



Supplement of

**Uncovering the melt: Unmanned Aircraft System (UAS)
and in-situ sensor synergies reveal dissolved organic
carbon (DOC) pathways in a northern peatland**

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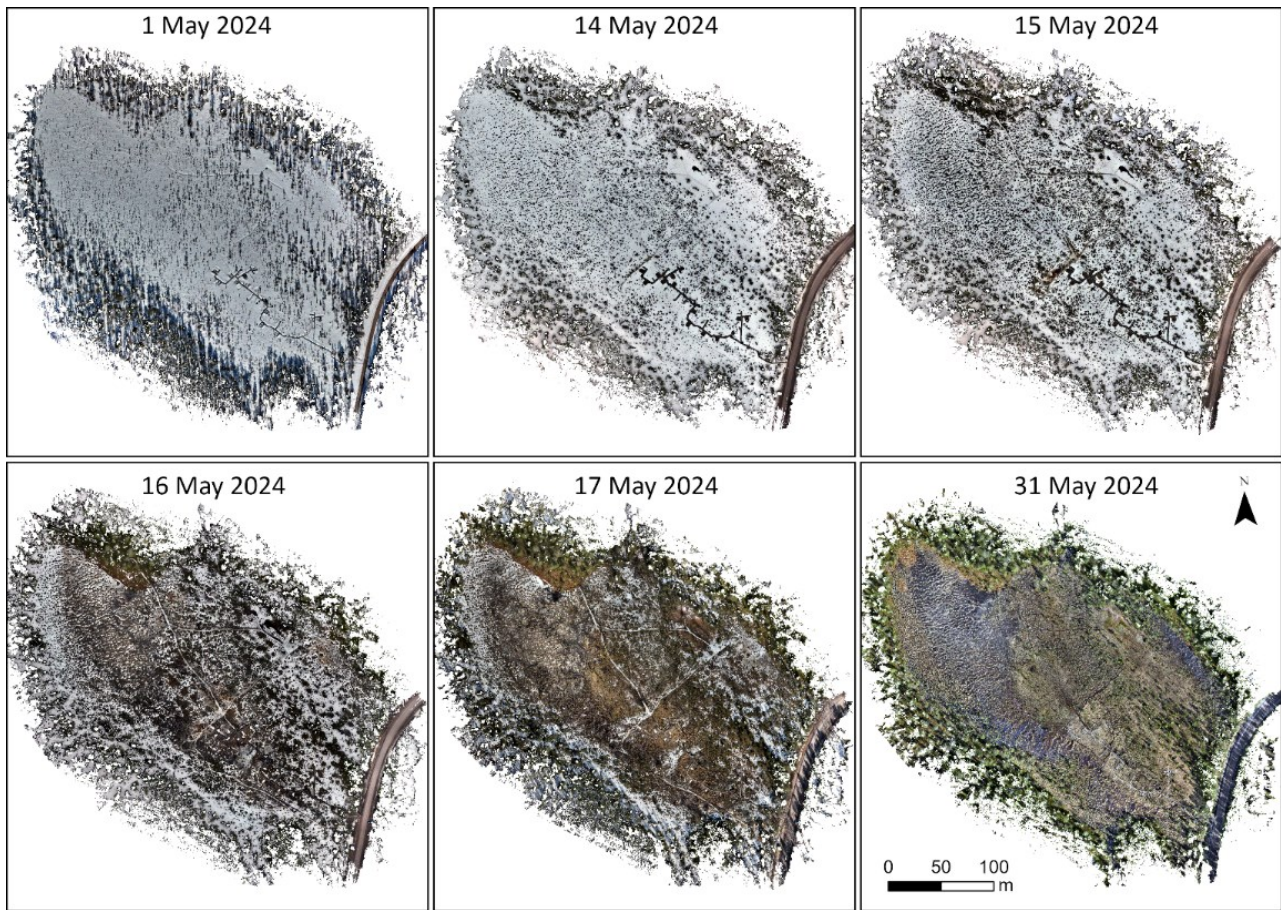


Figure S1. RGB orthomosaics for each UAS survey during the study period.

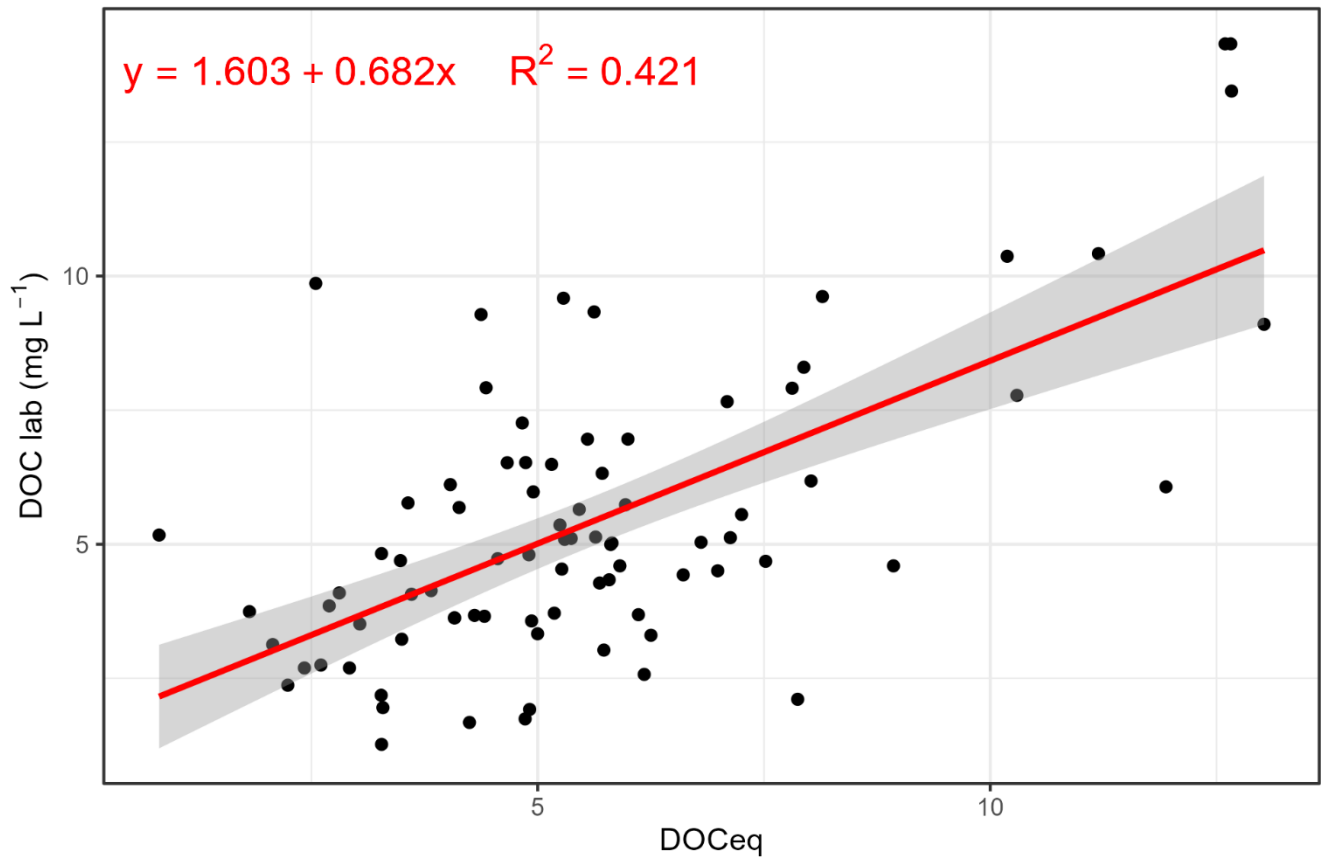
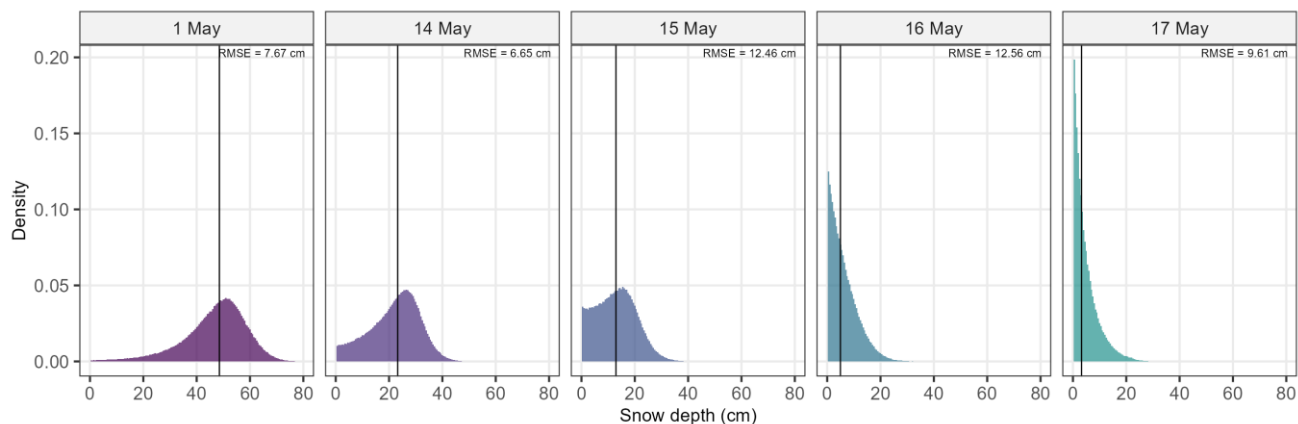


Figure S2. DOC measured by the Trios OPUS sensor and DOC analyzed from the grab samples during the study period.

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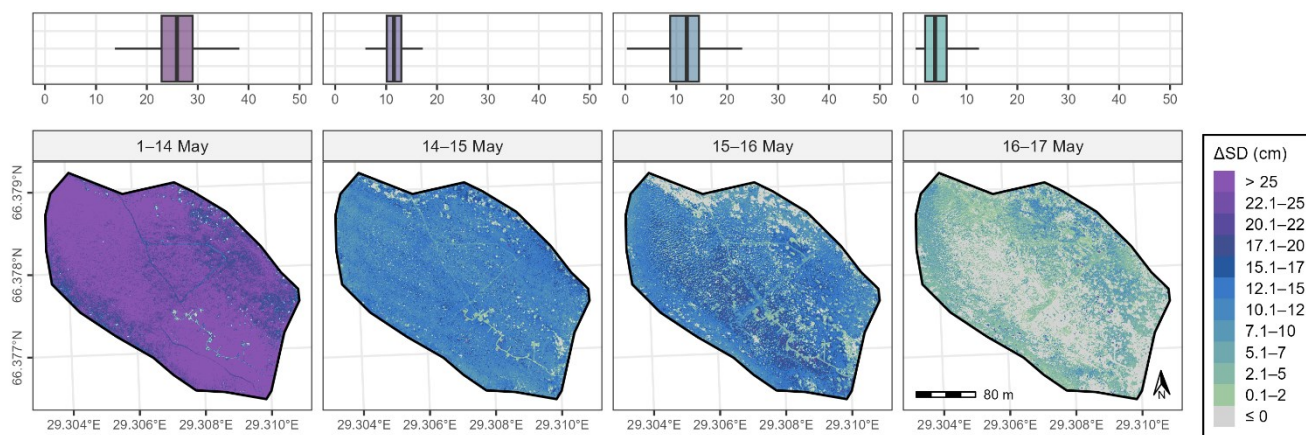
Table S1. Root mean square error (RMSE), mean error (ME), mean average error (MAE), standard deviation of errors (SD), and minimum and maximum errors for each snow depth survey based on the difference between UAS-derived snow depths and manual snow course measurements.

	RMSE (cm)	ME (cm)	MAE (cm)	SD (cm)	Min (cm)	Max (cm)
1 May	7.67	-5.97	6.94	5.20	-13.12	3.40
14 May	6.65	-5.66	5.70	3.77	-10.93	0.13
15 May	12.46	-12.07	12.07	3.30	-17.54	-7.76
16 May	12.56	-11.69	11.69	4.96	-19.24	-5.20
17 May	9.61	-8.17	8.17	5.46	-15.96	-2.03

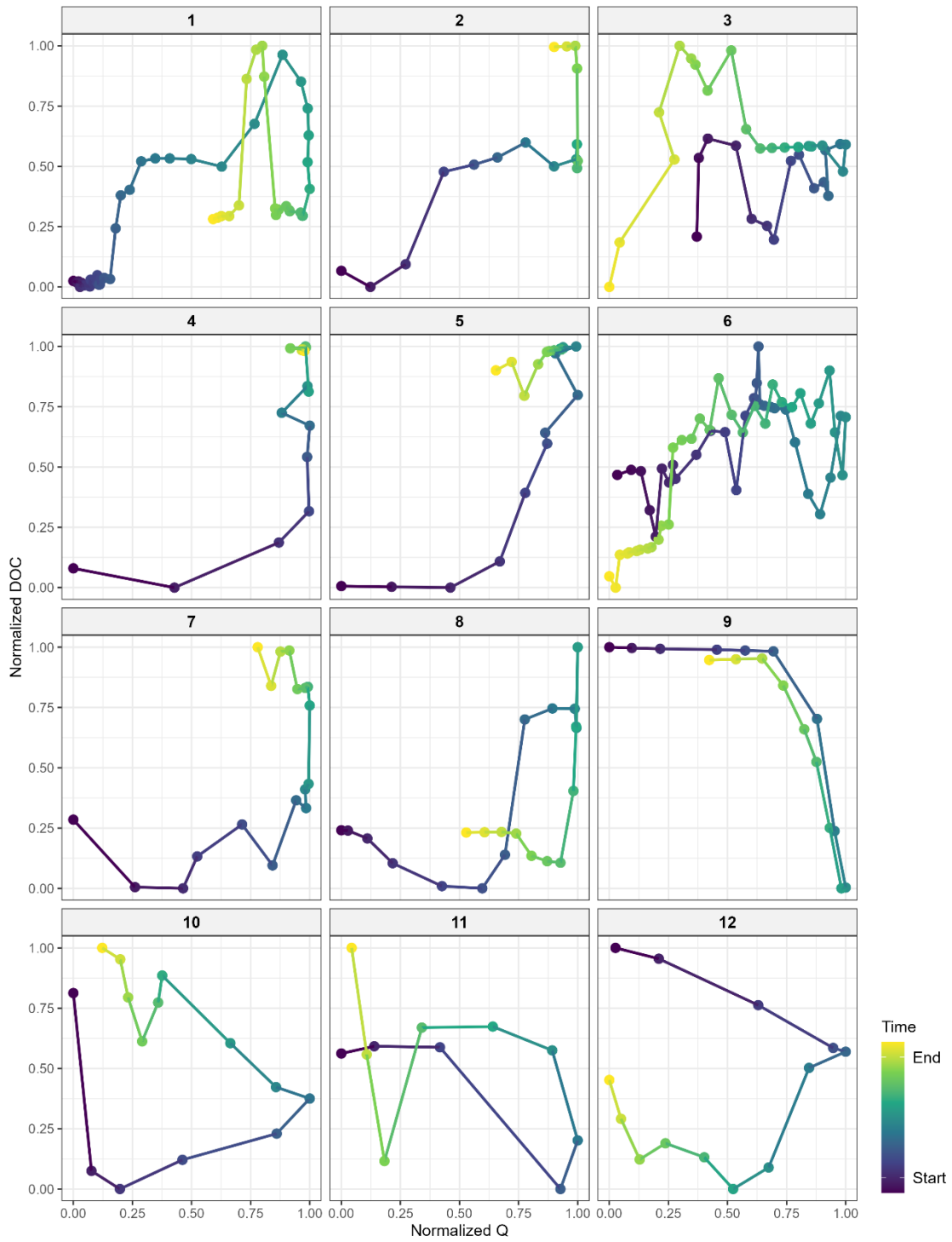


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Figure S3. UAS snow depth histograms and RMSE calculated based on manual snow transect measurements for each UAS survey on 1-17 May. Vertical lines represent the median snow depth value. Any values below 0 were considered errors and are not shown.



15 Figure S4. Maps and boxplots showing spatial variation in snow depth change (Δ SD cm) between subsequent UAS surveys on 1-17 May. Scale represents the absolute values, where all changes reflect a decline in snow depth.



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Figure S5. Hysteresis loops for normalized Q and DOC for events 1–12.

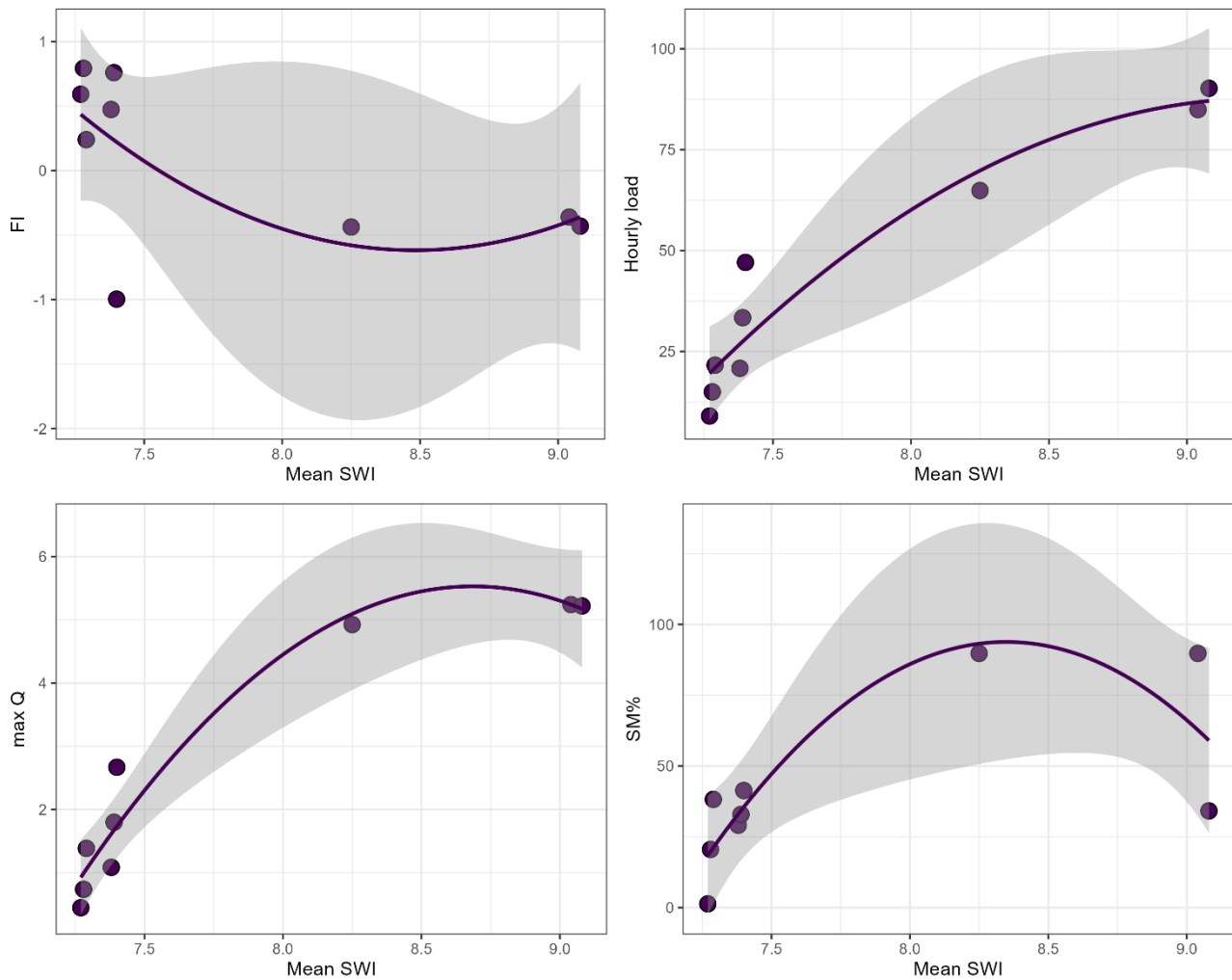


Figure S6. Relationships of mean Saga Wetness Index (SWI) of the snow-free areas and events' flushing index (FI), hourly DOC load, maximum discharge, and daily meltwater contribution (SM%).