

Remote Sensing and GIS-Based Environmental Monitoring by Extracting Land Surface Temperature of Abbottabad, Pakistan

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Abstract : Continuous environmental determinism and climatic change in the entire globe due to increasing land surface temperature (LST) has become a vital phenomenon nowadays. LST is accelerating because of increasing greenhouse gases in the environment which results of melting down ice caps, ice sheets and glaciers. It has not only worse effects on vegetation and water bodies of the region but has also severe impacts on monsoon areas in the form of capricious rainfall and monsoon failure extensive precipitation. Environment can be monitored with the help of various geographic information systems (GIS) based algorithms i.e. SC (Single), DA (Dual Angle), Mao, Sobrino and SW (Split Window). Estimation of LST is very much possible from digital image processing of satellite imagery. This paper will encompass extraction of LST of Abbottabad using SW technique of GIS and Remote Sensing over last ten years by means of Landsat 7 ETM+ (Environmental Thematic Mapper) and Landsat 8 vide their Thermal Infrared (TIR Sensor) and Optical Land Imager (OLI sensor less Landsat 7 ETM+) having 100 m TIR resolution and 30 m Spectral Resolutions. These sensors have two TIR bands each; their emissivity and spectral radiance will be used as input statistics in SW algorithm for LST extraction. Emissivity will be derived from Normalized Difference Vegetation Index (NDVI) threshold methods using 2-5 bands of OLI with the help of e-cognition software, and spectral radiance will be extracted TIR Bands (Band 10-11 and Band 6 of Landsat 7 ETM+). Accuracy of results will be evaluated by weather data as well. The successive research will have a significant role for all tiers of governing bodies related to climate change departments.

Keywords : environment, Landsat 8, SW Algorithm, TIR

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