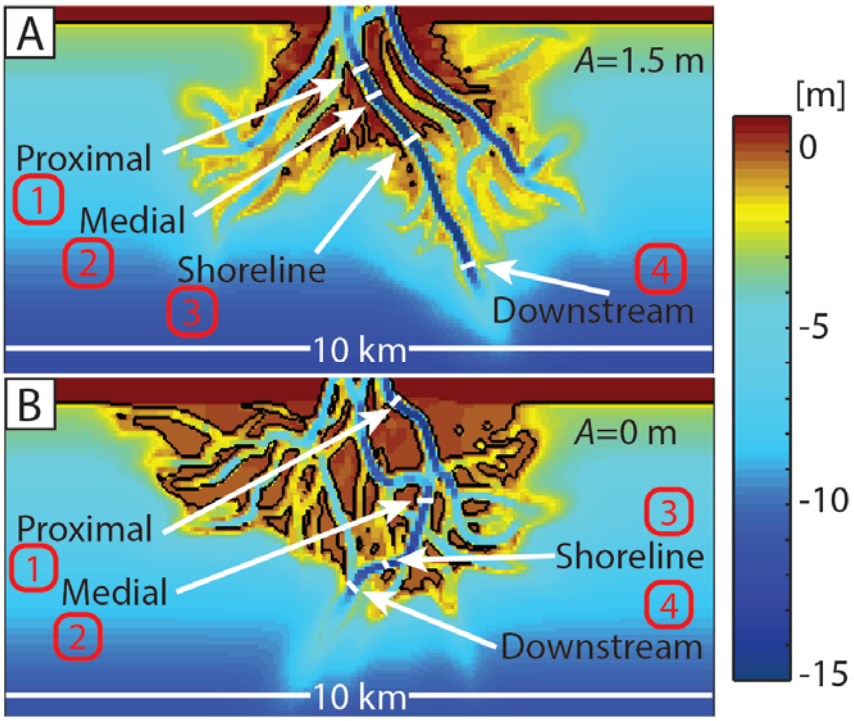

Figure DR3: Position of the four locations along the main distributary channel in which the width-averaged parameters shown in Fig. 5 (sea level, flow velocity, suspended sediment flux, bedload sediment flux) have been calculated. (A) Locations in the 50:50 run with *A*=1.5 m. (B) Locations in the 50:50 run with *A*=0 m.

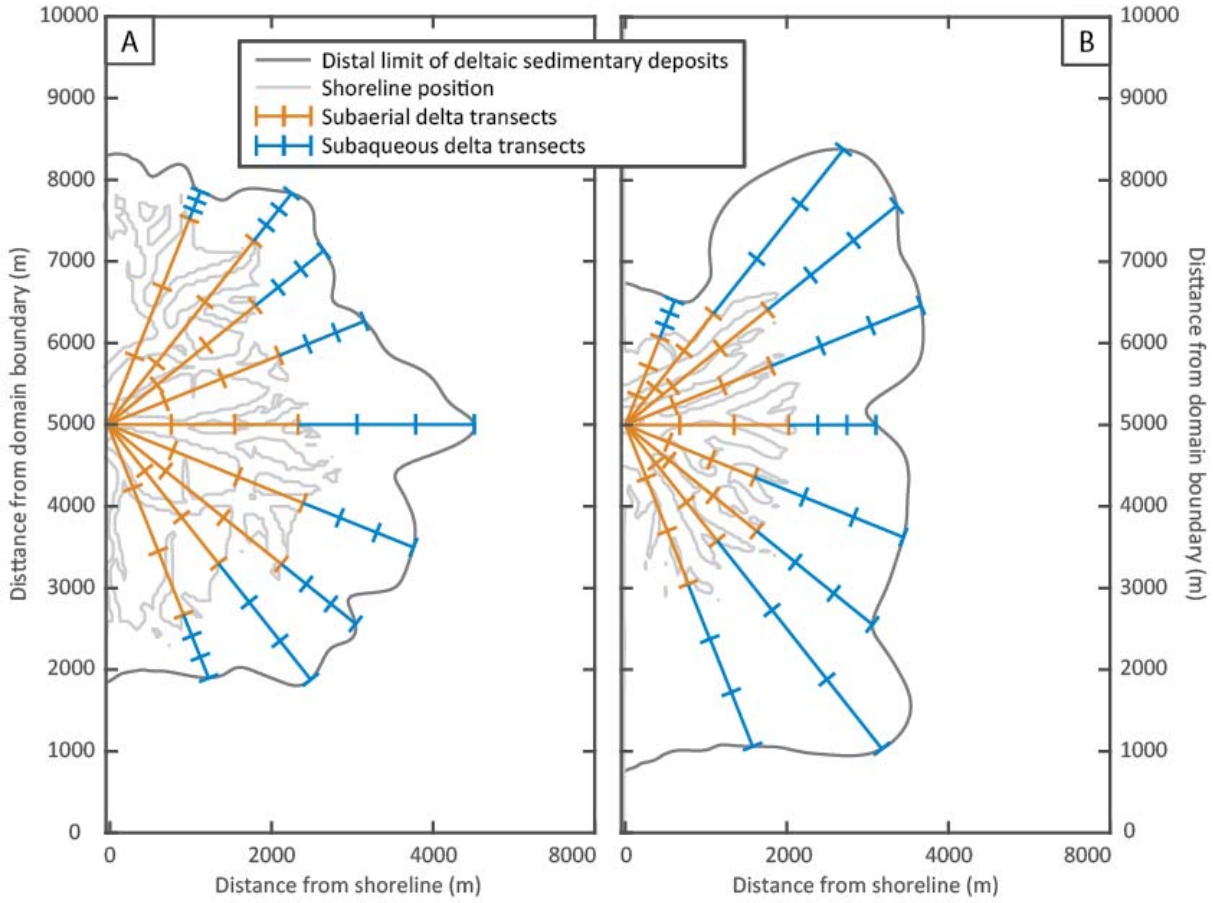

Figure DR4: Position of the transects along which the percentages of sand and mud in the deltaic deposits (Fig. 6) have been calculated. (A) Position of the transects in the 50:50 run with *A*=0. (B) Position of the transects in the 50:50 run with *A*=1.5 m. The subaerial delta transects include deposits from the delta apex to the shoreline. The subaqueous delta transects include deposits from the shoreline to the prodelta.

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