

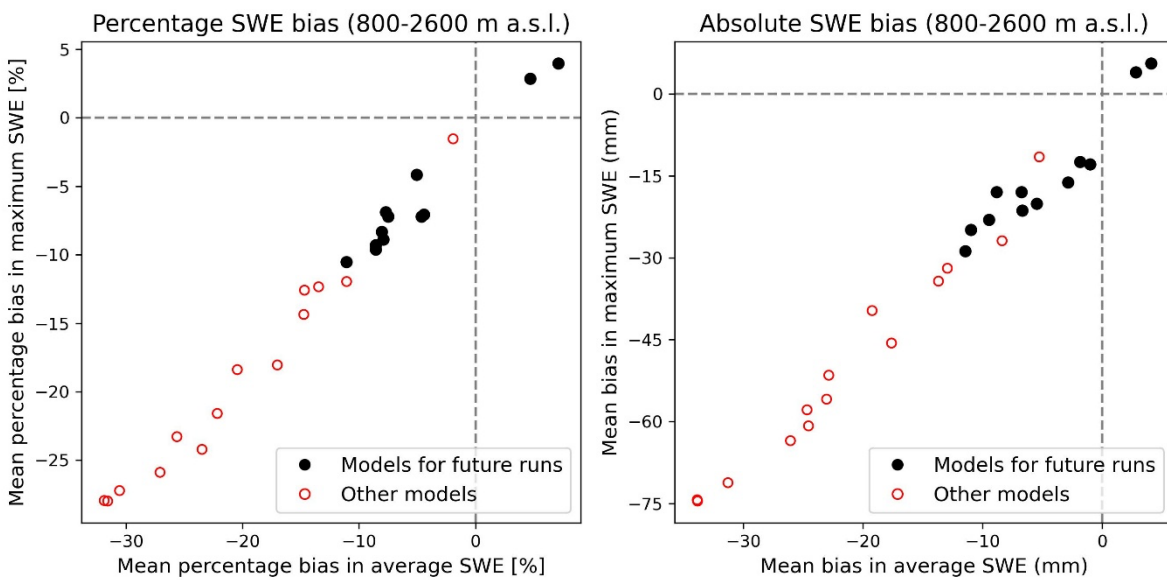
1 *Supplement of*

## 2 **Modeling 21st century snow dynamics in Switzerland using high-** 3 **resolution Climate CH2025 scenarios**

4 **Harsh Beria et al.**

5 *Correspondence to:* Harsh Beria ([hberia@ethz.ch](mailto:hberia@ethz.ch))

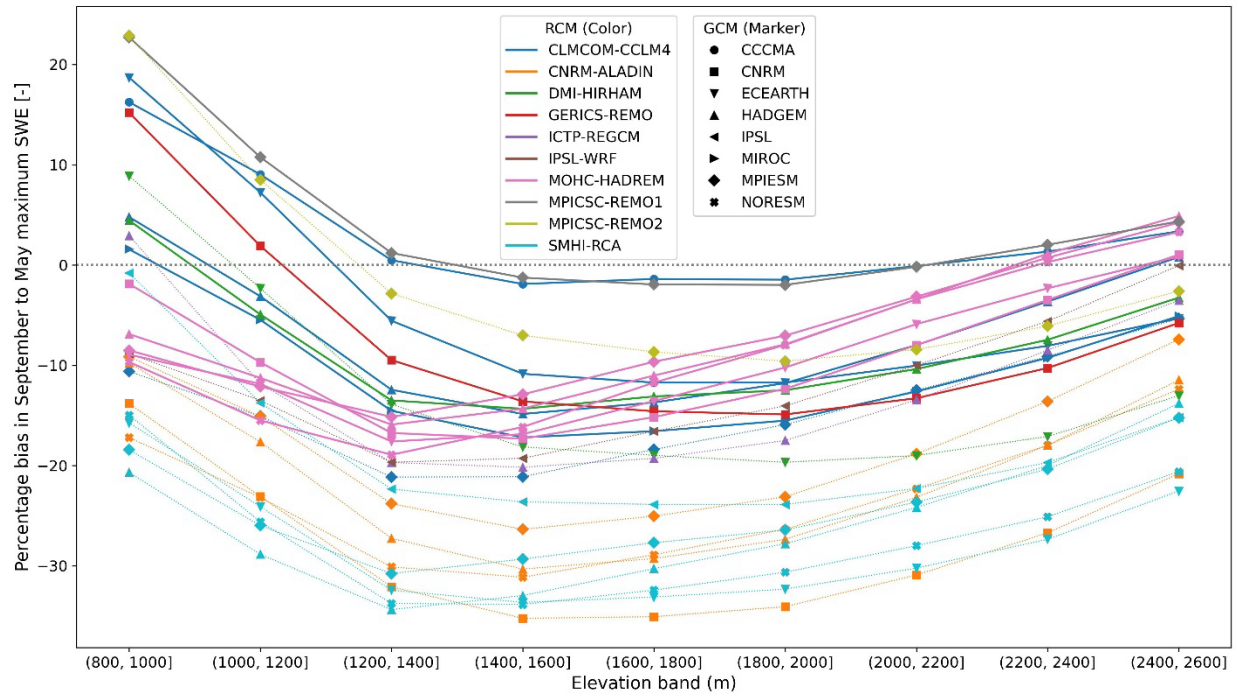
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8 Figure S1: Relationship between September-May mean SWE bias and maximum SWE bias for the 26 Climate  
9 CH2025 model chains over the 1991-2020 reference period. Biases were averaged across Switzerland and are shown  
10 as relative percentage bias (left) and absolute bias in millimeters SWE (right). Filled black circles indicate models  
11 selected for future SWE simulations, while red open circles indicate models excluded from future simulations.

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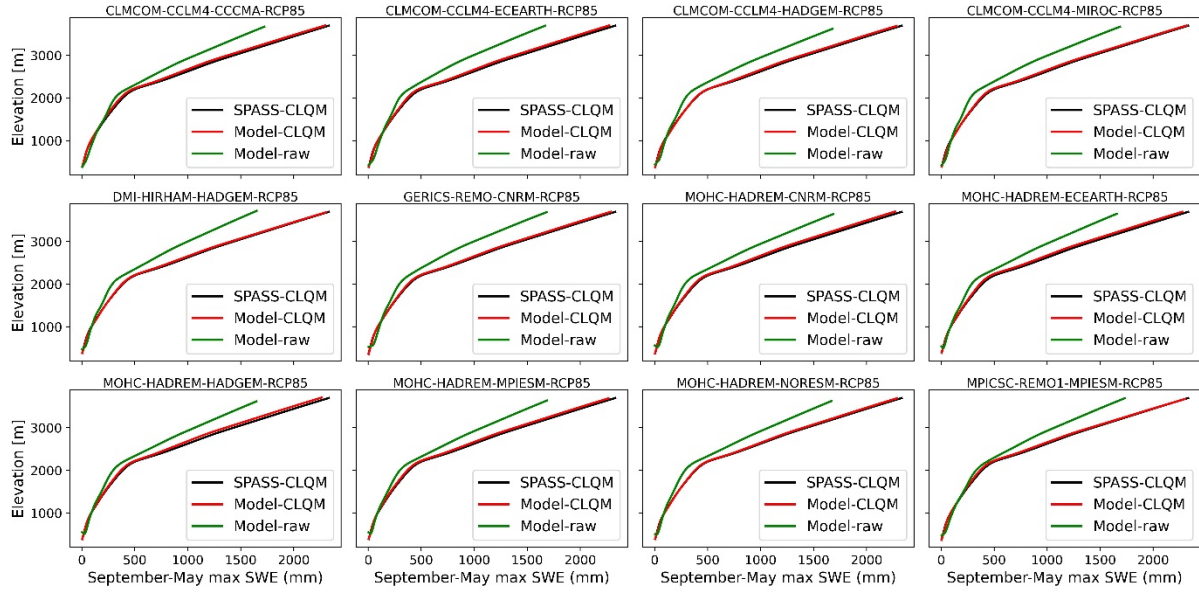
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14 Figure S2: Elevational dependence of September-May maximum SWE percentage bias for the 26 Climate CH2025  
 15 models over the 1991-2020 reference period. Biases are expressed relative to SPASS-CL and aggregated into 200 m  
 16 elevation bands from 800-2600 m a.s.l. Solid lines indicate model chains retained for future SWE simulations, while  
 17 dotted thin lines indicate model chains excluded from future simulations.

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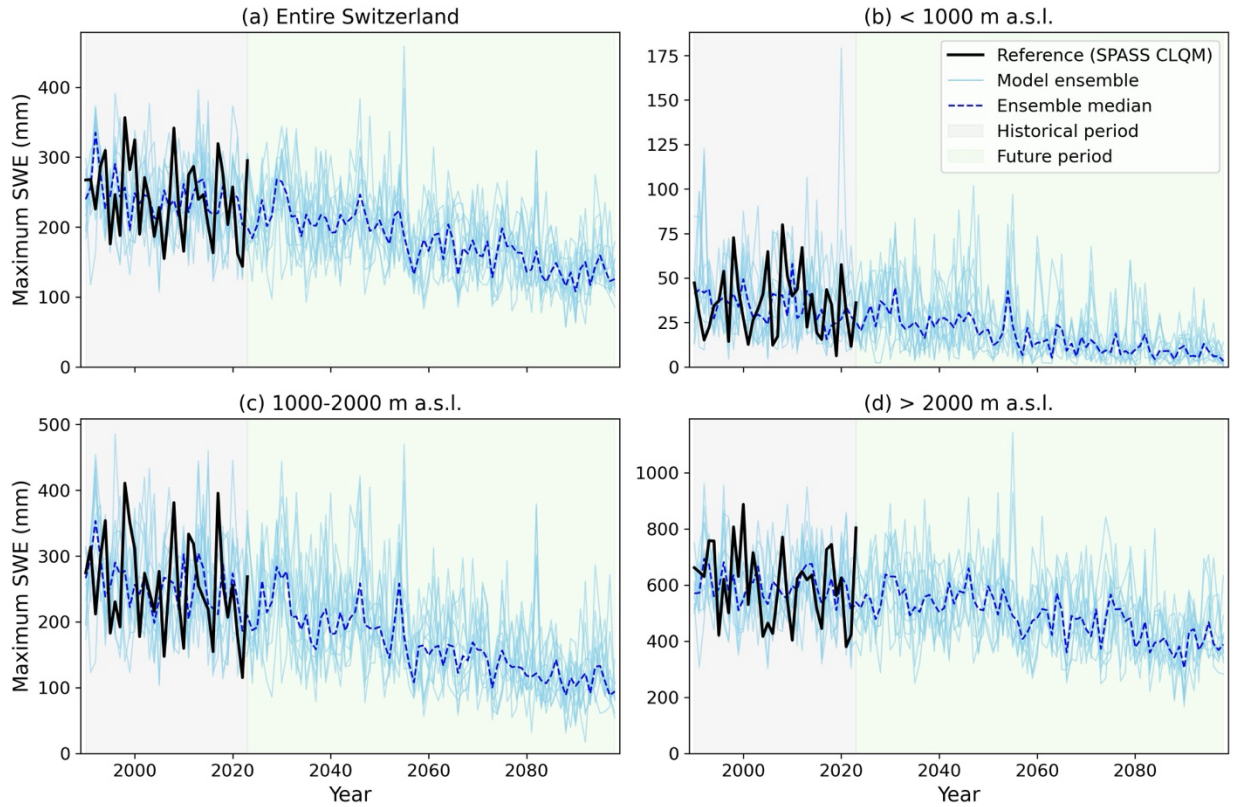


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22 Figure S3: Elevation dependence of September-May maximum SWE bias before and after quantile mapping of  
 23 simulated SWE for the 12 model chains retained for future scenarios. Biases are expressed as percentage differences  
 24 relative to the SPASS-CLQM reference dataset over the 1991-2020 reference period.

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28 Figure S4: Temporal evolution of September-May maximum SWE from 1991 to 2099 for the 12 selected Climate  
 29 CH2025 model chains, all of them assuming the RCP8.5 greenhouse gas scenario. SWE is averaged over (a)  
 30 Switzerland, (b) elevations below 1000 m a.s.l., (c) elevations between 1000 and 2000 m a.s.l., and (d) elevations  
 31 above 2000 m a.s.l. The 1991-2024 period is shaded in gray, and the future projection period is shaded in light green.  
 32 The black line shows the SPASS-CLQM reference dataset for the historical period. Individual model simulations are  
 33 shown in cyan, and the ensemble median is shown as a dashed violet line.