>> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

Submitted Abstract

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Abstract

Many efforts are underway to generate accurate local scale high resolution reference gridded data for mountain regions where data is generally sparse. This study is one of the efforts under the project of APN named "Towards robust projections of climate extremes and adaptation plans over South Asia" which aims to prepare local scales (5 km) reference data for the mountainous regions of Pakistan and Nepal that will be used to downscale CMIP6 data and produce local information on climate extremes and identify vulnerable regions.

In the first step, quality control was conducted to station data using both an objective and subjective technique. ERA5 data were adjusted for bias using observation data. To obtain a grid dataset with 5 km of horizontal resolution, we combine observed data with regularly spaced data (from bias-corrected ERA5 for instance) using kriging. ERA5 are excluded from the regions where an observation stations are available since station data has a higher weight. For the case of temperature, to minimize the errors that occur during the interpolation in regions with scarcity of observed data (in mountainous region) and rugosity topography. For this reason, the temperature is adjusted taking into account the estimated average of the Lapse Rate of Temperature (LRT). This adjustment takes into account the topography of the region where the interpolation is being calculated. For this purpose, a digital elevation model (high resolution) - Global 30 Arc-Second Elevation (GTOPO30) from U.S. Geological Survey (USGS). Following the preparation of the reference data, a seasonal maps are prepared to analyze the region's climatology, as well as local information on climatic extremes to identify vulnerable regions.