Influence of Bioclimatic Variables on Distribution of Public Parks in Nakhon Ratchasima Municipality, Thailand

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Abstract: Public parks are believed to be affected to climatic data worldwide, and thus may serve as important indicators of climate change. This study aimed to examine influence of bioclimatic variables on the spatial distribution of 14 public parks in Nakhon Ratchasima municipality of Thailand. Bioclimatic variables were analysed by BIOCLIM modeling that was produced from two spatial climatic factors: rainfall and temperature. Herein, both climatic data were taken from Thai Meteorological Department (TMD) on 30-year period (2001-2552) that was prepared in excel and then was processed by kriging method in ArcGIS 9.x. Moreover, bioclimatic variables was produced by BIOCLIM modeling, was exacted by correlation analysis with correlation coefficient > 0.7 (or to be suitable for season of Thailand), and finally was used for studying relationship between bioclimatic variables and 14 public parks.

As a result, BIOCLIM modeling has produced 19 bioclimatic variables, was selected by correlation analysis, and was outputted by 10 bioclimatic variables (6 bioclimatic temperatures and 4 bioclimatic precipitations) including (1) BIO1: mean annually temperature, (2) BIO2: mean diurnal range, (3) BIO4: Temperature Seasonality, (4) BIO5: Annually Maximum Temperature , (5) BIO6: Annually Minimum Temperature, (6) BIO7: Annually Temperature Range, (7) BIO12: Mean Annually Precipitation, (8) BIO13: Annually Maximum Precipitation, (9) BIO14: Annually Minimum Precipitation and (10) BIO15: Precipitation Seasonality. Relationship between 10 bioclimatic variables and 14 public parks in Nakhon Ratchasima municipality that were analyzed by GIS technique. The overall of the study area showed meanly BIO1 between 14.80-27.40 °C, BIO2 between 11.70-13.10 °C, BIO4 between 2.02-2.69, BIO5 between 24.90-39.00°C, BIO6 between 2.60-15.40°C, BIO12 between 879-1355 mm., BIO13 between 167-308 mm., BIO14 between 4-23 mm., and BIO15 between 66-87. The output of this study will be used to be modeled to predict the distribution of public parks integrated other related variables further.

Keywords: Bioclimatic variables, Public parks, Nakhon Ratchasima municipality