

# Himalayan winds play role in cloud and moisture transport, water redistribution

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Credit: British Antarctic Survey

Around 1 billion people depend on water resources originating from the

Hindu-Kush Karakoram Himalayan region, attributable to both rainfall and melting of snow and ice.

The wind in the valleys in the region plays an important role in transporting clouds and moisture and redistributing snow in the valleys, and so understanding what drives this wind is crucial. Around the world, wind in valleys generally travels up the valley, and up the sides of mountains, during the day. This is often driven by differences in pressure caused by the slopes of the mountains and the shape of the valleys. Here we use a regional climate [model](#) to determine whether the difference in pressure is the main cause of the acceleration of the wind in the Everest valley, or whether there are other forces which also affect the wind.

A comparison with observations shows that the model represents the diurnal cycle of the local winds well during both the summer (July 2013) and winter (January 2014) periods examined, with strong daytime up-valley winds and weak nighttime winds in both periods. Analysis of the forces driving the acceleration of the wind near the surface shows that they are driven by [pressure gradient](#), but also by turbulence and advection.

The forcing terms are extremely variable over the valley, and also strongly influenced by the presence of [glaciers](#). When glaciers are removed from the model in the summer run, the [wind](#) continues much further up the valley, indicating how the local valley winds might respond to future glacier shrinkage. This work will help the development of regional climate models in the Hindu-Kush Karakoram Himalaya, which are crucial for predicting future precipitation and glacier melt in the region.

**More information:** Emily R. Potter et al. Dynamical Drivers of the Local Wind Regime in a Himalayan Valley, *Journal of Geophysical*

*Research: Atmospheres* (2018). [DOI: 10.1029/2018JD029427](https://doi.org/10.1029/2018JD029427)

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