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Time-frequency analysis of dengue fever incidences in Taiwan under the impact of climate change

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The frequency of extreme weather event occurrences has increased as a result of climate change. Recently dengue fever has become a serious public health issue in southern Taiwan. This paper introduces a time-frequency analysis to examine the impact of climate change on the incidences of dengue fever. The long-term association among dengue fever incidences and hydro-meteorological variables is characterized in this study. The inter-annual and annual scales are identified to be significant in dengue fever incidences. Using the proposed time-frequency analysis, the fluctuation of the temporal lag effect is observed among dengue fever incidences, precipitation, relative humidity and temperature at annual scale, indicating the diverse mechanism during both the epidemic periods and normal time of dengue fever incidences. It is confirmed that the outbreak of dengue fever is associated with the El Niño-Southern Oscillation (ENSO) events using time-dependent intrinsic correlation (TDIC) approaches.

Biography

Christina W Tsai received her Ph.D. degree in Civil and Environmental Engineering from University of Illinois at Urbana-Champaign, USA. She is currently a Professor at Department of Civil Engineering at the National Taiwan University. She has published more than 70 papers in top-tiered journals and conference proceedings. Dr. Tsai is a Member of several international journal editorial boards.

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