Identifying the mayor sources of Hindu Kush Himalayan air and moisture using a Lagrangian approach

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The Hindu Kush-Karakoram-Himalyan region directly supports the livelihood of 200,000 million people and provides water and ecosystem services to 1.3 billlion people. Through rain fall and snow melt, agriculture and power generation are heavily dependent on reliable sources of water. This work examines the major sources of moisture over the Hindu Kush Himalayan region using a Lagrangian method which identifies the humidity contributions across the region using the ERA-Interim dataset over the period from 1980-2015. While many parts of this region are used to heavy precipitation during summer monsoon, in other regions such as Pakistan, these events are less frequent due to varying degrees of influence from mid-latitude weather systems in addition to those of the Tropics, over the course of the year. These findings show the impact of teleconnections on regional and seasonal changes of moisture sources across the HinduKush-Karakoram-Himalyan and provide insight into the related mechanisms.

Key words: moisture sources, transport, Himalayas, precipitation, Pakistan