

The Influence of Air Temperature Controls in Estimation of Air Temperature over Homogeneous Terrain

Authors : Fariza Yunus, Jasmee Jaafar, Zamalia Mahmud, Nurul Nisa' Khairul Azmi, Nursalleh K. Chang, Nursalleh K. Chang

Abstract : Variation of air temperature from one place to another is caused by air temperature controls. In general, the most important control of air temperature is elevation. Another significant independent variable in estimating air temperature is the location of meteorological stations. Distances to coastline and land use type are also contributed to significant variations in the air temperature. On the other hand, in homogeneous terrain direct interpolation of discrete points of air temperature work well to estimate air temperature values in un-sampled area. In this process the estimation is solely based on discrete points of air temperature. However, this study presents that air temperature controls also play significant roles in estimating air temperature over homogeneous terrain of Peninsular Malaysia. An Inverse Distance Weighting (IDW) interpolation technique was adopted to generate continuous data of air temperature. This study compared two different datasets, observed mean monthly data of T, and estimation error of T-T', where T' estimated value from a multiple regression model. The multiple regression model considered eight independent variables of elevation, latitude, longitude, coastline, and four land use types of water bodies, forest, agriculture and build up areas, to represent the role of air temperature controls. Cross validation analysis was conducted to review accuracy of the estimation values. Final results show, estimation values of T-T' produced lower errors for mean monthly mean air temperature over homogeneous terrain in Peninsular Malaysia.

Keywords : air temperature control, interpolation analysis, peninsular Malaysia, regression model, air temperature

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