Database of Precipitation and Temperature from Remote Sensing MODIS

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Abstract: Meteorological data is one of the key parameters used for environmental monitoring in regional and global scale. Total Precipitable Water Vapor (TPW) and Land Surface Temperature (LST) retrieved from satellite data may be used in several environmental issues such as meteorological model, monitoring drought and estimating soil moisture. To use the TPW and LST data in such purposes, their database should be developed. The objective of this paper is to create the database of TPW and LST data over Thailand from the Moderate Resolution Imaging Spectroradiometer (MODIS) data onboard the Terra and Aqua Earth Observation System. The present works focus on the database of LST data over the period of 2008-2012. To derive LST from MODIS data, we use a script in conjunction with Geographic Resources Analysis Support System (GRASS), a free and open source geographical information system. Then the batch data processes such as image rectification, re-projection, image mosaic and raster calculation for obtaining the LST value were performed by GRASS. Finally, the database of LST is created. In this paper, the design and development workflow of database most suitable for LST are described. The LST derived from MODIS is then validated with temperature measured from weather stations. To demonstrate the application of this database, the LST data is applied to drought monitoring in Thailand. The future work of this research will focus on TPW data.

Keyword: Land Surface Temperature, MODIS, GRASS, Remote Sensing