Supplement of

Airborne Lidar and Machine Learning Reveal Decreased Snow Depth in Burned Forests

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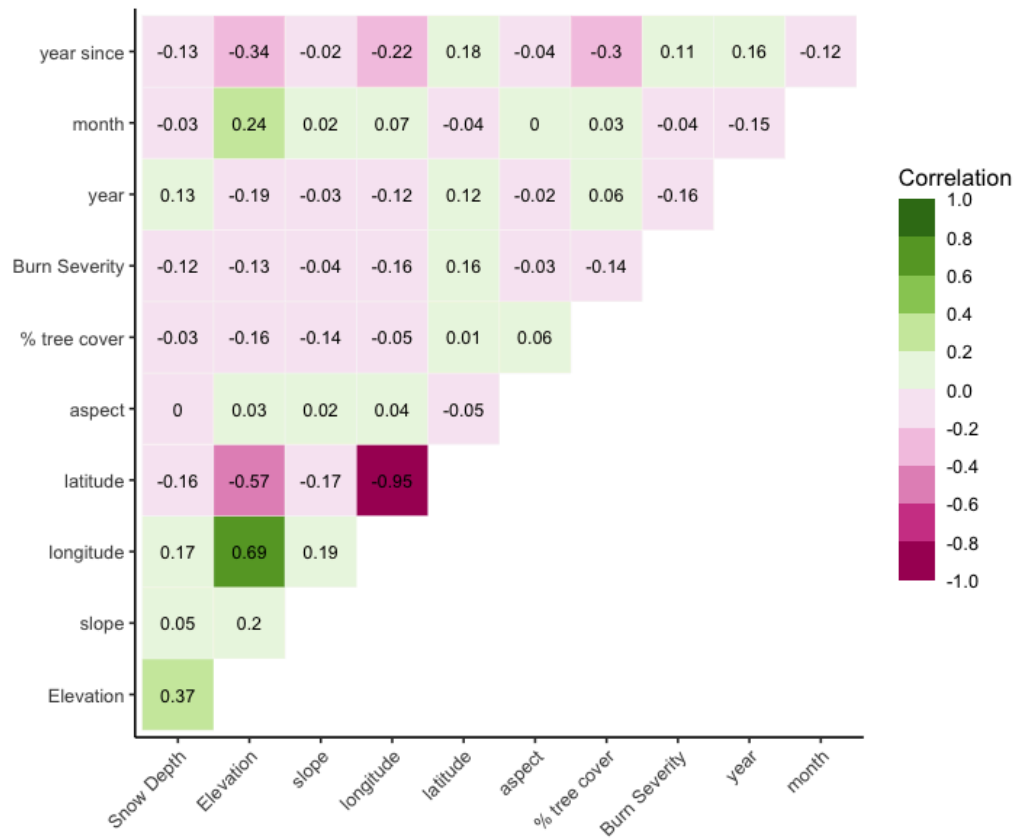*Correspondance to:* Arielle Koshkin (akoshkin@mines.edu)

Figure S1. Correlation matrix for predictor variables used in the machine learning algorithm. X and Y coordinates show a strong correlation across the Sierra Nevada, but are not strongly correlated within individual basins.
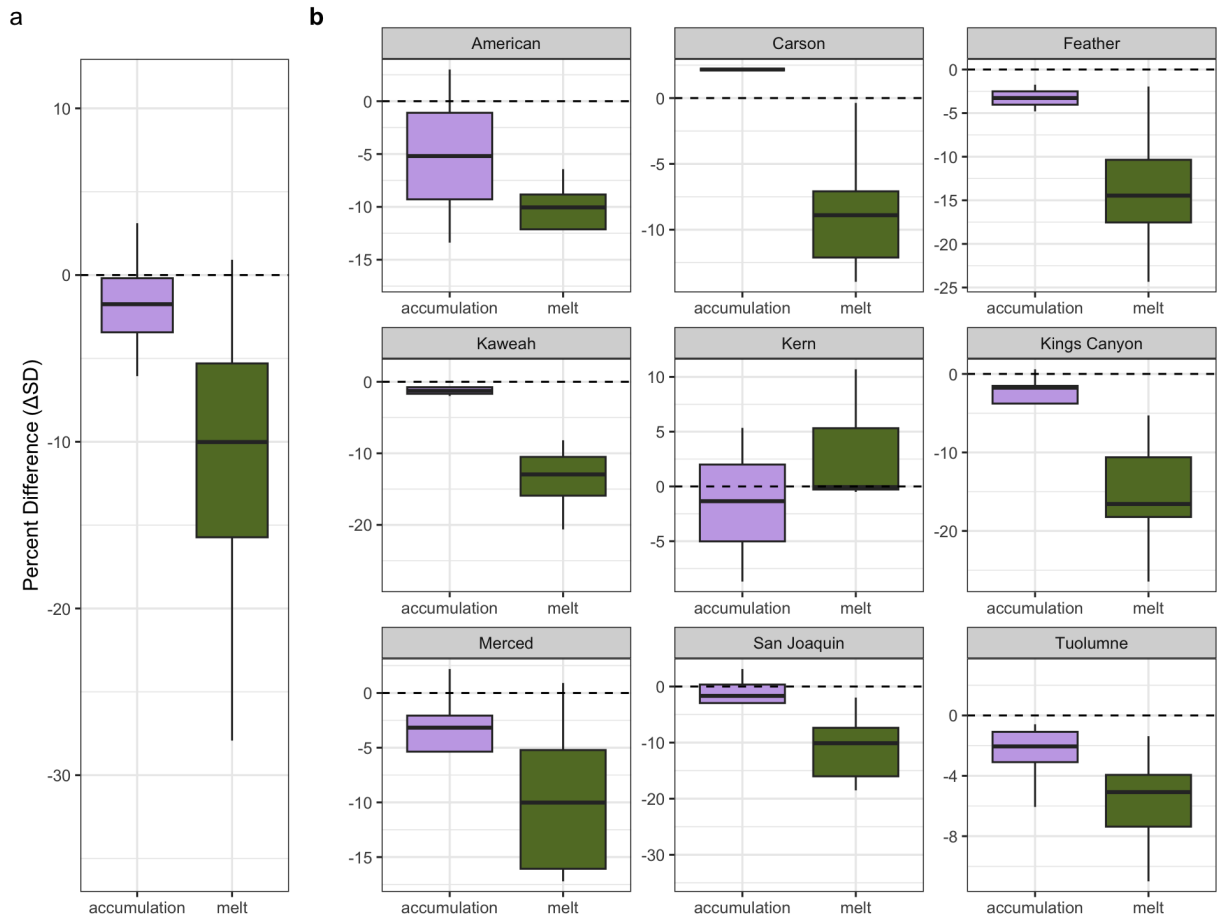
Figure S2. Basin-wide average of ΔSD in accumulation and melt season snow distribution across Sierra Nevada basins. (a) Box plots showing the overall percent difference in snow distribution during the accumulation (before peak SWE) and melt (after peak SWE) in all basins. (b) Box plots of ΔSD for each basin, separated by season (accumulation and melt).
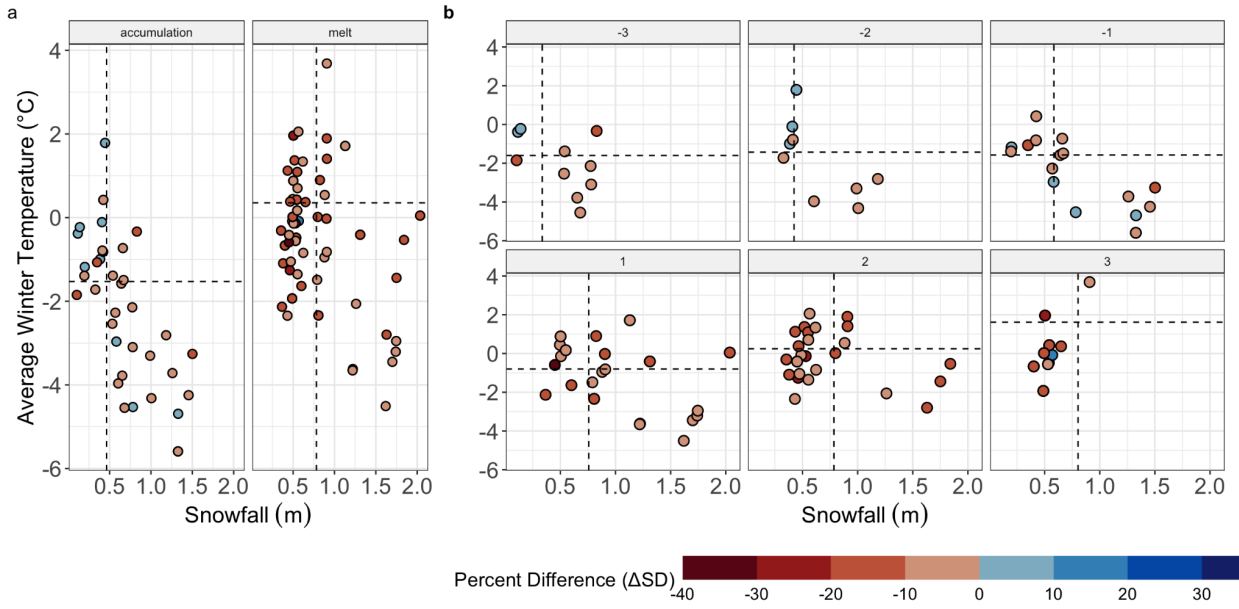
Figure S3. Basin-wide ΔSD by average monthly temperatures and snowfall. Colored points indicate the average ΔSD for each lidar acquisition. Dashed lines indicate average snowfall and temperature from 2020-2024 across the nine basins for the accumulation season (3 months before peak SWE) and melt (three months after peak SWE).
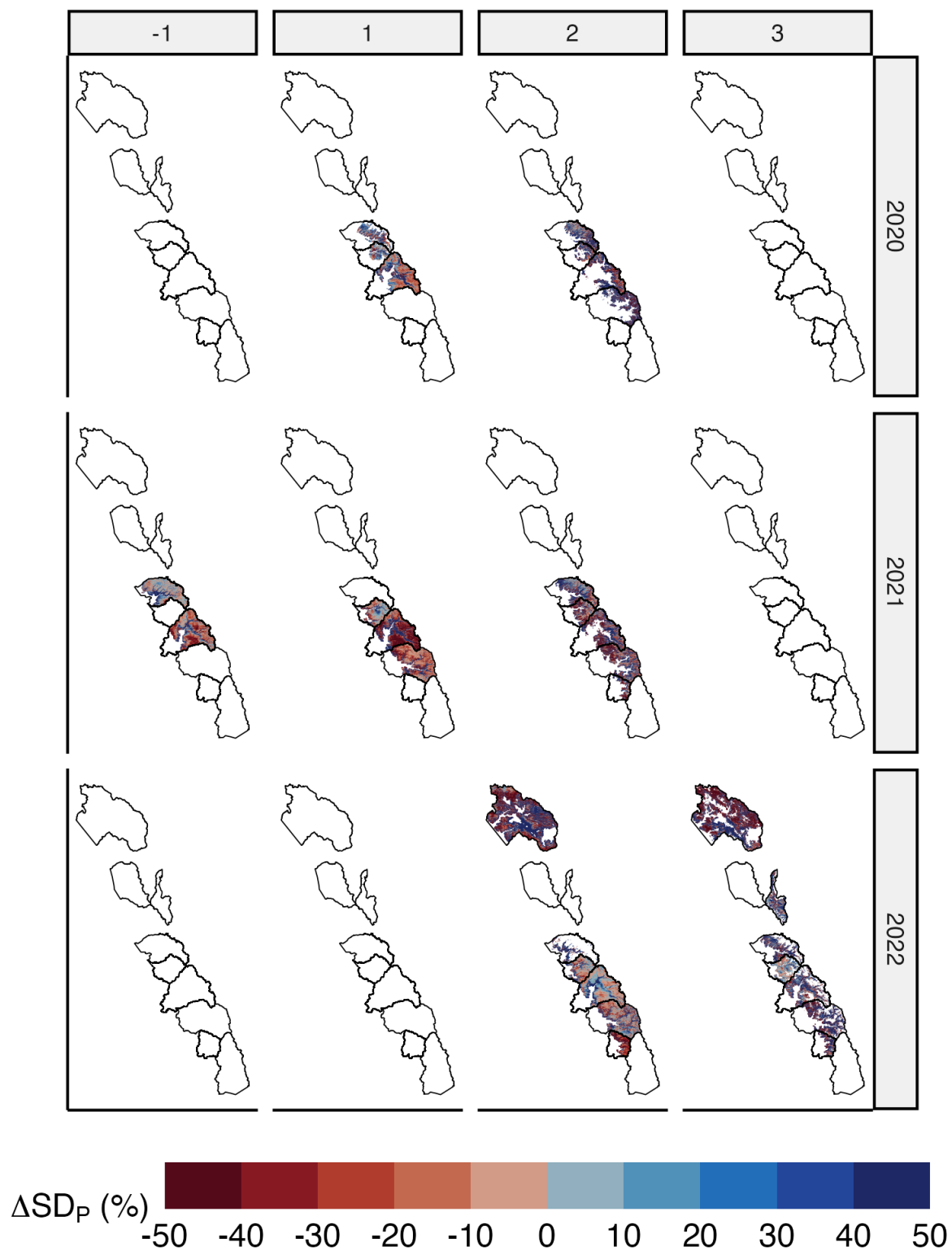
Figure S4. Spatial maps of ΔSD for water years 2020, 2021, and 2022 (the years with the fewest lidar acquisitions) across the 9 study basins.
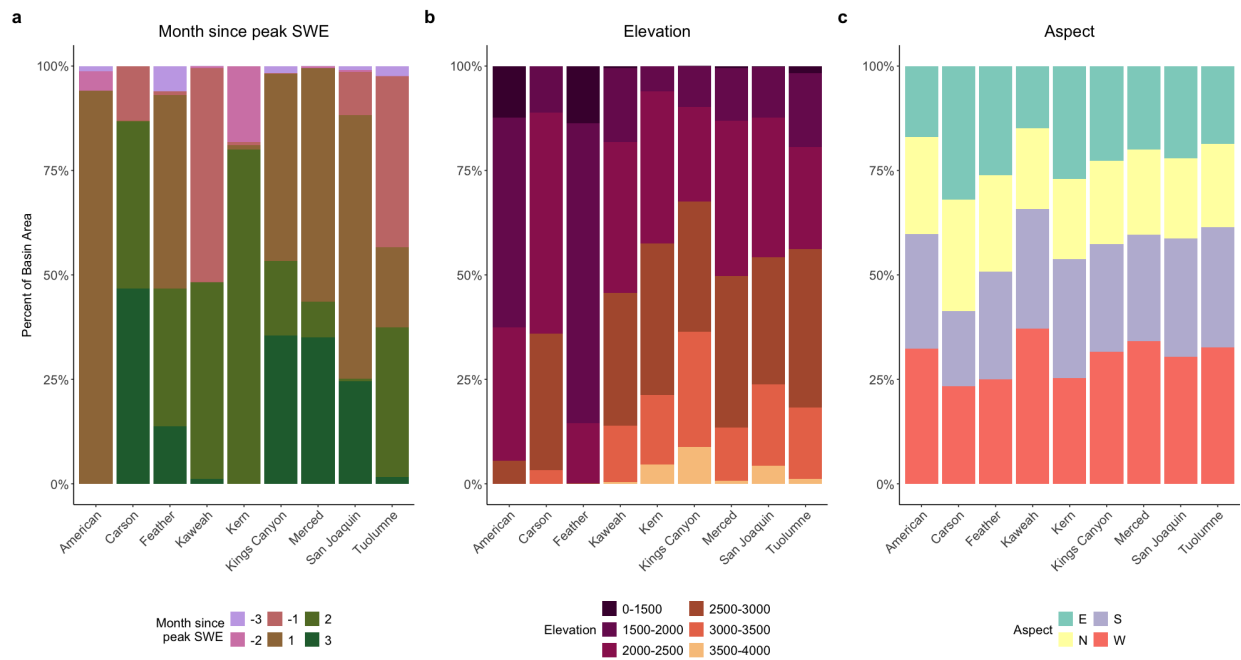
Figure S5. Characteristics of basin areas across Sierra Nevada watersheds. (a) Distribution of area flown by months since peak SWE for each basin. (b) Elevation distribution across basins. (c) Aspect distribution across basins.

Table 1. Basin information

Basin	ASO Basin Area (10^{15} km²)	Snow Zone Area (10^{15} km²)	% of the Basin in the snow zone	# of flights in each month since pSWE						Total # of flights
				-3	-2	-1	1	2	3	
American	3.27	2.5	78.8	1	1	0	4	0	0	6
Carson	1.50	1.29	86.9	2	0	1	2	2	4	9
Feather	8.38	6.76	80.6	2	0	1	3	2	3	10
Kern	4.18	3.20	76.9	4	2	2	2	4	3	14
Keweah	1.45	0.79	53.7	1	1	2	1	1	1	6
Kings Canyon	4.3	3.15	72.8	4	0	3	4	4	3	16
Merced	1.78	1.45	81.5	5	2	2	5	5	3	18
San Joaquin	4.24	3.25	76.7	5	1	3	4	5	3	18
Tuolumne	2.92	2.50	85.5	4	2	3	4	4	3	18
Total	**32.0**	**24.9**	**77.8**	**10**	**9**	**10**	**14**	**27**	**23**	**115**