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Evaluation of Hydrologic and Meteorological Impacts on Dengue Fever Incidences in Southern Taiwan using Time- Frequency Method

Christina Tsai and Ting-Gu Yeh
National Taiwan University, Taiwan (cwstsai@ntu.edu.tw)

Extreme weather events are occurring more frequently as a result of climate change. Recently dengue fever has become a serious issue in southern Taiwan. It may have characteristic temporal scales that can be identified. Some researchers have hypothesized that dengue fever incidences are related to climate change. This study applies time-frequency analysis to time series data concerning dengue fever and hydrologic and meteorological variables. Results of three time-frequency analytical methods - the Hilbert Huang transform (HHT), the Wavelet Transform (WT) and the Short Time Fourier Transform (STFT) are compared and discussed. A more effective time-frequency analysis method will be identified to analyze relevant time series data. The most influential time scales of hydrologic and meteorological variables that are associated with dengue fever are determined. Finally, the linkage between hydrologic/meteorological factors and dengue fever incidences can be established.