

Surface Temperature Estimation from Landsat ETM⁺ Data for a part of the Baspa Basin, NW Himalaya, India

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Abstract

This paper presents results of extracting surface temperatures from Landsat ETM⁺ Thermal Band (Band 6, Low gain) data for the Baspa River Basin, Himachal Pradesh, India. Initially, Top of Atmospheric (TOA) radiance is extracted from the digital number (DN) values. The TOA radiance is then converted to surface radiance by applying the Reference Channel Emissivity (RCE) method, assuming the emissivity of the study area is constant (0.97, the emissivity of glacier ice). The surface temperature is then extracted from the surface radiance. Based on images from June and October 2000, mean temperatures of 17.25°C and 11.98°C, respectively, are inferred. The extracted temperature data were compared to observed temperatures and showed a good correlation, with differences of 1–2°C.