LONG–TERM SPATIO – TEMPORAL WARMING TENDENCY IN THE VIETNAMESE MEKONG DELTA BASED ON OBSERVED AND GRIDDED DATASETS

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ABSTRACT

Detecting and estimating statistical characteristics of a given time series are one of the most essential tasks in hydrology and climatology. In this study, the annual mean and extreme temperatures from 11 meteorological stations over the Vietnamese Mekong Delta were subjected to normality, homogeneity and trend analysis by employing a number of powerful statistical tests (i.e., Shapiro–Wilk, cumulative deviations, Sen's slope estimator, classical Mann–Kendall and trend–free pre–whitening procedure with Mann–Kendall test). As for spatial assessment, the well–known (0.5° × 0.5°) gridded datasets (i.e., CRU TS 4.01) were also used to examine trend possibilities for three different time scales (i.e., 1901– 2016, 1951–2016 and 1981–2016) by integrating interpolation algorithms (i.e., IDW and ordinary kriging) with the classical/modified Mann–Kendall test. The outcomes show high domination of significantly increasing trends. Additionally, the results of trend estimation indicate that the magnitude of increase in minimum temperatures was mostly greater than the mean and maximum ones and the recent period (1981–2016) also revealed higher increasing rates compared to the previous periods. In general, these findings yield various evident indications of warming tendency in the Vietnamese Mekong Delta over the last three decades.

INTEGRATION OF GIS, GROUP AHP AND TOPSIS IN EVALUATING SUSTAINABLE LAND-USE MANAGEMENT IN THE ZONE OF THE SALTWATER AND FRESHWATER INTERACTIONS IN THE CONTEXT OF CLIMATE CHANGE: A CASE STUDY IN KIEN GIANG PROVINCE

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ABSTRACT

Climate change is a multi-criteria decision making (MCDM) problem that relates tovarious fields (natural, economic, social). In this research, the results achieved in the integration of GIS, AHP group and TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) in solving ESLM problem. The integration process is as follows: i) Identify sustainability indicators using the FAO approach; ii) Calculating the weight of each sustainability element by using AHP in group decision making; iii) Using GIS to build thematic layers corresponding to suitability elements and to combine layers; iv) Using TOPSIS method to calculate and to rank land suitability. This integrated model is used to evaluate land in the zone of the saltwater and freshwater interaction in the context of climate change, Kien Giang province, Vietnam. The similarities and differences are drawn through comparing results obtained by this method with the results obtained by using GIS, AHP group and the weighted average method.