



Atmospheric rivers and extreme precipitation in Norway

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‘Atmospheric rivers’ are long, narrow regions of high water vapour content that are responsible for the horizontal transport of moisture to higher latitudes. They are associated with the majority of extreme precipitation events in Norway throughout the observational record. These extreme precipitation events can be associated with flooding that has large impacts on society, such as the October 2014 event in Flåm. We examined changes in extreme precipitation between the current and future climates in the coupled global climate model, EC-EARTH, using high-resolution simulations (~25 km) that can resolve extratropical storms and atmospheric rivers. We use the r-largest method ($r=3$) to fit stationary (no covariates) and non-stationary (with an index of atmospheric rivers as a covariate) generalised extreme value distributions to the block maxima of annual precipitation. The value of a regional ‘index flood’ type approach is explored and future changes in the largest precipitation events of the year that are associated with atmospheric rivers are presented.