

Observed Trends in Extreme Temperature over the Klang Valley, Malaysia

ABSTRACT

This study investigates the recent extreme temperature trends across 19 stations in the Klang Valley, Malaysia, over the period 2006–16. Fourteen extreme index trends were analyzed using the Mann–Kendall non-parametric test, with Sen’s slope as a magnitude estimator. Generally, the annual daily mean temperature, daily mean maximum temperature, and daily mean minimum temperature in the Klang Valley increased significantly, by $0.07^{\circ}\text{C yr}^{-1}$, $0.07^{\circ}\text{C yr}^{-1}$ and $0.08^{\circ}\text{C yr}^{-1}$, respectively. For the warm temperature indices, the results indicated a significant upward trend for the annual maximum of maximum temperature, by $0.09^{\circ}\text{C yr}^{-1}$, and the annual maximum of minimum temperature, by $0.11^{\circ}\text{C yr}^{-1}$. The results for the total number of warm days and warm nights showed significant increasing trends of 5.02 d yr^{-1} and 6.92 d yr^{-1} , respectively. For the cold temperature indices, there were upward trends for the annual minimum of maximum temperature, by $0.09^{\circ}\text{C yr}^{-1}$, and the annual minimum of minimum temperature, by $0.03^{\circ}\text{C yr}^{-1}$, concurrent with the decreases in the total number cold days (TX10P), with -3.80 d yr^{-1} , and cold nights (TN10P), with -4.33 d yr^{-1} . The 34°C and 37°C summer days results showed significant upward trends of 4.10 d yr^{-1} and 0.25 d yr^{-1} , respectively. Overall, these findings showed upward warming trends in the Klang Valley, with the minimum temperature rate increasing more than that of the maximum temperature, especially in urban areas.