

香港極端風力、降雨及溫度的長期趨勢
Long-term trends of extreme winds, rainfall and temperature in Hong Kong

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摘要

Abstract

利用加入時間變數的廣義極端值分佈方法分析於香港天文台總部在 1884 年至 2008 年錄得的雨量和溫度資料以及於橫瀾島在 1968 年至 2008 年錄得的風力資料，探討香港極端降雨、溫度及風力的長期趨勢。結果顯示，在 1884 年至 2008 年間香港天文台總部的一至三小時的極端降雨量以及極端日最低和最高氣溫有顯著的上升趨勢，而香港天文台總部的四至二十四小時的極端降雨量、橫瀾島的極端十分鐘平均風速和最高陣風都沒有明顯的趨勢。達到每小時 100 毫米的一小時降雨量的重現期從 1900 年的 37 年縮短到 2000 年的 18 年，而出現 4 度或以下的嚴寒天氣的重現期從 1900 年的 6 年拉闊到 2000 年的 163 年。此外，千年一遇的日最低氣溫由 1900 年的 -1.7°C 上升至 2000 年的 3.6°C 。

Applying extreme value theory, a time-varied generalized extreme value (GEV) distribution was fitted to the rainfall and temperature data recorded from 1884 to 2008 at the Hong Kong Observatory Headquarters and wind speed data recorded from 1968 to 2008 at Waglan Island to examine the long-term trends of the extreme values of these weather elements in Hong Kong. Analysis results showed that the extreme 1 to 3-hourly rainfall amounts and the extreme daily minimum and maximum temperatures at the Hong Kong Observatory Headquarters exhibited statistically significant long term rising trends while the trends of the extreme 4 to 24-hourly rainfall at the Hong Kong Observatory and the extreme 10-minute mean wind speed and maximum gust at Waglan Island were not significant. The return period for the hourly rainfall rate reaching 100 mm per hour was shortened from 37 years in 1900 to 18 years in 2000. On the other hand, the return period for the daily minimum temperature of 4°C or lower was lengthened from 6 years in 1900 to 163 years in 2000. Furthermore, the 1000-year return value of daily minimum temperature at the Hong Kong Observatory Headquarters rose from -1.7°C in 1900 to 3.6°C in 2000.