

Supplementary

Deriving Snow Cover Metrics for Alaska from MODIS

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This supplementary supports the main text as follows:

Table S1. Parameter estimates for the general linear model evaluating sources of bias in MODIS-derived snow onset dates (FSD and LCFD) and snow melt dates (LSD and LCLD) relative to in situ observations in Alaska, USA. The model evaluates observations made from three different weather station types (SNOTEL, first-order, and GHCN) in two different combined snow classes (Tundra/Taiga, and Maritime/Alpine). The total number of days of post-filtering cloud cover was included as a covariate. The model includes all two-way interactions of station type, snow class, and cloud cover. The means parameterization (intercepts for station type and snow class removed) was used, so that means rather than effect sizes for the factor variates could be presented here. Parameter estimates that are significantly ($p < 0.05$) different from zero (no bias) are indicated by bold type.

Metric	Parameter	Estimate	Standard Error
Start of full snow season (FSD)	Tundra/Taiga: First order	7.49	4.19
	Maritime/Alpine: First order	26.44	5.92
	Tundra/Taiga: GHCN	0.45	2.23
	Maritime/Alpine: GHCN	9.30	2.11
	Tundra/Taiga: SNOTEL	7.94	3.71
	Maritime/Alpine: SNOTEL	8.31	4.38
	Cloud intercept	-0.40	0.26
	Maritime/Alpine: cloud	0.61	0.18
	GHCN: cloud	0.73	0.23
	SNOTEL: cloud	0.59	0.29

Table S1. Cont.

Metric	Parameter	Estimate	Standard Error
Start of continuous snow season (LCFD)	Tundra/Taiga: First order	2.96	3.00
	Maritime/Alpine: First order	6.70	4.31
	Tundra/Taiga: GHCN	-4.98	1.59
	Maritime/Alpine: GHCN	-3.78	1.51
	Tundra/Taiga: SNOTEL	-0.98	2.64
	Maritime/Alpine: SNOTEL	-7.95	3.11
	Cloud intercept	-0.90	0.19
	Maritime/Alpine: cloud	0.26	0.12
	GHCN: cloud	0.59	0.17
	SNOTEL: cloud	0.80	0.21
End of full snow season (LSD)	Tundra/Taiga: First order	-2.77	4.14
	Maritime/Alpine: First order	13.52	5.84
	Tundra/Taiga: GHCN	-2.09	2.20
	Maritime/Alpine: GHCN	10.70	2.04
	Tundra/Taiga: SNOTEL	-8.20	3.62
	Maritime/Alpine: SNOTEL	2.90	4.28
	Cloud intercept	0.50	0.26
	Maritime/Alpine: cloud	-0.81	0.18
	GHCN: cloud	-0.66	0.22
	SNOTEL: cloud	0.22	0.28
End of continuous snow season (LCLD)	Tundra/Taiga: First order	0.00	3.43
	Maritime/Alpine: First order	27.21	5.02
	Tundra/Taiga: GHCN	2.05	1.80
	Maritime/Alpine: GHCN	11.40	1.70
	Tundra/Taiga: SNOTEL	6.75	2.96
	Maritime/Alpine: SNOTEL	12.06	3.50
	Cloud intercept	0.53	0.21
	Maritime/Alpine: cloud	-0.13	0.15
	GHCN: cloud	-0.12	0.19
	SNOTEL: cloud	-0.35	0.24