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Glacier changes in the Nanga Parbat Himalayas: a re-photographic survey between the 1930s and now

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In contrast to the relatively well investigated glacier and landscape changes in the mountains of Europe and North America, very little investigations and documentations using repeat photography have been undertaken in the Himalayas and other high mountain regions of Asia. The present study seeks to investigate glacier and landscape changes in the Nanga Parbat region (NW-Himalaya) using a multi-temporal and multi-spatial approach which is based on terrestrial repeat photography and remote sensing data. A comprehensive collection of historical landscape photographs, taken by members of the German Himalaya expeditions 1934 and 1937, forms a valuable baseline data set for the area. Recent fieldwork made it possible to repeat a large number of these photographs viewpoints identical to the earlier ones, and the direct comparisons illustrate glacier dynamics and landscape changes over a span of seventy years. Furthermore, in order to fill the temporal gap and to analyze temporal and spatial dynamics of glaciers over the last 40 years we use different satellite sensors (Corona, Aster, Landsat, Spot, QuickBird). First investigations were carried out at the Raikot Glacier, which is located at the northern declivity of the Nanga Parbat, the ninth highest peak on earth. The multi-temporal comparison detects only small down-wasting rates of the Raikot Glacier over the last 70 years and a retreat of the terminus of about 250 m which is characterized by great fluctuations. Based on this multi-temporal and multi-data approach, we will detect and analyze glacier and landscape changes in the whole Nanga Parbat region.