Uncertainty of regional climate change projections associated with atmospheric blocking events

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Important uncertainties in climate-change projections at the regional scale are related to large-scale patterns of climate variability such as atmospheric blocking. Here future projections in blocking frequency are examined using both multi-model and large ensembles of climate models, with a particular focus on the Pacific sector during winter in the Northern Hemisphere. The two types of ensemble are required to adequately sample uncertainty due to both model formulation, which can strongly the representation of blocking, as well as that due to internal (i.e., natural) variability. The large ensembles are used to evaluate how future changes in blocking depend on the persistence of the blocking events. Projections made using empirical indicators such as blocking indices are assessed in relation to projections in the climatological mean state and variability. The relevance of model errors to future blocking projections is evaluated by comparing skill-based weighted and unweighted projections.

Key words: blocking, regional climate change, extremes