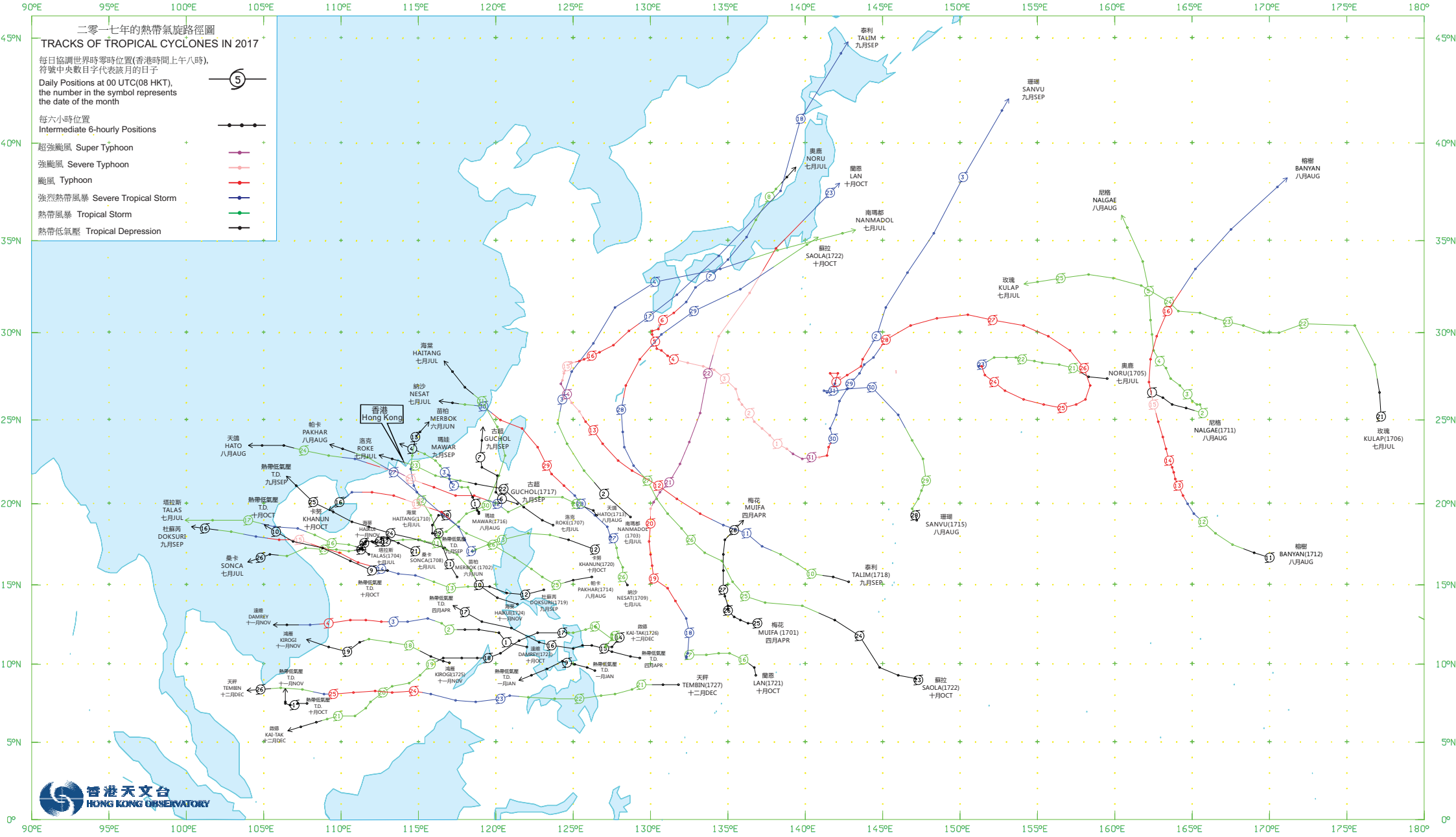
二零一七年的熱帶氣旋路徑圖
TRACKS OF TROPICAL CYCLONES IN 2017
每日協調世界時零時位置(香港時間上午八時),
符號中央數目字代表該月的日子
Daily Positions at 00 UTC(08 HKT),
the number in the symbol represents
the date of the month
每六小時位置
Intermediate 6-hourly Positions
超強颱風 Super Typhoon
強颱風 Severe Typhoon
颱風 Typhoon
強烈熱帶風暴 Severe Tropical Storm
熱帶風暴 Tropical Storm
熱帶低氣壓 Tropical Depression
香港
Hong Kong
泰利
TALIM
九月SEP
珊瑚
SANVU
九月SEP
奧鹿
NORU
七月JUL
蘭恩
LAN
十月OCT
南瑪都
NANMADOL
七月JUL
蘇拉
SAOLA(1722)
十月OCT
玫瑰
KULAP
七月JUL
榕樹
BANYAN
八月AUG
尼格
NALGAE
八月AUG
奧鹿
NORU(1705)
七月JUL
尼格
NALGAE(1711)
八月AUG
玫瑰
KULAP(1706)
七月JUL
珊瑚
SANVU(1715)
八月AUG
榕樹
BANYAN(1712)
八月AUG
泰利
TALIM(1718)
九月SEP
梅花
MUIFA
四月APR
梅花
MUIFA (1701)
四月APR
蘭恩
LAN(1721)
十月OCT
蘇拉
SAOLA(1722)
十月OCT
天秤
TEMBIN(1727)
十二月DEC
海棠
HAITANG
七月JUL
納沙
NESAT
七月JUL
苗柏
MERBOK
六月JUN
帕卡
PAKHAR
八月AUG
洛克
ROKE
七月JUL
瑪娃
MAWAR
九月SEP
古超
GUCHOL
九月SEP
天鴿
HATO
八月AUG
熱帶低氣壓
T.D.
九月SEP
塔拉斯
TALAS
七月JUL
杜蘇芮
DOKSURI
九月SEP
熱帶低氣壓
T.D.
十月OCT
卡努
KHANUN
十月OCT
桑卡
SONCA
七月JUL
海葵
HAITANG(1710)
七月JUL
瑪娃
MAWAR(1716)
八月AUG
古超
GUCHOL(1717)
九月SEP
洛克
ROKE(1707)
七月JUL
天鴿
HATO(1713)
八月AUG
南瑪都
NANMADOL
(1703)
七月JUL
塔拉斯
TALAS(1704)
七月JUL
桑卡
SONCA(1708)
七月JUL
苗柏
MERBOK (1702)
六月JUN
卡努
KHANUN(1720)
十月OCT
帕卡
PAKHAR(1714)
八月AUG
納沙
NESAT(1709)
七月JUL
杜蘇芮
DOKSURI(1719)
九月SEP
熱帶低氣壓
T.D.
四月APR
海葵
HAIKUI(1724)
十一月NOV
遠揚
DAMREY
十一月NOV
鴻雁
KIROGI
十一月NOV
啟德
KAI-TAK(1726)
十二月DEC
遠揚
DAMREY(1723)
十月OCT
熱帶低氣壓
T.D.
一月JAN
鴻雁
KIROGI(1725)
十一月NOV
天秤
TEMBIN
十二月DEC
啟德
KAI-TAK
十二月DEC
香港天文台
HONG KONG OBSERVATORY

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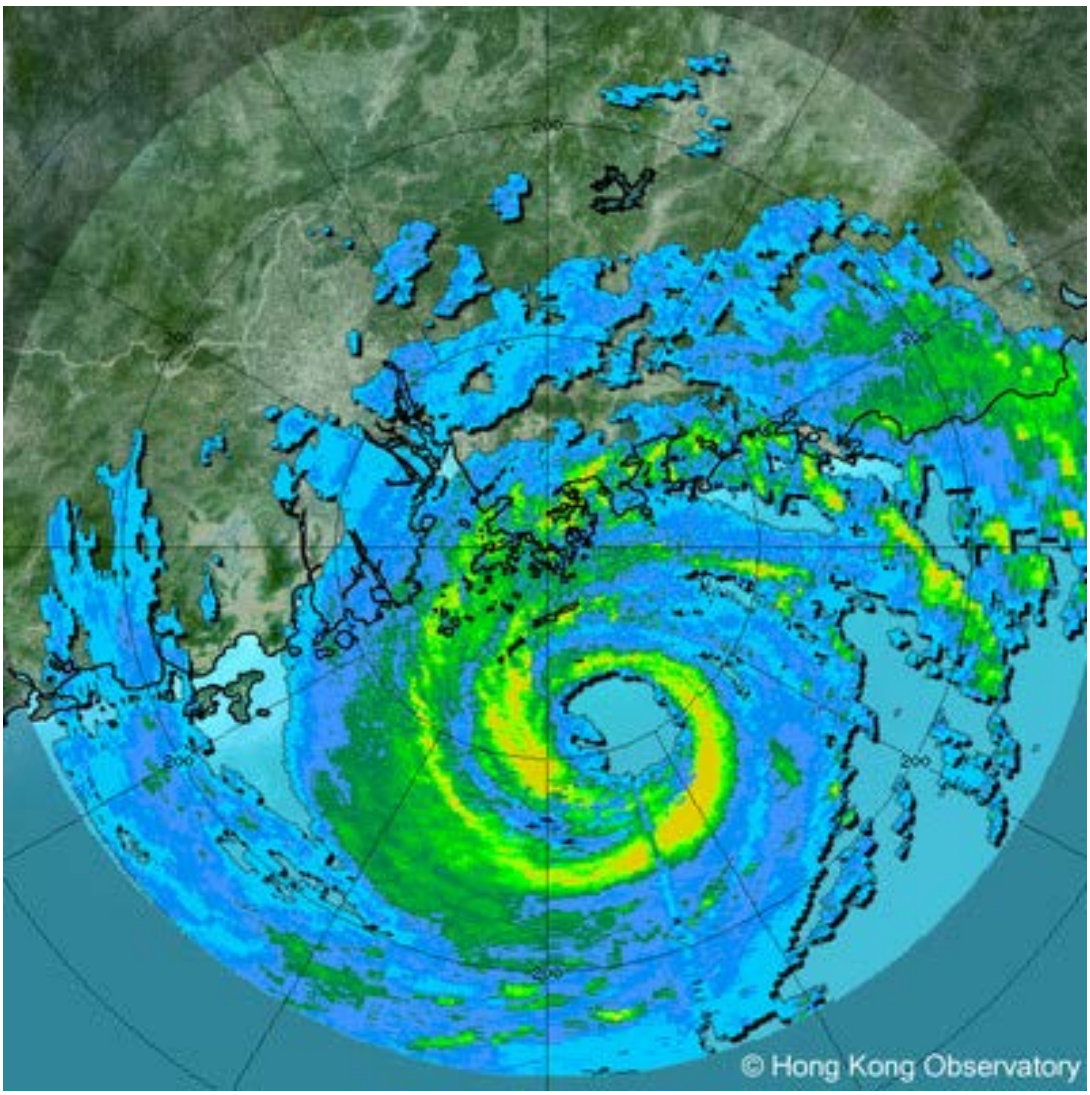
頁 3	目錄	更新
頁 189	表 4.10: 二零一七年熱帶氣旋在香港所造成的損失	更新
頁 217	附件一: 超強颱風天鴿(1713)引致香港直接經濟損失的估算	新增

Page 4	CONTENTS	Update
Page 189	TABLE 4.10: DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG IN 2017	Update
Page 219	Annex 1: Estimated Direct Economic Losses in Hong Kong caused by Super Typhoon Hato (1713)	Add

香港天文台
HONG KONG OBSERVATORY

二零一七年熱帶氣旋

TROPICAL CYCLONES IN 2017



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Hong Kong Observatory
134A Nathan Road
Kowloon, Hong Kong

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二零一七年八月二十三日上午8時的雷達圖像，天鴿的風眼清晰可見。

Cover

Image of radar echoes at 8 a.m. on 23 August 2017 which clearly shows the eye of Hato.

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第一節　　引言

1.1熱帶氣旋刊物的沿革

除了在一九四零至一九四六年因二次大戰而中斷外，天文台自一八八四年以來便一直進行地面氣象觀測，並將整理好的數據撮列於由天文台出版的《氣象資料》年刊內。天文台在一九四七年開始進行高空氣象觀測後，該年刊便分成兩冊：分別是《氣象資料第一冊（地面觀測）》及《氣象資料第二冊（高空觀測）》。一九八一年，年刊第二冊改稱為《無線電探空儀觀測摘要》，而第一冊亦於一九八七年改稱為《香港地面觀測年報》。一九九三年，該兩刊物由一本名為《香港氣象觀測摘要》的新刊物所取代。這份摘要載列了地面及高空的氣象數據。

一八八四至一九三九年期間，部分對香港造成破壞的颱風的報告，曾以附錄形式載於《氣象資料》年刊內。而在一九四七至一九六七年出版的《天文台年報》，更擴充了有關熱帶氣旋的內容，收納所有導致香港吹烈風的熱帶氣旋的報告。其後，年刊系列加推《氣象資料第三冊（熱帶氣旋摘要）》，以記載每年北太平洋西部及南海區域所有熱帶氣旋的資料。此冊第一期在一九七一年出版，內容包括一九六八年赤道至北緯45度、東經100至160度範圍內所有熱帶氣旋的報告。由一九八五年開始，第三冊的覆蓋範圍東面邊界由東經160度伸展至180度。一九八七年，第三冊改稱為《熱帶氣旋年報》，內容大致上維持不變。年報由一九九七年起以中英雙語刊印，一年後加設電腦光碟版，二零零零年以網上版取代印刷版。

在一九三九年及以前，每年北太平洋西部及南海區域的熱帶氣旋的路徑圖都收錄於《氣象資料》年刊內。一九四七至一九六七年的路徑圖則載列於《氣象資料第一冊》內。在早期的刊物內，熱帶氣旋的路徑只顯示每日位置，而每日定位時間在某程度上還未統一。但到了一九四四年以後，則一直維持以每日協調世界時(UTC)零時作定位。此項改變的資料詳載於天文台出版的《技術記錄第十一號第一冊》內。由一九六一年開始，所有熱帶氣旋的路徑圖都顯示每六小時的位置。

為了能回應傳媒、航運界及其他有關人士或團體的需求，天文台自一九六零年開始就影響香港的個別熱帶氣旋編寫臨時報告，盡早為有需要的人士提供資料。初時，天文台只就那些曾導致天文台發出烈風或暴風信號以上的熱帶氣旋編寫臨時報告。自一九六八年起，天文台為所有引致天文台發出熱帶氣旋警告信號的熱帶氣旋編寫臨時報告。

1.2 熱帶氣旋等級

為了讓市民對較強的颱風特別提高警覺，天文台在二零零九年開始將「颱風」分為三級，即「颱風」、「強颱風」和「超強颱風」。根據熱帶氣旋中心附近的最高持續地面風速，熱帶氣旋共分為以下六個級別：

(i) 熱帶低氣壓（T.D.）的最高持續風速為每小時63公里以下。
(ii) 熱帶風暴（T.S.）的最高持續風速為每小時63至87公里。
(iii) 強烈熱帶風暴（S.T.S.）的最高持續風速為每小時88至117公里。
(iv) 颱風#（T.）的最高持續風速為每小時118至149公里。
(v) 強颱風*（S.T.）的最高持續風速為每小時150至184公里。
(vi) 超強颱風*（SuperT.）的最高持續風速為每小時185公里或以上。

1.3 熱帶氣旋命名

從一九四七年至一九九九年，北太平洋西部及南海區域的熱帶氣旋非正式地採用美國軍方「聯合颱風警報中心」所編訂的名單上的名字。由二零零零年開始，日本氣象廳根據一套新名單為每個達到熱帶風暴強度的熱帶氣旋命名。這套名單（表1.1）經颱風委員會通過，共有140個名字，分別由亞太區內14個國家或地區提供。這些名字除了用於為國際航空及航海界發放的預測和警報外，也是向國際傳媒發放熱帶氣旋消息時採用的規範名稱。而名單會每年檢討和更新，通常導致嚴重傷亡的熱帶氣旋會依照受影響國家或地區的要求而被刪除。提供該名字的國家或地區會建議新名字取代。

另外，日本氣象廳在一九八一年起已獲委託為每個在北太平洋西部及南海區域出現而達到熱帶風暴強度的熱帶氣旋編配一個四位數字編號。例如編號“1702”代表在二零一七年區內第二個被日本氣象廳分類為熱帶風暴或更強的熱帶氣旋。在年報內，此編號會顯示在熱帶氣旋名稱後的括弧內，例如強烈熱帶風暴苗柏（1702）。

1.4 資料來源

年報內的海平面氣壓及地面風資料，是根據天文台氣象站及測風站網絡所錄得的數據。表1.2及1.3分別是該些網絡內各站的位置及海拔高度。

二零零九年以前颱風的最高持續風速為每小時118公里或以上。
* 二零零九年新增等級。

熱帶氣旋產生的最大風暴潮是由裝置在香港多處的潮汐測量器量度。圖1.1是本年報內提及的各個風速表及潮汐測量站的分佈地點。

年報內的雨量資料來自天文台氣象站和雨量站網絡及土力工程處的雨量站。

除特別列明外，年報內提及的最高持續風速均為10分鐘內風速的平均值；每小時平均風速為該小時前60分鐘內的平均風速；每日雨量為當天香港時間午夜前24小時內的總雨量。

1.5 年報內容

年報第二節是二零一七年所有影響北太平洋西部及南海區域的熱帶氣旋的概述。

年報第三節是二零一七年影響香港的熱帶氣旋的個別詳細報告，內容包括：

(i) 該熱帶氣旋對香港造成的影響；
(ii) 發出熱帶氣旋警告信號的過程；
(iii) 香港各地錄得的最高陣風風速及最高每小時平均風速；
(iv) 香港天文台錄得的最低平均海平面氣壓；
(v) 香港天文台及其他地方錄得的每日總雨量；
(vi) 香港各潮汐測量站錄得的最高潮位及最大風暴潮；及
(vii) 氣象衛星雲圖及雷達圖像。

有關熱帶氣旋的各種資料及統計表載於年報第四節內。

二零一七年每個熱帶氣旋的每六小時位置，連同當時的最低中心氣壓及最高持續風速，則表列於年報第五節內。

年報依照內文需要採用了不同的時間系統。正式的時間以協調世界時（即UTC）為準。至於在熱帶氣旋的敘述中，用作表示每天各時段的詞彙，例如“上午”、“下午”、“早上”、“黃昏” 等則是指香港時間。香港時間為協調世界時加八小時。

1.6 香港的熱帶氣旋警告系統

表 1.4 是香港熱帶氣旋警告信號的定義。

由二零零七年開始，發出 3 號和 8 號信號的參考範圍由維多利亞港擴展至由八個涵蓋全港並接近海平面的參考測風站組成的網絡(圖 1.1 顯示 2017 年所採用的八個參考測風站)。這些測風站處於較為空曠的位置，地理上的考慮也包括山脈地勢的自然分隔，可概括地反映全港的風勢。

當參考網絡中半數或以上的測風站錄得或預料持續風速達到指標的風速限值，而且風勢可能持續時，天文台會考慮發出 3 號或 8 號信號。

Section 1 INTRODUCTION

1.1 Evolution of tropical cyclone publications

Apart from a disruption due to World War II during 1940-1946, surface observations of meteorological elements since 1884 have been summarized and published in the Observatory's annual publication "Meteorological Results". Upper-air observations began in 1947 and from then onwards the annual publication was divided into two parts, namely "Meteorological Results Part I - Surface Observations" and "Meteorological Results Part II - Upper-air Observations". These two publications were re-titled "Surface Observations in Hong Kong" and "Summary of Radiosonde-Radiowind Ascents" in 1987 and 1981 respectively. In 1993, both publications were merged into one revised publication entitled "Summary of Meteorological Observations in Hong Kong", including surface as well as upper-air data.

During the period 1884-1939, reports on some destructive typhoons were printed as Appendices to the "Meteorological Results". This practice was extended and accounts of all tropical cyclones which caused gales in Hong Kong were included in the publication "Director's Annual Departmental Reports" from 1947 to 1967 inclusive. The series "Meteorological Results Part III - Tropical Cyclone Summaries" was subsequently introduced to provide information on tropical cyclones over the western North Pacific and the South China Sea. The first issue, published in 1971, contained reports on tropical cyclones in 1968 within the area bounded by the Equator, 45°N, 100°E and 160°E. The eastern boundary of the area of coverage was extended from 160°E to 180° from 1985 onwards. In 1987, the series was re-titled as "Tropical Cyclones in YYYY" but its contents remained largely the same. Starting from 1997, the series was published in both Chinese and English. The CD-ROM version of the publication first appeared in 1998 and the printed version was replaced by the Internet version in 2000.

Tracks of tropical cyclones in the western North Pacific and the South China Sea were published in "Meteorological Results" up to 1939 and in "Meteorological Results Part I" from 1947 to 1967. In earlier publications, only daily positions were plotted on the tracks and the time of the daily positions varied to some extent, but then remained fixed at 0000 UTC after 1944. Details of the changes are given in the Observatory's publication "Technical Memoir No. 11, Volume 1". From 1961 onwards, six-hourly positions are shown on the tracks of all tropical cyclones.

Provisional reports on individual tropical cyclones affecting Hong Kong were prepared since 1960 to provide early information to meet the needs of the press, shipping companies and others. These reports were printed and supplied on request. Initially, provisional reports were only available for tropical cyclones for which gale or storm signals or above had been issued in Hong Kong. From 1968 onwards, provisional reports were prepared for all tropical cyclones that necessitated the issuance of tropical cyclone warning signals.

1.2 Classification of tropical cyclones

To enhance public awareness of stronger typhoons, the Observatory further categorised 'Typhoon' into 'Typhoon', 'Severe Typhoon' and 'Super Typhoon' starting from the 2009

tropical cyclone season. Tropical cyclones are now classified into the following six categories according to the maximum sustained surface winds near their centres:

(a) A TROPICAL DEPRESSION (T.D.) has maximum sustained winds of less than 63 km/h.
(b) A TROPICAL STORM (T.S.) has maximum sustained winds in the range 63-87 km/h.
(c) A SEVERE TROPICAL STORM (S.T.S.) has maximum sustained winds in the range 88-117 km/h.
(d) A TYPHOON[#] (T.) has maximum sustained winds of 118-149 km/h.
(e) A SEVERE TYPHOON* (S.T.) has maximum sustained winds of 150-184 km/h.
(f) A SUPER TYPHOON* (SuperT.) has maximum sustained winds of 185 km/h or more.

1.3 Naming of tropical cyclones

Over the western North Pacific and the South China Sea between 1947 and 1999, tropical cyclone names were assigned by the U.S. Armed Forces' Joint Typhoon Warning Center according to a pre-determined but unofficial list. With effect from 2000, the Japan Meteorological Agency has been assigned the responsibility to name tropical cyclones attaining tropical storm intensity according to a new list adopted by the Typhoon Committee. It contains a total of 140 names contributed by 14 countries or territories within the Asia Pacific region (Table 1.1). Apart from being used in forecasts and warnings issued to the international aviation and shipping communities, the names are also used officially in information on tropical cyclones issued to the international press. The list is reviewed every year, and usually names of tropical cyclones that have caused serious damage or casualty will be retired upon the requests of countries or territories affected. Countries or territories providing those names will then propose new names as replacement.

Besides, since 1981, Japan Meteorological Agency has been delegated with the responsibility of assigning to each tropical cyclone in the western North Pacific and the South China Sea attaining tropical storm intensity a numerical code of four digits. For example, the second tropical cyclone of tropical storm intensity or above, as classified by Japan Meteorological Agency, within the region in 2017 was assigned the code "1702". In this report, the associated code immediately follows the name of the tropical cyclone in bracket, e.g. Severe Tropical Storm Merbok (1702).

[#] Prior to 2009, the maximum sustained winds of typhoon was defined to be 118 km/h or more.

* New categories adopted since 2009.

1.4 Data sources

Mean sea level pressure and surface wind data presented in this report were obtained from a network of meteorological stations and anemometers operated by the Hong Kong Observatory. Details of such stations are listed in Tables 1.2 and 1.3.

Maximum storm surges caused by tropical cyclones were measured by tide gauges installed at several locations around Hong Kong. The locations of anemometers and tide gauges mentioned in this report are shown in Figure 1.1.

Rainfall data presented in this report were obtained from a network of meteorological and rainfall stations operated by the Hong Kong Observatory, as well as raingauges operated by the Geotechnical Engineering Office.

Throughout this report, maximum sustained surface winds when used without qualification refer to wind speeds averaged over a period of 10 minutes. Hourly mean winds are winds averaged over a 60-minute interval ending on the hour. Daily rainfall amounts are computed over a 24-hour period ending at midnight Hong Kong Time.

1.5 Content

In Section 2, an overview of all the tropical cyclones over the western North Pacific and the South China Sea in 2017 is presented.

The reports in Section 3 are individual accounts of the life history of tropical cyclones affecting Hong Kong in 2017. They include the following information:-

(a) the effects of the tropical cyclone on Hong Kong;
(b) the sequence of display of tropical cyclone warning signals;
(c) the maximum gust peak speeds and maximum hourly mean winds recorded in Hong Kong;
(d) the lowest mean sea level pressure recorded at the Hong Kong Observatory;
(e) the daily amounts of rainfall recorded at the Hong Kong Observatory and selected locations;
(f) the times and heights of the maximum sea level and maximum storm surge recorded at various tide stations in Hong Kong;
(g) satellite and radar imageries.

Statistics and information relating to tropical cyclones are presented in various tables in Section 4.

Six-hourly positions together with the corresponding estimated minimum central pressures and maximum sustained surface winds for individual tropical cyclones in 2017 are tabulated in Section 5.

In this report, different time references are used depending on the contexts. The official reference times are given in Co-ordinated Universal Time and labelled UTC. Times of the day expressed as “a.m.”, “p.m.”, “morning”, “evening” etc. in the tropical cyclone narratives are in Hong Kong Time which is eight hours ahead of UTC.

1.6 Hong Kong's Tropical Cyclone Warning System

Table 1.4 shows the meaning of tropical cyclone warning signals in Hong Kong.

Starting from 2007, the reference for the issuance of No.3 and No.8 signals has been expanded from the Victoria Harbour to a network of eight near-sea level reference anemometers covering the whole of Hong Kong. The eight reference anemometers adopted in 2017 are depicted in Figure 1.1. The reference anemometers have good exposure and geographical distribution, taking into account the physical separation created by Hong Kong's natural terrain. Together, they are used to represent the overall wind condition in Hong Kong.

The Observatory will consider issuing the No. 3 or No. 8 signal, as the case may be, when half or more anemometers in the reference network register or are expected to register sustained strong winds or gale/storm force winds, and that the windy conditions are expected to persist.

表 1.1　　二零一七年一月一日起生效的熱帶氣旋名單

TABLE 1.1　　Tropical cyclone name list effective from 1 January 2017

來源	Contributed by	I	II	III	IV	V
		名字 Name	名字 Name	名字 Name	名字 Name	名字 Name
柬埔寨	Cambodia	達維 Damrey	康妮 Kong-rey	娜基莉 Nakri	科羅旺 Krovanh	莎莉嘉 Sarika
中國	China	海葵 Haikui	玉兔 Yutu	風神 Fengshen	杜鵑 Dujuan	海馬 Haima
朝鮮	DPR Korea	鴻雁 Kirogi	桃芝 Toraji	海鷗 Kalmaegi	舒力基 Surigae	米雷 Meari
中國香港	Hong Kong, China	啟德 Kai-tak	萬宜 Man-yi	鳳凰 Fung-wong	彩雲 Choi-wan	馬鞍 Ma-on
日本	Japan	天秤 Tembin	天兔 Usagi	北冕 Kammuri	小熊 Koguma	蝎虎 Tokage
老撾	Lao PDR	布拉萬 Bolaven	帕布 Pabuk	巴蓬 Phanfone	薔琵 Champi	洛坦 Nock-ten
中國澳門	Macau, China	三巴 Sanba	蝴蝶 Wutip	黃蜂 Vongfong	煙花 In-fa	梅花 Muifa
馬來西亞	Malaysia	杰拉華 Jelawat	聖帕 Sepat	鸚鵡 Nuri	查帕卡 Cempaka	苗柏 Merbok
米克羅尼西亞	Micronesia	艾雲尼 Ewiniar	木恩 Mun	森拉克 Sinlaku	尼伯特 Nepartak	南瑪都 Nanmadol
菲律賓	Philippines	馬力斯 Maliksi	丹娜絲 Danas	黑格比 Hagupit	盧碧 Lupit	塔拉斯 Talas
韓國	RO Korea	格美 Gaemi	百合 Nari	薔薇 Jangmi	銀河 Mirinae	奧鹿 Noru
泰國	Thailand	派比安 Prapiroon	韋帕 Wipha	米克拉 Mekkhala	妮妲 Nida	玫瑰 Kulap
美國	U.S.A.	瑪莉亞 Maria	范斯高 Francisco	海高斯 Higos	奧麥斯 Omais	洛克 Roke
越南	Viet Nam	山神 Son-Tinh	利奇馬 Lekima	巴威 Bavi	康森 Conson	桑卡 Sonca
柬埔寨	Cambodia	安比 Ampil	羅莎 Krosa	美莎克 Maysak	燦都 Chanthu	納沙 Nesat
中國	China	悟空 Wukong	白鹿 Bailu	海神 Haishen	電母 Dianmu	海棠 Haitang
朝鮮	DPR Korea	雲雀 Jongdari	楊柳 Podul	紅霞 Noul	蒲公英 Mindulle	尼格 Nalgae
中國香港	Hong Kong, China	珊珊 Shanshan	玲玲 Lingling	白海豚 Dolphin	獅子山 Lionrock	榕樹 Banyan
日本	Japan	摩羯 Yagi	劍魚 Kajiki	鯨魚 Kujira	圓規 Kompasu	天鴿 Hato
老撾	Lao PDR	麗琵 Leepi	法茜 Faxai	燦鴻 Chan-hom	南川 Namtheun	帕卡 Pakhar

表 1.1 (續)

TABLE 1.1 (cont'd)

來源 Contributed by		I	II	III	IV	V
		名字 Name	名字 Name	名字 Name	名字 Name	名字 Name
中國澳門	Macau, China	貝碧嘉 Bebinca	琵琶 Peipah	蓮花 Linfa	瑪瑙 Malou	珊瑚 Sanvu
馬來西亞	Malaysia	溫比亞 Rumbia	塔巴 Tapah	浪卡 Nangka	莫蘭蒂 Meranti	瑪娃 Mawar
米克羅尼西亞	Micronesia	蘇力 Soulik	米娜 Mitag	沙德爾 Saudel	雷伊 Rai	古超 Guchol
菲律賓	Philippines	西馬侖 Cimaron	海貝思 Hagibis	莫拉菲 Molave	馬勒卡 Malakas	泰利 Talim
韓國	RO Korea	飛燕 Jebi	浣熊 Neoguri	天鵝 Goni	鮎魚 Megi	杜蘇芮 Doksuri
泰國	Thailand	山竹 Mangkhut	博羅依 Bualoi	艾莎尼 Atsani	暹芭 Chaba	卡努 Khanun
美國	U.S.A.	百里嘉 Barijat	麥德姆 Matmo	艾濤 Etau	艾利 Aere	蘭恩 Lan
越南	Viet Nam	潭美 Trami	夏浪 Halong	環高 Vamco	桑達 Songda	蘇拉 Saola

註：在二零一七年，西北太平洋和南海的熱帶氣旋名單上，新增了四個新名字「小熊」、「沙德爾」、「查帕卡」和「舒力基」分別取代舊有名字「巨爵」、「蘇迪羅」、「茉莉」和「彩虹」。

Note: In 2017, four new names "Koguma", "Saudel", "Cempaka" and "Surigae" have been adopted for tropical cyclones in the western North Pacific and the South China Sea, replacing "Koppu", "Soudelor", "Melor" and "Mujigae" respectively.

表 1.2 年報內各氣壓表的海拔高度及所處氣象站的位置

TABLE 1.2 Elevations of various barometers and positions of weather stations mentioned in this annual report

站 Station		位置 Position		氣壓表的海拔高度(米) Elevation of barometer above M.S.L. (m)
		北緯 Latitude N	東經 Longitude E	
香港天文台總部	Hong Kong Observatory Headquarters	22°18'07"	114°10'27"	40
長洲	Cheung Chau	22°12'04"	114°01'36"	79
香港國際機場	Hong Kong International Airport	22°18'34"	113°55'19"	7
京士柏	King's Park	22°18'43"	114°10'22"	66
流浮山	Lau Fau Shan	22°28'08"	113°59'01"	36
橫瀾島	Waglan Island	22°10'56"	114°18'12"	60

表 1.3　年報內各風速表的海拔高度及所處氣象站的位置

TABLE 1.3　Elevations of various anemometers and positions of the weather stations mentioned in this annual report

站 Station		位置 Position		風速表的海拔高度(米) Elevation of anemometer above M.S.L. (m)
		北緯 Latitude N	東經 Longitude E	
黃麻角(赤柱)	Bluff Head (Stanley)	22°11’51”	114°12’43”	103
中環碼頭	Central Pier	22°17’20”	114°09’21”	30
長洲*	Cheung Chau*	22°12’04”	114°01’36”	99
長洲泳灘	Cheung Chau Beach	22°12’39”	114°01’45”	27
青洲	Green Island	22°17’06”	114°06’46”	107
香港國際機場*	Hong Kong International Airport*	22°18’34”	113°55’19”	14#
啟德*	Kai Tak*	22°18’35”	114°12’48”	16
京士柏	King’s Park	22°18’43”	114°10’22”	90
流浮山*	Lau Fau Shan*	22°28’08”	113°59’01”	50
昂坪	Ngong Ping	22°15’31”	113°54’46”	607
北角	North Point	22°17’40”	114°11’59”	26
坪洲	Peng Chau	22°17’28”	114°02’36”	47
平洲	Ping Chau	22°32’48”	114°25’42”	39
西貢*	Sai Kung*	22°22’32”	114°16’28”	32
沙洲	Sha Chau	22°20’45”	113°53’28”	31
沙螺灣	Sha Lo Wan	22°17’28”	113°54’25”	71
沙田*	Sha Tin*	22°24’09”	114°12’36”	16
石崗	Shek Kong	22°26’10”	114°05’05”	26
九龍天星碼頭	Star Ferry (Kowloon)	22°17’35”	114°10’07”	18
打鼓嶺*	Ta Kwu Ling*	22°31’43”	114°09’24”	28
大美督	Tai Mei Tuk	22°28’31”	114°14’15”	71
大帽山	Tai Mo Shan	22°24’38”	114°07’28”	966
大埔滘	Tai Po Kau	22°26’33”	114°11’03”	11
塔門	Tap Mun	22°28’17”	114°21’38”	35
塔門東	Tap Mun East	22°28’06”	114°21’47”	48
大老山	Tate's Cairn	22°21’28”	114°13’04”	587
將軍澳	Tseung Kwan O	22°18’57”	114°15’20”	52
青衣島蜆殼油庫*	Tsing Yi Shell Oil Depot*	22°20’48”	114°05’11”	43
屯門政府合署	Tuen Mun Government Offices	22°23’26”	113°58’36”	69
橫瀾島	Waglan Island	22°10’56”	114°18’12”	83
濕地公園	Wetland Park	22°28’00”	114°00’32”	15
黃竹坑	Wong Chuk Hang	22°14’52”	114°10’25”	30

所指風速表在北跑道近中間位置

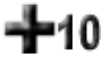
Refer to the wind sensor at the middle of the north runway

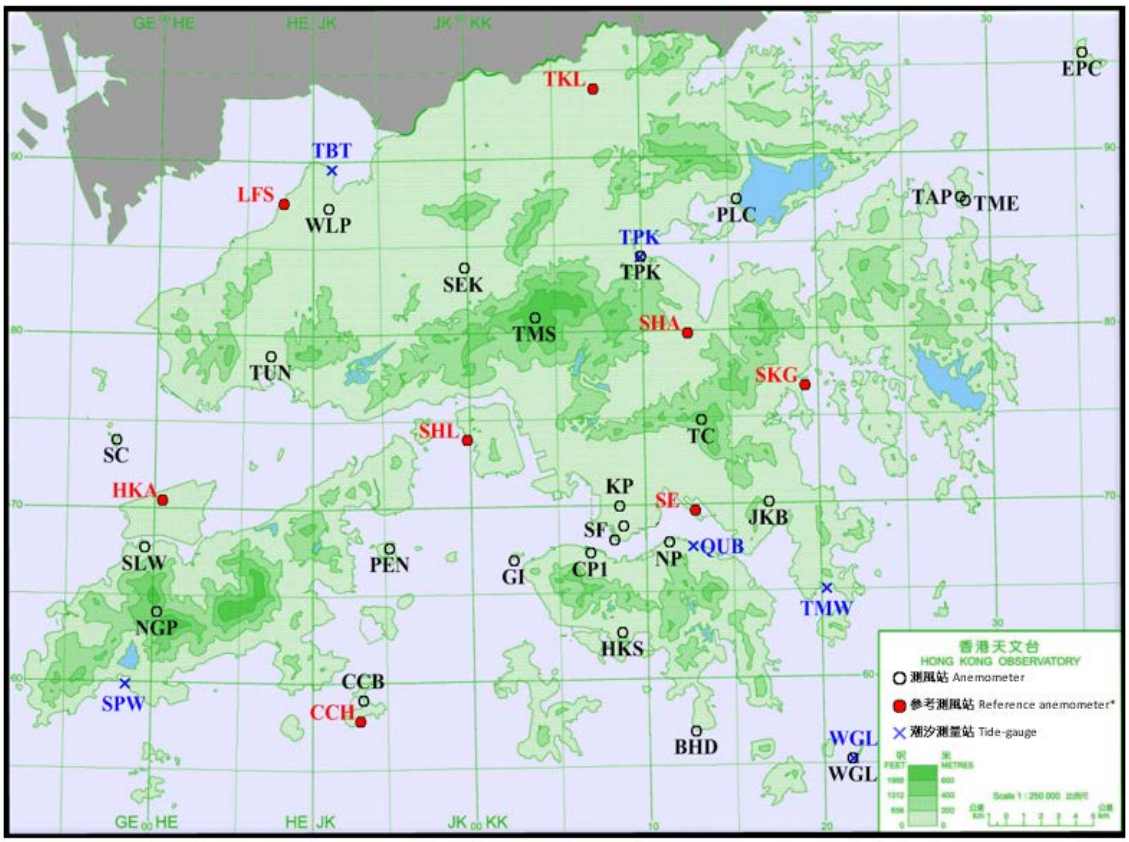
* 參考測風站

* Reference anemometer

表 1.4　　二零一七年香港熱帶氣旋警告信號的意義

TABLE 1.4　Meaning of tropical cyclone warning signals in Hong Kong in 2017

信號 Signals		顯示符號 Symbol Display	信號的意義 Meaning of Signals
戒備 Standby	1		有一熱帶氣旋集結於香港約800公里的範圍內，可能影響本港。 A tropical cyclone is centred within about 800 km of Hong Kong and may affect the territory.
強風 Strong Wind	3		香港近海平面處現正或預料會普遍吹強風，持續風力達每小時41至62公里，陣風更可能超過每小時110公里，且風勢可能持續。 Strong wind is expected or blowing generally in Hong Kong near sea level, with a sustained speed of 41-62 kilometres per hour (km/h), and gusts which may exceed 110 km/h, and the wind condition is expected to persist.
西北 烈風或暴風 NW'LY Gale or Storm	8 西北 NW		香港近海平面處現正或預料會普遍受烈風或暴風從信號所示方向吹襲，持續風力達每小時63至117公里，陣風更可能超過每小時180公里，且風勢可能持續。 Gale or storm force wind is expected or blowing generally in Hong Kong near sea level, with a sustained wind speed of 63-117 km/h from the quarter indicated and gusts which may exceed 180 km/h, and the wind condition is expected to persist.
西南 烈風或暴風 SW'LY Gale or Storm	8 西南 SW		
東北 烈風或暴風 NE'LY Gale or Storm	8 東北 NE		
東南 烈風或暴風 SE'LY Gale or Storm	8 東南 SE		
烈風或暴風風力增強 Increasing Gale or Storm	9		烈風或暴風的 風力現正或預料會顯著加強。 Gale or storm force wind is increasing or expected to increase significantly in strength.
颶風 Hurricane	10		風力現正或預料會達到颶風程度，持續風力達每小時118公里或以上，陣風更可能超過每小時220公里。 Hurricane force wind is expected or blowing with sustained speed reaching upwards from 118 km/h and gusts that may exceed 220 km/h.



* 熱帶氣旋警告系統的參考測風站網絡

Network of reference anemometers in the tropical cyclone warning system

圖1.1 年報內提及的測風站及潮汐測量站之分佈地點

Figure 1.1 Locations of anemometers and tide gauge stations mentioned in this annual report

測風站 Anemometers		測風站 Anemometers	
BHD	黃麻角(赤柱) Bluff Head (Stanley)	TMS	大帽山 Tai Mo Shan
CCB	長洲泳灘 Cheung Chau Beach	TUN	屯門政府合署 Tuen Mun Government Offices
CP1	中環碼頭 Central Pier	WLP	濕地公園 Wetland Park
EPC	平洲 Ping Chau	WGL	橫瀾島 Waglan Island
GI	青洲 Green Island	**參考測風站* Reference anemometers***	
HKS	黃竹坑 Wong Chuk Hang	CCH	長洲 Cheung Chau
JKB	將軍澳 Tseung Kwan O	LFS	流浮山 Lau Fau Shan
KP	京士柏 King's Park	HKA	香港國際機場 Hong Kong International Airport
NGP	昂坪 Ngong Ping	SE	啟德 Kai Tak
NP	北角 North Point	SHA	沙田 Sha Tin
PEN	坪洲 Peng Chau	SHL	青衣島蜆殼油庫 Tsing Yi Shell Oil Depot
PLC	大美督 Tai Mei Tuk	SKG	西貢 Sai Kung
SC	沙洲 Sha Chau	TKL	打鼓嶺 Ta Kwu Ling
SEK	石崗 Shek Kong		
SF	九龍天星碼頭 Star Ferry (Kowloon)	**潮汐測量站 Tide-gauge**	
SLW	沙螺灣 Sha Lo Wan	QUB	鰂魚涌 Quarry Bay
TAP#	塔門 Tap Mun	SPW	石壁 Shek Pik
TME#	塔門東 Tap Mun East	TBT	尖鼻咀 Tsim Bei Tsui
TC	大老山 Tate's Cairn	TMW	大廟灣 Tai Miu Wan
TPK	大埔滘 Tai Po Kau	TPK	大埔滘 Tai Po Kau
		WGL	橫瀾島 Waglan Island

#塔門東測風站在2017年7月6日取代在塔門測風站

#Tap Mun wind station is replaced by Tap Mun East wind station on 6 July 2017

第二節　　二零一七年熱帶氣旋概述

2.1　二零一七年的熱帶氣旋回顧

2.1.1 北太平洋西部（包括南海區域）的熱帶氣旋

二零一七年有32個熱帶氣旋影響北太平洋西部及南海區域（即由赤道至北緯45度、東經100至180度所包括的範圍），略多於1961-2010年約30個的長期年平均數目。全年有12個熱帶氣旋達到颱風或以上強度，少於1961-2010年約15個的長期年平均數目，其中有四個熱帶氣旋更達到超強颱風程度(中心附近最高持續風速達到每小時185公里或以上)。

圖2.1是二零一七年在北太平洋西部及南海區域熱帶氣旋數目之逐月分佈。

二零一七年內有九個熱帶氣旋在中國登陸，其中五個在香港300公里內的華南沿岸登陸，兩個橫過台灣。四個熱帶氣旋登陸日本，九個橫過菲律賓及七個登陸越南。十月的超強颱風蘭恩(1721)（圖2.3）是二零一七年北太平洋西部及南海區域最強的熱帶氣旋，其中心附近最高持續風速估計為每小時205公里，而最低海平面氣壓為925百帕斯卡（表4.1）。

2.1.2 香港責任範圍內的熱帶氣旋

在二零一七年的32個熱帶氣旋中，有22個出現在香港責任範圍（即北緯10至30度、東經105至125度），較1961-2010年約16個的長期年平均數目多（表2.1），當中有13個在香港責任範圍內形成。年內，香港天文台總共發出427個供船舶使用的熱帶氣旋警告（表4.2）。

2.1.3 南海區域內的熱帶氣旋

二零一七年共有18個熱帶氣旋影響南海區域（即北緯10至25度、東經105至120度），較1961-2010年約12個的長期年平均數目多，當中有八個在南海上形成。

2.1.4 影響香港的熱帶氣旋

二零一七年香港的颱風季節始於六月十一日，當天熱帶低氣壓苗柏(1702)在南海中部形成並移近廣東沿岸地區，天文台發出一號戒備信號。十月十六日強烈熱帶風暴卡努(1720)移向雷州半島及減弱，二零一七年颱風季節隨著天文台當天取消所有熱帶氣旋警告信號而結束。

年內共有七個熱帶氣旋影響香港（圖2.2），略多於1961-2010年約六個的長期年平均數目(表2.2)。這七個熱帶氣旋分別為六月的強烈熱帶風暴苗柏(1702)、七月的熱帶風暴洛克(1707)、八月的超強颱風天鴿(1713)及強烈熱帶風暴帕卡(1714)、九月的強烈熱帶風暴瑪娃(1716)及一個熱帶低氣壓、和十月的強颱風卡努(1720)。天鴿影響香港期間，天文台在八月二十三日曾發出十號颶風信號，是年內發出的最高熱帶氣旋警告信號，也是自二零一二年強颱風韋森特襲港以來再一次發出最高級別的熱帶氣旋警告信號。苗柏、洛克、帕卡及卡努吹襲期間天文台曾發出八號烈風或暴風信號。九月的瑪娃及熱帶低氣壓分別引致天文台發出三號強風信號和一號戒備信號。

2.1.5 熱帶氣旋的雨量

二零一七年熱帶氣旋為香港帶來的雨量（即由熱帶氣旋出現於香港600公里範圍內至其消散或離開香港600公里範圍之後72小時期間天文台總部錄得的雨量）共為922.1毫米（表4.8.1），約佔年內總雨量2572.1毫米的百分之35.9，比1961-2010年長期年平均值的728.8毫米多約27%。

強烈熱帶風暴苗柏(1702)為天文台總部帶來292.9毫米的雨量(表4.8.1)，是年內雨量最多的熱帶氣旋。

2.2 每月概述

這一節逐月介紹二零一七年北太平洋西部及南海區域的熱帶氣旋概況。影響香港的各熱帶氣旋及傷亡報告則詳述於第三節。

一月

一個熱帶低氣壓於一月八日下午在馬尼拉之東南約810公里的菲律賓南部海域上形成，初時採取西北偏西路徑移動，其中心附近最高持續風速估計為每小時45公里。翌日該熱帶低氣壓轉向西南偏西方向移動，最後於一月十日清晨在蘇祿海上減弱為一個低壓區。

二月至三月

二零一七年二月至三月期間並無熱帶氣旋在北太平洋西部及南海區域上形成。

四月

一個熱帶低氣壓於四月十四日下午在馬尼拉之東南偏東約1 020公里的菲律賓以東海域上形成，採取西北偏西路徑移動，其中心附近最高持續風速估計為每小時45公里。隨後兩天該熱帶低氣壓橫過菲律賓中部，最後於四月十七日在南海南部減弱為一個低壓區。

根據報章報導，該熱帶低氣壓菲律賓中部帶來洪水，造成最少10人死亡。

熱帶低氣壓梅花(1701)於四月二十五日早上在馬尼拉以東約1 730公里的北太平洋西部上形成，當日向西北偏西移動。翌日梅花轉向偏北方向移動，達到其最高強度，中心附近最高持續風速估計為每小時55公里，最後於四月二十八日早上在菲律賓以東的西北太平洋減弱為一個低壓區。

五月

二零一七年五月並無熱帶氣旋在北太平洋西部及南海區域上形成。

六月

熱帶低氣壓苗柏(1702)於六月十一日凌晨在東沙以南約580公里的南海中部上形成，向西北偏北移動，當日下午增強為熱帶風暴。翌日苗柏繼續移近廣東沿岸地區，當晚增強為強烈熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時105公里。午夜前苗柏在大鵬半島登陸並減弱為熱帶風暴，六月十三日上午苗柏採取東北偏北路徑橫過廣東，下午在江西消散。

根據報章報導，苗柏為廣東帶來狂風大雨，多處地區出現水浸，超過12萬人受災，直接經濟損失達2.6億元人民幣。汕尾有超過45 000戶電力供應受影響。

七月至九月

熱帶低氣壓南瑪都(1703)於七月二日凌晨在台北之東南約990公里的北太平洋西部上形成，大致向西北方向移動，下午發展為熱帶風暴。翌日南瑪都轉向東北偏北方向移動，大致趨向日本，並進一步增強為強烈熱帶風暴，達到其最高強度，中心附近最高持續風速估計為每小時105公里。南瑪都於七月四日橫掃九州、四國及本州南部海岸，並逐漸減弱，最後於七月五日清晨在日本以東海域演變為一股溫帶氣旋。

根據報章報導，南瑪都吹襲日本期間造成至少五人受傷，多處發生山泥傾瀉，近七萬戶停電，海陸空交通大受影響。

熱帶低氣壓塔拉斯(1704)於七月十五日下午在西沙以西約60公里的南海中部上形成，採取西北偏西路徑移向越南北部，並逐漸增強，於七月十六日晚上成為強烈熱帶風暴，並達到其最高強度，中心附近最高持續風速估計為每小時90公里。翌日清晨塔拉斯在越南北部登陸並開始減弱，當晚在泰國北部減弱為一個低壓區。

根據報章報導，塔拉斯吹襲越南期間造成至少14人死亡，數千間房屋被毀。

熱帶低氣壓奧鹿(1705)於七月二十日晚上在威克島之西北約1 160公里的北太平洋西部上形成，向偏西方向移動並逐漸增強，於七月二十三日發展為颱風。受到東面另一個熱帶氣旋玫瑰的影響，隨後三天奧鹿緩慢地以逆時針方向轉了一個圈。奧鹿於七月二十六及二十七日開始加速向西北偏西及之後的偏西方向移動，七月二十八更轉向西南及短暫地減弱，七月三十日再度增強。奧鹿於七月三十一日向西北偏西移動趨向琉球群島以東的海域，更進一步發展成為超強颱風，並達到其最高強度，中心附近最高持續風速估計為每小時195公里。八月一至四日奧鹿大致向西北移動，並逐漸減弱。八月五日奧鹿開始轉向東北直趨日本，隨後兩天加速掠過四國及本州，最後於八月八日在本州以北的海域減弱為一個低壓區。奧鹿的生命週期長達19天，成為自1961年以來在北太平洋西部及南海區域第三最長壽命的熱帶氣旋，僅次於1972年的麗妲及1986年的韋恩。

根據報章報導，奧鹿吹襲日本期間，造成至少兩死、36人傷及九人失蹤，數萬人被迫撤離，海陸空交通嚴重受阻，接近20萬戶的電力供應受到影響。

熱帶低氣壓玫瑰(1706)於七月二十一日早上在威克島之東北約1 270 公里的北太平洋西部上形成，初時向北移動，當晚增強為熱帶風暴。玫瑰翌日轉向西移動並達到其最高強度，中心附近最高持續風速估計為每小時75公里。七月二十三及二十四日玫瑰採取西北偏西路徑逐漸靠近奧鹿。受奧鹿的環流影響，七月二十五日玫瑰圍繞奧鹿轉動及迅速減弱為一個低壓區。

熱帶低氣壓桑卡(1708)於七月二十一日早上在西沙以東約260公里的南海中部上形成，向西北偏西方向移動。翌日桑卡移動緩慢，在海南島東南的海域徘徊。桑卡於七月二十四日晚上增強為熱帶風暴並加速向西移向越南，翌日早上達到其最高強度，中心附近最高持續風速估計為每小時75公里。桑卡於七月二十五日下午在越南登陸並減弱，翌日早上在老撾減弱為一個低壓區。

洛克(1707)是源自七月二十一日下午在呂宋北部以東海域生成的一個熱帶低氣壓。洛克於七月二十二日橫過呂宋海峽，進入南海東北部後採取西北偏西路徑穩定地移向珠三角一帶，傍晚增強為熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時65公

里。洛克於七月二十三日早上在香港附近登陸，日間減弱為熱帶低氣壓，傍晚在廣東內陸減弱為一個低壓區。

根據報章報導，洛克為廣東帶來狂風驟雨。一艘貨船在香港以東約70公里的水域沉沒，船上12名船員全部獲救。

熱帶低氣壓納沙(1709)於七月二十六日凌晨在馬尼拉以東約810公里的北太平洋西部上形成，初時向北移動，翌日轉向西北，大致趨向台灣，並逐漸增強。納沙於七月二十八日晚上增強為颱風，翌日早上達到其最高強度，中心附近最高持續風速估計為每小時145公里。納沙七月二十九日晚上橫掃台灣北部後，翌日早上在福建沿岸登陸，晚間在內陸消散。

熱帶低氣壓海棠(1710)於七月二十八日早上在東沙以南約150公里形成，初時在南海北部徘徊。受納沙的環流影響，海棠於七月二十九日開始加速移向東北，並增強為熱帶風暴。七月三十日海棠橫越呂宋海峽，當日下午達到其最高強度，中心附近最高持續風速估計為每小時85公里。隨後海棠採取偏北路徑掠過台灣西岸，繼而轉向西北偏北，翌日早上在接近納沙廿四小時登陸的地點橫過福建海岸。海棠隨即減弱，最後於七月三十一日晚上在福建內陸減弱為一個低壓區。

根據報章報導，台灣接連受納沙和海棠吹襲，至少有131人受傷及一人失蹤，逾67萬戶停電。納沙和海棠為福建、浙江及江西各地帶來暴雨和嚴重泛濫，其中福建逾20萬人需要緊急疏散。

熱帶低氣壓尼格(1711)於八月一日在威克島之西北偏北約920 公里的北太平洋西部上形成，初時向東南偏東漂移，翌日增強為熱帶風暴及轉向西北移動，並於八月三日達到其最高強度，中心附近最高持續風速估計為每小時75公里。八月四日尼格加速向北移動，翌日在日本以東的西北太平洋演變為一股溫帶氣旋。

熱帶低氣壓榕樹(1712)於八月十一日在威克島之東南約460 公里的北太平洋西部上形成，初時向西北移動，隨後數天採取偏北路徑移動，並逐漸增強，於八月十五日早上一度增強為強颱風，達到其最高強度，中心附近最高持續風速估計為每小時155公里。八月十六日榕樹開始轉向東北移動，並繼續減弱，翌日在國際換日線以西的海面演變為一股溫帶氣旋。

熱帶低氣壓天鴿(1713)於八月二十日晚上在高雄之東南偏東約740公里的北太平洋西部上形成，大致向偏西方向移動，橫過呂宋海峽，八月二十二日進入南海東北部，並增強為颱風及採取西北偏西路徑移向廣東沿岸。八月二十三日天鴿趨向珠江口一帶及進一步增強，早上在香港以南海域發展成為超強颱風，達到其最高強度，中心附近最高持續風速估

計為每小時185公里。正午過後天鴿在澳門及珠海附近沿岸登陸，移入廣東西部及逐漸減弱。翌日天鴿橫過廣西，晚上在雲南減弱為一個低壓區。

天鴿為珠江口沿岸帶來嚴重的風暴潮，多處錄得有紀錄以來的最高水位，當中珠海站錄得風暴潮2.79米，而最高水位則為6.14米。珠海沿海地區包括幾個地下停車場被海水淹浸，全市電力及食水供應不穩定。多艘貨船在香港西南約30公里的水域擱淺，39名船員獲救。天鴿為澳門帶來破壞性的風力及風暴潮，廣泛地區出現嚴重破壞及水浸，造成至少十人死亡，超過240人受傷，直接經濟損失超過83億元澳門幣。媽閣站最高水位升至5.58米，是澳門自一九二五年有紀錄以來的最高潮位。電力及食水供應亦受到影響。天鴿在廣東、廣西、福建、貴州及雲南至少造成15人死亡，一人失蹤，約有74萬人受災，超過6 500間房屋倒塌，直接經濟損失超過272億元人民幣。

熱帶低氣壓帕卡(1714)於八月二十四日晚上在馬尼拉以東約570公里的北太平洋西部上形成，初時大致向偏西方向移動。翌日帕卡發展為熱帶風暴，以西北路徑橫過呂宋。帕卡於八月二十六日早上進入南海，並繼續採取西北路徑加速移向廣東沿岸，晚間增強為強烈熱帶風暴，達到其最高強度，中心附近最高持續風速估計為每小時110公里。帕卡於八月二十七日早上在廣東西部沿岸珠海一帶登陸並逐漸減弱，當晚在廣西消散。

根據報章報導，帕卡及其殘餘在廣東、廣西、貴州及雲南帶來狂風暴雨，至少造成12人死亡，接近10萬人受災，直接經濟損失約3.7億元人民幣。在帕卡的吹襲下，澳門最少有八人受傷，多處地區出現水浸。一艘貨船在香港以東120公里沉沒，11名船員獲救。

熱帶低氣壓珊瑚(1715)於八月二十八日在硫黃島之東南約880 公里的北太平洋西部上形成，向偏北方向移動，翌日增強為熱帶風暴。珊瑚隨後逐漸轉向偏西方向移動及進一步增強，於八月三十一日發展成為颱風，在硫黃島以北海域徘徊，九月一日早上達到其最高強度，中心附近最高持續風速估計為每小時145公里。珊瑚於九月二日開始採取東北偏北路徑橫過日本以東海域並逐漸減弱，最後於九月三日晚上在北海道以東的西北太平洋演變為一股溫帶氣旋。

熱帶低氣壓瑪娃(1716)於八月三十一日下午在東沙之東南偏東約270公里的南海北部上形成，緩慢向西北偏北移動，並於九月一日晚上增強為熱帶風暴。隨後兩天瑪娃大致採取西北路徑緩慢靠近廣東東部沿岸，九月二日上午增強為強烈熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時90公里。瑪娃於九月三日減弱為熱帶風暴，當晚在汕尾附近登陸，翌日在廣東內陸減弱為一個低壓區。

根據報章報導，受瑪娃帶來的狂風暴雨影響，潮汕和珠三角地區多處出現嚴重水浸，海陸空交通大受影響。廣東有約11萬戶停電，而澳門多處地方亦出現水浸。

熱帶低氣壓古超(1717)於九月六日凌晨在高雄之東南偏南約310公里的呂宋海峽上形成，大致朝西北偏北方向漂移，當天下午達到其最高強度，中心附近最高持續風速估計為每小時55公里。翌日古超在台灣海峽上減弱為一個低壓區。

熱帶低氣壓泰利(1718)於九月九日晚上在關島之西北約290公里的北太平洋西部上形成，採取西北偏西路徑移向台灣以東海域並逐漸增強。泰利先在九月十一日晚上發展為颱風，其後於九月十四日早上進一步增強為超強颱風並達到其最高強度，中心附近最高持續風速估計為每小時185公里，並開始轉向東北移動。隨後數天泰利逐漸減弱，九月十七及十八日先後橫掃日本九州、四國、本州及北海道，最後於北海道以北的海域演變為一股溫帶氣旋。

根據報章報導，泰利吹襲日本期間，造成至少兩人死亡及三人失蹤，海陸空交通大受影響。

熱帶低氣壓杜蘇芮(1719)於九月十二日凌晨在馬尼拉以東約230公里靠近呂宋東岸形成，日間向西橫過呂宋。隨後兩天杜蘇芮採取西北偏西路徑橫過南海中部並逐漸增強，九月十五日登陸越南中部前發展為強颱風並達到其最高強度，中心附近最高持續風速估計為每小時165公里。登陸後杜蘇芮迅速減弱，於九月十六日在泰國北部消散。

根據報章報導，杜蘇芮吹襲菲律賓期間造成至少四人死亡。杜蘇芮亦為越南帶來狂風暴雨，至少九人死亡，超過110人受傷，約15萬間房屋受損。

一股熱帶低氣壓於九月二十三日晚上在香港之東南偏南約620公里的南海中部上形成，大致向西北偏西移動，翌日早上達到其最高強度，中心附近最高持續風速估計為每小時55公里。該熱帶低氣壓隨後採取西北路徑橫過海南島及北部灣，於九月二十五日晚上在越南北部減弱為一個低壓區。

十月至十一月

一股熱帶低氣壓於十月九日清晨在西沙之東南約130公里的南海中部上形成，向西北偏西方向移動，其中心附近最高持續風速估計為每小時45公里。該熱帶低氣壓於翌日早上在越南北部登陸並減弱為一個低壓區。

根據報章報導，該熱帶低氣壓為越南帶來暴雨，引發山泥傾瀉及嚴重水浸，造成至少72人死亡。

熱帶低氣壓卡努(1720)於十月十二日早上在馬尼拉之東北偏東約650公里的北太平洋西部上形成，採取西北偏西路徑移動，當晚增強為熱帶風暴。翌日卡努橫過呂宋北部，進入南海後重新組織並緩慢地向西南偏西方向漂移。卡努於十月十四日轉向西北移動，翌日採取西北偏西路徑靠近華南沿岸，並增強為強颱風，達到其最高強度，中心附近最高持續風速估計為每小時155公里。隨後卡努開始迅速減弱，十月十六日清晨橫過雷州半島，日間在北部灣減弱為一個低壓區。

根據報章報導，卡努在澳門造成最少七人受傷，海陸空交通大受影響。在卡努及東北季候風的共同效應下，廣東、海南、浙江、廣西、福建共有超過97萬人受災。台灣廣泛地區出現大雨，部份道路損毀，約一萬四千戶的電力供應中斷。

熱帶低氣壓蘭恩(1721)於十月十五日晚上在雅蒲島以西約140公里的北太平洋西部上形成，初時向西北偏西移動。其後於十月十七至二十日採取北至西北偏北路徑，大致移向琉球群島以東海域並繼續增強。蘭恩於十月二十一日增強為超強颱風並達到其最高強度，中心附近最高持續風速估計為每小時205公里。蘭恩隨後向東北偏北加速移向日本，並逐漸減弱，十月二十三日清晨橫掃本州東部，日間在日本以東的海域演變為一股溫帶氣旋。

根據報章報導，蘭恩吹襲日本期間造成最少七人死亡，逾130人受傷，數百間房屋損毀，約13萬戶的電力供應受影響。

熱帶低氣壓蘇拉(1722)於十月二十三日早上在關島之東南偏南約570公里的北太平洋西部上形成，隨後數天大致向西北偏西至西北方向移動，十月二十七日晚上轉向北，翌日橫過琉球群島並增強為颱風，達到其最高強度，中心附近最高持續風速估計為每小時120公里。其後蘇拉向東北加速，十月二十九日於日本以南掠過，晚上在日本以東的海域演變為一股溫帶氣旋。

根據報章報導，蘇拉吹襲日本期間最少有六人受傷，接近三萬戶的電力供應受影響。

一股熱帶低氣壓於十月三十一日晚上在越南以南的海域上形成，位於胡志明市之東南偏南約390公里，大致向西緩慢移動，其中心附近最高持續風速估計為每小時45公里。該熱帶低氣壓於十一月二日清晨在越南以南的海域上減弱為一個低壓區。

熱帶低氣壓達維(1723)於十一月一日凌晨在菲律賓附近、馬尼拉之東南偏南約400公里形成，大致向西移動，橫過南海南部，並逐漸增強。達維於十一月三日下午發展成為颱風，翌日凌晨達到其最高強度，中心附近最高持續風速估計為每小時145公里。達維於十一月四日早上登陸越南南部並迅速減弱，當晚在柬埔寨減弱為一個低壓區。

根據報章報導，達維在越南造成最少89人死亡、174人受傷及18人失蹤，超過2000間房屋被毀。與達維的殘餘低壓區相關的大雨引致馬來西亞檳城多處地方出現嚴重水浸，造成至少六人死亡，逾三千人疏散。

熱帶低氣壓海葵(1724)於十一月九日晚上在菲律賓附近、馬尼拉之東南偏南約100公里形成，向西北移動進入南海，並逐漸增強，翌日發展為熱帶風暴。海葵於十一月十一日開始轉向西移動，並達到其最高強度，中心附近最高持續風速估計為每小時85公里。翌日海葵迅速減弱，下午在南海中部減弱為一個低壓區。

熱帶低氣壓鴻雁(1725)於十一月十七日傍晚在南沙島以東約290公里的南海南部上形成，大致向西移動趨向越南。翌日鴻雁增強為熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時65公里。鴻雁於十一月十九日開始減弱，下午登陸越南南部並減弱為一個低壓區。

十二月

熱帶低氣壓啟德(1726)於十二月十四日早上在馬尼拉之東南偏東約820公里的北太平洋西部上形成，初時移動緩慢。晚上啟德增強為熱帶風暴，翌日達到其最高強度，中心附近最高持續風速估計為每小時85公里。十二月十六及十七日啟德向西至西南偏西移動，橫過菲律賓中部，並減弱為熱帶低氣壓。啟德進入南海南部後再度增強為熱帶風暴，並於十二月十九日轉向西南移動，最後於十二月二十二日清晨在越南以南的海域上減弱為一個低壓區。

根據報章報導，啟德在菲律賓引發嚴重水浸及山泥傾瀉，造成至少54人死亡及24人失蹤。

熱帶低氣壓天秤(1727)於十二月二十日晚上在馬尼拉之東南偏東約1 350公里的北太平洋西部上形成，並逐漸增強。隨後三天天秤朝西南偏西然後偏西方向移動，橫過菲律賓南部。天秤進入南海南部後於十二月二十四日增強為颱風，達到其最高強度，中心附近最高持續風速估計為每小時130公里。天秤隨後開始減弱，最終於十二月二十六日在越南以南的海域上減弱為一個低壓區。

根據報章報導，天秤為菲律賓帶來狂風暴雨，引發嚴重水浸及山泥傾瀉，造成至少240人死亡，超過180人失蹤，逾七萬人無家可歸。

備註：人命傷亡及財物損毀數據是根據報章報導輯錄而成。

Section 2 TROPICAL CYCLONE OVERVIEW FOR 2017

2.1 Review of tropical cyclones in 2017

2.1.1 Tropical cyclones over the western North Pacific (including the South China Sea)

In 2017, a total of 32 tropical cyclones occurred over the western North Pacific (WNP) and the South China Sea (SCS) bounded by the Equator, 45°N, 100°E and 180°, slightly more than the long-term (1961 - 2010) average figure of around 30. During the year, 12 of the tropical cyclones attained typhoon intensity or above, less than the long-term average (1961 - 2010) of about 15, with four of them reaching super typhoon intensity (maximum 10-minute wind speed of 185 km/h or above near the centre).

Figure 2.1 shows the monthly frequencies of the occurrence of tropical cyclones in WNP and SCS in 2017.

During the year, nine tropical cyclones made landfall over China, with five of them crossing the south China coast within 300 km of Hong Kong and two crossed Taiwan. Four tropical cyclones made landfall over Japan, nine traversed the Philippines and seven made landfall over Vietnam. With an estimated maximum sustained wind speed of 205 km/h and a minimum sea-level pressure of 925 hPa near its centre (Table 4.1), Super Typhoon Lan (1721) in October (Figure 2.3) was the most intense tropical cyclone over the western North Pacific and the South China Sea in 2017.

2.1.2 Tropical cyclones in Hong Kong's area of responsibility

Amongst the 32 tropical cyclones in 2017, 22 of them occurred inside Hong Kong's area of responsibility (i.e. the area bounded by 10°N, 30°N, 105°E and 125°E), more than the long-term annual average figure of around 16 (Table 2.1). 13 of them developed within Hong Kong's area of responsibility. Altogether, 427 tropical cyclone warnings to ships and vessels were issued by the Hong Kong Observatory in 2017 (Table 4.2).

2.1.3 Tropical cyclones over the South China Sea

18 tropical cyclones affected SCS bounded by 10°N, 25°N, 105°E and 120°E in 2017, more than the long-term annual average of around 12. Eight of them formed within SCS.

2.1.4 Tropical cyclones affecting Hong Kong

In 2017, the typhoon season in Hong Kong started on 11 June when tropical depression Merbok (1702) formed in the central part of the South China Sea and edged closer to the coast of Guangdong, necessitating the issuance of the Standby Signal No. 1. The typhoon season ended with the cancellation of all tropical cyclone warning signals on 16 October as Severe Tropical Storm Khanun (1720) moved towards Leizhou Peninsula and weakened that day.

Seven tropical cyclones affected Hong Kong during 2017 (Figure 2.2), slightly more than the long-term (1961-2010) average of about six in a year (Table 2.2). They were Severe Tropical Storm Merbok (1702) in June, Tropical Storm Roke (1707) in July, Super Typhoon Hato (1713) and Severe Tropical Storm Pakhar (1714) in August, Severe Tropical Storm Mawar (1716) and a Tropical Depression in September, and Severe Typhoon Khanun (1720) in October. The No.10 Hurricane

Signal was issued by the Hong Kong Observatory during the passage of Hato on 23 August. It was the highest tropical cyclone warning signal issued in 2017 and for the first time since Severe Typhoon Vicente hitting Hong Kong in July 2012. The No. 8 Gale or Storm Signal was issued during the passage of Merbok, Roke, Pakhar and Khanun. Mawar and the Tropical Depression in September necessitated the issuance of the Strong Wind Signal No. 3 and the Standby Signal No. 1 in Hong Kong respectively.

2.1.5 Tropical cyclone rainfall

Tropical cyclone rainfall (total rainfall recorded at the Hong Kong Observatory Headquarters from the time when a tropical cyclone comes within 600 km of Hong Kong to 72 hours after it has dissipated or moved more than 600 km away from Hong Kong) in 2017 was 922.1 mm (Table 4.8.1). This accounted for approximately 35.9 % of the year's total rainfall of 2572.1 mm and was about 27 % above the 1961-2010 long-term average of 728.8 mm.

Severe Tropical Storm Merbok (1702) brought 292.9 mm of rainfall to the Hong Kong Observatory Headquarters (Table 4.8.1) and was the wettest tropical cyclone in 2017.

2.2 Monthly overview

A monthly overview of tropical cyclones in 2017 is given in this section. Detailed reports on tropical cyclones affecting Hong Kong, including reports of damage, are presented in Section 3.

JANUARY

A tropical depression formed over the sea areas in the southern part of the Philippines about 810 km southeast of Manila on the afternoon of 8 January. It moved west-northwestwards at first with an estimated wind of 45 km/h near its centre. The tropical depression turned west-southwestwards the next day and finally weakened into an area of low pressure over Sulu Sea in the small hours of 10 January.

FEBURARY TO MARCH

No tropical cyclone formed over the western North Pacific and the South China Sea in February and March 2017.

APRIL

A tropical depression formed over the seas east of the Philippines about 1 020 km east-southeast of Manila on the afternoon of 14 April. It moved west-northwestwards with an estimated wind of 45 km/h near its centre. The tropical depression moved across the central part

of the Philippines in the following two days and finally weakened into an area of low pressure over the southern part of the South China Sea on 17 April.

According to press reports, the tropical depression brought flooding to the central part of the Philippines during its passage. At least 10 people were killed.

Tropical depression Muifa (1701) formed over the western North Pacific about 1 730 km east of Manila on the morning of 25 April and moved west-northwestwards on that day. Muifa turned northwards the next day and reached its peak intensity with an estimated wind of 55 km/h near its centre. It finally weakened into an area of low pressure over the western North Pacific to the east of the Philippines on the morning of 28 April.

MAY

No tropical cyclone formed over the western North Pacific and the South China Sea in May 2017.

JUNE

Merbok (1702) formed as a tropical depression over the central part of the South China Sea about 580 km south of Dongsha in the small hours of 11 June. Moving north-northwestwards, it intensified into a tropical storm that afternoon. Merbok continued to move closer to the coastal areas of Guangdong on 12 June and intensified into a severe tropical storm that night, reaching its peak intensity with an estimated sustained wind of 105 km/h near its centre. It made landfall over the Dapeng Peninsula before midnight and weakened into a tropical storm. Taking on a north-northeasterly track, Merbok moved across Guangdong on the morning of 13 June and dissipated over Jiangxi in the afternoon.

According to press reports, Merbok brought heavy rain and squalls to Guangdong, causing flooding in many places. At least 120 000 people were affected with a direct economic loss reaching 260 million RMB. Electricity supply to more than 45 000 households was interrupted in Shanwei.

JULY TO SEPTEMBER

Nanmandol (1703) formed as a tropical depression over the western North Pacific about 990 km southeast of Taibei on the early hours of 2 July. It moved generally northwestwards and developed into a tropical storm that afternoon. Nanmandol turned north-northeastwards in the general direction of Japan the next day and further intensified into a severe tropical storm, reaching its peak intensity with an estimated sustained wind of 105 km/h near its centre. It swept across Kyushu, Shikoku and the south coast of Honshu on 4 July and weakened gradually. Nanmandol finally evolved into an extratropical cyclone over the seas east of Japan in the small hours of 5 July.

According to press reports, at least five persons were injured in Japan during the passage of Nanmandol. There were extensive landslides and electricity supply to nearly 70 000 households was disrupted. Transportation services were seriously affected.

Talas (1704) formed as a tropical depression over the central part of the South China Sea about 60 km west of Xisha on the afternoon of 15 July. Talas moved west-northwest towards northern Vietnam and intensified gradually, becoming a severe tropical storm on the night of 16 July and reached its peak intensity with an estimated sustained wind of 90 km/h near its centre. It made landfall over the coast of northern Vietnam in the small hours of 17 July and started to weaken. Talas finally degenerated into an area of low pressure over the northern part of Thailand that night.

According to press reports, at least 14 persons were killed and thousands of houses were destroyed during the passage of Talas in Vietnam.

Noru (1705) formed as a tropical depression over the western North Pacific about 1 160 km northwest of Wake Island on the night of 20 July. Moving generally westwards, it intensified gradually and developed into a typhoon on 23 July. Under the influence of another tropical cyclone Kulap to the east, Noru made a slow counter-clockwise loop in the next three days. It started to accelerate west-northwestwards and then westwards on 26 and 27 July, before turning to the southwest on 28 July and temporarily weakened. It then re-intensified again on 30 July. Turning to the west-northwest towards the sea areas east of the Ryukyu Islands, Noru became a super typhoon on 31 July, reaching its peak intensity with an estimated sustained wind of 195 km/h near its centre. Noru moved generally northwestwards on 1 - 4 August and gradually weakened. It started to turn northeast towards Japan on 5 August and accelerated across Shikoku and Honshu over the next couple of days. Noru finally degenerated into an area of low pressure over the sea areas north of Honshu on 8 August. Noru's life span reached 19 days, making it the third longest-living tropical cyclone over the western North Pacific and the South China Sea since 1961, after Rita in 1972 and Wayne in 1986.

According to press reports, at least two persons were killed, 36 injured and nine reported missing in Japan during the passage of Noru. Tens of thousands people had to be evacuated, and transportation services were seriously disrupted. Electricity supply to near 200 000 households was affected.

Kulap (1706) formed as a tropical depression over the western North Pacific about 1 270 km northeast of Wake Island on the morning of 21 July. Moving northwards at first, it intensified into a tropical storm that night. It turned westwards the next day and reached its peak intensity with an estimated sustained wind of 75 km/h near its centre. Kulap headed west-northwestwards on 23 and 24 July and gradually getting closer to Noru. Under the influence of Noru's circulation, Kulap moved around Noru on 25 July and weakened rapidly into an area of low pressure.

Sonca (1708) formed as a tropical depression over the central part of the South China Sea about 260 km east of Xisha on the morning of 21 July and moved west-northwestwards. It slowed down the next day and lingered over the sea areas southeast of Hainan Island. Sonca intensified into a tropical storm on the night of 24 July and accelerated to the west towards Vietnam. It reached its peak intensity with an estimated sustained wind of 75 km/h near its centre the next morning. Sonca made landfall over Vietnam on the afternoon of 25 July and weakened. It finally degenerated into an area of low pressure over Lao PDR the next morning.

Roke (1707) originated from a tropical depression that developed over the sea areas east of northern Luzon on the afternoon of 21 July. It moved across the Luzon Strait on 22 July and after entering the northeastern part of the South China Sea, took on a west-northwestward course and headed steadily towards the Pearl River Delta. It intensified into a tropical storm that evening,

reaching its peak intensity with an estimated sustained wind of 65 km/h near its centre. Roke made landfall near Hong Kong on the morning of 23 July and weakened into a tropical depression during the day. It finally degenerated into an area of low pressure over inland Guangdong in the evening.

According to press reports, Roke brought squally showers to Guangdong during its passage. A vessel sunk over the seas about 70 km east of Hong Kong and all 12 crew members on board were rescued.

Nesat (1709) formed as a tropical depression over the western North Pacific about 810 km east of Manila on the early hours of 26 July. Moving generally northwards at first, it turned to the northwest the next day in the general direction of Taiwan and intensified gradually. Nesat developed into a typhoon on the night of 28 July and reached its peak intensity the next morning with an estimated sustained wind of 145 km/h. After sweeping across the northern part of Taiwan on the night of 29 July, Nesat made landfall over the coast of Fujian the next morning and dissipated inland during the night.

Haitang (1710) formed as a tropical depression about 150 km south of Dongsha on the morning of 28 July and lingered over the northern part of the South China Sea at first. Under the influence of the circulation of Nesat, Haitang accelerated northeastwards on 29 July and intensified into a tropical storm. Crossing the Luzon Strait on 30 July, Haitang reached its peak intensity with an estimated sustained wind of 85 km/h that afternoon. Then it swept past the west coast of Taiwan on a northward track and turned north-northwestwards to strike the coast of Fujian the next morning near where Nesat made landfall just 24 hours earlier. Haitang then weakened and finally degenerated into an area of low pressure over inland Fujian on the night of 31 July.

According to press reports, there were at least 131 people injured and one reported missing in Taiwan with Nesat and Haitang hitting the island in quick succession. More than 670 000 households were without electricity supply. Nesat and Haitang also brought torrential rain and severe flooding to Fujian, Zhejiang and Jiangxi, with more than 200 000 people evacuated in Fujian.

Nalgae (1711) formed as a tropical depression over the western North Pacific about 920 km north-northwest of Wake Island on 1 August and drifted east-southeastwards initially. It intensified into a tropical storm the next day and turned northwestwards, reaching its peak intensity with an estimated sustained wind of 75 km/h near its centre on 3 August. Nalgae accelerated northwards on 4 August and evolved into an extratropical cyclone over the western North Pacific east of Japan the next day.

Banyan (1712) formed as a tropical depression over the western North Pacific about 460 km southeast of Wake Island on 11 August. Moving northwestwards at first, it took on a more northerly course over the next few days and intensified gradually. It once developed into a severe typhoon on the morning of 15 August with an estimated sustained wind of 155 km/h near its centre at peak intensity. Banyan started to turn northeastwards and continued to weaken on 16 August, evolving into an extratropical cyclone the next day over the sea areas west of the International Date Line.

Hato (1713) formed as a tropical depression over the western North Pacific about 740 km east-southeast of Gaoxiong on the night of 20 August. It moved generally westwards across the Luzon Strait and entered the northeastern part of the South China Sea on 22 August, intensifying

into a typhoon and tracking west-northwest towards the coast of Guangdong. During its approach towards the Pearl River estuary on 23 August, Hato intensified further and became a super typhoon that morning over the sea areas south of Hong Kong, reaching its peak intensity with an estimated sustained wind of 185 km/h near its centre. After making landfall over the coast near Macao and Zhuhai shortly after noon time, Hato entered western Guangdong and gradually weakened. It moved across Guangxi the next day and degenerated into an area of low pressure over Yunnan at night.

Hato brought severe storm surge to the coast of Pearl River estuary. Record-high sea levels were recorded at many places. A maximum storm surge of 2.79 m and a maximum sea level of 6.14 m were recorded at Zhuhai station. The coastal areas in Zhuhai including some underground carparks were flooded by sea water. Electricity and water supply in the city became unstable. A number of vessels ran aground about 30 km southwest of Hong Kong and 39 crew members were rescued. Hato brought damaging winds and storm surge to Macao. Extensive areas of Macao suffered damage and were seriously flooded, resulting in at least ten deaths and more than 240 injuries. The direct economic loss exceeded 8.3 billion MOP. A maximum sea level of 5.58 metres was recorded in A-Ma station, a record high in Macao since records began in 1925. Electricity and water supplies were also affected. In Guangdong, Guangxi, Fujian, Guizhou and Yannan, there were at least 15 deaths and one missing during the passage of Hato. Around 740 000 people were affected and over 6 500 houses collapsed, with direct economic loss exceeding 27.2 billion RMB.

Pakhar (1714) formed as a tropical depression over the western North Pacific about 570 km east of Manila on the night of 24 August. Moving generally westwards at first, it developed into a tropical storm the next day and moved northwestwards across Luzon. After entering the South China Sea on the morning of 26 August, Pakhar maintained a northwestward track and accelerated towards the coast of Guangdong. It intensified into a severe tropical storm during the night, reaching its peak intensity with an estimated sustained wind of 110 km/h near its centre. After making landfall over the coast of western Guangdong in the vicinity of Zhuhai on the morning of 27 August, Pakhar weakened gradually and dissipated over Guangxi that night.

According to press reports, Pakhar and its remnant brought heavy rain and squalls to Guangdong, Guangxi, Guizhou and Yunnan, resulting in at least 12 deaths. Around 100 000 people were affected with direct economic loss around 370 million RMB. Eight people were injured and many places were flooded in Macao during the passage of Pakhar. A cargo vessel sunk about 120 km east of Hong Kong and 11 crew members on board were rescued.

Sanvu (1715) formed as a tropical depression over the western North Pacific about 880 km southeast of Iwo Jima on 28 August and, moving northwards, intensified into a tropical storm the next day. Turning gradually westwards and intensifying further, Sanvu developed into a typhoon on 31 August and lingered over the sea areas north of Iwo Jima and reached its peak intensity with an estimated sustained wind of 145 km/h near its centre on the morning of 1 September. It started to track north-northeastwards across the sea areas east of Japan and weakened gradually. Sanvu finally evolved into an extratropical cyclone over the western North Pacific east of Hokkaido on the night of 3 September.

Mawar (1716) formed as a tropical depression over the northern part of the South China Sea about 270 km east-southeast of Dongsha on the afternoon of 31 August. It drifted north-northwestwards slowly and intensified into a tropical storm on the night of 1 September. Tracking slowly to the northwest towards the coast of eastern Guangdong in the next two days, Mawar intensified into a severe tropical storm on the morning of 2 September and reached its peak

intensity with an estimated sustained wind of 90 km/h near its centre. It then weakened into a tropical storm on 3 September, making landfall near Shanwei that night and degenerating into an area of low pressure over inland Guangdong the next day.

According to press reports, torrential rain and squalls brought by Mawar seriously disrupted transportation services and caused severe flooding in the Chaozhou-Shantou region and the Pearl River Delta. Electricity supply to around 110 000 households were interrupted in Guangdong, and there was reports of flooding in many places in Macao.

Guchol (1717) formed as a tropical depression over the Luzon Strait about 310 km south-southeast of Gaoxiong on the small hours of 6 September and drifted generally north-northwestwards. It reached its peak intensity with an estimated sustained wind of 55 km/h near its centre that afternoon and degenerated into an area of low pressure over the Taiwan Strait the next day.

Talim (1718) formed as a tropical depression over the western North Pacific about 290 km northwest of Guam on the night of 9 September. It moved generally west-northwestwards towards the sea areas east of Taiwan and intensified gradually. Talim reached typhoon intensity on the night of 11 September before intensifying further into a super typhoon on the morning of 14 September and reaching its peak intensity with an estimated sustained wind of 185 km/h near its centre. After taking a turn to the northeast, Talim gradually weakened over the next few days. It swept across Kyushu, Shikoku, Honshu and Hokkaido of Japan on 17 and 18 September before evolving into an extratropical cyclone over the sea areas north of Hokkaido.

According to press reports, at least two persons were killed and three were reported missing in Japan during the passage of Talim. Transportation services were seriously affected.

Doksuri (1719) formed as a tropical depression off the east coast of Luzon about 230 km east of Manila on the small hours of 12 September and moved westwards crossing Luzon during the day. It traversed the central part of the South China Sea and intensified gradually over the next couple of days. Doksuri intensified into a severe typhoon and attained its peak intensity with an estimated sustained wind of 165 km/h near its centre before making landfall over the central part of Vietnam on 15 September. After landfall, Doksuri weakened rapidly and dissipated over the northern part of Thailand on 16 September.

According to press reports, Doksuri left at least four people dead in the Philippines during its passage. Doksuri also brought torrential rain and squalls to Vietnam, causing at least nine deaths with more than 110 people injured and about 150 000 houses damaged.

A tropical depression formed over the central part of the South China Sea about 620 km south-southeast of Hong Kong on the night of 23 September and tracked generally west-northwestwards. It reached its peak intensity the next morning with an estimated sustained wind of 55 km/h near its centre. Taking on a northwestward course, the tropical depression then moved across Hainan Island and Beibu Wan before weakening into an area of low pressure over the northern part of Vietnam on the night of 25 September.

OCTOBER TO NOVEMBER

A tropical depression formed over the central part of the South China Sea about 130 km southeast of Xisha on the early morning of 9 October. It tracked west-northwestwards with an estimated sustained wind of 45 km/h near its centre. The tropical depression made landfall over the northern part of Vietnam the next morning and weakened into an area of low pressure.

According to press reports, torrential rain induced by the tropical depression caused severe flooding and landslides in Vietnam, resulting in at least 72 deaths.

Khanun (1720) formed as a tropical depression over the western North Pacific about 650 km east-northeast of Manila on the morning of 12 October. It moved west-northwestwards and intensified into a tropical storm that night. Khanun moved across the northern part of Luzon the next day and drifted west-southwestwards slowly as it re-organized after entering the South China Sea. It turned northwestwards on 14 October and then west-northwestwards the next day as it approached the south China coast, intensifying into a severe typhoon and reaching its peak intensity with an estimated sustained wind of 155 km/h near its centre. It then started to weaken rapidly and moved across Leizhou Peninsula in the early morning on 16 October, degenerating into an area of low pressure over Beibu Wan during the day.

According to press reports, at least seven people were injured in Macao during the passage of Khanun. Transportation services were seriously disrupted. Under the combined influence of Khanun and the northeast monsoon, at least 970 000 people were affected in Guangdong, Hainan, Zhejiang, Guangxi and Fujian. There was also widespread heavy rain in Taiwan, with roads damaged and electricity supply to 14 000 households disrupted.

Lan (1721) formed as a tropical depression over the western North Pacific about 140 km west of Yap on the night of 15 October and moved west-northwestwards at first. It started to take on a north to north-northwestward track in the general direction of the sea areas east of Ryukyu Islands on 17 – 20 October and continued to intensify. It developed into a super typhoon on 21 October and reached its peak intensity with an estimated sustained wind of 205 km/h near its centre. Lan then accelerated to the north-northeast towards Japan and weakened gradually. It swept across the eastern part of Honshu on the early morning of 23 October before evolving into an extratropical cyclone over the sea areas east of Japan during the day.

According to press reports, at least seven persons were killed and more than 130 people injured in Japan during the passage of Lan. Hundreds of houses were damaged and electricity supply to around 130 000 households was disrupted.

Saola (1722) formed as a tropical depression over the western North Pacific about 570 km south-southeast of Guam on the morning of 23 October. It moved generally to the west-northwest and northwest over the next few days before turning northwards on the night of 27 October. It swept across Ryukyu Islands the next day and intensified into a typhoon, reaching its peak intensity with an estimated sustained wind of 120 km/h near its centre. Turning to the northeast, Saola accelerated and skirted past to the south of Japan on 29 October. It finally evolved into an extratropical cyclone over the sea areas east of Japan during the night.

According to press reports, at least six people were injured in Japan during the passage of Saola. Electricity supply to nearly 30 000 households was disrupted.

A tropical depression formed over the sea areas south of Vietnam about 390 km south-southeast of Ho Chi Minh City on the night of 31 October. It tracked slowly westwards in general with an estimated maximum sustained wind of 45 km/h near its centre. The tropical depression weakened into an area of low pressure early in the morning on 2 November over the sea areas south of Vietnam.

Damrey (1723) formed as a tropical depression near the Philippines about 400 km south-southeast of Manila on the small hours on 1 November. Moving generally westwards, it crossed the southern part of the South China Sea and intensified gradually. Damrey developed into a typhoon on the afternoon of 3 November and reached its peak intensity on the small hours the next day with an estimated maximum sustained wind of 145 km/h near its centre. It made landfall over the southern part of Vietnam on the morning of 4 November and weakened rapidly into an area of low pressure over Cambodia that night.

According to press reports, Damrey left at least 89 people dead, 174 injured and 18 missing in Vietnam during its passage. Over 2 000 houses were damaged. The heavy rain associated with the remnant low pressure area of Damrey triggered severe flooding in many places of Penang of Malaysia, leading to at least 6 deaths and the evacuation of over 3 000 people.

Haikui (1724) formed as a tropical depression near the Philippines about 100 km south-southeast of Manila on the night of 9 November. Moving northwestwards into the South China Sea, it intensified gradually and developed into a tropical storm the next day. Haikui started to turn westwards on 11 November and reached its peak intensity with an estimated maximum sustained wind of 85 km/h near its centre. It weakened rapidly the next day and degenerated into an area of low pressure over the central part of the South China Sea in the afternoon.

Kirogi (1725) formed as a tropical depression over the southern part of the South China Sea about 290 km east of Nansha Dao on the evening of 17 November. It moved generally westwards in the direction of Vietnam. Kirogi intensified into a tropical storm the next day, reaching its peak intensity with an estimated maximum sustained wind of 65 km/h near its centre. It started to weaken on 19 November, making landfall over the southern part of Vietnam and degenerating into an area of low pressure in the afternoon.

DECEMBER

Kai-tak (1726) formed as a tropical depression over the western North Pacific about 820 km east-southeast of Manila on the morning of 14 December and moved slowly at first. It intensified into a tropical storm at night, reaching its peak intensity the next day with an estimated maximum sustained wind of 85 km/h near its centre. Kai-tak then tracked west to west-southwestards across the central part of the Philippines on 16 – 17 December and weakened into a tropical depression. After entering the southern part of the South China Sea, Kai-tak re-intensified into a tropical storm and turned southwestwards on 19 December, before finally degenerating into an area of low pressure over the sea areas south of Vietnam early on 22 December.

According to press reports, Kai-tak caused severe flooding and landslides in the Philippines. At least 54 people were killed and 24 people were missing.

Tembin (1727) formed as a tropical depression over the western North Pacific about 1 350 km east-southeast of Manila on the night of 20 December. It intensified gradually, moving west-southwest and then westwards across the southern part of the Philippines over the next three days. After entering the southern part of the South China Sea, Tembin developed into a typhoon and reached its peak intensity with an estimated maximum sustained wind of 130 km/h near its centre on 24 December. It then started to weaken and finally degenerated into an area of low pressure over the sea areas south of Vietnam on 26 December.

According to press reports, torrential rain and squalls brought by Tembin caused severe flooding and landslides in the Philippines. At least 240 people were killed, more than 180 people were missing and over 70 000 people were made homeless.

Note: Casualties and damage figures were compiled from press reports.

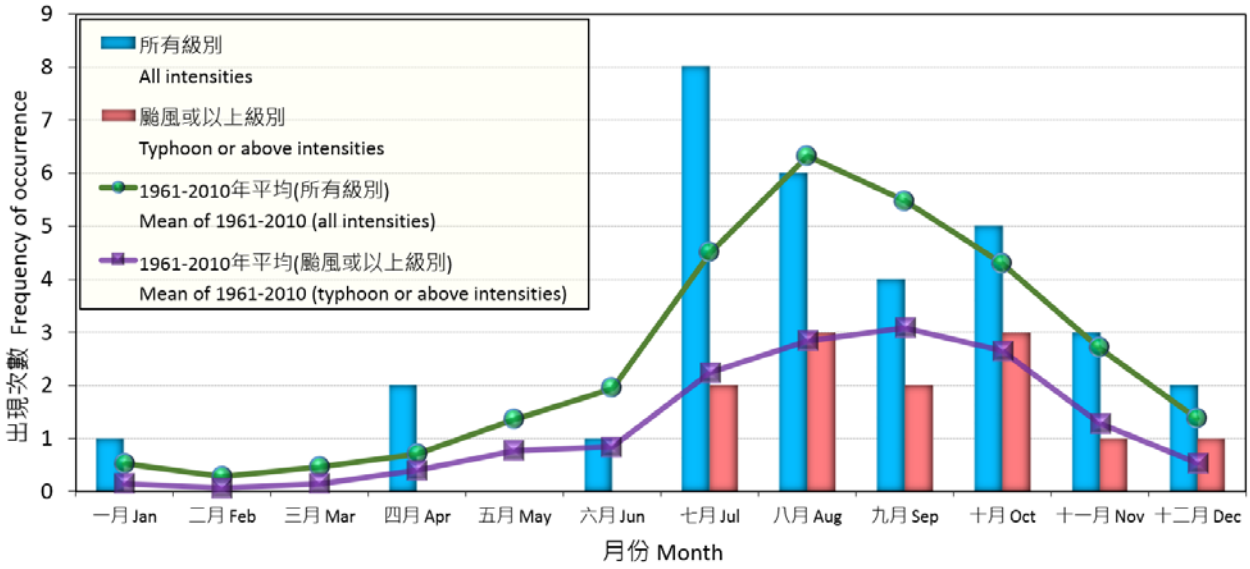


圖 2.1　二零一七年在北太平洋西部及南海區域的熱帶氣旋出現次數之每月分佈 (以熱帶氣旋在該月初次出現為準，假如一熱帶氣旋在九月形成並在十月首次增強為颱風或以上級別，它在「所有級別」及「颱風或以上級別」的統計數字將分別計算在九月及十月份內)。

Figure 2.1　Monthly frequencies of the occurrence of tropical cyclones in the western North Pacific and the South China Sea in 2017 (based on the first occurrence of the tropical cyclone in the month; for example if a tropical cyclone forms in September and first intensifies into typhoon or above intensities in October, its related statistics for “all intensities” and “typhoon or above intensities” will be counted in September and October respectively).

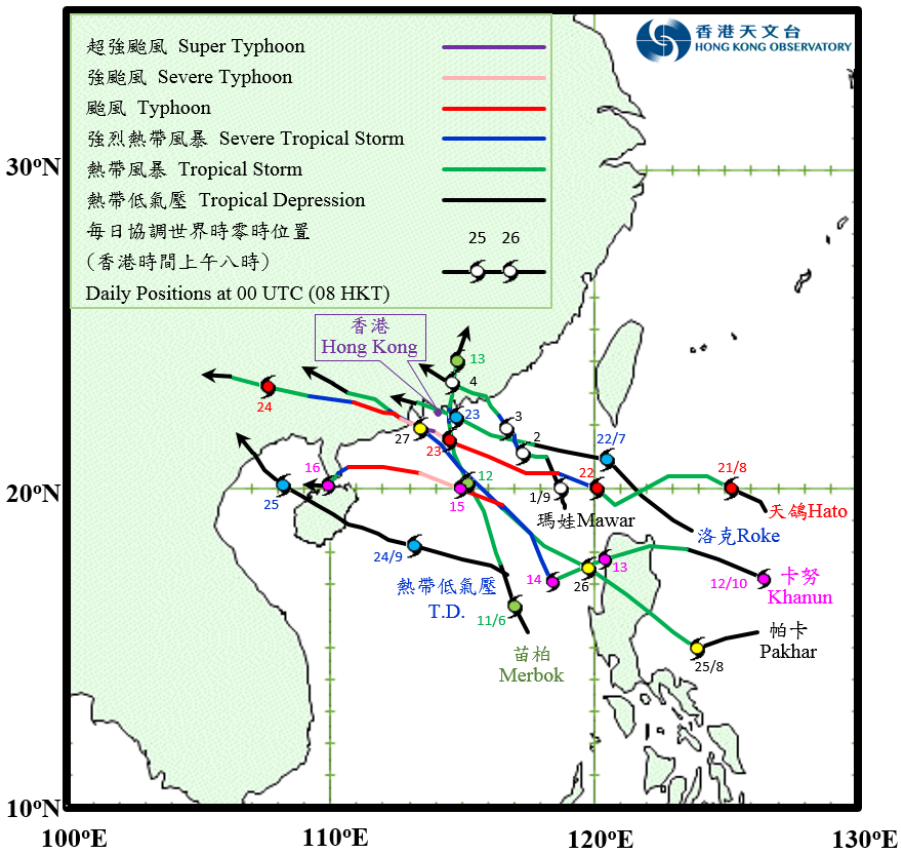


圖 2.2　二零一七年七個影響香港的熱帶氣旋的路徑圖。

Figure 2.2　Tracks of the seven tropical cyclones affecting Hong Kong in 2017.

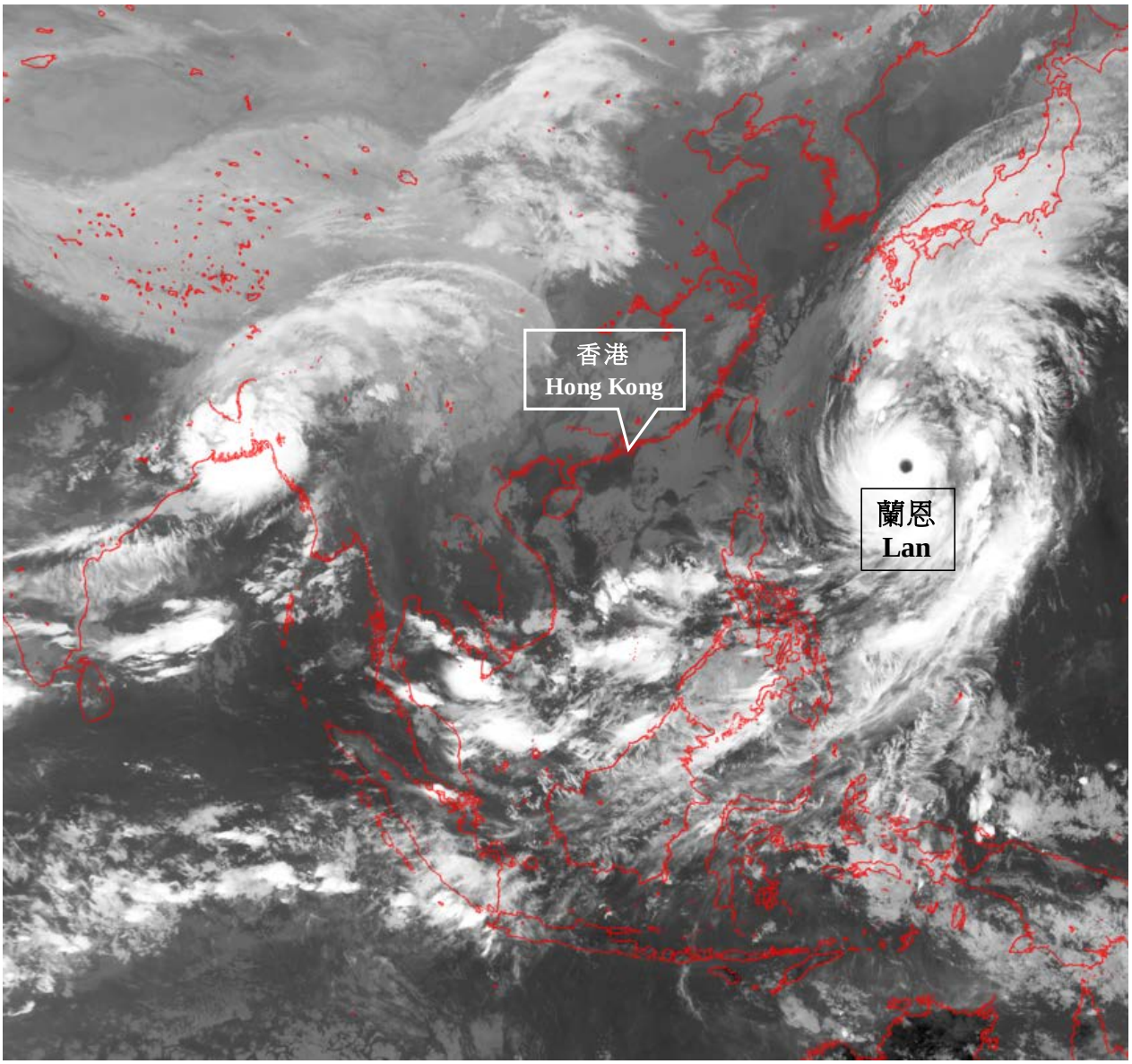


圖2.3　二零一七年十月二十一日上午8時超強颱風蘭恩(1721)的紅外線衛星圖片。當時蘭恩的最高風速估計為每小時205公里，而最低中心氣壓為925百帕斯卡。

Figure 2.3　Infra-red satellite imagery of Super Typhoon Lan (1721) at peak intensity at 8 a.m. on 21 October 2017. The estimated maximum sustained wind and minimum sea-level pressure of Lan was 205 km/h and 925 hPa respectively at that time.

〔此衛星圖像接收自日本氣象廳的向日葵8號衛星。〕

[The satellite imagery was originally captured by the Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

表 2.1　在香港責任範圍內(10°-30°N, 105°-125°E)熱帶氣旋出現之每月分佈(以熱帶氣旋在該月初次出現為準

Table 2.1　Monthly distribution of the occurrence of tropical cyclones in Hong Kong's area of responsibility (10° - 30°N, 105° - 125°E), based on the first occurrence of the tropical cyclone in the month

月份 Month / 年份 Year	一月 Jan	二月 Feb	三月 Mar	四月 Apr	五月 May	六月 Jun	七月 Jul	八月 Aug	九月 Sep	十月 Oct	十一月 Nov	十二月 Dec	共 Total
1961					3	5	2	5	4	3	1	1	24
1962					3		4	5	4	1	3		20
1963						3	3	3	2			2	13
1964					1	1	5	3	6	3	6	1	26
1965	1				2	3	4	3	2		1		16
1966					2		5	2	3	2	2	1	17
1967			1	1		1	2	6	1	2	3		17
1968							2	4	2	1	3		12
1969							3	3	4	1			11
1970		1				2	2	3	4	5	3		20
1971				1	2	2	5	3	3	4			20
1972	1					3	2	4	2	1	1	1	15
1973							4	4	2	4	3		17
1974						3	2	4	2	4	4	2	21
1975	1					1		3	2	3	1	1	12
1976					1	1	1	4	1		1	1	10
1977						1	4	1	3		1		10
1978	1			1		2	2	4	5	4	1		20
1979				1	2	1	3	5	2	2	1	1	18
1980			1		3	1	5	2	3	1	1		17
1981						3	3	3	1	1	3	1	15
1982			2		1	1	3	3	3	1		2	16
1983						1	3	1	3	5	2		15
1984						2	2	4	2	2	2		14
1985						2	2	2	4	4	1		15
1986					1	1	1	4	1	3	3	2	16
1987						1	3	2	1	1	3	1	12
1988	1				1	3	1	1	2	5	2	1	17
1989					2	1	4	2	4	3	1		17
1990					1	4	2	3	3	3	2		18
1991				1	1	1	3	2	2	1	3		14
1992						2	3	2	2	2			11
1993						1	1	2	3	2	2	3	14
1994				1	1	2	6	5	2	2		1	20
1995						1	1	5	5	3	1	1	17
1996		1		1	2		3	3	2	1	2		15
1997					1		1	4	1	2	1		10
1998							1	3	4	3	3	1	15
1999				1		1	1	2	3	2	1	1	12
2000					2	1	3	5	3	3	2	1	20
2001					1	2	4	2	2	1	1	1	14
2002	1					1	3	2	3				10
2003				1	1	2	2	3	1	1	1		12
2004			1		1	3	2	2	2	1	2	1	15
2005			1				2	3	4	3	2		15
2006					1	1	3	3	4	1	2	1	16
2007							1	4	3	1	3		12
2008				1	2	1	2	3	5	1	2		17
2009					2	2	3	2	3	4	1		17
2010							3	4	2	2			11
2011					2	3	1	2	2	2			12
2012				1		3	2	3	1	2		2	14
2013						2	3	4	4	3	3		19
2014	1					1	2		3		1	2	10
2015	1			1	1	1	2	2	2	2		1	13
2016					1		3	1	4	3	1	2	15
2017	1			1		1	6	3	4	2	3	1	22
平均 Average (1961-2010)	0.1	0.0	0.1	0.2	0.8	1.4	2.6	3.1	2.7	2.1	1.7	0.6	15.6

表 2.2　　影響香港的熱帶氣旋之每月分佈

Table 2.2　　Monthly distribution of tropical cyclones affecting Hong Kong

月份 Month # / 年份 Year	一月 Jan	二月 Feb	三月 Mar	四月 Apr	五月 May	六月 Jun	七月 Jul	八月 Aug	九月 Sep	十月 Oct	十一月 Nov	十二月 Dec	共 Total
1961					1		3		2				6
1962							2	1		1			4
1963						1	1	1	1				4
1964					1	1		1	4	3			10
1965						1	2		2		1		6
1966					1		3	1	1				6
1967				1		1	1	3		1	1		8
1968							1	3	2				6
1969							1		2	1			4
1970							1	2	1	2			6
1971					1	2	3	1	1	1			9
1972						2	1	1			1		5
1973							2	3	2	2			9
1974						2	1		2	4	1	1	11
1975						1		1	2	3			7
1976						1	1	2	1				5
1977						1	3	1	3				8
1978				1			1	2	2	2			8
1979							2	2	2				6
1980					1	1	4	1	2	1			10
1981						1	2	1	1				5
1982						1	2		1	1			5
1983							3		2	2			7
1984						1	1	2	1				5
1985						1	1		2	1			5
1986							1	2		1			4
1987						1		2	1	1			5
1988					1	1	1		1	2			6
1989					1	1	2		1	2			7
1990					1	2	1	1	1				6
1991							3	1	2				6
1992						1	3	1					5
1993						1	1	2	3	1	1		9
1994						2		1	1				4
1995							1	4	2	1			8
1996							2	2	2	1			7
1997							1	1					2
1998								2	1	2			5
1999				1		1	1	1	3	1			8
2000						1	2	2	1		1		7
2001						2	2	1	1				6
2002								2	1				3
2003							2	1	1				4
2004						1	1	1					3
2005								1	2				3
2006					1	1		3	1	1			7
2007								1	1				2
2008				1		1		2	1	1			6
2009						2	2	1	3				8
2010							2	1	1	1			5
2011						2	1		1	1			5
2012						2	1	2					5
2013						2	1	2	1		1		7
2014						1	1		2				4
2015						1	1			1			3
2016					1		2	1	2	3			9
2017						1	1	2	2	1			7
平均 Average (1961-2010)	0.0	0.0	0.0	0.1	0.2	0.7	1.5	1.3	1.5	0.9	0.1	0.0	6.0

熱帶氣旋警告信號首次發出的月份。#The month that the tropical cyclone warning signal was first issued.

第三節　二零一七年影響香港的熱帶氣旋

3.1　強烈熱帶風暴苗柏 (1702)：二零一七年六月十一日至十三日

苗柏是二零一七年首個影響香港的熱帶氣旋。苗柏吹襲香港期間，天文台需要發出八號烈風或暴風信號。苗柏的中心在六月十二日晚上橫過香港東部水域，是自二零零八年八月颱風鸚鵡後再次有熱帶氣旋的中心進入香港境內。

熱帶低氣壓苗柏於六月十一日凌晨在東沙以南約580公里的南海中部上形成，向西北偏北移動，當日下午增強為熱帶風暴。翌日苗柏繼續移近廣東沿岸地區，當晚增強為強烈熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時 105 公里。午夜前苗柏在大鵬半島登陸並減弱為熱帶風暴，六月十三日上午苗柏採取東北偏北路徑橫過廣東，下午在江西消散。

根據報章報導，苗柏為廣東帶來狂風大雨，多處地區出現水浸，超過 12 萬人受災，直接經濟損失達 2.6 億元人民幣。汕尾有超過 45 000 戶電力供應受影響。

香港天文台在六月十一日晚上 7 時 40 分發出一號戒備信號，當時苗柏集結在香港之東南偏南約530公里。晚間本港吹和緩偏東風。隨著苗柏靠近廣東沿岸，天文台在六月十二日早上 10 時 40 分發出三號強風信號，當時苗柏位於香港之東南偏南約 210 公里。下午本港逐漸轉吹清勁至強風程度的東至東北風，離岸間中吹烈風。下午 5 時 20 分天文台發出八號東北烈風或暴風信號，當時苗柏集結在香港天文台之東南偏南約 90 公里。本港風力顯著增強，普遍吹強風至烈風程度的北至東北風，離岸及高地風力更間中達到暴風程度。

苗柏趨近香港時開始採取較偏北路徑移動，本港轉吹西北風，天文台在晚上 8 時 20 分改發八號西北烈風或暴風信號。苗柏橫過香港東部水域，晚上 9 時 30 分最為接近，其中心在天文台總部以東約 25 公里處掠過。午夜前苗柏在大鵬半島登陸，本港逐漸轉吹西南風，天文台在六月十三日上午 12 時 10 分改發八號西南烈風或暴風信號。隨著苗柏移入內陸及減弱，本港風力隨即緩和，天文台於上午 4 時 40 分改發三號強風信號，取代八號西南烈風或暴風信號，並於當日早上 11 時 10 分取消所有熱帶氣旋警告信號。

在苗柏的影響下，九龍天星碼頭、橫瀾島及大老山錄得的最高每小時平均風速分別為每小時 59、87 及 85 公里，而最高陣風則分別為每小時 77、113 及 131 公里。尖鼻咀錄得最高潮位 2.86 米(海圖基準面以上)，而大埔滘則錄得最大風暴

潮(天文潮高度以上)0.55 米。各站錄得的最低瞬時海平面氣壓如下：

站	最低瞬時海平面氣壓 (百帕斯卡)	日期/月份	時間
香港天文台總部	995.5	12/6	下午 8 時 08 分
香港國際機場	998.4	12/6	下午 7 時 53 分
京士柏	995.5	12/6	下午 8 時 23 分
坪洲	996.1	12/6	下午 7 時 44 分
打鼓嶺	996.7	12/6	下午 10 時 16 分
大埔	996.0	12/6	下午 9 時 50 分
沙田	995.1	12/6	下午 9 時 51 分
上水	997.2	12/6	下午 9 時 46 分
流浮山	998.2	12/6	下午 8 時 47 分
長洲	996.0	12/6	下午 7 時 39 分
橫瀾島	989.7	12/6	下午 7 時 51 分

六月十一日本港大致天晴，日間天氣酷熱。受苗柏相關的雨帶影響，六月十二日及十三日本港有狂風大驟雨及雷暴。雨勢在六月十三日早上最大，當時天文台曾發出紅色暴雨警告、山泥傾瀉警告、新界北部水浸特別報告及雷暴警告。這兩天期間本港普遍錄得超過 150 毫米雨量，市區的雨量更超過 250 毫米。

苗柏吹襲香港期間，最少有十人受傷，另有超過600宗塌樹報告、20宗水浸報告及兩宗山泥傾瀉報告。上環一座商業大廈的玻璃幕牆爆裂，而土瓜灣一座大廈有鋁窗墜下，兩部私家車受損。在六月十三日早上的暴雨期間，多區道路出現水浸，交通大受影響。赤柱大潭道一幅護土牆在暴雨下倒塌。新界約300公頃的農地受到影響。香港國際機場有超過500班航班取消或延誤。

表3.1.1 - 3.1.4分別是苗柏影響香港期間各站錄得的最高風速、持續風力達到強風及烈風程度的時段、香港的日雨量及最高潮位資料。圖3.1.1 - 3.1.2分別為苗柏的路徑圖和本港的雨量分佈圖。圖3.1.3顯示香港各站錄得的風向和風速。圖3.1.4顯示天文台總部及橫瀾島錄得的海平面氣壓。圖3.1.5 - 3.1.6分別為苗柏的衛星及雷達圖像。苗柏在香港造成的破壞可參見圖3.1.7。

Section 3 TROPICAL CYCLONES AFFECTING HONG KONG IN 2017

3.1 Severe Tropical Storm Merbok (1702): 11 – 13 June 2017

Merbok was the first tropical cyclone affecting Hong Kong in 2017 and the No. 8 Gale or Storm Signal was issued by the Hong Kong Observatory during its passage. The centre of Merbok moved across the eastern part of Hong Kong waters on the night of 12 June, the first time the centre of a tropical cyclone entered the territory of Hong Kong since Typhoon Nuri in August 2008.

Merbok formed as a tropical depression over the central part of the South China Sea about 580 km south of Dongsha in the small hours of 11 June. Moving north-northwestwards, it intensified into a tropical storm that afternoon. Merbok continued to move closer to the coastal areas of Guangdong on 12 June and intensified into a severe tropical storm that night, reaching its peak intensity with an estimated sustained wind of 105 km/h near its centre. It made landfall over the Dapeng Peninsula before midnight and weakened into a tropical storm. Taking on a north-northeasterly track, Merbok moved across Guangdong on the morning of 13 June and dissipated over Jiangxi in the afternoon.

According to press reports, Merbok brought heavy rain and squalls to Guangdong with extensive flooding. At least 120 000 people were affected with a direct economic loss reaching 260 million RMB. Electricity supply to more than 45 000 households was interrupted in Shanwei.

In Hong Kong, the No. 1 Standby Signal was issued at 7:40 p.m. on 11 June when Merbok was about 530 km south-southeast of the territory. Local winds were moderate easterlies during the night. As Merbok edged closer to the coast of Guangdong, the No. 3 Strong Wind Signal was issued at 10:40 a.m. on 12 June when Merbok was about 210 km south-southeast of Hong Kong. Local winds gradually became fresh to strong east to northeasterlies in the afternoon and occasionally reaching gale force offshore. The No. 8 Northeast Gale or Storm Signal was issued at 5:20 p.m. on 12 June when Merbok was about 90 km south-southeast of the Hong Kong Observatory. Local winds strengthened significantly, becoming generally strong to gales force from north to northeast, with winds reaching storm force occasionally offshore and on high ground.

With Merbok taking on a more northerly track on its approach, winds started to turn northwesterly and the No. 8 Northwest Gale or Storm Signal was issued at 8:20 p.m. Merbok traversed the eastern part of Hong Kong waters and came closest to the Observatory Headquarters around 9:30 p.m. that evening with its centre located about 25 km to the east. Merbok made landfall over the Dapeng Peninsula before midnight and local winds gradually turned southwesterly. The No. 8 Southwest Gale or Storm Signal was issued at 12:10 a.m. on 13 June. With Merbok moving inland and weakening, local winds soon subsided. The No. 8 Southwest Gale or Storm Signal was replaced by the No. 3 Strong Wind Signal at 4:40 a.m. on 13 June, and all tropical cyclone warning signals were cancelled at 11:10 a.m. later that morning.

Under the influence of Merbok, maximum hourly mean winds of 59, 87 and 85 km/h and gusts of 77, 113 and 131 km/h were recorded at Star Ferry (Kowloon), Waglan Island and Tate's Cairn respectively. A maximum sea level (above chart datum) of 2.86 m was recorded

at Tsim Bei Tsui, and a maximum storm surge (above astronomical tide) of 0.55 m was recorded at Tai Po Kau. The lowest instantaneous mean sea-level pressures recorded at some selected stations are as follows:

Station	Lowest instantaneous mean sea-level pressure (hPa)	Date/Month	Time
Hong Kong Observatory Headquarters	995.5	12/6	8:08 p.m.
Hong Kong International Airport	998.4	12/6	7:53 p.m.
King's Park	995.5	12/6	8:23 p.m.
Peng Chau	996.1	12/6	7:44 p.m.
Ta Kwu Ling	996.7	12/6	10:16 p.m.
Tai Po	996.0	12/6	9:50 p.m.
Shatin	995.1	12/6	9:51 p.m.
Sheung Shui	997.2	12/6	9:46 p.m.
Lau Fau Shan	998.2	12/6	8:47 p.m.
Cheung Chau	996.0	12/6	7:39 p.m.
Waglan Island	989.7	12/6	7:51 p.m.

Locally, it was mainly fine and very hot during the day on 11 June. The rainbands associated with Merbok brought heavy squally showers and thunderstorms to Hong Kong on 12 and 13 June. The rain was most intense on the morning of 13 June. Red Rainstorm Warning, Landslip Warning, Special Announcement on Flooding in the Northern New Territories and Thunderstorm Warning were issued by the Observatory that morning. More than 150 millimetres of rainfall were generally recorded over the territory during these two days, with rainfall in the urban areas exceeding 250 millimetres.

In Hong Kong, at least 10 people were injured during the passage of Merbok. There were more than 600 reports of fallen trees, 20 reports of flooding and two reports of landslide. The glass curtain wall of a commercial building in Sheung Wan cracked, and an aluminum window fell down from a building in To Kwa Wan, damaging two private cars. Traffic was seriously disrupted as many roads were flooded during the rainstorm on the morning of 13 June. A retaining wall at Tai Tam Road in Stanley collapsed under the heavy rain. About 300 hectares of farmland in the New Territories were affected. More than 500 flights were cancelled or delayed at the Hong Kong International Airport.

Information on the maximum wind, periods of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Merbok is given in Tables 3.1.1 - 3.1.4 respectively. Figures 3.1.1 - 3.1.2 show respectively the track of Merbok and the rainfall distribution for Hong Kong. Figure 3.1.3 shows the winds recorded at various stations in Hong Kong. Figure 3.1.4 shows the traces of mean sea-level pressure recorded at the Hong Kong Observatory's Headquarters and Waglan Island. Figures 3.1.5 - 3.1.6 show respectively a satellite imagery and radar imageries of Merbok. Some damages caused by Merbok in Hong Kong are illustrated in Figure 3.1.7.

表 3.1.1　在苗柏影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.1.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Merbok were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
黃麻角(赤柱)	Bluff Head (Stanley)	東北偏東	ENE	68	12/6	15:50	東	E	31	12/6	14:00
中環碼頭	Central Pier	東北	NE	81	12/6	18:12	西北偏西	WNW	51	12/6	22:00
長洲	Cheung Chau	西北偏西	WNW	92	12/6	23:08	西北偏西	WNW	58	13/6	00:00
長洲泳灘	Cheung Chau Beach	西南	SW	79	13/6	06:10	東北	NE	51	12/6	16:00
青洲	Green Island	西南偏南	SSW	96	13/6	08:21	西北偏北	NNW	63	12/6	22:00
							西南	SW	63	13/6	07:00
香港國際機場	Hong Kong International Airport	西南	SW	79	13/6	06:04	西北	NW	51	12/6	23:00
啟德	Kai Tak	西南偏西	WSW	85	13/6	06:16	西	W	41	13/6	00:00
京士柏	King's Park	北	N	77	12/6	20:30	西北偏西	WNW	30	13/6	00:00
流浮山	Lau Fau Shan	西北	NW	75	12/6	23:34	西北偏北	NNW	52	12/6	22:00
昂坪	Ngong Ping	西南偏西	WSW	110	13/6	05:38	西南偏西	WSW	77	13/6	06:00
北角	North Point	西南偏西	WSW	96	13/6	05:18	西	W	59	13/6	00:00
坪洲	Peng Chau	西北	NW	83	12/6	21:16	西北	NW	49	12/6	22:00
平洲	Ping Chau	西	W	68	13/6	00:20	西	W	36	13/6	01:00
西貢	Sai Kung	東北偏北	NNE	99	12/6	20:34	北	N	49	12/6	21:00
沙洲	Sha Chau	北	N	79	12/6	19:54	北	N	58	12/6	20:00
沙田	Sha Tin	西南	SW	59	13/6	04:20	北	N	23	12/6	21:00
							西南	SW	23	13/6	07:00
九龍天星碼頭	Star Ferry (Kowloon)	西	W	77	12/6	23:38	西	W	59	13/6	00:00
打鼓嶺	Ta Kwu Ling	西	W	54	12/6	23:41	西北偏西	WNW	22	13/6	00:00
大美督	Tai Mei Tuk	東北偏北	NNE	103	12/6	20:21	東北偏北	NNE	54	12/6	21:00
大帽山	Tai Mo Shan	西北	NW	124	12/6	23:10	西	W	77	13/6	02:00
大埔滘	Tai Po Kau	西北偏西	WNW	75	12/6	23:24	西北偏西	WNW	40	12/6	23:00
塔門	Tap Mun	西	W	94	12/6	23:16	西	W	58	13/6	00:00
大老山	Tate's Cairn	東北偏北	NNE	131	12/6	20:14	北	N	85	12/6	21:00
將軍澳	Tseung Kwan O	東北偏北	NNE	68	12/6	18:58	西北偏北	NNW	23	12/6	21:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	西北偏北	NNW	65	12/6	20:59	西北	NW	31	12/6	21:00
屯門政府合署	Tuen Mun Government Offices	西北偏西	WNW	72	13/6	00:24	西北偏西	WNW	25	13/6	01:00
橫瀾島	Waglan Island	北	N	113	12/6	19:53	東北偏北	NNE	87	12/6	20:00
濕地公園	Wetland Park	西北	NW	52	12/6	23:34	西北	NW	22	13/6	00:00
黃竹坑	Wong Chuk Hang	西	W	77	12/6	21:35	西	W	31	12/6	22:00

沙螺灣及石崗 - 沒有資料　Sha Lo Wan and Shek Kong - data not available

表 3.1.2　在苗柏影響下，熱帶氣旋警告信號系統的八個參考測風站在熱帶氣旋警告信號生效時錄得持續風力達到強風及烈風程度的時段

Table 3.1.2　Periods during which sustained strong and gale force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Merbok were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風*時間 Start time when strong wind speed* was attained		最後達到強風*時間 End time when strong wind speed* was attained		最初達到烈風#時間 Start time when gale force wind speed# was attained		最後達到烈風#時間 End time when gale force wind speed# was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	12/6	16:30	13/6	10:09	12/6	23:08	12/6	23:23
香港國際機場	Hong Kong International Airport	12/6	18:56	13/6	06:52	-			
啟德	Kai Tak	12/6	21:01	12/6	23:58	-			
流浮山	Lau Fau Shan	12/6	19:40	13/6	06:23	-			
西貢	Sai Kung	12/6	12:43	12/6	21:46	-			

沙田、打鼓嶺及青衣島蜆殼油庫的持續風力未達到強風程度。
The sustained wind speed did not attain strong force at Sha Tin, Ta Kwu Ling and Tsing Yi Shell Oil Depot.

- 未達到指定的風速
- not attaining the specified wind speed

* 十分鐘平均風速達每小時 41-62 公里
* 10-minute mean wind speed of 41-62 km/h

十分鐘平均風速達每小時 63-87 公里
10-minute mean wind speed of 63-87 km/h

註:　本表列出持續風力達到強風及烈風程度的起始及終結時間。其間風力可能高於或低於指定的風力。

Note:　The table gives the start and end time of sustained strong or gale force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.1.3　苗柏掠過期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.1.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Merbok

站 (參閱圖 3.1.2) Station (See Fig. 3.1.2)			六月十一日 11 June	六月十二日 12 June	六月十三日 13 June	總雨量 (毫米) Total (mm)
香港天文台 Hong Kong Observatory			微量 Trace	37.7	219.4	257.1
香港國際機場 Hong Kong International Airport (HKA)			0.0	11.0	71.0	82.0
長洲 Cheung Chau (CCH)			0.0	7.0	118.0	125.0
H23	香港仔	Aberdeen	0.0	42.0	171.0	213.0
N05	粉嶺	Fanling	0.0	26.5	173.0	199.5
N13	糧船灣	High Island	0.0	35.0	165.0	200.0
K04	佐敦谷	Jordan Valley	0.0	61.0	213.5	274.5
N06	葵涌	Kwai Chung	0.0	54.0	186.0	240.0
H12	半山區	Mid Levels	0.0	38.0	260.0	298.0
N09	沙田	Sha Tin	0.0	46.0	150.0	196.0
H19	筲箕灣	Shau Kei Wan	0.0	42.0	243.0	285.0
SEK	石崗	Shek Kong	0.0	36.0	125.5	161.5
K06	蘇屋邨	So Uk Estate	0.0	52.5	197.0	249.5
R31	大美督	Tai Mei Tuk	[0.0]	41.5	159.5	[201.0]
R21	踏石角	Tap Shek Kok	[0.0]	23.5	92.5	[116.0]
TMR	屯門水庫	Tuen Mun Reservoir	[0.0]	24.5	[126.9]	[151.4]
N17	東涌	Tung Chung	0.0	10.5	109.0	119.5

註 : [ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.1.4　苗柏掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.1.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Merbok

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.35	12/6	10:12	0.24	12/6	14:10
石壁	Shek Pik	2.57	12/6	10:06	0.28	12/6	10:09
大埔滘	Tai Po Kau	2.28	12/6	11:46	0.55	12/6	15:19
大廟灣	Tai Miu Wan	2.36	12/6	10:35	0.38	12/6	19:44
尖鼻咀	Tsim Bei Tsui	2.86	12/6	11:13	0.45	13/6	07:44
橫瀾島	Waglan Island	2.42	12/6	09:29	0.29	12/6	19:59

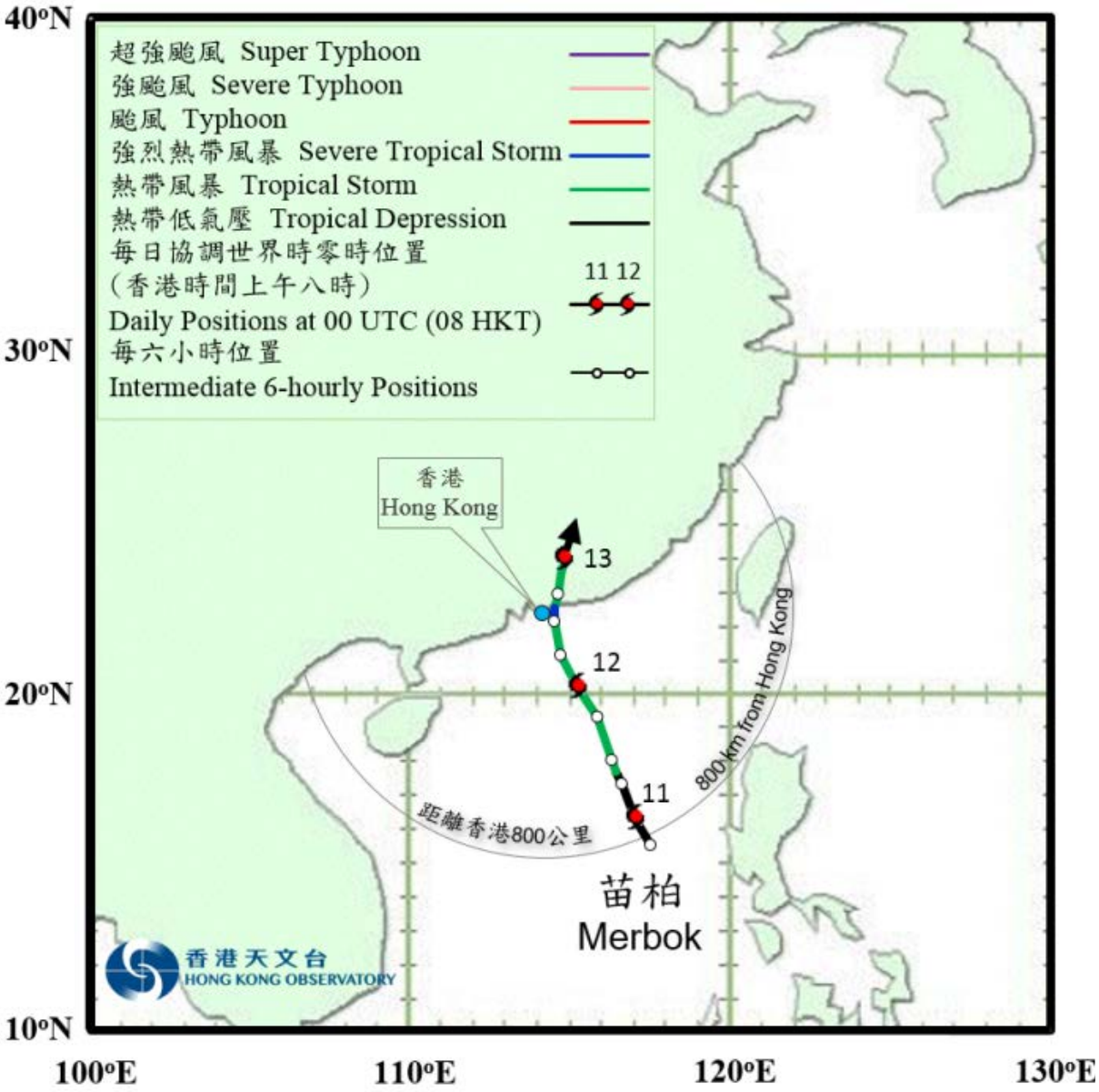


圖 3.1.1a　　二零一七年六月十一日至十三日苗柏的路徑圖。

Figure 3.1.1a　　Track of the Merbok on 11 – 13 June 2017.

圖 3.1.1b　　苗柏接近香港時的路徑圖。

Figure 3.1.1b　　Track of Merbok near Hong Kong.

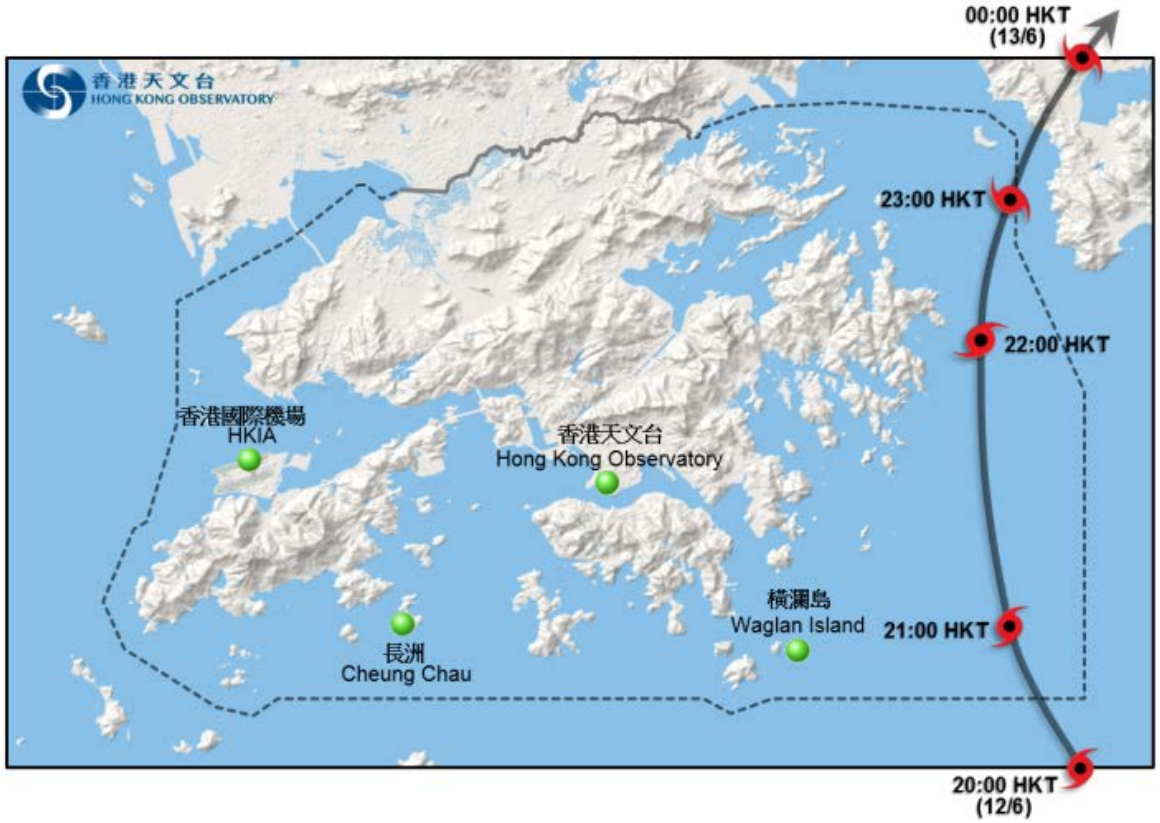


圖 3.1.1c　　苗柏橫過香港時的路徑圖。

Figure 3.1.1c　　Track of Merbok moving across Hong Kong.

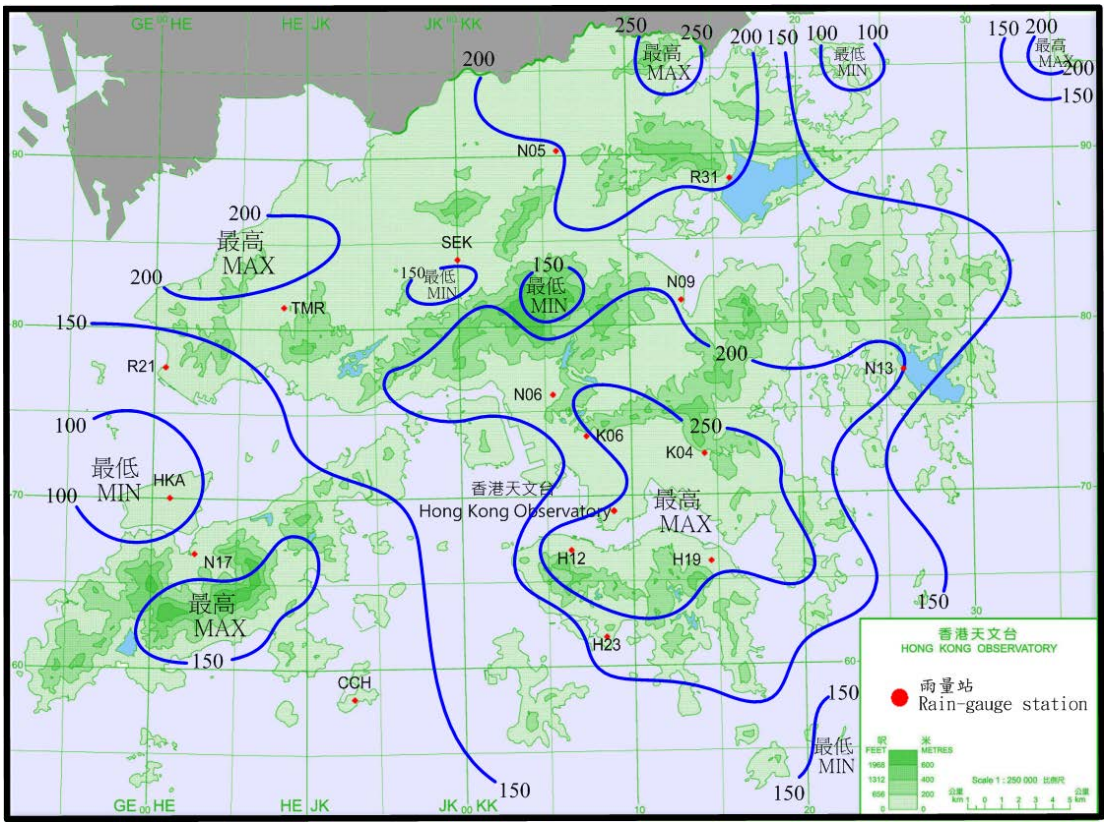


圖 3.1.2　　二零一七年六月十一日至十三日的雨量分佈(等雨量線單位為毫米)。

Figure 3.1.2　Rainfall distribution on 11 – 13 June 2017 (isohyets are in millimetres).

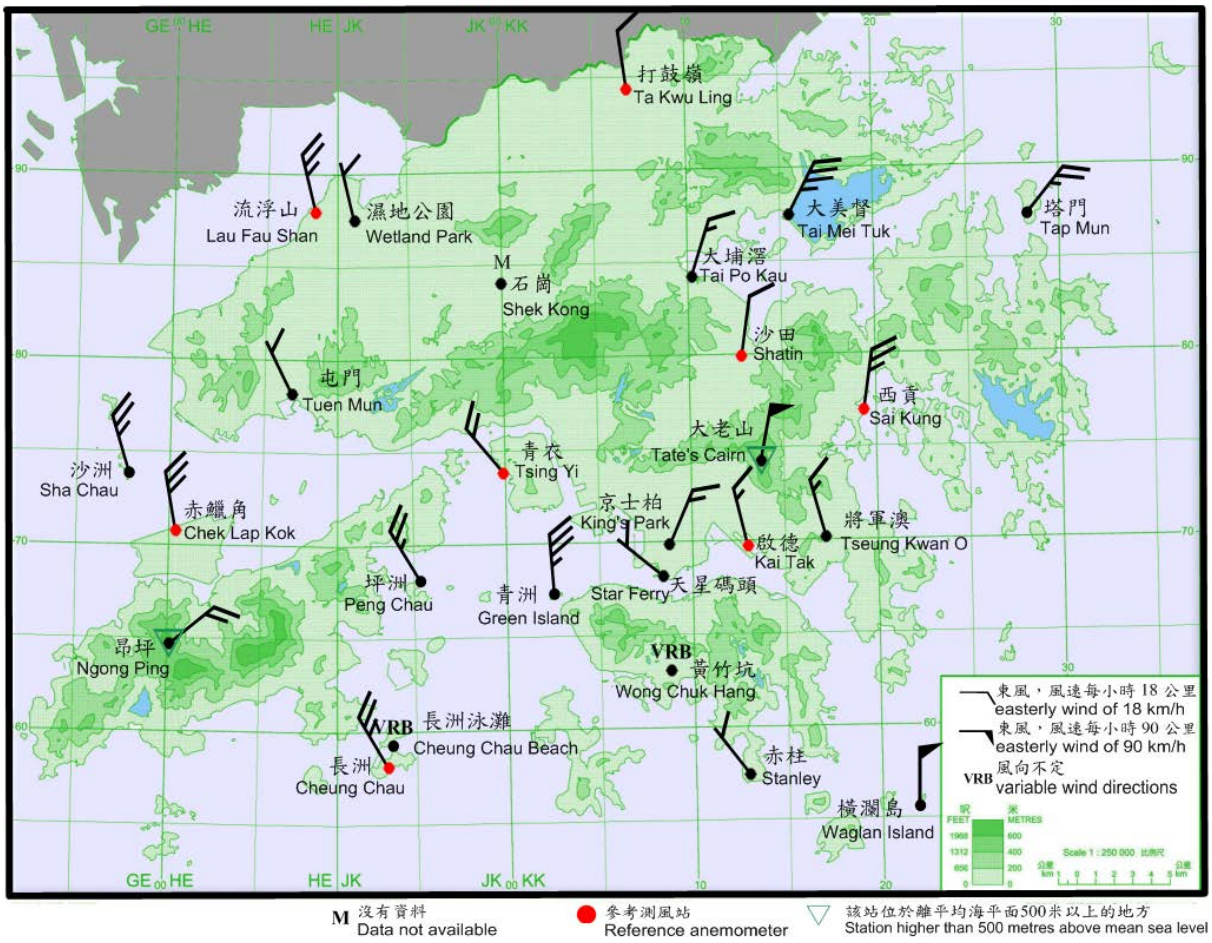


圖 3.1.3a　二零一七年六月十二日下午 8 時 20 分香港各站錄得的十分鐘平均風向和風速。當時橫瀾島及大老山的風力達到暴風程度。

Figure 3.1.3a　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 8:20 p.m. on 12 June 2017. Winds at Waglan Island and Tate's Cairn reached storm force at the time.

註：　黃竹坑及長洲泳灘當時錄得的十分鐘平均風速分別為每小時 19 及 14 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Wong Chuk Hang and Cheung Chau Beach were 19 and 14 km/h respectively.

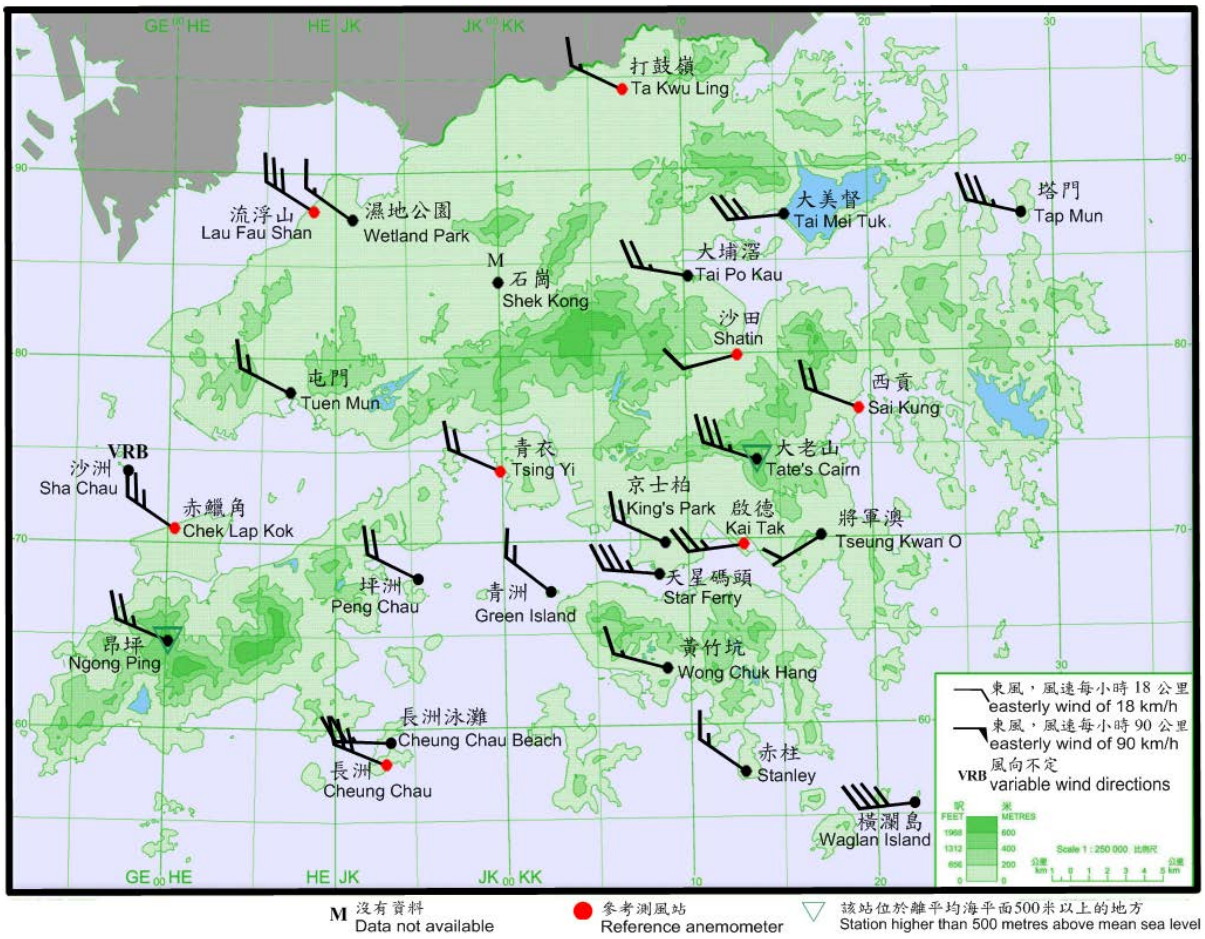


圖 3.1.3b　二零一七年六月十二日下午 11 時 40 分香港各站錄得的十分鐘平均風向和風速。當時九龍天星碼頭及橫瀾島的風力達到烈風程度。

Figure 3.1.3b　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 11:40 p.m. on 12 June 2017. Winds at Star Ferry (Kowloon) and Waglan Island reached gale force at the time.

註：　沙洲當時錄得的十分鐘平均風速為每小時 19 公里。

Note:　The 10-minute mean wind speed recorded at the time at Sha Chau was 19 km/h.

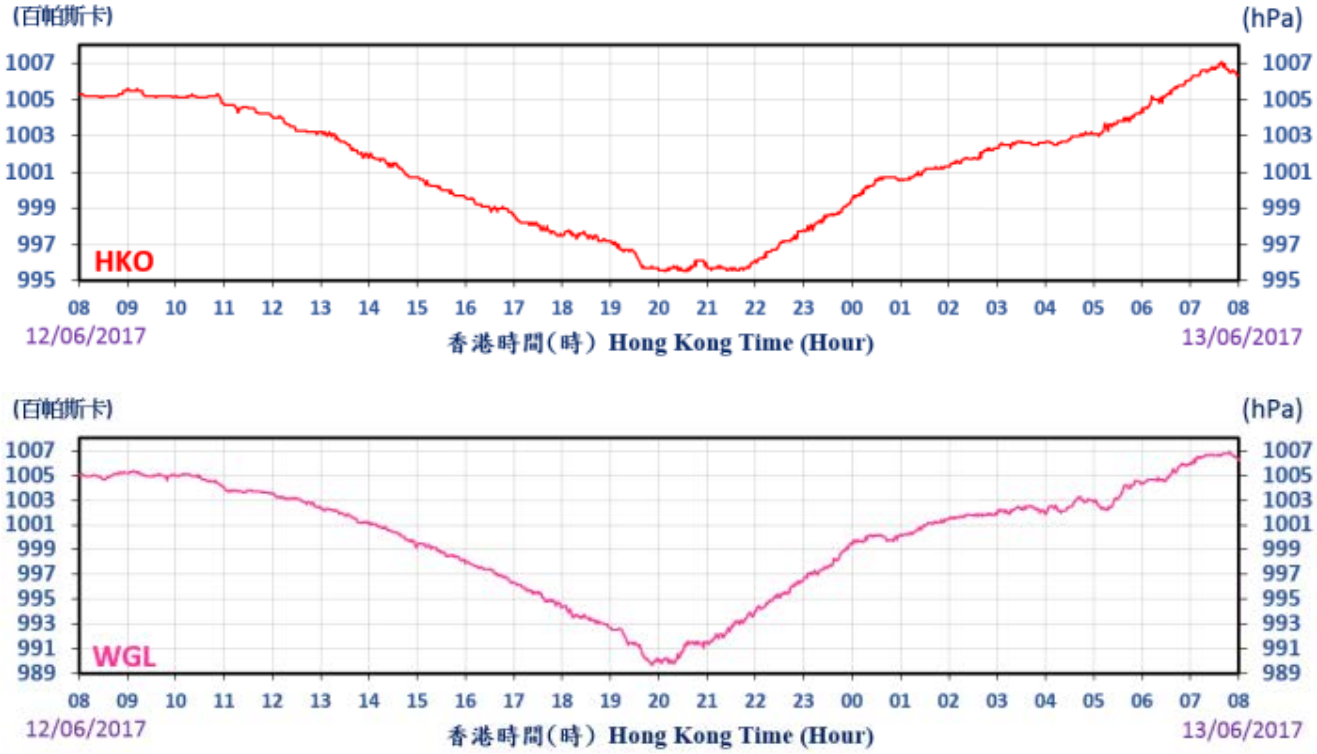


圖 3.1.4　二零一七年六月十二日至十三日天文台總部(上圖)及橫瀾島(下圖)錄得的海平面氣壓。

Figure 3.1.4　Traces of mean sea-level pressure recorded at the Observatory Headquarters (top panel) and Waglan Island (bottom panel) between 12 and 13 June 2017.

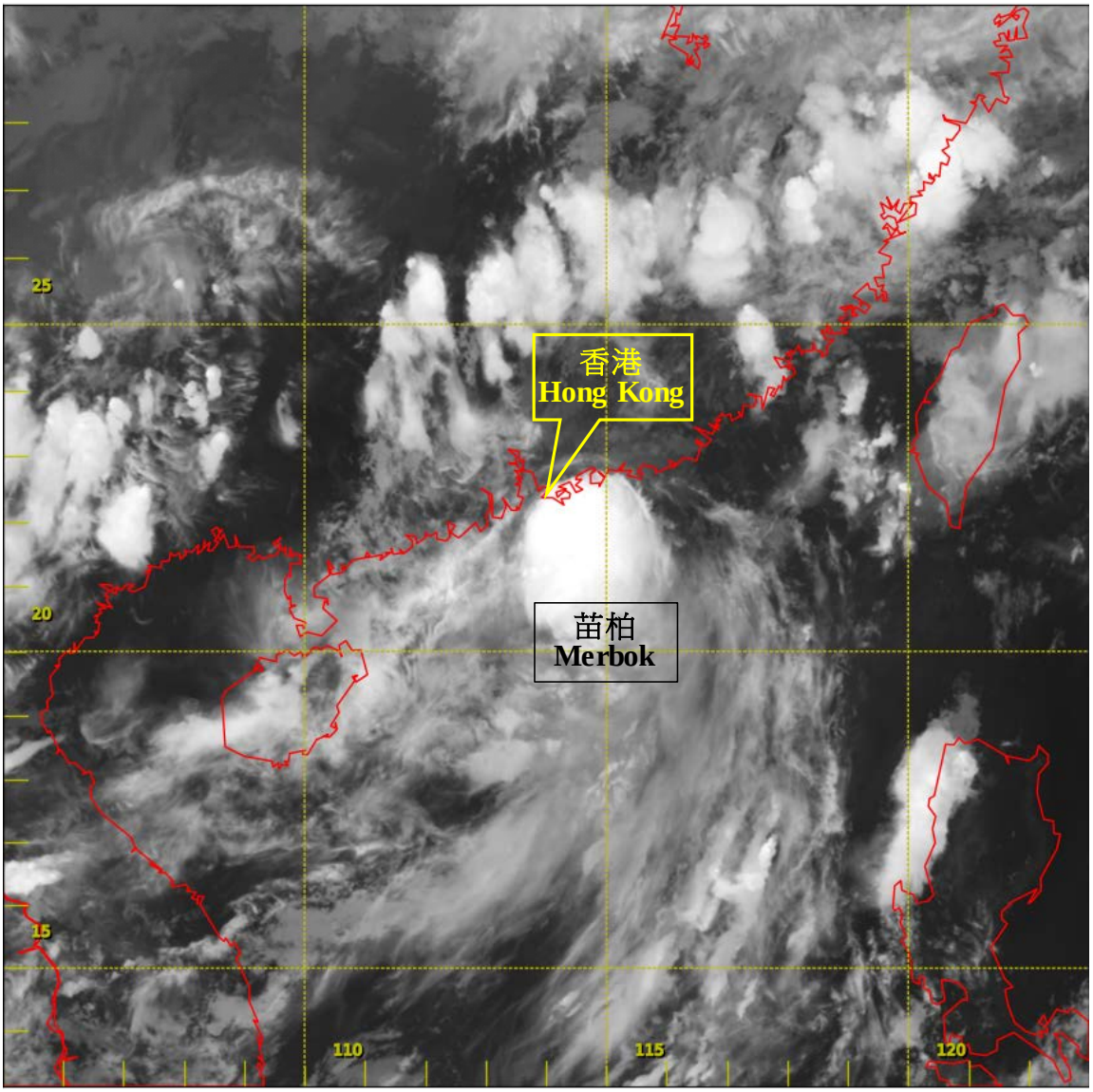


圖 3.1.5　二零一七年六月十二日下午 8 時左右的紅外線衛星圖片，當時苗柏達到其最高強度，中心附近最高持續風速估計為每小時 105 公里。

Figure 3.1.5　Infra-red satellite imagery around 8 p.m. on 12 June 2017, when Merbok was at peak intensity with estimated maximum sustained winds of 105 km/h near its centre.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕

[The satellite imagery was originally captured by the Himawari-8 (H-8) of Japan Meteorological Agency (JMA).]

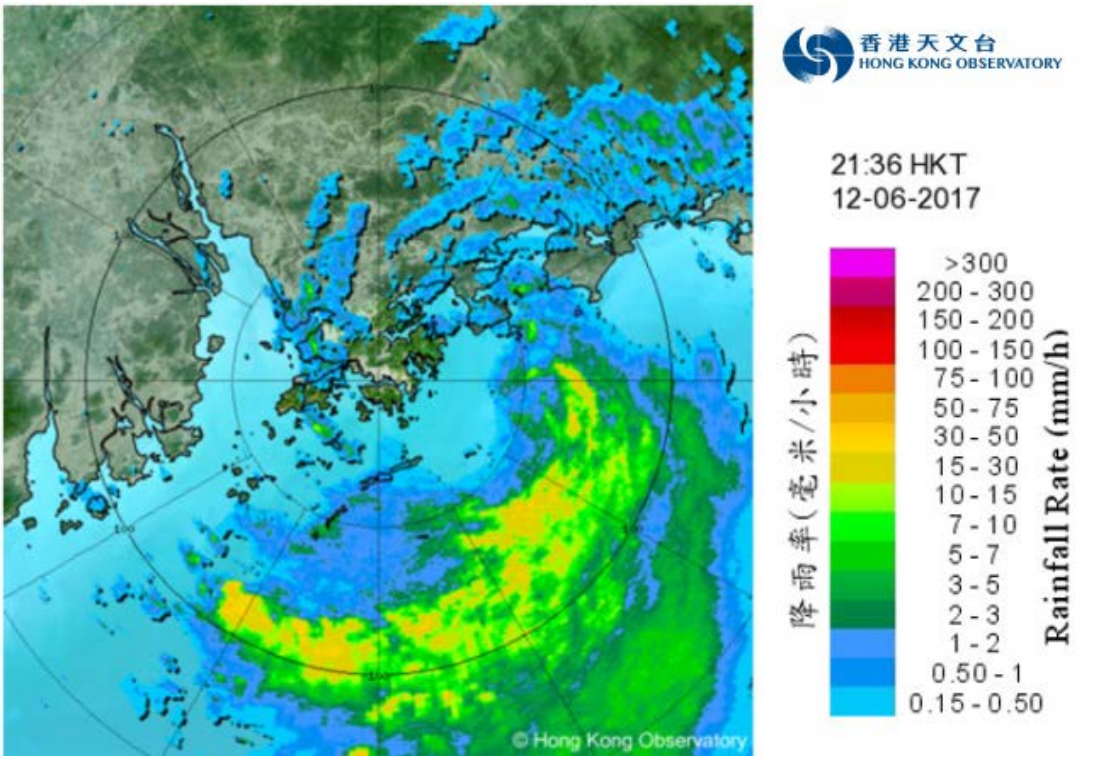


圖 3.1.6a　二零一七年六月十二日下午 9 時 36 分的雷達回波圖像，當時苗柏最接近香港。

Figure 3.1.6a　Image of radar echoes at 9:36 p.m. on 12 June 2017, when Merbok was closest to the territory.

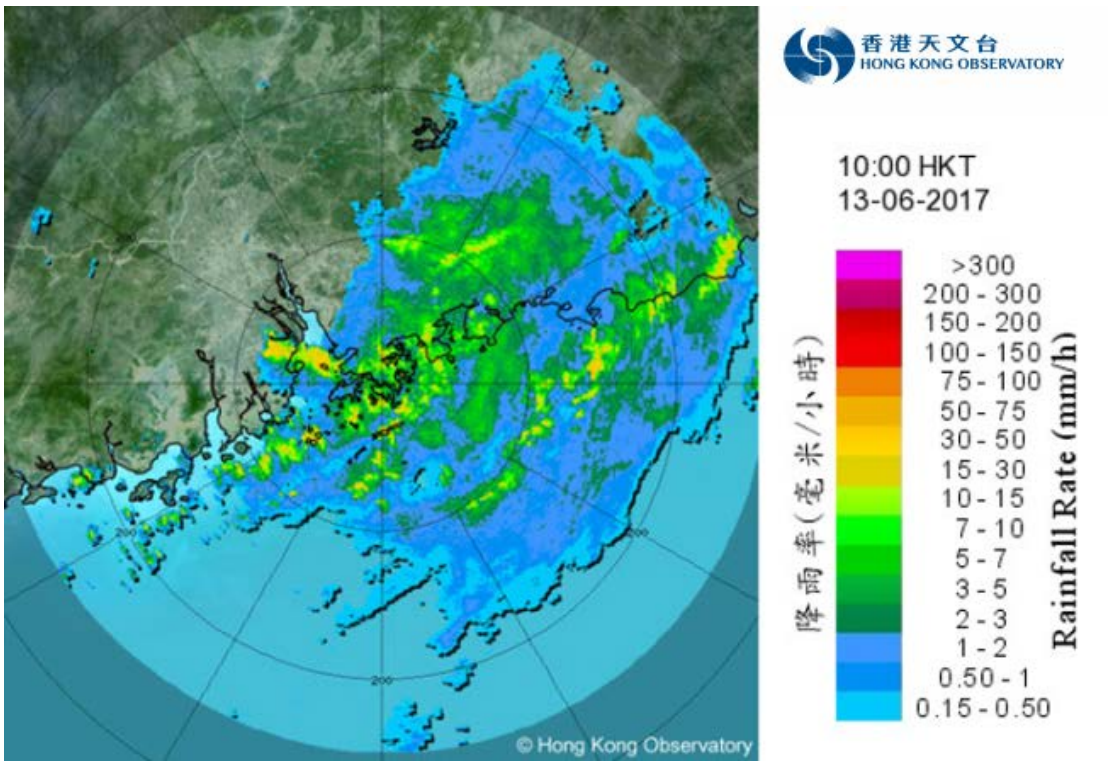


圖 3.1.6b　二零一七年六月十三日上午 10 時的雷達回波圖像。苗柏為香港帶來暴雨。

Figure 3.1.6b　Image of radar echoes at 10 a.m. on 13 June 2017, as rainstorms associated with Merbok affected Hong Kong.

圖 3.1.7　赤柱大潭道一幅護土牆在暴雨下倒塌。(照片由土力工程處及土木工程拓展署提供)

Figure 3.1.7　A retaining wall at Tai Tam Road in Stanley collapsed under the heavy rain. (courtesy of the Geotechnical Engineering Office and the Civil Engineering and Development Department)

3.2 熱帶風暴洛克 (1707)：二零一七年七月二十一日至二十三日

洛克是二零一七年第二個影響香港並導致香港天文台需要發出八號烈風或暴風信號的熱帶氣旋。

洛克是源自七月二十一日下午在呂宋北部以東海域生成的一個熱帶低氣壓。洛克於七月二十二日橫過呂宋海峽，進入南海東北部後採取西北偏西路徑穩定地移向珠三角一帶，傍晚增強為熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時65公里。洛克於七月二十三日早上橫過香港東北部，日間減弱為熱帶低氣壓，傍晚在廣東內陸減弱為一個低壓區。

根據報章報導，洛克為廣東帶來狂風驟雨。一艘貨船在香港以東約70公里的水域沉沒，船上12名船員獲救。

香港天文台在七月二十二日下午3時40分發出一號戒備信號，當時洛克集結在香港之東南偏東約460公里。隨著洛克迅速移近珠三角一帶，天文台在七月二十三日上午3時40分發出三號強風信號，當時洛克位於香港之東南偏東約150公里。本港風勢逐漸增強，吹和緩至清勁偏北風，高地間中吹強風。洛克靠近香港時，在其路徑右方的氣象浮標、船隻以及大鵬半島的氣象站和其中心附近的石油平台均錄得烈風。由於洛克會在早上相當接近香港，對本港構成威脅，天文台在早上9時20分發出八號西北烈風或暴風信號，當時洛克集結在香港天文台之東北偏東約35公里。

洛克於早上9時40分左右在西貢附近登陸前採取較西北之路徑移動，香港絕大部分地區因而免受其環流右方的烈風吹襲，期間只有塔門和部分高地曾錄得達烈風程度的陣風。洛克約在早上10時最接近天文台總部，當時它位於天文台之東北約25公里。隨著洛克開始遠離並減弱，天文台在下午1時20分改發三號強風信號，並於當日下午3時10分改發一號戒備信號。天文台在晚上7時40分取消所有熱帶氣旋警告信號。在熱帶氣旋警告信號生效期間，本港八個參考測風站的持續風力均未有達到強風程度。

在洛克的影響下，尖鼻咀錄得最高潮位(海圖基準面以上) 3.18米及最大風暴潮(天文潮高度以上)0.28米。各站錄得的最低瞬時海平面氣壓如下：

站	最低瞬時海平面氣壓 (百帕斯卡)	日期/月份	時間
香港天文台總部	1004.0	23/7	上午 9 時 47 分
京士柏	1003.7	23/7	上午 9 時 49 分
打鼓嶺	1002.5	23/7	上午 10 時 25 分
大埔	1003.1	23/7	上午 9 時 53 分
沙田	1003.3	23/7	上午 9 時 21 分
上水	1003.1	23/7	上午 9 時 48 分
流浮山	1004.0	23/7	上午 10 時 05 分
長洲	1004.3	23/7	上午 8 時 18 分
橫瀾島	1003.3	23/7	上午 8 時 12 分

七月二十二日本港日間部分時間有陽光及天氣酷熱。受洛克相關的雨帶影響，七月二十三日及二十四日凌晨本港間中有狂風大驟雨及雷暴。天文台在七月二十三日晚上曾發出黃色暴雨警告。七月二十四日日間天氣好轉，部分時間有陽光。這三天期間，本港大部分地區錄得超過 40 毫米雨量。

洛克吹襲香港期間並沒有造成嚴重破壞。香港國際機場有超過550班航班取消或延誤。

表3.2.1 - 3.2.3分別是洛克影響香港期間各站錄得的最高風速、香港的日雨量及最高潮位資料。圖3.2.1 - 3.2.2分別為洛克的路徑圖和本港的雨量分佈圖。圖3.2.3顯示香港各站錄得的風向和風速。圖3.2.4為塔門及大美督錄得的風向及風速變化。圖3.2.5顯示塔門錄得的十分鐘平均風速。圖3.2.6顯示打鼓嶺錄得的海平面氣壓。圖3.2.7 - 3.2.8分別為洛克的衛星及雷達圖像。

3.2 Tropical Storm Roke (1707): 21 – 23 July 2017

Roke was the second tropical cyclone affecting Hong Kong in 2017 and necessitating issuance of the No. 8 Gale or Storm Signal by the Hong Kong Observatory.

Roke originated from a tropical depression that developed over the sea areas east of northern Luzon on the afternoon of 21 July. It moved across the Luzon Strait on 22 July and after entering the northeastern part of the South China Sea, took on a west-northwestward course and headed steadily towards the Pearl River Delta. It intensified into a tropical storm that evening, reaching its peak intensity with an estimated sustained wind of 65 km/h near its centre. Roke swept past the northeastern part of Hong Kong on the morning of 23 July and weakened into a tropical depression during the day. It finally degenerated into an area of low pressure over inland Guangdong in the evening.

According to press reports, Roke brought squally showers to Guangdong during its passage. A vessel sunk over the seas about 70 km east of Hong Kong and all 12 crew members on board were rescued.

In Hong Kong, the No. 1 Standby Signal was issued at 3:40 p.m. on 22 July when Roke was about 460 km east-southeast of the territory. As Roke moved rapidly towards the Pearl River Delta, the No. 3 Strong Wind Signal was issued at 3:40 a.m. on 23 July when Roke was about 150 km east-southeast of Hong Kong. Local wind strengthened gradually, becoming moderate to fresh northerlies and occasionally reaching strong force on high ground. As Roke approached Hong Kong, gale winds were recorded near its centre from oil rig and on the right side along its path from weather buoy, ship, as well as weather stations at the Dapeng Peninsula. With Roke coming very close to Hong Kong in the morning and posing a threat to the territory, the Observatory issued the No. 8 Northwest Gale or Storm Signal at 9:20 a.m. on 23 July when it was about 35 km east-northeast of the Hong Kong Observatory.

Roke turned slightly more to the northwest as it made landfall near Sai Kung around 9:40 a.m. and as a result, Hong Kong for the most part was not exposed to the gale on the right side of its circulation. Only Tap Mun and some places on high ground reported gust reaching gale force during its passage. Roke came closest to the Hong Kong Observatory Headquarters around 10 a.m. that morning with its centre located about 25 km to the northeast. With Roke moving away and weakening, the No. 3 Strong Wind Signal was issued at 1:20 p.m. on 23 July, followed by the No. 1 Standby Signal at 3:10 p.m. All tropical cyclone warning signals were cancelled at 7:40 p.m. that evening. Sustained wind speed of all eight reference anemometers did not reach strong force when the tropical cyclone warning signals for Roke were in force.

Under the influence of Roke, a maximum sea level (above chart datum) of 3.18 m and a maximum storm surge (above astronomical tide) of 0.28 m were recorded at Tsim Bei Tsui. The lowest instantaneous mean sea-level pressures recorded at some selected stations are as follows:

Station	Lowest instantaneous mean sea-level pressure (hPa)	Date/Month	Time
Hong Kong Observatory Headquarters	1004.0	23/7	9:47 a.m.
King's Park	1003.7	23/7	9:49 a.m.
Ta Kwu Ling	1002.5	23/7	10:25 a.m.
Tai Po	1003.1	23/7	9:53 a.m.
Shatin	1003.3	23/7	9:21 a.m.
Sheung Shui	1003.1	23/7	9:48 a.m.
Lau Fau Shan	1004.0	23/7	10:05 a.m.
Cheung Chau	1004.3	23/7	8:18 a.m.
Waglan Island	1003.3	23/7	8:12 a.m.

Locally, it was very hot with sunny periods during the day on 22 July. The rainbands associated with Roke brought occasional heavy squally showers and thunderstorms to Hong Kong on 23 July that lasted till the small hours of 24 July. Amber Rainstorm Warning was issued on the night of 23 July. The weather improved during the day on 24 July with sunny periods. More than 40 millimetres of rainfall were recorded over most parts of Hong Kong during these three days.

Roke did not cause any significant damage in Hong Kong. More than 550 flights were cancelled or delayed at the Hong Kong International Airport.

Information on the maximum wind, daily rainfall and maximum sea level reached in Hong Kong during the passage of Roke is given in Tables 3.2.1 - 3.2.3 respectively. Figures 3.2.1 - 3.2.2 show respectively the track of Roke and the rainfall distribution for Hong Kong. Figure 3.2.3 shows the winds recorded at various stations in Hong Kong. Figure 3.2.4 shows the wind direction and speed recorded at Tap Mun and Tai Mei Tuk. Figure 3.2.5 shows the trace of 10-minute wind speed recorded at Tap Mun. Figure 3.2.6 shows the trace of mean sea-level pressure recorded at Ta Kwu Ling. Figures 3.2.7 - 3.2.8 show respectively a satellite imagery and a radar imagery of Roke.

表 3.2.1　在洛克影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.2.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Roke were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
黃麻角(赤柱)	Bluff Head (Stanley)	東	E	38	23/7	15:23	東	E	20	23/7	16:00
中環碼頭	Central Pier	東南偏東	ESE	40	23/7	15:37	東	E	25	23/7	16:00
長洲	Cheung Chau	東南偏東	ESE	52	23/7	15:53	東南偏東	ESE	34	23/7	17:00
長洲泳灘	Cheung Chau Beach	東	E	49	23/7	15:55	東	E	36	23/7	17:00
青洲	Green Island	西北偏北	NNW	59	23/7	08:05	西北偏北	NNW	40	23/7	09:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	41	23/7	16:44	東南偏東	ESE	27	23/7	17:00
啟德	Kai Tak	東北偏東	ENE	45	23/7	15:37	西北偏西	WNW	22	23/7	09:00
京士柏	King's Park	北	N	41	23/7	07:13	東南偏東	ESE	13	23/7	15:00
							東南	SE	13	23/7	16:00
流浮山	Lau Fau Shan	西北偏北	NNW	45	23/7	09:32	西北偏北	NNW	31	23/7	10:00
昂坪	Ngong Ping	東	E	68	23/7	14:08	東	E	41	23/7	19:00
北角	North Point	西南偏西	WSW	40	23/7	09:42	西南偏西	WSW	30	23/7	10:00
		東	E	40	23/7	15:41					
坪洲	Peng Chau	東	E	45	23/7	15:53	東	E	25	23/7	17:00
平洲	Ping Chau	東北偏東	ENE	67	23/7	09:13	東	E	19	23/7	10:00
西貢	Sai Kung	北	N	54	23/7	07:50	北	N	23	23/7	08:00
							北	N	23	23/7	09:00
沙洲	Sha Chau	西北偏北	NNW	41	23/7	09:36	東南偏東	ESE	27	23/7	17:00
沙螺灣	Sha Lo Wan	東南	SE	38	23/7	14:29	東南	SE	14	22/7	20:00
沙田	Sha Tin	北	N	34	23/7	08:08	西南偏南	SSW	14	23/7	11:00
石崗	Shek Kong	東北偏東	ENE	41	23/7	15:20	東北偏東	ENE	19	23/7	16:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	40	23/7	15:51	西	W	27	23/7	10:00
打鼓嶺	Ta Kwu Ling	西北偏北	NNW	34	23/7	09:05	西北偏北	NNW	14	23/7	10:00
大美督	Tai Mei Tuk	東北偏北	NNE	62	23/7	08:37	東	E	31	23/7	15:00
大帽山	Tai Mo Shan	北	N	70	23/7	09:20	東南	SE	49	23/7	14:00
		東南	SE	70	23/7	13:21	東南偏東	ESE	49	23/7	17:00
		東南	SE	70	23/7	13:26					
大埔滘	Tai Po Kau	西	W	47	23/7	09:36	東	E	25	23/7	16:00
塔門*	Tap Mun*	北	N	72	23/7	09:18	東	E	36	23/7	15:00
大老山	Tate's Cairn	北	N	68	23/7	07:55	北	N	45	23/7	08:00
將軍澳	Tseung Kwan O	西北偏北	NNW	40	23/7	08:30	西北偏北	NNW	14	23/7	08:00
							西北偏北	NNW	14	23/7	09:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	西北	NW	38	23/7	06:58	東南	SE	19	22/7	16:00
		西北	NW	38	23/7	07:00	東南	SE	19	22/7	17:00
		西北	NW	38	23/7	07:10	西北	NW	19	23/7	08:00
屯門政府合署	Tuen Mun Government Offices	東南	SE	31	23/7	13:37	東南偏南	SSE	16	22/7	16:00
橫瀾島	Waglan Island	西北偏北	NNW	59	23/7	07:57	西北偏北	NNW	40	23/7	08:00
濕地公園	Wetland Park	北	N	30	23/7	08:54	西北偏北	NNW	12	23/7	10:00
		北	N	30	23/7	08:58					
		北	N	30	23/7	09:02					
黃竹坑	Wong Chuk Hang	東	E	34	23/7	16:05	東	E	12	23/7	16:00

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

*The old wind station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017.

表 3.2.2　洛克掠過期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.2.2　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Roke

站 (參閱圖 3.2.2) Station (See Fig. 3.2.2)			七月二十二日 22 July	七月二十三日 23 July	七月二十四日 24 July	總雨量 (毫米) Total (mm)
香港天文台 Hong Kong Observatory			3.3	46.5	3.3	53.1
香港國際機場 Hong Kong International Airport (HKA)			0.4	9.1	1.6	11.1
長洲 Cheung Chau (CCH)			1.0	9.0	0.5	10.5
H23	香港仔	Aberdeen	0.5	48.5	4.5	53.5
N05	粉嶺	Fanling	5.0	32.5	8.5	46.0
N13	糧船灣	High Island	14.5	36.0	21.5	72.0
K04	佐敦谷	Jordan Valley	0.0	19.0	17.5	36.5
N06	葵涌	Kwai Chung	0.0	14.5	8.0	22.5
H12	半山區	Mid Levels	4.5	70.5	11.0	86.0
N09	沙田	Sha Tin	5.5	31.0	9.0	45.5
H19	筲箕灣	Shau Kei Wan	2.0	29.5	7.5	39.0
SEK	石崗	Shek Kong	[0.5]	[17.5]	[5.0]	[23.0]
K06	蘇屋邨	So Uk Estate	1.0	17.5	6.5	25.0
R31	大美督	Tai Mei Tuk	[0.5]	[27.5]	[35.5]	[63.5]
R21	踏石角	Tap Shek Kok	[0.0]	[30.0]	[4.5]	[34.5]
TMR	屯門水庫	Tuen Mun Reservoir	[0.1]	46.0	16.4	[62.5]
N17	東涌	Tung Chung	0.0	17.0	2.5	19.5

註 : [ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.2.3　洛克掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.2.3　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Roke

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.66	23/7	08:53	0.19	23/7	08:53
石壁	Shek Pik	2.75	23/7	08:04	0.22	23/7	08:03
大廟灣	Tai Miu Wan	2.61	23/7	09:06	0.26	23/7	09:07
尖鼻咀	Tsim Bei Tsui	3.18	23/7	09:04	0.28	23/7	09:04
橫瀾島	Waglan Island	2.71	23/7	08:58	0.22	23/7	18:33

大埔滘 - 沒有資料　Tai Po Kau - data not available

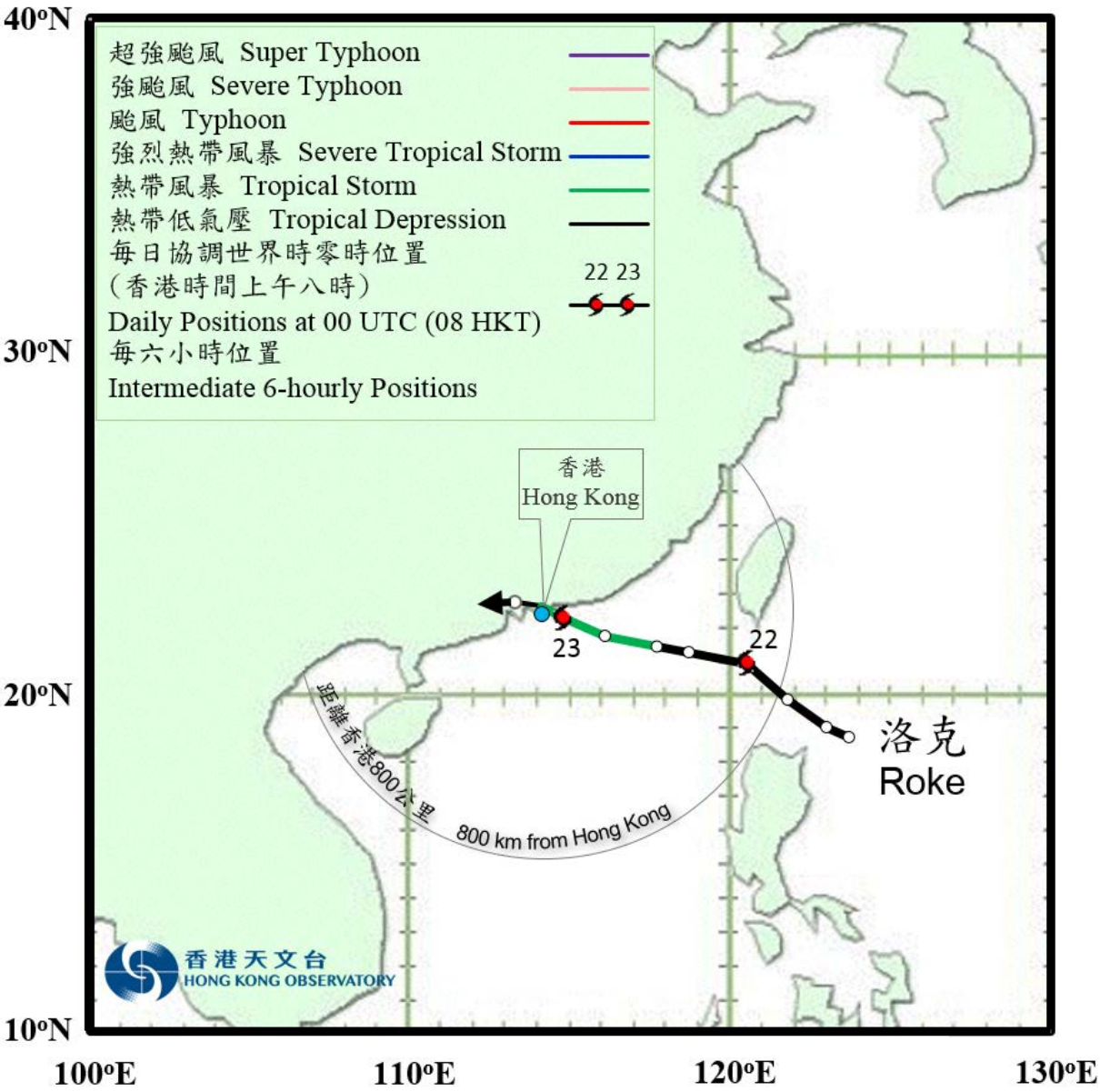


圖 3.2.1a　　二零一七年七月二十一日至二十三日洛克的路徑圖。

Figure 3.2.1a　　Track of Roke on 21 – 23 July 2017.

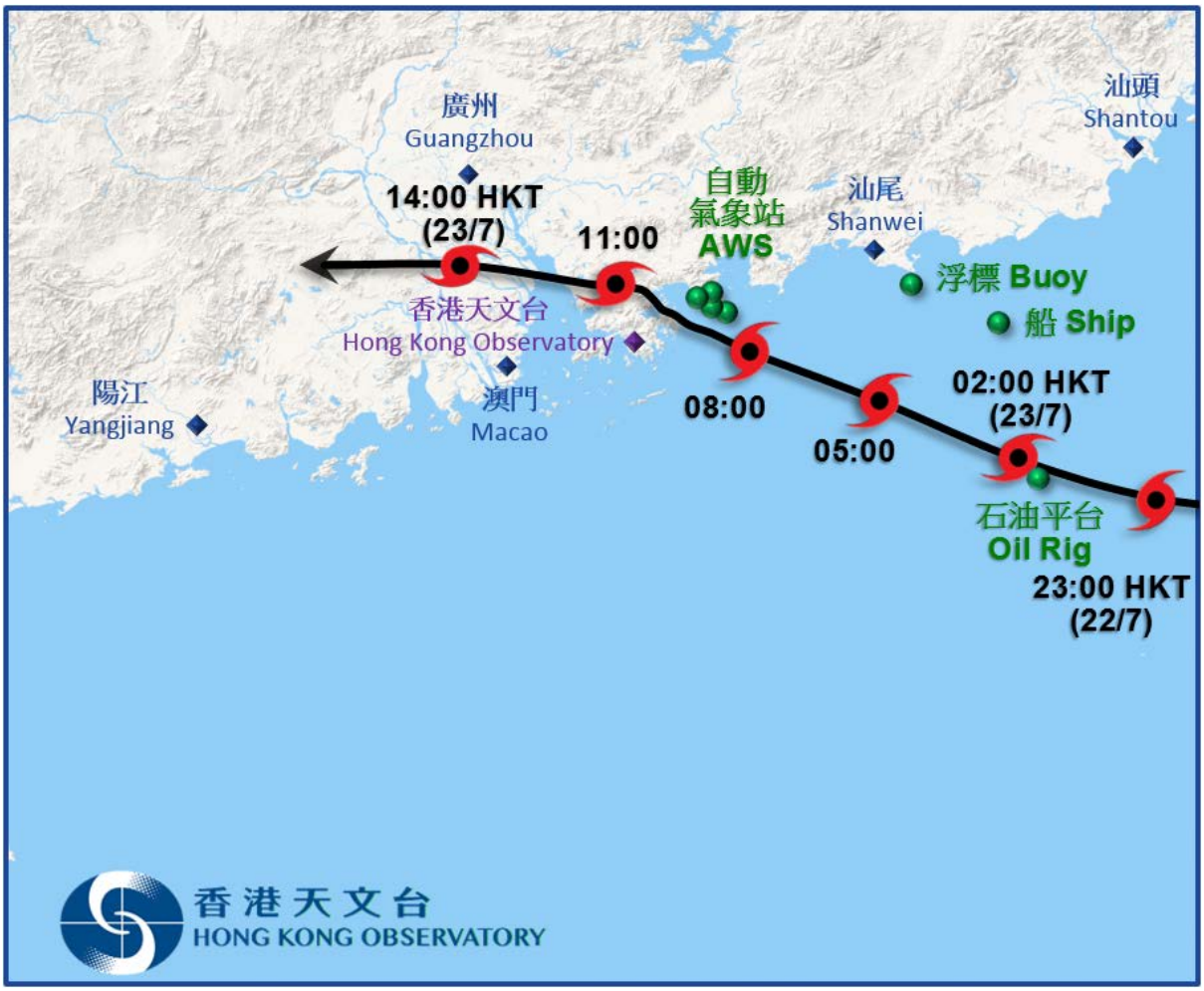


圖 3.2.1b　　洛克接近香港時的路徑圖。綠點顯示在洛克附近的烈風報告。

Figure 3.2.1b　　Track of Roke approaching Hong Kong. Green dots represent reports of gales near Roke.

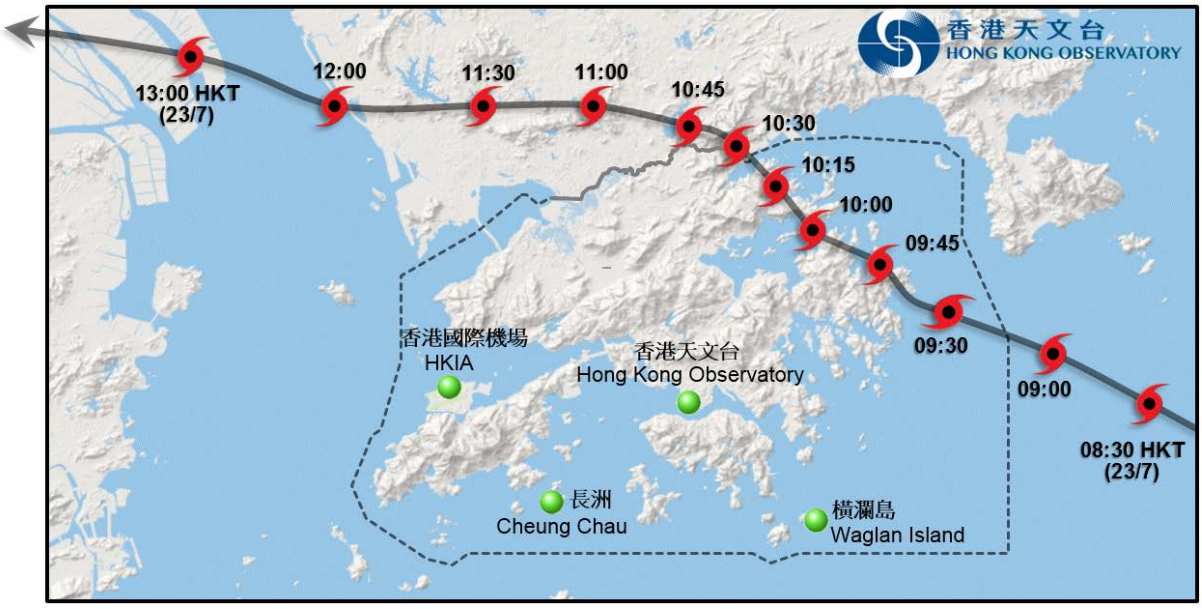


圖 3.2.1c　　洛克橫過香港時的路徑圖。

Figure 3.2.1c　　Track of Roke moving across Hong Kong.

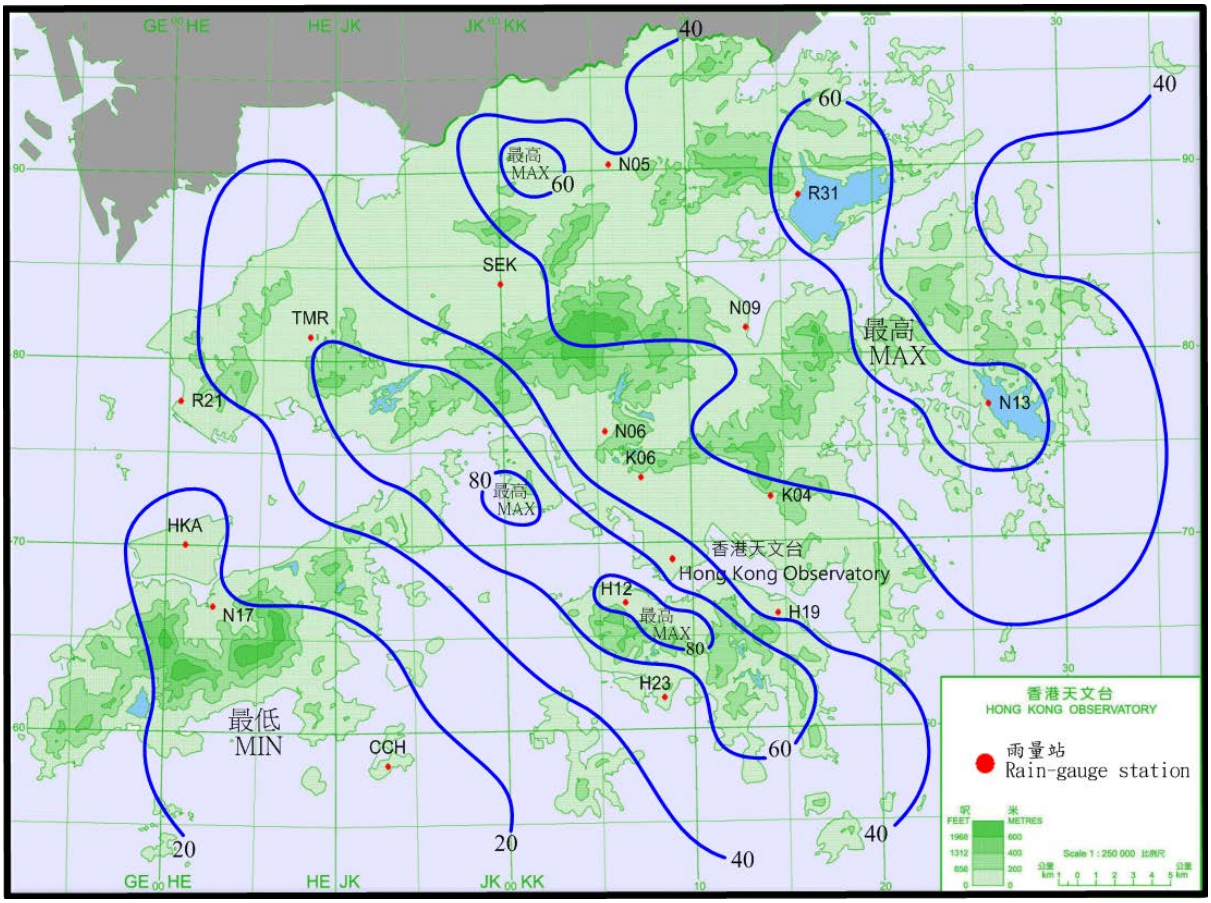


圖 3.2.2　　二零一七年七月二十二日至二十四日的雨量分佈(等雨量線單位為毫米)。

Figure 3.2.2　Rainfall distribution on 22 - 24 July 2017 (isohyets in millimetres).

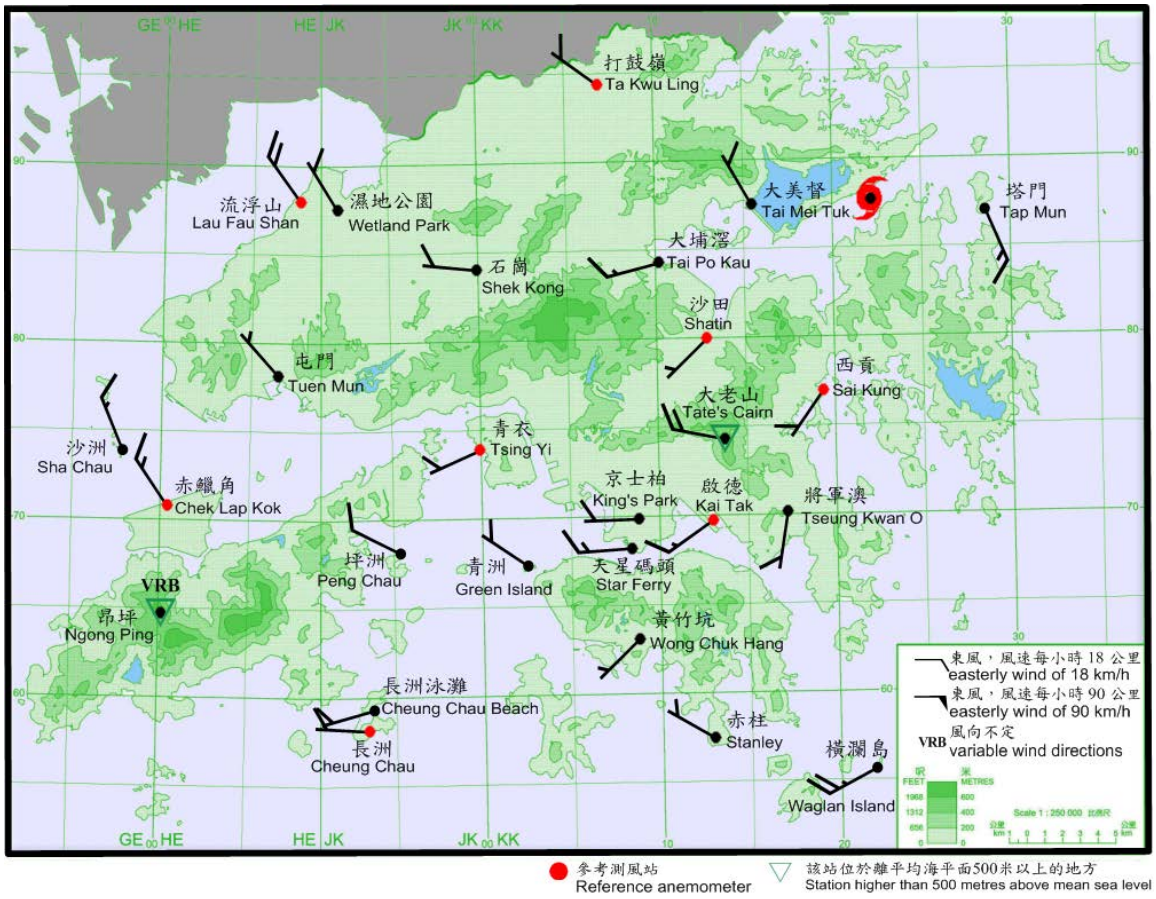


圖 3.2.3　　二零一七年七月二十三日上午 10 時正香港各站錄得的十分鐘平均風向和風速。當時洛克的中心在船灣淡水湖附近，並最接近天文台總部。

Figure 3.2.3　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 10 a.m. on 23 July 2017 when the centre of Roke was near the Plover Cove Reservoir and closest to the Hong Kong Observatory Headquarters.

註：　昂坪當時錄得的十分鐘平均風速分別為每小時 9 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Ngong Ping was 9 km/h.

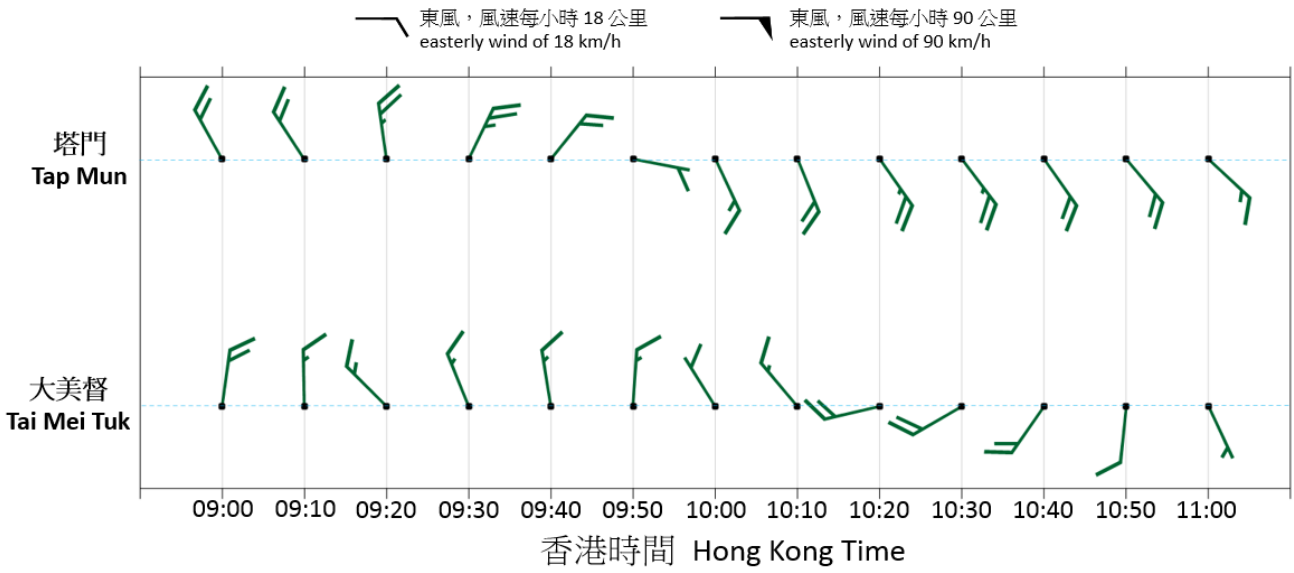


圖 3.2.4　二零一七年七月二十三日上午 9 時至 11 時在塔門及大美督錄得的十分鐘平均風向及風速變化。在洛克橫過本港東北部時，塔門的風向以順時針方向轉變，而大美督的風向則以逆時針方向轉變。

Figure 3.2.4　10-minute mean wind direction and speed recorded at Tap Mun and Tai Mei Tuk between 9 a.m. to 11 a.m. on 23 July 2017. When Roke moved across the northeastern part of Hong Kong, wind direction in Tap Mun shifted in a clockwise direction while that in Tai Mei Tuk turned anti-clockwise.

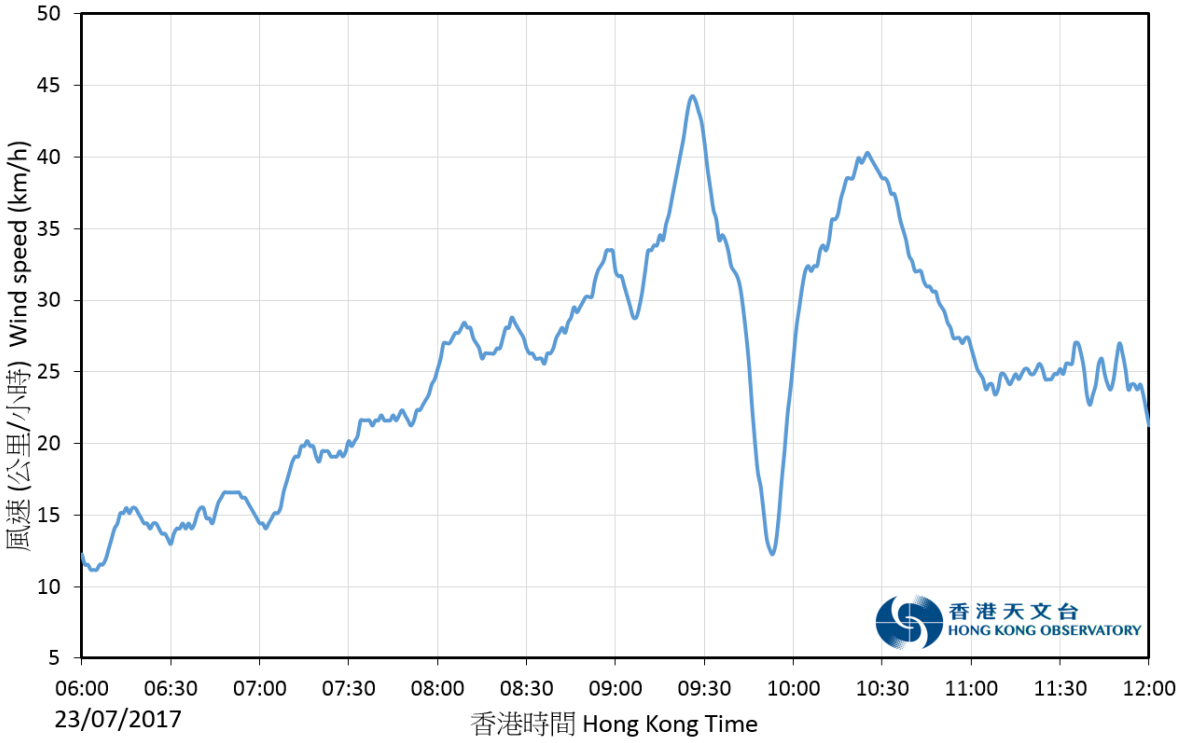


圖 3.2.5　　二零一七年七月二十三日早上在塔門錄得的十分鐘平均風速。

Figure 3.2.5　Trace of 10-minute wind speed at Tap Mun on the morning of 23 July 2017.

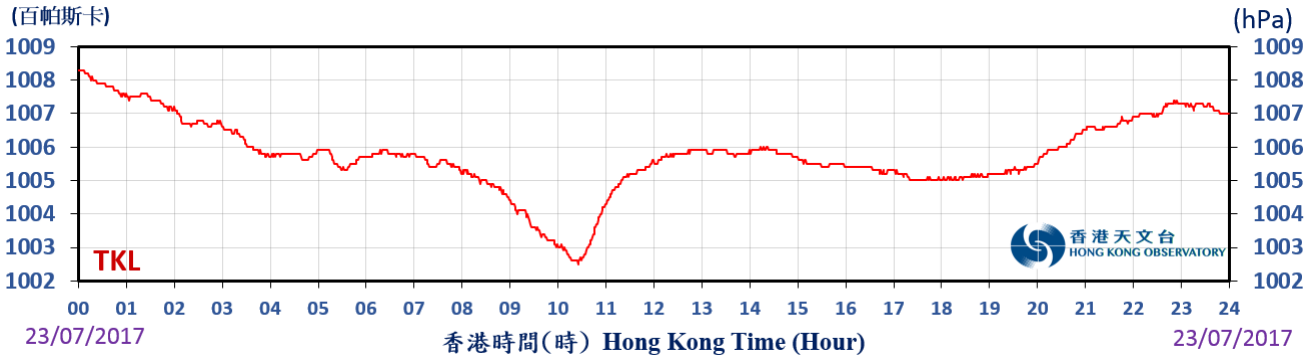


圖 3.2.6　　二零一七年七月二十三日打鼓嶺錄得的海平面氣壓。

Figure 3.2.6　Trace of mean sea-level pressure recorded at Ta Kwu Ling on 23 July 2017.

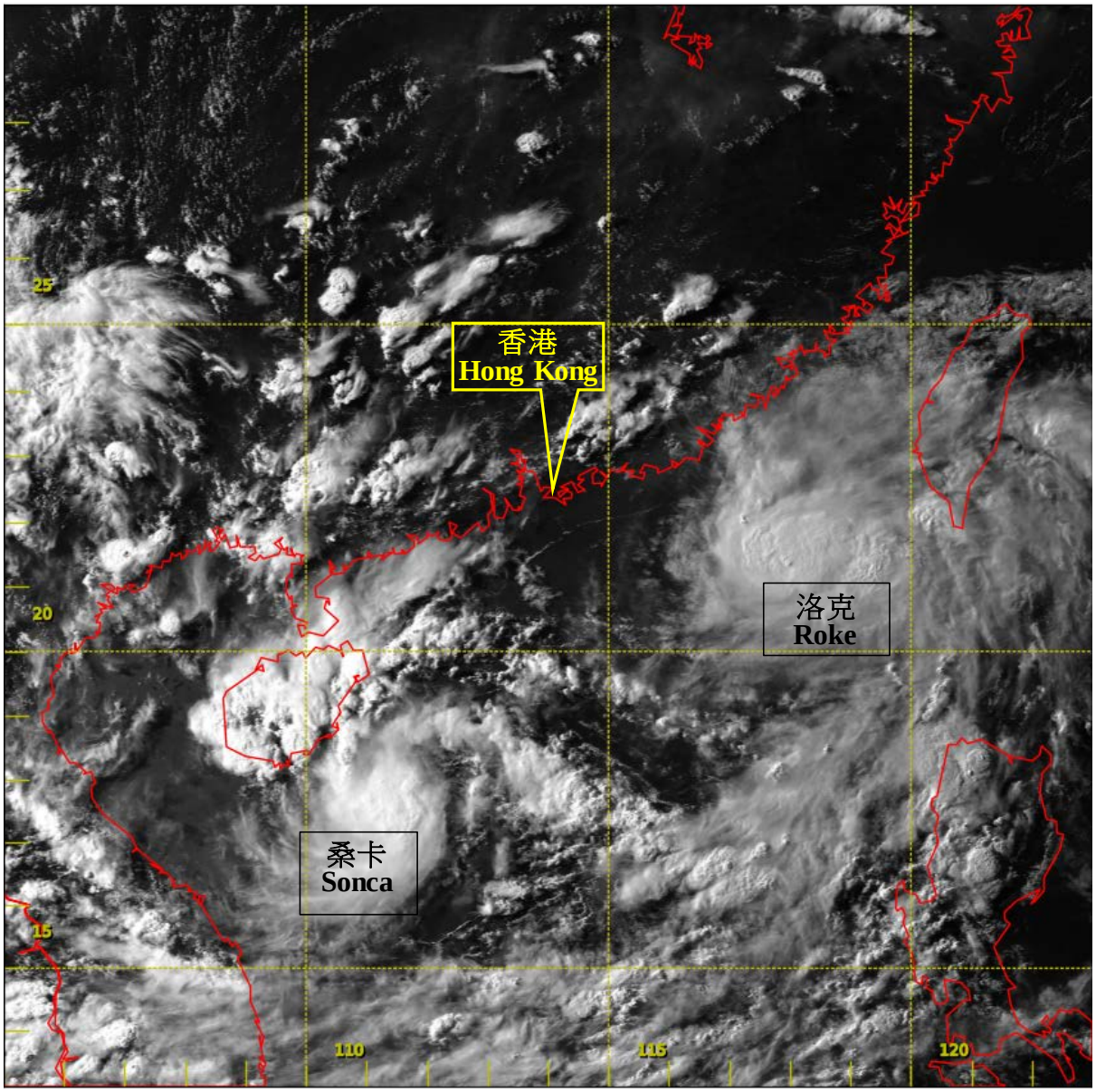


圖 3.2.7　二零一七年七月二十二日下午 5 時左右的可見光衛星圖片，當時洛克達到其最高強度，中心附近最高持續風速估計為每小時 65 公里。而在海南島附近的熱帶氣旋桑卡正向西緩慢移動。

Figure 3.2.7　Visible satellite imagery around 5 p.m. on 22 July 2017, when Roke was at peak intensity with estimated maximum sustained winds of 65 km/h near its centre. Meanwhile, tropical cyclone Sonca near Hainan Island was moving westwards slowly.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕

[The satellite imagery was originally captured by the Himawari-8 (H-8) of Japan Meteorological Agency (JMA).]

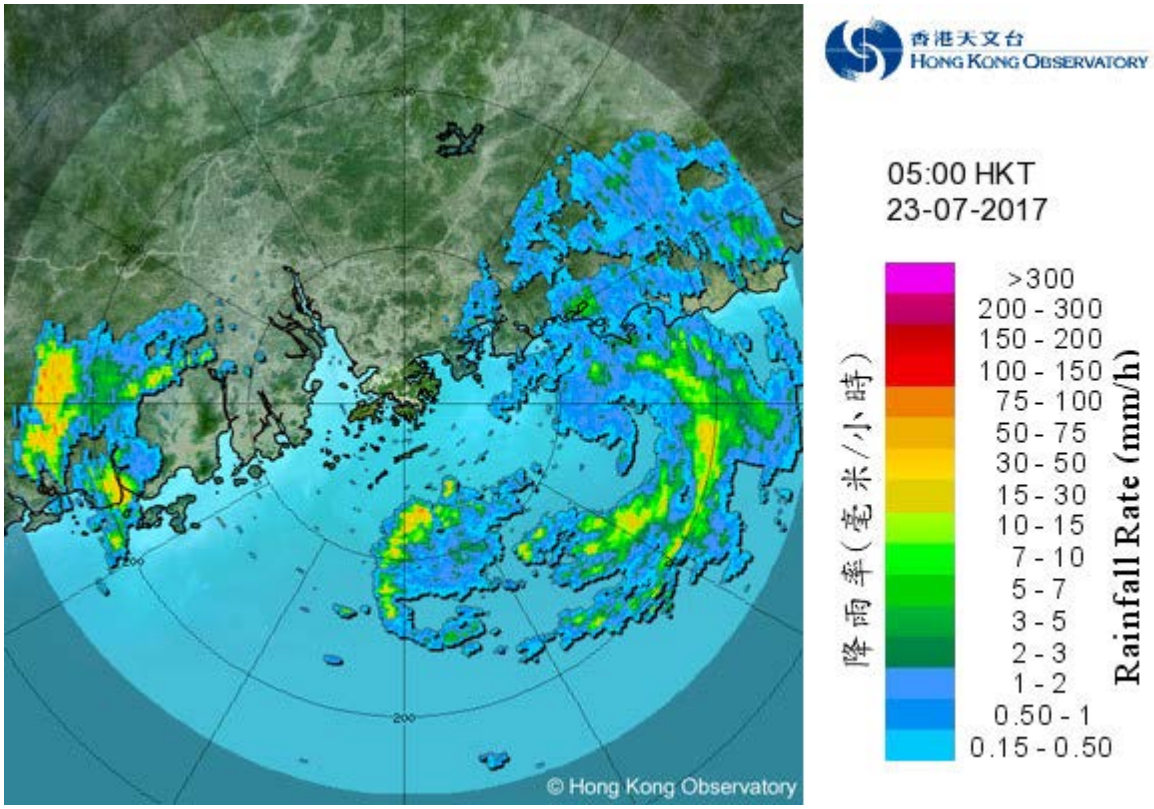


圖 3.2.8　　二零一七年七月二十三日上午 5 時的雷達回波圖像。

Figure 3.2.8　　Image of radar echoes at 5:00 a.m. on 23 July 2017.

3.3 超強颱風天鴿 (1713)：二零一七年八月二十日至二十四日

天鴿是二零一七年第三個影響香港的熱帶氣旋，天文台需要發出十號颶風信號，是自二零一二年強颱風韋森特襲港以來再一次發出最高級別的熱帶氣旋警告信號。由於南海北部海水溫度較正常偏高，天鴿橫過南海北部期間顯著增強，在香港以南水域更短暫發展為超強颱風，是自一九七九年荷貝以來再一次有超強颱風引致天文台發出八號或以上的熱帶氣旋警告信號。

熱帶低氣壓天鴿於八月二十日晚上在高雄之東南偏東約 740 公里的北太平洋西部上形成，大致向偏西方向移動，橫過呂宋海峽，八月二十二日進入南海東北部，並增強為颱風及採取西北偏西路徑移向廣東沿岸。八月二十三日天鴿趨向珠江口一帶及進一步增強，早上在香港以南海域發展成為超強颱風，達到其最高強度，中心附近最高持續風速估計為每小時 185 公里。正午過後天鴿在澳門及珠海附近沿岸登陸，移入廣東西部及逐漸減弱。翌日天鴿橫過廣西，晚上在雲南減弱為一個低壓區。

天鴿為珠江口沿岸帶來嚴重的風暴潮，多處錄得有紀錄以來的最高潮位，當中珠海站錄得風暴潮 2.79 米，而最高潮位則為 6.14 米。珠海沿海地區包括幾個地下停車場被海水淹浸，全市電力及食水供應不穩定。多艘貨船在香港西南約 30 公里的水域擱淺，39 名船員獲救。天鴿為澳門帶來破壞性的風力及風暴潮，廣泛地區出現嚴重破壞及水浸，造成至少十人死亡，超過 240 人受傷，直接經濟損失超過 83 億元澳門幣。媽閣站最高潮位升至 5.58 米，是澳門自一九二五年有紀錄以來的最高潮位。電力及食水供應亦受到影響。天鴿在廣東、廣西、福建、貴州及雲南至少造成 15 人死亡，一人失蹤，約有 74 萬人受災，超過 6,500 間房屋倒塌，直接經濟損失超過 272 億元人民幣。

香港天文台在八月二十二日早上 8 時 40 分發出一號戒備信號，當時天鴿集結在香港之東南偏東約 660 公里。日間本港吹輕微至和緩的偏北風。受高溫觸發的狂風雷暴下午影響本港多處地區。隨著天鴿移近廣東沿岸，天文台在下午 6 時 20 分發出三號強風信號，當時天鴿位於香港之東南偏東約 410 公里。翌日凌晨本港風勢逐漸增強，吹清勁至強風程度的偏北風，高地吹烈風，天文台在上午 5 時 20 分發出八號東北烈風或暴風信號，當時天鴿集結在香港之東南約 160 公里。其後本港風勢迅速增強，多處地方吹東北烈風，離岸及高地吹暴風。由於預料天鴿將會正面吹襲珠江口，天文台在上午 8 時 10 分發出九號烈風或暴風風力增強信號，當時天鴿已移至香港天文台之東南偏南約 100 公里。早上香港風力進一步

增強，天文台在上午 9 時 10 分發出十號颶風信號，當時天鴿位於天文台以南約 70 公里。本港風力普遍達到烈風至暴風程度，南部地區及高地則持續受到颶風吹襲。天鴿在早上 10 時左右最接近香港，位於香港天文台之西南偏南只有約 60 公里。天鴿在香港西面登陸，本港風向由東北逐漸轉為東南，風力開始減弱，天文台在下午 2 時 10 分改發八號東南烈風或暴風信號。隨著天鴿減弱及遠離，天文台分別在下午 5 時 10 分及下午 6 時 20 分改發三號強風信號及一號戒備信號。晚間天鴿進一步移入內陸，天文台在晚上 8 時 40 分取消所有熱帶氣旋警告信號。

天鴿所帶來的風暴潮令本港水位普遍升高一至兩米左右，適逢天文大潮及漲潮(維多利亞港內鰂魚涌當日早上的最高天文潮約為 2.4 米)，疊加效應導致本港多處低窪地區被海水淹浸。鰂魚涌的潮位最高升至 3.57 米(海圖基準面以上)，是自 1954 年有記錄以來的第二高，僅次於一九六二年超強颱風溫黛襲港期間錄得的最高潮位紀錄 3.96 米(海圖基準面以上)。尖鼻咀錄得自一九七四年有記錄以來的最高潮位 4.56 米(海圖基準面以上)。天鴿掠過期間香港各潮汐站所錄得的最高潮位可參考圖 3.3.7。

八月二十三日天鴿吹襲香港期間，橫瀾島、長洲、大美督及北角錄得的最高每小時平均風速分別為 130、124、94 及 85 公里，最高陣風則分別為每小時 193、171、140 及 137 公里。各站錄得的最低瞬時海平面氣壓如下：

站	最低瞬時海平面氣壓 (百帕斯卡)	日期/月份	時間
香港天文台總部	986.3	23/8	上午 9 時 39 分
香港國際機場	982.9	23/8	上午 10 時 57 分
京士柏	986.6	23/8	上午 9 時 40 分
坪洲	983.6	23/8	上午 9 時 52 分
打鼓嶺	990.9	23/8	上午 10 時 01 分
大埔	990.4	23/8	上午 9 時 20 分
沙田	989.6	23/8	上午 9 時 19 分
上水	990.1	23/8	上午 10 時 25 分
流浮山	988.3	23/8	上午 10 時 18 分
長洲	980.1	23/8	上午 10 時 33 分
橫瀾島	982.0	23/8	上午 9 時 34 分

受天鴿前沿下沉氣流所影響，八月二十二日本港天氣悶熱及有煙霞，多處地區的氣溫上升至37度或以上，而當天下午二時左右天文台的氣溫更高達36.6度，創下有記錄以來的最高氣溫。而高溫觸發的強烈對流在下午稍後為本港帶來大驟雨及狂風雷暴。在天鴿環流的影響下，八月二十三日本港有狂風大驟雨及雷暴，天文台在早上曾發出黃色暴雨警告。八月二十四日天氣好轉，日間部分時間有陽光。這三天期間，本港普遍錄得超過 60 毫米雨量。

天鴿吹襲香港期間，本港最少有 129 人受傷，另有超過 5 300 宗塌樹報告、多宗高空墜物意外、一宗山泥傾瀉報告及多處水浸報告。兩名警務人員在新蒲崗處理塌樹時被掉落的樹枝擊傷頭部，一人在觀塘被從高處墮下的晾衫竹枝擊傷。紅磡一幢住宅大廈有吊船在強風下鬆脫並猛撼撞毀數戶單位的玻璃窗。灣仔及中環分別有商業大廈的玻璃幕牆被吹毀，觀塘及荃灣有棚架倒塌。大嶼山愉景灣有貨船在岸邊擱淺，船上十人安全撤離。

天鴿所觸發的風暴潮導致本港多處沿岸地區出現嚴重水浸及破壞，當中包括大澳、石壁、梅窩、長洲、杏花邨、小西灣、鯉魚門、將軍澳、沙田、大埔、西貢、元朗及流浮山等多個地區。據報大澳的水浸較二零零八年黑格比更為嚴重，水浸預警系統在風暴期間啟動，多名居民需要疏散。鯉魚門一帶亦出現嚴重水浸，海水湧入多間村屋及店舖，多名村民被水圍困，需要消防員協助疏散。杏花邨海濱長廊一帶嚴重水浸，海水湧入邨內，有地下停車場被海水淹浸。海水亦湧入小西灣運動場。沙田城門河、吐露港沿岸及大埔林村河一帶的單車徑及行人隧道被淹浸。西貢、流浮山及大埔亦有多間村屋遭受水浸。大埔有多間村屋的電力供應曾受影響。將軍澳海濱長廊被海浪沖擊受損。元朗明渠及山貝河暴漲，附近一帶水浸。石壁監獄懲教職員宿舍亦出現嚴重水浸情況，有車輛被海水沖走。因光纖電纜受損，長洲及坪洲的對外通訊服務受到影響。

天鴿亦嚴重影響本港的海陸空交通，港鐵所有架空路段的鐵路服務曾一度暫停，多區道路因強風、塌樹或水浸需要封閉。多個渡輪碼頭設施出現嚴重損毀，影響渡輪復航。香港國際機場有至少 480 班航班取消，九班航班需要轉飛其它地方。

表 3.3.1 - 3.3.4 分別是天鴿影響香港期間各站錄得的最高風速、持續風力達到強風及烈風程度的時段、香港的日雨量及最高潮位資料。圖 3.3.1 - 3.3.2 分別為天鴿的路徑圖和天鴿中心附近最高持續風速。圖 3.3.3 - 3.3.4 分別是本港的雨量分佈圖及香港各站錄得的風向和風速。圖 3.3.5 顯示長洲、香港國際機場及北

角錄得的風速。圖 3.3.6 顯示天文台總部、長洲及香港國際機場錄得的海平面氣壓。圖 3.3.7 顯示各潮汐站錄得的最高潮位及水浸報告。圖 3.3.8 顯示鰂魚涌、大埔滘及尖鼻咀錄得的潮位及風暴潮。圖 3.3.9 - 3.3.10 分別為天鴿的衛星及雷達圖像[i]。圖 3.3.11 是雲頂高度疊加閃電位置的圖像。天鴿在香港造成的破壞可參見圖 3.3.12 - 3.3.20[ii]。而天鴿在澳門造成的破壞可參見圖 3.3.21 - 3.3.23。

[i] 請參看天文台網頁有關天鴿的衛星及雷達圖像動畫 (https://www.hko.gov.hk/tc/informtc/hato17/hato.htm)。

[ii] 請參看天文台網頁有關天鴿為香港帶來的風暴潮的短片 (https://www.hko.gov.hk/tc/informtc/hato17/hato.htm)。

3.3 Super Typhoon Hato (1713): 20 – 24 August 2017

Hato was the third tropical cyclone affecting Hong Kong in 2017. The highest tropical cyclone warning, No.10 Hurricane Signal, was issued for the first time since Severe Typhoon Vicente hitting Hong Kong in July 2012. Hato intensified significantly as it traversed the northern part of the South China Sea, momentarily attaining super typhoon intensity over the sea areas south of Hong Kong and the first time a super typhoon necessitating the issuance of tropical cyclone warning signals No.8 or above since Hope in 1979.

Hato formed as a tropical depression over the western North Pacific about 740 km east-southeast of Gaoxiong on the night of 20 August. It moved generally westwards across the Luzon Strait and entered the northeastern part of the South China Sea on 22 August, intensifying into a typhoon and tracking west-northwest towards the coast of Guangdong. During its approach towards the Pearl River estuary on 23 August, Hato intensified further and became a super typhoon that morning over the sea areas south of Hong Kong, reaching its peak intensity with an estimated sustained wind of 185 km/h near its centre. After making landfall over the coast near Macao and Zhuhai shortly after noon time, Hato entered western Guangdong and gradually weakened. It moved across Guangxi the next day and degenerated into an area of low pressure over Yunnan at night.

Hato brought severe storm surge to the coast of Pearl River estuary. Record-high sea levels were recorded at many places. A maximum storm surge of 2.79 m and a maximum sea level of 6.14 m were recorded at Zhuhai station. The coastal areas in Zhuhai including some underground carparks were flooded by sea water. Electricity and water supply in the city became unstable. A number of vessels ran aground about 30 km southwest of Hong Kong and 39 crew members were rescued. Hato brought damaging winds and storm surge to Macao. Extensive areas of Macao suffered damage and were seriously flooded, resulting in at least ten deaths and more than 240 injuries. The direct economic loss exceeded 8.3 billion MOP. A maximum sea level of 5.58 metres was recorded in A-Ma station, a record high in Macao since records began in 1925. Electricity and water supplies were also affected. In Guangdong, Guangxi, Fujian, Guizhou and Yunnan, there were at least 15 deaths and one missing during the passage of Hato. Around 740 000 people were affected and over 6 500 houses collapsed, with direct economic loss exceeding 27.2 billion RMB.

The Hong Kong Observatory issued the No.1 Standby Signal at 8:40 a.m. on 22 August when Hato was about 660 km east-southeast of the territory. Local winds were light to moderate northerlies during the day. Squally thunderstorms triggered by high temperatures affected many places in the territory during the afternoon. As Hato edged closer to the coast of Guangdong, the No.3 Strong Wind Signal was issued at 6:20 p.m. when Hato was about 410 km east-southeast of Hong Kong. Local winds strengthened gradually in the small hours of 23 August, becoming fresh to strong northerlies, reaching gale force on high ground. The Observatory issued the No.8 Northeast Gale or Storm Signal at 5:20 a.m. when Hato was about 160 km southeast of the territory. Local winds strengthened rapidly afterwards, with northeasterly gales in many places and reaching storm force offshore and on high ground. With Hato expected to make a direct hit over the Pearl River estuary, the No.9 Increasing Gale or Storm Signal was issued at 8:10 a.m. when Hato was about 100 km south-southeast of the Hong Kong Observatory. Local winds strengthened further that morning and the No.10 Hurricane Signal was issued at 9:10 a.m. when Hato was about 70 km south of the Hong Kong Observatory. Gale to storm force winds generally affected Hong Kong, with winds

persistently reaching hurricane force over the southern part of the territory and on high ground. Hato came closest to Hong Kong around 10 a.m. that morning with its centre passing only about 60 km south-southwest of the Hong Kong Observatory. As Hato made landfall to the west of Hong Kong, local winds gradually veered from northeasterly to southeasterly and started to subside. The No.8 Southeast Gale or Storm Signal was then issued at 2:10 p.m. With Hato weakening and moving away, the No.3 Strong Wind Signal and No.1 Standby Signal were issued at 5:10 p.m. and 6:20 p.m. respectively. Hato moved further inland during the night and all tropical cyclone warning signals were cancelled at 8:40 p.m.

The storm surge brought by Hato raised the water level in Hong Kong generally by about one to two metres. Coinciding with the high water of the astronomical tide (the astronomical high tide was about 2.4 m at Quarry Bay in the Victoria Harbour that morning), the aggregated effect resulted in the inundation of many low-lying areas in Hong Kong by sea water. The water level at Quarry Bay reached a maximum of 3.57 mCD (metres above Chart Datum), the second highest since records began in 1954 and only lower than the record high of 3.96 mCD set by Super Typhoon Wanda in 1962. A maximum water level of 4.56 mCD was recorded in Tsim Bei Tsui, the highest since records began in 1974. For the maximum sea levels recorded at various tide stations in Hong Kong during the passage of Hato, please refer to Figure 3.3.7.

As Hato battered Hong Kong on 23 August, maximum hourly mean winds of 130, 124, 94 and 85 km/h and maximum gusts of 193, 171, 140 and 137 km/h were recorded at Waglan Island, Cheung Chau, Tai Mei Tuk and North Point respectively. The lowest instantaneous mean sea-level pressures recorded at some selected stations are as follows:

Station	Lowest instantaneous mean sea-level pressure (hPa)	Date/Month	Time
Hong Kong Observatory Headquarters	986.3	23/8	9:39 a.m.
Hong Kong International Airport	982.9	23/8	10:57 a.m.
King's Park	986.6	23/8	9:40 a.m.
Peng Chau	983.6	23/8	9:52 a.m.
Ta Kwu Ling	990.9	23/8	10:01 a.m.
Tai Po	990.4	23/8	9:20 a.m.
Shatin	989.6	23/8	9:19 a.m.
Sheung Shui	990.1	23/8	10:25 a.m.
Lau Fau Shan	988.3	23/8	10:18 a.m.
Cheung Chau	980.1	23/8	10:33 a.m.
Waglan Island	982.0	23/8	9:34 a.m.

The subsidence effect ahead of Hato's circulation brought hazy skies and oppressive heat to Hong Kong on 22 August, with temperatures in many places reaching 37 degrees or above. Temperature at the Hong Kong Observatory soared to an all-time record-breaking high of 36.6 degrees around 2 p.m. that day. Intense convection triggered by high temperatures brought heavy showers and squally thunderstorms to the territory later in the afternoon. Under the influence of Hato's circulation, there were heavy squally showers and thunderstorms on 23 August, and Amber Rainstorm Warning was issued by the Observatory

that morning. The weather improved with sunny periods during the day on 24 August. More than 60 mm of rainfall were recorded generally over Hong Kong during the 3-day period.

In Hong Kong, at least 129 people were injured during the passage of Hato. There were over 5 300 reports of fallen trees, many incidents of falling objects, one report of landslide as well as a number of flooding reports. Two police officers were hit on the head by falling branches near San Po Kong when clearing the fallen trees. One person was injured by a falling clothes-hanging pole in Kwun Tong. A suspended work platform at an apartment block in Hung Hom came loose under strong winds and rammed into the windows of several units of the building. Glass curtain walls of several commercial buildings in Wan Chai and Central were shattered. Some scaffolding in Kwun Tong and Tsueu Wan collapsed. A vessel ran aground near Discovery Bay in Lantau Island and ten crew members on board were taken to safety.

Storm surge induced by Hato resulted in serious flooding and damages in a number of coastal areas in Hong Kong, including Tai O, Shek Pik, Mui Wo, Cheung Chau, Heng Fa Chuen, Siu Sai Wan, Lei Yue Mun, Tseung Kwan O, Sha Tin, Tai Po, Sai Kung, Yuen Long and Lau Fau Shan. The flooding in Tai O was reported to be more damaging than that of Hagupit in 2008. The flood alert system for Tai O was activated and many residents were evacuated. Serious flooding also occurred in Lei Yue Mun, with sea water flowing into a number of village houses and shops, trapping many residents who had to be helped to safety by firemen. The Heng Fa Chuen promenade was inundated, with sea water flowing into the estate and its underground car park. Siu Sai Wan Sports Ground was also flooded by sea water. The cycle tracks and subways near Shing Mun River in Sha Tin, coastal area of Tolo Harbour, Lam Tsuen River in Tai Po were flooded, as well as a number of village houses in Sai Kung, Lau Fau Shan and Tai Po. Electricity supply to many village houses in Tai Po was interrupted. The waterfront at Tseung Kwan O was damaged by sea waves. The surge of water level in Yuen Long nullah and Shan Pui River resulted in flooding nearby. Shek Pik Prison Staff Quarters was also seriously flooded, with vehicles swept away by sea waters. External communication services in Cheung Chau and Peng Chau were affected as a result of damaged optical fibre cables.

Transportation services in Hong Kong were seriously affected by Hato. Train services along the open sections of MTR were once suspended. Many roads were closed due to strong winds, fallen trees or flooding. Resumption of ferry services was affected due to the damage of facilities at a number of ferry terminals. More than 480 flights were cancelled and nine flights were diverted at the Hong Kong International Airport.

Information on the maximum wind, periods of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Hato is given in Tables 3.3.1 - 3.3.4 respectively. Figures 3.3.1 - 3.3.2 show respectively the track of Hato and the maximum sustained wind speed near the centre of Hato. Figures 3.3.3 - 3.3.4 are the rainfall distribution for Hong Kong and the winds recorded at various stations in Hong Kong respectively. Figure 3.3.5 shows traces of the wind speed recorded at Cheung Chau, Hong Kong International Airport and North Point. Figure 3.3.6 shows trace of mean sea-level pressure recorded at the Hong Kong Observatory's Headquarters, Cheung Chau and Hong Kong International Airport. Figure 3.3.7 shows the maximum sea level recorded at various tide stations in Hong Kong and flood reports. Figure 3.3.8 is the traces of sea level and storm surge recorded at Quarry Bay, Tai Po Kau and Tsim Bei Tsui. Figures 3.3.9 - 3.3.10 show respectively

a satellite imagery and a radar imagery of Hato[i]. Figure 3.3.11 is an image of cloud top height overliad with lightning locations[ii]. Figures 3.3.12 - 3.3.20 are the damages brought by Hato in Hong Kong. Figures 3.3.21 - 3.3.23 are the damages brought by Hato to Macao.

[i] The animation sequences of satellite and radar imageries are available on the Observatory's website at https://www.hko.gov.hk/en/informtc/hato17/hato.htm.

[ii] The videos of storm surge brought by Hato are available on the Observatory's website at https://www.hko.gov.hk/en/informtc/hato17/hato.htm.

表 3.3.1　本港各站在天鴿熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.3.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Hato were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
黃麻角(赤柱)	Bluff Head (Stanley)	東北	NE	139	23/8	09:06	東南	SE	87	23/8	11:00
中環碼頭	Central Pier	東	E	137	23/8	09:55	東	E	70	23/8	10:00
長洲	Cheung Chau	東南	SE	171	23/8	11:01	東南	SE	124	23/8	12:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	193	23/8	10:15	東北	NE	121	23/8	10:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	144	23/8	11:55	東	E	90	23/8	11:00
啟德	Kai Tak	東北	NE	130	23/8	08:54	東南偏東	ESE	67	23/8	12:00
京士柏	King's Park	東南偏東	ESE	113	23/8	10:49	東南偏東	ESE	52	23/8	11:00
流浮山	Lau Fau Shan	東北偏北	NNE	112	23/8	08:55	北	N	65	23/8	09:00
昂坪	Ngong Ping	東	E	224	23/8	11:07	東北偏東	ENE	131	23/8	11:00
北角	North Point	東北偏東	ENE	137	23/8	09:49	東北偏東	ENE	85	23/8	10:00
坪洲	Peng Chau	東	E	151	23/8	10:53	東	E	96	23/8	11:00
平洲	Ping Chau	東北偏東	ENE	77	23/8	08:57	東北偏東	ENE	25	23/8	09:00
西貢	Sai Kung	東	E	112	23/8	10:00	東北	NE	70	23/8	10:00
沙洲	Sha Chau	東南偏南	SSE	137	23/8	12:21	東南偏東	ESE	88	23/8	12:00
沙田	Sha Tin	東北偏北	NNE	104	23/8	09:27	東南	SE	38	23/8	13:00
石崗	Shek Kong	東北	NE	106	23/8	09:52	東	E	45	23/8	12:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	112	23/8	09:54	東	E	59	23/8	11:00
打鼓嶺	Ta Kwu Ling	東北偏北	NNE	99	23/8	09:42	東北偏北	NNE	41	23/8	10:00
大美督	Tai Mei Tuk	東北偏東	ENE	140	23/8	10:20	東北偏東	ENE	94	23/8	10:00
							東	E	94	23/8	11:00
大帽山	Tai Mo Shan	東南偏東	ESE	196	23/8	11:22	東南	SE	90	23/8	13:00
大埔滘	Tai Po Kau	東南偏東	ESE	113	23/8	11:38	東	E	68	23/8	11:00
塔門*	Tap Mun*	東北偏東	ENE	122	23/8	09:22	東北偏東	ENE	94	23/8	10:00
		東北偏東	ENE	122	23/8	09:29					
大老山	Tate's Cairn	東北	NE	187	23/8	08:37	東北偏東	ENE	118	23/8	09:00
將軍澳	Tseung Kwan O	東南偏東	ESE	96	23/8	11:04	東北偏北	NNE	36	23/8	09:00
							東南偏東	ESE	36	23/8	12:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南偏東	ESE	106	23/8	10:40	東南偏東	ESE	43	23/8	12:00
屯門政府合署	Tuen Mun Government Offices	東南	SE	112	23/8	11:52	東南	SE	43	23/8	13:00
橫瀾島	Waglan Island	東	E	193	23/8	09:10	東北	NE	130	23/8	09:00
濕地公園	Wetland Park	東北	NE	76	23/8	09:57	東北偏東	ENE	38	23/8	11:00
黃竹坑	Wong Chuk Hang	東	E	117	23/8	10:00	東	E	43	23/8	11:00

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站。

*The old anemometer station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017.

青洲, 沙螺灣- 沒有資料　Green Island, Sha Lo Wan - data not available

表 3.3.2　在天鴿影響下，熱帶氣旋警告信號系統的八個參考測風站在熱帶氣旋警告信號生效時錄得持續風力達到強風及烈風程度的時段

Table 3.3.2　Periods during which sustained strong and gale force winds were attained at the eight reference anemometers when tropical cyclone warning signals for Hato were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風* 時間 Start time when strong wind speed* was attained		最後達到強風* 時間 End time when strong wind speed* was attained		最初達到烈風# 時間 Start time when gale force wind speed# was attained		最後達到烈風# 時間 End time when gale force wind speed# was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	23/8	05:13	23/8	16:51	23/8	07:33	23/8	13:45
香港國際機場	Hong Kong International Airport	22/8	16:11	23/8	15:26	23/8	08:41	23/8	13:32
啟德	Kai Tak	23/8	08:49	23/8	12:41	23/8	10:26	23/8	12:05
流浮山	Lau Fau Shan	23/8	06:33	23/8	14:55	23/8	08:24	23/8	10:36
西貢	Sai Kung	23/8	06:16	23/8	16:13	23/8	08:08	23/8	12:26
沙田	Sha Tin	23/8	12:08	23/8	12:50	-			
打鼓嶺	Ta Kwu Ling	23/8	08:56	23/8	10:35	-			
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	23/8	10:37	23/8	13:34	-			

- 未達到指定的風速
- not attaining the specified wind speed

* 十分鐘平均風速達每小時 41-62 公里
* 10-minute mean wind speed of 41- 62 km/h

十分鐘平均風速達每小時 63-87 公里
10-minute mean wind speed of 63-87 km/h

註:　本表列出持續風力達到強風及烈風程度的起始及終結時間。期間風力可能高於或低於指定的風力。

Note: The table gives the start and end time of sustained strong or gale force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.3.3　　天鴿掠過期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.3.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Hato

站 (參閱圖 3.3.3) Station (See Fig. 3.3.3)			八月二十二日 22 Aug	八月二十三日 23 Aug	八月二十四日 24 Aug	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			2.0	67.1	微量 Trace	69.1
香港國際機場 Hong Kong International Airport (HKA)			20.4	58.7	2.4	81.5
長洲 Cheung Chau (CCH)			1.5	32.0	0.0	33.5
H23	香港仔	Aberdeen	1.5	51.5	0.0	53.0
N05	粉嶺	Fanling	3.0	49.0	1.0	53.0
N13	糧船灣	High Island	17.5	46.0	0.0	63.5
K04	佐敦谷	Jordan Valley	2.0	66.5	0.0	68.5
N06	葵涌	Kwai Chung	0.5	82.0	0.0	82.5
H12	半山區	Mid Levels	3.0	71.0	0.0	74.0
N09	沙田	Sha Tin	0.5	88.5	3.5	92.5
H19	筲箕灣	Shau Kei Wan	8.5	62.5	0.0	71.0
SEK	石崗	Shek Kong	1.0	96.0	0.0	97.0
K06	蘇屋邨	So Uk Estate	3.5	89.0	0.0	92.5
R31	大美督	Tai Mei Tuk	2.5	66.0	[2.5]	[71.0]
R21	踏石角	Tap Shek Kok	19.0	82.5	[3.0]	[104.5]
TMR	屯門水庫	Tuen Mun Reservoir	4.6	73.2	0.0	77.8
N17	東涌	Tung Chung	29.5	56.5	0.0	86.0

註 : [ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.3.4　　天鴿掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.3.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Hato

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	3.57	23/8	10:27	1.18	23/8	10:27
石壁	Shek Pik	3.91	23/8	11:30	1.54	23/8	11:32
大廟灣*	Tai Miu Wan*	3.14	23/8	07:53	1.05	23/8	07:53
大埔滘	Tai Po Kau	4.09	23/8	10:58	1.65	23/8	10:58
尖鼻咀	Tsim Bei Tsui	4.56	23/8	13:42	2.42	23/8	13:42
橫瀾島*	Waglan Island*	2.97	23/8	07:35	0.76	23/8	07:35

*數據不完整　* incomplete data

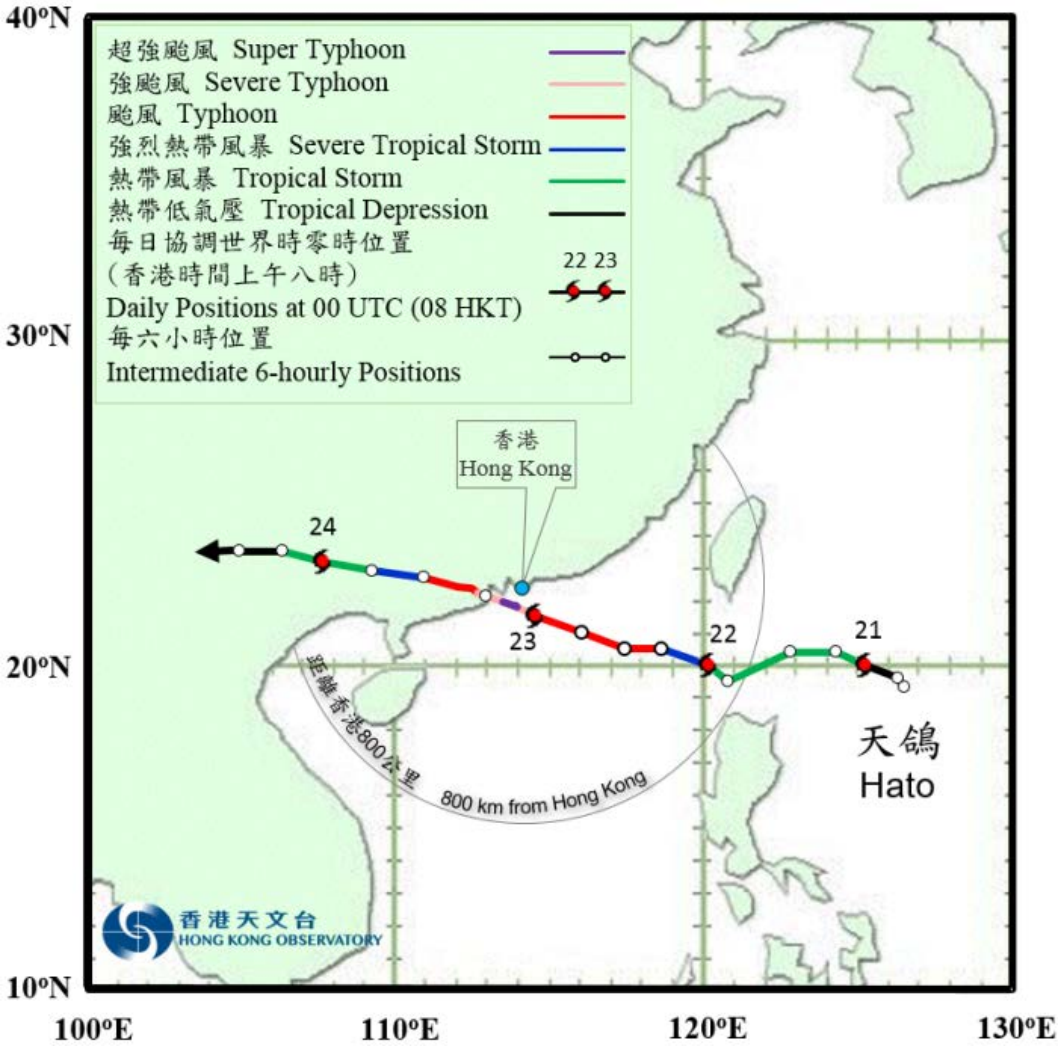


圖 3.3.1a　　二零一七年八月二十日至二十四日天鴿的路徑圖。

Figure 3.3.1a　　Track of Hato on 20 – 24 August 2017.

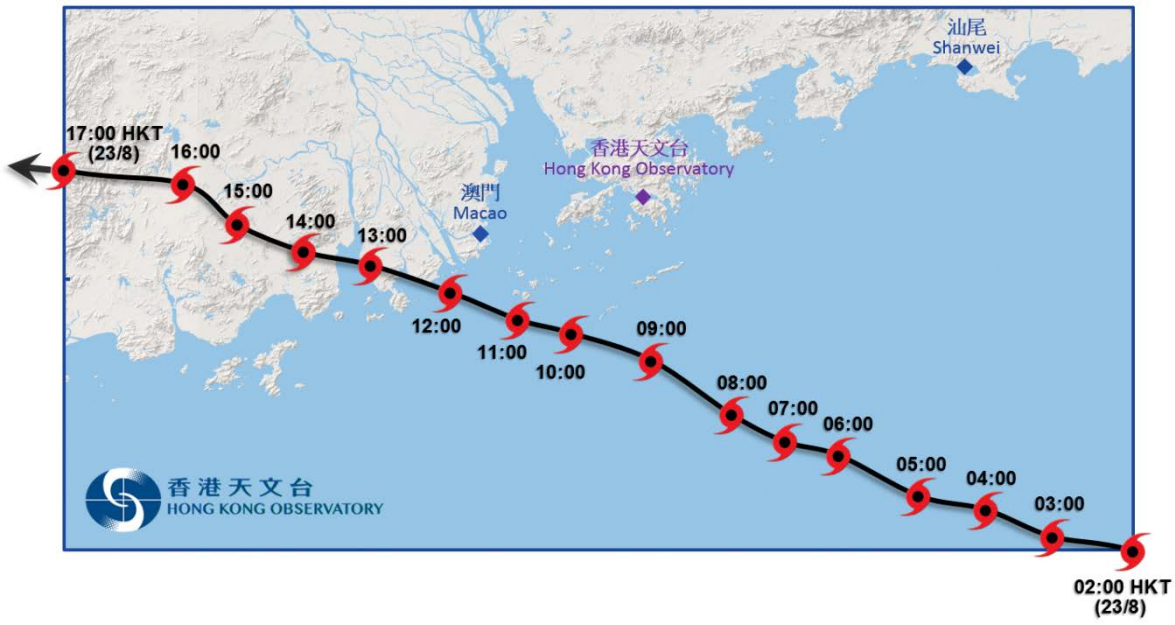


圖 3.3.1b　　天鴿接近香港時的路徑圖。

Figure 3.3.1b　　Track of Hato near Hong Kong.

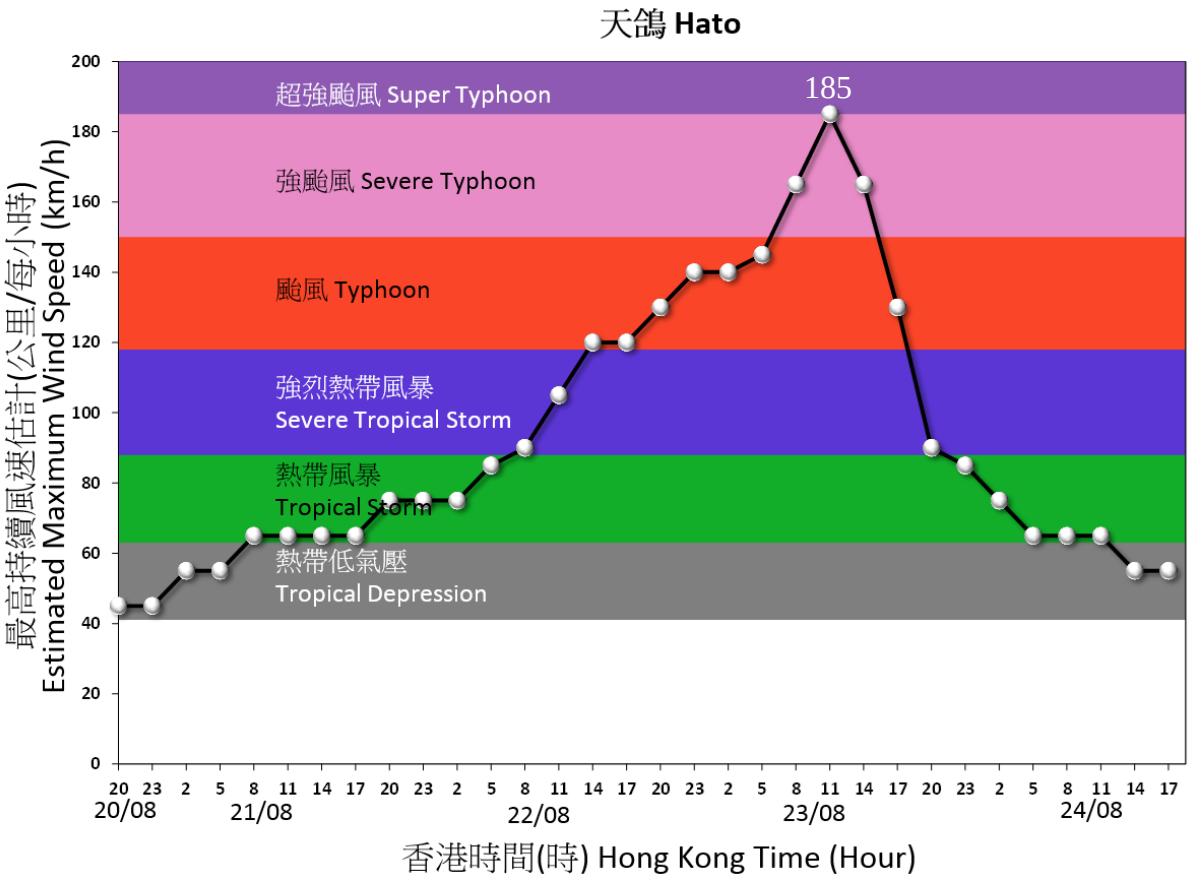


圖 3.3.2　　天鴿中心附近最高持續風速的時間序列。

Figure 3.3.2　Time series of the maximum sustained wind speed near the centre of Hato.

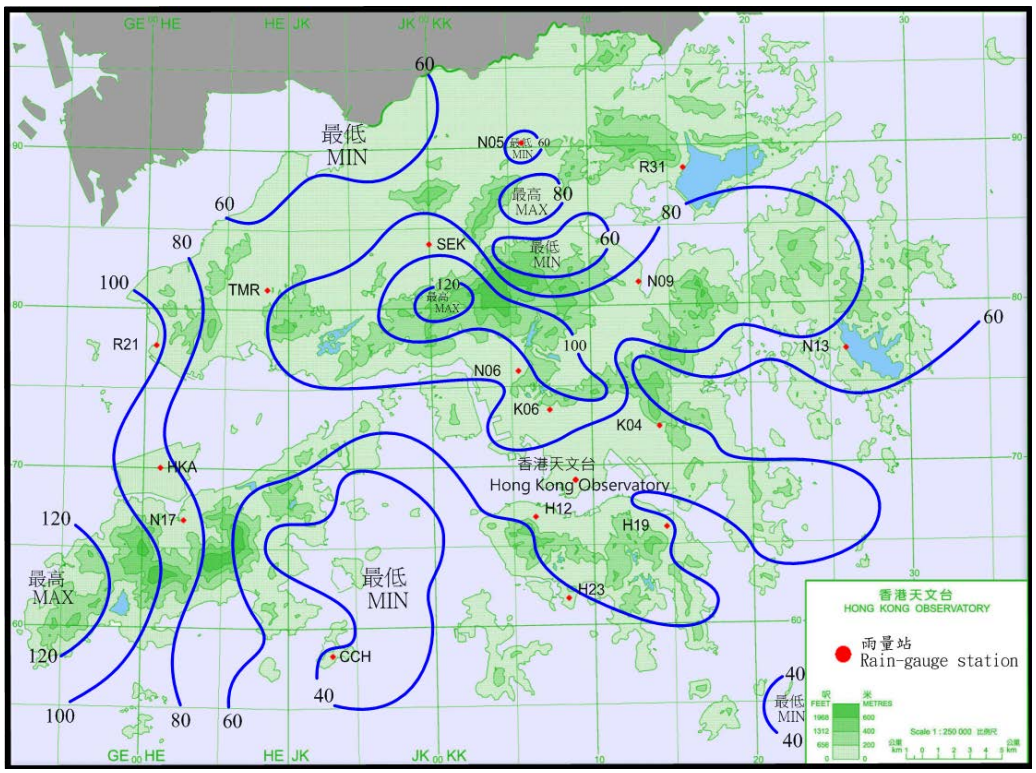


圖 3.3.3　　二零一七年八月二十二日至二十四日的雨量分佈(等雨量線單位為毫米)。

Figure 3.3.3　Rainfall distribution on 22 - 24 August 2017 (isohyets in millimetres).

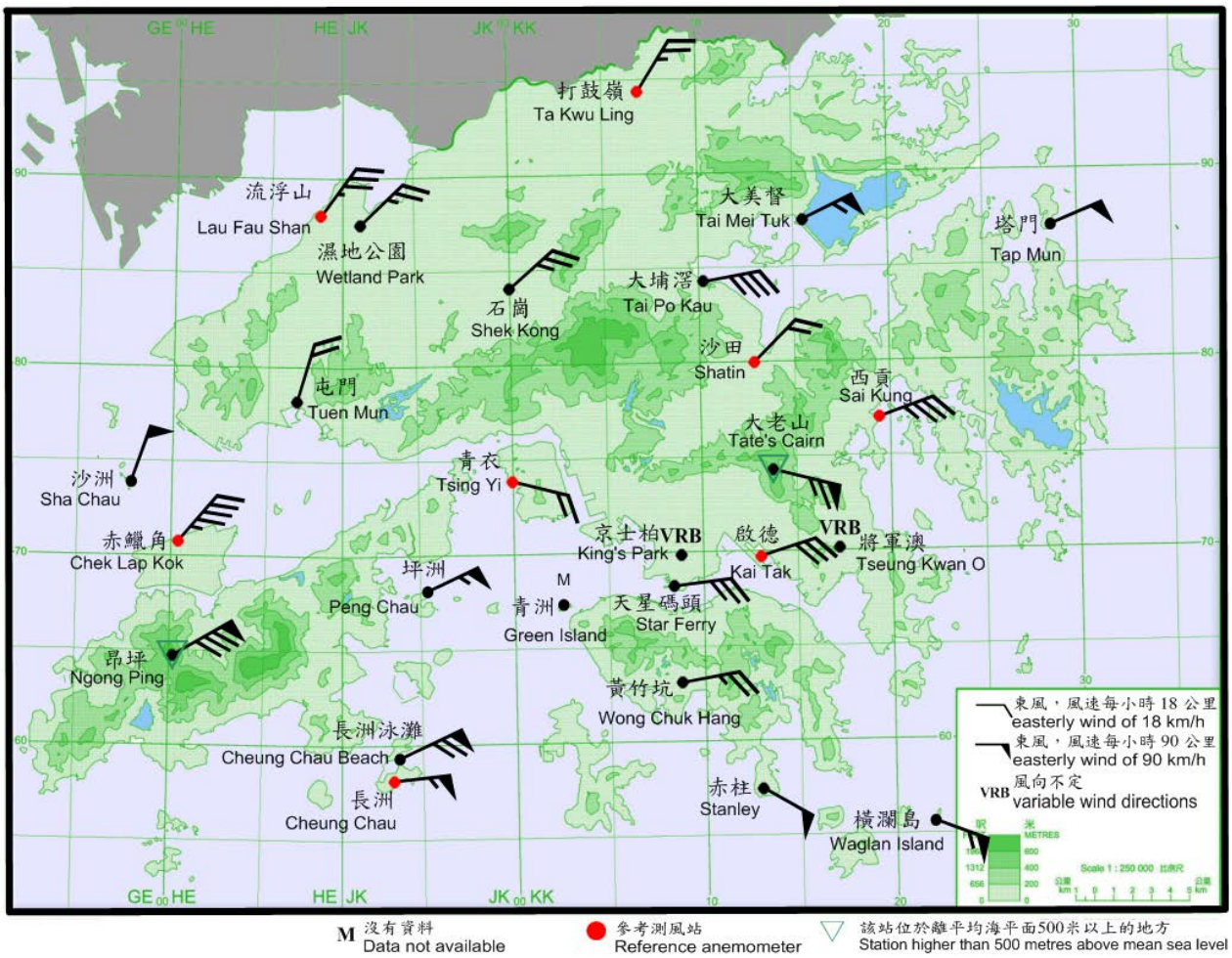


圖 3.3.4a　二零一七年八月二十三日上午 10 時正香港各站錄得的十分鐘平均風向和風速。當時本港普遍吹東至東北風，長洲泳灘、大老山及昂坪的風力達到颶風程度。

Figure 3.3.4a　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 10 a.m. on 23 August 2017. Winds were generally from the east to northeast over the territory, with winds reaching hurricane force at Cheung Chau Beach, Tate's Cairn and Ngong Ping at that time.

註：　京士柏及將軍澳當時錄得的十分鐘平均風速分別為每小時 36 及 20 公里。

Note:　The 10-minute mean wind speeds recorded at the time at King's Park and Tseung Kwan O were 36 km/h and 20 km/h respectively.

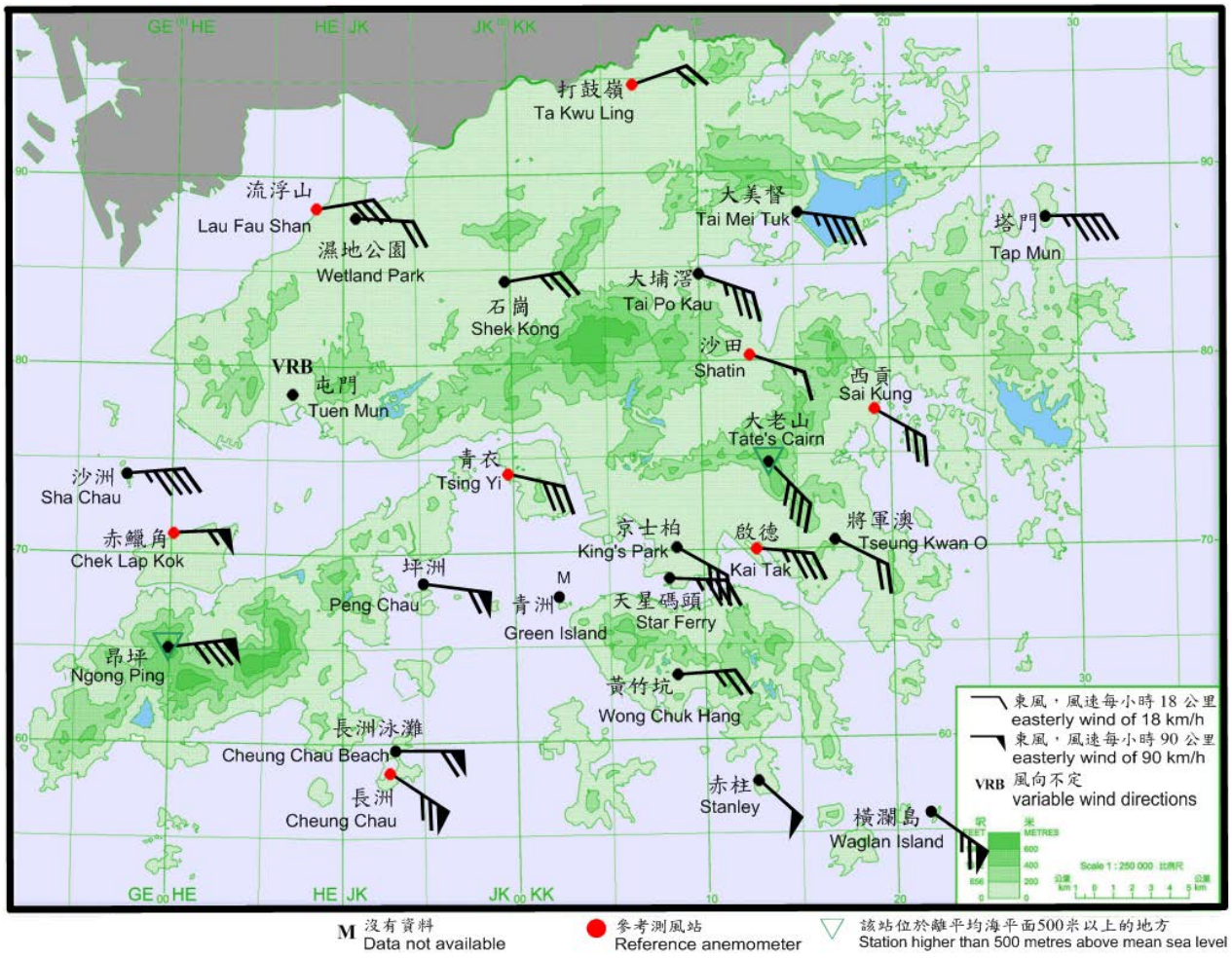


圖 3.3.4b　二零一七年八月二十三日上午 11 時正香港各站錄得的十分鐘平均風向和風速。當時本港普遍吹東至東南風，長洲及昂坪的風力達到颶風程度。

Figure 3.3.4b　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 11 a.m. on 23 August 2017. Winds were generally from the east to southeast over the territory, with winds reaching hurricane force at Cheung Chau and Ngong Ping at that time.

註:　屯門當時錄得的十分鐘平均風速為每小時 30 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Tuen Mun was 30 km/h.

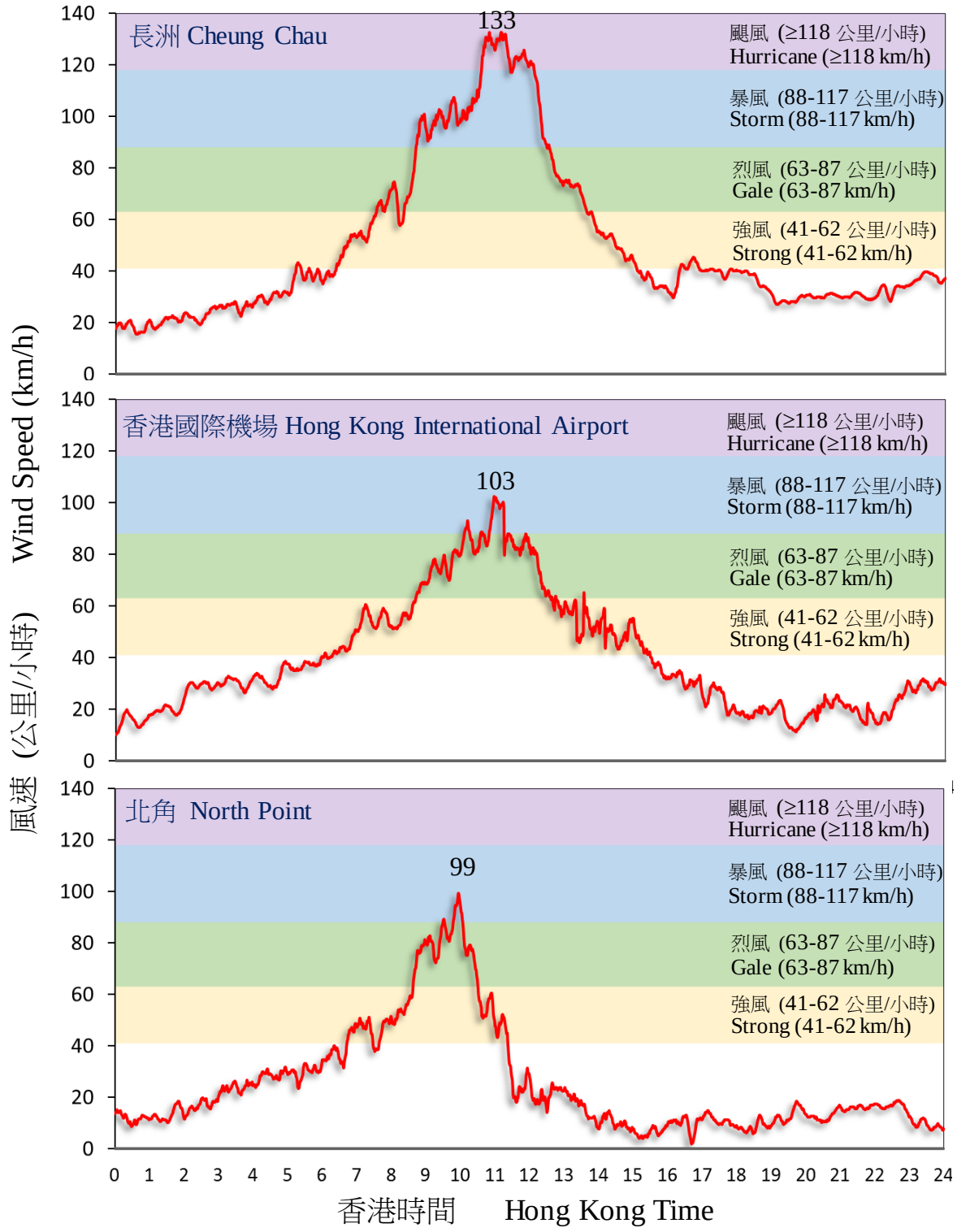


圖 3.3.5 二零一七年八月二十三日在長洲、香港國際機場及北角錄得的十分鐘風速。

Figure 3.3.5 Traces of 10-minute wind speed at Cheung Chau, Hong Kong International Airport and North Point on 23 August 2017.

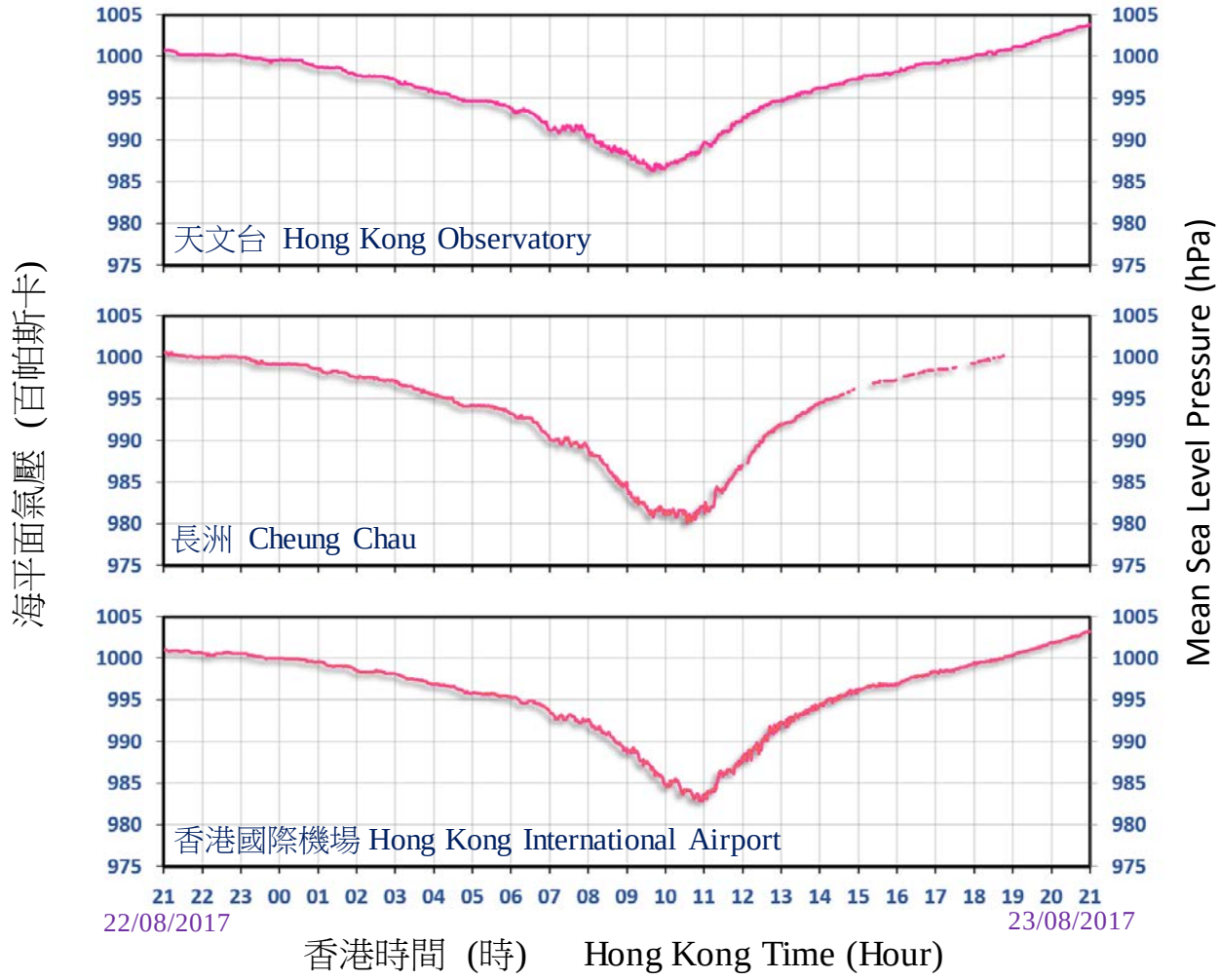


圖 3.3.6 二零一七年八月二十二至二十三日香港天文台、長洲及香港國際機場錄得的海平面氣壓。

Figure 3.3.6 Traces of mean sea-level pressure recorded at the Hong Kong Observatory, Cheung Chau and Hong Kong International Airport on 22 and 23 August 2017.

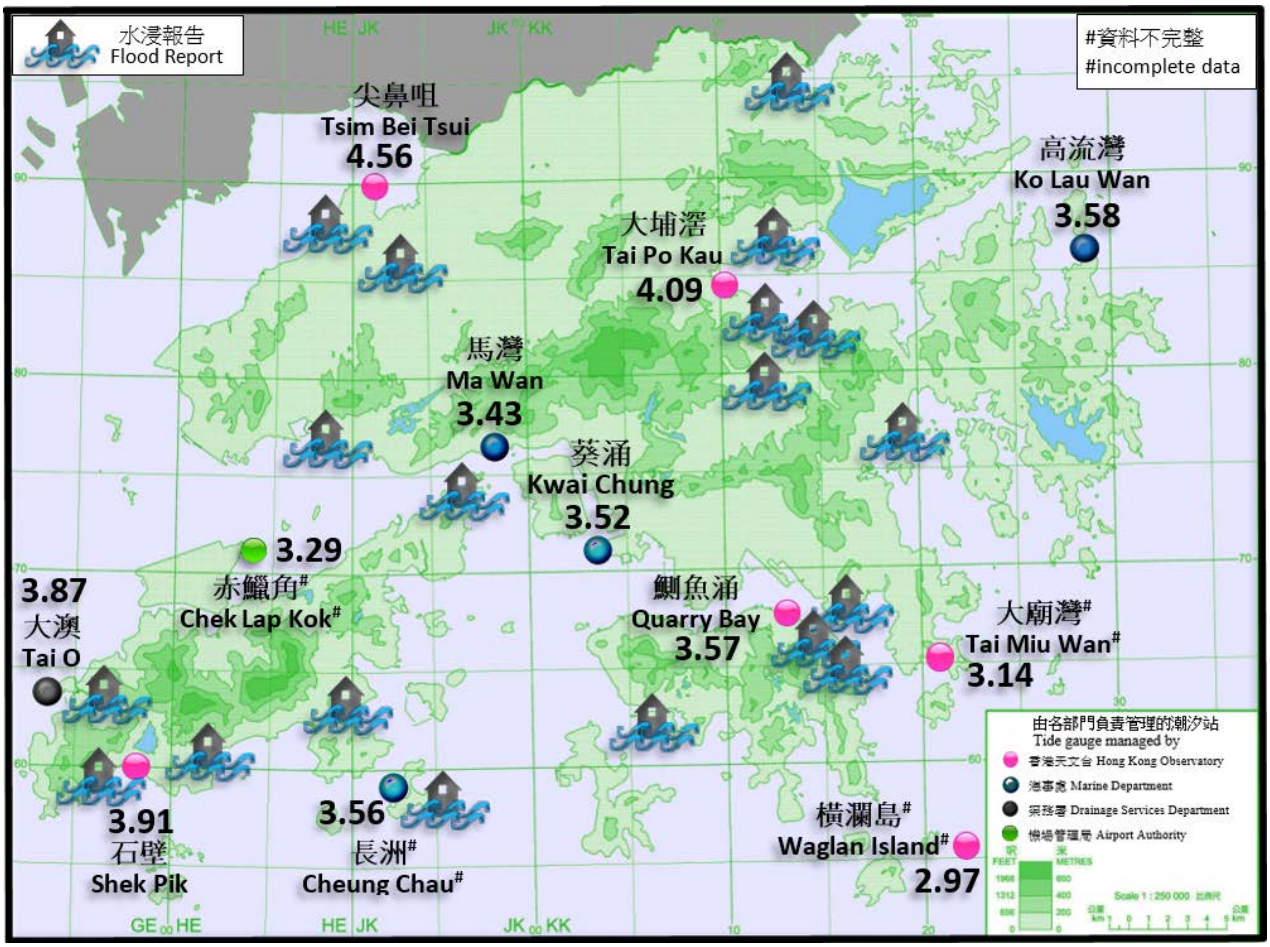


圖 3.3.7　二零一七年八月二十三日香港各潮汐站錄得的最高潮位(單位為米，海圖基準面以上)及根據政府部門、新聞及社交媒體的水浸報告。

Figure 3.3.7　Maximum sea level (metres above Chart Datum) recorded at various tide stations in Hong Kong and flood reports from government departments, news and social media on 23 August 2017.

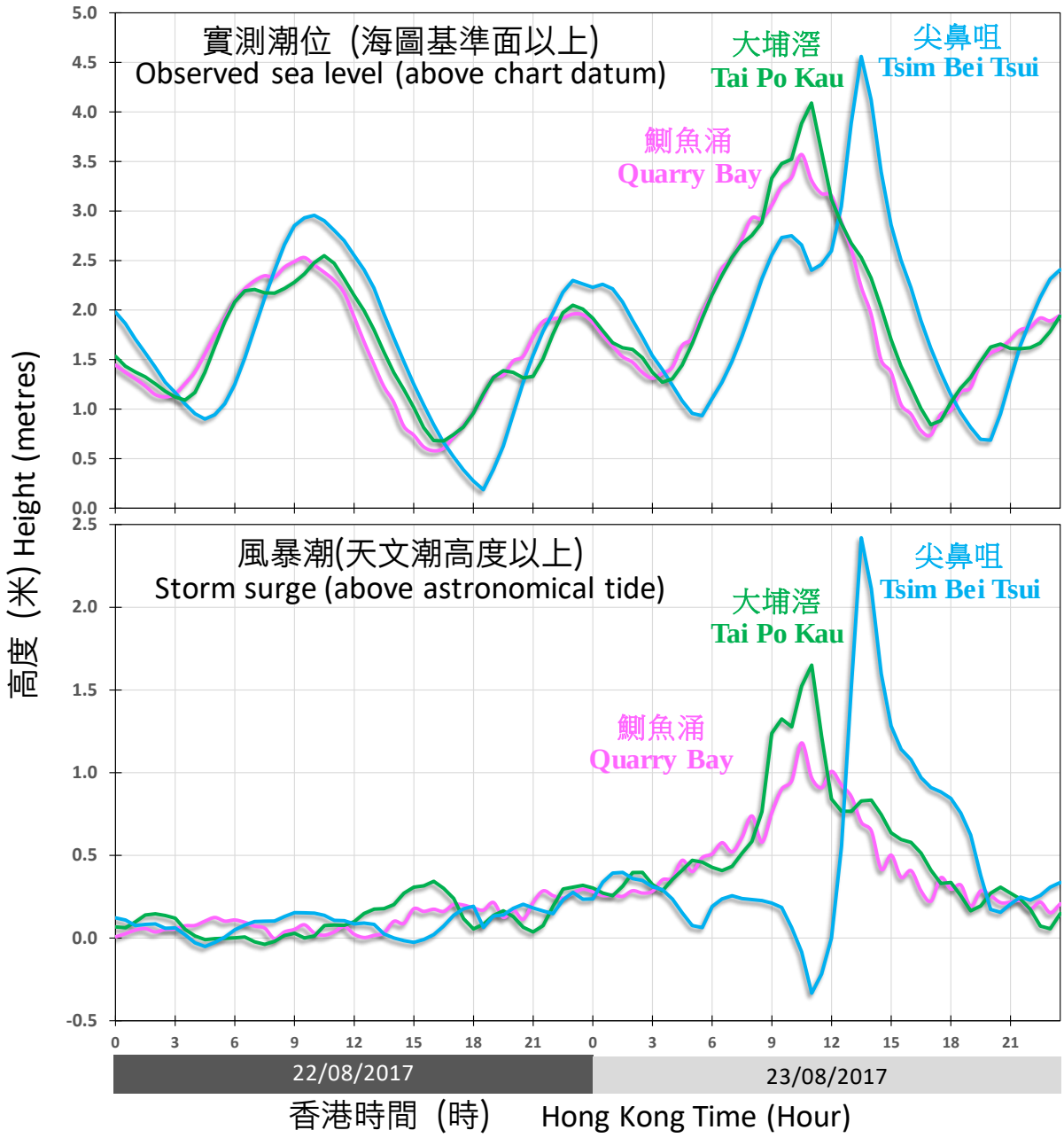


圖 3.3.8　二零一七年八月二十二至二十三日在鰂魚涌、大埔滘及尖鼻咀錄得的潮位(海圖基準面以上)及風暴潮(天文潮高度以上)。

Figure 3.3.8　Traces of sea level (above chart datum) and storm surge (above astronomical tide) recorded at Quarry Bay, Tai Po Kau, and Tsim Bei Tsui on 22 and 23 August 2017.

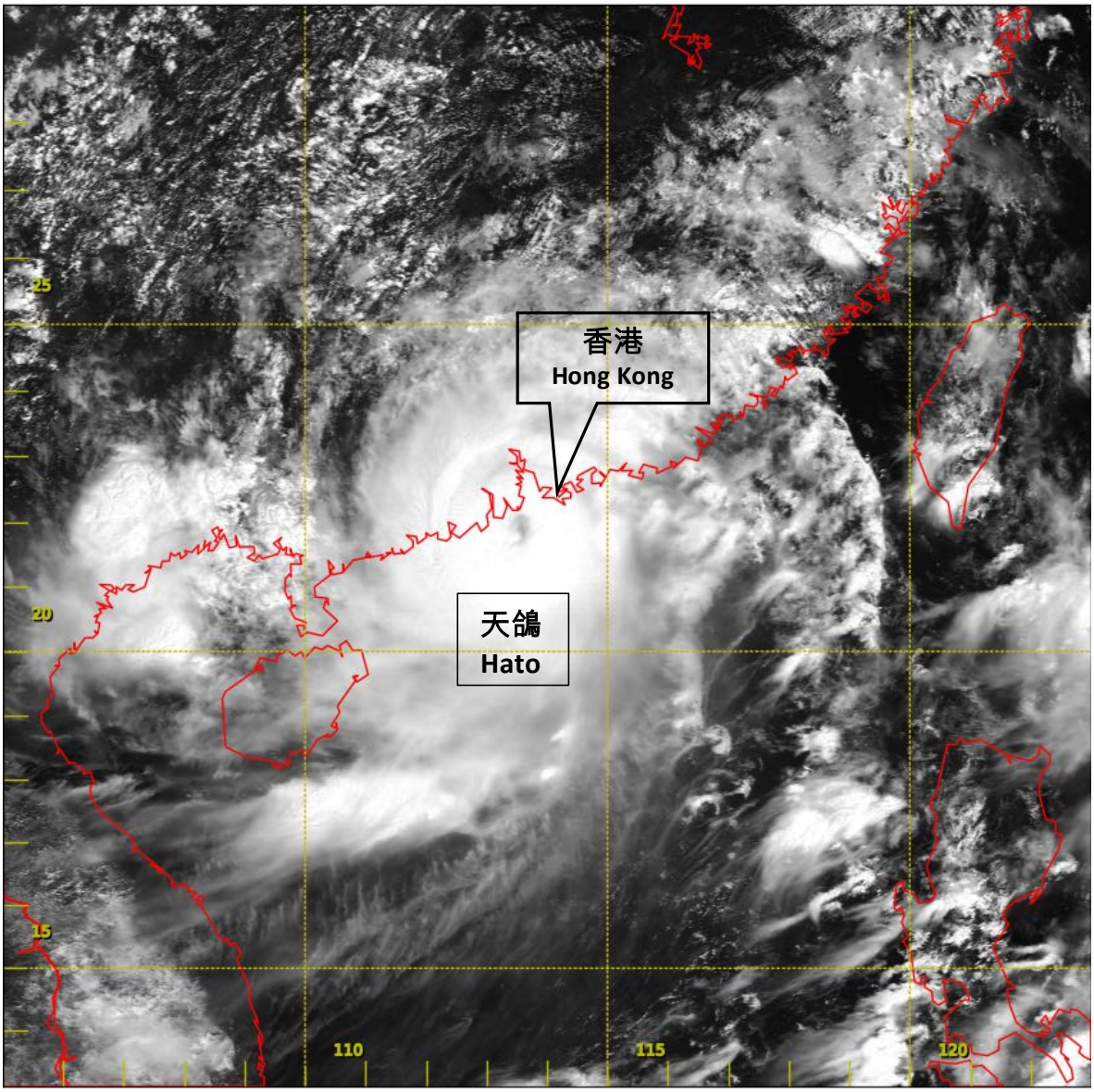


圖 3.3.9　二零一七年八月二十三日上午 11 時左右的可見光衛星圖片，當時天鴿達到其最高強度，中心附近最高持續風速估計為每小時 185 公里。

Figure 3.3.9　Visible satellite imagery around 11 a.m. on 23 August 2017, when Hato was at peak intensity with estimated maximum sustained winds of 185 km/h near its centre.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕

[The satellite imagery was originally captured by Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

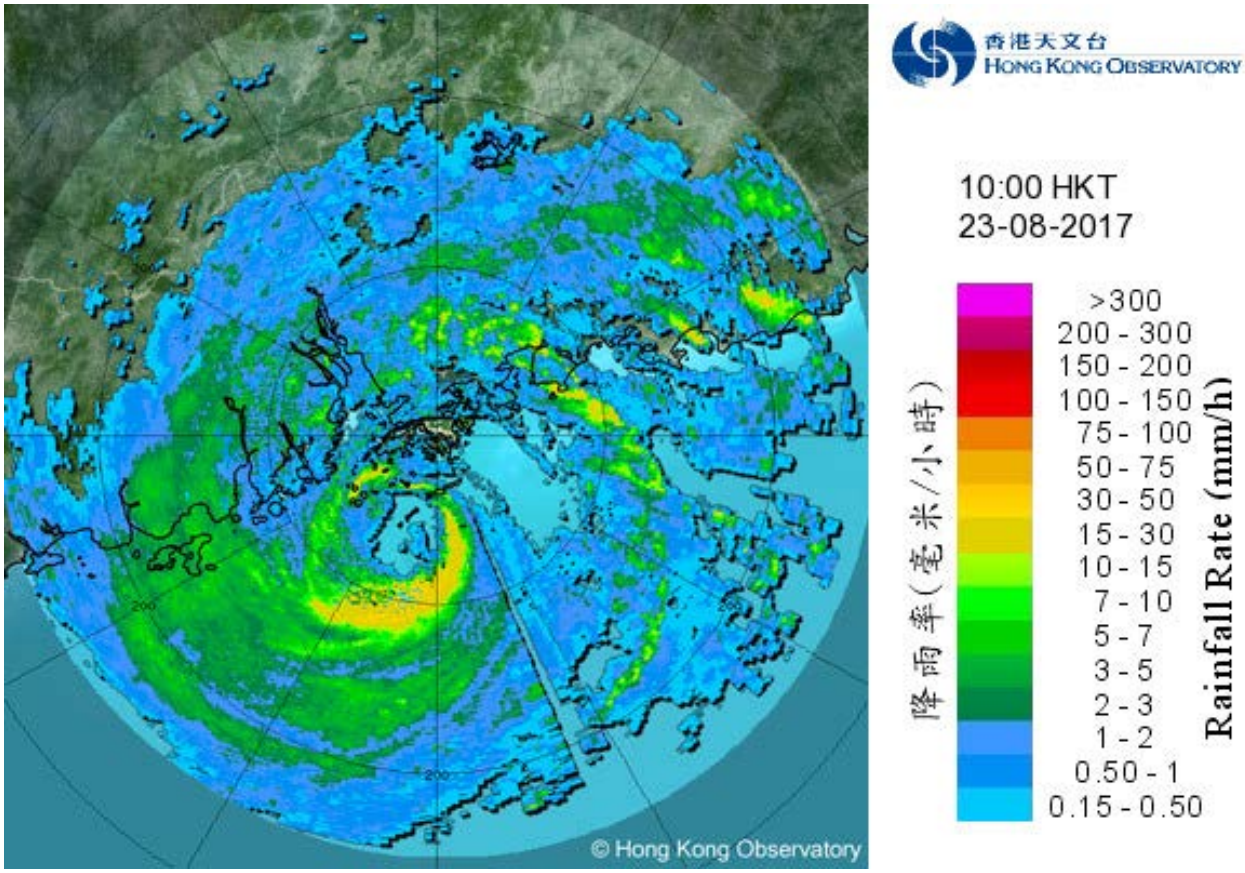


圖 3.3.10　二零一七年八月二十三日上午 10 時天鴿最接近天文台總部時的雷達回波圖像。

Figure 3.3.10　Image of radar echoes at 10:00 a.m. on 23 August 2017 when Hato was closest to the Hong Kong Observatory Headquarters.

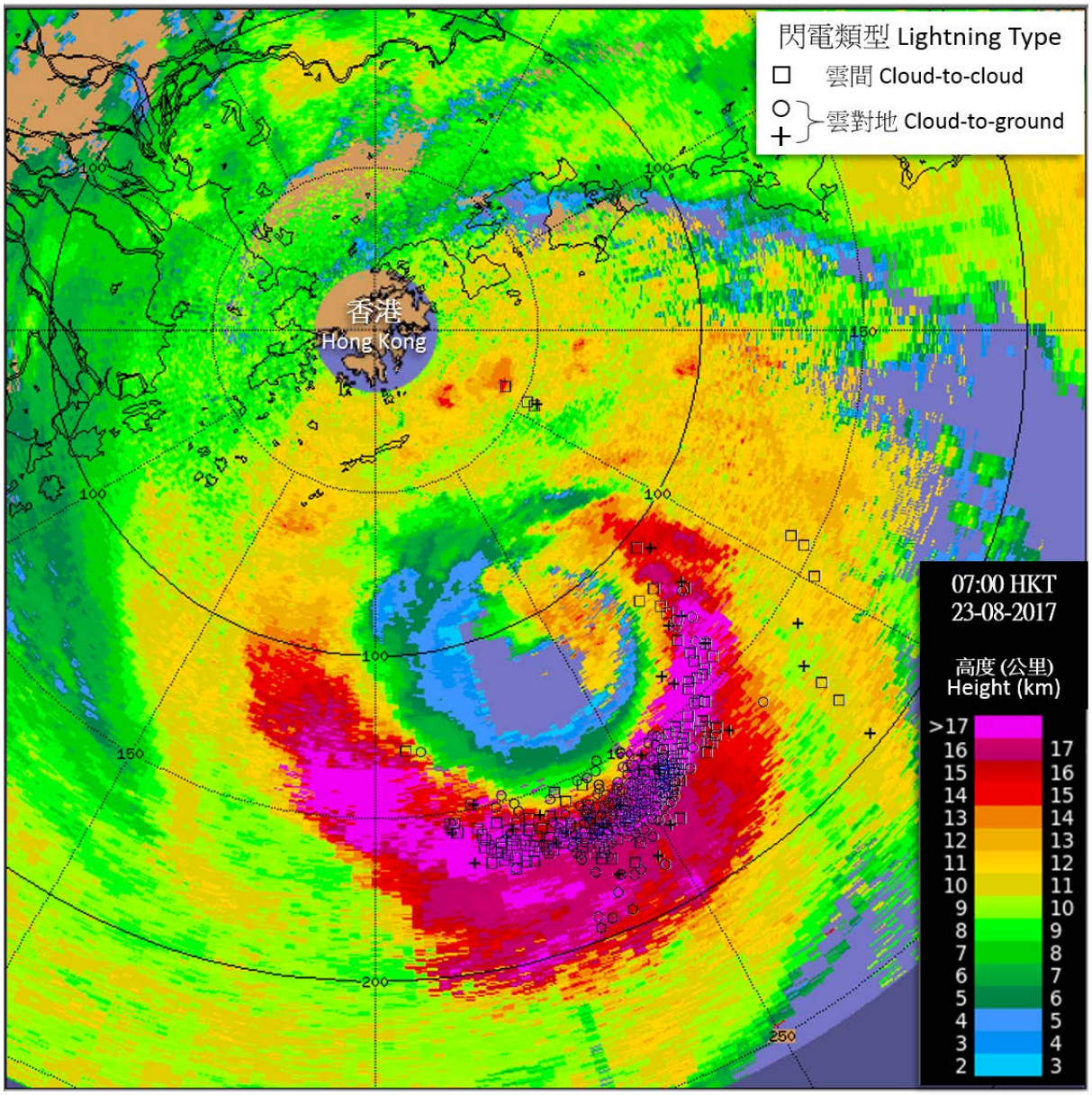


圖 3.3.11　二零一七年八月二十三日上午 7 時由雷達數據估算的雲頂高度疊加過去三十分鐘閃電位置的圖像。東南方眼壁附近出現非常強烈的對流和頻密閃電，雲頂高度超過 16 公里，直達對流層頂部。

Figure 3.3.11　Image of cloud top height estimated using radar data at 7 a.m. on 23 August 2017, overlaid with lightning locations during the past 30 minutes. Very intense convection and frequent lightning appeared near the eyewall of Hato over the southeastern quadrant with the cloud top reaching over 16 km to the top of the troposphere.

小西灣 Siu Sai Wan

美孚 Mei Foo

圖 3.3.12 天鴿襲港期間本港多處有樹木倒塌。(圖片鳴謝: Emile Ho 、W.O. Wong 和 Y. K. Chow (社區天氣觀測計劃)、David Grund、江偉和李子祥)

Figure 3.3.12 The passage of Hato resulted in fallen trees in many parts of the territory. (Photos courtesy of Emile Ho, W.O. Wong and Y. K. Chow from Community Weather Observation Scheme, David Grund, W. Kong, and T. C. Lee)

尖沙咀 Tsim Sha Tsui

長洲 Cheung Chau

圖 3.3.12 (續)

Figure 3.3.12 (Cont'd)

尖沙咀東 Tsim Sha Tsui East

屯門 Tuen Mun

圖 3.3.12 (續)
Figure 3.3.12 (Cont'd)

圖 3.3.13　天鴿襲港期間，紅磡碼頭巨浪拍岸。(圖片鳴謝: James Reynolds)

Figure 3.3.13　High waves affected Hung Hom Pier during the passage of Hato. (Photo courtesy of James Reynolds)

圖 3.3.14　灣仔及中環分別有商業大廈的玻璃幕牆被吹毀。(圖片鳴謝: 秦志豪先生和 Kevin Campbell)

Figure 3.3.14　Glass curtain walls of several commercial buildings in Wan Chai and Central were shattered. (Photos courtesy of W. Chun and Kevin Campbell)

圖 3.3.14 (續)
Figure 3.3.14 (Cont'd)

圖 3.3.15a　　杏花邨一帶嚴重水浸，海水湧入邨內。(圖片鳴謝: Steve Lee 和岑富祥)

Figure 3.3.15a Heng Fa Chuen was seriously flooded with sea water rushing into the estate. (Photos courtesy of Steve Lee and F. C. Sham)

圖 3.3.15a (續)
Figure 3.3.15a (Cont’d)

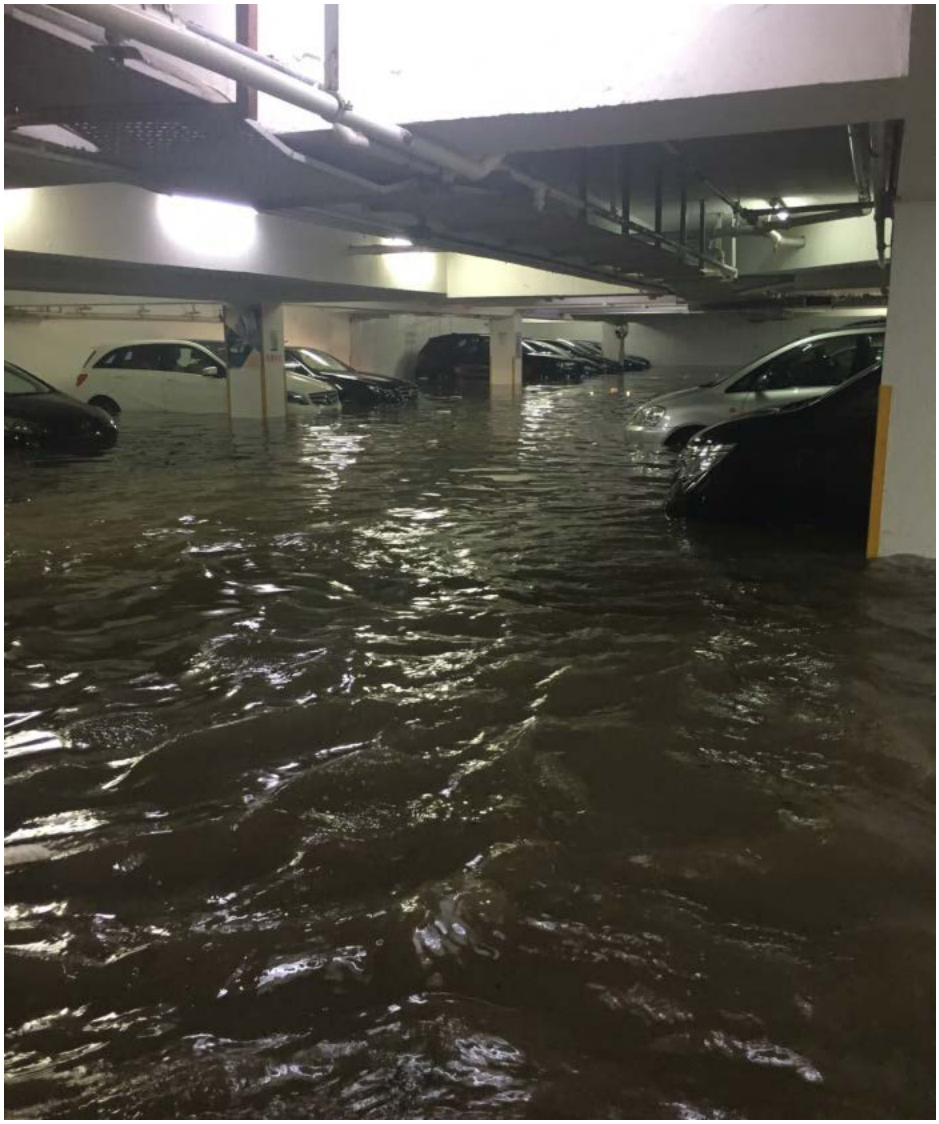


圖 3.3.15b　杏花邨有地下停車場完全被海水淹浸，多輛汽車被淹沒。(圖片鳴謝: Steve Lee 和岑富祥)

Figure 3.3.15b　Sea water flowed into an underground car park in Heng Fa Chuen, submerging a number of private vehicles inside. (Photos courtesy of Steve Lee and F. C. Sham)

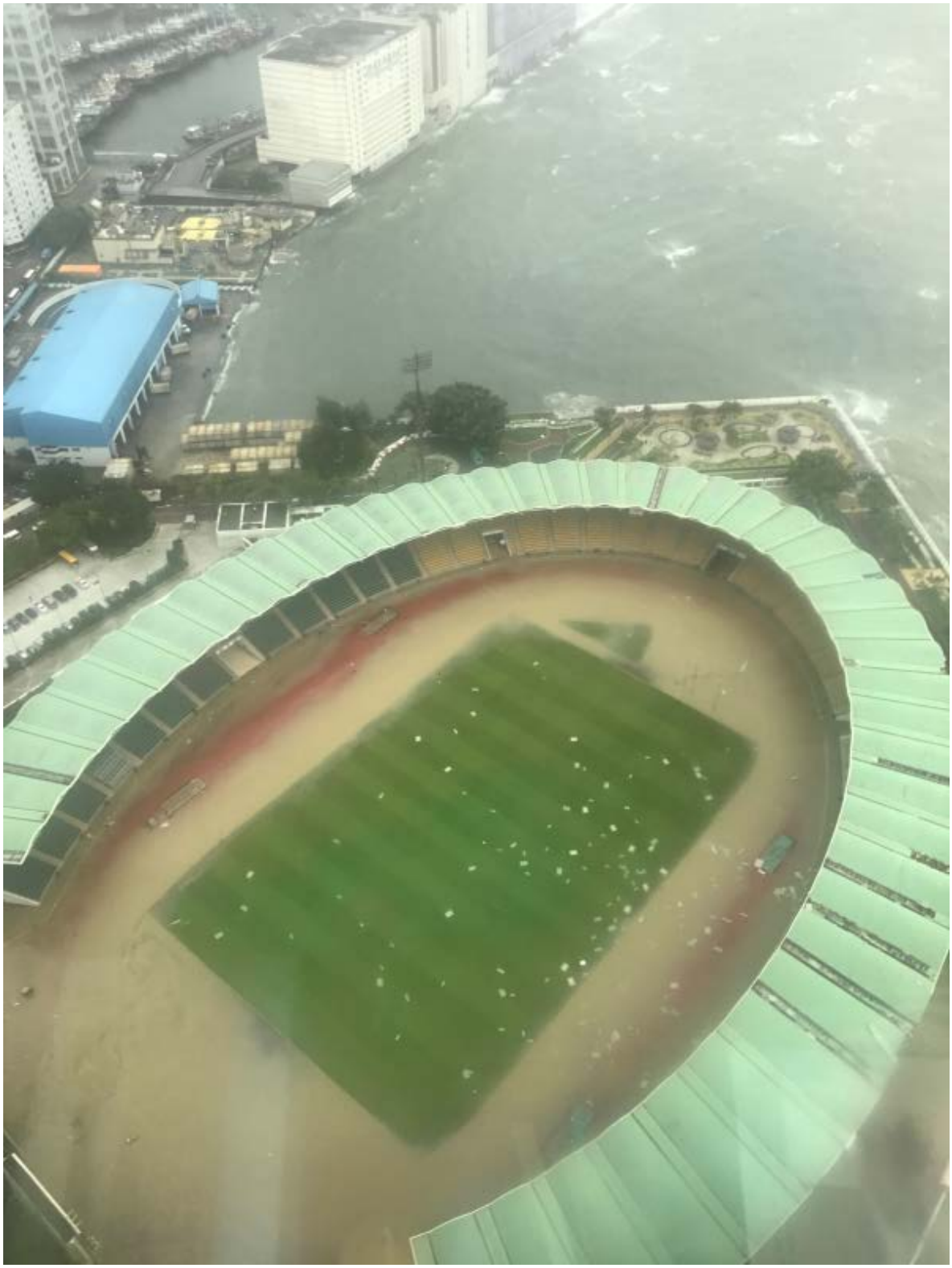


圖 3.3.15c 海水湧入小西灣運動場。(圖片鳴謝: Charmaine Mok)

Figure 3.3.15c Siu Sai Wan Sports Ground was flooded by sea water. (Photo courtesy of Charmaine Mok)

圖 3.3.16　大澳水浸嚴重，部份地區水深及胸。(圖片鳴謝: 渠務署和一市民)

Figure 3.3.16　Serious flooding in Tai O with water level reaching the chest high in some places. (Photos courtesy of Drainage Services Department and a member of the public)

圖 3.3.16　(續)

Figure 3.3.16　(Cont'd)

圖 3.3.17　沙田城門河及吐露港沿岸一帶的單車徑及行人隧道被淹浸。(圖片鳴謝: Toni Fung 和 Daisy Ho (社區天氣觀測計劃), Howl Ho)

Figure 3.3.17　The cycle tracks and subways near Shing Mun River in Sha Tin and coastal area of Tolo Harbour were flooded. (Photos courtesy of Toni Fung and Daisy Ho from Community Weather Observation Scheme, Howl Ho)

圖 3.3.17　(續)
Figure 3.3.17　(Cont’d)

圖 3.3.18　元朗明渠及山貝河暴漲，附近一帶水浸。(圖片鳴謝: 文錦豪 (社區天氣觀測計劃))

Figure 3.3.18　The surge of water level in Yuen Long Nullah and Shan Pui River resulted in flooding over the areas. (Photos courtesy of Man Kam-hoo from Community Weather Observation Scheme)

圖 3.3.19a 將軍澳海濱長廊行人路被海浪破壞。(圖片鳴謝: Bowie Wong (社區天氣觀測計劃))

Figure 3.3.19a Waterfront Promenade at Tseung Kwan O was damaged by sea waves. (Photo courtesy of Bowie Wong from Community Weather Observation Scheme)

圖 3.3.19b 長洲東灣一帶的圍欄被海浪破壞。(圖片鳴謝: Remington Yu (社區天氣觀測計劃))

Figure 3.3.19b The fences near Cheung Chau Tung Wan were damaged by sea waves. (Photo courtesy of Remington Yu from Community Weather Observation Scheme)

圖 3.3.20　多艘貨船在香港西南約 30 公里的水域擱淺，共 39 名船員獲救。(圖片鳴謝: 政府飛行服務隊)

Figure 3.3.20　A number of vessels ran aground about 30 km southwest of Hong Kong and a total of 39 crew members were rescued. (Photos courtesy of Government Flying Service)

圖 3.3.20　(續)
Figure 3.3.20　(Cont’d)

圖 3.3.21　澳門有住宅大廈的窗戶玻璃爆裂。(圖片鳴謝: 方志剛)

Figure 3.3.21　Window panes of residential buildings in Macao were broken. (Photo courtesy of Clarence Fong)

圖 3.3.22　位於澳門十月初五馬路的颱風委員會秘書處遭受風暴潮破壞。(圖片鳴謝: 颱風委員會秘書處)

Figure 3.3.22　Typhoon Committee Secretariat at Avenida de 5 de Outubro, Macao was damaged by storm surge. (Photos courtesy of Typhoon Committee Secretariat)

圖 3.3.23　澳門各區受風暴潮影響，出現嚴重水浸。(圖片鳴謝: Tomas Choi, Denise Lau)

Figure 3.3.23　Serious flooding in Macao under the influence of storm surge. (Photos courtesy of Tomas Choi and Denise Lau)

圖 3.3.23　(續)
Figure 3.3.23　(Cont’d)

3.4 強烈熱帶風暴帕卡 (1714)：二零一七年八月二十四日至二十七日

帕卡是二零一七年第四個影響香港並引致天文台需要發出八號烈風或暴風信號的熱帶氣旋。

熱帶低氣壓帕卡於八月二十四日晚上在馬尼拉以東約570公里的北太平洋西部上形成，初時大致向偏西方向移動。翌日帕卡發展為熱帶風暴，以西北路徑橫過呂宋。帕卡於八月二十六日早上進入南海，並繼續採取西北路徑加速移向廣東沿岸，晚間增強為強烈熱帶風暴，達到其最高強度，中心附近最高持續風速估計為每小時110公里。帕卡於八月二十七日早上在廣東西部沿岸珠海一帶登陸並逐漸減弱，當晚在廣西消散。

根據報章報導，帕卡及其殘餘在廣東、廣西、貴州及雲南帶來狂風暴雨，至少造成12人死亡，接近10萬人受災，直接經濟損失約3.7億元人民幣。在帕卡的吹襲下，澳門最少有八人受傷，多處地區出現水浸。一艘貨船在香港以東約120公里沉沒，11名船員獲救。

香港天文台在八月二十六日早上9時40分發出一號戒備信號，當時帕卡集結在香港之東南約730公里，日間本港吹和緩偏東風。隨著帕卡靠近廣東沿岸，天文台在當晚8時40分發出三號強風信號，當時帕卡位於香港之東南約370公里。晚上本港吹清勁至強風程度的東北風，離岸間中吹烈風。隨著帕卡迅速地靠近珠江口一帶，本港風力繼續增強，天文台在八月二十七日上午5時10分發出八號東南烈風或暴風信號，當時帕卡集結在香港天文台以南約100公里。黎明時份本港風力普遍達到烈風至暴風程度，高地間中吹颶風，而風向則由東北逐漸轉為東南。帕卡在早上7時左右最接近香港，位於香港天文台之西南約90公里。隨著帕卡移入廣東內陸，日間稍後本港風力開始減弱，天文台分別在下午1時40分及下午5時40分改發三號強風信號及一號戒備信號。晚上帕卡在廣西消散，天文台於下午10時10分取消所有熱帶氣旋警告信號。

在帕卡的影響下，昂坪、大美督及長洲錄得的最高每小時平均風速分別為每小時118、103及101公里，而最高陣風則分別為每小時173、146及155公里。尖鼻咀錄得最高潮位2.63米(海圖基準面以上)，而大埔滘則錄得最大風暴潮(天文潮高度以上)1.05米。各站錄得的最低瞬時海平面氣壓如下：

站	最低瞬時海平面氣壓 (百帕斯卡)	日期/月份	時間
香港天文台總部	996.5	27/8	上午 6 時 21 分
香港國際機場	995.5	27/8	上午 6 時 35 分
京士柏	996.7	27/8	上午 5 時 53 分
坪洲	995.5	27/8	上午 6 時 32 分
打鼓嶺	999.1	27/8	上午 6 時 22 分
大埔	999.1	27/8	上午 6 時 47 分
沙田	998.1	27/8	上午 6 時 01 分
上水	998.2	27/8	上午 6 時 42 分
流浮山	997.7	27/8	上午 6 時 27 分
長洲	993.8	27/8	上午 6 時 18 分
橫瀾島	994.0	27/8	上午 5 時 49 分

八月二十六日本港大致天晴，日間天氣酷熱。受帕卡相關的雨帶影響，本港當晚開始有驟雨。八月二十七日及二十八日本港有狂風大雨及雷暴，天文台在這兩天的早上都曾發出黃色暴雨警告。這三天期間本港大部分地區共錄得超過250毫米雨量。

帕卡吹襲香港期間，最少有62人受傷，另有超過2 000宗塌樹報告、16宗水浸報告及一宗山泥傾瀉報告，西環及九龍城有外牆棚架被吹倒。風暴期間兩人在飛鵝山遠足時受傷被困，需要消防員拯救，一名消防員在行動中受傷。八月二十七日及二十八日早上的暴雨期間導致多區道路出現水浸。東鐵大學站附近有大樹倒塌，列車服務一度受阻。香港國際機場有超過670班航班取消或延誤，50班航班需要轉飛其它地方。

表3.4.1 - 3.4.4 分別是帕卡影響香港期間各站錄得的最高風速、持續風力達到強風及烈風程度的時段、香港的日雨量及最高潮位資料。圖3.4.1 - 3.4.3分別為帕卡的路徑圖、本港的雨量分佈圖及香港各站錄得的風向和風速。圖3.4.4顯示長洲及大美督錄得的風速。 圖3.4.5顯示天文台總部及長洲錄得的海平面氣壓。 圖3.4.6 - 3.4.7 分別為帕卡的衛星及雷達圖像。帕卡在香港造成的破壞可參見圖3.4.8。

3.4 Severe Tropical Storm Pakhar (1714): 24 – 27 August 2017

Pakhar was the fourth tropical cyclone affecting Hong Kong and necessitating the issuance of the No. 8 Gale or Storm Signal in 2017.

Pakhar formed as a tropical depression over the western North Pacific about 570 km east of Manila on the night of 24 August. Moving generally westwards at first, it developed into a tropical storm the next day and moved northwestwards across Luzon. After entering the South China Sea on the morning of 26 August, Pakhar maintained a northwestward track and accelerated towards the coast of Guangdong. It intensified into a severe tropical storm during the night, reaching its peak intensity with an estimated sustained wind of 110 km/h near its centre. After making landfall over the coast of western Guangdong in the vicinity of Zhuhai on the morning of 27 August, Pakhar weakened gradually and dissipated over Guangxi that night.

According to press reports, Pakhar and its remnant brought heavy rain and squalls to Guangdong, Guangxi, Guizhou and Yunnan, resulting in at least 12 deaths. Around 100 000 people were affected with direct economic loss around 370 million RMB. In Macao, eight people were injured and many places were flooded during the passage of Pakhar. A cargo vessel sunk about 120 km east of Hong Kong and 11 crew members on board were rescued.

In Hong Kong, the No. 1 Standby Signal was issued at 9:40 a.m. on 26 August when Pakhar was about 730 km southeast of the territory. Moderate easterlies affected Hong Kong during the day. As Pakhar edged closer to the coast of Guangdong, the No. 3 Strong Wind Signal was issued at 8:40 p.m. that night when Pakhar was about 370 km southeast of Hong Kong. Local winds gradually became fresh to strong northeasterly during the night and occasionally reached gale force offshore. As Pakhar moved quickly towards the Pearl River Estuary, local winds continued to strengthen and the No. 8 Southeast Gale or Storm Signal was issued at 5:10 a.m. on 27 August when Pakhar was about 100 km south of the Hong Kong Observatory. Gale to storm force winds generally affected the territory around dawn, occasionally reaching hurricane force on high ground and with wind direction gradually veering from northeasterly to southeasterly. Pakhar came closest to Hong Kong around 7 a.m. that morning with its centre passing only about 90 km southwest of the Hong Kong Observatory. With Pakhar moving into inland Guangdong, local winds started to weaken later that day and the No. 3 Strong Wind Signal and No. 1 Standby Signal were issued at 1:40 p.m. and 5:40 p.m. respectively. Pakhar dissipated over Guangxi during the night and all tropical cyclone warning signals were cancelled at 10:10 p.m.

Under the influence of Pakhar, maximum hourly mean winds of 118, 103 and 101 km/h and gusts of 173, 146 and 155 km/h were recorded at Ngong Ping, Tai Mei Tuk and Cheung Chau respectively. A maximum sea level (above chart datum) of 2.63 m was recorded at Tsim Bei Tsui, and a maximum storm surge (above astronomical tide) of 1.05 m was recorded at Tai Po Kau. The lowest instantaneous mean sea-level pressures recorded at some selected stations are as follows:

Station	Lowest instantaneous mean sea-level pressure (hPa)	Date/Month	Time
Hong Kong Observatory Headquarters	996.5	27/8	6:21 a.m.
Hong Kong International Airport	995.5	27/8	6:35 a.m.
King's Park	996.7	27/8	5:53 a.m.
Peng Chau	995.5	27/8	6:32 a.m.
Ta Kwu Ling	999.1	27/8	6:22 a.m.
Tai Po	999.1	27/8	6:47 a.m.
Shatin	998.1	27/8	6:01 a.m.
Sheung Shui	998.2	27/8	6:42 a.m.
Lau Fau Shan	997.7	27/8	6:27 a.m.
Cheung Chau	993.8	27/8	6:18 a.m.
Waglan Island	994.0	27/8	5:49 a.m.

Locally, it was mainly fine and very hot during the day on 26 August. Showers set in at night under the influence of the rainbands associated with Pakhar. Heavy rain with squalls and thunderstorms affected the territory on 27 and 28 August, and Amber Rainstorm Warnings were issued by the Observatory in the morning on both days. More than 250 millimetres of rainfall were recorded over most part of the territory during the 3-day period.

In Hong Kong, at least 62 people were injured during the passage of Pakhar. There were more than 2 000 reports of fallen trees, 16 reports of flooding and one report of landslide. Some scaffolding in Sai Wan and Kowloon City collapsed. Two hikers were hurt and stranded on Kowloon Peak and had to be rescued by firemen. One fireman was injured during the rescue operation. Many roads were flooded during the rainstorms on the mornings of 27 and 28 August. Fallen trees near the University Station of the East Rail Line resulted in a disruption of train services. More than 670 flights were cancelled or delayed at the Hong Kong International Airport, and 50 flights were diverted.

Information on the maximum wind, periods of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Pakhar is given in Tables 3.4.1 - 3.4.4 respectively. Figures 3.4.1 - 3.4.3 show respectively the track of Pakhar, the rainfall distribution for Hong Kong and the winds recorded at various stations in Hong Kong. Figure 3.4.4 shows the wind speed recorded at Cheung Chau and Tai Mei Tuk. Figure 3.4.5 shows the traces of mean sea-level pressure recorded at the Hong Kong Observatory's Headquarters and Cheung Chau. Fugures 3.4.6 - 3.4.7 show respectively a satellite imagery and radar imageries of Pakhar. Some damages caused by Pakhar in Hong Kong are illustrated in Figure 3.4.8.

表 3.4.1　在帕卡影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.4.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Pakhar were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
黃麻角(赤柱)	Bluff Head (Stanley)	東北偏東	ENE	117	27/8	05:33	東南偏東	ESE	68	27/8	07:00
中環碼頭	Central Pier	東	E	113	27/8	05:13	東	E	63	27/8	06:00
長洲	Cheung Chau	東	E	155	27/8	06:18	東南偏東	ESE	101	27/8	08:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	146	27/8	06:17	東	E	101	27/8	07:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	101	27/8	07:59	東南偏東	ESE	68	27/8	08:00
啟德	Kai Tak	東	E	121	27/8	07:31	東	E	52	27/8	07:00
京士柏	King's Park	東南偏東	ESE	108	27/8	06:54	東南偏東	ESE	47	27/8	07:00
流浮山	Lau Fau Shan	東北偏東	ENE	99	27/8	06:52	東北偏東	ENE	54	27/8	07:00
昂坪	Ngong Ping	東南偏東	ESE	173	27/8	08:14	東	E	118	27/8	08:00
北角	North Point	東北偏東	ENE	128	27/8	06:14	東北偏東	ENE	72	27/8	06:00
坪洲	Peng Chau	東	E	122	27/8	06:26	東	E	79	27/8	07:00
平洲	Ping Chau	東	E	75	27/8	05:40	東	E	22	27/8	05:00
西貢	Sai Kung	東北	NE	128	27/8	05:44	東北偏東	ENE	67	27/8	06:00
沙洲	Sha Chau	東南偏東	ESE	110	27/8	07:49	東南	SE	77	27/8	09:00
沙螺灣	Sha Lo Wan	東南	SE	117	27/8	09:26	東	E	58	27/8	08:00
沙田	Sha Tin	北	N	112	27/8	05:46	東北	NE	31	27/8	07:00
石崗	Shek Kong	東北偏東	ENE	101	27/8	07:12	東北	NE	41	27/8	06:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	112	27/8	06:34	東	E	58	27/8	07:00
打鼓嶺	Ta Kwu Ling	東	E	88	27/8	08:08	東北	NE	34	27/8	07:00
大美督	Tai Mei Tuk	東北偏東	ENE	146	27/8	06:06	東北偏東	ENE	103	27/8	07:00
大帽山	Tai Mo Shan	東南	SE	182	27/8	09:00	東南	SE	121	27/8	10:00
大埔滘	Tai Po Kau	東	E	110	27/8	06:10	東	E	68	27/8	07:00
塔門*	Tap Mun*	東北偏東	ENE	149	27/8	07:12	東	E	101	27/8	08:00
大老山	Tate's Cairn	東	E	169	27/8	06:19	東南偏東	ESE	108	27/8	07:00
將軍澳	Tseung Kwan O	東南偏東	ESE	90	27/8	08:29	東南偏東	ESE	27	27/8	09:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東	E	92	27/8	07:28	東南偏東	ESE	31	27/8	07:00
屯門政府合署	Tuen Mun Government Offices	東南	SE	110	27/8	07:57	東南	SE	40	27/8	09:00
橫瀾島	Waglan Island	東	E	144	27/8	05:49	東	E	108	27/8	06:00
濕地公園	Wetland Park	東北偏東	ENE	81	27/8	06:27	東北偏東	ENE	31	27/8	07:00
黃竹坑	Wong Chuk Hang	東南偏東	ESE	110	27/8	06:24	東	E	40	27/8	07:00

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

*The old wind station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017.

青洲 - 沒有資料　Green Island - data not available

表 3.4.2　在帕卡影響下，熱帶氣旋警告信號系統的八個參考測風站在熱帶氣旋警告信號生效時錄得持續風力達到強風及烈風程度的時段

Table 3.4.2　Periods during which sustained strong and gale force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Pakhar were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風* 時間 Start time when strong wind speed* was attained		最後達到強風* 時間 End time when strong wind speed* was attained		最初達到烈風# 時間 Start time when gale force wind speed# was attained		最後達到烈風# 時間 End time when gale force wind speed# was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	27/8	0051	27/8	2121	27/8	0510	27/8	1718
香港國際機場	Hong Kong International Airport	27/8	0451	27/8	2047	27/8	0631	27/8	0901
啟德	Kai Tak	27/8	0506	27/8	1438	27/8	0622	27/8	0735
流浮山	Lau Fau Shan	27/8	0505	27/8	0945	-			
西貢	Sai Kung	27/8	0315	27/8	1727	27/8	0505	27/8	0656
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	27/8	0642	27/8	0647	-			

沙田及打鼓嶺的持續風力未達到強風程度。

The sustained wind speed did not attain strong force at Sha Tin and Ta Kwu Ling.

- 未達到指定的風速
- not attaining the specified wind speed

* 十分鐘平均風速達每小時 41-62 公里
* 10-minute mean wind speed of 41- 62 km/h

十分鐘平均風速達每小時 63-87 公里
10-minute mean wind speed of 63-87 km/h

註:　本表列出持續風力達到強風及烈風程度的起始及終結時間。期間風力可能高於或低於指定的風力。

Note: The table gives the start and end time of sustained strong or gale force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.4.3　帕卡掠過期間，香港天文台總部及其他各站所錄得的日雨量

Table 3.4.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Pakhar

站 (參閱圖 3.4.2) Station (See Fig. 3.4.2)			八月二十六日 26 Aug	八月二十七日 27 Aug	八月二十八日 28 Aug	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			6.3	165.3	98.3	269.9
香港國際機場 Hong Kong International Airport (HKA)			2.5	136.2	25.7	164.4
長洲 Cheung Chau (CCH)			2.5	73.0	24.5	100.0
H23	香港仔	Aberdeen	2.0	121.0	90.0	213.0
N05	粉嶺	Fanling	13.5	143.0	92.5	249.0
N13	糧船灣	High Island	3.5	143.5	120.5	267.5
K04	佐敦谷	Jordan Valley	6.5	184.0	80.0	270.5
N06	葵涌	Kwai Chung	4.0	170.5	100.0	274.5
H12	半山區	Mid Levels	3.0	171.5	89.0	263.5
N09	沙田	Sha Tin	6.5	198.5	76.5	281.5
H19	筲箕灣	Shau Kei Wan	0.5	176.0	89.5	266.0
SEK	石崗	Shek Kong	8.0	188.0	[39.5]	[235.5]
K06	蘇屋邨	So Uk Estate	4.5	207.5	113.5	325.5
R31	大美督	Tai Mei Tuk	16.5	183.5	[58.5]	[258.5]
R21	踏石角	Tap Shek Kok	1.5	110.0	[36.5]	[148.0]
TMR	屯門水庫	Tuen Mun Reservoir	4.4	132.0	31.0	167.4
N17	東 涌	Tung Chung	2.0	176.0	37.0	215.0

註 : [ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.4.4　帕卡掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

Table 3.4.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Pakhar

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.23	27/8	02:45	0.72	27/8	06:57
石壁	Shek Pik	2.38	27/8	12:22	0.67	27/8	06:52
大廟灣	Tai Miu Wan	2.23	27/8	00:51	0.82	27/8	05:49
大埔滘	Tai Po Kau	2.28	27/8	02:14	1.05	27/8	07:54
尖鼻咀	Tsim Bei Tsui	2.63	27/8	12:51	0.96	27/8	10:36
橫瀾島	Waglan Island	2.27	27/8	02:48	0.49	27/8	02:49

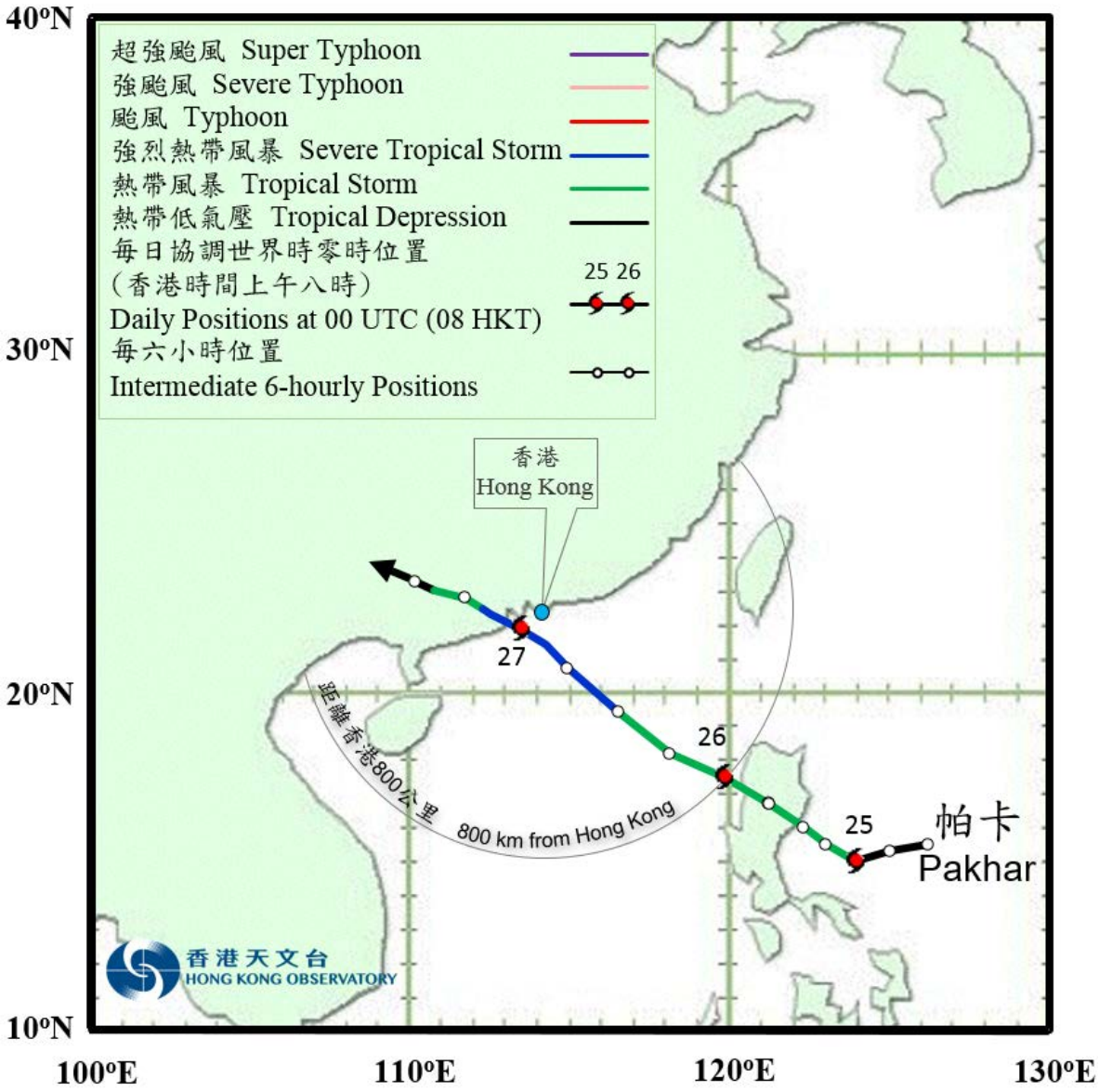


圖 3.4.1a　二零一七年八月二十四日至二十七日帕卡的路徑圖。

Figure 3.4.1a　Track of Pakhar on 24 - 27 August 2017.

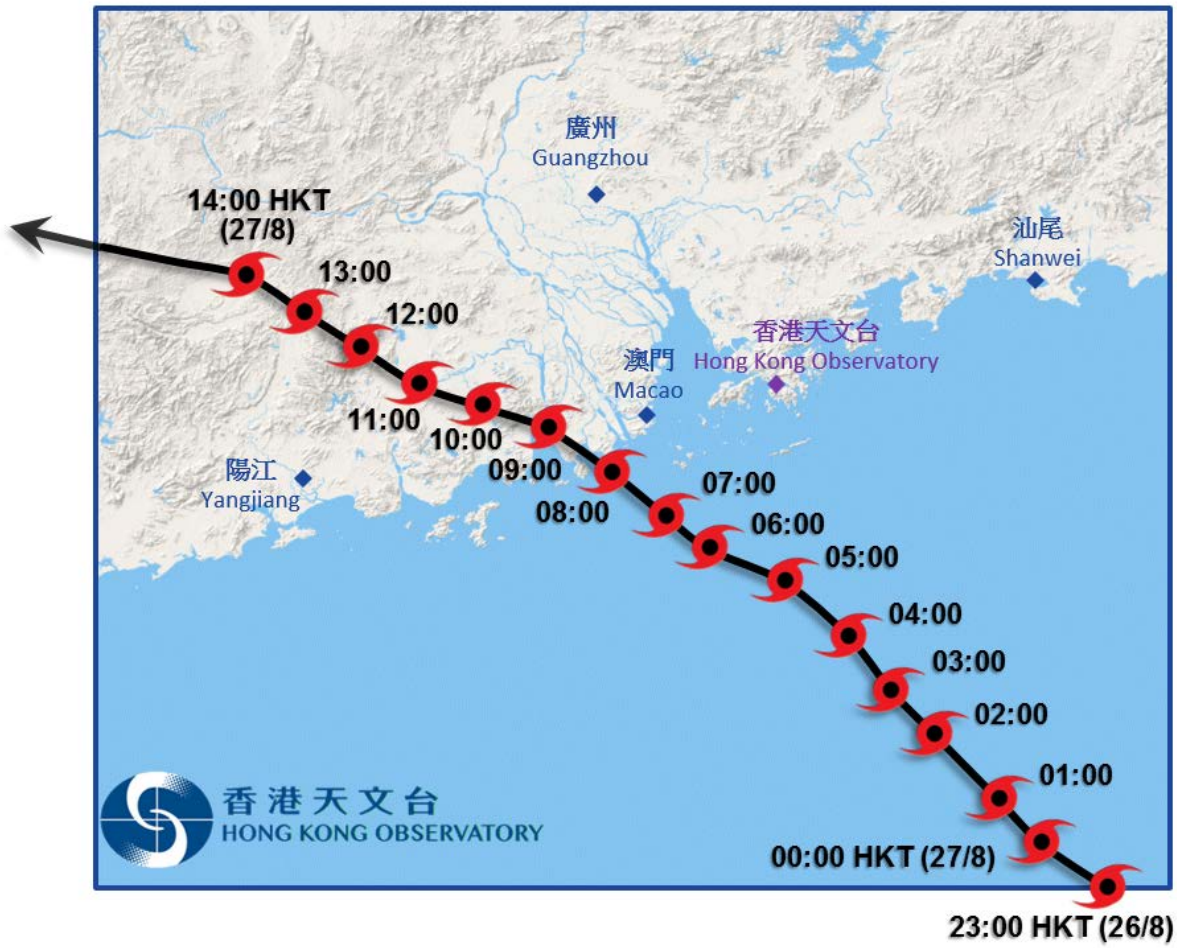


圖 3.4.1b　　帕卡接近香港時的路徑圖。

Figure 3.4.1b　　Track of Pakhar near Hong Kong.

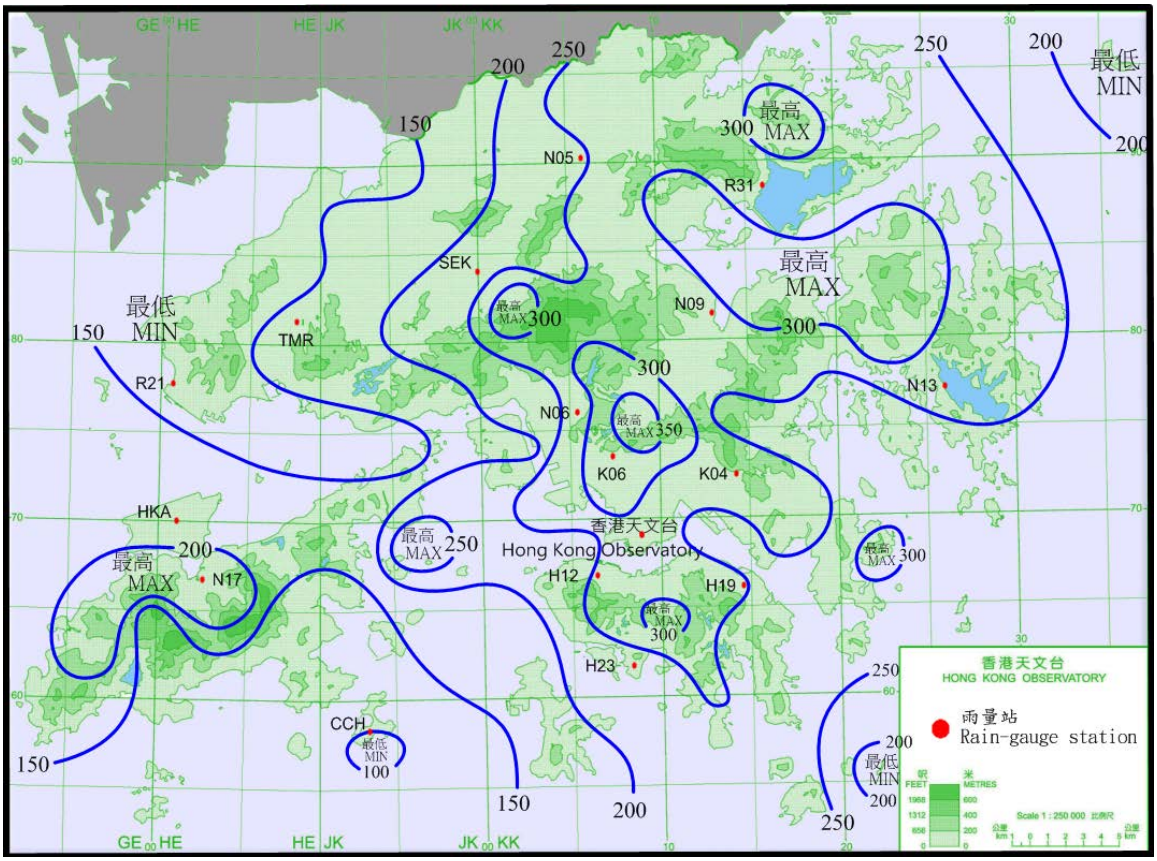


圖 3.4.2　　二零一七年八月二十六日至二十八日的雨量分佈(等雨量線單位為毫米)。

Figure 3.4.2　Rainfall distribution on 26 - 28 August 2017 (isohyets in millimetres).

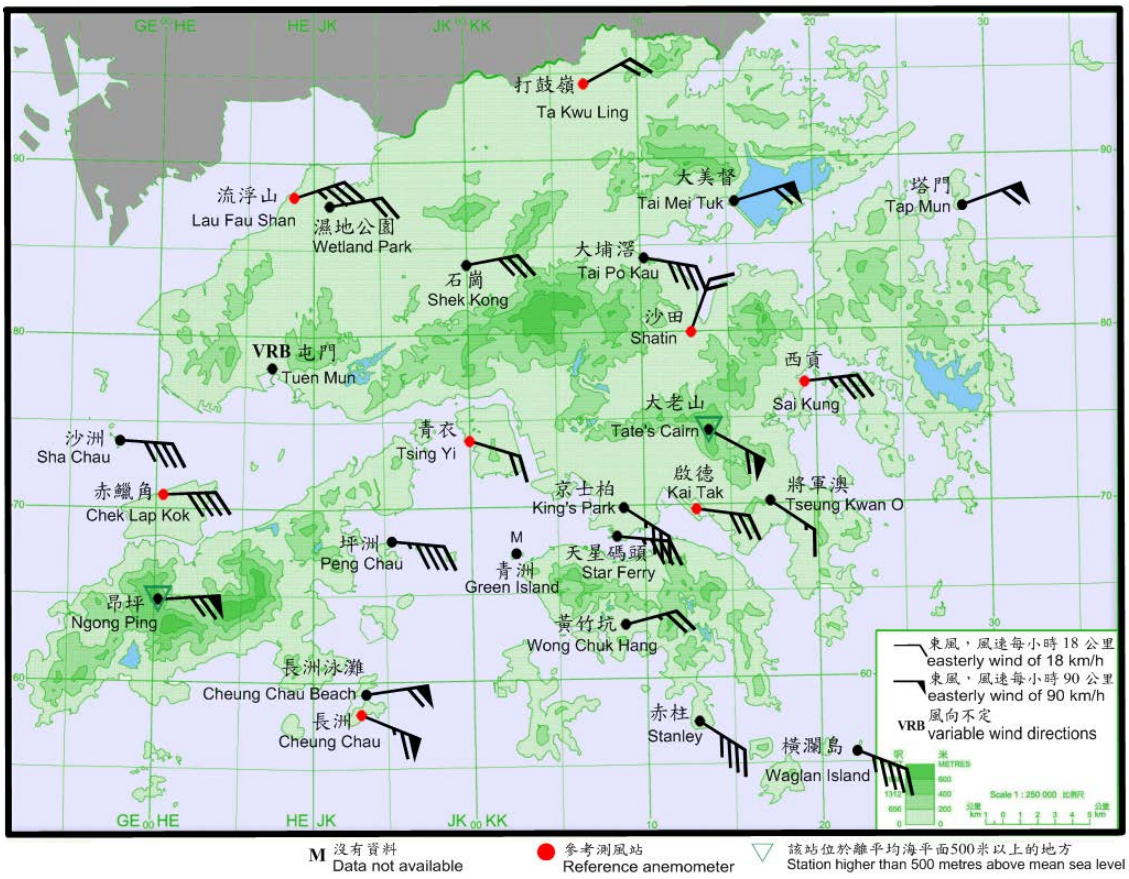


圖 3.4.3　二零一七年八月二十七日上午 7 時正香港各站錄得的十分鐘平均風向和風速。當時昂坪風力達到颶風程度，而大老山、長洲、長洲泳灘、塔門及大美督的風力達到暴風程度。

Figure 3.4.3　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 7:00 a.m. on 27 August 2017. Winds at Ngong Ping reached hurricane force, while winds at Tate's Cairn, Cheung Chau, Cheung Chau Beach, Tap Mun and Tai Mei Tuk reached storm force at the time.

註:　當時屯門錄得的十分鐘平均風速為每小時 13 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Tuen Mun was 13 km/h.

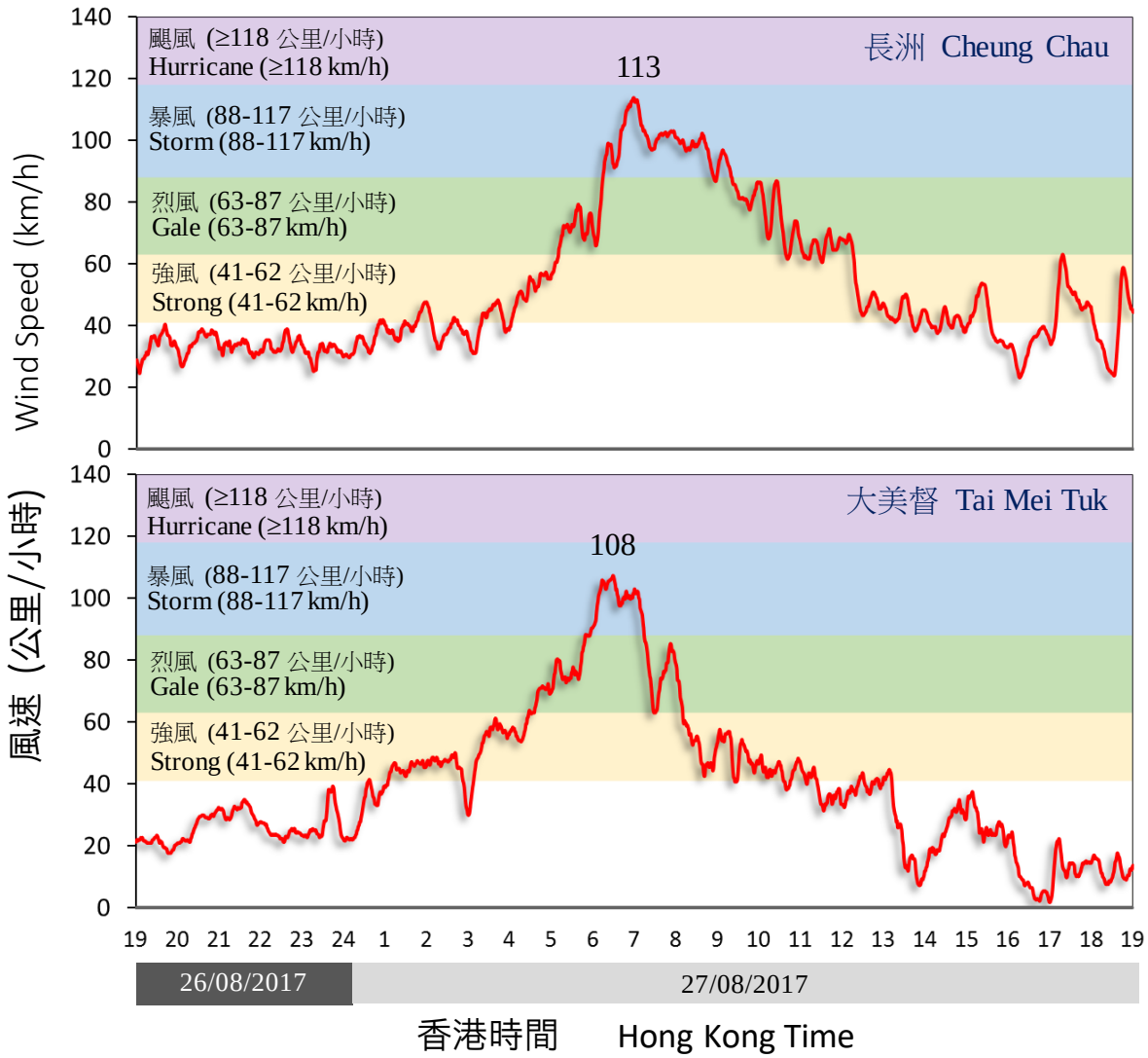


圖 3.4.4 二零一七年八月二十六至二十七日長洲及大美督錄得的十分鐘風速。

Figure 3.4.4 Traces of 10-minute wind speed recorded at Cheung Chau and Tai Mei Tuk on 26 and 27 August 2017.

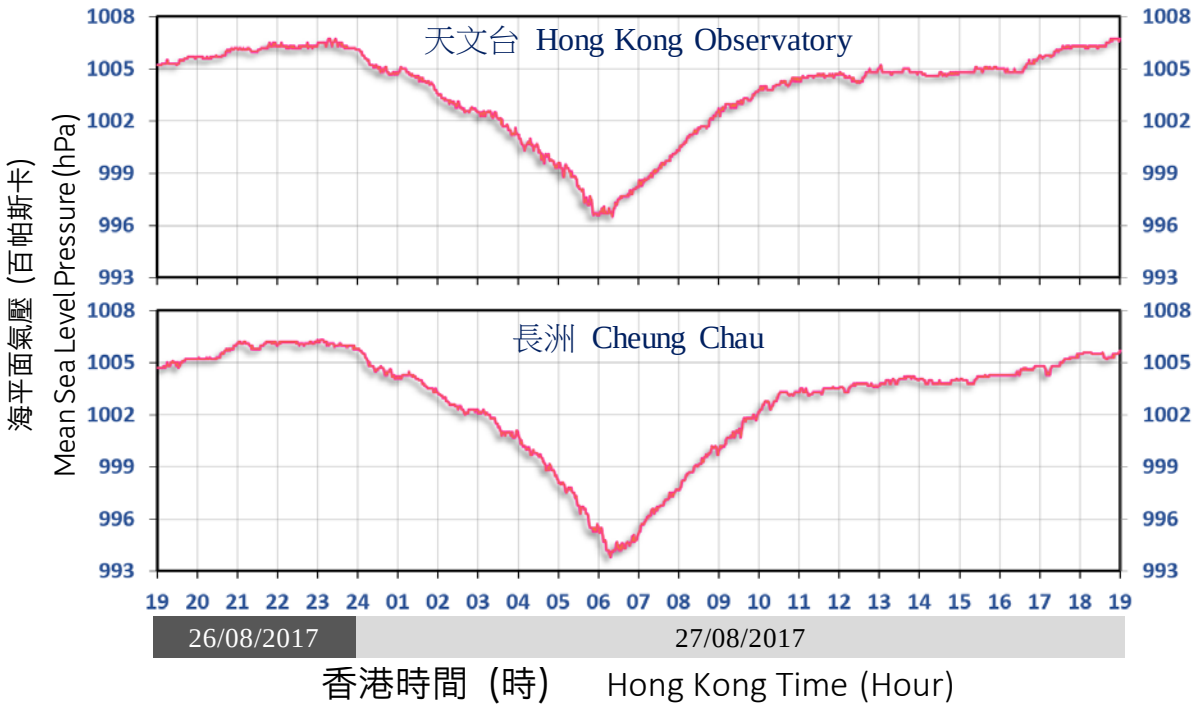


圖 3.4.5 二零一七年八月二十六日至二十七日天文台總部(上圖)及長洲(下圖)錄得的海平面氣壓。

Figure 3.4.5 Traces of mean sea-level pressure recorded at the Observatory Headquarters (top panel) and Cheung Chau (bottom panel) on 26 and 27 August 2017.

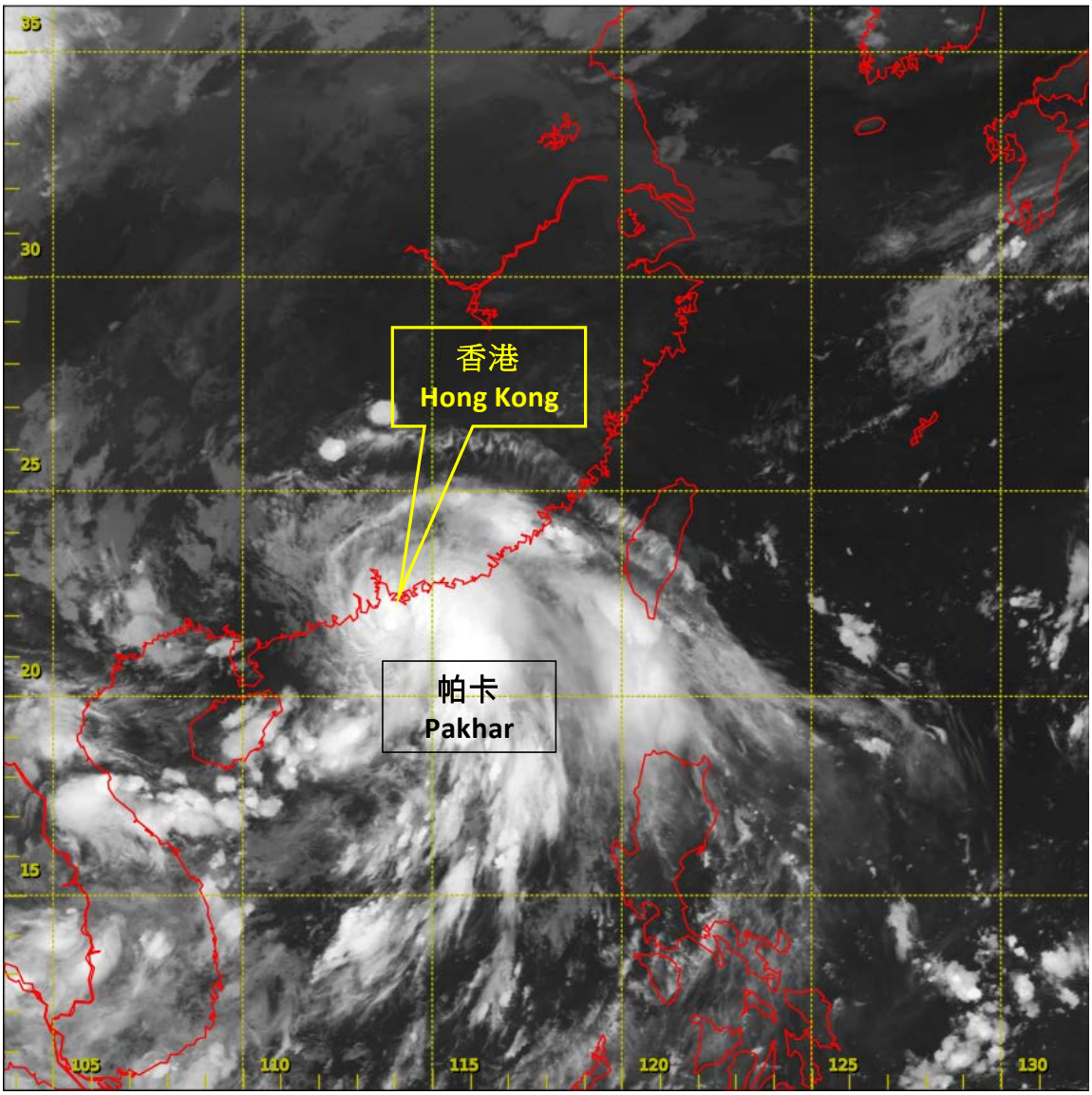


圖 3.4.6　二零一七年八月二十七日上午 5 時左右的紅外線衛星圖片，當時帕卡達到其最高強度，中心附近最高持續風速估計為每小時 110 公里。

Figure 3.4.6　Infra-red satellite imagery around 5 a.m. on 27 August 2017, when Pakhar was at peak intensity with estimated maximum sustained winds of 110 km/h near its centre.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕

[The satellite imagery was originally captured by Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

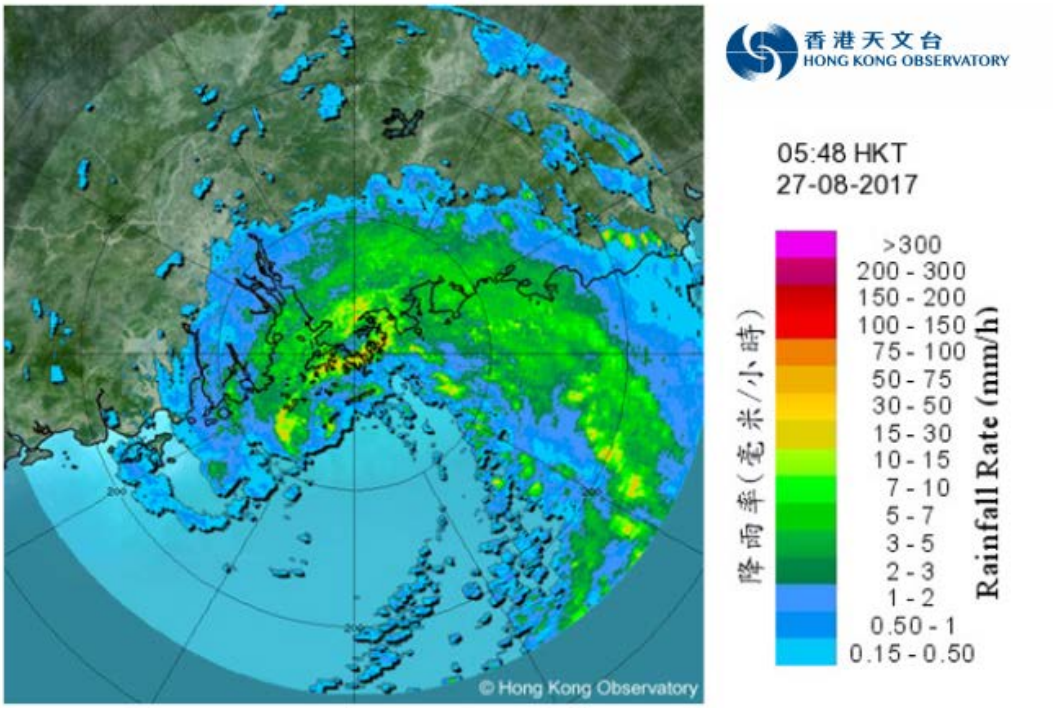


圖 3.4.7a　二零一七年八月二十七日上午 5 時 48 分的雷達回波圖像，當時帕卡北面的強雨帶正為本港帶來狂風大雨。

Figure 3.4.7a　Image of radar echoes at 5:48 a.m. on 27 August 2017, when the intense rainbands to the north of Pakhar were bringing heavy rain and squalls to Hong Kong.

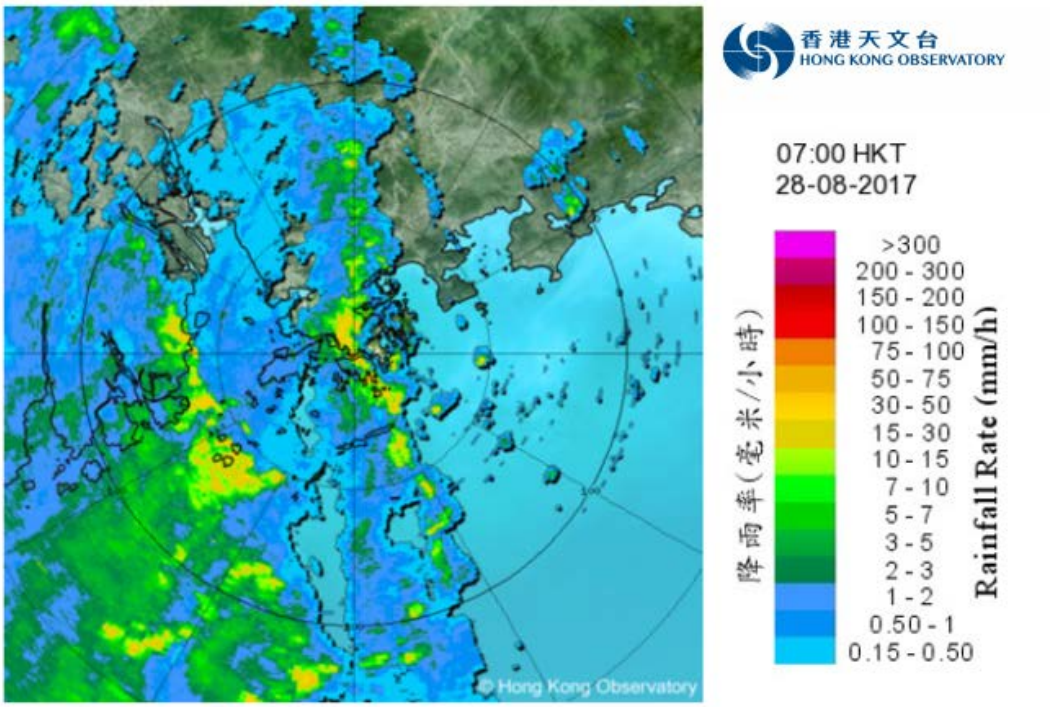


圖 3.4.7b　二零一七年八月二十八日上午 7 時的雷達回波圖像。帕卡已減弱為一個低壓區，但與其殘餘相關連的雨帶正為本港帶來暴雨。

Figure 3.4.7b　Image of radar echoes at 7 a.m. on 28 August 2017. Pakhar had already weakened into an area of low pressure but the rainbands associated with its remnant were bringing rainstorms to Hong Kong.

圖 3.4.8　荔枝角附近長沙灣道有大樹倒塌。(圖片鳴謝: 社區天氣觀測計劃 Kit Lo)

Figure 3.4.8　Fallen trees at Cheung Sha Wan Road near Lai Chi Kok. (photo courtesy of Kit Lo from Community Weather Observation Scheme)

3.5 強烈熱帶風暴瑪娃 (1716)：二零一七年八月三十一日至九月四日

瑪娃是二零一七年第五個導致香港天文台需要發出熱帶氣旋警告信號的熱帶氣旋。

熱帶低氣壓瑪娃於八月三十一日下午在東沙之東南偏東約270公里的南海北部上形成，緩慢向西北偏北移動，並於九月一日晚上增強為熱帶風暴。隨後兩天瑪娃大致採取西北路徑緩慢靠近廣東東部沿岸，九月二日上午增強為強烈熱帶風暴並達到其最高強度，中心附近最高持續風速估計為每小時90公里。瑪娃於九月三日減弱為熱帶風暴，當晚在汕尾附近登陸，翌日在廣東內陸減弱為一個低壓區。

根據報章報導，受瑪娃帶來的狂風暴雨影響，潮汕和珠三角地區出現嚴重水浸，海陸空交通大受影響。廣東有約11萬戶停電，而澳門多處地方亦有水浸報告。

香港天文台於九月二日上午2時20分發出一號戒備信號，當時瑪娃集結在香港之東南偏東約400公里。九月二日本港吹微風，天文台總部於當日下午3時21分錄得最低瞬時海平面氣壓1002.8百帕斯卡，當時瑪娃在香港之東南偏東約310公里。隨著瑪娃逐漸靠近廣東沿岸，九月三日日間本港普遍吹和緩西至西北風。雖然瑪娃於九月三日晚上在汕尾附近登陸及逐漸減弱，但仍然進一步接近本港，天文台在10時40分發出三號強風信號，當時瑪娃集結在香港之東北偏東約190公里。本港風勢逐漸增強，黎明時分本港普遍吹清勁至強風程度的西南風。瑪娃於九月四日上午8時左右最接近香港，在本港之東北偏北約120公里附近掠過。隨著瑪娃開始遠離香港及繼續減弱，本港風勢緩和，天文台在九月四日上午10時20分以一號戒備信號取代三號強風信號。下午瑪娃在廣東內陸減弱為一個低壓區，天文台於下午2時10分取消所有熱帶氣旋警告信號。

瑪娃影響香港期間，尖鼻咀錄得最高潮位2.89米(海圖基準面以上)及最大風暴潮(天文潮高度以上)0.44米。

受一股內陸氣流影響，九月二日本港有煙霞，短暫時間有陽光，黃昏有狂風雷暴。瑪娃的雨帶在九月三日及四日為本港帶來狂風大驟雨及雷暴。九月二至四日這三天期間本港普遍錄得超過50毫米雨量，而大嶼山、長洲、葵涌及屯門的雨量更超過100毫米。

瑪娃吹襲香港期間，西環及大圍有大樹倒塌壓毀幾輛私家車，輕鐵綫列車服務亦因大樹倒塌而一度受阻。九月三日黃昏大雨期間，大嶼山水口村有村屋遭受水浸。

表3.5.1 - 3.5.4 分別是瑪娃影響香港期間各站錄得的最高風速、持續風力達到強風程度的時段、香港的日雨量及最高潮位資料。圖3.5.1 - 3.5.3 分別為瑪娃的路徑圖、本港的雨量分佈圖及香港各站錄得的風向和風速。圖3.5.4 - 3.5.5 分別為瑪娃的衛星及雷達圖像。

3.5 Severe Tropical Storm Mawar (1716): 31 August – 4 September 2017

Mawar was the fifth tropical cyclone necessitating the issuance of tropical cyclone warning signal by the Hong Kong Observatory in 2017.

Mawar formed as a tropical depression over the northern part of the South China Sea about 270 km east-southeast of Dongsha on the afternoon of 31 August. It drifted north-northwestwards slowly and intensified into a tropical storm on the night of 1 September. Tracking slowly to the northwest towards the coast of eastern Guangdong over the next two days, Mawar intensified into a severe tropical storm on the morning of 2 September and reached its peak intensity with an estimated sustained wind of 90 km/h near its centre. It then weakened into a tropical storm on 3 September, making landfall near Shanwei that night and degenerating into an area of low pressure over inland Guangdong the next day.

According to press reports, torrential rain and squalls brought by Mawar caused severe flooding in the Chaozhou-Shantou region and the Pearl River Delta, seriously disrupting transportation services. Electricity supply to around 110 000 households was interrupted in Guangdong and flooding was reported in many places in Macao.

In Hong Kong, the Standby Signal No. 1 was issued at 2:20 a.m. on 2 September when Mawar was about 400 km east-southeast of the territory. Local winds were light on 2 September and the lowest instantaneous mean sea-level pressure of 1002.8 hPa was recorded at the Observatory headquarters at 3:21 p.m. on 2 September when Mawar was about 310 km east-southeast of Hong Kong. With Mawar moving gradually closer to the coast of Guangdong, local winds became moderate west to northwesterlies during the day on 3 September. Although Mawar made landfall near Shanwei and weakened gradually on the night of 3 September, it continued to edge closer to Hong Kong. The Strong Wind Signal No. 3 was issued at 10:40 p.m. that night when Mawar was about 190 km east-northeast of Hong Kong. Winds strengthened gradually and became fresh to strong southwesterlies around dawn. Mawar came closest to the territory around 8 a.m. on 4 September, passing at a distance of about 120 km to the north-northeast of Hong Kong. As Mawar started to move away from Hong Kong and continued to weaken, local winds subsided and the Strong Wind Signal No. 3 was replaced by the Standby Signal No. 1 at 10:20 a.m. on 4 September. With Mawar degenerating into an area of low pressure over inland Guangdong in the afternoon, all tropical cyclone warning signals were cancelled at 2:10 p.m.

A maximum sea level (above chart datum) of 2.89 m and a maximum storm surge (above astronomical tide) of 0.44 m were recorded at Tsim Bei Tsui during the passage of Mawar.

Under the influence of a continental airstream, the weather in Hong Kong was hazy with sunny intervals and evening squally thunderstorms on 2 September. The rainbands of Mawar brought heavy squally showers and thunderstorms to the territory on 3 and 4 September. More than 50 millimetres of rainfall were generally recorded in Hong Kong during the 3-day period of 2 - 4 September, with rainfall over Lautau Island, Cheung Chau, Kwai Chung and Tuen Mun exceeding 100 millimetres.

In Hong Kong, several private cars were damaged by fallen trees in Sai Wan and Tai Wai. Fallen trees also led to a disruption of light rail services. Village houses in Shui Hau Tsuen of Lautau Island were flooded during the heavy rain on the evening of 3 September.

Information on the maximum wind, period of strong force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Mawar is given in Tables 3.5.1 - 3.5.4 respectively. Figures 3.5.1 - 3.5.3 show respectively the track of Mawar, the rainfall distribution for Hong Kong and the winds recorded at various stations in Hong Kong. Fugures 3.5.4 - 3.5.5 show respectively a satellite imagery and a radar imagery of Mawar.

表 3.5.1　在瑪娃影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.5.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Mawar were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
黃麻角(赤柱)	Bluff Head (Stanley)	西	W	51	4/9	01:37	西南偏西	WSW	25	4/9	02:00
中環碼頭	Central Pier	西南偏西	WSW	58	4/9	09:43	西	W	22	3/9	15:00
長洲	Cheung Chau	西南偏南	SSW	65	4/9	02:42	南	S	45	4/9	03:00
長洲泳灘	Cheung Chau Beach	西南	SW	59	4/9	05:22	西南	SW	38	4/9	08:00
香港國際機場	Hong Kong International Airport	西南	SW	63	4/9	06:50	西南	SW	45	4/9	08:00
啟德	Kai Tak	西南	SW	59	4/9	08:06	西南	SW	25	4/9	10:00
京士柏	King's Park	西南偏西	WSW	43	4/9	08:57	西	W	16	4/9	08:00
流浮山	Lau Fau Shan	西南偏南	SSW	75	4/9	07:14	西南偏南	SSW	40	4/9	08:00
北角	North Point	西南偏西	WSW	54	4/9	11:38	西	W	31	4/9	12:00
坪洲	Peng Chau	東北	NE	63	3/9	18:12	西南	SW	25	4/9	07:00
							西南	SW	25	4/9	08:00
平洲	Ping Chau	西	W	43	4/9	00:25	西	W	22	4/9	01:00
西貢	Sai Kung	西南	SW	43	4/9	11:22	西南偏西	WSW	16	4/9	12:00
沙洲	Sha Chau	西南偏南	SSW	67	4/9	05:39	西南偏南	SSW	47	4/9	06:00
沙螺灣	Sha Lo Wan	西南偏南	SSW	67	4/9	10:55	西南	SW	31	4/9	07:00
沙田	Sha Tin	西南	SW	49	4/9	08:14	西南	SW	23	4/9	09:00
石崗	Shek Kong	西南	SW	31	4/9	13:06	西南偏西	WSW	12	4/9	12:00
九龍天星碼頭	Star Ferry (Kowloon)	西南偏西	WSW	70	4/9	07:48	西	W	31	4/9	08:00
打鼓嶺	Ta Kwu Ling	西南	SW	36	4/9	11:29	西南偏南	SSW	13	4/9	11:00
大美督	Tai Mei Tuk	西	W	51	4/9	13:22	西	W	31	3/9	23:00
大帽山	Tai Mo Shan	西南	SW	81	4/9	06:13	西南	SW	59	4/9	12:00
		西南	SW	81	4/9	11:35					
大埔滘	Tai Po Kau	西北偏西	WNW	47	4/9	09:38	西北	NW	16	3/9	23:00
塔門	Tap Mun	西	W	51	3/9	23:26	西	W	27	4/9	00:00
大老山	Tate's Cairn	西南偏南	SSW	81	4/9	07:57	西南偏南	SSW	52	4/9	11:00
		西南偏南	SSW	81	4/9	09:48					
將軍澳	Tseung Kwan O	南	S	52	4/9	07:49	西南偏南	SSW	12	4/9	02:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	西南偏南	SSW	40	4/9	07:47	南	S	20	4/9	04:00
屯門政府合署	Tuen Mun Government Offices	西南	SW	54	4/9	07:13	西南偏南	SSW	16	4/9	08:00
橫瀾島	Waglan Island	西南偏西	WSW	81	4/9	09:40	西南偏西	WSW	63	4/9	04:00
濕地公園	Wetland Park	西南偏南	SSW	40	4/9	10:02	南	S	12	4/9	07:00
							南	S	12	4/9	08:00
黃竹坑	Wong Chuk Hang	西南偏西	WSW	40	4/9	05:55	西北偏西	WNW	13	4/9	14:00

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

*The old wind station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017.

青洲、昂坪- 沒有資料　Green Island, Ngong Ping - data not available

表 3.5.2　在瑪娃影響下，熱帶氣旋警告信號系統的八個參考測風站在熱帶氣旋警告信號生效時錄得持續風力達到強風程度的時段

Table 3.5.2　Periods during which sustained strong winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Mawar were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風*時間 Start time when strong wind speed* was attained		最後達到強風*時間 End time when strong wind speed* was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	4/9	0126	4/9	1103
香港國際機場	Hong Kong International Airport	2/9	1737	4/9	1106
流浮山	Lau Fau Shan	4/9	0659	4/9	0727

啟德、西貢、沙田、打鼓嶺及青衣島蜆殼油庫的持續風力未達到強風程度。

The sustained wind speed did not attain strong force at Kai Tak, Sai Kung, Sha Tin, Ta Kwu Ling and Tsing Yi Shell Oil Depot.

* 十分鐘平均風速達每小時 41-62 公里

* 10-minute mean wind speed of 41- 62 km/h

註: 本表列出持續風力達到強風程度的起始及終結時間。期間風力可能高於或低於指定的風力。

Note: The table gives the start and end time of sustained strong force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.5.3　瑪娃掠過期間，香港天文台總部及其他各站所錄得的日雨量

Table 3.5.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Mawar

站 (參閱圖 3.5.2) Station (See Fig. 3.5.2)			九月二日 2 Sep	九月三日 3 Sep	九月四日 4 Sep	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			1.0	23.8	32.8	57.6
香港國際機場 Hong Kong International Airport (HKA)			16.1	32.0	41.3	89.4
長洲 Cheung Chau (CCH)			21.0	35.5	63.5	120.0
H23	香港仔	Aberdeen	0.5	16.5	32.0	49.0
N05	粉嶺	Fanling	2.0	35.0	32.5	69.5
N13	糧船灣	High Island	0.5	8.5	31.5	40.5
K04	佐敦谷	Jordan Valley	0.0	6.5	59.5	66.0
N06	葵涌	Kwai Chung	1.0	62.0	55.0	118.0
H12	半山區	Mid Levels	5.5	49.5	55.0	110.0
N09	沙田	Sha Tin	0.5	5.5	19.5	25.5
H19	筲箕灣	Shau Kei Wan	0.5	12.5	30.5	43.5
SEK	石崗	Shek Kong	9.0	29.5	20.5	59.0
K06	蘇屋邨	So Uk Estate	5.5	46.5	55.5	107.5
R31	大美督	Tai Mei Tuk	[0.5]	0.5	[39.0]	[40.0]
R21	踏石角	Tap Shek Kok	[4.0]	14.5	[60.5]	[79.0]
TMR	屯門水庫	Tuen Mun Reservoir	5.8	21.2	59.9	86.9
N17	東涌	Tung Chung	18.5	78.0	53.0	149.5

註：[ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.5.4　瑪娃掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

Table 3.5.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Mawar

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.41	3/9	06:22	0.35	3/9	03:32
石壁	Shek Pik	2.48	3/9	06:42	0.29	3/9	04:28
大廟灣	Tai Miu Wan	2.39	3/9	06:39	0.41	3/9	02:56
大埔滘	Tai Po Kau	2.36	2/9	07:23	0.40	3/9	03:15
尖鼻咀	Tsim Bei Tsui	2.89	4/9	08:11	0.44	2/9	18:08
橫瀾島	Waglan Island	2.42	3/9	06:33	0.27	3/9	03:24

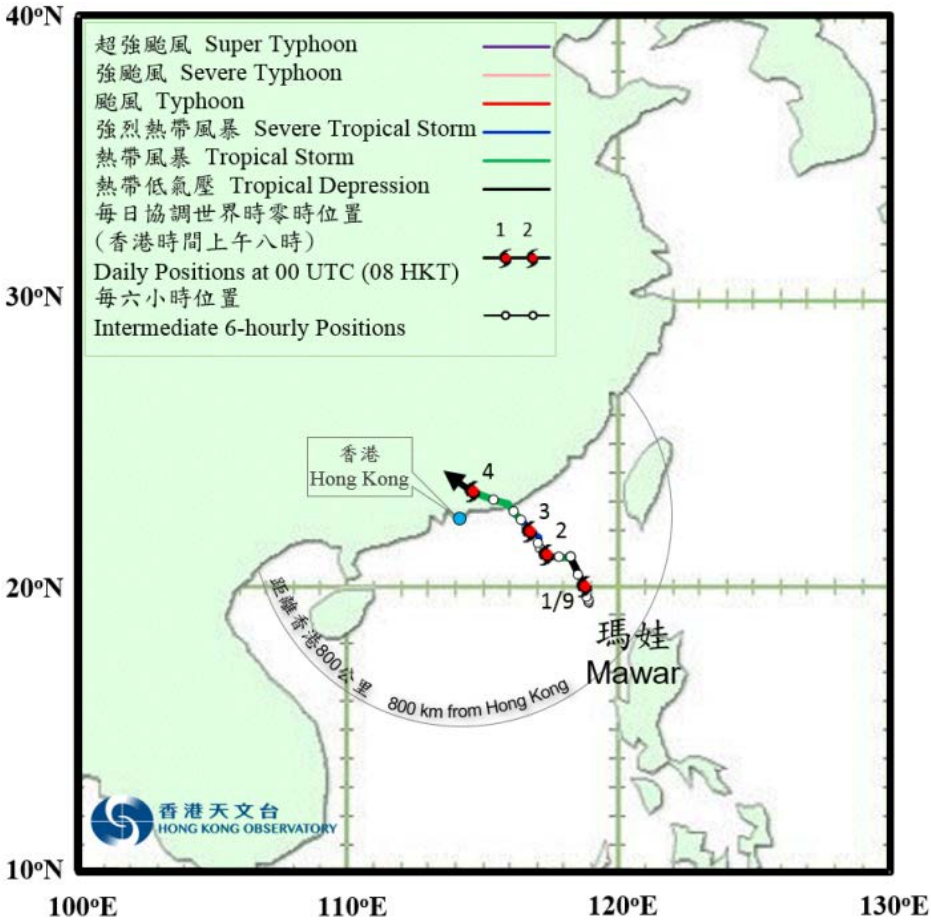


圖 3.5.1a　　二零一七年八月三十一日至九月四日瑪娃的路徑圖。

Figure 3.5.1a　Track of Mawar on 31 August - 4 September 2017.

圖 3.5.1b　　瑪娃接近香港時的路徑圖。

Figure 3.5.1b　Track of Mawar in the vicinity of Hong Kong.

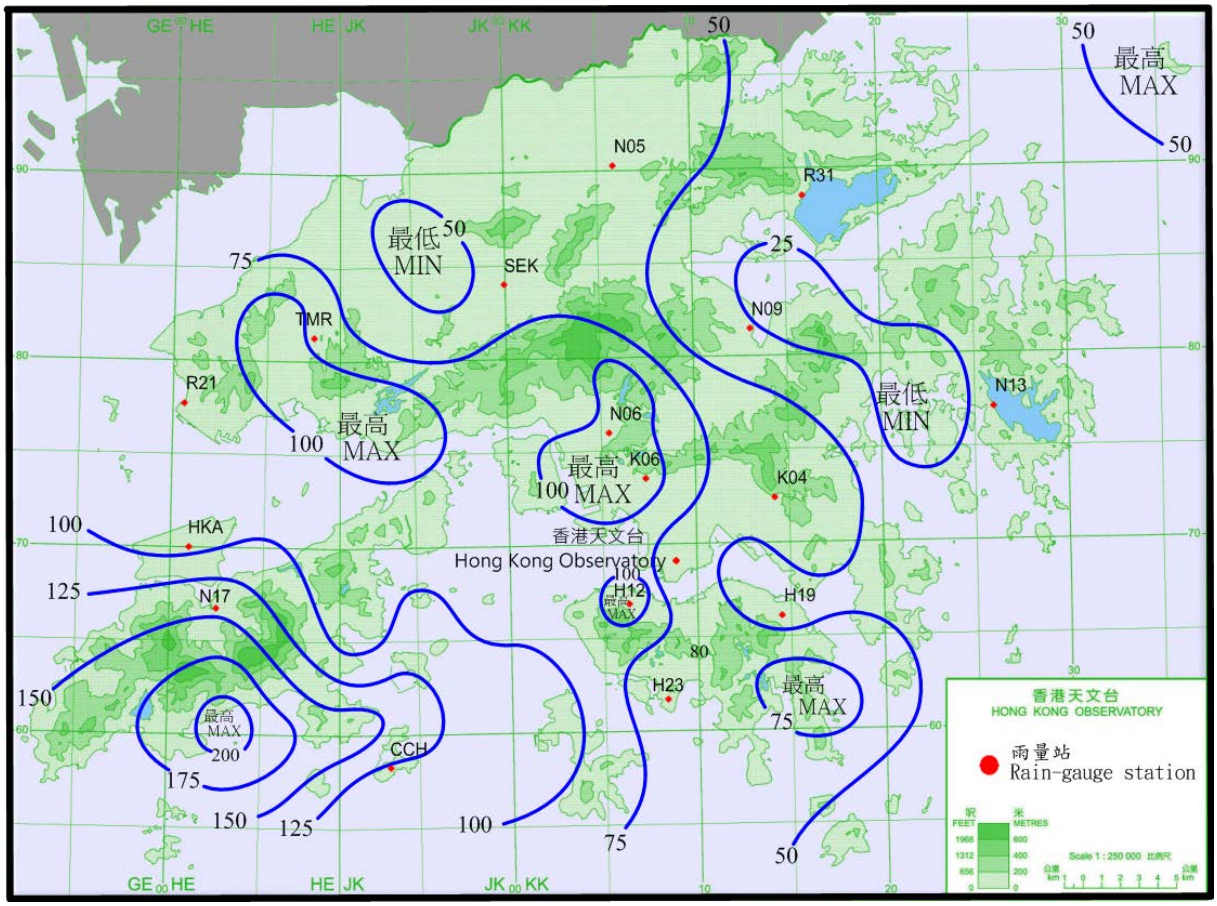


圖 3.5.2　　二零一七年九月二日至四日的雨量分佈(等雨量線單位為毫米)。

Figure 3.5.2　　Rainfall distribution on 2 – 4 September 2017 (isohyets in millimetres).

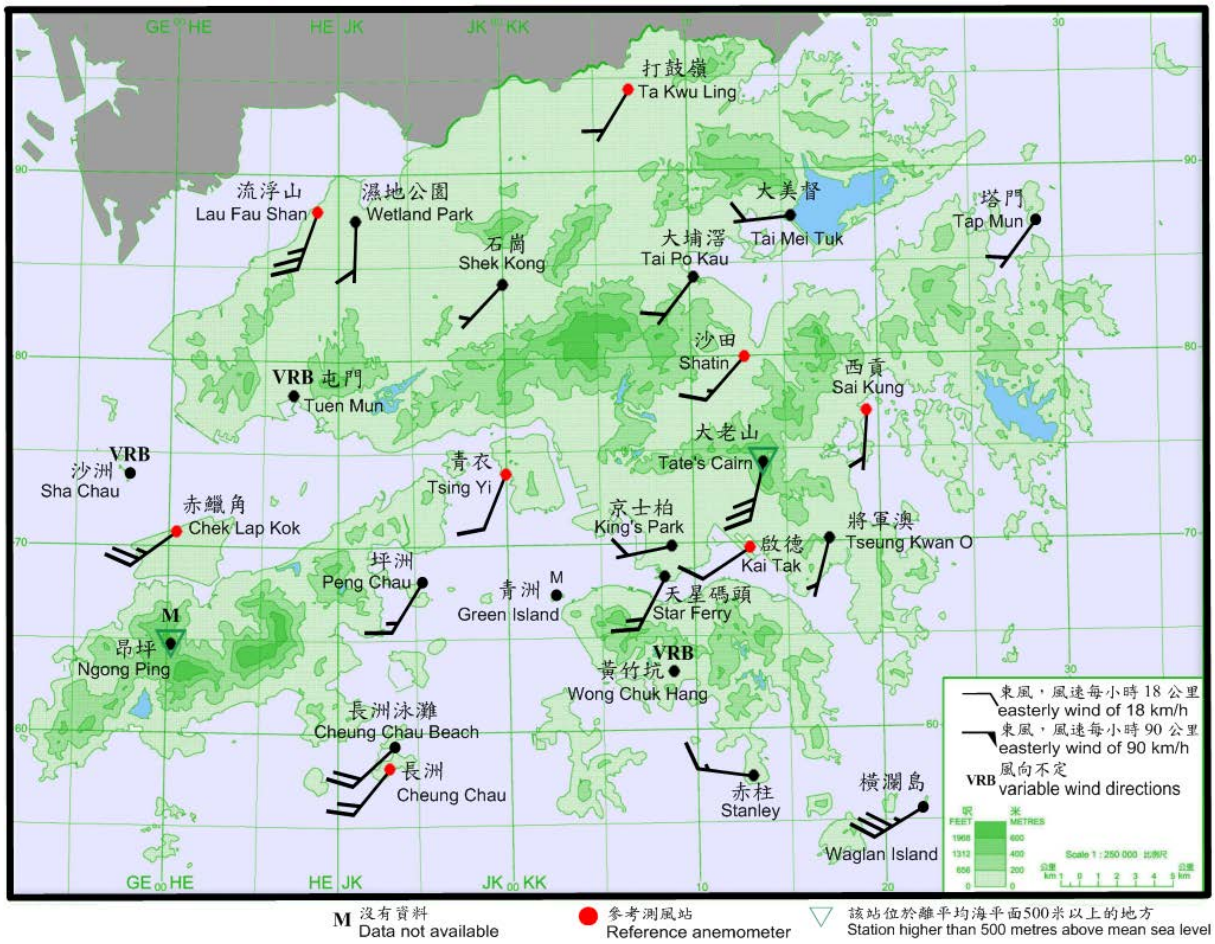


圖 3.5.3　二零一七年九月四日上午 7 時 10 分香港各站錄得的十分鐘平均風向和風速。當時赤鱲角、流浮山、大老山及橫瀾島風力達到強風程度。

Figure 3.5.3　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 7:10 a.m. on 4 September 2017. Winds at Chek Lap Kok, Lau Fau Shan, Tate's Cairn, Waglan Island reached strong force at that time.

註:　當時沙洲、屯門及黃竹坑錄得的十分鐘平均風速分別為每小時 23、14 及 9 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Sha Chau, Tuen Mun and Wong Chuk Hang were 23, 14 and 9 km/h respectively.

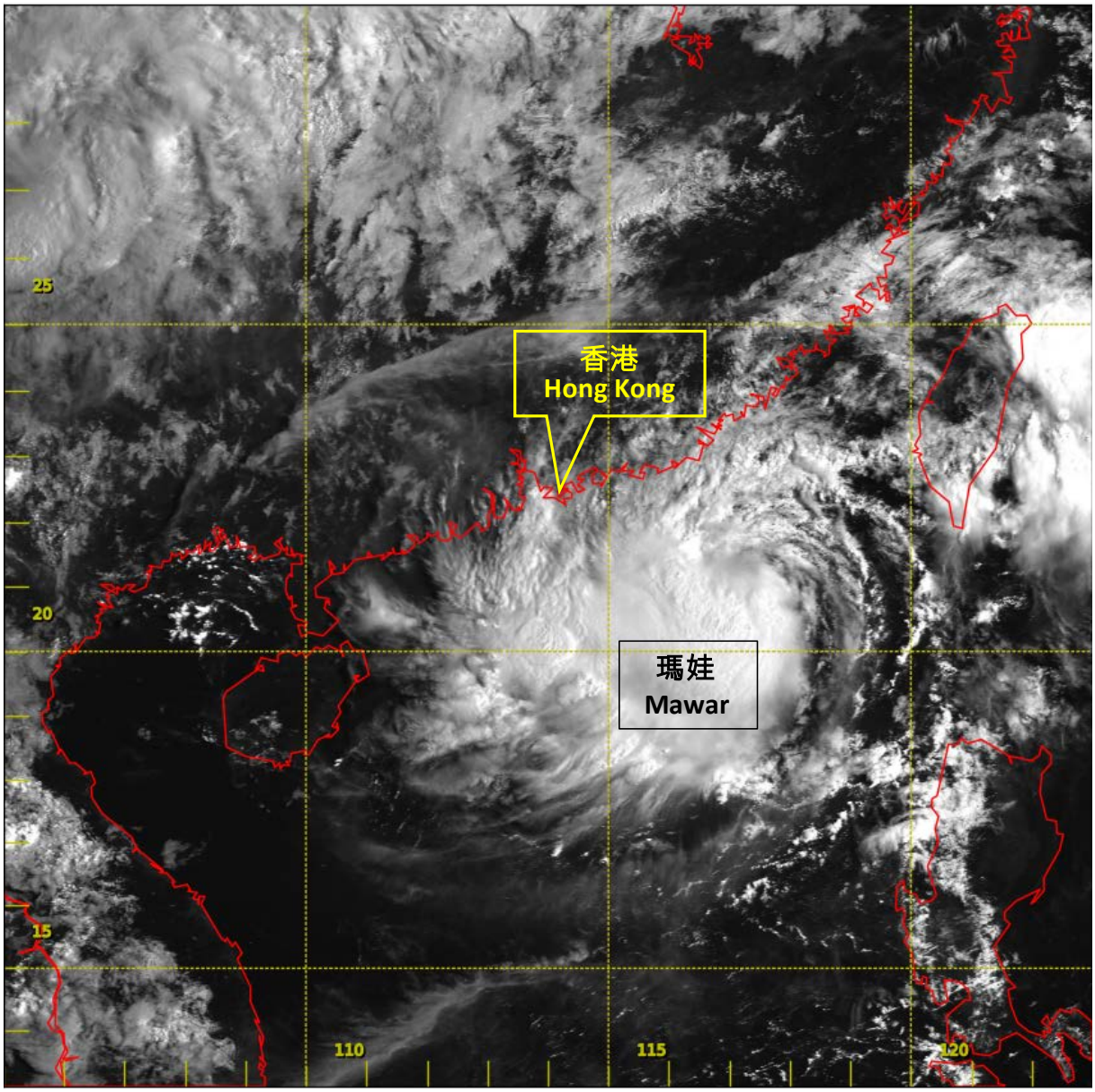


圖 3.5.4　二零一七年九月二日上午八時正的可見光衛星圖片，當時瑪娃達到其最高強度，中心附近最高持續風速估計為每小時 90 公里。

Figure 3.5.4　Visible satellite imagery at 8:00 a.m. on 2 September 2017 as Mawar reached its peak intensity with an estimated maximum sustained wind of 90 km/h near its centre.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕
[The satellite imagery was originally captured by Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

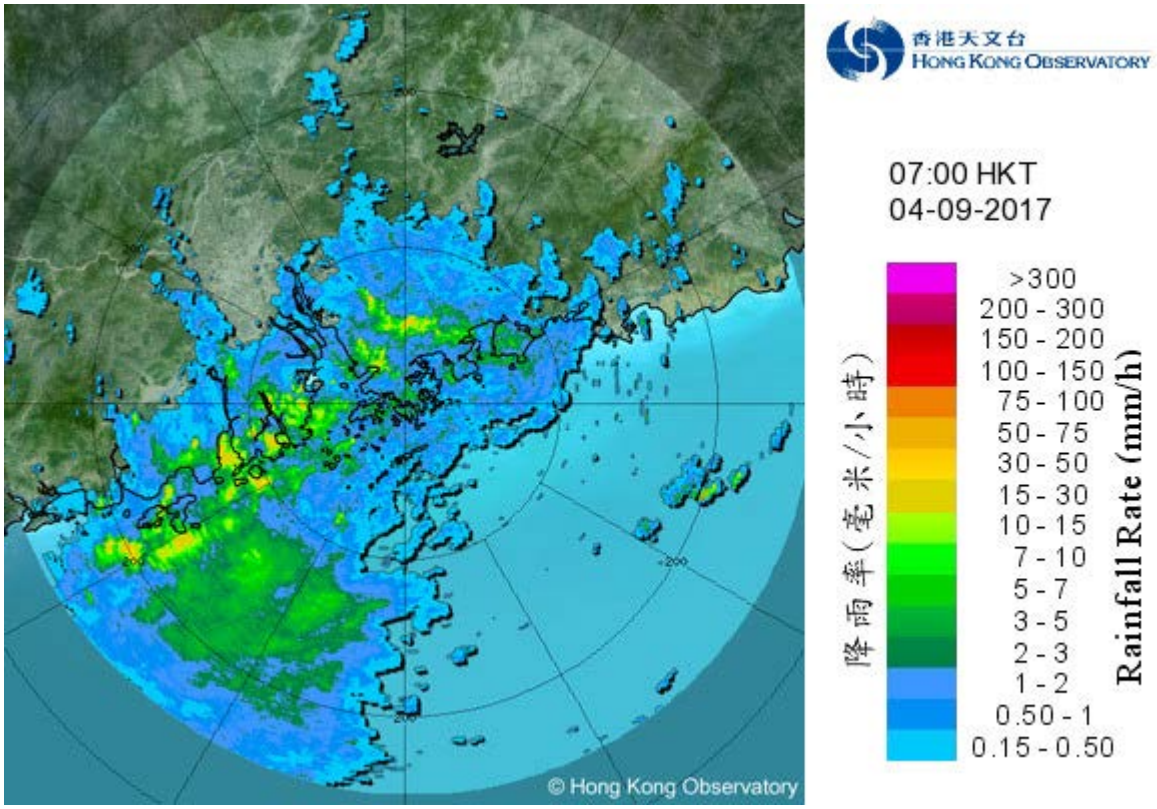


圖 3.5.5　二零一七年九月四日上午七時正的雷達圖像，當時瑪娃正橫過廣東內陸，與其相關的雨帶正影響廣東及南海北部。

Figure 3.5.5　Radar image at 7:00 a.m. on 4 September 2017 when Mawar was moving across inland Guangdong and its rainbands affecting Guangdong and the northern part of the South China Sea.

3.6 熱帶低氣壓：二零一七年九月二十三日至二十五日

九月二十三日晚上一個熱帶低氣壓在南海中部形成，成為二零一七年第六個導致香港天文台需要發出熱帶氣旋警告信號的熱帶氣旋。

熱帶低氣壓在香港之東南偏南約 620 公里的南海中部形成後，向西北偏西移向海南島，翌日早上達到其最高強度，中心附近最高持續風速估計為每小時 55 公里。該熱帶低氣壓隨後採取西北路徑橫過海南島及北部灣，九月二十五日晚上在越南北部減弱為一個低壓區。

天文台於九月二十三日晚上 11 時 10 分發出一號戒備信號，當時熱帶低氣壓集結在香港之東南偏南約 560 公里。翌日本港普遍吹和緩至清勁東至東南風，離岸及高地間中吹強風。熱帶低氣壓於九月二十四日上午 8 時左右最接近本港，位置在香港西南偏南約 470 公里。天文台總部於當日下午 2 時 16 分錄得最低瞬時海平面氣壓 1007.7 百帕斯卡。隨著熱帶低氣壓遠離本港，天文台於傍晚 7 時 20 分取消所有熱帶氣旋警告信號。

熱帶低氣壓掠過期間對香港並沒有造成任何嚴重破壞。受熱帶低氣壓的外圍雨帶影響，九月二十四日本港有狂風驟雨及雷暴，多處地區錄得超過 10 毫米雨量。尖鼻咀錄得最高潮位 (海圖基準面以上) 2.61 米及最大風暴潮 (天文潮高度以上) 0.35 米。

表 3.6.1 - 3.6.3 分別是熱帶低氣壓影響香港期間各站錄得的最高風速、香港的日雨量及最高潮位資料。圖 3.6.1 - 3.6.2 分別為熱帶低氣壓的路徑圖及本港的雨量分佈圖。圖 3.6.3 - 3.6.4 分別為熱帶低氣壓的衛星及雷達圖像。

3.6 Tropical Depression : 23 – 25 September 2017

A tropical depression formed over the central part of the South China Sea on the night of 23 September, making it the sixth tropical cyclone necessitating the issuance of tropical cyclone warning signals by the Hong Kong Observatory in 2017.

The Tropical Depression formed over the central part of the South China Sea about 620 km south-southeast of Hong Kong on the night of 23 September and tracked west-northwestwards towards Hainan Island. It reached its peak intensity the next morning with an estimated maximum sustained wind of 55 km/h near its centre. Taking on a northwestward course, the Tropical Depression then moved across Hainan Island and Beibu Wan before weakening into an area of low pressure over the northern part of Vietnam on the night of 25 September.

The Observatory issued the Standby Signal No. 1 at 11:10 p.m. on 23 September when the Tropical Depression was about 560 km south-southeast of Hong Kong. Local winds were generally moderate to fresh east to southeasterly the next day, occasionally strong offshore and on high ground. The Tropical Depression came closest to the territory around 8 a.m. on 24 September when it was about 470 km south-southwest of Hong Kong. At the Observatory Headquarters, the lowest instantaneous mean sea-level pressure of 1007.7 hPa was recorded at 2:16 p.m. that day. With the Tropical Depression moving away from Hong Kong, all tropical cyclone warning signals were cancelled at 7:20 p.m. in the evening.

The Tropical Depression did not cause any significant damage in Hong Kong during its passage. Its outer rainbands brought squally showers and thunderstorms to the territory on 24 September, with more than 10 millimetres of rainfall recorded over many places. A maximum sea level (above chart datum) of 2.61 m and a maximum storm surge of 0.35 m (above astronomical tide) were recorded at Tsim Bei Tsui.

Information on the maximum wind, daily rainfall and maximum sea level reached in Hong Kong during the passage of the Tropical Depression is given in Tables 3.6.1 - 3.6.3 respectively. Figures 3.6.1 - 3.6.2 show respectively the track and the rainfall distribution for Hong Kong. Figures 3.6.3 -3.6.4 show respectively a satellite imagery and a radar imagery of the Tropical Depression.

表 3.6.1　在熱帶低氣壓影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.6.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when tropical cyclone warning signals for the Tropical Depression were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
中環碼頭	Central Pier	東	E	54	24/9	08:46	東	E	31	24/9	10:00
長洲	Cheung Chau	東南偏東	ESE	85	24/9	05:30	東南偏東	ESE	47	24/9	16:00
							東南偏東	ESE	47	24/9	17:00
長洲泳灘	Cheung Chau Beach	東	E	77	24/9	05:31	東北偏東	ENE	49	24/9	09:00
青洲	Green Island	東	E	62	24/9	10:26	東北偏東	ENE	40	24/9	03:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	52	24/9	14:39	東南偏東	ESE	34	24/9	15:00
啟德	Kai Tak	東北	NE	54	24/9	09:24	東	E	30	24/9	15:00
京士柏	King's Park	東	E	51	24/9	05:54	東南偏東	ESE	22	24/9	15:00
流浮山	Lau Fau Shan	東	E	47	24/9	15:27	東	E	22	24/9	10:00
							東	E	22	24/9	11:00
坪洲	Peng Chau	東	E	51	24/9	10:29	東	E	36	24/9	10:00
平洲	Ping Chau	東北偏東	ENE	36	24/9	08:17	東	E	7	24/9	08:00
							東	E	7	24/9	09:00
西貢	Sai Kung	東北偏東	ENE	56	24/9	06:19	東北偏東	ENE	30	24/9	10:00
沙洲	Sha Chau	東南	SE	47	24/9	14:40	東南	SE	31	24/9	18:00
沙螺灣	Sha Lo Wan	東南	SE	51	24/9	17:36	東	E	23	24/9	10:00
沙田	Sha Tin	東南	SE	43	24/9	11:58	東南	SE	14	24/9	14:00
石崗	Shek Kong	東	E	47	24/9	09:53	東	E	22	24/9	10:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	56	24/9	10:19	東	E	27	24/9	15:00
打鼓嶺	Ta Kwu Ling	東北偏東	ENE	47	24/9	10:48	東	E	16	24/9	14:00
							東	E	16	24/9	16:00
大美督	Tai Mei Tuk	東	E	67	24/9	17:29	東北偏東	ENE	36	24/9	11:00
大帽山	Tai Mo Shan	東南偏東	ESE	88	24/9	11:07	東南偏東	ESE	58	24/9	11:00
大埔滘	Tai Po Kau	東南偏東	ESE	49	24/9	17:33	東	E	31	24/9	09:00
							東	E	31	24/9	10:00
塔門*	Tap Mun*	東	E	96	24/9	10:23	東	E	45	24/9	13:00
大老山	Tate's Cairn	東南偏東	ESE	87	24/9	10:11	東	E	45	24/9	08:00
將軍澳	Tseung Kwan O	東南偏東	ESE	41	24/9	12:56	東北	NE	13	24/9	09:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南	SE	52	24/9	13:37	東南	SE	19	24/9	15:00
屯門政府合署	Tuen Mun Government Offices	東南	SE	51	24/9	15:54	東南	SE	22	24/9	15:00
橫瀾島	Waglan Island	東	E	79	24/9	05:04	東北偏東	ENE	56	24/9	08:00
濕地公園	Wetland Park	東北偏東	ENE	31	24/9	10:08	東	E	14	24/9	15:00
黃竹坑	Wong Chuk Hang	東	E	52	24/9	07:44	東	E	20	24/9	11:00
		東	E	52	24/9	07:50					

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

*The old wind station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017

黃麻角(赤柱)、昂坪、北角- 沒有資料　Bluff Head (Stanley), Ngong Ping, North Point - data not available

表 3.6.2　熱帶低氣壓掠過期間，香港天文台總部及其他各站所錄得的日雨量

Table 3.6.2　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of the Tropical Depression

站 (參閱圖 3.6.2) Station (See Fig. 3.6.2)			九月二十四日 24 Sep	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			5.6	5.6
香港國際機場 Hong Kong International Airport (HKA)			7.8	7.8
長洲 Cheung Chau (CCH)			10.0	10.0
H23	香港仔	Aberdeen	10.0	10.0
N05	粉嶺	Fanling	19.5	19.5
N13	糧船灣	High Island	21.5	21.5
K04	佐敦谷	Jordan Valley	6.0	6.0
N06	葵涌	Kwai Chung	3.5	3.5
H12	半山區	Mid Levels	10.0	10.0
N09	沙田	Sha Tin	7.0	7.0
H19	筲箕灣	Shau Kei Wan	8.0	8.0
SEK	石崗	Shek Kong	8.5	8.5
K06	蘇屋邨	So Uk Estate	6.0	6.0
R31	大美督	Tai Mei Tuk	25.0	25.0
R21	踏石角	Tap Shek Kok	2.5	2.5
TMR	屯門水庫	Tuen Mun Reservoir	1.4	1.4
N17	東涌	Tung Chung	5.0	5.0

表 3.6.3　熱帶低氣壓掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

Table 3.6.3　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of the Tropical Depression

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.07	24/9	11:46	0.19	24/9	11:41
石壁	Shek Pik	2.23	23/9	23:32	0.26	24/9	11:17
大廟灣	Tai Miu Wan	2.09	23/9	23:29	0.23	24/9	08:09
大埔滘	Tai Po Kau	2.18	24/9	00:20	0.27	24/9	12:05
尖鼻咀	Tsim Bei Tsui	2.61	23/9	23:47	0.35	24/9	12:02
橫瀾島	Waglan Island	2.04	24/9	11:55	0.08	24/9	08:49

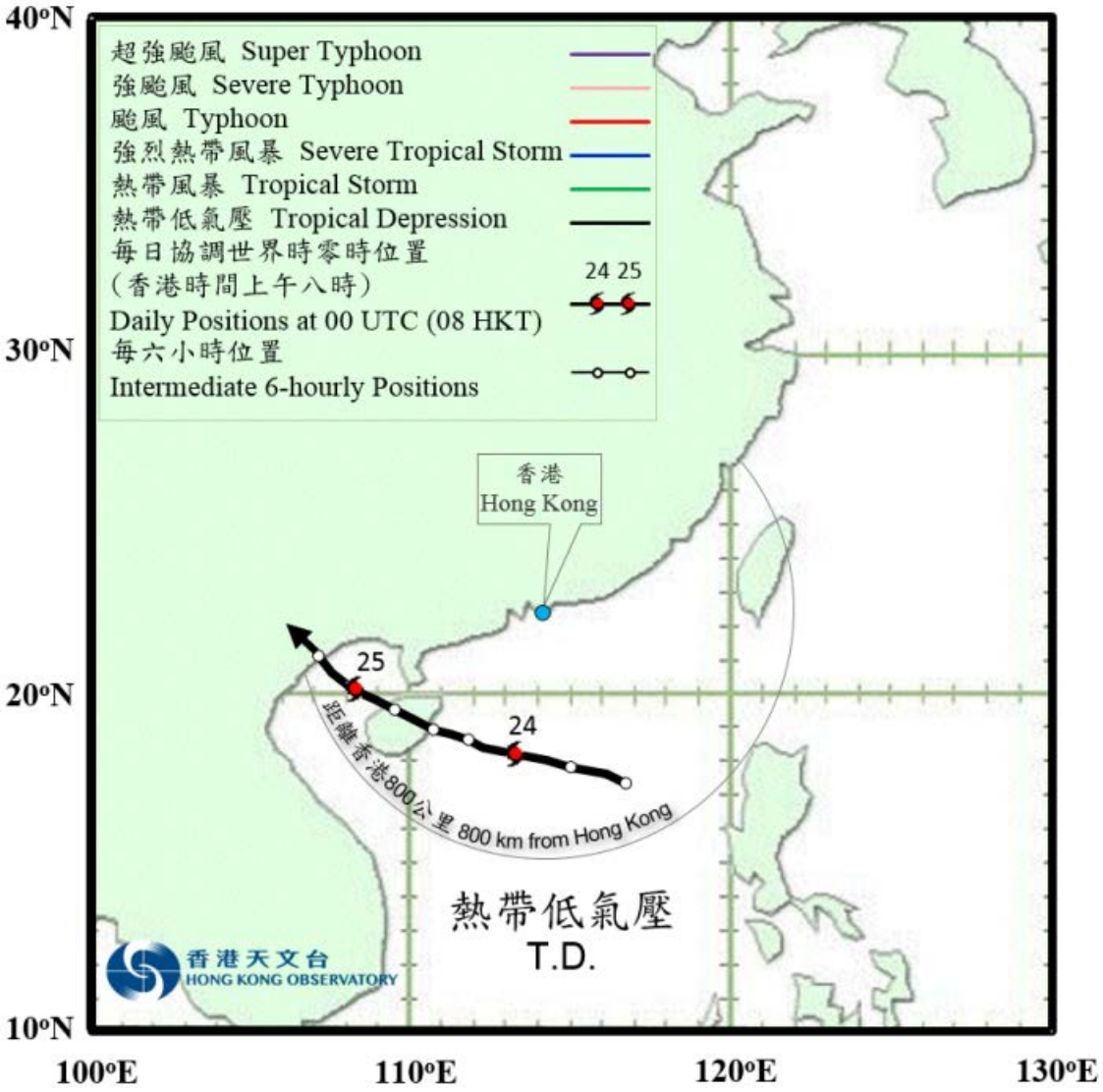


圖 3.6.1　　二零一七年九月二十三至二十五日熱帶低氣壓的路徑圖。

Figure 3.6.1　　Track of the Tropical Depression on 23 - 25 September 2017.

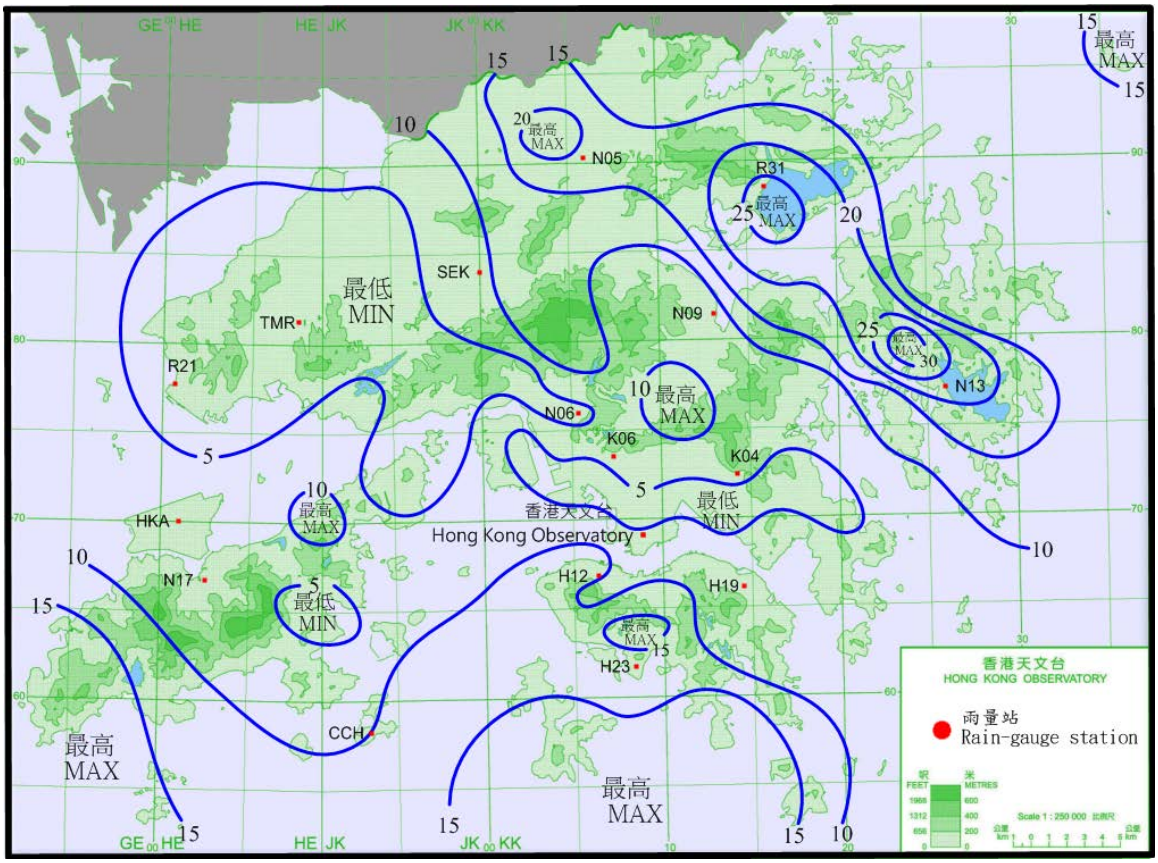


圖 3.6.2　　二零一七年九月二十四日的雨量分佈(等雨量線單位為毫米)。

Figure 3.6.2　Rainfall distribution on 24 September 2017 (isohyets in millimetres).

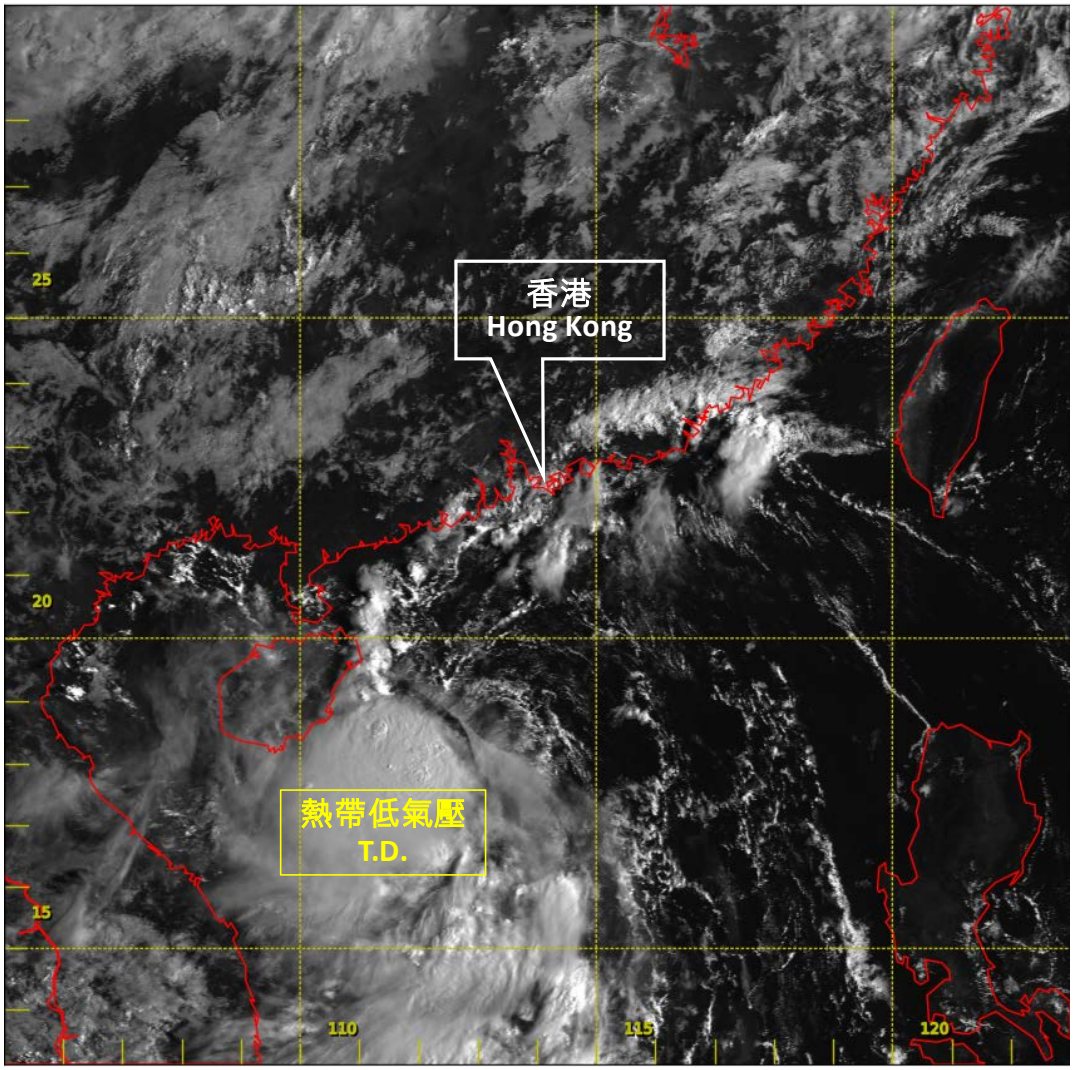


圖 3.6.3　二零一七年九月二十四日上午八時正的可見光衛星圖片，當時熱帶低氣壓達到其最高強度，中心附近最高持續風速估計為每小時 55 公里。

Figure 3.6.3 Visible satellite imagery at 8:00 a.m. on 24 September 2017 when the Tropical Depression was at its peak intensity with an estimated maximum sustained wind of 55 km/h near its centre.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕

[The satellite imagery was originally captured by Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

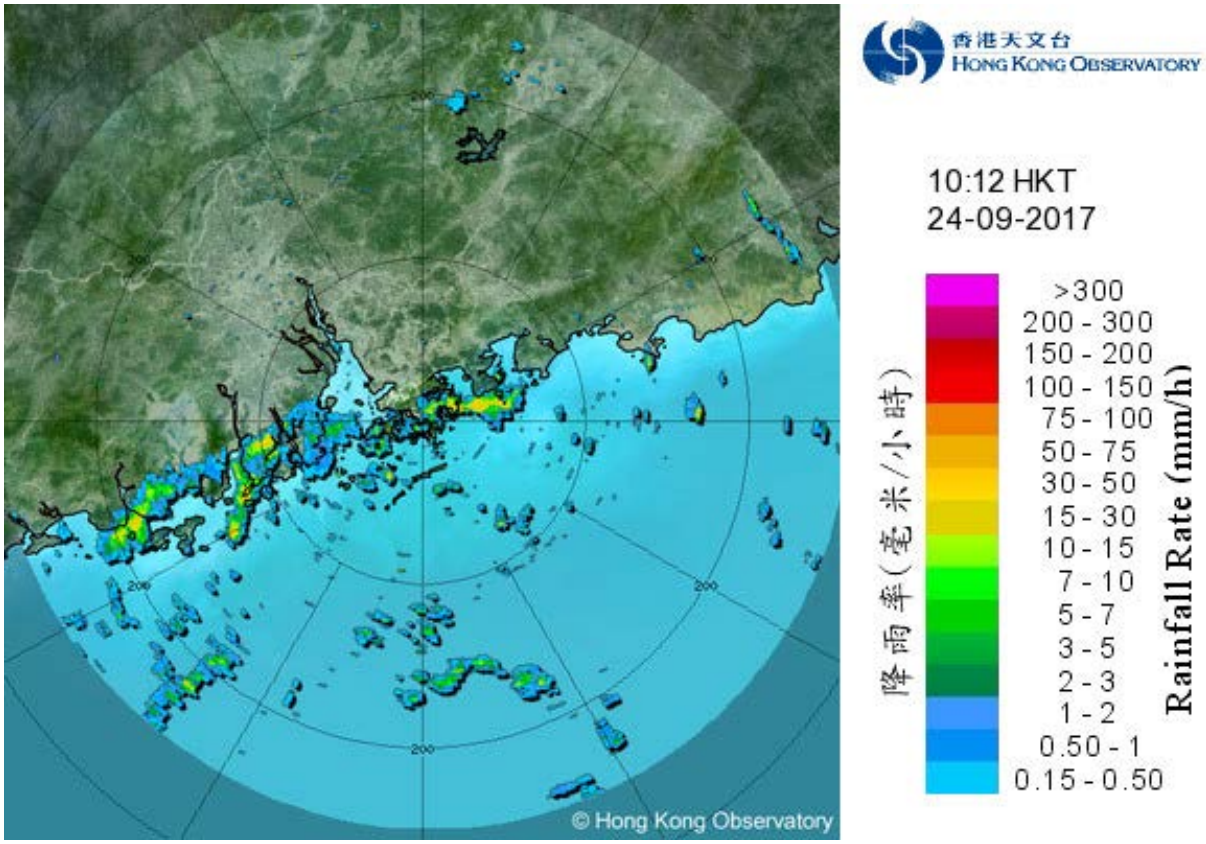


圖 3.6.4　二零一七年九月二十四日上午十時十二分的雷達圖像顯示熱帶低氣壓的外圍雨帶正影響廣東沿岸。

Figure 3.6.4　Radar image at 10:12 a.m. on 24 September 2017 showing the outer rainbands of the Tropical Depression affecting the coastal areas of Guangdong.

3.7 強颱風卡努 (1720)：二零一七年十月十二日至十六日

卡努是二零一七年第七個影響香港的熱帶氣旋，天文台需要發出年內第五個八號烈風或暴風信號，平了一九六四年及一九九九年一年內發出八號信號次數最多的紀錄。

熱帶低氣壓卡努於十月十二日早上在馬尼拉之東北偏東約650公里的北太平洋西部上形成，採取西北偏西路徑移動，當晚增強為熱帶風暴。翌日卡努橫過呂宋北部，並緩慢地向西南偏西方向漂移，進入南海後重新組織。十月十四日卡努轉向西北移動，並不斷增強，在晚間已由強烈熱帶風暴發展為颱風。翌日卡努採取西北偏西路徑靠近華南沿岸，並增強為強颱風，達到其最高強度，中心附近最高持續風速估計為每小時155公里。隨後卡努採取偏西路徑移動，並受東北風季風影響開始迅速減弱，十月十六日清晨卡努以熱帶風暴強度橫過雷州半島，日間在北部灣減弱為一個低壓區。

根據報章報導，卡努在澳門造成最少七人受傷，海陸空交通大受影響。在卡努及東北季候風的共同效應下，廣東、海南、浙江、廣西、福建共有超過97萬人受災。台灣廣泛地區出現大雨，部份道路損毀，約一萬四千戶的電力供應中斷。

香港天文台在十月十四日早上10時40分發出一號戒備信號，當時卡努集結在香港之東南約700公里。受卡努與東北季候風的共同影響，本港一直吹北風，日間風勢清勁，離岸及高地間中吹強風。隨著卡努移近華南沿岸，天文台在當晚7時10分發出三號強風信號，當時卡努位於香港之東南約570公里。晚間本港吹清勁至強風程度北風，離岸及高地間中吹烈風。隨著卡努繼續靠近廣東沿岸及進一步增強，天文台在十月十五日上午8時40分發出八號東北烈風或暴風信號，當時卡努集結在香港之東南偏南約260公里。本港早上普遍吹強風至烈風程度的偏北風，高地間中吹暴風。卡努在當日下午3時左右最接近香港，當時位於香港之西南偏南約210公里。下午本港開始轉吹東北風。隨著卡努遠離香港及減弱，本港風力逐漸緩和，天文台分別在傍晚7時20分及晚上10時40分改發三號強風信號及一號戒備信號，到十月十六日上午2時20分取消所有熱帶氣旋警告信號。

在卡努的影響下，大老山、橫瀾島及長洲錄得的最高每小時平均風速分別為每小時104、85及65公里，而最高陣風則分別為每小時151、106及99公里。尖鼻咀錄得最高潮位2.96米(海圖基準面以上)，而大廟灣則錄得最大風暴潮(天文潮高度以上) 1.05米。各站錄得的最低瞬時海平面氣壓如下：

站	最低瞬時海平面氣壓 (百帕斯卡)	日期/月份	時間
香港天文台總部	996.2	15/10	下午 3 時 00 分
香港國際機場	997.5	15/10	下午 2 時 52 分
京士柏	996.2	15/10	下午 3 時 04 分
坪洲	996.6	15/10	下午 2 時 29 分
打鼓嶺	998.4	15/10	下午 3 時 11 分
大埔	998.1	15/10	下午 3 時 03 分
沙田	998.1	15/10	下午 3 時 02 分
上水	998.5	15/10	下午 2 時 31 分
流浮山	998.6	15/10	下午 2 時 59 分
長洲	995.6	15/10	下午 1 時 54 分
橫瀾島	995.4	15/10	下午 3 時 02 分

十月十四日本港大致多雲，晚上有一兩陣雨。受卡努的外圍雨帶影響，十月十五日及十六日本港有狂風驟雨。這三天期間本港大部分地區共錄得超過40毫米雨量，新界北部及大嶼山西部的雨量更超過70毫米。

卡努吹襲香港期間，最少有22人受傷，另有超過580宗塌樹報告。一人在荃灣被樹枝擊中頭部受傷。深水埗有鍍鋅鐵片墮下，損毀兩部私家車。有12人在風暴下進行水上活動時遇險，需要救援人員協助。另有22位露營人士在西貢橋咀島露營被困，需要水警協助離開。在大風的情況下，青嶼幹線需要實施臨時交通措施，來往機場的道路嚴重擠塞。香港國際機場有超過600班航班取消或延誤。

表3.7.1 - 3.7.4 分別是卡努影響香港期間各站錄得的最高風速、持續風力達到強風及烈風程度的時段、香港的日雨量及最高潮位資料。圖3.7.1 - 3.7.3 分別為卡努的路徑圖、本港的雨量分佈圖及香港各站錄得的風向和風速。圖3.7.4顯示長洲泳灘及大美督錄得的風速。圖3.7.5 - 3.7.6 分別為卡努的衛星及雷達圖像。卡努在香港造成的破壞可參見圖3.7.7。

3.7 Severe Typhoon Khanun (1720): 12 – 16 October 2017

Khanun was the seventh tropical cyclone to affect Hong Kong in 2017 and for the fifth time in the year, the No. 8 Gale or Storm Signal had to be issued by the Observatory, equalling the record in 1964 and 1999 in terms of the number of No. 8 Signals issued in a year.

Khanun formed as a tropical depression over the western North Pacific about 650 km east-northeast of Manila on the morning of 12 October. It moved west-northwestwards and intensified into a tropical storm that night. Khanun moved across the northern part of Luzon the next day, drifting west-southwestwards slowly and re-organizing after entering the South China Sea. It turned northwestwards on 14 October and kept intensifying, evolving from a severe tropical storm into a typhoon by nighttime. Turning west-northwestwards the next day towards the south China coast, Khanun intensified further into a severe typhoon, reaching peak intensity with an estimated maximum sustained wind of 155 km/h near its centre. It then moved generally westwards and started to weaken rapidly under the influence of the northeast monsoon. Khanun became a tropical storm by the time it crossed Leizhou Peninsula in the early morning on 16 October, and degenerated into an area of low pressure over Beibu Wan during the day.

According to press reports, at least seven people were injured in Macao during the passage of Khanun. Transportation services were seriously disrupted. Under the combined influence of Khanun and the northeast monsoon, over 970 000 people were affected in Guangdong, Hainan, Zhejiang, Guangxi and Fujian. There was also widespread heavy rain in Taiwan, with roads damaged and electricity supply to 14 000 households disrupted.

In Hong Kong, the No. 1 Standby Signal was issued at 10:40 a.m. on 14 October when Khanun was about 700 km southeast of the territory. Under the combined effect of Khanun and the northeast monsoon, fresh northerlies continued to affect Hong Kong, occasionally reaching strong force offshore and on high ground during the day. With Khanun edging closer to the south China coast, the No. 3 Strong Wind Signal was issued at 7:10 p.m. that night when Khanun was about 570 km southeast of Hong Kong. Local winds became fresh to strong northerly during the night and occasionally reached gale force offshore and on high ground. As Khanun continued to move closer to the coast of Guangdong and further intensified, the No. 8 Northeast Gale or Storm Signal was issued at 8:40 a.m. on 15 October when Khanun was about 260 km south-southeast of Hong Kong. Strong to gale force northerly winds generally affected the territory in the morning and occasionally reached storm force on high ground. Khanun came closest to Hong Kong around 3 p.m. that day with its centre passing about 210 km south-southwest of Hong Kong. Local winds started to turn northeasterly in the afternoon. With Khanun weakening and moving away from Hong Kong, local winds moderated gradually. The No. 3 Strong Wind Signal and No. 1 Standby Signal were issued at 7:20 p.m. and 10:40 p.m. respectively, before all tropical cyclone warning signals were cancelled at 2:20 a.m. on 16 October.

Under the influence of Khanun, maximum hourly mean winds of 104, 85 and 65 km/h and maximum gusts of 151, 106 and 99 km/h were recorded at Tate's Cairn, Waglan Island and Cheung Chau respectively. A maximum sea level (above chart datum) of 2.96 m was recorded at Tsim Bei Tsui, and a maximum storm surge (above astronomical tide) of 1.05 m was recorded at Tai Miu Wan. The lowest instantaneous mean sea-level pressures recorded

at some selected stations are as follows:

Station	Lowest instantaneous mean sea-level pressure (hPa)	Date/Month	Time
Hong Kong Observatory Headquarters	996.2	15/10	3:00 p.m.
Hong Kong International Airport	997.5	15/10	2:52 p.m.
King's Park	996.2	15/10	3:04 p.m.
Peng Chau	996.6	15/10	2:29 p.m.
Ta Kwu Ling	998.4	15/10	3:11 p.m.
Tai Po	998.1	15/10	3:03 p.m.
Shatin	998.1	15/10	3:02 p.m.
Sheung Shui	998.5	15/10	2:31 p.m.
Lau Fau Shan	998.6	15/10	2:59 p.m.
Cheung Chau	995.6	15/10	1:54 p.m.
Waglan Island	995.4	15/10	3:02 p.m.

Locally, it was mainly cloudy with one or two rain patches at night on 14 October. Under the influence of the outer rainbands of Khanun, there were squally showers on 15 and 16 October. More than 40 millimetres of rainfall were recorded over most parts of the territory during the 3-day period, and rainfall even exceeded 70 millimetres in the northern part of the New Territories and the western part of Lantau Island.

In Hong Kong, at least 22 people were injured during the passage of Khanun and there were more than 580 reports of fallen trees. One person was hit on the head by falling branches in Tsuen Wan. Two private cars were damaged by fallen galvanized iron sheets in Sham Shui Po. There were 12 people in distress while engaging in water sports activities under stormy weather and required the assistance of rescuers, and 22 campers stranded on Sharp Island off Sai Kung were taken to safety by marine police. Temporary traffic arrangements were implemented in Lantau Link as a result of the windy condition, leading to serious congestion on the roads to and from the airport. More than 600 flights were cancelled or delayed at the Hong Kong International Airport.

Information on the maximum wind, periods of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Khanun is given in Tables 3.7.1 - 3.7.4 respectively. Figures 3.7.1 - 3.7.3 show respectively the track of Khanun, the rainfall distribution for Hong Kong and the winds recorded at various stations in Hong Kong. Figure 3.7.4 shows the wind speed recorded at Cheung Chau Beach and Tai Mei Tuk. Figures 3.7.5 - 3.7.6 show respectively a satellite imagery and a radar imagery of Khanun. Some damages caused by Khanun in Hong Kong are illustrated in Figure 3.7.7.

表 3.7.1　在卡努影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.7.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Khanun were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust					最高每小時平均風速 Maximum Hourly Mean Wind				
		風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速(公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
中環碼頭	Central Pier	東南偏東	ESE	79	15/10	17:07	東南偏東	ESE	36	15/10	18:00
長洲	Cheung Chau	北	N	99	15/10	07:46	東南偏東	ESE	65	15/10	19:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	101	15/10	16:39	東	E	68	15/10	18:00
青洲	Green Island	東北偏北	NNE	96	15/10	11:10	東北偏北	NNE	65	15/10	13:00
香港國際機場	Hong Kong International Airport	東北	NE	67	15/10	15:03	東北	NE	49	15/10	17:00
啟德	Kai Tak	東北偏北	NNE	83	15/10	11:25	東	E	31	15/10	18:00
京士柏	King's Park	東北	NE	81	15/10	08:37	東北	NE	34	15/10	09:00
流浮山	Lau Fau Shan	東北偏北	NNE	65	15/10	12:18	北	N	40	14/10	21:00
		東北	NE	65	15/10	16:12					
北角	North Point	東北	NE	76	15/10	11:26	東北偏東	ENE	43	15/10	13:00
坪洲	Peng Chau	東北偏北	NNE	81	15/10	10:23	東北偏東	ENE	47	15/10	16:00
平洲	Ping Chau	東北偏北	NNE	51	15/10	06:12	東北	NE	14	15/10	15:00
西貢	Sai Kung	北	N	90	15/10	10:24	北	N	51	15/10	10:00
沙洲	Sha Chau	東北偏北	NNE	101	15/10	13:36	北	N	77	15/10	14:00
沙螺灣	Sha Lo Wan	東北偏東	ENE	67	15/10	18:25	東	E	25	15/10	20:00
沙田	Sha Tin	東北偏北	NNE	56	15/10	08:43	東北偏北	NNE	27	15/10	13:00
石崗	Shek Kong	東	E	49	15/10	18:43	東北偏東	ENE	19	15/10	12:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	76	15/10	18:00	東	E	36	15/10	18:00
打鼓嶺	Ta Kwu Ling	北	N	68	15/10	08:46	北	N	31	15/10	11:00
大美督	Tai Mei Tuk	東北	NE	104	15/10	10:59	東北偏北	NNE	68	15/10	15:00
大帽山	Tai Mo Shan	東北偏東	ENE	121	15/10	12:12	東北偏東	ENE	87	15/10	13:00
大埔滘	Tai Po Kau	東北偏東	ENE	68	15/10	15:38	東南偏東	ESE	34	15/10	15:00
		東北偏東	ENE	68	15/10	15:39					
塔門*	Tap Mun*	東北偏東	ENE	76	15/10	18:51	東北偏東	ENE	51	15/10	18:00
大老山	Tate's Cairn	北	N	151	15/10	11:04	東北偏北	NNE	104	15/10	11:00
將軍澳	Tseung Kwan O	東北	NE	62	15/10	10:23	北	N	22	15/10	10:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	西北	NW	56	14/10	18:00	西北	NW	19	15/10	12:00
屯門政府合署	Tuen Mun Government Offices	東北偏北	NNE	62	15/10	11:31	東北偏北	NNE	23	15/10	20:00
橫瀾島	Waglan Island	東北	NE	106	15/10	14:24	北	N	85	15/10	10:00
濕地公園	Wetland Park	東北	NE	52	15/10	15:21	東北	NE	22	15/10	16:00
黃竹坑	Wong Chuk Hang	東北偏東	ENE	67	15/10	13:47	東北偏東	ENE	27	15/10	15:00

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

*The old wind station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017.

黃麻角(赤柱)、昂坪 - 沒有資料　Bluff Head (Stanley), Ngong Ping - data not available

表 3.7.2　在卡努影響下，熱帶氣旋警告信號系統的八個參考測風站在熱帶氣旋警告信號生效時錄得持續風力達到強風及烈風程度的時段

Table 3.7.2　Periods during which sustained strong and gale force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Khanun were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風* 時間 Start time when strong wind speed* was attained		最後達到強風* 時間 End time when strong wind speed* was attained		最初達到烈風# 時間 Start time when gale force wind speed# was attained		最後達到烈風# 時間 End time when gale force wind speed# was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	14/10	17:13	16/10	02:20	15/10	05:32	15/10	19:44
香港國際機場	Hong Kong International Airport	15/10	01:35	15/10	18:13	-			
流浮山	Lau Fau Shan	14/10	20:31	15/10	11:46	-			
西貢	Sai Kung	15/10	05:40	15/10	18:00	-			

啟德、沙田、打鼓嶺及青衣島蜆殼油庫的持續風力未達到強風程度。

The sustained wind speed did not attain strong force at Kai Tak, Sha Tin, Ta Kwu Ling and Tsing Yi Shell Oil Depot.

- 未達到指定的風速
- not attaining the specified wind speed

* 十分鐘平均風速達每小時 41-62 公里
* 10-minute mean wind speed of 41- 62 km/h

十分鐘平均風速達每小時 63-87 公里
10-minute mean wind speed of 63-87 km/h

註:　本表列出持續風力達到強風及烈風程度的起始及終結時間。期間風力可能高於或低於指定的風力。

Note: The table gives the start and end time of sustained strong or gale force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.7.3　卡努掠過期間，香港天文台總部及其他各站所錄得的日雨量

Table 3.7.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Khanun

站 (參閱圖 3.7.2) Station (See Fig. 3.7.2)			十月十四日 14 Oct	十月十五日 15 Oct	十月十六日 16 Oct	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			0.4	20.7	17.1	38.2
香港國際機場 Hong Kong International Airport (HKA)			0.1	26.2	9.0	35.3
長洲 Cheung Chau (CCH)			0.5	20.5	14.5	35.5
H23	香港仔	Aberdeen	0.5	22.5	7.5	30.5
N05	粉嶺	Fanling	0.5	59.5	17.0	77.0
N13	糧船灣	High Island	1.0	27.5	18.0	46.5
K04	佐敦谷	Jordan Valley	0.5	38.5	13.5	52.5
N06	葵涌	Kwai Chung	0.5	29.5	24.5	54.5
H12	半山區	Mid Levels	0.5	29.0	12.5	42.0
N09	沙田	Sha Tin	0.5	64.5	9.5	74.5
H19	筲箕灣	Shau Kei Wan	0.5	22.5	27.5	50.5
SEK	石崗	Shek Kong	0.5	61.5	29.0	91.0
K06	蘇屋邨	So Uk Estate	0.5	38.0	23.5	62.0
R31	大美督	Tai Mei Tuk	[4.5]	65.0	[37.0]	[106.5]
R21	踏石角	Tap Shek Kok	0.0	14.0	[9.0]	[23.0]
TMR	屯門水庫	Tuen Mun Reservoir	0.0	30.5	21.5	52.0
N17	東涌	Tung Chung	1.0	42.5	17.5	61.0

註 : [ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.7.4　卡努掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

Table 3.7.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Khanun

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.81	15/10	05:12	0.99	15/10	17:22
石壁	Shek Pik	2.88	15/10	19:02	1.04	15/10	19:04
大廟灣	Tai Miu Wan	2.86	15/10	05:55	1.05	15/10	16:59
大埔滘	Tai Po Kau	2.83	15/10	06:02	1.04	15/10	17:27
尖鼻咀	Tsim Bei Tsui	2.96	15/10	19:47	0.98	15/10	19:32
橫瀾島	Waglan Island	2.85	15/10	05:27	0.81	15/10	18:07

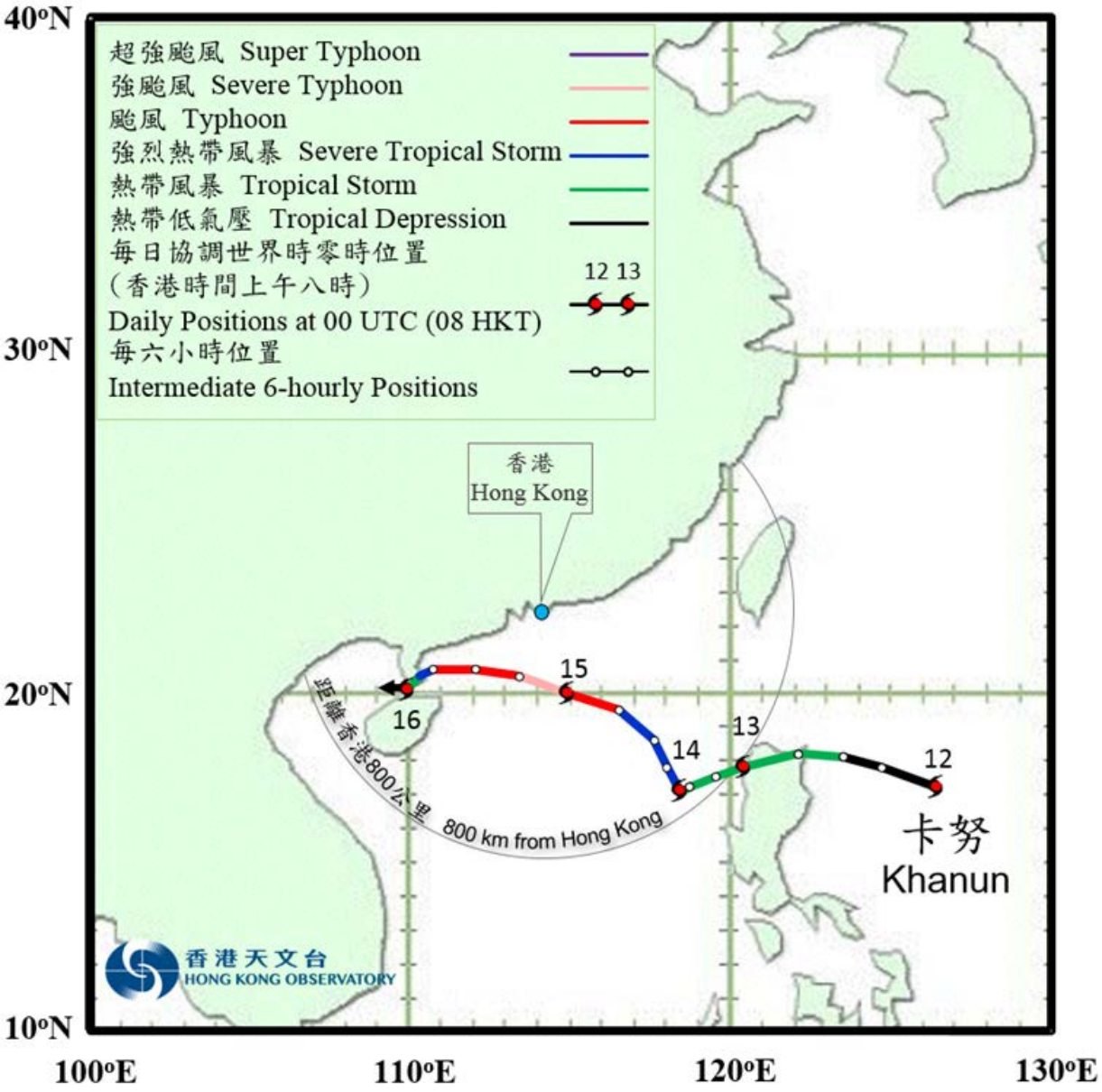


圖 3.7.1　　二零一七年十月十二日至十六日卡努的路徑圖。

Figure 3.7.1　　Track of Khanun on 12 - 16 October 2017.

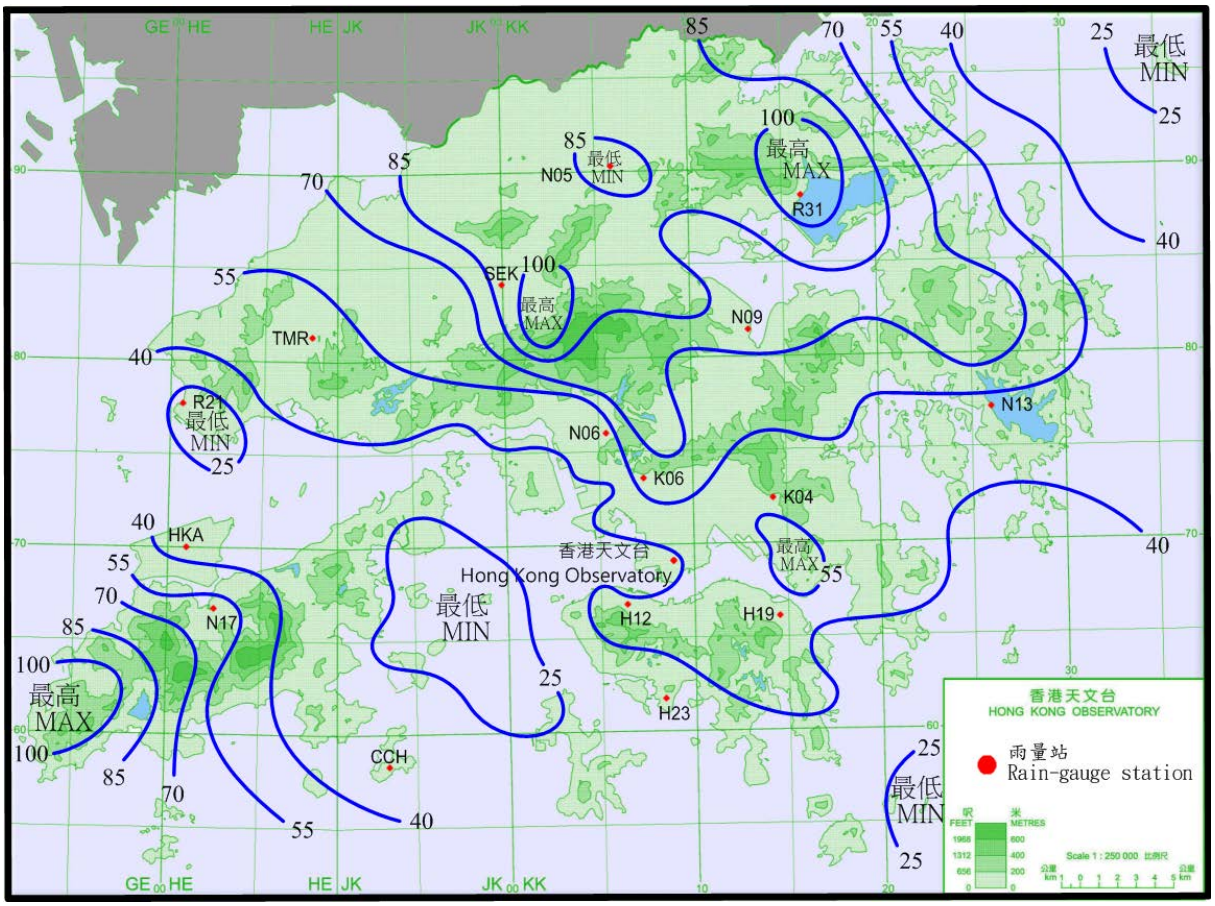


圖 3.7.2　　二零一七年十月十四日至十六日的雨量分佈(等雨量線單位為毫米)。

Figure 3.7.2　　Rainfall distribution on 14 - 16 October 2017 (isohyets in millimetres).

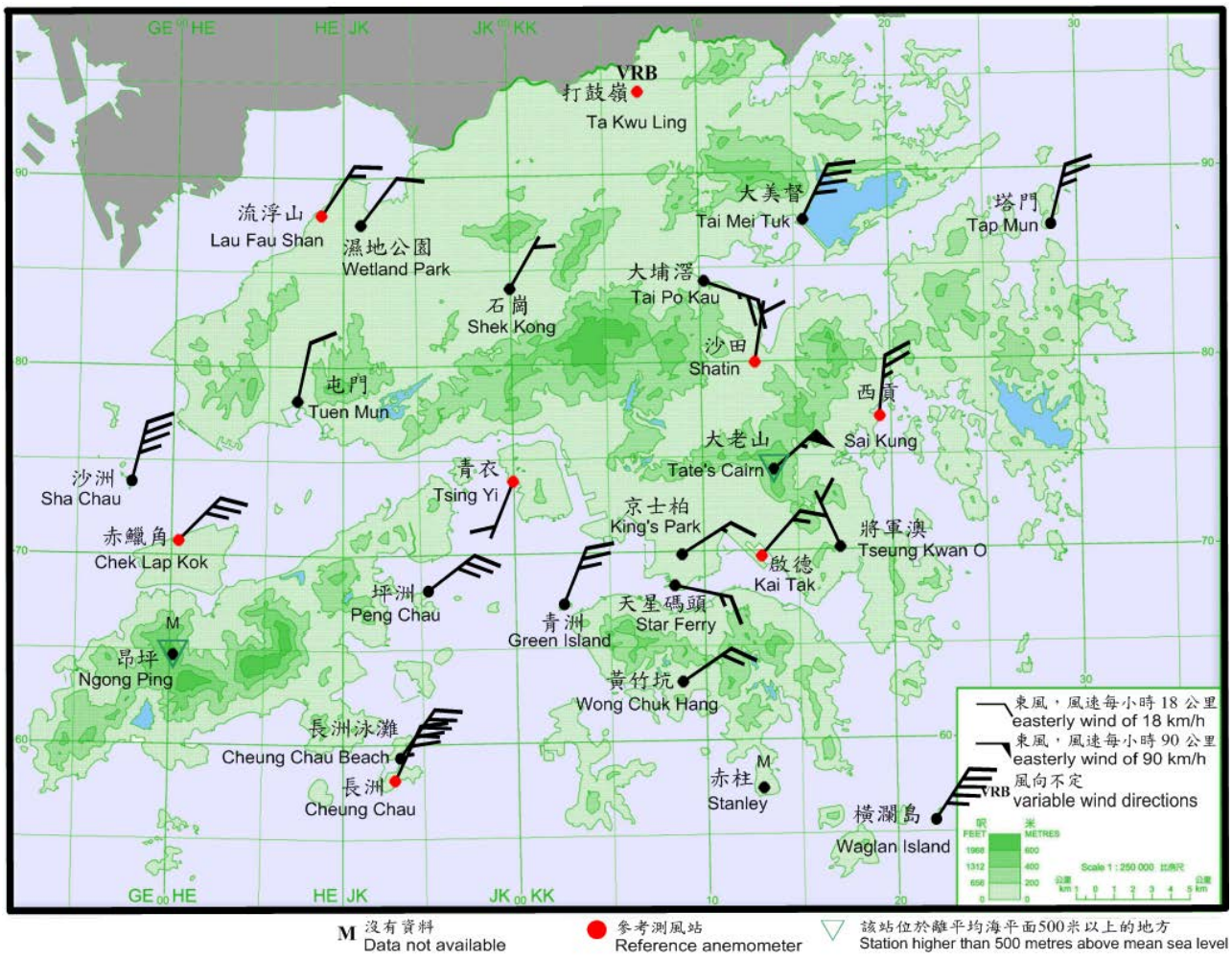


圖 3.7.3　二零一七年十月十五日下午 2 時 50 分香港各站錄得的十分鐘平均風向和風速。當時大老山風力達到暴風程度，而橫瀾島、長洲泳灘、沙洲及大美督的風力達到烈風程度。

Figure 3.7.3　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 2:50 p.m. on 15 October 2017. Winds at Tate's Cairn reached storm force, while winds at Waglan Island, Cheung Chau Beach, Sha Chau and Tai Mei Tuk reached gale force at the time.

註:　當時打鼓嶺錄得的十分鐘平均風速為每小時 12 公里。

Note:　The 10-minute mean wind speed recorded at the time at Ta Kwu Ling was 12 km/h.

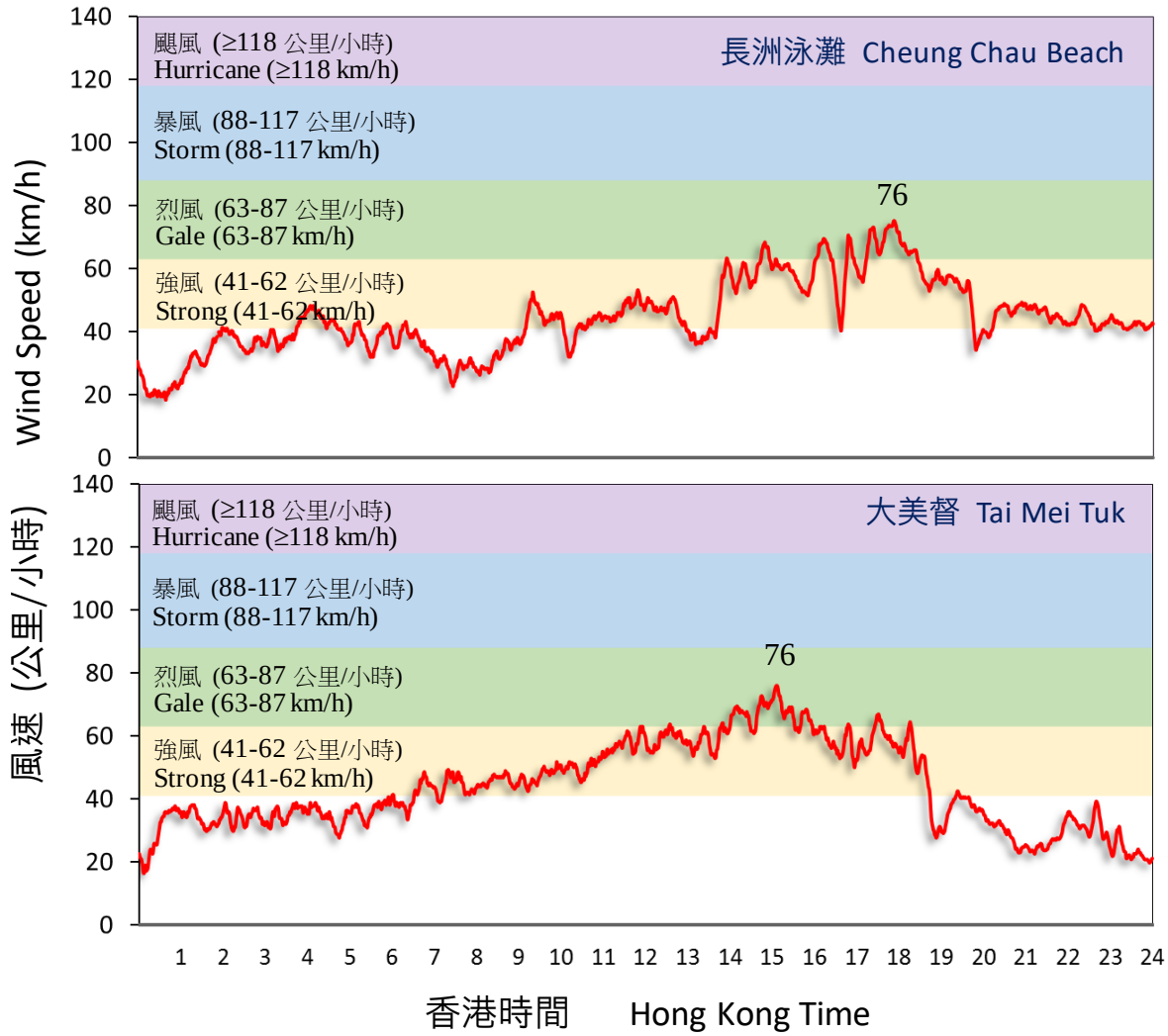


圖 3.7.4 二零一七年十月十五日長洲泳灘及大美督錄得的十分鐘風速。

Figure 3.7.4 Traces of 10-minute wind speed recorded at Cheung Chau Beach and Tai Mei Tuk on 15 October 2017.

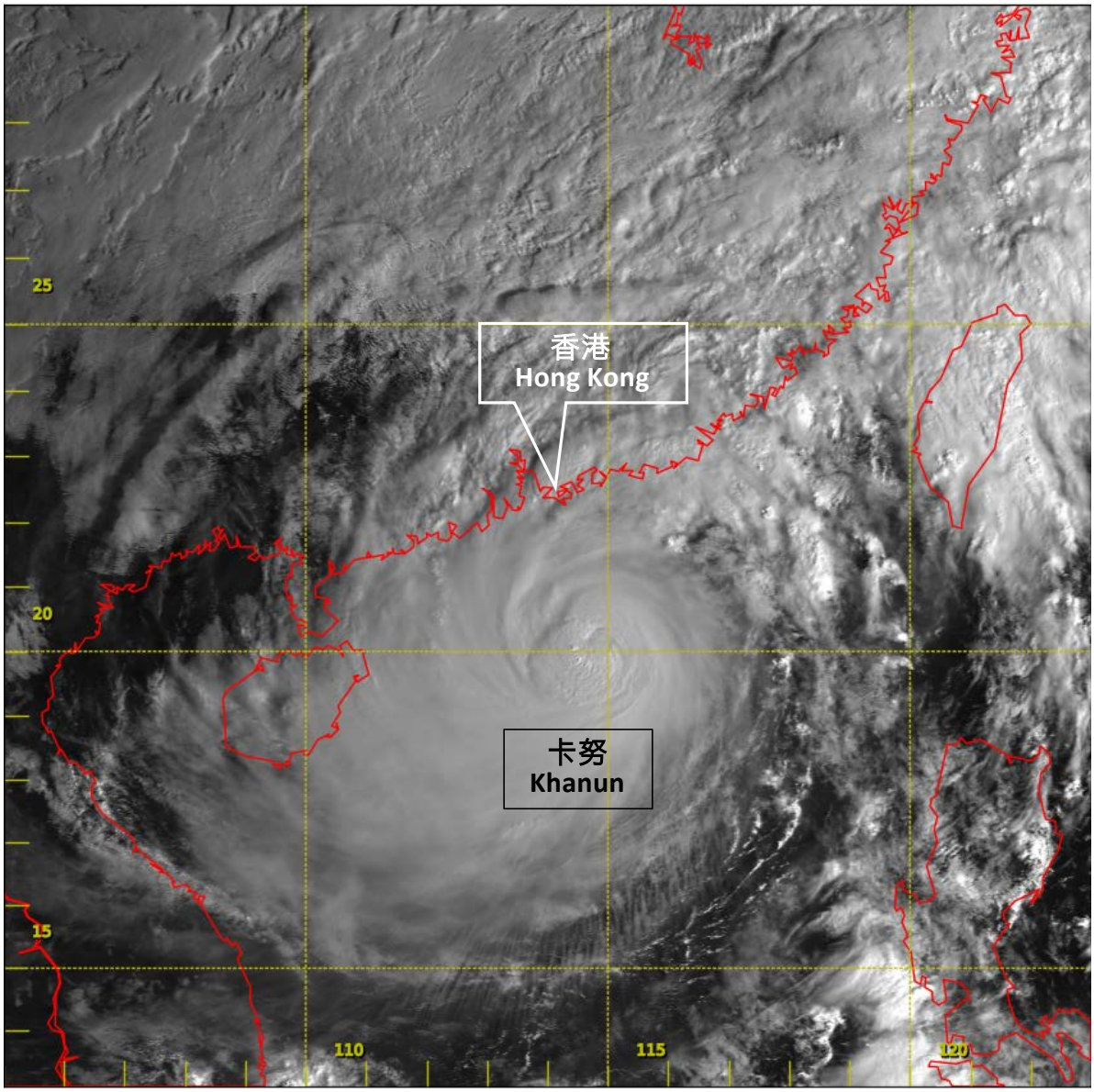


圖 3.7.5　二零一七年十月十五日上午 8 時左右的可見光衛星圖片，當時卡努達到其最高強度，中心附近最高持續風速估計為每小時 155 公里。

Figure 3.7.5　Visible satellite imagery around 8 a.m. on 15 October 2017, when Khanun was at peak intensity with estimated maximum sustained winds of 155 km/h near its centre.

〔此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。〕

[The satellite imagery was originally captured by Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

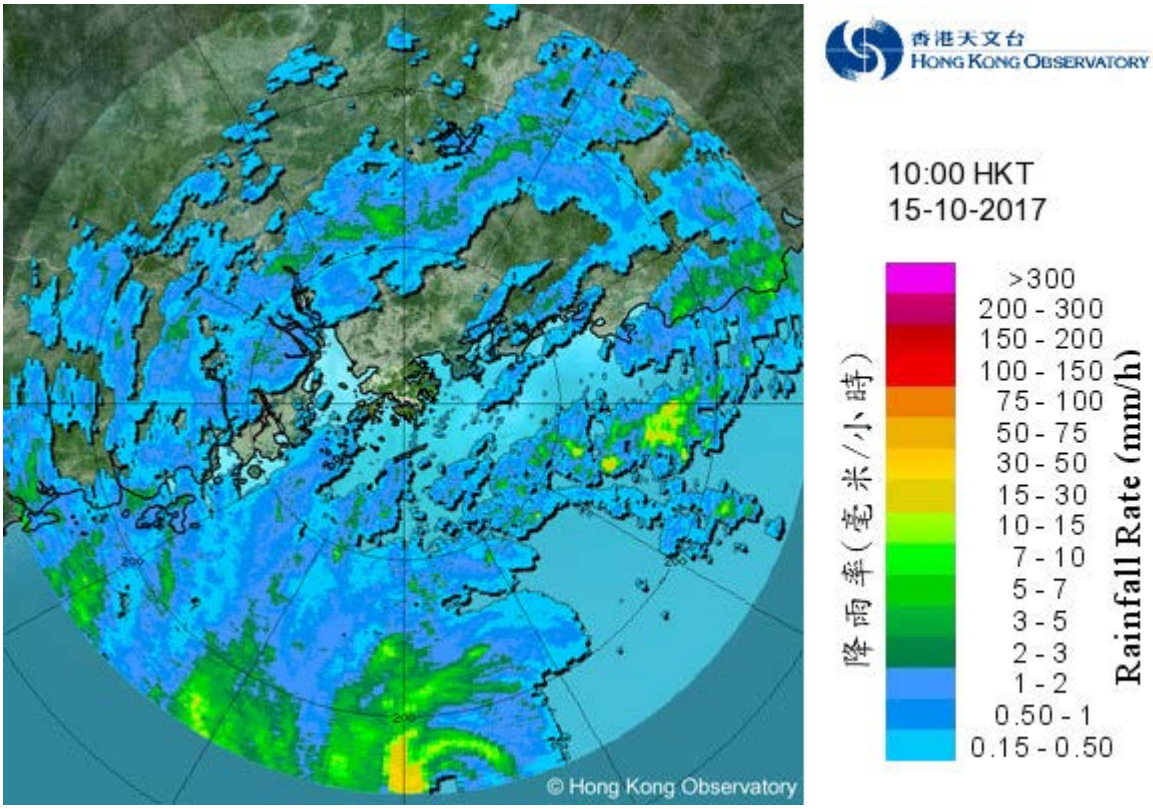


圖 3.7.6　二零一七年十月十五日上午 10 時正的雷達回波圖像，當時卡努的中心位於香港以南，與卡努相關的雨帶正影響廣東沿岸及南海北部。

Figure 3.7.6　Image of radar echoes at 10:00 a.m. on 15 October 2017 when the centre of Khanun was to the south of Hong Kong. The rainbands associated with Khanun were affecting the coast of Guangdong and the northern part of the South China Sea.

圖 3.7.7　　深水埗有鍍鋅鐵片墮下，損毀兩部私家車。(圖片鳴謝: 譚曉暉)

Figure 3.7.7　　Fallen galvanized iron sheets damaged two private cars in Sham Shui Po. (Photo courtesy of Tam Hiu Fai)

第四節　熱帶氣旋統計表

表4.1是二零一七年在北太平洋西部及南海區域（即由赤道至北緯45度、東經100度至180度所包括的範圍）的熱帶氣旋一覽。表內所列出的日期只說明某熱帶氣旋在上述範圍內出現的時間，因而不一定包括整個風暴過程。這個限制對表內其他元素亦同樣適用。

表4.2是天文台在二零一七年為船舶發出的熱帶氣旋警告的次數、時段、首個及末個警告發出的時間。當有熱帶氣旋位於香港責任範圍內時（即由北緯10至30度、東經105至125度所包括的範圍），天文台會發出這些警告。表內使用的時間為協調世界時。

表4.3是二零一七年熱帶氣旋警告信號發出的次數及其時段的摘要。表內亦提供每次熱帶氣旋警告信號生效的時間和發出警報的次數。表內使用的時間為香港時間。

表4.4是一九五六至二零一七年間熱帶氣旋警告信號發出的次數及其時段的摘要。

表4.5是一九五六至二零一七年間每年位於香港責任範圍內以及每年引致天文台需要發出熱帶氣旋警告信號的熱帶氣旋總數。

表4.6是一九五六至二零一七年間天文台發出各種熱帶氣旋警告信號的最長、最短及平均時段。

表4.7是二零一七年當熱帶氣旋影響香港時本港的氣象觀測摘要。資料包括熱帶氣旋最接近香港時的位置及時間和當時估計熱帶氣旋中心附近的最低氣壓、京士柏、香港國際機場及橫瀾島錄得的最高風速、香港天文台錄得的最低平均海平面氣壓以及香港各潮汐測量站錄得的最大風暴潮（即實際水位高出潮汐表中預計的部分，單位為米）。

表4.8.1是二零一七年位於香港600公里範圍內的熱帶氣旋及其為香港所帶來的雨量。

表4.8.2是一八八四至一九三九年以及一九四七至二零一七年十個為香港帶來最多雨量的熱帶氣旋和有關的雨量資料。

表4.9是自一九四六年至二零一七年間，天文台發出十號颶風信號時所錄得的氣象資料，包括熱帶氣旋吹襲香港時的最近距離及方位、天文台錄得的最低平均海平面氣壓、香港各站錄得的最高60分鐘平均風速和最高陣風。

表4.10是二零一七年熱帶氣旋在香港所造成的損失。資料參考了各政府部門和公共事業機構所提供的報告及本地報章的報導。

表4.11是一九六零至二零一七年間熱帶氣旋在香港所造成的人命傷亡及破壞。資料參考了各政府部門和公共事業機構所提供的報告及本地報章的報導。

表4.12是二零一七年天文台發出的熱帶氣旋路徑預測驗証。

Section 4 TROPICAL CYCLONE STATISTICS AND TABLES

TABLE 4.1 is a list of tropical cyclones in 2017 in the western North Pacific and the South China Sea (i.e. the area bounded by the Equator, 45°N, 100°E and 180°). The dates cited are the residence times of each tropical cyclone within the above-mentioned region and as such might not cover the full life-span. This limitation applies to all other elements in the table.

TABLE 4.2 gives the number of tropical cyclone warnings for shipping issued by the Hong Kong Observatory in 2017, the durations of these warnings and the times of issue of the first and last warnings for all tropical cyclones in Hong Kong's area of responsibility (i.e. the area bounded by 10°N, 30°N, 105°E and 125°E). Times are given in hours and minutes in UTC.

TABLE 4.3 presents a summary of the occasions/durations of the issuing of tropical cyclone warning signals in 2017. The sequence of the signals displayed and the number of tropical cyclone warning bulletins issued for each tropical cyclone are also given. Times are given in hours and minutes in Hong Kong Time.

TABLE 4.4 presents a summary of the occasions/durations of the issuing of tropical cyclone warning signals from 1956 to 2017 inclusive.

TABLE 4.5 gives the annual number of tropical cyclones in Hong Kong's area of responsibility between 1956 and 2017 and also the annual number of tropical cyclones necessitated the issuing of tropical cyclone warning signals in Hong Kong.

TABLE 4.6 shows the maximum, mean and minimum durations of the tropical cyclone warning signals issued during the period 1956-2017.

TABLE 4.7 is a summary of meteorological information for each tropical cyclone affecting Hong Kong in 2017, including the position, time and the estimated minimum central pressure of each tropical cyclone during its closest approach to Hong Kong, the maximum winds at King’s Park, Hong Kong International Airport and Waglan Island, the minimum mean sea-level pressure recorded at the Hong Kong Observatory and the maximum storm surge (the excess, in metres, of the actual water level over that predicted in the Tide Tables) recorded at various tide stations in Hong Kong.

TABLE 4.8.1 tabulates the amount of rainfall associated with each tropical cyclone that came within 600 km of Hong Kong in 2017.

TABLE 4.8.2 highlights the 10 wettest tropical cyclones in Hong Kong for the period 1884-1939 and 1947-2017.

TABLE 4.9 provides some meteorological information for those typhoons requiring the issuing of the Hurricane Signal No. 10 in Hong Kong from 1946 to 2017. The information presented includes the distances and bearings of nearest approach, the minimum mean sea-level pressures recorded at the Hong Kong Observatory and the maximum 60-minute mean winds and maximum gust peak speeds recorded at some stations in Hong Kong.

TABLE 4.10 contains damage caused by tropical cyclones in 2017. The information is based on reports from various government departments, public utility companies and local newspapers.

TABLE 4.11 presents casualties and damage caused by tropical cyclones in Hong Kong: 1960-2017. The information is based on reports from various government departments, public utility companies and local newspapers.

TABLE 4.12 shows verification of the tropical cyclone track forecasts issued by the Hong Kong Observatory in 2017.

表 4.1　　二零一七年在北太平洋西部及南海區域的熱帶氣旋一覽

TABLE 4.1　LIST OF TROPICAL CYCLONES IN THE WESTERN NORTH PACIFIC AND THE SOUTH CHINA SEA IN 2017

熱帶氣旋名稱	Name of tropical cyclone	編號 Code	路徑起點 Beginning of track				最高強度 (估計) Peak intensity (estimated)		路徑終點 End of track				DISP: 消散 Dissipated XT: 變為溫帶氣旋 Extratropical
			日期/月份 Date/Month	時間+ Time+	位置 Position 北緯 °N	東經 °E	風力 (公里每小時) Winds (km/h)	氣壓 (百帕斯卡) Pressure (hPa)	日期/月份 Date/Month	時間+ Time+	位置 Position 北緯 °N	東經 °E	
熱帶低氣壓	Tropical Depression	-	8 / 1	0600	9.6	126.4	45	1000	9 / 1	1800	9.3	122.3	DISP
熱帶低氣壓	Tropical Depression	-	14 / 4	0600	10.4	129.3	45	1002	17 / 4	0000	13.3	118.0	DISP
熱帶低氣壓梅花	Tropical Depression Muifa	1701	25 / 4	0000	12.6	136.9	55	1000	28 / 4	0000	18.4	135.4	DISP
強烈熱帶風暴苗柏	Severe Tropical Storm Merbok	1702	10 / 6	1800	15.5	117.5	105	984	13 / 6	0300	24.3	115.1	DISP
強烈熱帶風暴南瑪都	Severe Tropical Storm Nanmadol	1703	1 / 7	1800	19.2	128.7	105	982	4 / 7	1800	35.4	142.4	XT
強烈熱帶風暴塔拉斯	Severe Tropical Storm Talas	1704	15 / 7	0600	16.9	111.8	90	985	17 / 7	0900	19.0	100.8	DISP
超強颱風奧鹿	Super Typhoon Noru	1705	20 / 7	1200	27.4	159.5	195	935	8 / 8	1200	38.3	138.8	DISP
熱帶風暴玫瑰	Tropical Storm Kulap	1706	21 / 7	0000	25.2	177.2	75	995	25 / 7	0600	32.8	155.0	DISP
熱帶風暴洛克	Tropical Storm Roke	1707	21 / 7	0600	18.7	123.7	65	998	23 / 7	0600	22.7	113.3	DISP
熱帶風暴桑卡	Tropical Storm Sonca	1708	21 / 7	0000	17.1	114.8	75	992	26 / 7	0000	16.7	104.8	DISP
颱風納沙	Typhoon Nesat	1709	25 / 7	1800	15.0	128.5	145	955	30 / 7	1200	26.0	117.2	DISP
熱帶風暴海棠	Tropical Storm Haitang	1710	28 / 7	0000	19.3	116.8	85	985	31 / 7	1200	27.8	117.2	DISP
熱帶風暴尼格	Tropical Storm Nalgae	1711	1 / 8	0000	26.6	162.4	75	992	5 / 8	1200	35.7	160.8	XT
強颱風榕樹	Severe Typhoon Banyan	1712	11 / 8	0000	16.7	170.0	155	955	16 / 8	1800	37.8	170.5	XT
超強颱風天鴿	Super Typhoon Hato	1713	20 / 8	1200	19.3	126.5	185	950	24 / 8	1200	23.5	104.9	DISP
強烈熱帶風暴帕卡	Severe Tropical Storm Pakhar	1714	24 / 8	1200	15.5	126.2	110	980	27 / 8	1200	23.3	110.1	DISP
颱風珊瑚	Typhoon Sanvu	1715	27 / 8	1800	19.0	147.2	145	955	3 / 9	0600	41.6	152.7	XT
強烈熱帶風暴瑪娃	Severe Tropical Storm Mawar	1716	31 / 8	0600	19.4	118.9	90	990	4 / 9	0000	23.3	114.6	DISP
熱帶低氣壓古超	Tropical Depression Guchol	1717	5 / 9	1800	20.0	121.4	55	998	7 / 9	0600	23.8	119.1	DISP
超強颱風泰利	Super Typhoon Talim	1718	9 / 9	1200	15.2	142.8	185	935	18 / 9	0600	44.3	142.3	XT
強颱風杜蘇芮	Severe Typhoon Doksuri	1719	11 / 9	1800	14.7	123.1	165	950	16 / 9	0000	18.5	101.2	DISP
熱帶低氣壓	Tropical Depression	-	23 / 9	1200	17.3	116.7	55	996	25 / 9	0600	21.1	107.1	DISP
熱帶低氣壓	Tropical Depression	-	8 / 10	2100	15.9	113.0	45	1000	10 / 10	0000	18.3	105.8	DISP
強颱風卡努	Severe Typhoon Khanun	1720	12 / 10	0000	17.2	126.4	155	955	16 / 10	0000	20.1	109.9	DISP
超強颱風蘭恩	Super Typhoon Lan	1721	15 / 10	1200	9.3	136.8	205	925	23 / 10	0000	37.5	141.6	XT
颱風蘇拉	Typhoon Saola	1722	23 / 10	0000	9.0	147.3	120	970	29 / 10	1200	34.8	140.1	XT
熱帶低氣壓	Tropical Depression	-	31 / 10	1200	7.5	107.8	45	1002	1 / 11	1800	7.6	106.4	DISP
颱風達維	Typhoon Damrey	1723	31 / 10	1800	11.1	122.0	145	960	4 / 11	1200	12.5	106.5	DISP
熱帶風暴海葵	Tropical Storm Haikui	1724	9 / 11	1200	13.8	121.4	85	992	12 / 11	0000	17.7	112.9	DISP
熱帶風暴鴻雁	Tropical Storm Kirogi	1725	17 / 11	0900	10.1	117.0	65	995	19 / 11	0900	11.3	108.6	DISP
熱帶風暴啟德	Tropical Storm Kai-tak	1726	14 / 12	0000	11.7	128.0	85	994	21 / 12	1800	6.0	107.4	DISP
颱風天秤	Typhoon Tembin	1727	20 / 12	1200	8.7	131.8	130	965	26 / 12	0000	8.4	104.8	DISP

+時間為協調世界時。

+Times are given in UTC.

表 4.2　　二零一七年為船舶發出的熱帶氣旋警告

TABLE 4.2　TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 2017

熱帶氣旋	Tropical cyclone	發出警告的次數 No. of warnings issued	發出的日期及時間 Date and time of issue of				時段 (小時) Duration (hours)
			首次警告 First warning		末次警告 Last warning		
			日期/月份 Date/Month	時間+ Time+	日期/月份 Date/Month	時間+ Time+	
熱帶低氣壓	Tropical Depression	5	8 / 1	2100	9 / 1	0900	12
熱帶低氣壓	Tropical Depression	13	15 / 4	1800	17 / 4	0300	33
* 強烈熱帶風暴苗柏	* Severe Tropical Storm Merbok	23	10 / 6	2100	13 / 6	0300	54
強烈熱帶風暴南瑪都	Severe Tropical Storm Nanmadol	8	2 / 7	1200	3 / 7	0900	21
強烈熱帶風暴塔拉斯	Severe Tropical Storm Talas	16	15 / 7	0600	17 / 7	0000	42
熱帶風暴桑卡	Tropical Storm Sonca	30	22 / 7	0300	25 / 7	1800	87
* 熱帶風暴洛克	* Tropical Storm Roke	11	22 / 7	0600	23 / 7	1200	30
熱帶風暴海棠	Tropical Storm Haitang	26	28 / 7	0600	31 / 7	0600	72
颱風納沙	Typhoon Nesat	17	28 / 7	0900	30 / 7	0900	48
* 超強颱風天鴿	* Super Typhoon Hato	23	20 / 8	2100	23 / 8	1500	66
* 強烈熱帶風暴帕卡	* Severe Tropical Storm Pakhar	23	24 / 8	2100	27 / 8	1500	66
* 強烈熱帶風暴瑪娃	* Severe Tropical Storm Mawar	33	31 / 8	0600	4 / 9	0600	96
熱帶低氣壓古超	Tropical Depression Guchol	12	6 / 9	0000	7 / 9	0900	33
強颱風杜蘇芮	Severe Typhoon Doksuri	31	12 / 9	0000	15 / 9	1200	84
超強颱風泰利	Super Typhoon Talim	15	13 / 9	1800	15 / 9	0900	39
* 熱帶低氣壓	* Tropical Depression	14	23 / 9	1500	25 / 9	0600	39
熱帶低氣壓	Tropical Depression	9	8 /10	2100	9 /10	2100	24
* 強颱風卡努	* Severe Typhoon Khanun	34	12 /10	0600	16 /10	0600	96
颱風達維	Typhoon Damrey	30	31 /10	1800	4 /11	0900	87
強烈熱帶風暴海葵	Severe Tropical Storm Haikui	26	9 /11	1200	12 /11	1200	72
熱帶風暴鴻雁	Tropical Storm Kirogi	18	17 /11	0900	19 /11	1200	51
熱帶風暴啟德	Tropical Storm Kai-tak	22	16 /12	1200	19 /12	0300	63
	共 Total	439					1098

* 這些熱帶氣旋引致天文台需要發出熱帶氣旋警告信號。

+ 時間為協調世界時。

* Tropical cyclones for which tropical cyclone warning signals were issued in Hong Kong.

+ Times are given in UTC.

表 4.3　　二零一七年天文台所發出的熱帶氣旋警告信號及警報發出的次數

TABLE 4.3　TROPICAL CYCLONE WARNING SIGNALS ISSUED IN HONG KONG AND NUMBER OF WARNING BULLETINS ISSUED IN 2017

摘要 SUMMARY

信號 Signal	次數 No. of occasions	總時段 Total duration	
		時 h	分 min
1	12	139	30
3	11	73	50
8 西北 NW	2	7	50
8 西南 SW	1	4	30
8 東北 NE	3	16	30
8 東南 SE	2	11	30
9	1	1	0
10	1	5	0
共 Total	33	259	40

詳情 DETAILS

熱帶氣旋 Tropical cyclone	警報發出的次數 No. of warning bulletins issued	信號 Signal	發出 Issued		取消 Cancelled	
			日期/月份 Date/Month	時間* Time*	日期/月份 Date/Month	時間* Time*
強烈熱帶風暴苗柏 Severe Tropical Storm Merbok	55	1	11/06	19:40	12/06	10:40
		3	12/06	10:40	12/06	17:20
		8 東北 NE	12/06	17:20	12/06	20:20
		8 西北 NW	12/06	20:20	13/06	00:10
		8 西南 SW	13/06	00:10	13/06	04:40
		3	13/06	04:40	13/06	11:10
熱帶風暴洛克 Tropical Storm Roke	41	1	22/07	15:40	23/07	03:40
		3	23/07	03:40	23/07	09:20
		8 西北 NW	23/07	09:20	23/07	13:20
		3	23/07	13:20	23/07	15:10
		1	23/07	15:10	23/07	19:40
超強颱風天鴿 Super Typhoon Hato	55	1	22/08	08:40	22/08	18:20
		3	22/08	18:20	23/08	05:20
		8 東北 NE	23/08	05:20	23/08	08:10
		9	23/08	08:10	23/08	09:10
		10	23/08	09:10	23/08	14:10
		8 東南 SE	23/08	14:10	23/08	17:10
		3	23/08	17:10	23/08	18:20
		1	23/08	18:20	23/08	20:40
強烈熱帶風暴帕卡 Severe Tropical Storm Pakhar	48	1	26/08	09:40	26/08	20:40
		3	26/08	20:40	27/08	05:10
		8 東南 SE	27/08	05:10	27/08	13:40
		3	27/08	13:40	27/08	17:40
		1	27/08	17:40	27/08	22:10
強烈熱帶風暴瑪娃 Severe Tropical Storm Mawar	69	1	02/09	02:20	03/09	22:40
		3	03/09	22:40	04/09	10:20
		1	04/09	10:20	04/09	14:10
熱帶低氣壓 Tropical Depression	24	1	23/09	23:10	24/09	19:20
強颱風卡努 Severe Typhoon Khanun	53	1	14/10	10:40	14/10	19:10
		3	14/10	19:10	15/10	08:40
		8 東北 NE	15/10	08:40	15/10	19:20
		3	15/10	19:20	15/10	22:40
		1	15/10	22:40	16/10	02:20

* 香港時間（協調世界時加八小時）　　* Hong Kong Time （UTC + 8 hours）

表 4.4　　一九五六至二零一七年間每年各熱帶氣旋警告信號的發出次數及總時段

TABLE 4.4　FREQUENCY AND TOTAL DURATION OF DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS : 1956-2017

信號 Signals / 年份 Year	1	3	8 西北 NW	8 西南 SW	8 東北 NE	8 東南 SE	9	10	總時段 Total duration 時 h	分 min
1956	5	4	0	0	0	0	0	0	191	25
1957	4	9	1	1	2	2	0	1	295	45
1958	4	5	0	0	1	0	0	0	214	5
1959	1	1	0	0	0	0	0	0	36	35
1960	11	7	0	2	2	2	1	1	432	35
1961	6	7	1	2	1	0	1	1	192	55
1962	4	3	0	1	1	0	1	1	158	10
1963	4	5	0	0	1	0	0	0	175	50
1964	11	14	1	3	5	3	3	2	570	15
1965	7	6	0	0	1	1	0	0	239	40
1966	6	5	0	0	2	2	0	0	284	40
1967	8	6	0	0	2	1	0	0	339	10
1968	7	7	0	1	1	0	1	1	290	10
1969	4	2	0	0	0	0	0	0	110	15
1970	6	8	2	1	2	0	0	0	286	45
1971	9	10	1	3	2	2	1	1	323	25
1972	8	6	0	0	1	1	0	0	288	20
1973	8	6	1	1	1	0	1	0	416	50
1974	12	10	0	0	2	1	1	0	525	20
1975	8	6	1	0	0	1	1	1	292	20
1976	6	6	0	0	1	2	0	0	351	30
1977	8	6	0	0	1	0	0	0	395	10
1978	8	9	1	1	3	2	0	0	462	10
1979	5	5	1	0	2	2	1	1	281	15
1980	10	8	0	0	1	1	0	0	414	5
1981	5	4	0	0	1	1	0	0	202	20
1982	7	4	0	0	0	0	0	0	247	35
1983	8	7	0	1	2	2	1	1	289	42
1984	6	6	0	0	1	0	0	0	280	2
1985	5	4	1	0	0	1	0	0	193	35
1986	6	7	0	1	1	0	0	0	305	0
1987	6	1	0	0	0	0	0	0	165	45
1988	6	4	0	0	0	0	0	0	204	10
1989	7	8	0	0	2	2	0	0	306	10
1990	6	4	0	0	0	0	0	0	245	10
1991	8	6	0	0	1	1	0	0	349	55
1992	5	5	0	0	1	1	0	0	167	5
1993	8	9	0	0	2	4	0	0	325	40
1994	4	3	0	0	0	0	0	0	138	10
1995	8	6	2	2	1	1	0	0	348	50
1996	7	2	0	0	0	1	0	0	189	0
1997	2	3	0	1	1	0	1	0	97	30
1998	5	2	0	0	0	0	0	0	188	35
1999	10	13	4	3	2	0	2	1	520	0
2000	7	3	0	0	0	0	0	0	329	5
2001	6	6	1	1	2	1	0	0	253	35
2002	3	2	0	0	0	1	0	0	144	25
2003	4	5	1	1	1	1	1	0	158	0
2004	3	2	1	1	1	0	0	0	77	35
2005	3	1	0	0	0	0	0	0	142	45
2006	10	3	0	0	0	0	0	0	317	50
2007	4	3	0	1	0	0	0	0	86	50
2008	8	9	2	2	3	2	1	0	347	0
2009	13	9	1	1	1	2	1	0	255	30
2010	8	3	0	0	0	0	0	0	220	0
2011	8	5	0	0	0	1	0	0	213	0
2012	9	7	0	0	2	3	1	1	252	45
2013	10	7	1	1	0	1	0	0	292	50
2014	6	3	0	0	0	1	0	0	145	45
2015	4	3	1	0	0	0	0	0	136	50
2016	11	7	2	2	0	0	0	0	283	0
2017	12	11	2	1	3	2	1	1	259	40
共 Total	418	348	29	35	63	52	21	14	16249	19
平均 Mean	6.7	5.6	0.5	0.6	1.0	0.8	0.3	0.2	262	5

表 4.5　一九五六至二零一七年間每年位於香港責任範圍內以及每年引致天文台需要發出熱帶氣旋警告信號的熱帶氣旋總數

TABLE 4.5　ANNUAL NUMBER OF TROPICAL CYCLONES IN HONG KONG'S AREA OF RESPONSIBILITY AND THE NUMBER THAT NECESSITATED THE DISPLAY OF TROPICAL CYCLONE WARNING SIGNALS IN HONG KONG : 1956-2017

年份 Year	每年位於香港責任範圍內的熱帶氣旋總數 Annual number of tropical cyclones in Hong Kong's area of responsibility	每年引致天文台需要發出熱帶氣旋警告信號的熱帶氣旋總數 Annual number of tropical cyclones necessitating the display of signals in Hong Kong
1956	23	5
1957	12	6
1958	15	5
1959	18	2
1960	18	9
1961	24	6
1962	20	4
1963	13	4
1964	26	10
1965	16	6
1966	17	6
1967	17	8
1968	12	6
1969	11	4
1970	20	6
1971	20	9
1972	15	5
1973	17	9
1974	21	11
1975	12	7
1976	10	5
1977	10	8
1978	20	8
1979	18	6
1980	17	10
1981	15	5
1982	16	5
1983	15	7
1984	14	5
1985	15	5
1986	16	4
1987	12	5
1988	17	6
1989	17	7
1990	18	6
1991	14	6
1992	11	5
1993	14	9
1994	20	4
1995	17	8
1996	15	7
1997	10	2
1998	15	5
1999	12	8
2000	20	7
2001	14	6
2002	10	3
2003	12	4
2004	15	3
2005	15	3
2006	16	7
2007	12	2
2008	17	6
2009	17	8
2010	11	5
2011	12	5
2012	14	5
2013	19	7
2014	10	4
2015	13	3
2016	15	9
2017	22	7
平均 Mean	15.6	5.9

表 4.6　一九五六至二零一七年間天文台發出熱帶氣旋警告信號的時段

TABLE 4.6　DURATION OF TROPICAL CYCLONE WARNING SIGNALS ISSUED IN HONG KONG : 1956-2017

信號 Signal	次數 Number of occasions	每次時段 Duration of each occasion			每年總時段 Total duration per year		
		平均 Mean	最長 Maximum	最短 Minimum	平均 Mean	最長 Maximum	最短 Minimum
		時 分 h min	時 分 h min	時 分 h min	時 分 h min	時 分 h min	時 分 h min
一號或以上 1 or higher	382	42 32	161 0 (桃麗達 Tilda, 1964)	4 30 (熱帶低氣壓 T.D., 2000)	262 5	570 15 (1964)	36 35 (1959)
三號或以上 3 or higher	255	29 3	124 15 (瑪麗 Mary, 1960)	4 5 (熱帶低氣壓 T.D., 2006)	119 30	306 35 (1974)	15 5 (2004)
八號或以上 8 or higher	95	14 18	66 50 (瑪麗 Mary, 1960)	2 40 (雲茵 Wynne, 1984)	21 54	100 55 (1964)	0 0
8 西北 NW	29	5 48	15 45	1 30	2 43	18 0	0 0
8 西南 SW	35	4 58	10 45	2 0	2 48	16 10	0 0
8 東北 NE	63	7 35	35 35	1 35	7 42	40 20	0 0
8 東南 SE	52	7 28	21 45	0 20	6 15	31 15	0 0
九號或以上 9 or higher	22	6 51	12 25 (約克 York, 1999)	2 0 (杜鵑 Dujuan, 2003)	2 26	19 25 (1964)	0 0
十號 10	14	6 11	11 0 (約克 York, 1999)	2 30 (愛麗斯 Alice, 1961)	1 24	12 10 (1964)	0 0

註：( ) 內為創造該記錄的熱帶氣旋名稱及年份。

Note: ( ) are the years and the names of the tropical cyclones which created the record.

表 4.7　　二零一七年當熱帶氣旋影響香港時本港的氣象觀測摘要

TABLE 4.7　A SUMMARY OF METEOROLOGICAL OBSERVATIONS RECORDED IN HONG KONG DURING THE PASSAGES OF TROPICAL CYCLONES IN 2017

熱帶氣旋名稱 Name of tropical cyclone	當最接近香港時 Nearest approach to Hong Kong								香港天文台錄得的最低海平面氣壓(百帕斯卡) Minimum M.S.L. pressure (hPa) at the Hong Kong Observatory				最大風暴潮(米) Maximum storm surge (metres)					
	月份 Month	日期 Date	時間* Hour*	方位 Direction	距離(公里) Distance (km)	移動方向及速度(公里每小時) Movement (km/h)		估計最低中心氣壓(百帕斯卡) Estimated minimum central pressure (hPa)	月份 Month	日期 Date	時間* Hour*	瞬時 Inst. / 每小時 Hourly	鰂魚涌 Quarry Bay	石壁 Shek Pik	大廟灣 Tai Miu Wan	大埔滘 Tai Po Kau	尖鼻咀 Tsim Bei Tsui	橫瀾島 Waglan Island
強烈熱帶風暴苗柏 Severe Tropical Storm Merbok	6	12	21:30	東 E	25	15	北 N	984	6	12	20:08 - 20:35#	995.5	0.24	0.28	0.38	0.55	0.45	0.29
											20:00	995.6						
熱帶風暴洛克 Tropical Storm Roke	7	23	10:00	東北 NE	25	26	西北偏西 WNW	998	7	23	09:47 - 09:52#	1004.0	0.19	0.22	0.26	-	0.28	0.22
											09:00, 10:00	1004.1						
超強颱風天鴿 Super Typhoon Hato	8	23	10:00	西南偏南 SSW	60	30	西北偏西 WNW	955	8	23	09:39 - 09:42#	986.3	1.18	1.54	1.05 +	1.65	2.42	0.76 +
											10:00	986.7						
強烈熱帶風暴帕卡 Severe Tropical Storm Pakhar	8	27	07:00	西南 SW	90	33	西北 NW	980	8	27	06:21	996.5	0.72	0.67	0.82	1.05	0.96	0.49
											06:00	996.6						
強烈熱帶風暴瑪娃 Severe Tropical Storm Mawar	9	4	08:00	東北偏北 NNE	120	15	西北 NW	1002	9	2	15:21 -17:07#	1002.8	0.35	0.29	0.41	0.40	0.44	0.27
											16:00, 17:00	1003.0						
熱帶低氣壓 Tropical Depression	9	24	08:00	西南偏南 SSW	470	29	西北偏西 WNW	996	9	24	14:16 - 17:15#	1007.7	0.19	0.26	0.23	0.27	0.35	0.08
											16:00	1007.7						
強颱風卡努 Severe Typhoon Khanun	10	15	15:00	西南偏南 SSW	210	25	西北偏西 WNW	960	10	15	15:00	996.2	0.99	1.04	1.05	1.04	0.98	0.81
											15:00	996.2						

* 香港時間（協調世界時加八小時)

\# 最初及最後錄得的時間

\- 沒有資料

\+ 數據不完整

* Hong Kong Time （UTC + 8 hours）

\# First and last time recorded

\- data not available

\+ incomplete data

表 4.7 (續) TABLE 4.7 (cont'd)

熱帶氣旋名稱 Name of tropical cyclone	月份 Month	最高60分鐘平均風向及風速 (公里每小時) Maximum 60-min mean wind in points and km/h						最高10分鐘平均風向及風速 (公里每小時) Maximum 10-min mean wind in points and km/h						最高陣風風向及風速 (公里每小時) Maximum gust peak speed in km/h with direction in points					
		京士柏 King's Park		香港國際機場 Hong Kong International Airport		橫瀾島 Waglan Island		京士柏 King's Park		香港國際機場 Hong Kong International Airport		橫瀾島 Waglan Island		京士柏 King's Park		香港國際機場 Hong Kong International Airport		橫瀾島 Waglan Island	
強烈熱帶風暴苗柏 Severe Tropical Storm Merbok	6	西北偏西 WNW	30	西北 NW	52	北 N	92	北 N	34	西南 SW	63	北 N	99	北 N	77	西南 SW	79	北 N	113
熱帶風暴洛克 Tropical Storm Roke	7	東南 SE	14	東南偏東 ESE	27	西北偏北 NNW	43	東南 SE	20	東南偏東 ESE	31	西北偏北 NNW	49	北 N	41	東南偏東 ESE	41	西北偏北 NNW	59
超強颱風天鴿 Super Typhoon Hato	8	東南偏東 ESE	54	東 E	92	東 E	137	東南偏東 ESE	63	東 E	103	東北 NE	142	東南偏東 ESE	113	東南偏東 ESE	144	東 E	193
強烈熱帶風暴帕卡 Severe Tropical Storm Pakhar	8	東南偏東 ESE	49	東 E	72	東 E	108	東南偏東 ESE	58	東 E	76	東北偏東 ENE	113	東南偏東 ESE	108	東南偏東 ESE	101	東 E	144
強烈熱帶風暴瑪娃 Severe Tropical Storm Mawar	9	西 W	16	西南 SW	45	西南偏西 WSW	65	西北偏西 WNW	22	西北偏西 WNW	49	西南 SW	68	西南偏西 WSW	43	西南 SW	63	西南偏西 WSW	81
熱帶低氣壓 Tropical Depression	9	東南偏東 ESE	22	東南偏東 ESE	34	東北偏東 ENE	56	東南偏東 ESE	27	東南偏東 ESE	38	東北偏東 ENE	59	東 E	51	東南偏東 ESE	52	東 E	79
強颱風卡努 Severe Typhoon Khanun	10	東北 NE	34	東北 NE	49	北 N	87	東北 NE	40	東北 NE	52	東北 NE	92	東北 NE	81	東北 NE	67	東北 NE	106

表 4.8.1　二零一七年位於香港600公里範圍內的熱帶氣旋及其為本港帶來的雨量期間，天文台錄得的雨量

TABLE 4.8.1　RAINFALL ASSOCIATED WITH EACH TROPICAL CYCLONE THAT CAME WITHIN 600 KM OF HONG KONG IN 2017

熱帶氣旋名稱 Name of tropical cyclone	熱帶氣旋位於香港600公里範圍內的時期 Period when tropical cyclone within 600 km of Hong Kong (T_1 → T_2) 日期/月份 Date/Month 時間* Time*	香港天文台錄得的雨量(毫米) Rainfall at the Hong Kong Observatory (mm)				
		(i) 在香港600公里內 within 600 km of Hong Kong (T_1 → T_2)	(ii) 在 T_2 之後的24小時內 24-hour period after T_2	(iii) 在 T_2 之後的48小時內 48-hour period after T_2	(iv) 在 T_2 之後的72小時內 72-hour period after T_2	(i) + (iv) 共 Total T_1 → (T_2+72 小時 hours)
強烈熱帶風暴苗柏 Severe Tropical Storm Merbok	(T_1) 11 / 6 1500 - (T_2) 13 / 6 1100	227.7	45.0	52.4	65.2	292.9
熱帶風暴桑卡 # Tropical Storm Sonca #	(T1) 21 / 7 0800 - (T2) 23 / 7 1700	6.6	46.5	46.5	46.5	53.1 +
熱帶風暴洛克 Tropical Storm Roke	(T1) 22 / 7 1100 - (T2) 23 / 7 1400	3.3	46.5	46.5	46.5	49.8 +
熱帶風暴海棠 # Tropical Storm Haitang #	(T1) 28 / 7 0800 - (T2) 30 / 7 0700	0.0	0.0	2.2	20.7	20.7 ++
颱風納沙 # Typhoon Nesat #	(T1) 30 / 7 1200 - (T2) 30 / 7 2000	0.0	0.0	5.2	20.7	20.7 ++
超強颱風天鴿 Super Typhoon Hato	(T1) 22 / 8 1100 - (T2) 24 / 8 0500	69.1	0.1	0.1	39.4	108.5+++
強烈熱帶風暴帕卡 Severe Tropical Storm Pakhar	(T1) 26 / 8 1500 - (T2) 27 / 8 2000	166.8	103.1	103.1	103.1	269.9 +++
強烈熱帶風暴瑪娃 Severe Tropical Storm Mawar	(T1) 31 / 8 1400 - (T2) 4 / 9 0800	63.6	9.5	11.0	11.0	74.6
熱帶低氣壓古超 # Tropical Depression Guchol #	(T1) 6 / 9 2100 - (T2) 7 / 9 1400	1.0	1.5	2.8	27.7	28.7
熱帶低氣壓 Tropical Depression	(T1) 23 / 9 2100 - (T2) 25 / 9 0300	5.6	0.5	0.5	0.5	6.1
超強颱風卡努 Super Typhoon Khanun	(T1) 14 / 10 1700 - (T2) 16 / 10 0800	23.4	55.9	56.1	56.1	79.5
強烈熱帶風暴海葵 # Severe Tropical Storm Haikui #	(T1) 11 / 11 0500 - (T2) 12 / 11 0800	微量 Trace	14.7	27.4	27.4	27.4
					共 Total	922.1

* 香港時間（協調世界時加八小時）。

\# 該熱帶氣旋並未導致天文台需要發出熱帶氣旋警告信號。

T_1 熱帶氣旋首次出現於香港600公里範圍內的時間。

T_2 熱帶氣旋在香港600公里範圍內消散或離開該範圍的時間。

\+ 熱帶風暴洛克的雨量與熱帶風暴桑卡的雨量出現了49.8毫米的重疊部份。

++ 颱風納沙的雨量與熱帶風暴海棠的雨量出現了20.7毫米的重疊部份。

+++ 強烈熱帶風暴帕卡的雨量與超強颱風天鴿的雨量出現了39.3毫米的重疊部份。

* Hong Kong Time （UTC + 8 hours）.

\# Tropical cyclone without issuing of tropical cyclone warning signal in Hong Kong.

T_1 The time when a tropical cyclone was first centred within 600 km of Hong Kong.

T_2 The time when a tropical cyclone was dissipated within or moved outside 600 km of Hong Kong.

\+ Rainfall amount of T.S. Roke overlapped the rainfall amount of T.S. Sonca by 49.8 mm.

++ Rainfall amount of T. Nesat overlapped the rainfall amount of T.S. Haitang by 20.7 mm.

+++ Rainfall amount of S.T.S. Pakhar overlapped the rainfall amount of SuperT. Hato by 39.3 mm.

表 4.8.2　一八八四至一九三九年及一九四七至二零一七年間十個為香港帶來最多雨量的熱帶氣旋

TABLE 4.8.2　TEN WETTEST TROPICAL CYCLONES IN HONG KONG (1884-1939, 1947-2017)

熱帶氣旋 Tropical Cyclone			香港天文台錄得的雨量(毫米) Rainfall at the Hong Kong Observatory (mm)				
年份 Year	月份 Month	名稱 Name	(i) 在香港600公里內 within 600 km of Hong Kong ($T_1 \rightarrow T_2$)	(ii) 在 T_2 之後的 24 小時內 24-hour period after T_2	(iii) 在 T_2 之後的 48 小時內 48-hour period after T_2	(iv) 在 T_2 之後的 72 小時內 72-hour period after T_2	(i) + (iv) 共 Total $T_1 \rightarrow$ (T_2+72 小時 hours)
1999	8	森姆 Sam	368.1	178.9	248.1	248.4	616.5
1926	7	熱帶氣旋 T.C.	34.8 #	534.0 #	561.1 #	562.2 #	597.0
1916	6	熱帶氣旋 T.C.	494.8 #	27.9 #	59.4 #	67.2 #	562.0
1965	9	愛娜斯 Agnes	404.6	8.9	64.3	126.1	530.7
1978	7	愛娜斯 Agnes	502.4	12.3	12.3	16.6	519.0
1976	8	愛倫 Ellen	90.7	394.2	421.0	425.4	516.1
1993	9	黛蒂 Dot	459.6	37.9	37.9	37.9	497.5
1982	8	黛蒂 Dot	41.2	322.5	403.1	450.5	491.7
2016	10	莎莉嘉 Sarika	195.6	223.2	223.2	295.7+	491.3
1995	8	海倫 Helen	241.4	146.2	235.2	239.5	480.9

T_1 - 熱帶氣旋首次出現於香港600公里範圍內的時間。

T_2 - 熱帶氣旋在香港600公里範圍內消散或離開該範圍的時間。

\# 對於一九六一年以前的熱帶氣旋，欄(i)顯示當它位於香港600公里範圍內的日子裡，天文台所錄得的總日雨量，欄(ii)至(iv)分別是指其後一至三天累積的日雨量。

\+ 當中的72.5毫米雨量與超強颱風海馬重疊出現。

T_1 - The time when a tropical cyclone was first centred within 600 km of Hong Kong.

T_2 - The time when a tropical cyclone was dissipated within or moved outside 600 km of Hong Kong.

\# For years prior to 1961, column (i) is the sum of daily rainfall on those days when a tropical cyclone was centred within 600 km of Hong Kong, columns (ii) to (iv) show respectively the accumulated daily rainfall on the following one to three days.

\+ 72.5 mm of rainfall overlapped with the rainfall of SuperT. Haima.

表 4.9　　一九四六至二零一七年間引致天文台需要發出十號颶風信號的颱風

TABLE 4.9　TYPHOONS REQUIRING THE ISSUING OF THE HURRICANE SIGNAL NO. 10 DURING THE PERIOD 1946-2017

颱風名稱 Name of typhoon	當最接近天文台時 Nearest approach to the Hong Kong Observatory			最低平均海平面氣壓 (百帕斯卡) Minimum M.S.L. pressure (hPa)		最高60分鐘平均風向及風速 (公里每小時) Maximum 60-min mean wind in points and km/h							最高陣風風向及風速 (公里每小時) Maximum gust peak speed in km/h with direction in points						
	日期/月份 Date/Month	年份 Year	方位 Direction	距離 (公里) Distance (km)	每小時 Hourly	瞬時 Inst.	香港天文台 Hong Kong Observatory	京士柏 King's Park	啟德機場 # Kai Tak Airport #	橫瀾島 Waglan Island	長洲 Cheung Chau	大老山 Tate's Cairn	青洲 Green Island	香港天文台 Hong Kong Observatory	京士柏 King's Park	啟德機場 # Kai Tak Airport #	橫瀾島 Waglan Island	長洲 Cheung Chau	大老山 Tate's Cairn	青洲 Green Island
-	18 / 7	1946	南 S	70	985.7	-	東北 NE	-	-	-	-	-	-	-	-	-	-	-	-	-
姬羅莉亞 Gloria	22 / 9	1957	西南 SW	55	986.2	984.3	東南偏東 ESE	115	-	東南偏東 ESE	72	東 E	113	-	-	-	東 E	187	-	東北偏東 ENE	158	東北偏東 ENE	185	-	-	-
瑪麗 Mary	9 / 6	1960	西北偏西 WNW	10	974.3	973.8	東南偏南 SSE	96	-	東南偏南 SSE	92	西南偏南 SSW	112	-	-	-	東南偏南 SSE	191	-	東南 SE	164	西南偏南 SSW	194	-	-	-
愛麗斯 Alice	19 / 5	1961		0	981.6	981.1	東北偏東 ENE	83	-	東 E	70	東南偏東 ESE	90	東北偏東 ENE	76	-	-	東 E	166	-	東北偏東 ENE	139	西南 SW	128	東北偏東 ENE	135	-	-
溫黛 Wanda	1 / 9	1962	西南偏南 SSW	20	955.1	953.2	北 N	133	-	北 N	108	西北 NW	148	西北 NW	118	東南 SE	189	-	北 N	259	-	北 N	229	西北偏北 NNW	216	西北 NW	232	東南偏東 ESE	284	-
露比 Ruby	5 / 9	1964	西南 SW	30	971.0	968.2	東 E	110	-	北 N	118	東北偏東 ENE	148	東北 NE	113	東南偏東 ESE	167	-	東北偏北 NNE	227	-	西北 NW	203	東 E	230	東北偏北 NNE	216	東 E	268	-
黛蒂 Dot	13 / 10	1964	東 E	35	978.9	977.3	西北偏北 NNW	88	-	北 N	67	北 N	117	西北偏北 NNW	96	東北偏北 NNE	157	-	北 N	175	-	北 N	198	北 N	184	西北偏西 WNW	205	東北 NE	220	-
雪麗 Shirley	21 / 8	1968		0	968.7	968.6	北 N	68	-	北 N	75	東北偏北 NNE	124	西南偏南 SSW	90	東北偏北 NNE	126	-	北 N	133	-	北 N	151	東北 NE	209	西南偏南 SSW	167	東北偏北 NNE	203	-
露絲 Rose	17 / 8	1971	西南偏西 WSW	20	984.5	982.8	東南 SE	103	-	東南 SE	122	東南偏東 ESE	140	東南 SE	131	南 S	148	-	東南偏東 ESE	224	-	東南偏東 ESE	211	東南偏東 ESE	189	東南 SE	194	南 S	221	-
愛茜 Elsie	14 /10	1975	南 S	50	996.4	996.2	東北偏東 ENE	58	北 N	75	西北偏北 NNW	67	東北偏北 NNE	118	北 N	106	東北 NE	130	西北偏北 NNW	118	東北 NE	140	北 N	137	北 N	140	東北偏東 ENE	176	東北 NE	158	東北偏北 NNE	180	東北 NE	167
荷貝 Hope	2 / 8	1979	西北偏北 NNW	10	961.8	961.6	西 W	75	西北偏西 WNW	79	西 W	115	西南 SW	144	西南偏南 SSW	117	西北 NW	115	西 W	108	西 W	175	西北偏西 WNW	166	西北偏西 WNW	182	西南 SW	198	西南偏西 WSW	185	西北偏西 WNW	229	西 W	167
愛倫 Ellen	9 / 9	1983	西南 SW	45	983.9	983.1	東 E	92	東 E	88	東 E	112	東南偏東 ESE	169	東南偏東 ESE	171	東 E	126	南 S	137	東 E	185	東 E	167	東 E	203	東 E	227	東南偏東 SSE	238	東北偏東 ENE	218	南 S	220*
約克 York	16 / 9	1999	西南偏南 SSW	20	976.8	976.1	東 E	63	北 N	68	東北偏北 NNE	59	東北偏北 NNE	153	東北偏北 NNE	113	-	-	-	東 E	137	東北偏北 NNE	149	東北偏東 ENE	142	東北偏北 NNE	234	東北 NE	182	-	-
韋森特 Vicente	24 / 7	2012	西南 SW	100	986.3	986.0	東 E	56	東南偏東 ESE	56	東南偏東 ESE	70	東 E	108	東南偏東 ESE	128	東 E	117	東北 NE	92	東南偏東 ESE	117	東南偏東 ESE	110	東 E	135	東南偏東 ESE	149	東 E	184	東南偏東 ESE	166	東北 NE	155
天鴿 Hato	23 / 8	2017	西南偏南 SSW	60	986.7	986.3	東 E	62	東南偏東 ESE	54	東南偏東 ESE	67	東 E	137	東南偏東 ESE	128	東北偏東 ENE	118	-		東 E	122	東南偏東 ESE	113	東北 NE	130	東 E	193	東南 SE	171	東北 NE	187	-	

隨著香港國際機場遷移到赤鱲角，啟德的氣象所已於一九九八年七月六日關閉。啟德測風站於一九九八年九月四日開始運作。

* 估計，超出風速記錄圖的上限。

With the moving of the Hong Kong International Airport to Chek Lap Kok, the meteorological office at Kai Tak was closed on 6 July 1998. Kai Tak anemometer station started operation on 4 September 1998.

* estimated, exceeding upper limit of anemogram.

表 4.10　二零一七年熱帶氣旋在香港所造成的損失

TABLE 4.10 DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG IN 2017

熱帶氣旋名稱 Name of tropical cyclone	月份 Month	物質損毀 Damage in physical terms						金錢損失（百萬港元）* Damage in monetary terms (million HK$)						保險索賠總額# (百萬港元) The total amount of insurance claims (million HK$) **(b)**	估計直接經濟損失@ (百萬港元) Estimated direct economic loss (million HK$) **(a) + (b)**
		農業 Agriculture	公用建設 (處) Public works facilities (site)	公用業務 (處) Public utilities (site)	物業單位 (個) Property (unit)	山泥傾瀉及斜坡倒塌 (宗) Landslip and collapse of slope (case)	受到損壞的船隻數目 (艘) Ships lost or damaged (number)	農業 Agriculture	公用建設 Public works facilities	公用業務 Public utilities	私人物業 Private property	工業 Industry	共 Total **(a)**		
強烈熱帶風暴苗柏 Severe Tropical Storm Merbok	6	農地 Farmland: 360 公頃 hectares 農作物 Crops: 2547 噸 tons	道路 Road: 2 小徑 Footpath: 3 公墓 Cemetery: 2	鐵路 Railway: 1 安全護欄 Road barrier: 1	2	9	2	39.78000		0.00101			39.78101		
熱帶風暴洛克 Tropical Storm Roke	7					2	2								
超強颱風天鴿 Super Typhoon Hato	8	農地 Farmland: 547 公頃 hectares 農作物 Crops: 3274 噸 tons 塘魚 Pond fish: 983 噸 tons	道路 Road: 1 避雨亭 Rain Shelter: 2 欄桿 Railing: 25	電信設施 Telecommunication facilities: 1 變電站 Substation: 1	66	1	36	78.6151	3.9816	4.8908	0.0035	9.5459	97.0369	1107.8445	1204.8813
強烈熱帶風暴帕卡 Severe Tropical Storm Pakhar	8		工地 Construction site: 1	鐵路 Railway: 5 變電站 Substation: 4 搪瓷牆身板 VE Panels: 1	3	3	15			1.78846			1.78846		
強烈熱帶風暴瑪娃 Severe Tropical Storm Mawar	8						8			0.00640			0.00640		
強颱風卡努 Severe Typhoon Khanun	10					1	3								

#保險索償數據由香港保險業聯會提供（截至2019年3月16日），有關數據已經按參與調查的機構的所佔的市場份額作調整。請注意2017年的保險索償數據只涵蓋超強颱風天鴿。

The insurance claim figure is provided by the Hong Kong Federation of Insurers (up to 16 March 2019). The data have been adjusted by the market shares (80%) of the companies participating in the survey. Note that the insurance claim figure is only available for Super Typhoon Hato in 2017

*資料由各有關政府部門及公共事業機構提供，並已扣除相關的保險索償 （截至2019年10月31日)。

* The data is provided by relevant government departments and public utility companies (up to 31 October 2019). Items with insurance claim made have been excluded.

@ 直接經濟損失估算僅供參考，可能受到調查數據和分析方法的各種不確定性的影響。估算詳情及免責聲明可參考附件一。

@ The estimates are for reference only and may be subject to various uncertainties in the survey responses and analysis method. Please refer to Annex 1 for details of estimation and disclaimer.

由於四捨五入關係，表內個別項目的數字加起來可能與總數略有出入。

The sum of figures may not add up to total due to rounding.

表 4.11　　一九六零至二零一七年間熱帶氣旋在香港所造成的人命傷亡及破壞

TABLE 4.11　CASUALTIES AND DAMAGE CAUSED BY TROPICAL CYCLONES IN HONG KONG : 1960-2017

年份 Year	日期 / 月份 Date / Month	Name of tropical cyclone	熱帶氣旋名稱	死亡人數 Persons dead	失蹤人數 Persons missing	受傷人數 Persons injured	遇事越洋船舶 Ocean-going vessels in trouble	受到毀壞或翻沉的小艇數目 Small craft sunk or wrecked	受到損壞的小艇數目 Small craft damaged
1960	4 / 6 - 12 / 6	T. Mary	瑪麗	45	11	127	6	352	462
1961	17 / 5 - 21 / 5	T. Alice	愛麗斯	4	0	20	*	*	*
	7 / 9 - 10 / 9	S.T.S. Olga	奧嘉	7	0	0	0	1	0
1962	28 / 8 - 2 / 9	T. Wanda	溫黛	130	53	*	36	1 297	756
1963	1 / 9 - 9 / 9	T. Faye	菲爾	3	0	51	0	2	0
1964	26 / 5 - 28 / 5	T. Viola	維奧娜	0	0	41	5	18	18
	2 / 8 - 9 / 8	T. Ida	艾黛	5	4	56	3	7	60
	2 / 9 - 6 / 9	T. Ruby	露比	38	6	300	20	32	282
	4 / 9 - 10 / 9	T. Sally	莎莉	9	0	24	0	0	0
	7 /10 - 13 /10	T. Dot	黛蒂	26	10	85	2	31	59
1965	6 / 7 - 16 / 7	T. Freda	法妮黛	2	0	16	0	1	0
	25 / 9 - 28 / 9	T.S. Agnes	愛娜斯	5	0	3	0	0	0
1966	12 / 7 - 14 / 7	S.T.S. Lola	露娜	1	0	6	0	*	6
1967	19 / 8 - 22 / 8	S.T.S. Kate	姬蒂	0	0	3	3	1	0
1968	17 / 8 - 22 / 8	T. Shirley	雪麗	0	0	4	1	*	3
1969	22 / 7 - 29 / 7	T. Viola	維奧娜	0	0	0	0	3	0
1970	1 / 8 - 3 / 8	T.D. -	-	2+	0	0	0	0	0
	8 / 9 - 14 / 9	T. Georgia	喬治亞	0	0	0	2	0	*
1971	15 / 6 - 18 / 6	T. Freda	法妮黛	2	0	30	8	0	0
	16 / 7 - 22 / 7	T. Lucy	露茜	0	0	38	10	2	13
	10 / 8 - 17 / 8	T. Rose	露絲	110	5	286	33	303	*
1972	4 /11 - 9 /11	T. Pamela	柏美娜	1	0	8	3	0	0
1973	14 / 7 - 20 / 7	T. Dot	黛蒂	1	0	38	14	*	*
1974	7 / 6 - 14 / 6	T. Dinah	戴娜	0	0	0	1	*	*
	18 / 7 - 22 / 7	T. Ivy	艾菲	0	0	0	2	*	*
	15 /10 - 19 /10	T. Carmen	嘉曼	1	0	0	5	*	*
	21 /10 - 27 /10	T. Della	黛娜	0	0	0	2	*	*
1975	10 / 8 - 14 / 8	T.D. -	-	2	1	0	3	1	*
	9 /10 - 14 /10	T. Elsie	愛茜	0	0	46	7	2	1
	16 /10 - 23 /10	S.T.S. Flossie	霍蘿茜	0	0	0	1	*	*
1976	22 / 6 - 4 / 7	T. Ruby	露比	3	2	2	0	0	0
	21 / 7 - 26 / 7	S.T.S. Violet	維奧莉	2	1	1	0	0	0
	5 / 8 - 6 / 8	S.T.S. Clara	嘉麗	0	0	4	0	0	0
	21 / 8 - 24 / 8	T.S. Ellen	愛倫	27	3	65	0	4	7
	15 / 9 - 21 / 9	T. Iris	愛莉斯	0	0	27	6	0	1
1977	4 / 7 - 6 / 7	T.D. -	-	0	0	2	0	0	0
	3 / 9 - 5 / 9	T.S. Carla	嘉娜	0	0	1	1	0	0
	22 / 9 - 25 / 9	S.T.S. Freda	法妮黛	1	0	37	2	0	0
1978	24 / 7 - 30 / 7	S.T.S. Agnes	愛娜斯	3	0	134	0	25	42
	9 / 8 - 12 / 8	T.S. Bonnie	邦妮	0	0	0	2	0	0
	23 / 8 - 28 / 8	S.T.S. Elaine	伊蘭	1	0	51	8	5	8
	22 / 9 - 26 / 9	S.T.S. Kit	吉蒂	0	7	0	0	1	0
	7 /10 - 16 /10	S.T.S. Nina	蓮娜	0	0	2	0	0	0
	17 /10 - 29 /10	T. Rita	麗妲	0	0	3	1	5	0
1979	1 / 7 - 6 / 7	T. Ellis	艾利斯	0	0	0	0	2	0
	26 / 7 - 30 / 7	T.S. Gordon	戈登	0	0	0	0	2	0
	28 / 7 - 3 / 8	T. Hope	荷貝	12	0	260	29	167	207
	6 / 8 - 9 / 8	T.D. -	-	0	0	0	0	3	0
	16 / 9 - 24 / 9	S.T.S. Mac	麥克	1	0	67	2	12	0
1980	5 / 7 - 12 / 7	S.T.S. Ida	艾黛	0	0	0	1	0	0
	18 / 7 - 23 / 7	T. Joe	喬伊	2	1	59	4	0	1
	20 / 7 - 28 / 7	T. Kim	甘茵	0	0	0	0	2	1
	29 /10 - 2 /11	T.S. Cary	卡里	0	0	0	0	0	2
1981	3 / 7 - 7 / 7	S.T.S. Lynn	林茵	0	0	32	0	0	3
1982	27 / 6 - 2 / 7	T.S. Tess	戴絲	0	0	16	0	1	0
	22 / 7 - 30 / 7	T. Andy	安迪	0	0	0	0	0	1
	5 / 9 - 16 / 9	T. Irving	伊文	0	0	0	0	0	2

表 4.11 (續)
TABLE 4.11 (cont'd)

年份 Year	日期 / 月份 Date / Month	Name of tropical cyclone	熱帶氣旋名稱	死亡人數 Persons dead	失蹤人數 Persons missing	受傷人數 Persons injured	遇事越洋船舶 Ocean-going vessels in trouble	受到毀壞或翻沉的小艇數目 Small craft sunk or wrecked	受到損壞的小艇數目 Small craft damaged
1983	12 / 7 - 19 / 7	T. Vera	維娜	0	0	0	0	1	0
	29 / 8 - 9 / 9	T. Ellen	愛倫	10	12	333	44	135	225
	10 /10 - 14 /10	T. Joe	喬伊	0	0	58	2	0	3
	20 /10 - 26 /10	S.T.S. Lex	力士	0	0	0	0	0	1
1984	27 / 8 - 7 / 9	T. Ike	艾克	0	0	1	0	0	0
1985	19 / 6 - 25 / 6	T. Hal	哈爾	0	1	13	0	4	2
	1 / 9 - 7 / 9	T. Tess	戴絲	2	0	12	6	1	3
	13 /10 - 22 /10	T. Dot	黛蒂	0	0	1	0	0	0
1986	3 / 7 - 12 / 7	T. Peggy	蓓姬	1	0	26	3	0	3
	9 / 8 - 12 / 8	T.D. -	-	0	0	3	0	1	5
	18 / 8 - 6 / 9	T. Wayne	韋恩	3	1	15+	0	3	0
	11 /10 - 19 /10	T. Ellen	愛倫	0	0	4	1	2	1
1987	16 /10 - 27 /10	T. Lynn	林茵	0	0	1	0	0	0
1988	14 / 7 - 20 / 7	T. Warren	華倫	0	1	12	1	2	1
	19 / 9 - 22 / 9	T. Kit	吉蒂	0	0	0	0	0	1
	18 /10 - 23 /10	T. Pat	帕特	2	0	1	0	0	0
	21 /10 - 29 /10	T. Ruby	露比	0	0	4	0	0	0
1989	16 / 5 - 21 / 5	T. Brenda	布倫達	6	1	119	0	3	5
	11 / 7 - 19 / 7	T. Gordon	戈登	2	0	31	1	0	8
	8 /10 - 14 /10	T. Dan	丹尼	0	0	0	1	0	1
1990	15 / 5 - 19 / 5	T. Marian	瑪麗安	0	0	0	0	0	1
	15 / 6 - 19 / 6	S.T.S. Nathan	彌敦	5	1	1	1	0	2
	21 / 6 - 30 / 6	T. Percy	珀西	1	0	0	0	0	0
	27 / 7 - 31 / 7	S.T.S. Tasha	泰莎	0	0	1	0	1	0
	25 / 8 - 30 / 8	T. Becky	貝姬	0	1	0	0	0	0
	10 / 9 - 20 / 9	T. Ed	義德	0	0	1	0	0	0
1991	15 / 7 - 20 / 7	T. Amy	艾美	0	0	1	1	0	2
	20 / 7 - 24 / 7	S.T.S. Brendan	布倫登	0	0	17	1	1	13
	13 / 8 - 18 / 8	T. Fred	法雷德	0	0	0	0	1	0
1992	9 / 7 - 14 / 7	T. Eli	艾里	0	0	23	0	0	1
	17 / 7 - 18 / 7	T.S. Faye	菲爾	2	0	24	1	0	3
	19 / 7 - 23 / 7	S.T.S. Gary	加里	0	0	18	2	0	0
1993	21 / 6 - 28 / 6	T. Koryn	高蓮	0	0	183	0	0	2
	16 / 8 - 21 / 8	T. Tasha	泰莎	0	0	35	0	0	7
	9 / 9 - 14 / 9	T. Abe	艾貝	1	0	0	0	0	0
	15 / 9 - 17 / 9	S.T.S. Becky	貝姬	1	0	130	0	0	10
	23 / 9 - 27 / 9	T. Dot	黛蒂	0	1	48	0	1	0
	28 /10 - 5 /11	T. Ira	艾拉	2	0	30	0	1	0
1994	23 / 6 - 25 / 6	T.S. Sharon	莎朗	0	0	5	0	1	1
	25 / 8 - 29 / 8	S.T.S. Harry	夏里	1	0	2	0	0	2
1995	7 / 8 - 12 / 8	S.T.S. Helen	海倫	3	0	35	0	0	0
	25 / 8 - 1 / 9	T. Kent	肯特	0	0	5	0	0	0
	28 / 9 - 4 /10	T. Sibyl	斯寶	0	0	14	0	0	0
1996	5 / 9 - 10 / 9	T. Sally	莎莉	2	0	4	0	0	0
	18 / 9 - 23 / 9	S.T.S. Willie	威利	0	1	0	0	0	0
1997	31 / 7 - 3 / 8	T. Victor	維克托	1	0	58	0	0	0
	20 / 8 - 23 / 8	T. Zita	思蒂	0	0	3	0	0	0
1998	7 / 8 - 11 / 8	S.T.S. Penny	彭妮	1	0	1	0	0	0
	12 / 9 - 14 / 9	T.D. -	-	0	0	10	0	0	0
	15 /10 - 27 /10	T. Babs	寶絲	0	0	14	0	0	0
1999	28 / 4 - 2 / 5	T. Leo	利奧	0	0	14	0	0	0
	2 / 6 - 8 / 6	T. Maggie	瑪姬	0	0	5	0	2	0
	25 / 7 - 28 / 7	T.S. -	-	0	0	18	0	0	0
	19 / 8 - 23 / 8	T. Sam	森姆	4	0	328	0	0	0
	12 / 9 - 17 / 9	T. York	約克	2	0	500	3	*	*
	24 / 9 - 26 / 9	S.T.S. Cam	錦雯	1	0	23	0	0	0

表 4.11 (續)
TABLE 4.11 (cont'd)

年份 Year	日期 / 月份 Date / Month	Name of tropical cyclone	熱帶氣旋名稱	死亡人數 Persons dead	失蹤人數 Persons missing	受傷人數 Persons injured	遇事越洋船舶 Ocean-going vessels in trouble	受到毀壞或翻沉的小艇數目 Small craft sunk or wrecked	受到損壞的小艇數目 Small craft damaged
2000	15 / 7 - 16 / 7	T.D. -	-	0	1	6	0	0	0
	27 / 8 - 1 / 9	S.T.S. Maria	瑪莉亞	2	0	0	0	0	0
	5 / 9 - 10 / 9	T. Wukong	悟空	0	0	1	0	0	1
2001	30 / 6 - 3 / 7	T. Durian	榴槤	0	0	1	0	0	0
	1 / 7 - 8 / 7	T. Utor	尤特	1	0	1	0	1	0
	23 / 7 - 26 / 7	T. Yutu	玉兔	0	0	10	0	0	0
	28 / 8 - 1 / 9	T.S. Fitow	菲特	2	0	0	0	0	0
2002	15 / 8 - 20 / 8	S.T.S. Vongfong	黃蜂	0	0	2	0	0	1
	10 / 9 - 13 / 9	S.T.S. Hagupit	黑格比	0	0	32	0	0	3
2003	16 / 7 - 23 / 7	S.T.S. Koni	天鵝	0	0	15	0	0	0
	17 / 7 - 25 / 7	T. Imbudo	伊布都	1	0	45	0	2	8
	17 / 8 - 26 / 8	T. Krovanh	科羅旺	0	0	11	0	0	2
	29 / 8 - 3 / 9	T. Dujuan	杜鵑	0	4	24	0	1	4
2004	14 / 7 - 16 / 7	T.S. Kompasu	圓規	0	0	12	0	0	0
2005	10 / 8 - 14 / 8	S.T.S. Sanvu	珊瑚	0	0	0	0	0	1
	16 / 9 - 19 / 9	T.S. Vicente	韋森特	2	0	0	0	0	0
	21 / 9 - 28 / 9	T. Damrey	達維	0	0	5	0	0	1
2006	9 / 5 - 18 / 5	T. Chanchu	珍珠	0	0	6	0	1	0
	27 / 6 - 29 / 6	T.S. Jelawat	杰拉華	1	0	0	0	0	0
	31 / 7 - 4 / 8	T. Prapiroon	派比安	0	0	8	0	1	4
	6 / 8 - 10 / 8	S.T.S. Bopha	寶霞	0	0	0	0	0	1
	23 / 8 - 25 / 8	T.D. -	-	0	0	0	0	0	1
	12 / 9 - 13 / 9	T.D. -	-	0	0	1	0	0	0
	27 /10 - 6 / 11	T. Cimaron	西馬侖	0	0	4	0	0	0
2007	5 / 8 - 11 / 8	S.T.S. Pabuk	帕布	1	0	17	0	0	0
2008	15 / 4 - 20 / 4	T. Neoguri	浣熊	0	0	2	0	0	0
	18 / 6 - 26 / 6	T. Fengshen	風神	0	0	17	0	0	0
	4 / 8 - 8 / 8	S.T.S. Kammuri	北冕	0	0	37	0	0	0
	17 / 8 - 23 / 8	T. Nuri	鸚鵡	2	0	112	0	0	0
	19 / 9 - 25 / 9	T. Hagupit	黑格比	0	0	58	0	10	0
2009	15 / 7 - 19 / 7	T. Molave	莫拉菲	0	0	5	0	3	0
	1 / 8 - 9 / 8	S.T.S. Goni	天鵝	4	0	10	0	1	0
	9 / 9 - 12 / 9	T.S. Mujigae	彩虹	0	0	1	0	0	0
	12 / 9 - 16 / 9	T. Koppu	巨爵	0	0	74	0	0	0
2010	19 / 7 - 23 / 7	T. Chanthu	燦都	4	0	30	0	0	0
2011	18 / 6 - 25 / 6	T.S. Haima	海馬	0	0	3	0	1	0
	25 / 7 - 31 / 7	S.T.S. Nock-ten	洛坦	0	0	4	0	0	1
	23 / 9 - 1 /10	T. Nesat	納沙	0	0	26	0	1	1
	27 / 9 - 5 /10	S.T. Nalgae	尼格	0	0	1	0	0	0
2012	26 / 6 - 30 / 6	T.S. Doksuri	杜蘇芮	0	0	2	0	1	0
	20 / 7 - 25 / 7	S.T. Vicente	韋森特	0	0	138	0	1	0
	12 / 8 - 18 / 8	T. Kai-tak	啟德	0	0	1	0	0	0
	18 / 8 - 30 / 8	S.T. Tembin	天秤	1	0	1	0	0	0
2013	9 / 8 - 16 / 8	SuperT. Utor	尤特	0	1	9	0	0	0
	17 / 9 - 23 / 9	SuperT. Usagi	天兔	0	0	17	0	0	1
2014	14 / 6 - 15 / 6	T.S. Hagibis	海貝思	0	0	1	0	0	0
	14 / 9 - 17 / 9	T. Kalmaegi	海鷗	0	0	29	0	0	0
2016	31 / 7 - 2 / 8	T. Nida	妮妲	0	0	12	0	0	0
	16 /10 - 18 /10	SuperT. Sarika	莎莉嘉	0	1	2	0	0	0
	20 /10 - 21 /10	SuperT. Haima	海馬	0	0	13	0	0	3
2017	11 / 6 - 13 / 6	S.T.S. Merbok	苗柏	0	0	10	0	0	2
	22 / 7 - 23 / 7	T.S. Roke	洛克	0	0	0	0	0	2
	22 / 8 - 23 / 8	SuperT. Hato	天鴿	0	0	129	1	0	36
	26 / 8 - 27 / 8	S.T.S. Pakhar	帕卡	0	0	62	0	0	15
	2 / 9 - 4 / 9	S.T.S. Mawar	瑪娃	0	0	0	0	0	8
	14 /10 - 16 /10	S.T. Khanun	卡努	0	0	22	0	0	3

備註： 資料由各有關政府部門及公共事業機構提供，同時亦參考了本地報章上的損毀報導。
* 缺乏數據
\+ 被雷電擊中

N.B.: Based on information supplied by relevant government departments and public utility companies. Damage reports in the local press were also examined and collated.
* Data unavailable.
\+ Struck by lightning.

表 4.12　二零一七年天文台發出的熱帶氣旋路徑預測驗証 (誤差單位為公里)

TABLE 4.12　Verification of the tropical cyclone track forecasts issued by the Hong Kong Observatory in 2017 (Error in the unit of km)

熱帶氣旋名稱	Name of tropical cyclone	編號 Code	最高強度 Maximum Intensity	24 小時預測位置 24-hour forecast position		48 小時預測位置 48-hour forecast position		72 小時預測位置 72-hour forecast position		96 小時預測位置 96-hour forecast position		120 小時預測位置 120-hour forecast position	
				平均誤差 Average error	預測數目 No. of forecasts	平均誤差 Average error	預測數目 No. of forecasts	平均誤差 Average error	預測數目 No. of forecasts	平均誤差 Average error	預測數目 No. of forecasts	平均誤差 Average error	預測數目 No. of forecasts
梅花	Muifa	1701	T.D.	188	5	281	3	341	1	-	-	-	-
苗柏	Merbok	1702	S.T.S.	87	6	53	2	-	-	-	-	-	-
南瑪都	Nanmadol	1703	S.T.S.	97	7	231	4	-	-	-	-	-	-
塔拉斯	Talas	1704	S.T.S.	64	6	196	2	-	-	-	-	-	-
奧鹿	Noru	1705	SuperT.	74	16	131	14	214	12	317	10	390	8
洛克	Roke	1707	T.S.	42	1	-	-	-	-	-	-	-	-
桑卡	Sonca	1708	T.S.	111	12	195	8	234	4	-	-	-	-
納沙	Nesat	1709	T.	94	12	155	8	290	4	752	2	-	-
海棠	Haitang	1710	T.S.	85	10	87	6	109	2	-	-	-	-
天鴿	Hato	1713	SuperT.	88	14	154	10	225	6	390	2	-	-
帕卡	Pakhar	1714	S.T.S.	89	9	190	5	150	1	-	-	-	-
瑪娃	Mawar	1716	S.T.S.	65	12	77	8	145	4	-	-	-	-
古超	Guchol	1717	T.D.	49	2	-	-	-	-	-	-	-	-
泰利	Talim	1718	SuperT.	67	24	145	22	276	19	343	15	469	10
杜蘇芮	Doksuri	1719	S.T.	81	13	202	9	445	5	1103	1	-	-
卡努	Khanun	1720	S.T.	76	14	128	10	157	6	162	2	-	-
蘭恩	Lan	1721	SuperT.	78	17	137	15	193	11	319	9	252	7
蘇拉	Saola	1722	T.	85	10	238	7	412	5	427	3	381	1
達維	Damrey	1723	T.	56	12	105	8	107	4	-	-	-	-
海葵	Haikui	1724	T.S.	66	8	87	4	-	-	-	-	-	-
鴻雁	Kirogi	1725	T.S.	78	5	64	1	-	-	-	-	-	-
啟德	Kai-Tak	1726	T.S.	66	24	83	19	142	17	196	13	244	9
天秤	Tembin	1727	T.	80	16	136	8	207	6	262	4	313	2
熱帶低氣壓(1月8日-10日)	Tropical Depression (8-10 Jan)	-	T.D.	62	3	-	-	-	-	-	-	-	-
熱帶低氣壓(4月14日-17日)	Tropical Depression (14-17 Apr)	-	T.D.	155	8	180	4	-	-	-	-	-	-
熱帶低氣壓(9月23日-25日)	Tropical Depression (23-25 Sep)	-	T.D.	53	4	-	-	-	-	-	-	-	-
熱帶低氣壓(10月9日-10日)	Tropical Depression (9-10 Oct)	-	T.D.	62	1	-	-	-	-	-	-	-	-
熱帶低氣壓(10月31日-11月2日)	Tropical Depression (31 Oct - 2 Nov)	-	T.D.	41	2	-	-	-	-	-	-	-	-
平均誤差 Average Error				81		142		224		324		345	
預測總數 Total number of forecasts				273		177		107		61		37	

註：

1. 驗証包括當熱帶氣旋中心位於北緯7至36度，東經100至140度內，香港天文台發出觀測時間為協調世界時00時、06時、12時及18時的熱帶氣旋路徑。
2. 誤差是指香港天文台最佳路徑位置(見第五節)及預測位置的距離，單位為公里。

Note:

1. Verification includes tropical cyclone forecast tracks issued by the Hong Kong Observatory at 00, 06, 12 and 18 UTC for tropical cyclones within the area bounded by 7°N and 36°N, 100°E to 140°E.
2. Error refers to the distance between the tropical cyclone best track position (see Section 5) and forecast position of the Hong Kong Observatory, in the unit of km.

第五節　二零一七年熱帶氣旋的位置及強度數據

以下是二零一七年位於北太平洋西部及南海區域（即由赤道至北緯45度、東經100度至180度所包括的範圍）的熱帶氣旋。其每六小時之位置及強度刊於本節。

熱帶氣旋名稱	頁
熱帶低氣壓 (一月八日至十日)	196
熱帶低氣壓 (四月十四日至十七日)	196
熱帶低氣壓梅花 (1701)	197
強烈熱帶風暴苗柏 (1702)	197
強烈熱帶風暴南瑪都 (1703)	198
強烈熱帶風暴塔拉斯 (1704)	198
超強颱風奧鹿 (1705)	199
熱帶風暴玫瑰 (1706)	201
熱帶風暴洛克 (1707)	201
熱帶風暴桑卡 (1708)	202
颱風納沙 (1709)	203
熱帶風暴海棠 (1710)	204
熱帶風暴尼格 (1711)	204
強颱風榕樹 (1712)	205
超強颱風天鴿 (1713)	206
強烈熱帶風暴帕卡 (1714)	206
颱風珊瑚 (1715)	207
強烈熱帶風暴瑪娃 (1716)	208
熱帶低氣壓古超 (1717)	208
超強颱風泰利 (1718)	209
強颱風杜蘇芮 (1719)	210
熱帶低氣壓 (九月二十三日至二十五日)	210
熱帶低氣壓 (十月九日至十日)	211
強颱風卡努 (1720)	211
超強颱風蘭恩 (1721)	212
颱風蘇拉 (1722)	213
熱帶低氣壓 (十月三十一日至十一月二日)	213
颱風達維 (1723)	214
熱帶風暴海葵 (1724)	214
熱帶風暴鴻雁 (1725)	215
熱帶風暴啟德 (1726)	215
颱風天秤 (1727)	216

在本節，風速均取10分鐘內的平均值，單位為米每秒（1米每秒約為1.94海里或3.6公里每小時）。熱帶氣旋的強度分為：-

(a) T.D.: - 熱帶低氣壓
(b) T.S.: - 熱帶風暴
(c) S.T.S.: - 強烈熱帶風暴
(d) T.: - 颱風
(e) S.T.: - 強颱風
(f) Super T.: - 超強颱風

Section 5 TROPICAL CYCLONE POSITION AND INTENSITY DATA, 2017

Six-hourly position and intensity data are tabulated in this section for the following tropical cyclones in 2017 over the western North Pacific and the South China Sea (i.e. the area bounded by the Equator, 45°N, 100°E and 180°).

Name of tropical cyclone	Page
Tropical Depression (8 - 10 January)	196
Tropical Depression (14 - 17 April)	196
Tropical Depression Muifa (1701)	197
Severe Tropical Storm Merbok (1702)	197
Severe Tropical Storm Nanmadol (1703)	198
Severe Tropical Storm Talas (1704)	198
Super Typhoon Noru (1705)	199
Tropical Storm Kulap (1706)	201
Tropical Storm Roke (1707)	201
Tropical Storm Sonca (1708)	202
Typhoon Nesat (1709)	203
Tropical Storm Haitang (1710)	204
Tropical Storm Nalgae (1711)	204
Severe Typhoon Banyan (1712)	205
Super Typhoon Hato (1713)	206
Severe Tropical Storm Pakhar (1714)	206
Typhoon Sanvu (1715)	207
Severe Tropical Storm Mawar (1716)	208
Tropical Depression Guchol (1717)	208
Super Typhoon Talim (1718)	209
Severe Typhoon Doksuri (1719)	210
Tropical Depression (23 - 25 September)	210
Tropical Depression (9 - 10 October)	211
Severe Typhoon Khanun (1720)	211
Super Typhoon Lan (1721)	212
Typhoon Saola (1722)	213
Tropical Depression (31 October - 2 November)	213
Typhoon Damrey (1723)	214
Tropical Storm Haikui (1724)	214
Tropical Storm Kirogi (1725)	215
Tropical Storm Kai-tak (1726)	215
Typhoon Tembin (1727)	216

In this section, surface winds refer to wind speeds averaged over a period of 10 minutes given in the unit of m/s (1 m/s is about 1.94 knots or 3.6 km/h). Intensities of tropical cyclones are classified as follows:-

(a) T.D. : - tropical depression
(b) T.S. : - tropical storm
(c) S.T.S. : - severe tropical storm
(d) T. : - typhoon
(e) S.T. : - severe typhoon
(f) Super T. : - super typhoon

熱帶低氣壓(由一月八日至十日)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION OF 8 - 10 JANUARY

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
一月 JAN	8	0600	T.D.	1000	13	9.6	126.4
		1200	T.D.	1000	13	9.8	125.9
		1800	T.D.	1000	13	10.0	125.1
	9	0000	T.D.	1002	13	10.1	124.6
		0600	T.D.	1002	13	10.2	124.3
		1200	T.D.	1002	13	9.7	123.3
		1800	T.D.	1002	13	9.3	122.3
			消散 Dissipated				

熱帶低氣壓(由四月十四日至十七日)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION OF 14 - 17 APRIL

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
四月 APR	14	0600	T.D.	1002	13	10.4	129.3
		1200	T.D.	1002	13	10.5	128.7
		1800	T.D.	1002	13	10.8	127.5
	15	0000	T.D.	1002	13	11.0	127.0
		0600	T.D.	1002	13	11.2	126.2
		1200	T.D.	1002	13	11.2	125.6
		1800	T.D.	1002	13	11.0	125.0
	16	0000	T.D.	1002	13	11.2	123.6
		0600	T.D.	1002	13	11.4	122.8
		1200	T.D.	1002	13	12.3	121.0
		1800	T.D.	1002	13	12.7	119.1
	17	0000	T.D.	1002	13	13.3	118.0
			消散 Dissipated				

熱帶低氣壓梅花(1701)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION MUIFA (1701)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
四月 APR	25	0000	T.D.	1002	13	12.6	136.9
		0600	T.D.	1002	13	12.6	136.3
		1200	T.D.	1002	13	12.8	135.8
		1800	T.D.	1000	16	13.0	135.4
	26	0000	T.D.	1000	16	13.4	135.0
		0600	T.D.	1000	16	13.5	135.0
		1200	T.D.	1000	16	13.7	135.0
		1800	T.D.	1000	16	14.3	134.8
	27	0000	T.D.	1000	16	14.7	134.7
		0600	T.D.	1000	16	15.9	134.7
		1200	T.D.	1002	13	16.9	134.7
		1800	T.D.	1002	13	17.8	134.8
	28	0000	T.D.	1002	13	18.4	135.4
			消散 Dissipated				

強烈熱帶風暴苗柏(1702)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM MERBOK (1702)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
六月 JUN	10	1800	T.D.	1000	13	15.5	117.5
	11	0000	T.D.	998	16	16.3	117.0
		0600	T.D.	998	16	17.3	116.6
		1200	T.S.	994	18	18.0	116.3
		1800	T.S.	992	21	19.3	115.8
	12	0000	T.S.	990	23	20.2	115.2
		0600	S.T.S.	988	25	21.1	114.7
		1200	S.T.S.	984	28	22.1	114.5
		1800	T.S.	990	23	22.9	114.6
	13	0000	T.S.	994	18	24.0	114.8
		0300	T.D.	1000	13	24.3	115.1
			消散 Dissipated				

強烈熱帶風暴南瑪都(1703)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM NANMADOL (1703)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	1	1800	T.D.	1000	13	19.2	128.7
	2	0000	T.D.	998	16	20.6	127.0
		0600	T.S.	994	18	22.0	125.7
		1200	T.S.	990	21	23.6	124.6
		1800	T.S.	988	23	24.8	124.0
	3	0000	S.T.S.	985	25	26.2	124.3
		0600	S.T.S.	982	28	27.8	124.9
		1200	S.T.S.	982	28	29.4	126.3
		1800	S.T.S.	982	28	31.4	127.7
	4	0000	S.T.S.	985	25	32.8	130.3
		0600	S.T.S.	985	25	33.5	134.5
		1200	T.S.	988	23	34.5	138.2
		1800	T.S.	988	23	35.4	142.4
			變為溫帶氣旋 Became Extratropical				

強烈熱帶風暴塔拉斯(1704)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM TALAS (1704)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	15	0600	T.D.	998	13	16.9	111.8
		1200	T.D.	996	16	17.3	111.3
		1800	T.S.	994	18	17.5	110.5
	16	0000	T.S.	992	21	17.6	109.4
		0600	T.S.	988	23	18.1	108.3
		1200	S.T.S.	985	25	18.5	107.2
		1800	S.T.S.	985	25	18.6	105.7
	17	0000	T.S.	992	21	19.0	104.0
		0600	T.S.	994	18	19.0	101.7
		0900	T.S.	996	16	19.0	100.8
			消散 Dissipated				

超強颱風奧鹿(1705)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON NORU (1705)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	20	1200	T.D.	1004	13	27.4	159.5
		1800	T.D.	1002	16	27.5	158.3
	21	0000	T.S.	1000	18	28.0	157.3
		0600	T.S.	1000	18	28.2	156.4
		1200	T.S.	1000	18	28.3	155.3
		1800	T.S.	1000	18	28.4	154.8
	22	0000	T.S.	1000	18	28.5	154.0
		0600	T.S.	996	21	28.6	153.6
		1200	T.S.	992	23	28.6	153.0
		1800	T.S.	992	23	28.6	152.2
	23	0000	S.T.S.	988	25	28.2	151.4
		0600	S.T.S.	982	28	28.1	151.2
		1200	T.	975	33	28.1	151.4
		1800	T.	970	36	27.6	151.6
	24	0000	T.	970	36	27.2	152.2
		0600	T.	970	36	26.7	152.9
		1200	T.	970	36	26.2	154.1
		1800	T.	970	36	25.9	155.4
	25	0000	T.	970	36	25.7	156.6
		0600	T.	970	36	25.9	157.5
		1200	T.	970	36	26.2	158.1
		1800	T.	970	36	27.0	158.4
	26	0000	T.	970	36	28.0	158.0
		0600	T.	970	36	29.0	157.1
		1200	T.	970	36	29.8	155.7
		1800	T.	970	36	30.4	154.1
	27	0000	T.	970	36	30.7	152.1
		0600	T.	970	36	31.0	150.5
		1200	T.	970	36	30.8	148.5
		1800	T.	975	33	30.4	146.8
	28	0000	T.	975	33	29.6	145.2
		0600	S.T.S.	978	31	28.6	144.4
		1200	S.T.S.	978	31	28.2	143.8
		1800	S.T.S.	978	31	27.7	143.5
	29	0000	S.T.S.	978	31	27.1	142.9
		0600	S.T.S.	978	31	26.1	142.2
		1200	S.T.S.	978	31	25.3	142.0
		1800	S.T.S.	978	31	24.5	141.6
	30	0000	S.T.S.	978	31	23.9	141.8
		0600	T.	970	36	23.4	141.5
		1200	T.	960	41	22.9	141.4
		1800	S.T.	945	49	22.8	140.9
	31	0000	SuperT.	935	54	22.8	140.4
		0600	SuperT.	935	54	22.7	139.8
		1200	SuperT.	940	52	23.0	139.2
		1800	S.T.	945	49	23.3	138.8

超強颱風奧鹿(1705)的每六小時位置及強度 (續)
SIX-HOURLY POSITION AND INTENSITY DATA OF
SUPER TYPHOON NORU (1705) (CON'T)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月	1	0000	S.T.	945	49	23.6	138.2
		0600	S.T.	950	46	24.1	137.7
		1200	S.T.	955	43	24.5	137.2
		1800	S.T.	955	43	24.9	136.7
	2	0000	S.T.	950	46	25.4	136.4
		0600	S.T.	955	43	25.9	135.9
		1200	S.T.	955	43	26.2	135.7
		1800	S.T.	955	43	26.8	135.5
	3	0000	S.T.	955	43	27.4	134.8
		0600	S.T.	955	43	27.9	134.1
		1200	S.T.	955	43	28.1	133.4
		1800	S.T.	955	43	28.3	132.4
	4	0000	T.	960	41	28.5	131.5
		0600	T.	960	41	28.7	131.1
		1200	T.	960	41	29.0	130.7
		1800	T.	960	41	29.1	130.4
	5	0000	T.	960	41	29.5	130.3
		0600	T.	960	41	29.9	130.1
		1200	T.	960	41	30.1	130.1
		1800	T.	964	39	30.2	130.5
	6	0000	T.	968	36	30.7	130.8
		0600	T.	970	33	31.1	131.5
		1200	S.T.S.	972	31	31.7	132.3
		1800	S.T.S.	972	31	32.5	132.9
	7	0000	S.T.S.	972	31	33.1	133.9
		0600	S.T.S.	972	31	34.0	135.0
		1200	S.T.S.	975	28	35.2	136.2
		1800	T.S.	980	23	36.1	136.8
	8	0000	T.S.	984	21	37.3	137.7
		0600	T.S.	986	18	37.7	138.1
		1200	T.D.	990	16	38.3	138.8
			消散 Dissipated				

熱帶風暴玫瑰(1706)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF
TROPICAL STORM KULAP (1706)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	21	0000	T.D.	1004	13	25.2	177.2
		0600	T.D.	1002	16	26.6	177.1
		1200	T.S.	1000	18	28.2	176.8
		1800	T.S.	1000	18	30.4	175.5
	22	0000	T.S.	1000	18	30.5	172.2
		0600	T.S.	995	21	30.0	170.6
		1200	T.S.	995	21	30.0	169.6
		1800	T.S.	995	21	30.4	168.3
	23	0000	T.S.	995	21	30.6	167.3
		0600	T.S.	995	21	30.8	166.5
		1200	T.S.	995	21	31.1	165.5
		1800	T.S.	995	21	31.2	164.1
	24	0000	T.S.	995	21	31.7	163.5
		0600	T.S.	995	21	32.6	161.7
		1200	T.S.	995	21	33.0	159.9
		1800	T.S.	1000	18	33.2	158.3
	25	0000	T.S.	1000	18	33.0	156.5
		0600	T.S.	1000	18	32.8	155.0
			消散 Dissipated				

熱帶風暴洛克(1707)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF
TROPICAL STORM ROKE (1707)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	21	0600	T.D.	1002	13	18.7	123.7
		1200	T.D.	1002	13	19.0	123.0
		1800	T.D.	1002	13	19.8	121.8
	22	0000	T.D.	1002	13	20.9	120.5
		0600	T.D.	1000	16	21.2	118.7
		1200	T.S.	998	18	21.4	117.7
		1800	T.S.	998	18	21.7	116.1
	23	0000	T.S.	998	18	22.3	114.8
		0600	T.D.	1002	13	22.7	113.3
			消散 Dissipated				

熱帶風暴桑卡(1708)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM SONCA (1708)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	21	0000	T.D.	1004	13	17.1	114.8
		0600	T.D.	1004	13	17.6	113.7
		1200	T.D.	1004	13	17.9	113.0
		1800	T.D.	1004	13	17.9	112.6
	22	0000	T.D.	1004	13	17.7	112.5
		0600	T.D.	1000	16	17.7	112.0
		1200	T.D.	1000	16	17.7	111.6
		1800	T.D.	1000	16	17.7	111.6
	23	0000	T.D.	998	16	17.6	111.5
		0600	T.D.	998	16	17.6	111.5
		1200	T.D.	998	16	17.5	111.4
		1800	T.D.	998	16	17.2	111.4
	24	0000	T.D.	998	16	17.2	111.3
		0600	T.D.	998	16	17.2	111.2
		1200	T.S.	994	18	17.1	110.5
		1800	T.S.	994	18	17.2	109.7
	25	0000	T.S.	992	21	17.2	108.9
		0600	T.S.	992	21	17.3	107.7
		1200	T.S.	994	18	16.8	106.5
		1800	T.D.	998	16	16.9	105.4
	26	0000	T.D.	998	13	16.7	104.8
			消散 Dissipated				

颱風納沙(1709)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON NESAT (1709)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	25	1800	T.D.	1002	16	15.0	128.5
	26	0000	T.S.	998	18	15.5	128.2
		0600	T.S.	992	18	16.1	128.2
		1200	T.S.	990	21	16.7	127.9
		1800	T.S.	988	23	17.3	127.8
	27	0000	S.T.S.	984	25	17.9	127.6
		0600	S.T.S.	984	25	18.0	127.4
		1200	S.T.S.	984	25	18.6	127.2
		1800	S.T.S.	980	28	19.3	126.4
	28	0000	S.T.S.	975	31	20.0	125.5
		0600	S.T.S.	975	31	20.5	125.1
		1200	T.	970	33	21.1	124.4
		1800	T.	960	39	21.8	123.6
	29	0000	T.	955	41	22.3	123.3
		0600	T.	955	41	23.4	122.7
		1200	T.	960	39	24.5	121.7
		1800	T.	970	33	25.0	120.3
	30	0000	S.T.S.	975	31	25.8	119.2
		0600	T.S.	990	21	25.9	118.0
		1200	T.D. 消散 Dissipated	992	16	26.0	117.2

熱帶風暴海棠(1710)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM HAITANG (1710)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
七月 JUL	28	0000	T.D.	994	13	19.3	116.8
		0600	T.D.	994	13	19.3	116.3
		1200	T.D.	992	16	18.7	115.9
		1800	T.D.	992	16	18.2	115.9
	29	0000	T.D.	992	16	18.2	116.3
		0600	T.S.	990	18	18.3	116.8
		1200	T.S.	988	21	18.9	117.6
		1800	T.S.	988	21	19.4	118.1
	30	0000	T.S.	988	21	19.9	119.4
		0600	T.S.	985	23	21.7	120.2
		1200	T.S.	985	23	22.9	120.6
		1800	T.S.	988	21	24.6	120.1
	31	0000	T.S.	990	18	26.1	119.1
		0600	T.D.	992	16	26.9	118.0
		1200	T.D. 消散 Dissipated	994	13	27.8	117.2

熱帶風暴尼格(1711)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM NALGAE (1711)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月 AUG	1	0000	T.D.	1004	13	26.6	162.4
		0600	T.D.	1002	16	26.3	163.1
		1200	T.D.	1002	16	25.9	163.7
		1800	T.D.	1002	16	25.7	164.6
	2	0000	T.S.	998	18	25.4	165.7
		0600	T.S.	998	18	25.9	165.5
		1200	T.S.	998	18	25.9	165.3
		1800	T.S.	992	21	26.1	165.0
	3	0000	T.S.	992	21	26.5	164.7
		0600	T.S.	992	21	27.0	164.2
		1200	T.S.	992	21	27.4	163.6
		1800	T.S.	992	21	28.0	163.3
	4	0000	T.S.	992	21	28.4	162.9
		0600	T.S.	992	21	29.0	162.5
		1200	T.S.	992	21	29.9	162.4
		1800	T.S.	992	21	30.7	162.3
	5	0000	T.S.	992	21	32.3	162.2
		0600	T.S.	992	21	33.9	161.8
		1200	T.S. 變為溫帶氣旋 Became Extratropical	992	21	35.7	160.8

強颱風榕樹(1712)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TYPHOON BANYAN (1712)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月 AUG	11	0000	T.D.	1006	13	16.7	170.0
		0600	T.D.	1004	16	17.0	169.0
		1200	T.S.	1002	18	17.5	167.6
		1800	T.S.	1002	18	18.2	166.5
	12	0000	T.S.	995	23	18.9	165.7
		0600	S.T.S.	990	25	19.4	165.1
		1200	S.T.S.	980	31	20.0	164.7
		1800	T.	970	36	20.5	164.4
	13	0000	T.	960	41	21.1	164.1
		0600	T.	960	41	21.5	163.9
		1200	T.	960	41	21.9	163.8
		1800	T.	960	41	22.2	163.7
	14	0000	T.	960	41	22.6	163.5
		0600	T.	960	41	23.3	163.3
		1200	T.	960	41	24.0	163.1
		1800	T.	960	41	24.9	162.8
	15	0000	S.T.	955	43	25.9	162.5
		0600	T.	960	41	27.2	162.2
		1200	T.	965	39	28.5	162.3
		1800	T.	970	36	29.8	162.7
	16	0000	T.	975	33	31.2	163.4
		0600	S.T.S.	980	31	33.5	165.2
		1200	S.T.S.	985	28	35.6	167.5
		1800	S.T.S.	990	25	37.8	170.5
			變為溫帶氣旋 Became Extratropical				

超強颱風天鴿(1713)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON HATO (1713)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月 AUG	20	1200	T.D.	1000	13	19.3	126.5
		1800	T.D.	998	16	19.6	126.3
	21	0000	T.S.	994	18	20.0	125.2
		0600	T.S.	994	18	20.4	124.3
		1200	T.S.	990	21	20.4	122.8
		1800	T.S.	990	21	19.5	120.8
	22	0000	S.T.S.	985	25	20.0	120.1
		0600	T.	975	33	20.5	118.6
		1200	T.	970	36	20.5	117.4
		1800	T.	965	39	21.0	116.0
	23	0000	S.T.	955	46	21.5	114.5
		0300	SuperT.	950	52	21.9	113.7
		0600	S.T.	955	46	22.1	112.9
		0900	T.	970	36	22.4	112.0
		1200	S.T.S.	985	25	22.7	110.9
		1800	T.S.	990	21	22.9	109.2
	24	0000	T.S.	994	18	23.2	107.6
		0600	T.D.	996	16	23.5	106.3
		1200	T.D.	998	13	23.5	104.9
			消散 Dissipated				

強烈熱帶風暴帕卡(1714)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM PAKHAR (1714)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月 AUG	24	1200	T.D.	1000	13	15.5	126.2
		1800	T.D.	998	16	15.3	125.0
	25	0000	T.S.	994	18	15.0	123.9
		0600	T.S.	990	21	15.5	123.0
		1200	T.S.	990	21	16.0	122.3
		1800	T.S.	990	21	16.7	121.2
	26	0000	T.S.	994	18	17.5	119.8
		0600	T.S.	990	21	18.2	118.1
		1200	S.T.S.	985	25	19.4	116.5
		1800	S.T.S.	982	28	20.7	114.9
	27	0000	S.T.S.	980	31	21.9	113.4
		0600	T.S.	990	21	22.8	111.7
		1200	T.D.	1000	13	23.3	110.1
			消散 Dissipated				

颱風珊瑚(1715)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF
TYPHOON SANVU (1715)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月 AUG	27	1800	T.D.	1002	16	19.0	147.2
	28	0000	T.D.	1002	16	19.3	147.1
		0600	T.S.	994	18	19.7	146.9
		1200	T.S.	994	18	20.3	147.3
		1800	T.S.	992	21	20.8	147.5
	29	0000	T.S.	992	21	21.4	147.8
		0600	T.S.	990	23	22.7	147.6
		1200	T.S.	990	23	23.8	146.9
		1800	S.T.S.	985	25	25.3	146.0
	30	0000	S.T.S.	980	28	26.9	144.3
		0600	S.T.S.	980	28	26.8	142.7
		1200	S.T.S.	980	28	26.6	141.4
		1800	S.T.S.	980	28	26.7	141.2
	31	0000	S.T.S.	980	28	26.7	141.8
		0600	S.T.S.	975	31	27.1	141.9
		1200	T.	970	33	27.7	142.1
		1800	T.	965	36	27.7	141.6
九月 SEP	1	0000	T.	955	41	27.2	142.0
		0600	T.	955	41	27.6	142.7
		1200	T.	960	39	28.1	143.6
		1800	T.	970	33	28.5	143.7
	2	0000	S.T.S.	975	31	29.8	144.6
		0600	S.T.S.	975	31	31.4	145.2
		1200	S.T.S.	975	31	33.3	146.6
		1800	S.T.S.	980	28	35.4	148.3
	3	0000	S.T.S.	985	25	38.3	150.2
		0600	S.T.S. 變為溫帶氣旋 Became Extratropical	985	25	41.6	152.7

強烈熱帶風暴瑪娃(1716)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM MAWAR (1716)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
八月 AUG	31	0600	T.D.	1002	13	19.4	118.9
		1200	T.D.	1002	13	19.5	118.9
		1800	T.D.	1000	16	19.6	118.8
九月 SEP	1	0000	T.D.	1000	16	20.0	118.7
		0600	T.D.	1000	16	20.4	118.5
		1200	T.S.	998	18	21.0	118.2
		1800	T.S.	995	21	21.0	117.8
	2	0000	S.T.S.	990	25	21.1	117.3
		0600	S.T.S.	990	25	21.3	117.1
		1200	S.T.S.	990	25	21.5	117.0
		1800	S.T.S.	990	25	21.7	117.0
	3	0000	S.T.S.	990	25	21.9	116.7
		0600	T.S.	992	23	22.3	116.4
		1200	T.S.	995	21	22.6	116.1
		1800	T.S.	998	18	23.0	115.4
	4	0000	T.D. 消散 Dissipated	1002	13	23.3	114.6

熱帶低氣壓古超(1717)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION GUCHOL (1717)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
九月 SEP	5	1800	T.D.	1000	13	20.0	121.4
	6	0000	T.D.	1000	13	20.3	120.4
		0600	T.D.	998	16	20.7	120.0
		1200	T.D.	998	16	21.7	120.1
		1800	T.D.	1000	13	22.2	119.1
	7	0000	T.D.	1000	13	22.8	119.0
		0600	T.D. 消散 Dissipated	1000	13	23.8	119.1

超強颱風泰利(1718)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON TALIM (1718)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
九月 SEP	9	1200	T.D.	1000	13	15.2	142.8
		1800	T.D.	998	16	15.5	141.8
	10	0000	T.S.	994	18	15.7	140.4
		0600	T.S.	990	21	16.3	139.5
		1200	T.S.	990	21	16.9	138.4
		1800	S.T.S.	984	25	17.4	137.2
	11	0000	S.T.S.	975	31	18.2	136.2
		0600	S.T.S.	975	31	18.7	134.7
		1200	T.	970	33	19.4	133.2
		1800	T.	970	33	20.3	131.7
	12	0000	T.	970	33	21.1	130.5
		0600	T.	960	39	22.0	128.8
		1200	T.	960	39	22.6	127.9
		1800	T.	960	39	23.6	126.9
	13	0000	T.	960	39	24.4	126.3
		0600	T.	955	41	24.9	125.8
		1200	S.T.	950	43	25.5	125.4
		1800	S.T.	945	46	26.0	124.9
	14	0000	SuperT.	935	52	26.5	124.6
		0600	SuperT.	935	52	27.1	124.2
		1200	S.T.	940	49	27.3	124.3
		1800	S.T.	940	49	27.7	124.4
	15	0000	S.T.	950	43	28.1	124.6
		0600	S.T.	950	43	28.3	124.9
		1200	T.	955	41	28.4	125.4
		1800	T.	960	39	28.5	125.7
	16	0000	T.	965	36	28.7	126.2
		0600	T.	970	33	28.9	126.7
		1200	T.	970	33	29.3	127.6
		1800	T.	970	33	30.1	128.6
	17	0000	S.T.S.	975	31	30.9	129.9
		0600	S.T.S.	975	31	32.1	131.7
		1200	S.T.S.	975	31	34.2	134.4
		1800	S.T.S.	975	31	37.6	138.4
	18	0000	S.T.S.	975	31	41.2	139.7
		0600	S.T.S. 變為溫帶氣旋 Became Extratropical	975	31	44.3	142.3

強颱風杜蘇芮(1719)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TYPHOON DOKSURI (1719)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
九月 SEP	11	1800	T.D.	1000	13	14.7	123.1
	12	0000	T.D.	1000	13	14.4	121.9
		0600	T.D.	1000	13	14.5	120.7
		1200	T.D.	998	16	14.9	119.6
		1800	T.S.	994	18	14.9	118.2
	13	0000	T.S.	990	23	14.8	117.1
		0600	T.S.	990	23	15.2	116.0
		1200	S.T.S.	984	25	15.6	114.8
		1800	S.T.S.	984	25	15.7	113.7
	14	0000	S.T.S.	980	28	16.0	112.6
		0600	T.	970	36	16.4	111.1
		1200	T.	960	41	17.0	109.9
		1800	T.	960	41	17.3	108.8
	15	0000	S.T.	950	46	17.8	107.3
		0600	T.	960	41	17.8	106.0
		1200	S.T.S.	975	31	18.0	104.5
		1800	T.S.	990	23	18.3	102.9
	16	0000	T.D.	998	16	18.5	101.2
			消散 Dissipated				

熱帶低氣壓 (由九月二十三日至二十五日) 的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION OF 23 - 25 SEPTEMBER

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
九月 SEP	23	1200	T.D.	998	13	17.3	116.7
		1800	T.D.	998	13	17.8	115.0
	24	0000	T.D.	996	16	18.2	113.2
		0600	T.D.	996	16	18.6	111.8
		1200	T.D.	998	13	18.9	110.7
		1800	T.D.	998	13	19.5	109.5
	25	0000	T.D.	996	16	20.1	108.2
		0600	T.D.	998	13	21.1	107.1
			消散 Dissipated				

熱帶低氣壓(由十月九日至十日)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION OF 9 - 10 OCTOBER

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十月 OCT	8	2100	T.D.	1000	13	15.9	113.0
	9	0000	T.D.	1000	13	15.9	112.0
		0600	T.D.	1000	13	16.5	110.6
		1200	T.D.	1000	13	17.3	108.8
		1800	T.D.	1000	13	17.7	106.9
	10	0000	T.D.	1000	13	18.3	105.8
			消散 Dissipated				

強颱風卡努(1720)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TYPHOON KHANUN (1720)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十月 OCT	12	0000	T.D.	1000	13	17.2	126.4
		0600	T.D.	998	16	17.8	124.7
		1200	T.S.	994	18	18.1	123.5
		1800	T.S.	994	18	18.2	122.1
	13	0000	T.S.	994	18	17.8	120.4
		0600	T.S.	990	21	17.5	119.5
		1200	T.S.	988	23	17.2	118.7
		1800	T.S.	988	23	17.1	118.5
	14	0000	S.T.S.	986	25	17.1	118.4
		0600	S.T.S.	980	31	17.8	118.0
		1200	S.T.S.	980	31	18.6	117.6
		1800	T.	970	36	19.5	116.5
	15	0000	S.T.	955	43	20.0	114.9
		0600	T.	960	41	20.5	113.4
		1200	T.	975	33	20.7	112.0
		1800	S.T.S.	986	25	20.7	110.7
	16	0000	T.D.	1000	13	20.1	109.9
			消散 Dissipated				

超強颱風蘭恩(1721)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON LAN (1721)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十月 OCT	15	1200	T.D.	1000	13	9.3	136.8
		1800	T.D.	998	16	9.8	136.7
	16	0000	T.S.	996	18	10.3	136.0
		0600	T.S.	996	18	10.7	135.1
		1200	T.S.	994	21	10.7	134.4
		1800	T.S.	994	21	10.6	133.6
	17	0000	T.S.	990	23	10.6	132.5
		0600	S.T.S.	985	25	10.4	132.3
		1200	S.T.S.	980	28	10.5	132.3
		1800	S.T.S.	975	31	10.7	132.4
	18	0000	S.T.S.	975	31	12.0	132.5
		0600	S.T.S.	975	31	12.9	132.3
		1200	T.	970	33	14.0	131.6
		1800	T.	965	36	14.8	131.1
	19	0000	T.	965	36	15.4	130.2
		0600	T.	965	36	16.2	130.1
		1200	T.	960	39	16.9	130.0
		1800	T.	960	39	17.7	129.9
	20	0000	T.	955	41	18.8	130.0
		0600	S.T.	950	43	19.7	130.0
		1200	SuperT.	935	52	20.1	130.2
		1800	SuperT.	925	57	20.7	130.6
	21	0000	SuperT.	925	57	21.3	131.2
		0600	SuperT.	930	54	22.4	131.9
		1200	SuperT.	930	54	23.7	132.5
		1800	SuperT.	930	54	25.4	133.2
	22	0000	SuperT.	935	52	27.7	133.7
		0600	S.T.	940	46	29.8	134.4
		1200	S.T.	945	43	32.2	136.4
		1800	T.	950	41	34.6	138.1
	23	0000	S.T.S. 變為溫帶氣旋 Became Extratropical	970	31	37.5	141.6

颱風蘇拉(1722)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON SAOLA (1722)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十月 OCT	23	0000	T.D.	1000	13	9.0	147.3
		0600	T.D.	1000	13	9.1	147.1
		1200	T.D.	1000	13	9.3	146.0
		1800	T.D.	1000	13	9.8	144.8
	24	0000	T.D.	1000	13	11.8	143.5
		0600	T.D.	998	16	12.8	141.9
		1200	T.S.	994	18	13.7	139.8
		1800	T.S.	994	18	13.9	137.4
	25	0000	T.S.	990	21	14.3	136.1
		0600	T.S.	990	21	15.2	135.3
		1200	T.S.	985	23	16.5	134.6
		1800	T.S.	985	23	17.0	133.5
	26	0000	T.S.	985	23	17.8	132.6
		0600	T.S.	985	23	18.5	132.0
		1200	T.S.	985	23	19.4	131.1
		1800	T.S.	985	23	20.3	130.4
	27	0000	T.S.	985	23	21.4	129.8
		0600	S.T.S.	982	25	22.3	128.9
		1200	S.T.S.	978	28	23.4	128.3
		1800	S.T.S.	978	28	24.3	128.2
	28	0000	S.T.S.	975	31	25.6	128.1
		0600	T.	970	33	27.0	128.4
		1200	T.	970	33	28.5	129.3
		1800	S.T.S.	975	31	29.9	130.7
	29	0000	S.T.S.	975	31	31.2	132.8
		0600	S.T.S.	978	28	32.4	135.8
		1200	T.S.	985	23	34.8	140.1
			變為溫帶氣旋 Became Extratropical				

熱帶低氣壓(由十月三十一日至十一月二日)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION OF 31 OCTOBER - 2 NOVEMBER

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十月 OCT	31	1200	T.D.	1002	13	7.5	107.8
		1800	T.D.	1002	13	7.5	107.2
十一月 NOV	1	0000	T.D.	1002	13	7.4	107.0
		0600	T.D.	1002	13	7.4	106.7
		1200	T.D.	1002	13	7.5	106.4
		1800	T.D.	1002	13	7.6	106.4
			消散 Dissipated				

颱風達維(1723)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON DAMREY (1723)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十月 OCT	31	1800	T.D.	1002	13	11.1	122.0
十一月 NOV	1	0000	T.D.	1002	13	11.4	120.7
		0600	T.D.	1002	13	12.0	120.2
		1200	T.D.	1002	13	12.2	118.9
		1800	T.D.	1000	16	12.2	118.0
	2	0000	T.S.	998	18	12.2	117.0
		0600	T.S.	995	21	12.6	116.5
		1200	S.T.S.	988	25	12.9	115.6
		1800	S.T.S.	984	28	12.7	114.3
	3	0000	S.T.S.	980	31	12.7	113.4
		0600	T.	975	33	12.7	112.6
		1200	T.	970	36	12.8	111.6
		1800	T.	960	41	12.8	110.6
	4	0000	T.	965	39	12.6	109.2
		0600	S.T.S.	984	28	12.5	108.0
		1200	T.D. 消散 Dissipated	1000	16	12.5	106.5

熱帶風暴海葵(1724)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM HAIKUI (1724)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十一月 NOV	9	1200	T.D.	1002	13	13.8	121.4
		1800	T.D.	1000	16	14.2	120.1
	10	0000	T.D.	1000	16	15.0	118.9
		0600	T.S.	998	18	15.9	118.4
		1200	T.S.	998	18	16.9	117.5
		1800	T.S.	995	21	17.2	116.8
	11	0000	T.S.	992	23	17.6	116.2
		0600	T.S.	992	23	17.7	115.4
		1200	T.S.	995	21	17.8	115.1
		1800	T.S.	998	18	17.8	114.0
	12	0000	T.D. 消散 Dissipated	1002	13	17.7	112.9

熱帶風暴鴻雁(1725)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM KIROGI (1725)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十一月 NOV	17	0900	T.D.	1000	13	10.1	117.0
		1200	T.D.	1000	13	10.2	116.6
		1800	T.D.	998	16	10.5	115.8
	18	0000	T.S.	995	18	11.2	114.4
		0600	T.S.	995	18	11.4	113.2
		1200	T.S.	995	18	11.6	111.8
		1800	T.D.	998	16	11.4	111.2
	19	0000	T.D.	1000	13	10.8	110.4
		0600	T.D.	1000	13	11.1	109.2
		0900	T.D.	1000	13	11.3	108.6
			消散 Dissipated				

熱帶風暴啟德(1726)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM KAI-TAK (1726)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十二月 DEC	14	0000	T.D.	1002	13	11.7	128.0
		0600	T.D.	1000	16	11.1	127.5
		1200	T.S.	998	18	11.1	127.1
		1800	T.S.	996	21	11.2	127.1
	15	0000	T.S.	996	21	11.8	127.7
		0600	T.S.	996	21	11.9	127.5
		1200	T.S.	994	23	11.6	127.5
		1800	T.S.	994	23	12.4	126.4
	16	0000	T.S.	994	23	12.4	126.4
		0600	T.S.	994	23	12.2	125.8
		1200	T.S.	994	23	12.0	125.0
		1800	T.S.	998	18	12.0	124.7
	17	0000	T.D.	1000	16	12.0	124.3
		0600	T.D.	1002	13	12.0	122.7
		1200	T.D.	1002	13	11.5	121.5
		1800	T.D.	1002	13	10.7	120.3
	18	0000	T.D.	1002	13	10.4	119.5
		0600	T.D.	1002	13	10.4	118.8
		1200	T.D.	1002	13	10.4	117.8
		1800	T.D.	1000	16	10.4	116.6
	19	0000	T.S.	998	18	10.0	115.8
		0600	T.S.	998	18	9.3	115.1
		1200	T.S.	998	18	8.8	114.4
		1800	T.S.	998	18	8.6	113.3

熱帶風暴啟德(1726)的每六小時位置及強度 (續)
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM KAI-TAK (1726) (CON'T)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十二月 DEC	20	0000	T.S.	996	21	8.2	112.7
		0600	T.S.	996	21	7.6	111.9
		1200	T.S.	996	21	7.2	111.6
		1800	T.S.	996	21	6.7	110.9
	21	0000	T.S.	996	21	6.7	109.8
		0600	T.S.	998	18	6.5	109.1
		1200	T.D.	1000	16	6.3	108.4
		1800	T.D.	1002	13	6.0	107.4
			消散 Dissipated				

颱風天秤(1727)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON TEMBIN (1727)

月份 Month	日期 Date	時間 (協調世界時) Time (UTC)	強度 Intensity	估計最低中心氣壓 (百帕斯卡) Estimated minimum central pressure (hPa)	估計最高風速 (米每秒) Estimated maximum surface winds (m/s)	北緯 Lat. °N	東經 Long. °E
十二月 DEC	20	1200	T.D.	1002	13	8.7	131.8
		1800	T.D.	998	16	8.7	130.8
	21	0000	T.S.	995	18	8.7	129.4
		0600	T.S.	988	23	8.4	128.8
		1200	T.S.	988	23	8.1	127.7
		1800	T.S.	988	23	8.0	126.8
	22	0000	T.S.	988	23	7.8	125.4
		0600	T.S.	988	23	7.8	123.8
		1200	T.S.	988	23	7.9	122.1
		1800	S.T.S.	984	25	8.0	120.9
	23	0000	S.T.S.	980	28	7.8	120.3
		0600	S.T.S.	975	31	7.6	118.7
		1200	S.T.S.	975	31	7.7	117.4
		1800	S.T.S.	975	31	8.1	115.8
	24	0000	T.	970	33	8.3	114.7
		0600	T.	965	36	8.2	113.3
		1200	T.	965	36	8.3	112.2
		1800	T.	965	36	8.2	110.8
	25	0000	T.	970	33	8.1	109.5
		0600	S.T.S.	980	28	8.1	108.9
		1200	T.S.	988	23	8.4	107.5
		1800	T.S.	995	18	8.5	106.1
	26	0000	T.D.	1002	13	8.4	104.8
			消散 Dissipated				

附件一

超強颱風天鴿(1713)引致香港直接經濟損失的估算

1. 數據收集

(A) 政府部門、公共事業機構及其他組織報告的損失

香港天文台在 2019 年 4 月至 10 月向以下的政府部門、公共事業機構及其他組織進行調查，收集超強颱風天鴿所造成的破壞及經濟損失的數據：

漁農自然護理署、建築署、屋宇署、民航處、土木工程拓展署、渠務署、機電工程署、環境保護署、消防處、食物環境衞生署、政府產業署、路政署、民政事務總署、房屋署、地政總署、康樂及文化事務署、海事處、社會福利署、水務署。

中華電力有限公司、中國移動香港有限公司、城巴有限公司、愉景灣航運服務有限公司、環球全域電訊有限公司、香港中華煤氣有限公司、香港機場管理局、香港寬頻網絡有限公司、香港電燈有限公司、香港紅十字會、香港鐵路有限公司、香港電訊有限公司、香港電車有限公司、國際環球通訊網絡(香港)有限公司、九龍巴士(一九三三)有限公司、新世界第一渡輪服務有限公司、珀麗灣客運有限公司、山頂纜車有限公司、信德中旅船務管理有限公司及天星小輪有限公司。

截至 2019 年 10 月 31 日，政府部門、公共事業機構及其他組織報告的損失共 97,036,855 港元。為避免與(B)保險索償數據重複計算，相關的保險索償已在數據中扣除。

(B) 保險索償數據

因超強颱風天鴿而產生的香港保險索償統計數字由香港保險業聯會根據其成員調查提供。調查共收集了本港 54 間保險公司的數據，根據保險業監管局發佈的 2017 年度一般保險業務的統計數字，這 54 間公司共佔市場份額約 80%。截至 2019 年 3 月，根據調查所得的保險索償數字如下：

	索償總額 (港元)
(i) 財產損壞、業務中斷、工程保險 - 物料損壞	838,973,952
(ii) 僱員補償、汽車及旅遊	47,301,608

按參與調查的機構所佔的市場份額(80%)作調整，天鴿保險索償數字估計為 (838,973,952 港元+ 47,301,608 港元) / 80% = 1,107,844,450 港元

2. 超強颱風天鴿引致直接經濟損失的估算

超強颱風天鴿引致直接經濟損失的估算是 (A)政府部門、公共事業機構及其他組織報告

的損失 (扣除相關的保險索償)及 (B)保險索償數字 (按參與調查的機構的所佔的市場份額作調整)的總和。
= 97,036,855 港元 + 1,107,844,450 港元
= 1,204,881,305 港元 (約 12 億港元)

3. 免責聲明

直接經濟損失的估算是基於香港天文台向政府部門、公共事業機構及其他組織所收集的經濟損失數據、香港保險業聯會向成員收集的保險索償統計數字，以及相關政府報告所作出的。由於所收集的數據並非詳盡無遺，估算的損失亦有可能受到調查回應和分析方法的各種局限所影響，因此直接經濟損失估算僅供參考。

鳴謝

香港天文台感謝所有參與調查的政府部門、公共事業機構及其他組織、香港保險業聯會提供保險索償數字，以及政府統計處為經濟損失調查及估算方法提供的專業意見。

Annex 1
Estimated Direct Economic Losses in Hong Kong caused by Super Typhoon Hato (1713)

1. Data collection

(A) Losses reported by government departments, public utility companies and other organizations

The Hong Kong Observatory conducted a survey to collect data on damages and economic losses caused by Super Typhoon Hato from the following government departments, public utilities and other organizations between April and October 2019:

Agriculture, Fisheries and Conservation Department, Architectural Services Department, Building Services Department, Civil Aviation Department, Civil Engineering and Development Department, Drainage Services Department, Electrical and Mechanical Services Department, Environmental Protection Department, Fire Services Department, Food and Environmental Hygiene Department, Government Property Administrator, Highways Department, Home Affairs Department, Housing Department, Lands Department, Leisure and Cultural Services Department, Marine Department, Social Welfare Department, Water Supplies Department.

China Light and Power Company Limited, China Mobile Hong Kong Company Limited, City Bus Limited, Discovery Bay Transportation Services Limited, HGC Global Communications Limited, Hong Kong and China Gas Company Limited, Hong Kong Airport Authority, Hong Kong Broadband Network Limited, Hong Kong Electric Company Limited, Hong Kong Red Cross, Hong Kong Railway Company Limited, Hong Kong Telecommunications Limited, Hong Kong Tramways Limited, International Global Communications Network (Hong Kong) Limited, Kowloon Motor Bus Company (1933) Limited, New World First Ferry Services Limited, Park Island Transport Company Limited, Peak Tramways Company Limited, Shun Tak China Travel Shipping Management Limited and the “Star” Ferry Company, Limited.

As of 31 October 2019, the losses reported from government departments, public utilities and other organizations amount to HK$ 97,036,855. To avoid double counting the insurance claims data in part (B), items with insurance claims covered have been excluded.

(B) Insurance claims data

The insurance claims statistics incurred by Super Typhoon Hato in Hong Kong are provided by the Hong Kong Federation of Insurers (HKFI) based on its member surveys. The statistics were collected from 54 insurance companies in Hong Kong, accounting for around 80% of the market share according to the Annual Statistics for General Business 2017 issued by the Insurance Authority. The insurance claims incurred as of March 2019 are as follows :

	Total claims incurred (HK$)
(i) Property Damage, Business Interruption and Contractors' All Risks (CAR)	838,973,952
(ii) Employees' Compensation (EC), Motor and Travel	47,301,608

Adjusted by market share of the participating companies (80%), the insurance claims incurred by Hato is estimated to be (HK$ 838,973,952 + HK$ 47,301,608) / 80% = HK$ 1,107,844,450

2. Estimation of direct economic losses caused by Super Typhoon Hato

The estimated direct economic losses due to Hato in Hong Kong are considered to be the sum of **(A)** total reported losses of government departments, public utilities and other organizations (net of related insurance claims) and **(B)** insurance claims (adjusted by market share of companies participating in the survey):
= HK$ 97,036,855 + HK$ 1,107,844,450
= HK$ 1,204,881,305 (around HK$ 1.20 billion)

3. Disclaimer

The estimated direct economic losses are based on the best available information from the responses of government departments, public utilities and other organizations to the survey conducted by the Hong Kong Observatory, statistics on insurance claims collected from the members of the Hong Kong Federation of Insurers and other relevant government reports at the time of assessment. The estimates are for reference only as the data collection are by no means exhaustive and may be subject to various limitations in the survey responses and analysis method.

Acknowledgement

The Hong Kong Observatory gratefully acknowledges the government departments, public utilities and other organizations involved in the survey, the Hong Kong Federation of Insurers for providing insurance claims, and the Census and Statistics Department for providing professional advice to the survey and analysis methods of economic losses.