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Supplement of

Measuring the spatiotemporal variability in snow depth in subarctic environments using UASs – Part 1: Measurements, processing, and accuracy assessment

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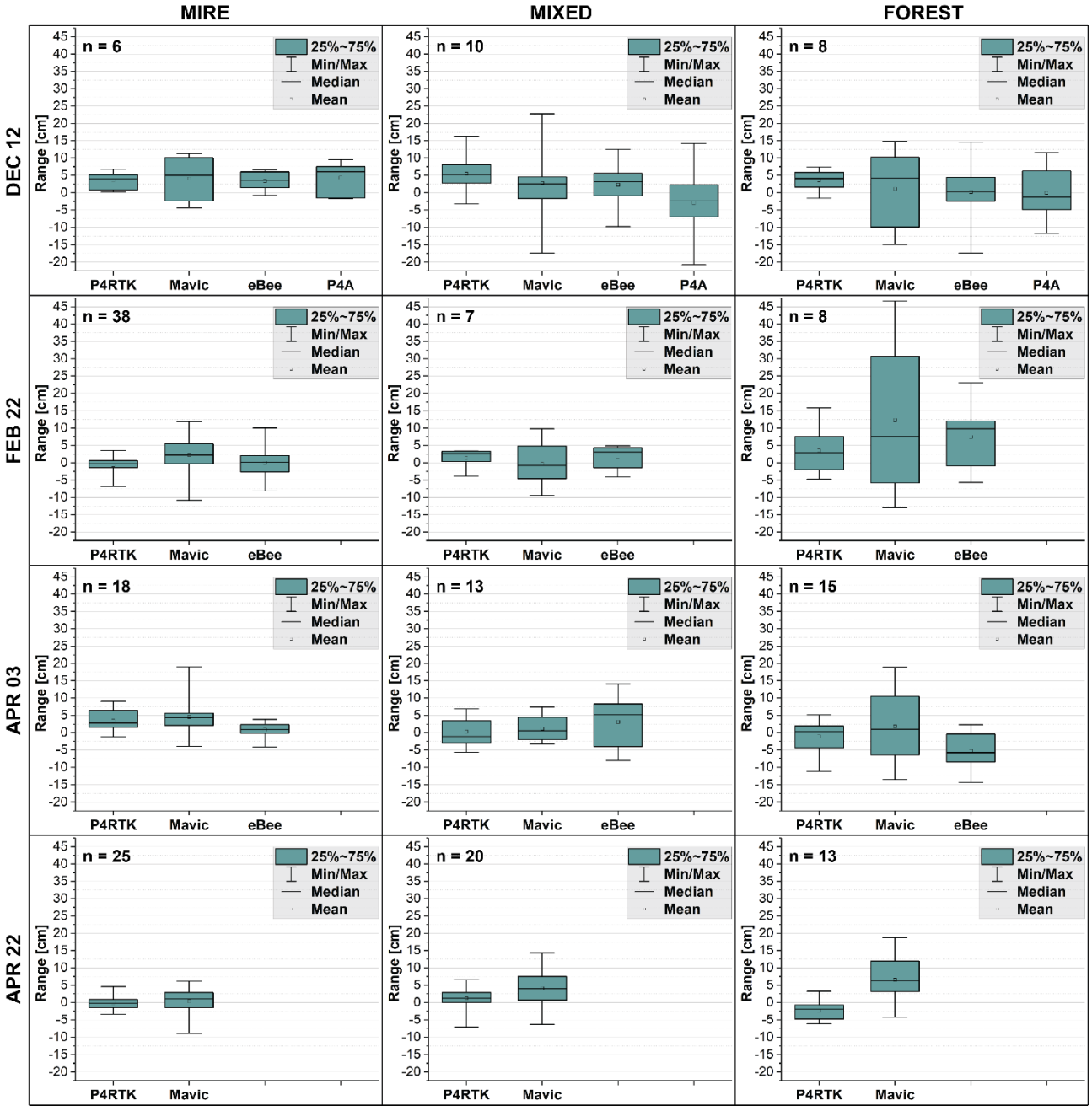


Figure S1. The difference between the DEM and GNSS survey elevations for each subplot and survey date.

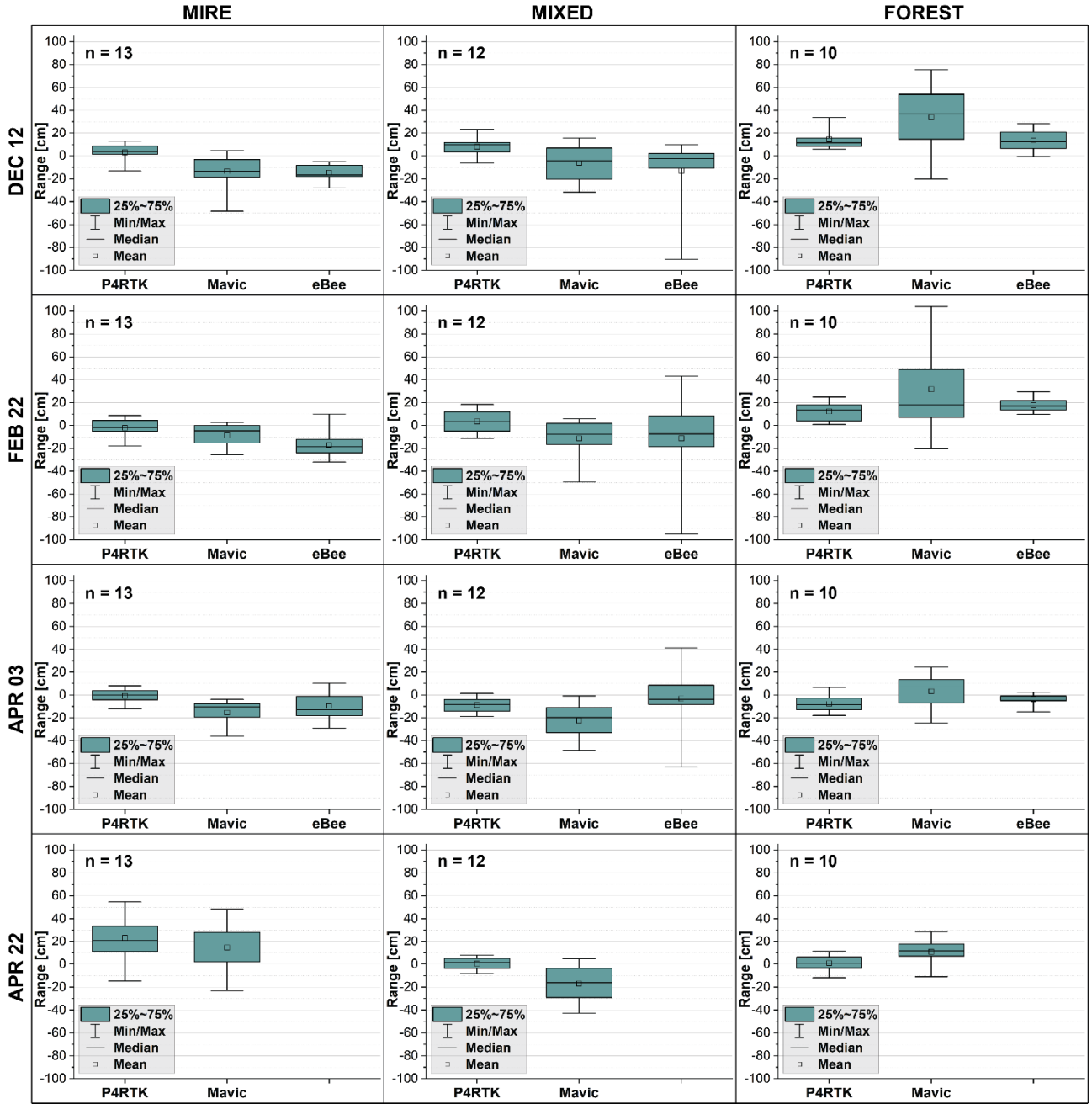


Figure S2. The difference between the snow depth DoDs and manual snow course measurements for each subplot and survey date, utilizing UAS-derived snow-free DSM.

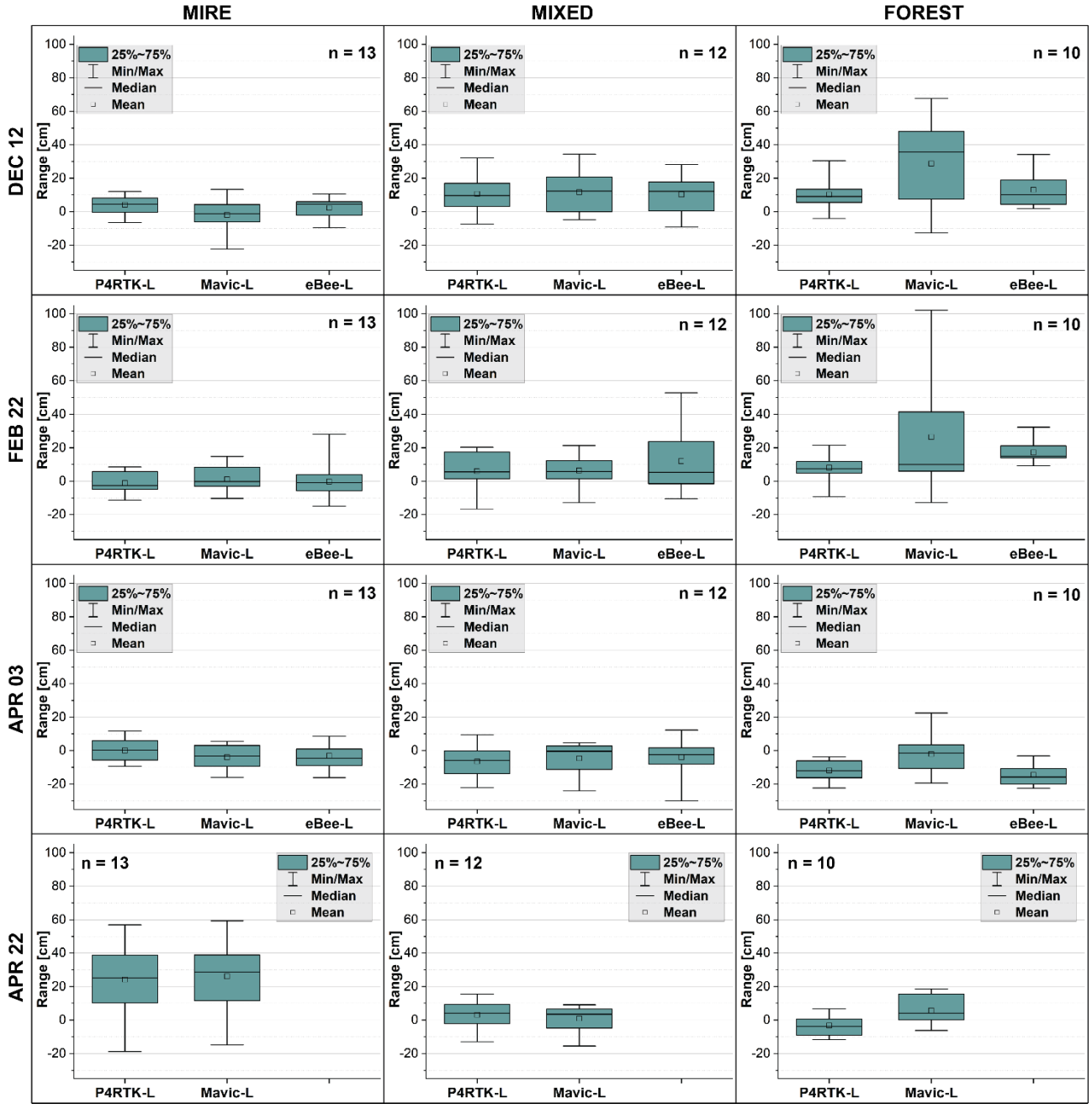
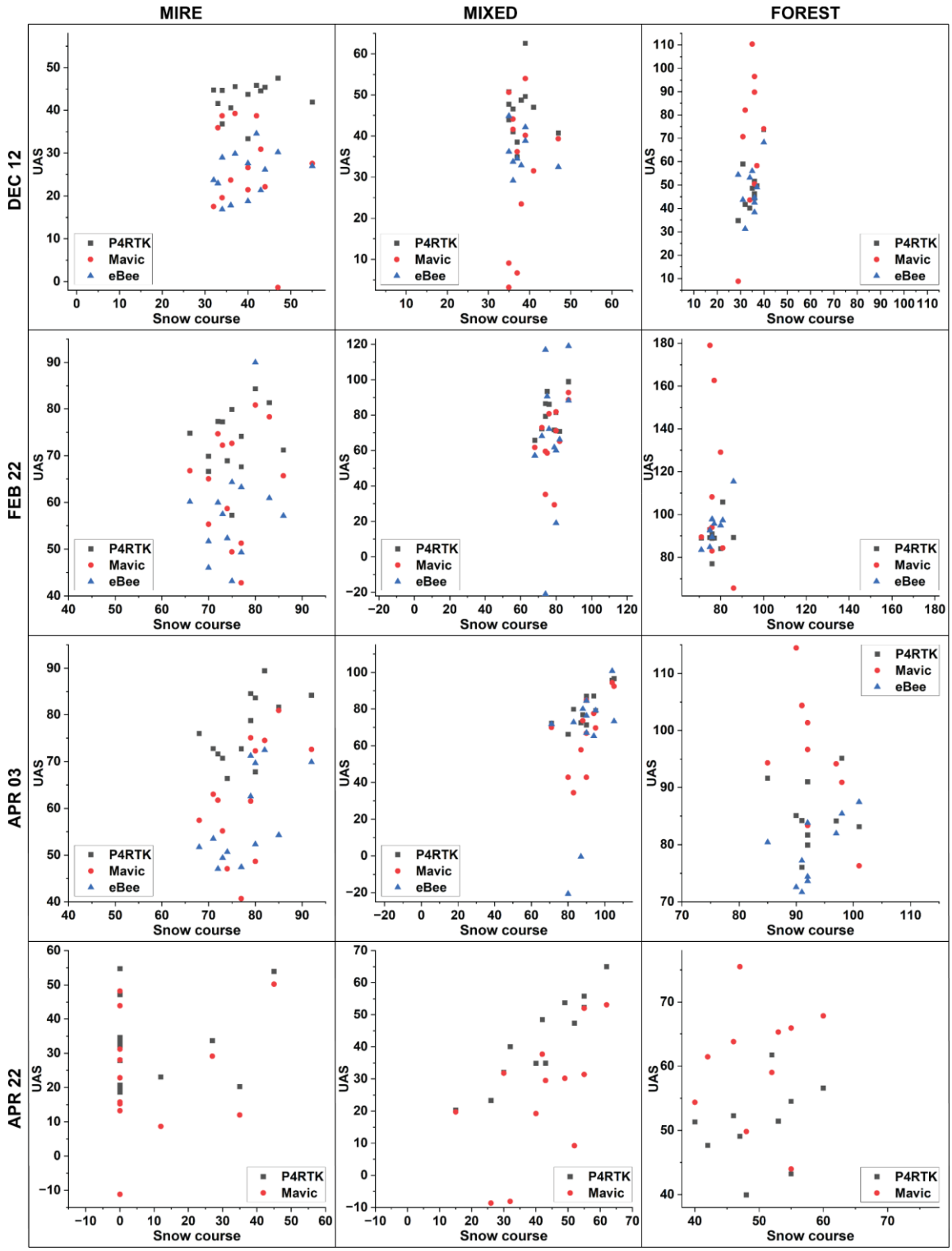


Figure S3. The difference between the snow depth DoDs and manual snow course measurements for each subplot and survey date, utilizing ALS-derived snow-free DSM.



10 **Figure S4. Scatterplots for UAS-derived vs. manual snow course measurements, utilizing UAS-derived snow-free DSM.**

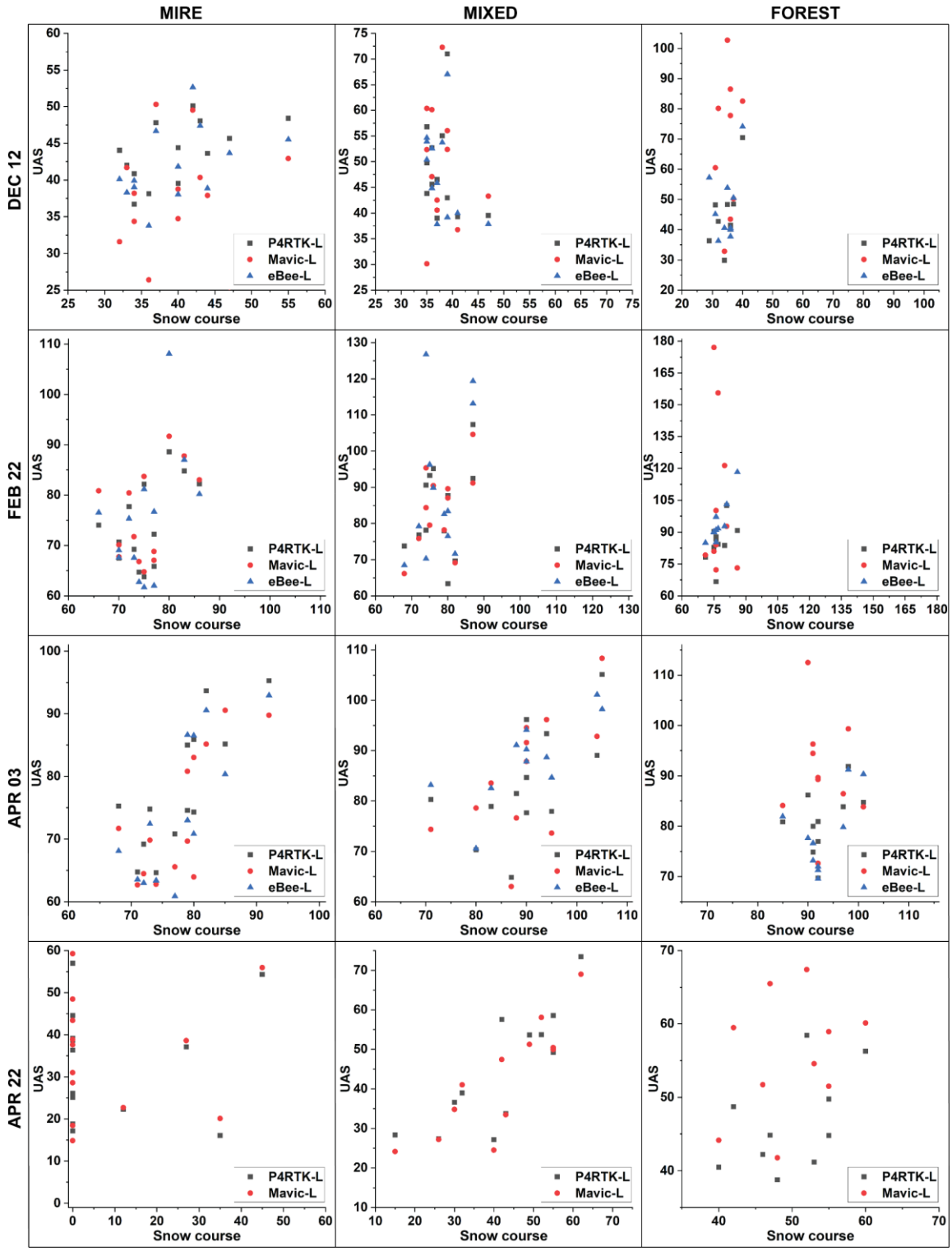


Figure S5. Scatterplots for UAS-derived vs. manual snow course measurements, utilizing ALS-derived snow-free DSM.

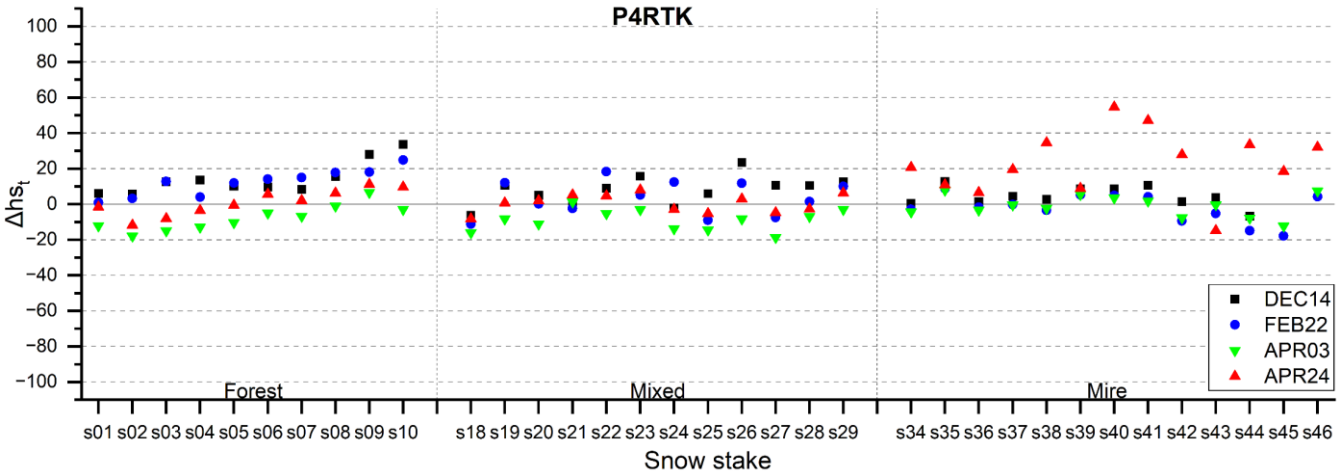


Figure S6. Difference between UAS-derived and manual snow depth measurements (Δhs_t) against the stake number when utilizing P4RTK and UAS-derived snow-free DSM.

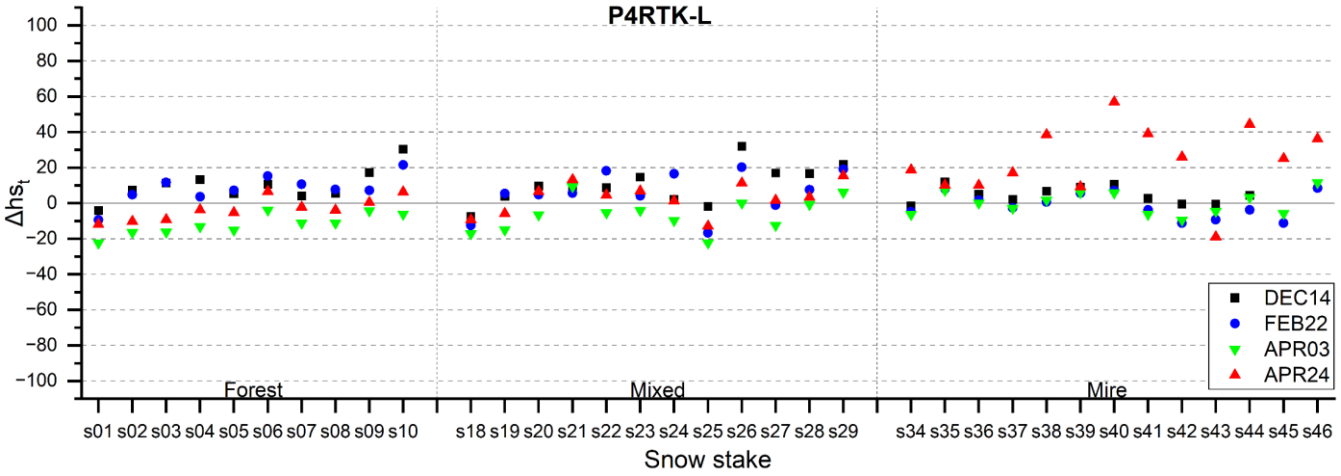


Figure S7. Difference between UAS-derived and manual snow depth measurements (Δhs_t) against the stake number when utilizing P4RTK and ALS-derived snow-free DSM.

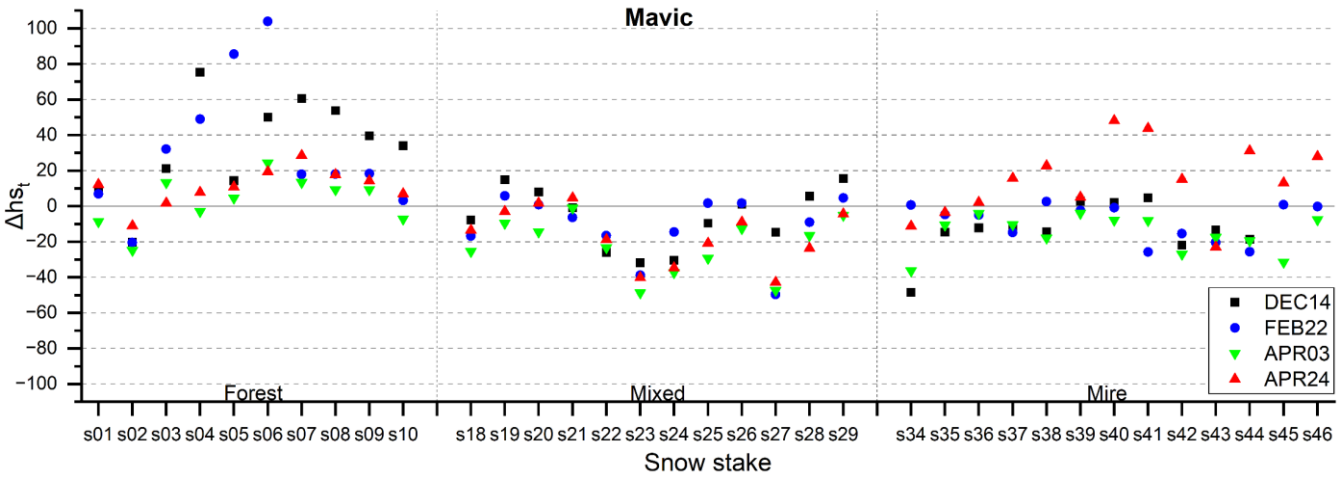


Figure S8. Difference between UAS-derived and manual snow depth measurements (Δhs_t) against the stake number when utilizing Mavic and UAS-derived snow-free DSM.

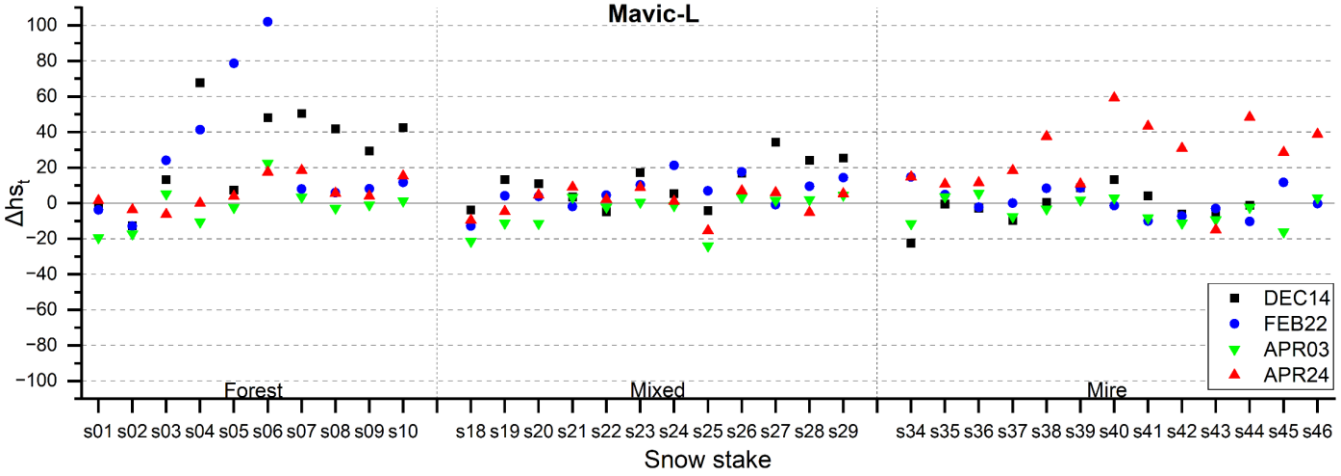


Figure S9. Difference between UAS-derived and manual snow depth measurements (Δhs_t) against the stake number when utilizing Mavic and ALS-derived snow-free DSM.

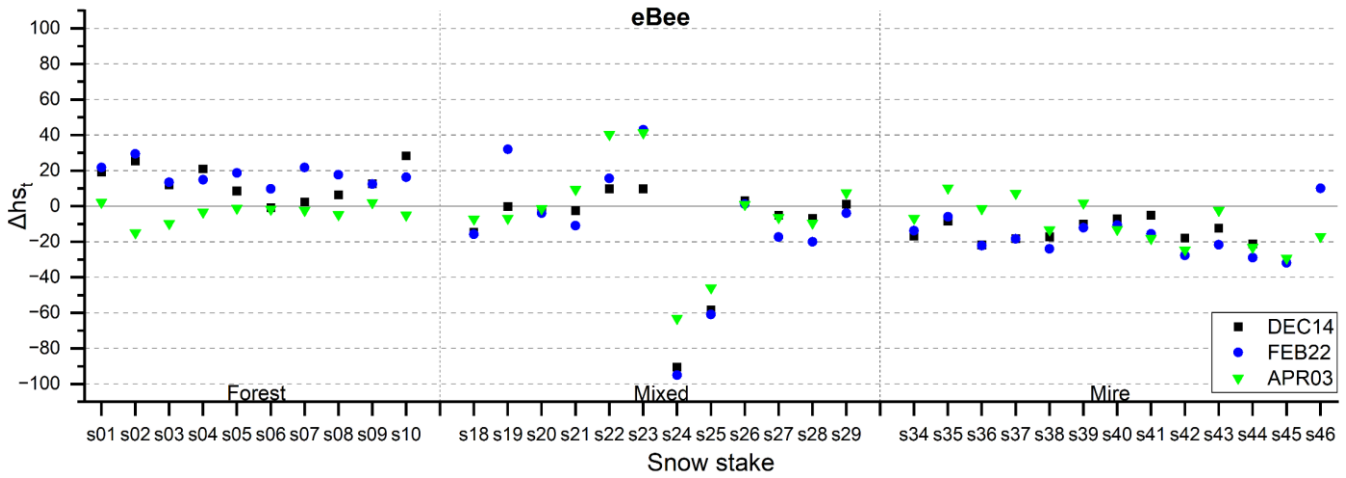


Figure S10. Difference between UAS-derived and manual snow depth measurements (Δhs_t) against the stake number when utilizing eBee and UAS-derived snow-free DSM.

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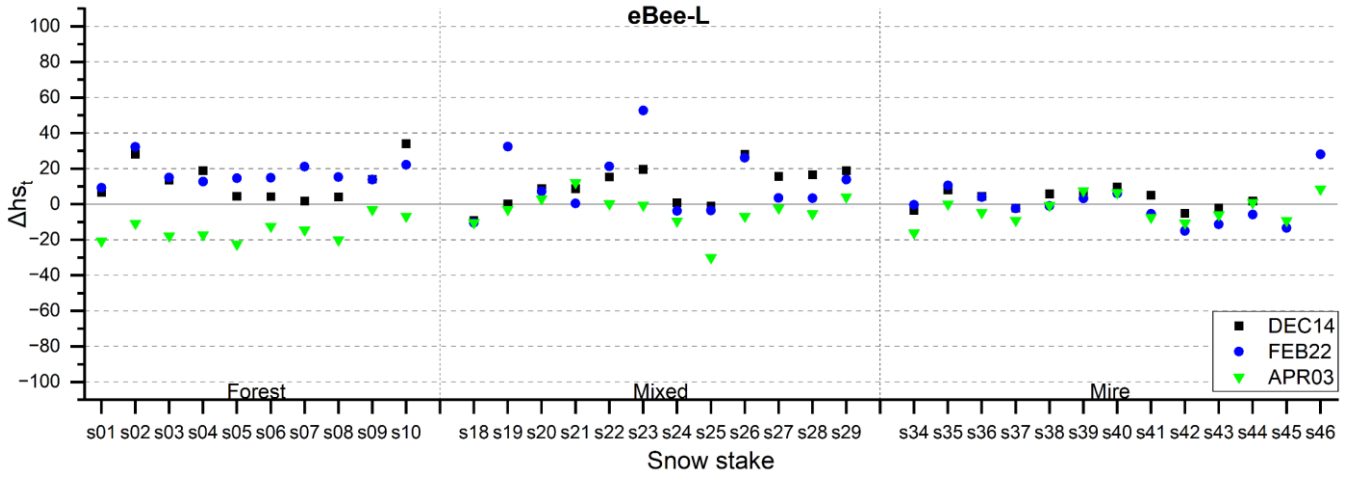

Figure S11. Difference between UAS-derived and manual snow depth measurements (Δhs_t) against the stake number when utilizing eBee and ALS-derived snow-free DSM.

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Table S1. Mean errors for the generated digital surface models obtained from a comparison to GNSS checkpoints.

	P4RTK	Mavic	eBee	ALS
Bareground Mire (cm)	-0.64	7.82	16.56	0.64
DEC12 Mire (cm)	3.49	4.09	3.38	
FEB21 Mire (cm)	-0.68	2.25	0.04	
APR03 Mire (cm)	3.50	4.54	0.78	
APR24 Mire	-0.06	0.34		
Bareground Mixed (cm)	1.82	5.37	9.97	0.83
DEC12 Mixed (cm)	5.42	2.73	2.26	
FEB21 Mixed (cm)	1.44	-0.33	1.73	
APR03 Mixed (cm)	0.29	1.12	3.17	
APR24 Mixed (cm)	1.22	4.11		
Bareground Forest (cm)	3.66	2.67	4.34	7.46
DEC12 Forest (cm)	3.60	1.11	0.22	
FEB21 Forest (cm)	3.52	12.29	7.43	
APR03 Forest (cm)	-1.10	1.78	-5.26	
APR24 Forest (cm)	-2.38	6.53		

Table S2. Standard deviations for the generated digital surface models obtained from a comparison to GNSS checkpoints.

	P4RTK	Mavic	eBee	ALS
Bareground Mire (cm)	3.49	5.16	3.69	8.67
DEC12 Mire (cm)	2.31	5.79	2.64	
FEB21 Mire (cm)	2.21	4.62	3.61	
APR03 Mire (cm)	2.81	3.13	1.86	
APR24 Mire	2.12			
Bareground Mixed (cm)	4.04	8.97	5.35	5.78
DEC12 Mixed (cm)	5.14	9.67	5.77	
FEB21 Mixed (cm)	2.40	5.78	3.07	
APR03 Mixed (cm)	4.04	3.62	6.81	
APR24 Mixed (cm)	2.91	4.99		
Bareground Forest (cm)	3.07	4.38	3.22	8.21
DEC12 Forest (cm)	2.81	10.73	8.62	
FEB21 Forest (cm)	6.49	21.43	8.83	
APR03 Forest (cm)	4.37	9.24	4.65	
APR24 Forest (cm)	2.53	6.75		

Table S3. Root mean square error for the generated digital surface models obtained from a comparison to GNSS checkpoints.

	P4RTK	Mavic	eBee	ALS
Bareground Mire (cm)	3.55	9.37	16.96	8.70
DEC12 Mire (cm)	4.19	7.09	4.28	
FEB21 Mire (cm)	2.31	5.14	3.61	
APR03 Mire (cm)	4.49	6.74	2.02	
APR24 Mire	2.12	3.15		
Bareground Mixed (cm)	4.37	10.47	11.31	5.84
DEC12 Mixed (cm)	7.48	10.05	6.20	
FEB21 Mixed (cm)	2.80	5.79	3.52	
APR03 Mixed (cm)	4.05	3.78	7.52	
APR24 Mixed (cm)	3.16	6.46		
Bareground Forest (cm)	4.78	5.13	5.40	11.10
DEC12 Forest (cm)	4.57	10.79	8.63	
FEB21 Forest (cm)	7.38	24.70	11.54	
APR03 Forest (cm)	4.50	9.41	7.02	
APR24 Forest (cm)	3.47	9.39		