SUPPLEMENT 1: TABLES AND FIGURES

Submission to Alpine Botany:

Experimental advancement of snowmelt influences flowering phenology and pollinator visitation in an alpine ecosystem

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SUPPLEMENTAL TABLES AND FIGURES

Table S1 List of plant species found in sites

Species	**Family**
Achillea millefolium var. *alpicola*	Asteraceae
Agoseris glauca	Asteraceae
Allium geyeri	Liliaceae
Antennaria sp	Asteraceae
Antennaria media	Asteraceae
Arenaria fendleri	Caryophyllaceae
Artemisia sp	Asteraceae
Artemisia scopulorum	Asteraceae
Polygonum bistortoides	Polygonaceae
Polygonum viviparum	Polygonaceae
Caltha leptosepala	Ranunculaceae
Campanula rotundifolia	Campanulaceae
Castilleja occidentalis	Scrophulariaceae
Cerastium arvense ssp. *Strictum*	Caryophyllaceae
Dodecatheon pulchellum	Primulaceae
Draba spp	Brassicaceae

Erigeron	Asteraceae
Erigeron glaucus	Asteraceae
Erigeron melanocephalus	Asteraceae
Eritrichium nanum	Boraginaceae
Erigeron pinnatisectus	Asteraceae
Erigeron simplex	Asteraceae
Gentiana algida	Gentianaceae
Gentianella amarella	Gentianaceae
Gentiana parryi	Gentianaceae
Gentiana tenella	Gentianaceae
Geum rossii var. *turbinatum*	Rosaceae
Lewisia pygmaea	Portulacaceae
Ligusticum tenuifolium	Apiaceae
Lloydia serotina	Liliaceae
Mertensia lanceolata	Boraginaceae
Minuartia obtusiloba	Caryophyllaceae
Oreoxis alpina ssp. *alpina*	Apiaceae
Packera crocata	Asteraceae

Pedicularis groenlandica	Scrophulariaceae
Pedicularis parryi	Scrophulariaceae
Phlox pulvinata	Polemoniaceae
Polemonium viscosum	Polemoniaceae
Potentilla diversifolia	Rosaceae
Ranunculus adoneus	Ranunculaceae
Rhodiola integrifolia	Crassulaceae
Saxifraga rhomboidea	Saxifragaceae
Sedum lanceolatum	Crassulaceae
Sibbaldia procumbens	Rosaceae
Silene acaulis var. *subacaulescens*	Caryophyllaceae
Solidago simplex	Asteraceae
Stellaria longipes ssp. *longipes*	Caryophyllaceae
Tetraneuris acaulis var. *caespitosa*	Asteraceae
Tetraneuris grandiflora	Asteraceae
Tonestus pygmaeus	Asteraceae
Trifolium dasyphyllum	Fabaceae
Trifolium parryi ssp. *parryi*	Fabaceae

Trollius laxus ssp. *albiflorus*	Ranunculaceae
Vaccinium sp	Ericaceae
Veronica wormskjoldii var. *wormskjoldii*	Scrophulariaceae
Viola adunca	Violaceae

18
19

Table S2 Coefficients for A) control pSEM and B) advanced snowmelt pSEM

A) Control pSEM Coefficients

Response	Predictor	Estimate	Std. Error	Std. Estimate	DF	Crit. Value	P.Value	Sign. Code
sodoy	tpi30	-0.05	0.01	-0.05	6.0	-3.39	**0.0007**	***
dff	sodoy	0.73	0.04	0.73	16.00	19.47	**<0.0001**	***
fldur	dff	-3.36	0.71	-0.82	12.61	-4.75	**0.0004**	***
flabund	fldur	0.54	0.23	0.43	13.00	2.37	**0.034**	*
flabund	tpi30	0.15	0.05	0.52	13.00	2.88	**0.013**	*
totvis	flabund	1.02	0.29	0.82	12.20	3.45	**0.0047**	**
totvis	vispk	3.47	1.09	0.79	12.71	3.18	**0.0075**	**
vispk	dff	1.43	0.26	1.43	16.00	5.45	**<0.0001**	***
vispk	fldur	0.13	0.06	0.13	16.00	2.08	**0.038**	*

Significance codes: 0 '*' 0.001 '**' 0.01 '*' 0.05**

B) Advanced Snowmelt pSEM Coefficients

Response	Predictor	Estimate	Std. Error	Std. Estimate	DF	Crit. Value	P.Value	Sign. Code
sodoy	tpi30	-0.05	0.01	-0.05	16.00	-3.89	**0.0001**	***
dff	sodoy	0.69	0.08	0.69	16.00	8.59	**<0.0001**	***
fldur	dff	-2.75	1.14	-0.63	13.97	-2.42	**0.03**	*
flabund	fldur	-0.47	0.59	-0.17	13.00	-0.79	0.44	
flabund	tpi30	0.45	0.17	0.60	13.00	2.71	**0.018**	*
totvis	flabund	0.15	0.21	0.18	13.92	0.71	0.49	
vispk	dff	0.41	0.25	0.41	16.00	1.66	0.097	

Significance codes: 0 '*' 0.001 '**' 0.01 '*' 0.05**

Key:

Code	Description
tpi30	TPI at 30-m radius
sodoy	Snowmelt timing (as day of year)
dff	Flowering onset

fldur	Flowering duration
flabund	Floral abundance
totvis	Pollinator visitation rate
vispk	Day of peak pollinator visitation rate

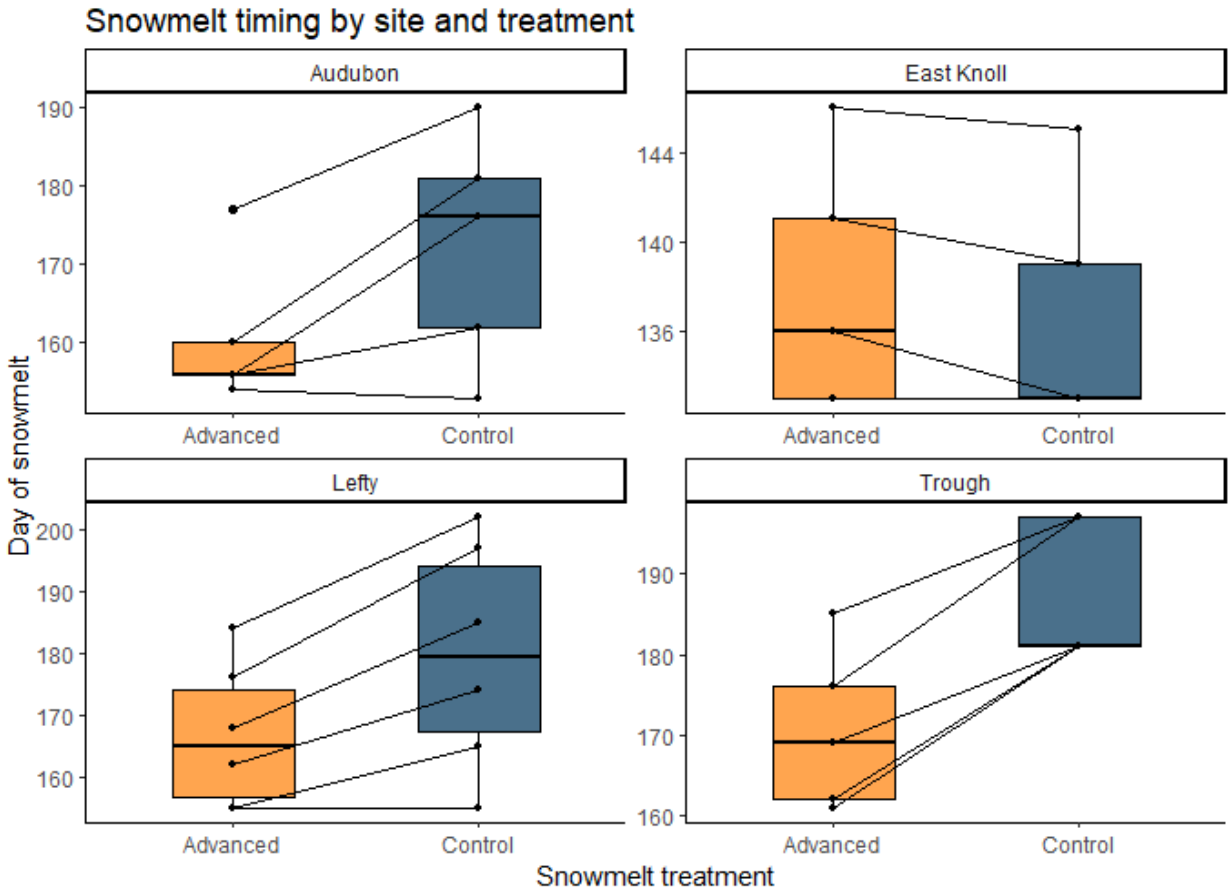

Figure S1 Effect of black-sand treatment across four sites, shown as day of snowmelt in control plots (dark blue) and plots where black sand was added to the surface of snow (light orange)