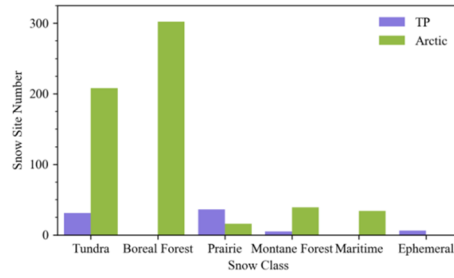**Supplementary Materials:**

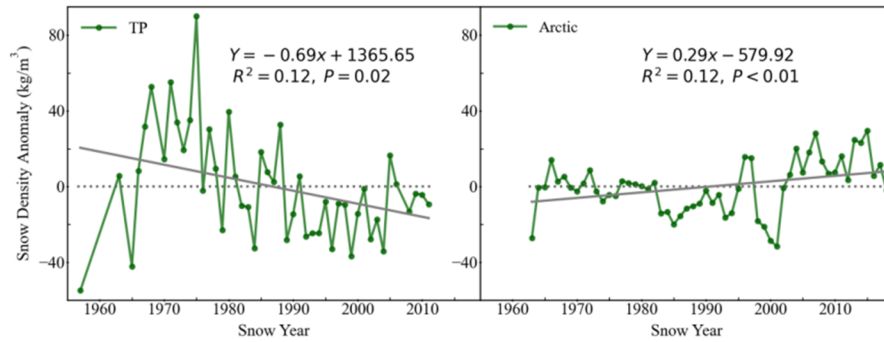
Figure S1. Snow site number for snow classes

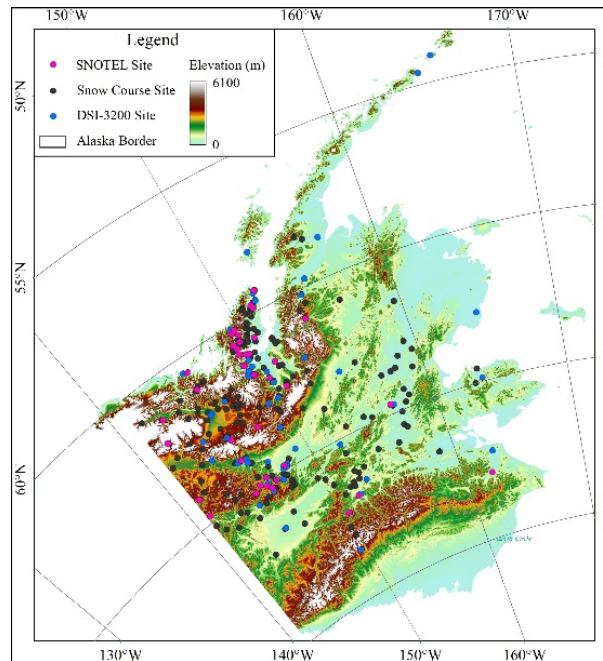**Figure S2.** Time series of average snow density

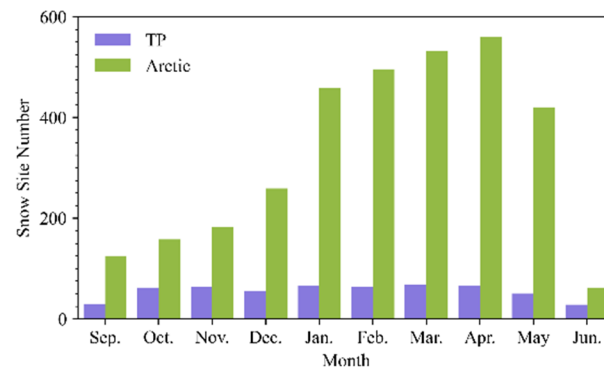**Figure S3.** Geographical location of snow sites with elevation as background in Alaska

Figure S4. Snow site number of per month

Table S1: Monthly mean snow densities with one standard deviation of each snow class over the TP and the Arctic. (kg/m^3)

Month	Area	Tundra	Boreal Forest	Prairie	Montane Forest	Maritime	Ephemeral
Sep.	TP	129±49	—	143±48	—	—	—
	Arctic	234±84	233±83	—	257±96	327±97	—
Oct.	TP	132±32	—	109±22	—	—	—
	Arctic	190±75	152±61	152±27	175±34	214±66	—
Nov.	TP	141±50	—	113±40	—	—	—
	Arctic	201±64	148±40	175±52	177±64	185±70	—
Dec.	TP	153±69	—	128±36	—	—	—
	Arctic	212±56	172±32	194±44	199±37	244±26	—
Jan.	TP	144±38	—	113±29	—	—	96±11
	Arctic	218±61	182±36	195±49	214±44	277±34	—
Feb.	TP	143±32	—	124±49	—	—	—
	Arctic	227±60	193±42	211±46	224±47	289±32	—
Mar.	TP	141±47	—	112±42	—	—	—
	Arctic	234±55	204±35	214±78	243±51	312±27	—
Apr.	TP	136±39	—	134±66	—	—	—
	Arctic	258±58	241±47	263±61	294±58	357±26	—
May.	TP	138±47	—	135±43	—	—	—
	Arctic	286±72	277±68	291±45	290±54	365±66	—
Jun.	TP	147±49	—	177±55	—	—	—
	Arctic	348±57	366±95	—	—	415±56	—
Annual	TP	140±33	—	130±41	—	—	96±11
	Arctic	228±56	210±42	215±51	232±52	290±63	—

Table S2: Monthly mean snow densities with standard deviation over the TP and the Arctic. (kg/m^3)

Area	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Annual
TP	133±48	122±29	132±72	139±56	125±37	134±42	126±46	137±58	137±45	158±52	138±61
Arctic	244±88	177±68	183±63	200±51	206±55	215±57	225±53	257±59	289±72	346±85	223±54