



Trends in rain rate distribution derived from gauges in Hong Kong

Stephen PW Lau (1), Long S Chiu (1,2), and T C Lee (3)

(1) Institute of Space and Earth Information Science, Chinese Univ. Hong Kong, PRC (pws lau@yahoo.com.hk), (2) Geography and Geoinformation Science, GMU, Fairfax VA 22030 USA (lchiu@gmu.edu), (3) Hong Kong Observatory

The impact of the increase in emission of greenhouse gases and changes in land cover/land use pattern have resulted in change in the general circulation of the atmosphere and the energy and water cycles. While there is general consensus in trends in temperature, the changes in the water cycle, in particular precipitation is still uncertain. Climate models predict relatively small change in the total rainfall, however, the distribution of rain rates becomes more extreme, i.e. increases in heavy and light or no/rain and decrease in the moderate rain categories. These complicated issues are compounded by the increase aerosols resulted from pollution, particularly in Megacities such as Hong Kong. To assess the changes associated with the regional hydrologic cycle due to these factors, we examine a long time series (starting in the late 1940s) of hourly rainfall of all gauge stations in Hong Kong maintained by the Hong Kong Observatory. In this presentation, annual variations of the rain rate distributions, the diurnal cycle, and rain event characteristics (duration, storm total, conditional rain rates, and separation) for the winter monsoon, summer monsoon, mid-summer rain and typhoon periods will be presented. Trends of the rain rate categories, event statistics, diurnal variability, will be examined by linear regression analysis, Empirical Mode Decomposition and wavelet analysis.