Projections of Climate Change Effects on Global Atmospheric River Landfalls

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A number of studies have examined projected impacts of climate change on atmospheric river (ARs) landfalls in two specific regions of the globe (i.e. western North America, UK). However, a uniform global assessment of climate change impacts on AR landfalls has not been performed. Given the importance of landfalling ARs to annual water supplies and flood risk in regions studied to date, and the widespread occurrence of AR landfalls identified across the globe (Guan and Waliser, 2015), it is important to quantify how AR landfalls will change across the globe in association with long-term climate change. By applying an AR detection algorithm suitable for global studies to CMIP5 global climate projections, we will quantify and illustrate how AR landfalls across the globe are projected to change over the 21st century. Along with a general evaluation of CMIP5 model fidelity in representing global AR landfall frequencies and spatial distributions in the present climate, our analysis will describe projected changes in AR landfall frequency, intensity (i.e. integrated vapor transport), and seasonal distributions. Along with our global assessment of climate change on AR landfalls, our study will highlight the implications of projected changes in AR landfalls on water supply and flood risk at the regional scale.