



Explaining contrasting climatic trends between the Central Himalaya and Karakoram with WRF simulators

Leila Carvalho

University of California, Santa Barbara

Glaciers over the central Himalaya have retreated at particularly high rates in recent decades, while most glaciers over the Karakoram are stable or have even advanced. To address the meteorological factors associated with this contrast, thirty-four years of Climate Forecast System Reanalyses (CFSR) are dynamically downscaled from 1979 to 2013 with the Weather Research and Forecasting (WRF) model over High Mountain Asia at convection permitting grid spacing (6.7km). In all seasons, CFSR shows an anti-cyclonic warming trend over most of the region, but the most distinctive differences between the central Himalaya and Karakoram are in summer. In summer, the central Himalaya has been beneath an anti-cyclonic trend, which the downscaling shows has reduced cloud cover, leading to a significant warming trend at the surface. Also, precipitation has significantly decreased over the central Himalaya. The Karakoram has been under the influence of a cyclonic cooling trend in the mid-troposphere, although in the upper troposphere the Karakoram has been under the same warming trend as the central Himalaya. According to the downscaling, there are no trends in precipitation or surface temperature over the Karakoram in summer, which is in strong contrast to the trends over the central Himalaya. Although other seasons are important for glacier mass balance, these trends identified by the downscaling in summer may explain much of the observed differences between the central Himalaya and Karakoram, in terms of the evolution of their glaciers in recent decades.

SPECIAL DATE, TIME, AND LOCATION

Wednesday, 22 March 2017, 1:30 PM

Refreshments 1:15 PM

NCAR-Foothills Laboratory

3450 Mitchell Lane

Bldg. 2, **Room 1001**