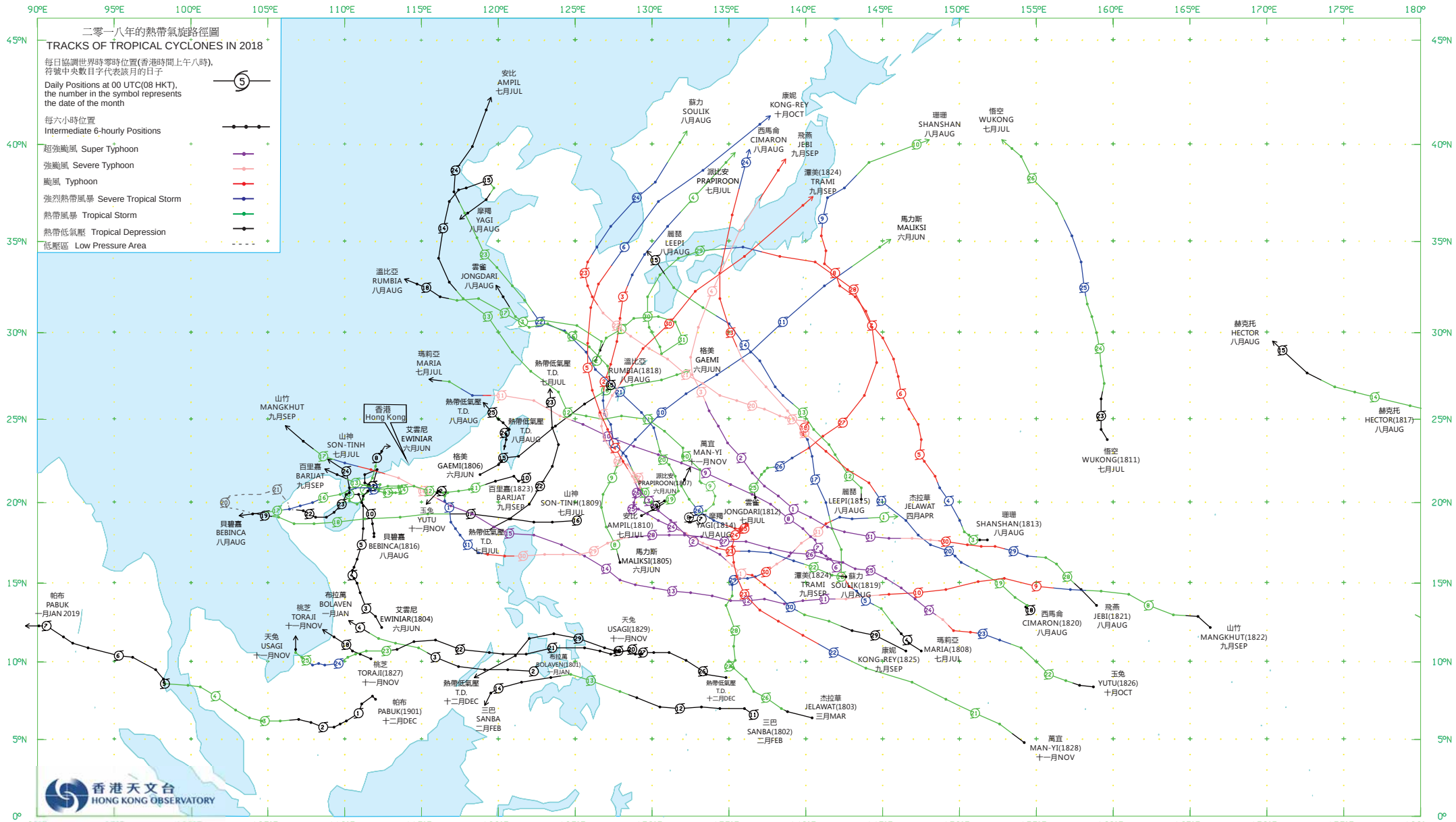
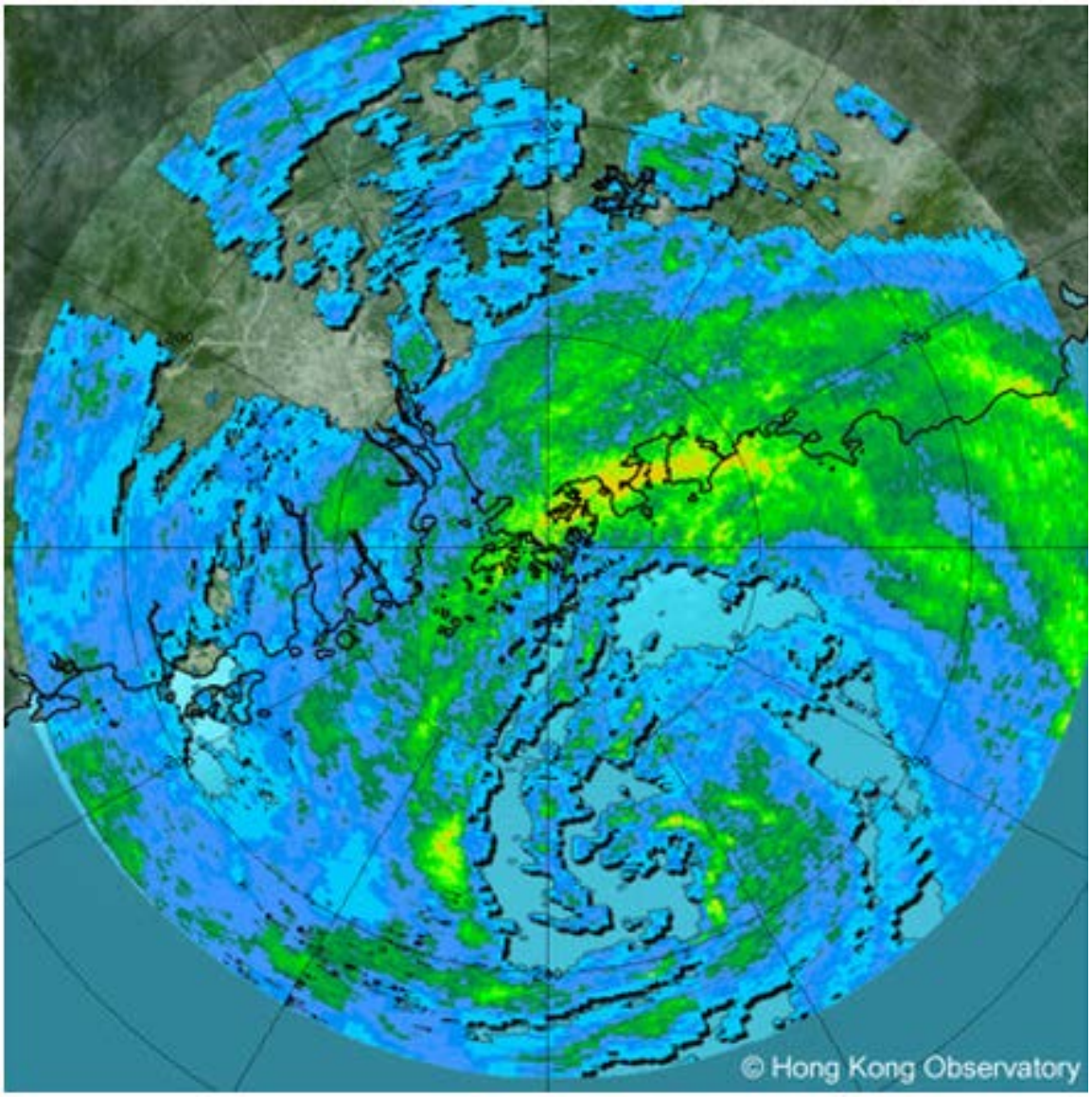

二零一八年的熱帶氣旋路徑圖
TRACKS OF TROPICAL CYCLONES IN 2018
每日協調世界時零時位置(香港時間上午八時),
符號中央數目字代表該月的日子
Daily Positions at 00 UTC(08 HKT),
the number in the symbol represents
the date of the month
每六小時位置
Intermediate 6-hourly Positions
超強颱風 Super Typhoon
強颱風 Severe Typhoon
颱風 Typhoon
強烈熱帶風暴 Severe Tropical Storm
熱帶風暴 Tropical Storm
熱帶低氣壓 Tropical Depression
低壓區 Low Pressure Area
香港
Hong Kong
香港天文台
HONG KONG OBSERVATORY

香港天文台
HONG KONG OBSERVATORY

二零一八年熱帶氣旋

TROPICAL CYCLONES IN 2018



二零二零年一月出版
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香港九龍彌敦道134A

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551.515.2:551.506.1(512.317)

封面

二零一八年九月十六日上午10時24分的雷達回波圖像，當時山竹的強烈螺旋雨帶正影響香港。

Cover

Image of radar echoes at 10:24 a.m. on 16 September 2018. The intense spiral rainband of Mangkhut was affecting Hong Kong at that time.

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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“1801”代表在二零一八年區內第一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，例如熱帶風暴布拉萬（1801）。

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

年報第二節是二零一八年所有影響北太平洋西部及南海區域的熱帶氣旋的概述。

年報第三節是二零一八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。

二零一八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。至於在熱帶氣旋的敍述中，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 2018 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 first tropical cyclone of tropical storm intensity or above, as classified by Japan Meteorological Agency, within the region in 2018 was assigned the code "1801". In this report, the associated code immediately follows the name of the tropical cyclone in bracket, e.g. Tropical Storm Bolaven (1801).

[#] 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 2018 is presented.

The reports in Section 3 are individual accounts of the life history of tropical cyclones affecting Hong Kong in 2018. 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 2018 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 2018 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　　二零一八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 2018

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	翠絲 Trases
中國	China	海葵 Haikui	玉兔 Yutu	風神 Fengshen	杜鵑 Dujuan	木蘭 Mulan
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	軒嵐諾 Hinnamnor
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	妮亞圖 Nyatoh	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 : 在二零一八年，西北太平洋和南海的熱帶氣旋名單上新增了四個新名字「木蘭」、「軒嵐諾」、「翠絲」和「妮亞圖」分別取代舊有名字「海馬」、「洛坦」、「莎莉嘉」和「莫蘭蒂」。

Note: In 2018, four new names "Mulan", "Hinnamnor", "Trases" and "Nyatoh" have been adopted for tropical cyclones in the western North Pacific and the South China Sea, replacing "Haima", "Nock-ten", "Sarika" and "Meranti" 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

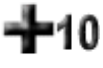
Refer to the wind sensor at the middle of the north runway

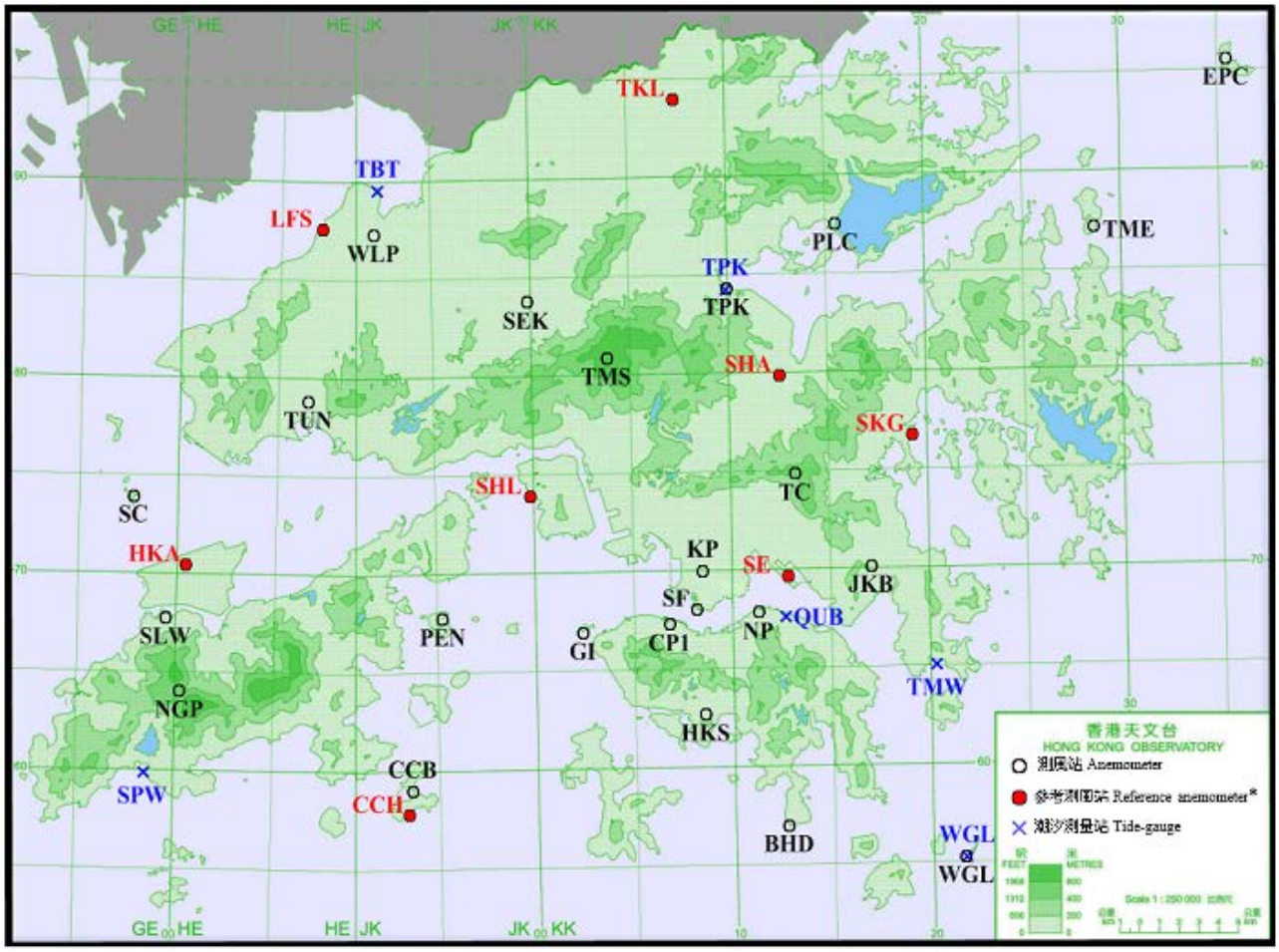
* 參考測風站

* Reference anemometer

表 1.4　　二零一八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 2018

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

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
TME	塔門東 Tap Mun East	SPW	石壁 Shek Pik
TC	大老山 Tate's Cairn	TBT	尖鼻咀 Tsim Bei Tsui
TPK	大埔滘 Tai Po Kau	TMW	大廟灣 Tai Miu Wan
		TPK	大埔滘 Tai Po Kau
		WGL	橫瀾島 Waglan Island

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

第二節　　二零一八年熱帶氣旋概述

2.1　二零一八年的熱帶氣旋回顧

2.1.1 北太平洋西部（包括南海區域）的熱帶氣旋

二零一八年有33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），多於1961-2010年約30個的長期年平均數目。全年有13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，其中有七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是二零一八年在北太平洋西部及南海區域熱帶氣旋數目之逐月分佈。

二零一八年內有11個熱帶氣旋在中國登陸，其中三個在香港300公里內的華南沿岸登陸，兩個橫過台灣。兩個熱帶氣旋登陸朝鮮半島，五個登陸日本，六個橫過菲律賓及四個登陸越南。九月的超強颱風山竹(1822)及十月的超強颱風玉兔(1826)（圖2.3a及2.3b）是二零一八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250公里，而最低海平面氣壓為900百帕斯卡（表4.1）。

2.1.2 香港責任範圍內的熱帶氣旋

在二零一八年的33個熱帶氣旋中，有17個出現在香港責任範圍（即北緯10至30度、東經105至125度），稍多於 1961-2010年約16個的長期年平均數目（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393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

二零一八年共有12個熱帶氣旋影響南海區域 (即北緯10至25度、東經105至120度)，與1961-2010年約12個的長期年平均數目相約，當中有六個在南海上形成。

2.1.4 影響香港的熱帶氣旋

二零一八年香港的颱風季節始於六月五日，當天隨著熱帶低氣壓艾雲尼(1804)掠過海南島以東海域，天文台發出一號戒備信號。十一月二日隨著徘徊在南海東北部的熱帶低氣壓玉兔(1826)明顯減弱，二零一八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。

年內共有六個熱帶氣旋影響香港（圖2.2），接近1961-2010年約六個的長期年平均數目(表2.2)。這六個熱帶氣旋分別為六月的熱帶風暴艾雲尼(1804)、七月的熱帶風暴山神(1809)、八月的強烈熱帶風暴貝碧嘉(1816)、九月的超強颱風山竹(1822)及熱帶風暴百里嘉(1823)、和十月至十一月的超強颱風玉兔(1826)。山竹影響香港期間，天文台在九月十六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，也是繼二零一七年天鴿後再次發出最高級別的熱帶氣旋警告信號，並持續了10小時，是戰後第二最長的十號颶風信號，僅次於一九九九年約克的11小時。其餘五個影響香港的熱帶氣旋均引致天文台發出三號強風信號。當中熱帶風暴山神(1809)引致天文台兩度發出熱帶氣旋警告，而強烈熱帶風暴貝碧嘉(1816) 長時間在廣東西部沿海一帶徘徊，引致熱帶氣旋警告信號連續生效了132小時5分鐘，是一九四六年以來的第三最長。

2.1.5 熱帶氣旋的雨量

二零一八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723.7毫米（表4.8.1），約佔年內總雨量2162.9毫米的百分之33.5，比1961-2010年長期年平均值的728.8毫米少約1%。

強烈熱帶風暴貝碧嘉(1816)為天文台總部帶來236.4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

這一節逐月介紹二零一八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

熱帶低氣壓布拉萬(1801)於一月二日早上在菲律賓附近、馬尼拉之東南偏南約600公里形成，向西至西北偏西方向移動，橫過南海南部。翌日布拉萬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。隨後布拉萬開始減弱，最後於一月四日上午在越南南部附近海域減弱為一個低壓區。

根據報章報導，布拉萬為菲律賓帶來狂風暴雨，引發嚴重水浸及山泥傾瀉，造成至少三人死亡。最後於一月十日清晨在蘇祿海上減弱為一個低壓區。

二月

熱帶低氣壓三巴(1802)於二月十一日早上在雅蒲島之西南偏南約360 公里的北太平洋西部上形成，向西至西北偏西移向菲律賓南部。三巴於二月十三日凌晨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。當晚三巴減弱為熱帶低氣壓，最後於二月十四日晚上在蘇祿海上減弱為一個低壓區。

根據報章報導，三巴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14人死亡。

三月至四月

熱帶低氣壓杰拉華(1803)於三月二十五日下午在雅蒲島之東南約430公里的北太平洋西部形成，翌日增強為熱帶風暴，向西北移動。杰拉華於三月二十七日轉向北移動，三月二十九日減慢向東漂移，並繼續發展。杰拉華翌日轉向東北移動並一度增強為超強颱風及達到其最高強度，中心附近最高持續風速估計為每小時195公里。隨後開始迅速減弱及向東移動，最後於四月一日在硫黃島東南之北太平洋西部消散。

五月

二零一八年五月並無熱帶氣旋在北太平洋西部及南海區域上形成。

六月至十一月

熱帶低氣壓艾雲尼(1804)於六月二日晚上在西沙以南約510公里的南海南部上形成，向西北偏北移動。六月四日艾雲尼轉向北至東北偏北方向移動，翌日掠過海南島以東海域。六月六日艾雲尼移動減慢，並增強為熱帶風暴，在雷州半島以東及海南島東北部打圈徘徊。六月七日早上艾雲尼達到其最高強度，中心附近最高持續風速估計為每小時75公里，並開始穩定地向東北偏北方向移動，晚上在廣東西部海岸陽江市附近登陸，並逐漸減弱，最後於六月八日晚上在廣東內陸減弱為一個低壓區。

根據報章報導，艾雲尼為海南、廣東、廣西、福建及湖南帶來暴雨，多處出現水浸及山泥傾瀉，共造成至少五人死亡，超過21萬人受災。

熱帶低氣壓馬力斯(1805)於六月八日清晨在馬尼拉之東北偏東約760公里的北太平洋西部上形成，初時向西北偏北移動並逐漸增強。翌日馬力斯採取東北路徑移向日本以南海

域，當晚增強為強烈熱帶風暴，六月十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110公里。最後馬力斯在六月十二日於日本以東的海域演變為一股溫帶氣旋。

熱帶低氣壓格美(1806)於六月十四日在高雄之西南約180公里的南海東北部上形成，向東北移動，翌日橫過台灣南部。格美於六月十六日在沖繩島附近增強為熱帶風暴，向東北偏東移動，當晚達到其最高強度，中心附近最高持續風速估計為每小時75公里。翌日格美在日本以南海域演變為一股溫帶氣旋。

根據報章報導，格美吹襲台灣期間，高雄市13,500戶停電，兩艘油輪擱淺。格美在沖繩島引發多處水浸及山泥傾瀉，至少兩人受傷。

熱帶低氣壓派比安(1807)於六月二十九日清晨在沖繩島之東南偏南約750公里的北太平洋西部上形成，大致向西北偏北方向移動並逐漸增強。七月一日派比安轉向北至東北移動，翌日早上增強為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120公里。隨後派比安開始減弱，最後於七月四日在本州以北的海域演變為一股溫帶氣旋。

根據報章報導，派比安吹襲沖繩期間，至少有四人受傷。派比安為日本九州及四國帶來狂風大雨，造成至少一死16傷。九州有逾5萬戶停電。派比安亦在韓國造成最少一人死亡及一人失蹤。

熱帶低氣壓瑪莉亞(1808)於七月三日晚上在關島之東南約430公里的北太平洋西部上形成，大致向西北方向移動並迅速增強。瑪莉亞於七月六日早上增強為超強颱風，於七月九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220公里。瑪莉亞先後掠過沖繩島以南海域及台灣以北海域，並逐漸減弱，七月十一日早上在福建沿岸登陸，翌日在江西消散。

根據報章報導，瑪莉亞在台灣造成至少一死八傷，約126,000戶停電。瑪莉亞吹襲福建和浙江期間，亦造成至少一人死亡，九人失蹤，約55萬人受災，多處地方出現海水倒灌。

熱帶低氣壓山神(1809)於七月十六日早上在馬尼拉之東北約650公里的北太平洋西部上形成，當日向西迅速橫過呂宋海峽，翌日進入南海北部後繼續迅速移動，中午前增強為熱帶風暴，七月十八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85公里。山神橫過海南島及北部灣後，於七月十九日在越南北部減弱為一個低壓區，其殘餘當日繼續向西移入內陸。與山神相關的殘餘低壓區於七月二十日在中南半島向東迴轉，移向北部灣。它於七月二十二日在北部灣再度增強為熱帶低氣壓，並向東北移動掠過海南島西北部，其後在七月二十三日轉向北橫過雷州半島。山神於七月二十四日在廣西消散。

根據報章報導，山神吹襲海南島期間，海陸空交通大受影響。山神及其殘餘亦為越南帶來暴雨，造成至少32人死亡，17人失蹤，超過5 000間房屋倒塌。

熱帶低氣壓安比(1810)於七月十八日晚上在沖繩島之東南偏南約800公里的北太平洋西部上形成，初時移動緩慢。安比翌日增強為熱帶風暴，並採取西北路徑朝東海方向移動。安比於七月二十日晚上進一步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。安比於七月二十二日下午橫過江蘇一帶並減弱，翌日繼續橫掃山東及河北，七月二十四日在中國東北部演變為一股溫帶氣旋。

根據報章報導，安比在中國造成最少一人死亡，近180萬人受災，直接經濟損失達11.9億元人民幣。

一個熱帶低氣壓於七月二十一日在東沙之東南約390公里的南海北部上形成，向東北方向橫過呂宋海峽，移向台灣以東海域。該熱帶低氣壓於七月二十二日清晨達其最高強度，中心附近最高持續風速估計為每小時55公里。隨後該熱帶低氣壓轉向北移動，翌日在東海減弱為一個低壓區。

熱帶低氣壓悟空(1811)於七月二十二日晚上在威克島之西北約890公里的北太平洋西部上形成，大致向偏北方向移動，並逐漸增強。悟空於七月二十五日增強為強烈熱帶風暴，並達其最高強度，中心附近最高持續風速估計為每小時105公里。七月二十六日悟空於日本以東海域演變為一股溫帶氣旋。

熱帶低氣壓雲雀(1812)於七月二十五日在硫黃島之西南約690公里的北太平洋西部上形成，大致向東北方向移動，並逐漸增強。雲雀於七月二十六日晚上增強為颱風，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140公里。雲雀於七月二十九日先後橫掃日本本州南部及九州北部，並減弱為熱帶風暴。隨後兩天雲雀以逆時針方向在九州以南海域轉了一個圈，然後於八月一日以西南偏南路徑橫過東海。八月二日早上雲雀向北迴轉，隨後向西加速。雲雀於八月三日日間在上海沿岸登陸及移入內陸，晚間在江蘇減弱為一個低壓區。

根據報章報導，雲雀吹襲日本期間，造成至少24人受傷，超過15萬戶停電，逾400班航班取消。

熱帶低氣壓珊珊(1813)於八月二日晚上在關島之東北偏東約880公里的北太平洋西部上形成，初時向西方向移動。珊珊於八月三日開始採取西北偏北路徑移向日本，並逐漸增強。珊珊於八月四日增強為颱風，並於八月七日達到其最高強度，中心附近最高持續風速估計為每小時145公里。隨後珊珊逐漸減弱，於八月九日掠過日本關東沿岸地區，並轉向東

北方向移動。翌日珊珊在日本以東的海域演變為一股溫帶氣旋。根據報章報導，珊珊吹襲日本期間，造成至少六人受傷。

熱帶低氣壓摩羯(1814)於八月七日在沖繩島之東南約980公里的北太平洋西部上形成，初時移動緩慢。翌日摩羯增強為熱帶風暴，並於隨後數天移向沖繩島。摩羯掠過沖繩島以南海域後，採取西北路徑橫過東海，八月十二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。摩羯登陸浙江沿岸後，移入內陸及減弱，摩羯於八月十五日移出渤海並再度短暫增強為熱帶風暴，最後於八月十六日在山東減弱為一個低壓區。

根據報章報導，摩羯吹襲華東期間造成至少二人死亡。

熱帶低氣壓貝碧嘉(1816)於八月九日在香港之西南約540公里的南海北部上形成，向北緩慢移動，在八月十一日接近正午於廣東西部陽江附近登陸。隨後貝碧嘉以逆時針方向在廣東西部沿岸地區徘徊及於當晚移回沿岸海域，八月十二日貝碧嘉向東南漂移並增強為熱帶風暴，它於八月十三日至十四日以逆時針方向在廣東西部沿岸海域徘徊，八月十五日貝碧嘉加速向西南偏西移動，並增強為強烈熱帶風暴，達到其最高強度，中心附近的最高持續風速估計為每小時90公里。翌日貝碧嘉橫過北部灣，八月十七日在越南北部登陸及在內陸減弱為一個低壓區。

根據報章報導，貝碧嘉為廣東、廣西及海南帶來狂風暴雨，造成最少三人死亡、二人失蹤。貝碧嘉吹襲越南期間，多處有水浸及山泥傾瀉，至少有10人死亡，三人失蹤。

熱帶低氣壓麗琵(1815)於八月十一日晚上在硫黃島之東南偏南約560公里的北太平洋西部上形成，向西北移動並逐漸增強。麗琵於八月十三日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。麗琵於八月十五日橫過日本九州，隨後在朝鮮半島以南海域減弱為一個低壓區。 根據報章報導，麗琵為日本九州帶來狂風暴雨，一人被強風吹倒墮海重傷。

赫克托(1817)在北太平洋東部上形成，八月十四日凌晨以熱帶風暴強度越過國際換日線進入北太平洋西部，中心附近最高持續風速估計為每小時75公里。赫克托向西北偏西方向移動並繼續減弱，翌日在海上消散。

熱帶低氣壓溫比亞(1818)於八月十五日早上在沖繩島之西北偏北約90公里的北太平洋西部上形成，下午增強為熱帶風暴，向西北或西北偏西移動，橫過東海。溫比亞於八月十六日晚上達到其最高強度，中心附近最高持續風速估計為每小時85公里。溫比亞於八月十七日早上登陸上海沿岸，採取西北偏西路徑移入內陸並逐漸減弱，翌日晚上在河南減弱為一個低壓區。

根據報章報導，溫比亞在華東及華中共造成至少22人死亡及七人失踪，超過一千萬人受災，直接經濟損失接近50億元人民幣。

熱帶低氣壓蘇力(1819)於八月十六日在關島之西北約190公里的北太平洋西部上形成，大致採取偏北路徑移動，並逐漸增強。蘇力於八月十八日在硫黃島以西的海域增強為強颱風，並轉向西北偏西移動，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165公里。隨後蘇力先後橫過東海及黃海，並逐漸減弱，八月二十三日轉向東北移動，晚上減弱為強烈熱帶風暴並橫過朝鮮半島。蘇力於翌日晚間在日本本州以北的海域上演變為一股溫帶氣旋。

根據報章報導，蘇力吹襲韓國期間，一人被大浪捲走失蹤、兩人受傷。而蘇力在日本奄美大島亦造成至少一人受傷，逾2萬戶停電。

熱帶低氣壓西馬侖(1820)於八月十八日早上在關島以東約1060公里的北太平洋西部上形成，採取西北路徑移向日本以南海域，並逐漸增強。西馬侖於八月二十二日增強為強颱風，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。西馬侖於八月二十三日晚間先後橫掃日本四國及本州西部，八月二十四在日本本州以北的海域上演變為一股溫帶氣旋。

根據報章報導，西馬侖為日本帶來狂風暴雨，引致山泥傾瀉，造成至少三人死亡、22人受傷，近10萬戶停電。

一個在南海東北部形成及徘徊在台灣附近的低壓區於八月二十三日上午在高雄以北約40公里處發展為一個熱帶低氣壓，其中心附近最高持續風速估計為每小時55公里。該熱帶低氣壓移動緩慢，當日在台灣西部徘徊，翌日向西北移動，橫過台灣海峽。它於八月二十五日早上在福建沿岸登陸，日間在福建內陸減弱為一個低壓區。

根據報章報導，該熱帶低氣壓為台灣帶來狂風暴雨，引致多處水浸，造成至少七人死亡、119人受傷。

熱帶低氣壓飛燕(1821)於八月二十七日晚上在關島以東約1 520公里的北太平洋西部上形成，初時向西北方向移動並迅速增強。飛燕於八月二十九日增強為颱風並轉向西移動，於八月三十一日進一步發展為超強颱風，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230公里。隨後兩天飛燕逐漸由西北轉向偏北移動，靠近日本以南海域，並減弱為強颱風。九月四日日間飛燕先後橫掃日本四國東部、大阪灣及本州的關西地區，翌日在北海道以西的海域演變為一股溫帶氣旋。

根據報章報導，飛燕為日本帶來狂風暴雨，廣泛地區受嚴重破壞，至少有11人死亡、超過680人受傷，超過200萬戶停電。飛燕所引發的嚴重風暴潮令大阪一帶錄得當地歷來的最高水位，沿岸地區嚴重水浸，當中關西國際機場需要全面關閉三日，超過5 000名乘客滯留機場。

熱帶低氣壓山竹(1822)於九月七日在關島以東約2 330公里的北太平洋西部上形成，隨後數天迅速向西移動，並逐漸增強，於九月十一日發展為超強颱風。山竹在九月十四日轉向西北移動，在登陸呂宋前達到其最高強度，中心附近的最高持續風速估計為每小時250公里。山竹橫過呂宋北部後減弱，並繼續迅速以西北路徑橫過南海北部，移近廣東沿岸。山竹在九月十六日上午減弱為強颱風，黃昏前在廣東台山附近登陸，隨後移入廣東西部及進一步減弱。翌日晚上山竹在廣西減弱為一個低壓區。

根據報章報導，山竹為呂宋帶來狂風暴雨。最少有82人死亡、138人受傷及兩人失蹤，約15 000房屋倒塌。山竹為珠江口沿岸帶來破壞性的風力及嚴重的風暴潮，多處建築物及沿岸設施受損，低窪地區嚴重水浸。澳門有40人受傷，超過5 500人撤離，有多宗建築物損毀報告。內港水浸高度曾達1.9米或以上。山竹亦在廣東、廣西、海南、貴州及雲南造成至少六人死亡，接近330萬人受災。

熱帶低氣壓百里嘉(1823)於九月十日早上在高雄之東南約200公里的海域上形成，大致向偏西方向移動，橫過南海北部。百里嘉於九月十一日增強為熱帶風暴，翌日晚上達到最高強度，中心附近最高持續風速估計為每小時85公里。九月十三日百里嘉橫過雷州半島及減弱，傍晚在廣西內陸消散。根據報章報導，受百里嘉影響，湛江及茂名共有4萬人需要撤離。

熱帶低氣壓潭美(1824)於九月二十一日晚在關島之西北約320公里的北太平洋西部上形成，向西北偏西方向移動，並迅速增強。潭美於九月二十三日增強為颱風，翌日進一步增強為超強颱風。潭美於九月二十五日清晨達到其最高強度，中心附近最高持續風速估計為每小時220公里。當晚它轉向東北偏北方向緩慢移動，並開始減弱。隨後數天潭美逐漸移向琉球群島一帶，於九月二十九日掠過沖繩島後，採取東北路徑移向日本本州。潭美於九月三十日晚間橫過本州，翌日在本州東北部演變為一股溫帶氣旋。

根據報章報導，潭美吹襲日本期間造成至少五人死亡、一人失蹤及200人受傷，逾130萬戶停電。受潭美影響，日本海陸空交通幾乎癱瘓，超過十萬旅客受影響。

熱帶低氣壓康妮(1825)於九月二十九日清晨在關島之東南偏南約370公里的北太平洋西部上形成，向西北偏西移動，並迅速增強。康妮於九月三十日晚增強為颱風，翌日晚上進一步增強為超強颱風，十月二日早上達到最高強度，中心附近最高持續風速估計為每小

時230公里。十月三日康妮開始逐漸減弱並繼續移向琉球群島一帶。康妮於十月五日及六日先後掠過濟州島及朝鮮半島南部，最後於十月七日在北海道附近演變為一股溫帶氣旋。

根據報章報導，康妮為日本帶來狂風暴雨，造成最少一人死亡、十人受傷，沖繩縣和鹿兒島縣有逾四萬戶停電。康妮吹襲韓國期間亦造成至少兩人死亡和一人失蹤，超過六萬戶停電。

熱帶低氣壓玉兔(1826)於十月二十一日下午在關島之東南偏東約1 620公里的北太平洋西部上形成，大致向西北方向移動並迅速增強。玉兔於十月二十四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250公里。玉兔於十月二十六日及二十七日轉向西至西南偏西移動及開始逐漸減弱，十月三十日橫過呂宋後進入南海中部並減弱為颱風。玉兔於翌日進一步減弱為強烈熱帶風暴並轉向西北移動，橫過南海東北部。玉兔於十一月一日向偏北方向緩慢移動，晚上減弱為熱帶風暴。受華南乾燥東北季候風影響，翌日玉兔進一步減弱為熱帶低氣壓並在南海東北部徘徊，最後於晚上減弱為低壓區。

根據報章報導，玉兔吹襲塞班島期間造成至少兩人死亡及133人受傷，多處地方停電。玉兔為菲律賓北部帶來狂風暴雨並引發山泥傾瀉及水浸，造成最少20人死亡。

熱帶低氣壓桃芝(1827)於十一月十七日下午在胡志明市以東約550公里的南海南部上形成，大致採取西北路徑移向越南南部，其中心附近最高持續風速估計為每小時55公里。翌日下午桃芝在越南南部登陸並迅速減弱為低壓區。

根據報章報導，桃芝影響越南期間造成至少19人死亡。

熱帶低氣壓天兔(1829)於十一月二十日上午在馬尼拉之東南偏東約 940公里的菲律賓以東海域上形成，向西橫過菲律賓南部。天兔於十一月二十二日橫過南海南部，翌日增強為熱帶風暴並向西南偏西方向移動。天兔於十一月二十四日進一步增強為強烈熱帶風暴，並達其最高強度，中心附近最高持續風速估計為每小時90公里。天兔於十一月二十五日轉向西北方向移動，日間登陸越南南部並減弱，最後於翌日在越南南部減弱為低壓區。

根據報章報導，天兔為菲律賓帶來暴雨及水浸，造成最少一人死亡。天兔吹襲越南期間亦引發水浸，造成至少兩人死亡。

熱帶低氣壓萬宜(1828)於十一月二十日晚上在關島之東南1 420公里的北太平洋西部上形成，向西北偏西移動並逐漸增強。萬宜於十一月二十二日增強為颱風，翌日轉向偏北方向移動並達到最高強度，中心附近最高持續風速估計為每小時145公里。隨後兩天萬宜移動緩慢並在呂宋以東海域徘徊。萬宜於十一月二十六日轉向西北方向移動並迅速減弱，最後於翌日清晨在西北太平洋上減弱為低壓區。

十二月

一股熱帶低氣壓於十二月二十五日晚上在馬尼拉之東南偏東約1630公里的北太平洋西部上形成，採取西至西北偏西路徑移向菲律賓中部，其中心附近最高持續風速估計為每小時55公里。該熱帶低氣壓於十二月二十九日橫過菲律賓中部後轉向西南方向移動，翌日早上在蘇祿海上減弱為低壓區。

根據報章報導，該熱帶低氣壓為菲律賓帶來暴雨並引發山泥傾瀉，造成156人死亡，26人失蹤及105人受傷。

熱帶低氣壓帕布(1901)於二零一八年十二月三十一日下午在胡志明市之東南偏東約690公里的南海南部上形成，向西南偏西移向越南以南海域。帕布於二零一九年一月二日轉向偏西方向移動，翌日增強為熱帶風暴並橫過泰國灣。帕布於一月四日清晨達到其最高強度，中心附近最高持續風速估計為每小時85公里。帕布於當晚橫過馬來半島並減弱，翌日進入安達曼海並進一步減弱為熱帶低氣壓，最後於一月七日在孟加拉灣減弱為低壓區。

根據報章報導，帕布為越南帶來暴雨，造成最少一人死亡、六人受傷。根據泰國氣象局記錄，帕布是自1951年有記錄以來首個在一月橫過泰國的熱帶氣旋，吹襲泰國期間帶來狂風暴雨，引發水浸及山泥傾瀉，造成至少八人死亡。帕布亦在馬來西亞也造成最少一人死亡。

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 2018

2.1 Review of tropical cyclones in 2018

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

In 2018, a total of 33 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°, more than the long-term (1961 - 2010) average figure of around 30. During the year, 13 of the tropical cyclones attained typhoon intensity or above, less than the long-term average (1961 - 2010) of about 15, with seven 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 2018.

During the year, 11 tropical cyclones made landfall over China, with three of them crossing the south China coast within 300 km of Hong Kong and two crossed Taiwan. Two tropical cyclones made landfall over the Korean Peninsula, five made landfall over Japan, six traversed the Philippines and four made landfall over Vietnam. With an estimated maximum sustained wind speed of 250 km/h and a minimum sea-level pressure of 900 hPa near their centres (Table 4.1), Super Typhoon Mangkhut (1822) in September and Super Typhoon Yutu (1826) in October (Figure 2.3a and 2.3b) were the most intense tropical cyclones over the western North Pacific and the South China Sea in 2018.

2.1.2 Tropical cyclones in Hong Kong's area of responsibility

Amongst the 33 tropical cyclones in 2018, 17 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), slightly 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, 393 tropical cyclone warnings to ships and vessels were issued by the Hong Kong Observatory in 2018 (Table 4.2).

2.1.3 Tropical cyclones over the South China Sea

12 tropical cyclones affected SCS bounded by 10°N, 25°N, 105°E and 120°E in 2018, on par with the long-term annual average of around 12. Six of them formed within SCS.

2.1.4 Tropical cyclones affecting Hong Kong

In 2018, the typhoon season in Hong Kong started on 5 June when Tropical Depression Ewiniar (1804) skirted past the sea areas east of Hainan Island, necessitating the issuance of the Standby Signal No. 1. The typhoon season ended with the cancellation of all tropical cyclone warning signals on 2 November with Tropical Depression Yutu (1826) lingering over the northeastern part of the South China Sea weakened significantly that day.

Six tropical cyclones affected Hong Kong during 2018 (Figure 2.2), close to the long-term (1961-2010) average of about six in a year (Table 2.2). They were Tropical Storm Ewiniar (1804) in June, Tropical Storm Son-Tinh (1809) in July, Severe Tropical Storm Bebinca (1816) in August, Super Typhoon Mangkhut (1822) and Tropical Storm Barijat (1823) in September, and Super

Typhoon Yutu (1826) in October to November. After Hato in 2017, the No.10 Hurricane Signal was issued by the Hong Kong Observatory again during the passage of Mangkhut on 16 September. It was the highest tropical cyclone warning signal issued in 2018. The Signal No. 10 lasted for ten hours which was the second longest duration since World War II, just after the 11 hours of York in 1999. The rest of the five tropical cyclones all necessitated the issuance of the Strong Wind Signal No. 3 in Hong Kong. Moreover, Tropical Storm Son-Tinh (1809) necessitated the issuance of the tropical cyclone warning signals on two separate occasions. Severe Tropical Storm Bebinca (1816) lingered over the seas off the coast of western Guangdong for a rather long time. The tropical cyclone warning signals had been in force for 132 hours and 5 minutes, making it the third longest since 1946.

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 2018 was 723.7 mm (Table 4.8.1). This accounted for approximately 33.5 % of the year's total rainfall of 2162.9 mm and was about 1 % below the 1961-2010 long-term average of 728.8 mm.

Severe Tropical Storm Bebinca (1816) brought 236.4 mm of rainfall to the Hong Kong Observatory Headquarters (Table 4.8.1) and was the wettest tropical cyclone in 2018.

2.2 Monthly overview

A monthly overview of tropical cyclones in 2018 is given in this section. Detailed reports on tropical cyclones affecting Hong Kong, including reports of damage, are presented in Section 3.

JANUARY

Bolaven (1801) formed as a tropical depression near the Philippines about 600 km south-southeast of Manila on the morning on 2 January. It moved west to west-northwestwards across the southern part of the South China Sea. Bolaven intensified into a tropical storm the next day and reached peak intensity with an estimated maximum sustained wind of 65 km/h near its centre. It then started to weaken and finally degenerated into an area of low pressure over the sea areas off the southern part of Vietnam on the morning of 4 January.

According to press reports, torrential rain and squalls brought by Bolaven caused severe flooding and landslides in the Philippines, leaving at least three people dead.

FEBURARY

Sanba (1802) formed as a tropical depression over the western North Pacific about 360 km south-southwest of Yap on the morning on 11 February. It moved west to west-northwestwards towards the southern part of the Philippines. Sanba intensified into a tropical storm in the small hours of 13 February and reached peak intensity with an estimated maximum sustained wind of 65 km/h near its centre. It weakened into a tropical depression that night, before finally degenerating into an area of low pressure over the Sulu Sea on the night of 14 February.

According to press reports, torrential rain and squalls brought by Sanba caused severe flooding and landslides in the Philippines, leaving at least 14 people dead.

MARCH TO APRIL

Jelawat (1803) formed as a tropical depression over the western North Pacific about 430 km southeast of Yap on the afternoon of 25 March. It intensified into a tropical storm the next day and moved northwestwards. Jelawat turned northwards on 27 March and slowed down on 29 March, drifting eastwards and continuing to develop. Jelawat turned northeastwards the next day and attained super typhoon intensity, reaching its peak intensity with an estimated sustained wind of 195 km/h near its centre. It subsequently weakened rapidly while tracking eastwards. It finally dissipated over the western North Pacific southeast of Iwo Jima on 1 April.

MAY

No tropical cyclone formed over the western North Pacific and the South China Sea in May 2018.

JUNE TO NOVEMBER

Ewiniar (1804) formed as a tropical depression over the southern part of the South China Sea about 510 km south of Xisha on the night of 2 June and moved north-northwestwards. Ewiniar turned to move north to north-northeastwards on 4 June and skirted past the sea areas east of Hainan Island the next day. Slowing down and intensifying into a tropical storm on 6 June, it lingered and made a loop east of Leizhou Peninsula and the northeastern part of Hainan Island. Ewiniar reached its peak intensity with an estimated sustained wind of 75 km/h near its centre on the morning of 7 June and started to move steadily north-northeastwards, making landfall near Yangjiang across the coast of western Guangdong that night. It weakened gradually and finally degenerated into an area of low pressure over the inland areas of Guangdong on the night of 8 June.

According to press reports, Ewiniar brought torrential rain to Hainan, Guangdong, Guangxi, Fujian and Hunan, with flooding and landslides reported in many places. At least five people were killed and over 210 000 people were affected.

Maliksi (1805) formed as a tropical depression over the western North Pacific about 760 km east-northeast of Manila on the early morning of 8 June. It moved north-northwestwards at first and intensified gradually. Maliksi then turned to the northeast towards the sea areas south of Japan the next day. It developed into a severe tropical storm that night, reaching its peak intensity on the morning of 10 June with an estimated sustained wind of 110 km/h near its centre. Maliksi finally evolved into an extratropical cyclone over the seas east of Japan on 12 June.

Gaemi (1806) formed as a tropical depression over the northeastern part of the South China Sea about 180 km southwest of Gaoxiong on 14 June. It moved northeastwards and swept across the southern part of Taiwan the next day. Gaemi intensified into a tropical storm near Okinawa on 16 June, reaching its peak intensity that night with an estimated sustained wind of 75 km/h

near its centre and evolving into an extratropical cyclone over the seas south of Japan the next day.

According to press reports, electricity supply to around 13,500 households was interrupted and two oil tankers went aground near Gaoxiong during the passage of Gaemi over Taiwan. Gaemi caused extensive flooding and landslides in Okinawa and at least two persons were injured.

Prapiroon (1807) formed as a tropical depression over the western North Pacific about 750 km south-southeast of Okinawa on the early morning of 29 June. It tracked generally north-northwestwards and intensified gradually. Prapiroon turned north to northeastwards on 1 July and intensified into a typhoon on the morning of 2 July, reaching its peak intensity with an estimated sustained wind of 120 km/h near its centre. Prapiroon started to weaken afterwards, before finally evolving into an extratropical cyclone over the sea areas north of Honshu, Japan on 4 July.

According to press reports, at least four people were injured in Okinawa during the passage of Prapiroon. It also brought squalls and heavy rain to Kyushu and Shikoku of Japan, leaving one dead and 16 injured, and electricity supply to over 50,000 households interrupted in Kyushu. At least one people was killed and one was missing in the Republic of Korea during the passage of Prapiroon.

Maria (1808) formed as a tropical depression over the western North Pacific about 430 km southeast of Guam on the night of 3 July. It tracked generally northwestwards and intensified rapidly. It developed into a super typhoon on the morning of 6 July and reached its peak intensity with an estimated sustained wind of 220 km/h near its centre on the morning of 9 July. Maria swept across the sea areas to the south of Okinawa and then north of Taiwan and started to weaken gradually. Maria made landfall over the coast of Fujian on the morning of 11 July and dissipated over Jiangxi the next day.

According to press reports, at least one people was killed and eight were injured in Taiwan during the passage of Maria. Electricity supply to around 126,000 households were interrupted. In Fujian and Zhejiang, at least one person was killed, nine were missing and 550,000 people were affected during the passage of Maria. There were backflow of sea water in many places.

Son-Tinh (1809) formed as a tropical depression over the western North Pacific about 650 km northeast of Manila on the morning of 16 July and moved quickly westwards across the Luzon Strait on that day. It continued to move at a fast pace after entering the northern part of the South China Sea on 17 July. Son-Tinh intensified into a tropical storm before noon, reaching its peak intensity with an estimated sustained wind of 85 km/h near the centre on the early morning of 18 July. After moving across Hainan Island and Beibu Wan, Son-Tinh degenerated into an area of low pressure over the northern part of Vietnam on 19 July and its remnant continued to track westward further inland on that day. The low pressure area associated with the remnant of Son-Tinh made a sharp turn to the east over the Indo-China and moved towards Beibu Wan on 20 July. It re-intensified into a tropical depression over Beibu Wan on 22 July and took a northeasterly track, sweeping across the northwestern part of Hainan Island. Son-Tinh then turned north and moved across Leizhou Peninsula on 23 July, before dissipating over Guangxi on 24 July.

According to press reports, Son-Tinh greatly disrupted the traffic of Hainan Island during its passage. Son-Tinh and its remnant also brought torrential rain to Vietnam. At least 32 people were killed, 17 were reported missing and more than 5,000 houses collapsed.

Ampil (1810) formed as a tropical depression over the western North Pacific about 800 km south-southeast of Okinawa on the night of 18 July and moved slowly at first. It intensified into a tropical storm the next day and took on a northwest course towards the East China Sea. Ampil further intensified into a severe tropical storm on the night of 20 July, reaching its peak intensity with an estimated sustained wind of 90 km/h near its centre. It moved across the vicinity of Jiangsu and weakened on 22 July. Ampil continued to sweep across Shandong and Hebei the next day, before evolving into an extratropical cyclone over the northeastern part of China on 24 July.

According to press reports, at least one people was killed in China during the passage of Ampil. Near 1.8 million people were affected with a direct economic loss around 1.19 billion RMB.

A tropical depression formed over the western North Pacific about 390 km southeast of Dongsha on 21 July. It tracked northeastwards across the Luzon Strait, heading towards the seas east of Taiwan. The tropical depression reached its peak intensity with an estimated sustained wind of 55 km/h near its centre on the early morning of 22 July. It then turned to move northwards and weakened into an area of low pressure over the East China Sea the next day.

Wukong (1811) formed as a tropical depression over the western North Pacific about 890 km northwest of Wake Island on the night of 22 July. Tracking generally northwards, it intensified gradually. Wukong intensified into a severe tropical storm on 25 July, reaching its peak intensity with an estimated sustained wind of 105 km/h near its centre. It finally evolved into an extratropical cyclone over the seas east of Japan on 26 July.

Jongdari (1812) formed as a tropical depression over the western North Pacific about 690 km southwest of Iwo Jima on 25 July. Moving generally northeastward, it intensified gradually and became a typhoon on the night of 26 July. Jongdari reached its peak intensity on the morning of 27 August with an estimated maximum sustained wind of 140 km/h near its centre. It moved across the southern part of Honshu, and then the northern part of Kyushu of Japan on 29 July, and weakened into a tropical storm. Jongdari made an anti-clockwise loop over the seas south of Kyushu in the next two days and then moved across the East China Sea on a south-southwesterly course. Jongdari made a sharp turn to the north on the morning of 2 August and then picked up speed towards the west. It made landfall over the coast of Shanghai on 3 August during the day, moved inland and weakened into an area of low pressure over Jiangsu at night.

According to press reports, at least 24 people were injured and over 400 flights were cancelled in Japan during the passage of Jongdari. Electricity supply to more than 150,000 households was interrupted.

Shanshan (1813) formed as a tropical depression over the western North Pacific about 880 km east-northeast of Guam on the night of 2 August and tracked westwards at first. It intensified gradually and started to track north-northwestwards towards Japan on 3 August. Shanshan developed into a typhoon on 4 August, reaching its peak intensity on 7 August with an estimated maximum sustained wind of 145 km/h near its centre. Shanshan weakened gradually afterwards and skirted past the coastal areas of Kanto region on 9 August, and turned to move northeastwards. It evolved into an extratropical cyclone over the sea areas east of Japan the next day. According to press reports, at least six people were injured in Japan during the passage of Shanshan.

Yagi (1814) formed as a tropical depression over the western North Pacific about 980 km southeast of Okinawa on 7 August and moved slowly at first. It intensified into a tropical storm

the next day and turned to move towards Okinawa in the following few days. After sweeping across the sea areas south of Okinawa, Yagi moved across the East China Sea on a northwesterly course and reached its peak intensity on the afternoon of 12 August with an estimated maximum sustained wind of 85 km/h near its centre. After making landfall over the coast of Zhejiang, Yagi moved inland and weakened. It finally degenerated into an area of low pressure over Shandong on 16 August.

According to press reports, Yagi left at least two deaths during its passage over eastern China.

Bebinca (1816) formed as a tropical depression over the northern part of the South China Sea about 540 km southwest of Hong Kong. Moving slowly northwards, it made landfall near Yangjiang of the western Guangdong around noon on 11 August. Bebinca then made an anti-clockwise loop over the coastal region of western Guangdong and moved back to the coastal waters that night. After drifting southeastwards on 12 August, Bebinca intensified into a tropical storm and looped slowly in anti-clockwise direction off the coast of western Guangdong on 13 and 14 August. Bebinca picked up speed to move west-southwestwards and intensified into a severe tropical storm on 15 August, reaching its peak intensity with an estimated maximum sustained wind of 90 km/hr near its centre. It moved across Beibu Wan the next day. Bebinca made landfall over the northern part of Vietnam and weakened into an area of low pressure inland on 17 August.

According to press reports, Bebinca brought torrential rain and squalls to Guangdong, Guangxi and Hainan. At least three people were killed and 2 were reported missing. Bebinca also caused extensive flooding and landslides in Vietnam during its passage, killing at least 10 people with another three missing.

Leepi (1815) formed as a tropical depression over the western North Pacific about 560 km south-southeast of Iwo Jima on the night of 11 August. It tracked northwestward and intensified gradually. Leepi developed into a severe tropical storm on 13 August, reaching its peak intensity with an estimated maximum sustained wind of 90 km/h near its centre. Leepi swept across Kyushu of Japan on 15 August and then weakened into an area of low pressure over the seas south of the Korean Peninsula.

According to press reports, Leepi brought torrential rain and squalls to Kyushu of Japan. One person fell into the sea under strong wind and suffered from serious injury.

Originating from the eastern North Pacific, tropical storm Hector (1817) crossed the International Date Line and entered the western North Pacific on the small hours of 14 August, with an estimated maximum sustained wind of 75 km/h near its centre. Moving west-northwestwards, Hector continued to weaken and dissipate over sea the next day.

Rumbia (1818) formed as a tropical depression over the western North Pacific about 90 km north-northwest of Okinawa on the morning of 15 August, and developed into a tropical storm that afternoon. It generally took on a northwest or west-northwesterly course across the East China Sea. Rumbia reached its peak intensity with an estimated maximum sustained wind of 85 km/h near its centre on the night of 16 August. After making landfall over the coast of Shanghai on the morning of 17 August, Rumbia moved inland on a west-northwesterly course and weakened gradually. It finally degenerated into an area of low pressure over Henan the next night.

According to press reports, at least 22 people were killed and seven were missing in eastern and central China during the passage of Rumbia. More than 10 million people were affected, with a direct economic loss of about five billion RMB.

Soulik (1819) formed as a tropical depression over the western North Pacific about 190 km northwest of Guam on the night of 16 August. It generally took on a northerly track and intensified gradually. Soulik intensified into a severe typhoon over the sea areas west of Iwo Jima on the night of 18 August and turned to move west-northwestwards. It reached its peak intensity with an estimated maximum sustained wind of 165 km/h near its centre the next morning. Soulik swept across the East China Sea and the Yellow Sea afterwards and weakened gradually. It turned to track northeastwards, weakened into a severe tropical storm during the night of 23 August and moved across the Korean Peninsula. Soulik evolved into an extratropical cyclone over the seas north of Honshu, Japan the next night.

According to press reports, one people was swept away by freak waves and reported missing and two others were injured in the Republic of Korea during the passage of Soulik. At least one person was injured and electricity supply to over 20 000 households was interrupted on the island of Amami Oshima, Japan during the passage of Soulik.

Cimaron (1820) formed as a tropical depression over the western North Pacific about 1 060 km east of Guam on the morning of 18 August. It took on a northwesterly track in the direction of the sea areas south of Japan and intensified gradually. Cimaron developed into a severe typhoon on 22 August, reaching its peak intensity with an estimated maximum sustained wind of 165 km/h near its centre. After skirting over Shikoku and then moving across the western part of Honshu, Japan on the night of 23 August, Cimaron finally evolved into an extratropical cyclone over the seas north of Honshu, Japan the next day.

According to press reports, Cimaron brought torrential rain and squalls to Japan with unleashed landslides, leaving at least three deaths and 22 injuries. Electricity supply to about 100 000 households was interrupted.

Originating in the northeastern part of the South China Sea, an area of low pressure near Taiwan developed into a tropical depression about 40 km north of Gaoxiong on the morning on 23 August with an estimated maximum sustained wind of 55 km/h near its centre. The tropical depression moved slowly and lingered around western Taiwan on that day. It swept across the Taiwan Strait on a northwesterly course on 24 August and made landfall over the coast of Fujian on the morning of 25 August. The tropical depression weakened into an area of low pressure over inland Fujian during the day.

According to press reports, torrential rain and squalls brought by the tropical depression triggered extensive flooding in Taiwan. At least seven people were killed and 119 people were injured.

Jebi (1821) formed as a tropical depression over the western North Pacific about 1 520 km east of Guam on the night of 27 August. It tracked northwestwards at first and intensified rapidly. Jebi intensified into a typhoon on 29 August and turned to move westwards. It further developed into a super typhoon on 31 August, reaching its peak intensity on the morning of 1 September with an estimated maximum sustained wind of 230 km/h near its centre. Jebi's track turned gradually from northwestwards to northwards and edged closer to the sea areas south of Japan in the next two days when it weakened into a severe typhoon. It swept across the eastern part

of Shikoku, Osaka Bay and Kansai of Honshu during the day of 4 September. It evolved into an extratropical cyclone over the seas west of Hokkaido the next day.

According to press reports, the torrential rain and squalls brought by Jebi wreaked havoc to Japan, with at least 11 people killed, 680 people injured. Electricity supply to more than 2 million households was interrupted. Record-breaking water levels were registered in the vicinity of Osaka because of the severe storm surge induced by Jebi, resulting in serious flooding over the coastal regions. The Kansai international airport was fully closed for three days because of serious inundation, forcing over 5 000 passengers to stay at the airport.

Tropical depression Mangkhut (1822) formed over the western North Pacific about 2 330 km east of Guam on 7 September. Moving westwards rapidly, it intensified gradually in the following few days. Mangkhut developed into a super typhoon on 11 September. It turned to move northwest on 14 September, reaching its peak intensity before making landfall over Luzon with an estimated maximum sustained wind of 250 km/h near the centre. Mangkhut weakened after crossing the northern part of Luzon and continued to track northwestwards quickly across the northern part of the South China Sea, edging towards the coast of Guangdong. Mangkhut weakened into a severe typhoon on the morning of 16 September and made landfall over the vicinity of Taishan of Guangdong before dusk. It then moved into western part of Guangdong and weakened further. Mangkhut degenerated into an area of low pressure over Guangxi the next night.

According to press reports, Mangkhut brought torrential rain and squalls to Luzon. There were at least 82 deaths, 138 injuries and two missing. Around 15 000 houses were collapsed. Mangkhut brought damaging winds and severe storm surge to the coast of Pearl River estuary, leading to damages of many buildings and coastal structures, as well as serious inundation of low lying areas. In Macao, 40 people were injured and more than 5 500 people were evacuated. There were a number of reports of building damages. The water level of Inner Harbour once went up to 1.9 metres or higher. At least six people were killed and more than 3.3 million were affected in Guangdong, Guangxi, Hainan, Guizhou and Yunnan.

Barijat (1823) formed as a tropical depression over the sea areas about 200 km southeast of Gaoxiong on the morning of 10 September and moved generally westwards across the northern part of the South China Sea. It intensified into a tropical storm on 11 September and reached its peak intensity with an estimated maximum sustained wind of 85 km/h near its centre the next night. Barijat moved across Leizhou Peninsula and weakened on 13 September. It dissipated over inland Guangxi in that evening. According to press reports, 40 000 people were evacuated in Maoming and Zhanjiang during the passage of Barijat.

Trami (1824) formed as a tropical depression over the western North Pacific about 320 km northwest of Guam on the night of 21 September. It tracked generally west-northwestwards and intensified rapidly. Trami developed into a typhoon on 23 September and further intensified into a super typhoon the next day, reaching its peak intensity in the small hours of 25 September with an estimated maximum sustained wind of 220 km/h near its centre. Trami turned to move slowly on a north-northeasterly course on the night of 25 September and started to weaken. It moved towards the vicinity of the Ryukyu Islands gradually in the following days. After skirting past Okinawa on 29 September, Trami took on a northeast course towards Honshu of Japan. It skirted past Honshu of Japan during the night of 30 September and evolved into an extratropical cyclone over the northern part of Honshu the next day.

According to press reports, Trami left at least five deaths with one missing and 200 injured during its passage to Japan. Electricity supply to more than 1.3 million households was interrupted. Transportation services in Japan were paralyzed, affecting more than 100 000 passengers.

Kong-rey (1825) formed as a tropical depression over the western North Pacific about 370 km south-southeast of Guam on the early morning of 29 September. Moving west-northwestwards, it intensified rapidly. Kong-rey developed into a typhoon on the night of 30 September and further intensified into a super typhoon the next night, reaching its peak intensity on the morning of 2 October with an estimated maximum sustained wind of 230 km/h near its centre. It started to weaken on 3 October and continued to move towards the vicinity of the Ryukyu Islands. Kong-rey moved across Jeju and the southern part of the Korean Peninsula on 5 and 6 October. It finally evolved into an extratropical cyclone in the vicinity of Hokkaido on 7 October.

According to press reports, Kong-rey brought torrential rain and squalls to Japan, with at least one people killed and 10 people injured. Electricity supply to more than 40 000 households was interrupted in Okinawa and Kagoshima Prefectures. At least two people were killed and one was missing in the Republic of Korea during the passage of Kong-rey, and electricity supply to more than 60 000 households was interrupted.

Yutu (1826) formed as a tropical depression over the western North Pacific about 1 620 km east-southeast of Guam on the afternoon of 21 October. Tracking generally northwestwards, it intensified rapidly. Yutu developed into a super typhoon on 24 October, reaching its peak intensity the next day with an estimated maximum sustained wind of 250 km/h near its centre. Yutu turned to move west to west-southwestwards on 26 and 27 October and started to weaken gradually. After moving across Luzon on 30 October, Yutu entered the central part of the South China Sea and weakened into a typhoon. Yutu further weakened into a severe tropical storm on the next day and turned to move northwestwards across the northeastern part of the South China Sea. Yutu moved northwards slowly on 1 November and weakened into a tropical storm that night. Under the influence of the dry northeast monsoon over southern China, Yutu further weakened into a tropical depression the next day and lingered over the northeastern part of the South China Sea. It finally weakened into an area of low pressure at night.

According to press reports, Yutu left at least 2 deaths and 133 injured during its passage to Saipan. Electricity supply for many places was interrupted. Yutu also brought torrential rain and squalls to the northern part of the Philippines which triggered landslides and flooding, killing at least 20 people.

Toraji (1827) formed as a tropical depression over the southern part of the South China Sea about 550 km east of Ho Chi Minh City on the afternoon of 17 November. With an estimated maximum sustained wind of 55 km/h near its centre, Toraji moved on a northwesterly track in the direction of the southern part of Vietnam. It made landfall over the southern part of Vietnam on the afternoon of the next day and weakened into an area of low pressure rapidly. According to press reports, at least 19 people were killed in Vietnam during the passage of Toraji.

Usagi (1829) formed as a tropical depression over the western North Pacific about 940 km east-southeast of Manila on the morning of 20 November. It tracked westwards and moved across the southern part of the Philippines. Usagi crossed the southern part of the South China Sea on 22 November. It intensified into a tropical storm the next day and turned to move on a

west-southwesterly course. Usagi further intensified into a severe tropical storm on 24 November and reached its peak intensity with an estimated maximum sustained wind of 90 km/h near its centre. It changed its course to move northwestwards on 25 November. Usagi made landfall over the southern part of Vietnam during the day and weakened gradually. It finally weakened into an area of low pressure over the southern part of Vietnam on the early morning of 26 November.

According to press reports, Usagi brought torrential rain and flooding to the Philippines, with at least one people killed. In Vietnam, the flooding brought by Usagi also killed at least two people.

Man-yi (1828) formed as a tropical depression over the western North Pacific about 1 420 km southeast of Guam on the night of 20 November. Tracking west-northwestwards, it intensified gradually. Man-yi developed into a typhoon on 22 November and turned to move northwards the next day, reaching its peak intensity with an estimated maximum sustained wind of 145 km/h near its centre. It moved slowly and lingered over the seas east of Luzon in the following two days. Man-yi turned to track northwestwards and weakened rapidly on 26 November, before finally weakening into an area of low pressure over the western North Pacific on the early morning of 27 November.

DECEMBER

A tropical depression formed over the western North Pacific about 1 630 km east-southeast of Manila on the night of 25 December. It took on a west to west-northwesterly track in the direction of the central part of the Philippines with an estimated maximum sustained wind of 55 km/h near its centre. After crossing the central part of the Philippines on 29 December, the tropical depression turned to move southwestwards and degenerated into an area of low pressure the next morning.

According to press reports, the tropical depression brought torrential rain to the Philippines and triggered landslides, leaving 156 deaths, 26 missing and 105 injuries.

Pabuk (1901) formed as a tropical depression over the southern part of the South China Sea about 690 km east-southeast of Hochiminh on the afternoon of 31 December 2018 and tracked west-southwestwards in the direction of the seas south of Vietnam. It turned to move westwards on 2 January 2019. Pabuk intensified into a tropical storm and moved across the Gulf of Thailand the next day. It reached its peak intensity with an estimated maximum sustained wind of 85 km/h near its centre on the small hours of 4 January. Pabuk moved across the Malay Peninsula that night and weakened. After entering the Andaman Sea the next day, it further weakened into a tropical depression. Pabuk finally degenerated into an area of low pressure over the Bay of Bengal on 7 January.

According to press reports, Pabuk brought heavy rain to Vietnam, leaving at least one death and six injuries. According to the Thai Meteorological Department, Pabuk was the first tropical cyclone making landfall over Thailand in January since record began in 1951. The torrential rain and squalls brought by Pabuk triggered flooding and landslides in Thailand, killing at least eight people. There was also one death report in Malaysia during the passage of Pabuk.

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

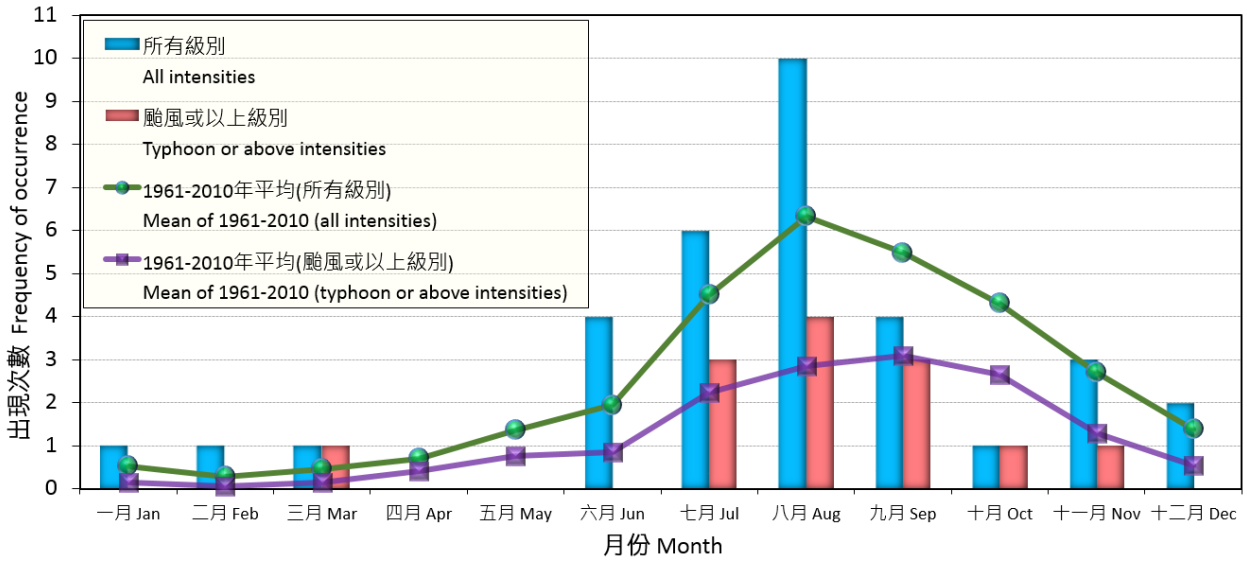


圖 2.1　二零一八年在北太平洋西部及南海區域的熱帶氣旋出現次數之每月分佈 (以熱帶氣旋在該月初次出現為準，假如一熱帶氣旋在九月形成並在十月首次增強為颱風或以上級別，它在「所有級別」及「颱風或以上級別」的統計數字將分別計算在九月及十月份內)。

Figure 2.1　Monthly frequencies of the occurrence of tropical cyclones in the western North Pacific and the South China Sea in 2018 (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).

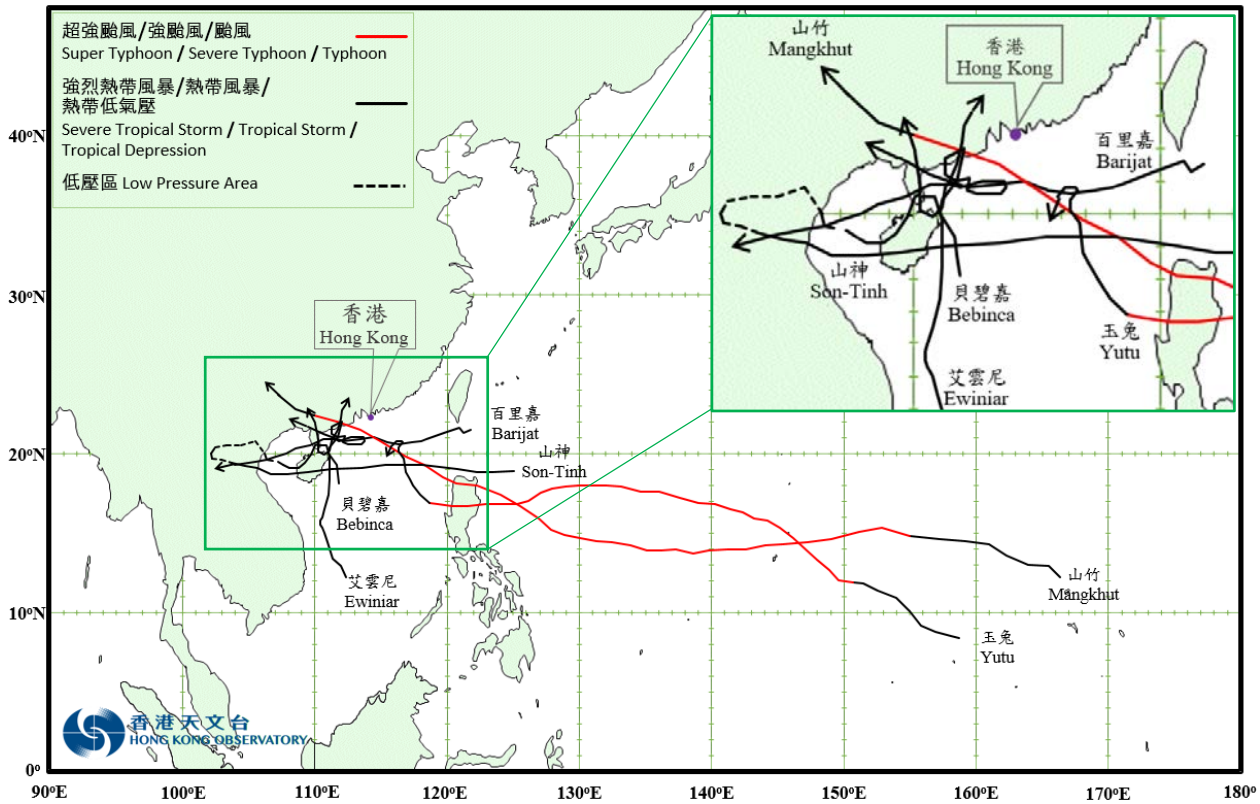


圖 2.2　二零一八年六個影響香港的熱帶氣旋的路徑圖。

Figure 2.2　Tracks of the six tropical cyclones affecting Hong Kong in 2018.

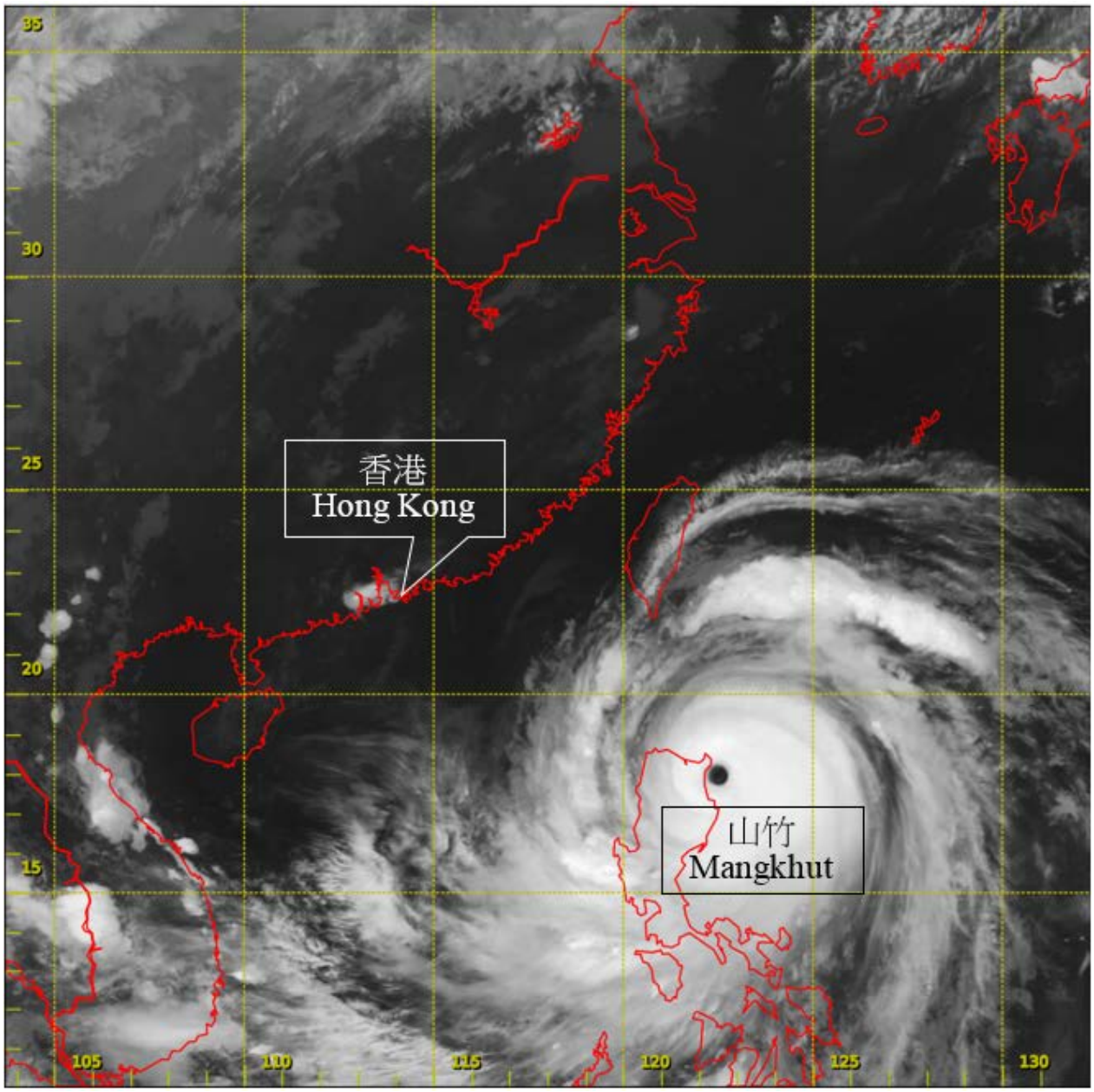


圖2.3a　二零一八年九月十四日下午11時左右超強颱風山竹(1822)的紅外線衛星圖片，當時山竹達到其最高強度，中心附近最高持續風速估計為每小時250公里，而最低中心氣壓為900百帕斯卡。

Figure 2.3a　Infra-red satellite imagery of Super Typhoon Mangkhut (1822) around 11 p.m. on 14 September 2018, when Mangkhut was at peak intensity with estimated maximum sustained winds of 250 km/h near its centre and minimum sea-level pressure of 900 hPa.

〔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).]

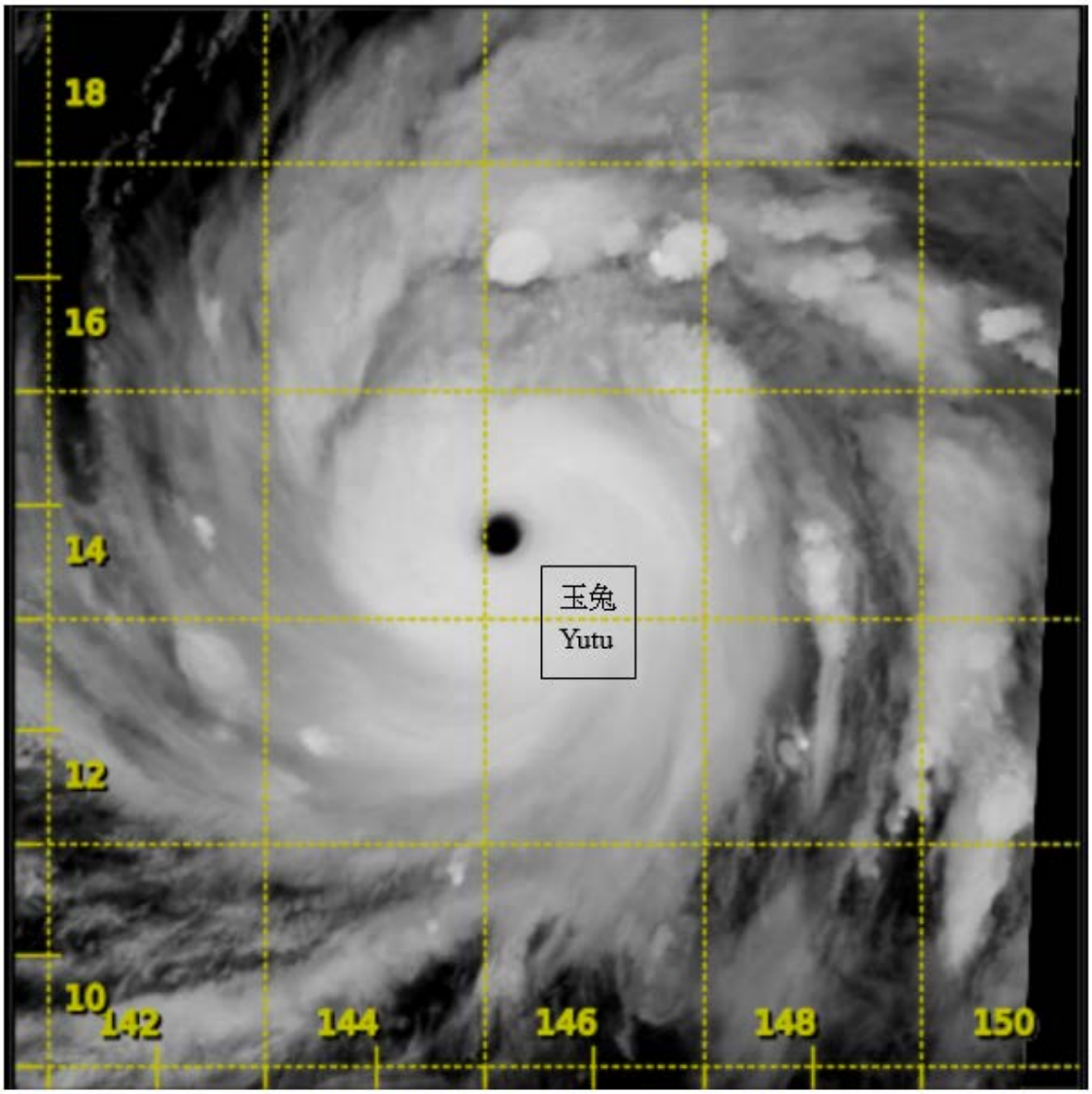


圖2.3b　二零一八年十月二十四日下午8時左右超強颱風玉兔(1826)的紅外線衛星圖片，當時玉兔達到其最高強度，中心附近最高持續風速估計為每小時250公里，而最低中心氣壓為900百帕斯卡。

Figure 2.3b　Infra-red satellite imagery of Super Typhoon Yutu (1826) around 8 p.m. on 24 October 2018, when Yutu was at peak intensity with estimated maximum sustained winds of 250 km/h near its centre and minimum sea-level pressure of 900 hPa.

〔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
2018	1					2	4	4	2	1	2	1	17
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
2018						1	1	1	2	1			6
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　二零一八年影響香港的熱帶氣旋

3.1　熱帶風暴艾雲尼 (1804)：二零一八年六月二日至八日

艾雲尼是二零一八年首個影響香港的熱帶氣旋。

熱帶低氣壓艾雲尼於六月二日晚上在西沙以南約 510 公里的南海南部上形成，向西北偏北移動。六月四日艾雲尼轉向北至東北偏北方向移動，翌日掠過海南島以東海域。六月六日艾雲尼移動減慢，並增強為熱帶風暴，在雷州半島以東及海南島東北部打圈徘徊。六月七日早上艾雲尼達到其最高強度，中心附近最高持續風速估計為每小時 75 公里，並開始穩定地向東北偏北方向移動，晚上在廣東西部海岸陽江市附近登陸，並逐漸減弱，最後於六月八日晚上在廣東內陸減弱為一個低壓區。

根據報章報導，艾雲尼為海南、廣東、廣西、福建及湖南帶來暴雨，多處出現水浸及山泥傾瀉，共造成至少五人死亡，超過 21 萬人受災。

香港天文台在六月五日上午 11 時 20 分發出一號戒備信號，當時艾雲尼集結在香港之西南偏南約 590 公里。六月五日及六日本港吹和緩至清勁東至東南風，離岸及高地間中吹強風。隨著艾雲尼逐漸靠近香港，天文台在六月七日下午 12 時 40 分發出三號強風信號，當時艾雲尼位於香港之西南偏西約 330 公里。當日下午本港普遍轉吹清勁至強風程度的東南風，高地間中吹烈風。艾雲尼於六月八日下午 1 時左右最接近香港，其中心在本港之西北偏西約 200 公里。隨著艾雲尼減弱，本港風力逐漸緩和，天文台在六月八日下午 3 時 40 分改發一號戒備信號，並於傍晚 6 時 20 分取消所有熱帶氣旋警告信號。

艾雲尼掠過期間，尖鼻咀錄得最高潮位 2.52 米(海圖基準面以上)及最大風暴潮(天文潮高度以上) 0.68 米。天文台總部於六月八日下午 5 時 01 分錄得最低瞬時海平面氣壓 998.7 百帕斯卡，當時艾雲尼位於本港西北偏西約 200 公里。

艾雲尼在六月五日至八日為本港帶來連場狂風大雨，期間本港普遍錄得超過 250 毫米雨量，而新界東北部的雨量更超過 400 毫米。六月六日午後的暴雨引致天文台發出今年首個黃色暴雨警告。翌日早上再有滂沱大雨，主要集中在沙田及大埔，而傍晚在長洲有水龍捲報告。六月八日早上的暴雨則導致天文台需要發出紅色暴雨警告。

艾雲尼吹襲期間，本港有多宗塌樹、水浸及山泥傾瀉報告。西灣河有大樹倒塌，壓毀兩部駛經的客貨車，其中一名司機受輕傷。大圍有私家車及薄扶林有小巴亦因塌樹遭受損毀。多處道路受水浸或塌樹影響而導致交通阻塞。

表3.1.1 - 3.1.4分別是艾雲尼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3.1.1 - 3.1.2分別為艾雲尼的路徑圖和本港的雨量分佈圖。圖3.1.3 - 3.1.4分別為艾雲尼的衛星及雷達圖像。圖3.1.5為艾雲尼影響香港期間在長洲捕捉到的水龍捲現象。

Section 3 TROPICAL CYCLONES AFFECTING HONG KONG IN 2018

3.1 Tropical Storm Ewiniar (1804): 2 – 8 June 2018

Ewiniar was the first tropical cyclone affecting Hong Kong in 2018.

Ewiniar formed as a tropical depression over the southern part of the South China Sea about 510 km south of Xisha on the night of 2 June and moved north-northwestwards. Ewiniar turned to move north to north-northeastwards on 4 June and skirted past the sea areas east of Hainan Island the next day. Slowing down and intensifying into a tropical storm on 6 June, it lingered and made a loop east of Leizhou Peninsula and the northeastern part of Hainan Island. Ewiniar reached its peak intensity with an estimated sustained wind of 75 km/h near its centre on the morning of 7 June and started to move steadily north-northeastwards, making landfall near Yangjiang across the coast of western Guangdong that night. It weakened gradually and finally degenerated into an area of low pressure over the inland areas of Guangdong on the night of 8 June.

According to press reports, Ewiniar brought torrential rain to Hainan, Guangdong, Guangxi, Fujian and Hunan, with flooding and landslides reported in many places. At least five people were killed and over 210 000 people were affected.

In Hong Kong, the No. 1 Standby Signal was issued at 11:20 a.m. on 5 June when Ewiniar was about 590 km south-southwest of the territory. Local winds were moderate to fresh east to southeasterlies on 5 and 6 June, occasionally strong offshore and on high ground. With Ewiniar edging closer to Hong Kong, the No. 3 Strong Wind Signal was issued at 12:40 p.m. on 7 June when Ewiniar was about 330 km west-southwest of Hong Kong. Local winds became generally fresh to strong southeasterly in the afternoon, occasionally reaching gale force on high ground. Ewiniar came closest to Hong Kong around 1 p.m. on 8 June with its centre about 200 km west-northwest of Hong Kong. With Ewiniar weakening and local winds subsiding gradually, the No. 3 Strong Wind Signal was replaced by the No. 1 Standby Signal at 3:40 p.m. on 8 June, and all tropical cyclone warning signals were cancelled at 6:20 p.m. that evening.

During the passage of Ewiniar, a maximum sea level (above chart datum) of 2.52 m and a maximum storm surge (above astronomical tide) of 0.68 m were recorded at Tsim Bei Tsui. The lowest instantaneous mean sea-level pressure of 998.7 hPa was recorded at the Observatory headquarters at 5:01 p.m. on 8 June when Ewiniar was about 200 km west-northwest of Hong Kong.

Ewiniar brought episodes of heavy rain and squalls to Hong Kong during 5 – 8 June. Overall, more than 250 millimetres of rainfall were generally recorded over the territory, with rainfall over the northeastern part of the New Territories exceeding 400 millimetres. The rainstorm shortly after noon time on 6 June led to the issuance of the first Amber Rainstorm Warning this year. There were more outbreaks of heavy rain the next morning, especially at Sha Tin and Tai Po, and waterspout was spotted at Cheung Chau that evening. The heavy downpour on the morning of 8 June necessitated the issuance of the Red Rainstorm Warning by the Observatory.

In Hong Kong, there were reports of fallen trees, flooding and landslide during the passage of Ewiniar. A tree collapsed in Sai Wan Ho, damaging two vans passing by and one of the drivers suffered a minor injury. A private car in Tai Wai and a minibus in Pokfulam were also damaged by toppled trees. A number of roads were blocked due to flooding or fallen trees, resulting in disruption of traffic.

Information on the maximum wind, periods of strong force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Ewiniar is given in Tables 3.1.1 - 3.1.4 respectively. Figures 3.1.1 - 3.1.2 show respectively the track of Ewiniar and the rainfall distribution for Hong Kong. Figures 3.1.3 - 3.1.4 show respectively a satellite imagery and radar imageries of Ewiniar. Waterspout captured in Cheung Chau during the passage of Ewiniar is illustrated in Figure 3.1.5.

表 3.1.1　在艾雲尼影響下，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 Ewiniar 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)	東南偏南	SSE	67	7/6	03:45	東南偏南	SSE	34	8/6	14:00
中環碼頭	Central Pier	東南	SE	49	8/6	13:16	東南偏東	ESE	23	7/6	20:00
長洲	Cheung Chau	南	S	87	8/6	09:03	東南偏東	ESE	52	8/6	01:00
長洲泳灘	Cheung Chau Beach	南	S	67	8/6	09:00	東	E	45	8/6	00:00
香港國際機場	Hong Kong International Airport	東南偏南	SSE	65	7/6	04:04	東南偏東	ESE	34	8/6	01:00
啟德	Kai Tak	東	E	62	8/6	00:52	東南偏東	ESE	31	8/6	08:00
京士柏	King's Park	東南偏南	SSE	52	5/6	13:06	東	E	20	6/6	23:00
							東	E	20	7/6	00:00
流浮山	Lau Fau Shan	東南	SE	54	7/6	04:58	東南	SE	25	8/6	16:00
北角	North Point	東	E	45	7/6	07:27	東	E	20	7/6	19:00
坪洲	Peng Chau	東南	SE	56	7/6	10:04	東南偏東	ESE	30	8/6	01:00
平洲	Ping Chau	東南偏南	SSE	38	8/6	12:16	東南偏南	SSE	9	8/6	15:00
西貢	Sai Kung	南	S	67	5/6	13:09	東南偏南	SSE	31	8/6	09:00
沙洲	Sha Chau	西南偏南	SSW	79	8/6	07:53	東南	SE	40	8/6	01:00
沙螺灣	Sha Lo Wan	東南偏東	ESE	72	8/6	01:56	東南偏東	ESE	31	8/6	02:00
沙田	Sha Tin	東南	SE	47	8/6	04:49	東南	SE	19	8/6	05:00
							東南	SE	19	8/6	08:00
石崗	Shek Kong	東	E	41	8/6	07:28	東北偏東	ENE	12	6/6	18:00
							東	E	12	7/6	10:00
							東	E	12	8/6	08:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	59	7/6	03:58	東南偏東	ESE	31	8/6	01:00
							東	E	31	8/6	02:00
打鼓嶺	Ta Kwu Ling	東	E	40	8/6	02:34	東北偏東	ENE	14	7/6	21:00
							東北偏東	ENE	14	8/6	00:00
大美督	Tai Mei Tuk	東	E	54	7/6	19:59	東	E	30	7/6	21:00
大帽山	Tai Mo Shan	東南	SE	104	7/6	04:13	東南	SE	68	8/6	02:00
大埔滘	Tai Po Kau	東南偏東	ESE	51	7/6	00:48	東南偏東	ESE	23	8/6	00:00
塔門東	Tap Mun East	東南偏東	ESE	72	8/6	02:16	東	E	49	7/6	23:00
大老山	Tate's Cairn	南	S	79	8/6	08:41	南	S	45	8/6	09:00
將軍澳	Tseung Kwan O	東南偏東	ESE	45	8/6	00:28	東	E	14	8/6	01:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南	SE	58	8/6	07:51	東南	SE	27	8/6	10:00
屯門政府合署	Tuen Mun Government Offices	東南偏南	SSE	54	7/6	03:19	東南偏南	SSE	22	8/6	10:00
濕地公園	Wetland Park	南	S	45	7/6	04:56	東南偏南	SSE	16	8/6	16:00
黃竹坑	Wong Chuk Hang	東南	SE	54	6/6	23:07	東	E	19	8/6	08:00

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

表 3.1.2　在艾雲尼影響下，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 3.1.2　Periods during which sustained strong force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Ewiniar 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	6/6	01:31	8/6	09:24
香港國際機場	Hong Kong International Airport	7/6	04:04	8/6	08:44
西貢	Sai Kung	7/6	00:43	7/6	08:28

啟德、沙田、流浮山、打鼓嶺、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, Lau Fau Shan, 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。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 force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.1.3　艾雲尼掠過期間，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 Ewiniar

站 (參閱圖 3.1.2) Station (See Fig. 3.1.2)			六月五日 5 June	六月六日 6 June	六月七日 7 June	六月八日 8 June	總雨量 (毫米) Total (mm)
香港天文台 Hong Kong Observatory			28.2	58.3	47.4	70.2	204.1
香港國際機場 Hong Kong International Airport (HKA)			17.8	74.4	83.4	71.9	247.5
長洲 Cheung Chau (CCH)			[35.5]	134.0	[35.5]	[57.0]	[262.0]
H23	香港仔	Aberdeen	49.0	39.0	52.0	70.0	210.0
N05	粉嶺	Fanling	38.5	130.5	225.5	71.0	465.5
N13	糧船灣	High Island	38.5	41.0	30.5	93.5	203.5
K04	佐敦谷	Jordan Valley	39.5	52.5	107.5	124.0	323.5
N06	葵涌	Kwai Chung	41.5	111.5	78.5	81.0	312.5
H12	半山區	Mid Levels	59.5	76.5	70.5	92.5	299.0
N09	沙田	Sha Tin	43.0	115.5	135.5	78.0	372.0
H19	筲箕灣	Shau Kei Wan	36.5	70.5	76.5	118.5	302.0
SEK	石崗	Shek Kong	[23.5]	[94.5]	[68.5]	60.5	[247.0]
K06	蘇屋邨	So Uk Estate	32.0	88.5	72.0	66.0	258.5
R31	大美督	Tai Mei Tuk	41.0	189.5	70.0	100.0	400.5
R21	踏石角	Tap Shek Kok	25.0	75.0	105.5	68.0	273.5

屯門水庫、東涌 - 沒有資料　Tuen Mun Reservoir , Tung Chung - data not available

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

表 3.1.4　艾雲尼掠過期間，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 Ewiniar

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	2.18	5/6	12:59	0.35	8/6	07:51
石壁	Shek Pik	2.24	5/6	11:44	0.40	8/6	06:35
大埔滘	Tai Po Kau	2.08	5/6	12:43	0.33	8/6	06:26
大廟灣	Tai Miu Wan	2.13	5/6	11:17	0.46	8/6	13:21
尖鼻咀	Tsim Bei Tsui	2.52	5/6	13:34	0.68	8/6	08:12

橫瀾島 - 沒有資料　Waglan Island - data not available

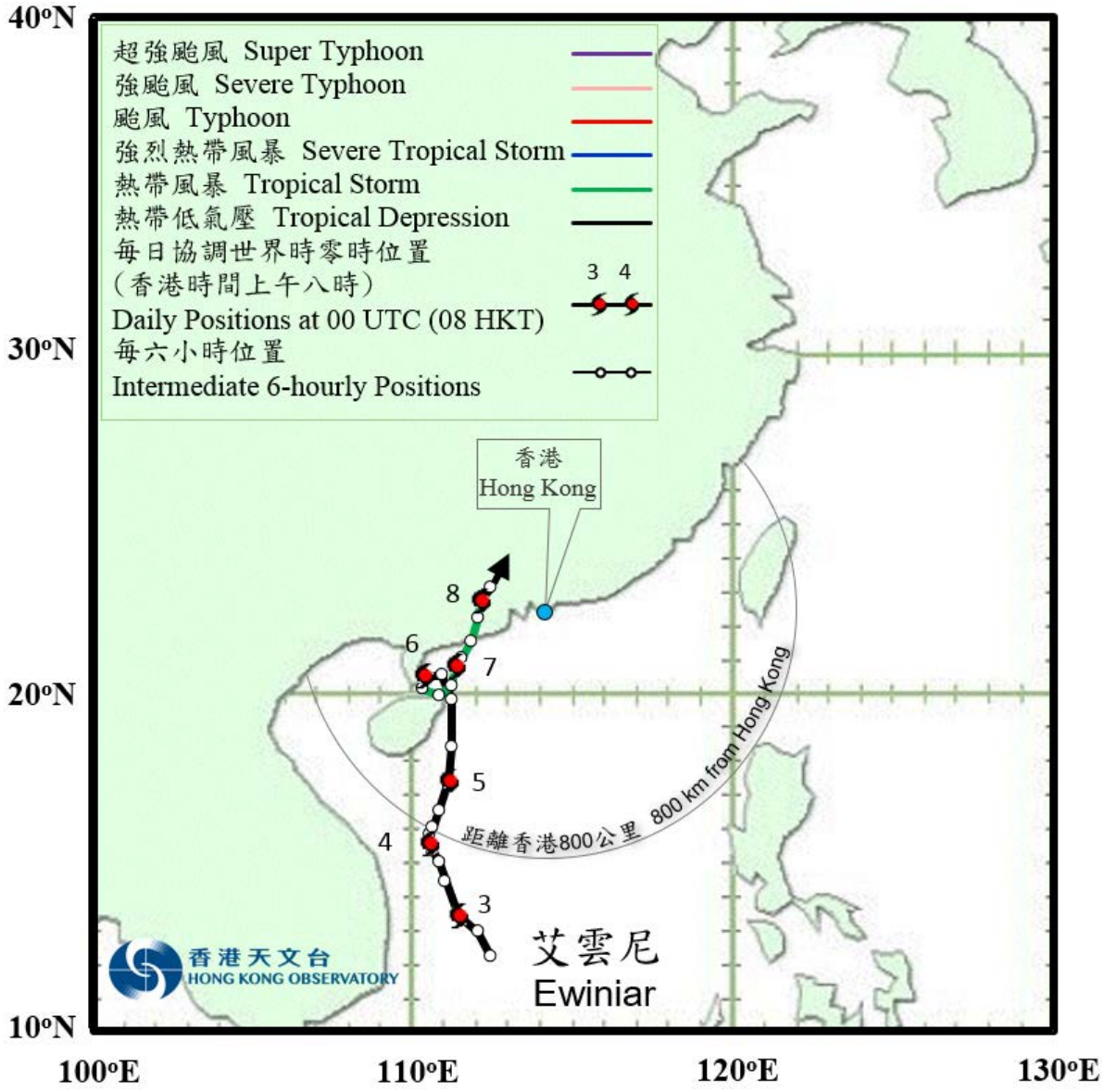


圖 3.1.1a　　二零一八年六月二日至八日艾雲尼的路徑圖。

Figure 3.1.1a　　Track of the Ewiniar: 2 – 8 June 2018.

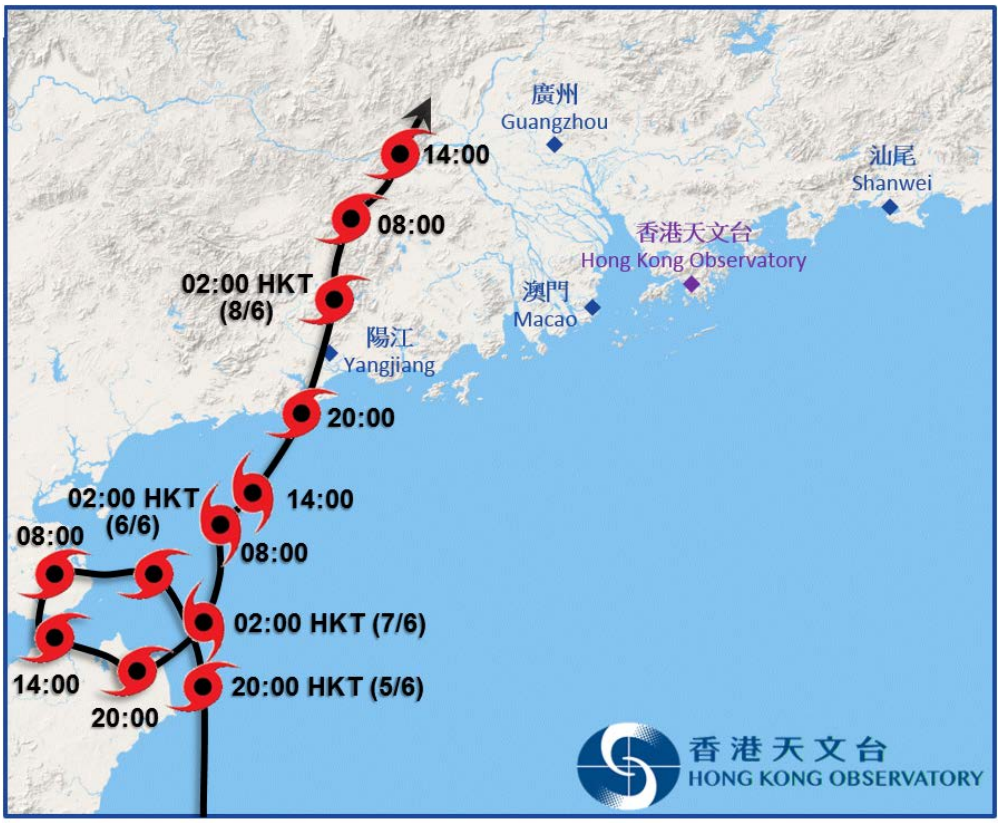


圖 3.1.1b　　艾雲尼接近香港時的路徑圖。

Figure 3.1.1b　　Track of Ewiniar near Hong Kong.

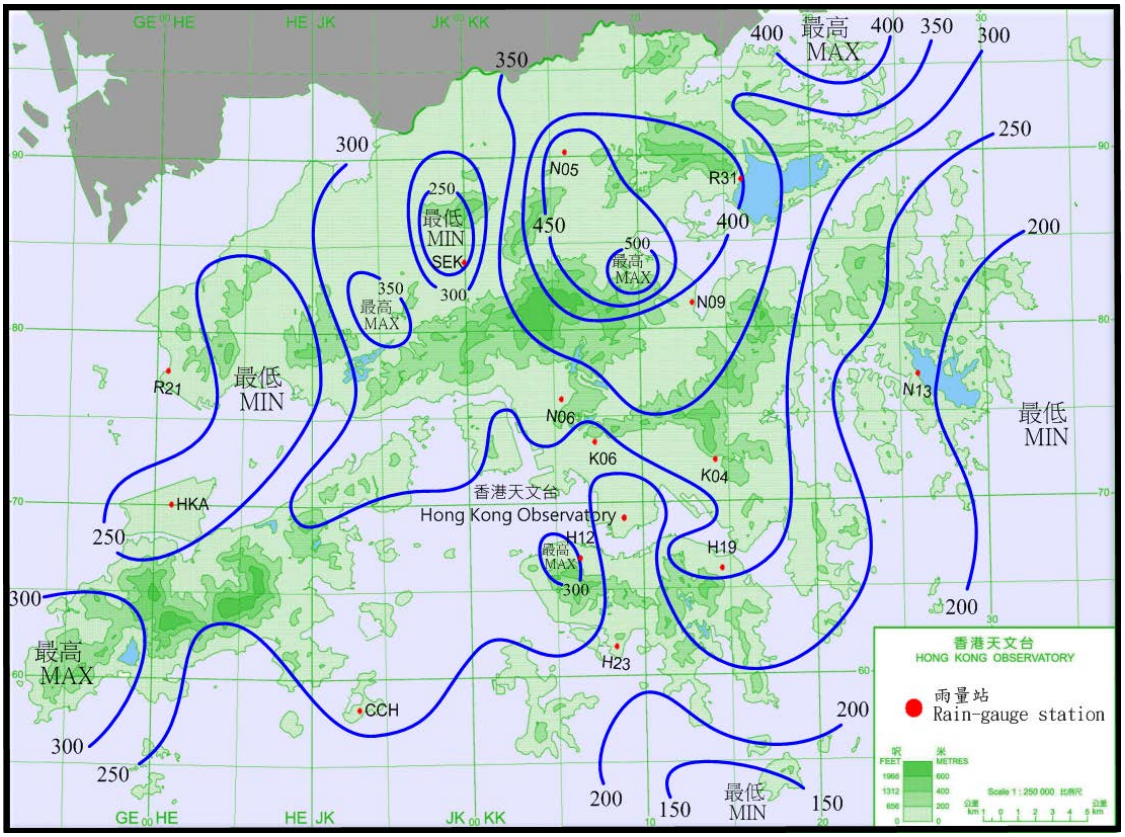


圖 3.1.2　　二零一八年六月五日至八日的雨量分佈(等雨量線單位為毫米)。

Figure 3.1.2　Rainfall distribution on 5 – 8 June 2018 (isohyets are in millimetres).

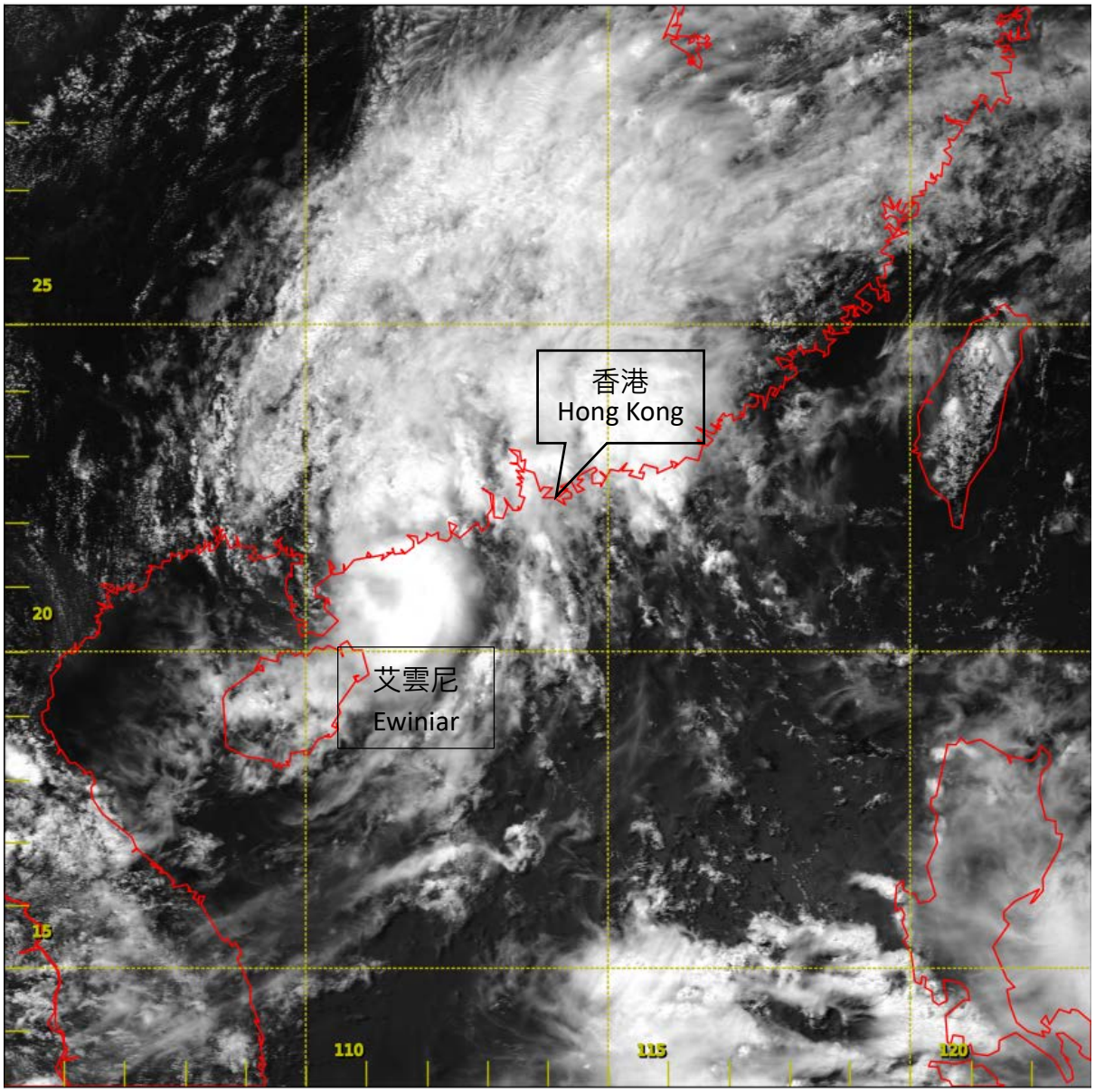


圖 3.1.3　二零一八年六月七日下午 2 時左右的可見光衛星圖片，當時艾雲尼達到其最高強度，中心附近最高持續風速估計為每小時 75 公里。

Figure 3.1.3　Visible satellite imagery around 2 p.m. on 7 June 2018, when Ewiniar was at peak intensity with estimated maximum sustained winds of 75 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).]

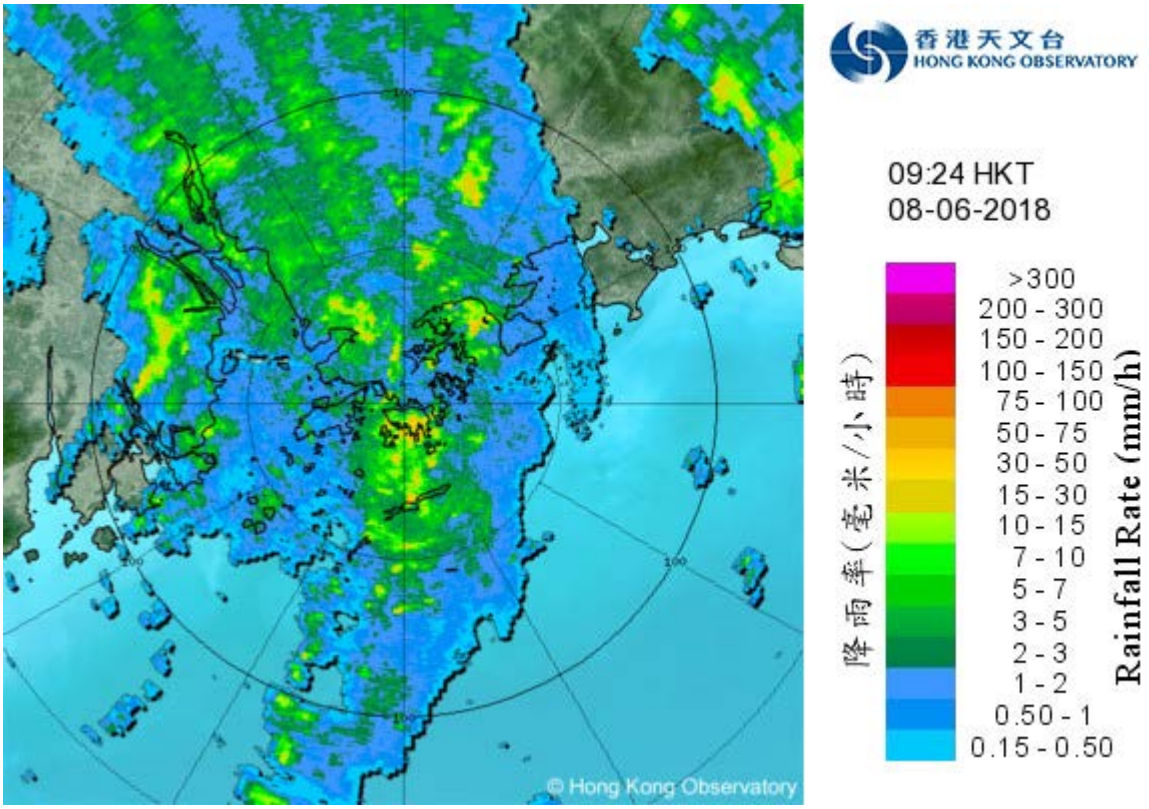


圖 3.1.4　二零一八年六月八日上午 9 時 24 分的雷達回波圖像，艾雲尼的雨帶正影響香港。

Figure 3.1.4　Image of radar echoes at 9:24 a.m. on 8 June 2018 when the rainbands of Ewiniar were affecting Hong Kong.

圖 3.1.5　二零一八年六月七日下午 6 時 45 分左右長洲有水龍捲報告，天文台長洲自動氣象站的網絡照相機亦捕捉到此現象

Figure 3.1.5　Waterspout was reported around 6:45 p.m. on 7 June 2018 at Cheung Chau and captured by the Observatory webcam at Cheung Chau automatic weather station.

3.2 熱帶風暴山神 (1809)：二零一八年七月十六日至二十四日

山神是二零一八年第二個影響香港的熱帶氣旋。山神不規則的路徑引致天文台兩度發出熱帶氣旋警告，上一次出現類似情況是二零一零年的強烈熱帶風暴獅子山。

熱帶低氣壓山神於七月十六日早上在馬尼拉之東北約650公里的北太平洋西部上形成，當日向西迅速橫過呂宋海峽，翌日進入南海北部後繼續迅速移動，中午前增強為熱帶風暴，七月十八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85公里。山神橫過海南島及北部灣後，於七月十九日在越南北部減弱為一個低壓區，其殘餘當日繼續向西移入內陸。與山神相關的殘餘低壓區於七月二十日在中南半島向東迴轉，移向北部灣。它於七月二十二日在北部灣再度增強為熱帶低氣壓，並向東北移動掠過海南島西北部，其後在七月二十三日轉向北橫過雷州半島。山神於七月二十四日在廣西消散。

根據報章報導，山神吹襲海南島期間，海陸空交通大受影響。山神及其殘餘亦為越南帶來暴雨，造成至少32人死亡，17人失蹤，超過5 000間房屋倒塌。

香港天文台在七月十七日上午2時40分發出一號戒備信號，當時山神集結在香港之東南偏東約740公里。日間本港吹和緩至清勁東至東北風。隨着山神迅速橫過南海北部，天文台當日下午4時20分發出三號強風信號，當時山神位於香港以南約350公里。傍晚時分本港風力普遍增強，吹清勁至強風程度的偏東風，離岸及高地間中吹烈風。山神於七月十七日下午6時左右最接近香港，在本港以南約340公里掠過。翌日早上山神在海南島登陸及減弱，天文台在早上9時40分取消所有熱帶氣旋警告信號。但受到中國東南沿岸的一道高壓脊影響，本港離岸及高地仍然吹強風，天文台隨即發出強烈季候風信號，直至當晚9時正取消。

由於山神的殘餘由越南北部移入北部灣時再度增強為熱帶低氣壓及逐漸靠近本港，天文台在七月二十三日下午3時40分再度發出一號戒備信號，當時山神集結在香港之西南偏西約460公里。當日下午本港吹和緩至清勁東南風，離岸及高地間中吹強風。翌日早上山神開始加速向西北移動及遠離本港，天文台在上午10時40分取消所有熱帶氣旋警告信號。

山神第一次影響香港期間，尖鼻咀錄得最高潮位(海圖基準面以上) 2.94米，石壁及尖鼻咀則錄得最大風暴潮(天文潮高度以上) 0.64米。天文台總部於七月十

七日下午4時08分錄得最低瞬時海平面氣壓1000.1百帕斯卡，當時山神位於本港以南約350公里。而山神在第二次影響香港期間，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) 0.26米。天文台總部於七月二十三日下午4時36分錄得最低瞬時海平面氣壓1000.3百帕斯卡，當時山神位於本港西南偏西約460公里。

七月十七日本港陽光充沛，天氣酷熱。隨著山神逐漸靠近，受其外圍雨帶影響，傍晚及翌日間中有狂風大驟雨及雷暴。隨著山神遠離香港，七月十八日本港下午短暫時間有陽光。七月十七日至十八日本港普遍錄得超過30毫米雨量，新界北部的雨量更超過60毫米。

隨著山神再度靠近本港，七月二十三日本港雲量較多，間中有大驟雨及幾陣狂風雷暴。七月二十四日山神遠離本港，除初時有幾陣驟雨外，日間短暫時間有陽光。這兩天本港大部分地區錄得超過30毫米雨量。

山神第一次影響香港期間並沒有造成嚴重破壞。而在山神第二次影響香港期間，銅鑼灣有圍板被強風吹倒，兩名途人受傷。

表3.2.1 - 3.2.4分別是山神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3.2.1 - 3.2.2分別為山神的路徑圖和本港的雨量分佈圖。圖3.2.3 - 3.2.4分別為山神的衛星及雷達圖像。

3.2 Tropical Storm Son-Tinh (1809): 16 – 24 July 2018

Son-Tinh was the second tropical cyclone affecting Hong Kong in 2018. It necessitated the issuance of the tropical cyclone warning signals on two separate occasions owing to its irregular track. The last time this had happened was in 2010 when severe tropical storm Lionrock affected Hong Kong.

Son-Tinh formed as a tropical depression over the western North Pacific about 650 km northeast of Manila on the morning of 16 July and moved quickly westwards across the Luzon Strait on that day. It continued to move at a fast pace after entering the northern part of the South China Sea on 17 July. Son-Tinh intensified into a tropical storm before noon, reaching its peak intensity with an estimated sustained wind of 85 km/h near the centre on the early morning of 18 July. After moving across Hainan Island and Beibu Wan, Son-Tinh degenerated into an area of low pressure over the northern part of Vietnam on 19 July and its remnant continued to track westward further inland on that day. The low pressure area associated with the remnant of Son-Tinh made a sharp turn to the east over the Indo-China and moved towards Beibu Wan on 20 July. It re-intensified into a tropical depression over Beibu Wan on 22 July and took a northeasterly track, sweeping across the northwestern part of Hainan Island. Son-Tinh then turned north and moved across Leizhou Peninsula on 23 July, before dissipating over Guangxi on 24 July.

According to press reports, Son-Tinh greatly disrupted the traffic of Hainan Island during its passage. Son-Tinh and its remnant also brought torrential rain to Vietnam. At least 32 people were killed, 17 were reported missing and more than 5 000 houses collapsed.

In Hong Kong, the No. 1 Standby Signal was issued at 2:40 a.m. on 17 July when Son-Tinh was about 740 km east-southeast of the territory. Local winds were moderate to fresh east to northeasterlies during the day. As Son-Tinh moved rapidly across the northern part of the South China Sea, the No. 3 Strong Wind Signal was issued at 4:20 p.m. in the afternoon when it was about 350 km south of Hong Kong. Locally, winds generally strengthened in the evening, becoming fresh to strong easterlies and occasionally reaching gale force offshore and on high ground. Son-Tinh came closest to Hong Kong at around 6 p.m. on 17 July as it skirted past about 340 km south of Hong Kong. With Son-Tinh making landfall over Hainan Island and weakening the next morning, all tropical cyclone warning signals were cancelled at 9:40 a.m. Nevertheless, under the influence of a ridge of high pressure over the coastal region of southeastern China, strong winds still affected offshore areas and high ground. The Strong Monsoon Signal was issued immediately afterwards and lasted till 9:00 p.m. that night.

With Son-Tinh re-intensifying into a tropical depression after moving from the northern part of Vietnam into Beibu Wan and moving closer to Hong Kong gradually, the No. 1 Standby Signal was issued again at 3:40 p.m. on 23 July when Son-Tinh was about 460 km west-southwest of Hong Kong. Local winds were moderate to fresh southeasterlies in the afternoon, occasionally reaching strong force offshore and on high ground. When Son-Tinh started to track northwestwards and moved away from Hong Kong the next morning, all tropical cyclone warning signals were cancelled at 10:40 a.m.

During the first passage of Son-Tinh, a maximum sea level (above chart datum) of 2.94 m was recorded at Tsim Bei Tsui and a maximum storm surge (above astronomical tide) of 0.64 m

was recorded at Shek Pik and Tsim Bei Tsui. The lowest instantaneous mean sea-level pressure of 1000.1 hPa was recorded at the Observatory headquarters at 4:08 p.m. on 17 July when Son-Tinh was about 350 km south of Hong Kong. During the second passage of Son-Tinh, a maximum sea level (above chart datum) of 2.61 m and a maximum storm surge (above astronomical tide) of 0.26 m were recorded at Tsim Bei Tsui. The lowest instantaneous mean sea-level pressure of 1000.3 hPa was recorded at the Observatory headquarters at 4:36 p.m. on 23 July when Son-Tinh was about 460 km west-southwest of Hong Kong.

With plenty of sunshine, the weather of Hong Kong was very hot on 17 July. As Son-Tinh came closer to Hong Kong, its outer rainbands brought occasional heavy squally showers and thunderstorms to the territory in the evening and the next day. With Son-Tinh moving away from Hong Kong, there were sunny intervals on the afternoon of 18 July. More than 30 millimetres of rainfall were generally recorded over the territory on 17 and 18 July. Over 60 millimetres of rainfall were registered over the northern part of the New Territories.

With Son-Tinh edging closer to Hong Kong again, the local weather turned cloudier with occasional heavy showers and a few squally thunderstorms on 23 July. As Son-Tinh moved away, there were a few showers at first and sunny intervals during the day on 24 July. More than 30 millimetres of rainfall were generally recorded over the territory during these two days.

Son-Tinh did not cause any significant damage in Hong Kong during its first passage. A hoarding in Causeway Bay was blown down and two passersby were injured during the second passage of Son-Tinh.

Information on the maximum wind, periods of strong force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Son-Tinh is given in Tables 3.2.1 - 3.2.4 respectively. Figures 3.2.1 - 3.2.2 show respectively the track of Son-Tinh and the rainfall distribution for Hong Kong. Figures 3.2.3 - 3.2.4 show respectively satellite imageries and a radar imagery of Son-Tinh.

表 3.2.1　在山神影響下，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 Son-Tinh were in force

(a) 第一次影響香港期間 [七月十七日至十八日]

First passage [17 – 18 July]

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)	東南偏東	ESE	76	18/7	00:15	東南偏東	ESE	49	17/7	23:00
							東南偏東	ESE	49	18/7	01:00
中環碼頭	Central Pier	東南偏東	ESE	72	17/7	22:06	東南偏東	ESE	38	17/7	22:00
							東南偏東	ESE	38	18/7	00:00
長洲	Cheung Chau	東南偏東	ESE	87	17/7	22:12	東南偏東	ESE	63	17/7	23:00
長洲泳灘	Cheung Chau Beach	東	E	87	17/7	21:52	東	E	58	17/7	23:00
							東	E	58	18/7	00:00
青洲	Green Island	東北偏東	ENE	81	17/7	23:20	東北偏東	ENE	43	18/7	00:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	68	17/7	19:42	東南偏東	ESE	36	17/7	23:00
啟德	Kai Tak	東南偏東	ESE	65	17/7	21:26	東南偏東	ESE	31	17/7	22:00
京士柏	King's Park	東	E	58	17/7	23:22	東	E	30	18/7	00:00
流浮山	Lau Fau Shan	東南偏東	ESE	49	17/7	22:44	東	E	20	18/7	04:00
北角	North Point	東北偏東	ENE	58	18/7	08:07	東	E	31	18/7	09:00
坪洲	Peng Chau	東	E	68	17/7	23:21	東	E	41	18/7	00:00
平洲	Ping Chau	東南	SE	31	18/7	01:49	東南偏東	ESE	7	18/7	08:00
西貢	Sai Kung	東南	SE	67	17/7	22:17	東南	SE	27	17/7	23:00
沙洲	Sha Chau	東南偏東	ESE	59	17/7	23:16	東南偏東	ESE	38	17/7	23:00
沙螺灣	Sha Lo Wan	東南	SE	87	17/7	22:31	東南	SE	31	17/7	23:00
沙田	Sha Tin	東北偏東	ENE	49	18/7	00:08	東南偏東	ESE	13	17/7	23:00
石崗	Shek Kong	東北偏東	ENE	58	18/7	08:17	東	E	22	18/7	01:00
九龍天星碼頭	Star Ferry (Kowloon)	東南偏東	ESE	70	17/7	22:07	東	E	34	17/7	23:00
打鼓嶺	Ta Kwu Ling	東北	NE	58	18/7	02:19	東	E	16	18/7	05:00
大美督	Tai Mei Tuk	東	E	94	18/7	02:08	東	E	47	17/7	22:00
大帽山	Tai Mo Shan	東南偏東	ESE	122	17/7	23:37	東南偏東	ESE	90	18/7	00:00
大埔滘	Tai Po Kau	東南偏東	ESE	67	17/7	22:23	東南偏東	ESE	34	18/7	01:00
塔門東	Tap Mun East	東	E	87	18/7	01:56	東	E	52	17/7	22:00
		東	E	87	18/7	01:57					
大老山	Tate's Cairn	東南偏東	ESE	101	17/7	22:22	東南偏東	ESE	54	17/7	23:00
將軍澳	Tseung Kwan O	東南偏東	ESE	43	17/7	20:31	東南偏東	ESE	16	17/7	21:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南	SE	67	17/7	23:35	東南偏東	ESE	22	18/7	00:00
屯門政府合署	Tuen Mun Government Offices	東南偏南	SSE	59	18/7	03:26	東南偏東	ESE	16	17/7	21:00
橫瀾島	Waglan Island	東南偏東	ESE	88	18/7	01:56	東	E	56	18/7	00:00
濕地公園	Wetland Park	東南偏東	ESE	36	18/7	04:18	東南	SE	13	17/7	23:00

昂坪、黃竹坑 - 沒有資料　Ngong Ping, Wong Chuk Hang - data not available

(b) 第二次影響香港期間 [七月二十三日至二十四日]
Second passage [23 – 24 July]

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)	東南偏南	SSE	43	24/7	00:22	東南	SE	31	23/7	16:00
中環碼頭	Central Pier	東南偏東	ESE	43	24/7	09:35	東南偏東	ESE	22	24/7	09:00
長洲	Cheung Chau	東南	SE	68	23/7	18:52	東南偏東	ESE	43	23/7	16:00
長洲泳灘	Cheung Chau Beach	東	E	52	23/7	15:44	東	E	27	23/7	16:00
青洲	Green Island	南	S	75	23/7	19:23	東南偏東	ESE	36	23/7	16:00
香港國際機場	Hong Kong International Airport	東南	SE	56	24/7	08:50	東南偏南	SSE	30	24/7	09:00
啟德	Kai Tak	東南偏東	ESE	34	23/7	18:10	東南偏東	ESE	20	23/7	16:00
		東	E	34	23/7	18:16					
		東南	SE	34	24/7	09:15					
京士柏	King's Park	東南偏南	SSE	41	24/7	09:05	東南偏南	SSE	19	24/7	09:00
流浮山	Lau Fau Shan	東南偏南	SSE	51	23/7	19:37	東南	SE	25	24/7	10:00
北角	North Point	東	E	30	23/7	18:45	東	E	14	23/7	18:00
坪洲	Peng Chau	東南偏東	ESE	47	23/7	15:44	東南偏東	ESE	25	23/7	16:00
		東南偏南	SSE	47	24/7	03:52	東南偏南	SSE	25	24/7	05:00
平洲	Ping Chau	西南偏南	SSW	36	23/7	16:20	東南偏南	SSE	7	23/7	17:00
西貢	Sai Kung	南	S	72	23/7	15:40	東南偏南	SSE	34	23/7	16:00
沙洲	Sha Chau	東南偏南	SSE	52	24/7	01:08	東南偏南	SSE	34	24/7	06:00
沙螺灣	Sha Lo Wan	東南	SE	51	24/7	09:18	南	S	20	24/7	10:00
		西南	SW	51	24/7	10:10					
沙田	Sha Tin	西南偏南	SSW	31	23/7	15:41	西南偏南	SSW	14	23/7	16:00
石崗	Shek Kong	東南偏南	SSE	31	23/7	16:27	東南偏南	SSE	12	23/7	17:00
九龍天星碼頭	Star Ferry (Kowloon)	東南偏東	ESE	43	24/7	02:13	東南偏東	ESE	22	23/7	16:00
打鼓嶺	Ta Kwu Ling	南	S	31	23/7	16:02	東南偏東	ESE	9	24/7	10:00
大美督	Tai Mei Tuk	東南偏南	SSE	63	23/7	15:52	東南	SE	23	23/7	16:00
大帽山	Tai Mo Shan	東南	SE	76	23/7	19:26	東南偏南	SSE	56	23/7	17:00
大埔滘	Tai Po Kau	東南偏東	ESE	31	24/7	10:35	東南	SE	16	23/7	16:00
塔門東	Tap Mun East	東南	SE	68	23/7	16:01	東南偏東	ESE	40	23/7	16:00
大老山	Tate's Cairn	南	S	62	23/7	16:26	南	S	38	23/7	17:00
將軍澳	Tseung Kwan O	東	E	30	24/7	00:30	南	S	12	23/7	16:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南偏南	SSE	51	23/7	19:26	東南偏東	ESE	25	23/7	16:00
屯門政府合署	Tuen Mun Government Offices	東南偏南	SSE	58	23/7	19:20	東南偏南	SSE	20	24/7	10:00
橫瀾島	Waglan Island	東南	SE	51	24/7	02:44	東南偏南	SSE	40	24/7	03:00
濕地公園	Wetland Park	南	S	40	23/7	19:39	東南偏南	SSE	16	24/7	10:00

昂坪、黃竹坑 - 沒有資料　Ngong Ping, Wong Chuk Hang - data not available

表 3.2.2　在山神影響香港期間，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 3.2.2　Periods during which sustained strong force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Son-Tinh were in force

(a) 第一次影響香港期間 [七月十七日至十八日]

First passage [17 – 18 July]

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	17/7	19:11	18/7	09:38
香港國際機場	Hong Kong International Airport	17/7	19:42	18/7	00:04

啟德、流浮山、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, Lau Fau Shan, Sai Kung, Sha Tin, Ta Kwu Ling and Tsing Yi Shell Oil Depot.

(b) 第二次影響香港期間 [七月二十三日至二十四日]

Second passage [23 – 24 July]

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	23/7	15:40	24/7	00:38
西貢	Sai Kung	23/7	15:40	23/7	15:49

香港國際機場、啟德、流浮山、沙田、打鼓嶺、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 Hong Kong International Airport, Kai Tak, Lau Fau Shan, 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 3.2.3　山神掠過期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.2.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Son-Tinh

(a) 第一次影響香港期間 [七月十七日至十八日]
First passage [17 – 18 July]

站 (參閱圖 3.2.2) Station (See Fig. 3.2.2)			七月十七日 17 Jul	七月十八日 18 Jul	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory (HKO)			6.5	29.6	36.1
香港國際機場 Hong Kong International Airport (HKA)			17.0	10.2	27.2
長洲 Cheung Chau (CCH)			6.5	11.0	17.5
H23	香港仔	Aberdeen	5.5	31.0	36.5
N05	粉嶺	Fanling	22.5	31.0	53.5
N13	糧船灣	High Island	3.5	35.5	39.0
K04	佐敦谷	Jordan Valley	4.5	34.0	38.5
N06	葵涌	Kwai Chung	24.0	20.0	44.0
H12	半山區	Mid Levels	4.5	41.0	45.5
N09	沙田	Sha Tin	22.0	59.5	81.5
H19	筲箕灣	Shau Kei Wan	6.0	34.5	40.5
SEK	石崗	Shek Kong	24.5	32.5	57.0
K06	蘇屋邨	So Uk Estate	10.5	24.0	34.5
R31	大美督	Tai Mei Tuk	[6.5]	29.5	[36.0]
R21	踏石角	Tap Shek Kok	41.0	5.0	46.0
TMR	屯門水庫	Tuen Mun Reservoir	18.9	15.2	34.1

(b) 第二次影響香港期間 [七月二十三日至二十四日]
Second passage [23 – 24 July]

站 (參閱圖 3.2.2) Station (See Fig. 3.2.2)			七月二十三日 23 Jul	七月二十四日 24 Jul	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory (HKO)			30.8	0.1	30.9
香港國際機場 Hong Kong International Airport (HKA)			23.9	7.3	31.2
長洲 Cheung Chau (CCH)			19.5	5.5	25.0
H23	香港仔	Aberdeen	28.0	0.0	28.0
N05	粉嶺	Fanling	14.5	3.0	17.5
N13	糧船灣	High Island	6.0	0.5	6.5
K04	佐敦谷	Jordan Valley	18.0	1.5	19.5
N06	葵涌	Kwai Chung	29.0	1.5	30.5
H12	半山區	Mid Levels	23.0	0.5	23.5
N09	沙田	Sha Tin	13.5	16.0	29.5
H19	筲箕灣	Shau Kei Wan	30.0	0.0	30.0
SEK	石崗	Shek Kong	19.0	7.5	26.5
K06	蘇屋邨	So Uk Estate	37.0	0.0	37.0
R31	大美督	Tai Mei Tuk	24.0	39.5	63.5
R21	踏石角	Tap Shek Kok	18.0	23.0	41.0
TMR	屯門水庫	Tuen Mun Reservoir	27.3	16.3	43.6

東涌 - 沒有資料　Tung Chung - data not available

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

表 3.2.4　山神掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

Table 3.2.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Son-Tinh

	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
第一次影響香港期間 [七月十七日至十八日] First passage (17 – 18 July)	鰂魚涌	Quarry Bay	2.53	17/7	12:45	0.53	18/7	02:38
	石壁	Shek Pik	2.59	17/7	12:45	0.64	18/7	01:22
	大廟灣	Tai Miu Wan	2.47	17/7	12:27	0.57	18/7	02:15
	大埔滘	Tai Po Kau	2.58	17/7	13:37	0.58	18/7	02:38
	尖鼻咀	Tsim Bei Tsui	2.94	17/7	12:40	0.64	18/7	02:04
	橫瀾島	Waglan Island	2.54	17/7	12:35	0.49	18/7	01:59
第二次影響香港期間 [七月二十三日至二十四日] Second passage (23 – 24 July)	鰂魚涌	Quarry Bay	2.13	24/7	06:33	0.18	23/7	15:01
	石壁	Shek Pik	2.24	24/7	06:04	0.23	23/7	18:24
	大廟灣	Tai Miu Wan	2.06	24/7	05:44	0.21	23/7	15:01
	大埔滘	Tai Po Kau	2.04	24/7	07:50	0.22	23/7	15:49
	尖鼻咀	Tsim Bei Tsui	2.61	24/7	07:06	0.26	24/7	07:03
	橫瀾島	Waglan Island	2.14	24/7	06:03	0.14	23/7	15:08

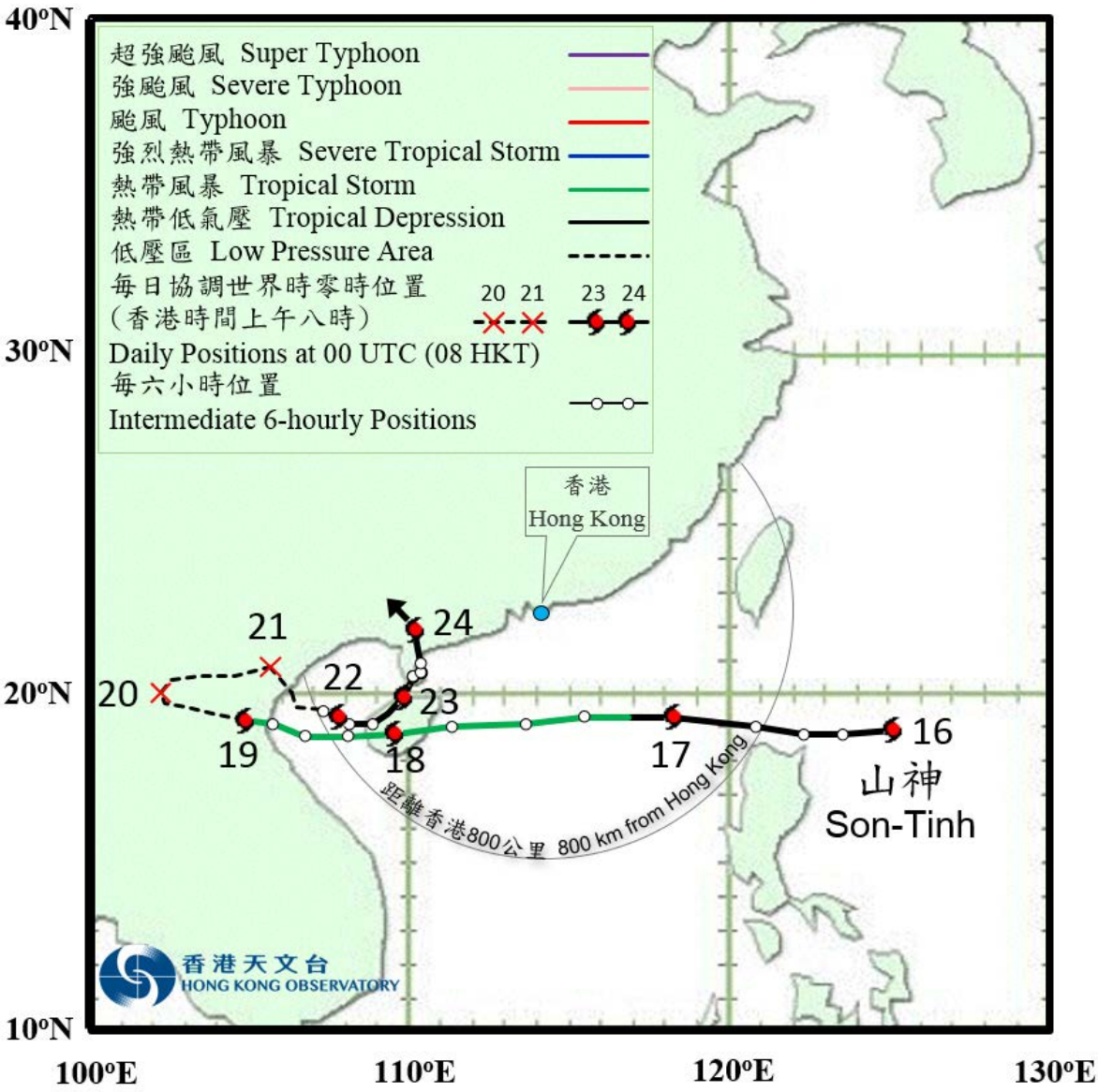


圖 3.2.1　　二零一八年七月十六日至二十四日山神的路徑圖。

Figure 3.2.1　　Track of Son-Tinh on 16 – 24 July 2018.

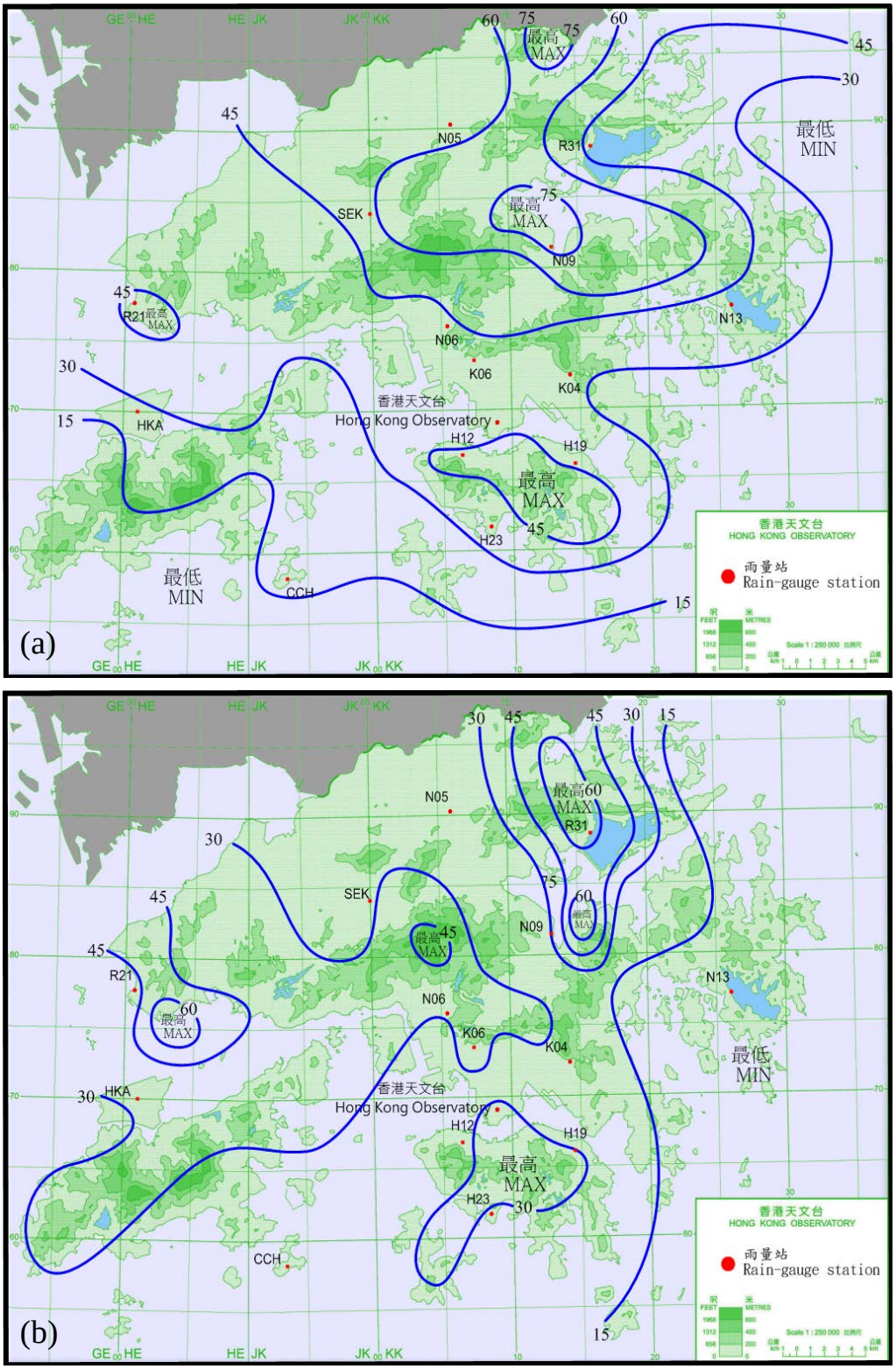


圖 3.2.2 (a) 二零一八年七月十七日至十八日及 (b) 七月二十三日至二十四日的雨量分佈 (等雨量線單位為毫米)。

Figure 3.2.2 Rainfall distribution on (a) 17 – 18, and (b) 23 - 24 July 2018 (isohyets in millimetres).

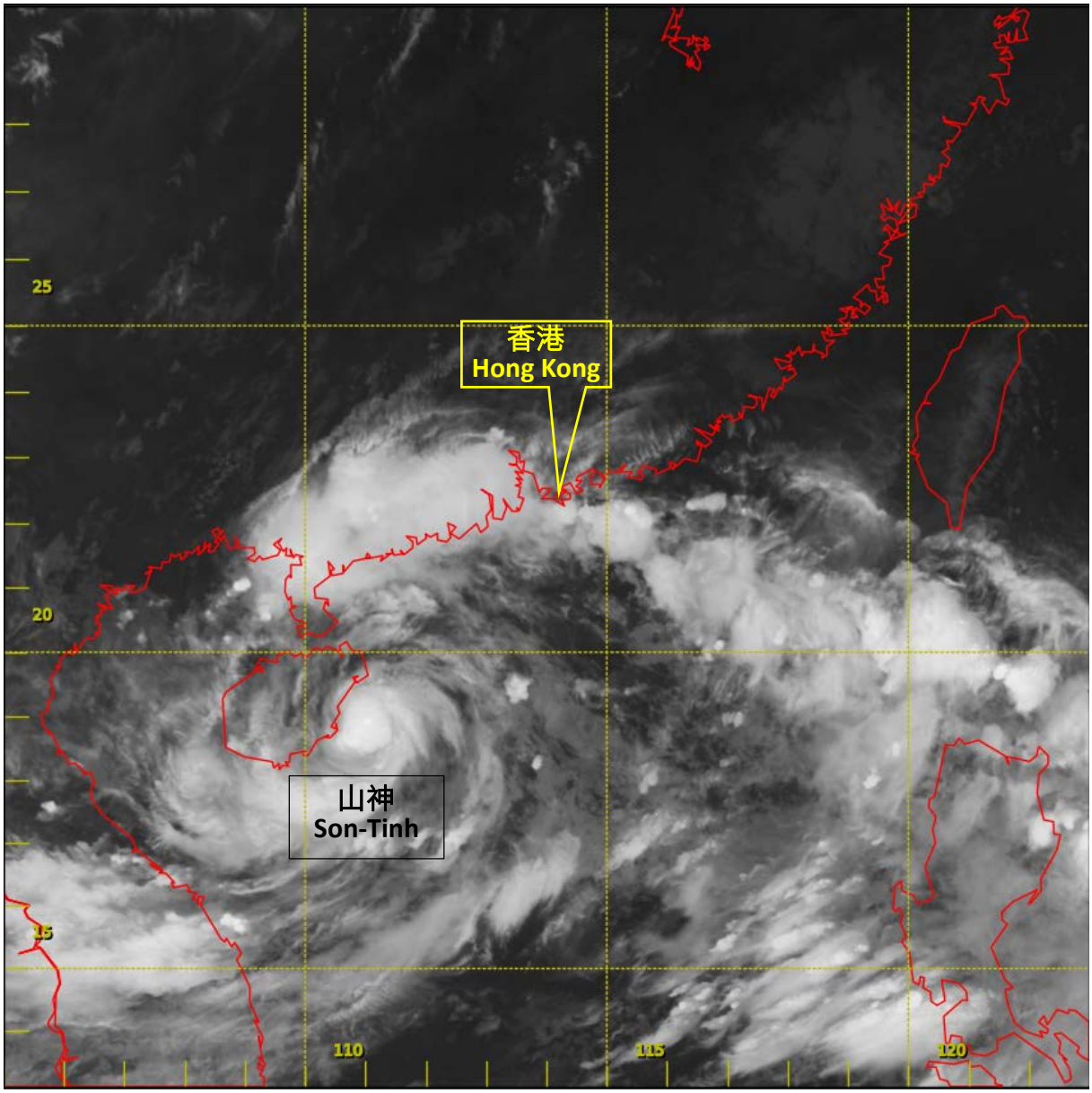


圖 3.2.3a　二零一八年七月十八日上午 2 時左右的紅外線衛星圖片，當時山神達到其最高強度，中心附近最高持續風速估計為每小時 85 公里。

Figure 3.2.3a　Infra-red satellite imagery around 2 a.m. on 18 July 2018, when Son-Tinh was at peak intensity with estimated maximum sustained winds of 85 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).]

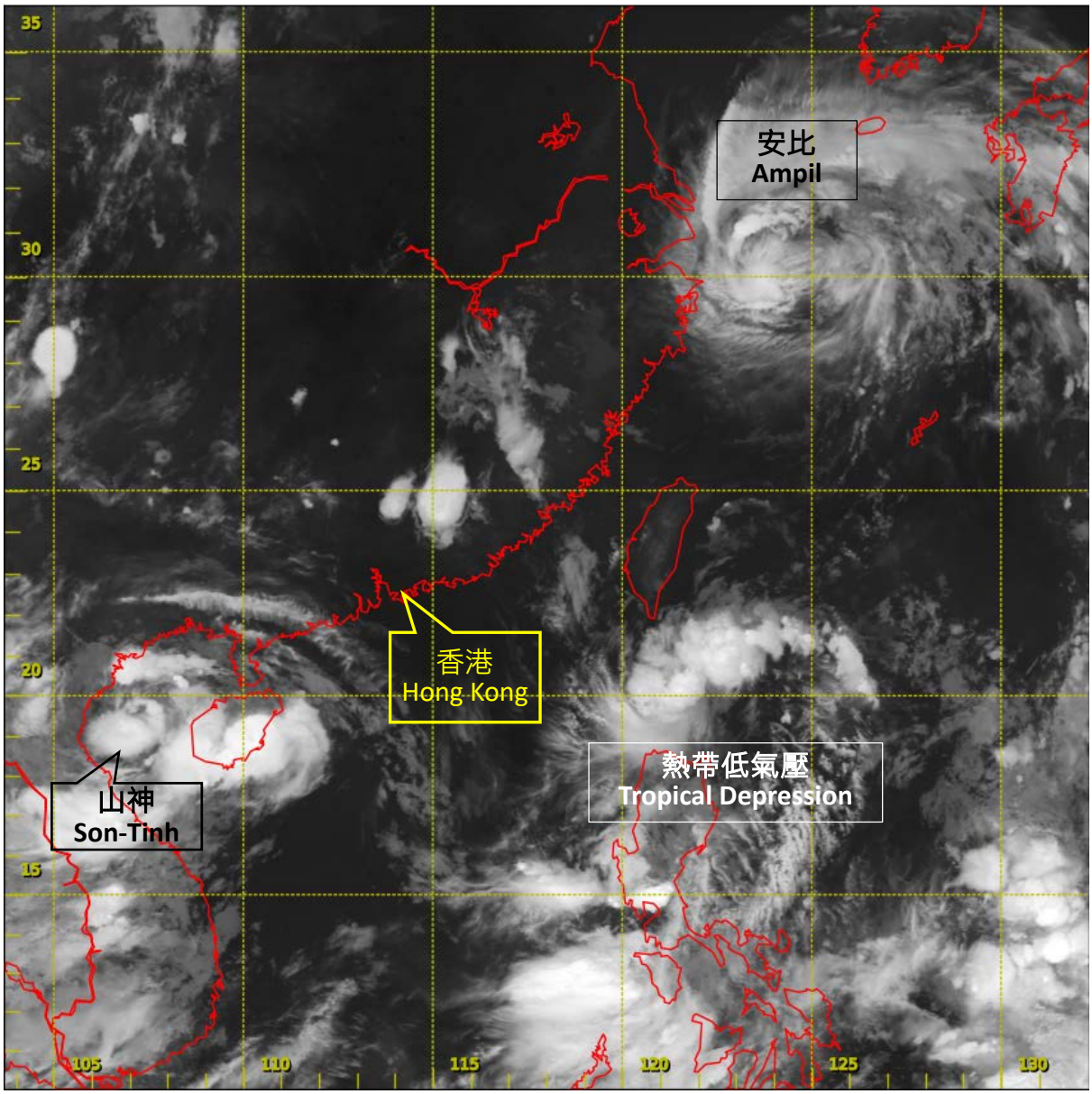


圖 3.2.3b　二零一八年七月二十二日上午 2 時左右的紅外線衛星圖片，當時山神在北部灣重新增強為熱帶低氣壓。同時，在呂宋海峽有另一股熱帶低氣壓向東北移動，而強烈熱帶風暴安比正移向江蘇。

Figure 3.2.3b　Infra-red satellite imagery around 2 a.m. on 22 July 2018, when Son-Tinh re-intensified into a tropical depression over Beibu Wan. Meanwhile, another tropical depression over Luzon Strait was moving northeastwards and severe tropical storm Ampil was moving towards Jiangsu.

〔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).]

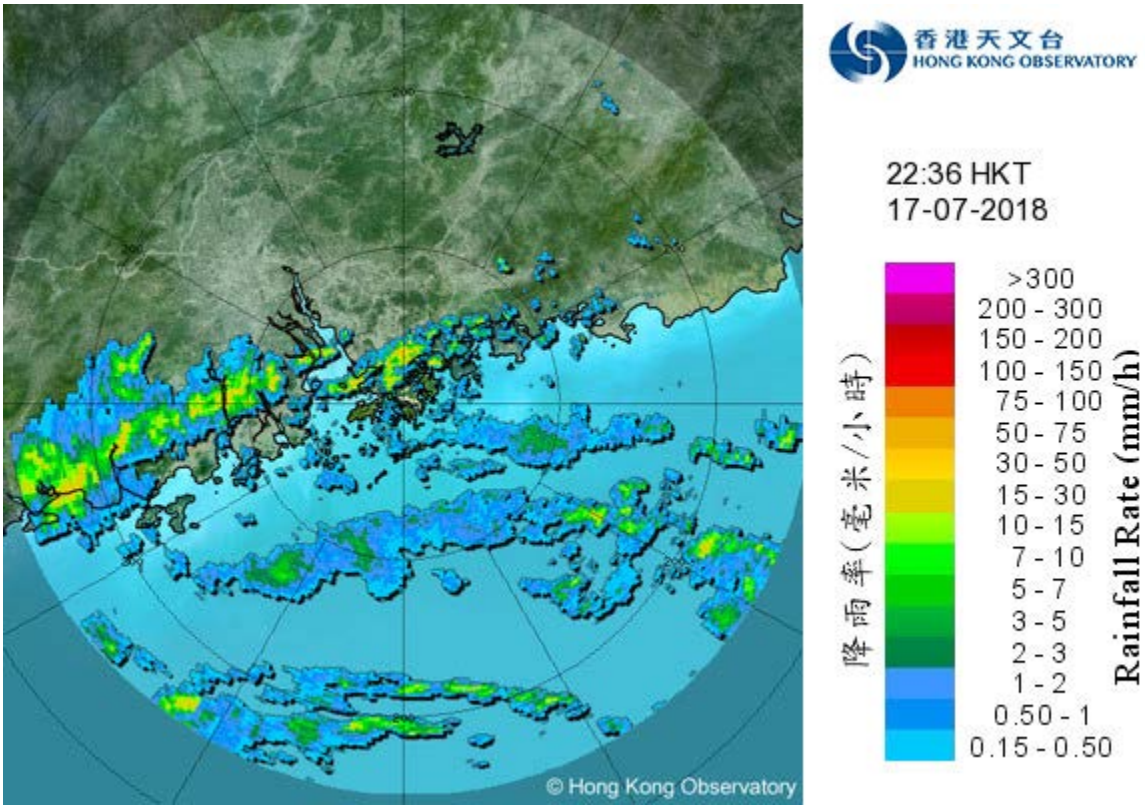


圖 3.2.4　二零一八年七月十七日晚上 10 時 36 分的雷達回波圖像，山神的雨帶正影響廣東沿岸地區及南海北部。

Figure 3.2.4　Image of radar echoes at 10:36 p.m. on 17 July 2018 when the rainbands of Son-Tinh were affecting the coastal areas of Guangdong and the northern part of the South China Sea.

3.3 強烈熱帶風暴貝碧嘉 (1816)：二零一八年八月九日至十七日

貝碧嘉是二零一八年第三個影響香港的熱帶氣旋。在微弱引導氣流的背景下，貝碧嘉路徑飄忽，頗長時間在廣東西部沿海一帶徘徊，引致熱帶氣旋警告信號連續生效了132小時5分鐘，是一九四六年以來的第三最長，僅次於1964年桃麗達的161小時及1977年戴娜的139小時10分鐘。

熱帶低氣壓貝碧嘉於八月九日在香港之西南約540公里的南海北部上形成，向北緩慢移動，在八月十一日接近正午於廣東西部陽江附近登陸。隨後貝碧嘉以逆時針方向在廣東西部沿岸地區徘徊及於當晚移回沿岸海域，八月十二日貝碧嘉向東南漂移並增強為熱帶風暴，它於八月十三日至十四日以逆時針方向在廣東西部沿岸海域徘徊，八月十五日貝碧嘉加速向西南偏西移動，並增强爲强烈熱帶風暴，達到其最高強度，中心附近的最高持續風速估計為每小時90公里。翌日貝碧嘉橫過北部灣，八月十七日在越南北部登陸及在內陸減弱為一個低壓區。

根據報章報導，貝碧嘉為廣東、廣西及海南帶來狂風暴雨，造成最少三人死亡，二人失蹤。貝碧嘉吹襲越南期間，多處有水浸及山泥傾瀉，至少有10人死亡，三人失蹤。

香港天文台在八月九日下午5時15分發出一號戒備信號，當時貝碧嘉集結在香港之西南約540公里。在八月九日至十三日期間，本港普遍吹和緩至清勁的東至東南風，離岸及高地間中吹強風。八月十四日貝碧嘉開始緩慢地向偏北方向移動，稍為靠近珠江口一帶，天文台在八月十四日上午5時20分發出三號强風信號，當時貝碧嘉位於香港之西南偏南約190公里。由於貝碧嘉環流相對較細小，當日本港只普遍吹和緩至清勁的東至東南風，離岸及高地間中吹強風。貝碧嘉於當日下午2時左右最接近香港，在本港之西南偏南約150公里掠過。晚上貝碧嘉向偏西方向移動及遠離香港，天文台在八月十五日上午2時20分以一號戒備信號取代三號強風信號，並於當日上午5時20分取消所有熱帶氣旋警告信號。

貝碧嘉影響香港期間，尖鼻咀錄得最高潮位(海圖基準面以上) 3.33米，大埔滘則錄得最大風暴潮(天文潮高度以上) 0.43米。天文台總部於八月十二日下午5時34分錄得最低瞬時海平面氣壓994.7百帕斯卡，當時貝碧嘉位於本港之西南約260公里。

受華南高空反氣旋影響，八月九日本港部分時間有陽光，局部地區有驟雨，

日間天氣酷熱。與貝碧嘉相關的外圍雨帶在八月十至十五日間中為本港帶來狂風大驟雨及雷暴，天文台在八月十、十一及十二日均有發出黃色暴雨警告信號。在八月九至十五日期間，本港普遍錄得超過150毫米雨量，新界部分地區的雨量更超過250毫米。

貝碧嘉吹襲香港期間，本港有至少18宗塌樹報告。元朗新田公路有大樹倒塌，壓毀兩部駛經的私家車及貨櫃車，其中一名司機受輕傷。

表3.3.1 - 3.3.4 分別是貝碧嘉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3.3.1 - 3.3.2 分別為貝碧嘉的路徑圖及本港的雨量分佈圖。圖3.3.3 - 3.3.4 分別為貝碧嘉的衛星及雷達圖像。

3.3 Severe Tropical Storm Bebinca (1816): 9 – 17 August 2018

Bebinca was the third tropical cyclone affecting Hong Kong in 2018. Under the influence of weak steering flow, it exhibited an erratic movement and lingered over the seas off the coast of western Guangdong for a rather long time. The tropical cyclone warning signals had been in force for 132 hours and 5 minutes, making it the third longest since 1946, just after 161 hours for Tilda in 1964 and 139 hours 10 minutes for Dinah in 1977.

Bebinca formed as a tropical depression over the northern part of the South China Sea about 540 km southwest of Hong Kong. Moving slowly northwards, it made landfall near Yangjiang of western Guangdong around noon on 11 August. Bebinca then made an anti-clockwise loop over the coastal region of western Guangdong and moved back to the coastal waters that night. After drifting southeastwards on 12 August, Bebinca intensified into a tropical storm and looped slowly in anti-clockwise direction off the coast of western Guangdong on 13 and 14 August. Bebinca picked up speed to move west-southwestwards and intensified into a severe tropical storm on 15 August, reaching its peak intensity with an estimated sustained wind of 90 km/hr near its centre. It moved across Beibu Wan the next day. Bebinca made landfall over the northern part of Vietnam and weakened into an area of low pressure inland on 17 August.

According to press reports, Bebinca brought torrential rain and squalls to Guangdong, Guangxi and Hainan. At least three people were killed and 2 were reported missing. Bebinca also caused extensive flooding and landslides in Vietnam during its passage, killing 10 people with another three missing.

In Hong Kong, the No. 1 Standby Signal was issued at 5:15 p.m. on 9 August when Bebinca was about 540 km southwest of the territory. Local winds were moderate to fresh east to southeasterlies on 9 - 13 August, and occasionally reaching strong force offshore and on high ground. As Bebinca started to move slowly northwards on 14 August, edging slightly closer to the Pearl River Estuary, the No. 3 Strong Wind Signal was issued at 5:20 a.m. on 14 August when it was about 190 km south-southwest of Hong Kong. As the circulation of Bebinca was relatively small, local winds were only moderate to fresh east to southeasterlies during the day, and occasionally reaching strong force offshore and on high ground. Bebinca came closest to the territory at around 2 p.m. on that day as it skirted past about 150 km south-southwest of Hong Kong. As it tracked westwards and departed from Hong Kong at night, the No. 3 Strong Wind Signal was replaced by the No. 1 Standby Signal at 2:20 a.m. on 15 August, and all tropical cyclone warning signals were cancelled at 5:20 a.m. on that day.

During the passage of Bebinca, a maximum sea level (above chart datum) of 3.33 m was recorded at Tsim Bei Tsui and a maximum storm surge (above astronomical tide) of 0.43 m was recorded at Tai Po Kau. The lowest instantaneous mean sea-level pressure of 994.7 hPa was recorded at the Observatory headquarters at 5:34 p.m. on 12 August when Bebinca was about 260 km southwest of Hong Kong.

Under the influence of an anticyclone aloft over southern China, there were sunny periods and isolated showers in Hong Kong on 9 August. It was very hot during the day. The outer rainbands associated with Bebinca brought occasional heavy squally showers and thunderstorms to Hong Kong on 10 – 15 August. Amber Rainstorm Warning Signals were

issued on 10, 11 and 12 August. More than 150 millimetres of rainfall were generally recorded over the territory during 9 – 15 August, with rainfall over parts of the New Territories exceeding 250 millimetres.

In Hong Kong, there were at least 18 reports of fallen trees during the passage of Bebinca. A tree collapsed at San Tin Highway near Yuen Long and damaged a private car and a container truck passing by. One of the drivers suffered a minor injury.

Information on the maximum wind, period of strong force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Bebinca is given in Tables 3.3.1 - 3.3.4 respectively. Figures 3.3.1 - 3.3.2 show respectively the track of Bebinca and the rainfall distribution for Hong Kong. Fugures 3.3.3 - 3.3.4 show respectively a satellite imagery and a radar imagery of Bebinca.

表 3.3.1　在貝碧嘉影響下，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 3.3.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Bebinca 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)	東南偏南	SSE	52	10/8	03:05	東南偏東	ESE	31	9/8	18:00
中環碼頭	Central Pier	東	E	52	9/8	18:03	東南偏東	ESE	31	9/8	18:00
長洲	Cheung Chau	東南	SE	75	10/8	03:18	東南偏東	ESE	43	9/8	18:00
長洲泳灘	Cheung Chau Beach	東	E	59	9/8	17:25	東	E	45	10/8	00:00
青洲	Green Island	東北偏東	ENE	63	9/8	17:24	東北偏東	ENE	43	9/8	22:00
		東北偏東	ENE	63	9/8	17:30					
香港國際機場	Hong Kong International Airport	東南偏東	ESE	62	12/8	05:14	東	E	36	9/8	19:00
啟德	Kai Tak	東	E	52	9/8	20:04	東南偏東	ESE	25	9/8	18:00
京士柏	King's Park	東	E	45	10/8	03:31	東	E	20	9/8	19:00
流浮山	Lau Fau Shan	東	E	51	9/8	17:37	東北偏東	ENE	27	9/8	22:00
北角	North Point	東	E	49	9/8	22:12	東	E	30	9/8	23:00
坪洲	Peng Chau	東南偏南	SSE	56	10/8	03:30	東	E	34	9/8	18:00
平洲	Ping Chau	南	S	25	10/8	04:26	東南偏東	ESE	6	14/8	11:00
西貢	Sai Kung	東北偏東	ENE	47	9/8	22:02	東南偏南	SSE	31	10/8	05:00
沙洲	Sha Chau	東南偏南	SSE	47	11/8	05:14	東南偏東	ESE	34	9/8	19:00
沙螺灣	Sha Lo Wan	東南	SE	65	10/8	16:38	東	E	23	9/8	22:00
沙田	Sha Tin	東	E	34	9/8	22:18	東南偏東	ESE	14	9/8	19:00
		東南偏南	SSE	34	11/8	04:37					
九龍天星碼頭	Star Ferry (Kowloon)	東	E	51	9/8	17:20	東	E	30	9/8	18:00
打鼓嶺	Ta Kwu Ling	東	E	41	9/8	19:37	東	E	16	9/8	20:00
大美督	Tai Mei Tuk	東南	SE	56	12/8	06:53	東	E	38	9/8	18:00
大帽山	Tai Mo Shan	東南偏東	ESE	79	10/8	23:36	東南偏東	ESE	59	11/8	00:00
大埔滘	Tai Po Kau	東南	SE	54	9/8	17:56	東南偏東	ESE	30	9/8	18:00
塔門東	Tap Mun East	東南偏東	ESE	58	10/8	02:06	東	E	41	9/8	20:00
大老山	Tate's Cairn	東南偏東	ESE	63	12/8	05:11	東	E	47	9/8	18:00
將軍澳	Tseung Kwan O	東南偏東	ESE	40	9/8	18:15	東北偏東	ENE	13	13/8	12:00
							東北偏東	ENE	13	13/8	13:00
							東北偏東	ENE	13	13/8	14:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南	SE	43	10/8	03:46	東南偏東	ESE	20	11/8	07:00
屯門政府合署	Tuen Mun Government Offices	東	E	41	9/8	18:32	東	E	16	9/8	19:00
橫瀾島	Waglan Island	東北偏東	ENE	59	14/8	08:06	東	E	45	9/8	22:00
濕地公園	Wetland Park	東南偏南	SSE	31	11/8	06:39	東南偏東	ESE	16	9/8	18:00
黃竹坑	Wong Chuk Hang	東	E	52	10/8	03:16	東北偏東	ENE	14	9/8	18:00
							東北	NE	14	9/8	22:00

昂坪、石崗- 沒有資料　Ngong Ping, Shek Kong - data not available

表 3.3.2　在貝碧嘉影響下，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 3.3.2　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 Bebinca 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	9/8	17:15	14/8	17:00

香港國際機場、啟德、沙田、流浮山、西貢、打鼓嶺、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 Hong Kong International Airport, Kai Tak, Sha Tin, Lau Fau Shan, Sai Kung, 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 3.3.3　貝碧嘉掠過期間，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 Bebinca

站 (參閱圖 3.3.2) Station (See Fig. 3.3.2)			八月九日 9 Aug	八月十日 10 Aug	八月十一日 11 Aug	八月十二日 12 Aug	八月十三日 13 Aug	八月十四日 14 Aug	八月十五日 15 Aug	總雨量 (毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory (HKO)			微量 Trace	47.9	51.9	18.9	0.1	32.9	2.2	153.9
香港國際機場 Hong Kong International Airport (HKA)			微量 Trace	45.0	53.1	44.7	微量 Trace	15.3	1.9	160.0
長洲 Cheung Chau (CCH)			0.0	51.0	[38.5]	41.5	11.0	14.5	2.0	[158.5]
H23	香港仔	Aberdeen	0.0	47.5	51.5	43.0	5.0	20.5	3.5	171.0
N05	粉嶺	Fanling	0.5	36.5	77.5	69.5	0.0	28.0	9.0	221.0
N13	糧船灣	High Island	0.0	36.0	27.5	62.0	0.5	58.5	6.5	191.0
K04	佐敦穀	Jordan Valley	0.5	55.0	57.0	29.5	2.0	26.5	4.0	174.5
N06	葵涌	Kwai Chung	0.0	43.5	154.5	36.0	0.5	39.5	1.0	275.0
H12	半山區	Mid Levels	0.0	45.5	66.5	36.5	8.0	37.0	5.0	198.5
N09	沙田	Sha Tin	0.0	40.5	76.0	91.5	0.0	57.0	10.0	275.0
H19	筲箕灣	Shau Kei Wan	0.0	55.0	26.0	21.5	15.0	30.5	0.0	148.0
K06	蘇屋邨	So Uk Estate	0.0	43.5	[125.0]	25.0	2.0	20.5	0.5	[216.5]
R31	大美督	Tai Mei Tuk	1.5	35.5	57.0	[77.0]	[0.0]	18.0	17.0	[206.0]
R21	踏石角	Tap Shek Kok	0.0	35.0	34.0	49.0	[0.0]	34.5	1.5	[154.0]
TMR	屯門水庫	Tuen Mun Reservoir	0.0	51.1	41.3	30.7	0.0	32.3	6.3	161.7

石崗、東涌 - 沒有資料　Shek Kong, Tung Chung - data not available

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

表 3.3.4　貝碧嘉掠過期間，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 Bebinca

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	2.77	12/8	09:31	0.31	14/8	08:59
石壁	Shek Pik	2.83	12/8	08:58	0.26	12/8	23:24
大廟灣	Tai Miu Wan	2.66	12/8	09:37	0.31	12/8	23:30
大埔滘	Tai Po Kau	2.78	12/8	10:54	0.43	12/8	15:14
尖鼻咀	Tsim Bei Tsui	3.33	12/8	09:54	0.42	12/8	18:02
橫瀾島	Waglan Island	2.71	12/8	09:27	0.18	12/8	23:30

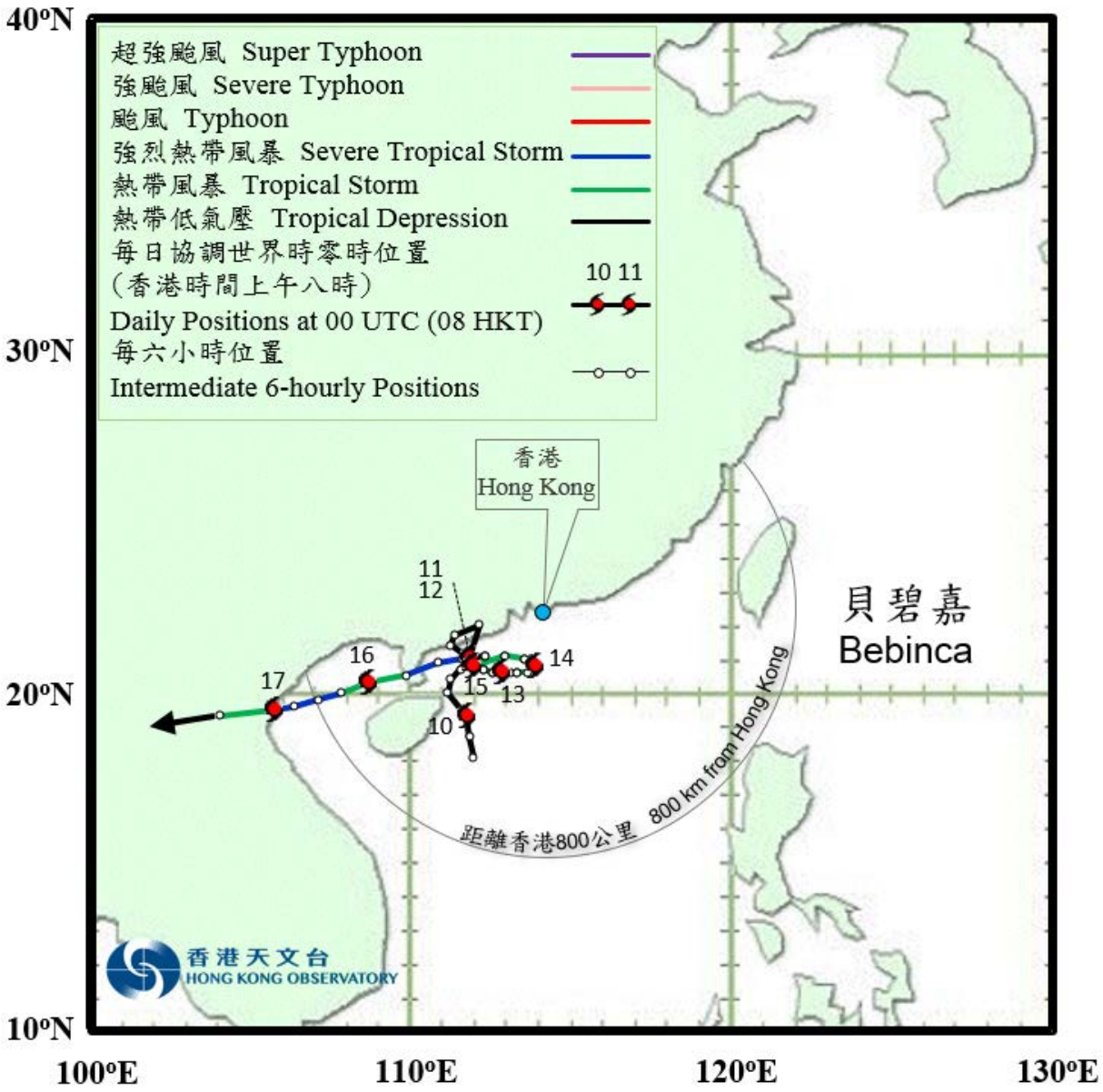


圖 3.3.1a　　二零一八年八月九日至十七日貝碧嘉的路徑圖。

Figure 3.3.1a　Track of Bebinca on 9 - 17 August 2018.

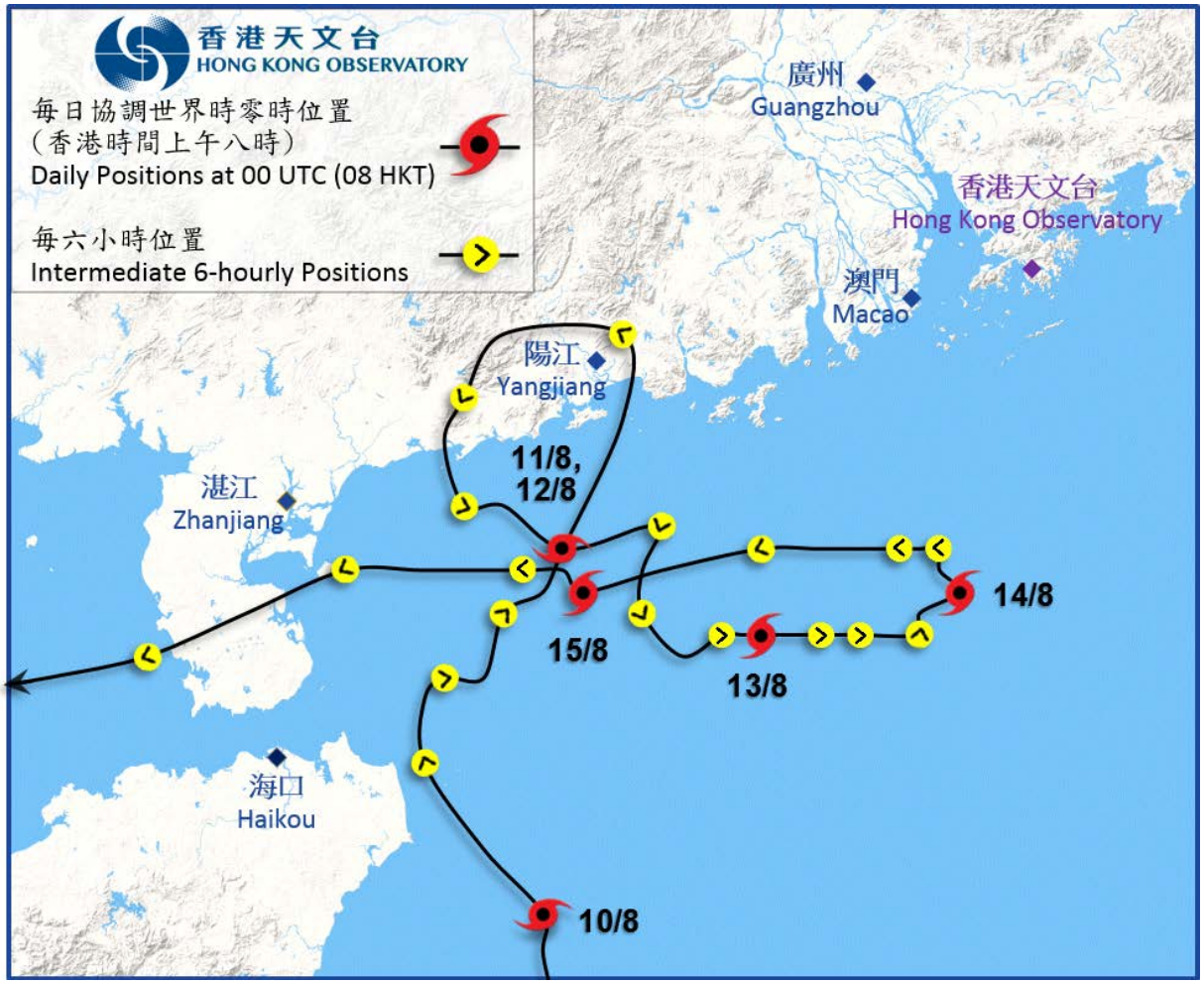


圖 3.3.1b　　貝碧嘉接近香港時的路徑圖。

Figure 3.3.1b　Track of Bebinca in the vicinity of Hong Kong.

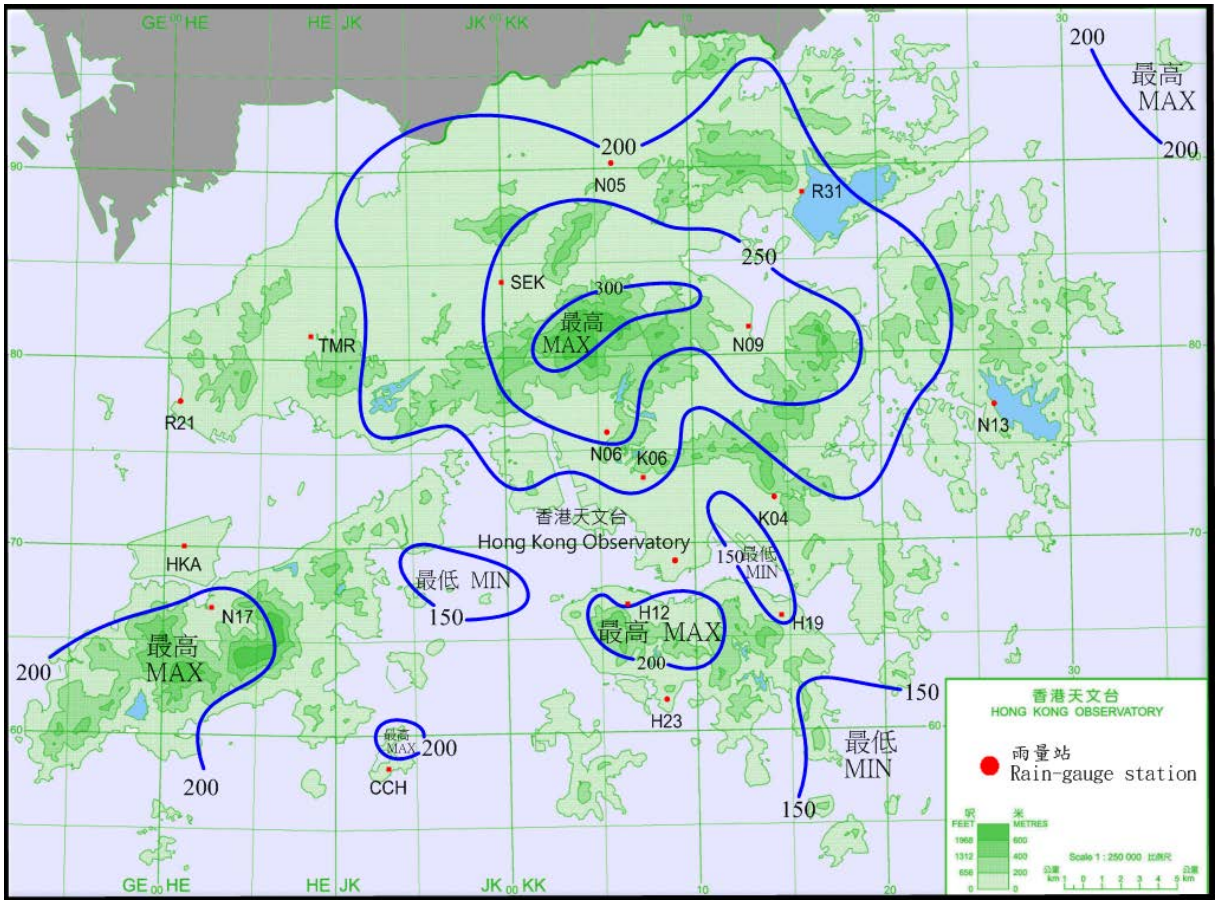


圖 3.3.2　　二零一八年八月九日至十五日的雨量分佈 (等雨量線單位為毫米)。

Figure 3.3.2　　Rainfall distribution on 9 – 15 August 2018 (isohyets in millimetres).

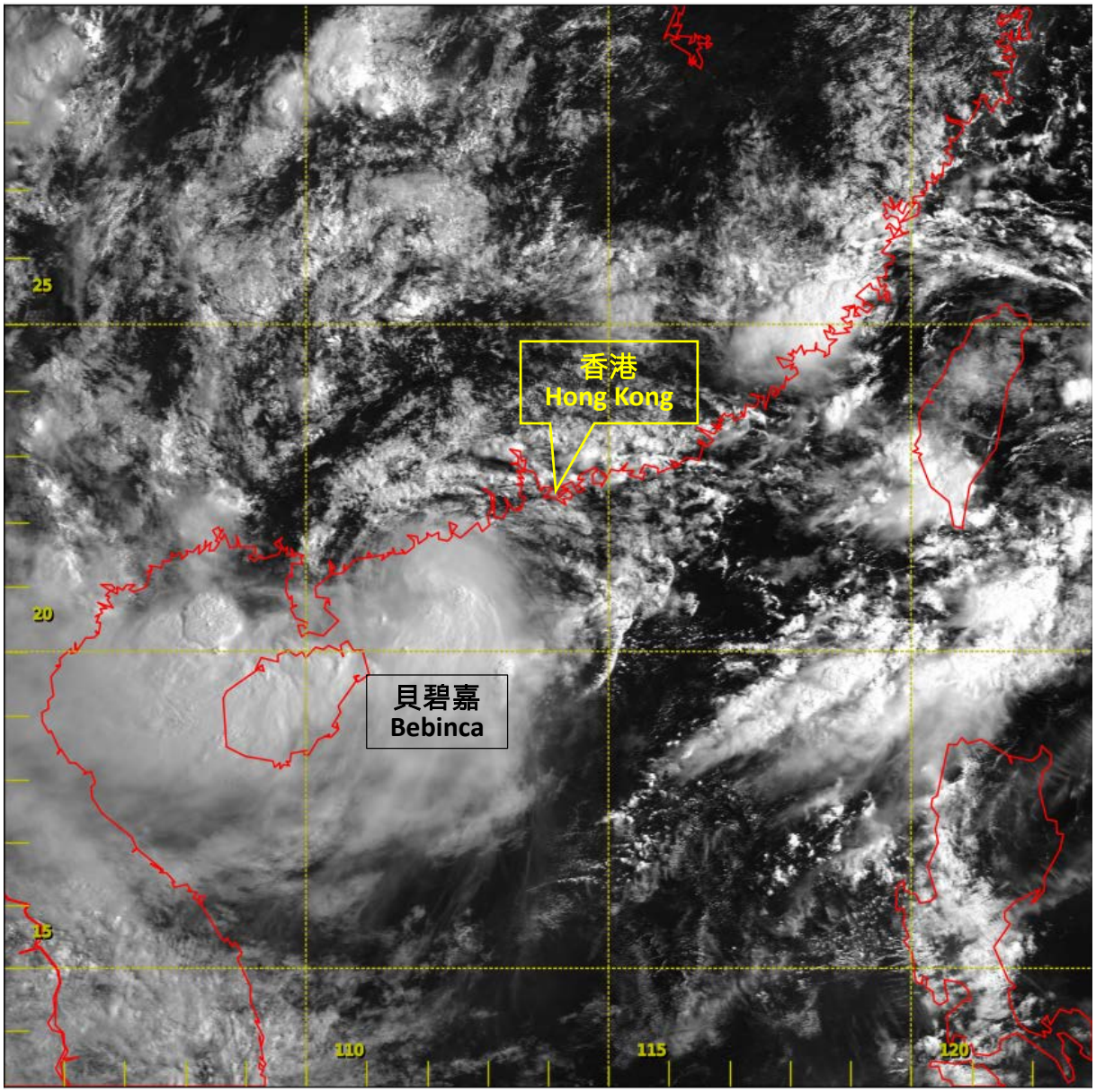


圖 3.3.3　二零一八年八月十五日上午 8 時左右的可見光衛星圖片，當時貝碧嘉達到其最高強度，中心附近最高持續風速估計為每小時 90 公里。

Figure 3.3.3　Visible satellite imagery around 8 a.m. on 15 August 2018, when Bebinca was at peak intensity with an estimated maximum sustained winds 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).]

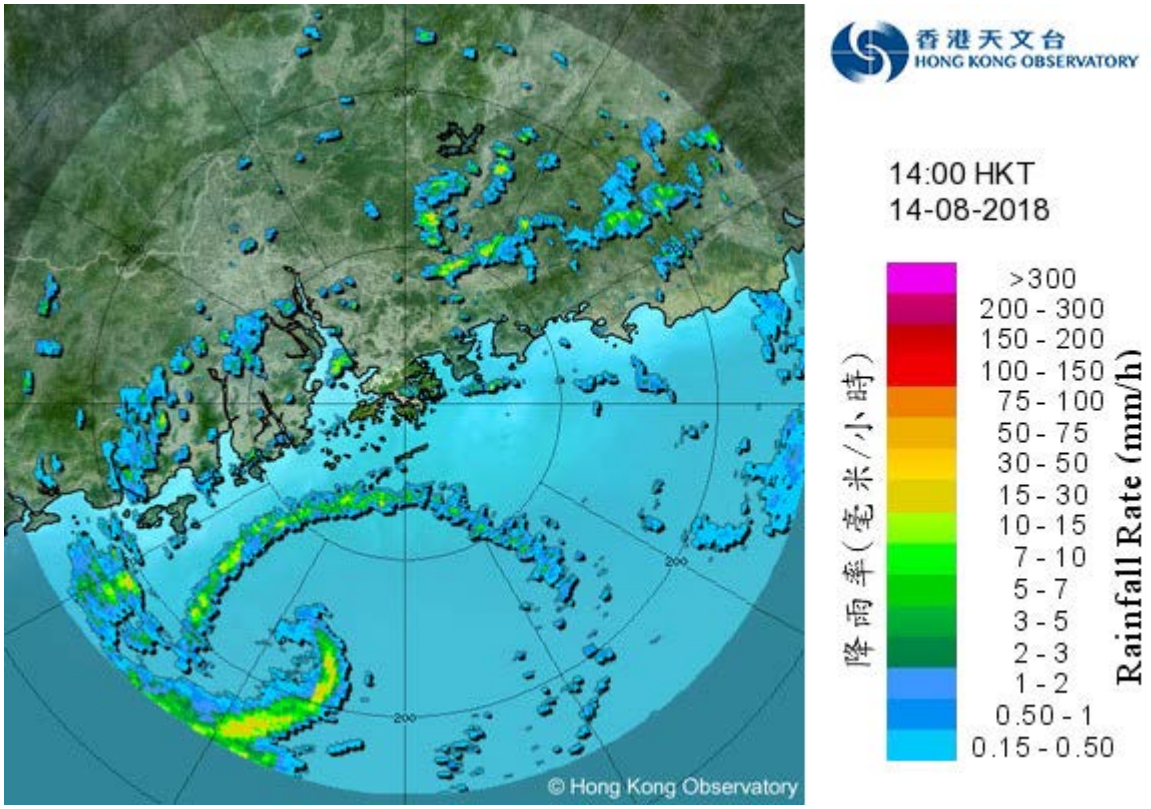


圖 3.3.4　二零一八年八月十四日下午 2 時的雷達回波圖像，當時貝碧嘉位於本港之西南偏南約 150 公里。與貝碧嘉相關的雨帶正影響廣東沿岸地區及南海北部。

Figure 3.3.4　Radar echoes captured at 2 p.m. on 14 August 2018 when the centre of Bebinca was located about 150 km south-southwest of Hong Kong. Showers associated with Bebinca were affecting the coastal areas of Guangdong and the northern part of the South China Sea.

3.4 熱帶風暴百里嘉 (1823)：二零一八年九月十日至十三日

百里嘉是二零一八年第四個影響香港的熱帶氣旋。

熱帶低氣壓百里嘉於九月十日早上在高雄之東南約200公里的海域上形成，大致向偏西方向移動，橫過南海北部。百里嘉於九月十一日增強為熱帶風暴，翌日晚上達到最高強度，中心附近最高持續風速估計為每小時85公里。九月十三日百里嘉橫過雷州半島及減弱，傍晚在廣西內陸消散。

根據報章報導，受百里嘉影響，湛江及茂名共有4萬人需要撤離。

香港天文台在九月十一日上午10時40分發出一號戒備信號，當時百里嘉集結在香港之東南偏東約460公里。九月十一日本港普遍吹輕微至和緩偏北風。隨著百里嘉靠近本港，天文台在九月十二日下午12時20分發出三號强風信號，當時百里嘉位於香港之東南偏南約170公里。當日下午本港普遍吹清勁至強風程度東至東北風。百里嘉於下午3時左右最接近香港，在本港以南約150公里掠過。隨著百里嘉繼續向西移動並遠離香港，本港風勢逐漸緩和，天文台在九月十三日上午4時10分以一號戒備信號取代三號強風信號，並於當日上午7時40分取消所有熱帶氣旋警告信號。

百里嘉影響香港期間，尖鼻咀錄得最高潮位(海圖基準面以上) 2.88米，大埔滘則錄得最大風暴潮(天文潮高度以上) 0.38米。天文台總部於九月十二日下午4時49分錄得最低瞬時海平面氣壓1006.0百帕斯卡，當時百里嘉位於本港以南約150公里。

百里嘉吹襲香港期間並沒有造成嚴重破壞。受百里嘉外圍下沉氣流影響，九月十一日本港天氣普遍晴朗。百里嘉於九月十二日在本港南面掠過，當日本港有幾陣驟雨。隨著百里嘉遠離香港，九月十三日除初時有幾陣驟雨外，本港部分時間有陽光。

表3.4.1 - 3.4.4 分別是百里嘉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3.4.1為百里嘉的路徑圖。圖3.4.2 - 3.4.3 分別為百里嘉的衛星及雷達圖像。

3.4 Tropical Storm Barijat (1823): 10 – 13 September 2018

Barijat was the fourth tropical cyclone affecting Hong Kong in 2018.

Barijat formed as a tropical depression over the sea areas about 200 km southeast of Gaoxiong on the morning of 10 September and moved generally westwards across the northern part of the South China Sea. It intensified into a tropical storm on 11 September and reached its peak intensity with an estimated maximum sustained wind of 85 km/h near its centre the next night. Barijat moved across Leizhou Peninsula and weakened on 13 September. It dissipated over inland Guangxi in that evening.

According to press reports, affected by Barijat, 40 000 people were evacuated in Maoming and Zhanjiang .

In Hong Kong, the No. 1 Standby Signal was issued at 10:40 a.m. on 11 September when Barijat was about 460 km east-southeast of Hong Kong. Local winds were light to moderate northerlies on 11 September. As Barijat edged closer towards Hong Kong, the No. 3 Strong Wind Signal was issued at 12:20 p.m. on 12 September when it was about 170 km south-southeast of Hong Kong. Local winds were generally fresh to strong east to northeasterlies in that afternoon. Barijat came closest to the territory at around 3 p.m. on that day as it skirted past about 150 km south of Hong Kong. As Barijat continued to track westwards and depart from Hong Kong, the No. 3 Strong Wind Signal was replaced by the No. 1 Standby Signal at 4:10 a.m. on 13 September, and all tropical cyclone warning signals were cancelled at 7:40 a.m. on that day.

During the passage of Barijat, a maximum sea level (above chart datum) of 2.88 m was recorded at Tsim Bei Tsui and a maximum storm surge (above astronomical tide) of 0.38 m was recorded at Tai Po Kau. The lowest instantaneous mean sea-level pressure of 1006.0 hPa was recorded at the Observatory headquarters at 4:49 p.m. on 12 September when Barijat was about 150 km south of Hong Kong.

Barijat did not cause any significant damage in Hong Kong. Under the influence of the outer subsiding air of Barijat, the weather of Hong Kong was generally fine on 11 September. As Barijat skirted past to the south of Hong Kong, there were a few showers on 12 September. With Barijat moving away from Hong Kong, apart from a few showers at first, there were sunny periods on 13 September.

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 Barijat is given in Tables 3.4.1 - 3.4.4 respectively. Figure 3.4.1 shows the track of Barijat. Figures 3.4.2 - 3.4.3 show respectively a satellite imagery and radar imageries of Barijat.

表 3.4.1　在百里嘉影響下，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 Barijat 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	70	12/9	14:32	東	E	31	12/9	19:00
中環碼頭	Central Pier	東	E	62	12/9	17:44	東	E	38	12/9	16:00
							東	E	38	12/9	17:00
長洲	Cheung Chau	東南偏東	ESE	67	12/9	19:30	東	E	40	12/9	20:00
							東	E	40	12/9	21:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	67	12/9	14:54	東北偏東	ENE	51	12/9	15:00
青洲	Green Island	東北偏東	ENE	77	12/9	14:45	東北偏東	ENE	52	12/9	17:00
香港國際機場	Hong Kong International Airport	東北偏東	ENE	51	12/9	16:21	東北偏東	ENE	31	12/9	17:00
啟德	Kai Tak	東南偏東	ESE	54	12/9	20:48	東	E	25	12/9	22:00
京士柏	King's Park	東	E	58	12/9	18:25	東	E	22	12/9	18:00
流浮山	Lau Fau Shan	東北偏東	ENE	51	12/9	14:34	東北偏東	ENE	30	12/9	20:00
北角	North Point	東	E	58	12/9	17:19	東北偏東	ENE	36	12/9	15:00
坪洲	Peng Chau	東北偏東	ENE	62	12/9	14:52	東	E	41	12/9	17:00
平洲	Ping Chau	東南	SE	31	12/9	12:41	東南	SE	7	12/9	13:00
西貢	Sai Kung	東北偏東	ENE	56	12/9	13:45	東北偏東	ENE	34	12/9	17:00
沙洲	Sha Chau	東北	NE	49	12/9	12:24	東	E	25	12/9	15:00
							東	E	25	12/9	19:00
沙螺灣	Sha Lo Wan	東	E	47	12/9	19:52	東	E	23	12/9	17:00
沙田	Sha Tin	東北	NE	49	12/9	13:30	東北	NE	16	12/9	14:00
石崗	Shek Kong	東北	NE	49	12/9	14:25	東	E	22	12/9	22:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	54	12/9	19:30	東	E	30	12/9	20:00
打鼓嶺	Ta Kwu Ling	東北	NE	38	12/9	16:55	東北偏東	ENE	14	12/9	14:00
大美督	Tai Mei Tuk	東北偏東	ENE	63	12/9	14:05	東北偏東	ENE	47	12/9	14:00
大帽山	Tai Mo Shan	東南偏東	ESE	79	12/9	21:37	東南偏東	ESE	58	12/9	22:00
大埔滘	Tai Po Kau	東	E	45	12/9	18:42	東	E	31	12/9	19:00
							東	E	31	12/9	22:00
塔門東	Tap Mun East	東北偏東	ENE	58	12/9	13:35	東北偏東	ENE	43	12/9	17:00
大老山	Tate's Cairn	東北偏東	ENE	77	12/9	13:56	東	E	52	12/9	23:00
將軍澳	Tseung Kwan O	東	E	51	12/9	15:34	東北偏北	NNE	14	12/9	10:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南	SE	40	12/9	15:37	東南偏東	ESE	14	12/9	17:00
屯門政府合署	Tuen Mun Government Offices	東南偏東	ESE	43	12/9	14:13	東北偏北	NNE	14	12/9	06:00
橫瀾島	Waglan Island	東北偏東	ENE	77	12/9	14:24	東北偏東	ENE	63	12/9	15:00
濕地公園	Wetland Park	東	E	36	12/9	13:39	東	E	14	12/9	15:00
黃竹坑	Wong Chuk Hang	東北	NE	58	12/9	18:01	東北偏東	ENE	22	12/9	18:00

昂坪- 沒有資料　Ngong Ping - data not available

表 3.4.2　在百里嘉影響下，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 3.4.2　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 Barijat 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	12/9	14:48	12/9	21:54

香港國際機場、啟德、沙田、流浮山、西貢、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 the Hong Kong International Airport, Kai Tak, Sha Tin, Lau Fau Shan, Sai Kung, 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 3.4.3　百里嘉掠過期間，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 Barijat

站 Station			九月十一日 11 Sep	九月十二日 12 Sep	九月十三日 13 Sep	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			0.0	微量 Trace	2.5	2.5
香港國際機場 Hong Kong International Airport (HKA)			0.0	2.1	0.3	2.4
長洲 Cheung Chau (CCH)			0.0	0.0	0.5	0.5
H23	香港仔	Aberdeen	0.0	3.5	1.5	5.0
N05	粉嶺	Fanling	0.0	0.0	0.5	0.5
N13	糧船灣	High Island	0.0	0.5	1.5	2.0
K04	佐敦谷	Jordan Valley	0.0	0.5	1.5	2.0
N06	葵涌	Kwai Chung	0.0	1.5	1.0	2.5
H12	半山區	Mid Levels	0.0	1.0	1.5	2.5
N09	沙田	Sha Tin	0.0	0.5	5.0	5.5
H19	筲箕灣	Shau Kei Wan	0.0	1.0	4.5	5.5
SEK	石崗	Shek Kong	0.5	1.0	3.0	4.5
K06	蘇屋邨	So Uk Estate	0.0	1.5	1.0	2.5
R31	大美督	Tai Mei Tuk	0.0	0.0	0.0	0.0
R21	踏石角	Tap Shek Kok	0.0	[0.0]	0.0	[0.0]
TMR	屯門水庫	Tuen Mun Reservoir	0.0	0.0	0.0	0.0

東涌 - 沒有資料　Tung Chung - data not available

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

表 3.4.4　百里嘉掠過期間，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 Barijat

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	2.51	12/9	11:31	0.30	12/9	13:10
石壁	Shek Pik	2.49	12/9	10:59	0.25	12/9	19:57
大廟灣	Tai Miu Wan	2.37	12/9	11:48	0.25	12/9	19:24
大埔滘	Tai Po Kau	2.56	11/9	11:07	0.38	12/9	15:20
尖鼻咀	Tsim Bei Tsui	2.88	11/9	11:22	0.27	13/9	00:03
橫瀾島	Waglan Island	2.50	12/9	11:49	0.19	12/9	13:46

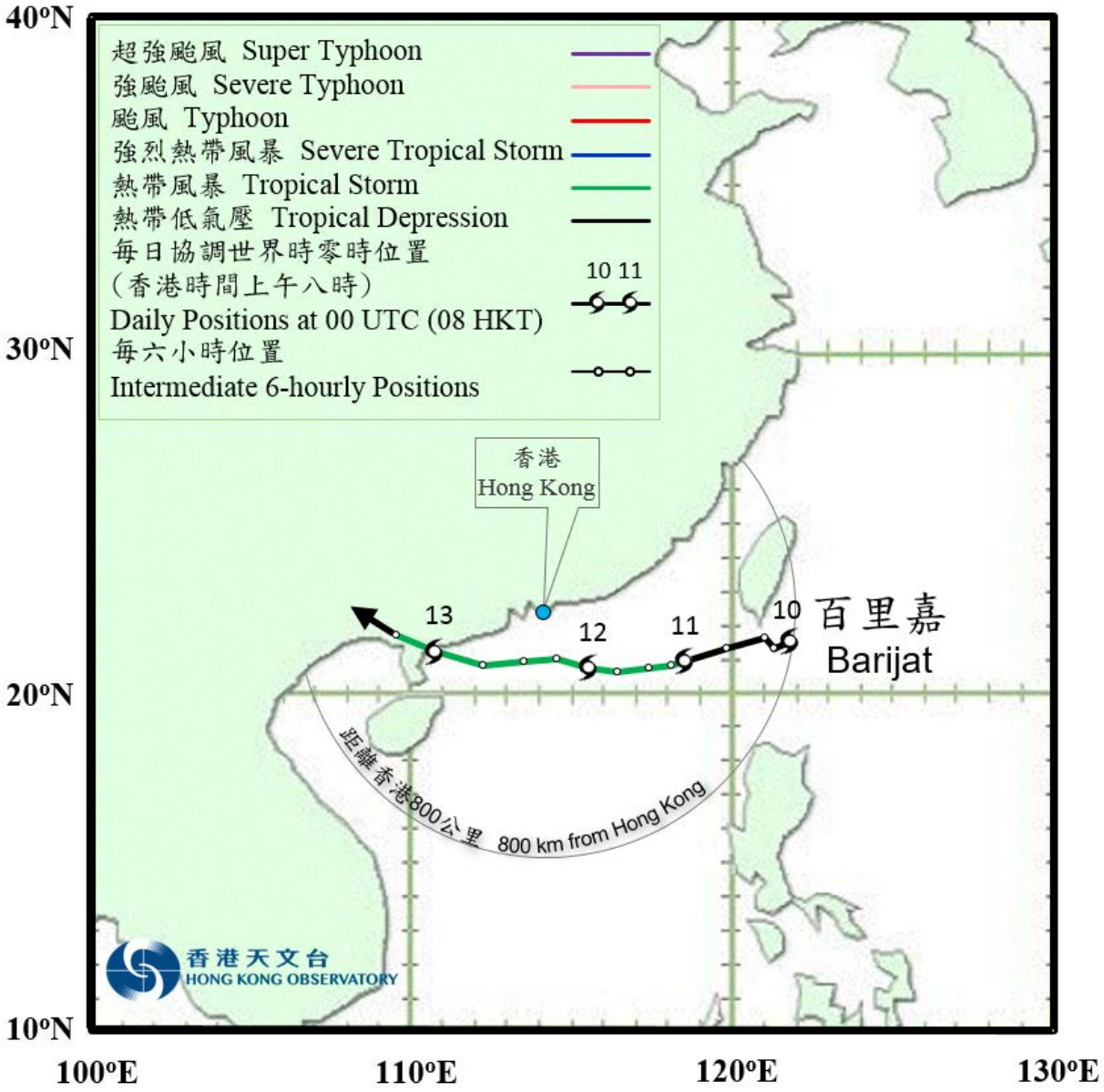


圖 3.4.1a 二零一八年九月十日至十三日百里嘉的路徑圖。

Figure 3.4.1a Track of Barijat on 10 - 13 September 2018.

圖 3.4.1b　　百里嘉接近香港時的路徑圖。

Figure 3.4.1b　　Track of Barijat near Hong Kong.

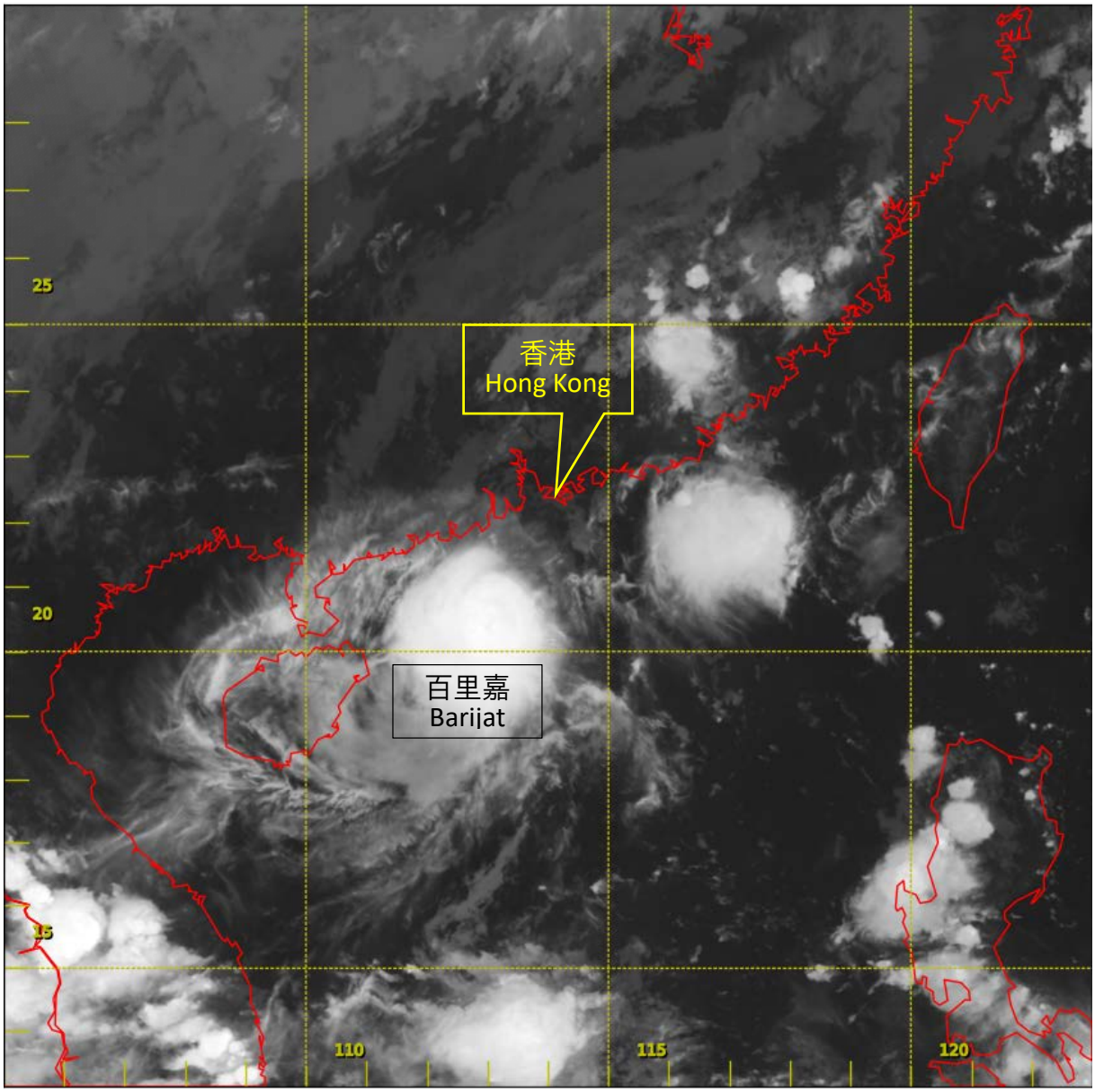


圖 3.4.2　二零一八年九月十二日下午 8 時的紅外線衛星圖片，當時百里嘉達到其最高強度，中心附近最高持續風速估計為每小時 85 公里。

Figure 3.4.2　Infra-red satellite imagery around 8 p.m. on 12 September 2018, when Barijat was at peak intensity with an estimated maximum sustained wind of 85 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).]

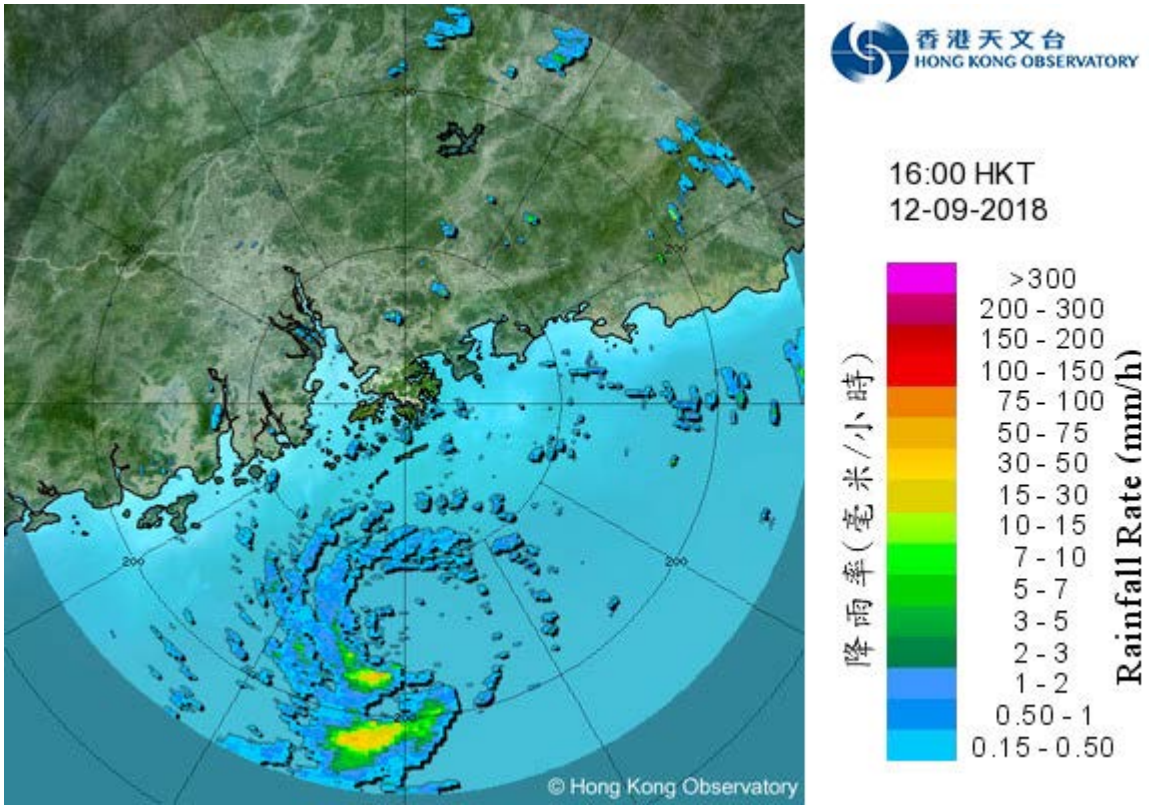


圖 3.4.3　二零一八年九月十二日下午 4 時的雷達回波圖像，當時百里嘉位於本港以南約 150 公里。與百里嘉相關的雨帶正影響廣東沿岸及南海北部。

Figure 3.4.3　Radar echoes captured at 4 p.m. on 12 September 2018 when the centre of Barijat was located about 150 km south of Hong Kong. Showers associated with Barijat were affecting the coast of Guangdong and the northern part of the South China Sea at the time.

3.5 超強颱風山竹 (1822)：二零一八年九月七日至十七日

山竹是二零一八年第五個影響香港的熱帶氣旋。繼二零一七年天鴿後，天文台在山竹襲港期間再次發出十號颶風信號，並持續了 10 小時，是戰後第二最長的十號颶風信號，僅次於一九九九年約克的 11 小時。山竹環流廣闊、風力強勁、移動迅速，加上其特別的風力結構，為香港帶來破壞性風力和破紀錄的風暴潮，並造成廣泛及嚴重的影響。

熱帶低氣壓山竹於九月七日在關島以東約 2 330 公里的北太平洋西部上形成，隨後數天迅速向西移動，並逐漸增強，於九月十一日發展為超強颱風。山竹在九月十四日轉向西北移動，在登陸呂宋前達到其最高強度，中心附近的最高持續風速估計為每小時 250 公里。山竹橫過呂宋北部後減弱，並繼續迅速以西北路徑橫過南海北部，移近廣東沿岸。山竹在九月十六日上午減弱為強颱風，黃昏前在廣東台山附近登陸，隨後移入廣東西部及進一步減弱。翌日晚上山竹在廣西減弱為一個低壓區。

根據報章報導，山竹為呂宋帶來狂風暴雨。最少有 82 人死亡、138 人受傷及兩人失蹤，約 15 000 間房屋倒塌。山竹為珠江口沿岸帶來破壞性的風力及嚴重的風暴潮，多處建築物及沿岸設施受損，低窪地區嚴重水浸。澳門有 40 人受傷，超過 5 500 人撤離，有多宗建築物損毀報告。內港離地面水浸高度曾達 1.9 米或以上。山竹亦在廣東、廣西、海南、貴州及雲南造成至少六人死亡，接近 330 萬人受災。

由於山竹移動迅速及預料會對香港構成嚴重威脅，天文台早於九月十四日晚上 10 時 20 分發出一號戒備信號，當時山竹集結在香港之東南偏東約 1 110 公里，是有記錄以來最遠的一次。九月十五日日間本港吹輕微至和緩的東北風。隨著山竹迅速移近廣東沿岸，天文台在九月十五日下午 4 時 20 分發出三號強風信號，當時山竹位於香港之東南約 650 公里。晚上本港風勢增強，吹清勁至強風程度的偏北風。隨著山竹繼續逼近珠江口一帶，天文台在九月十六日上午 1 時 10 分發出八號東北烈風或暴風信號，當時山竹集結在香港之東南約 410 公里。其後本港風勢繼續增強，離岸及高地吹烈風至暴風程度的偏北風。由於預料當山竹接近香港時，本港風力會進一步增強，天文台在上午 7 時 40 分發出九號烈風或暴風風力增強信號，當時山竹已移至香港之東南偏南約 200 公里。其後本港風力急速增強，天文台在上午 9 時 40 分發出十號颶風信號，當時山竹位於香港之東南偏南

約 160 公里。在八號、九號及十號熱帶氣旋警告信號發出的時候，風暴與本港的距離均是自一九六一年以來該信號的最遠紀錄。九月十六日日間本港各區長時間受具破壞性的暴風至颶風所吹襲。山竹在下午 1 時左右最接近香港，當時它位於天文台總部之西南偏南約 100 公里。而隨著山竹在香港的西南面掠過，本港風向由東北逐漸轉為東南。黃昏前山竹在廣東台山附近登陸，遠離本港並逐漸減弱，當香港不再受颶風威脅，天文台在下午 7 時 40 分改發八號東南烈風或暴風信號。晚間本港風力繼續減弱，天文台在九月十七日上午 5 時 20 分改發三號強風信號，並於當日下午 2 時 40 分改發一號戒備信號。隨著山竹進一步移入內陸和減弱，天文台在九月十七日晚上 7 時 10 分取消所有熱帶氣旋警告信號。

山竹橫過呂宋北部後減弱，其眼壁的對流亦較橫過呂宋前弱，相反離山竹中心約 100 至 200 公里之間的螺旋雨帶仍然保持強烈對流和十分完整的結構。綜合微波衛星圖像(圖 3.5.6)、多普勒天氣雷達圖像(圖 3.5.7)、地面觀測和氣象偵察飛行數據的分析，山竹眼壁外螺旋雨帶的風力明顯高於眼壁附近的環流。當山竹在香港南面經過時，該強烈螺旋雨帶在日間影響本港。再加上山竹在南海北部移動速度相當快(時速達 35 公里)，而香港長時間位於風暴的右半圓(亦即危險半圓)，風暴的風力及移動速度的疊加令香港當日大部分時間受到猛烈風力吹襲。因此，雖然山竹的路徑較接近澳門、珠海及台山一帶，但由於山竹特別的風力結構，本港所受風力卻是珠江三角洲一帶之中最強勁的。

山竹吹襲香港期間，香港各測風站錄得的最高風力載於表 3.5.1，香港整體的風力超越過去三十年引致天文台需要發出十號颶風信號的熱帶氣旋所帶來的風力，包括一九九九年的約克、二零一二年的韋森特及二零一七年的天鴿(見表 3.5.2)。九月十六日在橫瀾島及長洲錄得的最高 60 分鐘平均風速分別為每小時 161 及 157 公里，均是該站歷來的第二最高，僅次於一九八三年的愛倫。當日香港大部分地區錄得每小時超過 150 公里的陣風，大老山的陣風更達每小時 256 公里，排名於一九六二年的溫黛和一九六四年的露比之後。而位於維多利亞港內的北角測風站錄得的最高 10 分鐘平均風速為每小時 124 公里(圖 3.5.9)，是一九九八年該站啓用以來首次錄得持續颶風。另外，正在清水灣測試的自動測風站更錄得高達每小時 191 公里的 10 分鐘平均風速 (註 1)，相信是天文台自一九八零年代開始在香港安裝自動氣象站以來的近地面最高紀錄。

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	977.0	16/9	下午 1 時 28 分
香港國際機場	973.9	16/9	下午 2 時 11 分
京士柏	977.5	16/9	下午 1 時 44 分
打鼓嶺	981.3	16/9	下午 12 時 52 分
大埔	980.5	16/9	下午 1 時 17 分
沙田	980.1	16/9	下午 12 時 21 分
上水	979.8	16/9	下午 2 時 06 分
流浮山	976.7	16/9	下午 1 時 59 分
長洲	971.8	16/9	下午 2 時 10 分
橫瀾島	973.5	16/9	下午 12 時 10 分

山竹襲港的路徑是引致香港出現嚴重風暴潮的典型路徑。當時山竹在香港西南偏南近距離掠過，與其相關的猛烈東至東南風把海水推向並堆積在岸邊。加上山竹環流廣闊，它的風場推動較廣闊的洋面，繼而進一步推高水位。山竹所帶來的風暴潮令本港水位普遍升高超過兩米，引致本港多處出現異常高的水位。天文台的六個潮汐站當中的五個(鰂魚涌、大埔滘、尖鼻咀、大廟灣及石壁)錄得破紀錄的風暴潮，其中鰂魚涌和大埔滘潮汐站分別錄得 2.35 米及 3.40 米的風暴潮增水。而橫瀾島潮汐站因在山竹吹襲期間受嚴重損毀，並未能錄得最高潮位紀錄。當日鰂魚涌的潮位(即天文潮位加風暴潮)最高升至 3.88 米(海圖基準面以上，下同)，超越了天鴿襲港時錄得的 3.57 米，並僅次於 1962 年溫黛襲港期間錄得的 3.96 米。大埔滘則錄得最高潮位 4.71 米，同樣僅次於溫黛襲港期間錄得的 5.03 米。有關山竹掠過期間香港各潮汐站所錄得的最高潮位可參考圖 3.5.11。

山竹前沿的下沉氣流於九月十四日及十五日為本港帶來大致天晴及酷熱的天氣。九月十五日天文台氣溫飆升至 35.1 度，是有記錄以來九月的第二高。在山竹環流的影響下，九月十六日本港天氣急速轉壞及有狂風大雨。當日本港大部分地區錄得超過 150 毫米的雨量。天文台曾發出紅色暴雨警告及新界北部水浸特別報告。受到與山竹相關的雨帶影響，九月十七日本港仍間中有狂風驟雨。

山竹吹襲期間，本港至少有 458 人受傷，另有超過六萬宗的塌樹報告，數目是有記錄以來最多，多處有物件被吹倒、高空墜物及建築物受損，大角咀有建築

地盤一個天秤被吹斷，亦有大廈外牆及天台屋被強風吹倒。秀茂坪有垃圾收集站的鐵皮屋頂被吹走。全港有至少 500 宗玻璃窗或玻璃幕牆損毀報告，當中紅磡、灣仔、中環、旺角有商業大廈玻璃幕牆爆裂。將軍澳有住宅單位的玻璃窗被吹毀，荔景亦有住宅單位的冷氣機被吹入室內，導致一人受傷。全港有超過四萬戶電力供應中斷(圖 3.5.13)，包括多個新界西及新界北的鄉郊地區、西貢、將軍澳及杏花邨的個別樓宇、長洲、吉澳、東平洲等。當中約 13 500 戶停電超過 24 小時，而一些較偏遠地區及個別樓宇的電力供應在四日後仍未能完全恢復。停電亦引致一些地方的食水供應受到影響。

與二零一七年的天鴿相比，山竹所引致的暴雨、風暴潮及巨浪造成的破壞更為嚴重。大澳、石壁、梅窩、長洲、杏花邨、小西灣、海怡半島、鯉魚門、將軍澳、沙田、大埔、西貢、元朗、流浮山、沙頭角、石澳及坪洲等多處沿岸地區因風暴潮和大浪而嚴重水浸。多個沿岸設施包括污水處理廠、公眾泳灘、海濱長廊及運動場都受到不同程度的損毀。大澳、鯉魚門及沙田曾大屋村一帶因嚴重水浸，多名村民需要疏散。海水亦湧入杏花邨及將軍澳南一帶，有地下停車場被海水淹浸，多輛汽車被淹沒。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亦被海水淹浸。西貢南圍、流浮山、大埔三門仔新村、沙頭角新村亦有多間村屋水浸。在巨浪下數以百計不同大小的船隻擱淺、沉沒或受嚴重破壞。各區的農田、魚排及魚塘均有不同程度的損毀。

本港海陸空交通在山竹來襲當天癱瘓，而翌日部分地區的主要道路仍因塌樹或水浸需封閉，公共交通服務未能完全恢復正常，大部分專營巴士路線停駛，港鐵東鐵綫和輕鐵只維持有限度服務。多個渡輪碼頭設施嚴重損毀，影響渡輪復航。香港國際機場有 889 班航班取消。

有關山竹與其他曾引致本港發出十號颶風信號的熱帶氣旋比較，可參考天文台網誌《令我們覺醒的「山竹」》：https://www.hko.gov.hk/tc/blog/00000216.htm。

表 3.5.1 是山竹影響香港期間各站錄得的最高風速。表 3.5.2 比較山竹與過去三十年引致天文台需要發出十號颶風信號的熱帶氣旋的最高風速及最高陣風。表 3.5.3 - 3.5.5 分別是山竹影響香港期間各站錄得的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 3.5.1 - 3.5.2 分別為山竹的路徑圖和山竹中心附近最高持續風速。圖 3.5.3 是本港的雨量分佈圖。圖 3.5.4- 3.5.5 分別為山竹的衛星及雷達圖像（註 2)。圖 3.5.6 是山竹風力結構變化的示意圖。圖 3.5.7 為山竹的多普勒雷達回波圖像。圖 3.5.8 是香港各站錄得的風向和風速。圖

3.5.9 顯示長洲、橫瀾島及北角錄得的風速。圖 3.5.10 顯示天文台總部、長洲及橫瀾島錄得的海平面氣壓。圖 3.5.11 顯示各潮汐站錄得的最高潮位及水浸報告。圖 3.5.12 顯示鰂魚涌、大埔滘及尖鼻咀錄得的潮位及風暴潮。圖 3.5.13 顯示在山竹的影響下，有關電力及食水中斷的報告。一些山竹在香港造成的破壞的圖片可參見圖 3.5.14-3.5.19，更多有關山竹為香港帶來破壞的相片及短片，請參看山竹風暴破壞互動地圖網頁(https://www.weather.gov.hk/tc/cwsrc/index_mangkhut.html)。

註 1：清水灣自動站位處複雜地形，風速計高度在海平面以上七十多米，估計相應近海平面的風速低於每小時 185 公里。

註 2：請參看天文台網頁有關山竹的衛星及雷達圖像動畫(https://www.weather.gov.hk/tc/informtc/mangkhut18/mangkhut.htm)。

3.5 Super Typhoon Mangkhut (1822):7 – 17 September 2018

Mangkhut was the fifth tropical cyclone affecting Hong Kong in 2018. After Hato in 2017, the Hurricane Signal No. 10 was issued again during the passage of Mangkhut and lasted for ten hours. It was the second longest duration of Signal No. 10 since World War II, just after the 11 hours of York in 1999. Mangkhut is characterized by its extensive circulation, ferocious winds and fast movement as well as special wind structure. It brought damaging winds and record-breaking storm surges to Hong Kong, causing widespread and serious impacts.

Tropical depression Mangkhut formed over the western North Pacific about 2 330 km east of Guam on 7 September. Moving westwards quickly, it intensified gradually in the following few days. Mangkhut developed into a super typhoon on 11 September. It turned to the northwest on 14 September, reaching its peak intensity before making landfall over Luzon with an estimated maximum sustained wind of 250 km/h near the centre. Mangkhut weakened after crossing the northern part of Luzon and continued to track northwestwards quickly across the northern part of the South China Sea towards the coast of Guangdong. Mangkhut weakened into a severe typhoon on the morning of 16 September and made landfall in the vicinity of Taishan of Guangdong before dusk. It then moved into western part of Guangdong and weakened further. Mangkhut degenerated into an area of low pressure over Guangxi the next night.

According to press reports, Mangkhut brought torrential rain and squalls to Luzon. There were at least 82 deaths, 138 injuries and two missing. Around 15 000 houses collapsed. Mangkhut brought damaging winds and severe storm surge to the coast of Pearl River estuary, leading to damages of many buildings and coastal structures, as well as serious inundation of low lying areas. In Macao, 40 people were injured and more than 5 500 people were evacuated. There were a number of reports of building damages. The height of the inundation in Inner Harbour once reached 1.9 metres or higher above ground. At least six people were killed and more than 3.3 million were affected in Guangdong, Guangxi, Hainan, Guizhou and Yunnan.

As Mangkhut was a fast-moving storm and posed a serious threat to Hong Kong, the Hong Kong Observatory issued the Standby Signal No. 1 well in advance at 10:20 p.m. on 14 September when Mangkhut was about 1 110 km east-southeast of the territory, the farthest distance on record. Local winds were light to moderate northeasterlies during the day of 15 September. As Mangkhut edged closer to the coast of Guangdong quickly, the No. 3 Strong Wind Signal was issued at 4:20 p.m. on 15 September when Mangkhut was about 650 km southeast of Hong Kong. Local winds strengthened at night, becoming fresh to strong northerlies. With Mangkhut maintaining its course towards the Pearl River Estuary, the Observatory issued the No. 8 Northeast Gale or Storm Signal at 1:10 a.m. on 16 September when Mangkhut was about 410 km southeast of the territory. Local winds continued to strengthen afterwards, with gale to storm force northerlies offshore and on high ground. As winds were expected to increase further when Mangkhut came closer to Hong Kong, the Increasing Gale or Storm Signal No. 9 was issued at 7:40 a.m. when Mangkhut was about 200 km south-southeast of the territory. With local winds picking up rapidly afterwards, the Observatory issued the Hurricane Signal No. 10 at 9:40 a.m. when Mangkhut was about 160 km south-southeast of the territory. At the time when tropical cyclone signals number

8, 9 and 10 were issued, the storm was the farthest away from Hong Kong for the corresponding signal since 1961. The destructive storm to hurricane force winds affected Hong Kong for a long period of time during the day of 16 September. Mangkhut came closest to the Hong Kong Observatory Headquarters around 1 p.m. when its centre was located at about 100 km to the south-southwest. With Mangkhut shirting past to the southwest of Hong Kong, local winds veered from the northeast to the southeast gradually. Mangkhut made landfall over the vicinity of Taishan of Guangdong before dusk. With Mangkhut moving away from Hong Kong and weakening gradually, hurricane force winds no longer affected the territory. The No. 8 Southeast Gale or Storm Signal was issued at 7:40 p.m. to replace the No. 10 Signal. With local winds subsiding continuously, the No. 3 Strong Wind Signal was issued at 5:20 a.m. on 17 September, followed by the No. 1 Standby Signal at 2:40 p.m. Mangkhut moved further inland and weakened, and all tropical cyclone warning signals were cancelled at 7:10 p.m. that night.

While Mangkhut weakened after moving across the northern part of Luzon with weaker convection over the eyewall, the spiral rainband between 100 and 200 kilometres from its centre remained intense and the structure was intact. Analysis of microwave satellite images (Figure 3.5.6), Doppler weather radar images (Figure 3.5.7), surface observations and flight reconnaissance data revealed that the winds associated with the spiral rainband outside the eyewall were stronger than those near the eyewall. When Mangkhut skirted past to the south of Hong Kong, the intense spiral rainband swept across Hong Kong during the day. Moreover, Mangkhut moved rapidly over the northern part of the South China Sea (speed reaching 35 km/h). With Hong Kong staying in the right semicircle of the storm (also known as the dangerous semicircle) for a long time, the superposition of wind speed and moving speed of the storm brought ferocious winds to Hong Kong most of the time during the day. In view of the special wind structure of Mangkhut, the wind strength experienced by Hong Kong was the strongest among the Pearl River Delta areas even though Mangkhut tracked closer to Macao, Zhuhai and Taishan.

Table 3.5.1 showed the maximum wind recorded at various stations in Hong Kong during the passage of Mangkhut. Under the influence of Mangkhut, the wind strength over Hong Kong was generally stronger than that of the tropical cyclones necessitating the issuance of No. 10 signals in the recent three decades, including York in 1999, Vicente in 2012 and Hato in 2017 (Table 3.5.2). The maximum 60-minute mean wind speeds recorded at Waglan Island and Cheung Chau were 161 km/h and 157 km/h respectively. Both are the second highest records at the corresponding stations, just lower than the record high of Ellen in 1983. Gusts over 150 km/h were registered in most parts of the territory on that day and a maximum gust of 256 km/h was recorded at Tate’s Cairn, ranking after Wanda in 1962 and Ruby in 1964. A maximum 10-minute mean wind of 124 km/h was registered at North Point anemometer located inside the Victoria Harbour (Figure 3.5.9), the first time sustained hurricane force winds were recorded at the station since the start of its operation in 1998. Besides, the automatic weather station under testing at Clear Water Bay even recorded a maximum 10-minute average wind speed of 191 km/h (Note 1), which is believed to be the highest record near the surface since the Observatory's commencement of automatic weather station installation in Hong Kong in the 1980s.

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	977.0	16/9	1:28 p.m.
Hong Kong International Airport	973.9	16/9	2:11 p.m.
King's Park	977.5	16/9	1:44 p.m.
Ta Kwu Ling	981.3	16/9	12:52 p.m.
Tai Po	980.5	16/9	1:17 p.m.
Shatin	980.1	16/9	12:21 p.m.
Sheung Shui	979.8	16/9	2:06 p.m.
Lau Fau Shan	976.7	16/9	1:59 p.m.
Cheung Chau	971.8	16/9	2:10 p.m.
Waglan Island	973.5	16/9	12:10 p.m.

Mangkhut's track is a typical one causing severe storm surge in Hong Kong. When it skirted past to the south-southwest of Hong Kong, the associated ferocious east to southeasterly winds pushed water towards the shore and piled up against the coast. In addition, Mangkhut's extensive circulation drove a more extensive area of the ocean which in turn raised the water level further. The severe storm surge induced by Mangkhut raised the water level in Hong Kong generally by more than two metres, resulting in an unusually high water level in many places in Hong Kong. Five of the six tide stations of the Observatory (including Quarry Bay, Tai Po Kau, Tsim Bei Tsui, Tai Miu Wan and Shek Pik) registered record breaking storm surges. Among them, the water level increases recorded at the tide station at Quarry Bay and Tai Po Kau were 2.35 metres and 3.40 metres respectively. As the tide station at Waglan Island was severely damaged by Mangkhut, the highest sea level was not recorded. The sea level (the sum of astronomical tide and storm surge) of Quarry Bay rose to a maximum of 3.88 metres (above Chart Datum, same below), exceeding the 3.57 metres registered during the passage of Hato in 2017, and only lower than the record high of 3.96 metres set by Wanda in 1962. A maximum water level of 4.71 metres was recorded at Tai Po Kau, also only lower than the record high of 5.03 metres set by Wanda. For the maximum sea level recorded at various tide stations in Hong Kong on 16 September 2018, please refer to Figure 3.5.11.

The subsiding air ahead of Mangkhut's circulation brought mainly fine and very hot weather to Hong Kong on 14 and 15 September. Temperature at the Hong Kong Observatory soared to 35.1 degrees on 15 September, the second highest record for September. Under the influence of the circulation of Mangkhut, the weather in Hong Kong deteriorated rapidly with heavy rain and squalls on 16 September. More than 150 millimetres of rainfall were recorded over most parts of the territory on that day. Red Rainstorm Warning and Special Announcement on Flooding in the Northern New Territories were issued by the Observatory. Under the influence of the rain bands associated with Mangkhut, there were still occasional squally showers on 17 September.

In Hong Kong, at least 458 people were injured during the passage of Mangkhut. There

were more than 60 000 reports of fallen trees, the highest number on record. Many incidents of blowing down and falling objects as well as building damages were reported. A tower crane of a construction site in Tai Kok Tsui was blown down. The wall of a building and a rooftop home also collapsed. The roof of a refuse collection centre in Sau Ming Ping was also blown away. At least 500 reports of smashed windows or glass curtain walls were received. Among them, glass curtain walls of several commercial buildings in Hung Hom, Wan Chai, Central and Mong Kok were damaged. Windows were broken in several apartment buildings in Tseung Kwan O. An air conditioning unit was crashed into an apartment in Lai King, injuring a person inside. Electricity supply to over 40 000 households in Hong Kong was interrupted (Figure 3.5.13), including Sai Kung, Cheung Chau, Kat O, Tung Ping Chau, individual buildings in Tseung Kwan O and Heng Fa Chuen, and rural areas in the western and northern New Territories. Power outage to some 13 500 households lasted for more than 24 hours, and the electricity supply to some remote areas and individual buildings were not fully restored even after four days. Supply of fresh water in some places was also affected due to power outages.

The destructions caused by the heavy rain, storm surge and high waves induced by Mangkhut are more serious than those of Hato in 2017. Severe inundation triggered by storm surge and huge waves were observed in a number of coastal areas, including Tai O, Shek Pik, Mui Wo, Cheung Chau, Heng Fa Chuen, Siu Sai Wan, South Horizons, Lei Yue Mun, Tseung Kwan O, Sha Tin, Tai Po, Sai Kung, Yuen Long, Lau Fau Shan, Sha Tau Kok, Shek O and Peng Chau. Many coastal structures suffered from different levels of damages, including sewage treatment works, public beaches, waterfront promenades and sports ground. Flooding was serious in Tai O, Lei Yue Mun and Tsang Tai Uk in Shatin and many residents were evacuated. Sea water flowed into the estates and underground car parks in Hung Fa Chuen and Tseung Kwan O south, submerging a number of private vehicles inside. The cycle tracks and subways near Shing Mun River in Shatin, coastal area of Tolo Harbour, Lam Tsuen River in Tai Po were inundated. A number of villages houses in Nam Wai in Sai Kung, Lau Fau Shan, Sam Mun Tsai San Tsuen in Tai Po and San Tsuen in Sha Tau Kok were seriously flooded. Hundreds of vessels of various sizes were stranded, sunk or seriously damaged by the powerful waves. Farmland, fish rafts and fish ponds in all districts suffered different levels of damage.

Sea, land and air transportation services were paralyzed on the day Mangkhut battered Hong Kong. Owing to fallen trees and flooding, parts of the major roads were still closed and public transports could not be fully resumed the next day. Most of the public bus services were suspended and there were limited services of East Rail Line and Light Rail of MTR. Ferry services resumption was affected due to the damage of facilities at a number of ferry terminals. 889 flights were cancelled at the Hong Kong International Airport.

For comparison between Mangkhut and the tropical cyclones necessitating the issuance of the Hurricane Signal No. 10, please refer to the Observatory's Blog – "A Wake up Call from Mangkhut" (https://www.hko.gov.hk/en/blog/00000216.htm).

Information on the maximum wind during the passage of Mangkhut is given in Table 3.5.1. Table 3.5.2 is a comparison of the maximum wind during the passage of Mangkhut and the tropical cyclones necessitating the issuance of No. 10 signals in the recent three decades. Information of periods of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Mangkhut is given in Tables 3.5.3 - 3.5.5 respectively. Figures 3.5.1 - 3.5.2 show respectively the track of

Mangkhut and the maximum sustained wind speed near the centre of Mangkhut. Figure 3.5.3 is the rainfall distribution for Hong Kong. Figures 3.5.4 - 3.5.5 show respectively a satellite imagery and a radar imagery of Mangkhut (Note 2). Figure 3.5.6 is an illustration of the change of wind structure of Mangkhut. Figure 3.5.7 is the Doppler velocity of Mangkhut. Figure 3.5.8 shows the winds recorded at various stations in Hong Kong. Figure 3.5.9 shows traces of the wind speed recorded at Cheung Chau, Waglan Island and North Point. Figure 3.5.10 shows trace of mean sea-level pressure recorded at the Hong Kong Observatory's Headquarters, Cheung Chau and Waglan Island. Figure 3.5.11 shows the maximum sea level recorded at various tide stations in Hong Kong and flood reports. Figure 3.5.12 is the traces of sea level and storm surge recorded at Quarry Bay, Tai Po Kau and Tsim Bei Tsui. Figure 3.5.13 shows reports of interruption of power and water supply under the influence of Mangkhut. Figures 3.5.14-3.5.19 are some photos of the damages brought by Mangkhut in Hong Kong. Please refer to the Interactive Map of Storm Damage by Mangkhut for more photos and videos of damages brought by Mangkhut (https://www.weather.gov.hk/en/cwsrc/index_mangkhut.html).

Note 1: The automatic weather station at Clear Water Bay is located on a complex terrain with the anemometer at an elevation over 70 metres above sea level. The corresponding wind speed near sea level is estimated to be lower than 185 km/h.

Note 2: The animation sequences of satellite and radar imageries are available on the Observatory's website at https://www.weather.gov.hk/en/informtc/mangkhut18/mangkhut.htm.

表 3.5.1　本港各站在山竹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 Mangkhut 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)	-	-	157	16/9	14:00	-	-	101	16/9	15:00
中環碼頭	Central Pier	東	E	169	16/9	12:30	東	E	99	16/9	13:00
長洲	Cheung Chau	東	E	212	16/9	14:10	東	E	151	16/9	15:00
長洲泳灘	Cheung Chau Beach	東北	NE	209	16/9	12:01	東北偏東	ENE	142	16/9	14:00
青洲	Green Island	東北偏北	NNE	229	16/9	10:29	東北	NE	124	16/9	11:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	157	16/9	16:26	東	E	99	16/9	15:00
啟德	Kai Tak	東北偏東	ENE	142	16/9	10:28	東南偏東	ESE	77	16/9	17:00
		東北偏東	ENE	142	16/9	13:59					
京士柏	King's Park	東北偏北	NNE	161	16/9	10:17	東	E	67	16/9	15:00
流浮山	Lau Fau Shan	東北偏東	ENE	166	16/9	12:40	東北偏東	ENE	96	16/9	14:00
北角	North Point	東	E	171	16/9	12:51	東	E	110	16/9	13:00
平洲	Ping Chau	東	E	124	16/9	11:30	東南偏南	SSE	47	16/9	11:00
西貢	Sai Kung	東北	NE	180	16/9	11:43	東北	NE	108	16/9	12:00
沙洲	Sha Chau	東	E	164	16/9	14:02	東南偏東	ESE	103	16/9	15:00
沙螺灣	Sha Lo Wan	東	E	169	16/9	14:11	東	E	87	16/9	15:00
沙田	Sha Tin	東北偏北	NNE	149	16/9	11:42	東北偏北	NNE	47	16/9	11:00
石崗	Shek Kong	東北	NE	164	16/9	11:22	東	E	72	16/9	15:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	135	16/9	13:48	東	E	79	16/9	14:00
打鼓嶺	Ta Kwu Ling	東北偏東	ENE	133	16/9	13:28	東北偏北	NNE	52	16/9	11:00
大美督	Tai Mei Tuk	東北偏東	ENE	198	16/9	12:08	東北偏東	ENE	139	16/9	13:00
大帽山	Tai Mo Shan	東南偏東	ESE	250	16/9	14:05	東南偏東	ESE	167	16/9	15:00
大埔滘	Tai Po Kau	東	E	146	16/9	13:09	東	E	88	16/9	13:00
大老山	Tate's Cairn	東北偏東	ENE	256	16/9	10:33	東北偏東	ENE	158	16/9	12:00
將軍澳	Tseung Kwan O	東北偏北	NNE	153	16/9	10:40	東北偏北	NNE	52	16/9	11:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南偏東	ESE	137	16/9	14:22	東南偏東	ESE	58	16/9	15:00
屯門政府合署	Tuen Mun Government Offices	東	E	133	16/9	14:01	東南	SE	51	16/9	17:00
橫瀾島	Waglan Island	東北	NE	220	16/9	10:14	東北	NE	158	16/9	11:00
濕地公園	Wetland Park	東	E	130	16/9	13:06	東	E	58	16/9	14:00
黃竹坑	Wong Chuk Hang	東北偏東	ENE	173	16/9	13:40	東北偏東	ENE	54	16/9	14:00

-沒有資料 data not available

昂坪、坪洲、塔門東- 沒有資料　Ngong Ping, Peng Chau and Tap Mun East- data not available

表 3.5.2　山竹與過去三十年引致天文台需要發出十號颶風信號的熱帶氣旋(約克、韋森特及天鴿)襲港期間錄得的最高 60 分鐘平均風速及最高陣風

Table 3.5.2　Maximum 60-minute mean wind speeds and maximum gusts recorded during the passage of Mangkhut and the tropical cyclones necessitating the issuance of No. 10 signals in the recent three decades (York, Vicente and Hato)

站 (參閱圖 1.1) Station (See Fig. 1.1)	最高 60 分鐘平均風速/最高陣風 (公里/小時) Maximum 60-minute mean wind speeds / Maximum gust peak speeds (km/h)			
	1999	2012	2017	2018
	約克 York	韋森特 Vicente	天鴿 Hato	山竹 Mangkhut
長洲 Cheung Chau	113/182	128/184	128/171	157/212
香港國際機場 Hong Kong International Airport	88/135	85/133	92/144	101/157
流浮山 Lau Fau Shan	106/158	59/106	70/112	96/166
啟德 Kai Tak	59/142	70/135	67/130	81/142
北角 North Point	77/155	67/130	85/137	110/171
西貢 Sai Kung	108/211	76/121	70/112	112/180
沙田 Sha Tin	51/153	41/88	40/104	51/149
九龍天星碼頭 Star Ferry (Kowloon)	81/149	83/122	63/112	85/135
青衣島蜆殼油庫 Tsing Yi Shell Oil Depot	85/153	43/106	45/106	59/137
打鼓嶺 Ta Kwu Ling	58/121	41/94	43/99	52/133
大尾督 Tai Mei Tuk	115/180	101/146	101/140	139/198
橫瀾島 Waglan Island	153/234	108/149	137/193	161/220

表 3.5.3　在山竹影響下，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 3.5.3　Periods during which sustained strong and gale force winds were attained at the eight reference anemometers when tropical cyclone warning signals for Mangkhut 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	15/9	21:27	17/9	18:13	16/9	04:20	17/9	08:04
香港國際機場	Hong Kong International Airport	16/9	03:47	17/9	09:23	16/9	07:53	17/9	01:35
啟德	Kai Tak	16/9	09:27	17/9	06:05	16/9	12:14	16/9	20:46
流浮山	Lau Fau Shan	16/9	01:11	17/9	01:06	16/9	08:13	16/9	16:34
西貢	Sai Kung	16/9	00:15	17/9	06:11	16/9	08:20	16/9	21:40
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	16/9	07:20	16/9	22:46	16/9	14:40	16/9	14:41
沙田	Sha Tin	16/9	10:01	16/9	20:53	-			
打鼓嶺	Ta Kwu Ling	16/9	10:04	16/9	16:40	-			

- 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 3.5.4　　山竹掠過期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.5.4　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Mangkhut

站 (參閱圖 3.5.3) Station (See Fig. 3.5.3)			九月十四日 14 Sep	九月十五日 15 Sep	九月十六日 16 Sep	九月十七日 17 Sep	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			0.0	微量 Trace	167.5	12.0	179.5
香港國際機場 Hong Kong International Airport (HKA)			0.0	微量 Trace	191.5	4.2	195.7
長洲 Cheung Chau (CCH)			[0.0]	0.0	79.0	9.0	[88.0]
H23	香港仔	Aberdeen	0.0	0.0	99.0	7.5	106.5
N05	粉嶺	Fanling	0.0	0.0	126.5	28.5	155.0
N13	糧船灣	High Island	0.0	0.0	[83.5]	2.0	[85.5]
K04	佐敦谷	Jordan Valley	0.0	0.0	160.0	6.0	166.0
N06	葵涌	Kwai Chung	0.0	0.0	214.0	22.5	236.5
H12	半山區	Mid Levels	0.0	0.0	143.0	22.0	165.0
N09	沙田	Sha Tin	1.5	0.0	223.0	0.0	224.5
H19	筲箕灣	Shau Kei Wan	0.0	0.0	138.5	6.5	145.0
SEK	石崗	Shek Kong	[0.0]	0.0	279.0	41.5	320.5
K06	蘇屋邨	So Uk Estate	0..0	0.0	[253.0]	17.0	[270.0]
R31	大美督	Tai Mei Tuk	0.5	0.0	[150.5]	[3.5]	[154.5]
R21	踏石角	Tap Shek Kok	0.0	0.0	213.0	36.0	249.0

東涌(N17)、屯門水庫(TMR) - 沒有資料　　Tung Chung (N17), Tuen Mun Reservoir (TMR) - data not available

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

表 3.5.5　　山竹掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.5.5　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Mangkhut

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	3.88	16/9	14:42	2.35	16/9	14:42
石壁	Shek Pik	3.89	16/9	14:16	2.34	16/9	14:16
大廟灣*	Tai Miu Wan*	4.19	16/9	13:41	2.77	16/9	13:41
大埔滘	Tai Po Kau	4.71	16/9	12:34	3.40	16/9	12:34
尖鼻咀	Tsim Bei Tsui	4.18	16/9	17:14	2.58	16/9	17:21

*基於不完整的數據　* based on incomplete data

橫瀾島潮汐站在山竹吹襲期間受嚴重損毀，損毀前錄得的最高潮位為 2.68 米。

The tide station at Waglan Island was severely damaged by Mangkhut and the maximum sea level of 2.68 m was recorded before damage.

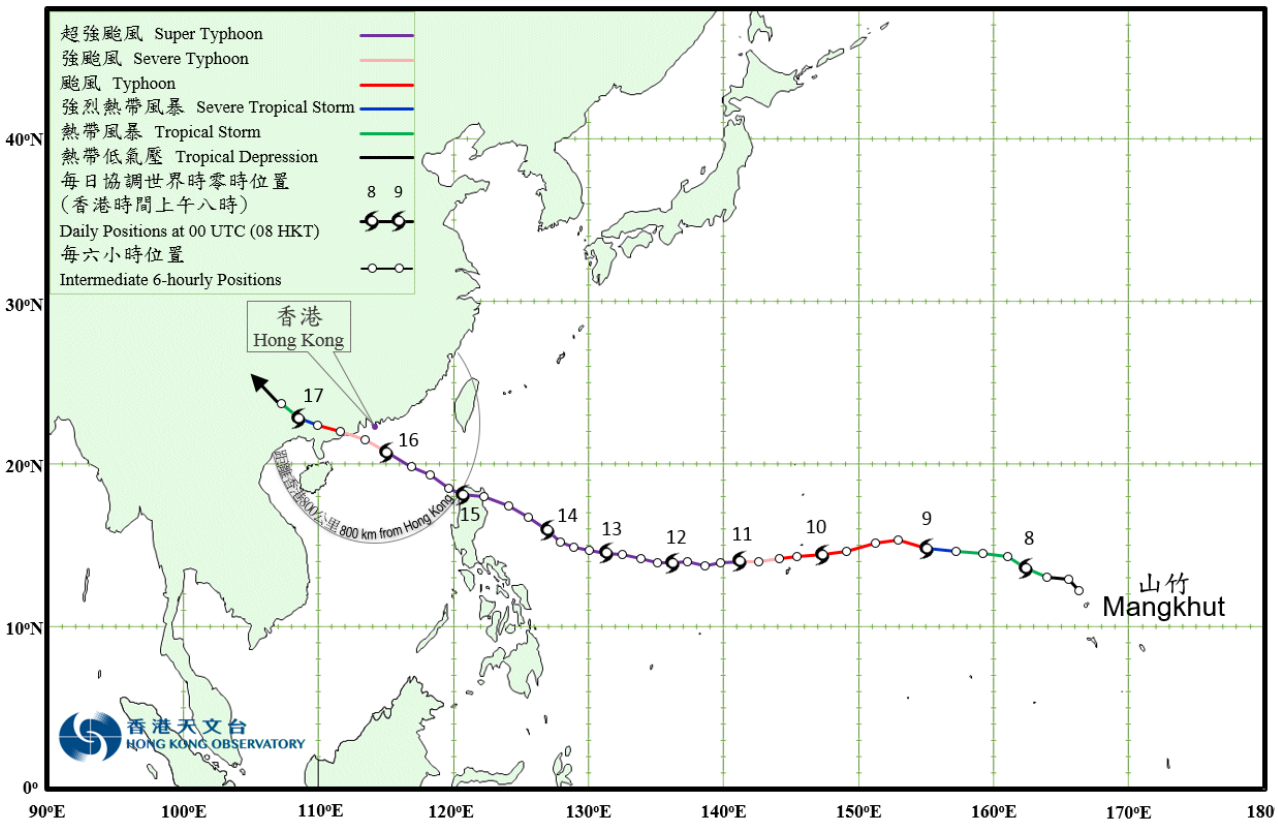


圖 3.5.1a　　二零一八年九月七日至十七日山竹的路徑圖。

Figure 3.5.1a　Track of Mangkhut on 7 – 17 September 2018.

圖 3.5.1b　　山竹接近香港時的路徑圖。

Figure 3.5.1b　　Track of Mangkhut near Hong Kong.

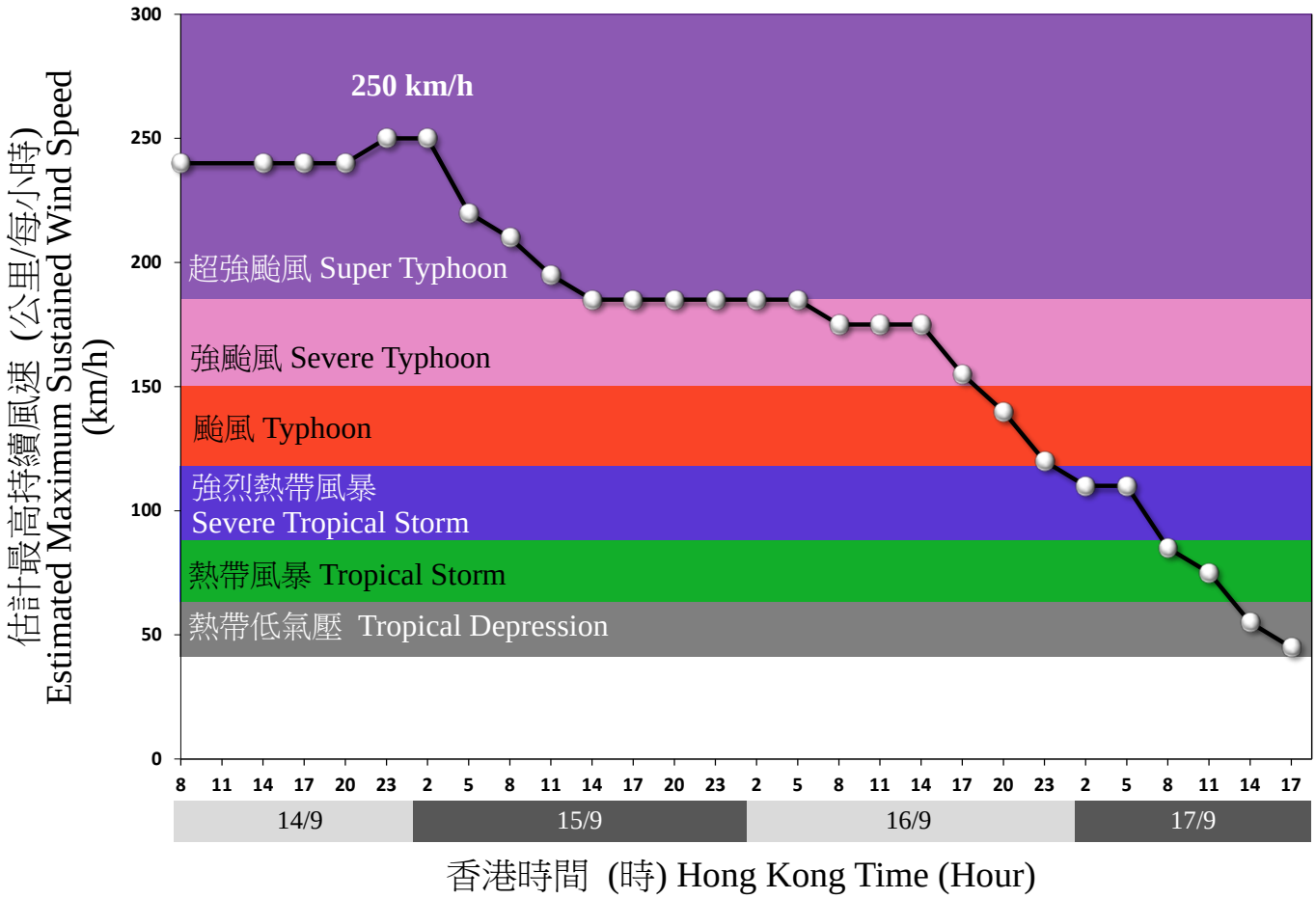


圖 3.5.2a　　二零一八年九月十四日至十七日山竹最高持續風速的時間序列。

Figure 3.5.2a Time series of the maximum sustained wind speed near the centre of Mangkhut: 14 to 17 September 2018.

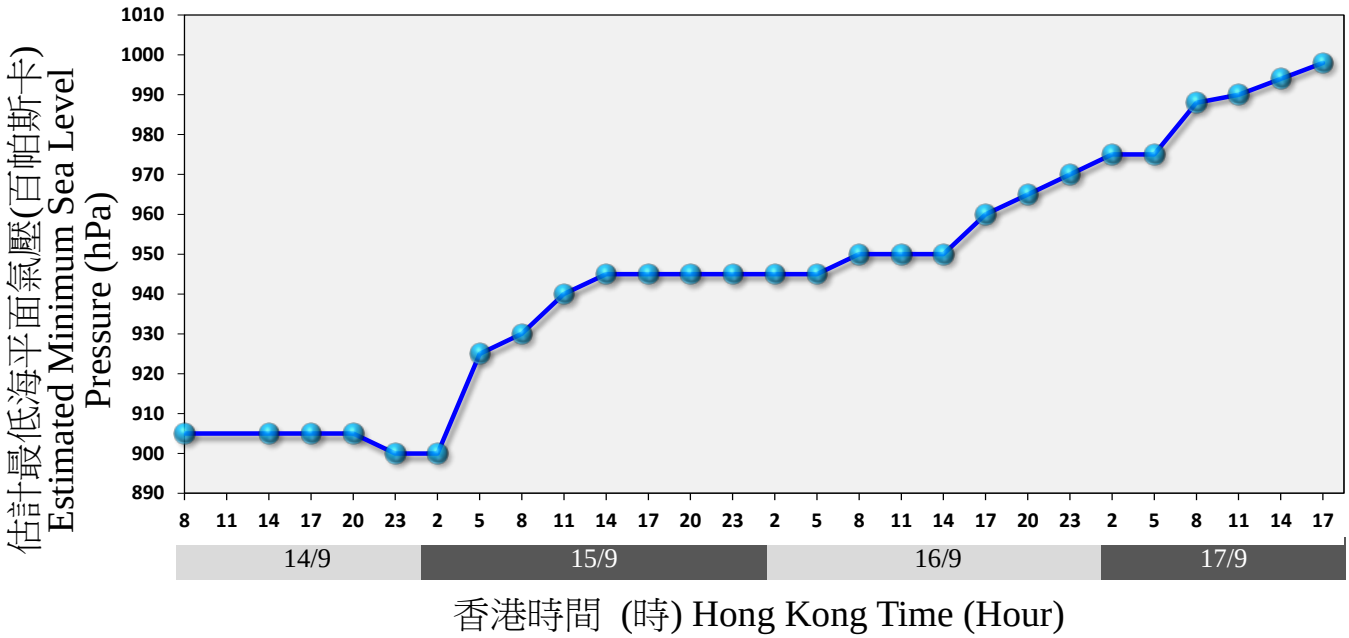


圖 3.5.2b　　二零一八年九月十四日至十七日山竹最低海平面氣壓的時間序列。

Figure 3.5.2b Time series of minimum sea level pressure of Mangkhut: 14 to 17 September 2018.

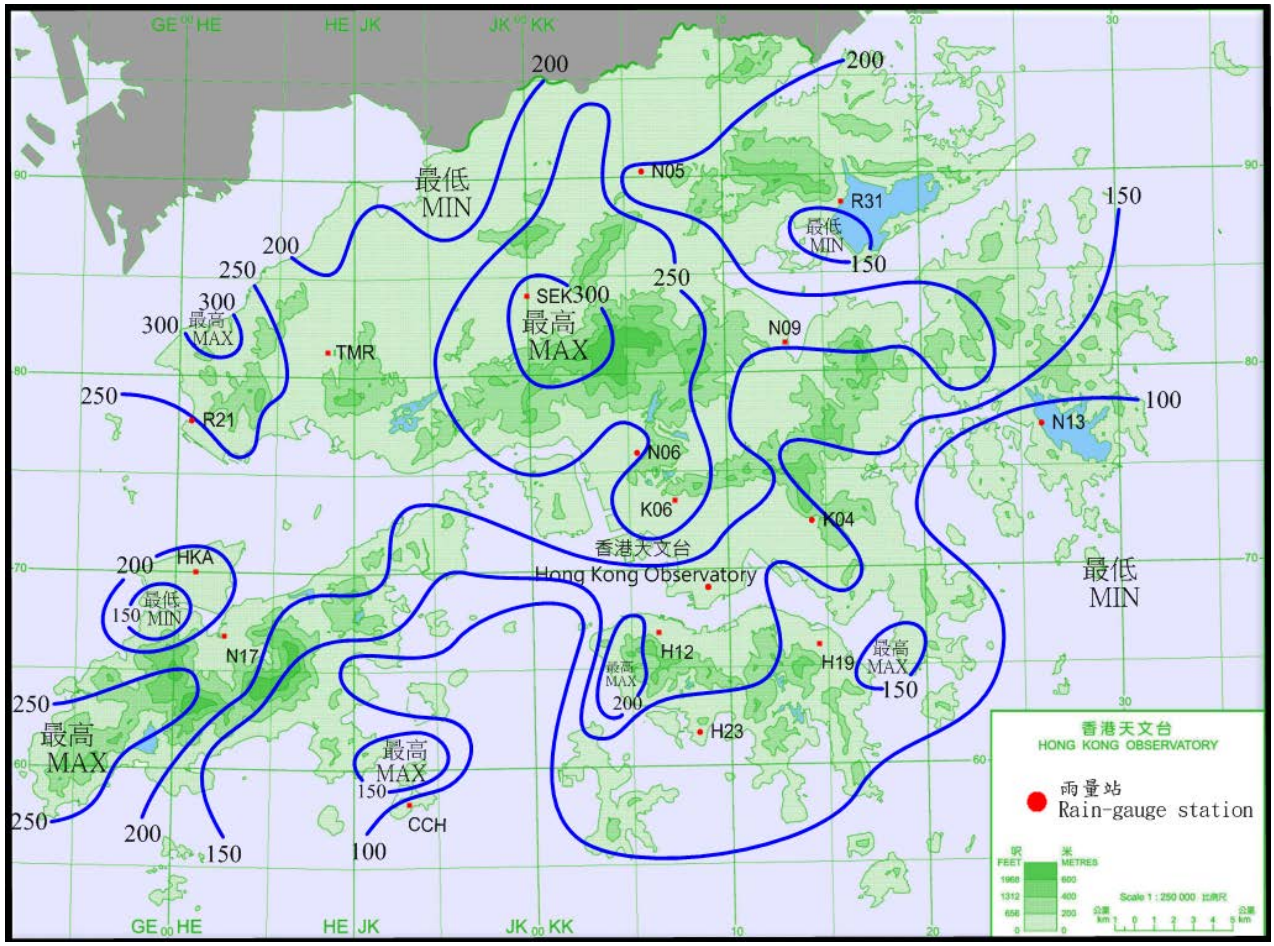


圖 3.5.3　　二零一八年九月十四日至十七日的雨量分佈(等雨量線單位為毫米)。

Figure 3.5.3　Rainfall distribution on 14 - 17 September 2018 (isohyets in millimetres).

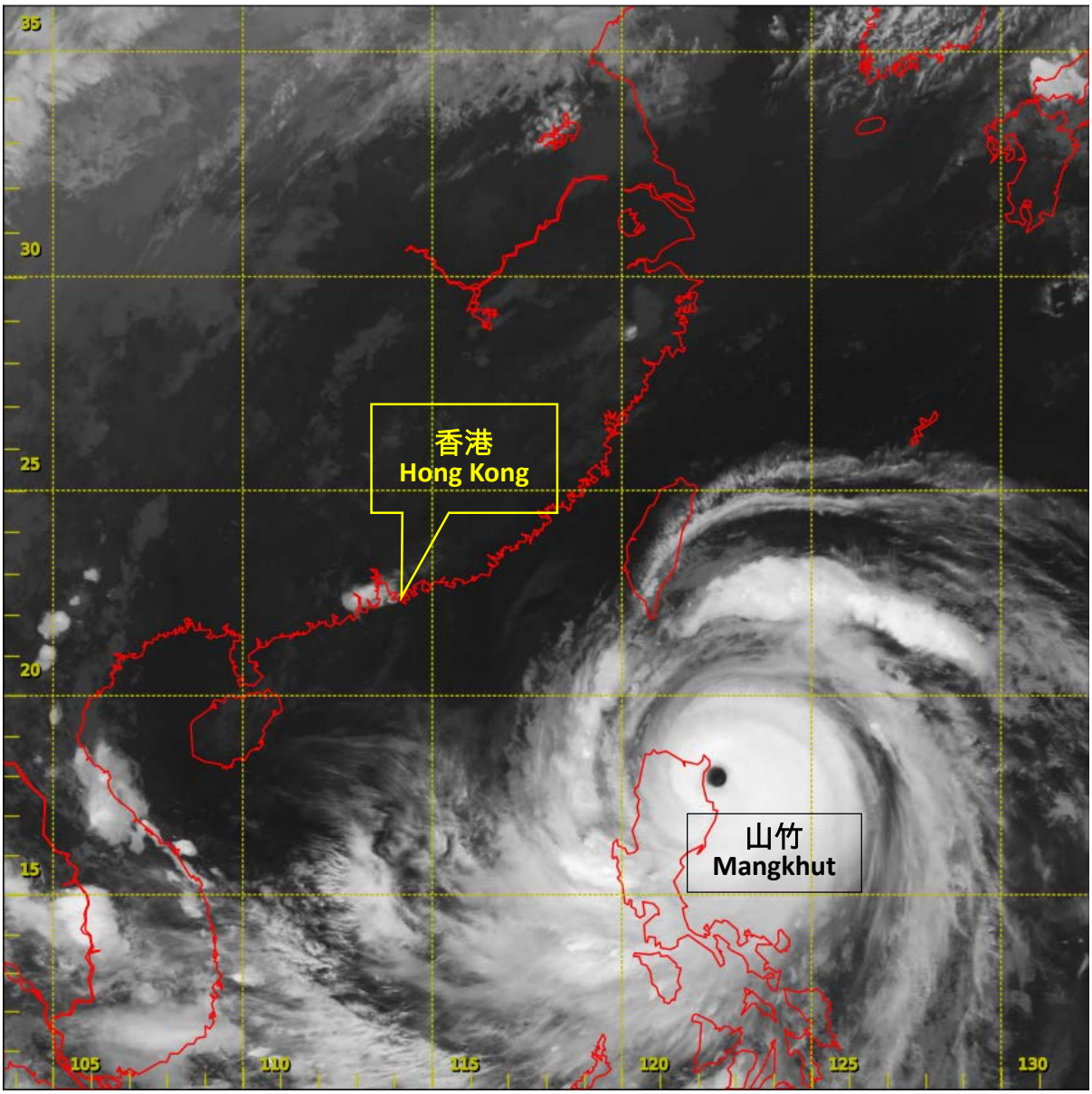


圖 3.5.4a　二零一八年九月十五日上午 1 時左右的紅外線衛星圖片，當時山竹達到其最高強度，中心附近最高持續風速估計為每小時 250 公里

Figure 3.5.4a　Infra-red satellite imagery around 1 a.m. on 15 September 2018, when Mangkhut was at peak intensity with estimated maximum sustained winds of 250 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).]

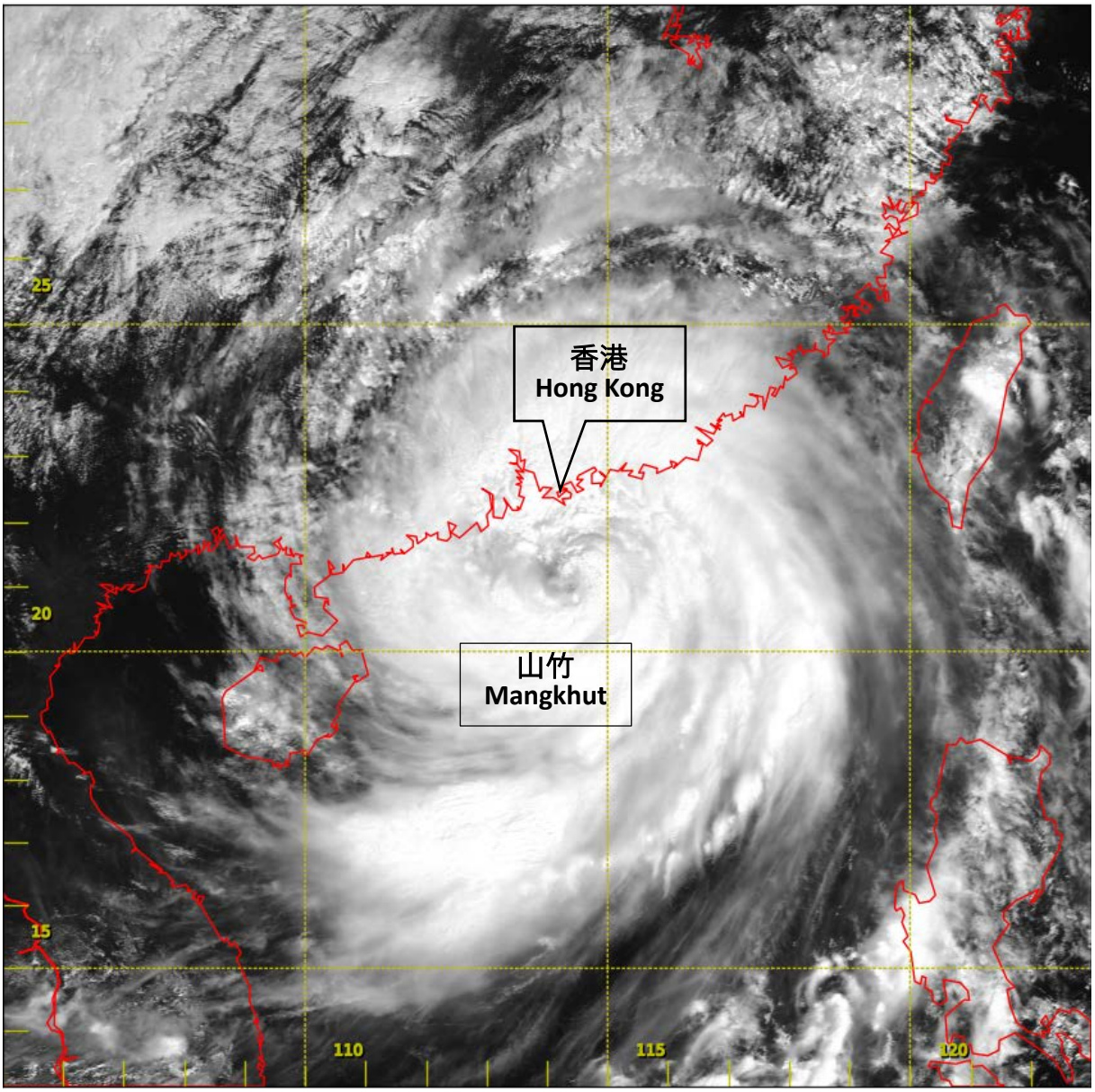


圖 3.5.4b　二零一八年九月十六日上午 11 時左右的可見光衛星圖片，山竹廣闊的環流覆蓋南海北部及華南沿岸地區。

Figure 3.5.4b　Visible satellite imagery around 11 a.m. on 16 September 2018. The extensive circulation of Mangkhut covered the northern part of the South China Sea and south China coastal areas.

〔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).]

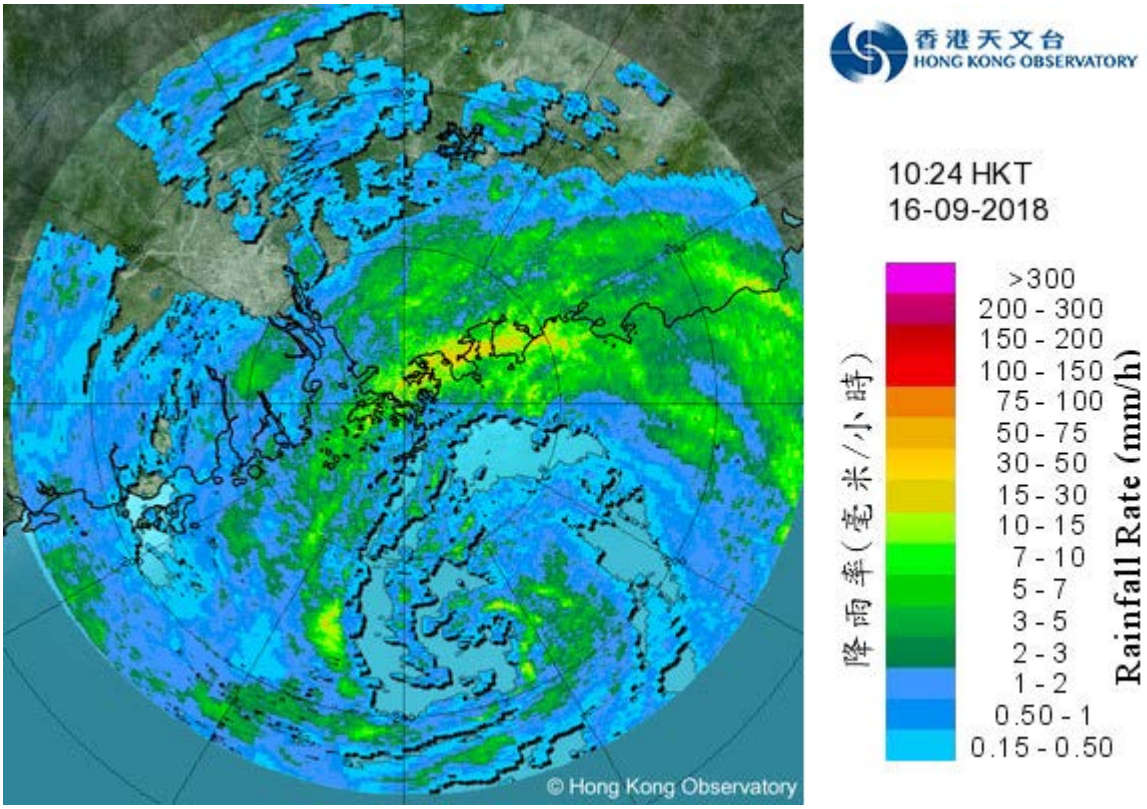


圖 3.5.5a 二零一八年九月十六日上午 10 時 24 分的雷達回波圖像，當時山竹的強烈螺旋雨帶正影響香港。

Figure 3.5.5a Image of radar echoes at 10:24 a.m. on 16 September 2018. The intense spiral rainband of Mangkhut was affecting Hong Kong at that time.

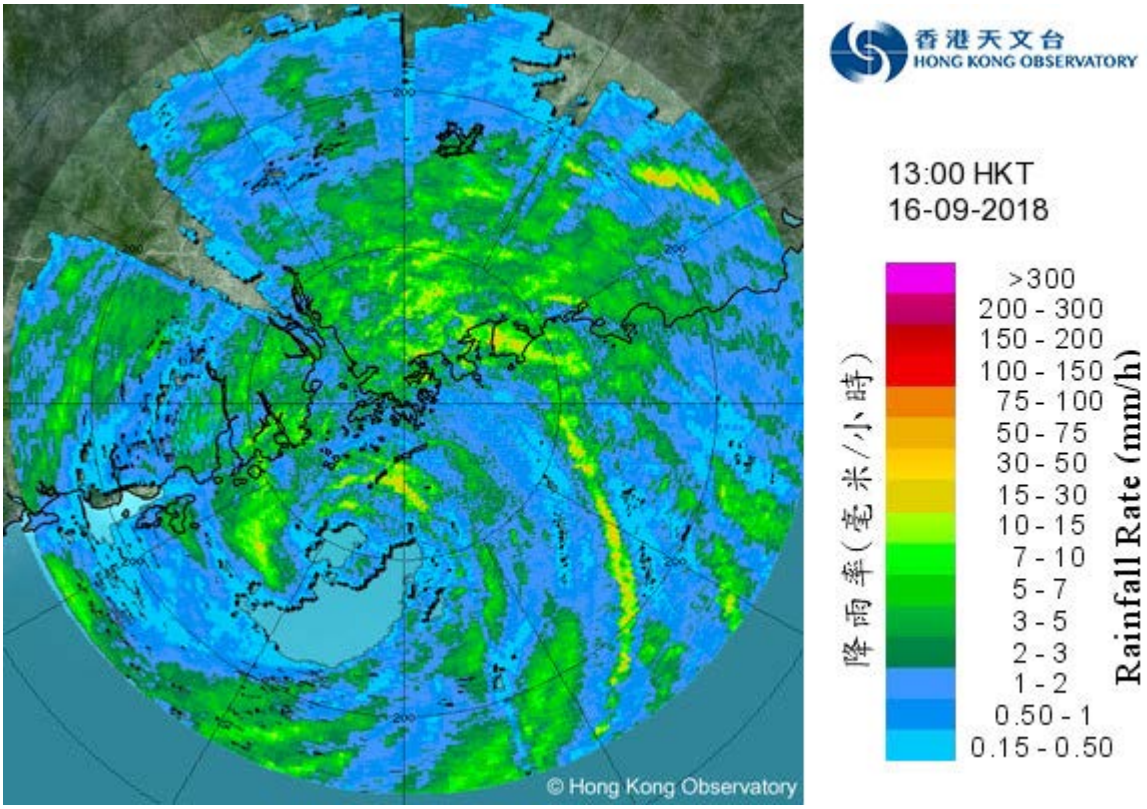


圖 3.5.5b 二零一八年九月十六日下午 1 時的雷達回波圖像，當時山竹最接近香港，其中心在天文台總部的西南偏南約 100 公里。

Figure 3.5.5b Image of radar echoes at 1 p.m. on 16 September 2018 when Mangkhut was closest to Hong Kong, with its centre located about 100 km south-southwest of the Observatory Headquarters.

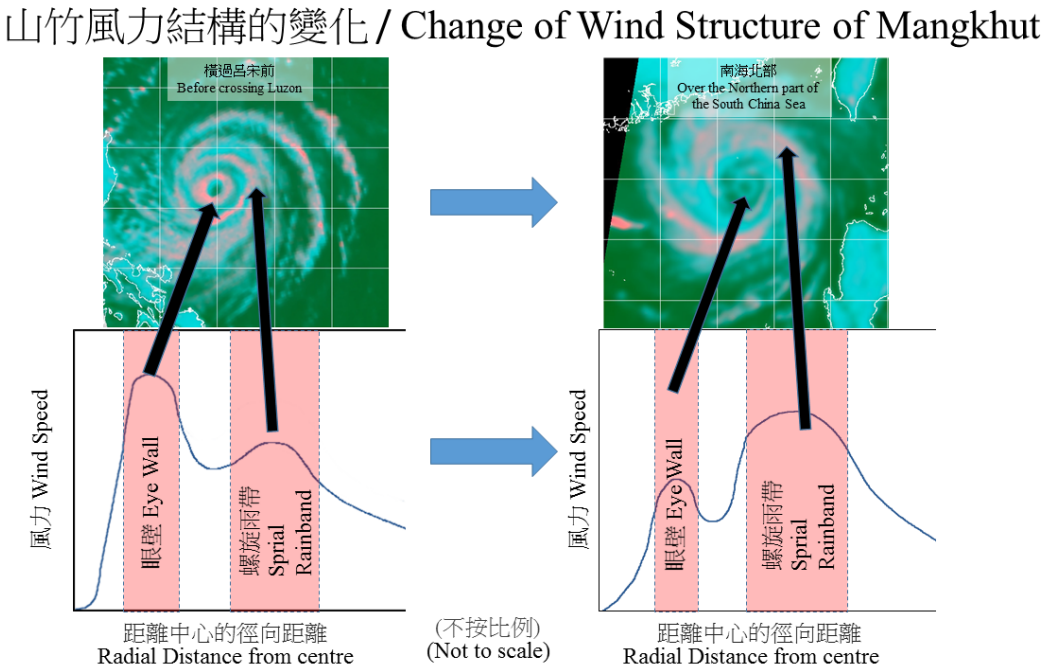


圖 3.5.6 山竹在橫過呂宋前及在南海北部風力結構變化的示意圖。

Figure 3.5.6 Diagram illustrating the change of wind structure of Mangkhut before crossing Luzon and over the northern part of the South China Sea.

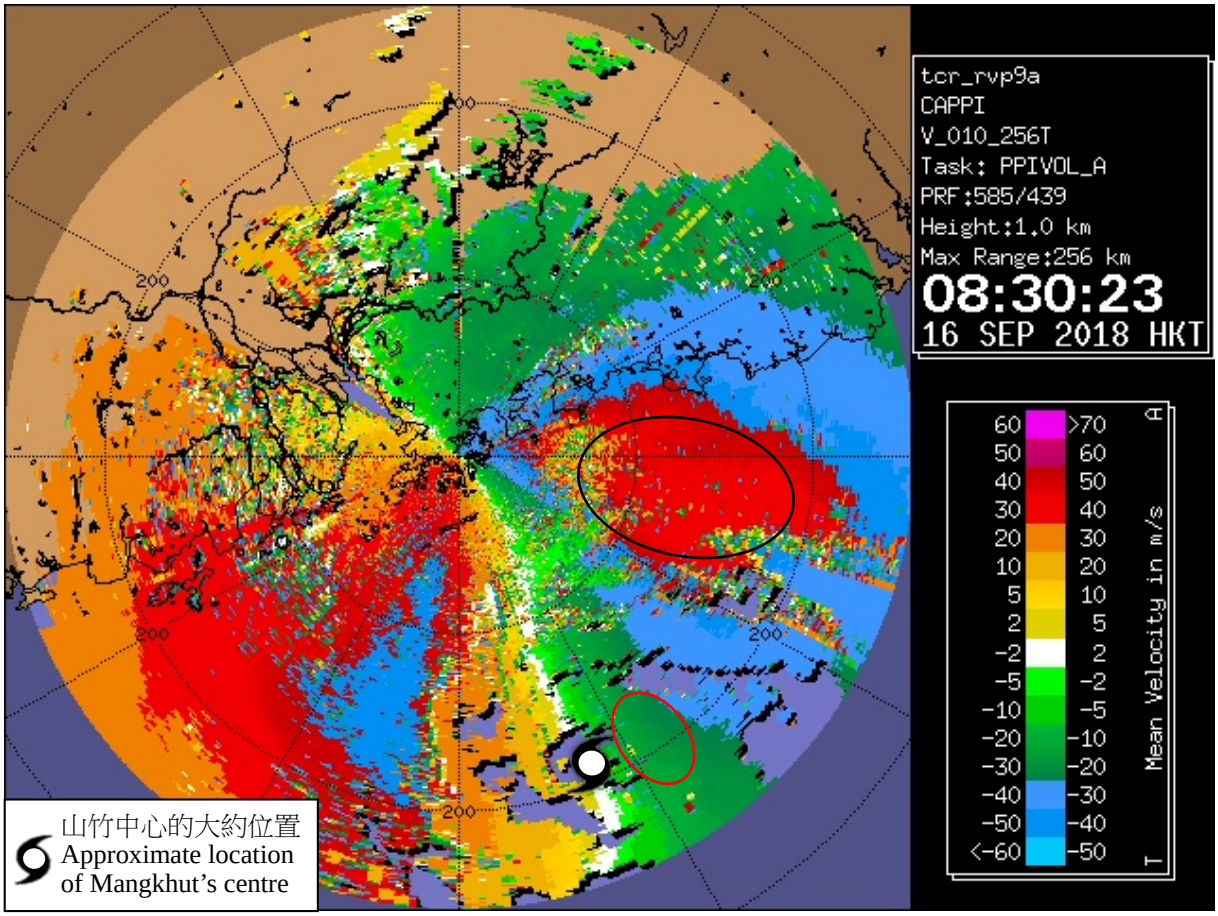


圖 3.5.7　二零一八年九月十六日上午 8 時 30 分的多普勒雷達回波圖像，顯示在 1 公里高度的徑向風(即雨區在雷達方向的速度，正(負)速度表示雨區遠離(接近)雷達)。圖像顯示山竹外圍螺旋雨帶的徑向風較眼壁的徑向風大。

Figure 3.5.7　Radar imagery showing the Doppler velocity at 8:30 a.m. on 16 September 2018. The image revealed the radial winds at 1 km (i.e. the velocity of rain echoes relative to the radar, and positive (negative) values indicates rain echoes moving away from (towards) the radar). The image showed that the radial wind over the outer spiral rainband was higher than that near the eyewall.

註：要注意的是多普勒天氣雷達速度探測範圍的限制。而最大可探測的速度稱為最大不模糊速度。大老山天氣雷達的最大不模糊速度為每秒 45.1 米。假若徑向風超過了最大不模糊速度，便會出現速度折疊的現象，速度會由正數(負數)每秒 45.1 米轉為負數(正數)每秒 45.1 米。

以山竹外圍螺旋雨帶 (即黑色圈部分)作為例子，圖中直接讀出的徑向風介乎每秒正 30 至 40 米(正數表示遠離雷達)，但事實上該雨區正移近雷達。經折疊修正之後，在雨區 1 公里高度的實際徑向風應介乎每秒負 50.1 米至負 60.1 米。相反在眼壁附近的雨區(紅色圈部分)並無出現速度折疊現象，徑向風介乎每秒負 20 至 30 米。

Note: Please note the constraint of the range of the velocity detected by Doppler radar. The maximum detectable speed is called Nyquist velocity. The Nyquist velocity of Tate's Cairn Weather Radar is 45.1 m/s. If the radial wind exceeds the Nyquist velocity, there will be velocity

folding, and the radial speed will change from positive (negative) 45.1 m/s to negative (positive) 45.1 m/s.

Using the spiral rainband of Mangkhut (circled in black) as an example, the radial wind read directly from the figure ranged between +30 and +40 m/s (positive value means moving away from radar). In fact the rain echoes were moving towards the radar. After adjusting for the folding, the actual radial wind of the rain echoes at a height 1 km should range from –50.1 m/s to –60.1 m/s. In contrast, there was no velocity folding of the rain echoes near the eyewall (circled in red), and the radial wind ranged between –20 and –30 m/s.

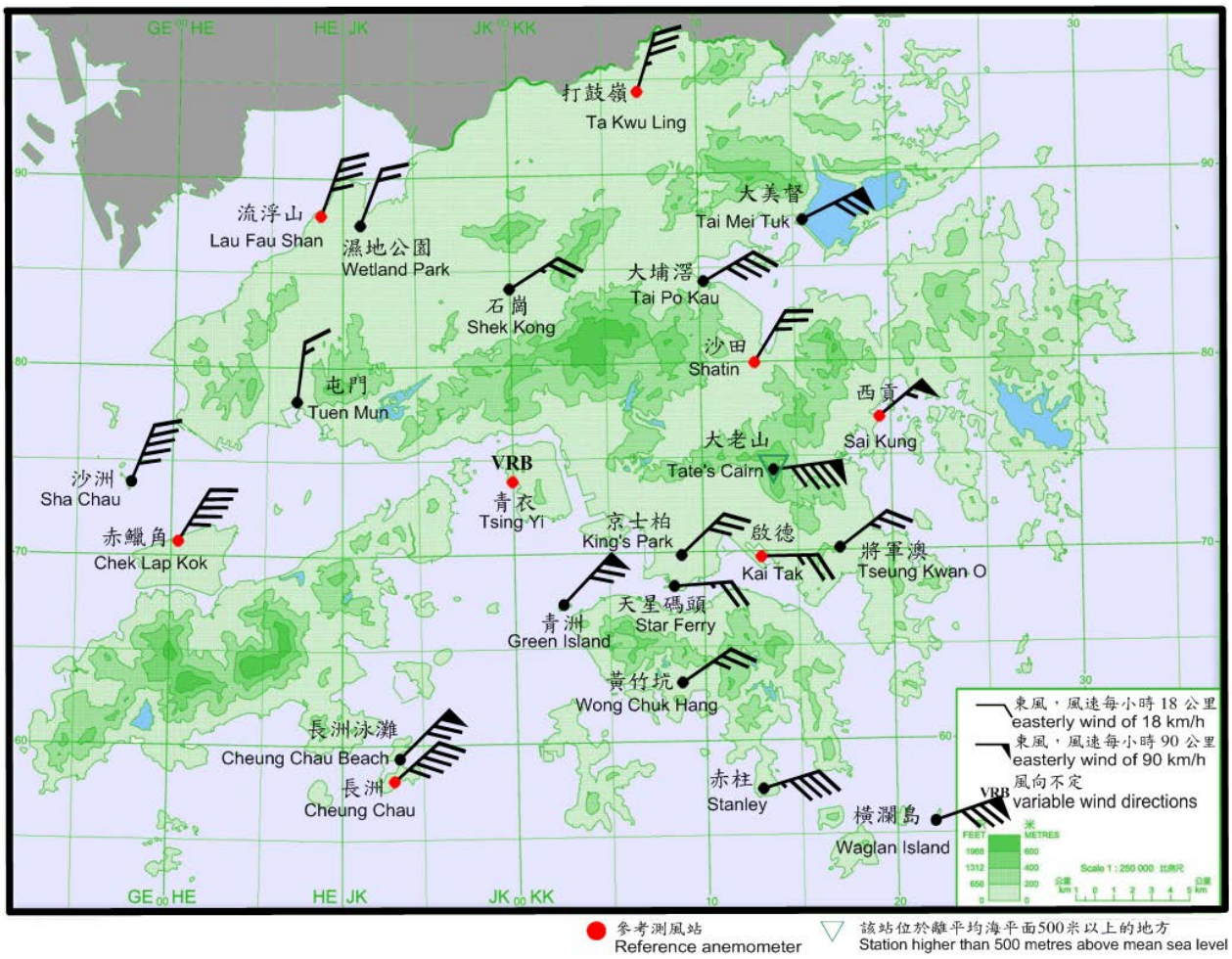


圖 3.5.8a　二零一八年九月十六日上午 11 時正香港各站錄得的十分鐘平均風向和風速。當時長洲泳灘、大老山、大美督、青洲及橫瀾島的風力達到颶風程度。

Figure 3.5.8a　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 11 a.m. on 16 September 2018. Winds reached hurricane force at Cheung Chau Beach, Tate's Cairn, Tai Mei Tuk, Green Island and Waglan Island at that time.

註：　青衣當時錄得的十分鐘平均風速為每小時 27 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Tsing Yi was 27 km/h.

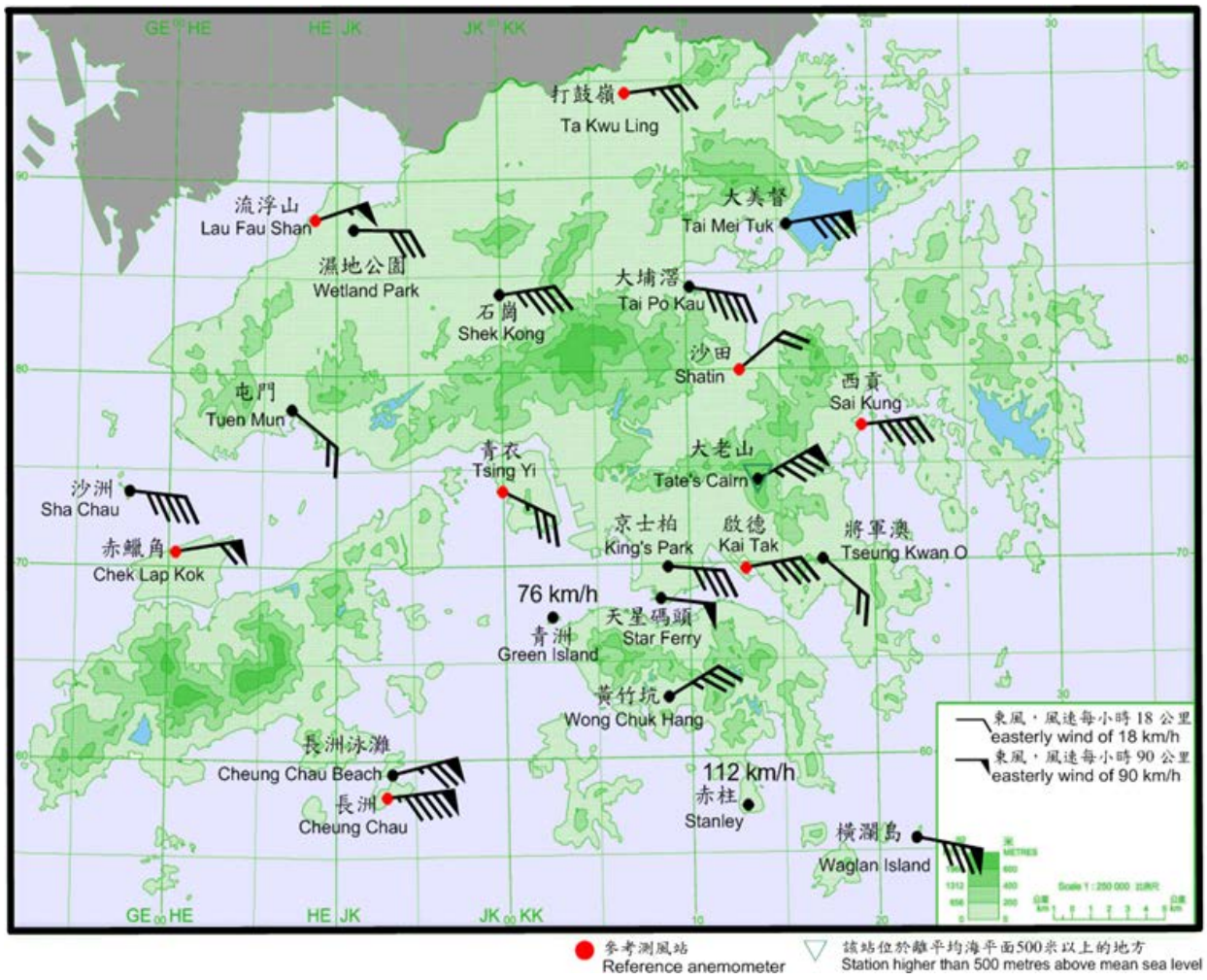


圖 3.5.8b　二零一八年九月十六日下午 2 時正香港各站錄得的十分鐘平均風向和風速。當時長洲、長洲泳灘、大老山、大美督及橫瀾島的風力達到颶風程度。

Figure 3.5.8b　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 2 p.m. on 16 September 2018. Winds reached hurricane force at Cheung Chau, Cheung Chau Beach, Tate's Cairn, Tai Mei Tuk and Waglan Island at that time.

註:　青洲及赤柱當時只有風速數據。

Note:　Only wind speeds were available at Green Island and Stanley at that time.

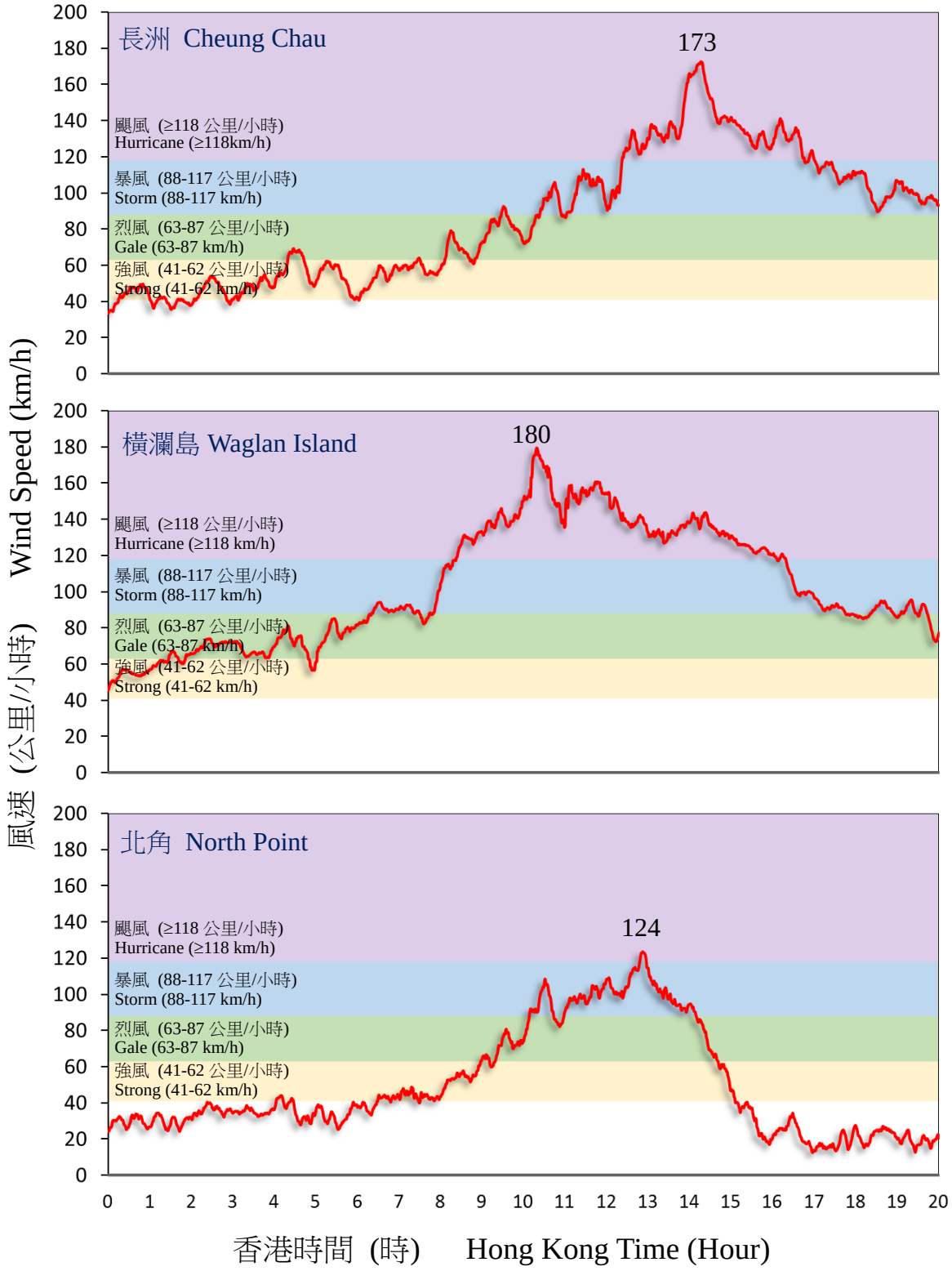


圖 3.5.9 二零一八年九月十六日在長洲、橫瀾島及北角錄得的十分鐘平均風速。

Figure 3.5.9 Traces of 10-minute mean wind speed at Cheung Chau, Waglan Island and North Point on 16 September 2018.

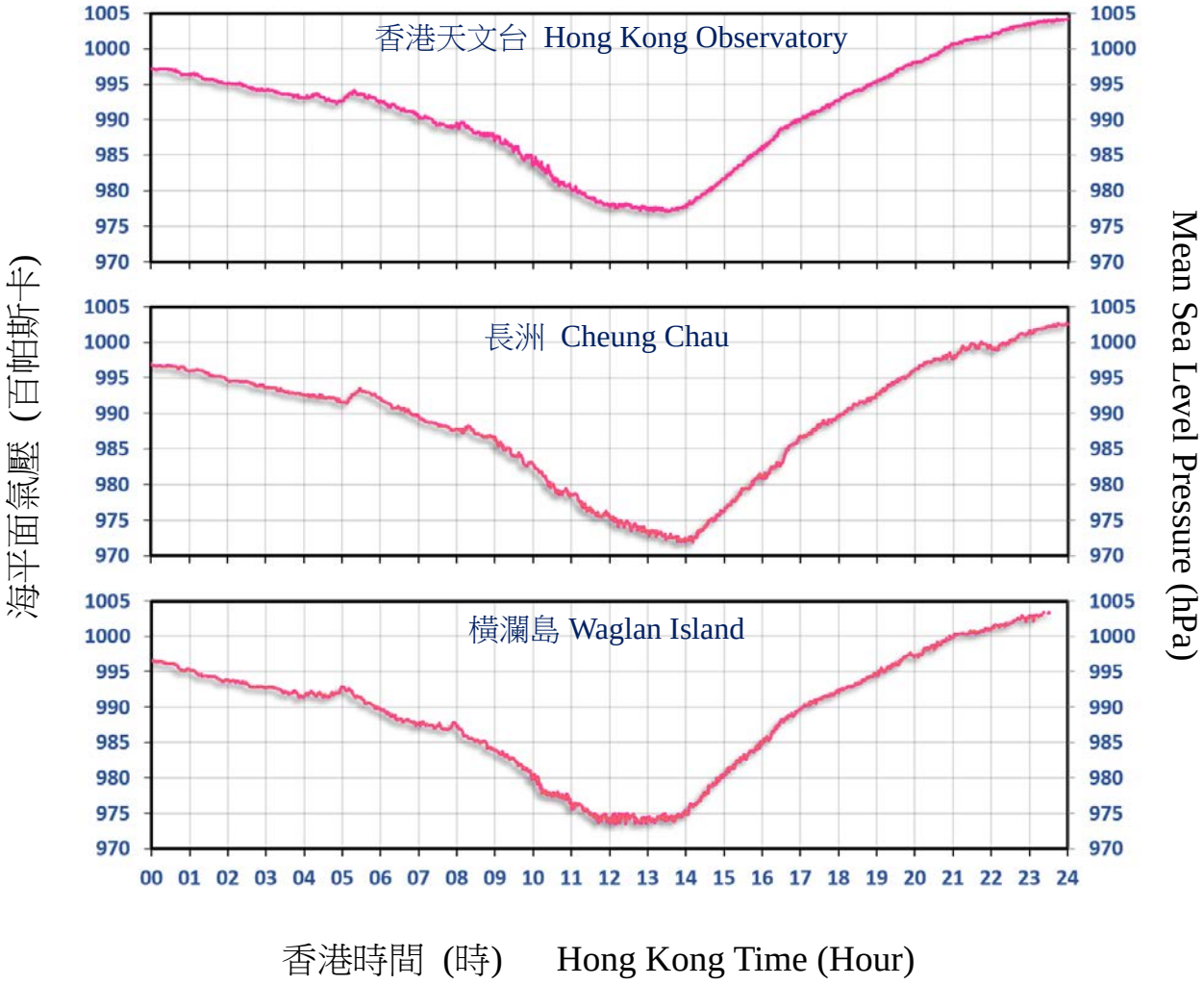


圖 3.5.10 二零一八年九月十六日香港天文台、長洲及橫瀾島錄得的海平面氣壓。

Figure 3.5.10 Traces of mean sea-level pressure recorded at the Hong Kong Observatory, Cheung Chau and Waglan Island on 16 September 2018.

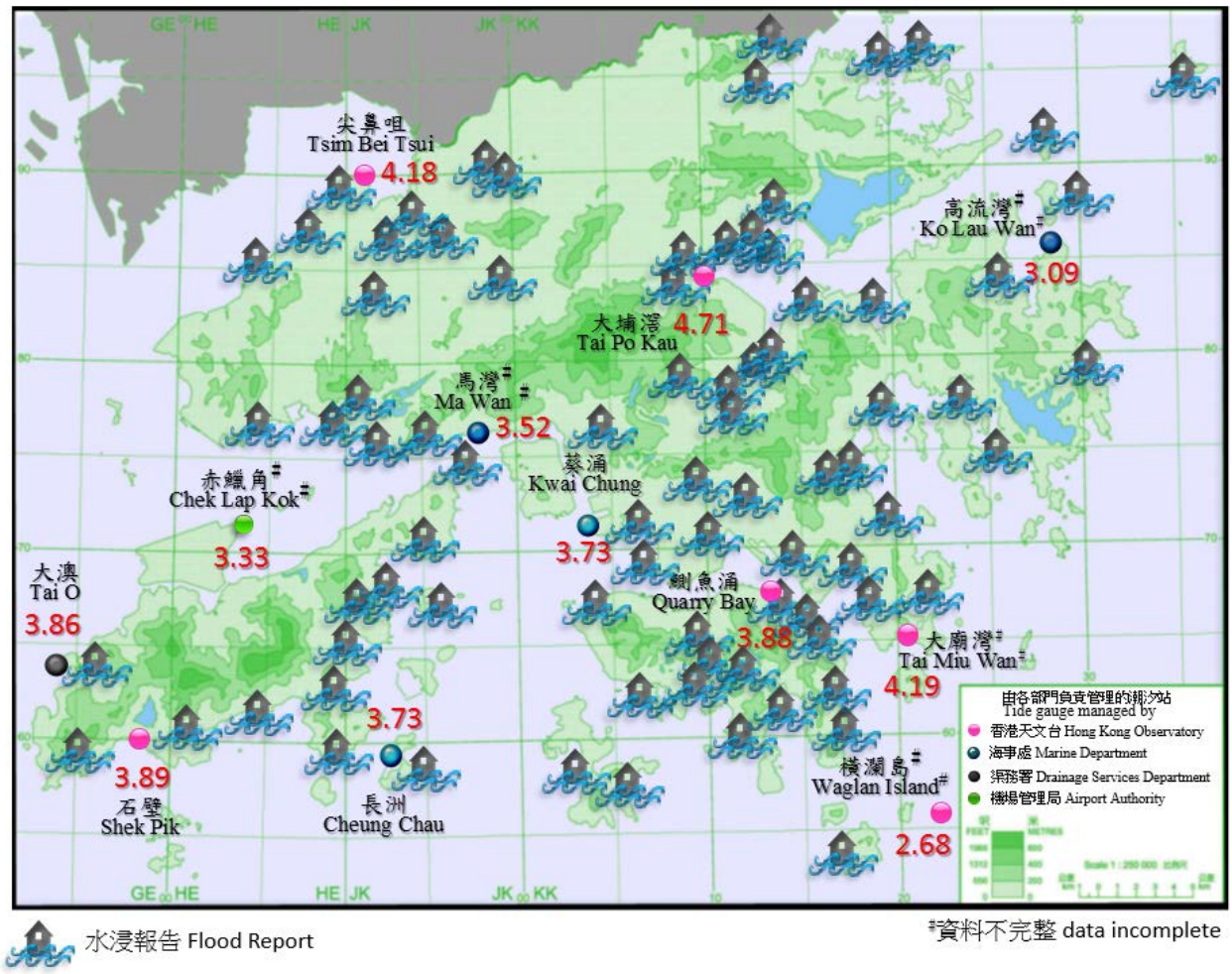


圖 3.5.11　二零一八年九月十六日香港各潮汐站錄得的最高潮位(單位為米，海圖基準面以上)及水浸報告。根據政府部門、新聞及社交媒體的資料，並非詳盡無遺。

Figure 3.5.11　Maximum sea level (metres above Chart Datum) recorded at various tide gauges in Hong Kong and flood reports from government departments, news and social media on 16 September 2018. The flood reports are not exhaustive.

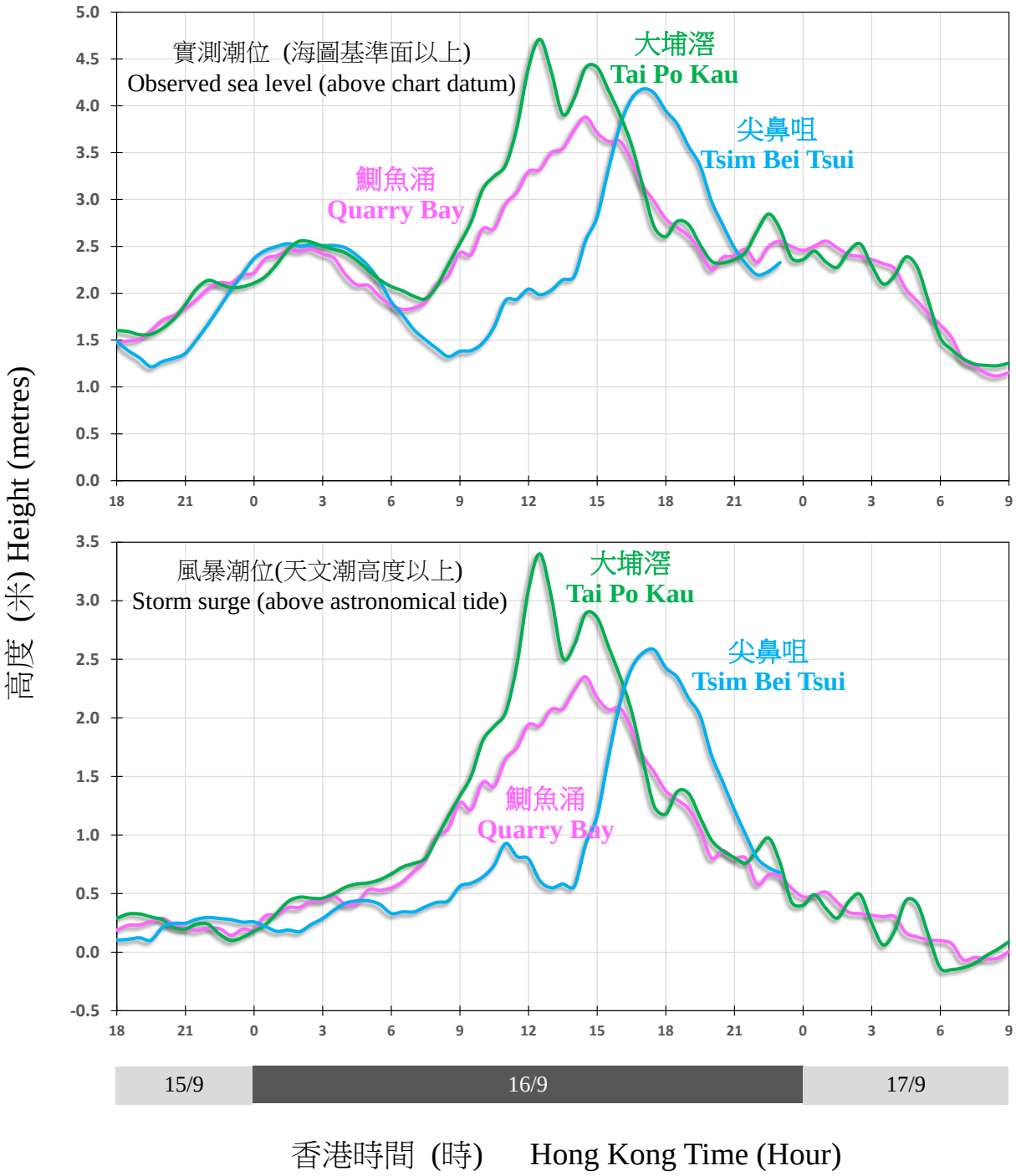


圖 3.5.12 二零一八年九月十五至十七日在鰂魚涌、大埔滘及尖鼻咀錄得的潮位(海圖基準面以上)及風暴潮(天文潮高度以上)。

Figure 3.5.12 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 15-17 September 2018.

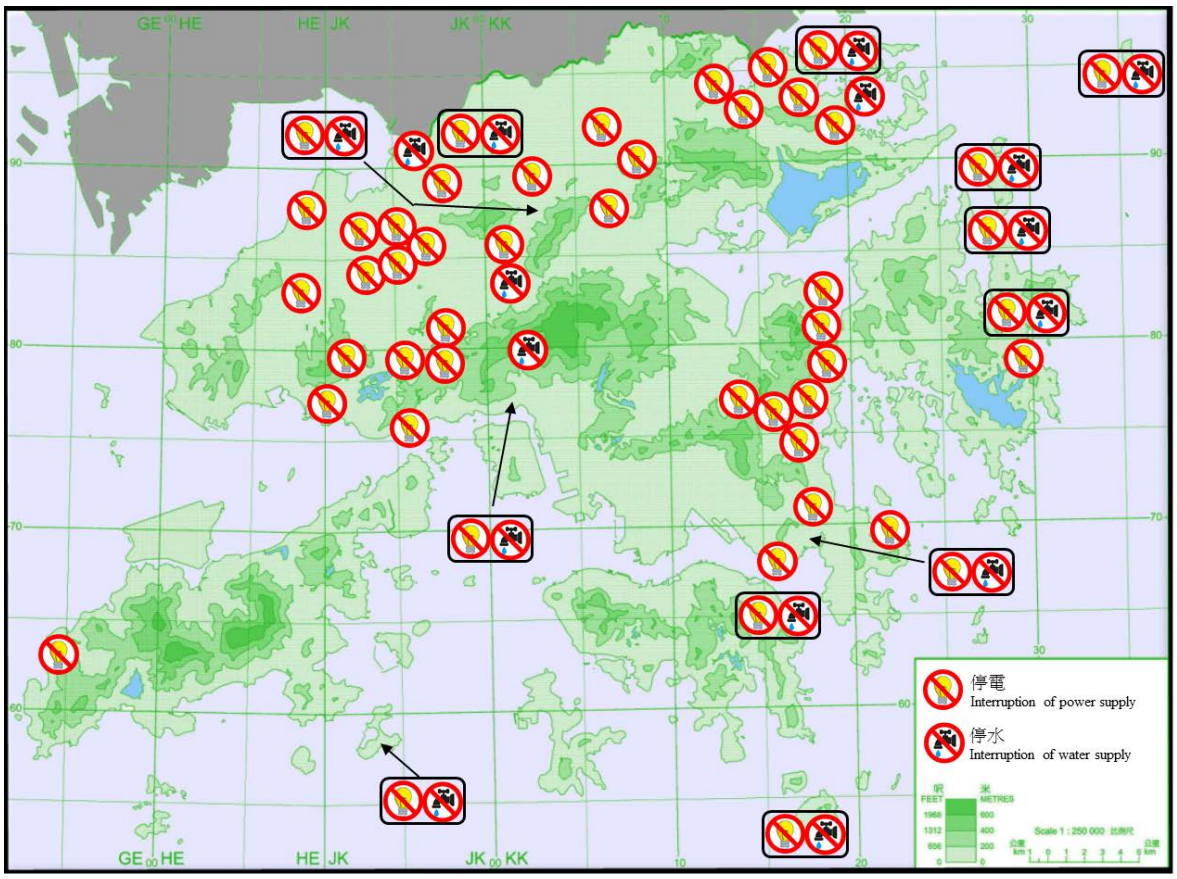


圖 3.5.13　在山竹的影響下，有關電力及食水中斷的報告。根據政府部門、新聞及社交媒體的資料，並非詳盡無遺。

Figure 3.5.13　Reports of interruption of power and water supply under the influence of Mangkhut based on government departments, news and social media. The incident reports are not exhaustive.

沙田 Sha Tin
(鳴謝 MCW 提供相片 Courtesy of MCW)

黃大仙 Wong Tai Sin
(鳴謝鄭向龍提供相片 Courtesy of 鄭向龍)

觀塘 Kwun Tong
(鳴謝李子祥提供相片 Courtesy of TC Lee)

小西灣 Siu Sai Wan
(鳴謝 Dickson Ho 提供相片 Courtesy of Dickson Ho)

樂富 Lok Fu
(鳴謝 Andy Lam 提供相片 Courtesy of Andy Lam)

屯門 Tuen Mun
(鳴謝呂大年提供相片 Courtesy of 呂大年)

圖 3.5.14 山竹襲港期間本港多處有樹木倒塌。

Figure 3.5.14 The passage of Mangkhut resulted in fallen trees in many parts of the territory.

九龍灣 Kowloon Bay
(鳴謝 Andy Ho 提供相片 Courtesy of Andy Ho)

長洲 Cheung Chau
(鳴謝龔穎恒提供相片 Courtesy of T Kung)

中環 Central
(鳴謝龔穎恒提供相片 Courtesy of T Kung)

愉景灣 Discovery Bay
(鳴謝龔穎恒提供相片 Courtesy of T Kung)

圖 3.5.14 (續)
Figure 3.5.14 (Cont'd)

啟德 Kai Tak
(鳴謝 Andy Ho 提供相片 Courtesy of Andy Ho)

九龍灣 Kowloon Bay
(鳴謝 Andy Ho 提供相片 Courtesy of Andy Ho)

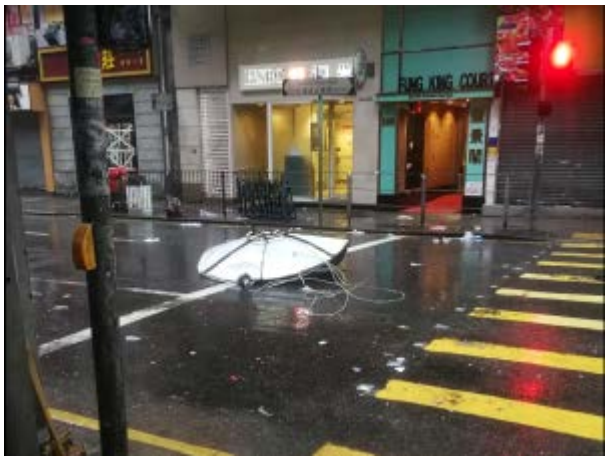
天水圍 Tin Shui Wai
(鳴謝 Helen Ho 提供相片 Courtesy of Helen Ho)

廣播道 Broadcast Drive
(鳴謝周偉基提供相片 Courtesy of Chow Wai Ki)

新蒲崗 San Po Kong
(鳴謝馮俊傑提供相片 Courtesy of 馮俊傑)

彩虹邨 Choi Hung Estate
(鳴謝 Andy Ho 提供相片 Courtesy of Andy Ho)

圖 3.5.15　　山竹襲港期間本港多處地區受猛風破壞。
Figure 3.5.15　　Widespread damages by ferocious winds during the passage of Mangkhut.



中西區 Central and Western District
(鳴謝江鴻銘提供相片 Courtesy of 江鴻銘)

中西區 Central and Western District
(鳴謝 Andrew Mak 提供相片 Courtesy of Andrew Mak)

西灣河 Sai Wan Ho
(鳴謝 Stephanie Lo 提供相片 Courtesy of Stephanie Lo)

西流江 Sai Lau Kong
(鳴謝尹文亮提供相片 Courtesy of 尹文亮)

圖 3.5.15 (續)
Figure 3.5.15 (Cont'd)

天文台總部 Observatory Headquarters
(鳴謝岑智明提供相片 Courtesy of C M Shun)

荃灣 Tsuen Wan
(鳴謝 K T Lau 提供相片 Courtesy of K T Lau)

西貢 Sai Kung
(鳴謝蔡振榮提供相片 Courtesy of CW Choy)

荔枝角道 Lai Chi Kok Road
(鳴謝 Ryan Leung 提供相片 Courtesy of Ryan Leung)

圖 3.5.15 (續)
Figure 3.5.15 (Cont'd)

紅磡 Hung Hom
(鳴謝吳耀華提供相片 Courtesy of Y W Ng)

旺角 Mong Kok
(鳴謝鄧先生提供相片 Courtesy of 鄧先生)

圖 3.5.16　山竹襲港期間玻璃幕牆被吹毀。
Figure 3.5.16　Shattered Glass Curtain Walls during the passage of Mangkhut.

中環 Central
(鳴謝岑智明提供相片 Courtesy of C M Shun)

灣仔 Wan Chai
(鳴謝岑智明提供相片 Courtesy of C M Shun)

灣仔 Wan Chai
(鳴謝 Shirley Yang 提供相片 Courtesy of Shirley Yang)

圖 3.5.16 (續)
Figure 3.5.16 (Cont'd)

鴨脷洲海怡半島 South Horizons, Ap Lei Chau
(鳴謝 H C Chan 提供相片 Courtesy of H C Chan)

杏花邨 Heng Fa Chuen
(鳴謝 Fong Wai 提供相片 Courtesy of Fong Wai)

圖 3.5.17　山竹襲港期間巨浪拍岸。

Figure 3.5.17　High waves affected coastal areas during the passage of Mangkhut.

沙田 Sha Tin
(鳴謝 Anson Tang 提供相片 Courtesy of Anson Tang)

沙田 Sha Tin
(鳴謝 Leo Chan 提供相片 Courtesy of Leo Chan)

沙田 Sha Tin
(鳴謝 Leo Chan 提供相片 Courtesy of Leo Chan)

杏花邨 Heng Fa Chuen
(鳴謝 Dickson Ho 提供相片 Courtesy of Dickson Ho)

杏花邨 Heng Fa Chuen
(鳴謝 David Leung 提供相片 Courtesy of David Leung)

圖 3.5.18　　山竹襲港期間，風暴潮帶來的水浸和破壞。
Figure 3.5.18　Flooding and damage caused by storm surge during the passage of Mangkhut.

吉澳 Kat O
(鳴謝 Mr Shek 提供相片 Courtesy of Mr Shek)

東平洲 Tung Ping Chau
(鳴謝林學賢提供相片 Courtesy of David Lam)

橫瀾島 Waglan Island
(鳴謝余才來提供相片 Courtesy of C L Yu)

坪洲 Peng Chau
(鳴謝鍾佩琪提供相片 Courtesy of 鍾佩琪)

深水灣 Deep Water Bay
(鳴謝 Tsui Sai Kung 提供相片 Courtesy of Tsui Sai Kung)

大埔 Tai Po
(鳴謝 Andy Ho 提供相片 Courtesy of Andy Ho)

圖 3.5.18 (續)
Figure 3.5.18 (Cont'd)

長洲 Cheung Chau
(鳴謝龔穎恒提供相片 Courtesy of T Kung)

梅窩碼頭 Mui Wo Pier
(鳴謝 Mo Wong 提供相片 Courtesy of Mo Wong)

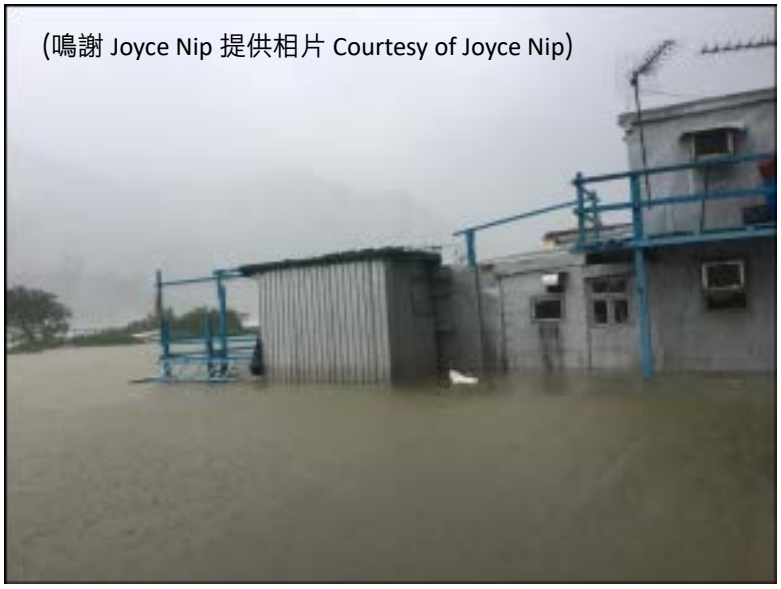
小西灣運動場 Siu Sai Wan Sports Ground
(鳴謝 Lee Yuen Nar Susanna 提供相片 Courtesy of Lee Yuen Nar Susanna)

圖 3.5.18 (續)
Figure 3.5.18 (Cont'd)

將軍澳南海濱長廊 Tseung Kwan O South Waterfront Promenade

圖 3.5.18 (續)

Figure 3.5.18 (Cont'd)



大澳 Tai O

圖 3.5.18 (續)
Figure 3.5.18 (Cont'd)


(鳴謝 Angie Lee 提供相片 Courtesy of Angie Lee)


(鳴謝 S S Wong 提供相片 Courtesy of S S Wong)


(鳴謝 Brain Tse 提供相片 Courtesy of Brain Tse)

(鳴謝 Mr Tsui 提供相片 Courtesy of Mr Tsui)

西貢 Sai Kung

圖 3.5.19　山竹襲港期間有船隻擱淺、沉沒或受嚴重破壞。

Figure 3.5.19　Vessels of various sizes were stranded, sunk or seriously damaged during the passage of Mangkhut.

石澳 Shek O
(鳴謝林學賢提供相片 Courtesy of David Lam)

沙田 Sha Tin
(鳴謝陳兆偉提供相片 Courtesy of Wallace Chan)

圖 3.5.19 (續)
Figure 3.5.19 (Cont'd)

3.6 超強颱風玉兔 (1826)：二零一八年十月二十一日至十一月二日

玉兔是二零一八年第六個影響香港的熱帶氣旋。玉兔吹襲香港期間，天文台需要發出三號強風信號，是自一九九三年艾拉以來再次在 11 月發出三號信號。

熱帶低氣壓玉兔於十月二十一日下午在關島之東南偏東約 1 620 公里的北太平洋西部上形成，大致向西北方向移動並迅速增強。玉兔於十月二十四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 250 公里。玉兔於十月二十六日及二十七日轉向西至西南偏西移動及開始逐漸減弱，十月三十日橫過呂宋後進入南海中部並減弱為颱風。玉兔於翌日進一步減弱為強烈熱帶風暴並轉向西北移動，橫過南海東北部。玉兔於十一月一日向偏北方向緩慢移動，晚上減弱為熱帶風暴。受華南乾燥東北季候風影響，翌日玉兔進一步減弱為熱帶低氣壓並在南海東北部徘徊，最後於晚上減弱為低壓區。

根據報章報導，玉兔吹襲塞班島期間造成至少兩人死亡及 133 人受傷，多處地方停電。玉兔為菲律賓北部帶來狂風暴雨並引發山泥傾瀉及水浸，造成最少 20 人死亡。

香港天文台在十月三十一日上午 8 時 40 分發出一號戒備信號，當時玉兔集結在香港之東南約 670 公里。當日本港普遍吹和緩至清勁北風，離岸及高地間中吹強風。隨著玉兔靠近廣東東部沿海地區，天文台在十一月一日下午 12 時 40 分發出三號强風信號，當時玉兔位於香港之東南約 370 公里。在東北季候風及玉兔的共同影響下，本港普遍吹和緩至清勁北風，離岸及高地吹強風。天文台總部於十一月一日下午 3 時 38 分錄得最低瞬時海平面氣壓 1010.5 百帕斯卡，當時玉兔位於本港之東南約 340 公里。隨著玉兔的環流受乾燥氣流入侵而明顯減弱，本港風勢逐漸緩和，天文台在十一月二日上午 2 時 10 分以一號戒備信號取代三號強風信號，並於當日上午 8 時 10 分取消所有熱帶氣旋警告信號。玉兔於十一月二日上午 11 時左右最接近香港，其中心位於本港之東南約 270 公里。

玉兔影響香港期間，大廟灣錄得最高潮位(海圖基準面以上) 2.78 米及最大風暴潮(天文潮高度以上) 0.65 米。

受東北季候風影響，十月三十一日本港部分時間有陽光，天氣非常乾燥，相對濕度普遍維持在百分之四十以下。隨著玉兔靠近，十一月一日及二日本港雲量較多，早晚有微雨。

玉兔吹襲香港期間並沒有造成嚴重破壞。十月三十一日下午一名市民在石澳滑浪期間不幸遇溺身亡。

表 3.6.1 - 3.6.4 分別是玉兔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 3.6.1 為玉兔的路徑圖。圖 3.6.2 - 3.6.3 分別為玉兔的衛星及雷達圖像。

3.6 Super Typhoon Yutu (1826): 21 October – 2 November 2018

Yutu was the sixth tropical cyclone affecting Hong Kong in 2018 and, after Ira in 1993, necessitated the issuance of the No. 3 Strong Wind Signal in November again.

Yutu formed as a tropical depression over the western North Pacific about 1 620 km east-southeast of Guam on the afternoon of 21 October. Tracking generally northwestwards, it intensified rapidly. Yutu developed into a super typhoon on 24 October, reaching its peak intensity the next day with an estimated maximum sustained wind of 250 km/h near its centre. Yutu turned to move west to west-southwestwards on 26 and 27 October and started to weaken gradually. After moving across Luzon on 30 October, Yutu entered the central part of the South China Sea and weakened into a typhoon. Yutu further weakened into a severe tropical storm on the next day and turned to move northwestwards across the northeastern part of the South China Sea. Yutu drifted northwards slowly on 1 November and weakened into a tropical storm that night. Under the influence of the dry northeast monsoon over southern China, Yutu further weakened into a tropical depression the next day and lingered over the northeastern part of the South China Sea. It finally weakened into an area of low pressure at night.

According to press reports, Yutu left at least 2 deaths and 133 injured during its passage to Saipan. Electricity supply for many places was interrupted. The torrential rain and squalls brought by Yutu caused landslides and flooding in the northern part of the Philippines, killing at least 20 people.

In Hong Kong, the No. 1 Standby Signal was issued at 8:40 a.m. on 31 October when Yutu was about 670 km southeast of the territory. Local winds were moderate to fresh northerlies, occasionally strong offshore and on high ground. As Yutu edged closer to the coastal waters of eastern Guangdong, the No. 3 Strong Wind Signal was issued at 12:40 p.m. on 1 November when it was about 370 km southeast of Hong Kong. Under the combine effect of the northeast monsoon and Yutu, local winds were moderate to fresh northerlies, strong offshore and on high ground. The lowest instantaneous mean sea-level pressure of 1010.5 hPa was recorded at the Observatory headquarters at 3:38 p.m. on 1 November when Yutu was about 340 km southeast of Hong Kong. As Yutu's circulation weakened significantly due to dry air intrusion, local winds subsided gradually and the No. 3 Strong Wind Signal was replaced by the No. 1 Standby Signal at 2:10 a.m. on 2 November. All tropical cyclone warning signals were cancelled at 8:10 a.m. on that day. Yutu came closest to the territory at around 11 a.m. on 2 November as it skirted past about 270 km southeast of Hong Kong.

During the passage of Yutu, a maximum sea level (above chart datum) of 2.78 m and a maximum storm surge (above astronomical tide) of 0.65 m were recorded at Tai Miu Wan.

Under the influence of the northeast monsoon, there were sunny periods on 31 October in Hong Kong. It was also very dry with the relative humidity generally staying below 40 per cent on that day. With the approach of Yutu, the weather became cloudier in Hong Kong on 1 and 2 November. There were also light rain patches in the morning and at night.

Yutu did not cause any significant damage in Hong Kong. A person was tragically drowned while surfing in Shek O on the afternoon of 31 October.

Information on the maximum wind, periods of strong force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Yutu is given in Tables 3.6.1 - 3.6.4 respectively. Figure 3.6.1 shows the track of Yutu. Figures 3.6.2 - 3.6.3 show respectively satellite imageries and a radar imagery of Yutu.

表 3.6.1　在玉兔影響下，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 Yutu 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)	-	-	47	31/10	23:15	-	-	12	1/11	01:00
							-	-	12	1/11	02:00
中環碼頭	Central Pier	東北偏北	NNE	47	1/11	02:26	東北偏北	NNE	23	1/11	03:00
		東北	NE	47	1/11	19:18					
長洲	Cheung Chau	北	N	63	1/11	22:41	北	N	36	31/10	18:00
長洲泳灘	Cheung Chau Beach	東北	NE	68	1/11	23:02	東北偏北	NNE	31	2/11	00:00
青洲	Green Island	東北偏北	NNE	68	31/10	20:16	東北偏北	NNE	43	31/10	21:00
香港國際機場	Hong Kong International Airport	北	N	45	1/11	16:37	北	N	31	1/11	16:00
啟德	Kai Tak	西北	NW	49	31/10	12:45	北	N	19	31/10	13:00
京士柏	King's Park	東北偏北	NNE	51	31/10	16:48	東北偏北	NNE	22	31/10	14:00
流浮山	Lau Fau Shan	北	N	56	1/11	17:41	北	N	31	1/11	18:00
北角	North Point	北	N	41	31/10	12:33	北	N	23	31/10	13:00
		北	N	41	31/10	12:44					
坪洲	Peng Chau	北	N	56	31/10	11:05	北	N	34	1/11	23:00
		北	N	56	31/10	11:06					
平洲	Ping Chau	東北偏北	NNE	34	1/11	20:00	北	N	9	1/11	14:00
							北	N	9	1/11	16:00
西貢	Sai Kung	北	N	59	31/10	13:52	北	N	36	31/10	14:00
沙洲	Sha Chau	北	N	56	1/11	15:48	北	N	41	1/11	18:00
		北	N	56	1/11	15:49					
沙螺灣	Sha Lo Wan	東北	NE	41	31/10	22:02	東北	NE	19	1/11	03:00
沙田	Sha Tin	東北偏北	NNE	41	31/10	12:36	東北偏北	NNE	19	31/10	13:00
石崗	Shek Kong	東北偏北	NNE	43	31/10	12:25	東北	NE	20	31/10	11:00
九龍天星碼頭	Star Ferry (Kowloon)	西	W	30	31/10	13:23	西北偏西	WNW	7	31/10	13:00
打鼓嶺	Ta Kwu Ling	東北偏北	NNE	54	1/11	01:19	東北偏北	NNE	23	1/11	20:00
		東北	NE	54	1/11	16:25	北	N	23	1/11	22:00
大美督	Tai Mei Tuk	北	N	63	1/11	18:03	東北	NE	36	31/10	13:00
大帽山	Tai Mo Shan	東北	NE	88	31/10	20:36	東北	NE	68	31/10	21:00
大埔滘	Tai Po Kau	北	N	43	31/10	13:46	西北偏西	WNW	19	1/11	19:00
塔門東	Tap Mun East	北	N	51	1/11	17:46	西北偏北	NNW	22	1/11	19:00
							北	N	22	1/11	20:00
大老山	Tate's Cairn	北	N	79	31/10	23:49	北	N	58	31/10	22:00
							北	N	58	31/10	23:00
							北	N	58	1/11	01:00
							西北偏北	NNW	58	1/11	21:00
							西北偏北	NNW	58	1/11	22:00
將軍澳	Tseung Kwan O	東北	NE	43	1/11	20:56	東北	NE	19	1/11	13:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	北	N	56	1/11	20:24	西北偏北	NNW	23	1/11	13:00
屯門政府合署	Tuen Mun Government Offices	東北偏北	NNE	62	1/11	21:33	東北偏北	NNE	23	1/11	22:00
橫瀾島	Waglan Island	北	N	62	1/11	15:39	北	N	51	1/11	16:00
濕地公園	Wetland Park	東北偏北	NNE	41	31/10	23:43	東北偏北	NNE	13	1/11	19:00
黃竹坑	Wong Chuk Hang	西北	NW	43	31/10	21:17	西	W	13	1/11	21:00

昂坪- 沒有資料　Ngong Ping - data not available

表 3.6.2　在玉兔影響下，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 3.6.2　Periods during which sustained strong force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Yutu 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	31/10	17:45	31/10	17:51
西貢	Sai Kung	31/10	13:27	31/10	13:31

香港國際機場、啟德、沙田、流浮山、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 the Hong Kong International Airport, Kai Tak, Sha Tin, Lau Fau Shan, 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。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 force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.6.3　玉兔掠過期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.6.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Yutu

站 Station			十月三十一日 31 Oct	十一月一日 1 Nov	十一月二日 2 Nov	總雨量 (毫米) Total (mm)
香港天文台 Hong Kong Observatory			0.0	0.0	0.1	0.1
香港國際機場 Hong Kong International Airport (HKA)			0.0	0.2	微量 Trace	0.2
長洲 Cheung Chau (CCH)			0.0	0.0	0.0	0.0
H23	香港仔	Aberdeen	0.0	0.0	0.0	0.0
N05	粉嶺	Fanling	0.0	0.0	0.0	0.0
N13	糧船灣	High Island	0.0	0.0	0.0	0.0
K04	佐敦谷	Jordan Valley	0.0	0.0	2.0	2.0
N06	葵涌	Kwai Chung	0.0	0.0	0.0	0.0
H12	半山區	Mid Levels	0.0	0.0	0.0	0.0
N09	沙田	Sha Tin	0.0	0.0	[0.0]	[0.0]
H19	筲箕灣	Shau Kei Wan	0.0	0.0	0.0	0.0
SEK	石崗	Shek Kong	0.0	0.0	0.0	0.0
K06	蘇屋邨	So Uk Estate	0.0	0.0	1.5	1.5
R31	大美督	Tai Mei Tuk	0.0	0.5	0.0	0.5
R21	踏石角	Tap Shek Kok	0.0	0.0	0.0	0.0
N17	東涌	Tung Chung	0.0	0.0	0.0	0.0
TMR	屯門水庫	Tuen Mun Reservoir	0.0	0.0	0.0	0.0

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

表 3.6.4　玉兔掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.6.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Yutu

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	2.63	2/11	04:51	0.51	1/11	15:11
石壁	Shek Pik	2.66	2/11	04:44	0.49	2/11	04:44
大埔滘	Tai Po Kau	2.77	1/11	02:32	0.57	1/11	02:30
大廟灣	Tai Miu Wan	2.78	2/11	03:56	0.65	2/11	03:56
尖鼻咀	Tsim Bei Tsui	2.73	2/11	05:53	0.59	1/11	12:11

橫瀾島 - 沒有資料　Waglan Island - data not available

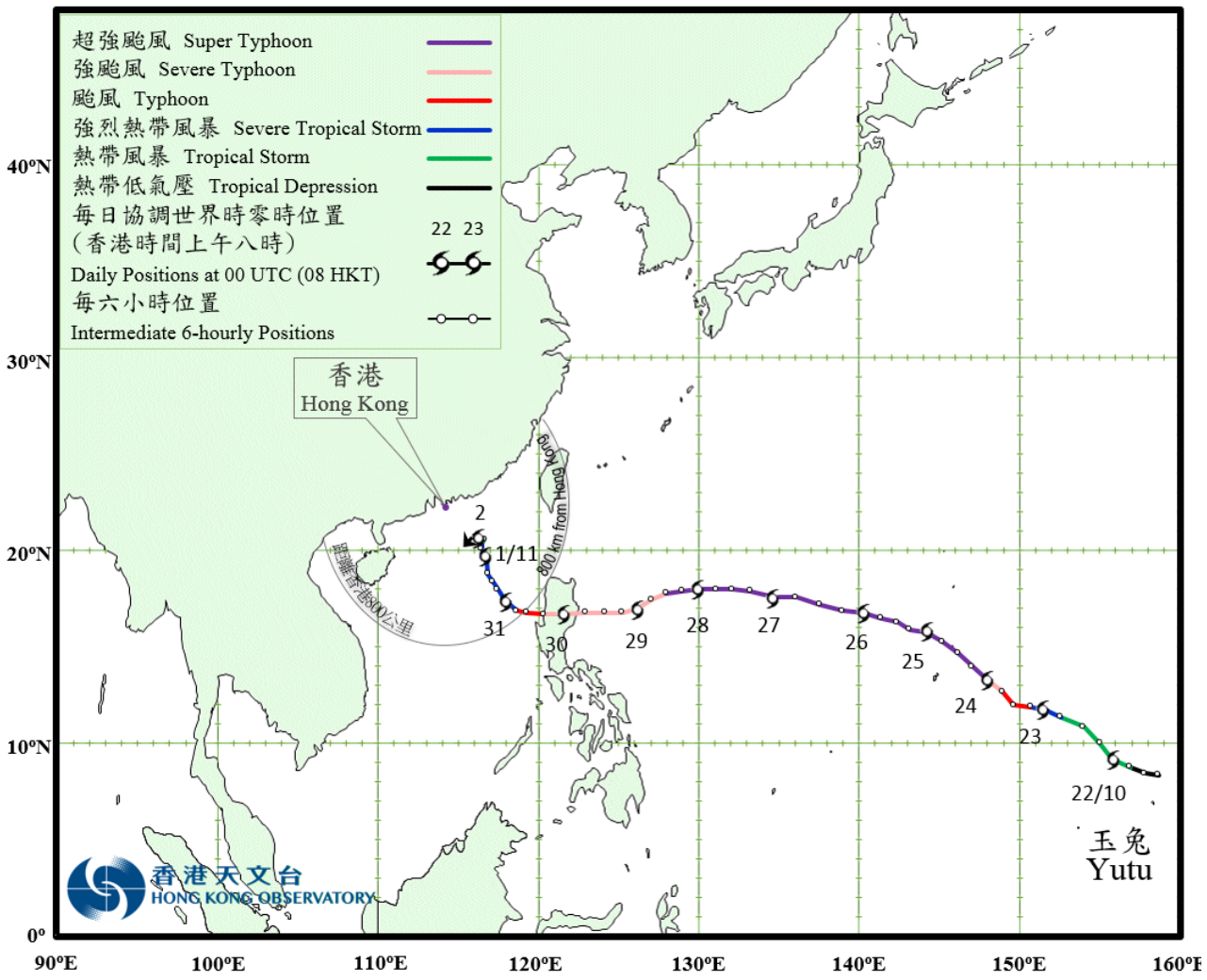


圖 3.6.1a　　二零一八年十月二十一日至十一月二日玉兔的路徑圖。

Figure 3.6.1a　　Track of Yutu: 21 October - 2 November 2018.

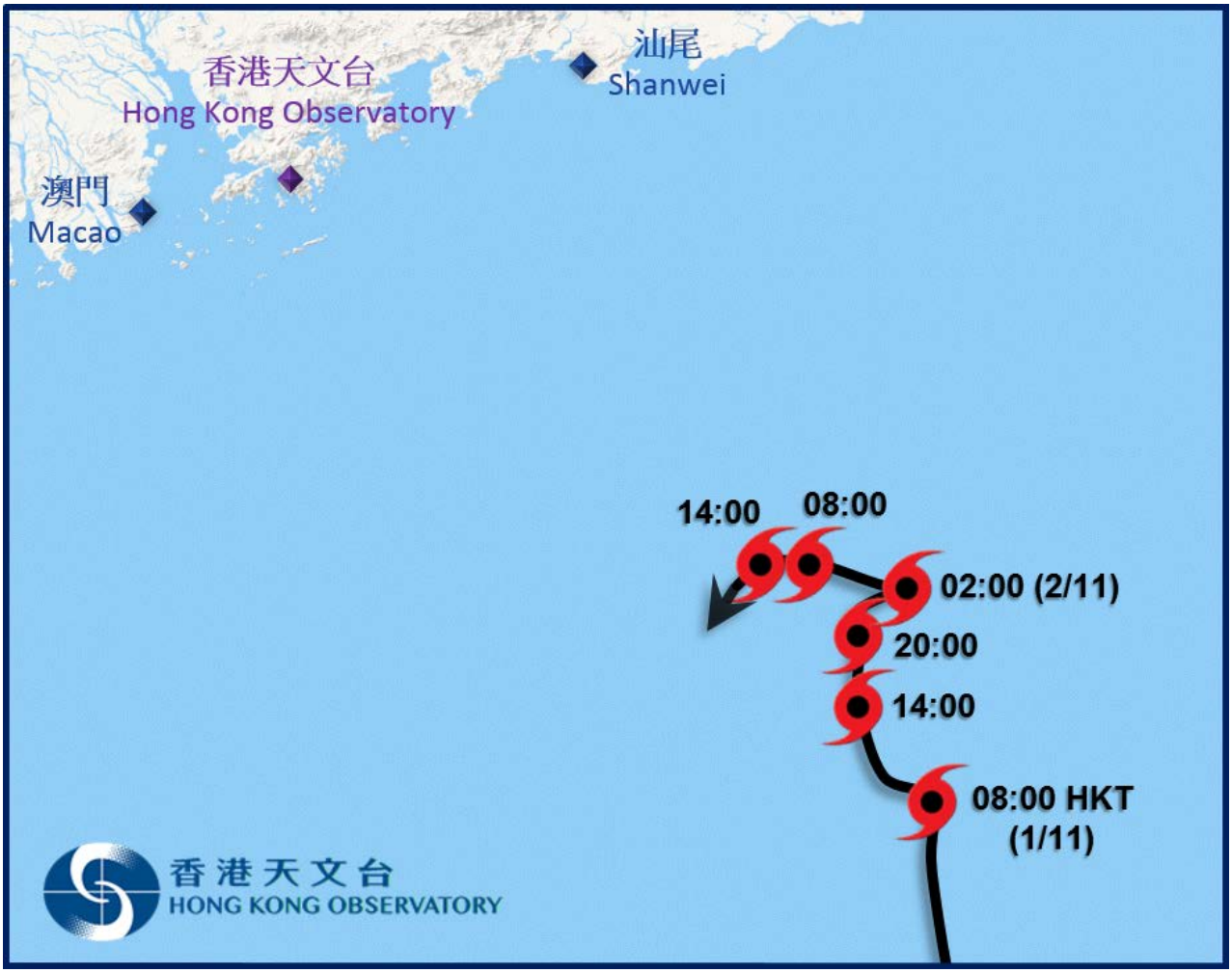


圖 3.6.1b　　玉兔接近香港時的路徑圖。

Figure 3.6.1b　　Track of Yutu near Hong Kong.

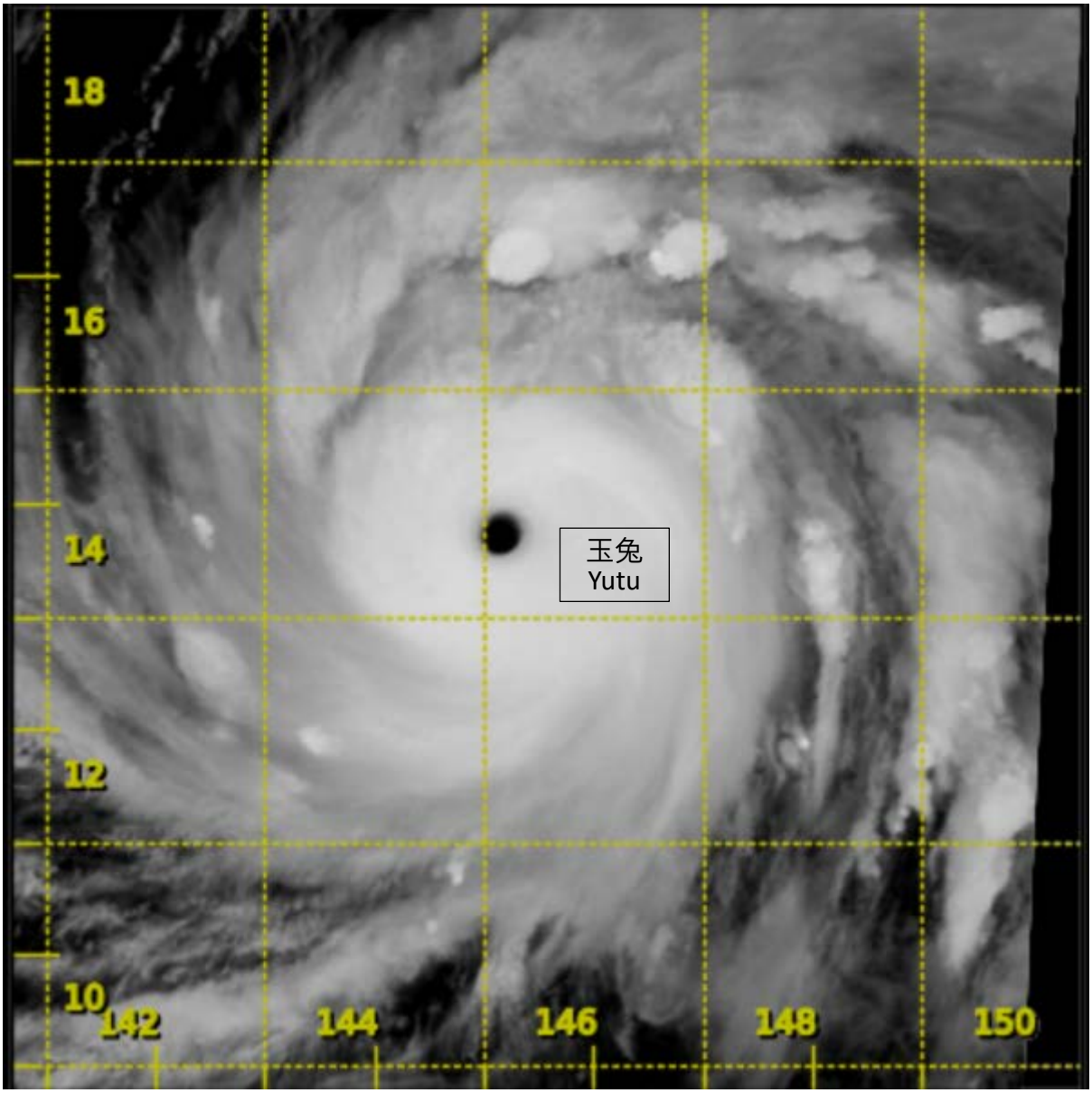


圖 3.6.2a　二零一八年十月二十四日下午 8 時左右的紅外線衛星圖片，當時玉兔達到其最高強度，中心附近最高持續風速估計為每小時 250 公里。

Figure 3.6.2a　Infra-red satellite imagery around 8 p.m. on 24 October 2018, when Yutu was at peak intensity with an estimated maximum sustained winds of 250 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).]

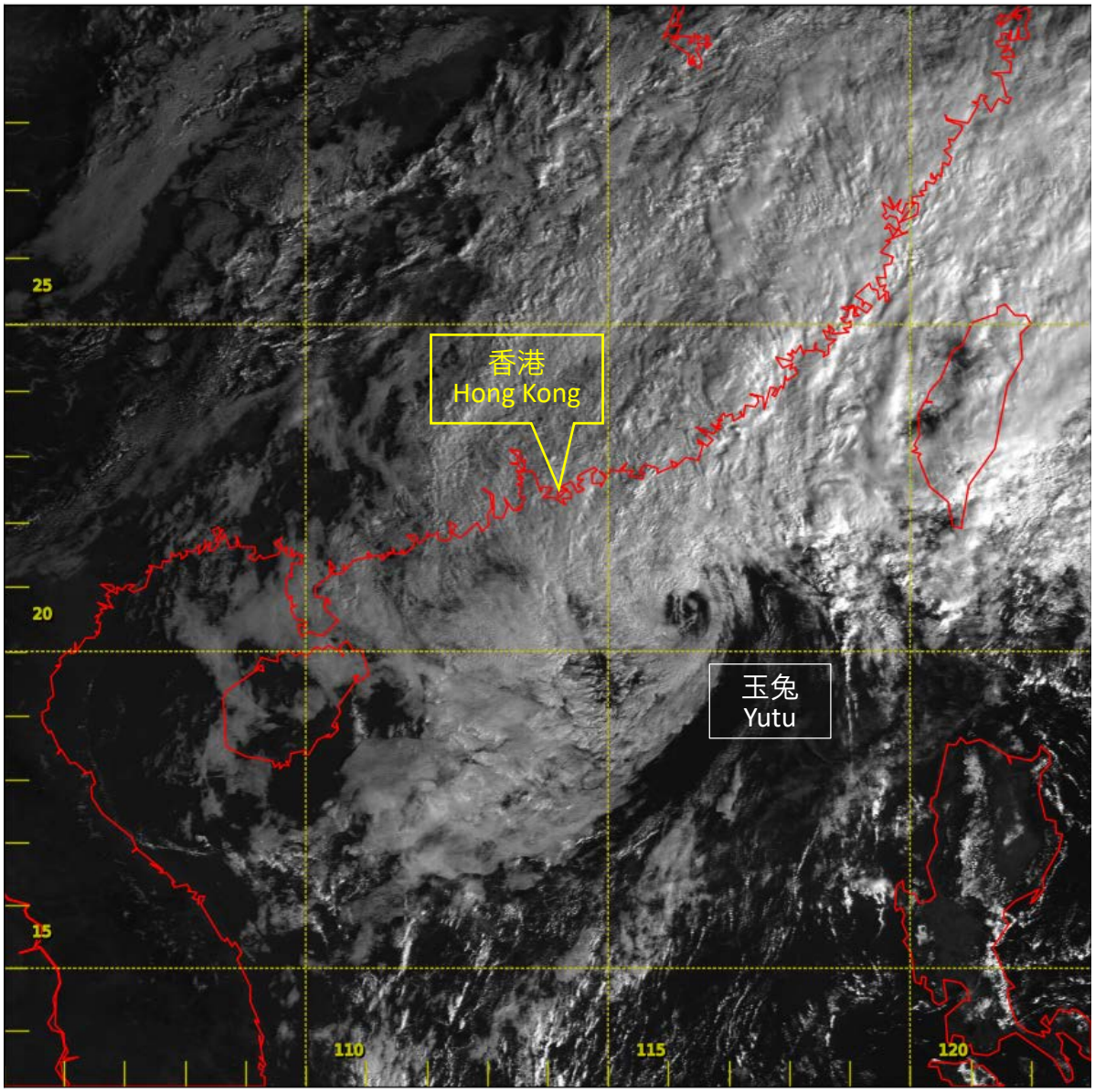


圖 3.6.2b　二零一八年十一月二日上午 8 時左右的可見光衛星圖片，當時玉兔已減弱為熱帶低氣壓。

Figure 3.6.2b　Visible satellite imagery around 8 a.m. on 2 November 2018, when Yutu was weakened into a tropical depression.

〔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).]

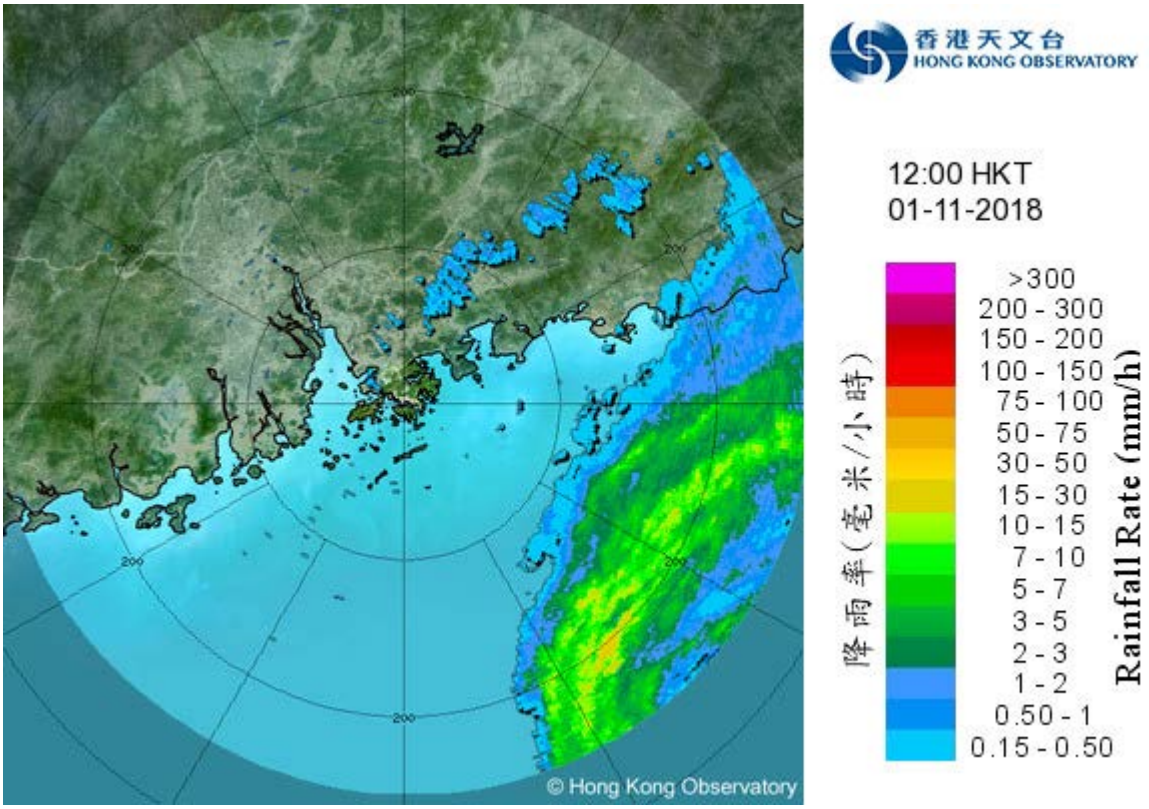


圖 3.6.3　二零一八年十一月一日正午 12 時的雷達回波圖像，與玉兔相關的雨帶正影響南海東北部。

Figure 3.6.3　Radar echoes captured at noon on 1 November 2018. Rainband associated with Yutu was affecting the northeastern part of the South China Sea.

第四節　熱帶氣旋統計表

表4.1是二零一八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是天文台在二零一八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是二零一八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是一九五六至二零一八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是一九五六至二零一八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是一九五六至二零一八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是二零一八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是二零一八年位於香港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二零一八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是自一九四六年至二零一八年間，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是二零一八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，當中超強颱風山竹(1822)引致香港直接經濟損失的估算的詳情載於附件一。

表4.11是一九六零至二零一八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是二零一八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 2018 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 2018, 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 2018. 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 2018 inclusive.

TABLE 4.5 gives the annual number of tropical cyclones in Hong Kong's area of responsibility between 1956 and 2018 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 1956-2018.

TABLE 4.7 is a summary of meteorological information for each tropical cyclone affecting Hong Kong in 2018, 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 2018.

TABLE 4.8.2 highlights the 10 wettest tropical cyclones in Hong Kong for the period 1884-1939 and 1947-2018.

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 2018. 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 2018. The information is based on reports from various government departments, public utility companies and local newspapers. For details of the estimated direct economic loss in Hong Kong caused by Super Typhoon Mangkhut (1822), please refer to Annex 1.

TABLE 4.11 presents casualties and damage caused by tropical cyclones in Hong Kong: 1960-2018. 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 2018.

表 4.1　　二零一八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 2018

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 Became 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	
熱帶風暴布拉萬	1801	2 / 1	0000	9.4	122.3	65	998	4 / 1	0000	12.2	111.0	DISP
熱帶風暴三巴	1802	11 / 2	0000	6.6	136.6	65	995	14 / 2	0600	8.0	119.5	DISP
超強颱風杰拉華	1803	25 / 3	0600	6.4	140.4	195	930	1 / 4	0000	19.1	145.1	DISP
熱帶風暴艾雲尼	1804	2 / 6	1200	12.2	112.4	75	990	8 / 6	0900	23.3	112.5	DISP
強烈熱帶風暴馬力斯	1805	7 / 6	1800	16.3	127.9	110	975	11 / 6	1200	34.7	144.8	XT
熱帶風暴格美	1806	14 / 6	0600	21.7	118.8	75	990	16 / 6	1800	27.6	131.6	XT
颱風派比安	1807	28 / 6	1800	20.1	130.8	120	965	4 / 7	0600	39.1	134.8	XT
超強颱風瑪莉亞	1808	3 / 7	1200	10.7	147.5	220	915	11 / 7	1500	27.3	115.8	DISP
熱帶風暴山神	1809	16 / 7	0000	18.9	125.1	85	986	24 / 7	0300	22.3	109.5	DISP
強烈熱帶風暴安比	1810	18 / 7	1200	19.2	129.3	90	982	24 / 7	0600	39.9	118.3	XT
熱帶低氣壓	-	21 / 7	0300	18.2	119.2	55	996	23 / 7	0000	26.0	123.4	DISP
強烈熱帶風暴悟空	1811	22 / 7	1200	23.8	159.6	105	980	26 / 7	1200	39.8	153.4	XT
颱風雲雀	1812	24 / 7	1800	20.3	136.7	140	960	3 / 8	1200	32.0	120.3	DISP
颱風珊珊	1813	2 / 8	1200	17.7	151.8	145	955	10 / 8	0000	40.0	147.2	XT
熱帶風暴摩羯	1814	7 / 8	0000	19.0	133.2	85	988	15 / 8	1800	36.5	118.0	DISP
強烈熱帶風暴貝碧嘉	1816	9 / 8	0900	17.9	111.9	90	980	17 / 8	0600	19.3	104.0	DISP
強烈熱帶風暴麗琵	1815	11 / 8	1200	20.2	143.6	90	994	15 / 8	0000	34.0	130.2	DISP
熱帶風暴赫克托	1817	13 / 8	1800	25.8	179.3	75	995	15 / 8	0000	29.0	171.0	DISP
熱帶風暴溫比亞	1818	15 / 8	0000	27.0	127.3	85	984	18 / 8	0600	32.7	114.7	DISP
強颱風蘇力	1819	15 / 8	2100	14.6	143.4	165	945	24 / 8	1200	40.1	131.8	XT
強颱風西馬侖	1820	18 / 8	0000	13.3	154.6	165	945	24 / 8	0000	39.1	136.1	XT
熱帶低氣壓	-	23 / 8	0300	23.0	120.3	55	994	25 / 8	0000	25.4	119.6	DISP
超強颱風飛燕	1821	27 / 8	1200	13.6	158.9	230	910	4 / 9	1200	38.7	138.2	XT
超強颱風山竹	1822	7 / 9	0600	12.2	166.3	250	900	17 / 9	0900	24.1	106.8	DISP
熱帶風暴百里嘉	1823	10 / 9	0000	21.5	121.8	85	992	13 / 9	0600	21.7	109.5	DISP
超強颱風潭美	1824	21 / 9	1200	15.4	142.6	220	910	30 / 9	1800	36.9	139.8	XT
超強颱風康妮	1825	28 / 9	1800	10.7	146.5	230	910	6 / 10	1800	41.0	137.0	XT
超強颱風玉兔	1826	21 / 10	0600	8.4	158.7	250	900	2 / 11	0900	20.6	116.0	DISP
熱帶低氣壓桃芝	1827	17 / 11	0600	10.2	111.7	55	1000	18 / 11	0600	11.6	109.3	DISP
強烈熱帶風暴天兔	1829	20 / 11	0000	10.8	128.7	90	984	25 / 11	1800	10.8	106.8	DISP
颱風萬宜	1828	20 / 11	1200	4.8	154.2	145	955	26 / 11	1800	21.4	132.1	DISP
熱帶低氣壓	-	25 / 12	1200	9.0	134.8	55	998	29 / 12	2100	9.4	119.2	DISP
熱帶風暴帕布	1901	31 / 12	0600	7.6	112.0	85	988	7 / 1	0600	12.3	90.1	DISP

+時間為協調世界時。

+Times are given in UTC.

表 4.2　　二零一八年為船舶發出的熱帶氣旋警告

TABLE 4.2　TROPICAL CYCLONE WARNINGS FOR SHIPPING ISSUED IN 2018

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+	
熱帶風暴布拉萬	Tropical Storm Bolaven	12	3 / 1	0000	4 / 1	0600	30
* 熱帶風暴艾雲尼	* Tropical Storm Ewiniar	48	2 / 6	1200	8 / 6	0900	141
熱帶風暴格美	Tropical Storm Gaemi	15	14 / 6	0300	15 / 6	1800	39
超強颱風瑪莉亞	Super Typhoon Maria	10	10 / 7	0900	11 / 7	1200	27
* 熱帶風暴山神 (第一次影響香港期間)	* Tropical Storm Son-Tinh (First passage)	22	16 / 7	0600	18 / 7	2100	63
* (第二次影響香港期間)	* (Second passage)	21	21 / 7	1800	24 / 7	0300	57
熱帶低氣壓	Tropical Depression	19	21 / 7	0300	23 / 7	0300	48
* 強烈熱帶風暴貝碧嘉	* Severe Tropical Storm Bebinca	65	9 / 8	0900	17 / 8	0300	186
熱帶風暴摩羯	Tropical Storm Yagi	8	12 / 8	0000	12 / 8	2100	21
熱帶風暴溫比亞	Tropical Storm Rumbia	6	15 / 8	1800	16 / 8	0900	15
熱帶低氣壓	Tropical Depression	17	23 / 8	0300	25 / 8	0300	48
* 熱帶風暴百里嘉	* Tropical Storm Barijat	27	10 / 9	0300	13 / 9	0900	78
* 超強颱風山竹	* Super Typhoon Mangkhut	26	14 / 9	0900	17 / 9	1200	75
* 超強颱風玉兔	* Super Typhoon Yutu	39	29 /10	0900	2 /11	2100	108
熱帶低氣壓桃芝	Tropical Depression Toraji	11	17 /11	0600	18 /11	1200	30
強烈熱帶風暴天兔	Severe Tropical Storm Usagi	40	20 /11	2100	25 /11	1500	114
熱帶低氣壓	Tropical Depression	7	29 /12	0300	29 /12	2100	18
	共 Total	393					1029

* 這些熱帶氣旋引致天文台需要發出熱帶氣旋警告信號。

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

+ 時間為協調世界時。

+ Times are given in UTC.

表 4.3　　二零一八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 2018

摘要 SUMMARY

信號 Signal	次數 No. of occasions	總時段 Total duration	
		時 h	分 min
1	12	281	25
3	7	112	50
8 西北 NW	0	0	0
8 西南 SW	0	0	0
8 東北 NE	1	6	30
8 東南 SE	1	9	40
9	1	2	0
10	1	10	0
共 Total	23	422	25

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*
熱帶風暴艾雲尼 Tropical Storm Ewiniar	82	1	05/06	11:20	07/06	12:40
		3	07/06	12:40	08/06	15:40
		1	08/06	15:40	08/06	18:20
熱帶風暴山神 Tropical Storm Son-Tinh	56	1	17/07	02:40	17/07	16:20
		3	17/07	16:20	18/07	09:40
		1	23/07	15:40	24/07	10:40
強烈熱帶風暴貝碧嘉 Severe Tropical Storm Bebinca	140	1	09/08	17:15	14/08	05:20
		3	14/08	05:20	15/08	02:20
		1	15/08	02:20	15/08	05:20
熱帶風暴百里嘉 Tropical Storm Barijat	49	1	11/09	10:40	12/09	12:20
		3	12/09	12:20	13/09	04:10
		1	13/09	04:10	13/09	07:40
超強颱風山竹 Super Typhoon Mangkhut	78	1	14/09	22:20	15/09	16:20
		3	15/09	16:20	16/09	01:10
		8 東北 NE	16/09	01:10	16/09	07:40
		9	16/09	07:40	16/09	09:40
		10	16/09	09:40	16/09	19:40
		8 東南 SE	16/09	19:40	17/09	05:20
		3	17/09	05:20	17/09	14:40
		1	17/09	14:40	17/09	19:10
超強颱風玉兔 Super Typhoon Yutu	50	1	31/10	08:40	01/11	12:40
		3	01/11	12:40	02/11	02:10
		1	02/11	02:10	02/11	08:10

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

表 4.4　　一九五六至二零一八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 : 1956-2018

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
2018	12	7	0	0	1	1	1	1	422	25
共 Total	430	355	29	35	64	53	22	15	16671	44
平均 Mean	6.8	5.6	0.5	0.6	1.0	0.8	0.3	0.2	264	38

表 4.5　一九五六至二零一八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 : 1956-2018

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
2018	17	6
平均 Mean	15.7	5.9

表 4.6　一九五六至二零一八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 : 1956-2018

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	389	42 51	161 0 (桃麗達 Tilda, 1964)	4 30 (熱帶低氣壓 T.D., 2000)	264 38	570 15 (1964)	36 35 (1959)
三號或以上 3 or higher	261	28 56	124 15 (瑪麗 Mary, 1960)	4 5 (熱帶低氣壓 T.D., 2006)	119 51	306 35 (1974)	15 5 (2004)
八號或以上 8 or higher	96	14 26	66 50 (瑪麗 Mary, 1960)	2 40 (雲茜 Wynne, 1984)	22 0	100 55 (1964)	0 0
8 西北 NW	29	5 48	15 45	1 30	2 40	18 0	0 0
8 西南 SW	35	4 58	10 45	2 0	2 45	16 10	0 0
8 東北 NE	64	7 34	35 35	1 35	7 41	40 20	0 0
8 東南 SE	53	7 30	21 45	0 20	6 19	31 15	0 0
九號或以上 9 or higher	23	7 5	12 25 (約克 York, 1999)	2 0 (杜鵑 Dujuan, 2003)	2 35	19 25 (1964)	0 0
十號 10	15	6 26	11 0 (約克 York, 1999)	2 30 (愛麗斯 Alice, 1961)	1 32	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　　二零一八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 2018

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
熱帶風暴艾雲尼 Tropical Storm Ewiniar	6	8	13:00	西北偏西 WNW	200	8	東北偏北 NNE	996	6	8	17:01 - 17:15#	998.7	0.35	0.40	0.33	0.46	0.68	-
											17:00	998.8						
熱帶風暴山神 Tropical Storm Son-Tinh (第一次影響香港期間) (First passage)	7	17	18:00	南 S	340	32	西 W	992	7	17	16:08 - 18:30#	1000.1	0.53	0.64	0.57	0.58	0.64	0.49
											17:00	1000.1						
(第二次影響香港期間) (Second passage)	7	24	05:00	西南偏西 WSW	410	19	北 N	995	7	23	16:36 - 16:40#	1000.3	0.18	0.23	0.21	0.22	0.26	0.14
											14:00, 16:00	1001.0						
強烈熱帶風暴貝碧嘉 Severe Tropical Storm Bebinca	8	14	14:00	西南偏南 SSW	150	3	西北 NW	984	8	12	17:34 - 18:24#	994.7	0.31	0.26	0.31	0.43	0.42	0.18
											18:00	994.7						
熱帶風暴百里嘉 Tropical Storm Barijat	9	12	15:00	南 S	150	17	西 W	998	9	12	16:49 -17:00#	1006.0	0.30	0.25	0.25	0.38	0.27	0.19
											17:00	1006.0						
超強颱風山竹 Super Typhoon Mangkhut	9	16	13:00	西南偏南 SSW	100	33	西北偏西 WNW	950	9	16	13:28, 13:32	977.0	2.35	2.34	2.77+	3.40	2.58	2.68^
											13:00	977.6						
超強颱風玉兔 Super Typhoon Yutu	11	2	11:00	東南 SE	270	3	西 W	1002	11	1	15:38 - 15:53#	1010.5	0.51	0.49	0.65	0.57	0.59	-
											16:00	1010.7						

* 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

^ 橫瀾島潮汐站在山竹吹襲期間受嚴重損毀，損毀前錄得的最高潮位為2.68米。

* Hong Kong Time （UTC + 8 hours）

\# First and last time recorded

\- data not available

\+ incomplete data

^ The tide station at Waglan Island was severely damaged by Mangkhut and the maximum sea level of 2.68 m was recorded before damage.

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	
熱帶風暴艾雲尼 Tropical Storm Ewiniar	6	東 E	22	東南偏東 ESE	34	-		東 E	27	東南偏南 SSE	49	-		東南偏南 SSE	52	東南偏南 SSE	65	-	
熱帶風暴山神 Tropical Storm Son-Tinh (第一次影響香港期間) (First passage)	7	東 E	30	東南偏東 ESE	36	東 E	58	東 E	31	東南 SE	52	東 E	63	東 E	58	東南偏東 ESE	68	東南偏東 ESE	88
(第二次影響香港期間) (Second passage)	7	東南偏南 SSE	20	東南偏南 SSE	30	東南 SE	41	東南偏南 SSE	22	東南偏南 SSE	34	東南偏南 SSE	41	東南偏南 SSE	41	東南 SE	56	東南 SE	51
強烈熱帶風暴貝碧嘉 Severe Tropical Storm Bebinca	8	東 E	22	東 E	36	東 E	45	東 E	25	東 E	40	東北偏東, 東 ENE, E	49	東 E	45	東南偏東 ESE	62	東北偏東 ENE	59
熱帶風暴百里嘉 Tropical Storm Barijat	9	東 E	22	東北偏東 ENE	34	東北偏東 ENE	63	東北偏東 ENE	30	東北偏東 ENE	40	東北偏東 ENE	68	東 E	58	東北偏東 ENE	51	東北偏東 ENE	77
超強颱風山竹 Super Typhoon Mangkhut	9	東 E	70	東 E	101	東北 NE	161	東 E	81	東 E	115	東北 NE	180	東北偏北 NNE	161	東南偏東 ESE	157	東北 NE	220
超強颱風玉兔 Super Typhoon Yutu	11	北 N	23	北 N	34	北 N	51	東北偏北 NNE	27	北 N	36	北 N	54	東北偏北 NNE	51	北 N	45	北 N	62

- 沒有資料 - data not available

表 4.8.1　二零一八年位於香港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 2018

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)
熱帶風暴艾雲尼 Tropical Storm Ewiniar	(T_1) 5 / 6 1000 - (T_2) 8 / 6 1700	192.9	4.8	4.8	4.8	197.7
熱帶風暴格美 # Tropical Storm Gaemi #	(T_1) 14 / 6 1400 - (T_2) 14 / 6 2000	0.0	0.2	0.2	0.2	0.2
熱帶風暴山神 Tropical Storm Son-Tinh 第一次影響香港期間 First passage	(T_1) 17 / 7 0600 - (T_2) 18 / 7 0700	9.1	27.0	48.2	51.4	60.5
第二次影響香港期間 Second passage	(T_1) 23 / 7 0200 - (T_2) 24 / 7 1100	30.8	2.0	6.2	6.5	37.3
強烈熱帶風暴貝碧嘉 Severe Tropical Storm Bebinca	(T_1) 9 / 8 1700 - (T_2) 16 / 8 0700	156.0	1.9	59.0	80.4	236.4
熱帶風暴百里嘉 Tropical Storm Barijat	(T_1) 11 / 9 0200 - (T_2) 13 / 9 1400	2.5	0.0	0.0	128.8+	131.3
超強颱風山竹 Super Typhoon Mangkhut	(T_1) 15 / 9 1800 - (T_2) 17 / 9 0900	178.7+	2.0	2.0	2.0	180.7
超強颱風玉兔 Super Typhoon Yutu	(T_1) 31 /10 1300 - (T_2) 2 /11 1700	微量 Trace	8.4	8.4	8.4	8.4
					共 Total	723.7

* 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。

\+ 超強颱風山竹的雨量與熱帶風暴百里嘉的雨量出現了128.8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 Super Typhoon Mangkhut overlapped the rainfall amount of Tropical Storm Barijat by 128.8 mm.

表 4.8.2　一八八四至一九三九年及一九四七至二零一八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, 1947-2018)

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　一九四六至二零一八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 1946-2018

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	東南偏南 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	-	
山竹 Mangkhut	16 / 9	2018	西南偏南 SSW	100	977.6	977.0	東 E	81	東 E	70	東南偏東 ESE	81	東北 NE	161	東 E	157	東北偏東 ENE	166	東北 NE	128	東 E	169	東北偏北 NNE	161	東北偏東 ENE	142	東北 NE	220	東 E	212	東北偏東 ENE	256	東北偏北 NNE	229

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。

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.

* 估計，超出風速記錄圖的上限。

* estimated, exceeding upper limit of anemogram.

表 4.10　　二零一八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 2018

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)	塌樹報告(宗) Report(s) of fallen Trees	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)**		
熱帶風暴艾雲尼 Tropical Storm Ewiniar	6		道路 Road: 1 人行道/小徑 Pavement/Footpath: 3 空曠地區 Open area: 3		2		6	23								
熱帶風暴山神 Tropical Storm Son-Tinh	7		道路 Road: 1		1		1	20								
強烈熱帶風暴貝碧嘉 Severe Tropical Storm Bebinca	8		道路 Road: 2 建築工地 Construction site: 1		2		13	18				0.0558		0.0558		
熱帶風暴百里嘉 Tropical Storm Barijat	9		建築工地 Construction site: 1				2									
超強颱風山竹 Super Typhoon Mangkhut	9	農地 Farmland: 567 公頃 hectares 農作物 Crops: 4143 噸 tons 塘魚 Pond fish: 885 噸 tons	道路 Road: 5 處 sites 3.07 公里 km 港口 Harbour and port: 18 人行道/小徑 Pavement/Footpath: 77 1.31 公里 km 空曠地區 Open area: 7 人行隧道 Subway: 33 人行天橋 Footbridge: 53 升降機/扶手電梯Lift/escalator: 54 噪音屏障 Noise Barrier: 9 交通標誌 Traffic Sign: 346 欄杆 Railing: 8 處 sites 34 米m 太陽能燈 Solar lights: 29 避雨亭 Rain shelter: 14 樓梯 Staircase: 26 平方米m^2 平台 Platform: 2 城市設施 Urban facilities: 60 其他 Others: 3	鐵路 Railway: 5 處 sites 電力供應 Electric supply: 3590 家庭 families 10 處 sites 供水 Water Supply: 2013 家庭 families 10 處 sites 電信設施Telecommunication facilities: 1 處 site 污水處理廠 Treatment works: 3 輸電纜 Power transmission cable: 3 其他 Others: 12 處 sites	856	18	708	60,894	115.0032	707.4957	18.3404	23.8195	45.1291	909.7878	3,688.3578	4,598.1456
超強颱風玉兔 Super Typhoon Yutu	10 - 11				1		2									

#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2018年的保險索償數據只涵蓋超強颱風山竹。

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 Mangkhut in 2018.

*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)。同時亦參考了發展局局長在二零一九年六月五日的立法會會議上就<<因應颱風吹襲所作準備及跟進工作>>的書面回覆。

* 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. Reference is also made to the written reply by the Secretary for Development at the Legislative Council meeting on "Preparation for and follow-up work after the onslaught of typhoons" on 5 June 2019 .

@ 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　　一九六零至二零一八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 - 2018

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
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

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
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
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

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
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
2018	5 / 6 - 8 / 6	T.S. Ewiniar	艾雲尼	0	0	1	0	0	6
	17 / 7 - 24 / 7	T.S. Son-Tinh	山神	0	0	2	0	0	1
	9 / 8 - 15 / 8	S.T.S. Bebinca	貝碧嘉	0	0	1	0	0	13
	11 / 9 - 13 / 9	T.S. Barijat	百里嘉	0	0	0	0	0	2
	14 / 9 - 17 / 9	SuperT. Mangkhut	山竹	0	0	458	0	0	708
	31 /10 - 2 /11	SuperT. Yutu	玉兔	1	0	0	0	0	2

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　二零一八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 2018 (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
三巴	Sanba	1802	T.S.	102	7	48	3	80	1	-	-	-	-
杰拉華	Jelawat	1803	SuperT.	95	13	202	11	283	9	405	6	412	4
艾雲尼	Ewiniar	1804	T.S.	83	22	111	18	204	14	249	10	366	6
馬力斯	Maliksi	1805	S.T.S.	63	8	99	6	272	3	-	-	-	-
格美	Gaemi	1806	T.S.	255	4	-	-	-	-	-	-	-	-
派比安	Prapiroon	1807	T.	120	12	313	9	617	1	-	-	-	-
瑪莉亞	Maria	1808	SuperT.	46	9	58	5	67	3	-	-	-	-
山神	Son-Tinh	1809	T.S.	51	16	96	6	-	-	-	-	-	-
安比	Ampil	1810	S.T.S.	79	10	134	8	206	4	295	2	522	1
雲雀	Jongdari	1812	T.	92	16	173	14	171	12	315	10	517	8
摩羯	Yagi	1814	T.S.	101	16	172	12	313	9	422	7	431	5
麗琵	Leepi	1815	S.T.S.	229	5	416	1	-	-	-	-	-	-
貝碧嘉	Bebinca	1816	S.T.S.	89	28	119	24	202	20	345	14	349	11
溫比亞	Rumbia	1818	T.S.	59	7	126	5	-	-	-	-	-	-
蘇力	Soulik	1819	S.T.	42	12	83	10	145	8	282	5	693	3
西馬侖	Cimaron	1820	S.T.	83	3	174	1	-	-	-	-	-	-
山竹	Mangkhut	1822	SuperT.	34	17	62	13	109	9	129	5	168	3
百里嘉	Barijat	1823	T.S.	36	9	75	5	137	1	-	-	-	-
潭美	Trami	1824	SuperT.	43	15	68	13	95	11	191	9	406	7
康妮	Kong-rey	1825	SuperT.	52	13	110	11	232	9	435	7	699	5
玉兔	Yutu	1826	SuperT.	31	27	64	23	111	19	166	15	170	11
桃芝	Toraji	1827	T.D.	134	1	-	-	-	-	-	-	-	-
萬宜	Man-yi	1828	T.	107	15	189	11	188	7	141	3	-	-
天兔	Usagi	1829	S.T.S.	73	20	102	16	111	12	178	8	230	4
帕布	Pabuk	1901	T.S.	81	4	60	4	117	4	158	2	141	2
熱帶低氣壓 (7月21日-23日)	Tropical Depression (21-23 Jul)	-	T.D.	81	4	-	-	-	-	-	-	-	-
熱帶低氣壓 (8月23日-25日)	Tropical Depression (23-25 Aug)	-	T.D.	34	4	-	-	-		-	-	-	-
熱帶低氣壓 (12月25日-30日)	Tropical Depression (25 - 30 Dec)	-	T.D.	168	14	311	10	414	6	334	2	-	-
平均誤差 Average Error				79		129		185		272		378	
預測總數 Total number of forecasts				331		239		162		105		70	

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　二零一八年熱帶氣旋的位置及強度數據

以下是二零一八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。

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, 2018

Six-hourly position and intensity data are tabulated in this section for the following tropical cyclones in 2018 over the western North Pacific and the South China Sea (i.e. the area bounded by the Equator, 45°N, 100°E and 180°).

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

熱帶風暴布拉萬(1801)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM BOLAVEN (1801)

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	2	0000	T.D.	1002	13	9.4	122.3
		0600	T.D.	1002	13	9.5	120.6
		1200	T.D.	1000	16	9.5	119.1
		1800	T.D.	1000	16	9.7	117.4
	3	0000	T.D.	1000	16	10.3	115.9
		0600	T.S.	998	18	10.9	114.8
		1200	T.S.	998	18	11.2	113.3
		1800	T.S.	998	18	11.5	112.2
	4	0000	T.D.	1002	13	12.2	111.0
			消散 Dissipated				

熱帶風暴三巴(1802)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM SANBA (1802)

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
二月 FEB	11	0000	T.D.	1002	13	6.6	136.6
		0600	T.D.	998	16	7.0	136.0
		1200	T.D.	998	16	7.0	134.4
		1800	T.D.	998	16	7.1	133.2
	12	0000	T.D.	998	16	7.0	131.8
		0600	T.D.	998	16	7.1	130.5
		1200	T.D.	998	16	7.7	129.0
		1800	T.S.	995	18	8.1	127.9
	13	0000	T.S.	995	18	8.8	126.0
		0600	T.S.	995	18	9.2	124.7
		1200	T.D.	998	16	9.0	123.4
		1800	T.D.	998	16	8.7	121.5
	14	0000	T.D.	998	13	8.3	120.0
		0600	T.D.	1002	13	8.0	119.5
			消散 Dissipated				

超強颱風杰拉華(1803)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON JELAWAT (1803)

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
三月 MAR	25	0600	T.D.	1000	13	6.4	140.4
		1200	T.D.	998	16	6.8	138.8
		1800	T.S.	995	18	7.0	138.4
	26	0000	T.S.	995	18	7.7	137.4
		0600	T.S.	995	18	8.1	136.6
		1200	T.S.	995	18	8.9	136.1
		1800	T.S.	995	18	9.6	135.3
	27	0000	T.S.	995	18	9.7	135.0
		0600	T.S.	995	18	9.7	135.1
		1200	T.S.	995	18	10.1	135.4
		1800	T.S.	990	21	11.0	135.3
	28	0000	T.S.	990	21	12.0	135.4
		0600	T.S.	988	23	13.6	134.8
		1200	T.S.	988	23	14.2	135.2
		1800	S.T.S.	984	25	14.9	135.2
	29	0000	S.T.S.	984	25	15.2	135.3
		0600	S.T.S.	984	25	15.3	135.7
		1200	S.T.S.	984	25	15.3	136.2
		1800	S.T.S.	980	31	15.4	136.7
	30	0000	T.	965	36	15.7	137.4
		0600	S.T.	940	49	16.2	138.1
		1200	SuperT	930	54	16.7	138.9
		1800	S.T.	935	49	17.5	139.7
	31	0000	S.T.	950	43	18.2	140.8
		0600	T.	960	39	18.7	141.3
		1200	S.T.S.	975	31	19.1	142.2
		1800	S.T.S.	980	28	19.0	143.0
四月 APR	1	0000	T.S.	988	23	19.1	145.1
			消散 Dissipated				

熱帶風暴艾雲尼(1804)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM EWINIAR (1804)

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	2	1200	T.D.	1000	13	12.2	112.4
		1800	T.D.	1000	13	12.9	112.0
	3	0000	T.D.	1000	13	13.4	111.4
		0600	T.D.	1000	13	14.4	111.0
		1200	T.D.	1000	13	15.0	110.8
		1800	T.D.	1000	13	15.3	110.6
	4	0000	T.D.	1000	13	15.5	110.5
		0600	T.D.	1000	13	15.8	110.5
		1200	T.D.	1000	13	16.0	110.6
		1800	T.D.	1000	13	16.5	110.8
	5	0000	T.D.	998	16	17.4	111.1
		0600	T.D.	998	16	18.4	111.2
		1200	T.D.	998	16	19.8	111.2
		1800	T.D.	998	16	20.5	110.9
	6	0000	T.S.	995	18	20.5	110.3
		0600	T.S.	995	18	20.1	110.3
		1200	T.S.	995	18	19.9	110.8
		1800	T.S.	995	18	20.2	111.2
	7	0000	T.S.	995	18	20.8	111.3
		0600	T.S.	990	21	21.0	111.5
		1200	T.S.	990	21	21.5	111.8
		1800	T.S.	994	18	22.2	112.0
	8	0000	T.D.	995	16	22.7	112.1
		0600	T.D.	996	13	23.1	112.4
		0900	T.D. 消散 Dissipated	996	13	23.3	112.5

強烈熱帶風暴馬力斯(1805)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM MALIKSI (1805)

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	7	1800	T.D.	998	13	16.3	127.9
	8	0000	T.S.	996	18	17.4	127.6
		0600	T.S.	996	18	18.5	127.0
		1200	T.S.	996	18	19.7	126.7
		1800	T.S.	994	21	20.5	126.8
	9	0000	T.S.	988	23	21.5	127.4
		0600	T.S.	988	23	22.2	127.7
		1200	S.T.S.	980	25	23.0	128.1
		1800	S.T.S.	978	28	23.8	128.9
	10	0000	S.T.S.	975	31	25.4	130.6
		0600	S.T.S.	975	31	26.5	132.2
		1200	S.T.S.	978	28	27.6	134.2
		1800	S.T.S.	978	28	28.9	136.4
	11	0000	S.T.S.	980	25	30.6	138.5
		0600	S.T.S.	980	25	32.6	141.2
		1200	T.S. 變為溫帶氣旋 Became Extratropical	988	23	34.7	144.8

熱帶風暴格美(1806)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM GAEMI (1806)

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	14	0600	T.D.	996	13	21.7	118.8
		1200	T.D.	994	16	22.3	120.0
		1800	T.D.	994	16	22.5	120.2
	15	0000	T.D.	994	16	22.7	120.3
		0600	T.D.	994	16	22.8	121.3
		1200	T.D.	994	16	24.6	123.7
		1800	T.D.	994	16	25.9	125.6
	16	0000	T.S.	992	18	26.7	127.0
		0600	T.S.	992	18	27.0	128.7
		1200	T.S.	990	21	27.3	130.6
		1800	T.S.	992	18	27.6	131.6
			變為溫帶氣旋 Became Extratropical				

颱風派比安(1807)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON PRAPIROON (1807)

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	28	1800	T.D.	1000	13	20.1	130.8
	29	0000	T.D.	998	16	19.8	130.2
		0600	T.S.	994	18	20.0	130.0
		1200	T.S.	994	18	20.0	129.9
		1800	T.S.	990	21	20.0	129.5
	30	0000	T.S.	988	23	20.6	129.5
		0600	T.S.	988	23	20.8	129.3
		1200	T.S.	984	23	21.6	128.9
		1800	S.T.S.	984	25	22.8	128.3
七月 JUL	1	0000	S.T.S.	984	25	23.6	127.5
		0600	S.T.S.	984	25	24.7	127.3
		1200	S.T.S.	980	28	25.3	126.9
		1800	S.T.S.	970	31	26.1	126.8
	2	0000	T.	965	33	27.2	126.9
		0600	T.	965	33	28.2	127.3
		1200	T.	965	33	29.5	127.7
		1800	T.	965	33	30.8	127.9
	3	0000	T.	965	33	32.0	128.1
		0600	S.T.S.	970	31	33.2	128.7
		1200	S.T.S.	970	31	34.3	129.5
		1800	S.T.S.	984	25	35.8	131.0
	4	0000	T.S.	988	23	37.3	132.7
		0600	T.S.	988	23	39.1	134.8
			變為溫帶氣旋 Became Extratropical				

超強颱風瑪莉亞(1808)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON MARIA (1808)

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	3	1200	T.D.	1000	13	10.7	147.5
		1800	T.D.	1000	13	11.2	146.7
	4	0000	T.D.	998	16	11.4	146.6
		0600	T.D.	998	16	11.8	146.2
		1200	T.S.	995	18	12.5	145.6
		1800	T.S.	990	21	13.4	144.9
	5	0000	S.T.S.	988	25	13.9	143.9
		0600	S.T.S.	980	28	14.5	143.3
		1200	T.	970	33	14.8	142.8
		1800	S.T.	950	46	15.5	142.4
	6	0000	SuperT	935	52	16.0	142.0
		0600	SuperT	930	54	16.5	141.6
		1200	SuperT	930	54	16.7	141.3
		1800	SuperT	930	54	16.9	141.0
	7	0000	SuperT	930	54	17.2	140.8
		0600	SuperT	930	54	17.7	140.6
		1200	SuperT	930	54	17.9	140.3
		1800	SuperT	930	54	18.4	139.8
	8	0000	SuperT	930	54	19.0	138.9
		0600	SuperT	925	57	19.9	137.7
		1200	SuperT	920	59	20.5	136.5
		1800	SuperT	920	59	21.1	135.1
	9	0000	SuperT	915	61	21.8	133.5
		0600	SuperT	915	61	22.4	131.9
		1200	SuperT	920	59	22.9	130.4
		1800	SuperT	930	54	23.4	128.8
	10	0000	SuperT	930	54	24.0	127.1
		0600	SuperT	930	54	24.7	125.5
		1200	S.T.	950	46	25.2	124.0
		1800	S.T.	950	46	26.1	122.3
	11	0000	S.T.	955	43	26.4	120.2
		0600	S.T.S.	980	28	26.4	118.3
		1200	T.S.	994	18	27.2	116.8
		1500	T.D.	996	16	27.3	115.8
			消散 Dissipated				

熱帶風暴山神(1809)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM SON-TINH (1809)

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	16	0000	T.D.	1000	13	18.9	125.1
		0600	T.D.	1000	13	18.8	123.5
		1200	T.D.	996	16	18.8	122.3
		1800	T.D.	996	16	19.0	120.8
	17	0000	T.D.	996	16	19.3	118.2
		0600	T.S.	992	18	19.3	115.4
		1200	T.S.	990	21	19.1	113.6
		1800	T.S.	986	23	19.0	111.3
	18	0000	T.S.	992	18	18.8	109.5
		0600	T.S.	990	21	18.7	108.0
		1200	T.S.	990	21	18.7	106.7
		1800	T.S.	990	21	19.1	105.7
	19	0000	T.D.	996	16	19.2	104.8
		0600	LOW	1000	11	19.4	103.8
		1200	LOW	1000	11	19.6	103.0
		1800	LOW	1000	11	19.7	102.3
	20	0000	LOW	1000	11	20.0	102.2
		0600	LOW	1000	11	20.4	102.5
		1200	LOW	1000	11	20.5	103.4
		1800	LOW	1000	11	20.5	104.5
	21	0000	LOW	1000	11	20.8	105.6
		0600	LOW	998	11	20.0	106.3
		1200	LOW	998	11	19.6	106.4
		1800	T.D.	995	13	19.5	107.3
	22	0000	T.D.	992	16	19.3	107.7
		0600	T.D.	992	16	19.1	108.1
		1200	T.D.	992	16	19.1	108.8
		1800	T.D.	992	16	19.4	109.3
	23	0000	T.D.	992	16	19.9	109.8
		0600	T.D.	992	16	20.5	110.1
		1200	T.D.	992	16	20.6	110.3
		1800	T.D.	995	13	20.9	110.3
	24	0000	T.D.	995	13	21.9	110.1
		0300	T.D. 消散 Dissipated	995	13	22.3	109.5

LOW: 低壓區 Low Pressue Area

強烈熱帶風暴安比(1810)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM AMPIL (1810)

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	18	1200	T.D.	996	13	19.2	129.3
		1800	T.D.	994	16	19.7	130.3
	19	0000	T.S.	992	18	20.2	131.2
		0600	T.S.	990	21	20.7	131.7
		1200	T.S.	990	21	21.6	131.5
		1800	T.S.	988	23	22.3	131.1
	20	0000	T.S.	988	23	22.6	130.7
		0600	T.S.	988	23	23.1	130.5
		1200	S.T.S.	982	25	24.5	130.1
		1800	S.T.S.	982	25	25.4	129.3
	21	0000	S.T.S.	982	25	26.6	127.9
		0600	S.T.S.	982	25	27.9	126.3
		1200	S.T.S.	982	25	28.9	125.7
		1800	S.T.S.	982	25	30.1	124.3
	22	0000	S.T.S.	982	25	30.6	122.7
		0600	T.S.	988	23	31.8	121.7
		1200	T.S.	990	21	32.6	120.9
		1800	T.S.	990	21	33.6	119.9
	23	0000	T.S.	992	18	34.3	119.1
		0600	T.S.	992	18	35.2	118.6
		1200	T.S.	992	18	36.5	117.8
		1800	T.D.	994	16	37.6	117.1
	24	0000	T.D.	994	16	38.7	117.2
		0600	T.D. 變為溫帶氣旋 Became Extratropical	996	13	39.9	118.3

熱帶低氣壓(由七月二十一日至二十三日)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION OF 21 - 23 JULY

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	0300	T.D.	998	13	18.2	119.2
		0600	T.D.	998	13	18.5	119.7
		1200	T.D.	998	13	19.0	120.7
		1800	T.D.	996	16	19.9	122.0
	22	0000	T.D.	996	16	21.0	122.7
		0600	T.D.	996	16	22.2	123.5
		1200	T.D.	996	16	23.5	123.9
		1800	T.D.	996	16	24.5	123.5
	23	0000	T.D. 消散 Dissipated	998	13	26.0	123.4

強烈熱帶風暴悟空(1811)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM WUKONG (1811)

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	22	1200	T.D.	1004	13	23.8	159.6
		1800	T.D.	1000	16	24.4	159.2
	23	0000	T.D.	1000	16	25.2	159.2
		0600	T.D.	1000	16	26.2	159.2
		1200	T.S.	996	18	27.1	159.4
		1800	T.S.	992	21	28.1	159.2
	24	0000	T.S.	988	23	29.1	159.1
		0600	T.S.	988	23	30.0	158.9
		1200	T.S.	988	23	30.9	158.6
		1800	T.S.	988	23	31.6	158.3
	25	0000	S.T.S.	984	25	32.5	158.1
		0600	S.T.S.	980	28	33.9	157.9
		1200	S.T.S.	984	25	35.3	157.3
		1800	T.S.	988	23	37.0	156.3
	26	0000	T.S.	988	23	38.3	154.7
		0600	T.S.	992	21	39.4	154.0
		1200	T.S. 變為溫帶氣旋 Became Extratropical	996	18	39.8	153.4

颱風雲雀(1812)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON JONGDARI (1812)

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	24	1800	T.D.	1000	13	20.3	136.7
	25	0000	T.S.	994	18	20.9	136.6
		0600	T.S.	990	21	21.7	137.1
		1200	T.S.	988	23	21.9	137.3
		1800	T.S.	988	23	22.1	137.5
	26	0000	S.T.S.	984	25	22.2	138.3
		0600	S.T.S.	984	25	22.7	139.1
		1200	T.	970	33	23.3	140.2
		1800	T.	970	33	24.0	141.1
	27	0000	T.	960	39	24.8	142.4
		0600	T.	960	39	26.4	143.8
		1200	T.	960	39	28.3	144.6
		1800	T.	960	39	30.3	144.3
	28	0000	T.	960	39	32.4	143.1
		0600	T.	960	39	33.9	140.6
		1200	T.	965	36	34.2	138.3
		1800	S.T.S.	975	31	34.7	135.9
	29	0000	T.S.	988	23	34.5	133.1
		0600	T.S.	990	21	34.1	131.7
		1200	T.S.	994	18	33.2	130.5
		1800	T.S.	994	18	32.0	129.7
	30	0000	T.S.	994	18	30.9	129.7
		0600	T.S.	994	18	30.3	129.8
		1200	T.S.	994	18	29.2	130.5
		1800	T.S.	994	18	28.8	130.6
	31	0000	T.S.	994	18	29.6	132.0
		0600	T.S.	994	18	30.6	131.5
		1200	T.S.	994	18	30.9	130.4
		1800	T.S.	994	18	30.8	128.8
八月 AUG	1	0000	T.S.	994	18	30.2	128.0
		0600	T.S.	994	18	29.7	127.0
		1200	T.D.	996	16	29.0	126.6
		1800	T.D.	996	16	28.4	126.3
	2	0000	T.S.	994	18	28.4	126.4
		0600	T.S.	990	21	29.5	126.7
		1200	T.S.	990	21	30.4	125.1
		1800	T.S.	990	21	30.7	122.8
	3	0000	T.S.	990	21	30.6	121.6
		0600	T.S.	994	18	30.9	121.1
		1200	T.D.	996	16	32.0	120.3
			消散 Dissipated				

颱風珊珊(1813)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON SHANSHAN (1813)

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	2	1200	T.D.	1002	13	17.7	151.8
		1800	T.D.	1000	16	17.7	151.3
	3	0000	T.S.	998	18	17.7	150.9
		0600	T.S.	998	18	18.0	150.6
		1200	T.S.	992	21	18.2	150.3
		1800	S.T.S.	985	25	18.9	150.0
	4	0000	S.T.S.	985	25	20.1	149.3
		0600	S.T.S.	975	31	20.9	148.7
		1200	T.	970	33	21.6	148.4
		1800	T.	965	36	22.5	147.7
	5	0000	T.	965	36	22.9	147.4
		0600	T.	965	36	23.8	147.5
		1200	T.	965	36	24.7	147.3
		1800	T.	965	36	25.6	146.7
	6	0000	T.	965	36	26.5	146.2
		0600	T.	965	36	27.5	146.0
		1200	T.	965	36	28.5	145.7
		1800	T.	965	36	29.7	145.0
	7	0000	T.	965	36	30.4	144.3
		0600	T.	955	41	31.2	143.9
		1200	T.	960	39	32.0	143.2
		1800	T.	960	39	32.6	142.2
	8	0000	T.	965	36	33.3	141.9
		0600	T.	970	33	33.8	141.2
		1200	T.	970	33	34.5	141.3
		1800	T.	970	33	35.3	141.0
	9	0000	S.T.S.	975	31	36.2	141.1
		0600	S.T.S.	980	28	37.3	141.4
		1200	S.T.S.	985	25	37.8	142.5
		1800	T.S.	988	23	39.1	144.1
	10	0000	T.S. 變為溫帶氣旋 Became Extratropical	992	21	40.0	147.2

熱帶風暴摩羯(1814)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM YAGI (1814)

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	7	0000	T.D.	996	16	19.0	133.2
		0600	T.D.	996	16	18.8	132.5
		1200	T.D.	996	16	18.8	132.4
		1800	T.D.	996	16	19.1	132.5
	8	0000	T.D.	996	16	19.1	132.4
		0600	T.S.	992	18	19.5	133.5
		1200	T.S.	992	18	19.9	134.0
		1800	T.S.	992	18	20.4	134.1
	9	0000	T.S.	992	18	21.0	133.8
		0600	T.S.	992	18	21.2	133.2
		1200	T.S.	992	18	21.3	133.1
		1800	T.S.	992	18	22.0	133.1
	10	0000	T.S.	992	18	22.8	132.2
		0600	T.S.	992	18	22.8	132.0
		1200	T.S.	992	18	23.3	132.0
		1800	T.S.	992	18	24.3	130.8
	11	0000	T.S.	992	18	25.0	129.7
		0600	T.S.	992	18	25.2	128.0
		1200	T.S.	990	21	25.0	126.8
		1800	T.S.	990	21	25.2	125.7
	12	0000	T.S.	990	21	25.4	124.5
		0600	T.S.	988	23	26.6	123.9
		1200	T.S.	988	23	27.8	122.1
		1800	T.S.	988	23	28.9	120.9
	13	0000	T.S.	992	18	30.9	119.3
		0600	T.S.	992	18	31.9	117.7
		1200	T.D.	996	16	32.8	116.8
		1800	T.D.	998	13	34.1	116.1
	14	0000	T.D.	998	13	35.7	116.4
		0600	T.D.	998	13	37.1	116.8
		1200	T.D.	998	13	37.7	117.4
		1800	T.D.	998	13	37.8	117.9
	15	0000	T.D.	996	16	38.2	119.3
		0600	T.S.	992	18	37.8	119.7
		1200	T.D.	996	16	37.2	119.2
		1800	T.D.	998	13	36.5	118.0
			消散 Dissipated				

強烈熱帶風暴貝碧嘉(1816)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM BEBINCA (1816)

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	9	0900	T.D.	996	13	17.9	111.9
		1200	T.D.	996	13	18.1	111.9
		1800	T.D.	996	13	18.7	111.8
	10	0000	T.D.	996	13	19.3	111.7
		0600	T.D.	996	13	20.0	111.1
		1200	T.D.	996	13	20.4	111.2
		1800	T.D.	994	16	20.7	111.5
	11	0000	T.D.	994	16	21.0	111.8
		0600	T.D.	994	16	22.0	112.1
		1200	T.D.	994	16	21.7	111.3
		1800	T.D.	994	16	21.2	111.3
	12	0000	T.D.	994	16	21.0	111.8
		0600	T.S.	990	18	21.1	112.3
		1200	T.S.	990	18	20.7	112.2
		1800	T.S.	988	21	20.6	112.6
	13	0000	T.S.	988	21	20.6	112.8
		0600	T.S.	988	21	20.6	113.1
		1200	T.S.	984	23	20.6	113.3
		1800	T.S.	984	23	20.6	113.6
	14	0000	T.S.	984	23	20.8	113.8
		0600	T.S.	984	23	21.0	113.7
		1200	T.S.	984	23	21.0	113.5
		1800	T.S.	984	23	21.0	112.8
	15	0000	S.T.S.	980	25	20.8	111.9
		0600	S.T.S.	980	25	20.9	111.6
		1200	S.T.S.	980	25	20.9	110.7
		1800	T.S.	990	21	20.5	109.7
	16	0000	T.S.	984	23	20.3	108.6
		0600	S.T.S.	980	25	20.0	107.9
		1200	S.T.S.	980	25	19.8	107.1
		1800	S.T.S.	980	25	19.6	106.4
	17	0000	T.S.	988	21	19.5	105.6
		0600	T.D.	994	16	19.3	104.0
			消散 Dissipated				

強烈熱帶風暴麗琵(1815)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM LEEPI (1815)

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	1200	T.D.	1002	16	20.2	143.6
		1800	T.S.	998	21	20.9	143.6
	12	0000	T.S.	998	21	21.6	142.8
		0600	T.S.	998	21	22.9	141.9
		1200	T.S.	998	21	23.5	141.5
		1800	T.S.	996	23	24.4	140.5
	13	0000	T.S.	996	23	25.4	139.8
		0600	S.T.S.	994	25	26.4	138.5
		1200	S.T.S.	994	25	26.9	138.0
		1800	S.T.S.	994	25	28.4	137.0
	14	0000	S.T.S.	994	25	29.3	136.0
		0600	S.T.S.	994	25	30.5	135.0
		1200	T.S.	996	23	31.4	133.3
		1800	T.S.	1000	18	32.5	131.4
	15	0000	T.D.	1002	16	34.0	130.2
			消散 Dissipated				

熱帶風暴赫克托(1817)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM HECTOR (1817)

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	13	1800	T.S.	995	21	25.8	179.3
	14	0000	T.S.	995	21	26.3	177.0
		0600	T.S.	998	18	26.6	175.7
		1200	T.S.	998	18	26.9	174.4
		1800	T.D.	1000	16	27.7	172.6
	15	0000	T.D.	1002	13	29.0	171.0
			消散 Dissipated				

熱帶風暴溫比亞(1818)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM RUMBIA (1818)

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	15	0000	T.D.	990	16	27.0	127.3
		0600	T.S.	994	18	28.1	127.1
		1200	T.S.	994	18	29.2	125.9
		1800	T.S.	994	18	29.7	124.9
	16	0000	T.S.	994	18	29.8	124.8
		0600	T.S.	990	21	30.0	124.4
		1200	T.S.	984	23	30.5	123.2
		1800	T.S.	984	23	30.3	122.0
	17	0000	T.S.	984	23	31.1	120.4
		0600	T.S.	988	21	31.9	118.7
		1200	T.S.	990	18	31.8	117.3
		1800	T.D.	990	16	32.0	116.2
	18	0000	T.D.	992	16	32.5	115.3
		0600	T.D.	994	13	32.7	114.7
			消散 Dissipated				

強颱風蘇力(1819)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TYPHOON SOULIK (1819)

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	15	2100	T.D.	998	16	14.6	143.4
	16	0000	T.S.	994	18	15.4	142.3
		0600	T.S.	994	18	17.1	142.3
		1200	T.S.	994	18	18.4	141.7
		1800	S.T.S.	984	25	20.0	141.3
	17	0000	S.T.S.	984	25	21.4	140.6
		0600	S.T.S.	980	28	22.8	140.4
		1200	S.T.S.	975	31	23.8	140.1
		1800	T.	970	33	24.1	139.8
	18	0000	T.	965	36	24.5	139.9
		0600	T.	960	39	24.8	140.1
		1200	S.T.	950	43	24.8	140.0
		1800	S.T.	950	43	24.9	139.9
	19	0000	S.T.	945	46	25.0	139.1
		0600	S.T.	945	46	25.1	138.7
		1200	S.T.	945	46	25.2	138.3
		1800	S.T.	945	46	25.6	137.3
	20	0000	S.T.	945	46	25.8	136.5
		0600	S.T.	945	46	26.1	135.5
		1200	S.T.	945	46	26.4	134.4
		1800	S.T.	945	46	27.1	133.3
	21	0000	S.T.	945	46	27.6	132.2
		0600	S.T.	945	46	28.5	131.0
		1200	S.T.	945	46	29.1	129.8
		1800	S.T.	945	46	29.8	128.6
	22	0000	S.T.	950	43	30.4	127.7
		0600	S.T.	950	43	31.1	126.8
		1200	T.	955	41	32.0	126.1
		1800	T.	960	39	32.6	125.8
	23	0000	T.	970	33	33.3	125.6
		0600	T.	970	33	33.9	125.8
		1200	S.T.S.	975	31	34.7	126.4
		1800	S.T.S.	980	28	35.8	127.3
	24	0000	S.T.S.	984	25	37.3	129.0
		0600	S.T.S.	984	25	38.1	130.2
		1200	T.S. 變為溫帶氣旋 Became Extratropical	990	23	40.1	131.8

強颱風西馬侖(1820)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TYPHOON CIMARON (1820)

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	18	0000	T.D.	1002	16	13.3	154.6
		0600	T.D.	1002	16	13.5	154.3
		1200	T.S.	998	18	13.6	154.4
		1800	T.S.	998	18	14.1	153.6
	19	0000	T.S.	990	21	15.0	152.6
		0600	T.S.	990	21	15.8	151.1
		1200	S.T.S.	985	25	16.3	150.1
		1800	S.T.S.	985	25	16.7	149.7
	20	0000	S.T.S.	980	28	17.0	149.3
		0600	S.T.S.	980	28	17.4	148.1
		1200	S.T.S.	980	28	18.0	147.3
		1800	S.T.S.	980	28	18.9	146.5
	21	0000	S.T.S.	975	31	20.1	144.9
		0600	T.	965	36	21.2	144.1
		1200	T.	965	36	22.0	142.7
		1800	T.	955	41	23.1	141.3
	22	0000	S.T.	945	46	24.2	139.9
		0600	S.T.	950	43	25.5	138.8
		1200	S.T.	950	43	26.9	137.4
		1800	S.T.	950	43	28.4	135.9
	23	0000	T.	955	41	30.0	135.1
		0600	T.	955	41	31.9	134.4
		1200	T.	960	39	33.3	134.4
		1800	T.	970	33	36.4	135.2
	24	0000	S.T.S. 變為溫帶氣旋 Became Extratropical	980	28	39.1	136.1

熱帶低氣壓(由八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 AUGUST

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	23	0300	T.D.	996	13	23.0	120.3
		0600	T.D.	994	16	23.4	120.4
		1200	T.D.	994	16	23.8	120.5
		1800	T.D.	994	16	24.1	120.5
	24	0000	T.D.	994	16	24.2	120.4
		0600	T.D.	994	16	24.4	120.7
		1200	T.D.	996	13	24.8	120.3
		1800	T.D.	996	13	25.0	120.0
	25	0000	T.D.	996	13	25.4	119.6
			消散 Dissipated				

超強颱風飛燕(1821)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON JEBI (1821)

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	1200	T.D.	1004	16	13.6	158.9
		1800	T.D.	1004	16	14.6	157.9
	28	0000	T.S.	1002	18	15.4	157.0
		0600	T.S.	1000	21	16.2	156.3
		1200	T.S.	1000	21	16.6	155.6
		1800	S.T.S.	990	25	16.7	154.4
	29	0000	S.T.S.	980	28	17.0	153.5
		0600	T.	970	33	17.3	152.3
		1200	T.	965	36	17.3	151.4
		1800	T.	955	41	17.4	150.5
	30	0000	T.	955	41	17.6	149.1
		0600	S.T.	950	43	17.7	148.1
		1200	S.T.	950	43	17.8	146.9
		1800	SuperT	930	54	17.8	145.4
	31	0000	SuperT	920	59	17.9	144.2
		0600	SuperT	920	59	18.2	142.5
		1200	SuperT	915	61	18.5	141.4
		1800	SuperT	915	61	19.1	140.3
九月 SEP	1	0000	SuperT	910	64	19.6	139.2
		0600	SuperT	910	64	20.4	138.2
		1200	SuperT	920	59	21.0	137.3
		1800	SuperT	925	57	21.8	136.5
	2	0000	SuperT	925	57	22.7	135.8
		0600	SuperT	930	54	23.6	134.9
		1200	SuperT	930	54	24.6	134.3
		1800	SuperT	935	52	25.5	133.7
	3	0000	S.T.	945	46	26.6	133.2
		0600	S.T.	945	46	27.6	132.6
		1200	S.T.	945	46	28.6	132.5
		1800	S.T.	945	46	30.3	133.0
	4	0000	S.T.	945	46	32.3	133.9
		0600	S.T.	950	43	35.6	135.7
		1200	T.	970	33	38.7	138.2
			變為溫帶氣旋 Became Extratropical				

超強颱風山竹(1822)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON MANGKHUT (1822)

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	7	0600	T.D.	1000	13	12.2	166.3
		1200	T.D.	996	16	12.9	165.5
		1800	T.S.	994	18	13.0	163.9
	8	0000	T.S.	994	18	13.6	162.3
		0600	T.S.	990	21	14.3	161.0
		1200	T.S.	988	23	14.5	159.2
		1800	S.T.S.	984	25	14.6	157.2
	9	0000	T.	970	33	14.8	155.0
		0600	T.	970	33	15.3	152.9
		1200	T.	965	36	15.1	151.2
		1800	T.	955	41	14.6	149.1
	10	0000	T.	955	41	14.4	147.3
		0600	T.	955	41	14.3	145.4
		1200	S.T.	950	43	14.2	144.1
		1800	S.T.	945	46	14.0	142.6
	11	0000	SuperT	935	52	14.0	141.2
		0600	SuperT	925	57	13.9	139.8
		1200	SuperT	915	61	13.7	138.6
		1800	SuperT	910	64	14.0	137.3
	12	0000	SuperT	905	67	13.9	136.2
		0600	SuperT	905	67	13.9	135.1
		1200	SuperT	905	67	14.2	133.9
		1800	SuperT	905	67	14.4	132.5
	13	0000	SuperT	905	67	14.5	131.3
		0600	SuperT	905	67	14.7	130.1
		1200	SuperT	905	67	14.9	128.9
		1800	SuperT	905	67	15.2	127.9
	14	0000	SuperT	905	67	15.9	127.0
		0600	SuperT	905	67	16.7	125.6
		1200	SuperT	905	67	17.4	124.1
		1800	SuperT	900	69	18.0	122.3
	15	0000	SuperT	930	59	18.1	120.7
		0600	SuperT	945	52	18.5	119.7
		1200	SuperT	945	52	19.3	118.3
		1800	SuperT	945	52	19.8	116.9
	16	0000	S.T.	950	49	20.7	115.1
		0600	S.T.	950	49	21.5	113.5
		1200	T.	965	39	22.0	111.7
		1800	S.T.S.	975	31	22.4	110.0
	17	0000	T.S.	988	23	22.8	108.6
		0600	T.D.	994	16	23.7	107.3
		0900	T.D.	998	13	24.1	106.8
			消散 Dissipated				

熱帶風暴百里嘉(1823)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM BARIJAT (1823)

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	10	0000	T.D.	1004	13	21.5	121.8
		0600	T.D.	1000	16	21.3	121.3
		1200	T.D.	1000	16	21.6	121.0
		1800	T.D.	1000	16	21.3	119.8
	11	0000	T.S.	998	18	20.9	118.5
		0600	T.S.	998	18	20.8	118.1
		1200	T.S.	998	18	20.7	117.4
		1800	T.S.	998	18	20.6	116.4
	12	0000	T.S.	998	18	20.7	115.5
		0600	T.S.	998	18	21.0	114.5
		1200	T.S.	992	23	20.9	113.5
		1800	T.S.	992	23	20.8	112.2
	13	0000	T.S.	992	23	21.2	110.7
		0600	T.D. 消散 Dissipated	1004	13	21.7	109.5

超強颱風潭美(1824)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON TRAMI (1824)

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	21	1200	T.D.	1000	16	15.4	142.6
		1800	T.S.	992	21	15.5	141.7
	22	0000	T.S.	988	23	16.0	140.5
		0600	S.T.S.	984	25	16.4	139.2
		1200	S.T.S.	980	28	16.9	137.7
		1800	S.T.S.	975	31	17.0	136.3
	23	0000	T.	965	36	17.0	135.1
		0600	T.	960	39	17.2	134.2
		1200	S.T.	940	46	17.5	133.3
		1800	S.T.	935	49	18.1	132.2
	24	0000	SuperT	930	52	18.5	131.3
		0600	SuperT	925	54	18.9	130.4
		1200	SuperT	920	57	19.3	129.7
		1800	SuperT	910	61	19.6	129.1
	25	0000	SuperT	910	61	19.6	128.7
		0600	SuperT	910	61	19.8	128.8
		1200	SuperT	920	57	20.0	128.8
		1800	SuperT	930	52	20.3	128.9
	26	0000	SuperT	930	52	20.6	129.0
		0600	S.T.	935	49	20.9	129.2
		1200	S.T.	935	49	21.3	129.2
		1800	S.T.	940	46	21.4	129.1
	27	0000	S.T.	940	46	21.5	129.1
		0600	S.T.	945	43	21.6	129.0
		1200	S.T.	945	43	21.8	128.8
		1800	S.T.	945	43	22.3	128.4
	28	0000	S.T.	945	43	22.5	127.8
		0600	S.T.	945	43	23.1	127.4
		1200	S.T.	945	43	23.8	126.9
		1800	S.T.	945	43	24.6	126.7
	29	0000	S.T.	945	43	25.3	126.8
		0600	S.T.	945	43	26.4	127.4
		1200	T.	955	41	27.7	128.4
		1800	T.	950	41	29.1	129.4
	30	0000	T.	950	41	30.5	131.1
		0600	T.	950	41	32.3	132.8
		1200	T.	950	41	34.2	136.0
		1800	T.	970	36	36.9	139.8
			變為溫帶氣旋 Became Extratropical				

超強颱風康妮(1825)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON KONG-REY (1825)

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	28	1800	T.D.	1000	13	10.7	146.5
	29	0000	T.D.	998	16	11.7	144.5
		0600	T.D.	998	16	12.0	143.0
		1200	T.S.	995	18	12.6	141.5
		1800	T.S.	988	23	13.0	139.9
	30	0000	S.T.S.	984	25	13.5	139.0
		0600	S.T.S.	975	31	14.4	138.0
		1200	T.	970	33	14.9	137.3
		1800	T.	960	39	15.5	136.5
十月 OCT	1	0000	S.T.	950	43	15.6	135.8
		0600	S.T.	945	46	16.1	135.2
		1200	SuperT	935	52	16.8	134.4
		1800	SuperT	920	59	17.2	133.6
	2	0000	SuperT	910	64	17.6	132.7
		0600	SuperT	910	64	18.1	132.1
		1200	SuperT	915	61	18.9	131.2
		1800	SuperT	920	59	19.5	130.4
	3	0000	SuperT	930	54	20.1	129.8
		0600	SuperT	935	52	20.8	129.1
		1200	S.T.	945	46	21.6	128.7
		1800	T.	955	41	22.5	128.1
	4	0000	T.	960	39	23.3	127.6
		0600	T.	960	39	24.4	127.1
		1200	T.	965	36	25.4	126.6
		1800	T.	965	36	26.7	126.1
	5	0000	T.	970	33	28.0	125.8
		0600	T.	970	33	29.4	125.8
		1200	T.	970	33	31.4	126.0
		1800	T.	970	33	32.7	126.5
	6	0000	S.T.S.	975	31	34.7	128.2
		0600	S.T.S.	980	28	37.1	130.4
		1200	S.T.S.	980	28	38.7	133.3
		1800	S.T.S. 變為溫帶氣旋 Became Extratropical	984	25	41.0	137.0

超強颱風玉兔(1826)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SUPER TYPHOON YUTU (1826)

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	21	0600	T.D.	1004	13	8.4	158.7
		1200	T.D.	1002	16	8.5	157.8
		1800	T.S.	998	18	8.8	156.9
	22	0000	T.S.	998	18	9.2	155.8
		0600	T.S.	995	21	10.0	155.0
		1200	T.S.	990	23	10.9	154.0
		1800	S.T.S.	985	25	11.4	152.6
	23	0000	S.T.S.	975	31	11.8	151.5
		0600	T.	965	36	11.9	150.7
		1200	T.	955	41	12.0	149.6
		1800	S.T.	940	49	12.7	148.9
	24	0000	SuperT	925	57	13.3	148.0
		0600	SuperT	905	67	14.0	147.1
		1200	SuperT	900	69	14.7	146.2
		1800	SuperT	905	67	15.3	145.2
	25	0000	SuperT	905	67	15.8	144.2
		0600	SuperT	905	67	15.9	143.2
		1200	SuperT	910	64	16.3	142.4
		1800	SuperT	915	61	16.5	141.4
	26	0000	SuperT	915	61	16.8	140.3
		0600	SuperT	915	61	16.9	139.0
		1200	SuperT	915	61	17.2	137.6
		1800	SuperT	910	64	17.6	136.1
	27	0000	SuperT	910	64	17.6	134.7
		0600	SuperT	910	64	17.9	133.2
		1200	SuperT	910	64	18.0	132.1
		1800	SuperT	915	61	18.0	131.1
	28	0000	SuperT	920	59	18.0	130.0
		0600	SuperT	935	52	17.9	129.0
		1200	S.T.	940	49	17.8	128.0
		1800	S.T.	945	46	17.5	127.1
	29	0000	S.T.	950	43	17.0	126.2
		0600	S.T.	950	43	16.8	125.3
		1200	S.T.	950	43	16.8	124.2
		1800	S.T.	950	43	16.8	123.0
	30	0000	S.T.	950	43	16.7	121.6
		0600	T.	960	39	16.7	120.4
		1200	T.	965	36	16.8	119.3
		1800	S.T.S.	976	31	16.9	118.7
	31	0000	S.T.S.	982	28	17.4	118.0
		0600	S.T.S.	982	28	18.0	117.5
		1200	S.T.S.	982	28	18.4	117.2
		1800	S.T.S.	988	25	18.8	116.9
		2100	S.T.S.	988	25	19.4	116.8
十一月 NOV	1	0000	S.T.S.	988	25	19.7	116.8
		0600	S.T.S.	988	25	20.1	116.5
		1200	T.S.	992	23	20.4	116.5
		1800	T.S.	996	21	20.6	116.7
	2	0000	T.D.	1002	16	20.7	116.3
		0600	T.D.	1004	13	20.7	116.1
		0900	T.D.	1004	13	20.6	116.0
			消散 Dissipated				

熱帶低氣壓桃芝(1827)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL DEPRESSION TORAJI (1827)

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	0600	T.D.	1002	13	10.2	111.7
		1200	T.D.	1002	13	10.5	111.0
		1800	T.D.	1000	16	10.7	110.5
	18	0000	T.D.	1000	16	11.1	110.1
		0600	T.D.	1002	13	11.6	109.3
			消散 Dissipated				

強烈熱帶風暴天兔(1829)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF SEVERE TROPICAL STORM USAGI (1829)

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	20	0000	T.D.	1002	13	10.8	128.7
		0600	T.D.	1002	13	10.5	127.3
		1200	T.D.	1002	13	10.7	126.6
		1800	T.D.	1002	13	10.9	125.6
	21	0000	T.D.	1002	13	10.9	123.5
		0600	T.D.	1002	13	10.5	121.8
		1200	T.D.	1002	13	10.5	120.3
		1800	T.D.	1002	13	10.6	119.4
	22	0000	T.D.	1000	16	10.8	117.5
		0600	T.D.	1000	16	11.4	115.9
		1200	T.D.	1000	16	11.3	114.5
		1800	T.D.	1000	16	10.8	113.4
	23	0000	T.S.	996	18	10.7	112.7
		0600	T.S.	992	21	10.7	111.4
		1200	T.S.	988	23	10.5	110.7
		1800	T.S.	988	23	10.3	110.2
	24	0000	S.T.S.	984	25	9.9	109.6
		0600	S.T.S.	984	25	9.8	108.7
		1200	S.T.S.	984	25	9.9	108.3
		1800	S.T.S.	984	25	9.8	107.9
	25	0000	T.S.	988	23	10.1	107.5
		0600	T.S.	990	21	10.3	107.2
		1200	T.S.	996	18	10.6	106.8
		1800	T.D.	1000	16	10.8	106.8
			消散 Dissipated				

颱風萬宜(1828)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TYPHOON MAN-YI (1828)

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	20	1200	T.D.	1000	16	4.8	154.2
		1800	T.S.	998	18	6.0	152.6
	21	0000	T.S.	995	21	6.7	151.0
		0600	T.S.	995	21	7.6	149.1
		1200	T.S.	990	23	8.7	146.9
		1800	T.S.	990	23	9.6	143.9
	22	0000	S.T.S.	984	25	10.6	141.8
		0600	T.	970	33	11.7	139.8
		1200	T.	965	36	12.6	138.2
		1800	T.	955	41	13.3	137.0
	23	0000	T.	955	41	14.3	136.0
		0600	T.	955	41	15.4	135.5
		1200	T.	955	41	16.3	135.3
		1800	T.	955	41	17.3	135.2
	24	0000	T.	955	41	18.0	135.4
		0600	T.	955	41	18.2	135.7
		1200	T.	955	41	18.6	136.2
		1800	T.	955	41	18.7	136.1
	25	0000	T.	955	41	18.4	136.0
		0600	T.	960	39	18.4	135.7
		1200	T.	970	33	18.4	135.4
		1800	S.T.S.	984	25	18.9	134.0
	26	0000	S.T.S.	984	25	19.5	133.0
		0600	T.S.	990	23	20.2	132.4
		1200	T.S.	998	18	21.0	131.9
		1800	T.D.	1002	13	21.4	132.1
			消散 Dissipated				

熱帶低氣壓(由十二月二十五日至三十日)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF
TROPICAL DEPRESSION OF 25 - 30 DECEMBER

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	25	1200	T.D.	1000	13	9.0	134.8
		1800	T.D.	1000	13	9.2	133.5
	26	0000	T.D.	1000	13	9.4	133.3
		0600	T.D.	1000	13	10.1	132.2
		1200	T.D.	1000	13	10.6	131.1
		1800	T.D.	1000	13	10.6	130.1
	27	0000	T.D.	1000	13	10.6	129.4
		0600	T.D.	1000	13	10.5	129.3
		1200	T.D.	998	16	10.5	128.9
		1800	T.D.	998	16	10.7	128.5
	28	0000	T.D.	998	16	10.7	127.8
		0600	T.D.	998	16	10.7	127.8
		1200	T.D.	998	16	10.7	127.6
		1800	T.D.	998	16	10.9	126.9
	29	0000	T.D.	998	16	11.5	125.2
		0600	T.D.	1000	13	11.8	123.6
		1200	T.D.	1000	13	11.5	122.0
		1800	T.D.	1000	13	10.4	121.1
		2100	T.D.	1000	13	9.4	119.2
			消散 Dissipated				

熱帶風暴帕布(1901)的每六小時位置及強度
SIX-HOURLY POSITION AND INTENSITY DATA OF TROPICAL STORM PABUK (1901)

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	31	0600	T.D.	1002	13	7.6	112.0
		1200	T.D.	1002	13	7.8	111.8
		1800	T.D.	998	16	7.3	111.1
一月 JAN (2019)	1	0000	T.D.	998	16	6.7	110.9
		0600	T.D.	998	16	6.2	110.1
		1200	T.D.	998	16	6.0	109.7
		1800	T.D.	998	16	5.8	109.3
	2	0000	T.D.	998	16	5.8	108.6
		0600	T.D.	998	16	6.1	107.8
		1200	T.D.	998	16	6.3	107.0
		1800	T.S.	994	18	6.2	105.8
	3	0000	T.S.	994	18	6.2	104.8
		0600	T.S.	994	18	6.2	104.6
		1200	T.S.	992	21	6.4	103.8
		1800	T.S.	988	23	6.9	102.9
	4	0000	T.S.	988	23	7.8	101.6
		0600	T.S.	988	23	8.4	100.6
		1200	T.S.	988	23	8.5	99.8
		1800	T.S.	992	21	8.6	98.3
	5	0000	T.D.	998	16	8.6	98.3
		0600	T.D.	998	16	8.9	98.2
		1200	T.D.	998	16	9.5	97.7
		1800	T.D.	1002	13	10.3	96.2
	6	0000	T.D.	1002	13	10.4	95.3
		0600	T.D.	1002	13	10.9	93.3
		1200	T.D.	1002	13	11.2	92.3
		1800	T.D.	1002	13	11.6	91.7
	7	0000	T.D.	1002	13	12.3	90.6
		0600	T.D.	1002	13	12.3	90.1
			消散 Dissipated				

附件一
超強颱風山竹(1822)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，收集超強颱風山竹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。

天文台亦參考了發展局局長在二零一九年六月五日的立法會會議上就‹‹因應颱風吹襲所作準備及跟進工作››的書面回覆中的統計數據[1]。

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 909,787,790 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

因超強颱風山竹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[2]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	2,806,698,755
(ii) 僱員補償、汽車及旅遊	143,987,521

按參與調查的機構所佔的市場份額(80%)作調整，山竹保險索償數字估計為 (2,806,698,755 港元+ 143,987,521 港元) / 80% = 3,688,357,845 港元

2. 超強颱風山竹引致直接經濟損失的估算

超強颱風山竹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。

= 909,787,790 港元 + 3,688,357,845 港元

= 4,598,145,635 港元 (約 46 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。

參考

[1] 發展局局長在二零一九年六月五日的立法會會議上就‹‹因應颱風吹襲所作準備及跟進工作››的書面回覆
(https://www.info.gov.hk/gia/general/201906/05/P2019060500367.htm)
[2] 香港保險業聯會, 2019: 保險減輕自然災害造成的財產損失，2019 年 8 月 1 日新聞稿 (https://www.hkfi.org.hk/press/20190801_typhoon_chi.pdf)

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 Mangkhut (1822)

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 Mangkhut 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.

Reference was also made to the statistics from the written reply by the Secretary for Development at the Legislative Council meeting on “Preparation for and follow-up work after the onslaught of typhoons” on 5 June 2019[1].

As of 31 October 2019, the losses reported from government departments, public utilities and other organizations amount to HK$909,787,790. 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 Mangkhut in Hong Kong are provided by the Hong Kong Federation of Insurers (HKFI) based on its member surveys[2]. 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)	2,806,698,755
(ii) Employees' Compensation (EC), Motor and Travel	143,987,521

Adjusted by market share of the participating companies (80%), the insurance claims incurred by Mangkhut is estimated to be (HK$ 2,806,698,755 + HK$ 143,987,521) / 80% = HK$ 3,688,357,845

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

The estimated direct economic losses due to Mangkhut 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$ 909,787,790 + HK$ 3,688,357,845

= HK$ 4,598,145,635 (around HK$ 4.60 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.

References

[1] Written reply by the Secretary for Development at the Legislative Council meeting on "Preparation for and follow-up work after the onslaught of typhoons" on 5 June 2019. https://www.info.gov.hk/gia/general/201906/05/P2019060500373.htm
[2] HKFI, 2019 : Insurance Mitigates Public Losses Caused By Natural Hazards, Press release on 1 August 2019. https://www.hkfi.org.hk/press/20190801_typhoon_eng.pdf

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.