



## **Evaluation of the moisture sources in two extreme landfalling atmospheric river events using an Eulerian WRF tracers tool**

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A new 3-D tracer tool is coupled to the WRF model to analyze the origin of the moisture in two extreme atmospheric river (AR) events: the so-called “Great Coastal Gale of 2007” in the Pacific Ocean and the “Great Storm of 1987” in the North Atlantic. Results show that between 80 and 90% of moisture advected by the ARs, and a high percentage of the total precipitation produced by the systems have a tropical origin. The tropical contribution to precipitation is in general above 50% and largely exceeds this value in the most affected areas. Local convergence transport is responsible for the remaining moisture and precipitation. The ratio of tropical moisture to total moisture is maximized as the cold front arrives on land. Vertical cross sections of the moisture content suggest that the maximum in tropical humidity does not necessarily coincide with the low-level jet (LLJ) of the extratropical cyclone. Instead, the amount of tropical humidity is maximized in the lowest atmospheric level in southern latitudes and can be located above, below or ahead of the LLJ in northern latitudes in both analyzed cases.