

Supplement of

Precipitation Biases and Snow Physics Limitations Drive the Uncertainties in Macroscale Modeled Snow Water Equivalent

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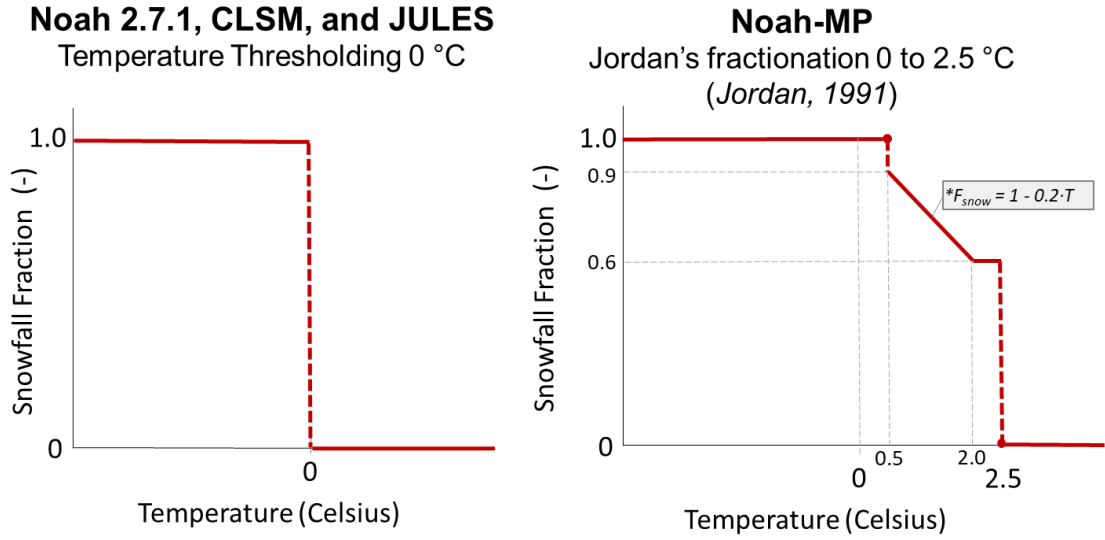


Figure S1. Schematic diagrams of the two precipitation partitioning methods, single threshold method (Catchment, JULES, and Noah) and Jordan's fractioning method (Noah-MP)

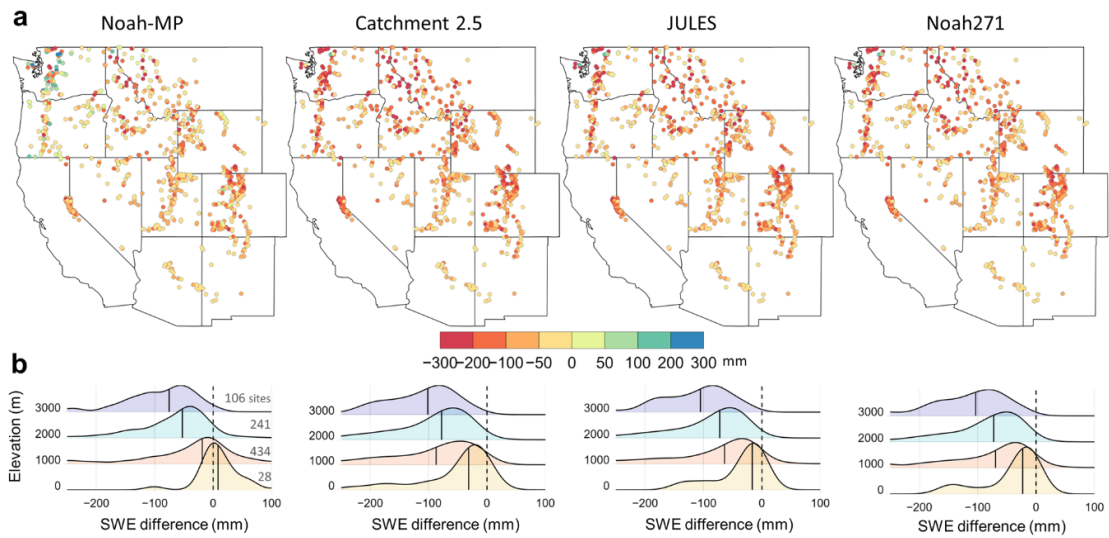


Figure S2. (a) Mean difference maps in SWE between four LSM estimates and SNOTEL across the western United States from 2010 to 2017 and (b) density plots of the SWE difference by four elevation ranges of SNOTEL sites

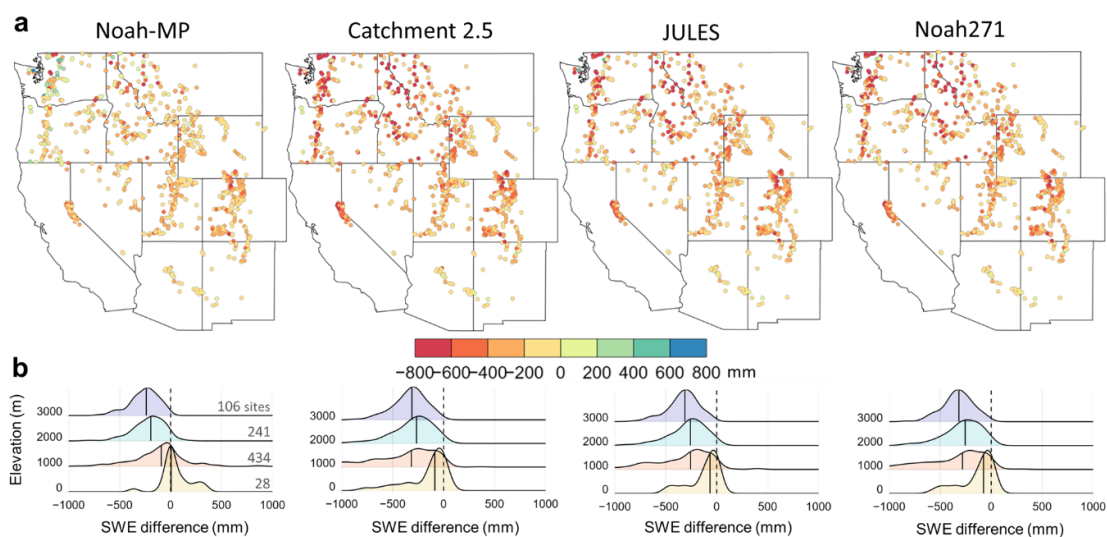


Figure S3. (a) Mean difference maps (four LSMs ensembled by three forcings minus SNOTEL) in the April 1st SWE from 2010 to 2017 across the western United States and (b) density plots of the SWE difference by four elevation ranges of SNOTEL sites

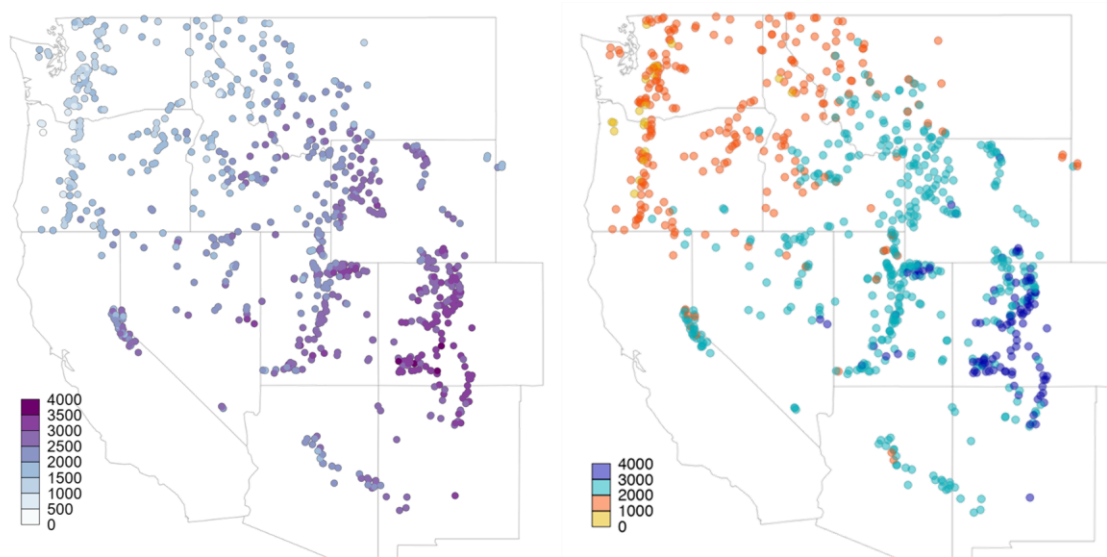


Figure S4. Time series of accumulated snowfall from three forcings (ECMWF, GDAS, and MERRA2) and accumulated precipitation from the SNOTEL data for eight water years from 2010 to 2017

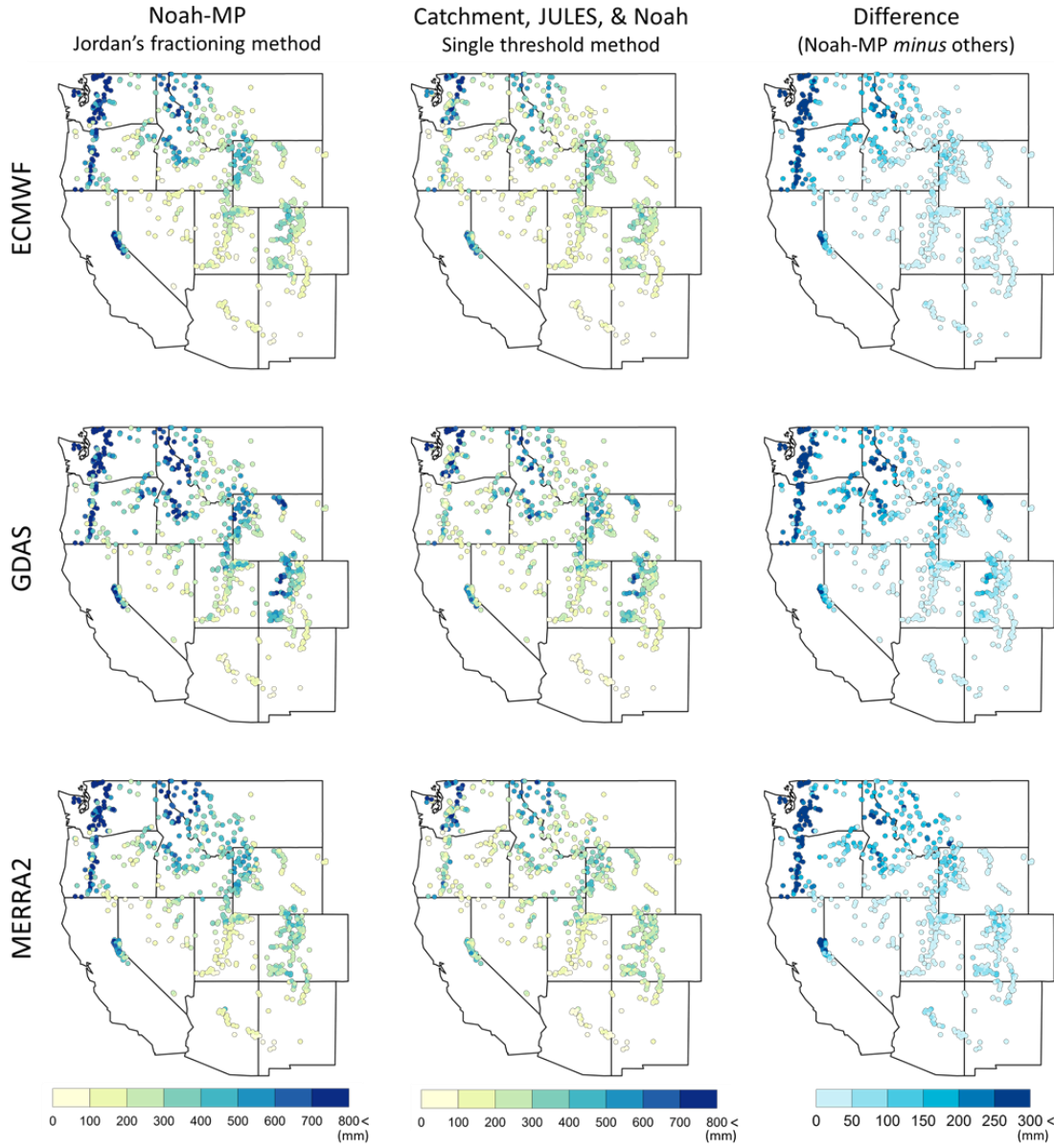


Figure S5. (a) Mean annual total snowfall maps from 2010 to 2017 using Jordan (1991)'s fractioning method in Noah-MP and a single threshold method (0°C) in other three LSMs with the three meteorological forcings and their difference maps

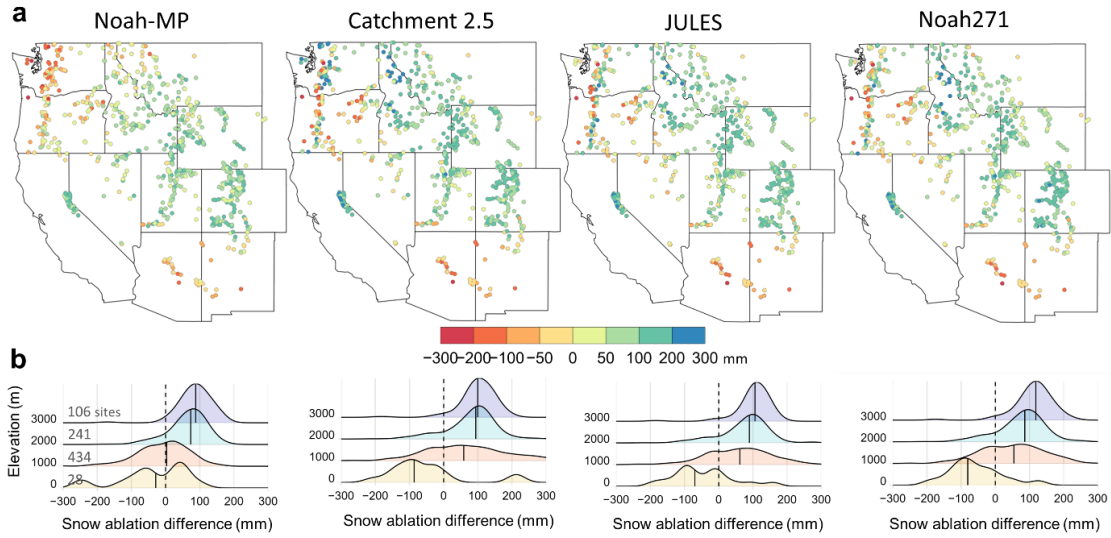


Figure S6. (a) Mean snow ablation difference maps (four LSMs ensembled by three forcings minus SNOTEL) during the accumulation periods from October 1 to April 1 for 2010 - 2017 across the western United States and (b) density plots of the snow ablation difference by four elevation ranges of SNOTEL sites

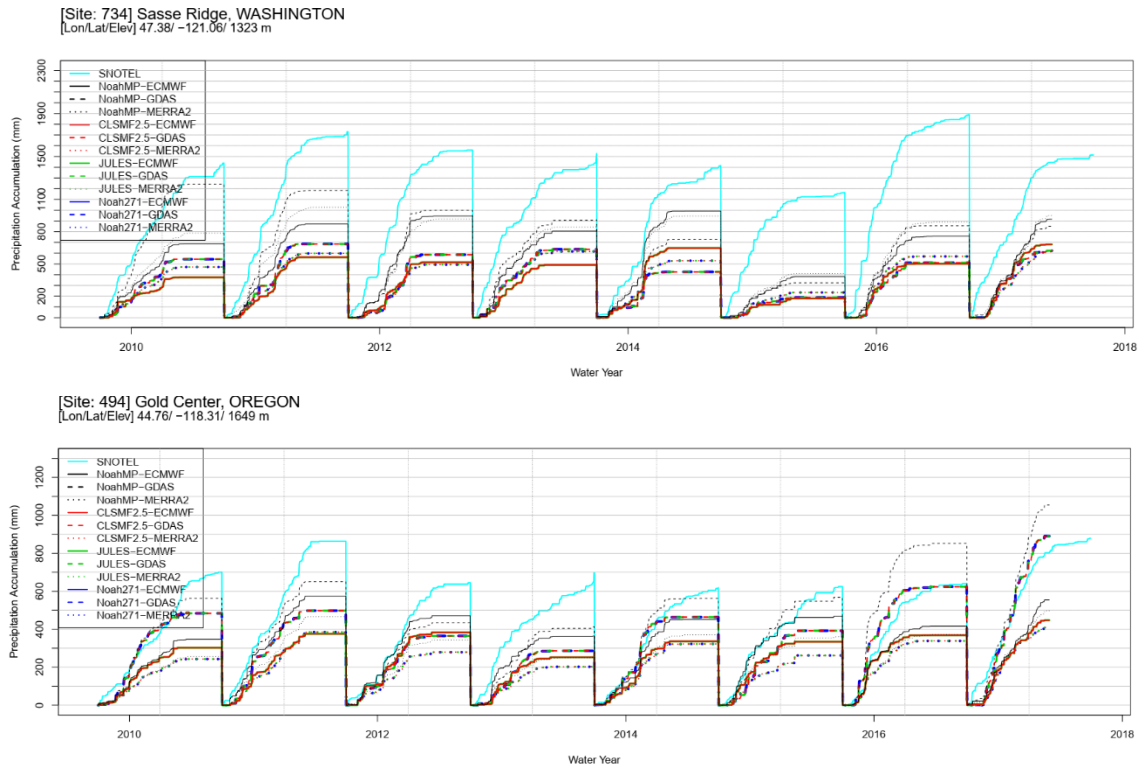


Figure S7. Time series of accumulated snowfall from three forcings (ECMWF, GDAS, and MERRA2) and accumulated precipitation from the SNOTEL data at two SNOTEL sites (Sasse Ridge, WA [No. 734] and Gold Center, OR [No. 494]) for eight water years from 2010 to 2017