Study Variability of the Land Surface Temperature of Land Cover during El Niño Southern Oscillation (ENSO) in a Tropical City

ABSTRACT

The World Health Organization has reported numerous fatalities, primarily among urban residents, during El Niño events. This study employed remote sensing technology to investigate the influence of the El Niño Southern Oscillation on temperature. The objective was to analyze the effect of ENSO on temperature across different land cover types using Landsat satellite data. Pre-processing was applied to the satellite data before converting numerical values into surface temperatures. The findings revealed that RS technology effectively captured the impact of varying ENSO intensity levels on surface temperatures. ENSO strength influenced temperature variations in the study areas. During El Niño events, urban areas exhibited higher land surface temperatures compared to vegetation, wetlands, and water bodies, a pattern consistent during La Niña. Specifically, there was a 2.5 °C temperature increase in the urban land cover area during El Niño events between 2016 and 1997. Water bodies, vegetation, and wetlands experienced respective temperature increases of 0.17 °C, 0.17 °C, and +0.7 °C during ONI value 1 events between 2016 and 1997. These findings are crucial for local authorities, providing spatial information on hot spots to enhance vigilance against potential El Niño temperatures.