APPLICATION OF REMOTE SENSING AND REGRESSION TECHNIQUES TO ESTIMATE RELATIVE HUMIDITY

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High values of relative humidity and air temperature at the surface level cause significant impacts on human health. Relative humidity is usually obtained from stations but these observations have limitations related with their spatial and temporal resolution that in consequence produce problems for real time monitoring the behavior of this variable. In this work, it is expected to derive a model to estimate the relative humidity in hourly basis for land covered areas under clear sky conditions. The introduced model is developed using forward selection technique with an algorithm that controls the occurrences of the multicollinearity problem. The derived regression model includes sinusoidal functions that control the daytime sun exposure at each grid point. Estimation of relative humidity is based on three physical parameters: land surface temperature, precipitable water and normalized vegetation index, as well as some geographical and temporal data. These data are obtained primarily from two satellites: 1) Geostationary Operational Environmental Satellite (GOES) and 2) Aqua and Terra satellites with polar orbit. Observations from meteorological stations are used as the ground truth to perform model development and validation. This study is conducted for the Mesoamerican and Caribbean Area which includes the zone between 0 to 30 degrees north and 60 to 100 degrees west. Preliminary results has shown that it is feasible to estimate relative humidity using the described methodology and obtaining a R^2 value about 0.52, those results encouraging and they are expected to be improved in the near future with the inclusion of more parameters.