

عنوان مقاله:

An Attempt in Presenting Model for Temperature Determination at Near Land Surface Using MODIS Images

محل انتشار:

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خلاصه مقاله:

Near surface air temperature spatiotemporal patterns are highly depended on the ground surface characteristics and vary over time and space. This makes Land Surface Temperature (LST) an important parameter for air temperature estimation. Since the air temperature is affected by many natural features, in this study, it is tried to model the air temperature by deploying some of these parameters. The parameters whom have been taken into account in this study include land surface temperature, Normalized Difference Vegetation Index (NDVI), Total precipitable Water (TPW) and Lifted Index (LI) as measure of air stability. To assess the impact of each of these parameters, 15 different linear regression models were tested. In addition to linear modeling, several nonlinear models and Support Vector Regression air temperature (SVR) methods was performed. To model, the time series data of Arkansas state in united states over 11 years have been used. Finally, to evaluate the models, state of Missouri meteorological data and some field measurements have been used. The NDVI, TPW and LI parameters are products of MODIS. Finally it was found out that the LST and TPW have positive effect, LI have negative and NDVI had slightly positive impact on the air temperature at meters height. the achieved accuracy in linear model when all parameters are involved in, was 2.33°C with correlation coefficient of $R=0.94$. Next, nonlinear models were examined. It was found that it doesn't end up to any significant increase in the accuracy but certainly increases the computation time. Finally SVR model was applied to the linear model taking all parameters into account. The achieved accuracy of this model was about 3.45°C with correlation coefficient of 0.94.

کلمات کلیدی:

Air temperature, Atmospheric parameters, Linear regression, SVR, MODIS, Remote Sensing

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