Supplementary Material

Tables

Table S1. Information for the tested four sites in the engineering study of 2019.

		X	Z			X	Z
	1	0	18.18		1	0	18.32
	2	4.4	18.18		2	3.12	19.75
	3	7.48	19.76		3	5.8	19.75
	4	10.98	19.8		4	6.1	19.47
	5	12.24	19.38		5	7.1	19.47
	6	13.5	19.38		6	12.62	15.8
Site-1	7	19.5	15.47	Site-3	7	24.4	15.25
	8	23.82	15.81		8	30.7	15.67
	9	28.08	16.68		9	36.2	19.48
	10	32.28	19.42		10	37.76	19.48
	11	33.66	19.42		11	38.82	19.9
	12	34.92	19.9		12	41.86	19.9
	13	37.92	19.9		13	45.02	18.54
					14	46.82	18.54

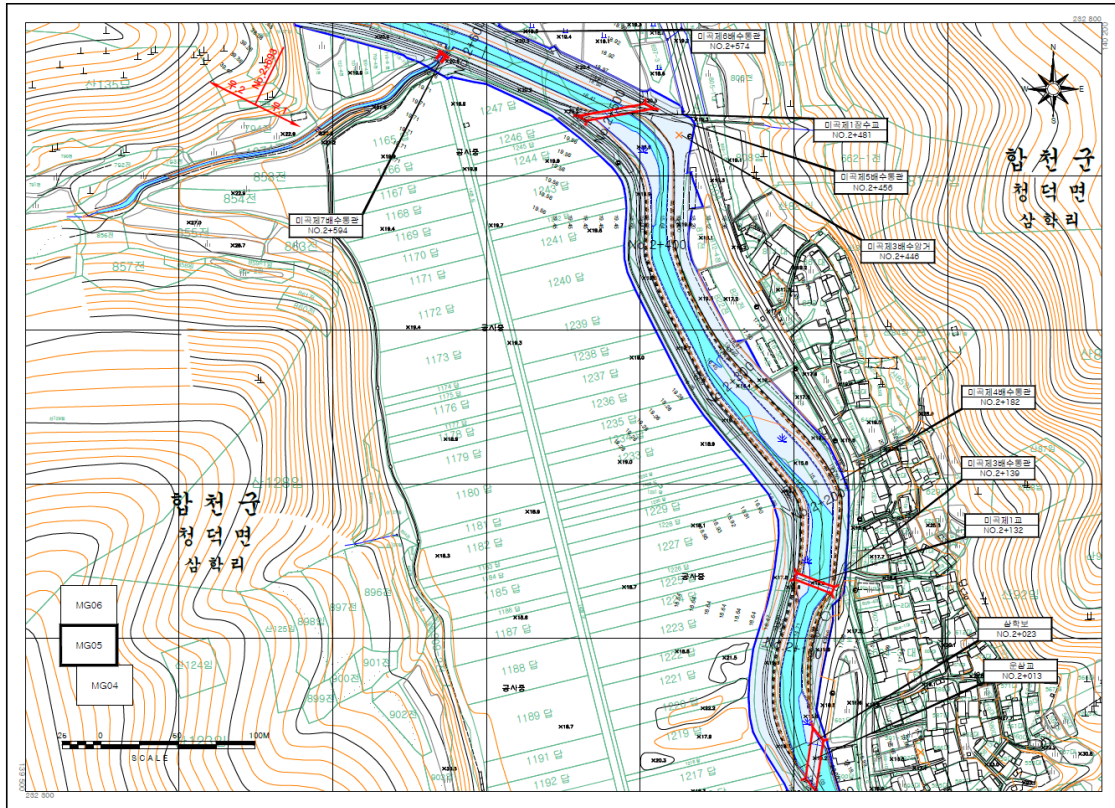|		X	Z			X	Z
	1	0	17.46		1	0	17.64
	2	9.06	17.82		2	2.6	17.64
	3	10.26	19.68		3	5.54	19.68
	4	13.48	19.68		4	8.94	19.68
	5	14.42	19.39		5	11.14	19.48
	6	15.42	19.39		6	15.7	16.53
	7	21.76	15.04	Site-4	7	19.42	16.53
Site-2	8	26.24	14.7		8	20.92	16.08
	9	30.32	14.98		9	23.18	16.52
	10	37	19.36		10	24.54	16.52
	11	38.5	19.36		11	26.6	15.75
	12	39.8	19.89		12	29.08	15.98
	13	43	19.89		13	37	19.83
	14	46.32	18.35		14	40	19.83
	15	47.94	18.35				

Figures

Figure S1. Plane map of the study area from the engineered study (2019) (Migok-cheon stream).
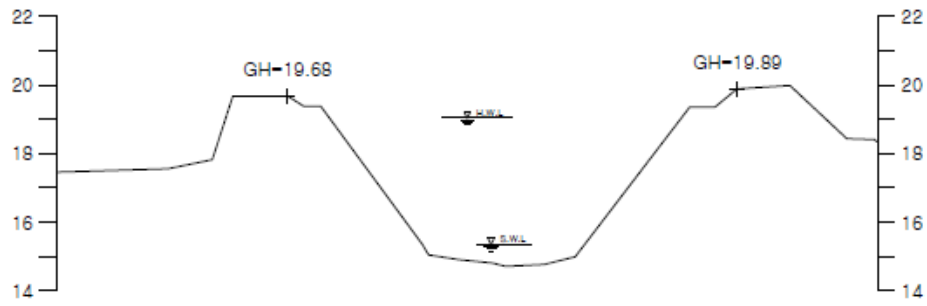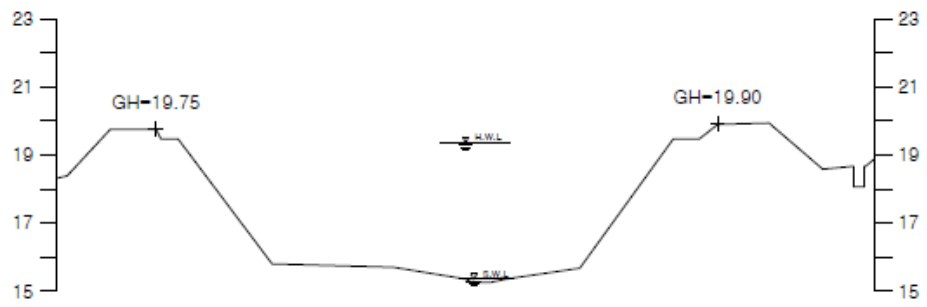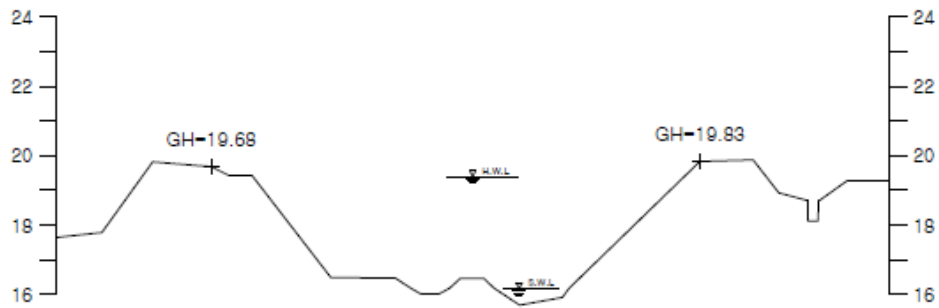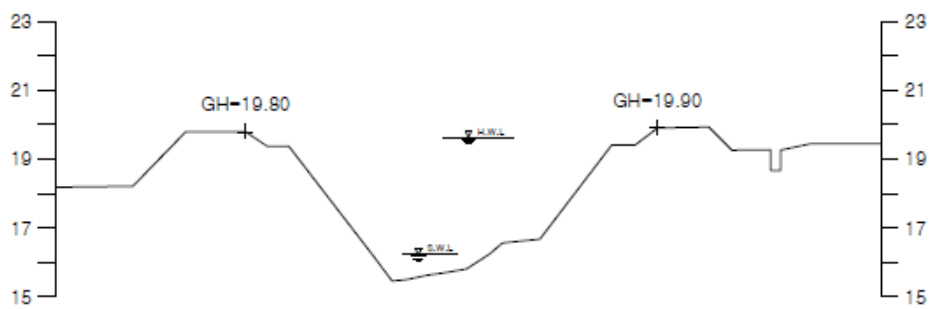
Figure S2. Cross-sections of the tested site of the study area from the engineered study (2019) (Migok-cheon stream).

(a)

(b)

(c)

(d)

Figure S3. Pictures of (a) EMILID Reach RS2 for ground surveying and (b) its installed system; and (c) the employed UAV of the EVO II and (d) its controller.
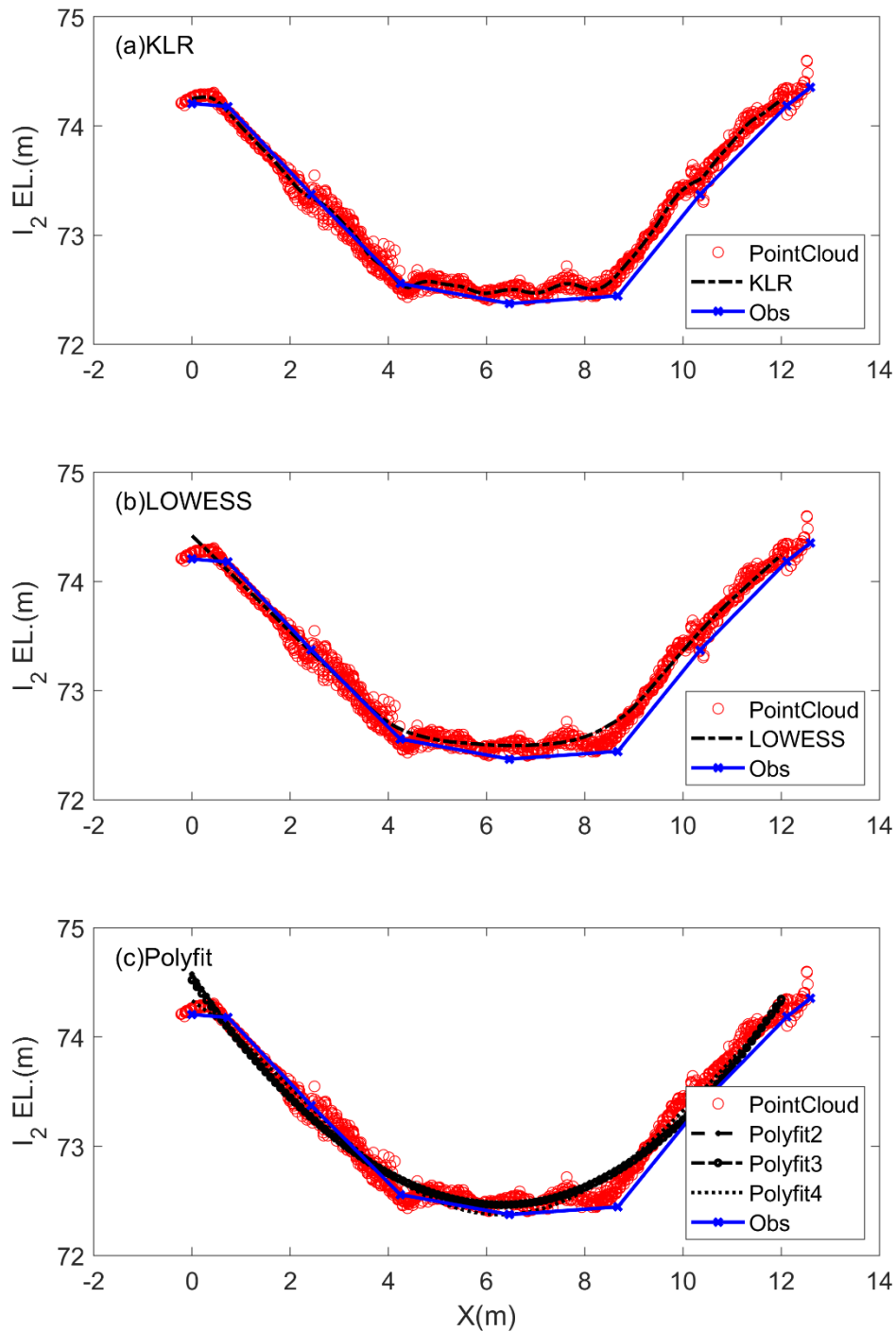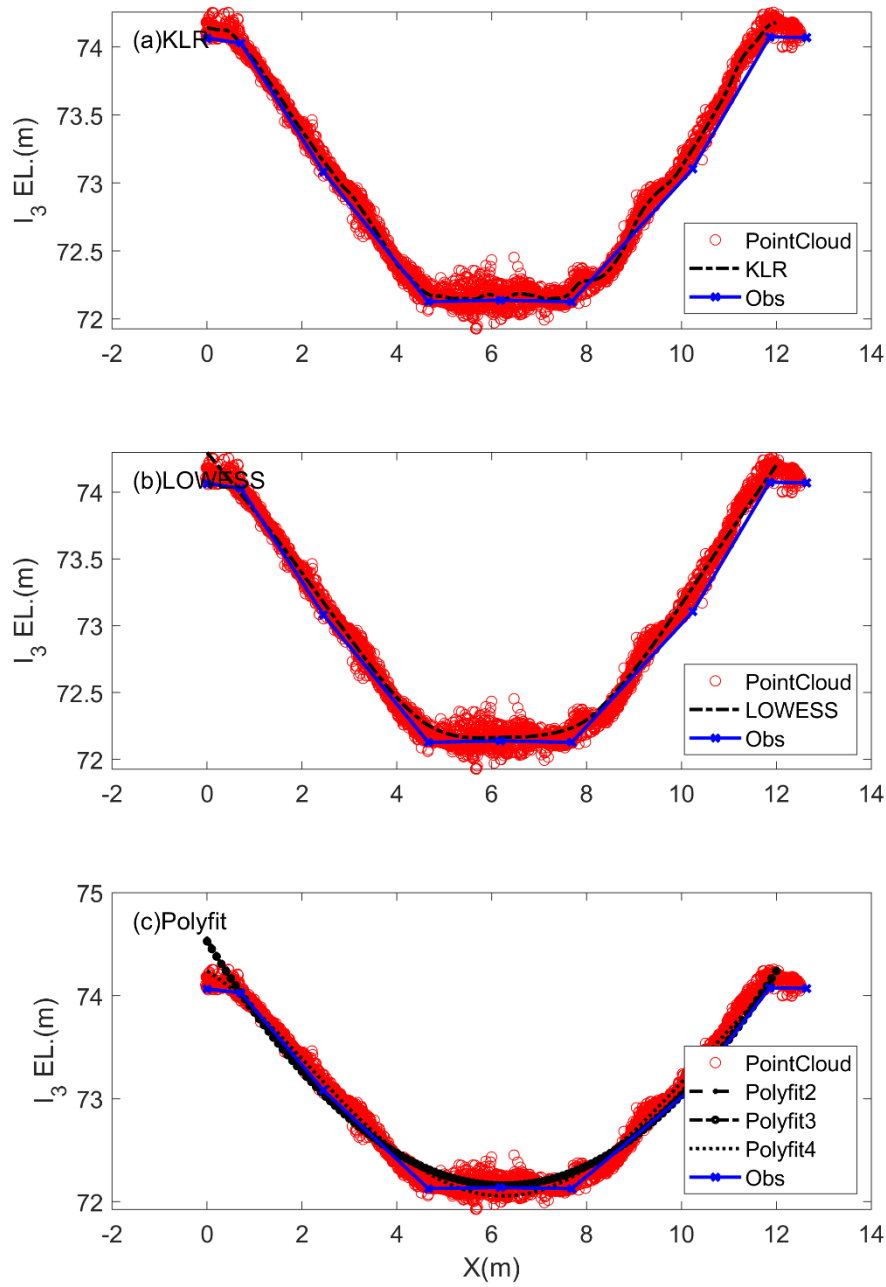
Figure S4. Point cloud data (red circles) for the channel I$_2$ of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
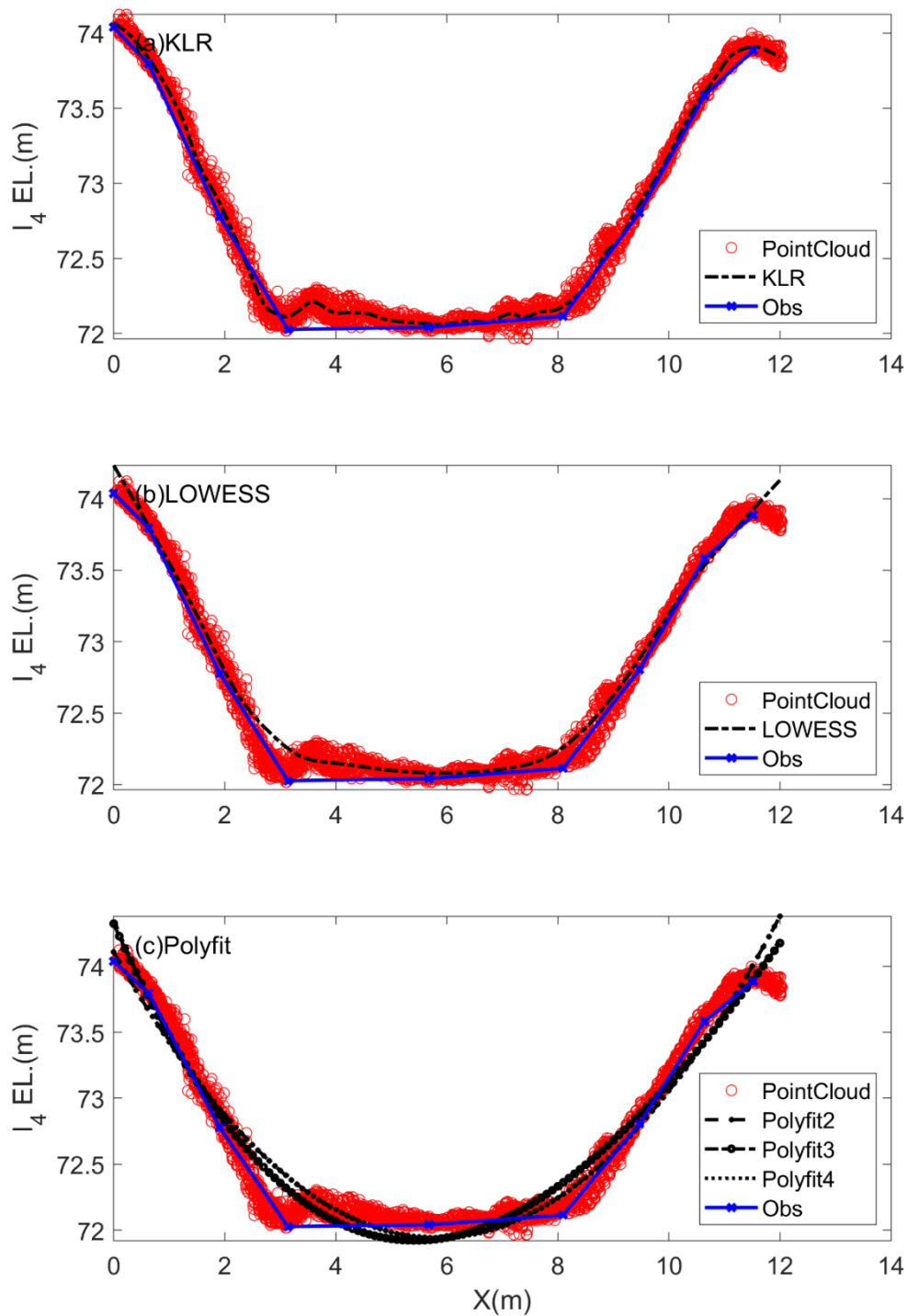
Figure S5. Point cloud data (red circles) for the channel I₃ of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
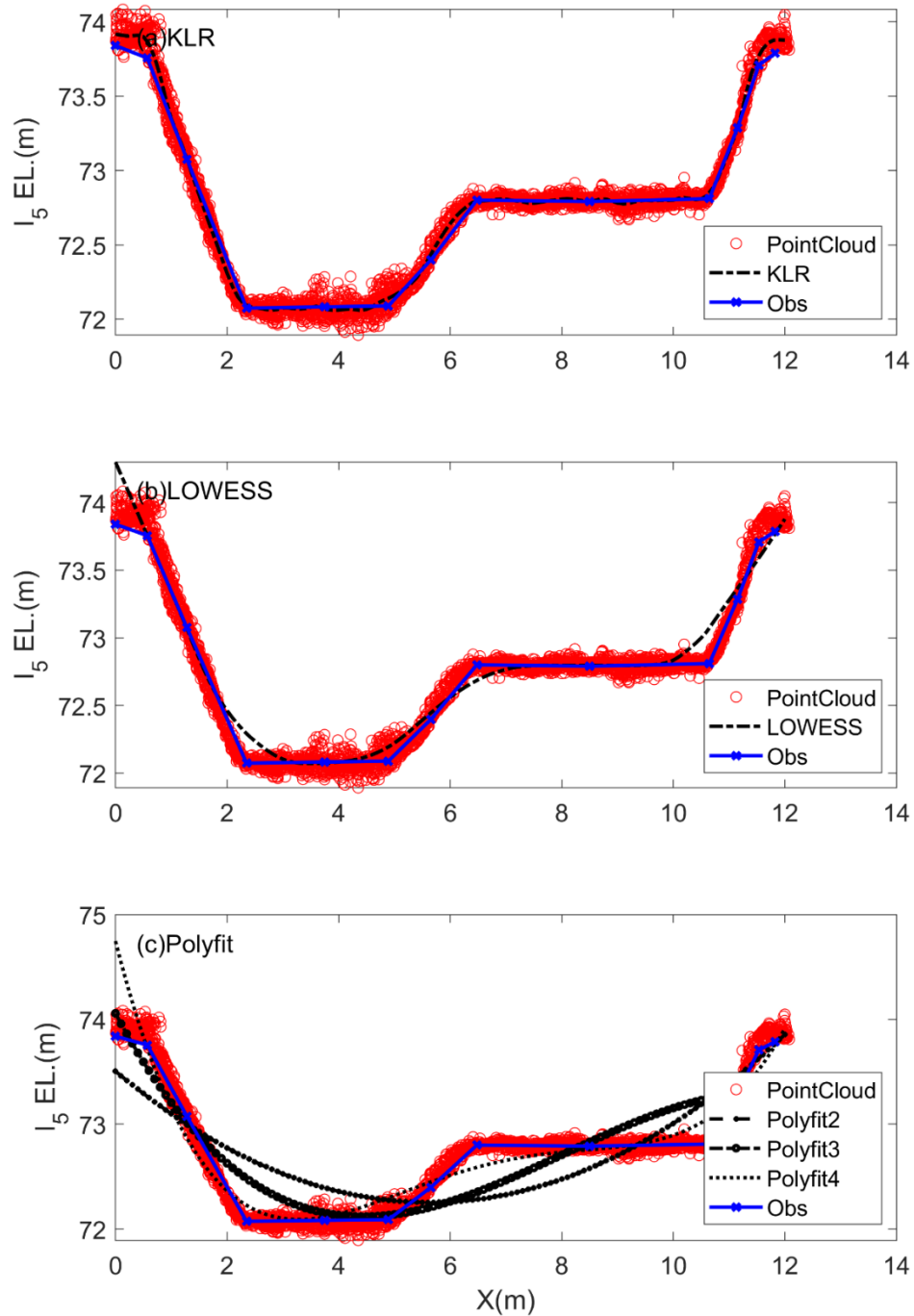
Figure S6. Point cloud data (red circles) for the channel I$_4$ of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
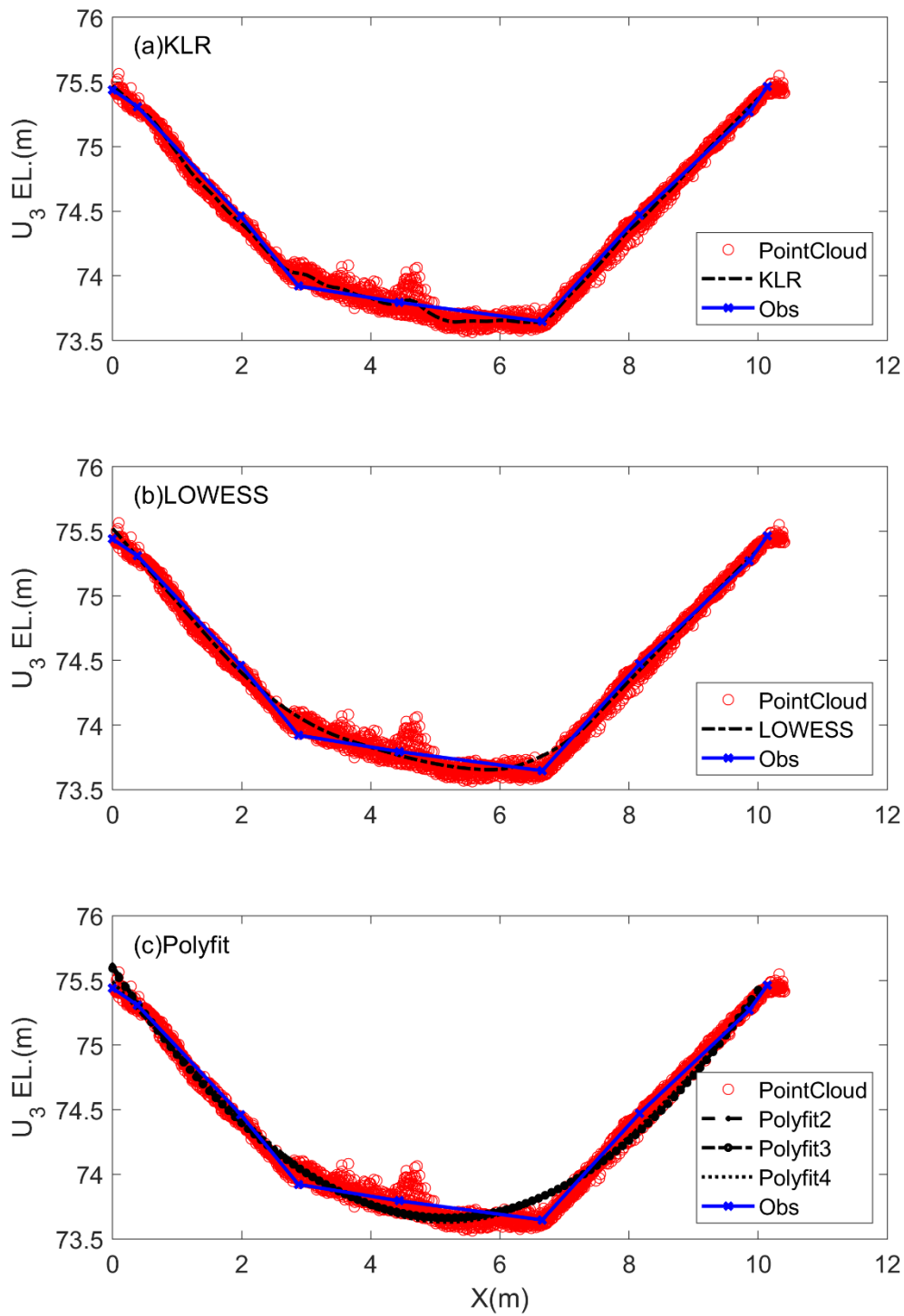
Figure S7. Point cloud data (red circles) for the channel I₅ of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
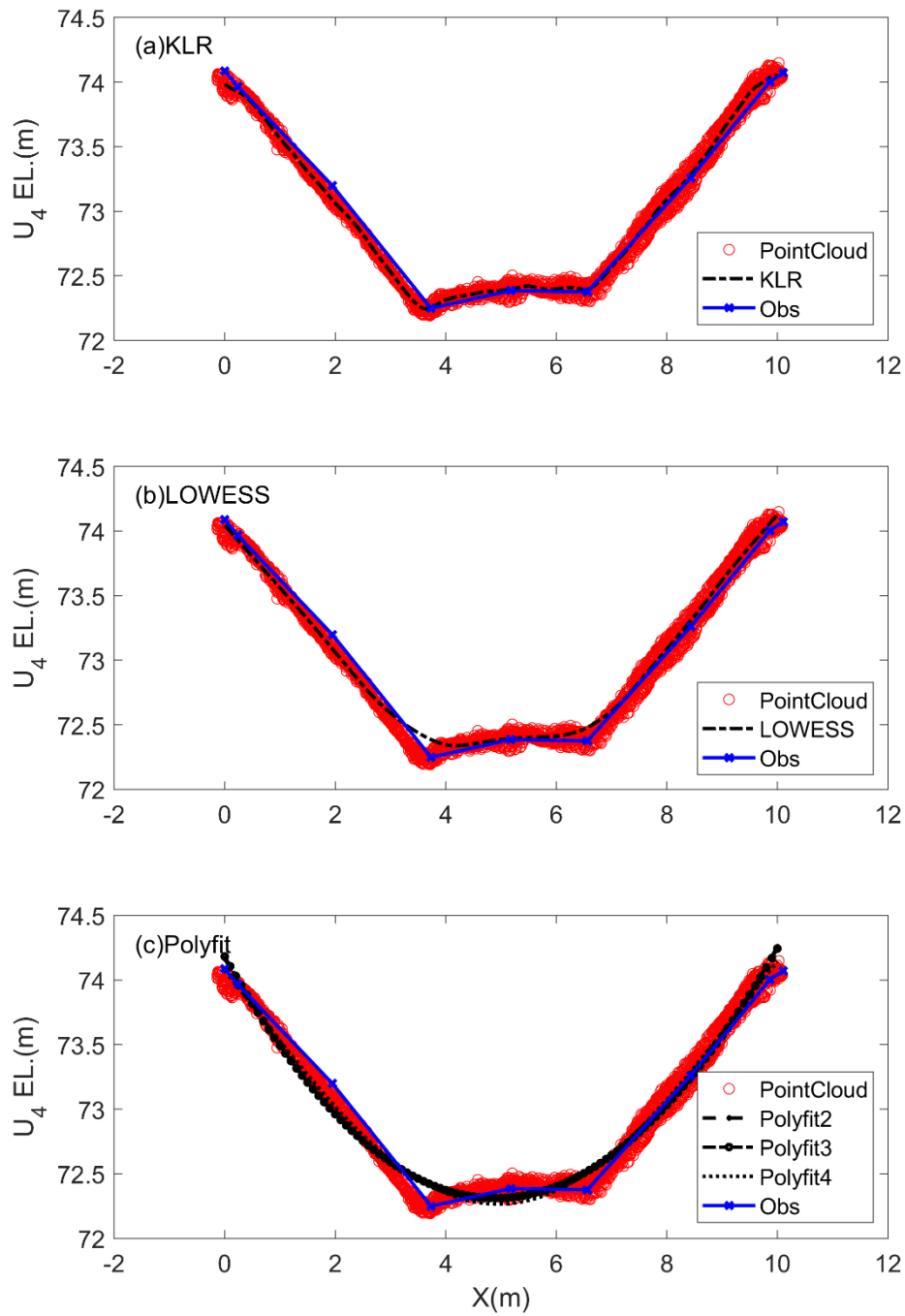
Figure S8. Point cloud data (red circles) for the channel U_3 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
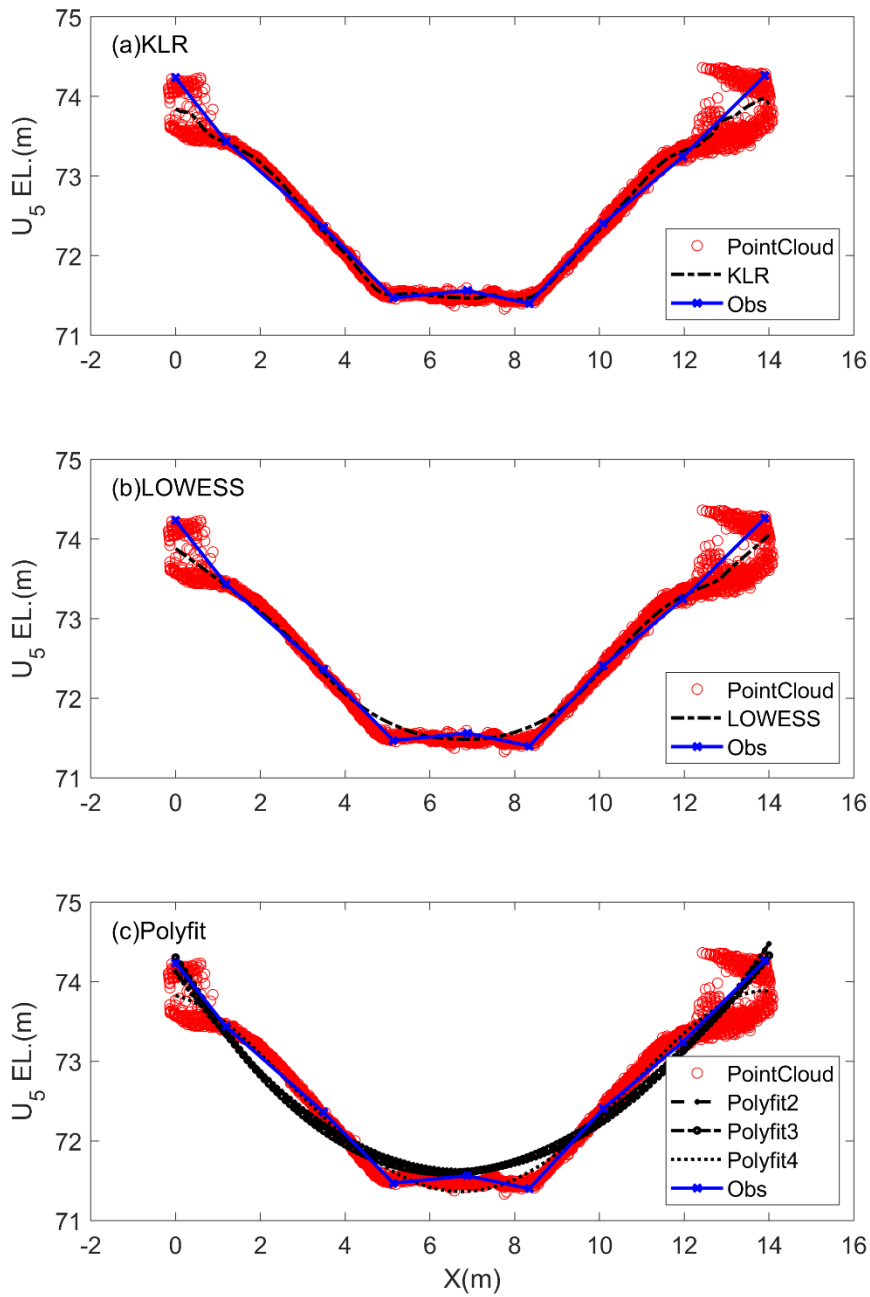
Figure S9. Point cloud data (red circles) for the channel U_4 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).

Figure S10. Point cloud data (red circles) for the channel U_5 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
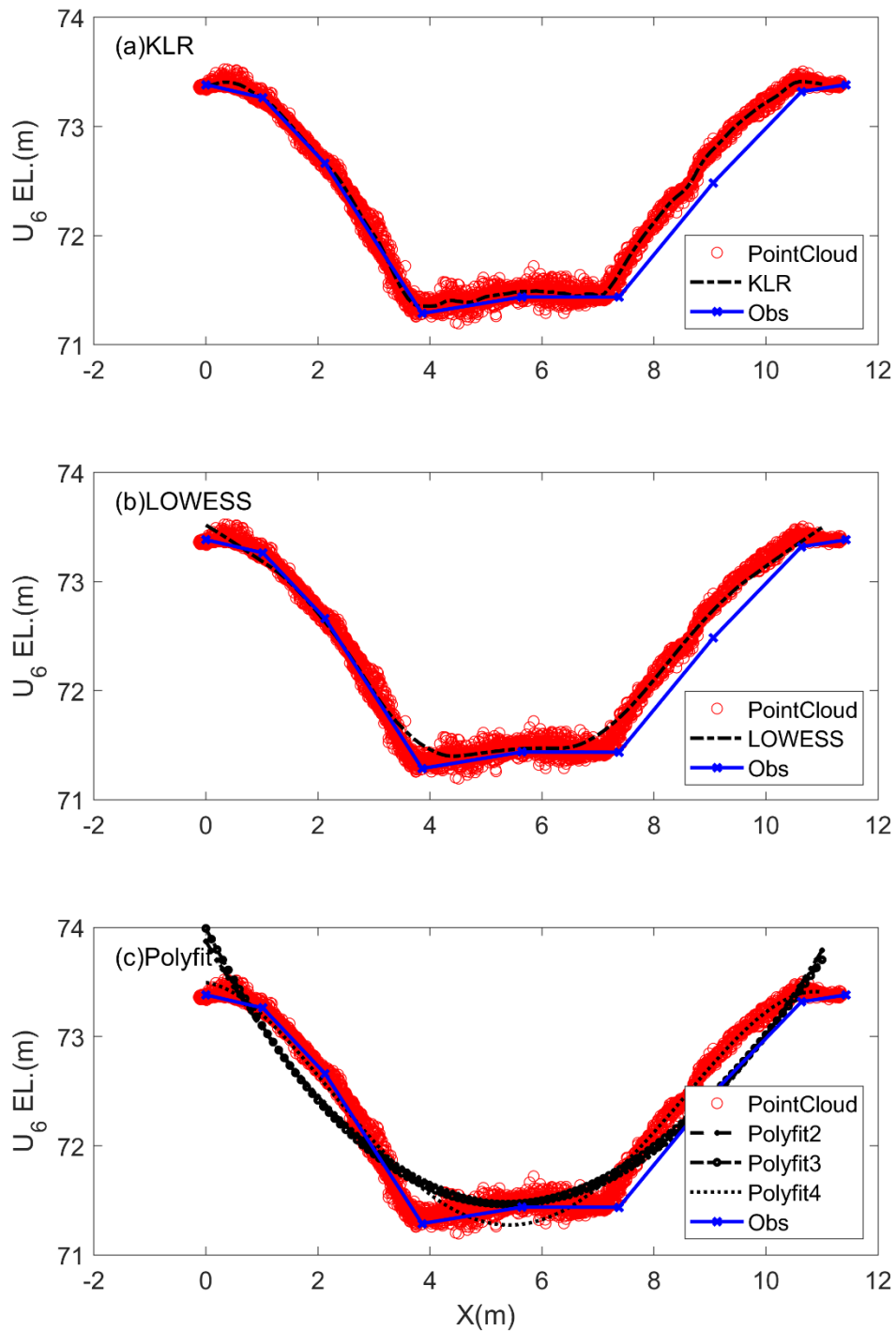
Figure S11. Point cloud data (red circles) for the channel U_6 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
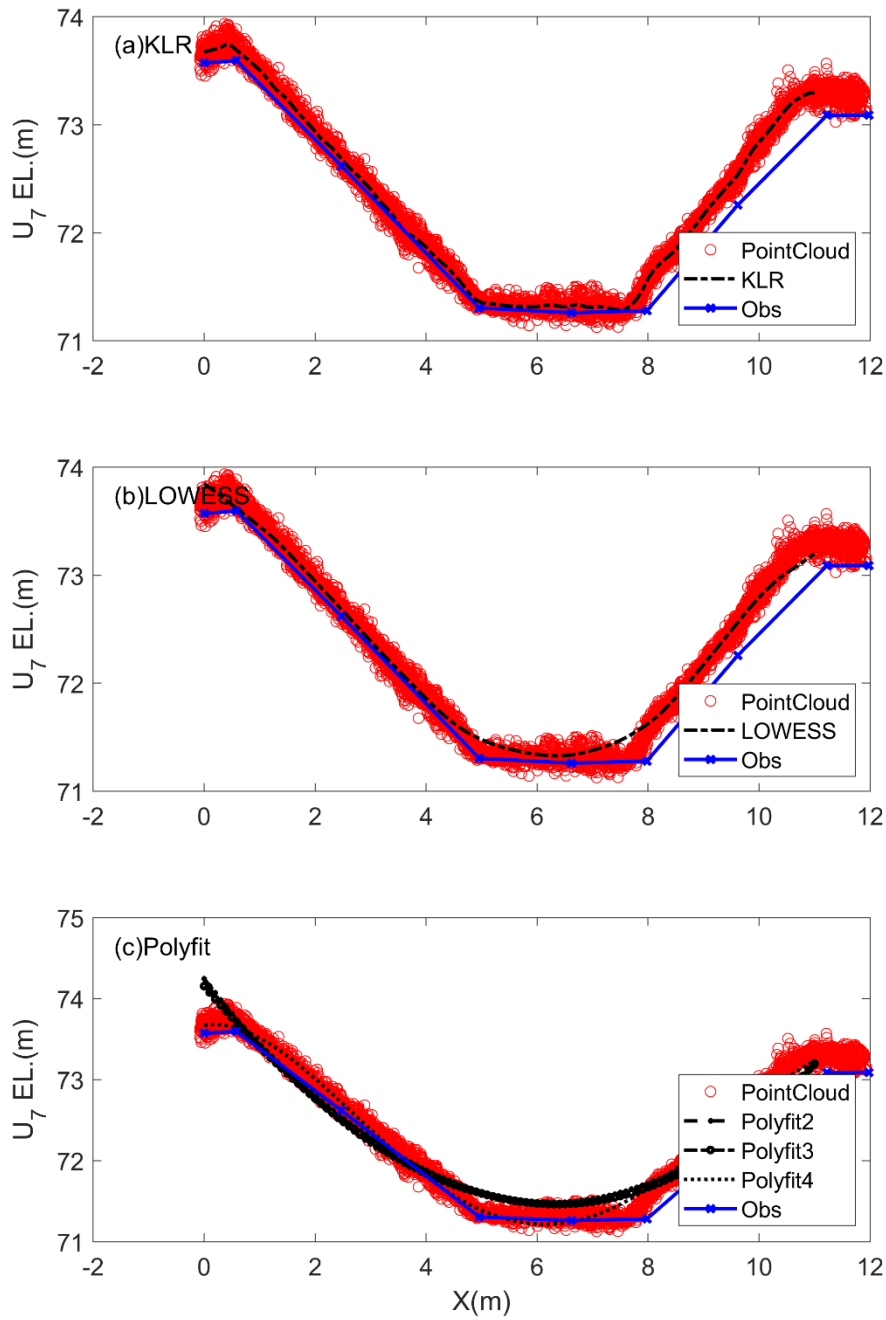
Figure S12. Point cloud data (red circles) for the channel U_7 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
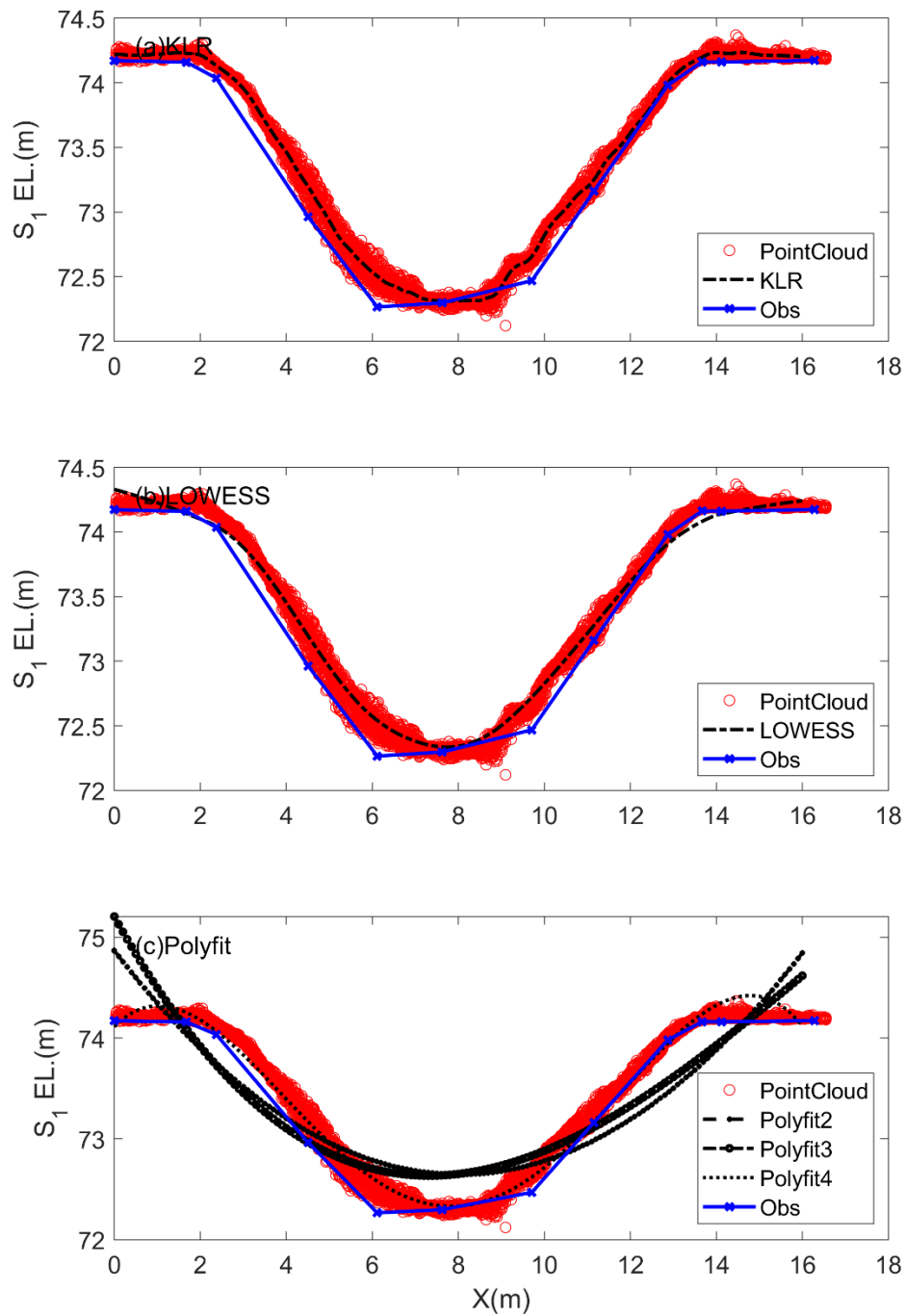
Figure S13. Point cloud data (red circles) for the channel S_1 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
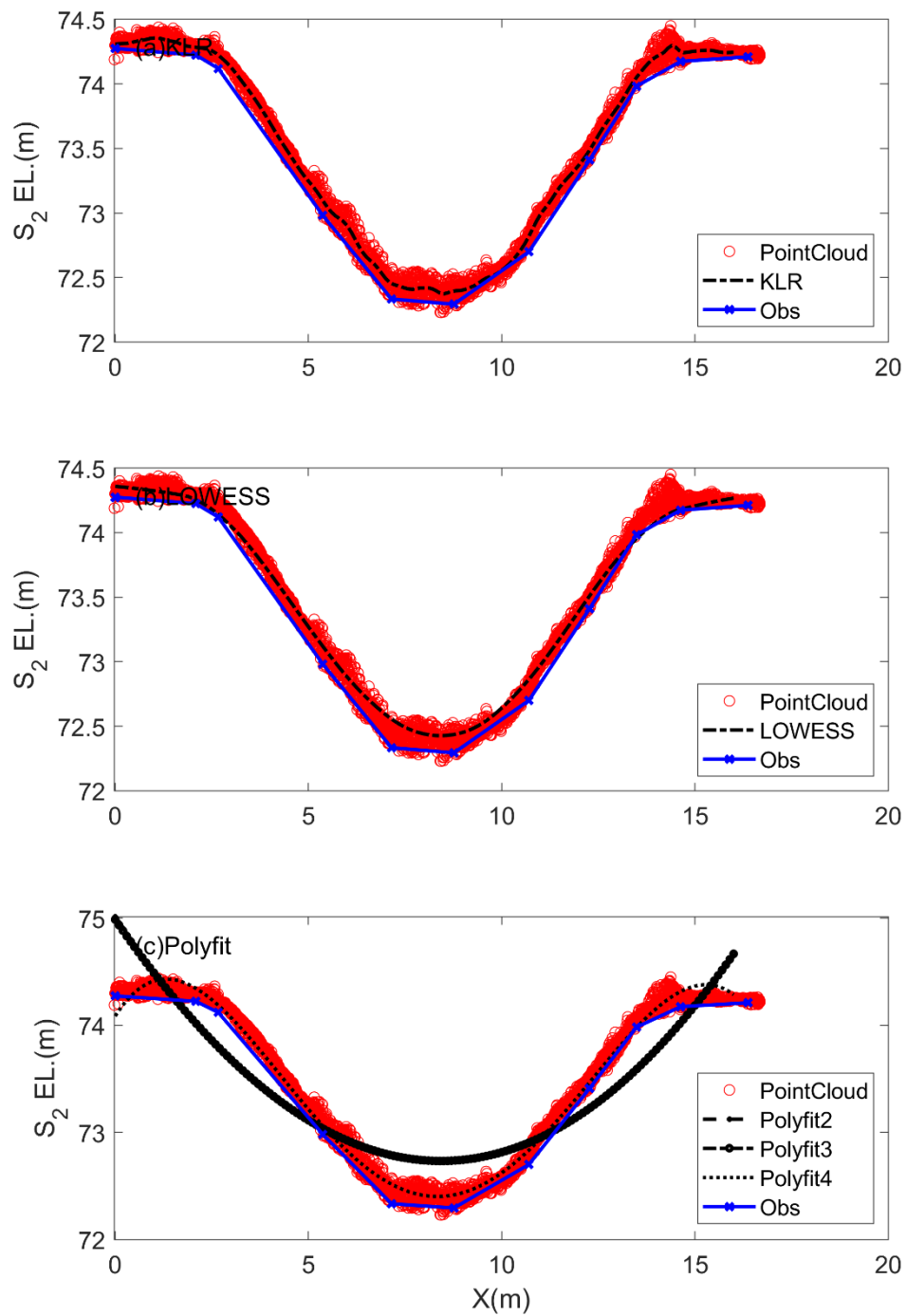
Figure S14. Point cloud data (red circles) for the channel S_2 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
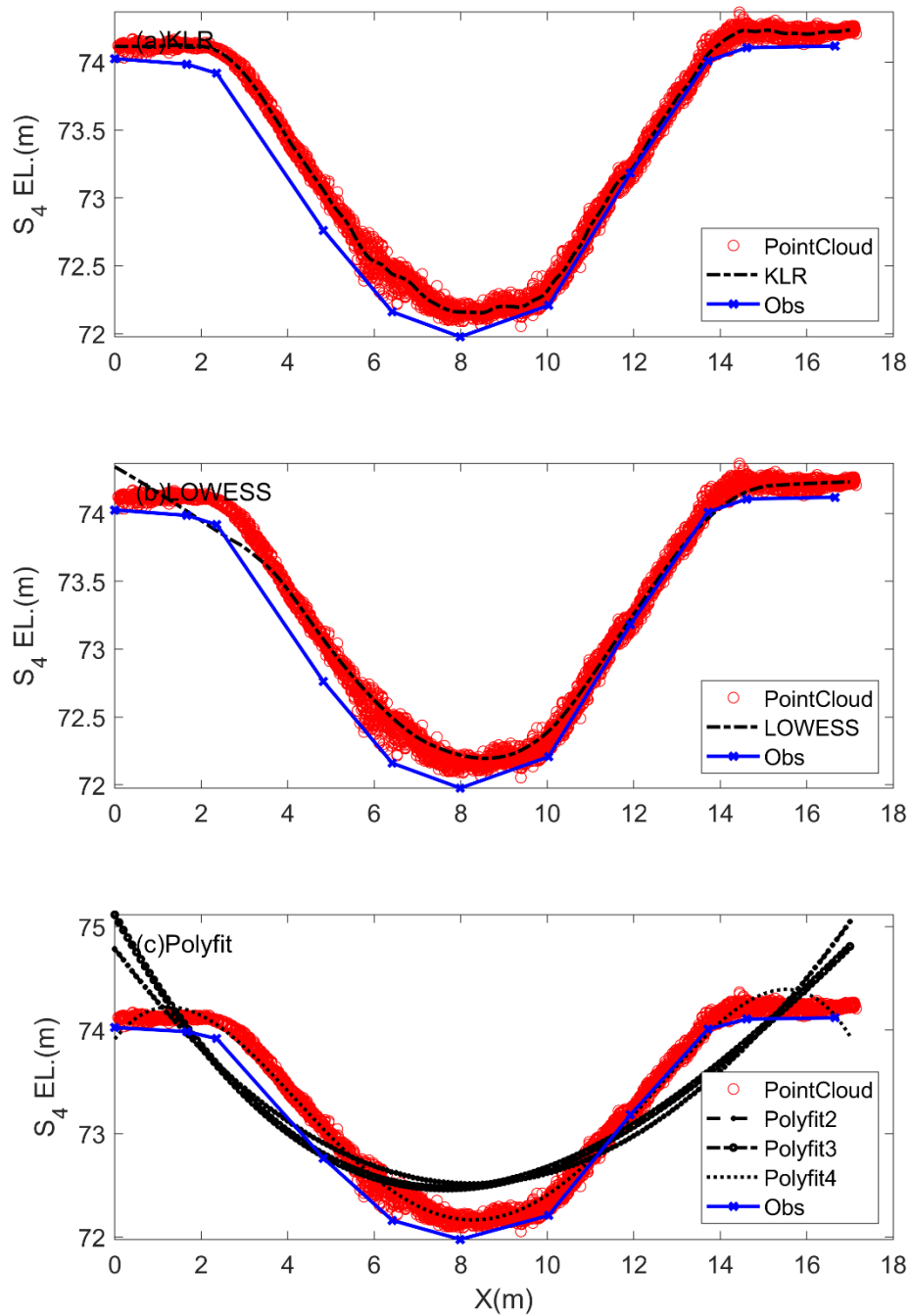
Figure S15. Point cloud data (red circles) for the channel S$_4$ of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
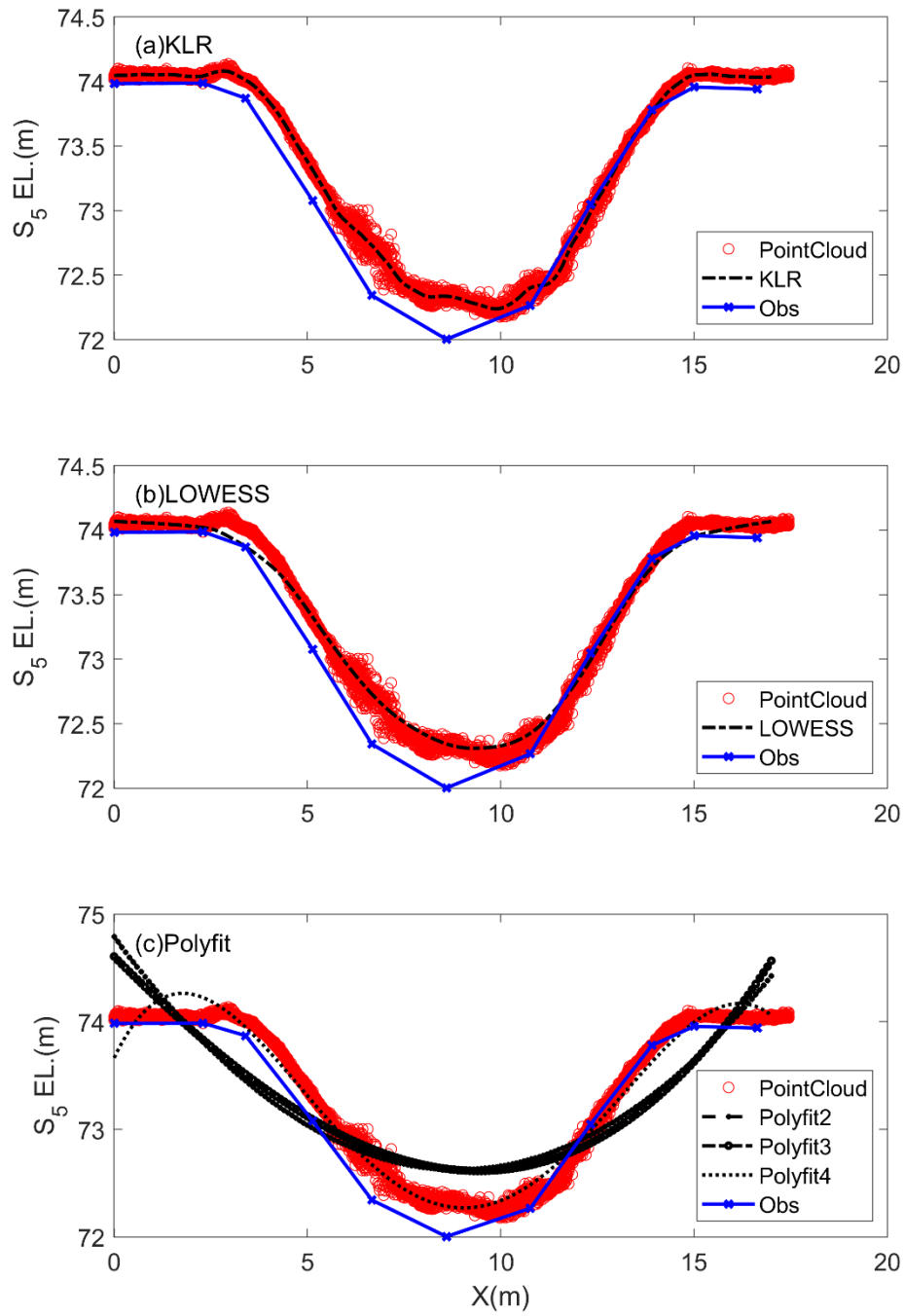
Figure S16. Point cloud data (red circles) for the channel S_5 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).
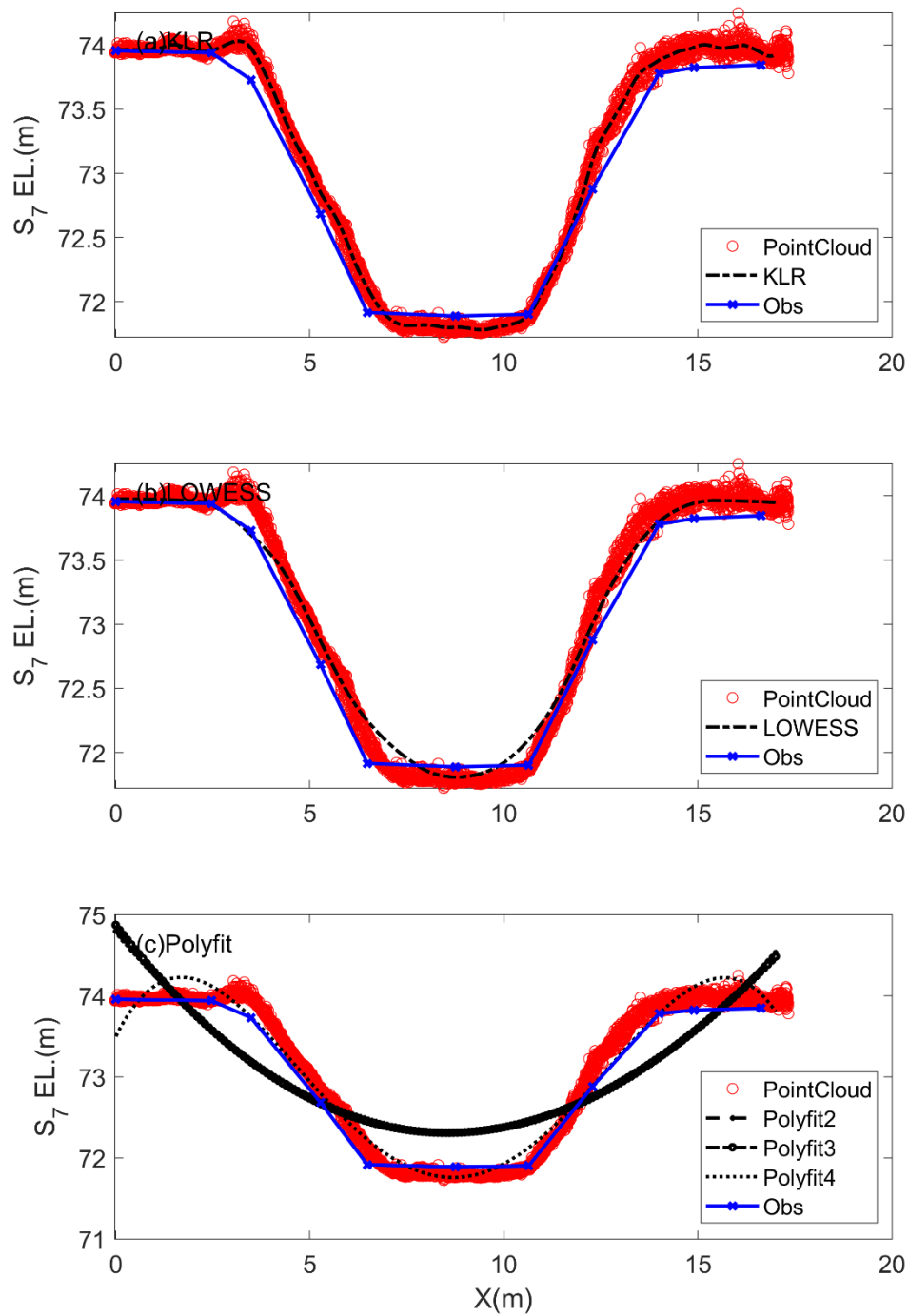
Figure S17. Point cloud data (red circles) for the channel S_7 of the REC and model-fitted line (black dashed line) with KLR (panel(a)), LOWESS (panel(b)), and PolyFit (panel(c)) as well as the ground surveying (blue solid line with x marker).