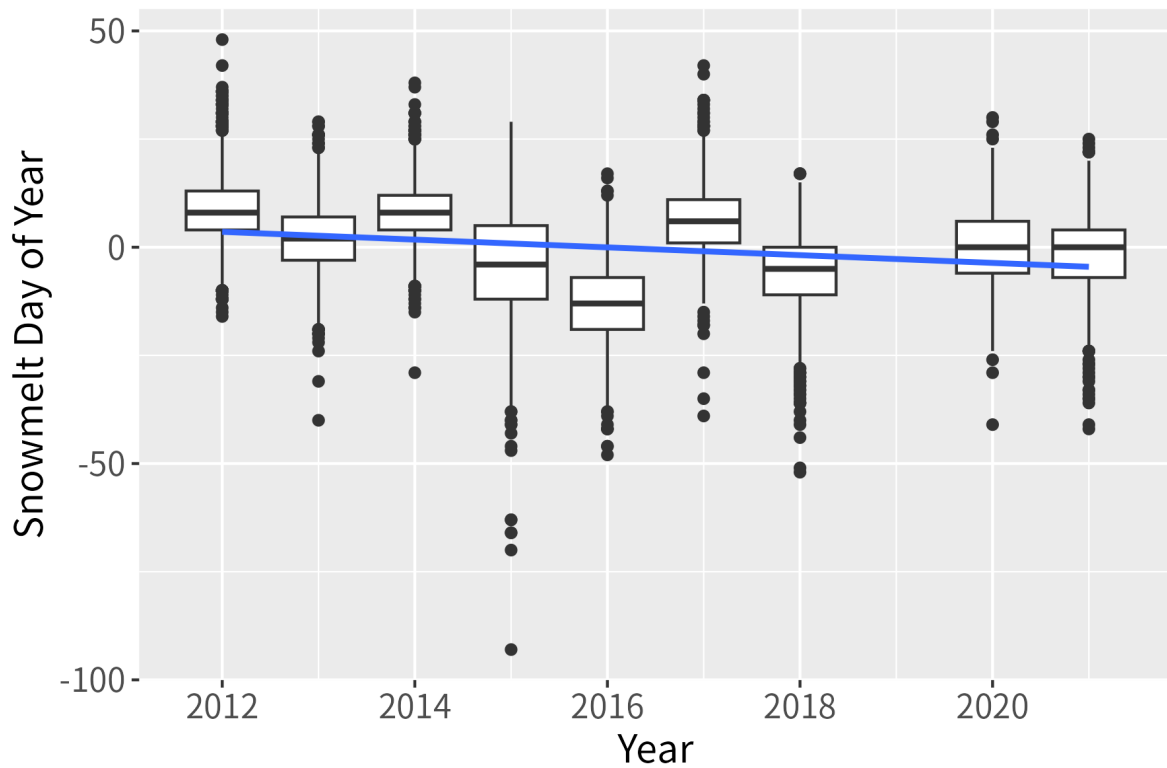**Supplementary Information**

Fig. S1: Interannual variation in snowmelt DOY (2011–2021).
Changes in snowmelt Day of Year (DOY) relative to 2011 (set as 0). A total of 1,000
pixels were randomly sampled and plotted. The blue line indicates the fitted linear
regression. Despite large interannual fluctuations, an overall trend toward earlier
snowmelt is evident. Data for 2019 are missing due to construction work at the
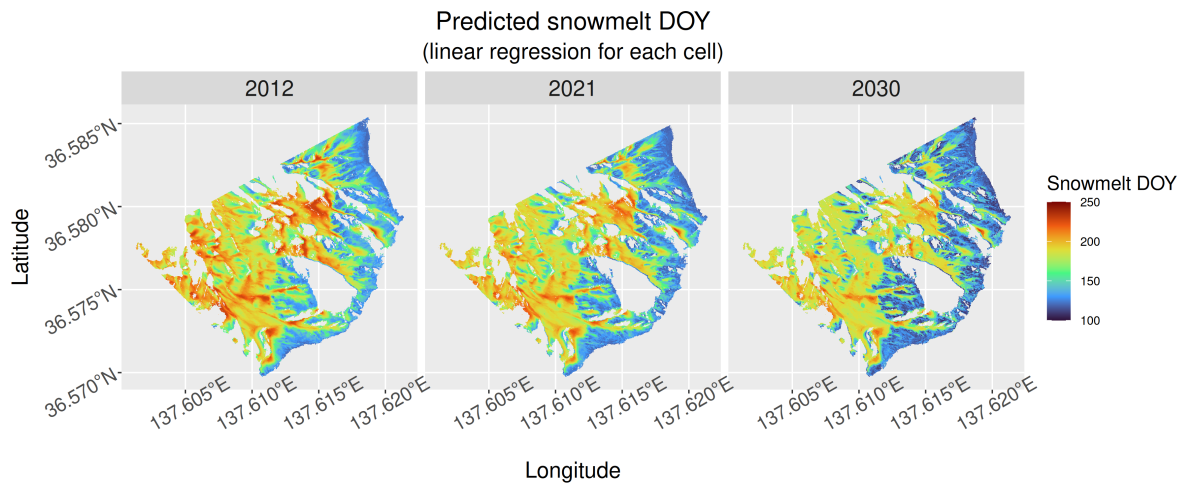mountain lodge where the camera was installed.

Fig. S2: Predicted snowmelt DOY (linear regression for each cell).
Predicted snowmelt DOY for 2012, 2021, and 2030, derived from cell-wise linear
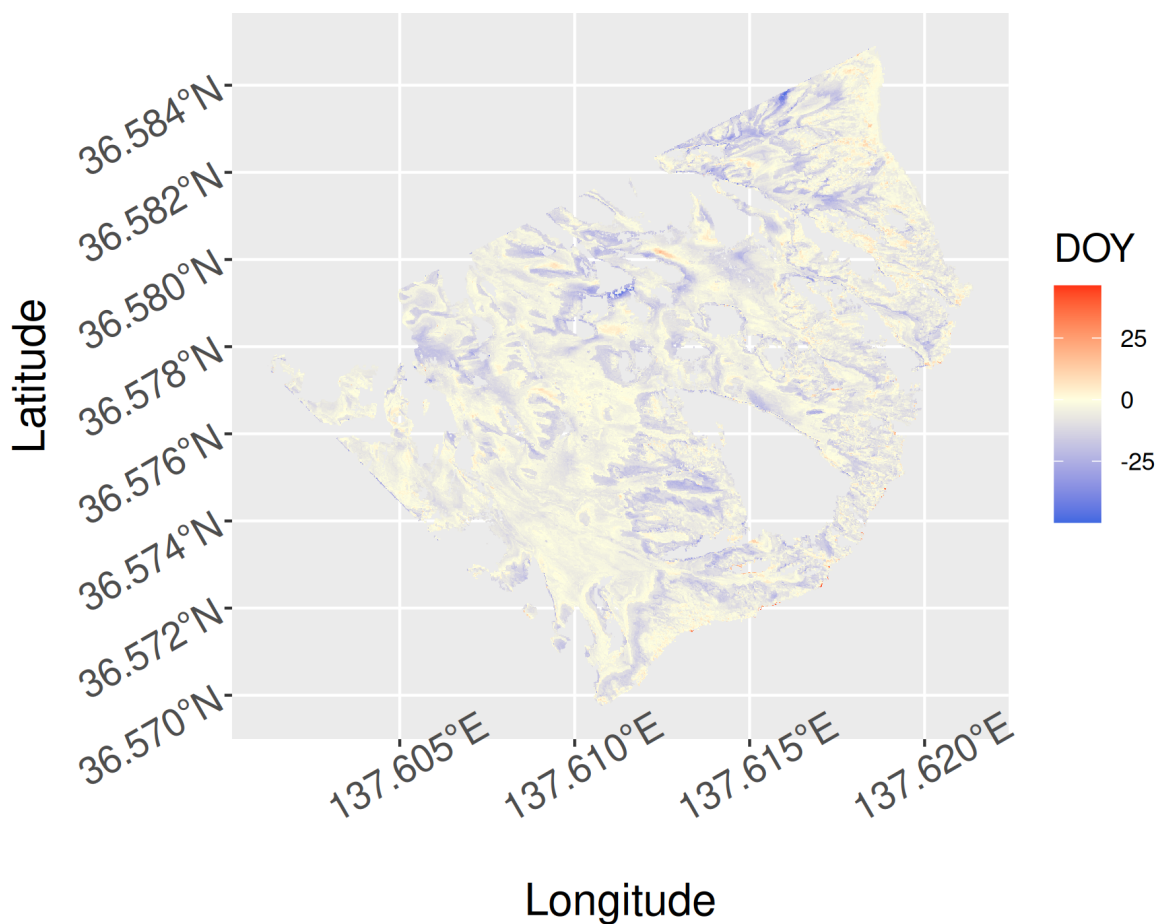regression models fitted to annual snowmelt DOY between 2011 and 2021.

Fig. S3: Changes in predicted snowmelt DOY (2021 − 2012; negative values indicate earlier snowmelt).
Difference in predicted snowmelt DOY between 2012 and 2021. Most areas show earlier snowmelt, with clear spatial heterogeneity in the degree of change.