Table R1. Structural Similarity Index Measure (SSIM), Spatial Efficiency metric (SPAEF; Demirel et al., 2018), RMSE, and Bias computed for the long-term climatology of simulated and MODIS LST fields over 2003-2018.

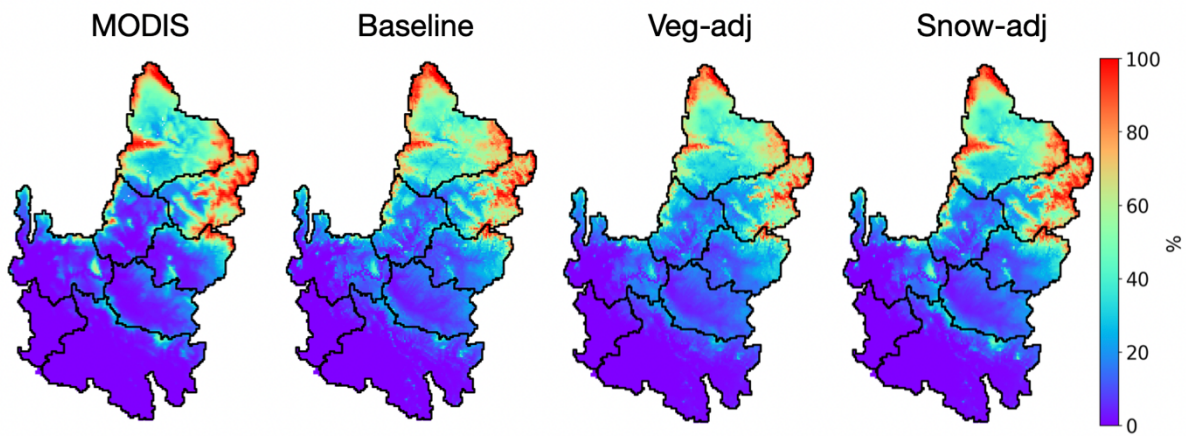|	Baseline	Forcing-adj	Veg-adj	Snow-adj
SSIM Daytime	0.881	0.878	0.927	0.927
SSIM Nighttime	0.662	0.703	0.698	0.701
SPAEF Daytime	0.763	0.798	0.925	0.930
SPAEF Nighttime	0.746	0.796	0.806	0.835
RMSE Daytime	2.701	3.256	1.624	1.597
RMSE Nighttime	2.394	1.965	1.958	1.952
Bias Daytime	1.552	2.493	0.538	0.331
Bias Nighttime	-0.607	0.242	0.135	-0.076

Figure R1. Long-term climatology of monthly snow cover (in %) derived from MODIS observations and VIC simulations in the snow season (November-May) over 2003-2018.
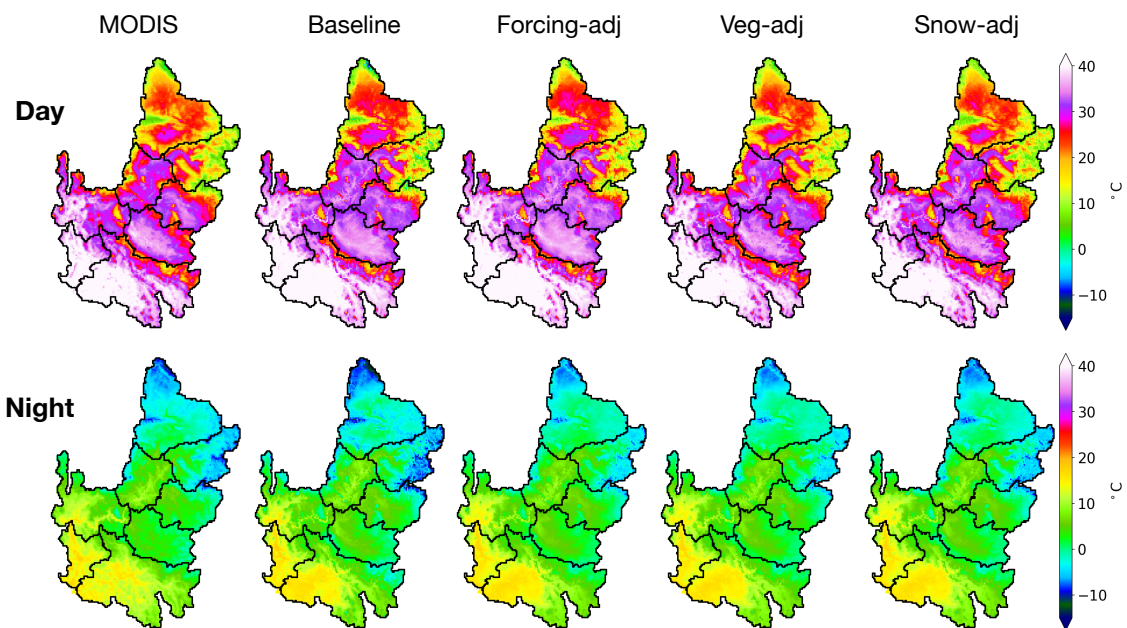
Figure R2. Long-term climatology of LST over 2003-2018 derived from MODIS observations and VIC simulations for each calibration step. Top (bottom) row is the daytime (nighttime) LST.

Reference:

Demirel, M. C., Stisen, S., and Koch, J.: SPAEF: SPAtial EFficiency, https://doi.org/10.5281/ZENODO.1158890, 2018.