Estimated daily average net radiation from MODIS data over Brazilian southeast under all sky conditions

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Daily average net radiation (DANR), is a fundamental variable for estimation of daily evapotranspiration (ET) at watershed or regional scales, and in turn for hydrological modeling and water resources management. Nevertheless, the traditional methods for estimating the DANR are inadequate at these scales because of their spatial discontinuity and the uneven distribution of radiation sites. The remote sensing provides numerous terrestrial and atmosphere products, which can help to overcome the spatial limitations. Recently, several algorithms have been developed to estimate DANR from MODIS data, however, these have been restricted to cloudless days, or are dependent on site-specific secondary data. In this study, we use the methodology proposed by Bisht and Bras (2010) to estimate DANR, using only remote sensing data under all sky conditions. This framework is used over the restinga of Marambaia -RJ in the Brazilian southeast, during 2015. The results, when validated with the data collected in an automatic meteorological station, present a good agreement. The results of remote sensing showed good performance r2 = 0.93, RMSE = 85.81 Wm-2, MAE = 74.50 Wm-2 and d = 0.96. In general, this methodology can be consider as interesting alternative in an effort to calculate the DANR for areas without any instrumentation. In Brazil, outside the Amazon, research on DANR under all sky conditions with ground validation data is difficult to find, which have made our study significant.