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## Future changes in atmospheric rivers and extreme precipitation in Norway

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Atmospheric rivers (AR) are associated with flooding events in Norway, like the flood that impacted Flåm in 2014. We assess trends in Norwegian AR characteristics, and the influence of AR variability on extreme precipitation in Norway. After evaluating the global climate model, EC-Earth, compared to the ERA-Interim reanalysis, we show that ARs increase in both intensity and frequency by the end of the century. In two regions on the west coast, the majority of winter precipitation maxima are associated with AR events (> 80% of cases). A non-stationary extreme value analysis indicates that the magnitude of extreme precipitation events in these regions is associated with AR intensity. Indeed, the 1-in-20 year extreme event is 17% larger when the AR-intensity is high, compared to when it is low. Finally, we find that the region mean temperature during winter AR events increases in the future. In the future, when the climate is generally warmer, AR days will tend to make landfall when the temperature is above the freezing point. The partitioning of more precipitation as rain, rather than snow, can have severe impacts on flooding and water resource management in Norway.