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Future Snow Water Equivalent and Snowmelt Extremes from NA-CORDEX Ensembles

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Snowpack and snowmelt driven extreme events can have large societal and economic consequences. Extreme snow can damage infrastructure and buildings. Snow meltwater is a dominant driver of severe spring flooding in the north-central and -eastern U.S. and southern Canada with impacts to the built and natural environments. However, the currently there is very limited guidance regarding the magnitude of “future” snow-driven extremes in a changing climate as needed to plan, design, and manage potentially vulnerable infrastructure and ecosystems. Regional climate models (RCMs) are commonly used to study and quantify regional climate changes, even though the ability of these models to accurately represent snow varies. In this study, trends and designs of extreme 25- and 100-year snowpack (snow water equivalent; SWE) and snowmelt events are estimated in the mid and late 21st century using the North America - Coordinated Regional Climate Downscaling Experiment (NA-CORDEX) ensemble of RCMs under Representative Con-centration Pathways 8.5 (RCP 8.5). This study aims to answer the following three research questions:

- How much will snow-driven extreme events be changed in the mid and late 21st century?
- Which regions have the largest differences among models?
- Which RCM models are the source of these regional uncertainties?