

3.7 強颱風卡努 (1720)：二零一七年十月十二日至十六日

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

at some selected stations are as follows:

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

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

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

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

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

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

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

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

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

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

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

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

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

啟德、沙田、打鼓嶺及青衣島蜆殼油庫的持續風力未達到強風程度。

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

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

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

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

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

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

表 3.7.3 卡努掠過期間，香港天文台總部及其他各站所錄得的日雨量

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

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

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

表 3.7.4 卡努掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

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

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

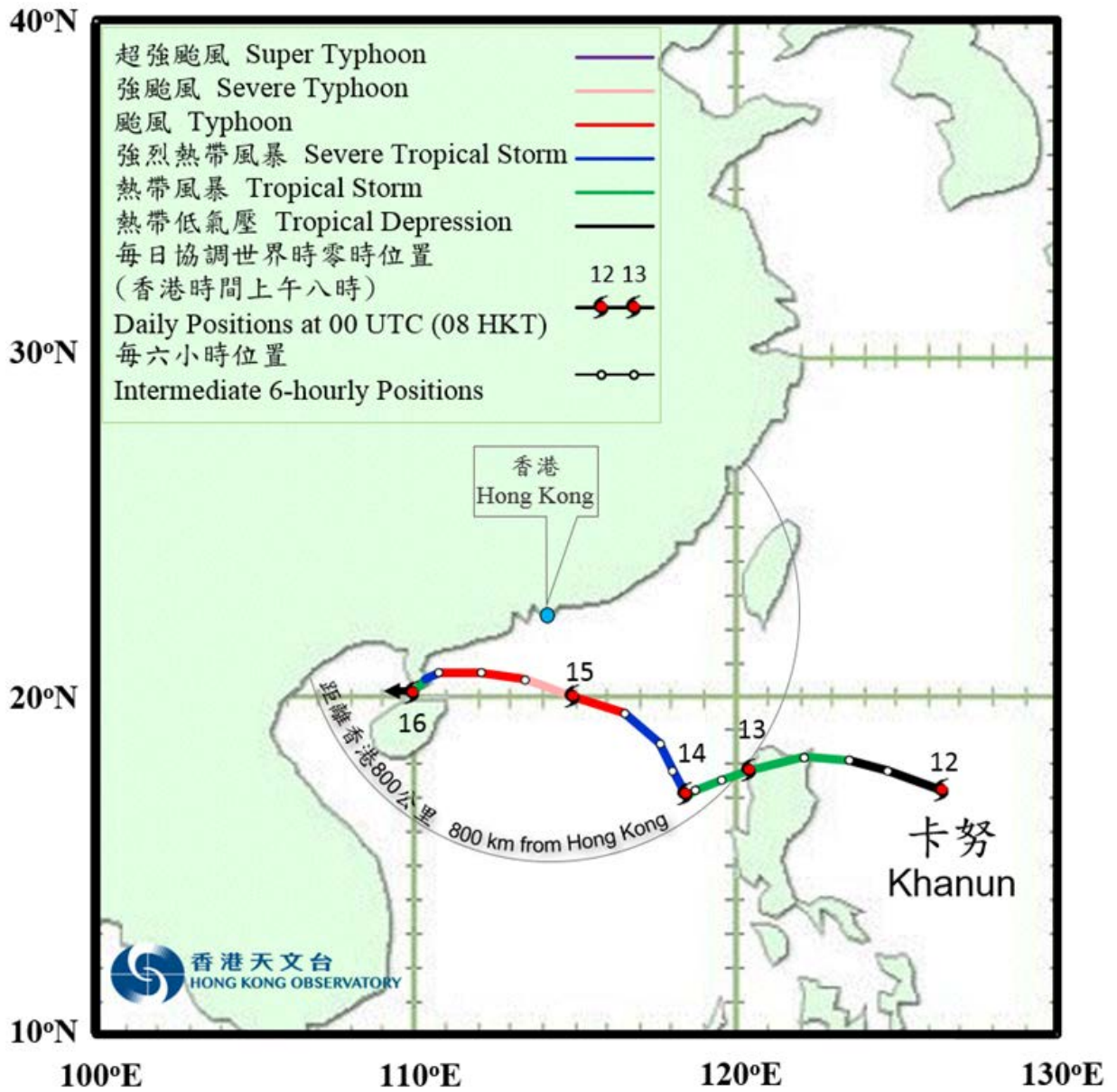


圖 3.7.1 二零一七年十月十二日至十六日卡努的路徑圖。

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

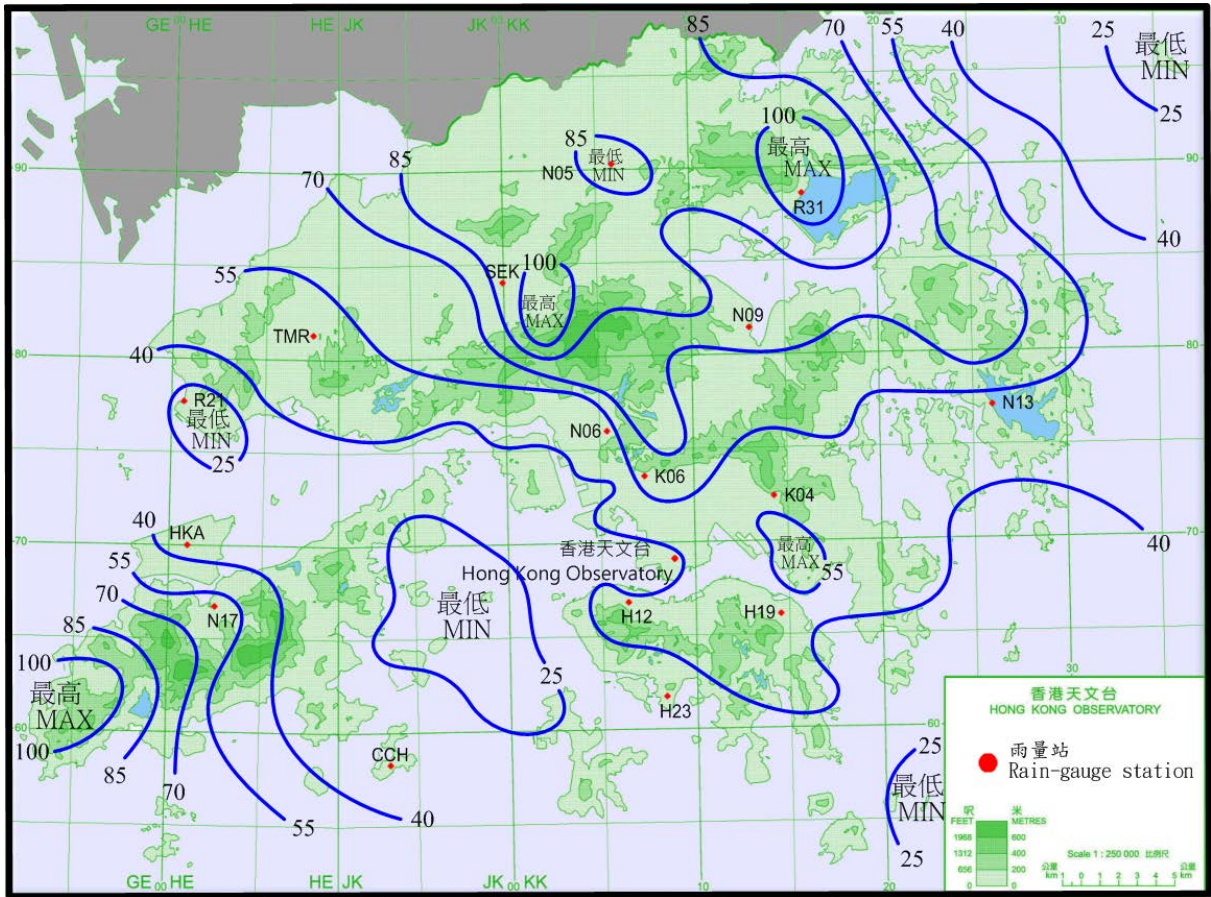


圖 3.7.2 二零一七年十月十四日至十六日的雨量分佈(等雨量線單位為毫米)。
Figure 3.7.2 Rainfall distribution on 14 - 16 October 2017 (isohyets in millimetres).

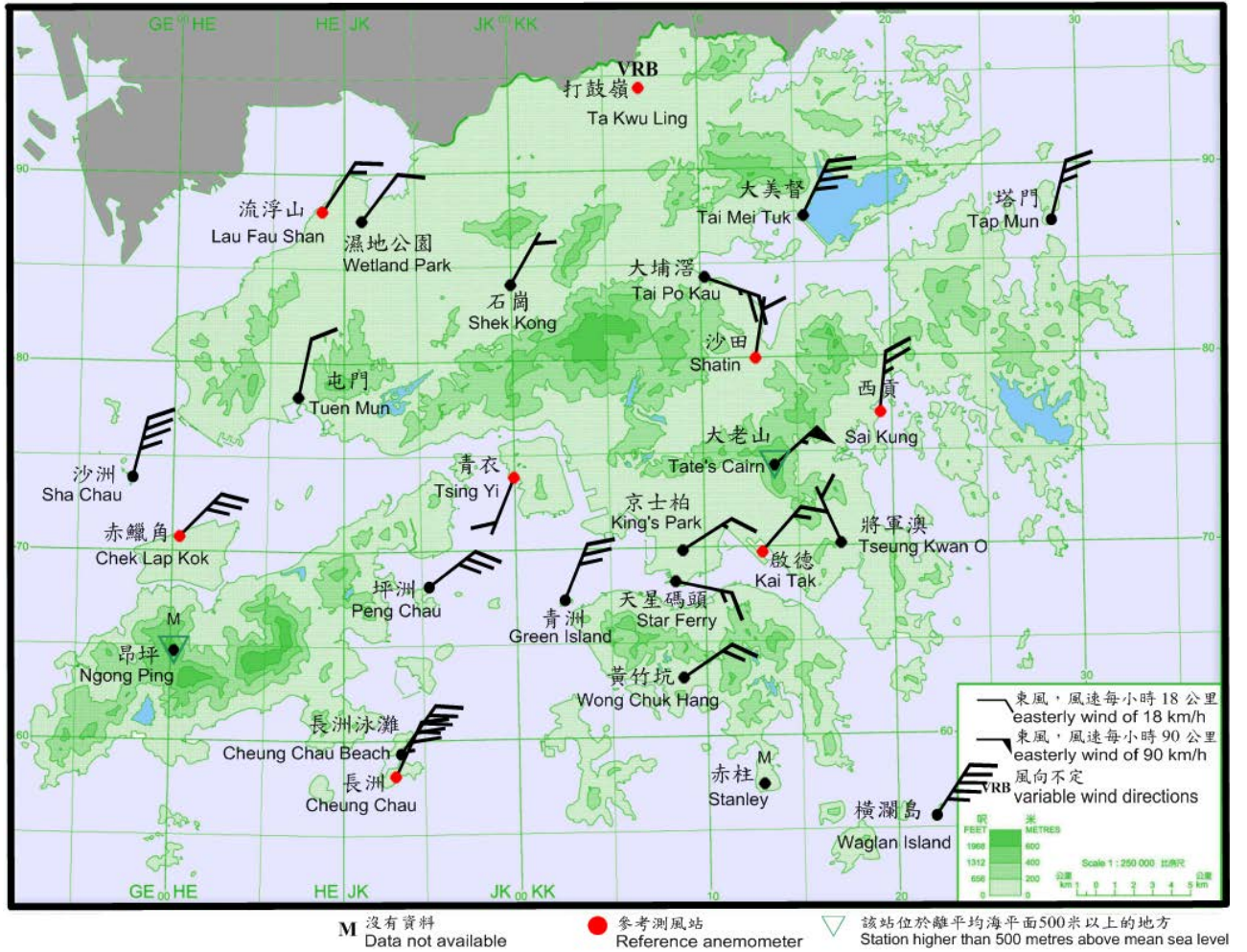


圖 3.7.3 二零一七年十月十五日下午 2 時 50 分香港各站錄得的十分鐘平均風向和風速。當時大老山風力達到暴風程度，而橫瀾島、長洲泳灘、沙洲及大美督的風力達到烈風程度。

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

註： 當時打鼓嶺錄得的十分鐘平均風速為每小時 12 公里。

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

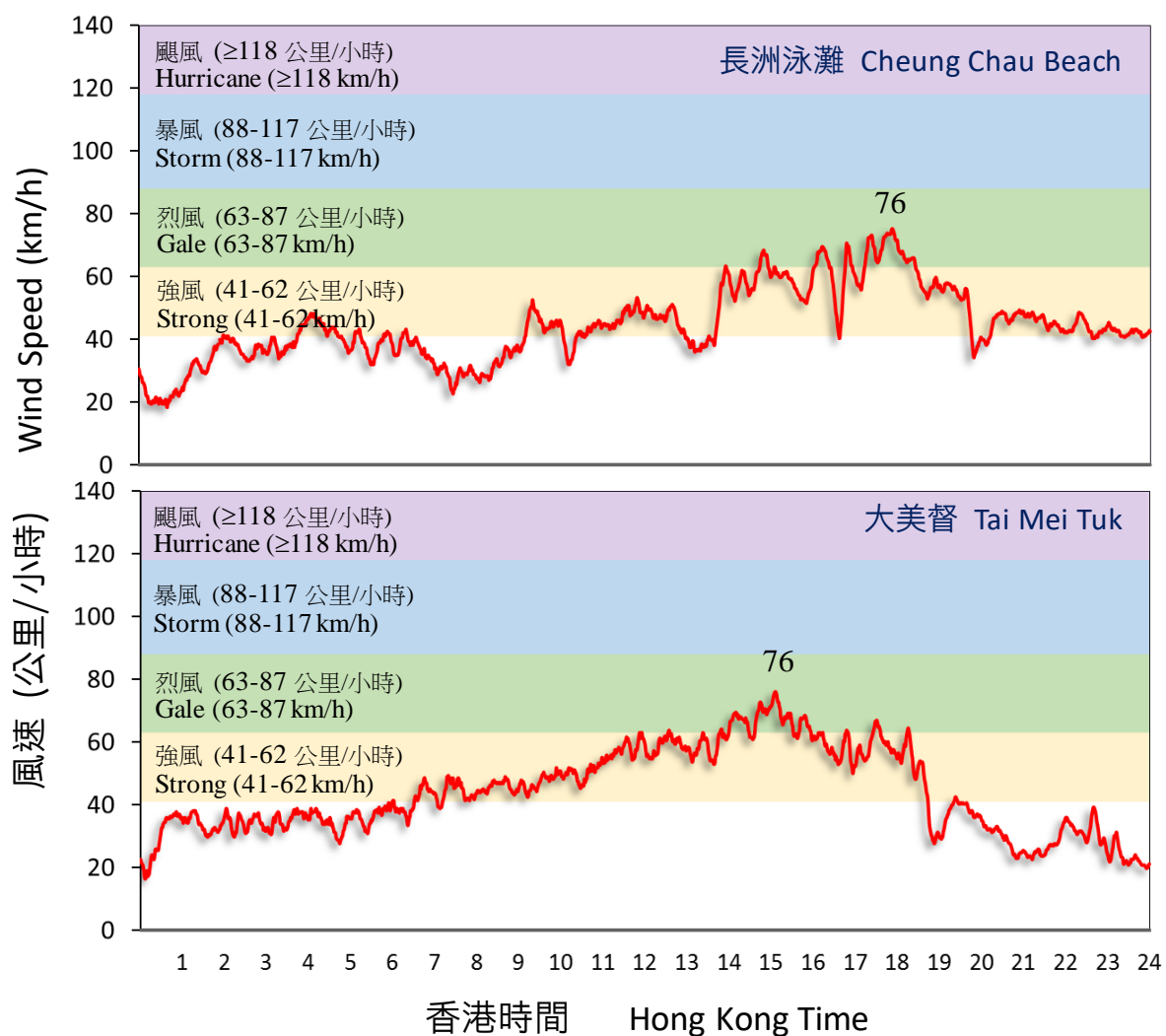


圖 3.7.4 二零一七年十月十五日長洲泳灘及大美督錄得的十分鐘風速。

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

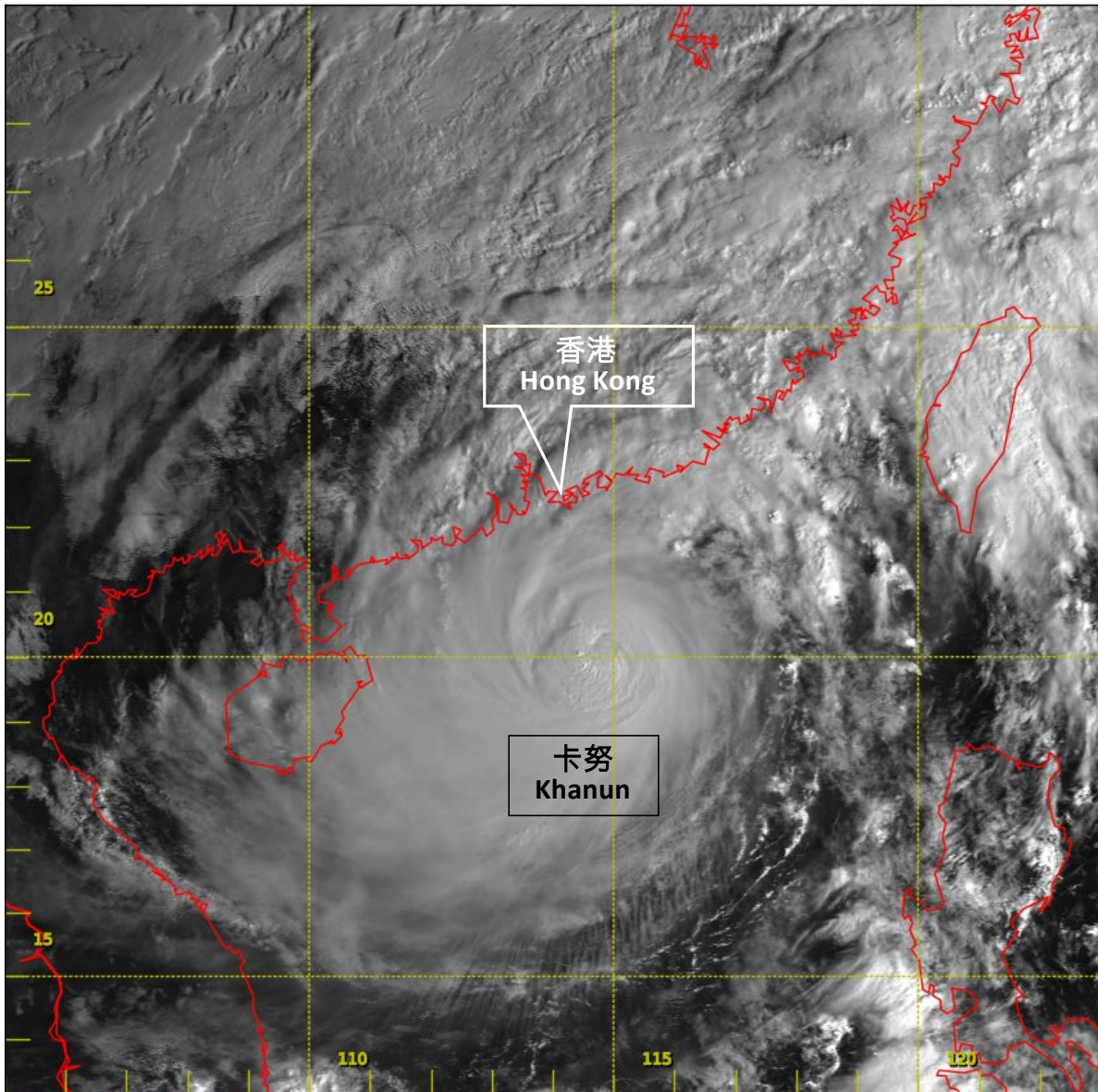


圖 3.7.5 二零一七年十月十五日上午 8 時左右的可見光衛星圖片，當時卡努達到其最高強度，中心附近最高持續風速估計為每小時 155 公里。

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

[此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。]

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

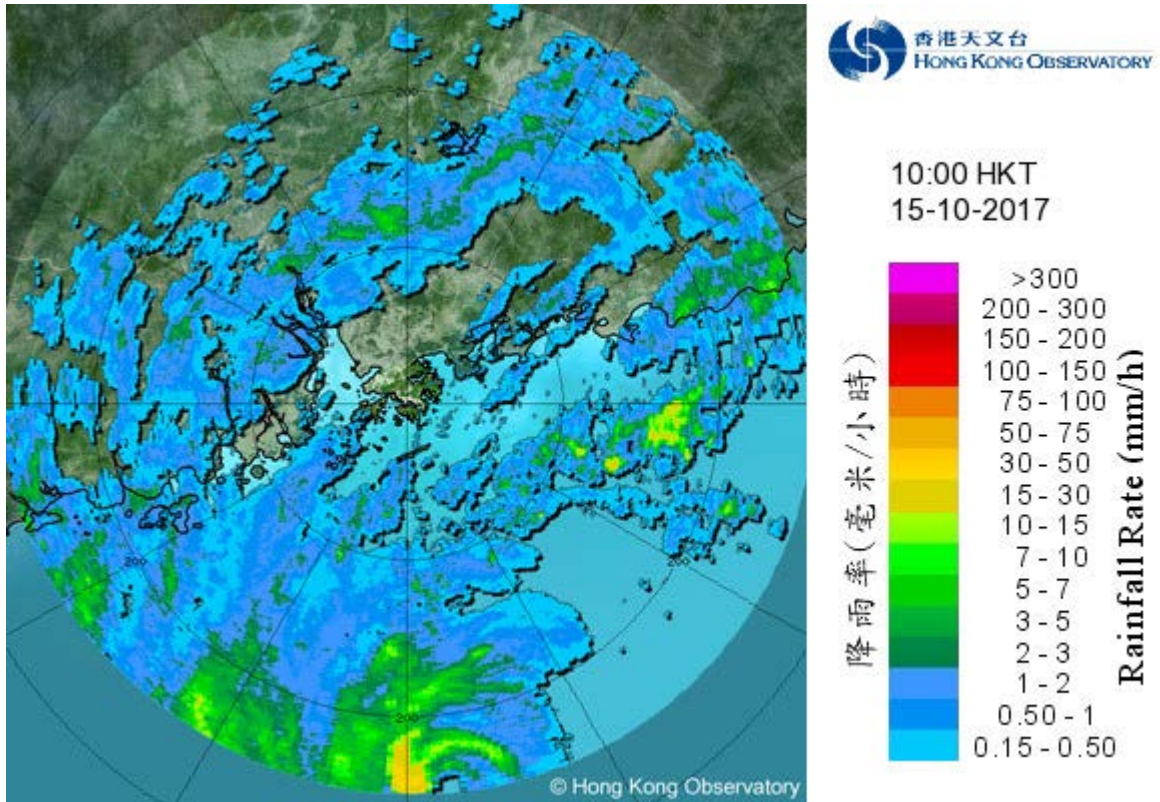


圖 3.7.6 二零一七年十月十五日上午 10 時正的雷達回波圖像，當時卡努的中心位於香港以南，與卡努相關的雨帶正影響廣東沿岸及南海北部。

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



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

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