



## North Atlantic Atmospheric Rivers and Extreme Precipitation over Western Norway

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This study concerns with the interrelation between North Atlantic atmospheric rivers, extratropical cyclones and associated warm conveyor belts. Atmospheric (moisture) rivers are detected using the spatial and temporal extent of the vertically integrated water vapour and water vapour transport in the troposphere. Persistent atmospheric rivers resulting in the most extreme precipitation events over western Norway are then selected for further investigation. Finally, associated low-pressure systems are identified and their composite structure and life cycle are analysed.

Two synoptic configurations are remarkable in terms of the large-scale circulation and orientation of the cyclones. The first configuration is accompanied by a few small cyclones from a frontal wave oriented north-eastward, while the second configuration consists of a single large cyclone located over the northern part of the North Atlantic. The storm-related (or large-scale) and orographic precipitation for both configurations are also calculated and compared with the observed values at stations located throughout the western Norway. The interaction between the warm conveyor belt embedded within the warm sector of the frontal cyclone and the orographic forcing are shown to enhance the storm's associated precipitation.