11 Supplemental

Table S1: Comparison between the classic iButton instrumentation (Lewkowicz, 2008) and the HOBO Pendant light/temperature loggers used in this study for the SCLT method. Only commonly used IButton models are compared. Sourced from: (a)-(c) https://www.ibuttonlink.com/pages/maxim-integrated-products-data-sheets (d) (Onset Computer Corporation, 2020)

| Number	Variable	Storable readings	Sampling rate	Storage capacity at 1 hr (yrs)	Logger accuracy	Logger precision	Operational range (°C)	Price (CAD)	Cost per stake (CAD)
DS1925L[a]	Temperature	125440	5min to 273hrs	14.32	±0.5°C	0.5°C to 0.0625°C	-40 to +85	66.19 @ 1k units	700
DS1922L[b]	Temperature	8192	1s to 273hrs	0.94	Correctible to ±0.5°C	0.5°C to 0.0625°C	-40 to +85	59.52 @ 1k units	630
DS1921G[c]	Temperature	2048	1min to 255min	0.23	±1°C	0.5°C	-40 to +85	26.64 @ 1k units	300
MX2202[d]	Temp / Light	98000	1s to 18hrs	11.19	±0.5°C / ±10% lux	0.04°C / 1 lux	-20 to +70	82.40 @50 units	1030

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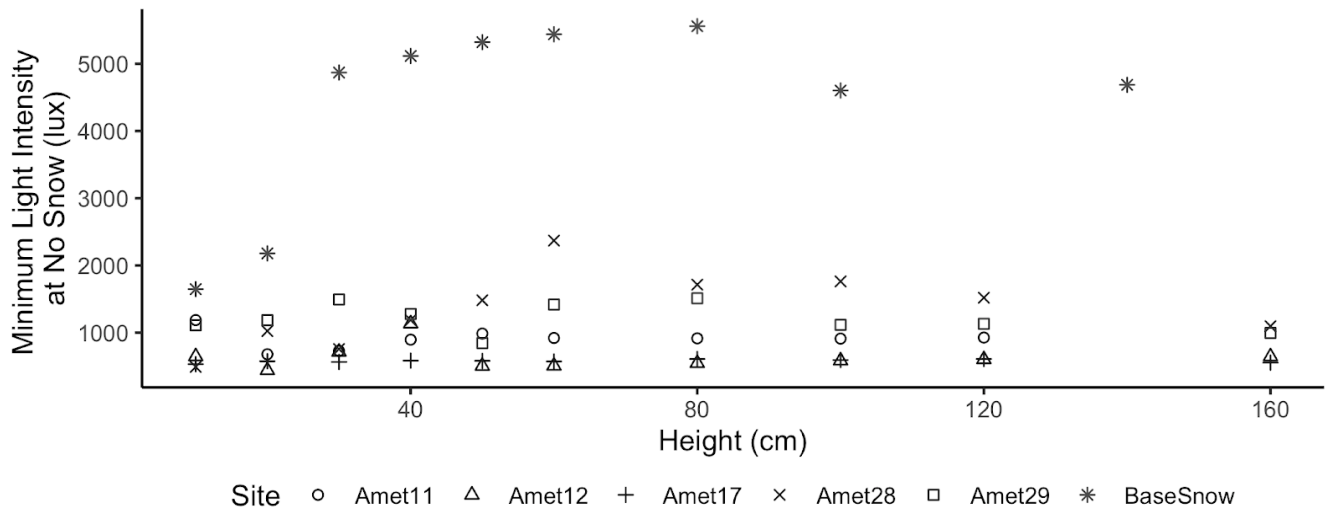
Figure S1: Minimum light intensity at no snow conditions (Tmax > 0.5 °C) for each logger along every stake. These values are used as the individual logger thresholds for the changepoint analysis and for the range of thresholds used in the interpolated analysis.
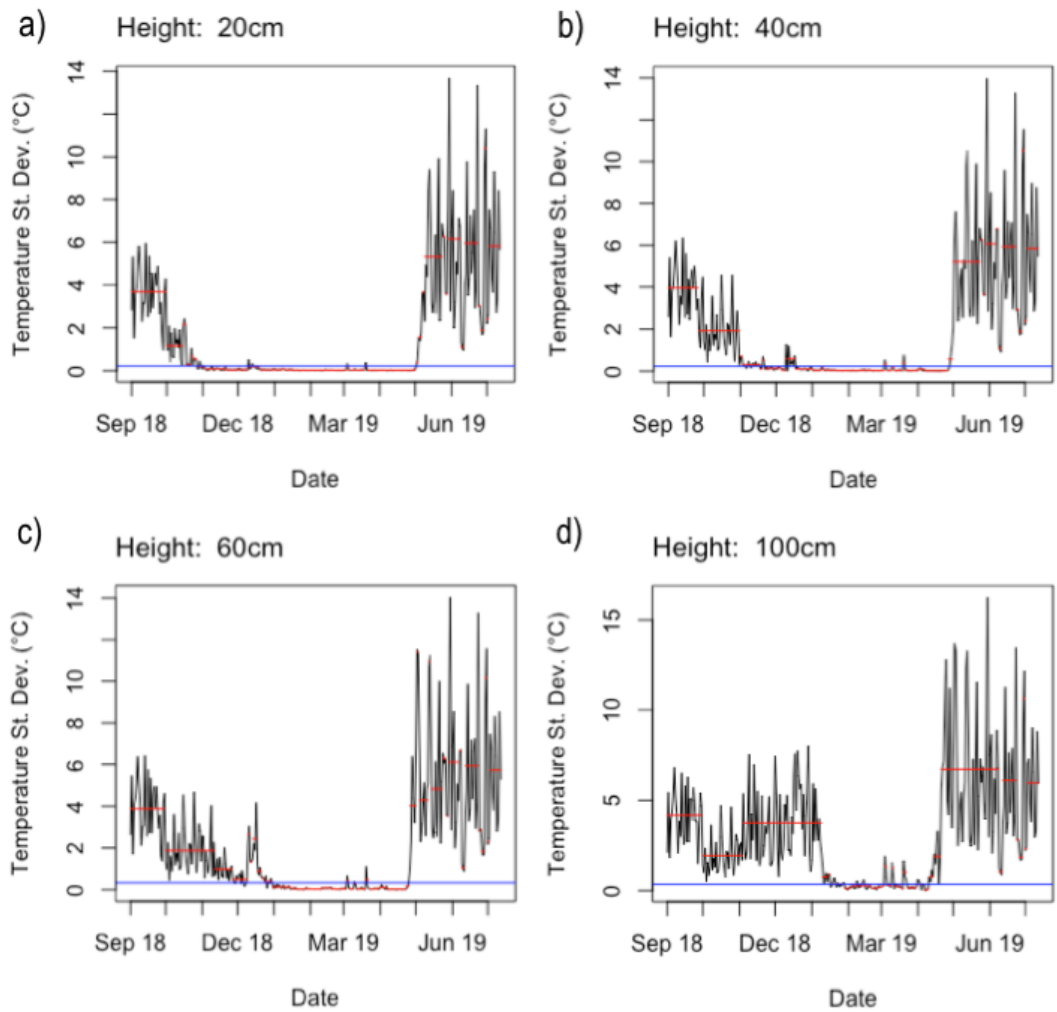
Figure S2: Changepoint analysis applied to (a) 20, (b) 40, (c) 60 and (d) 100 cm height loggers along Amet11. The red line shows changepoint segment means and the blue line shows the no-snow temperature standard deviation threshold for each logger. Snow cover occurs at a given logger when the changepoint segment drops below the no-snow threshold.
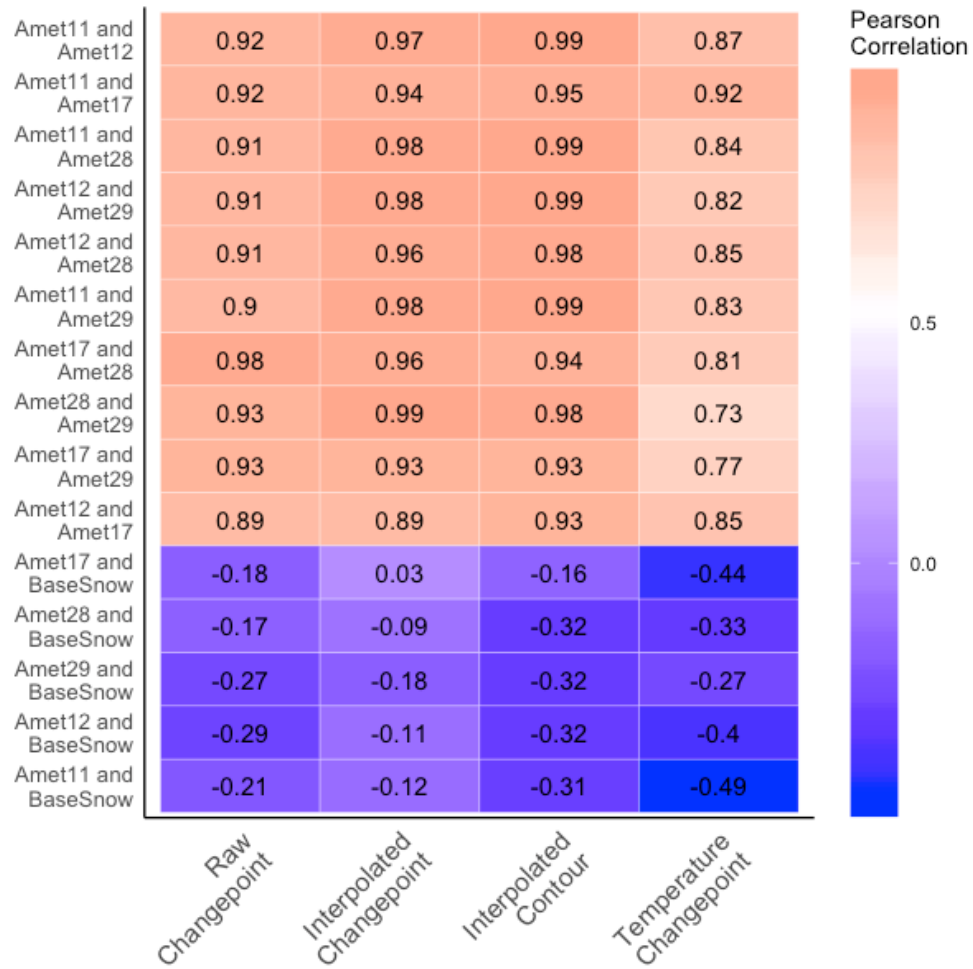
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Table S2: Mean absolute error (MAE) for the thin plate spline interpolation applied to each site. Interpolation of the light data was implemented with a logarithmic scale.

Site	MAE (Daily Max Light)	MAE (Daily SD Light)	MAE (Daily Max Temp)	MAE (Daily SD Temp)
Amet11	0.342 lux	0.295 lux	0.099°C	0.94°C
Amet12	0.267 lux	0.234 lux	1.28°C	0.669°C
Amet17	0.165 lux	0.144 lux	0.048°C	0.399°C
Amet28	0.398 lux	0.338 lux	2.01°C	1.09°C
Amet29	0.204 lux	0.173 lux	0.458°C	0.488°C
BaseSnow	0.114 lux	0.089 lux	1.29°C	1.41°C
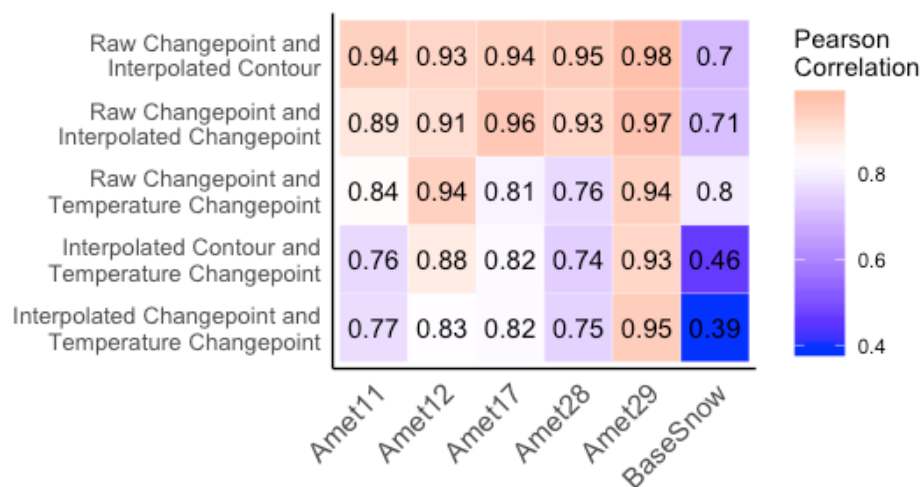
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Figure S3: Pearson correlation coefficients (R) comparing snow depths from December 2019 and January 2020, estimated between methods for each site.

	Raw Changepoint	Interpolated Changepoint	Interpolated Contour	Temperature Changepoint
Amet11 and Amet12	0.92	0.97	0.99	0.87
Amet11 and Amet17	0.92	0.94	0.95	0.92
Amet11 and Amet28	0.91	0.98	0.99	0.84
Amet12 and Amet29	0.91	0.98	0.99	0.82
Amet12 and Amet28	0.91	0.96	0.98	0.85
Amet11 and Amet29	0.9	0.98	0.99	0.83
Amet17 and Amet28	0.98	0.96	0.94	0.81
Amet28 and Amet29	0.93	0.99	0.98	0.73
Amet17 and Amet29	0.93	0.93	0.93	0.77
Amet12 and Amet17	0.89	0.89	0.93	0.85
Amet17 and BaseSnow	-0.18	0.03	-0.16	-0.44
Amet28 and BaseSnow	-0.17	-0.09	-0.32	-0.33
Amet29 and BaseSnow	-0.27	-0.18	-0.32	-0.27
Amet12 and BaseSnow	-0.29	-0.11	-0.32	-0.4
Amet11 and BaseSnow	-0.21	-0.12	-0.31	-0.49

Figure S4: Pearson correlation coefficients (R) comparing snow depths from December 2019 and January 2020, estimated between sites for each method.
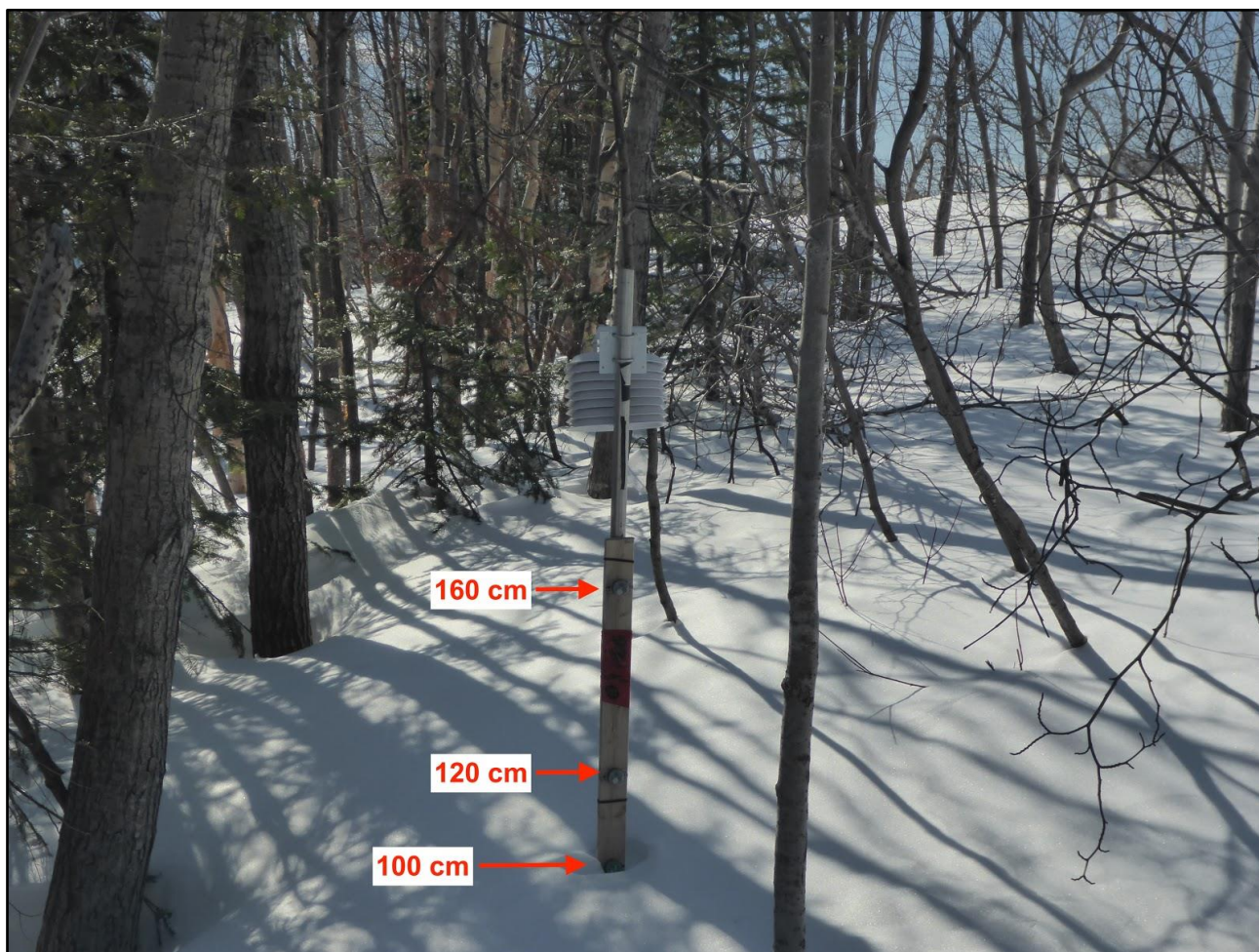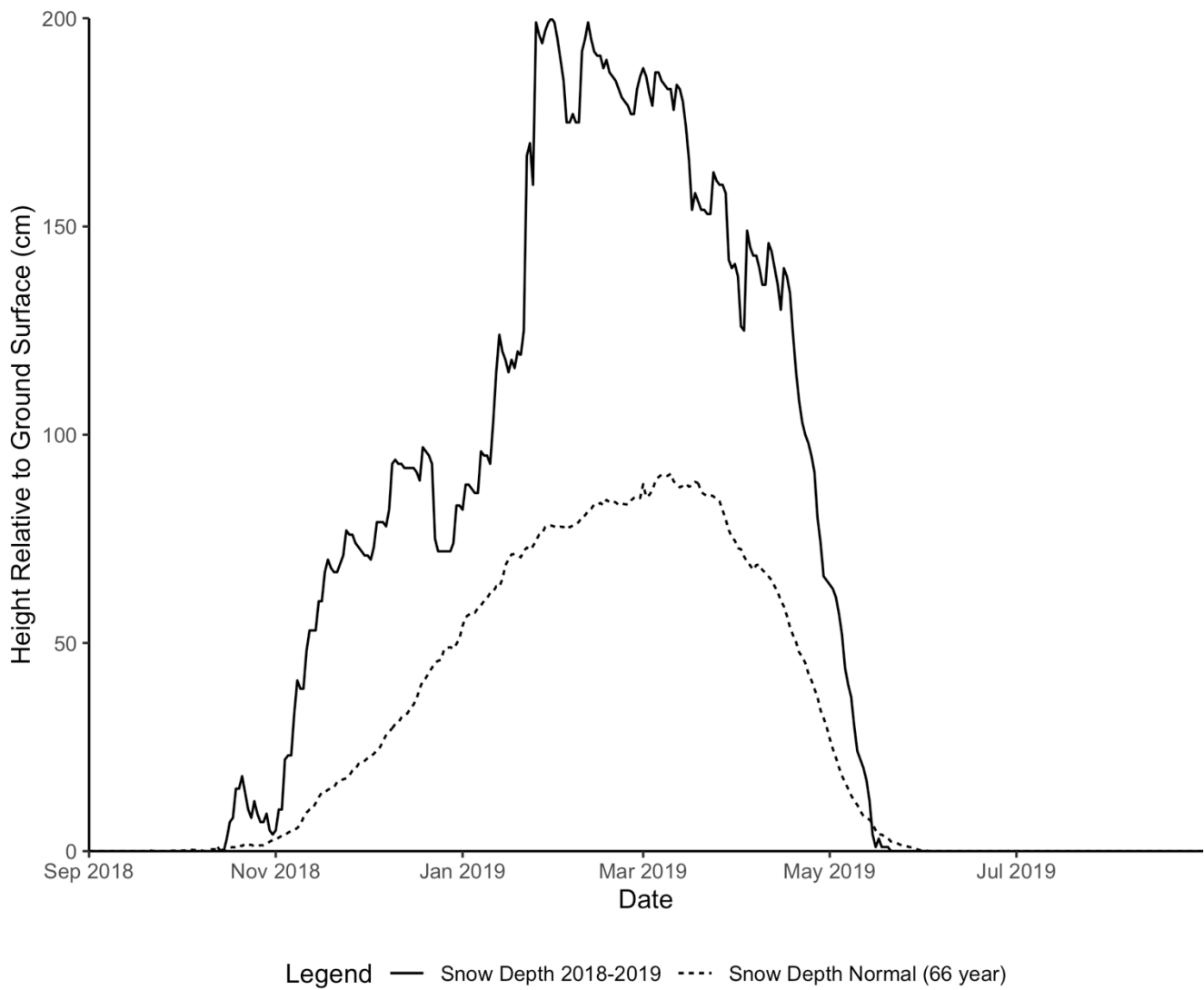
Figure S5: Photograph of Amet17 taken on March 25, 2020. Snow height was visually estimated to be 95 ± 5 cm. The nearby weather station at Goose Bay Airport (~5 km distance) contemporaneously recorded a snow depth of 52 cm.

Figure S6: Snow depth for winter 2018-2019 measured at Happy Valley-Goose Bay Airport relative to 66 year daily normal for snow depth.