



Atmospheric rivers and past hydrometeorological extremes: Challenges and opportunities

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Atmospheric rivers are a key term for describing water vapour transport in extratropical regions. The concept has become particularly valuable for linking meteorological process understanding with research focused on the impacts of heavy precipitation. Atmospheric rivers are narrow, elongated features of high integrated water vapour and water vapour flux can lead to severe precipitation and flooding if moisture is extracted efficiently. The orographic rises at the West Coast of the United States and Western Norway are regions where Atmospheric Rivers are one of the prime mechanisms for moisture delivery and precipitation extremes in the present climate. Due to the small horizontal scales of some of the processes climate models are challenged to represent this important transport process between mid-latitudes and the subtropics faithfully. Recent aircraft data and regional tracer model studies provide new insight into the formation and moisture transport mechanisms. In this study I review the concept and pertinent processes of Atmospheric Rivers, thereby focusing on caveats, challenges and opportunities for understanding past hydrometeorological extremes.